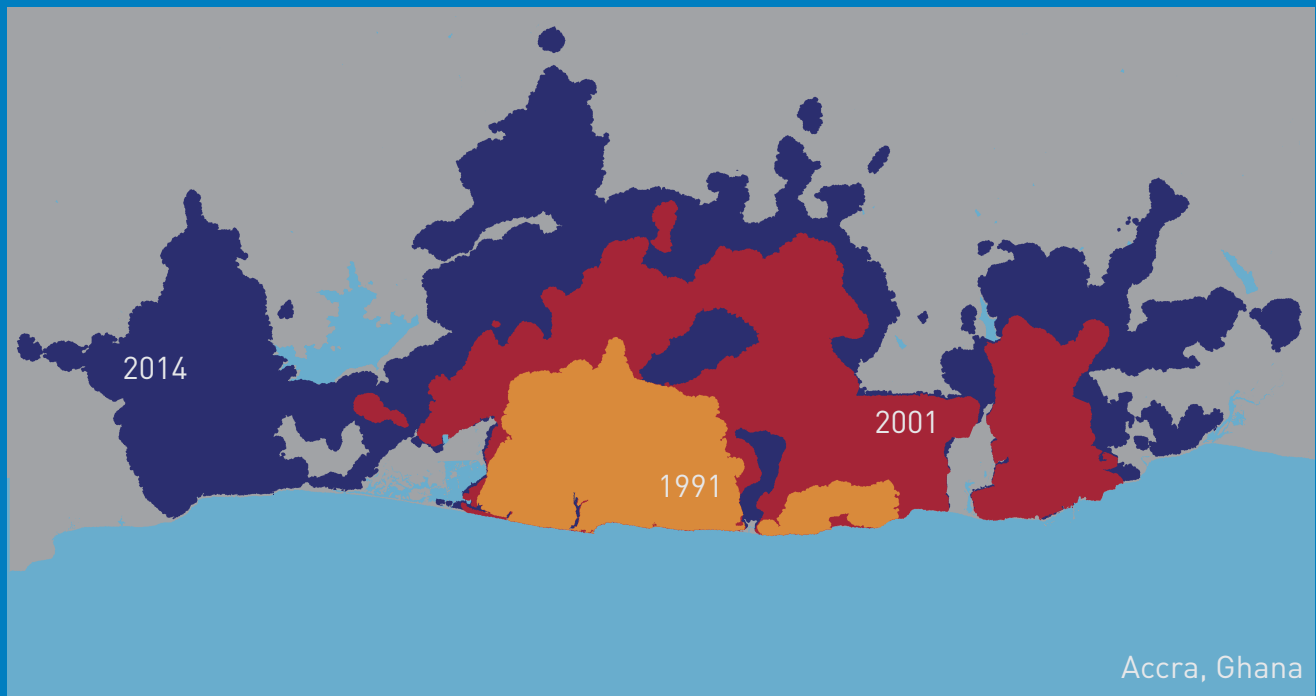


Atlas of Urban Expansion

The 2016 Edition
Volume 1: Areas and Densities



Shlomo Angel, Alejandro M. Blei, Jason Parent,
Patrick Lamson-Hall, and Nicolás Galarza Sánchez
with
Daniel L. Civco, Rachel Qian Lei and Kevin Thom

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NEW YORK UNIVERSITY



LINCOLN INSTITUTE
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CONTENTS

v	Foreward
1	Chapter 1: The Dynamics of Global Urban Expansion
9	Chapter 2: The Global Sample of 200 Cities, 1990-2014
21	Chapter 3: Understanding and Measuring Urban Expansion
33	Maps and Metrics for 200 Cities, 1990-2014
435	Table 1: Areas and Densities metrics for 200 cities: 1990-2014
477	Acknowledgments
480	Image Credits
481	References
483	Index of Cities by Country and Region
487	About the Research Partnership

FOREWARD

The *Atlas of Urban Expansion—2016 Edition* presents maps and measures of the recent, as well as the long-term, expansion of cities in an easily accessible format, providing authoritative data, information, and advice on current and emerging urbanization trends and conditions in cities the world over.

The study underlying the Atlas pushes forward the borders of the ‘science of cities’ using state-of-the-art research, satellite imagery, and novel analytical techniques to produce one of the most critical masses of urban indicators and metrics since Habitat II. Much like medical science before it, this book adopts cities as units of analysis and studies them together to discover patterns of similarities and differences among them.

UN-Habitat, the UN agency charged with overseeing, reporting, and advising on world urbanization trends and developments, has started to monitor these trends and developments with a new UN Global Sample of Cities. This sample—composed of 200 cities that statistically represent the urban world—was created, tested, and applied in a series of studies undertaken by a tri-partite collaboration between UN-Habitat, New York University, and the Lincoln Institute of Land Policy. The *Atlas of Urban Expansion—2016 Edition* is part of a broader research programme entitled *Monitoring Global Urban Expansion* that, in different products, provides maps and metrics on the growth and expansion of cities the world over, along with information regarding the quality of that expansion, the performance of the housing sector, and the state of regulatory regimes in the expansion areas of cities, the areas built between 1990 and 2014. All these studies provide globally representative evidence to substantiate and support the implementation, follow-up, and review of the city-related Sustainable Development Goals

and the New Urban Agenda.

The results of this study are quite shocking: urban growth is mostly taking place in an unplanned and disorderly manner, informality is becoming more common over time, cities are expanding their territories faster than their populations, residential densities are decreasing dramatically, public spaces and the lands allocated to streets and arterial roads are also in decline. All these are real, empirical facts, proving that the contemporary model of urbanization is becoming highly unsustainable.

The aim of this study is to provide informed analyses to policy makers, public officials, research administrators, and scientists for use in their decision-making processes. In this sense, the *Atlas of Urban Expansion* is part of the emerging ‘science of policy’ that is dedicated to the production of knowledge that best serves the public interest.

Joan Clos, Under-Secretary-General, United Nations
Executive Director, UN-Habitat
Nairobi, Kenya
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The chronicle of global urbanization that follows offers a visually stunning example of how increasingly enhanced satellite technology might be used to guide the future growth of the world’s cities. The *Atlas of Urban Expansion—The 2016 Edition* underscores a basic truth: we’ll need to do a better job managing this planet of cities over the next decades than we did during the last few. The next half-century represents our last and only opportunity to get urbanization right. As we welcome hundreds of millions of people into our cities in the coming decades, we’ll need our best tools to craft them into the cities we, and the planet, need. The *Atlas* is one of those tools.

Buttressed by survey research that connects actions on the ground with the view from space, the *Atlas* begins to articulate a more informed narrative about the relationship between land policies and urban form. Only by understanding the quality of urban growth that has occurred up to this point, and the efficacy of our efforts to manage it, can we hope to make the necessary changes in urban practice that we need to build environmentally and fiscally sustainable places.

An urban observatory based on the approach demonstrated in the *Atlas* will play an important role in monitoring the implementation of the New Urban Agenda following Habitat III in Quito, Ecuador in October 2016. It will produce a more scientific, evidence-based record of city-building—holding us, and UN member states, accountable for delivering on our commitments to create the better urban future embodied in the New Urban Agenda and the Sustainable Development Goals. We will see whether cities

are on the right track by observing from space and on the ground if cities are getting better for all of the billions of citizens inhabiting them; and not just observing, but testing hypotheses regarding what we think will work, and finding out what does.

The Lincoln Institute of Land Policy was honored to begin this work with Shlomo “Solly” Angel and his team, establishing the original online Atlas of Urban Expansion and publishing two books, *The Atlas of Urban Expansion* and *Planet of Cities*. We celebrate this next stage of this important undertaking, in partnership with New York University and UN-Habitat: *The Atlas of Urban Expansion—2016 edition*.

George W. “Mac” McCarthy
President and CEO, Lincoln Institute of Land Policy
Cambridge, Mass.
www.lincolninstitute.edu

The anti-sprawl agenda—decrying unplanned, low density, fragmented and non-compact urban expansion—has been guiding city planners for decades and we now find that the majority of cities have adopted land use plans that seek to contain their outward expansion in one form or another. This new finding raises a number of important questions: Has the expansion of cities—still propelled by urban population growth, by larger incomes that allow residents to consume more land, by inexpensive transport that allows them to travel to work over longer distances, and by resistance to the densification of built-up neighborhoods—slowed down, or even halted? Are average urban population densities increasing or decreasing? Where are the new urban areas, the areas developed during the past twenty-five years? Are these areas being properly laid out before development occurs? Are sufficient public works—be they local roads that organize neighborhoods or arterial roads that connect workers to the best jobs available to them—being put in place, or does the new urban periphery remain largely invisible to municipal officials, suffering from benign neglect?

In the past, these questions could only be answered, if at all, by studies that focused on one city in detail, on a few cities in one country, or on a few cities in a few countries, and concluding these studies with hints or implications for overall urban policy everywhere. Worse yet, researchers—attracted to cities with better data—often chose to study cities in more developed countries and then offer urban policy recipes for cities in less developed ones, where conditions—rapid rates of population growth, inadequate municipal or housing finance, and weak rule of law, for example—make the transfer of knowledge, policy prescriptions, and planning practices rather irrelevant. The observation that there will be eighteen or more new urban residents in less developed countries in the coming decades for each new urban

resident in more developed ones, makes such intellectual exports even less relevant.

The new *Atlas of Urban Expansion—2016 Edition* sheds new light on some of these questions by studying urban expansion and urban peripheries in cities the world over, be they in more developed or less developed countries, be they familiar megacities with many millions of residents or unfamiliar provincial towns with 100,000 inhabitants or more. With a new focus on a carefully chosen sample of 200 cities from the entire universe of cities—all 4,231 cities and metropolitan areas that had 100,000 people or more in 2010—it becomes possible to gather new knowledge about cities, knowledge that had thus far eluded us. The new Atlas explores a number of new data layers that pertain to this global sample of cities and that can now inform us about the universe of cities as a whole. It also offers us a new platform for studying more and more data layers in the future in a systematic manner, quickly becoming an effective tool for monitoring cities globally, a tool that will allow us to monitor the New Urban Agenda and the city-based Sustainable Development Goals in a rigorous and systematic manner in the years to come.

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CHAPTER 1

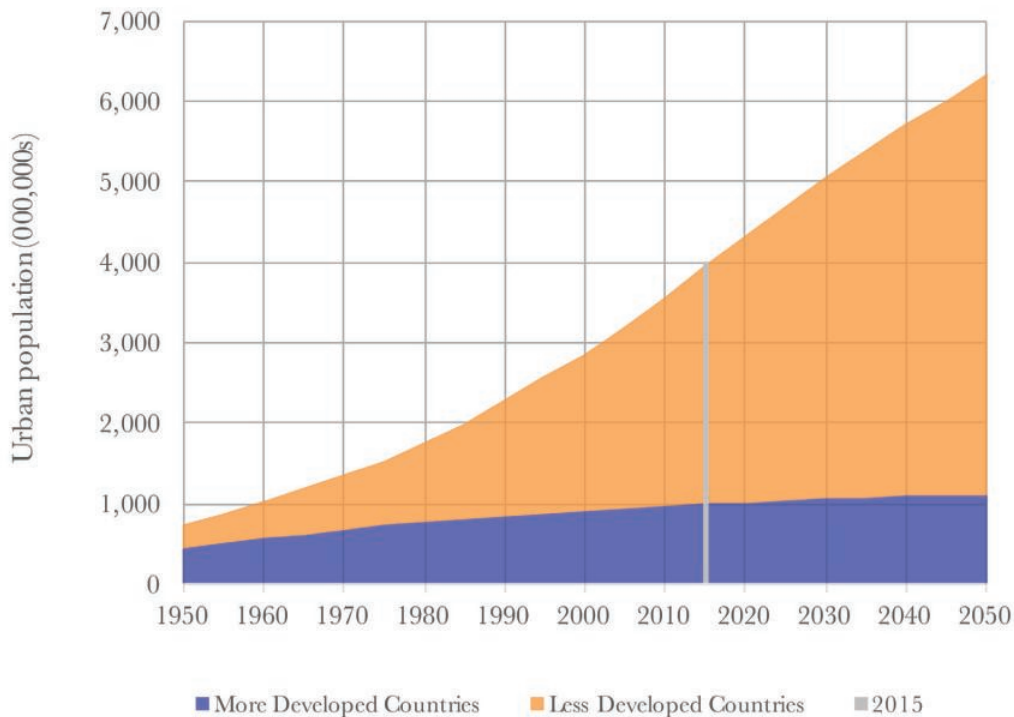
The Dynamics of Global Urban Expansion

The *Atlas of Urban Expansion—The 2016 Edition* provides maps and estimates of the dimensions and attributes of urban expansion in a global sample of 200 cities. These maps and estimates should help us examine two sets of simple questions. First, what are the physical extents of urban areas on our planet today, what are their key attributes, and how and why are they changing over time? Second, how well configured are recently built urban peripheries, and how and why are layouts changing over time? Answers to these questions, provisional as they may be, may make us all less fearful of the rapid expansion of the urban peripheries of our cities, and hence better able to confront this expansion in a meaningful way. In large part, these are not theoretical questions but rather practical ones. Allowing cities to expand simply through the cumulative acts of their residents carries heavy costs. City residents need to engage—as responsible citizens acting together in their common interest—in ensuring that urban peripheries are laid out in a timely and pragmatic manner before they are occupied, as urban communities have done many times in the past. This is a seemingly simple task that, for one reason or another, we are failing at today—as an initial inspection of the Atlas clearly shows—with serious consequences for the productivity, inclusiveness, and sustainability of our cities in the decades to come.

Humanity is in the midst of its most ambitious project, the Urbanization Project—the gradual movement of people away from being closer to the land to being closer to each other. This project, which entails accommodating increasing numbers of people in cities, started in earnest at the beginning of the eighteenth century when less than 10% of the people lived in cities, and will be largely complete by the end of the twenty-first century when three-quarters or more of humanity will live in cities. By 1950, only 30% of the world’s population resided in cities. That share increased to 54% by 2015 and is now expected to increase to 66% by 2050. The world’s urban population is expected to increase from 4.0 billion in 2015 to 6.3 billion in 2050, and almost all of this growth is expected to take place in less developed countries (figure 1.1). Cities in more developed countries will add only 130 million people to their populations during this period. Cities in less developed countries will need to absorb 18 times that number, or close to 2.3 billion people, thereby increasing their total urban population of 3.0 billion in 2015 by 75% (United Nations Population Division 2014, files 2 and 3).

FIGURE 1.1:

Increases in the urban population of more developed and less developed countries, 1950-2050



When cities grow in population and income, they grow outwards and upwards (figure 1.2). The amount of outward expansion is typically underestimated and the quality of urban layouts in expansion areas is largely unknown. The population of cities in less developed countries doubled between 1990 and 2015, for example—the time period covered in this Atlas—and their urban extents increased on average

by a factor of 3.5. In parallel, the population of cities in more developed countries increased by a factor of 1.2 between 1990 and 2015; their urban extents increased by a factor of 1.8. The areas of cities are growing at a faster rate than their populations, in part because economic development results in more consumption in general and more land consumption per capita. In fact, average urban densities in less developed countries—3.3 times higher than densities in more developed countries in 1990—declined at an average annual rate of 2.1% between 1990 and 2015. In more developed countries, densities declined at 1.5% during this period. Urban land consumption per capita in these regions—the reciprocal of density—increased at identical rates.

FIGURE 1.2:

The outward and upward growth of Panama City, Panama, 1930 – 2009



Images via: Skyscraper City, Brian Gratwicke

These trends are likely to continue in one form or another. Between 2015 and 2050, urban extents in more developed countries can be expected to increase by a factor of 1.9 at the current rate of increase in land consumption, by a factor of 1.5 at half the current rate, and by a factor of 1.1 if land consumption per capita remains constant over time. During this period, urban extents in less developed countries will increase by a factor of 3.7 at the current rate of increase in land consumption, by a factor of 2.5 at half the current rate, and by a factor of 1.8 if land consumption remains constant.

By now, it should be clear that we cannot hope to slow down the urbanization process or to shift populations among cities. People are free to move within their own countries and their right to move is

enshrined in the Universal Declaration of Human Rights.¹ We know that population growth in cities large and small cannot be guided by policy effectively. But the conversion of land from rural to urban use is very much guided and influenced by policy.

When cities grow in population and wealth they expand. As cities expand, they need to convert and prepare lands for urban use. Stated as a broad policy goal, cities need adequate lands to accommodate their growing populations and these lands need to be affordable, properly serviced, and accessible to jobs to be of optimum use to their inhabitants. To meet this goal, cities need concerted public action—action that secures adequate lands for public works and public open spaces in advance of development, for example—that precedes and guides the operation of the free market on the urban fringe. In the absence of concerted public action, land and housing markets, efficient as they may be in theory, will fail to perform properly in practice.

Indeed, an initial inspection of urban layouts in the global sample of cities suggests that most of the residential fabric in the expansion areas of cities (1990–2014), especially in less developed countries, is unplanned and disorderly, taking place in defiance of municipal plans or regulations. It suggests that the share of urban lands that are laid out before occupation is declining over time; it also suggests that the share of the areas of cities within walking distance of arterial roads is declining as well, failing to connect urban peripheries effectively to metropolitan labor markets, making cities less productive, less inclusive, and less sustainable. In many cities, not enough land is allocated to local streets, segregating neighborhoods, minimizing redundancy in route selection, and creating serious bottlenecks, all of which impede the integration of the urban fringe into the city. The share of the land allocated to streets in newly urbanized areas is also declining. Substantial areas on the urban fringe consist of large city blocks and a very small share of intersections that are 4-way, which creates traffic jams and compromises walking and biking. In addition, the average block size is increasing over time.

Yet, there is reluctance to engage with the prospects of urban expansion, perhaps for perfectly understandable reasons. Many people believe that cities consume enough land as it is, and that all future construction should take place within existing urban footprints. Others oppose expansion to conserve municipal budgets, reduce commuting and its subsequent traffic congestion, help decaying central cities thrive again, conserve energy, reduce air pollution, or protect precious cultivated lands at the urban

¹ UN General Assembly, Universal Declaration of Human Rights, Article 13, 10 December 1948, 217 A (III), available at: <http://www.un.org/en/documents/udhr/> [accessed 13 August 2015].

fringe. This reluctance, reasonable as it may seem, keeps the reality of urban expansion in the dark and prevents us from addressing it in a clear and forthright manner.

Empirical data on actual urban expansion, its key attributes, and their change over time can provide a much-needed basis for understanding the global and historical contexts of urban expansion. Coupled with theories that could explain the underlying forces that propel and shape urban expansion, these data could provide the evidence needed to assess and address our concerns: that it would be very difficult, if not futile, to resist urban expansion in the face of rapid population growth; that ignoring it or denying it in the hope that it will not occur will simply allow expansion to take place unhindered and in a more costly and destructive way. Acquiring a better understanding of expansion will make it less formidable and more manageable. Making minimal yet effective preparations for it is the only responsible way to proceed.

The Atlas of Urban Expansion—2016 Edition focuses on the land converted to urban use in the past 25 years in a global representative sample of 200 cities. It provides maps and metric data on the spatial changes in these cities during this period with the aim of helping cities the world over make realistic plans in preparing lands for their future expansion. Increased global awareness is urgently needed to better understand and plan for this massive expansion of cities in coming decades. Local and national governments, civic institutions, international organizations, and concerned citizens will need to advocate for and implement minimum adequate preparations of lands for urban expansion. For example, it is vital that cities acquire the rights-of-way for arterial roads that can carry public transport and trunk infrastructure, and that cities protect selected open spaces on the urban periphery from encroachment in advance of the coming expansion. The sooner they act, the more effective and the less costly it will be.

It is important to note that the risks of making at least some preparations on the urban periphery for the expected expansion of cities are asymmetrical. The risk of failure to prepare adequate lands for expansion carries a high cost. It will likely result in disorderly development with a shortage of arterial roads that provide access to the job market from the urban periphery, with land supply bottlenecks that render housing unaffordable, with a shortage of public open spaces, and with damage to areas of high environmental risk. It will be next to impossible to secure lands for arterial roads or public open spaces in the expansion areas of cities after they have been occupied. The damage to the productivity, the inclusiveness, and the sustainability of these cities will have been done. In contrast, as long as investments in land preparation are kept to a minimum, the risk of preparing too much land for urban expansion and keeping it vacant or in agricultural use is rather low.

The main objective of this edition of the Atlas, like its previous 2012 edition, is to increase awareness

and help residents, policy makers, and researchers around the world come to terms with and prepare for the expected global urban expansion in the coming decades. This call for action is timely because, as noted earlier, the Urbanization Project now underway will be largely completed by the end of the twenty-first century. By then, it will be too late to turn the tide. If the land required for public works or public open spaces is not protected from encroachment before it is developed, it will be next to impossible to ensure the orderly development of cities to make them more productive, more inclusive, and more sustainable in the decades to come.

MONITORING GLOBAL URBAN EXPANSION

The Atlas of Urban Expansion—2016 Edition is part of a long-term research project that includes a series of related publications and online resources and involves a number of partnerships and funding sources. The earlier phases of the research program, leading to the creation of this new atlas, culminated in the publication of *The Dynamics of Global Urban Expansion* (Angel et al., 2005), and *The Atlas of Urban Expansion* (Angel et al., 2012). The World Bank supported the research work for the former publication and the Lincoln Institute of Land Policy supported research for the latter, as well as its publication. Research for both publications focused on the collection and analysis of satellite imagery and population data for a global sample of 120 cities in two time periods, 1990 and 2000. Research for the *Atlas of Urban Expansion* also included collecting, geo-referencing, and digitizing the historical maps of the built-up areas of cities at 20–25 year intervals for the period from 1800 to 2000 for a representative sub-group of 30 cities from the 120-city sample. The policy implications and the general lessons drawn from these data collection and analysis efforts were summarized in a policy focus report entitled *Making Room for a Planet of Cities* (Angel et al., 2011) and elaborated upon in the book *Planet of Cities* (Angel, S., 2012).

The NYU Urban Expansion Program at the Marron Institute of Urban Management and the Stern School of Business at New York University, in partnership with the United Nations Human Settlements Programme (UN-Habitat) and the Lincoln Institute of Land Policy, initiated a multiphase research effort in 2014 to expand the monitoring of the quantitative and qualitative aspects of global urban expansion to more cities, more time periods, and more attributes. The monitoring program is now in advanced stages of completion of three interdependent phases. A number of new phases, requiring new partners and new sources of funding, are in earlier stages of development.

Phase I—the mapping and measurement of global urban expansion—focused on mapping and measuring urban extent, average built-up area density, fragmentation of the built-up area of the city by open spaces, and compactness of the geographical shapes of urban extents in the global sample of 200

cities in three time periods: circa 1990, circa 2000, and circa 2014. This phase required the classification and analysis of medium-resolution Landsat satellite imagery as well as the analysis of population data associated with the enumeration zones that contain the built-up areas of these cities. The key output of this phase is the Atlas of Urban Expansion—2016 Edition, Volume 1: Areas and Densities. This volume will be available online (www.atlasofurbanexpansion.org) as an open source of data for all interested parties worldwide, including a PDF version, spreadsheets, and GIS files, all available for download. This phase will include a number of technical reports and publications focused on findings in peer-reviewed journals and other venues.

Phase II—the mapping and measurement of urban layouts—focused on the recently-built urban peripheries (areas built between 1990 and 2014) in the global sample of 200 cities; urban areas built before 1990 compared to areas built between 1990 and 2014 in cities in the global sample; and city areas built in five different time periods (before 1900, between 1900 and 1930, between 1930 and 1960, between 1960 and 1990, and between 1990 and 2014) in a representative subgroup of 30 cities from the global sample. This phase relied on digitizing and analyzing a random sample of 10-hectare locales using high-resolution Bing and Google Earth imagery. This analysis yielded information and metrics on different attributes of urban layouts that could be observed from space: the share of residential areas that were laid out informally, formally, or not at all; the share of the land that was laid out in rectangular grids; the share of the land in streets; the average width of streets; the average size of blocks; the density of 3-way and 4-way intersections; and the share of the built-up area within walking distance of arterial roads, among others. The key output of this phase is the Atlas of Urban Expansion—2016 Edition, Volume 2: Blocks and Roads. This volume will also be available online (www.atlasofurbanexpansion.org) as an open source of data for all interested parties worldwide, including a PDF version, spreadsheets, and GIS files, all available for download. This phase will include a number of technical reports and publications focused on findings in peer-reviewed journals and other venues.

Phase III—The Land and Housing Survey in a Global Sample of Cities—included two separate survey instruments in ten languages. The first, The Survey of the Regulatory Regime Governing Land and Housing, captured land ownership patterns, land-use planning practices, and the development of new subdivisions in the expansion areas of cities. The second, The Affordability Survey, measured the prices as well as the key attributes of different types of residential plots, houses, and apartments available for sale or rent in the 200 cities in the global sample and compared them to household incomes in these cities. This phase required the engagement of city-based researchers in the 200 cities in the global sample, as well as regional coordinators based at New York University. The two surveys are now

complete. This phase will also include a number of technical reports and publications focused on the findings in peer-reviewed journals and other venues, but the results of this survey are not included in the Atlas.

Selected findings from all three phases were used by the three partners—UN- Habitat, New York University, and the Lincoln Institute of Land Policy—at Habitat III: United Nations Conference on Housing and Sustainable Urban Development that took place in Quito, Ecuador, from the 17th to the 20th of October 17–20, 2016, and were also presented at Habitat III, both at selected events at Habitat III and in audiovisual displays at conference venues throughout the conference.

CHAPTER 2

The Global Sample of Cities

THE 2010 UNIVERSE OF 4,231 CITIES

The study of global urbanization trends from the perspective of countries in which national censuses differentiate between urban and rural populations yields important insights and policy prescriptions as we have seen in the previous chapter. Yet these results are limited because national urban population statistics lump all cities, large and small, together. We can advance our knowledge and understanding of global urbanization attributes and trends if we focus our attention on all the cities in the world, rather than on all countries, as units of analysis.

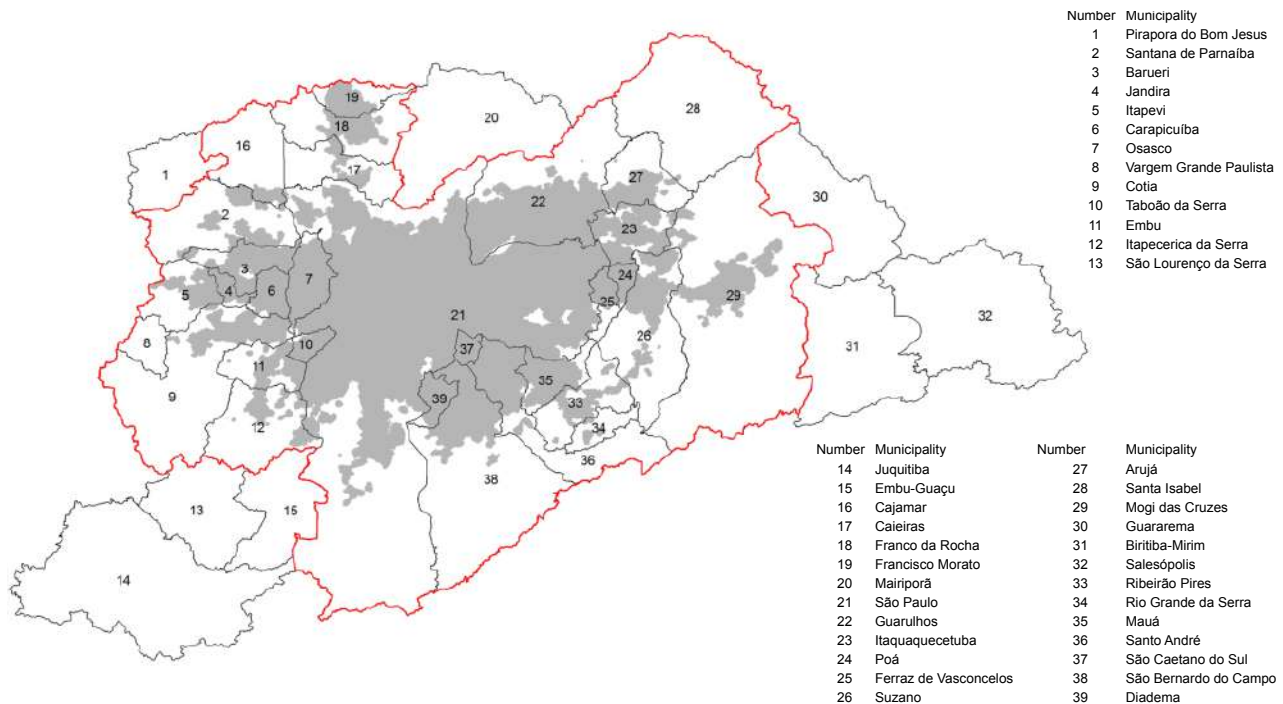
Identifying the universe of all cities in a given year requires a definition of what constitutes a city. Since cities have been defined along many different dimensions, any such definition involves a choice, or rather a number of choices. Cities can be distinguished from hamlets, villages, or towns by population thresholds; they can be identified by their historical centers, their municipal boundaries, the commuting patterns of their workers, or their geographical extent (Parr, 2007). They can also be identified by their local newspapers or by their local sports teams. We chose to identify cities first by a population threshold and then by their geographical extent. To ensure that the settlements we defined were indeed cities, we

chose a population threshold of 100,000, a threshold that is above the thresholds used to define what constitutes a city in all countries except China.

Identifying cities by their geographical extent follows the Roman tradition of defining a city by the edge of its built-up area, its *extrema tectorum*. That geographical extent is typically associated with a city name, the name of its largest and most prominent historical center. The built-up areas of municipalities—the governmental units associated with well-defined administrative boundaries—often merge into each other over time, as do their labor markets, as more and more people live in one municipality and commute to work in another. We define cities as agglomerations of contiguous built-up areas (and the open spaces in and around them) that may contain a large number of municipalities but, more often than not, constitute a single labor market. We consider the metropolitan region of São Paulo, Brazil, for example, to be a single city even though it contains no fewer than 39 municipalities (figure 2.1). We define São Paulo as a city by its urban edge, its *extrema tectorum*, which can be derived from freely available satellite imagery. In 2010, there were 156 free standing cities of 100,000 people or more in Brazil that had their own contiguous built-up areas made up of one or more municipalities. In contrast, there were no fewer than 5,570 municipalities in the country at that time, defined as administrative subdivisions of its national territory.

FIGURE 2.1:

The urban extent of São Paulo, Brazil (grey), showing the administrative boundaries of the 39 municipalities that constituted its metropolitan region. The urban extent of São Paulo is contained in 31 municipalities (bounded in a red line).



Using the population threshold and geographical extent definition of a city enables us to construct an entire universe of cities for the world at large. Other, possibly more precise, definitions that use information on commuting patterns or on small-area population densities cannot be used to create such a universe of cities because those data are not universally available for all cities in all countries.

Ideally, the population of a city in the universe, using our definition of population threshold and geographical extent, is the share of the population within the geographical area of the city in all the administrative (or census enumeration) zones that encompass that extent—identifiable in satellite imagery—excluding the population of villages and towns within those zones that are not part of its extent. These population estimates can, in principle, be constructed from available population data for census enumeration zones for dates roughly corresponding to 1990, 2000, and 2010. They require population data for well-defined enumeration zones, as well as rules for allocating the population of a given zone among its urban and rural built-up areas. We used this more demanding method of obtaining population estimates for the urban extent of all 200 cities in the global sample of cities described here.

For the remaining cities in the universe, we used a number of data sources that provide information on their populations, associating population with city names and coordinates without associating a specific set of enumeration zones with those names. Notably, the most useful sources on information on city populations were the United Nations Population Division (for cities of 300,000 or more) and the website www.citypopulation.de (Brinkhoff, 2016). Both sources had been consulted extensively to construct the 2010 universe of cities. That said, neither source could provide precise data on Chinese cities. According to the official definition of a city in China, the country had no more than 662 cities in 2010. We have identified a total of 1,029 settlements in China that had contiguous geographical extents of substantial area as well as populations of 100,000 or more in 2010. Their populations were estimated from data we obtained from the Chinese Academy of Sciences.

All the cities that were found to contain 100,000 or more people in 2010 were identified on Google Earth to determine whether they were part of larger urban agglomerations. Urban agglomerations were identified and listed in the universe by a single city name. Only cities that were not part of larger, named urban agglomerations were listed as cities in the universe.

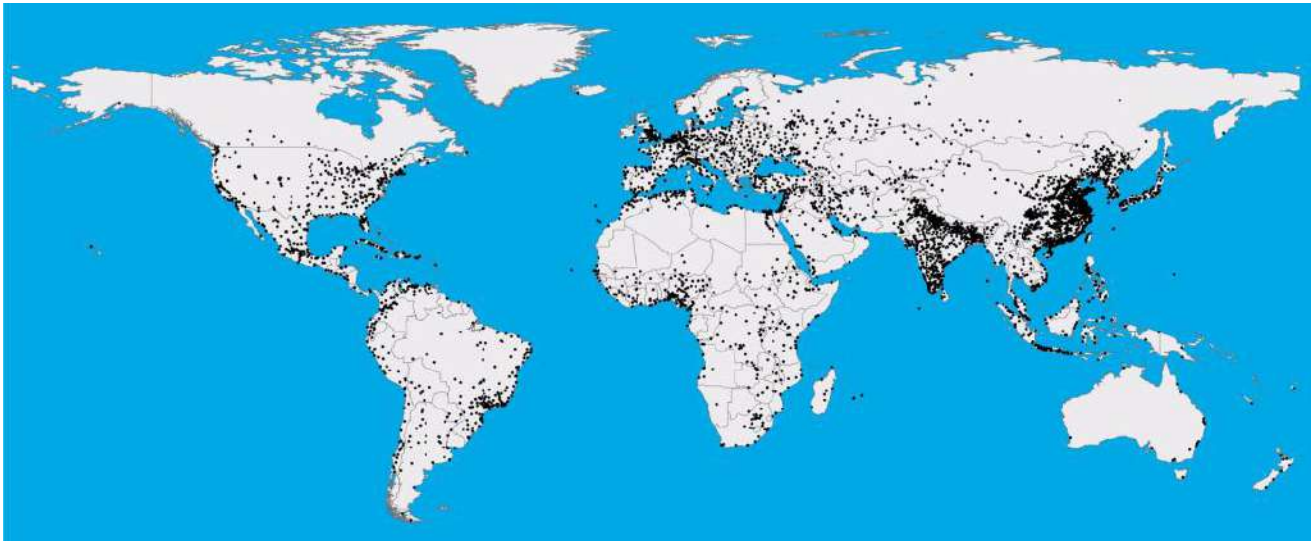
The 2010 universe of cities is the third universe of cities constructed by the authors and their colleagues. The first universe of cities, described in *The Dynamics of Global Urban Expansion* (Angel, S. et al., 2005), identified a total of 3,943 cities with 100,000 or more residents in 2000. The second universe of cities, described in the *Atlas of Urban Expansion* (Angel, S., et al., 2012), identified a total of 3,646 cities that had 100,000 or more people in 2000. The 2010 universe of cities shown in figure 2.2 contains a total

of 4,231 free-standing cities in 172 countries or territories that had 100,000 or more people that year.

The universe of cities provides us with a new and powerful tool for analyzing urbanization patterns, attributes, and trends on a global scale. It makes it possible for us to assign individual values to cities in the universe—such as populations or population growth rates, for example—and then to study variations in these values among regions, income groups, or population sizes. However, the greatest and most promising value of having a universe of cities is in taking a stratified sample of cities from this universe and obtaining rigorous results from this sample and generalizing these results to the universe of cities as a whole. The global sample of 200 cities, drawn from the 2010 universe of cities, is the focus of this Atlas.

FIGURE 2.2:

The 2010 Universe of Cities, comprising a total of 4,231 cities that had 100,000 people or more in 2010.



THE GLOBAL SAMPLE OF CITIES

Beyond the names of cities, their locations, and their estimated populations at several points in time, no quantitative information pertaining to the universe of cities is available at this time. We can learn more about these cities by studying a carefully constructed sample from this universe selected with the goal of obtaining quantitative measures that can be generalized to the entire universe. For this edition of the Atlas, we selected a global sample of 200 cities (see figure 2.1). The sample was stratified so as to be more representative of this universe—namely, to ensure that cities of all sizes, from all regions, and from large and small countries were well-represented. The sample was constructed with three strata in mind:

World Regions: Cities were selected at random from eight world regions in proportion to the urban population in each region. The eight regions were:

- (1) East Asia and the Pacific;

- (2) Southeast Asia;
- (3) South and Central Asia;
- (4) Western Asia and North Africa;
- (5) Sub-Saharan Africa;
- (6) Latin America and the Caribbean;
- (7) Europe and Japan; and
- (8) Land-Rich Developed Countries.

City Population Size: An approximately equal number of cities were selected at random from four ranges of population size, each range containing one-quarter of the total population of the cities in the universe. The population ranges were:

- (1) 100,000 - 427,000;
- (2) 427,001 - 1,570,000;
- (3) 1,570,001 - 5,715,000; and
- (4) 5,715,001 and above.

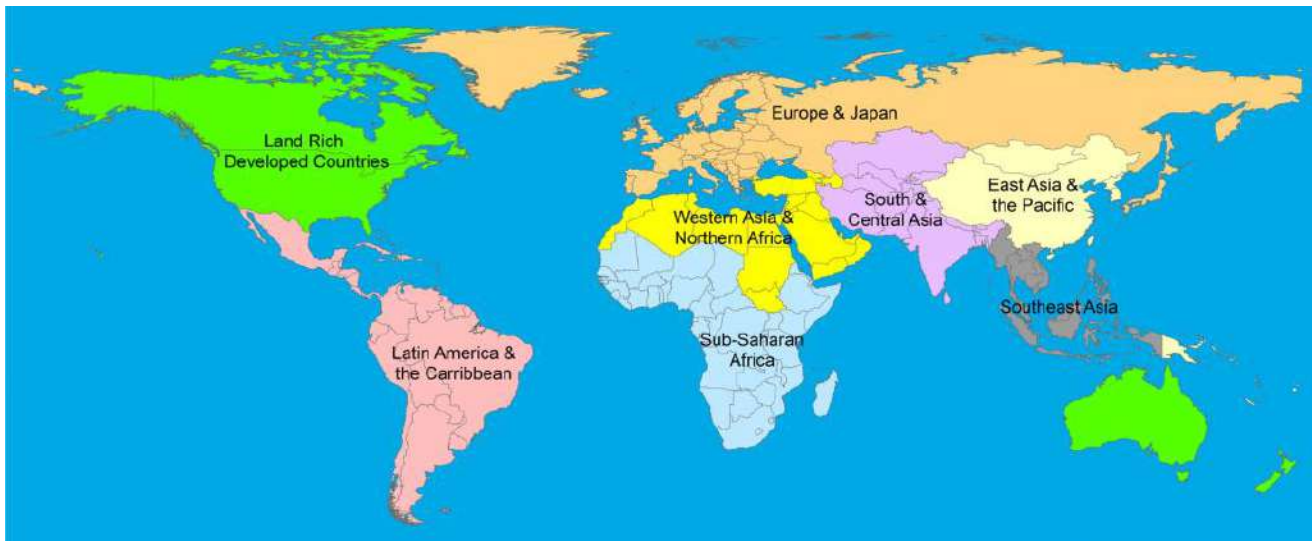
Number of Cities in the Country: Cities were selected at random from three country groups identified by the number of cities in the country in proportion to the urban population in each group. The three groups were:

- (1) 1 - 9 cities;
- (2) 10 - 19 cities; and
- (3) 20 or more cities.

The eight world regions largely followed the divisions presented in the United Nations' *World Urbanization Prospects* (U.N. Population Division, 2014), with minor changes. The United Nations divided countries into two mega-regions: more developed countries and less developed countries. The more developed countries mega-region included North America (U.S. and Canada), Australia and New Zealand, Europe, and Japan. The less developed countries mega-region included all other countries, even though some of them, (e.g. Singapore), had higher per capita income than many more developed countries. The more developed countries mega-region was divided in two to reflect different patterns of urban expansion: (1) Europe and Japan, with lower levels of arable land per person and typically higher urban densities; and (2) land-rich developed countries (U.S., Canada, Australia, and New Zealand) with higher levels of arable land per person and typically lower urban densities. The less developed countries

mega-region was divided into six regions: (1) East Asia and the Pacific, (2) Southeast Asia, (3) South and Central Asia, (4) Western Asia and North Africa, (5) Sub-Saharan Africa, and (6) Latin America and the Caribbean (see figure 2.3). To ensure that there were a minimum number of cities representing each of the eight world regions, we over-sampled cities from the smaller regions—Southeast Asia and Western Asia and North Africa—and under-sampled cities from the largest region, East Asia and the Pacific.

FIGURE 2.3:
The assignment of countries into eight world regions.



The assignment of cities in the universe of cities to four population-size categories entailed ranking the cities in the universe in increasing order of their populations and then dividing them into four ranges—small, medium, large, and very large cities—so that each of the four ranges contained approximately the same total population. The universe of cities had a total population of 2.49 billion in 2010. The four population-size ranges had approximately 622 million people in each range. This division into ranges resulted in a highly skewed distribution of the number of cities in each range: there were 3,150 small cities in the first range, 814 medium-sized cities in the second, 227 large cities in the third, and only 54 very large cities in the fourth. Each range contained approximately one-quarter of the number of cities in the preceding range, yet each range contained the same population total. Sampling at random from the universe as a whole would have resulted in three-quarters of the cities in the sample being small cities. Instead, we opted to under-sample small cities and to over-sample larger ones, drawing approximately the same number of cities from each city-size range. More specifically, we drew 56 small cities, 50 medium-sized ones, 54 large ones, and 40 very large ones from the universe. As a result of this decision, the 200 cities in the sample—while constituting only 4.7% of the total number of cities in the universe—contained 29% of the population of the universe.

Finally, the assignment of cities to one of three groups, each pertaining to the number of cities in the country, was important to ensure that countries with fewer cities were adequately represented in the sample. Indeed, less than 7% of the population of the universe of cities was found to be in countries with 1–9 cities and less than 6% in countries with 10–19 cities. Almost 88% were in countries with 20 or more cities. Cities in the first two groups would be under-represented if the sample were drawn at random from the universe as a whole. To correct this bias, we sampled cities from countries with fewer cities in slightly higher proportion than the share of their population in the universe of cities. As a result, the sample contains cities from as many as 79 countries.

Summary values for the three strata comparing the cities in the universe and the cities in the sample are given in table 2.1. The location of cities in the sample is shown in figure 2.4.

TABLE 2.1:
A comparison of the universe of cities and the sample of cities, stratified according to world regions, city population ranges, and number-of-cities-in-the-country groups.

Categories in the Three Strata		Universe of Cities				Sample of Cities				Sample/Universe Ratios	
Category ID Number	Categories	Number of Cities in this Category in Universe	Share of Cities in this Category in Universe	Population in this Category in Universe	Share of Population in this Category in Universe	Number of Cities in this Category in Sample	Share of Cities in this Category in Sample	Population in this Category in Sample	Share of Population in this Category in Sample	Ratio of Cities in this Category in Sample and Universe	Ratio of Population in this Category in Sample and Universe
World Regions											
1	East Asia and the Pacific (EAP)	1,081	26%	652,310,754	26%	42	21%	174,414,516	24%	4%	27%
2	Southeast Asia (SEA)	229	5%	143,551,770	6%	15	8%	53,516,916	7%	7%	37%
3	South and Central Asia (SCA)	693	16%	387,180,823	16%	32	16%	115,807,394	16%	5%	30%
4	Western Asia and North Africa (WANA)	301	7%	176,496,133	7%	15	8%	57,446,118	8%	5%	33%
5	Sub-Saharan Africa (SSA)	329	8%	186,702,647	8%	18	9%	51,003,826	7%	5%	27%
6	Latin America and the Caribbean (LAC)	483	11%	310,444,386	12%	26	13%	89,709,870	12%	5%	29%
7	Europe and Japan (E&J)	781	18%	389,298,026	16%	34	17%	119,848,657	16%	4%	31%
8	Land-Rich Developed Countries (LRDC)	334	8%	242,563,694	10%	18	9%	70,259,700	10%	5%	29%
Grand Total		4,231	100%	2,488,548,233	100%	200	100%	732,006,997	100%	5%	29%
City Population Ranges											
1	100,000 - 427,000	3,143	74%	622,020,086	25%	59	30%	14,185,408	2%	2%	2%
2	427,001 - 1,570,000	811	19%	621,981,767	25%	47	24%	38,611,298	5%	6%	6%
3	1,570,001 - 5,715,000	225	5%	617,006,284	25%	54	27%	173,340,491	24%	24%	28%
4	5,715,001+	52	1%	627,540,096	25%	40	20%	505,869,800	69%	77%	81%
Grand Total		4,231	100%	2,488,548,233	100%	200	100%	732,006,997	100%	5%	29%
Number-of-Cities-in-the-Country Groups											
1	1-9	368	9%	183,410,690	7%	24	12%	38,599,273	5%	7%	21%
2	10-19	306	7%	160,113,938	6%	17	9%	41,477,283	6%	6%	26%
3	20 +	3,557	84%	2,145,023,605	86%	159	80%	651,930,441	89%	4%	30%
Grand Total		4,231	100%	2,488,548,233	100%	200	100%	732,006,997	100%	5%	29%

The new global sample of 200 cities is different in some respects from the sample of 120 cities used in the two earlier publications, *The Dynamics of Global Urban Expansion* (Angel et al., 2005) and *Atlas of Urban Expansion* (Angel et al., 2012). The first two strata, eight world regions, and four city population size ranges used in the earlier sample were maintained. However, the earlier sample used countries' Gross Domestic Product (GDP) per capita as a stratum. This was abandoned because of the strong correlation between the regional affiliation of cities in the sample and their countries' GDP per capita. The number

of cities in the country was introduced instead as a third stratum for the reasons explained here. Cities in the earlier sample that fit into the new sampling framework were retained in the new sample. Other cities were dropped because they were parts of larger metropolitan agglomerations, they had less than 100,000 people in 2010, or they did not represent enough similar cities in the universe. Altogether, 96 cities from the earlier sample of 120 cities are in the new sample. The earlier classifications of the satellite imagery of these cities were revisited, completed, and corrected where necessary. New metrics were derived for them as well, in line with the revised definitions of the metrics in this edition of the Atlas described in detail in the following chapter.

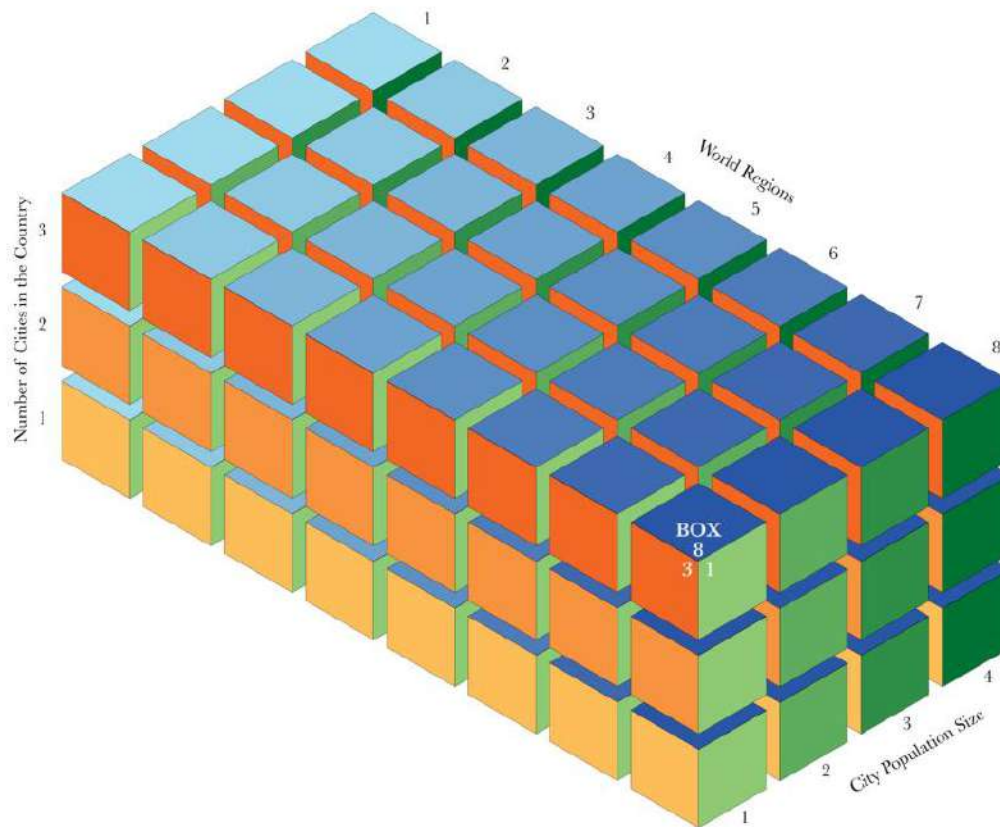
FIGURE 2.4:
The global sample of 200 cities.



The simplest way to envision the stratified sampling process, given the three strata chosen in this edition of the Atlas, is to envision these strata as dimensions: world regions along the x-axis, city population size ranges along the y-axis, and the number of cities in the country groups along the z-axis. Each city in the universe (or in the sample, for that matter) could then be seen as belonging to a box in three-dimensional space, identified by a three-digit number, its world region (1–8), its city population size range (1–4), and its number of cities in the country group (1–3) (see figure 2.5). Halifax, Canada, for example, belongs to box 813. It is located in Region 8 (land-rich developed countries); it had 390,000 people in 2010, assigning it to city population size range 1; and Canada had 34 cities in the 2010 universe of cities, assigning Halifax to number of cities in the country group 3 (20+ cities in the country). Box 813 contains all 210 cities in the universe that were located in land-rich developed countries, that had less than 427,000 people in 2010, and that were in countries with 20 cities or more.

FIGURE 2.5:

The sampling framework comprising 96 boxes, each box corresponding to one of eight world regions, one of four city-population-size ranges, and one of three number-of-cities-in-the-country groups ($8 \times 4 \times 3 = 96$).



Of the 96 boxes ($8 \times 4 \times 3 = 96$) shown in figure 2.5, only 76 had cities in the universe of cities. The rest were empty. Of these, 61 boxes had cities in the sample. The remaining 15 boxes that are not represented by cities in the sample contain 114 cities in the universe with a total population of 63.2 million, comprising 3% of the cities and 3% the population of the universe in 2010. These cities were assigned to “nearby” boxes, boxes in the same region with cities with similar population size and similar number of cities in the country assignments, to be represented by the sample as well. In this manner, all the cities in the universe were represented by cities in the sample.

The process of selecting cities in this framework consisted of picking cities at random from each box in rough proportion to the total population in each box. For example, four cities were selected at random to represent box 813: Victoria, British Columbia in Canada, and Gainesville FL, Killeen, TX, and Modesto, CA, in the United States. As there were 210 cities in the universe in this box, one city in the sample represented some 50 cities in the box 813. In parallel, as there were 44.9 million people in the cities in the universe in this box and 1.1 million people in the four sample cities in the box, every urban dweller in the cities in the sample in box 813 represented 40 urban dwellers in the universe of

cities in this box.

The values 50 and 40 in this example can be thought of as city-based and population-based weights respectively. They can be used to obtain weighted averages for the universe from values obtained for the sample. If a city in a given box represents 50 cities, then any value associated with it—say, its population growth rate between 2000 and 2010—is given a city-based weight of 50, while another city in the sample representing, say, only 27 cities is given a city-based weight of 27. Similarly, if the population of a sampled city in a given box represents a population 40 times as large, then each resident in this city is given a population-based weight of 40.

The population growth rates for these cities were not used as a stratum in the creation of the sample. The universe of cities contains data on the population of each city for three time periods, 1990, 2000, and 2010. We could use this information to test whether the sample was representative of the universe. Indeed, when we compared the average population growth rates between 2000 and 2010 in all the cities in the universe with both the city-based and population-based weighted averages of the cities in the sample, we found that they were not different from each other at the 95% confidence level. This assured us that the global sample of cities was indeed representative of the universe of cities.

Using these city-based and population-based weights, we can now answer new questions about the universe of cities as a whole. For example, we determined that average densities in the universe declined significantly between 1990 and 2000, and continued to decline—albeit at a significantly lower rate—between 2000 and 2014. We also determined, for example, that the average share of area that was laid out before it was occupied in the expansion zones of cities in the universe—areas converted to urban use between 1990 and 2014—was significantly lower than it was in areas developed before 1990. In other words, the global sample of cities makes it possible, for the first time, to monitor global urban expansion in a consistent and rigorous manner. Needless to say, it can also be used to monitor other urban attributes of interest, from housing affordability to air quality, from Internet use to access to public open spaces, and from the quality of drinking water to the availability of public transport in the sample of cities to obtain valid, rigorous, comparative data—data that was never available before—on the universe of cities as a whole.

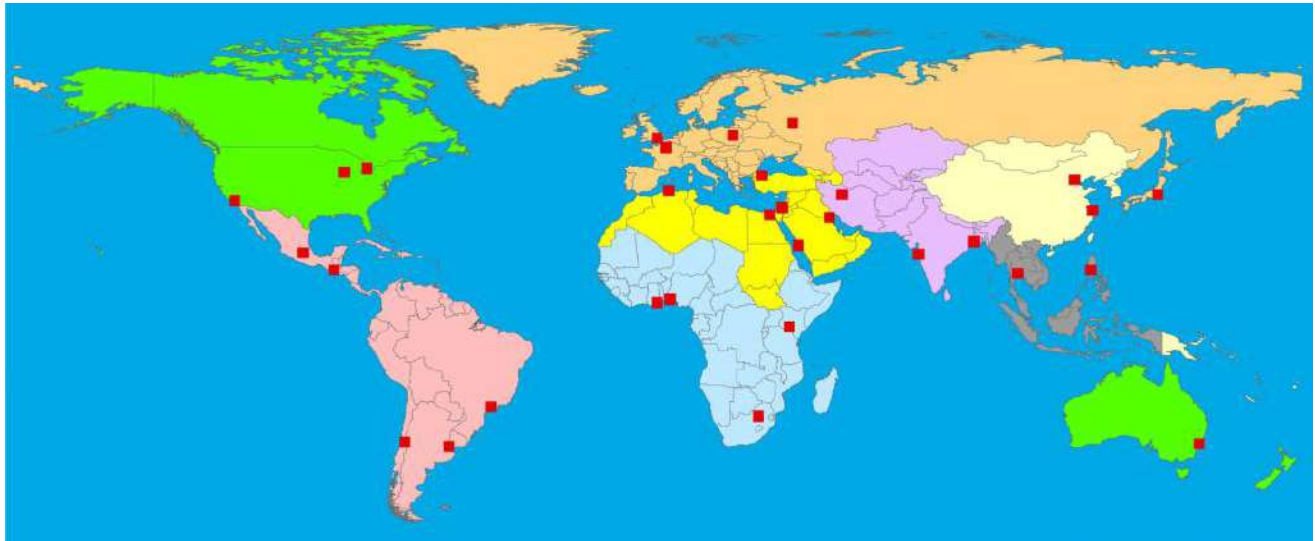
THE REPRESENTATIVE GROUP OF 30 CITIES

A representative group of 30 cities, including 27 from the global sample of 200 cities, was created to explore long-term changes in urban expansion, urban population density, and the attributes of urban

layouts from circa 1800 until circa 2014. The selection of cities for this historical analysis was guided by two factors: their regional distribution and the availability of historic maps depicting their built-up areas at 20- to 25-year intervals. Three cities—Jeddah, Saudi Arabia, Nairobi, Kenya, and Kuwait City, Kuwait—were added to the 27 representative cities from the global sample to ensure a balanced sub-regional distribution of cities (figure 2.6).

FIGURE 2.6:

The location of the 30 cities in the representative group of cities where urban expansion was mapped and animated between 1800 and 2014.



To be included in this representative group, the relevant maps of a given city needed to depict the totality of the urban extent of the city for time periods some 20–25 years apart and have sufficiently clear landmarks to be georeferenced to Google Earth imagery. This geo-referencing process aligned the maps to a common coordinate system, thereby allowing them to be accurately compared to each other. A complete list of the map references containing the original maps used to construct the composite maps for each city is available in the earlier *Atlas of Urban Expansion* (Angel, S. et al., 2012).

The maps are digitized composite maps of the urban extent of a given city on different dates. A total of 261 maps were used to create the composite maps for the 30 cities in this representative sample, an average of 8.7 maps per city approximately 19 ± 1 years apart. The composite maps for each city with their associated populations, densities, and changes over time appear in the 2012 edition of the *Atlas of Urban Expansion*. They were subsequently animated to show the long-term expansion of these cities. These animations can be seen on the Atlas website at www.atlasofurbanexpansion.org.

These maps were also used in Volume 2 of the Atlas to study the changes in the attributes of urban extents over time. We divided the urban extents of the 30 cities in this representative sample to areas

that were built-up in five time periods: (1) Before ~1990, (2) between ~1900 and ~1930, (3) between ~1930 and ~1960, (4) between ~1960 and ~1990, and (5) between ~1990 and 2014. We then studied the attributes of the urban fabric and calculated the metrics associated with them in each one of these areas for each city. We used these metrics to calculate average values of each attribute—say, the share of the built-up area in streets or the average block size—in each one of the five time periods, so as to observe their changes over a century or more.

CHAPTER 3

Understanding and Measuring Urban Expansion

THE CLASSIFICATION OF SATELLITE IMAGERY

The maps of the urban extent of cities in the global sample were created using Landsat imagery that has been available since the early 1970s with improved quality over time. For the Atlas, we used cloud-free images from Landsat 5 (1984), Landsat 6 (1993), Landsat 7 (1999) and Landsat 8 (2013) satellites. The images are available every 16 days in scenes of 185-by-185 kilometers each with a typical pixel size of 30-by-30 meters. These images have several spectral bands that can be used to identify impervious surfaces roughly corresponding to built-up areas, as well as water surfaces. This makes it possible to classify them by human-assisted algorithms into three classes with a high degree of accuracy: built-up, open space, and water. Potere and his colleagues tested an earlier classification of Landsat imagery of a subset of cities in the global sample by our research team by comparing it to Google Earth imagery in thousands of randomly selected locations. They concluded that

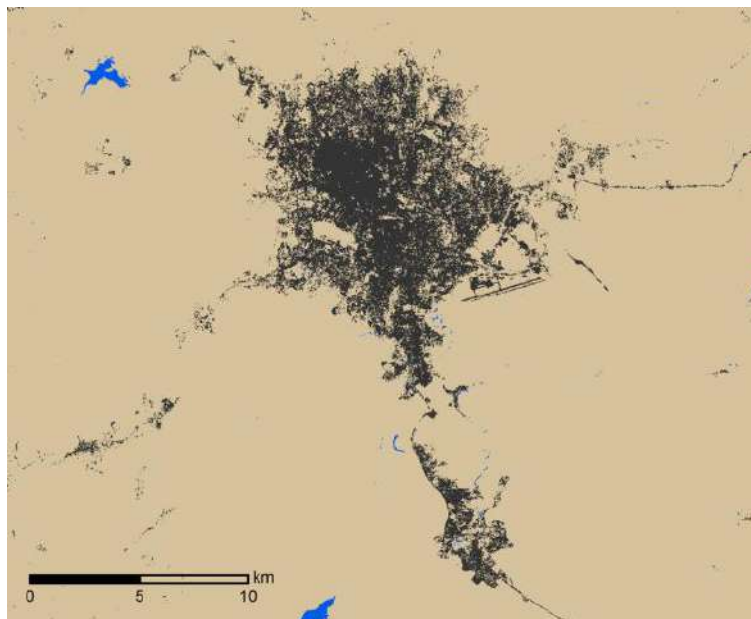
[t]he user's accuracy for the urban class was quite high, indicating that a portion of the Landsat-based site that is labeled "urban" will also appear as urbanized in the high-resolution

imagery 91% of the time. The producer's accuracy for urban areas is slightly lower, indicating that urbanized areas within our sample were correctly identified 89.3% of the time. For this assessment, both the user's and producer's accuracies were important because we wanted to be certain that the ... map collection was neither missing urban land (urban omission errors) nor mislabeling nonurban areas as urban land (urban commission errors). (Potere et al., 2008, 6546)

The classification of the study area of Addis Ababa, Ethiopia, in 2014 into these three classes—built-up, open space (not built-up), and water, is shown in figure 3.1. In this figure, built-up pixels are identified in both large and small clusters or patches. Most built-up pixels are contiguous and clearly associated with the main urban cluster of the city, but some are found along inter-city roads and some in scattered villages throughout the study area. A geographic information system (GIS) allows us to count the built-up pixels within the study area and calculate the total built-up area within the study area.

FIGURE 3.1:

30-by-30 meter pixels in Landsat satellite imagery for the study area of Addis Ababa, Ethiopia, in 1986, classified into built-up (black), open space (light brown), and water (blue) areas.



MAPS AND METRICS OF THE URBAN EXTENT OF CITIES

We differentiated the built-up pixels classified in the Landsat imagery for all cities in the global sample into three types—urban, suburban, and rural—depending on the share of built-up pixels within the Walking Distance Circle—defined as a circle with a one-square-kilometer area and a 584-meter radius, roughly a ten-minute walk—around each one of them:

Urban pixels are the majority of built-up pixels (50% or more) in their Walking Distance Circle;

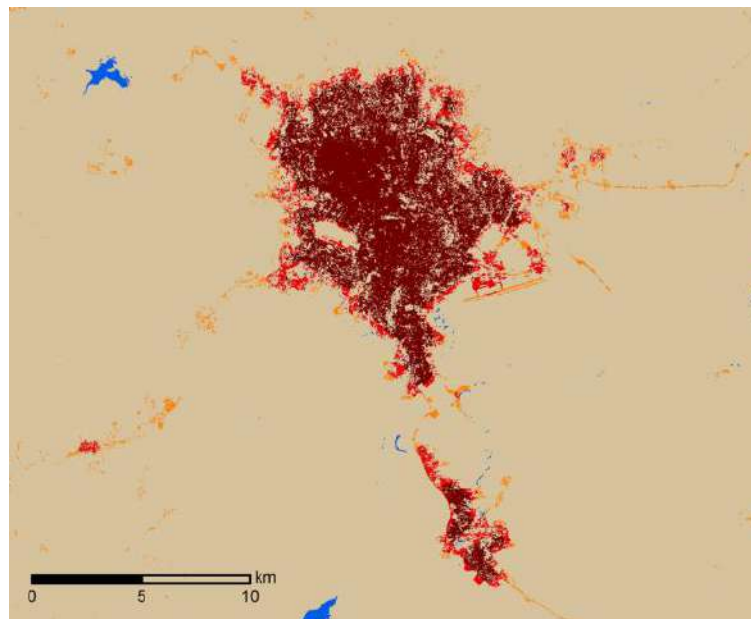
Suburban pixels are 25–50% built-up pixels in their Walking Distance Circle; and

Rural pixels are less than 25% built-up pixels in their Walking Distance Circle.

The cutoff percentages for this three-fold division are somewhat arbitrary. They were chosen to correspond with the researchers' perceptions of what constitutes urban, rural, and suburban areas in a large number of real-world cities. It should be noted that in the 2012 version of the *Atlas*, the cutoff between suburban and rural pixels was 10%, rather than 25%. This cutoff point led to the identification of large rural areas on the fringe of cities as suburban. This cutoff point was therefore corrected to 25%. The map of the study area of 1986 Addis Ababa, Ethiopia, identifying urban, suburban, and rural pixels is shown in figure 3.2. Again, using GIS software, we calculated the shares of the urban, suburban, and rural built-up areas from this map.

FIGURE 3.2:

The built-up area within the study area of Addis Ababa, Ethiopia, in 1986 differentiated into urban (dark red), suburban (red) and rural (ochre) pixels.



Clearly, a city contains not only built-up areas but open spaces in and around them as well. Both city and country now interpenetrate and fragment each other on a vast scale. As Gottman and Harper note, “Breaking out of the old bounds, walls, boulevards, or administrative limits which set it apart, the city has massively invaded the open country, though parts of the countryside may have kept their rural appearance” (1990, 101). It is therefore particularly difficult to determine which open spaces belong to a contemporary city and which do not, or alternatively, which open spaces are disturbed by the city, and which are not. Landscape ecology studies maintain that settlements developed near a forest or prairie

affect vegetation and wildlife along their edges, often in a belt up to 100 meters wide (Brand and George, 2001; Chen, Franklin, and Spies, 1992; Winter, Johnson, and Faaborg, 2000). This insight was used to distinguish urbanized open spaces from rural open spaces and to identify three distinct types of open spaces that together make up all the open space in a given study area:

Fringe open space consists of all open space pixels within 100 meters of urban or suburban pixels;

Captured open space consists of all open space clusters that are fully surrounded by urban and suburban built-up pixels and the fringe open space pixels around them, and that are less than 200 hectares in area; and

Rural open space consists of all open spaces that are not fringe or captured open spaces.

Fringe open space and captured open space, taken together, make up the urbanized open space in a given study area. In other words, urbanized open space and rural open space make up the entire open space within a given study area. Unfortunately, we cannot differentiate urbanized open space into public and private open spaces using satellite imagery. Using GIS software, we can, however, calculate the areas of the different types of open space within the study area.

The urban and suburban built-up area, together with the urbanized open space in and around them, make up *urban clusters*. There can be several urban clusters within a given study area, not all of them associated with a particular city. The urban clusters within the study area of Addis Ababa, Ethiopia, in 1986, with the open space within the study area differentiated into fringe open space, captured open space, and rural open space are shown in figure 3.3.

The largest urban cluster in a given study area is associated with the main city in the study area. Its city hall is identified and located to ensure that it is within this urban cluster. If there are more urban clusters close by, we need to determine whether they belong to this main cluster or form independent settlements that are not part of this cluster. Again, there is no rigorous procedure to determine this simply by examining satellite imagery. Local residents often know whether two separate clusters form one or two distinct cities. In the absence of local knowledge, we relied on the geographical proximity of nearby clusters to determine whether to include them in the main cluster using an inclusion rule. The inclusion rule operates by drawing a *buffer*—a zone with a border that is equidistant from the edge of the cluster—around each urban cluster, with the area of the buffer equal to one-quarter of the area of the cluster. The inclusion rule unites all clusters whose buffers intersect one another. The largest urban cluster in a given study area of a given city, together with the clusters added to it by the inclusion rule,

is defined as the *urban extent* of the city. Urban clusters outside the urban extent are defined as *ex-urban* areas. The urban extent of 1986 Addis Ababa, Ethiopia, together with the ex-urban areas within its study area, is shown in figure 3.4.

FIGURE 3.3:

The urban clusters in the study area of Addis Ababa, Ethiopia in 1986, with open space within the study area differentiated into fringe open space (light green), captured open space (bright green), rural open space (dark green).

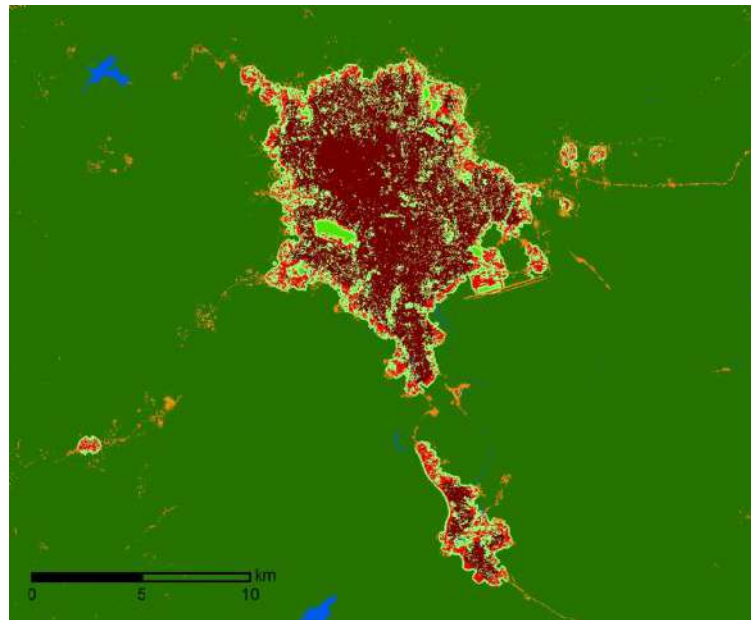
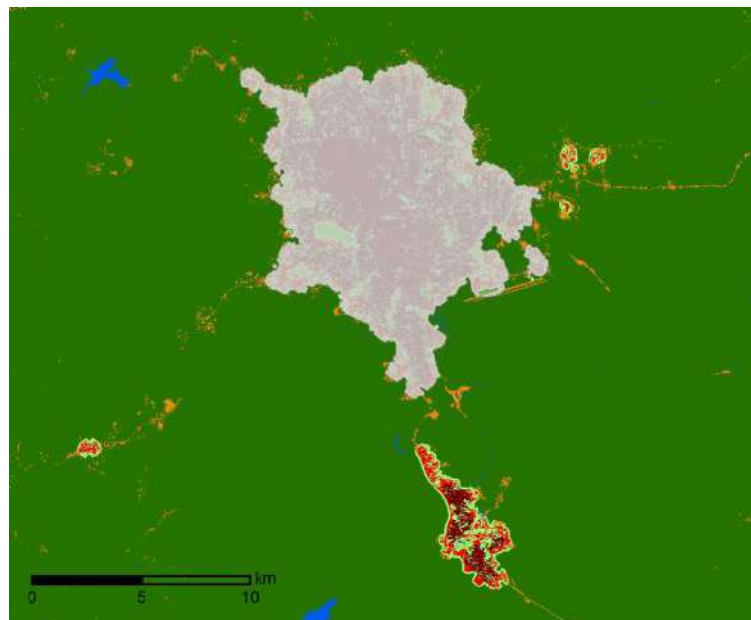


FIGURE 3.4:

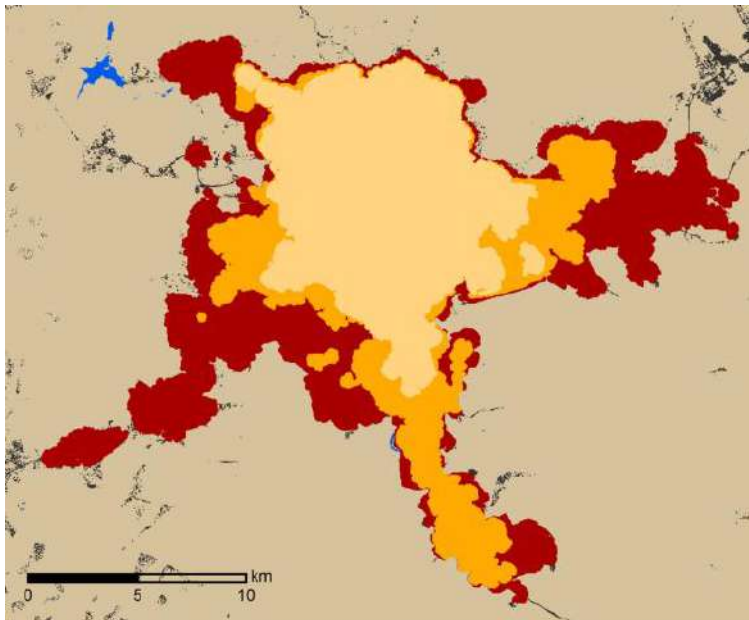
The urban extent (grey) of Addis Ababa, Ethiopia in 1986 and the ex-urban areas within its study area.



We used the same procedure to generate maps for the urban extent of all the cities in the sample for three time periods: circa 1990, circa 2000, and circa 2014. This allowed us to identify new areas of expansion between 1990 and 2014 and to calculate the urban extent in each period as well as the annual rates of expansion between these dates. The expansion of the urban extent of Addis Ababa is shown in figure 3.5.

FIGURE 3.5:

The expansion of the urban extent of Addis Ababa, Ethiopia: The area developed before 1986 (ochre), the area developed between 1986 and 2000 (orange), the area developed between 2000 and 2010 (brown).



Finally, creating maps of the urban extent of cities in two or more time periods allowed us to investigate the composition of the added area in greater detail. Indeed, we can determine what share of the built-up area added between two time periods was added by filling in any urbanized open space within the earlier urban extent, what share was added by extending that extent outwards in a contiguous manner, what share was added by leapfrogging over rural open space into new areas in a noncontiguous manner, and what share was added by incorporating ex-urban and rural settlements that were already built-up in the earlier period into the new urban extent. We can define four types of newly built-up areas that together constitute all the built-up area added to the earlier urban extent between two time periods:

Infill consists of all built-up pixels added in the new period that occupy urbanized open space within the urban extent of the earlier period;

Extension consists of all built-up pixels added in the new period that constitute contiguous urban clusters that are attached to the urban extent of the earlier period;

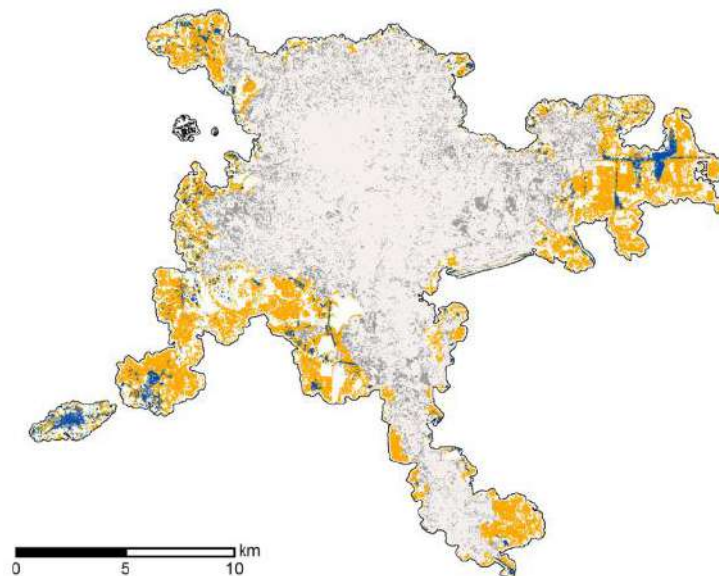
Leapfrog consists of all built-up pixels added in the new period that constitute new contiguous urban clusters that are not attached to the urban extent of the earlier period or to new extension clusters; and

Inclusion consists of all urban, rural, or suburban built-up pixels that were outside the urban extent in the earlier period and are now within the urban extent of the new period.

We can map the infill, extension, leapfrog, and inclusion areas for all cities in the global sample during two time periods: ~1990 to ~2000; and ~2000 to ~2014. We can then calculate the composition of the added area during these periods. The map showing the composition of the area added between 2000 and 2010 in Addis Ababa, Ethiopia, is shown in figure 3.6.

FIGURE 3.6:

The composition of the added built-up area in Addis Ababa, Ethiopia, between 2000 and 2014, showing the share of infill (grey), extension (orange), leapfrog (black), and inclusion (blue).



DENSITY, FRAGMENTATION, AND COMPACTNESS METRICS

The maps and their associated metrics described in the previous section allow us to measure a number of important spatial attributes of cities in a consistent manner, making possible comparison among cities as well as comparisons over time. Three of these attributes are mapped and measured: density, fragmentation, and compactness. Density measures the intensity of use of the urban extent or the built-up area of a city by its population. Fragmentation measures the degree to which the built-up area saturates the city's urban extent or, conversely, the extent to which the built-up area within it is fragmented by urbanized open space. Compactness measures the extent to which the overall geographic

shape of urban extent approximates a circle, the shape that minimizes the average distance from any point within it to its center or, alternatively, the shape that minimizes the average distance between all points within it.

The density of the population of a city varies greatly *across* its urban extent. It has been found to decline systematically with distance from the city center. It is typically higher in low-income neighborhoods than in higher-income areas and it approaches zero in industrial, commercial, or civic districts that contain no residences, or in empty open spaces. Density is typically defined as a ratio of the number of people per unit of area. In this Atlas, we use hectares to measure area; a hectare constitutes one-hundredth of a square kilometer or approximately 2.5 acres. Our interest in the study of urban expansion suggests that an appropriate measure of density is the average density of the entire urban extent of the city because it is this measure that translates a city's population into the overall area it occupies. For example, a city of one million people with an average density of 100 persons per hectare will occupy 10,000 hectares. In other words, if we could estimate a city's future population and its future density, we could derive a measure of the total area it will occupy. That said, we may also be interested in measuring the density of the built-up area within the city's urban extent because this measure is independent from the degree to which a city may be fragmented. We therefore calculated two density metrics for each city in the sample in each time period:

Urban extent density is the ratio of the total population of the city and its urban extent, measured in persons per hectare.

Built-up area density is the ratio of the total population of the city and its built-up area, measured in persons per hectare.

Urban extent density is always lower than built-up area density. Also, because the urban extent of the city contains its urbanized open space, urban extent density is not independent from the city's level of fragmentation while built-up area density is. Two cities with the same population and the same built-up area will have the same built-up area density. If one city is more fragmented—its built-up area occupies only 40% of its urban extent—and the other city's built-up area occupies 80% of its urban extent, then the urban extent density in the former will be half that of the latter.

The determination of the density of a given city's urban extent requires a correct estimate of the population of the city at the date of that urban extent. It also requires that the population be associated with all that extent and only with that extent, rather than with a different area that is smaller or larger than that extent. Typically, when a city's population is associated with its name, it is difficult to know

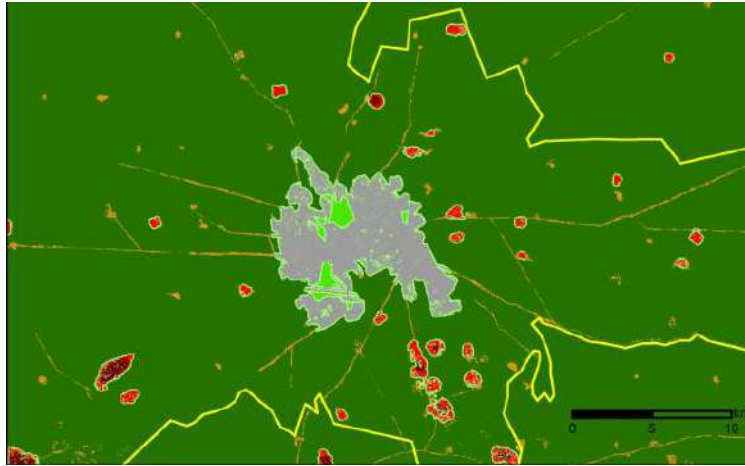
whether it refers only to the central city that bears that name, to the central city and its suburbs and outlying municipalities, or to a large region that contains that city as well as its rural hinterland.

In general, the only way that we can obtain correct population estimates is to associate a population with an enumeration zone in the manner that national censuses typically do. A population census is indeed a map of enumeration zones, each with a well-defined boundary, with a population associated with each zone. Such maps provide the best possible population estimates. That said, in some countries it is possible to obtain digital maps of enumeration zones and their associated populations at the level of city blocks, while in others it is only possible to obtain maps at the county or provincial level. We have sought to obtain the most detailed maps of enumeration zones for the cities in the global sample, using a number of valuable sources, including but not limited to: The Center for International Earth Science Information Network (CIESIN) at Columbia University, www.citypopulation.de (Brinkhoff, 2016), the Chinese Academy of Sciences, and various national census bureaus.

The method for obtaining the population of an urban extent of a given city at a particular date required identifying the set of enumeration zones and their populations that fully contained that urban extent at that date, or interpolating or extrapolating the populations of these enumeration zones to estimate their populations at that date. The population analysis apportioned the populations of individual enumeration zones evenly to all built-up pixels within them. Within a zone, only a fraction of the built-up pixels may actually be within the urban extent boundary; in other words, an enumeration zone that intersects the urban extent, especially at the periphery, may contain a number of built-up pixels that are inside the urban extent as well as a number of pixels that are outside the urban extent. For each zone that intersected the urban extent, we calculated the share of its built-up pixels that were inside the urban extent boundary and we multiplied that share by the total population of the zone. Summing this result over all zones that intersected the urban extent, we obtained the new urban extent population. We attempted to address a source of bias in the population apportionment by developing a procedure for identifying and removing built up pixels associated with rural roads. In large zones on the periphery with many roads, apportioning population evenly to all built up pixels would underestimate the true population associated with the urban extent within that zone. Other sources of bias could not be adequately addressed, namely, the procedure assumes that the population densities of rural built-up pixels and urban extent pixels (urban and suburban built-up pixels) within an enumeration zone are identical. The identification of rural roads, rural settlements, and urban extent pixels in the study area of Marrakesh, Morocco in 2002 is shown in figure 3.7.

FIGURE 3.7:

The identification of urban extent pixels (grey), and rural built up pixels (orange)—including rural settlement and rural road pixels—in the study area of Marrakesh, Morocco in 2002, used to allocate the population of the enumeration zone (yellow) to the urban extent.



Obtaining accurate population estimates for the urban extents of cities in the global sample allowed us to compare densities in different time periods to assess whether they are increasing or decreasing over time, either in individual cities, in cities of different types, or in the universe of cities as a whole. It also allowed us to construct statistical models that explain variation in densities among cities in the sample or in the universe as a whole.

As noted earlier, the Atlas also provides information on the fragmentation of the urban extents of cities: the degree to which their built-up areas are fragmented by open space or, conversely, the degree to which their built-up areas fragment the open space in and around them. Fragmentation matters for a number of reasons. The more fragmented the built-up area, the lower its urban extent density, the greater the distance between locations in the city, and the more open space is disturbed by the city. Conversely, the more fragmented the city, the closer its built-up areas are to open space, possibly an important amenity. The landscape ecology literature provides numerous methods and metrics for measuring fragmentation (see McGarigal and Marks, 1994). The Atlas provides two measures of urban fragmentation, highly correlated with each other, that are particularly relevant in the study of cities:

Saturation is the ratio of the built-up area within the urban extent of the city and its urban extent.

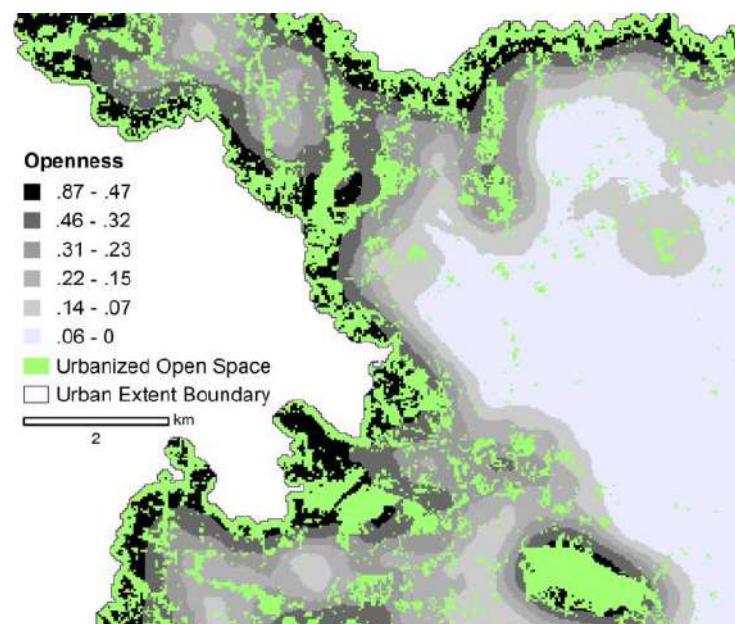
The *openness index* is the average share of open space pixels within the Walking Distance Circle (a circle with an area of 1km² and a radius of 564 meters) of every built-up pixel within the urban extent.

Both indices have values ranging from 0 to 1. Saturation is at a maximum when the urban extent

contains no open space at all and at a minimum when it contains only open space. Conversely, the openness index is at a maximum when the urban extent contains only open space and at a minimum when it contains no open space at all. Clearly, urban built-up pixels have lower openness values than suburban built-up pixels or rural built-up pixels. A map showing the variation in openness values across the urban extent of Addis Ababa in 2014 is shown in figure 3.8. The openness index for Addis Ababa for that year was 0.24.

FIGURE 3.8:

The openness values of built-up pixels within the urban extent of Addis Ababa, Ethiopia, in 2014, range from high values (dark colors) on the urban periphery to low values (light colors) in the city center. The openness index for the city as a whole, 0.24, is the average of these values.



Finally, the Atlas provides information on the compactness of the urban extents of cities. Compactness, in the sense used here, is the two-dimensional shape compactness of the urban extent in geographic space, to be distinguished from other measures of the compactness of cities that are associated with density or with its three-dimensional compactness. The perfect circle is considered to be the most compact of all two-dimensional shapes in a number of respects (Angel et al., 2010). An urban extent of a city is considered to be more compact the closer it is to being a perfect circle. Again, many metrics have been proposed for measuring shape compactness, but most are irrelevant for measuring the compactness of cities where the main concern is one of maximizing access, either access to jobs in the Central Business District (CBD) in monocentric cities or access from all locations to all others in more decentralized cities. In this Atlas, we produced metrics of two compactness attributes of cities that are highly correlated with each other. Both rely on comparing the shape of the urban extent to the shape

of the *equal area circle*, a circle with the area of the urban extent, centered at city hall.

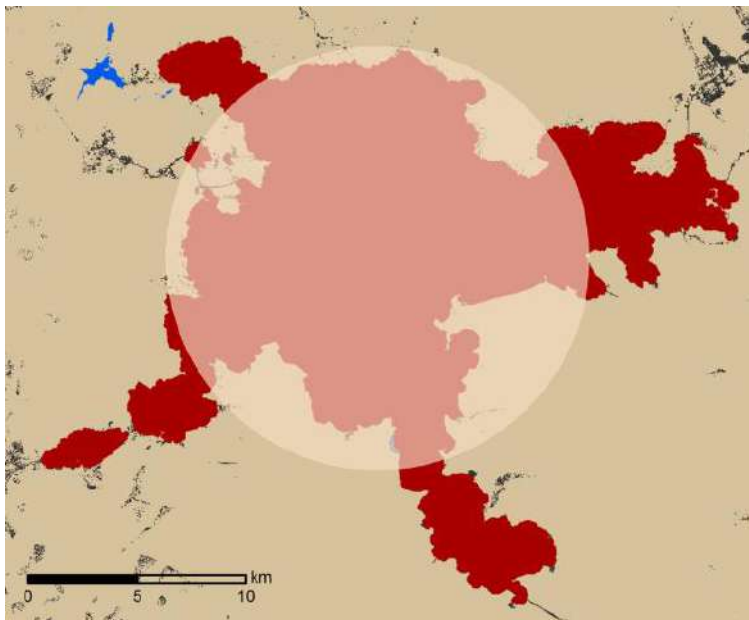
The *proximity index* is the ratio of the average beeline distance of all points in the equal area circle to city hall and the average beeline distance of all points in the urban extent to city hall.

The *cohesion index* is the ratio of the average beeline distance of all points to all other points in the equal area circle and the average beeline distance of all points to all other points in the urban extent.

Both indices vary between 0 and 1, with higher values corresponding to urban extents that are closer in shape to the circle. The urban extent of 2014 Addis Ababa, Ethiopia, and its equal area circle are shown in figure 3.9 below. Its proximity index was 0.84 and its cohesion index was 0.82 that year.

FIGURE 3.9:

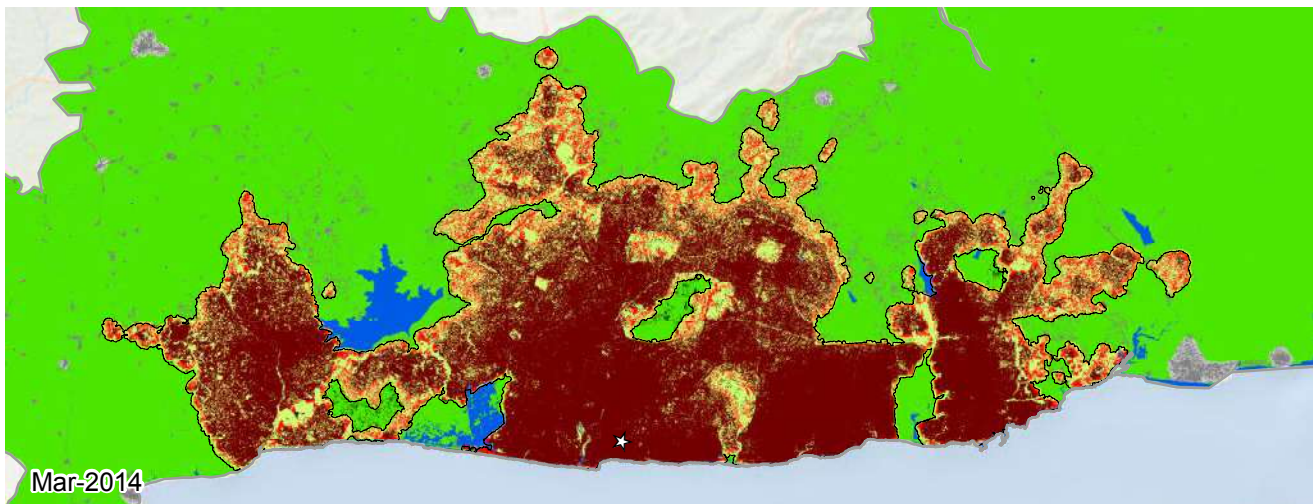
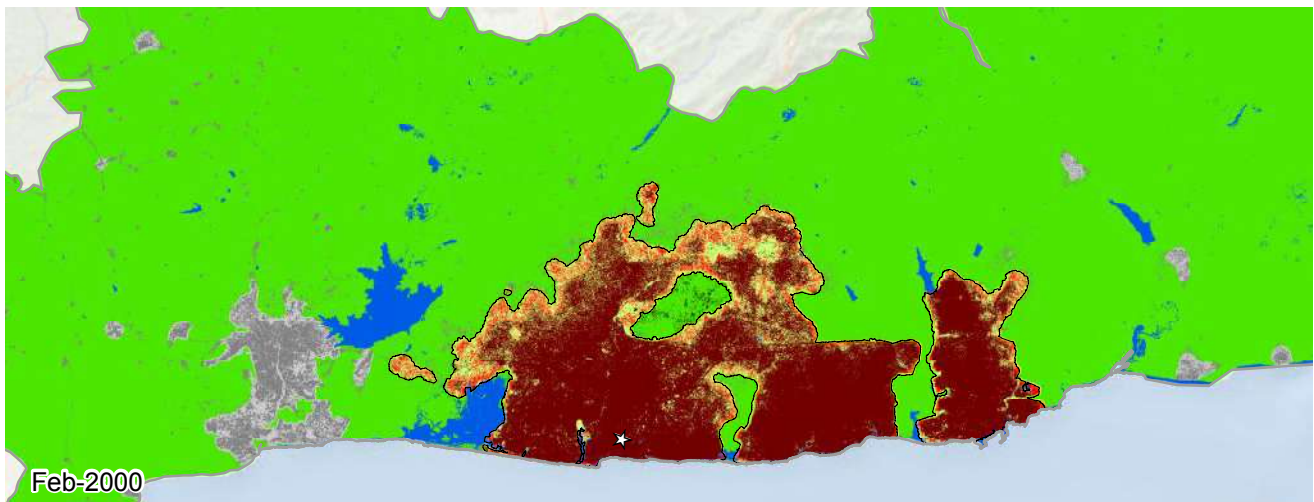
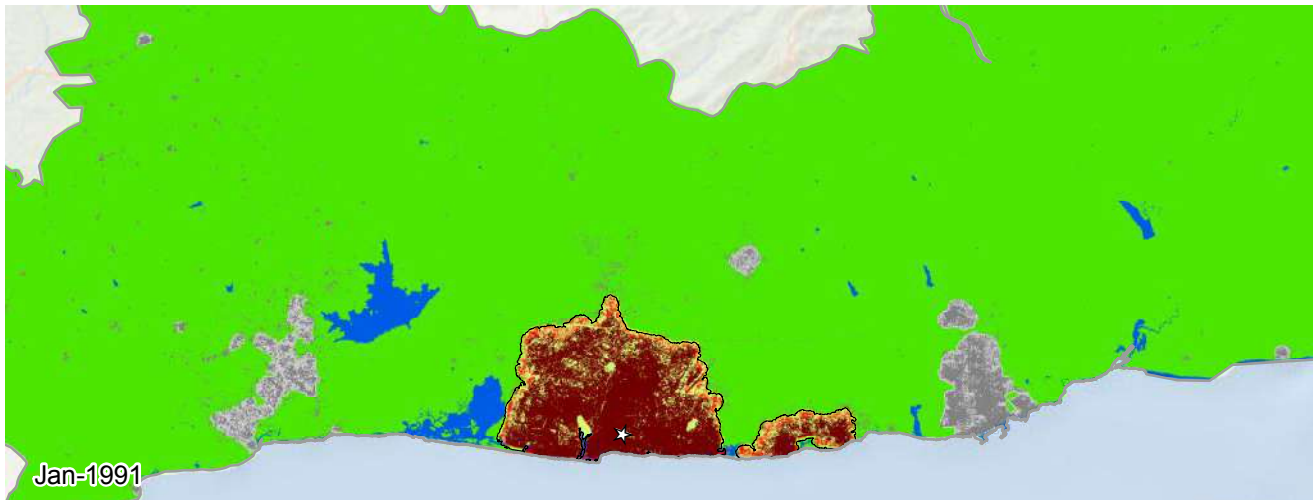
The urban extent of Addis Ababa, Ethiopia, in 2010 and its associated equal area circle.



In the following pages, we provide maps of the urban extents of the 200 cities in the sample and tables and charts of the metrics associated with them.

Maps and Metrics for 200 Cities, 1990-2014

This section provides maps and metrics for the 200 cities in the global sample. The cities are arranged in alphabetical order. For each city, maps of its urban extent and its composition are provided for three dates on the left hand page: ~1990, ~2000, and ~2014. The right hand page locates the city on a global map, provides a table with values for key spatial attributes and their change over time, and presents charts comparing these attributes to other cities in its region and to cities in the world at large. An index at the back of this volume lists page numbers for sample cities organized by country and by region.



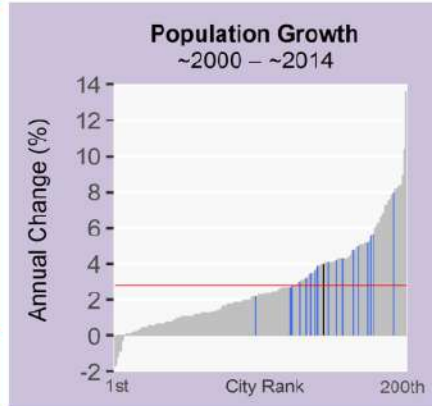
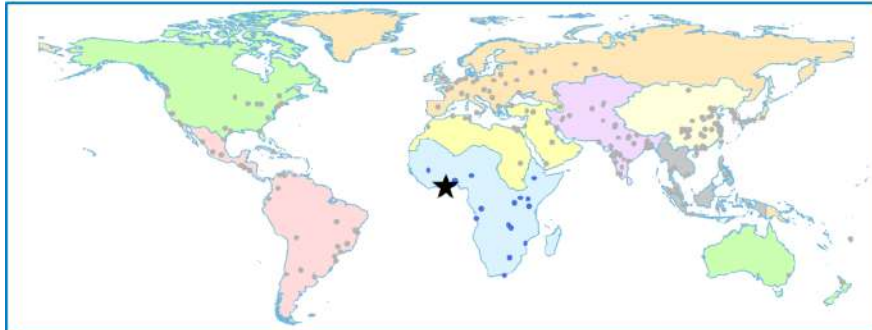
Accra, Ghana
1991-2014

0 5 10 15 20 km

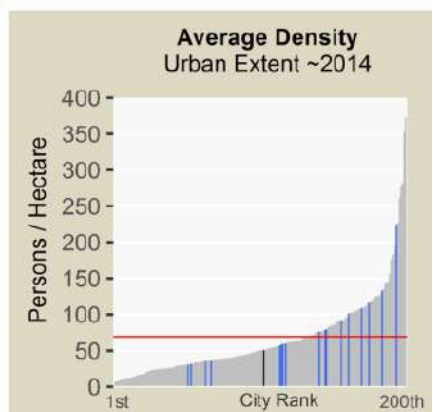
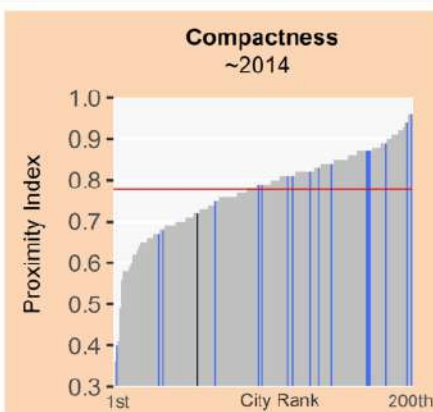
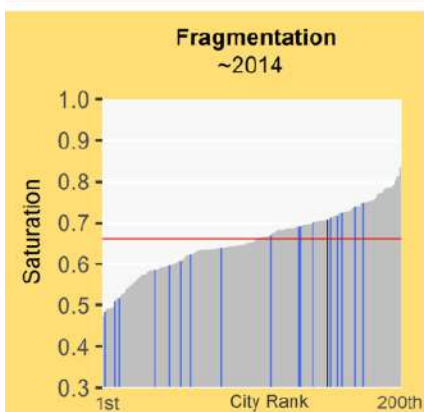
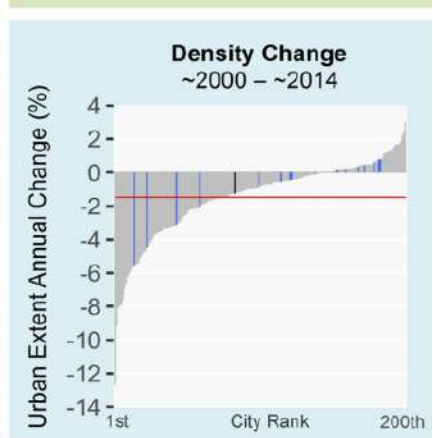
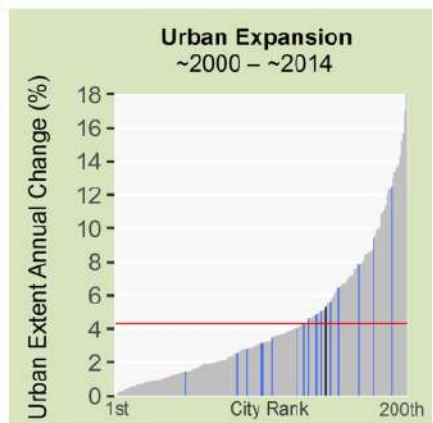
Study area
 Urban extent
 Urban built-up area
 Suburban built-up area
 Rural built-up area
 Urbanized open space

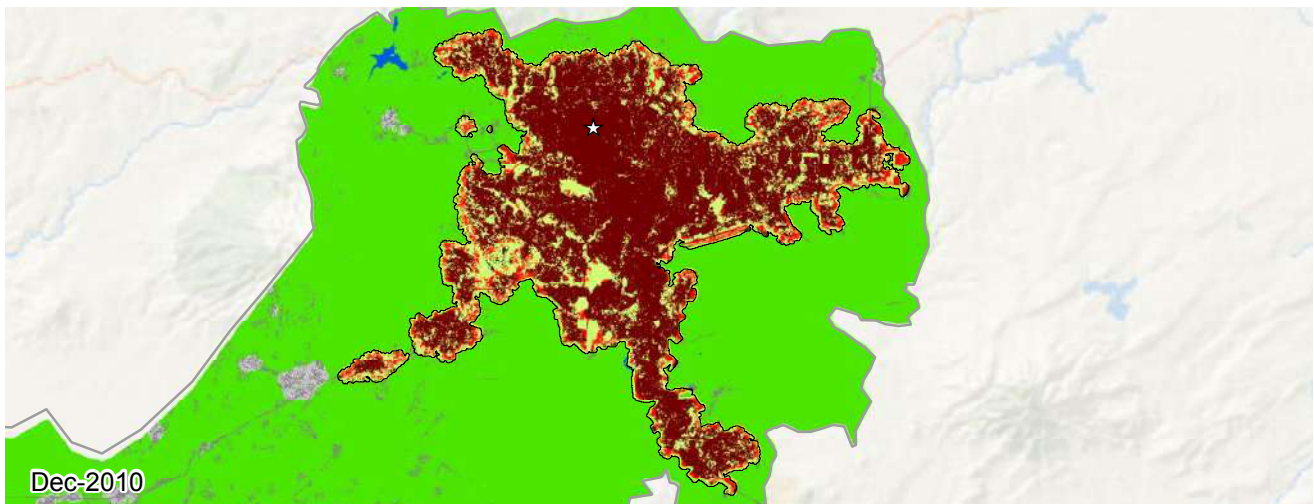
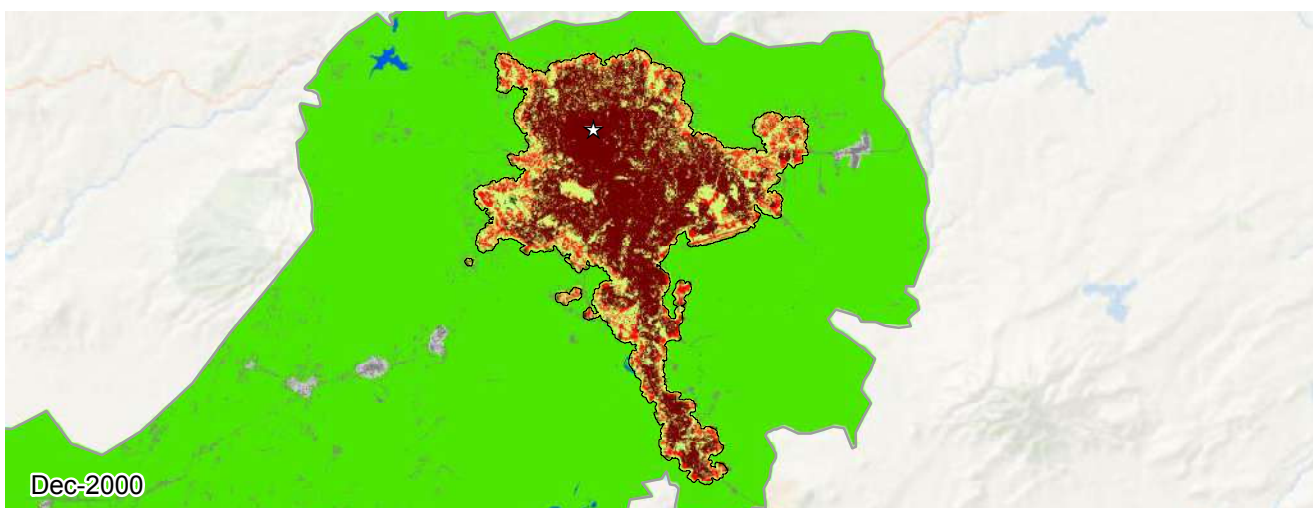
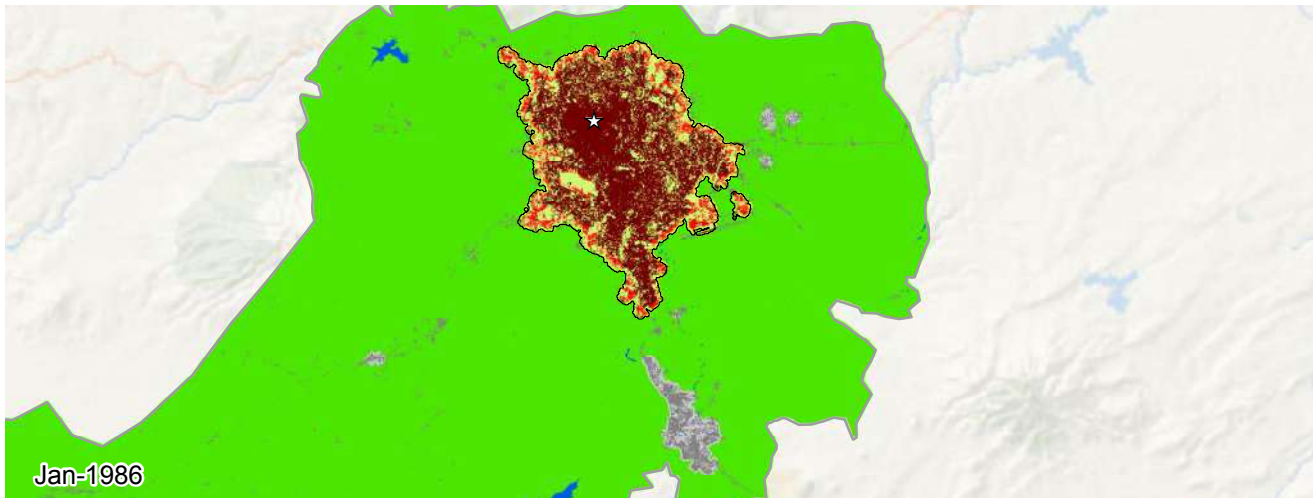
Rural open space
 Exurban built-up area
 Exurban open space
 Water
 No data
★ CBD

Accra, Ghana (Sub-Saharan Africa)



Metrics	Jan 1991	Feb 2000	Mar 2014	% Annual Change ('00-'14)
Population	1,307,783	2,513,025	4,429,649	4.0
Built-up Area (Hectares)				
Total	10,022	32,171	61,780	4.6
Urban	9,052	29,165	52,847	4.2
Suburban	908	2,821	8,366	7.7
Rural	60	183	566	8.0
Open space (Hectares)				
Urbanized Open Space	3,301	9,069	25,431	7.3
Urban Extent	13,323	41,241	87,211	5.3
Density (Persons / Hectare)				
Built-up Area Density	130.5	78.1	71.7	-0.6
Urban Extent Density	98.2	60.9	50.8	-1.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.75	0.78	0.71	-0.7
Openness Index	0.21	0.16	0.22	1.9
Compactness (Roundness)				
Proximity	0.81	0.77	0.72	-0.5
Cohesion	0.79	0.77	0.71	-0.6
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	3,091	13%	5,522	18%
Extension	13,830	62%	18,718	63%
Leapfrog	2,352	10%	0	0%
Inclusion	2,874	12%	5,368	18%





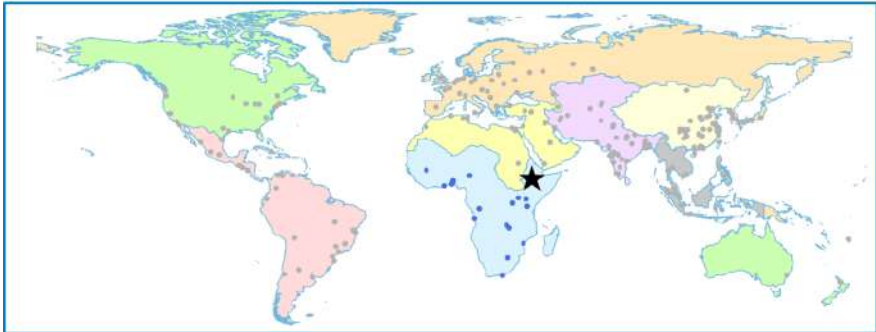
**Addis Ababa, Ethiopia
1986-2010**

0 5 10 15 20 km

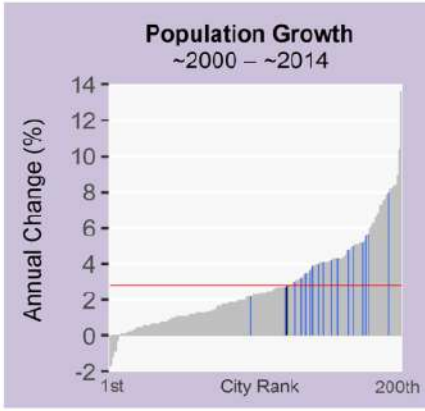
N

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

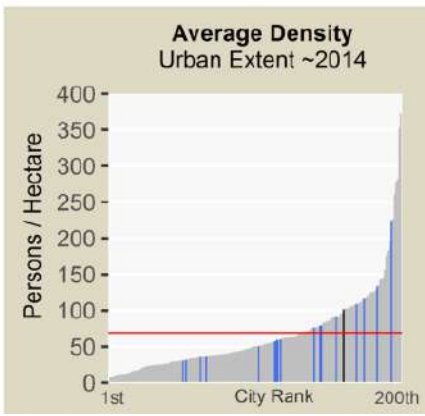
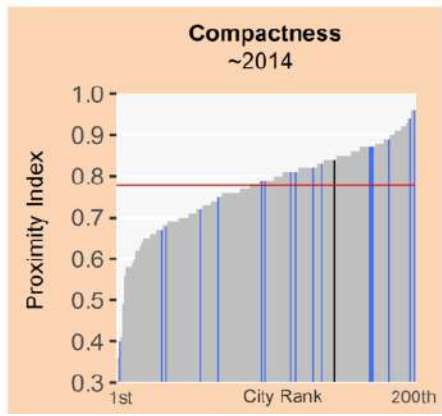
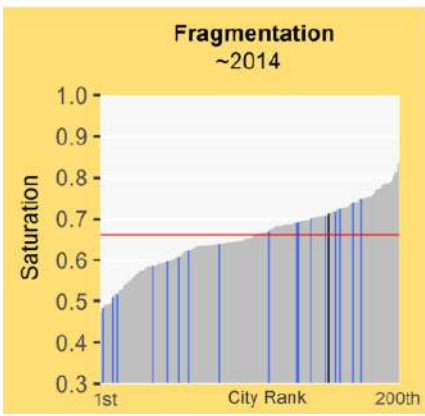
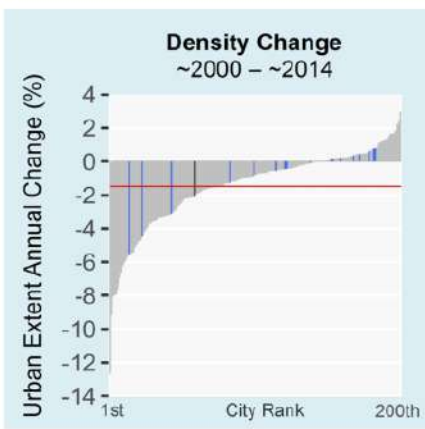
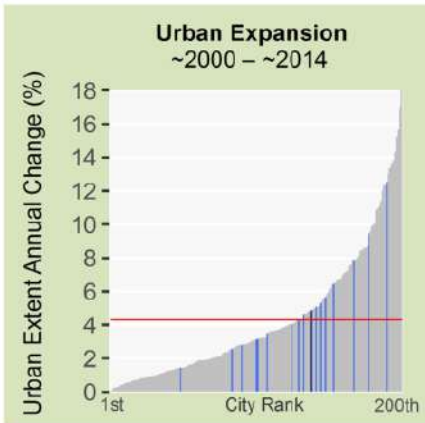
Addis Ababa, Ethiopia (Sub-Saharan Africa)

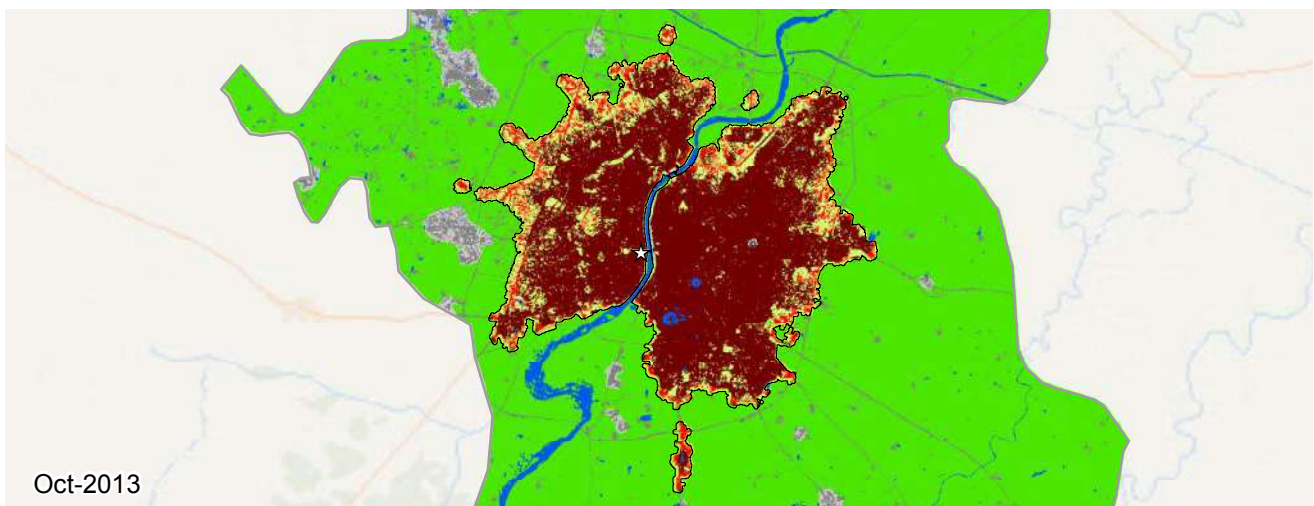
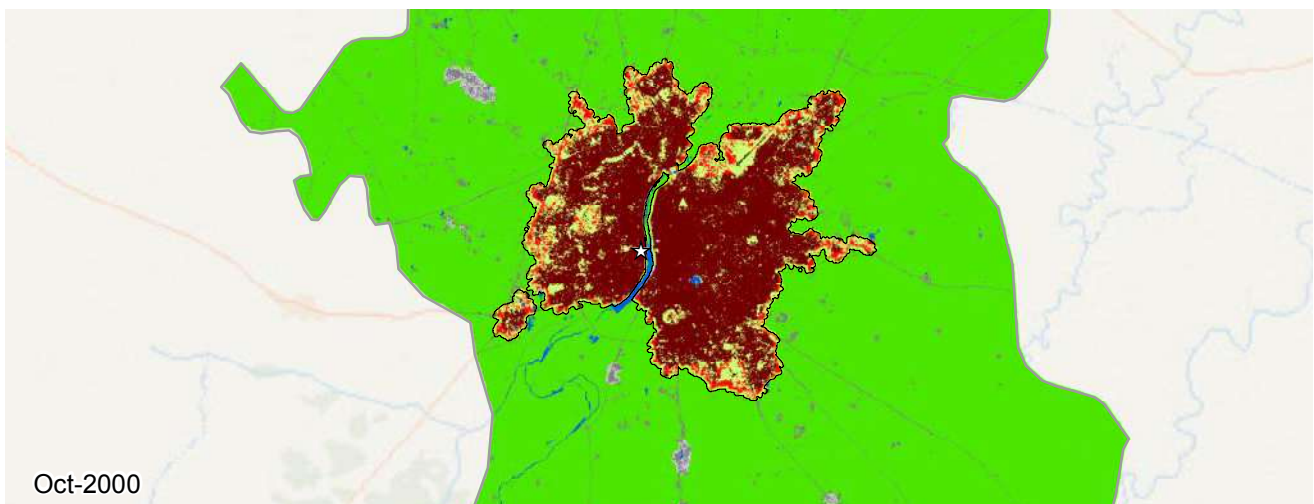
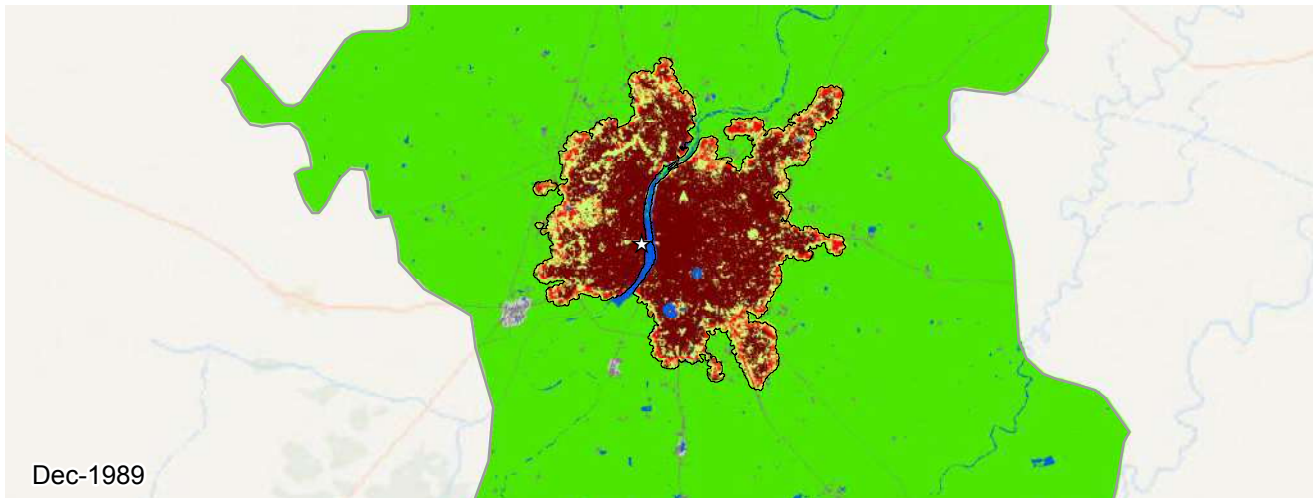


Legend for Charts
 Addis Ababa | Other cities in region | All other cities | Global average



Metrics	Jan 1986	Dec 2000	Dec 2010	% Annual Change ('00-'10)
Population	1,445,700	2,276,356	3,009,130	2.8
Built-up Area (Hectares)				
Total	7,530	11,712	21,133	5.9
Urban	6,242	9,341	18,483	6.8
Suburban	1,198	2,187	2,466	1.2
Rural	90	183	183	-0.0
Open space (Hectares)				
Urbanized Open Space	4,018	6,531	8,494	2.6
Urban Extent	11,549	18,244	29,627	4.8
Density (Persons / Hectare)				
Built-up Area Density	192.0	194.3	142.4	-3.1
Urban Extent Density	125.2	124.8	101.6	-2.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.64	0.71	1.1
Openness Index	0.29	0.29	0.24	-2.1
Compactness (Roundness)				
Proximity	0.95	0.85	0.84	-0.1
Cohesion	0.95	0.83	0.82	-0.2
Added Area (Hectares)	'86-'00	Share	'00-'10	Share
Infill	1,077	25%	2,996	31%
Extension	2,012	48%	5,520	58%
Leapfrog	0	0%	0	0%
Inclusion	1,091	26%	903	9%





**Ahmedabad, India
1989-2013**

0 4 8 12 16 km

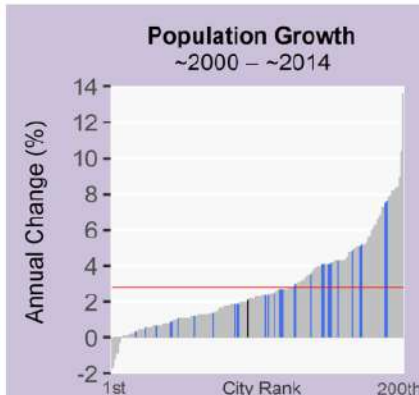
N

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

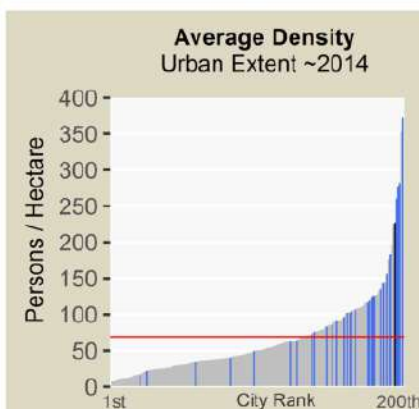
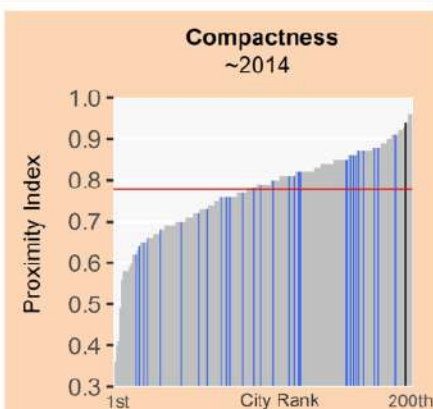
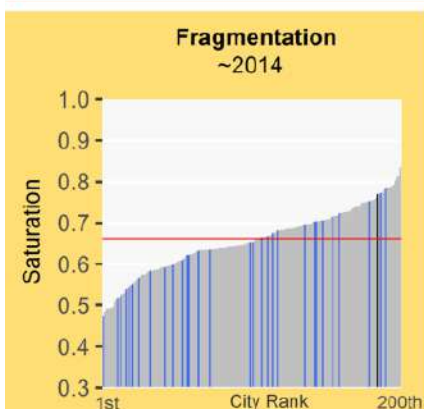
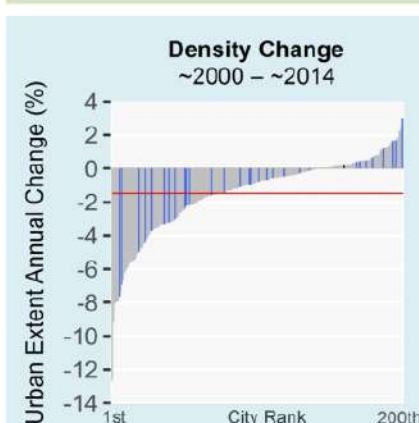
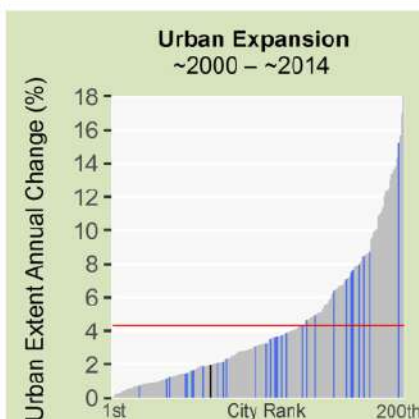
Ahmedabad, India (South and Central Asia)

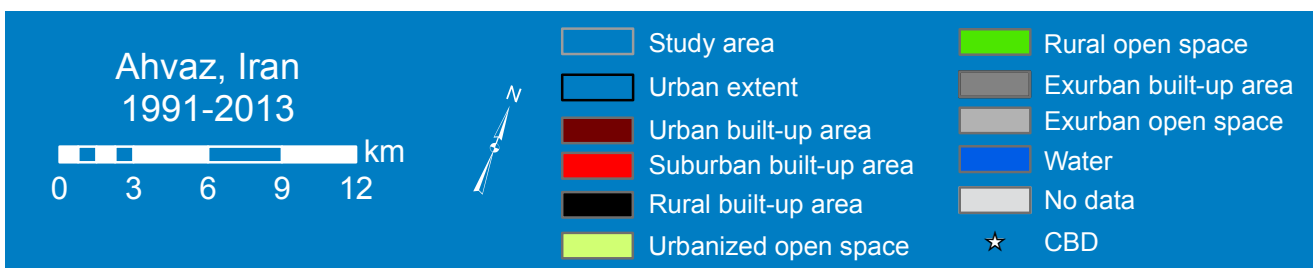
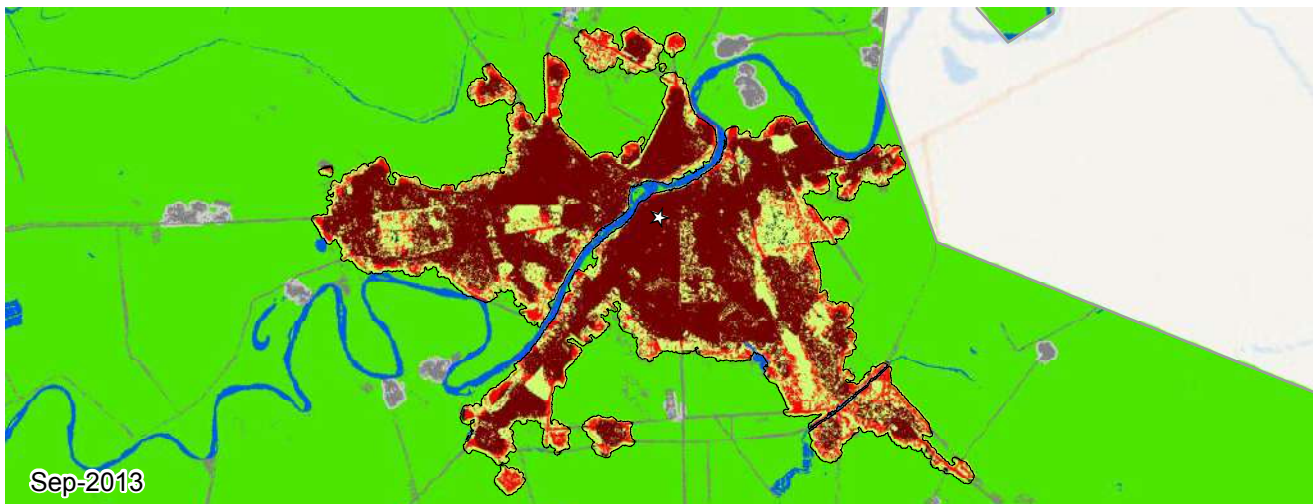
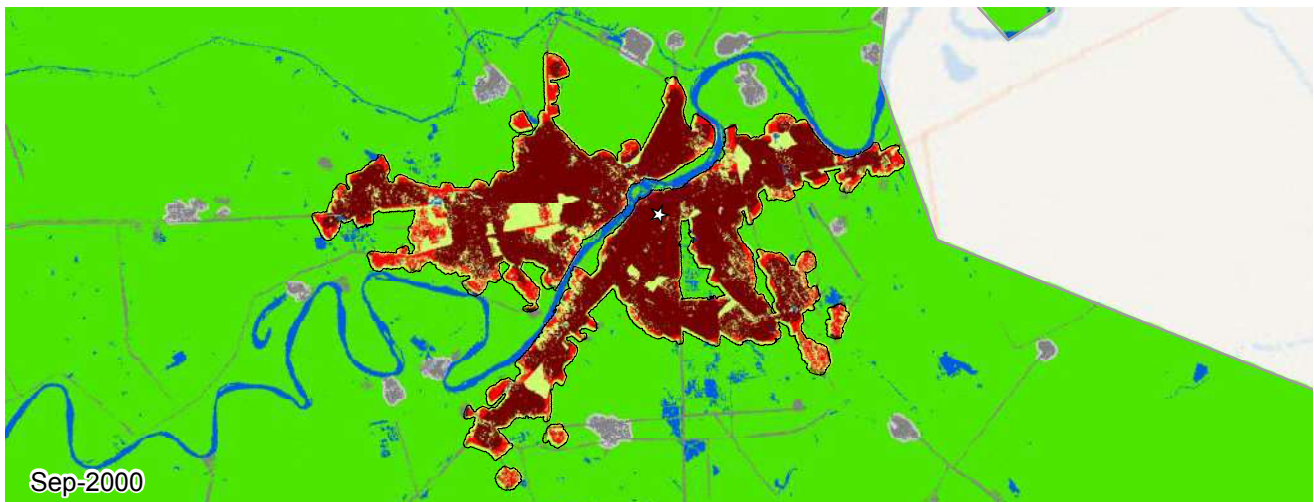
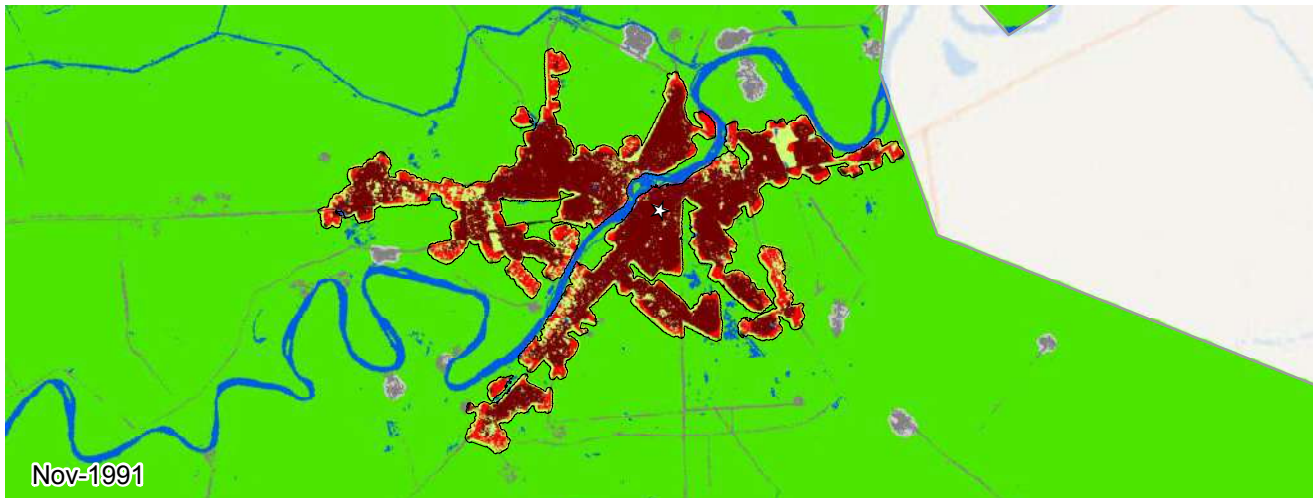


Legend for Charts
 Ahmedabad | Other cities in region | All other cities | Global average

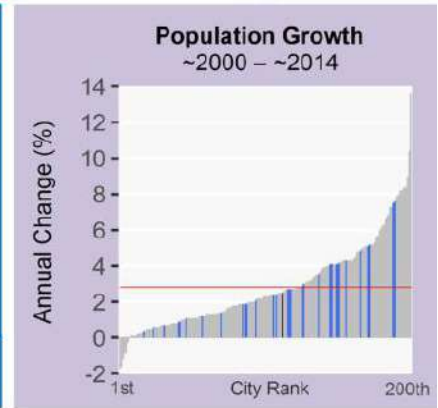
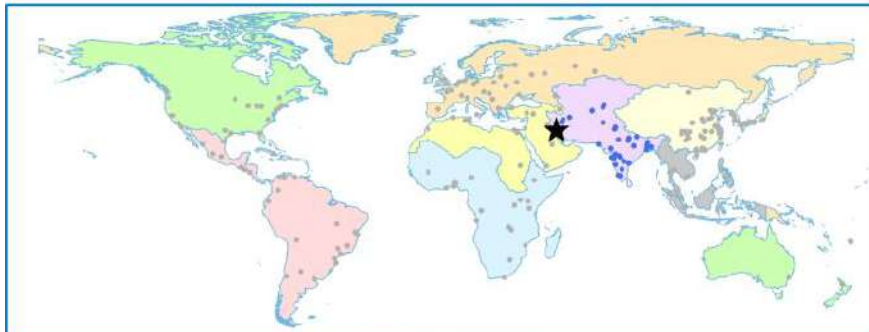


Metrics	Dec 1989	Oct 2000	Oct 2013	% Annual Change ('00-'13)
Population	3,737,722	4,718,390	6,232,951	2.1
Built-up Area (Hectares)				
Total	12,173	15,916	21,103	2.2
Urban	10,356	14,148	18,931	2.2
Suburban	1,697	1,642	2,034	1.6
Rural	119	125	136	0.7
Open space (Hectares)				
Urbanized Open Space	5,018	5,376	6,305	1.2
Urban Extent	17,192	21,292	27,408	1.9
Density (Persons / Hectare)				
Built-up Area Density	307.0	296.5	295.4	-0.0
Urban Extent Density	217.4	221.6	227.4	0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.71	0.75	0.77	0.2
Openness Index	0.25	0.20	0.19	-0.8
Compactness (Roundness)				
Proximity	0.92	0.93	0.94	0.1
Cohesion	0.91	0.92	0.93	0.1
Added Area (Hectares)	'89-'00	Share	'00-'13	Share
Infill	1,776	47%	1,846	35%
Extension	1,417	37%	2,747	52%
Leapfrog	0	0%	0	0%
Inclusion	548	14%	592	11%

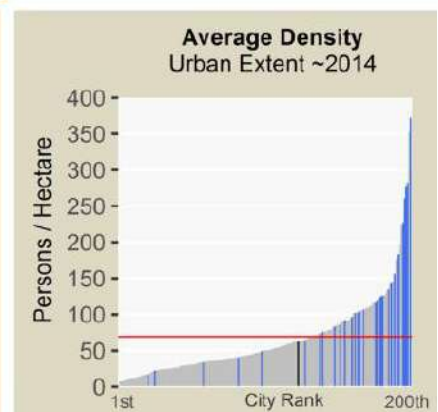
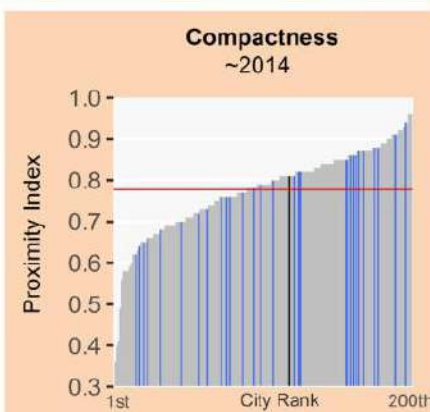
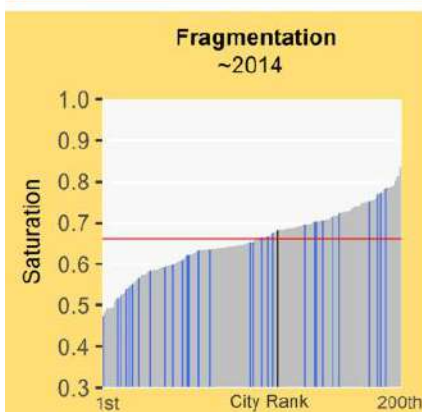
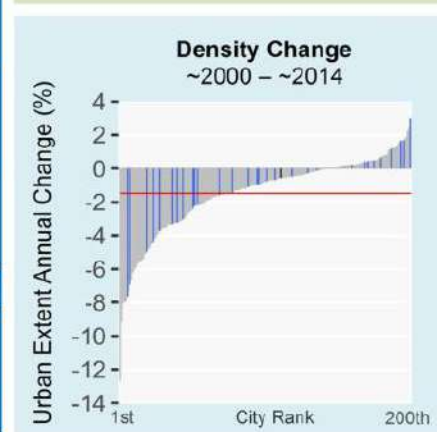
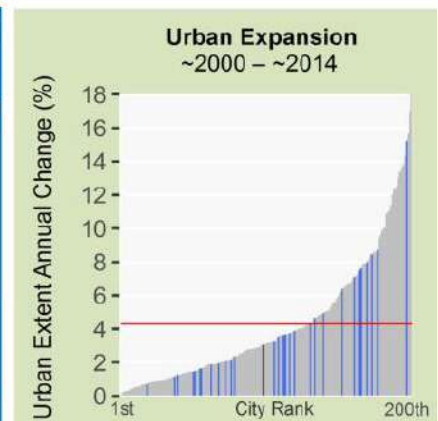


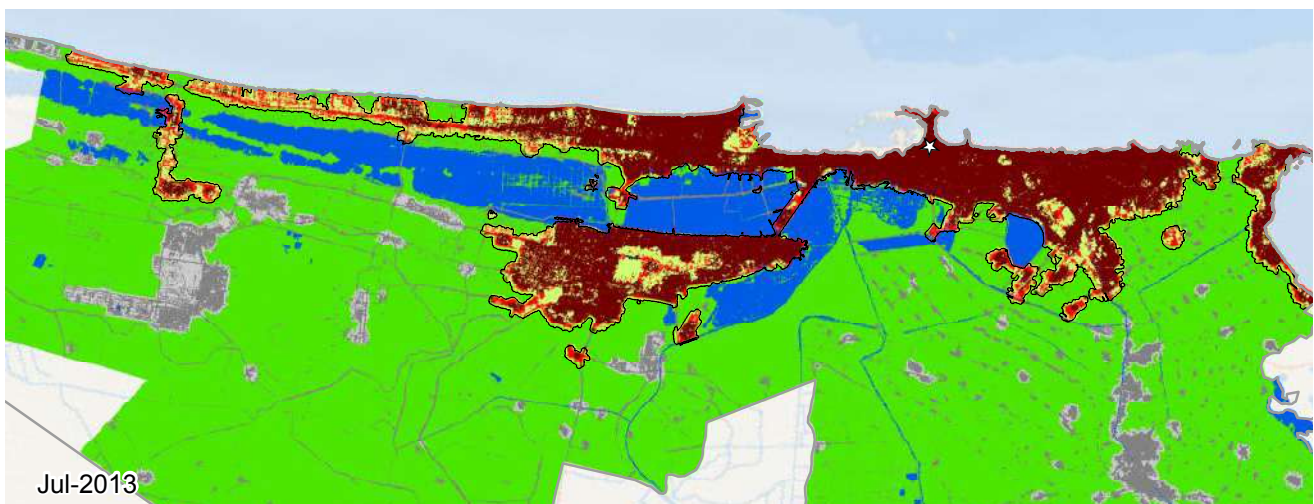
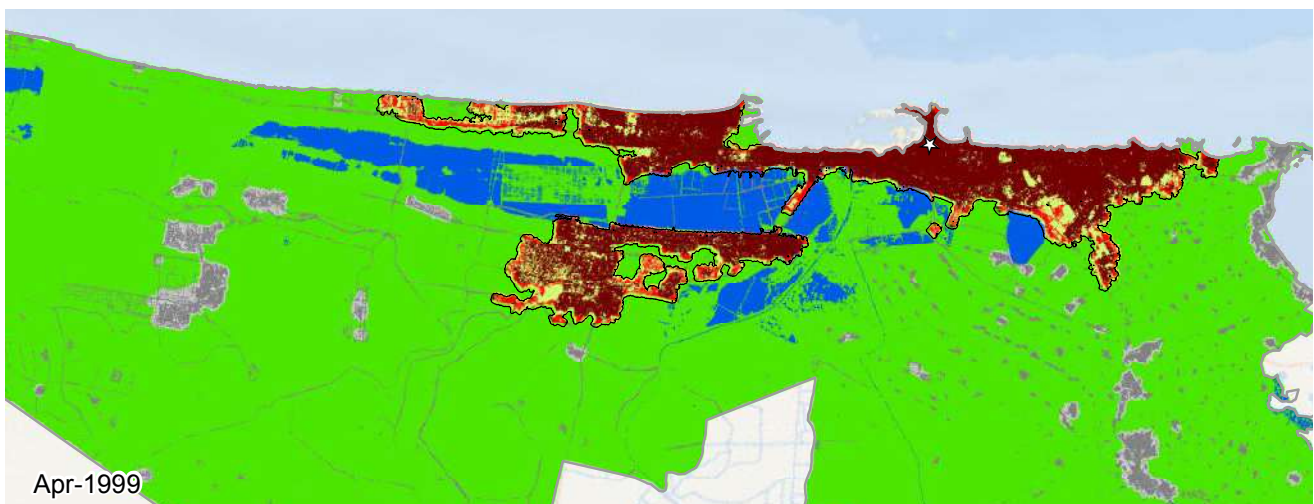


Ahvaz, Iran (South and Central Asia)



Metrics	Nov 1991	Sep 2000	Sep 2013	% Annual Change ('00-'13)
Population	698,309	853,526	1,178,559	2.5
Built-up Area (Hectares)				
Total	7,079	9,199	12,872	2.6
Urban	5,421	7,520	10,520	2.6
Suburban	1,576	1,605	2,203	2.4
Rural	81	74	149	5.4
Open space (Hectares)				
Urbanized Open Space	2,769	3,497	6,026	4.2
Urban Extent	9,849	12,697	18,899	3.1
Density (Persons / Hectare)				
Built-up Area Density	98.6	92.8	91.6	-0.1
Urban Extent Density	70.9	67.2	62.4	-0.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.72	0.72	0.68	-0.5
Openness Index	0.33	0.29	0.28	-0.3
Compactness (Roundness)				
Proximity	0.72	0.77	0.81	0.4
Cohesion	0.70	0.75	0.79	0.4
Added Area (Hectares)	'91-'00	Share	'00-'13	Share
Infill	517	24%	773	21%
Extension	857	40%	1,621	44%
Leapfrog	539	25%	625	17%
Inclusion	206	9%	652	17%

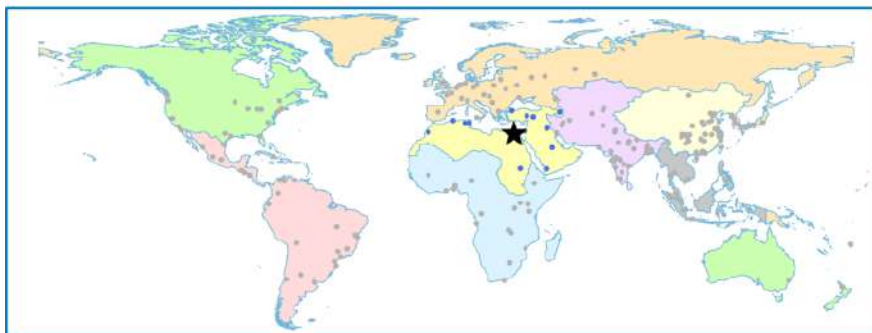




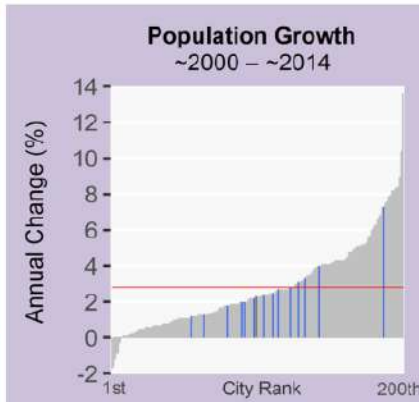
**Alexandria, Egypt
1987-2013**

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

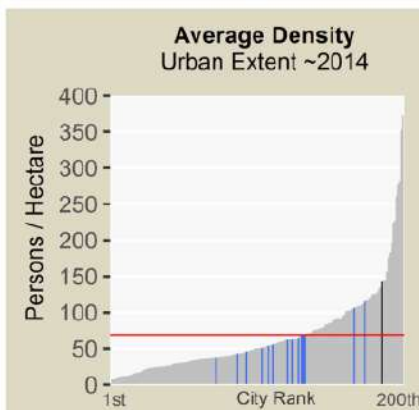
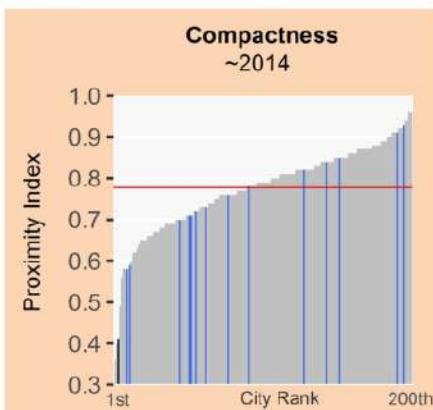
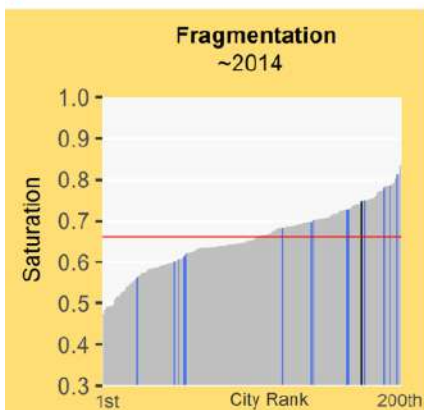
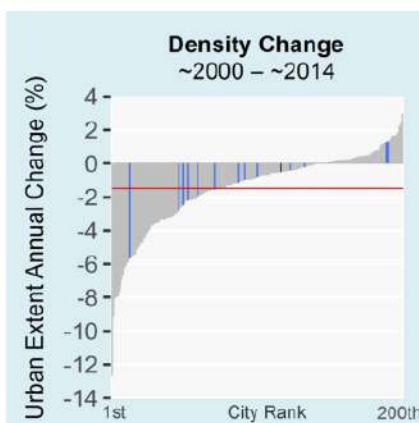
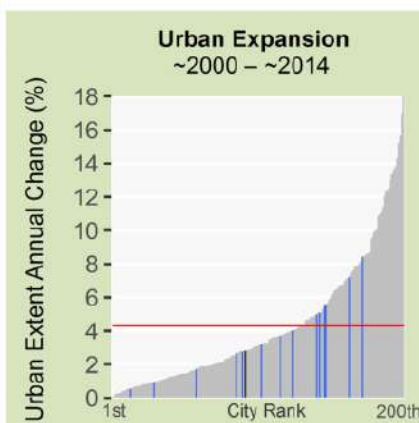
Alexandria, Egypt (Western Asia and North Africa)

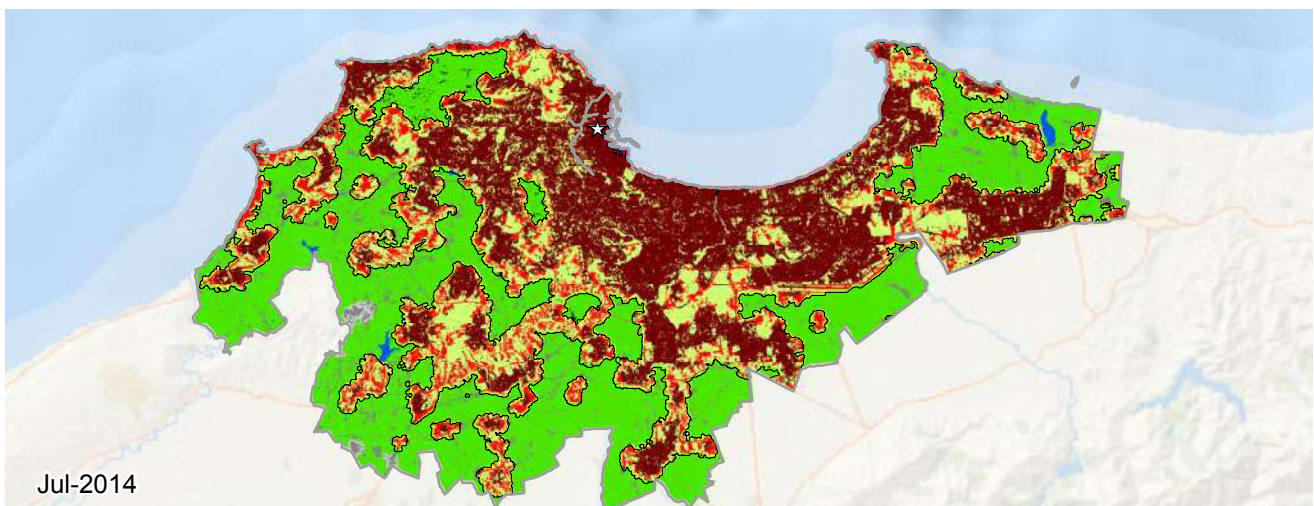
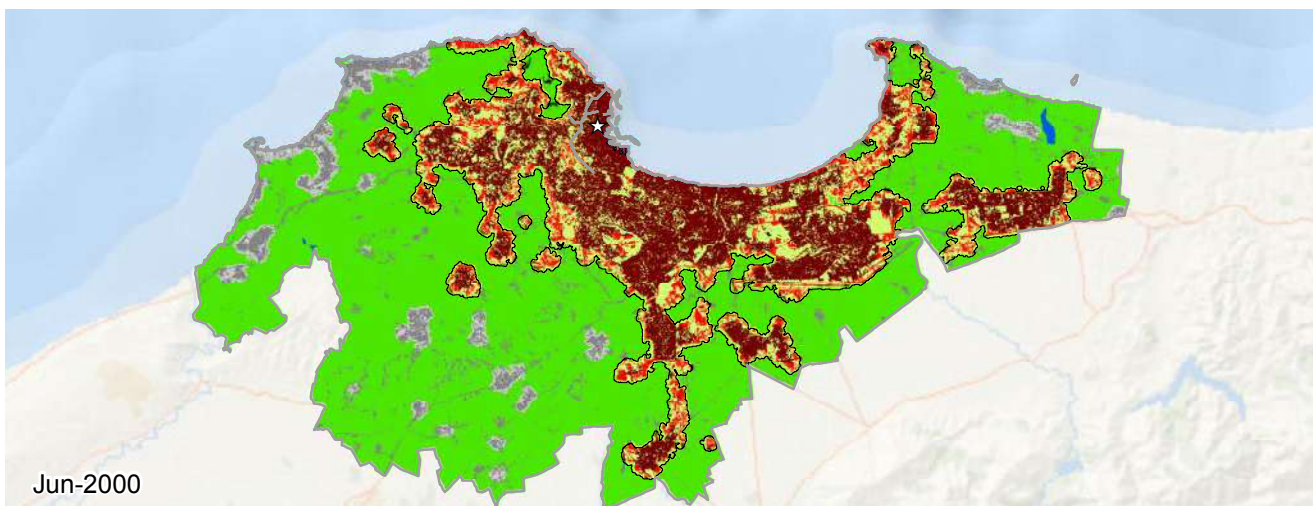
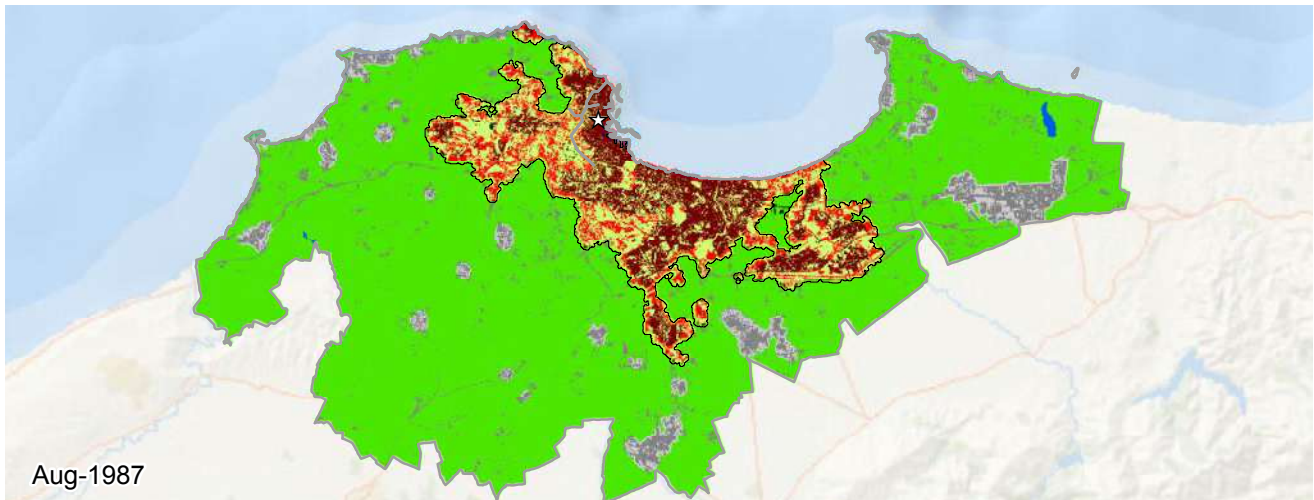


Legend for Charts
 Alexandria | Other cities in region | All other cities | Global average



Metrics	Oct 1987	Apr 1999	Jul 2013	% Annual Change ('99-'13)
Population	2,558,891	3,132,780	4,345,193	2.3
Built-up Area (Hectares)				
Total	7,818	15,513	22,781	2.7
Urban	6,756	13,156	18,900	2.5
Suburban	997	2,234	3,624	3.4
Rural	63	122	256	5.2
Open space (Hectares)				
Urbanized Open Space	2,174	4,842	7,636	3.2
Urban Extent	9,992	20,356	30,418	2.8
Density (Persons / Hectare)				
Built-up Area Density	327.3	201.9	190.7	-0.4
Urban Extent Density	256.1	153.9	142.8	-0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.78	0.76	0.75	-0.1
Openness Index	0.22	0.24	0.24	-0.0
Compactness (Roundness)				
Proximity	0.42	0.43	0.41	-0.3
Cohesion	0.42	0.45	0.41	-0.6
Added Area (Hectares)	'87-'99	Share	'99-'13	Share
Infill	1,307	16%	1,748	23%
Extension	4,505	58%	3,585	48%
Leapfrog	0	0%	288	3%
Inclusion	1,936	24%	1,695	23%





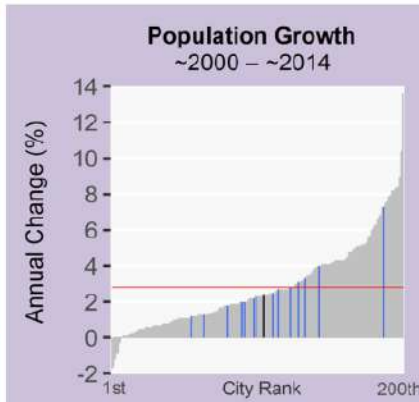
Algiers, Algeria
1987-2014

0 4 8 12 16 km

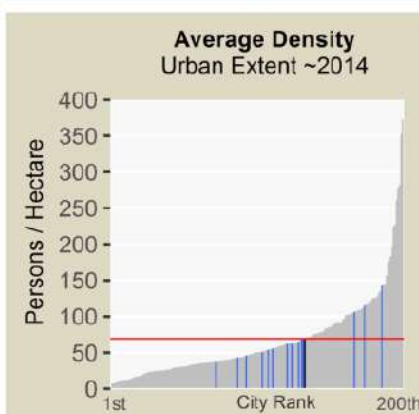
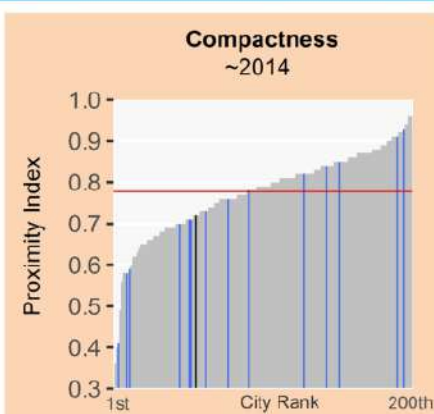
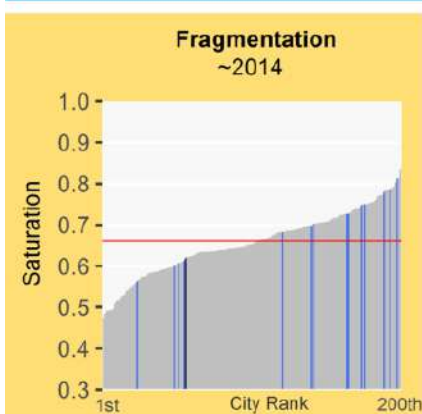
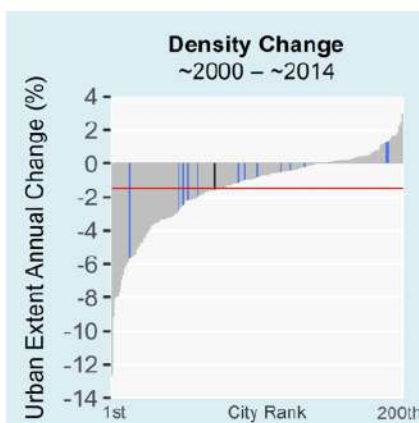
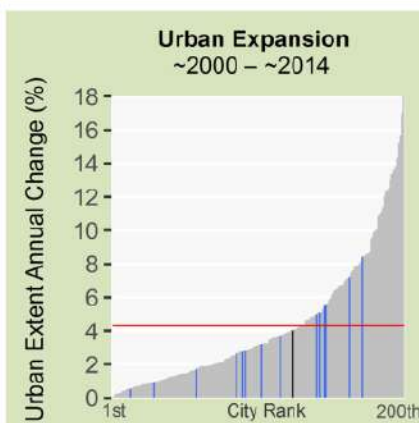
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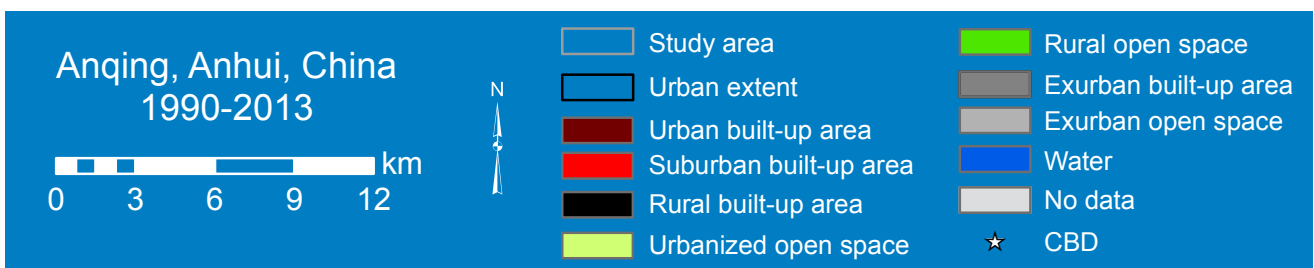
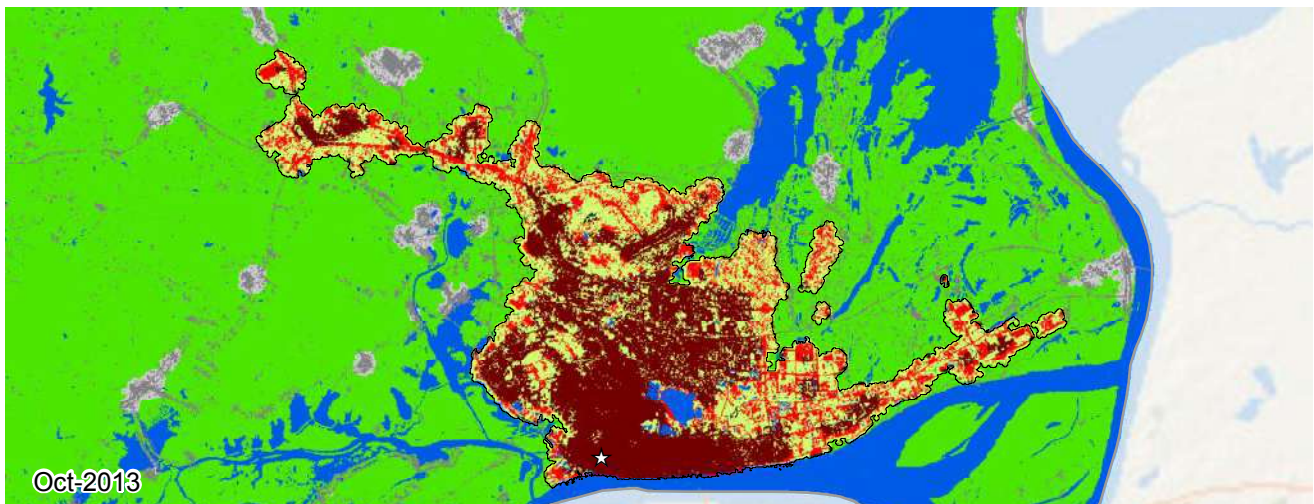
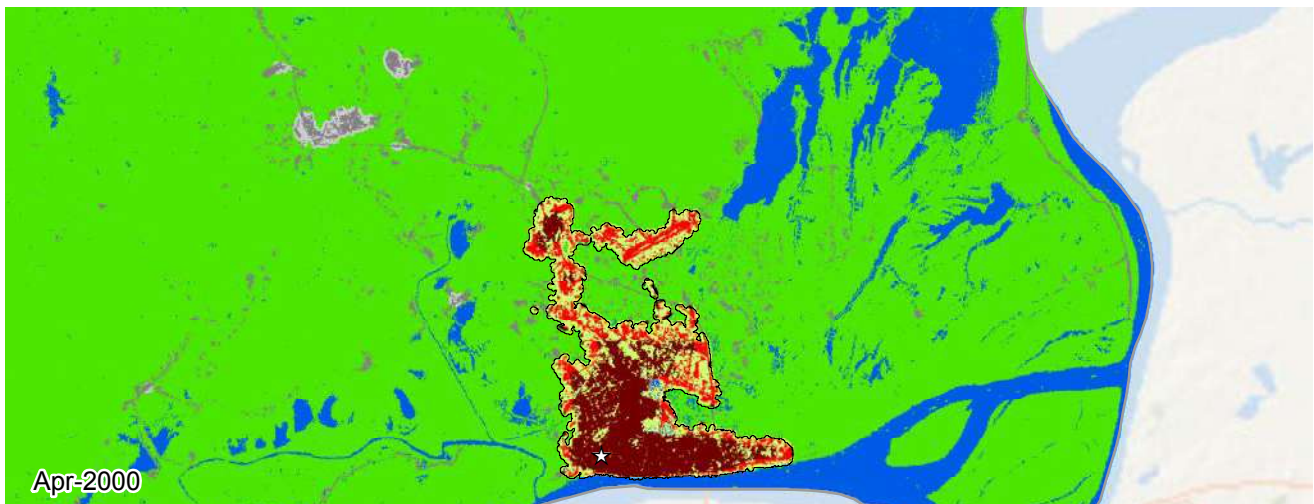
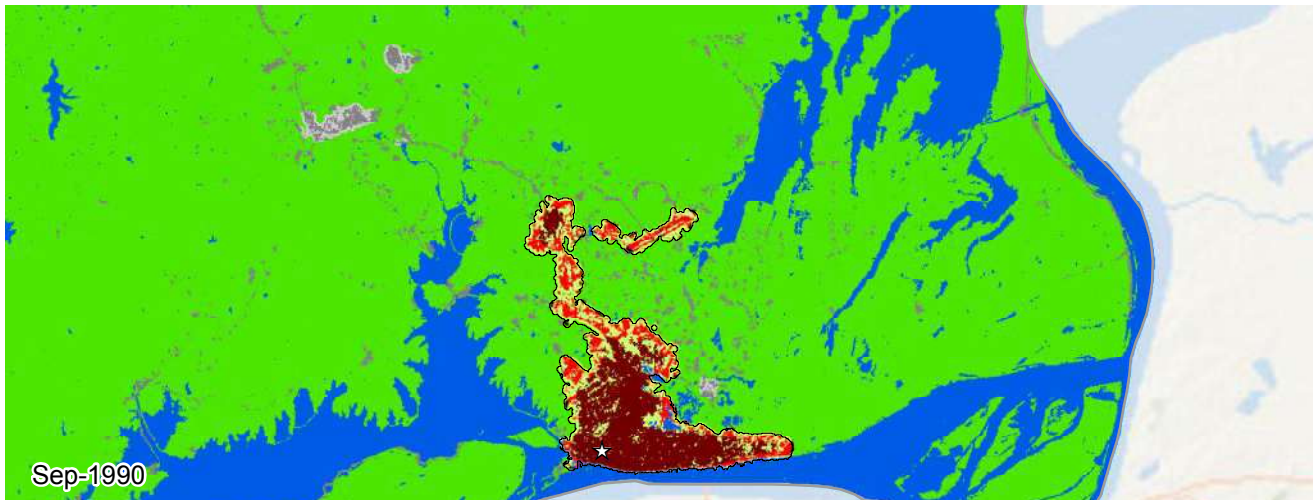
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Algiers, Algeria (Western Asia and North Africa)

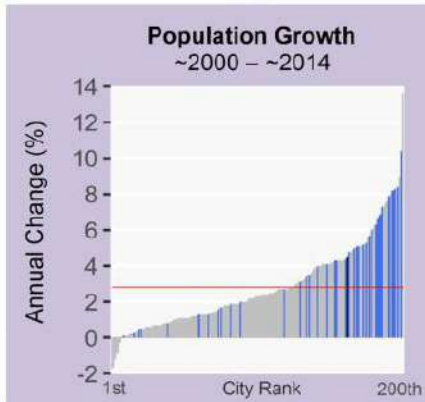


Metrics	Aug 1987	Jun 2000	Jul 2014	% Annual Change ('00-'14)
Population	1,535,734	2,184,790	3,085,560	2.5
Built-up Area (Hectares)				
Total	7,445	15,638	27,798	4.1
Urban	4,439	11,382	20,537	4.2
Suburban	2,809	3,959	6,835	3.9
Rural	196	297	426	2.5
Open space (Hectares)				
Urbanized Open Space	6,457	9,800	17,014	3.9
Urban Extent	13,903	25,439	44,812	4.0
Density (Persons / Hectare)				
Built-up Area Density	206.3	139.7	111.0	-1.6
Urban Extent Density	110.5	85.9	68.9	-1.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.61	0.62	0.1
Openness Index	0.45	0.37	0.33	-0.7
Compactness (Roundness)				
Proximity	0.69	0.66	0.72	0.6
Cohesion	0.69	0.65	0.70	0.6
Added Area (Hectares)	'87-'00	Share	'00-'14	Share
Infill	2,532	30%	3,614	29%
Extension	2,404	29%	4,990	41%
Leapfrog	407	4%	0	0%
Inclusion	2,856	34%	3,563	29%

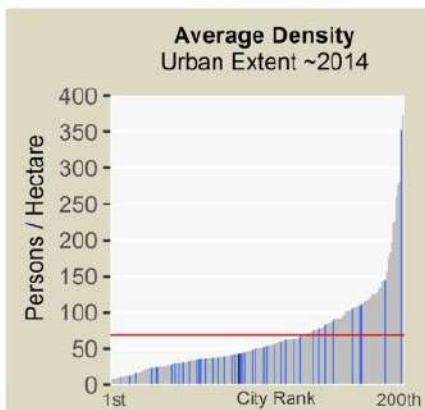
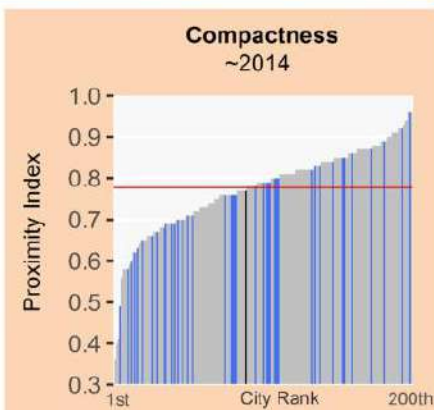
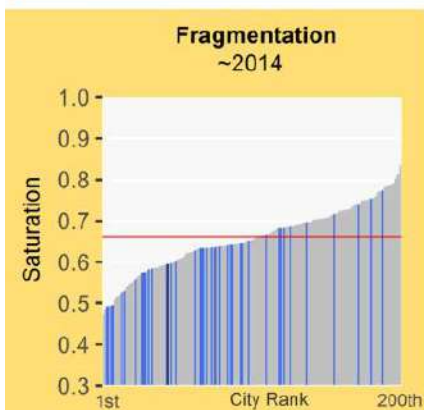
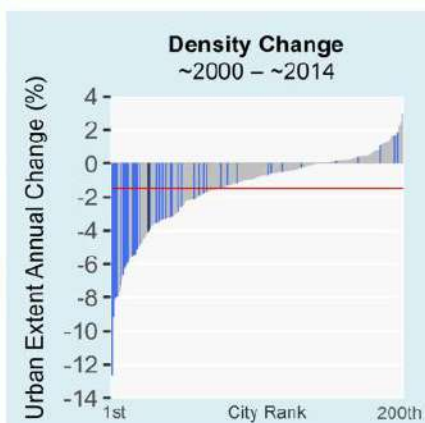
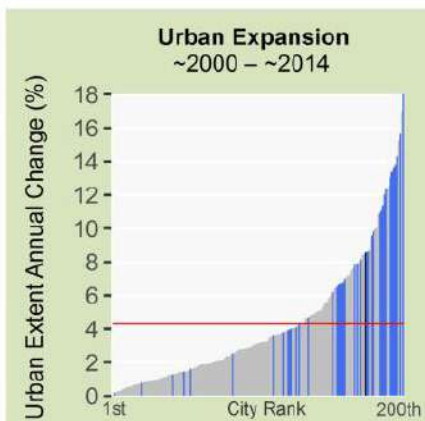


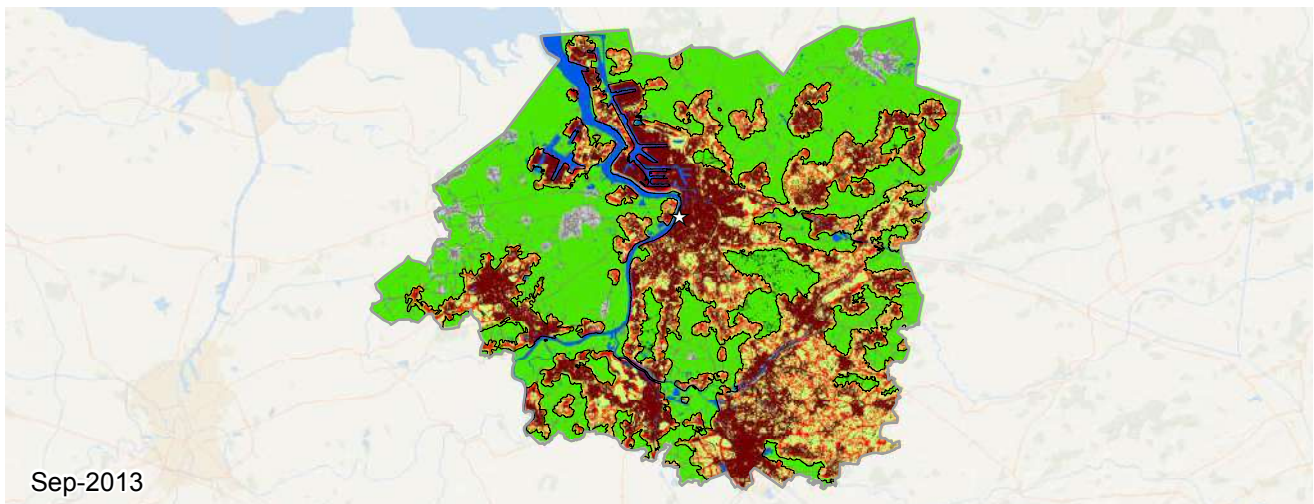
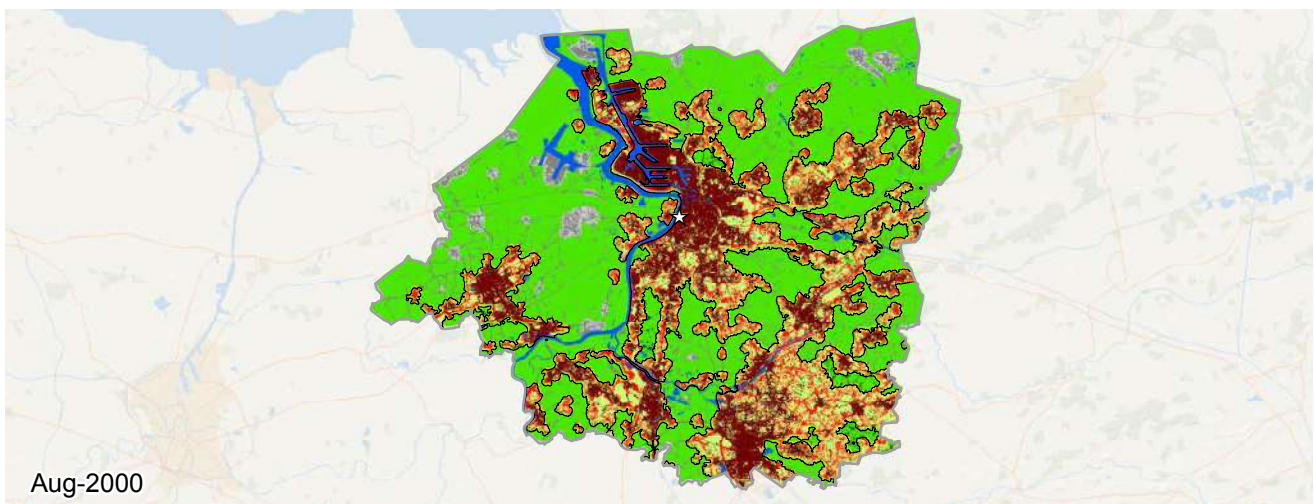
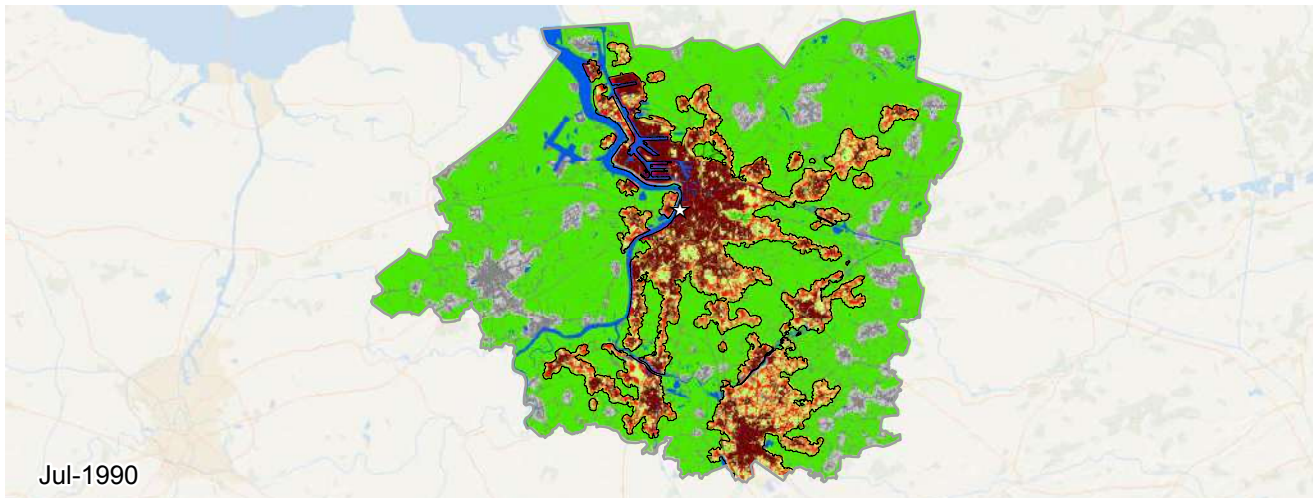


Anqing, Anhui, China (East Asia and the Pacific)



Metrics	Sep 1990	Apr 2000	Oct 2013	% Annual Change ('00-'13)
Population	402,523	350,035	642,625	4.5
Built-up Area (Hectares)				
Total	2,274	2,787	8,778	8.5
Urban	1,592	1,835	6,076	8.9
Suburban	631	883	2,531	7.8
Rural	50	69	170	6.7
Open space (Hectares)				
Urbanized Open Space	1,229	1,851	5,963	8.7
Urban Extent	3,504	4,639	14,742	8.6
Density (Persons / Hectare)				
Built-up Area Density	177.0	125.6	73.2	-4.0
Urban Extent Density	114.9	75.5	43.6	-4.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.60	0.60	-0.1
Openness Index	0.34	0.36	0.35	-0.1
Compactness (Roundness)				
Proximity	0.69	0.78	0.77	-0.1
Cohesion	0.68	0.77	0.74	-0.3
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	115	22%	850	14%
Extension	236	46%	4,203	70%
Leapfrog	0	0%	0	0%
Inclusion	160	31%	937	15%





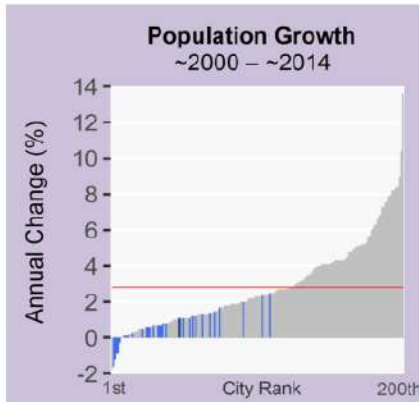
**Antwerp, Belgium
1990-2013**

0 6 12 18 24 km

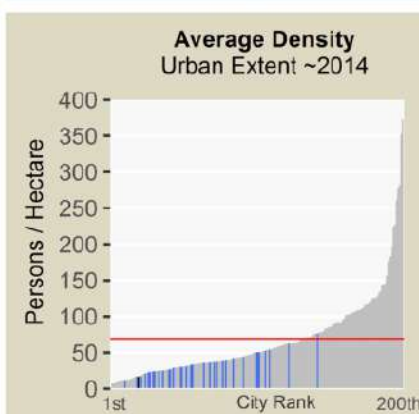
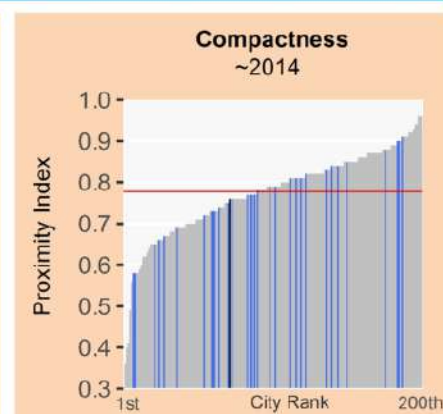
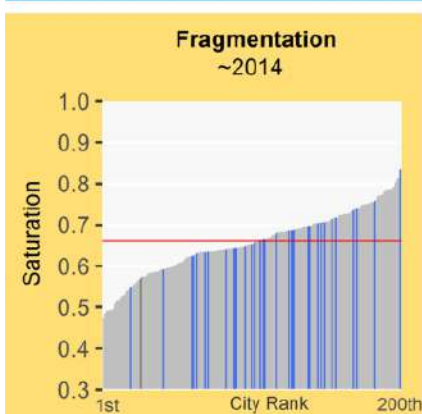
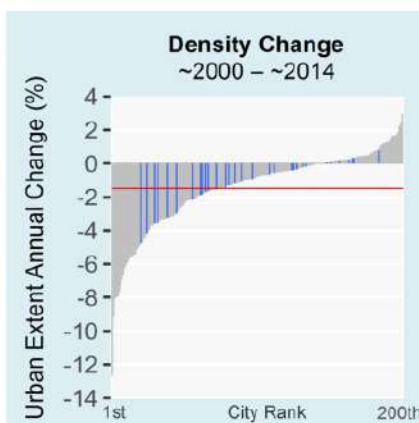
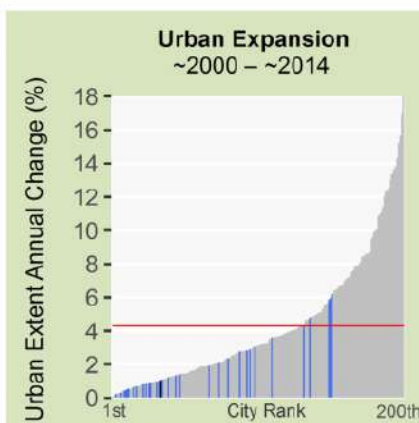
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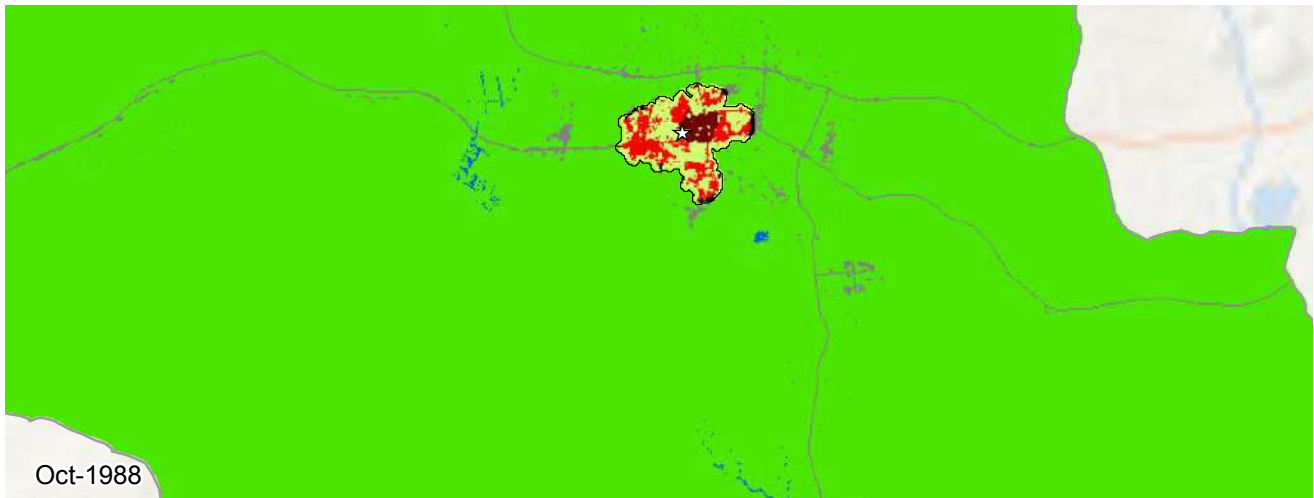
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Antwerp, Belgium (Europe and Japan)

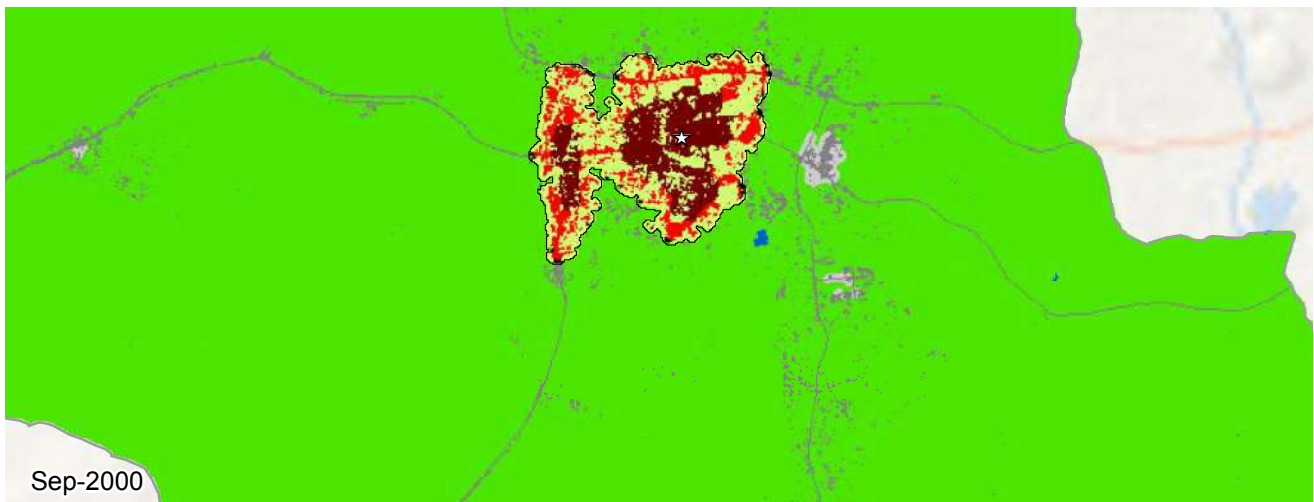


Metrics	Jul 1990	Aug 2000	Sep 2013	% Annual Change ('00-'13)
Population	885,819	1,107,990	1,277,376	1.1
Built-up Area (Hectares)				
Total	21,676	35,705	43,115	1.4
Urban	12,290	20,448	27,604	2.3
Suburban	8,736	14,152	14,522	0.2
Rural	649	1,105	988	-0.9
Open space (Hectares)				
Urbanized Open Space	17,704	29,970	32,287	0.6
Urban Extent	39,381	65,675	75,402	1.1
Density (Persons / Hectare)				
Built-up Area Density	40.9	31.0	29.6	-0.4
Urban Extent Density	22.5	16.9	16.9	0.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.55	0.54	0.57	0.4
Openness Index	0.44	0.43	0.40	-0.6
Compactness (Roundness)				
Proximity	0.68	0.74	0.76	0.3
Cohesion	0.67	0.73	0.75	0.3
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	3,454	24%	3,537	47%
Extension	2,417	17%	1,146	15%
Leapfrog	225	1%	560	7%
Inclusion	7,931	56%	2,171	29%

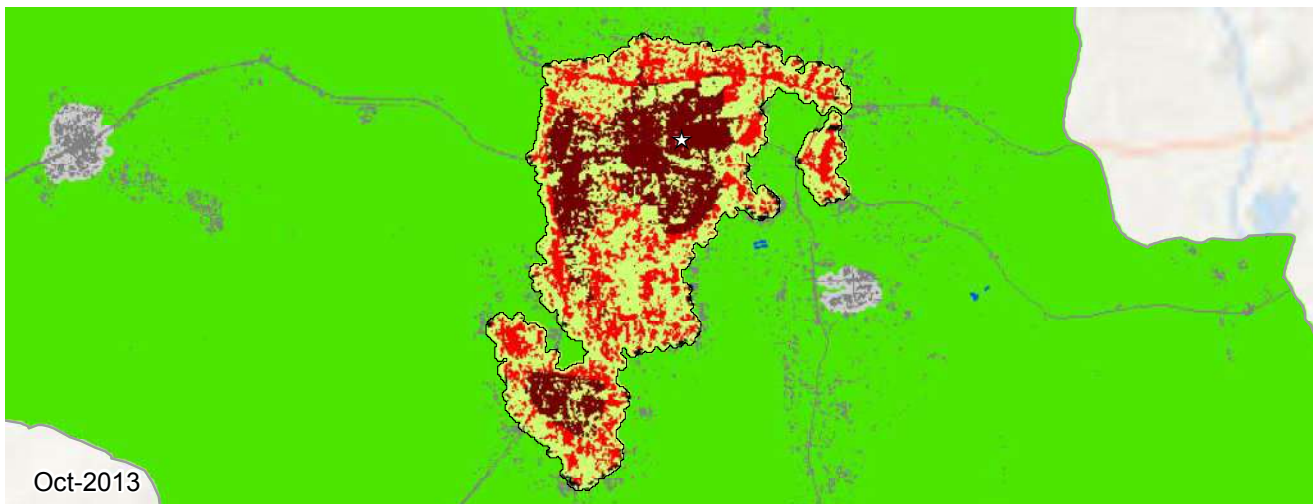




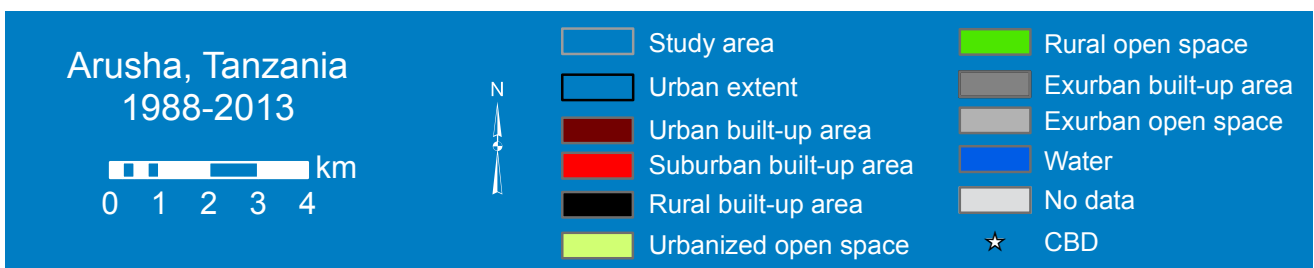
Oct-1988



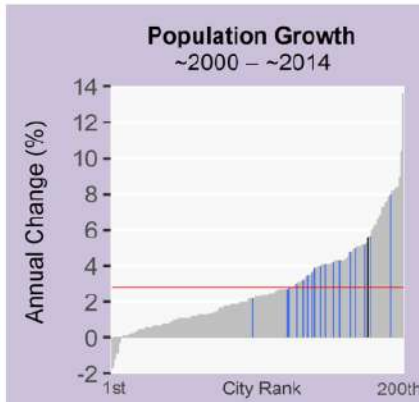
Sep-2000



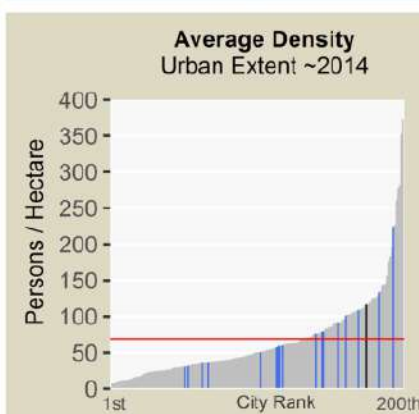
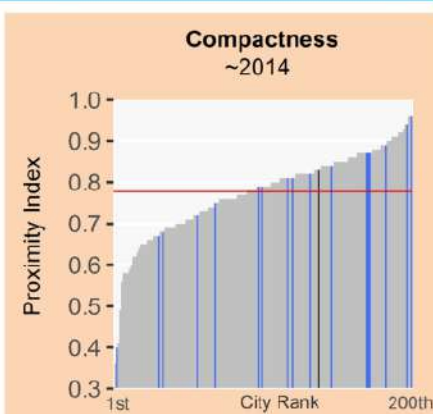
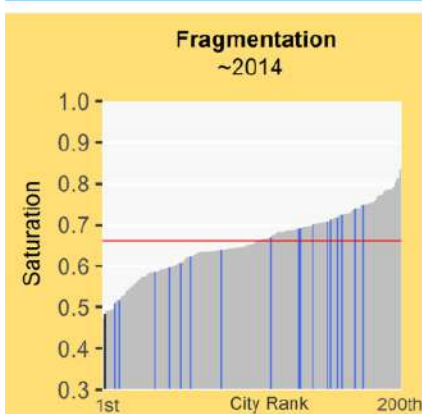
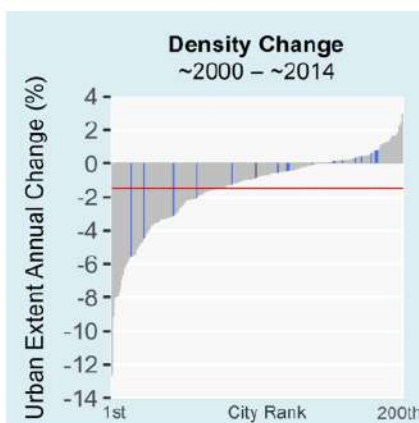
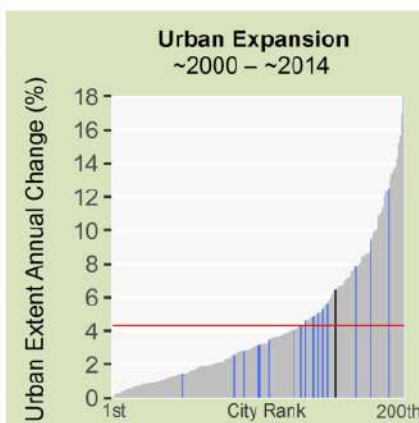
Oct-2013

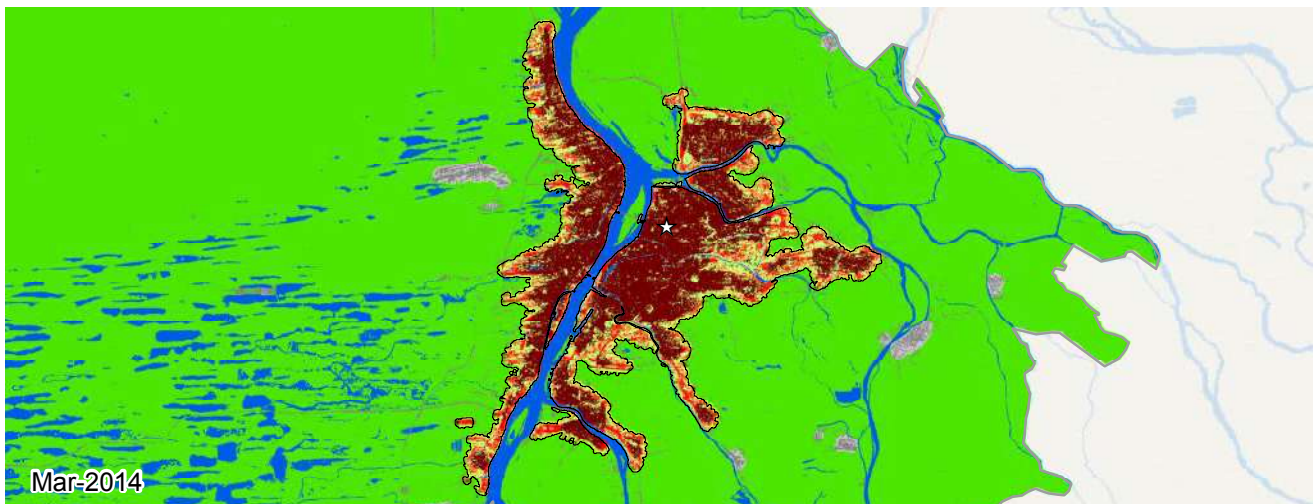
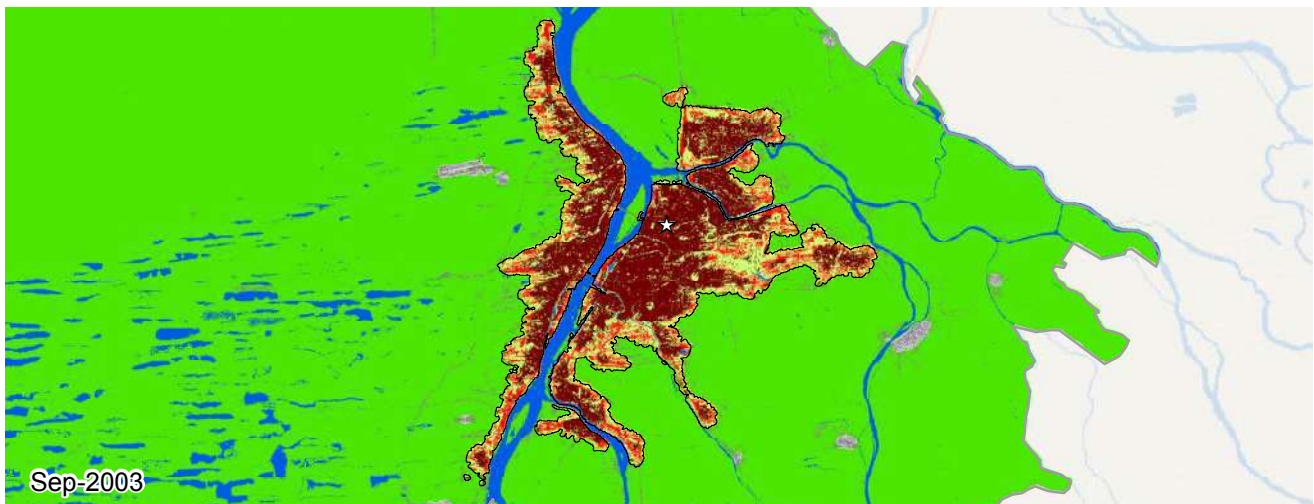
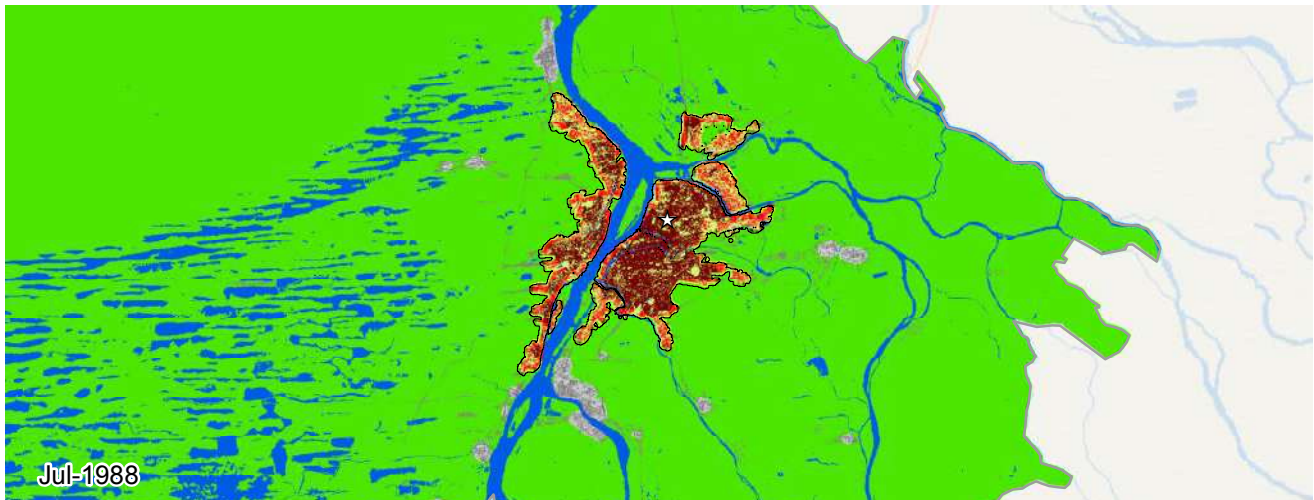


Arusha, Tanzania (Sub-Saharan Africa)



Metrics	Oct 1988	Sep 2000	Oct 2013	% Annual Change ('00-'13)
Population	84,149	181,168	377,169	5.6
Built-up Area (Hectares)				
Total	178	693	1,562	6.2
Urban	39	380	761	5.3
Suburban	125	287	746	7.3
Rural	13	26	55	5.7
Open space (Hectares)				
Urbanized Open Space	207	694	1,665	6.7
Urban Extent	385	1,388	3,228	6.5
Density (Persons / Hectare)				
Built-up Area Density	472.0	261.1	241.3	-0.6
Urban Extent Density	218.4	130.5	116.8	-0.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.46	0.50	0.48	-0.2
Openness Index	0.59	0.47	0.48	0.2
Compactness (Roundness)				
Proximity	0.94	0.92	0.83	-0.8
Cohesion	0.93	0.92	0.82	-0.9
Added Area (Hectares)	'88-'00	Share	'00-'13	Share
Infill	79	15%	116	13%
Extension	362	70%	584	67%
Leapfrog	0	0%	0	0%
Inclusion	74	14%	168	19%





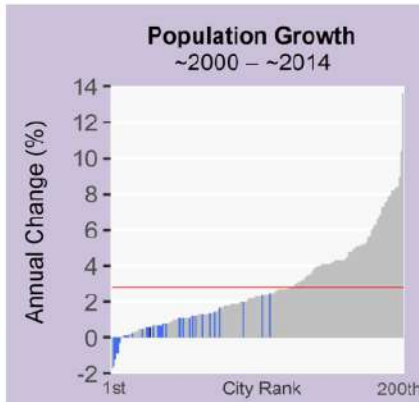
**Astrakhan, Russia
1988-2014**

0 5 10 15 20 km

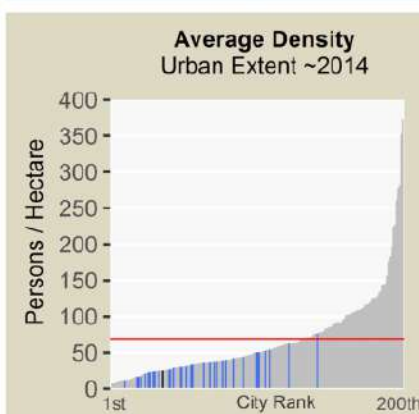
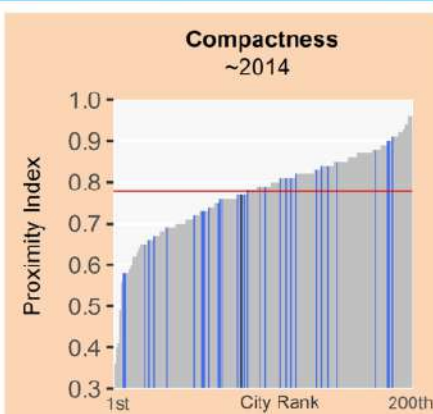
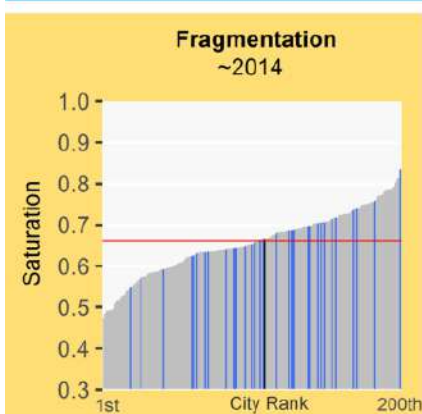
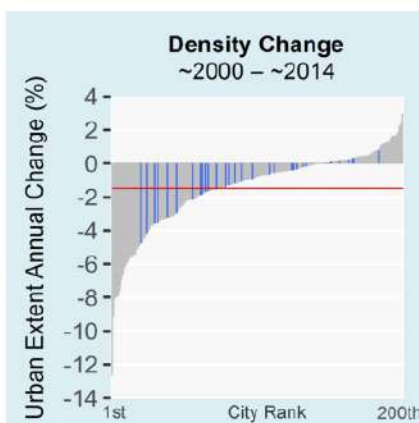
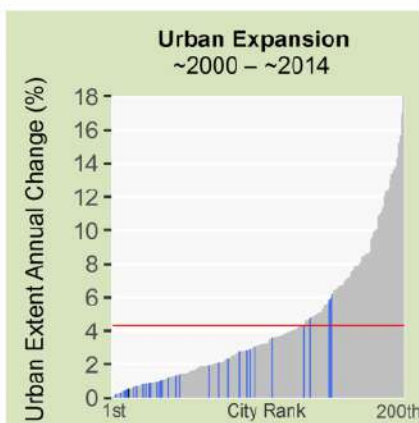
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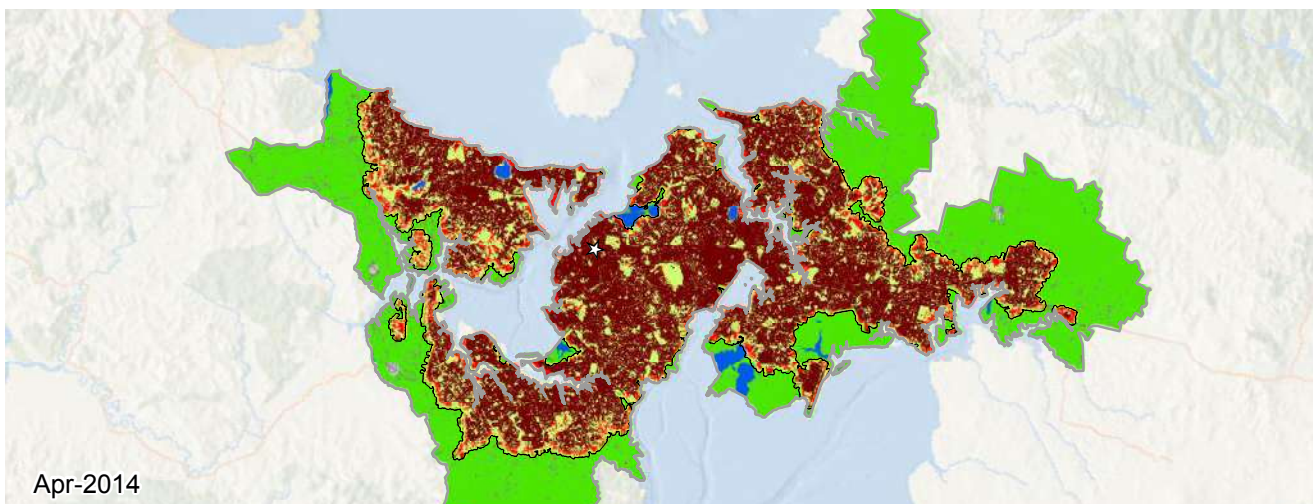
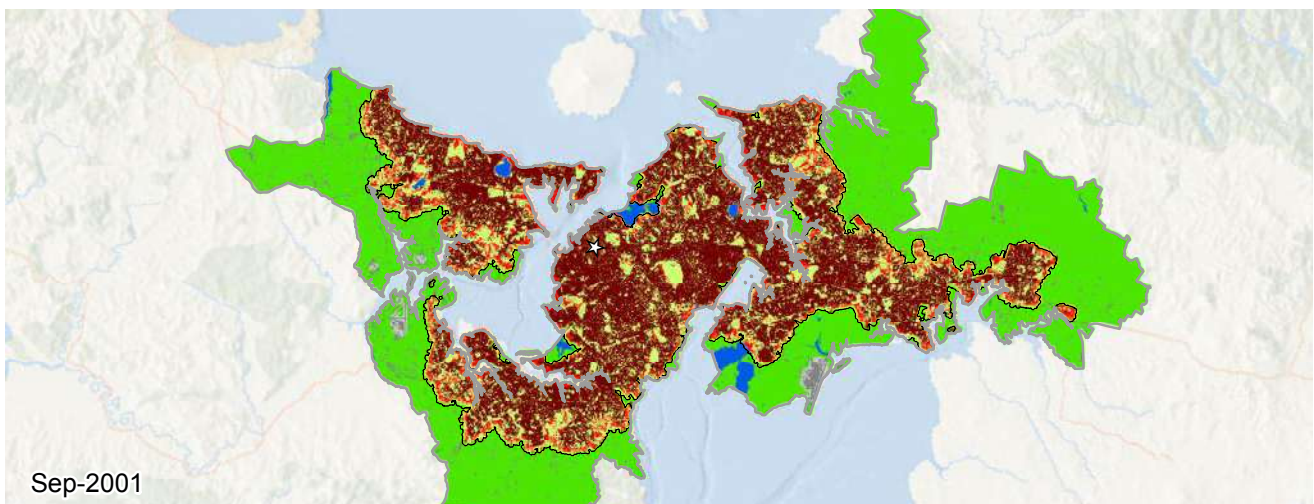
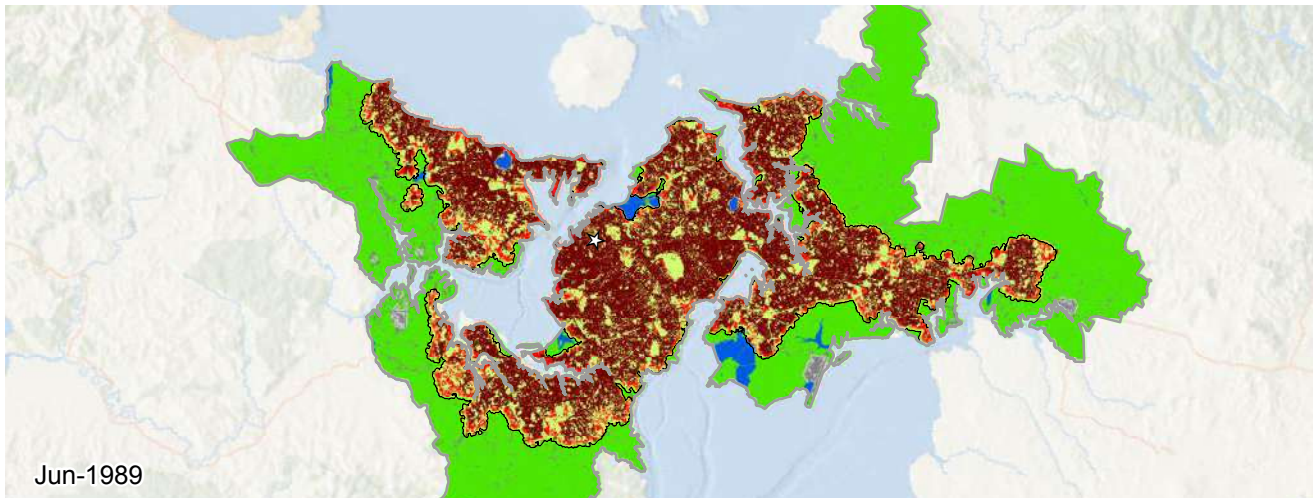
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Astrakhan, Russia (Europe and Japan)















Metrics	Jul 1988	Sep 2003	Mar 2014	% Annual Change ('03-'14)
Population	475,766	532,540	567,628	0.6
Built-up Area (Hectares)				
Total	5,622	13,289	14,857	1.1
Urban	3,510	9,964	11,514	1.4
Suburban	1,951	3,074	3,106	0.1
Rural	160	250	235	-0.6
Open space (Hectares)				
Urbanized Open Space	3,728	7,808	7,459	-0.4
Urban Extent	9,351	21,097	22,316	0.5
Density (Persons / Hectare)				
Built-up Area Density	84.6	40.1	38.2	-0.5
Urban Extent Density	50.9	25.2	25.4	0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.60	0.63	0.67	0.5
Openness Index	0.42	0.33	0.31	-0.7
Compactness (Roundness)				
Proximity	0.77	0.78	0.77	-0.0
Cohesion	0.75	0.76	0.75	-0.1
Added Area (Hectares)	'88-'03	Share	'03-'14	Share
Infill	2,152	28%	1,009	64%
Extension	3,969	51%	130	8%
Leapfrog	0	0%	126	8%
Inclusion	1,562	20%	301	19%



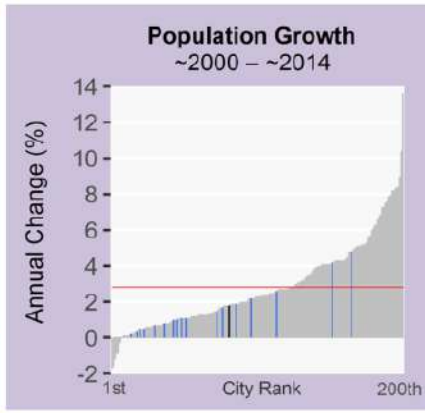


**Auckland, New Zealand
1989-2014**

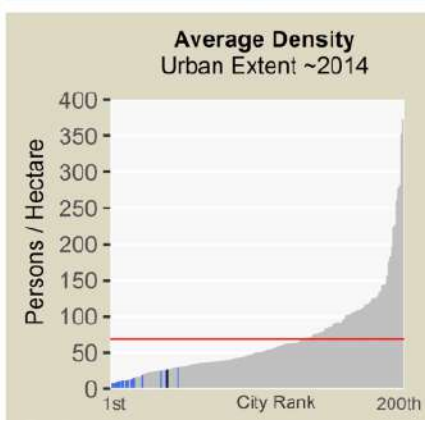
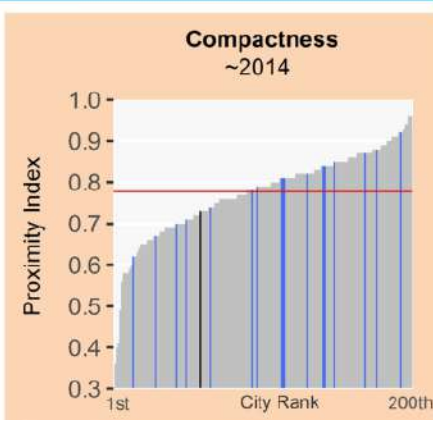
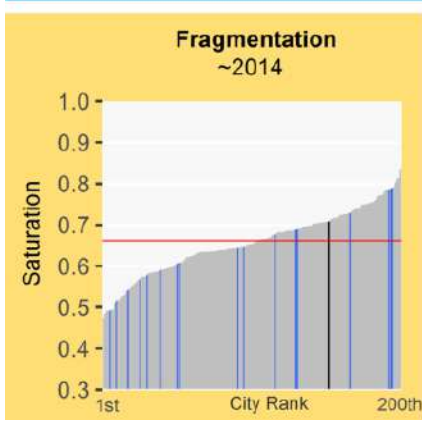
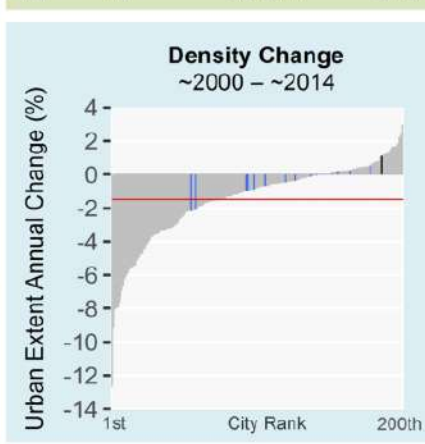
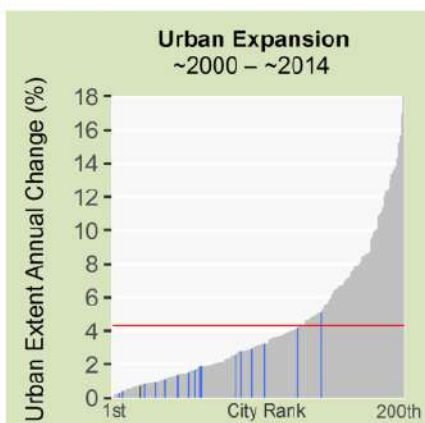
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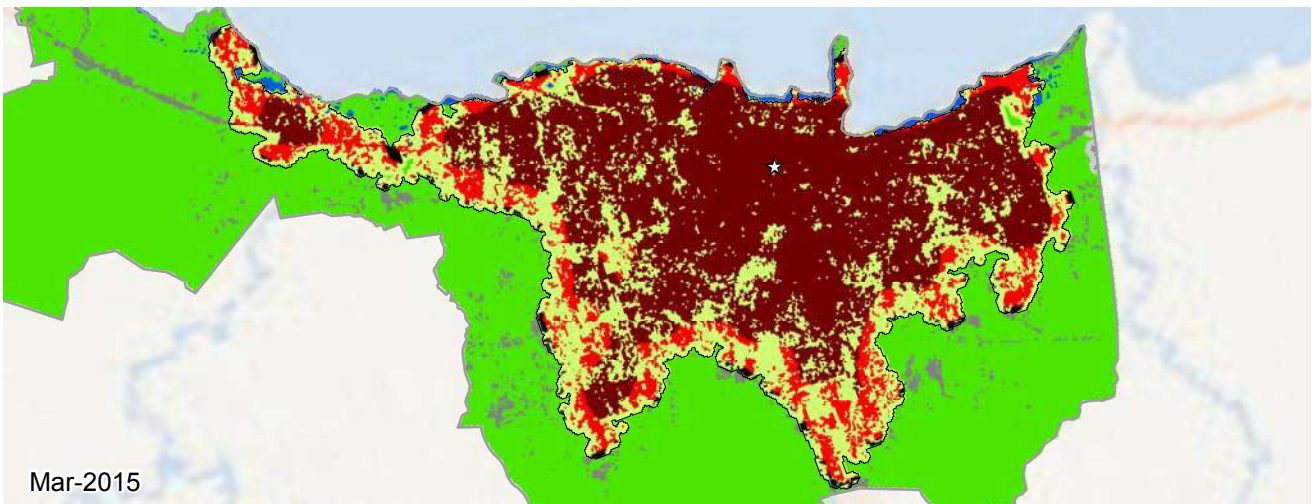
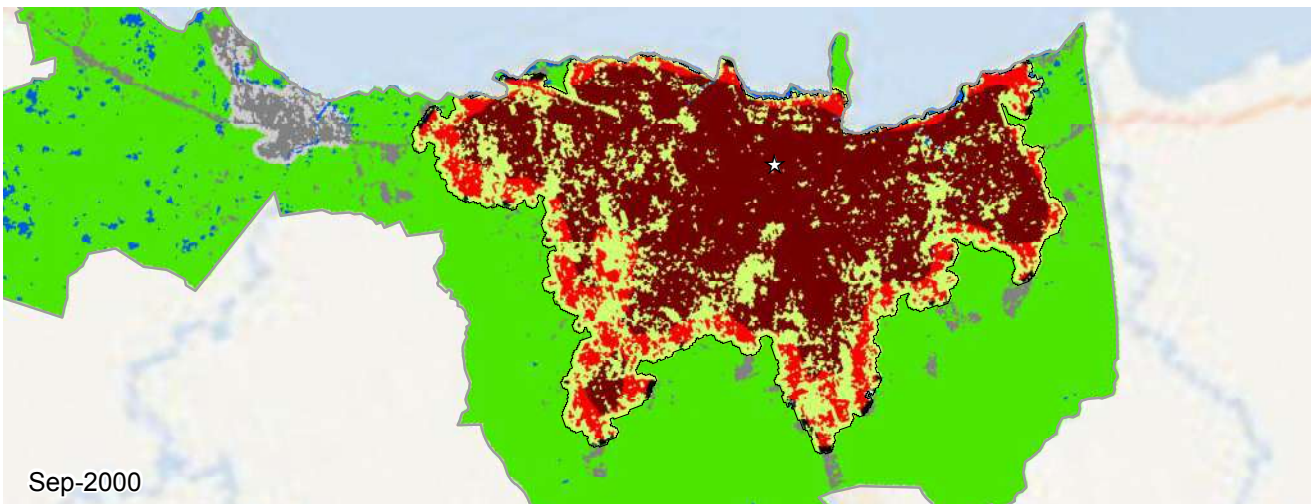
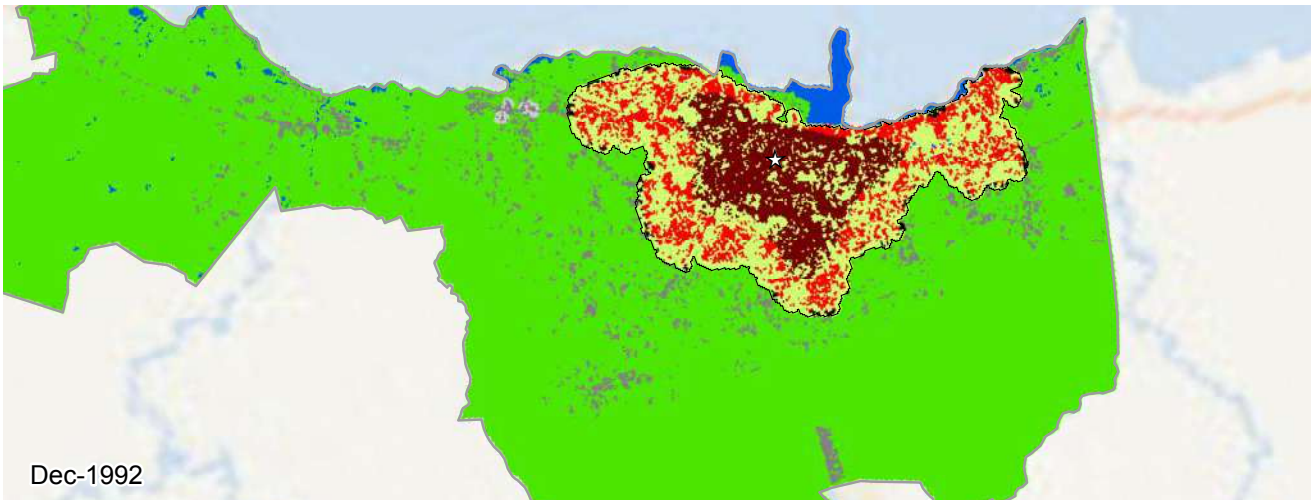
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Auckland, New Zealand (Land-Rich Developed Countries)



Metrics	Jun 1989	Sep 2001	Apr 2014	% Annual Change ('01-'14)
Population	838,073	1,031,718	1,300,732	1.8
Built-up Area (Hectares)				
Total	27,642	29,917	34,601	1.2
Urban	22,728	24,971	30,011	1.5
Suburban	4,707	4,734	4,361	-0.7
Rural	207	211	228	0.6
Open space (Hectares)				
Urbanized Open Space	13,892	14,707	14,224	-0.3
Urban Extent	41,535	44,625	48,826	0.7
Density (Persons / Hectare)				
Built-up Area Density	30.3	34.5	37.6	0.7
Urban Extent Density	20.2	23.1	26.6	1.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.67	0.67	0.71	0.4
Openness Index	0.33	0.32	0.29	-1.0
Compactness (Roundness)				
Proximity	0.73	0.73	0.73	0.1
Cohesion	0.71	0.72	0.72	0.0
Added Area (Hectares)	'89-'01	Share	'01-'14	Share
Infill	895	39%	2,696	57%
Extension	783	34%	1,307	27%
Leapfrog	261	11%	2	0%
Inclusion	335	14%	677	14%



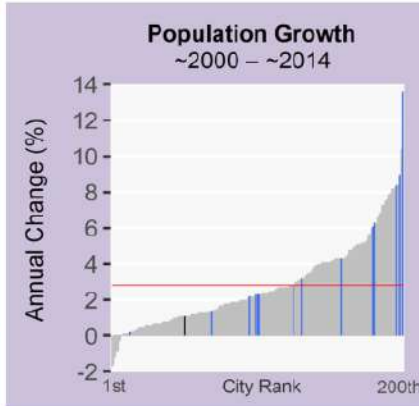


**Bacolod, Philippines
1992-2015**

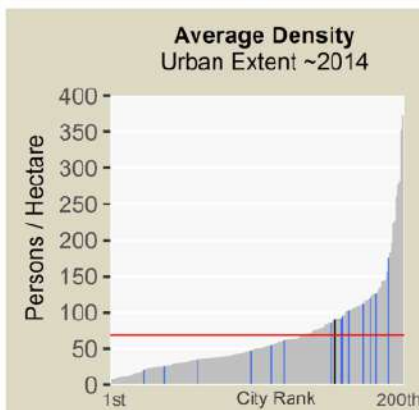
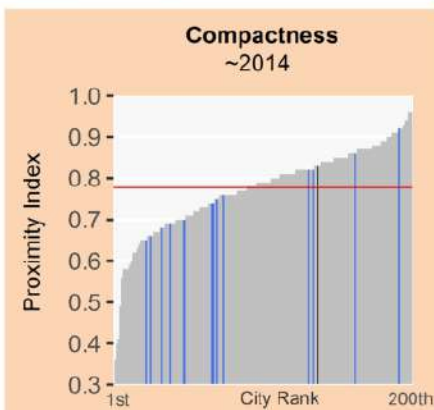
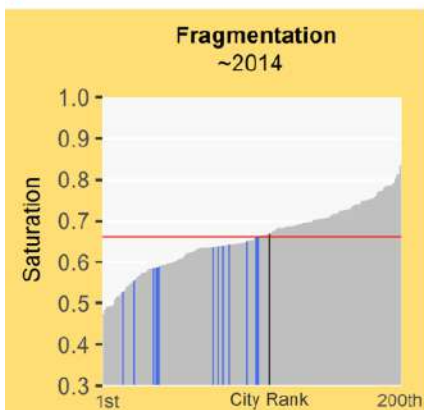
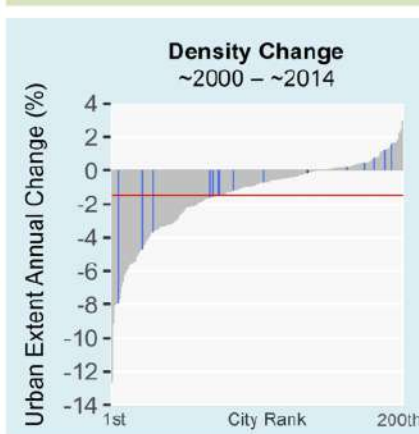
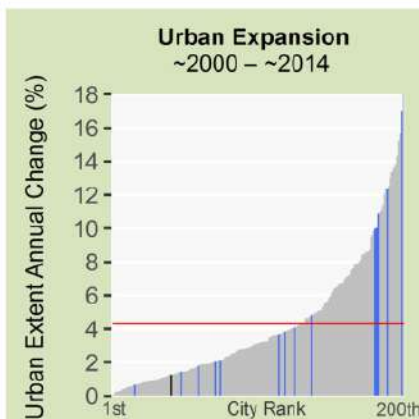
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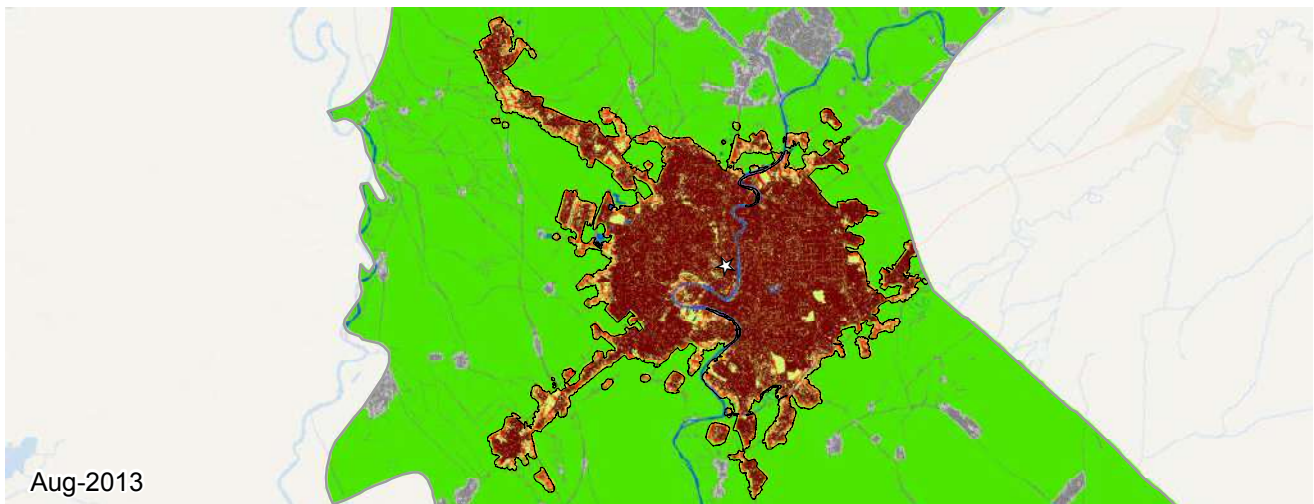
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Bacolod, Philippines (Southeast Asia)



Metrics	Dec 1992	Sep 2000	Mar 2015	% Annual Change ('00-'15)
Population	269,116	378,445	443,455	1.1
Built-up Area (Hectares)				
Total	887	2,788	3,297	1.2
Urban	449	2,248	2,607	1.0
Suburban	407	507	625	1.4
Rural	31	32	64	4.6
Open space (Hectares)				
Urbanized Open Space	895	1,308	1,627	1.5
Urban Extent	1,782	4,096	4,925	1.3
Density (Persons / Hectare)				
Built-up Area Density	303.1	135.7	134.5	-0.1
Urban Extent Density	150.9	92.4	90.0	-0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.50	0.68	0.67	-0.1
Openness Index	0.48	0.31	0.31	0.0
Compactness (Roundness)				
Proximity	0.83	0.88	0.83	-0.4
Cohesion	0.82	0.87	0.81	-0.5
Added Area (Hectares)	'92-'00	Share	'00-'15	Share
Infill	535	28%	154	30%
Extension	1,117	58%	136	26%
Leapfrog	0	0%	0	0%
Inclusion	247	13%	217	42%



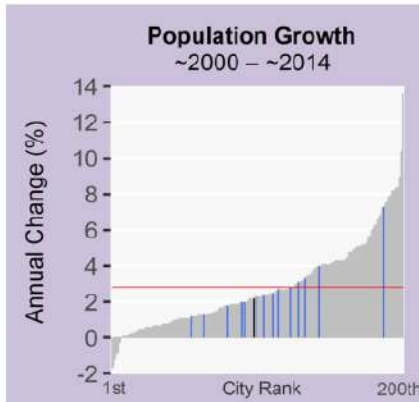
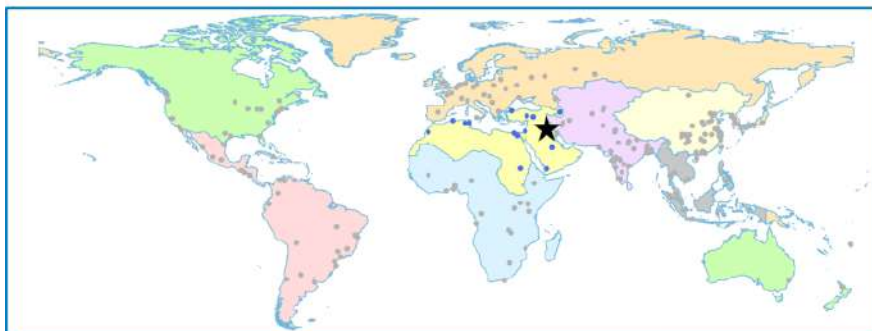


**Baghdad, Iraq
1990-2013**

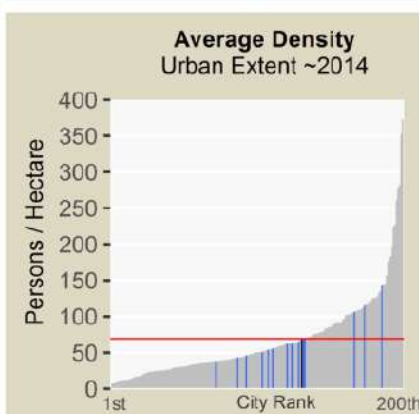
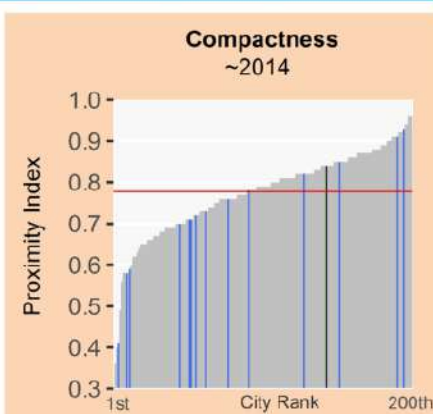
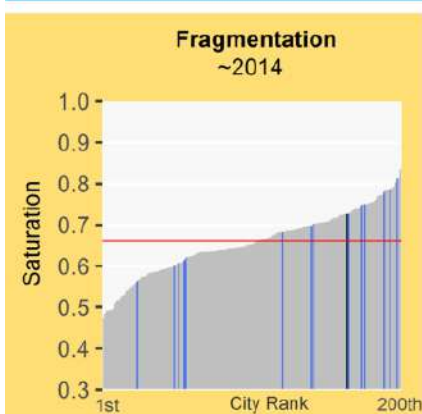
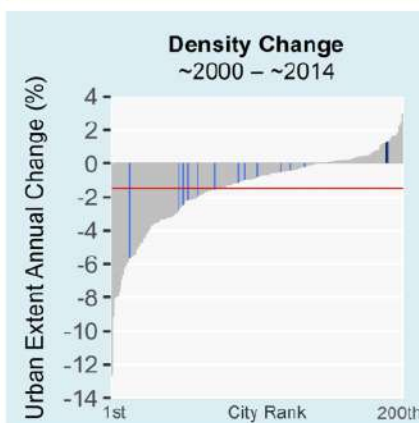
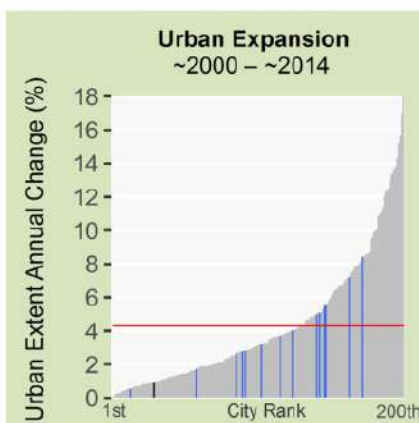
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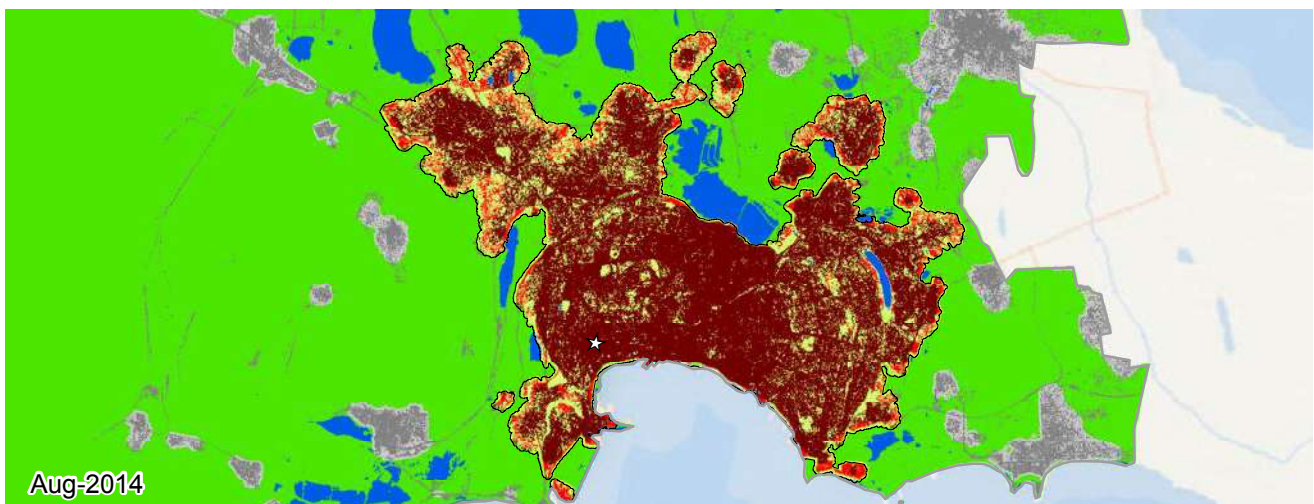
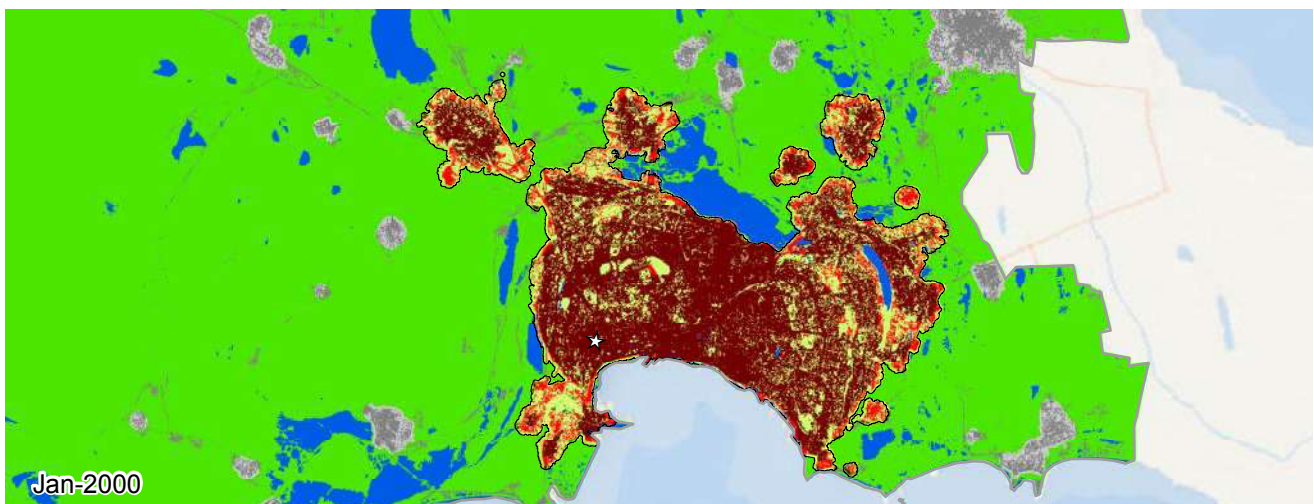
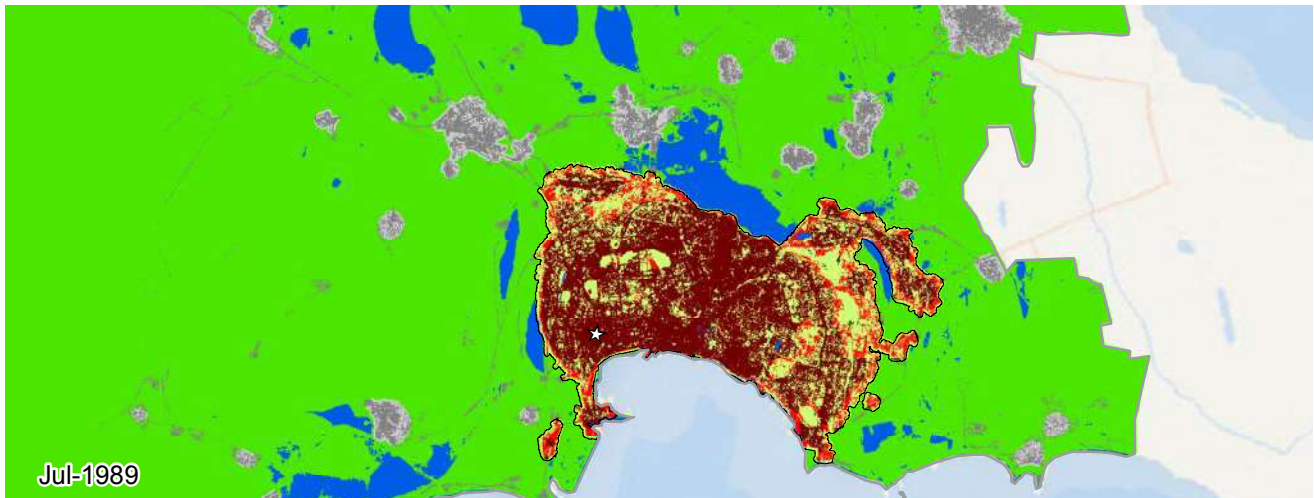
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Baghdad, Iraq (Western Asia and North Africa)



Metrics	Aug 1990	Aug 2000	Aug 2013	% Annual Change ('00-'13)
Population	2,837,103	3,985,381	5,279,192	2.2
Built-up Area (Hectares)				
Total	34,866	43,502	56,288	2.0
Urban	23,812	34,312	48,596	2.7
Suburban	10,474	8,617	7,169	-1.4
Rural	579	572	521	-0.7
Open space (Hectares)				
Urbanized Open Space	27,412	25,283	21,207	-1.4
Urban Extent	62,279	68,786	77,495	0.9
Density (Persons / Hectare)				
Built-up Area Density	81.4	91.6	93.8	0.2
Urban Extent Density	45.6	57.9	68.1	1.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.56	0.63	0.73	1.1
Openness Index	0.41	0.34	0.24	-2.6
Compactness (Roundness)				
Proximity	0.79	0.82	0.84	0.2
Cohesion	0.77	0.78	0.81	0.3
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	5,975	69%	8,334	65%
Extension	1,272	14%	2,665	20%
Leapfrog	40	0%	100	0%
Inclusion	1,347	15%	1,685	13%





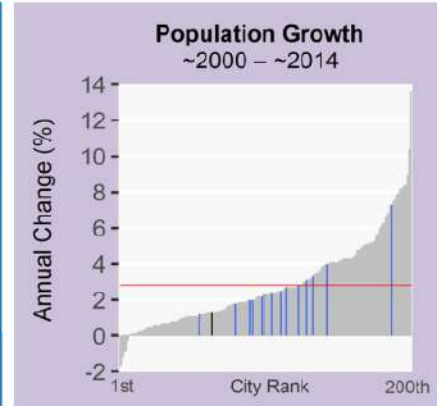
**Baku, Azerbaijan
1989-2014**

0 3 6 9 12 km

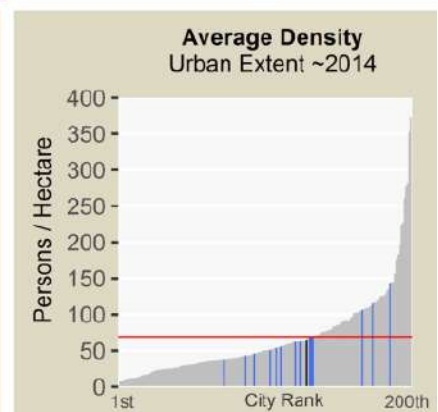
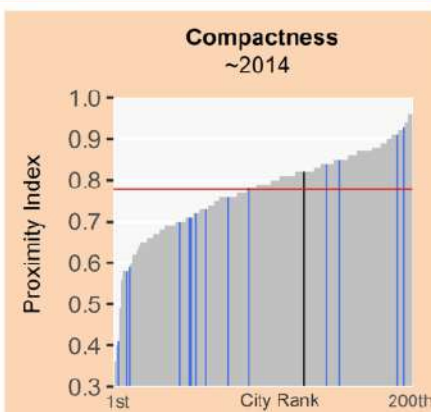
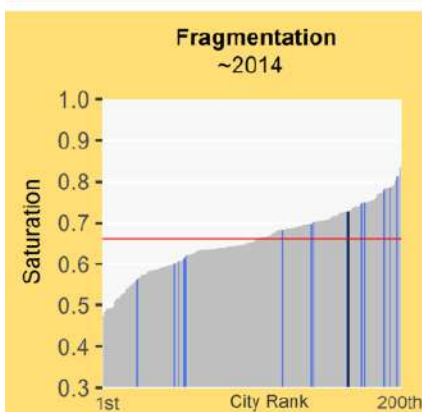
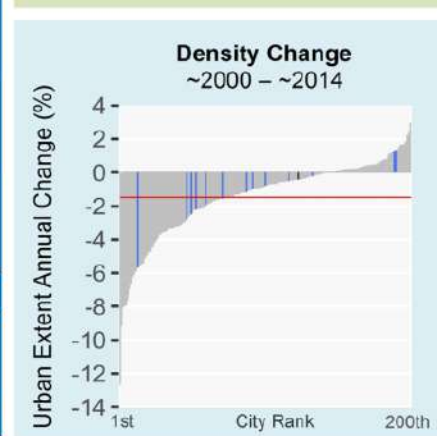
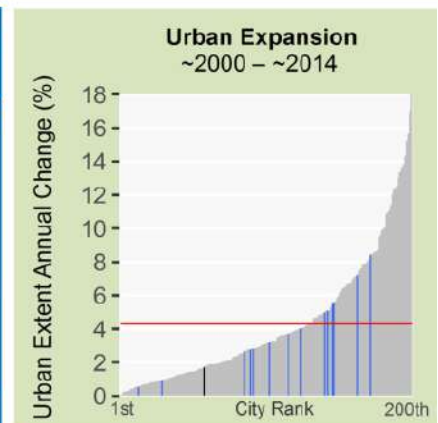
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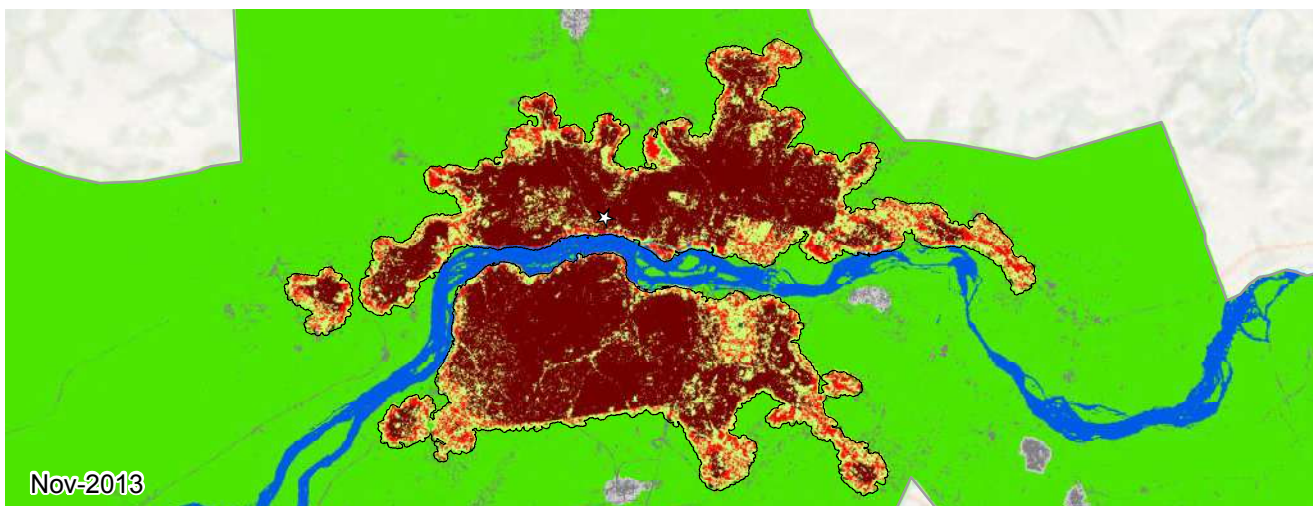
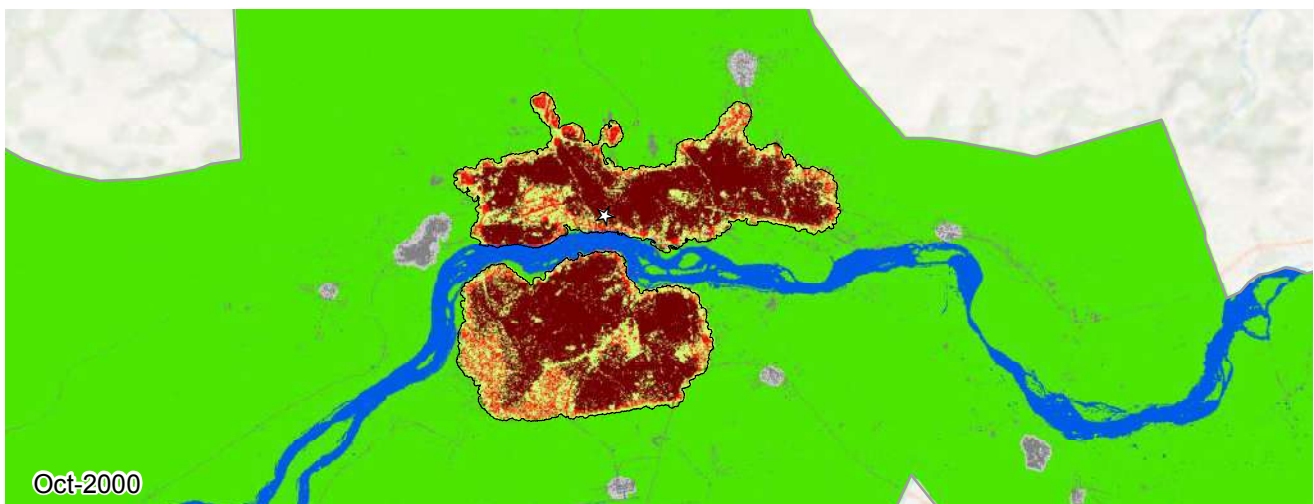
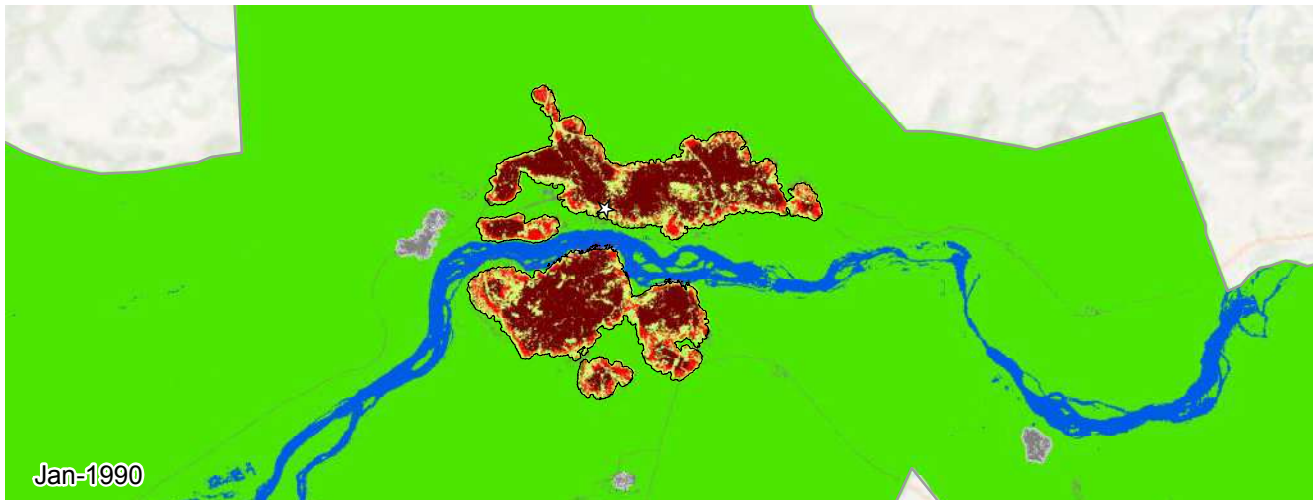
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Baku, Azerbaijan (Western Asia and North Africa)



Metrics	Jul 1989	Jan 2000	Aug 2014	% Annual Change ('00-'14)
Population	1,318,614	1,383,761	1,671,787	1.3
Built-up Area (Hectares)				
Total	9,358	13,690	18,669	2.1
Urban	7,704	11,559	16,497	2.4
Suburban	1,582	1,993	2,039	0.2
Rural	71	138	132	-0.3
Open space (Hectares)				
Urbanized Open Space	4,888	6,293	6,992	0.7
Urban Extent	14,247	19,983	25,662	1.7
Density (Persons / Hectare)				
Built-up Area Density	140.9	101.1	89.5	-0.8
Urban Extent Density	92.6	69.2	65.1	-0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.66	0.69	0.73	0.4
Openness Index	0.32	0.29	0.24	-1.2
Compactness (Roundness)				
Proximity	0.85	0.81	0.82	0.1
Cohesion	0.85	0.80	0.82	0.1
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	1,533	35%	2,194	44%
Extension	1,265	29%	163	3%
Leapfrog	185	4%	1,970	39%
Inclusion	1,348	31%	650	13%



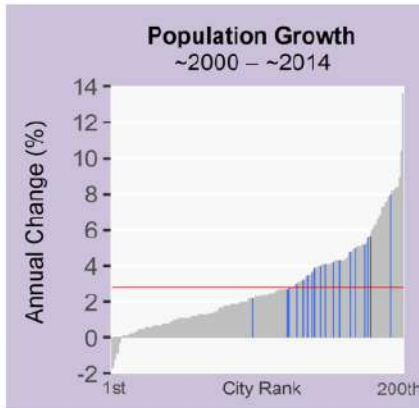


**Bamako, Mali
1990-2013**

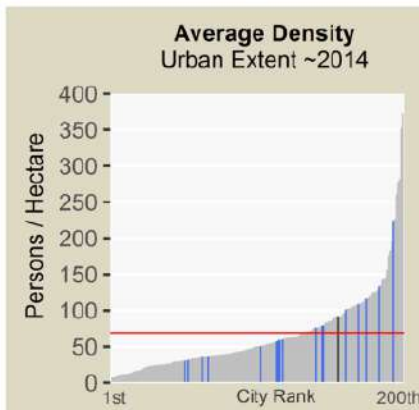
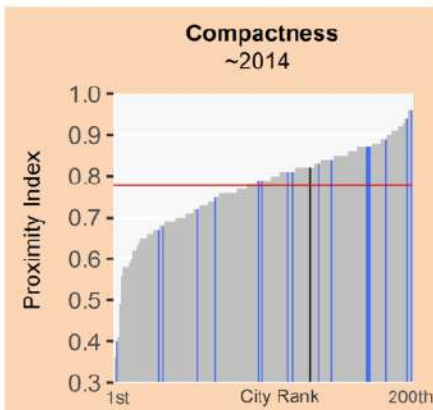
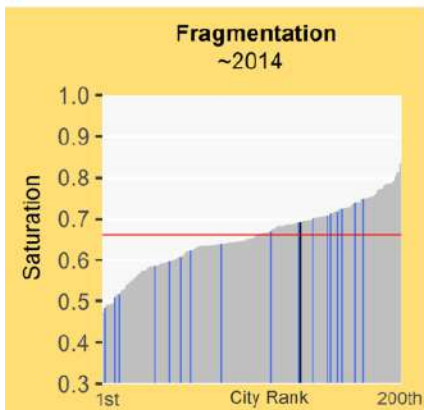
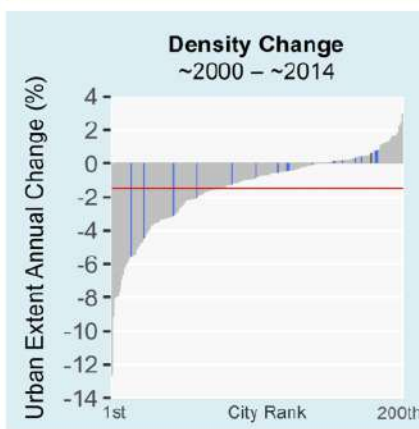
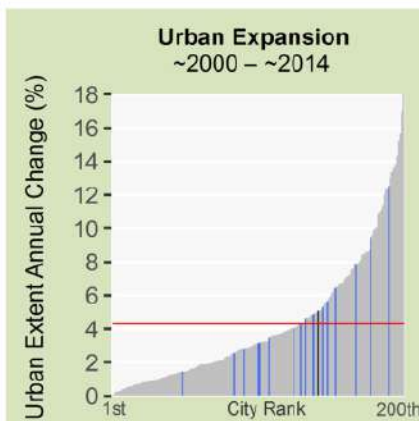
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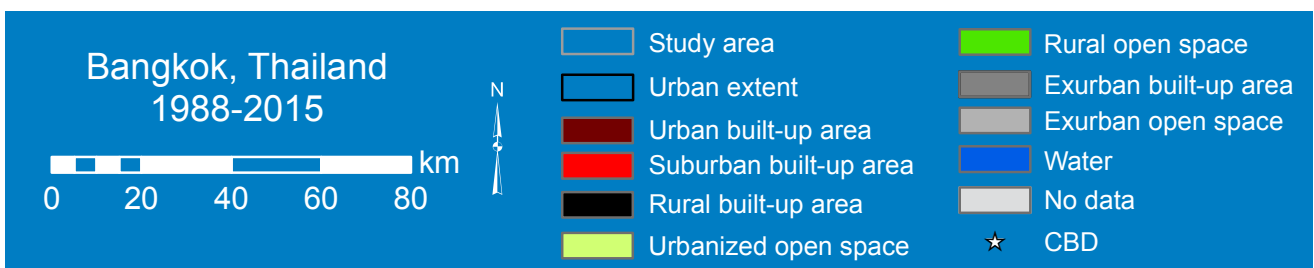
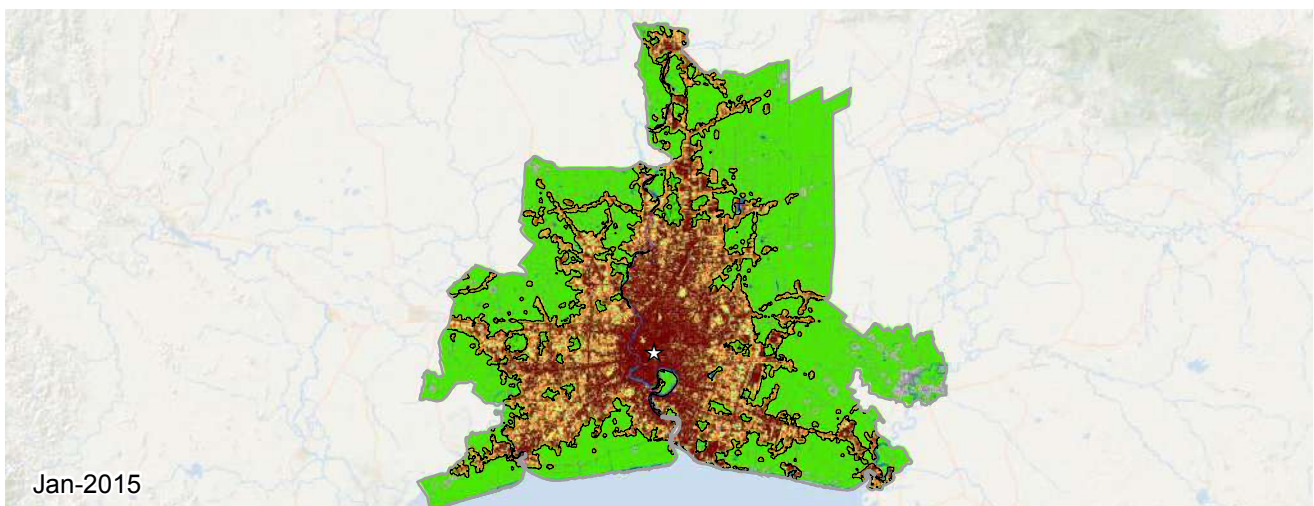
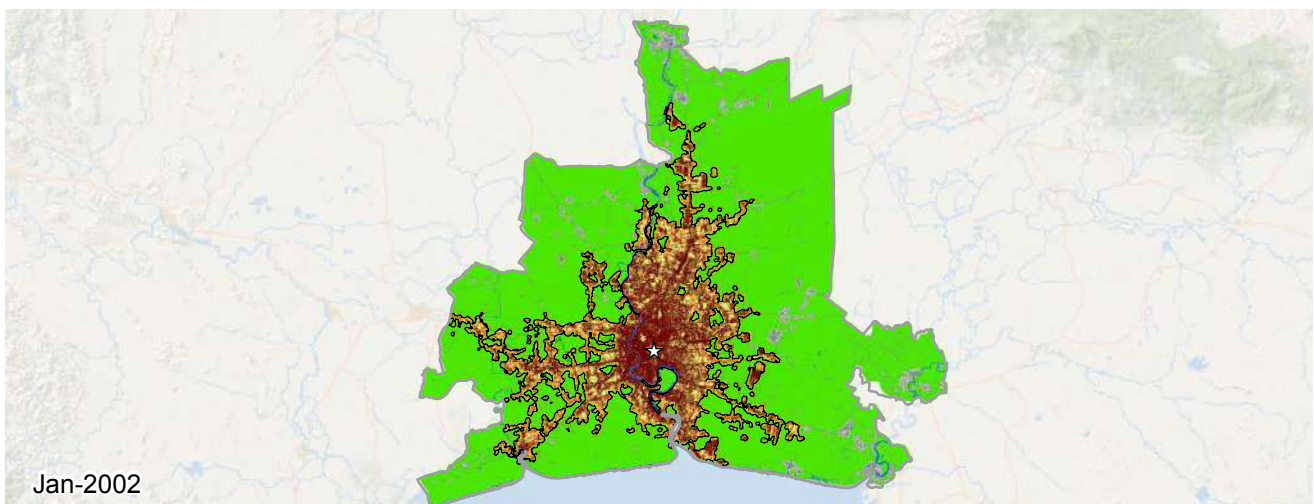
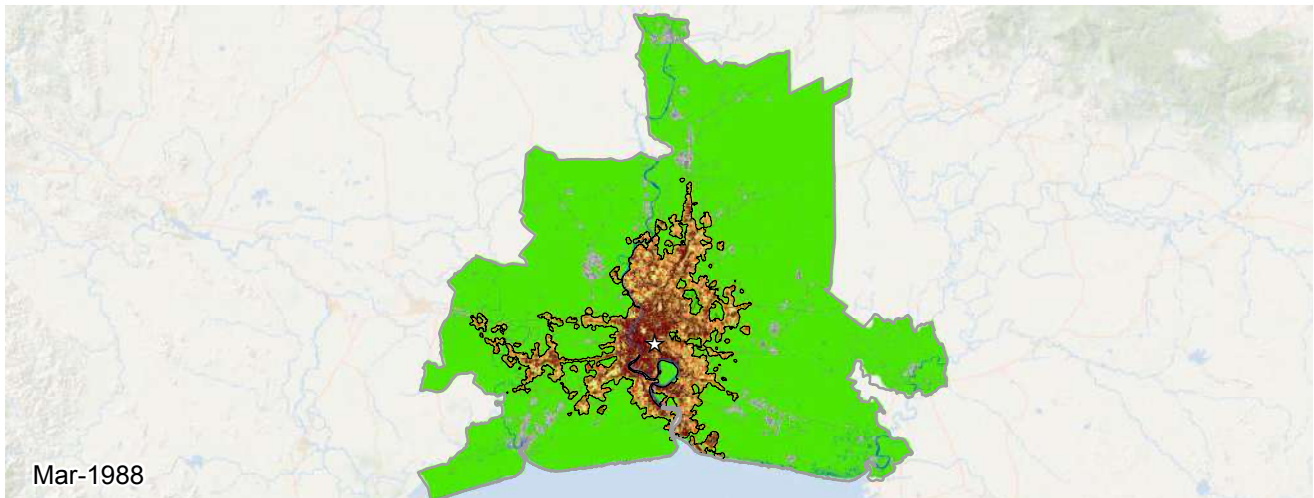
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Bamako, Mali (Sub-Saharan Africa)



Metrics	Jan 1990	Oct 2000	Nov 2013	% Annual Change ('00-'13)
Population	352,485	1,113,715	2,358,106	5.7
Built-up Area (Hectares)				
Total	2,648	8,975	17,643	5.2
Urban	2,118	7,574	14,501	5.0
Suburban	489	1,318	2,942	6.1
Rural	40	82	200	6.8
Open space (Hectares)				
Urbanized Open Space	1,432	4,162	7,893	4.9
Urban Extent	4,080	13,137	25,537	5.1
Density (Persons / Hectare)				
Built-up Area Density	133.1	124.1	133.7	0.6
Urban Extent Density	86.4	84.8	92.3	0.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.68	0.69	0.1
Openness Index	0.32	0.26	0.25	-0.2
Compactness (Roundness)				
Proximity	0.76	0.83	0.82	-0.1
Cohesion	0.76	0.84	0.81	-0.2
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	1,084	29%	2,344	26%
Extension	984	27%	2,497	28%
Leapfrog	1,398	38%	2,815	32%
Inclusion	155	4%	1,026	11%

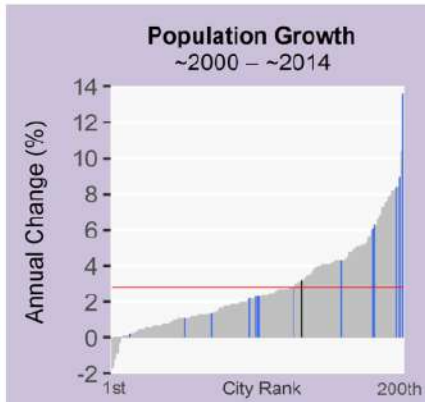




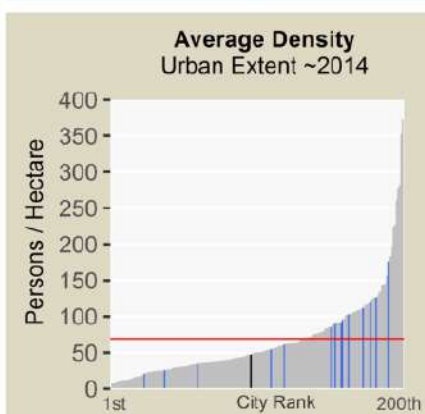
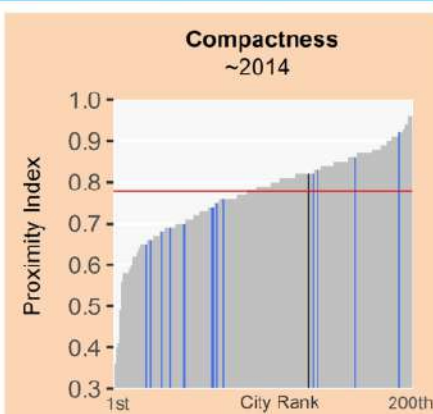
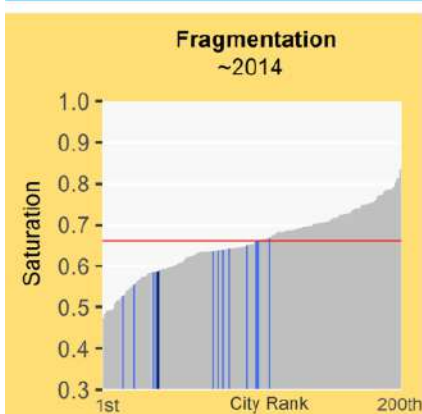
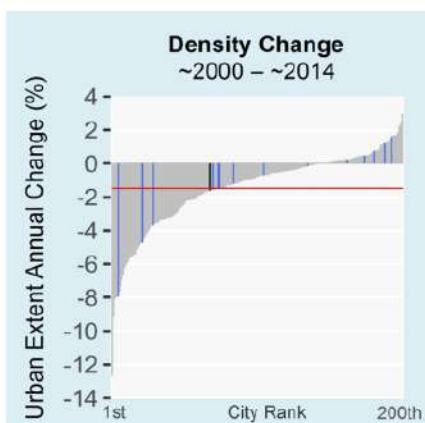
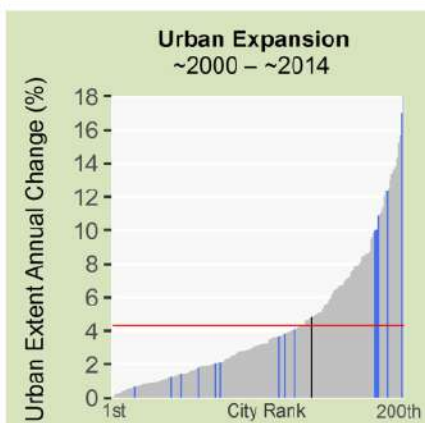
Bangkok, Thailand (Southeast Asia)

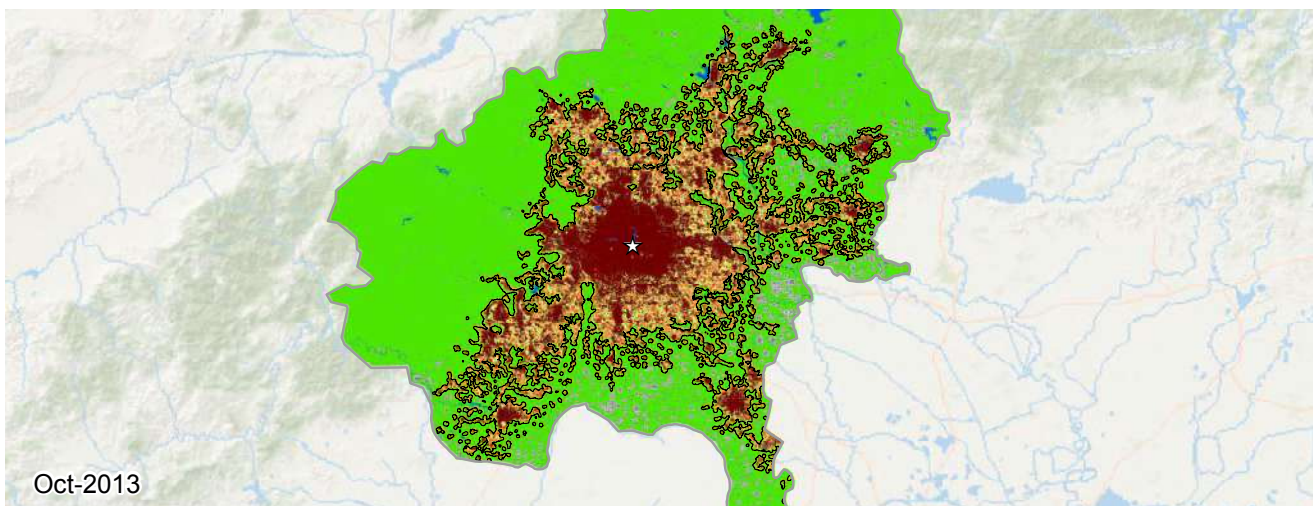
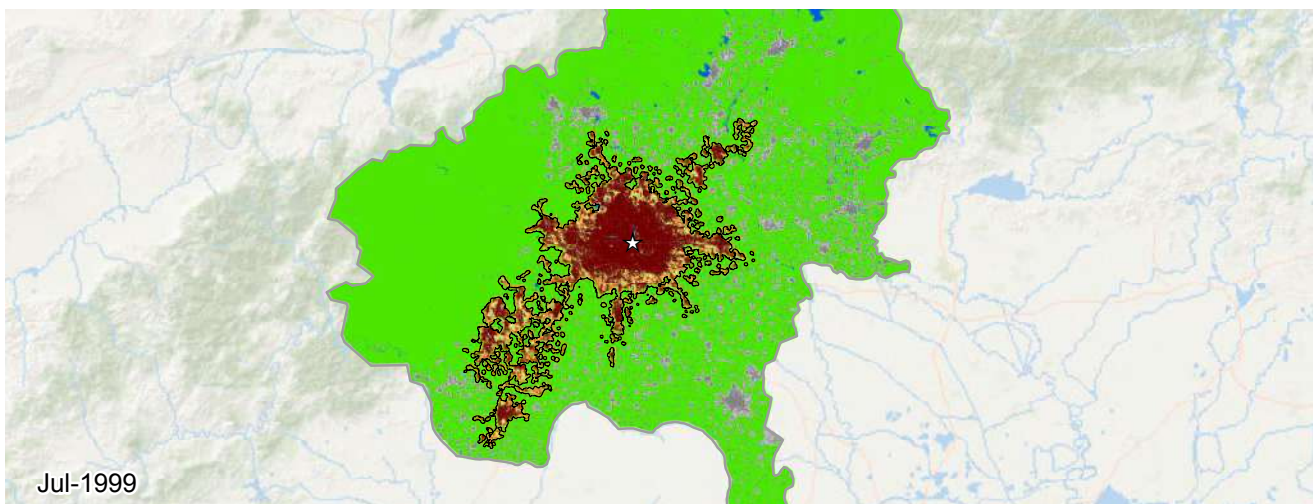
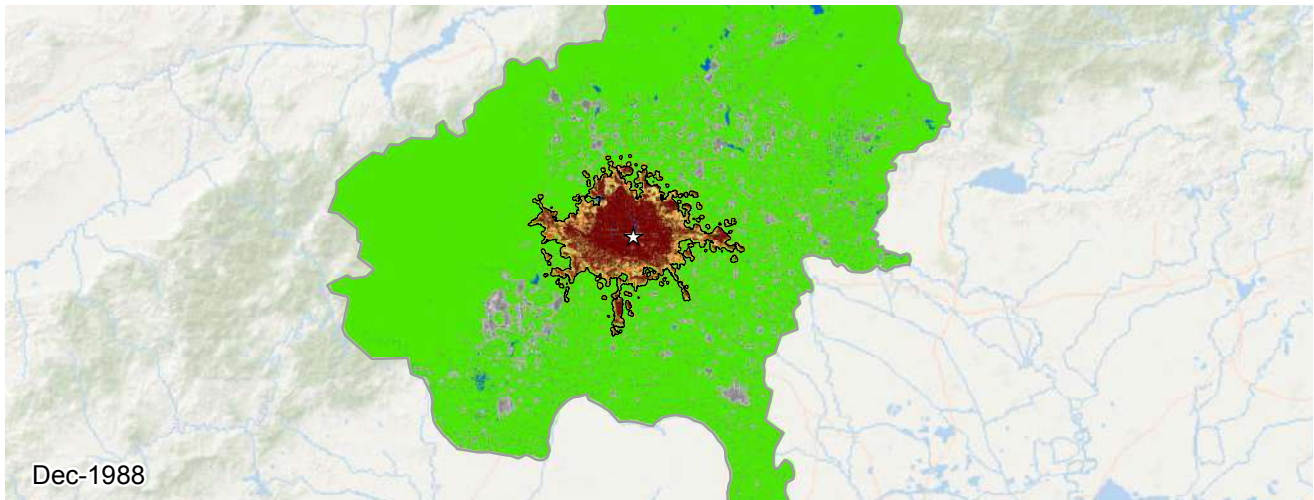


Legend for Charts
 Bangkok | Other cities in region | All other cities | Global average



Metrics	Mar 1988	Jan 2002	Jan 2015	% Annual Change ('02-'15)
Population	6,048,385	9,223,565	14,011,130	3.2
Built-up Area (Hectares)				
Total	50,745	90,084	172,912	5.0
Urban	28,991	60,619	122,659	5.4
Suburban	20,316	27,470	47,003	4.1
Rural	1,437	1,995	3,248	3.7
Open space (Hectares)				
Urbanized Open Space	46,179	66,933	121,550	4.6
Urban Extent	96,924	157,018	294,462	4.8
Density (Persons / Hectare)				
Built-up Area Density	119.2	102.4	81.0	-1.8
Urban Extent Density	62.4	58.7	47.6	-1.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.52	0.57	0.59	0.2
Openness Index	0.45	0.39	0.36	-0.6
Compactness (Roundness)				
Proximity	0.77	0.77	0.82	0.4
Cohesion	0.76	0.75	0.80	0.5
Added Area (Hectares)	'88-'02	Share	'02-'15	Share
Infill	14,602	37%	23,466	28%
Extension	12,534	31%	40,742	49%
Leapfrog	115	0%	148	0%
Inclusion	12,087	30%	18,434	22%

















**Beijing, Beijing, China
1988-2013**

0 25 50 75 100 km

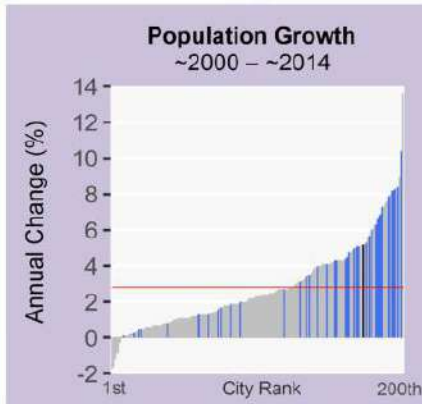
N

	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

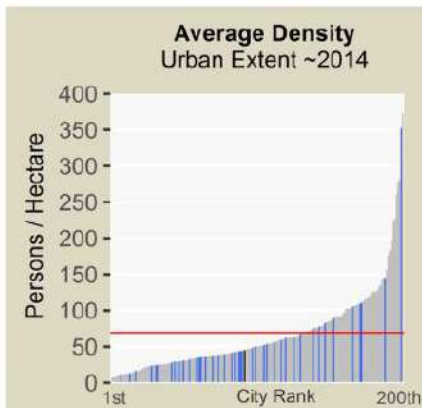
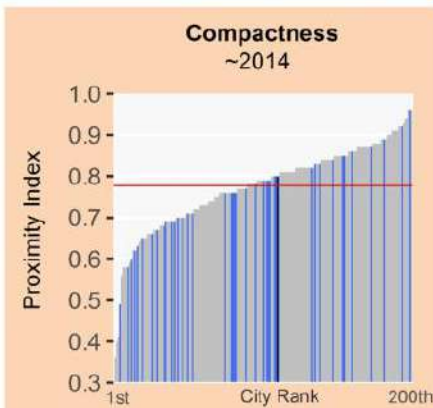
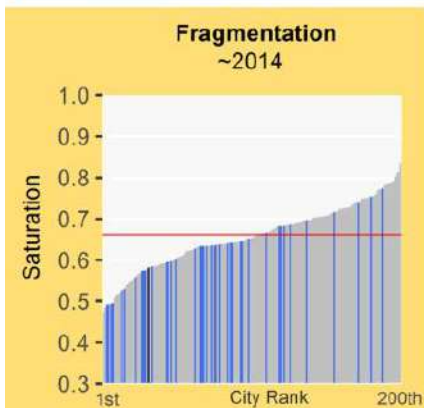
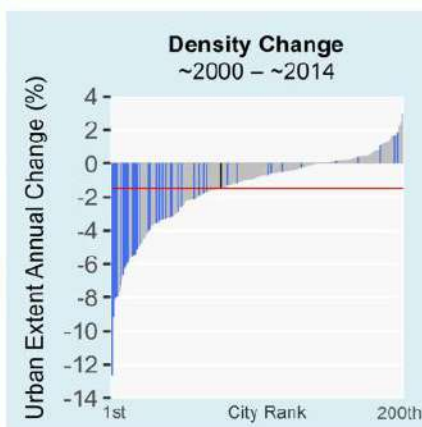
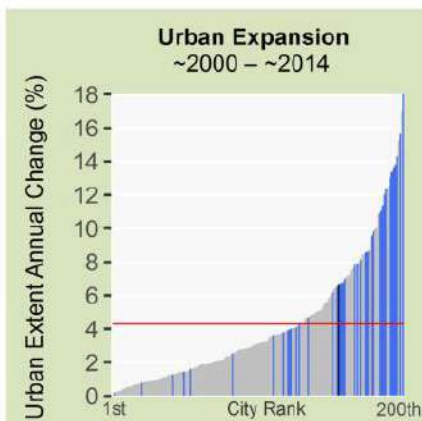
Beijing, Beijing, China (East Asia and the Pacific)

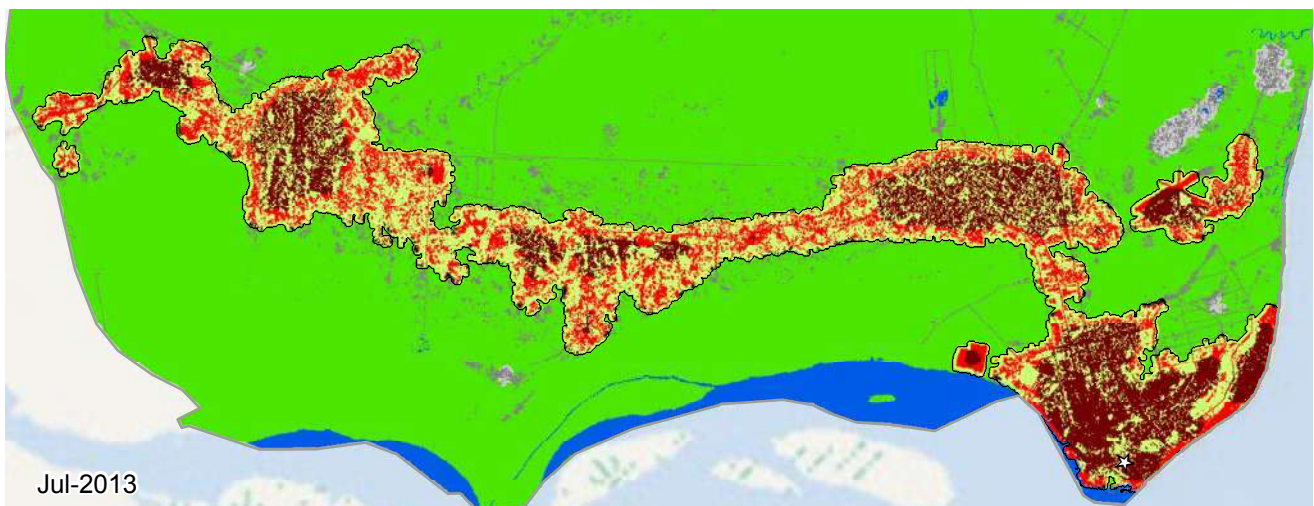
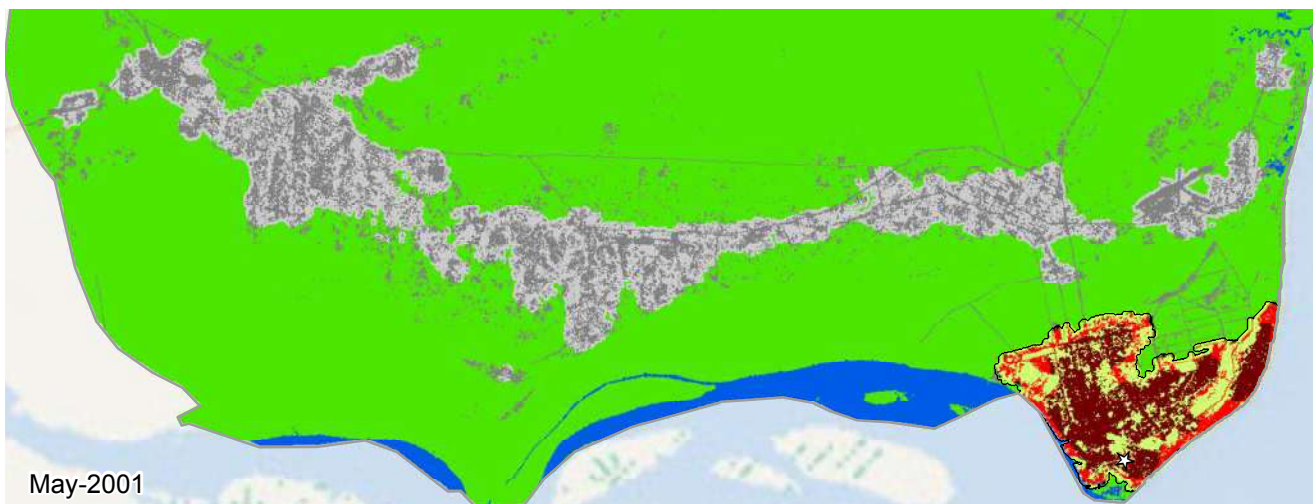
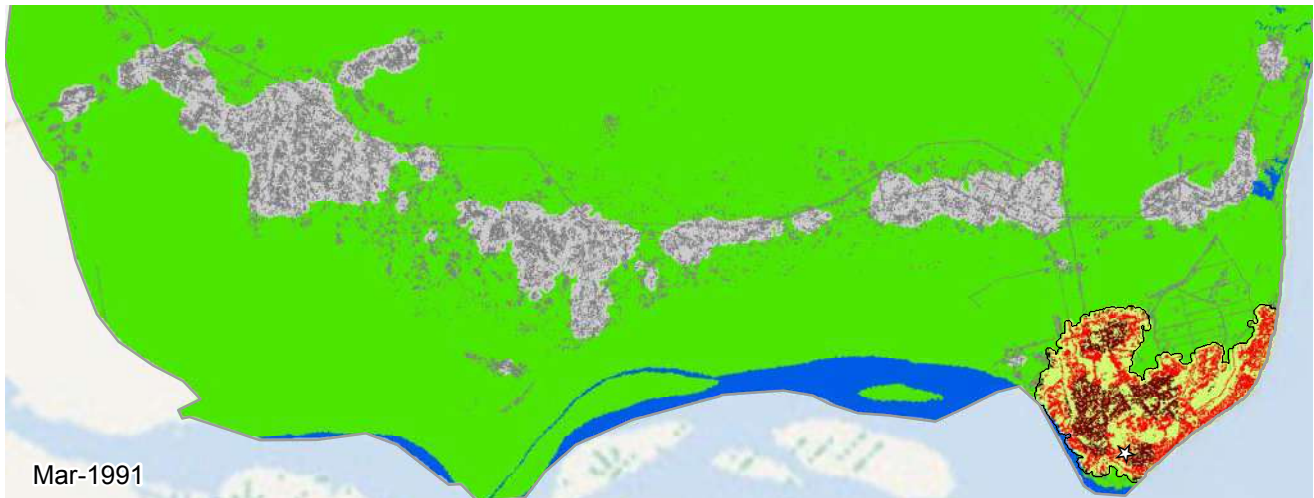


Legend for Charts
 Beijing | Other cities in region | All other cities | Global average



Metrics	Dec 1988	Jul 1999	Oct 2013	% Annual Change ('99-'13)
Population	6,037,392	9,869,843	20,669,397	5.2
Built-up Area (Hectares)				
Total	66,759	114,226	265,433	5.9
Urban	54,320	86,179	175,361	5.0
Suburban	11,580	26,006	83,882	8.2
Rural	858	2,040	6,189	7.8
Open space (Hectares)				
Urbanized Open Space	31,973	61,298	190,250	7.9
Urban Extent	98,732	175,525	455,683	6.7
Density (Persons / Hectare)				
Built-up Area Density	90.4	86.4	77.9	-0.7
Urban Extent Density	61.1	56.2	45.4	-1.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.68	0.65	0.58	-0.8
Openness Index	0.25	0.28	0.34	1.5
Compactness (Roundness)				
Proximity	0.90	0.70	0.80	0.9
Cohesion	0.89	0.69	0.77	0.8
Added Area (Hectares)	'88-'99	Share	'99-'13	Share
Infill	12,867	27%	27,567	18%
Extension	9,875	20%	54,735	36%
Leapfrog	1,484	3%	361	0%
Inclusion	23,239	48%	68,542	45%



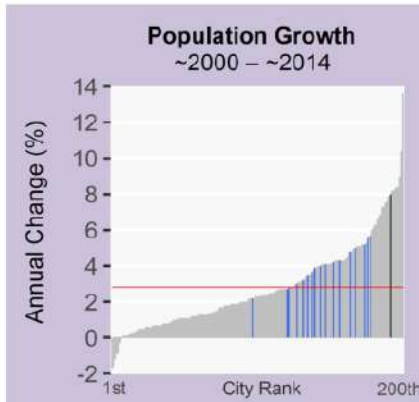


**Beira, Mozambique
1991-2013**

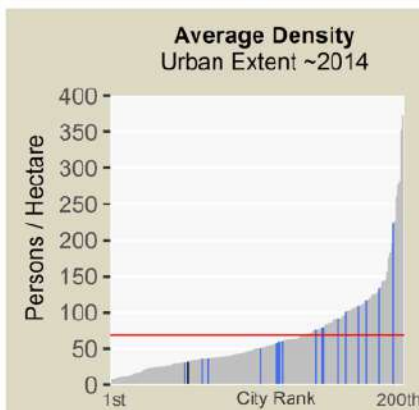
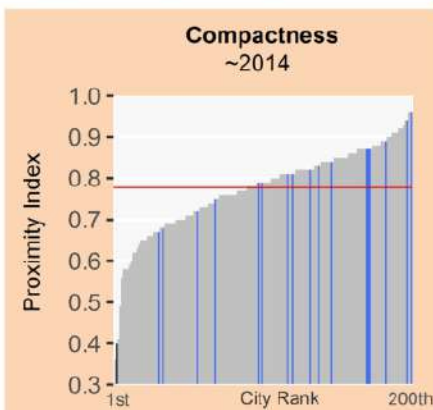
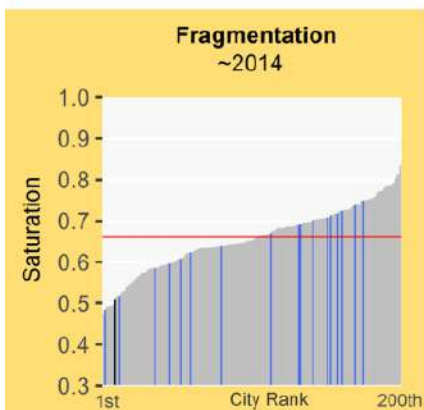
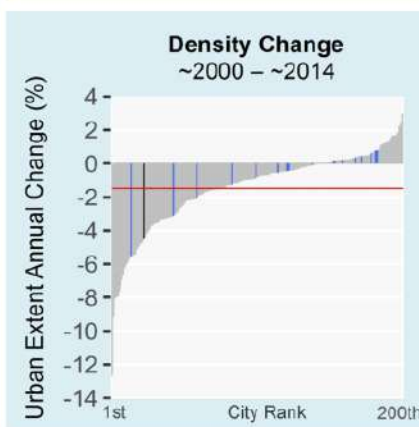
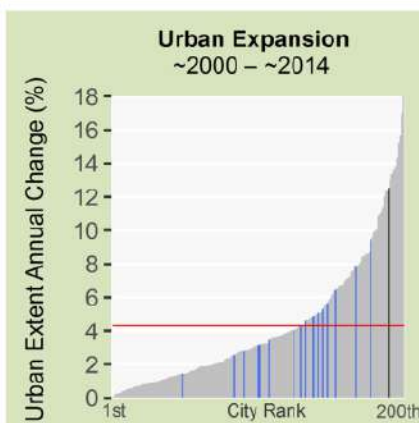
0 2 4 6 8 km

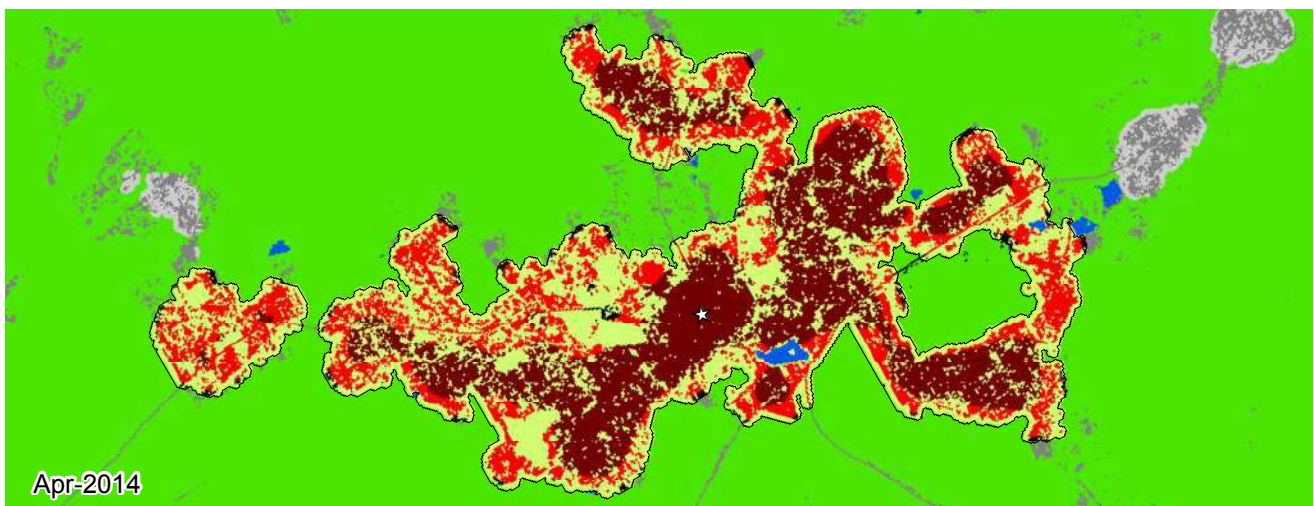
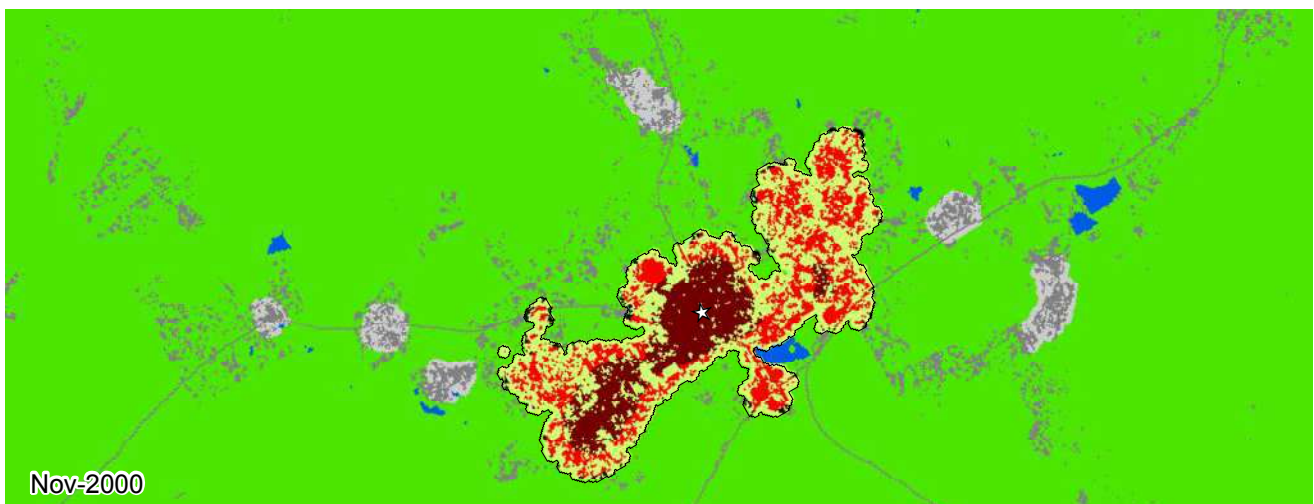
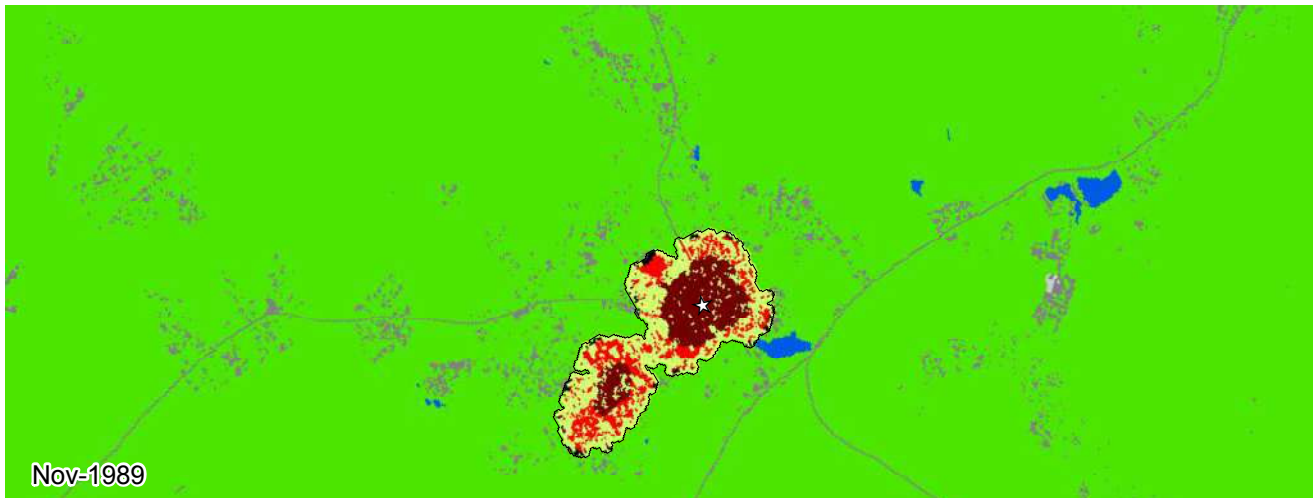
Study area
 Urban extent
 Urban built-up area
 Suburban built-up area
 Rural built-up area
 Urbanized open space
 Rural open space
 Exurban built-up area
 Exurban open space
 Water
 No data
 CBD

Beira, Mozambique (Sub-Saharan Africa)



Metrics	Mar 1991	May 2001	Jul 2013	% Annual Change ('01-'13)
Population	131,884	143,908	382,574	8.0
Built-up Area (Hectares)				
Total	1,037	1,596	6,208	11.2
Urban	386	1,152	3,225	8.5
Suburban	630	421	2,818	15.6
Rural	20	22	164	16.3
Open space (Hectares)				
Urbanized Open Space	1,169	1,034	5,944	14.4
Urban Extent	2,207	2,631	12,152	12.6
Density (Persons / Hectare)				
Built-up Area Density	127.1	90.2	61.6	-3.1
Urban Extent Density	59.8	54.7	31.5	-4.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.47	0.61	0.51	-1.4
Openness Index	0.54	0.40	0.48	1.5
Compactness (Roundness)				
Proximity	0.88	0.89	0.40	-6.5
Cohesion	0.87	0.88	0.43	-6.0
Added Area (Hectares)	'91-'01	Share	'01-'13	Share
Infill	372	66%	540	11%
Extension	99	17%	544	11%
Leapfrog	0	0%	84	1%
Inclusion	87	15%	3,442	74%



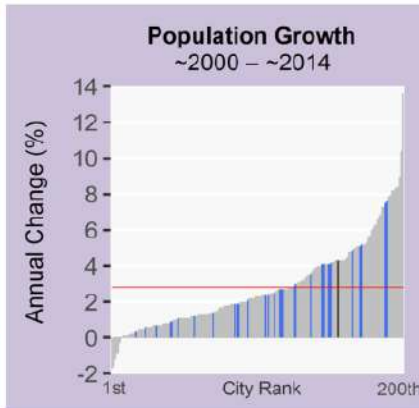


**Belgaum, India
1989-2014**

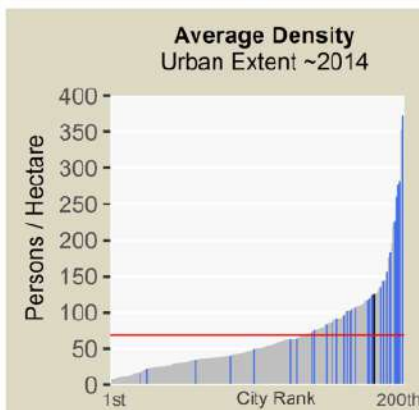
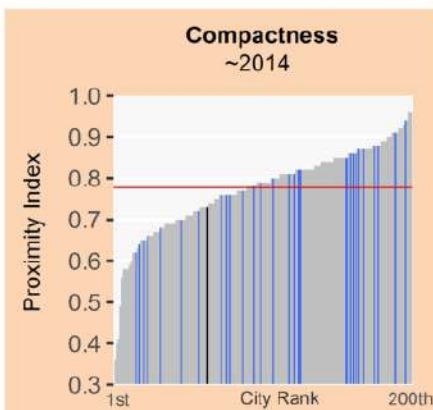
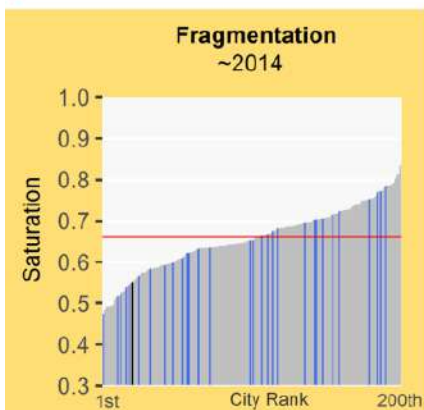
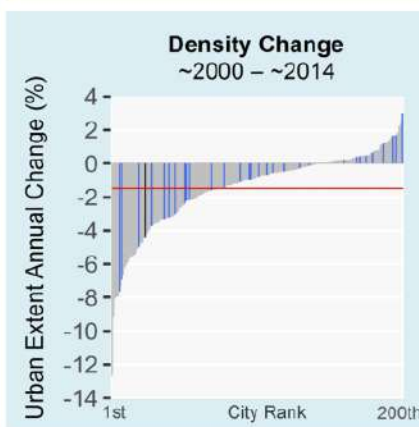
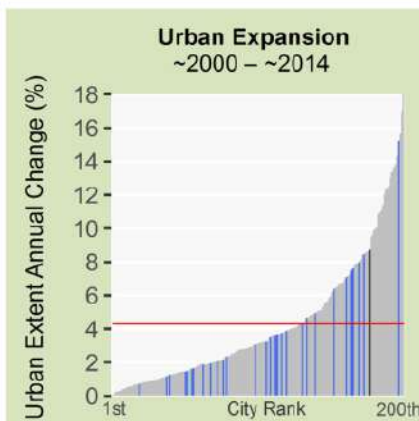
0 1 2 3 4 km

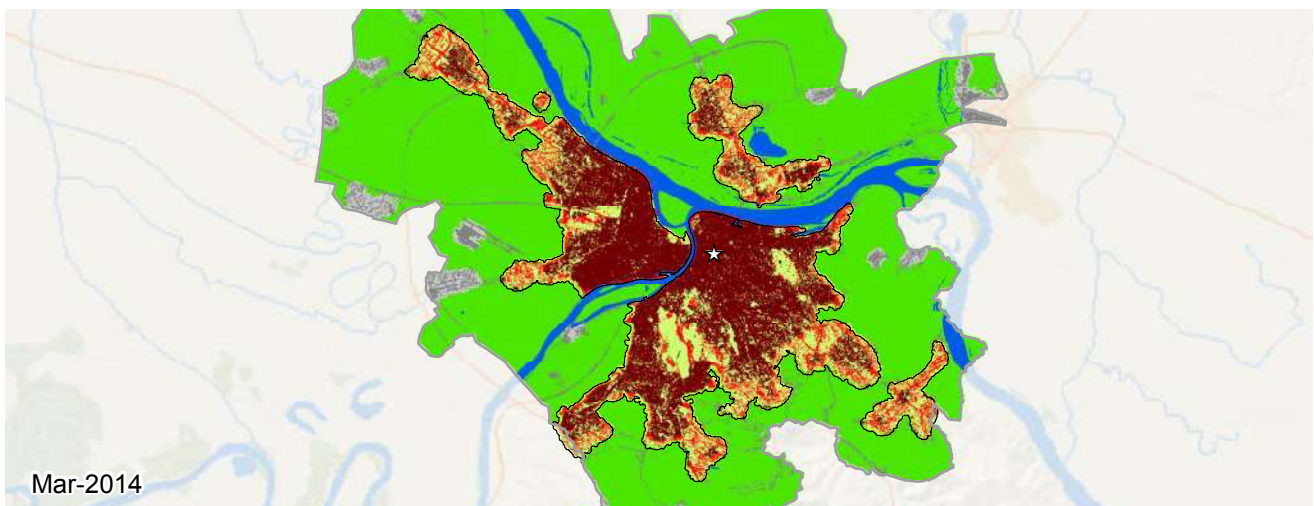
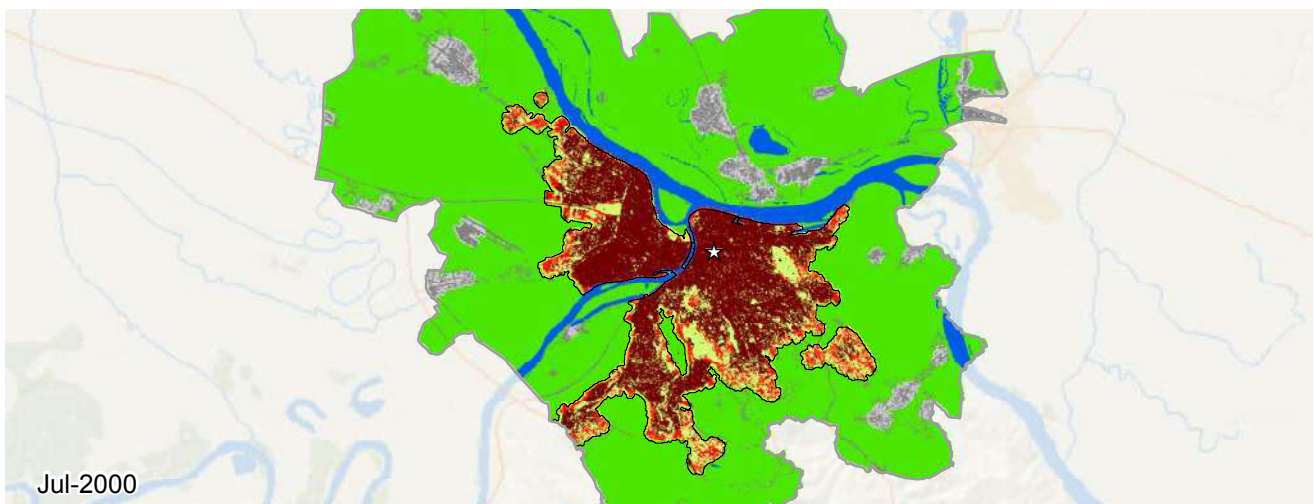
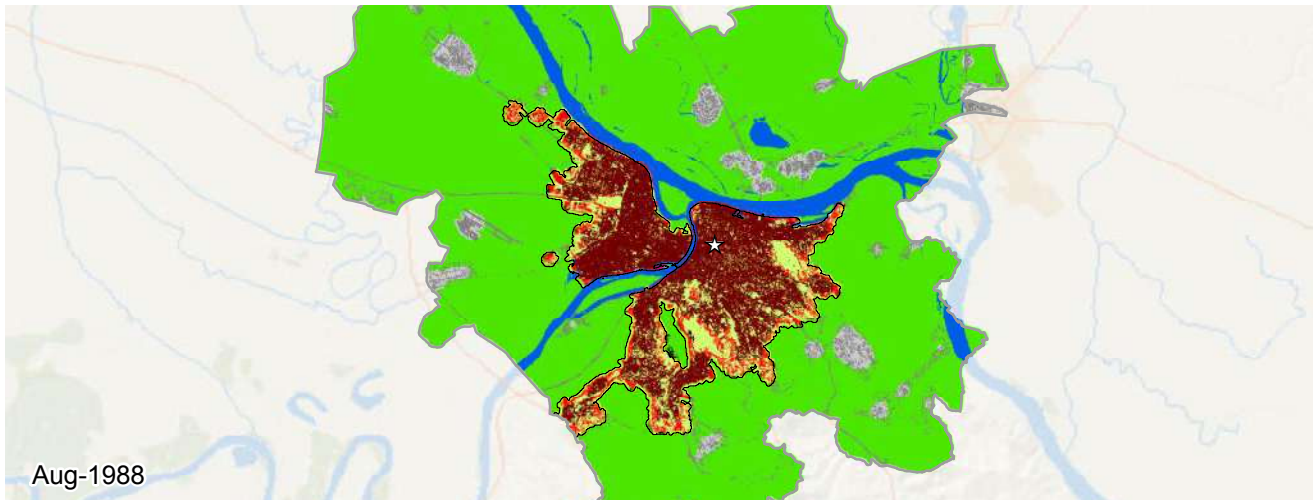
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Belgaum, India (South and Central Asia)



Metrics	Nov 1989	Nov 2000	Apr 2014	% Annual Change ('00-'14)
Population	229,411	358,118	636,865	4.3
Built-up Area (Hectares)				
Total	334	762	2,779	9.6
Urban	180	324	1,563	11.7
Suburban	136	408	1,145	7.7
Rural	17	28	70	6.6
Open space (Hectares)				
Urbanized Open Space	321	807	2,277	7.7
Urban Extent	656	1,569	5,056	8.7
Density (Persons / Hectare)				
Built-up Area Density	685.0	469.8	229.1	-5.4
Urban Extent Density	349.4	228.1	125.9	-4.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.51	0.49	0.55	0.9
Openness Index	0.47	0.50	0.45	-0.7
Compactness (Roundness)				
Proximity	0.80	0.76	0.73	-0.3
Cohesion	0.81	0.77	0.72	-0.5
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	59	13%	313	15%
Extension	272	63%	1,044	51%
Leapfrog	0	0%	85	4%
Inclusion	94	22%	573	28%





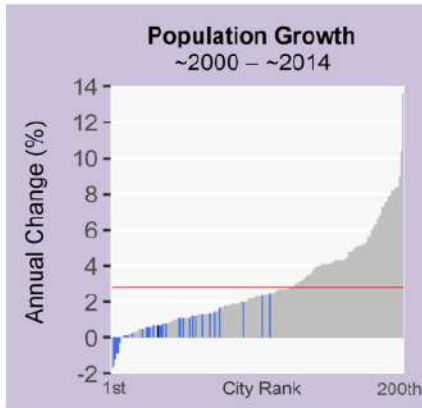
**Belgrade, Serbia
1988-2014**

0 4 8 12 16 km

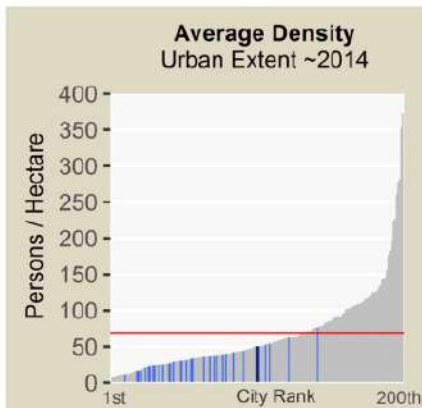
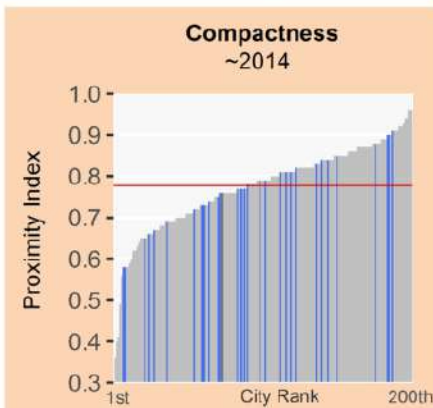
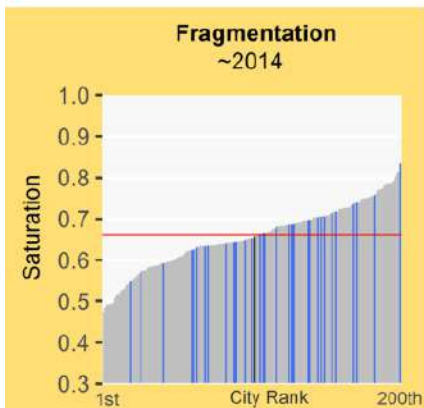
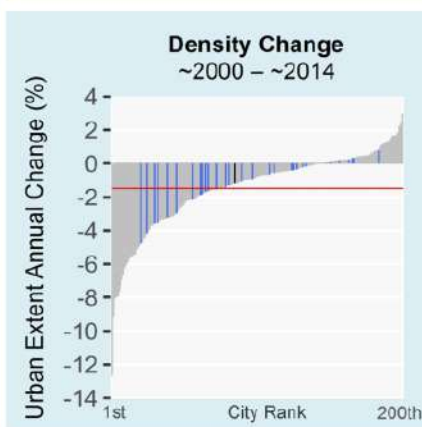
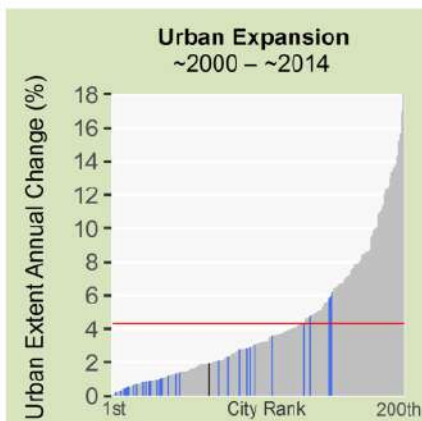
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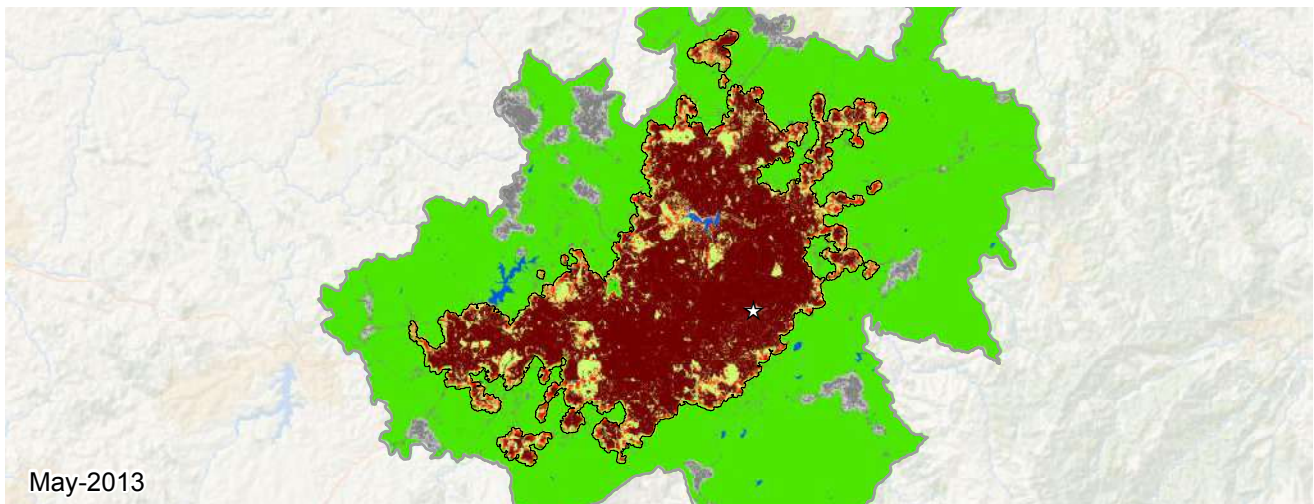
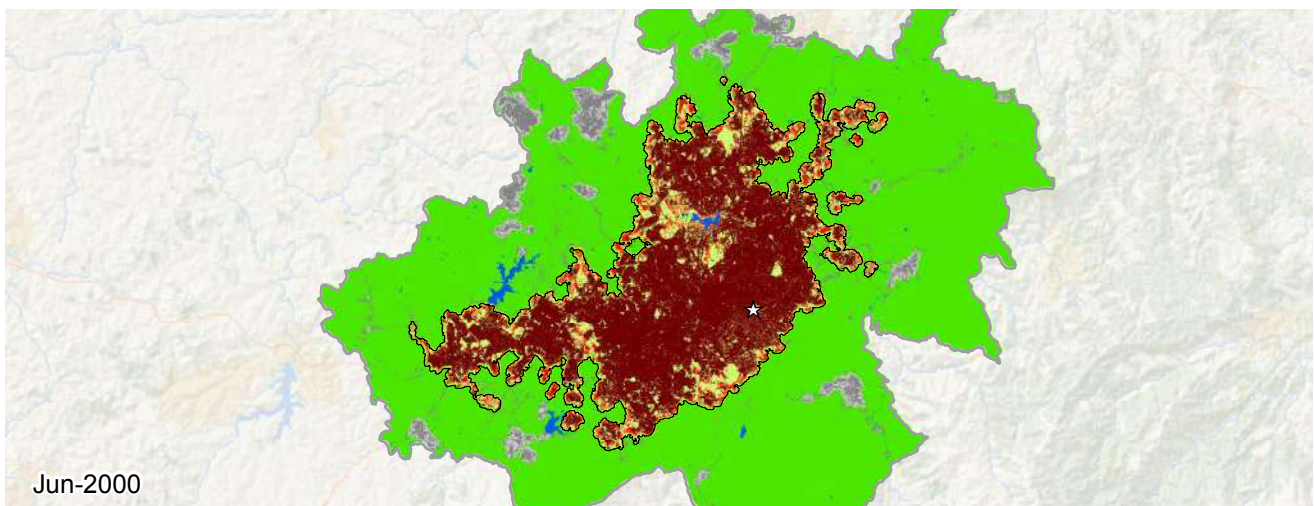
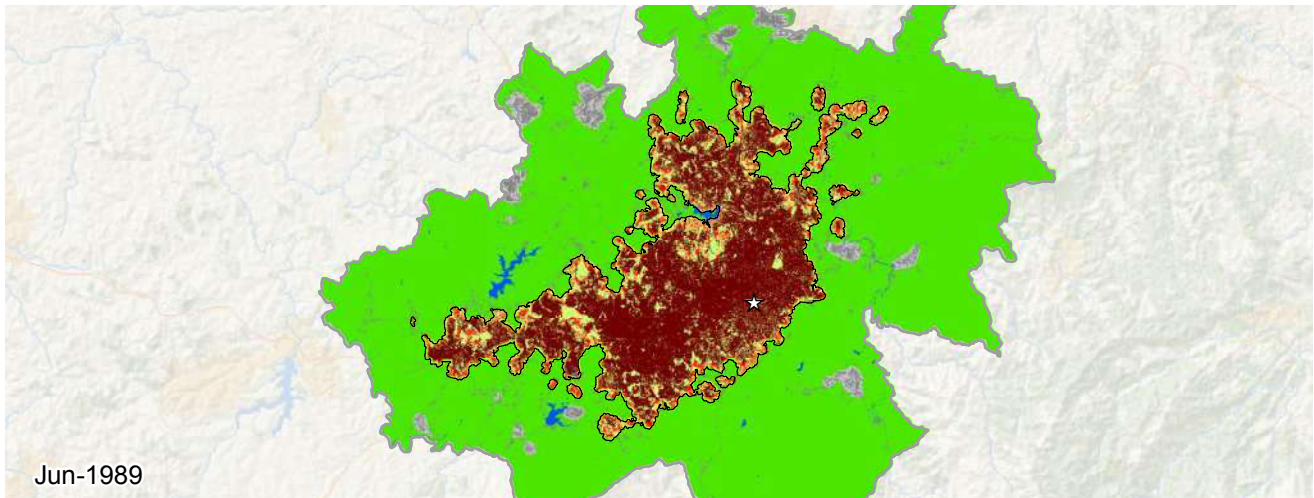
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Belgrade, Serbia (Europe and Japan)



Metrics	Aug 1988	Jul 2000	Mar 2014	% Annual Change ('00-'14)
Population	801,013	876,835	963,946	0.7
Built-up Area (Hectares)				
Total	8,619	10,198	12,565	1.5
Urban	7,078	8,302	9,819	1.2
Suburban	1,442	1,785	2,573	2.7
Rural	98	110	172	3.3
Open space (Hectares)				
Urbanized Open Space	3,905	4,492	6,522	2.7
Urban Extent	12,525	14,690	19,087	1.9
Density (Persons / Hectare)				
Built-up Area Density	92.9	86.0	76.7	-0.8
Urban Extent Density	64.0	59.7	50.5	-1.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.69	0.69	0.66	-0.4
Openness Index	0.29	0.28	0.31	0.8
Compactness (Roundness)				
Proximity	0.82	0.81	0.76	-0.5
Cohesion	0.80	0.80	0.74	-0.6
Added Area (Hectares)	'88-'00	Share	'00-'14	Share
Infill	702	44%	845	24%
Extension	439	27%	1,057	30%
Leapfrog	3	0%	0	0%
Inclusion	433	27%	1,507	44%

















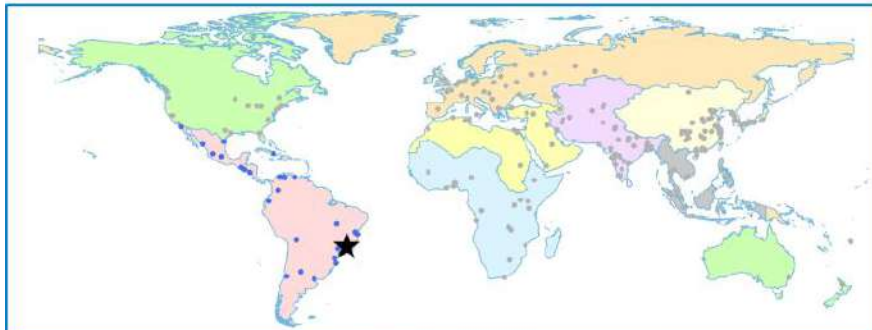
**Belo Horizonte, Brazil
1989-2013**

0 8 16 24 32 km

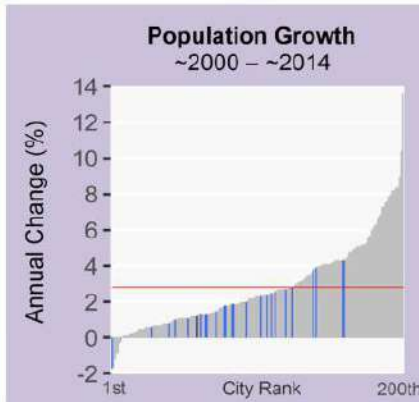
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	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

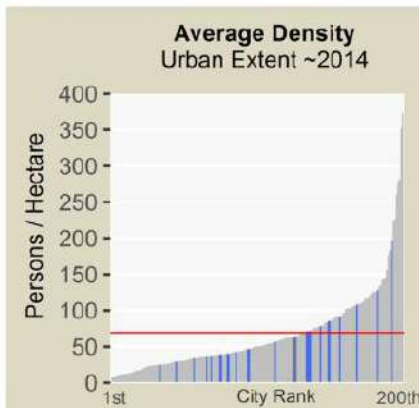
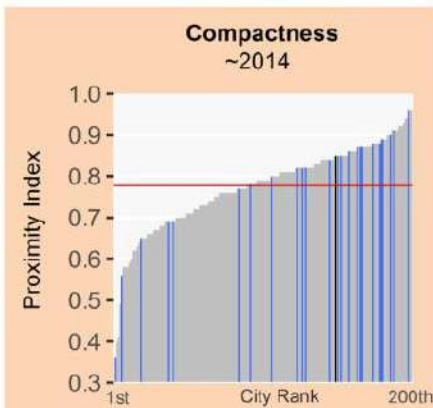
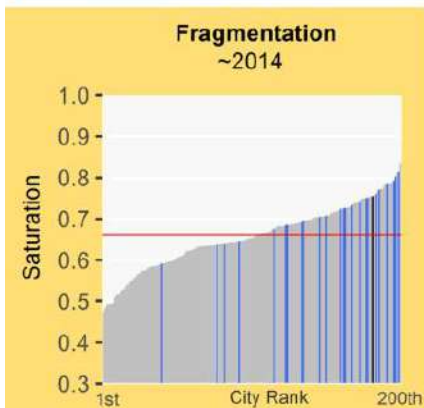
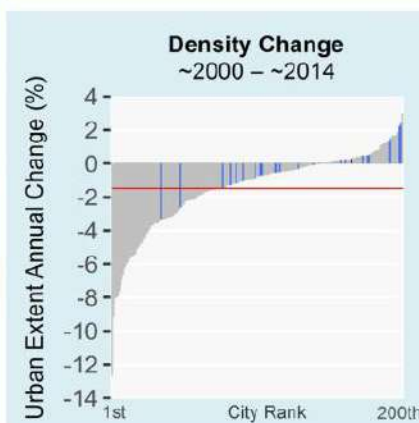
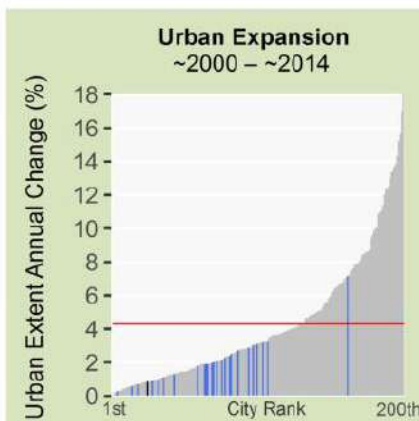
Belo Horizonte, Brazil (Latin America and the Caribbean)

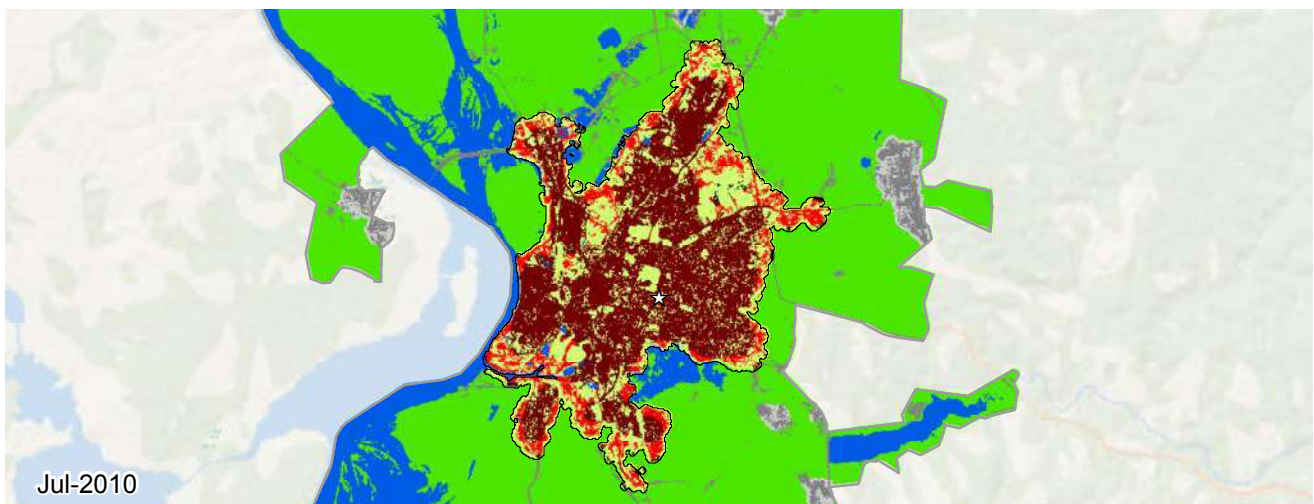
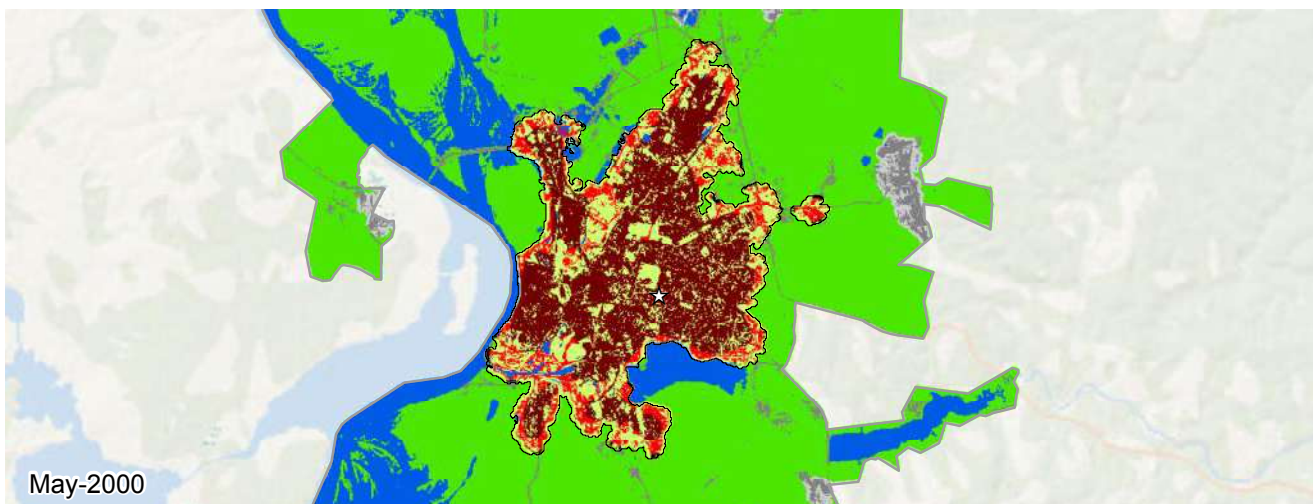
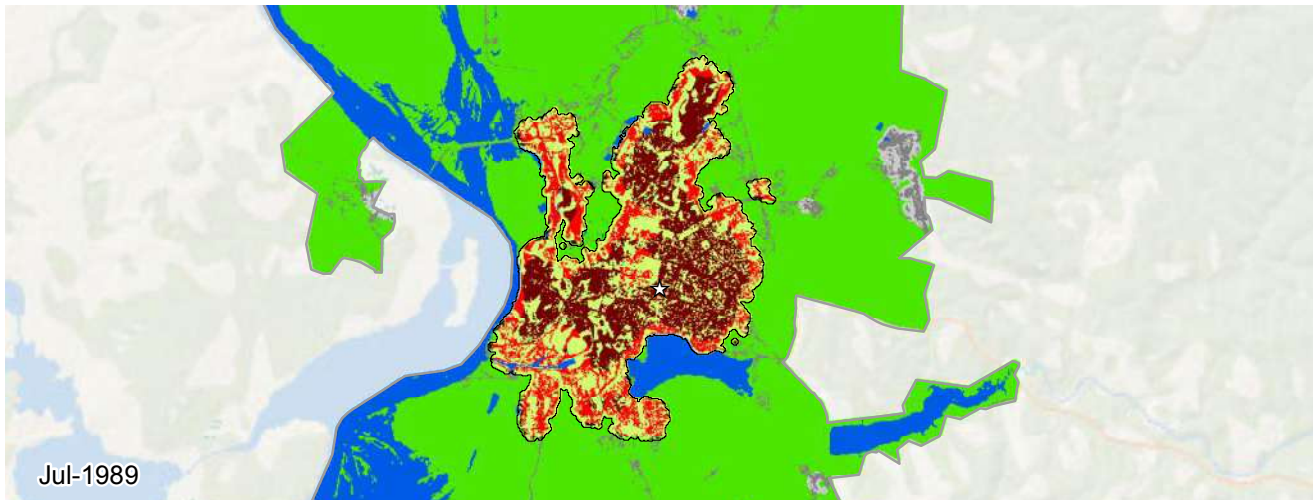


Legend for Charts
 Belo Horizonte | Other cities in region | All other cities | Global average



Metrics	Jun 1989	Jun 2000	May 2013	% Annual Change ('00-'13)
Population	2,709,528	3,479,598	4,038,046	1.2
Built-up Area (Hectares)				
Total	33,854	43,053	48,701	1.0
Urban	28,642	37,953	43,235	1.0
Suburban	4,801	4,755	5,062	0.5
Rural	411	344	402	1.2
Open space (Hectares)				
Urbanized Open Space	15,172	14,797	15,850	0.5
Urban Extent	49,027	57,851	64,551	0.8
Density (Persons / Hectare)				
Built-up Area Density	80.0	80.8	82.9	0.2
Urban Extent Density	55.3	60.1	62.6	0.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.69	0.74	0.75	0.1
Openness Index	0.25	0.20	0.18	-0.7
Compactness (Roundness)				
Proximity	0.83	0.85	0.85	-0.0
Cohesion	0.82	0.84	0.84	0.0
Added Area (Hectares)	'89-'00	Share	'00-'13	Share
Infill	5,274	57%	3,065	54%
Extension	2,577	28%	1,063	18%
Leapfrog	26	0%	133	2%
Inclusion	1,320	14%	1,384	24%





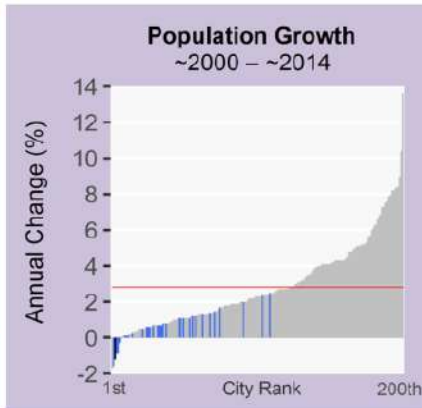
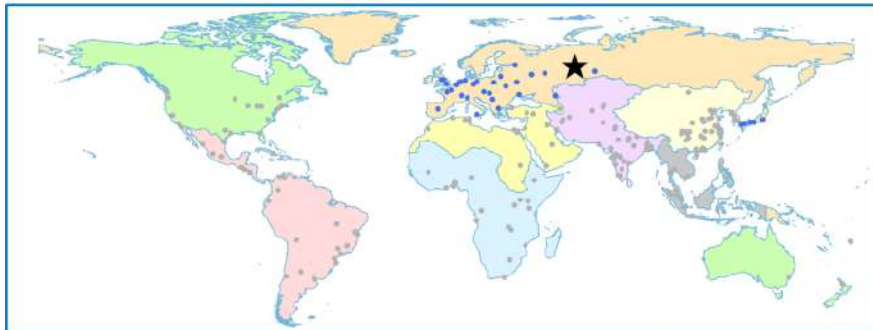
**Berezniki, Russia
1989-2010**

0 2.5 5 7.5 10 km

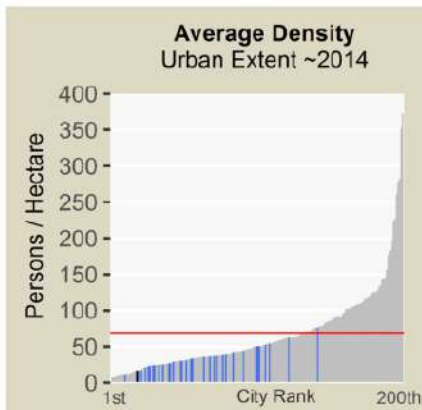
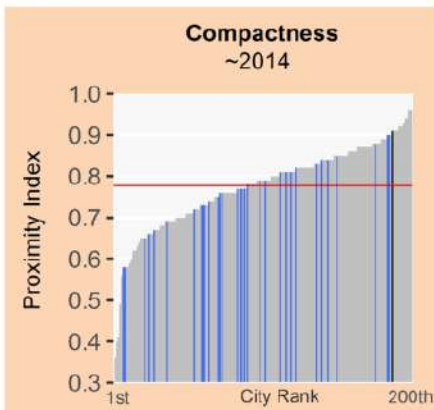
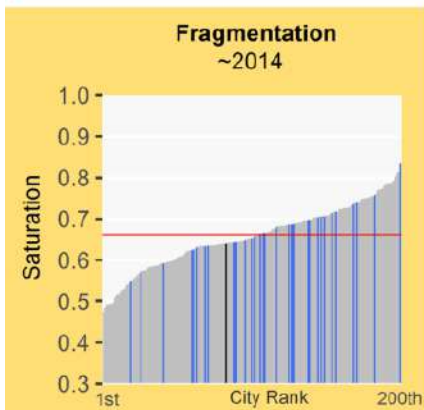
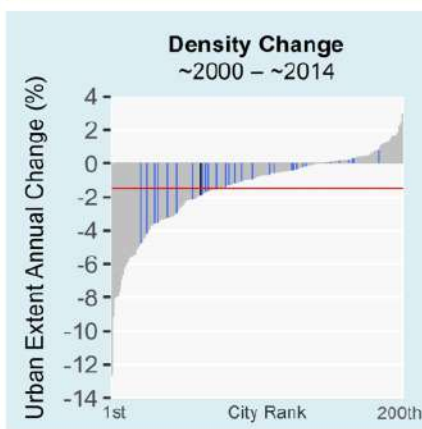
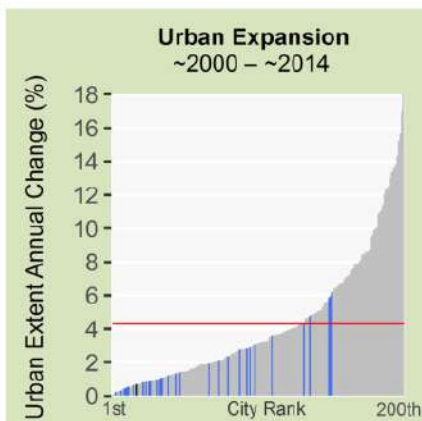
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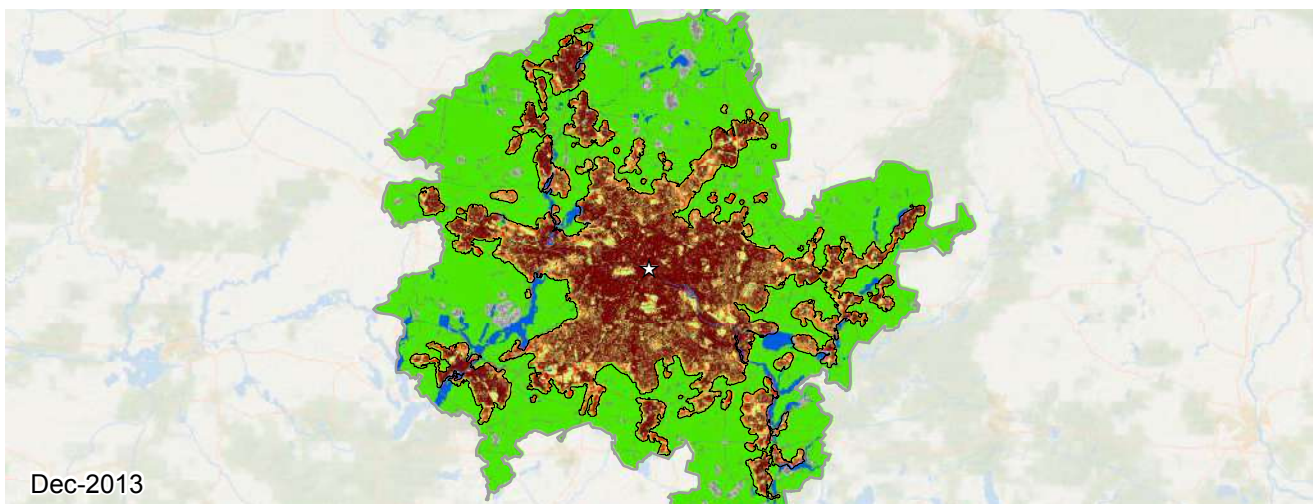
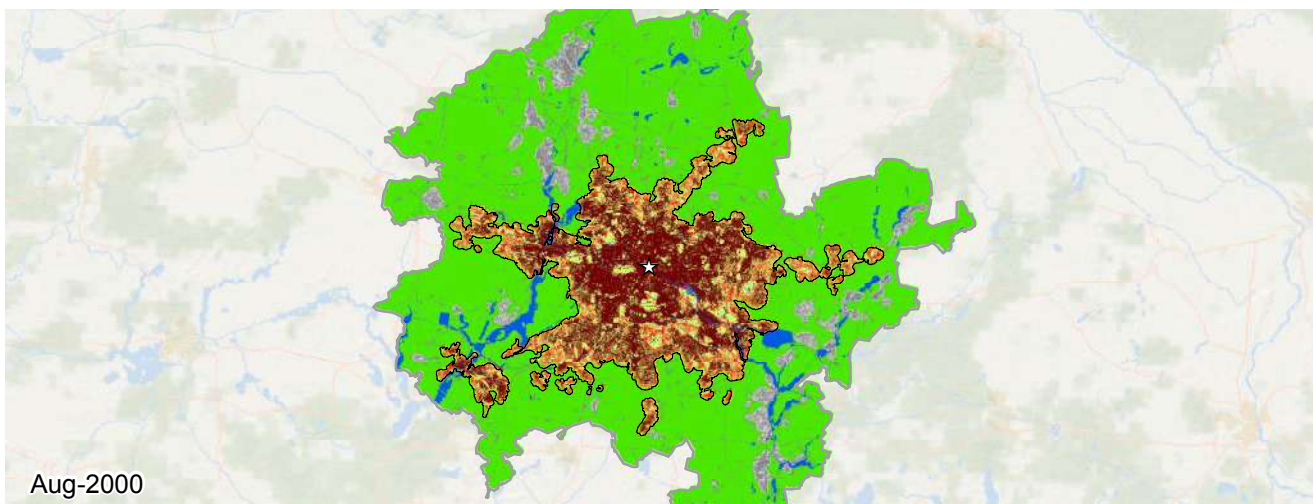
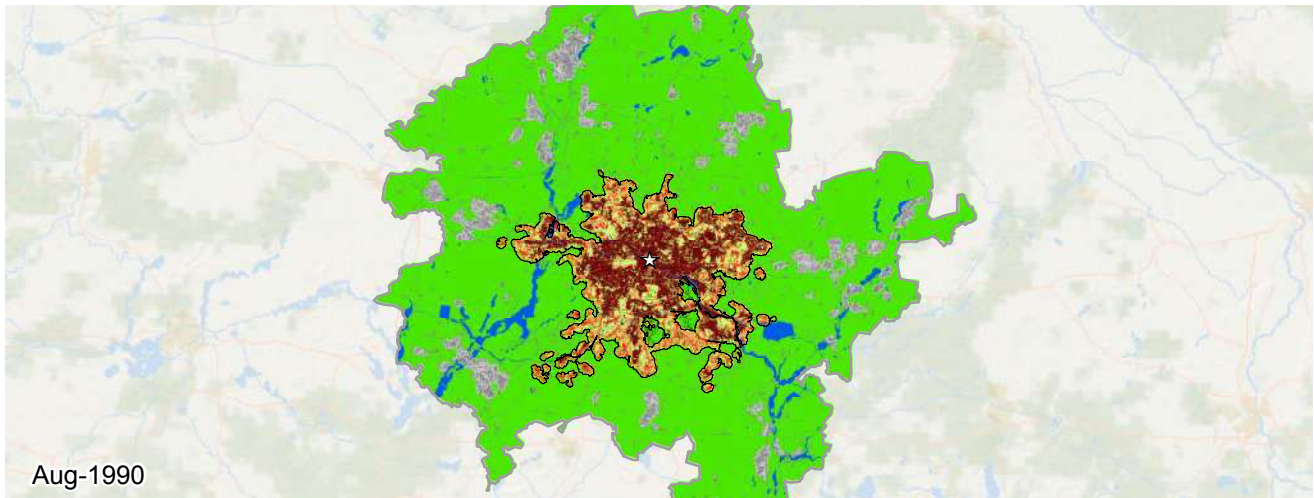
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Berezniki, Russia (Europe and Japan)



Metrics	Jul 1989	May 2000	Jul 2010	% Annual Change ('00-'10)
Population	137,284	127,504	112,759	-1.2
Built-up Area (Hectares)				
Total	2,884	3,911	4,275	0.9
Urban	1,712	2,989	3,334	1.1
Suburban	1,095	864	880	0.2
Rural	75	57	60	0.5
Open space (Hectares)				
Urbanized Open Space	2,459	2,319	2,404	0.4
Urban Extent	5,343	6,230	6,680	0.7
Density (Persons / Hectare)				
Built-up Area Density	47.6	32.6	26.4	-2.1
Urban Extent Density	25.7	20.5	16.9	-1.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.63	0.64	0.2
Openness Index	0.46	0.36	0.34	-0.6
Compactness (Roundness)				
Proximity	0.88	0.90	0.91	0.1
Cohesion	0.87	0.89	0.89	0.1
Added Area (Hectares)	'89-'00	Share	'00-'10	Share
Infill	613	59%	218	59%
Extension	262	25%	69	18%
Leapfrog	0	0%	1	0%
Inclusion	151	14%	74	20%

















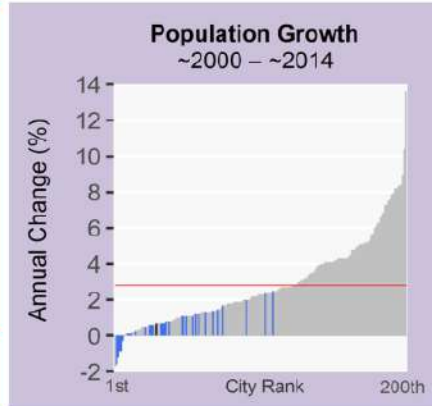
Berlin, Germany
1990-2013

0 10 20 30 40 km

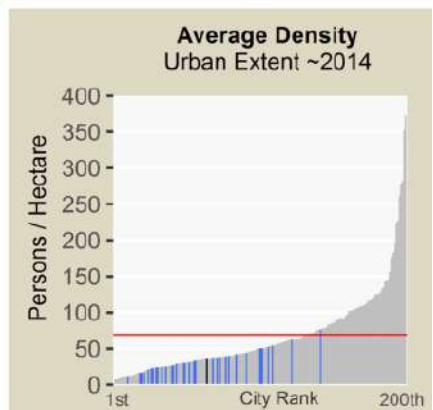
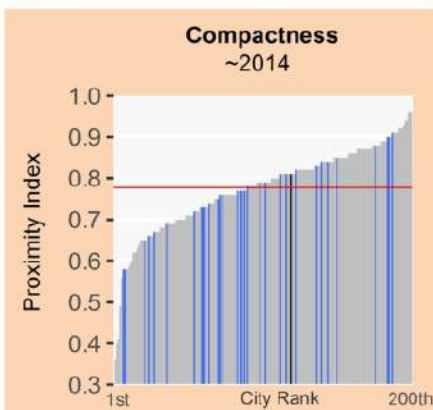
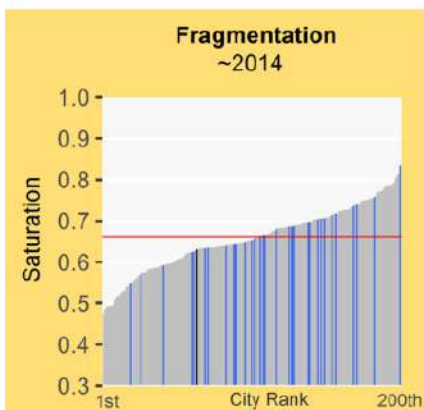
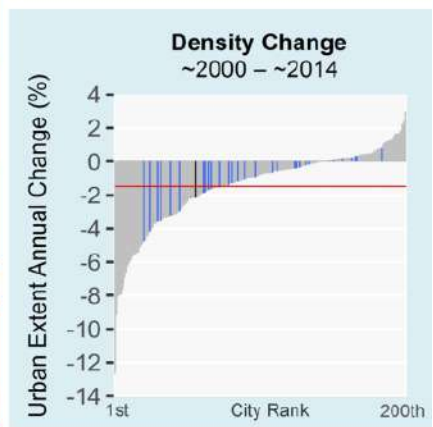
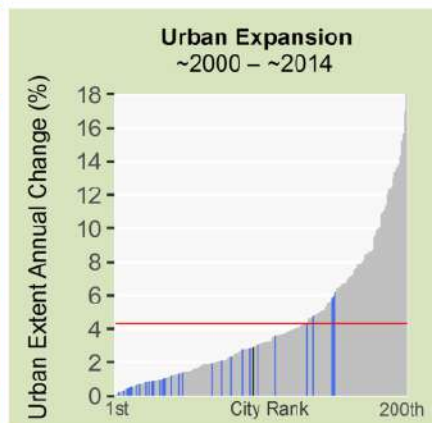
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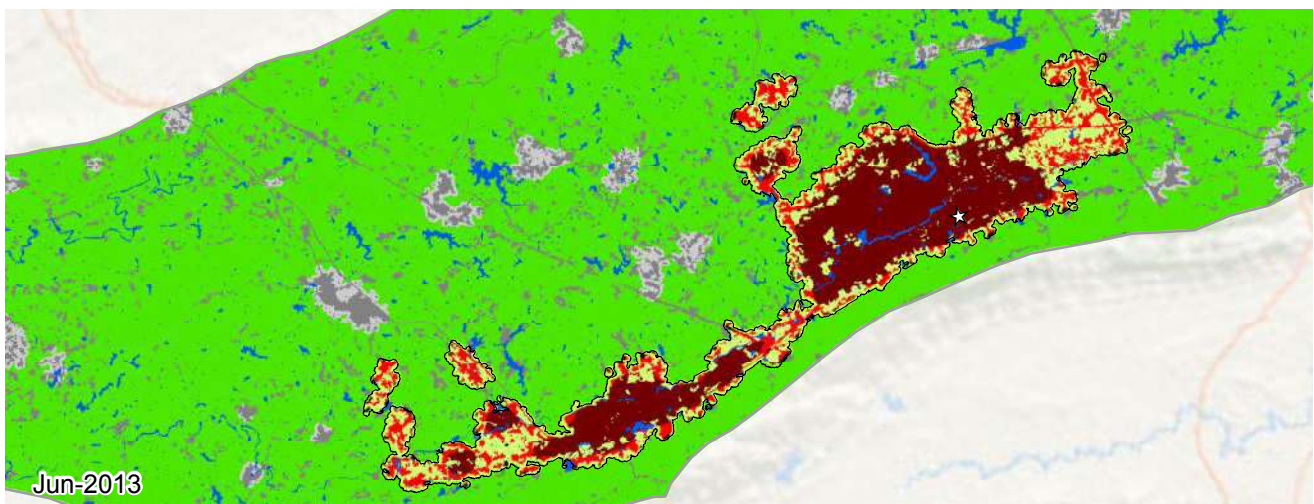
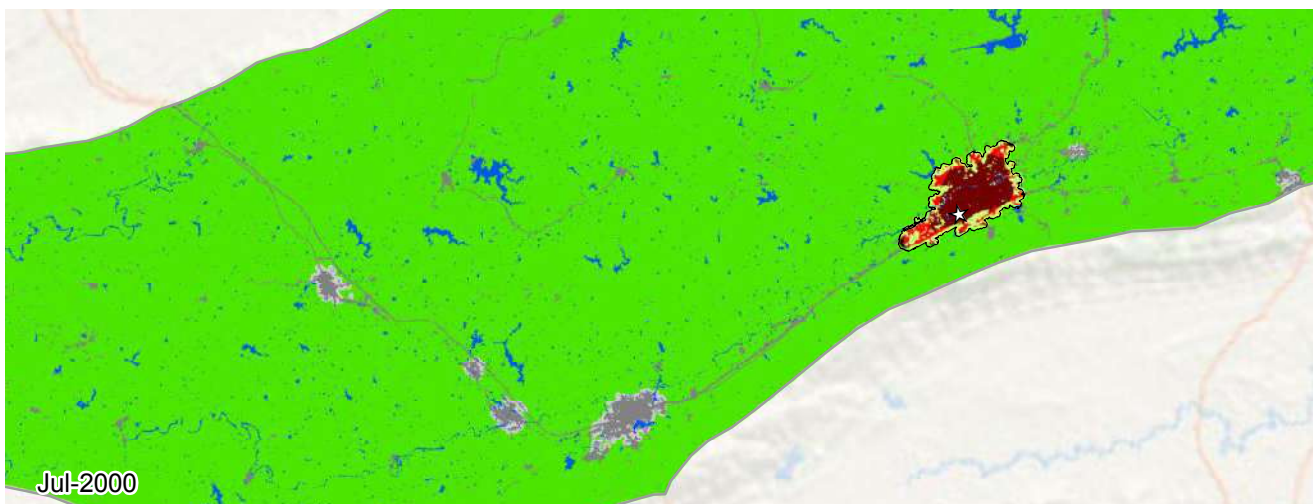
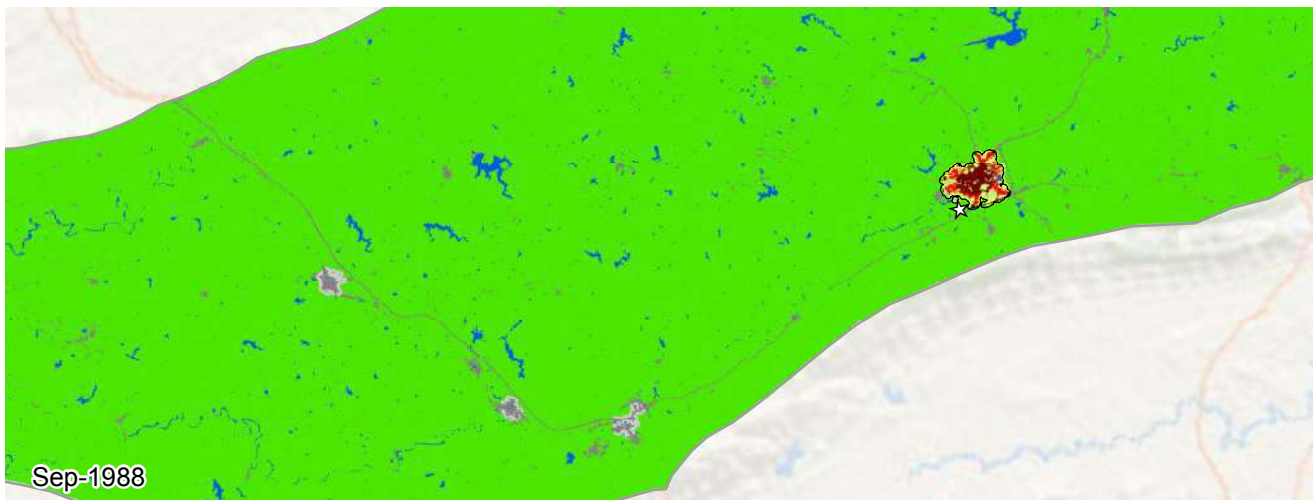
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Berlin, Germany (Europe and Japan)



Metrics	Aug 1990	Aug 2000	Dec 2013	% Annual Change ('00-'13)
Population	3,248,604	3,510,570	3,860,242	0.7
Built-up Area (Hectares)				
Total	24,707	44,413	68,742	3.3
Urban	16,462	32,591	53,160	3.7
Suburban	7,631	11,120	14,525	2.0
Rural	612	700	1,057	3.1
Open space (Hectares)				
Urbanized Open Space	20,178	29,723	40,283	2.3
Urban Extent	44,885	74,137	109,025	2.9
Density (Persons / Hectare)				
Built-up Area Density	131.5	79.0	56.2	-2.6
Urban Extent Density	72.4	47.4	35.4	-2.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.55	0.60	0.63	0.4
Openness Index	0.39	0.35	0.34	-0.3
Compactness (Roundness)				
Proximity	0.89	0.86	0.81	-0.4
Cohesion	0.88	0.83	0.78	-0.5
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	6,958	35%	8,613	35%
Extension	6,344	32%	5,048	20%
Leapfrog	18	0%	835	3%
Inclusion	6,385	32%	9,832	40%

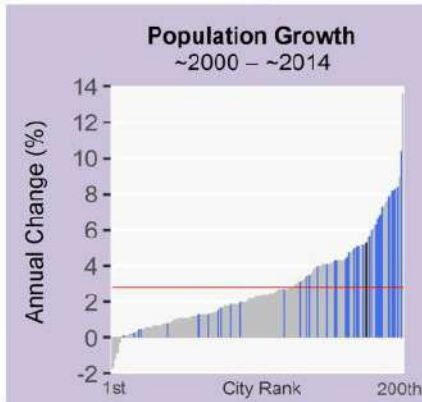




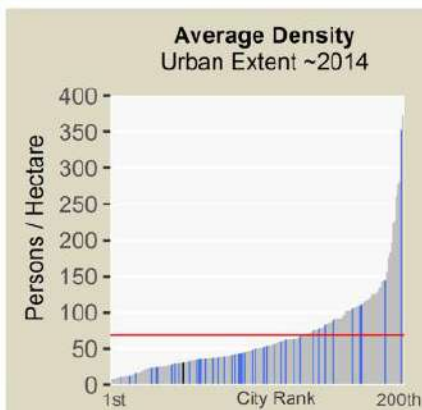
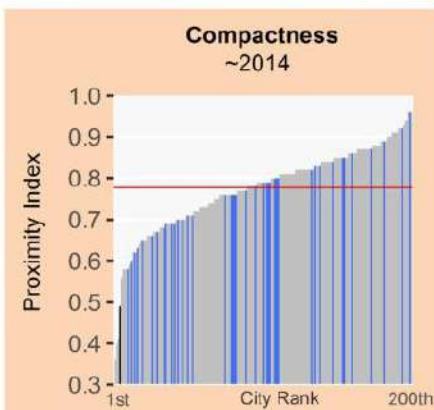
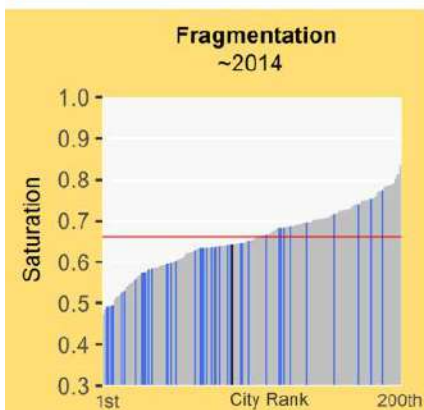
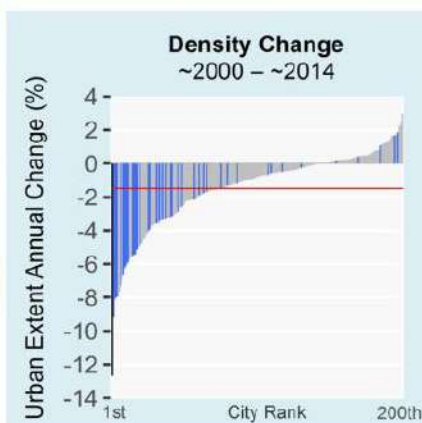
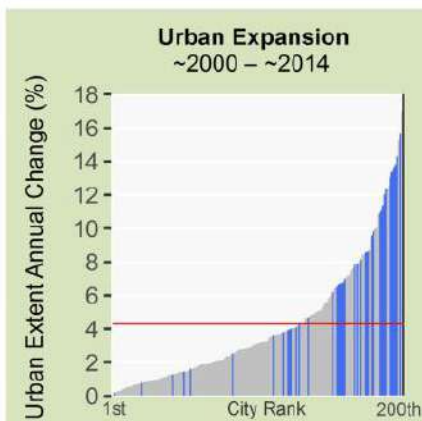
**Bicheng, Chongqing, China
1988-2013**

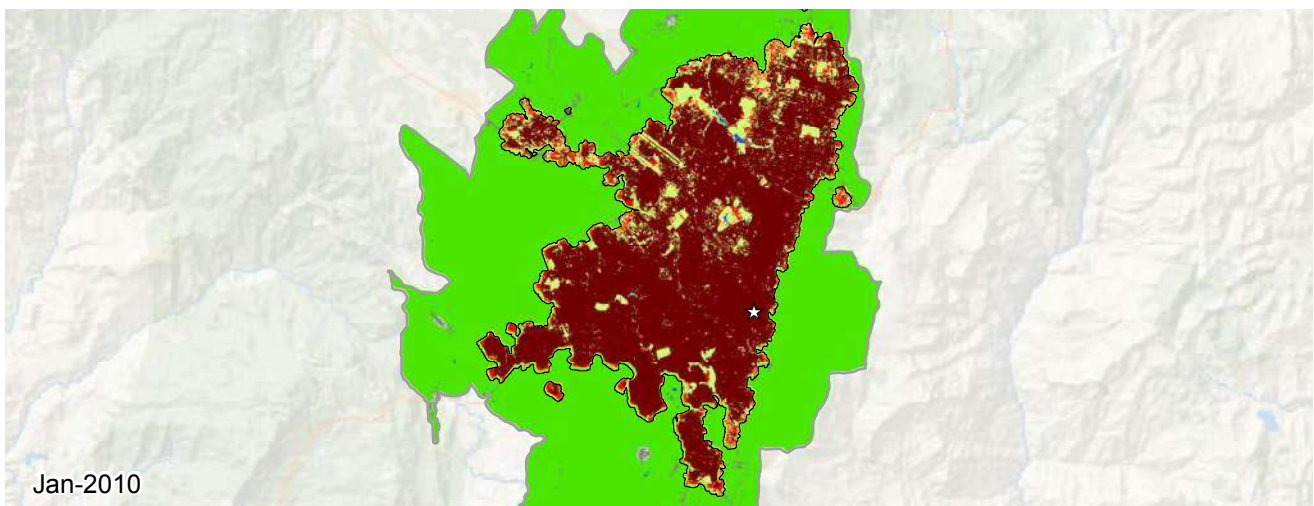
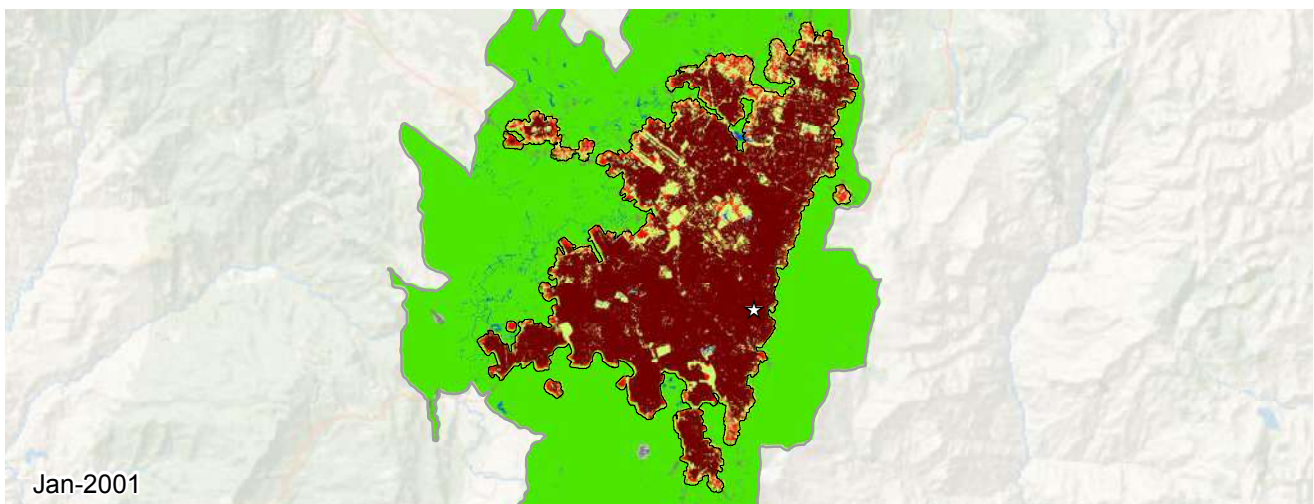
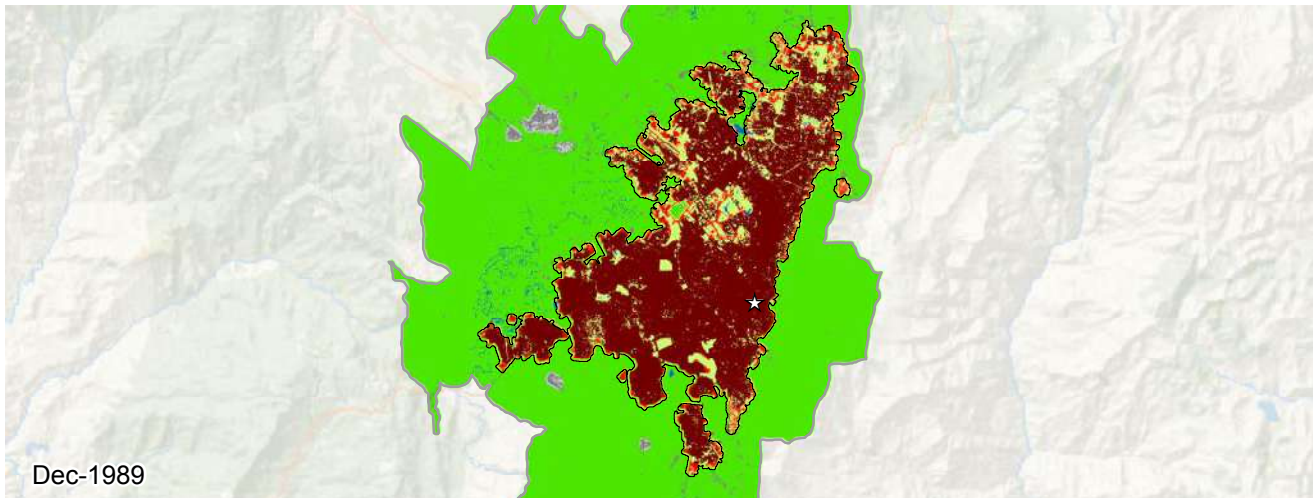
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Bicheng, Chongqing, China (East Asia and the Pacific)



Metrics	Sep 1988	Jul 2000	Jun 2013	% Annual Change ('00-'13)
Population	84,136	119,871	238,159	5.3
Built-up Area (Hectares)				
Total	157	510	5,018	17.7
Urban	85	381	3,511	17.2
Suburban	61	115	1,377	19.2
Rural	10	13	129	17.5
Open space (Hectares)				
Urbanized Open Space	137	256	2,797	18.5
Urban Extent	294	766	7,816	18.0
Density (Persons / Hectare)				
Built-up Area Density	535.1	234.9	47.5	-12.4
Urban Extent Density	285.6	156.3	30.5	-12.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.53	0.67	0.64	-0.3
Openness Index	0.49	0.33	0.33	0.0
Compactness (Roundness)				
Proximity	0.96	0.89	0.49	-4.5
Cohesion	0.95	0.88	0.50	-4.3
Added Area (Hectares)	'88-'00	Share	'00-'13	Share
Infill	49	13%	131	2%
Extension	253	71%	3,602	79%
Leapfrog	0	0%	112	2%
Inclusion	49	13%	661	14%





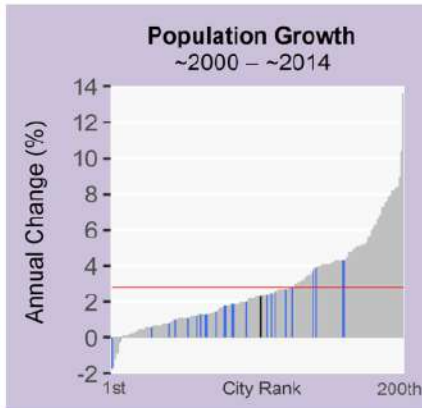
Bogota, Colombia
1989-2010

0 6 12 18 24 km

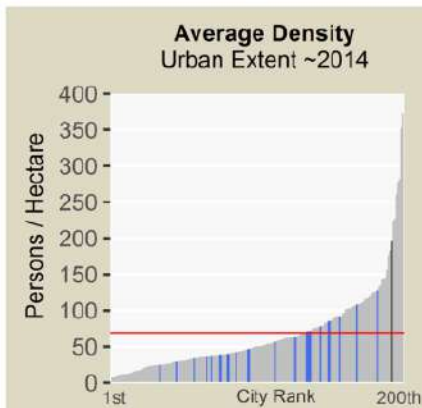
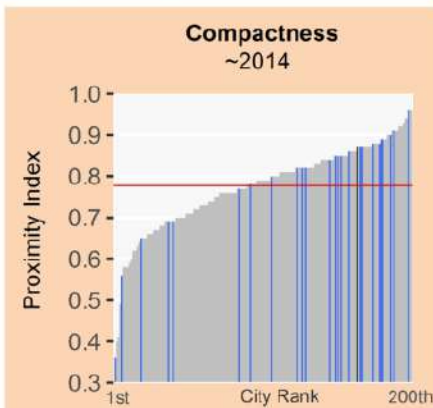
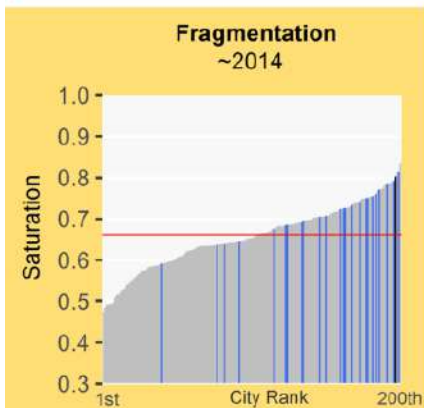
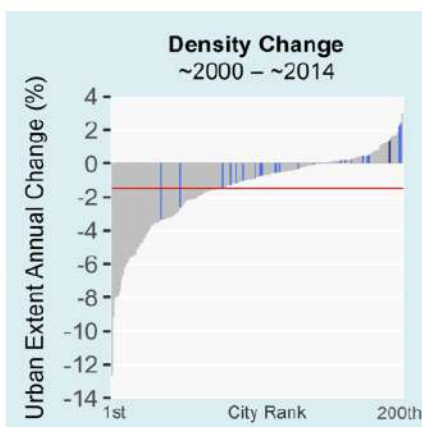
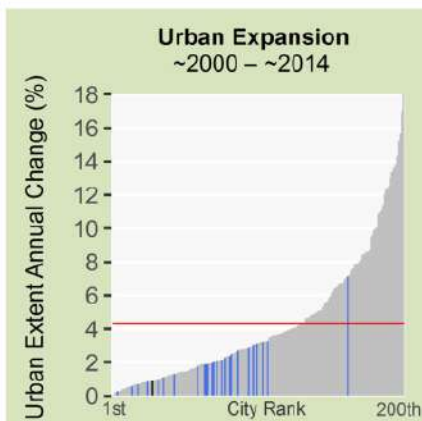
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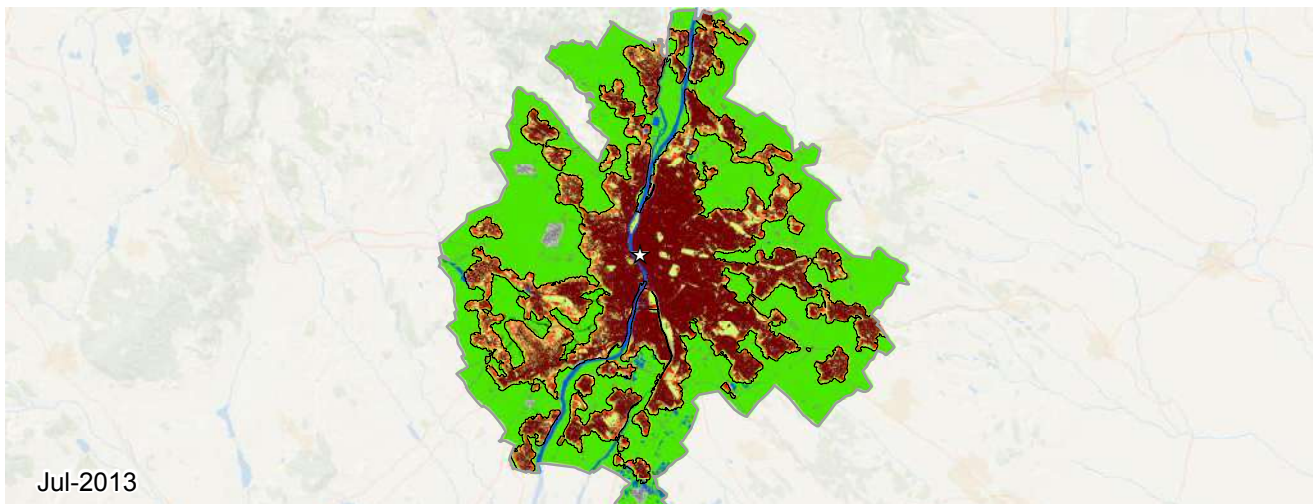
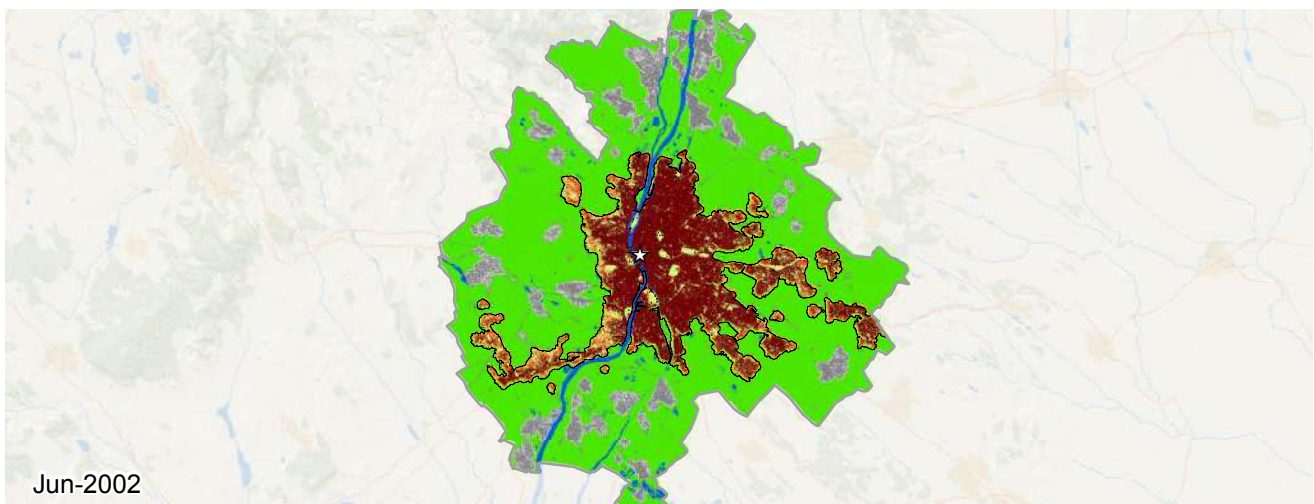
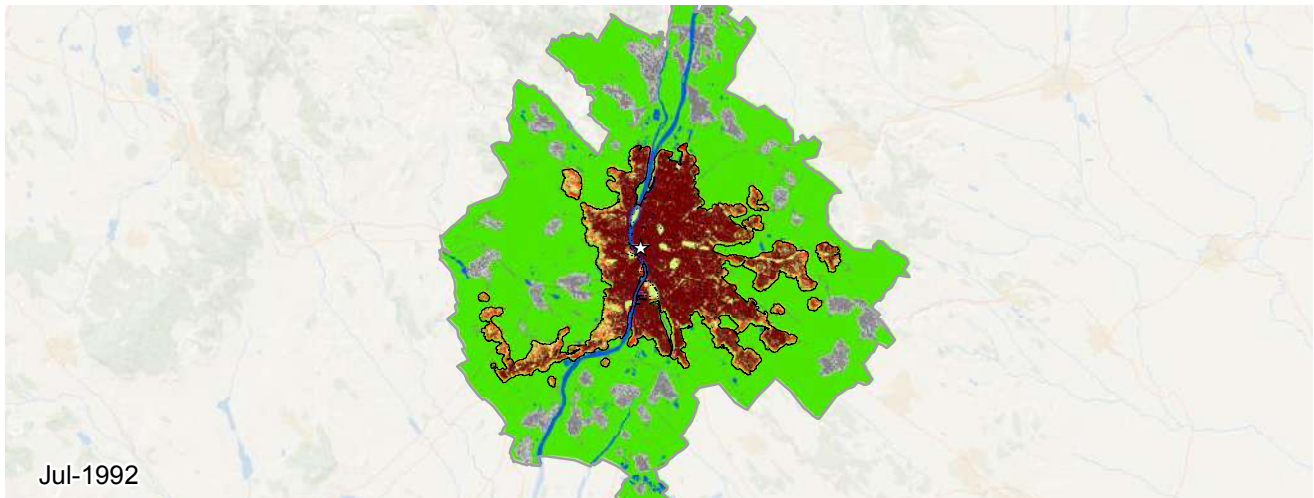
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Bogota, Colombia (Latin America and the Caribbean)



Metrics	Dec 1989	Jan 2001	Jan 2010	% Annual Change ('01-'10)
Population	4,438,704	6,362,427	7,801,693	2.3
Built-up Area (Hectares)				
Total	24,581	28,501	31,895	1.3
Urban	22,110	25,836	29,662	1.5
Suburban	2,297	2,501	2,111	-1.9
Rural	173	163	121	-3.3
Open space (Hectares)				
Urbanized Open Space	7,541	8,133	7,827	-0.4
Urban Extent	32,123	36,634	39,723	0.9
Density (Persons / Hectare)				
Built-up Area Density	180.6	223.2	244.6	1.0
Urban Extent Density	138.2	173.7	196.4	1.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.77	0.78	0.80	0.4
Openness Index	0.19	0.18	0.16	-1.7
Compactness (Roundness)				
Proximity	0.84	0.86	0.87	0.2
Cohesion	0.83	0.85	0.86	0.2
Added Area (Hectares)	'89-'01	Share	'01-'10	Share
Infill	1,654	42%	1,988	58%
Extension	1,615	41%	1,147	33%
Leapfrog	1	0%	6	0%
Inclusion	647	16%	252	7%

















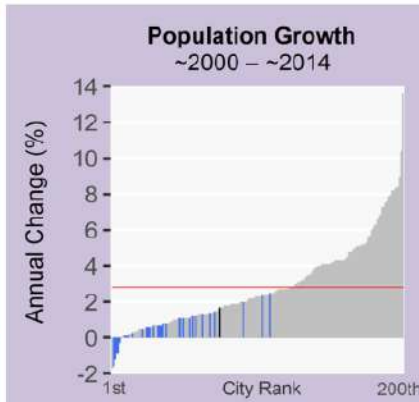
**Budapest, Hungary
1992-2013**

0 8 16 24 32 km

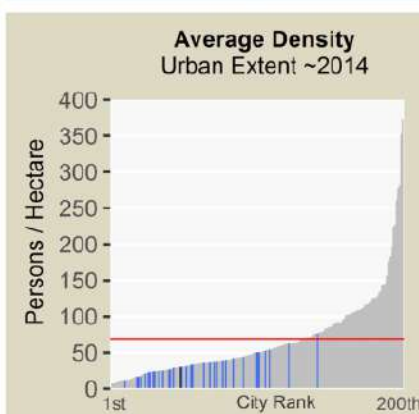
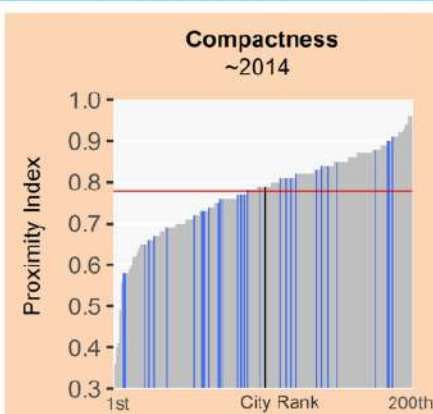
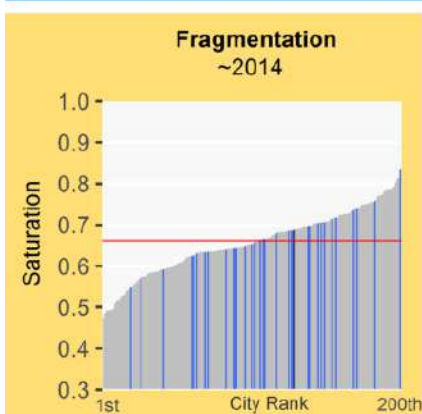
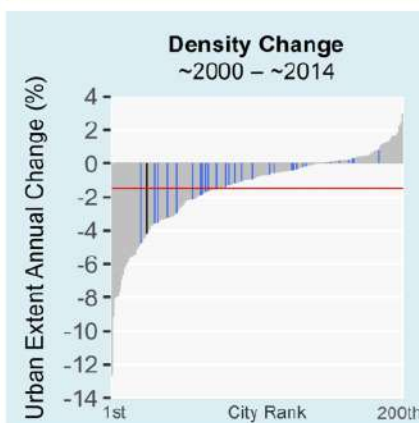
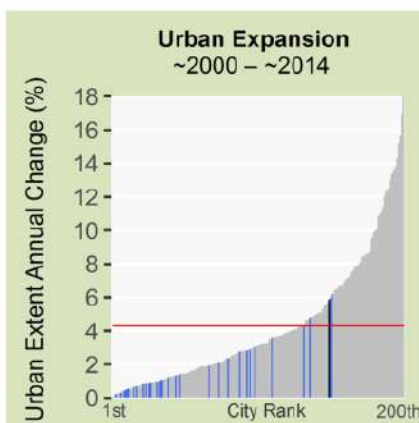
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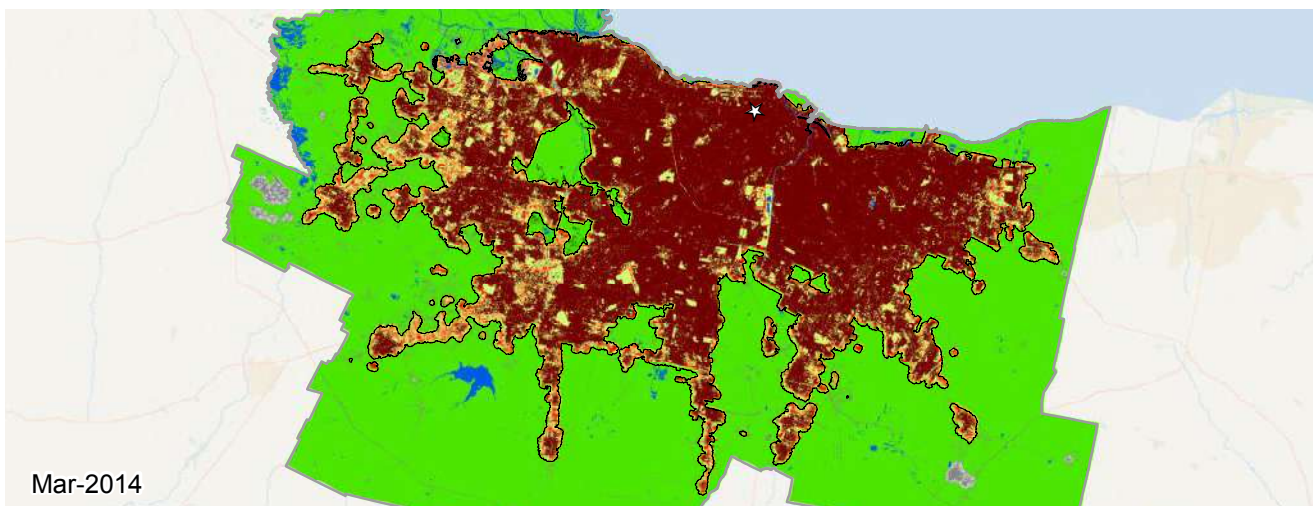
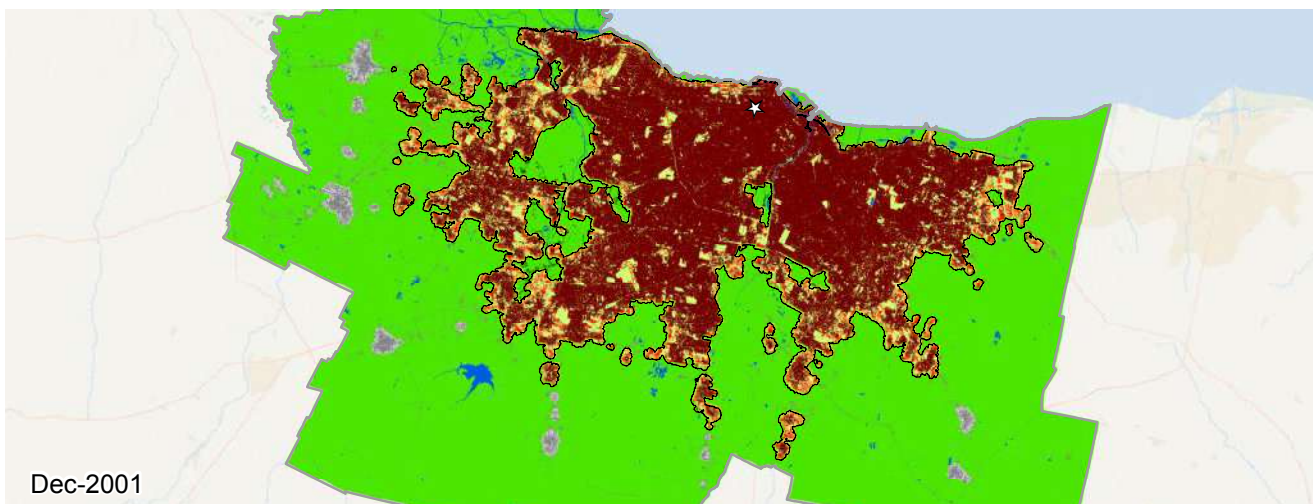
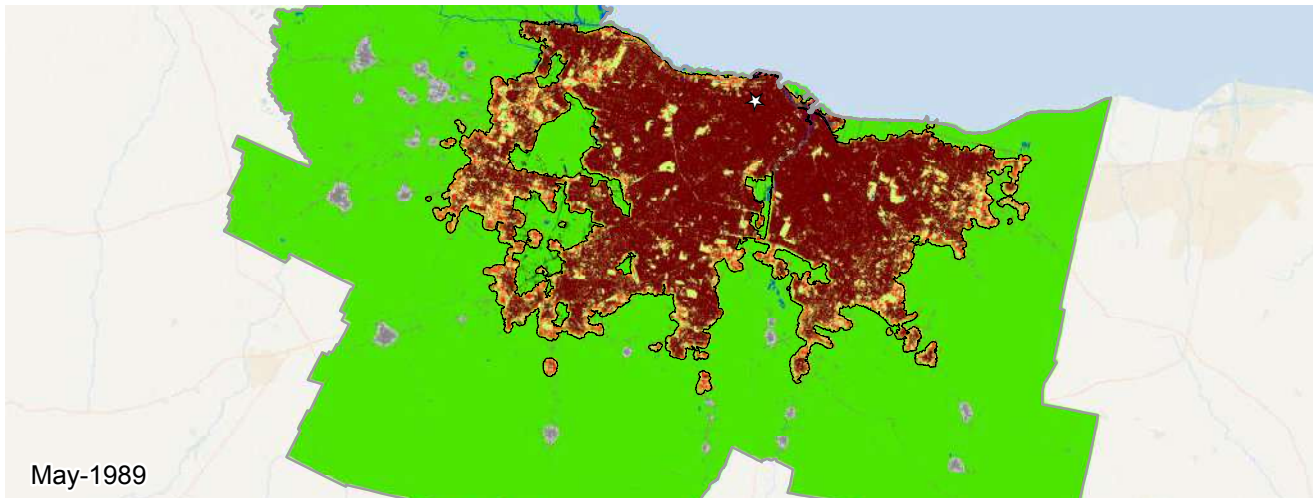
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Budapest, Hungary (Europe and Japan)



Metrics	Jul 1992	Jun 2002	Jul 2013	% Annual Change ('02-'13)
Population	2,041,590	1,885,418	2,272,784	1.7
Built-up Area (Hectares)				
Total	27,060	28,413	52,029	5.5
Urban	22,831	23,865	42,060	5.1
Suburban	3,941	4,252	9,330	7.1
Rural	288	295	637	7.0
Open space (Hectares)				
Urbanized Open Space	10,262	11,035	23,685	6.9
Urban Extent	37,323	39,448	75,715	5.9
Density (Persons / Hectare)				
Built-up Area Density	75.4	66.4	43.7	-3.8
Urban Extent Density	54.7	47.8	30.0	-4.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.73	0.72	0.69	-0.4
Openness Index	0.25	0.25	0.27	0.6
Compactness (Roundness)				
Proximity	0.82	0.78	0.79	0.0
Cohesion	0.79	0.76	0.76	0.0
Added Area (Hectares)	'92-'02	Share	'02-'13	Share
Infill	127	9%	5,171	21%
Extension	124	8%	7,106	30%
Leapfrog	101	7%	0	0%
Inclusion	1,045	74%	11,377	48%

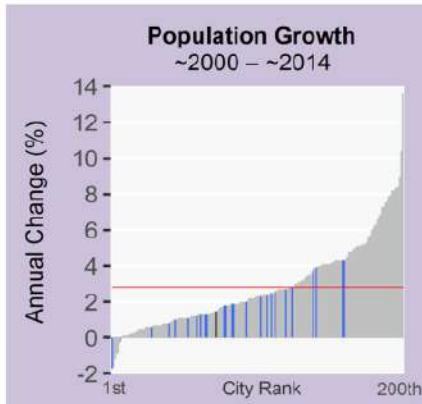
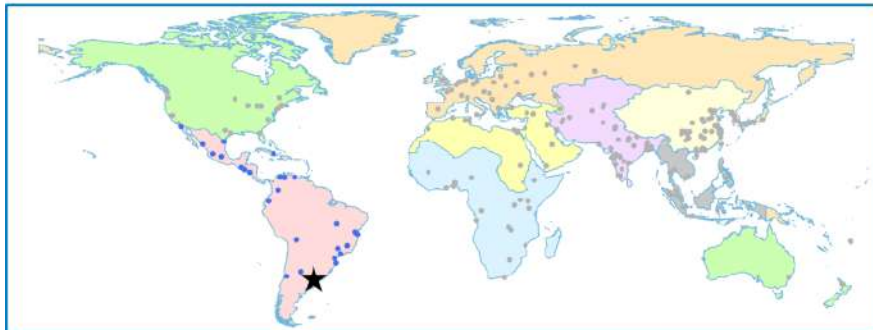




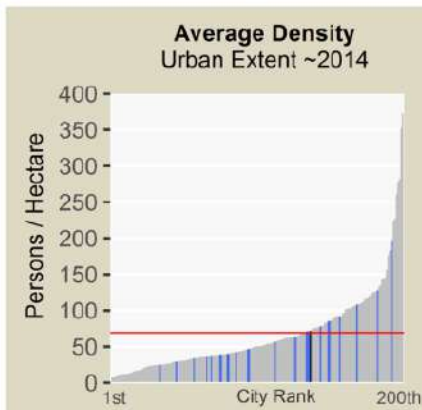
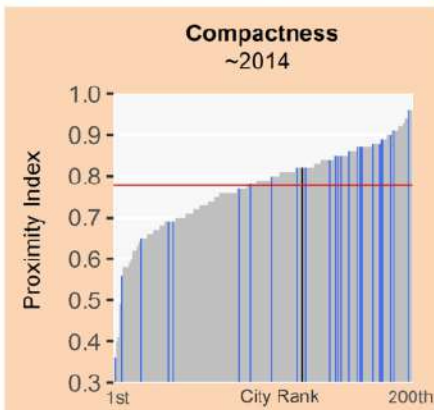
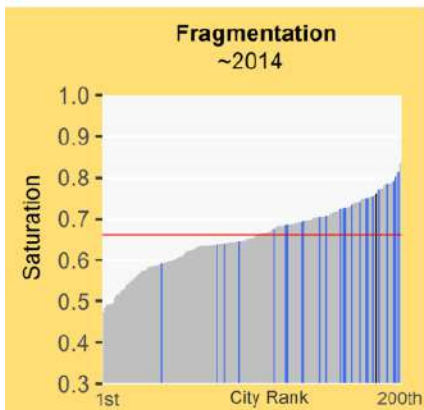
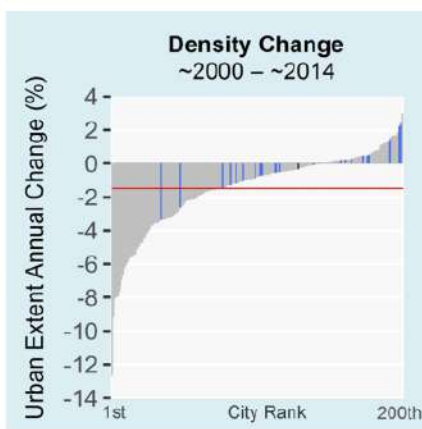
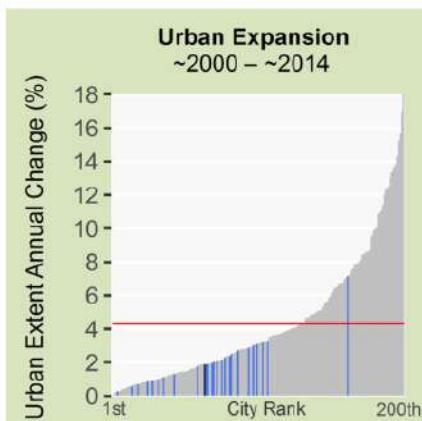
**Buenos Aires, Argentina
1989-2014**

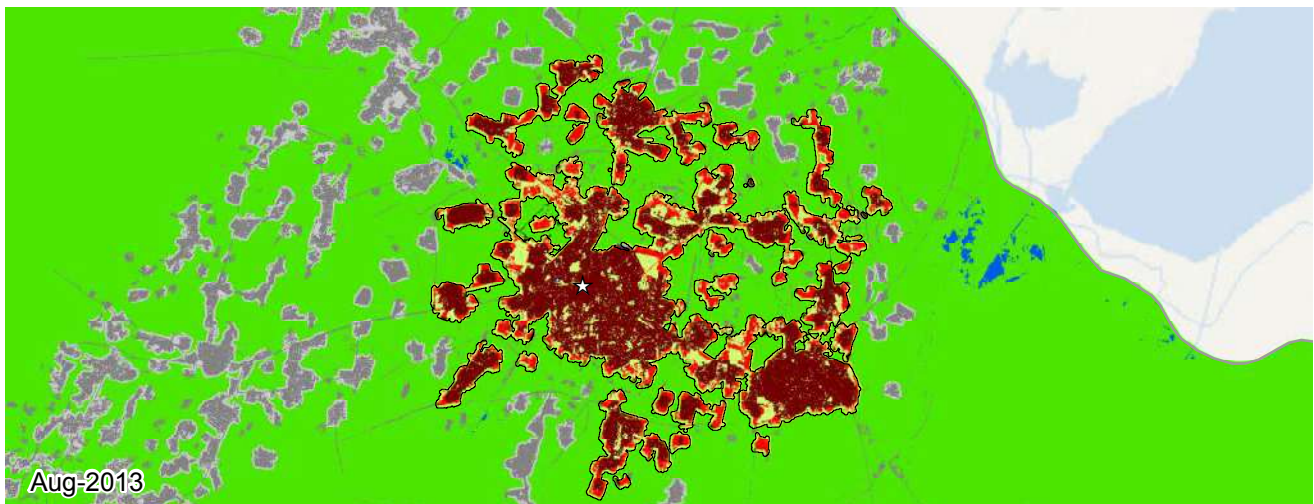
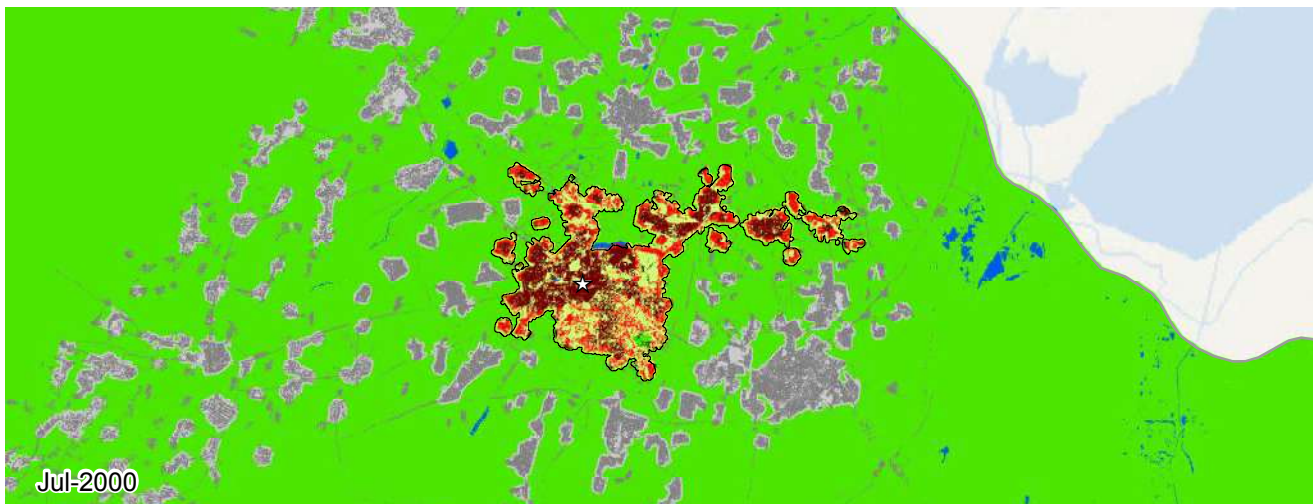
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Buenos Aires, Argentina (Latin America and the Caribbean)



Metrics	May 1989	Dec 2001	Mar 2014	% Annual Change ('01-'14)
Population	10,568,200	11,494,967	13,879,005	1.5
Built-up Area (Hectares)				
Total	99,014	115,642	147,305	2.0
Urban	87,997	103,531	132,652	2.0
Suburban	10,274	11,337	13,631	1.5
Rural	741	773	1,021	2.3
Open space (Hectares)				
Urbanized Open Space	33,999	37,989	46,088	1.6
Urban Extent	133,013	153,631	193,393	1.9
Density (Persons / Hectare)				
Built-up Area Density	106.7	99.4	94.2	-0.4
Urban Extent Density	79.5	74.8	71.8	-0.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.74	0.75	0.76	0.1
Openness Index	0.20	0.19	0.17	-0.7
Compactness (Roundness)				
Proximity	0.83	0.83	0.82	-0.1
Cohesion	0.82	0.82	0.81	-0.1
Added Area (Hectares)	'89-'01	Share	'01-'14	Share
Infill	8,015	48%	14,456	45%
Extension	4,945	29%	11,601	36%
Leapfrog	400	2%	48	0%
Inclusion	3,266	19%	5,559	17%





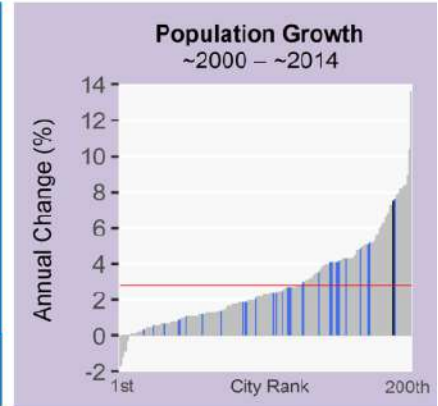
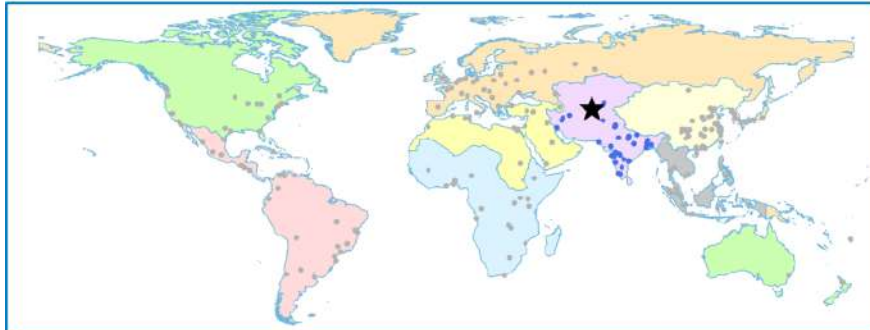
**Bukhara, Uzbekistan
1991-2013**

0 5 10 15 20 km

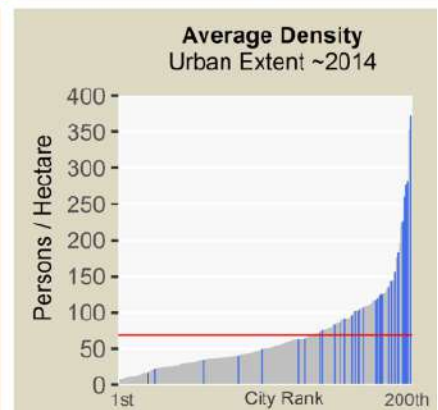
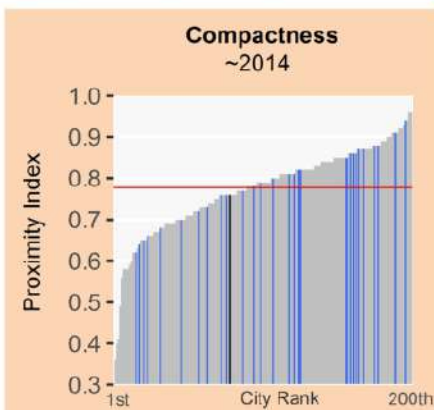
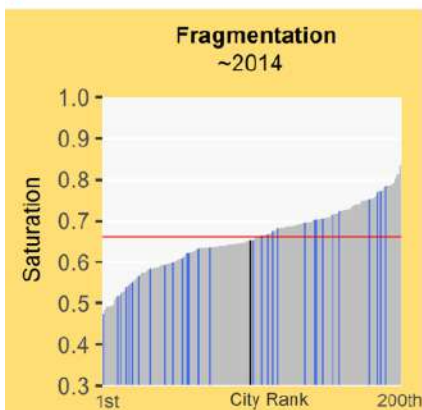
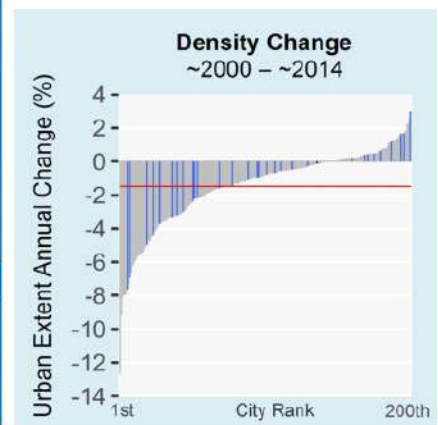
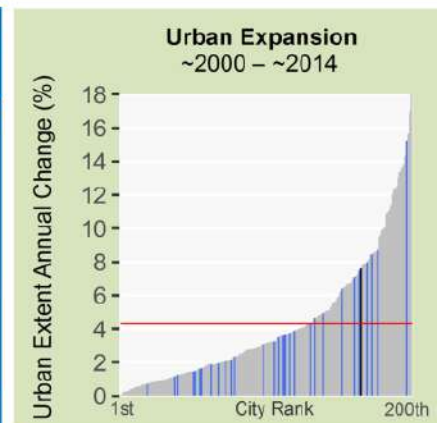
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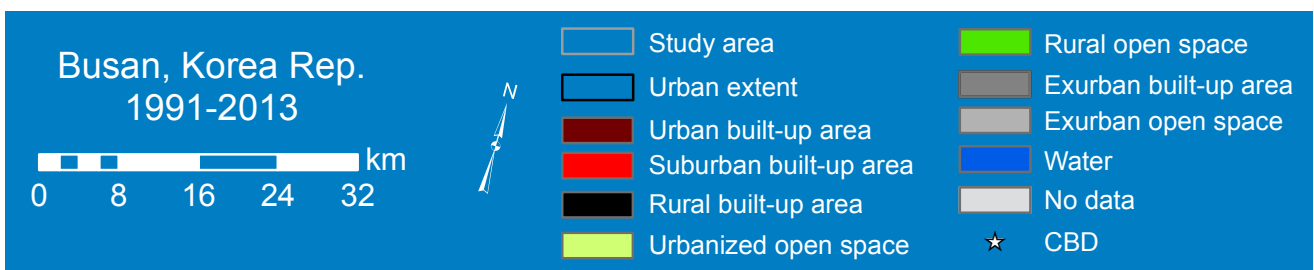
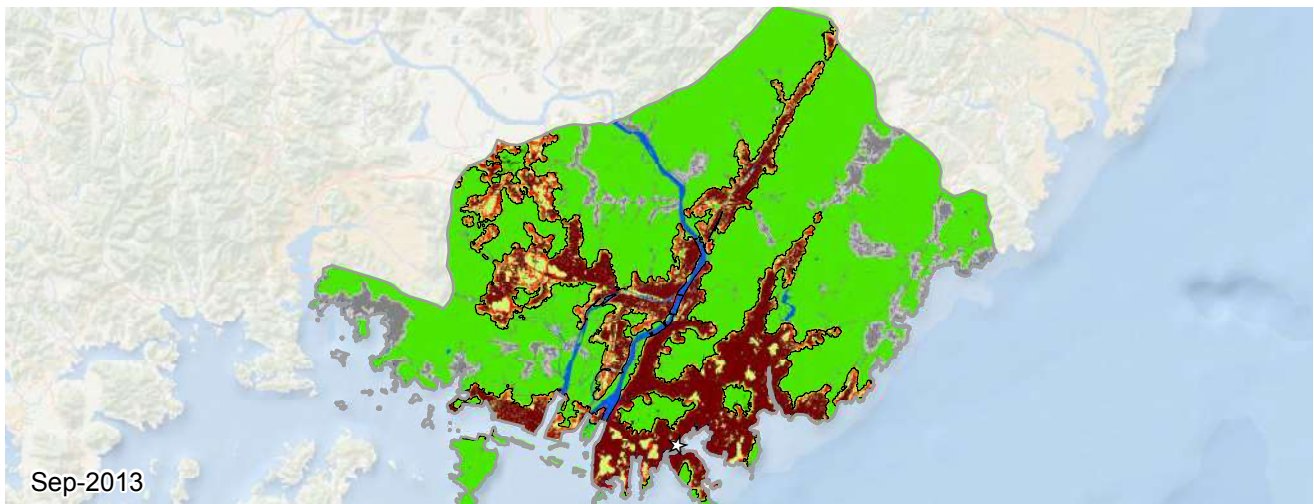
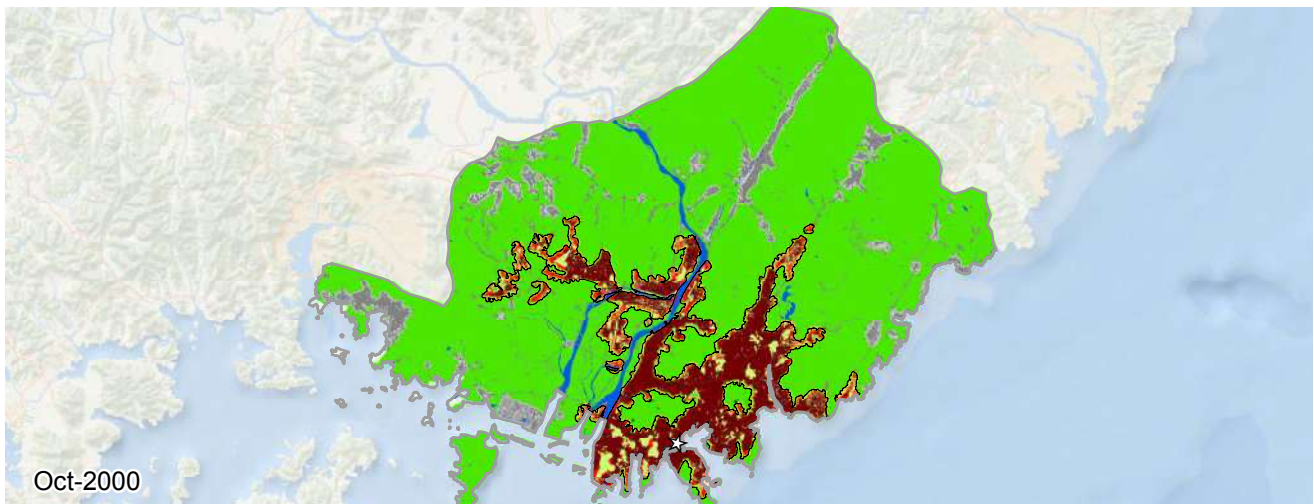
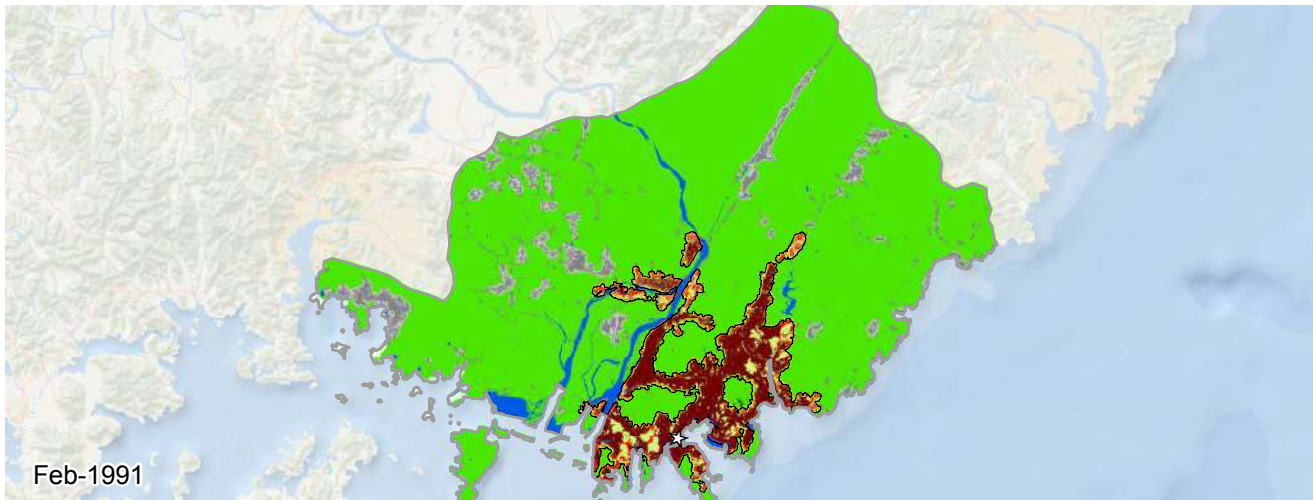
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Bukhara, Uzbekistan (South and Central Asia)

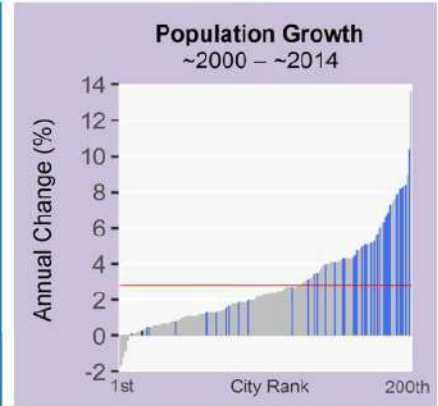


Metrics	Apr 1991	Jul 2000	Aug 2013	% Annual Change ('00-'13)
Population	42,304	138,578	369,044	7.5
Built-up Area (Hectares)				
Total	724	4,160	14,153	9.4
Urban	247	2,119	9,827	11.7
Suburban	440	1,893	4,061	5.8
Rural	35	147	264	4.5
Open space (Hectares)				
Urbanized Open Space	871	3,822	7,482	5.1
Urban Extent	1,595	7,983	21,636	7.6
Density (Persons / Hectare)				
Built-up Area Density	58.4	33.3	26.1	-1.9
Urban Extent Density	26.5	17.4	17.1	-0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.45	0.52	0.65	1.7
Openness Index	0.54	0.49	0.36	-2.3
Compactness (Roundness)				
Proximity	0.84	0.74	0.76	0.2
Cohesion	0.83	0.73	0.76	0.3
Added Area (Hectares)	'91-'00	Share	'00-'13	Share
Infill	421	12%	2,070	20%
Extension	1,958	56%	1,387	13%
Leapfrog	34	0%	268	2%
Inclusion	1,021	29%	6,265	62%

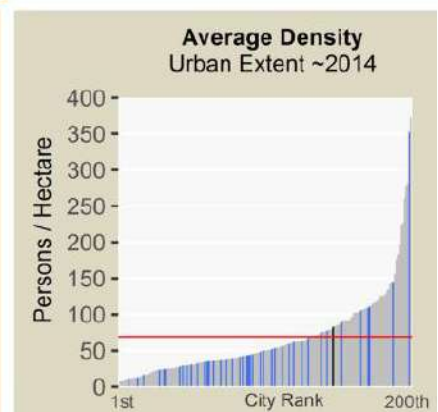
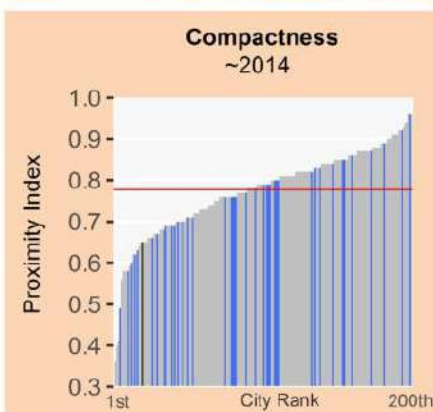
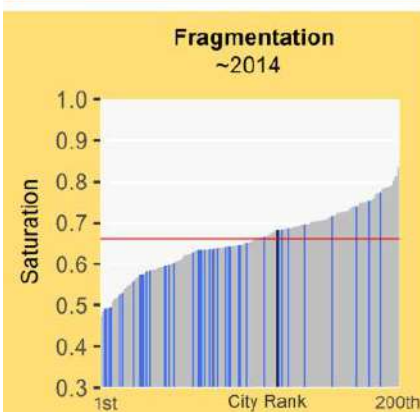
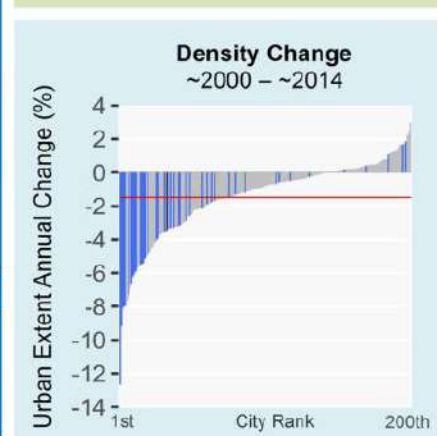
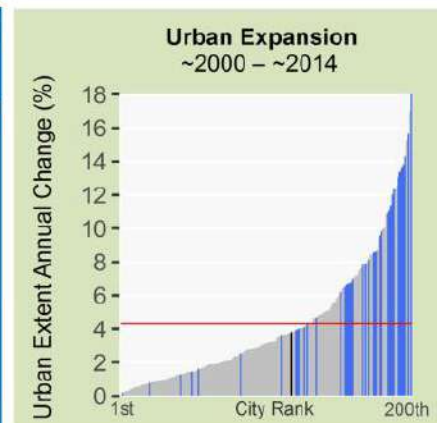


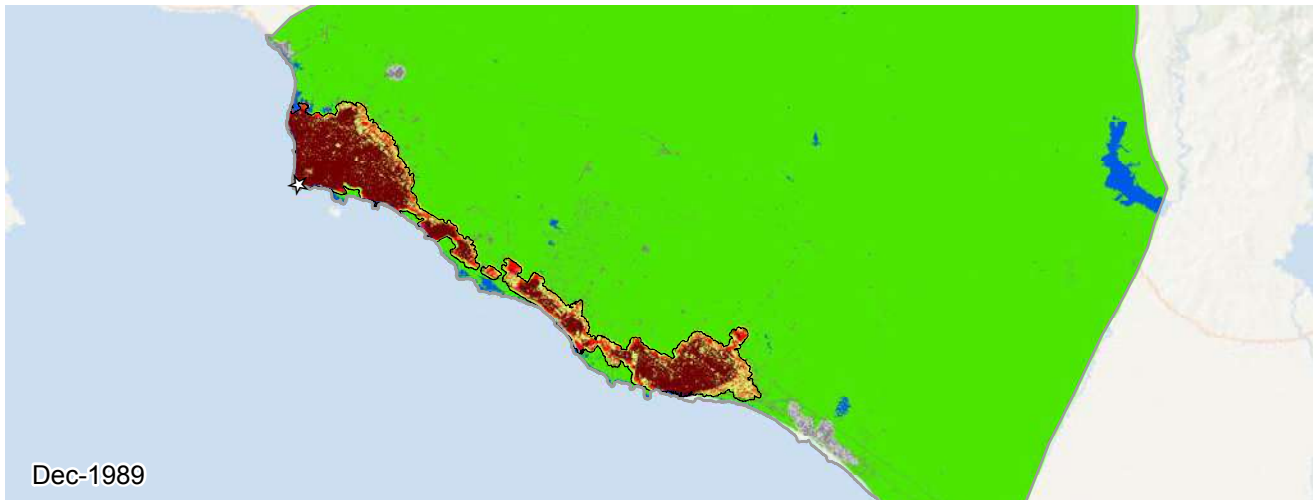


Busan, Korea Rep. (East Asia and the Pacific)



Metrics	Feb 1991	Oct 2000	Sep 2013	% Annual Change ('00-'13)
Population	3,731,022	3,837,304	3,974,065	0.3
Built-up Area (Hectares)				
Total	13,689	20,897	32,656	3.5
Urban	10,630	16,516	25,259	3.3
Suburban	2,855	4,113	6,898	4.0
Rural	204	267	498	4.8
Open space (Hectares)				
Urbanized Open Space	5,966	8,423	15,228	4.6
Urban Extent	19,655	29,320	47,885	3.8
Density (Persons / Hectare)				
Built-up Area Density	272.5	183.6	121.7	-3.2
Urban Extent Density	189.8	130.9	83.0	-3.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.70	0.71	0.68	-0.3
Openness Index	0.32	0.29	0.31	0.3
Compactness (Roundness)				
Proximity	0.70	0.69	0.65	-0.5
Cohesion	0.69	0.68	0.64	-0.5
Added Area (Hectares)	'91-'00	Share	'00-'13	Share
Infill	2,116	29%	2,409	20%
Extension	2,657	36%	4,458	37%
Leapfrog	151	2%	0	0%
Inclusion	2,287	31%	4,869	41%



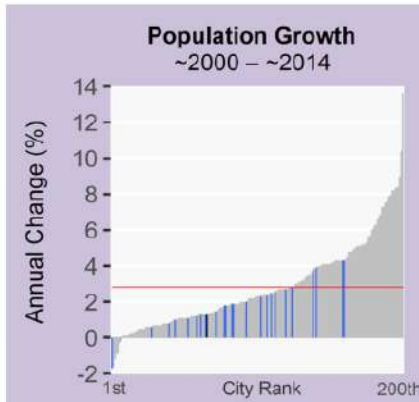


**Cabimas, Venezuela
1989-2014**

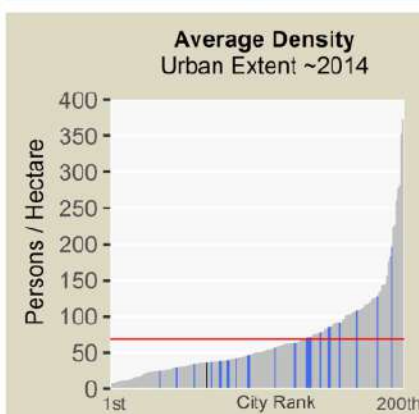
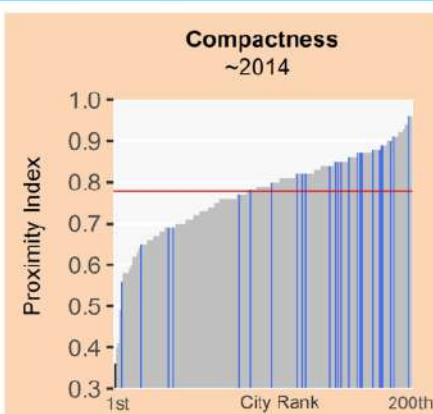
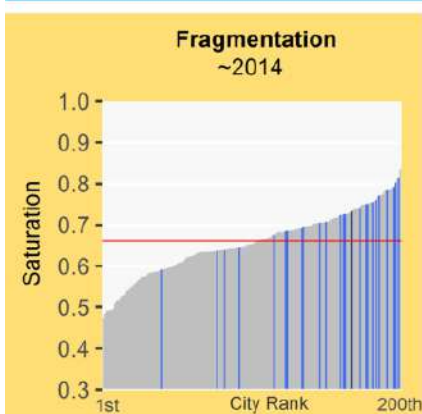
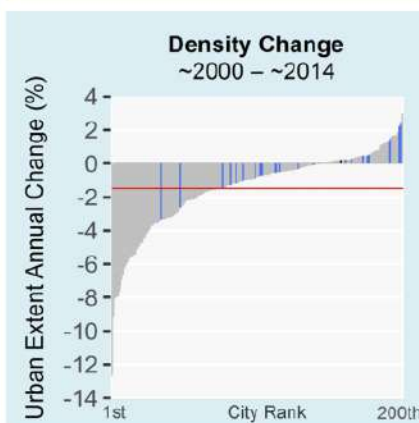
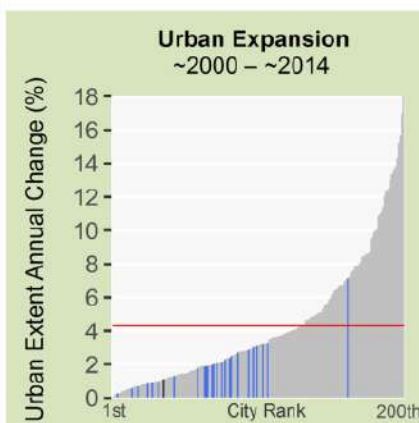
0 5 10 15 20 km

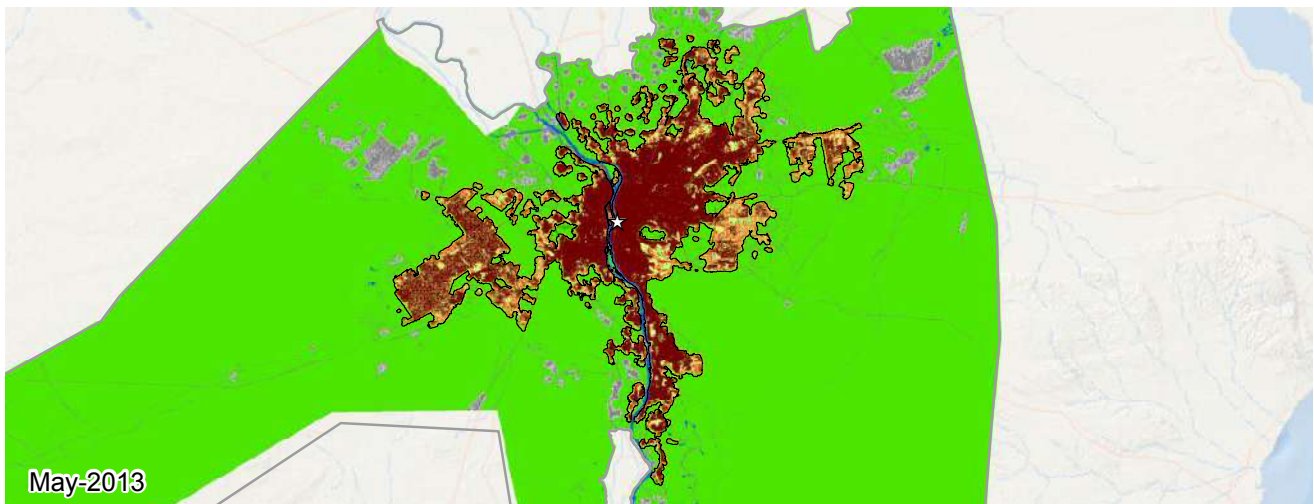
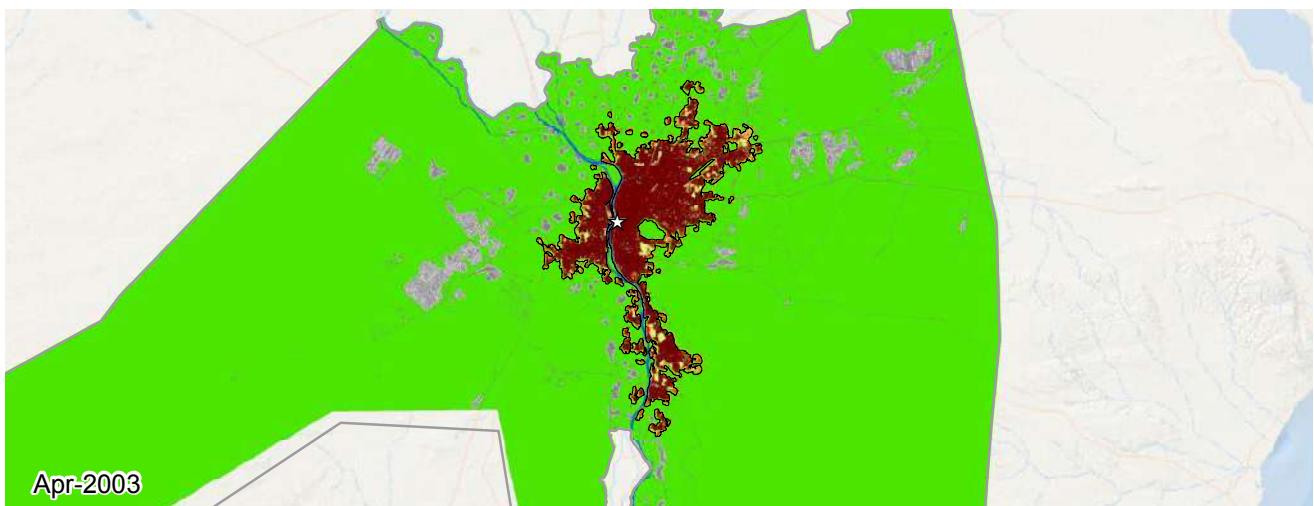
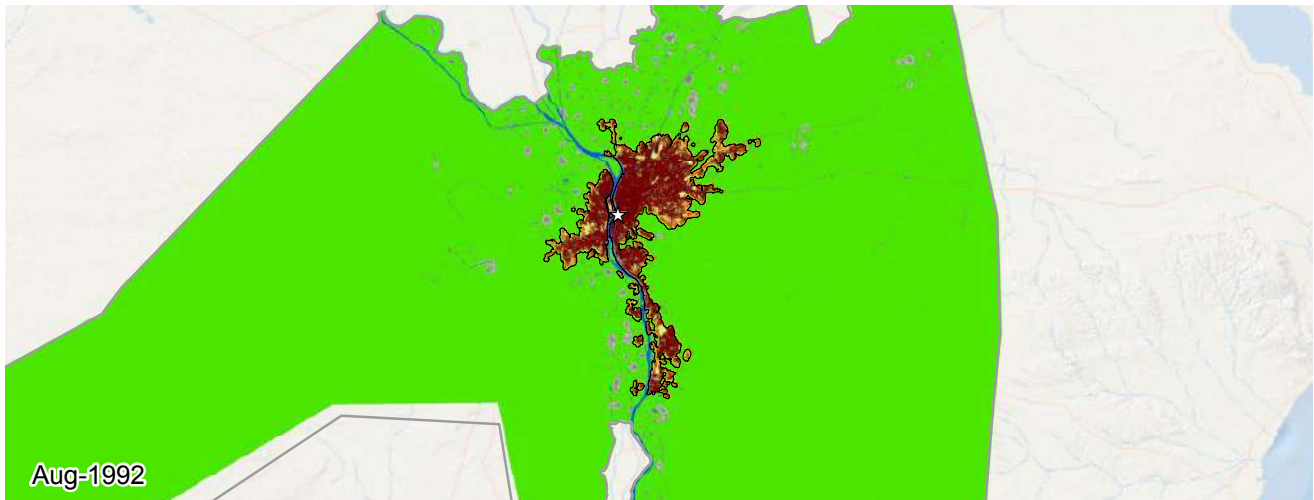
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Cabimas, Venezuela (Latin America and the Caribbean)



Metrics	Dec 1989	Jan 2000	Jan 2014	% Annual Change ('00-'14)
Population	238,324	384,017	460,893	1.3
Built-up Area (Hectares)				
Total	5,895	7,911	9,488	1.3
Urban	4,797	6,577	8,193	1.6
Suburban	1,022	1,263	1,223	-0.2
Rural	76	71	71	0.0
Open space (Hectares)				
Urbanized Open Space	2,413	3,141	3,452	0.7
Urban Extent	8,308	11,053	12,940	1.1
Density (Persons / Hectare)				
Built-up Area Density	40.4	48.5	48.6	0.0
Urban Extent Density	28.7	34.7	35.6	0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.71	0.72	0.73	0.2
Openness Index	0.27	0.26	0.23	-0.8
Compactness (Roundness)				
Proximity	0.32	0.33	0.36	0.6
Cohesion	0.35	0.35	0.38	0.5
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	814	40%	691	44%
Extension	712	35%	661	42%
Leapfrog	5	0%	0	0%
Inclusion	483	23%	185	12%





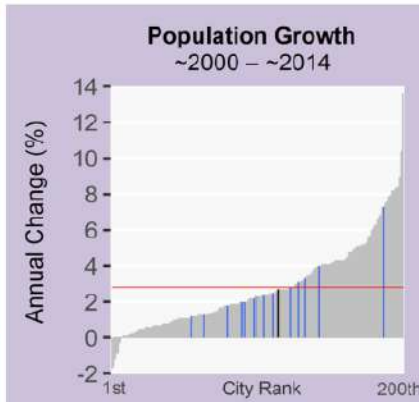
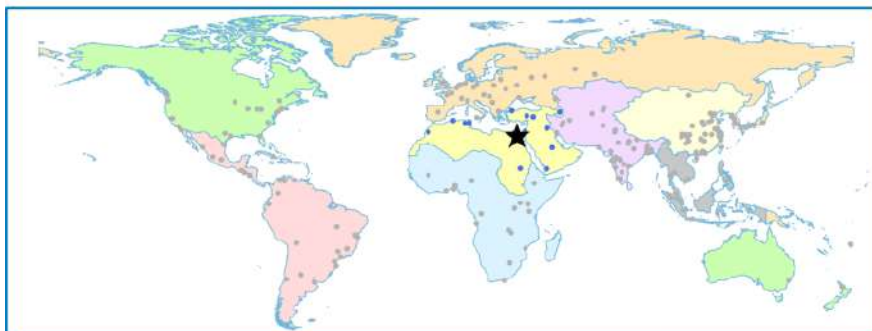
**Cairo, Egypt
1992-2013**

0 10 20 30 40 km

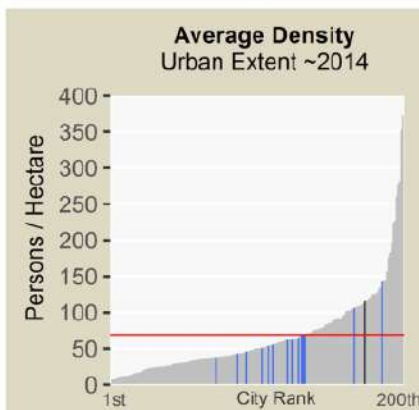
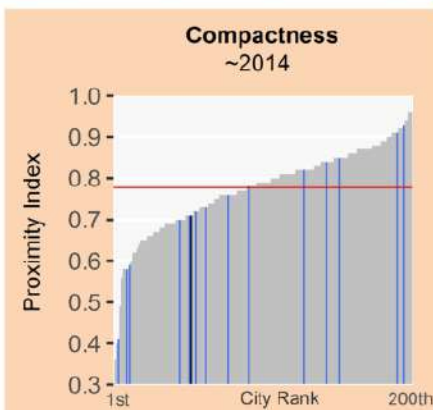
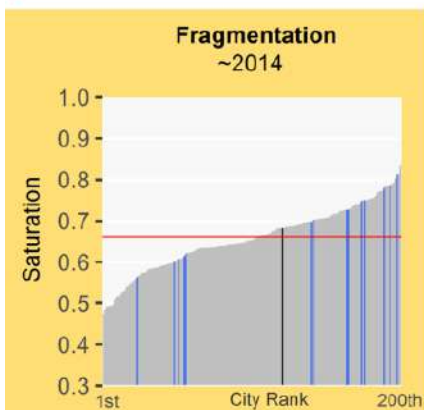
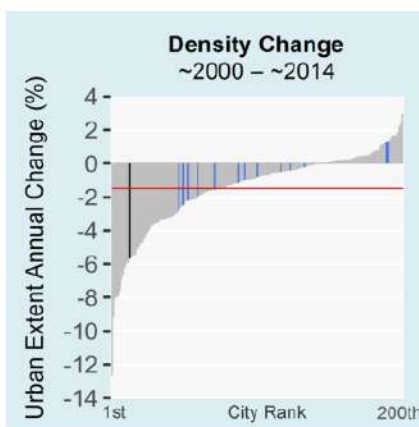
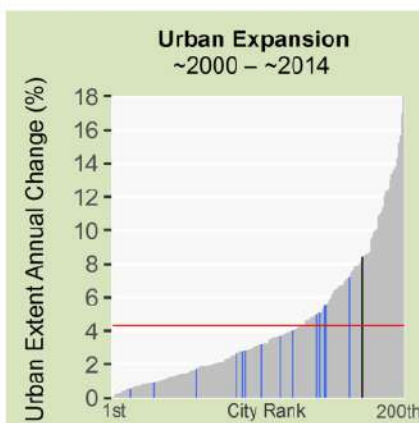
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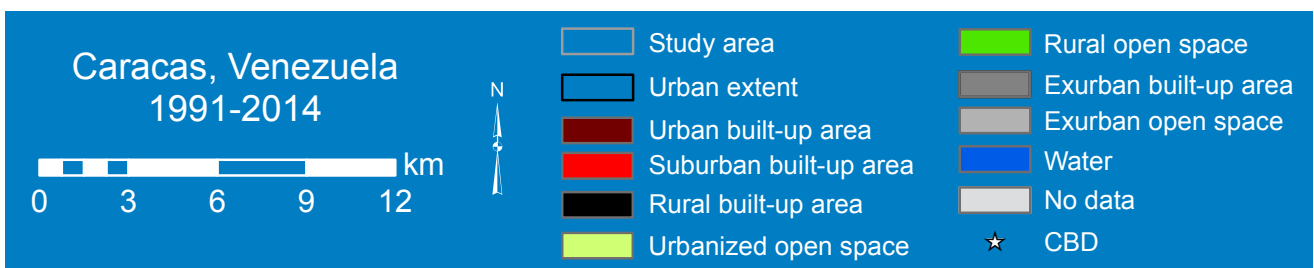
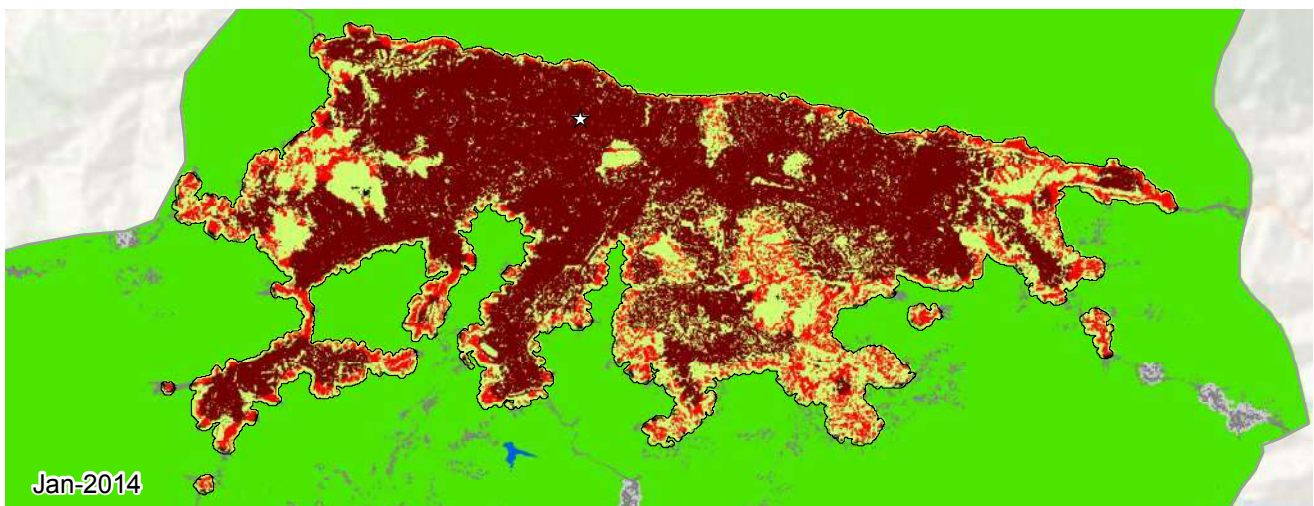
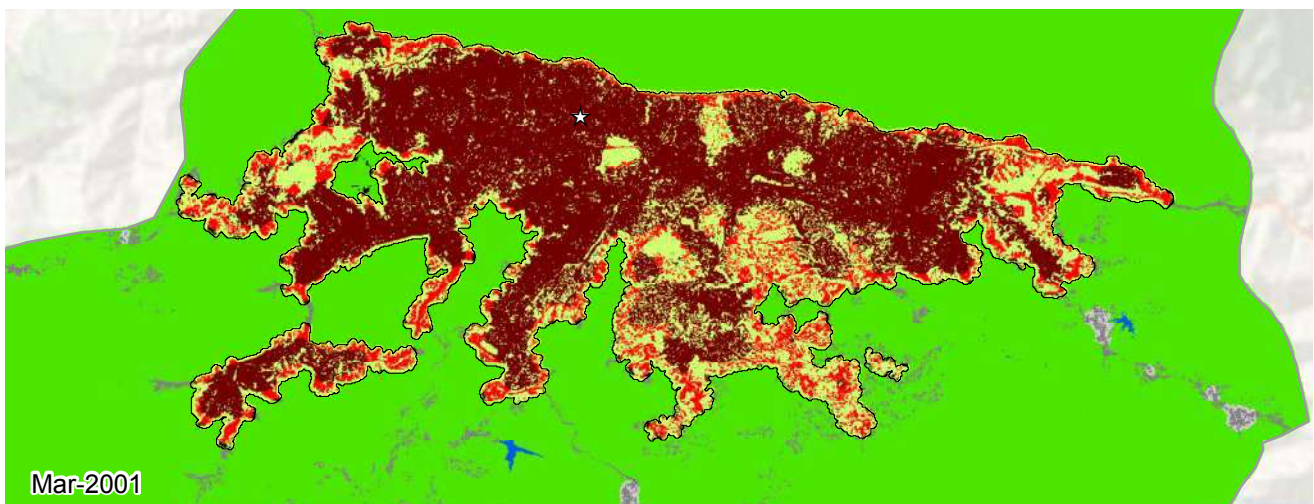
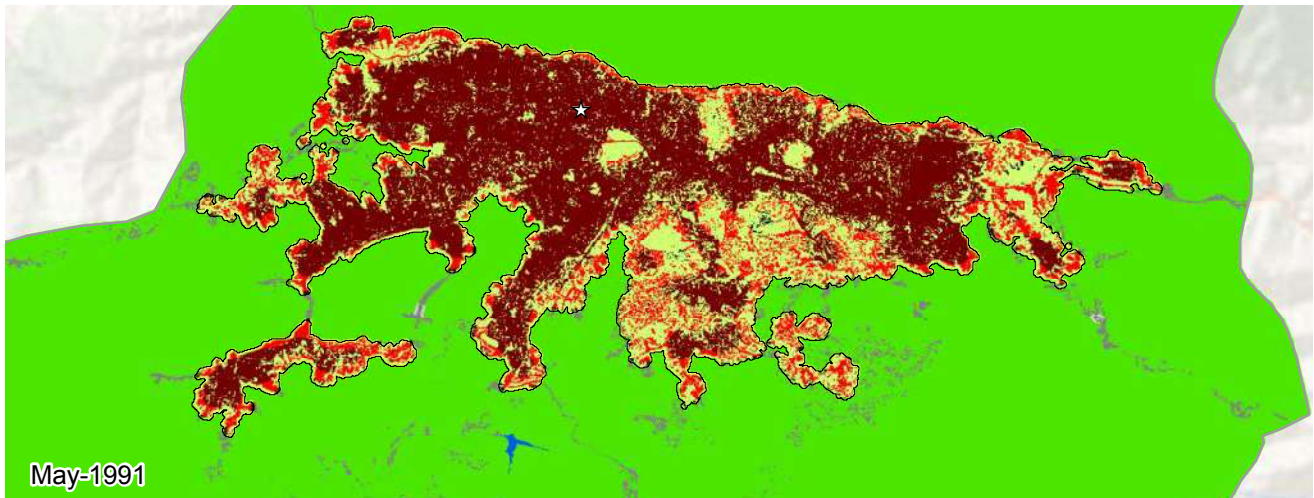
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Cairo, Egypt (Western Asia and North Africa)

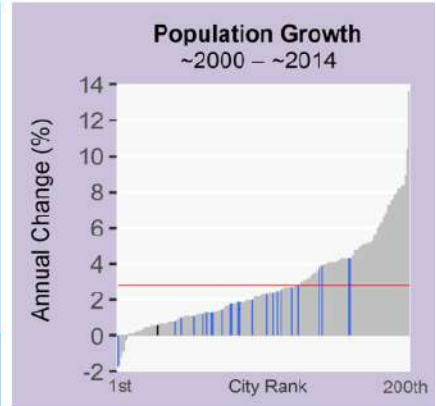


Metrics	Aug 1992	Apr 2003	May 2013	% Annual Change ('03-'13)
Population	9,621,784	11,928,479	15,734,934	2.7
Built-up Area (Hectares)				
Total	29,716	45,507	93,092	7.1
Urban	24,381	39,689	74,782	6.3
Suburban	4,999	5,386	17,099	11.5
Rural	336	431	1,210	10.2
Open space (Hectares)				
Urbanized Open Space	11,485	12,664	43,302	12.2
Urban Extent	41,202	58,172	136,395	8.5
Density (Persons / Hectare)				
Built-up Area Density	323.8	262.1	169.0	-4.4
Urban Extent Density	233.5	205.1	115.4	-5.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.72	0.78	0.68	-1.4
Openness Index	0.26	0.20	0.26	2.6
Compactness (Roundness)				
Proximity	0.67	0.70	0.71	0.1
Cohesion	0.66	0.68	0.69	0.1
Added Area (Hectares)	'92-'03	Share	'03-'13	Share
Infill	5,700	36%	8,543	17%
Extension	7,674	48%	23,837	50%
Leapfrog	293	1%	80	0%
Inclusion	2,122	13%	15,123	31%

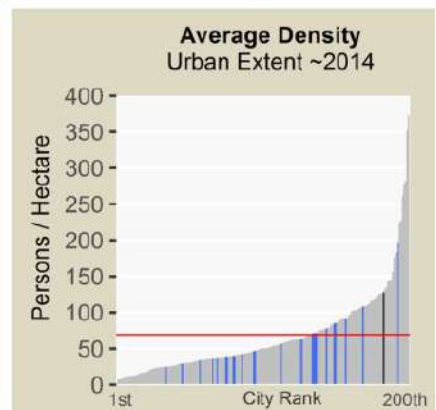
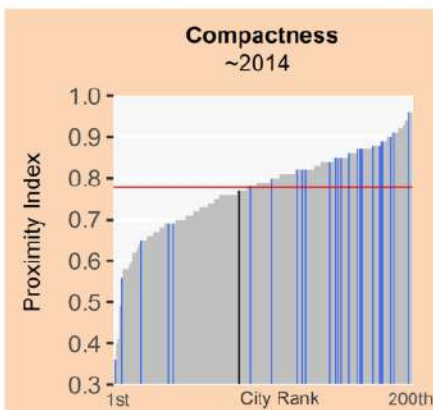
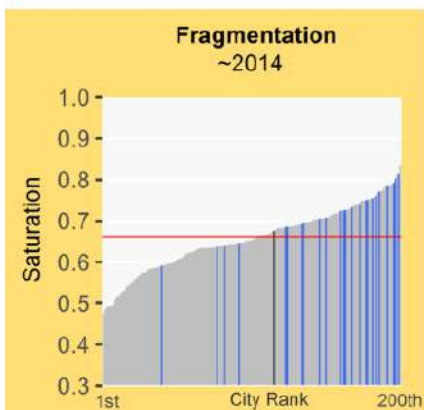
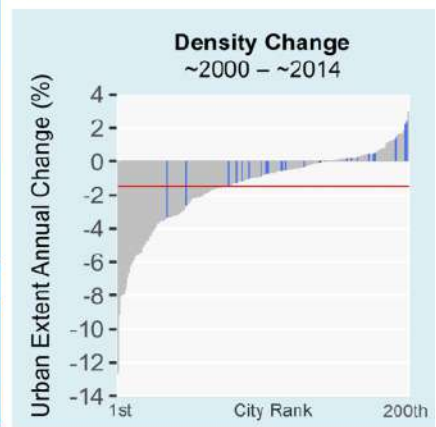
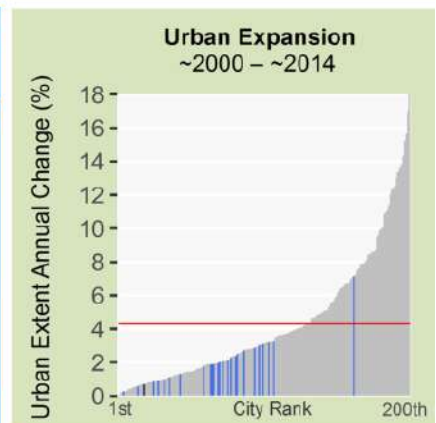


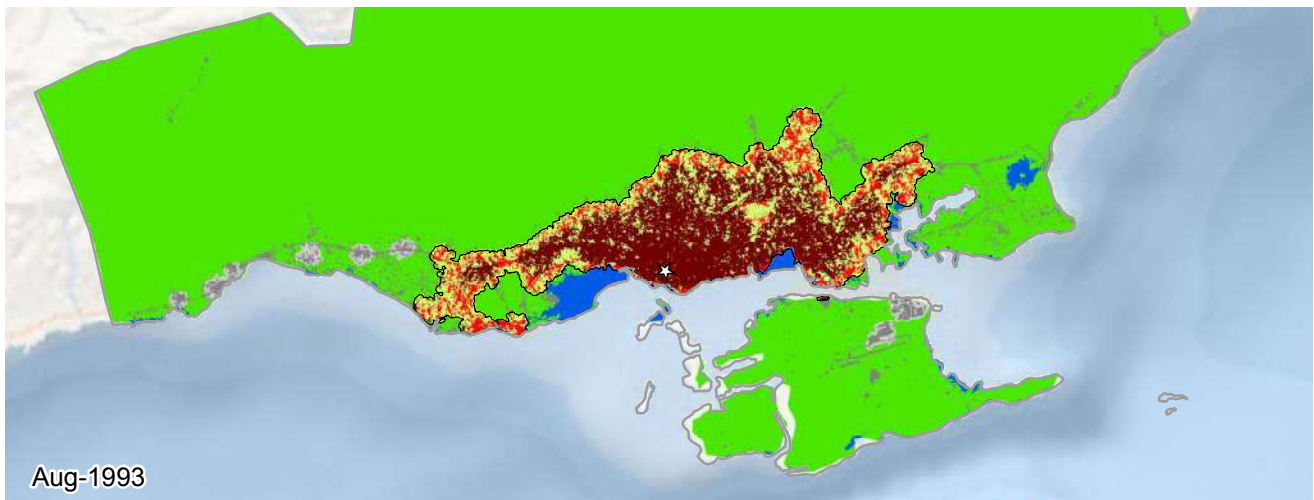


Caracas, Venezuela (Latin America and the Caribbean)

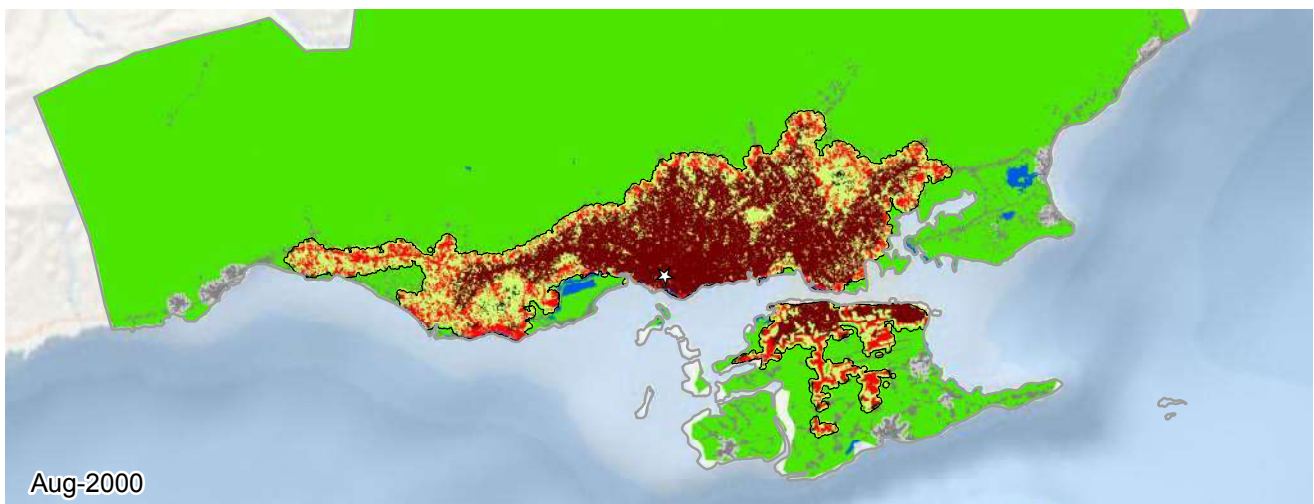


Metrics	May 1991	Mar 2001	Jan 2014	% Annual Change ('01-'14)
Population	2,549,724	2,868,564	3,104,391	0.6
Built-up Area (Hectares)				
Total	12,788	14,884	16,351	0.7
Urban	9,864	11,946	13,282	0.8
Suburban	2,741	2,770	2,893	0.3
Rural	182	168	175	0.3
Open space (Hectares)				
Urbanized Open Space	6,985	7,282	7,850	0.6
Urban Extent	19,773	22,167	24,202	0.7
Density (Persons / Hectare)				
Built-up Area Density	199.4	192.7	189.9	-0.1
Urban Extent Density	128.9	129.4	128.3	-0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.67	0.68	0.0
Openness Index	0.30	0.28	0.26	-0.4
Compactness (Roundness)				
Proximity	0.75	0.76	0.77	0.1
Cohesion	0.73	0.75	0.77	0.1
Added Area (Hectares)	'91-'01	Share	'01-'14	Share
Infill	1,172	55%	798	54%
Extension	493	23%	365	24%
Leapfrog	52	2%	24	1%
Inclusion	379	18%	277	18%

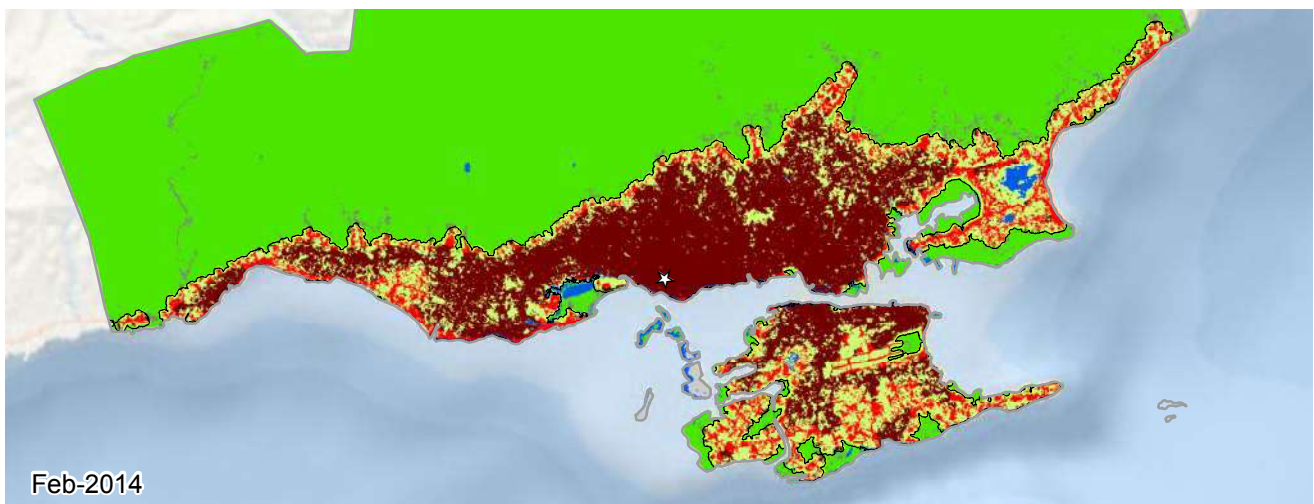




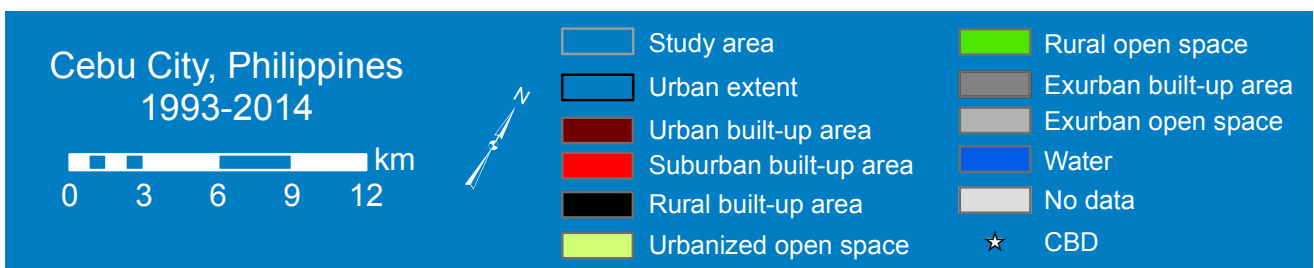
Aug-1993



Aug-2000



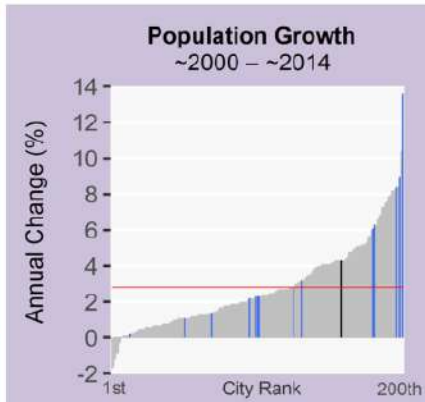
Feb-2014



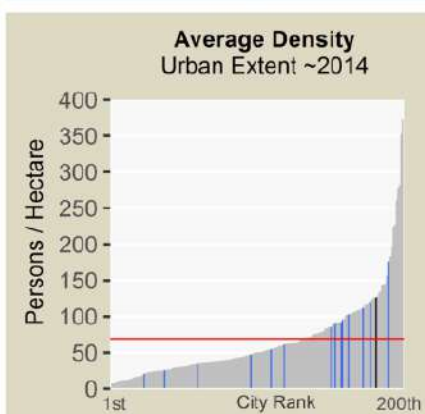
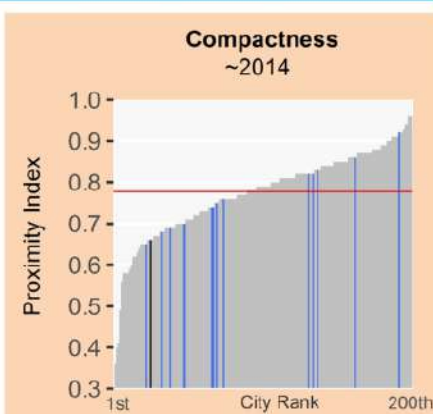
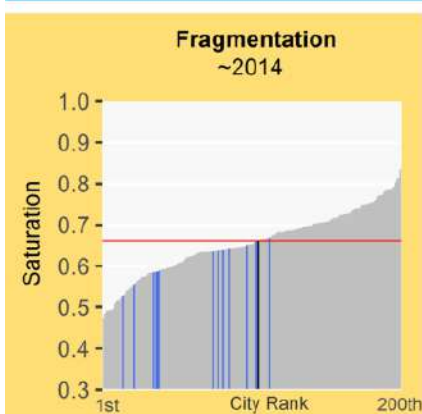
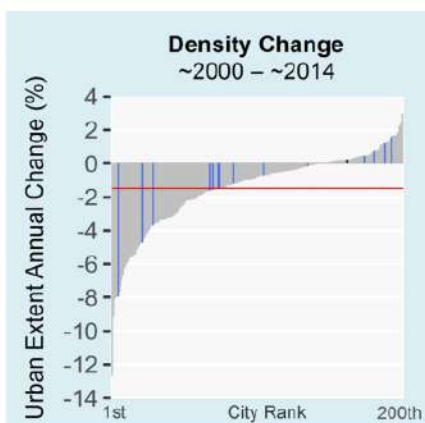
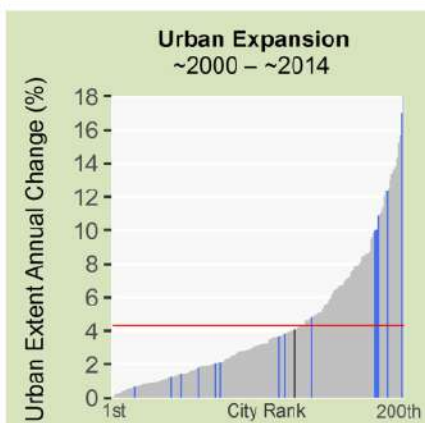
Cebu City, Philippines (Southeast Asia)

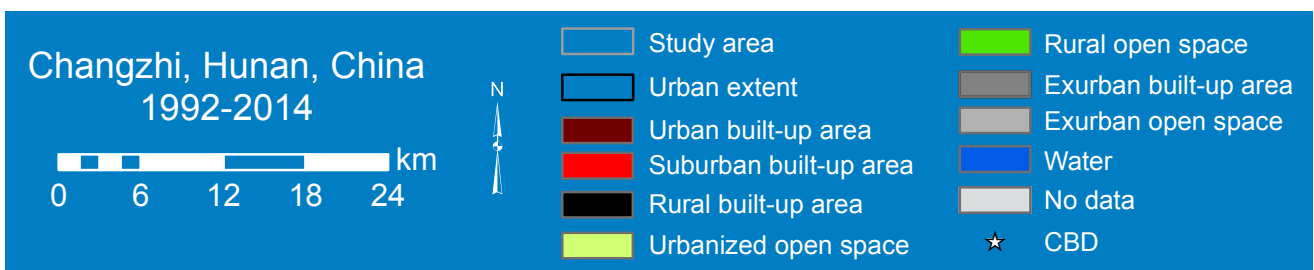
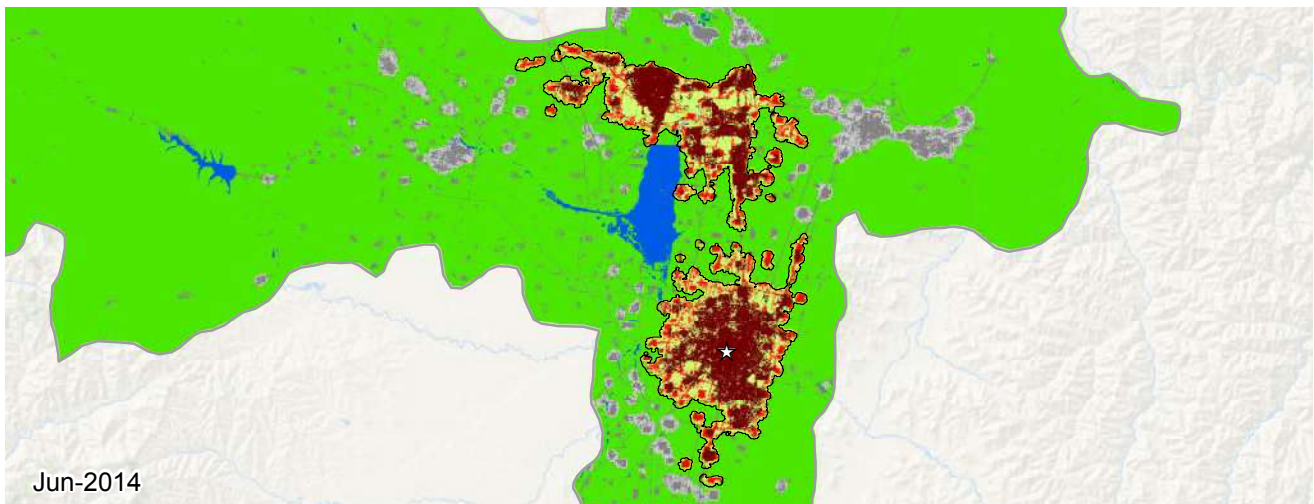
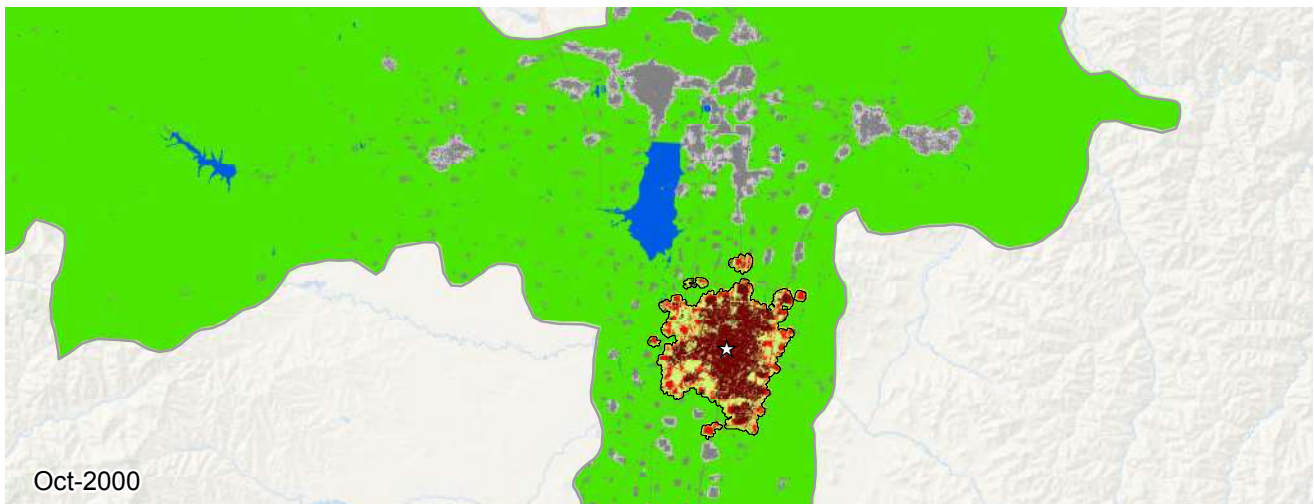
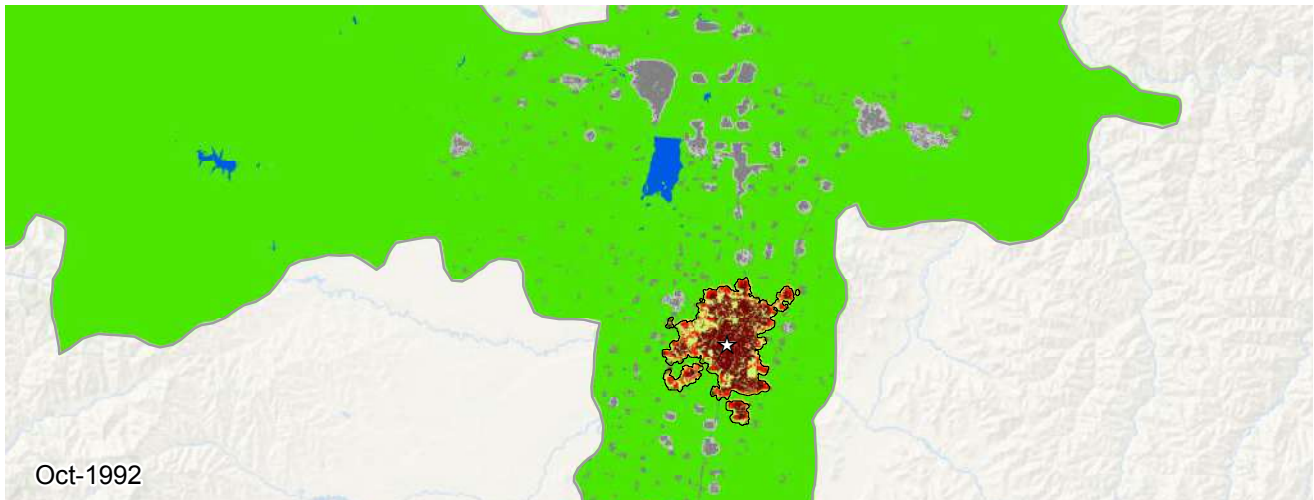


Legend for Charts
 Cebu City | Other cities in region | All other cities | Global average



Metrics	Aug 1993	Aug 2000	Feb 2014	% Annual Change ('00-'14)
Population	942,998	1,338,322	2,391,838	4.3
Built-up Area (Hectares)				
Total	4,648	6,685	12,462	4.6
Urban	3,525	4,834	9,488	5.0
Suburban	1,042	1,698	2,828	3.8
Rural	81	153	145	-0.4
Open space (Hectares)				
Urbanized Open Space	2,679	4,200	6,395	3.1
Urban Extent	7,328	10,886	18,858	4.1
Density (Persons / Hectare)				
Built-up Area Density	202.8	200.2	191.9	-0.3
Urban Extent Density	128.7	122.9	126.8	0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.63	0.61	0.66	0.5
Openness Index	0.33	0.34	0.30	-0.9
Compactness (Roundness)				
Proximity	0.68	0.65	0.66	0.0
Cohesion	0.67	0.65	0.64	-0.1
Added Area (Hectares)	'93-'00	Share	'00-'14	Share
Infill	561	27%	2,002	35%
Extension	338	16%	1,376	24%
Leapfrog	623	30%	981	17%
Inclusion	513	25%	1,316	23%

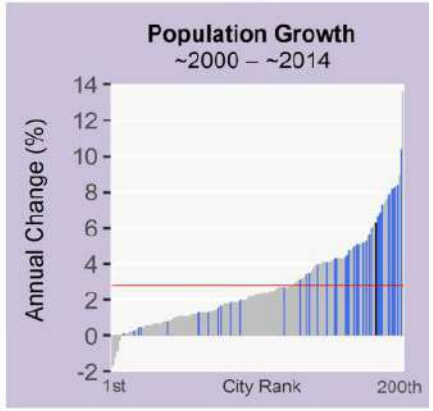




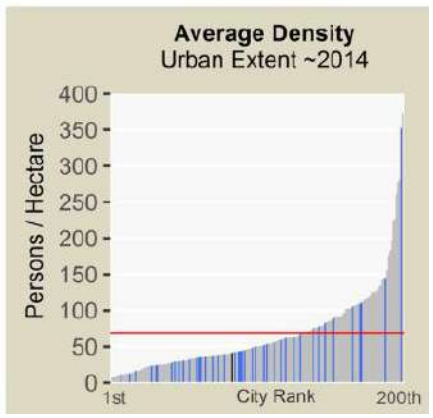
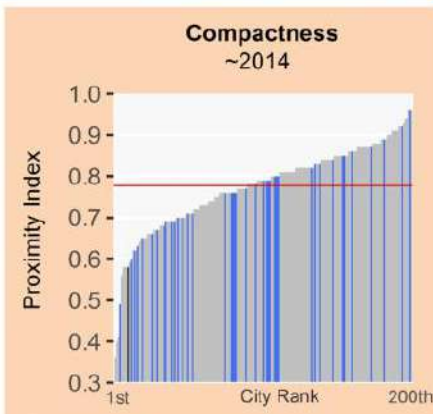
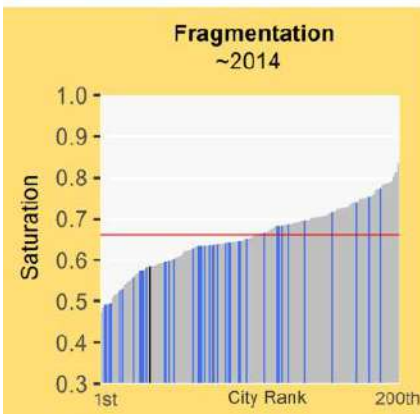
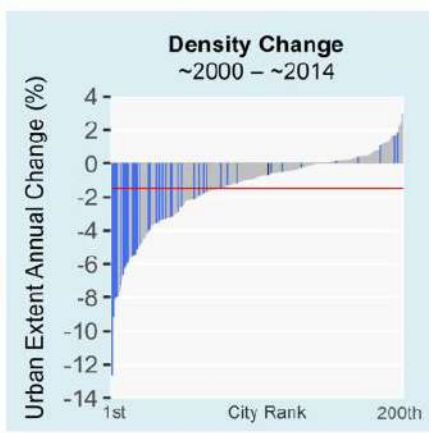
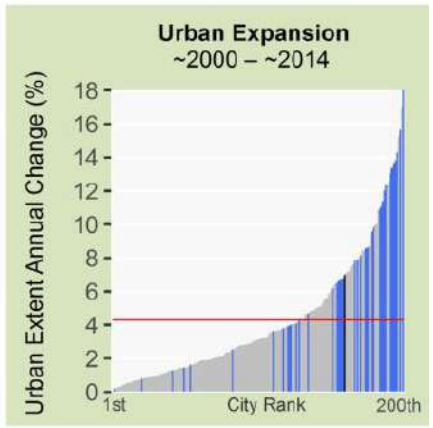
Changzhi, Hunan, China (East Asia and the Pacific)

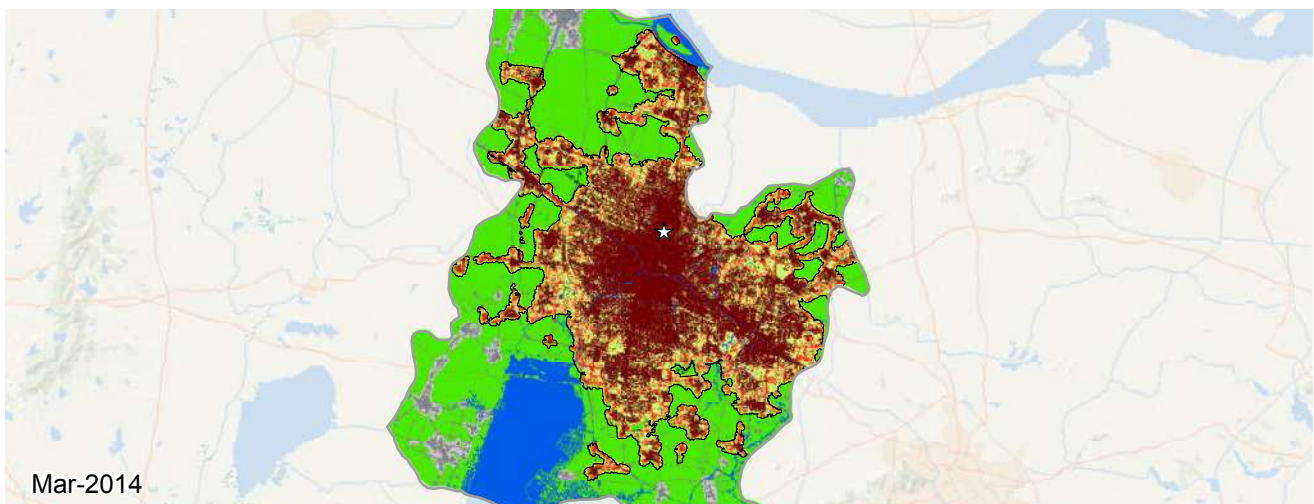
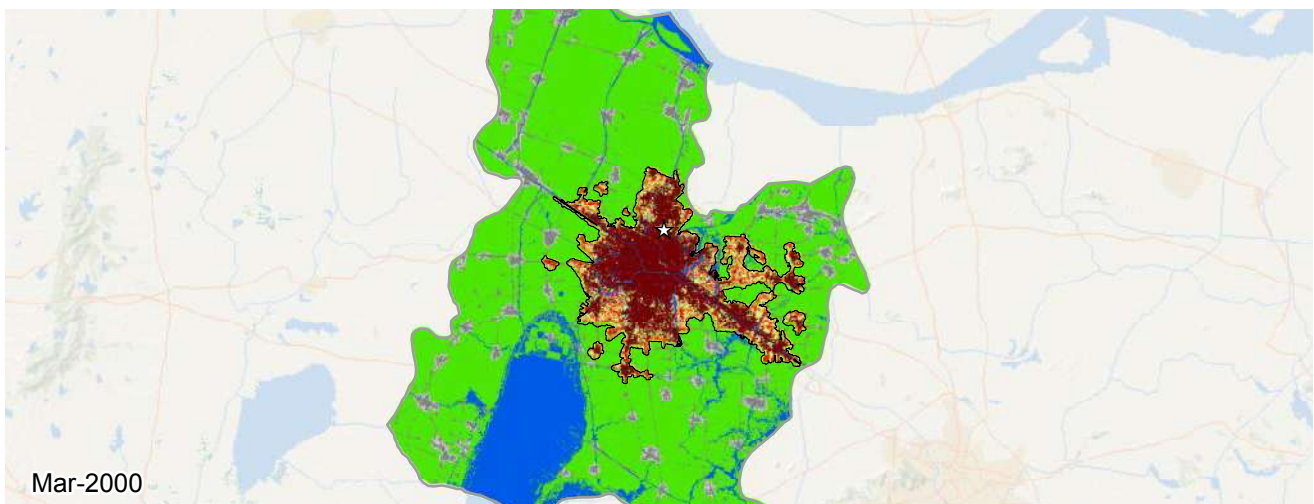
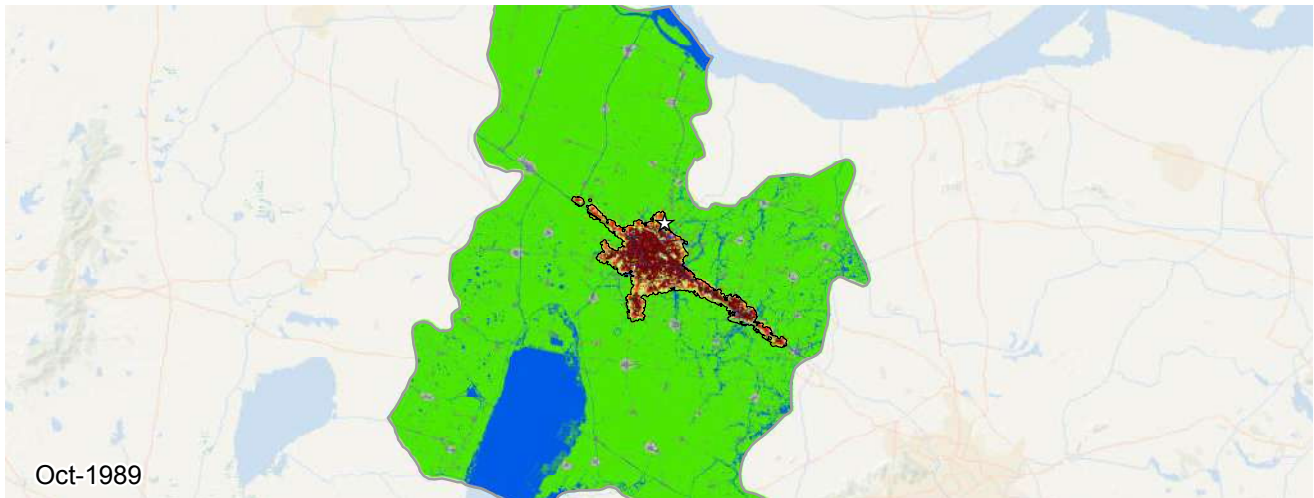


Legend for Charts
 Changzhi | Other cities in region | All other cities | Global average



Metrics	Oct 1992	Oct 2000	Jun 2014	% Annual Change ('00-'14)
Population	286,760	346,288	822,354	6.3
Built-up Area (Hectares)				
Total	2,921	4,516	11,526	6.9
Urban	2,009	3,230	7,712	6.4
Suburban	843	1,183	3,516	8.0
Rural	68	102	296	7.8
Open space (Hectares)				
Urbanized Open Space	1,902	3,039	8,191	7.3
Urban Extent	4,823	7,556	19,717	7.0
Density (Persons / Hectare)				
Built-up Area Density	98.2	76.7	71.3	-0.5
Urban Extent Density	59.5	45.8	41.7	-0.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.61	0.60	0.58	-0.2
Openness Index	0.38	0.34	0.36	0.4
Compactness (Roundness)				
Proximity	0.90	0.95	0.58	-3.6
Cohesion	0.89	0.93	0.61	-3.1
Added Area (Hectares)	'92-'00	Share	'00-'14	Share
Infill	542	33%	1,104	15%
Extension	595	37%	1,436	20%
Leapfrog	6	0%	0	0%
Inclusion	451	28%	4,487	63%

















**Changzhou, Jingsu, China
1989-2014**

0 8 16 24 32 km

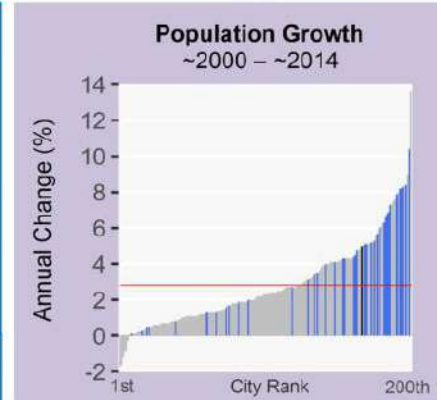
N

 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

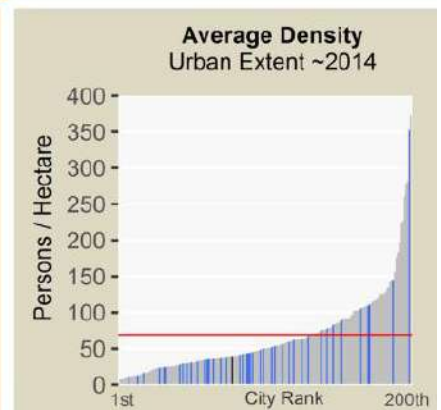
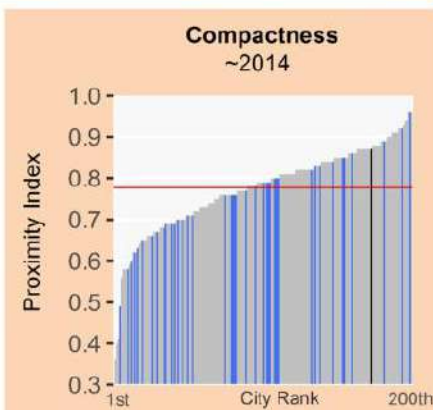
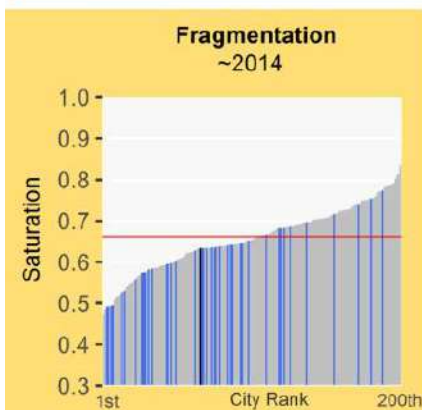
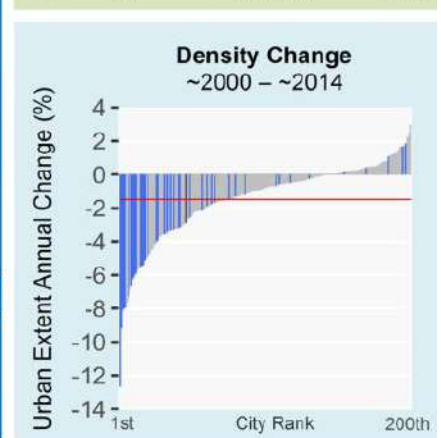
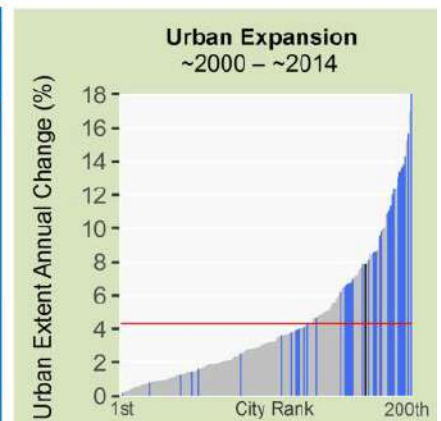
Changzhou, Jingsu, China (East Asia and the Pacific)

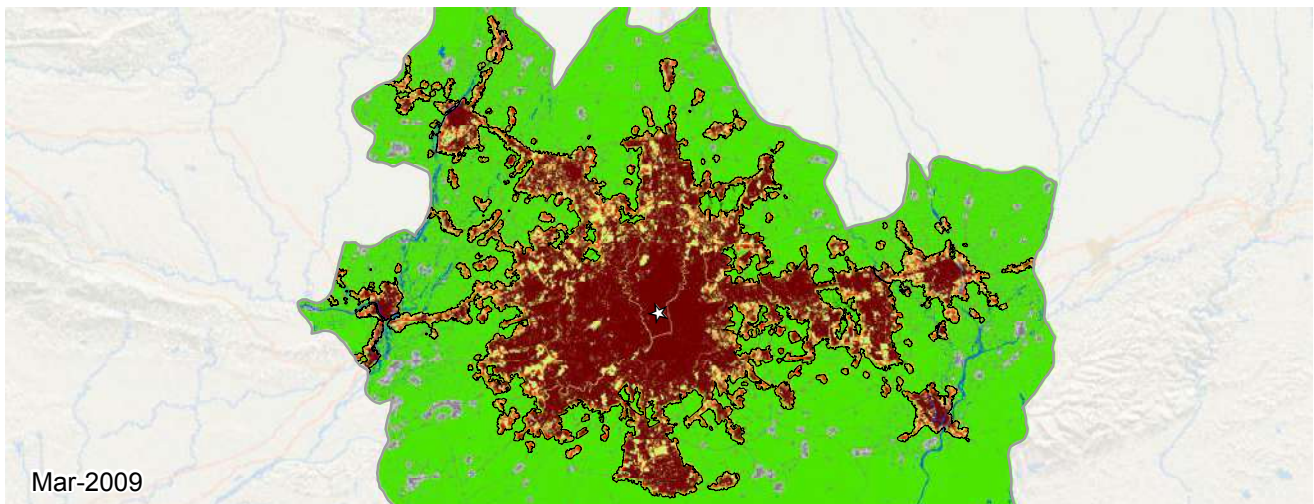
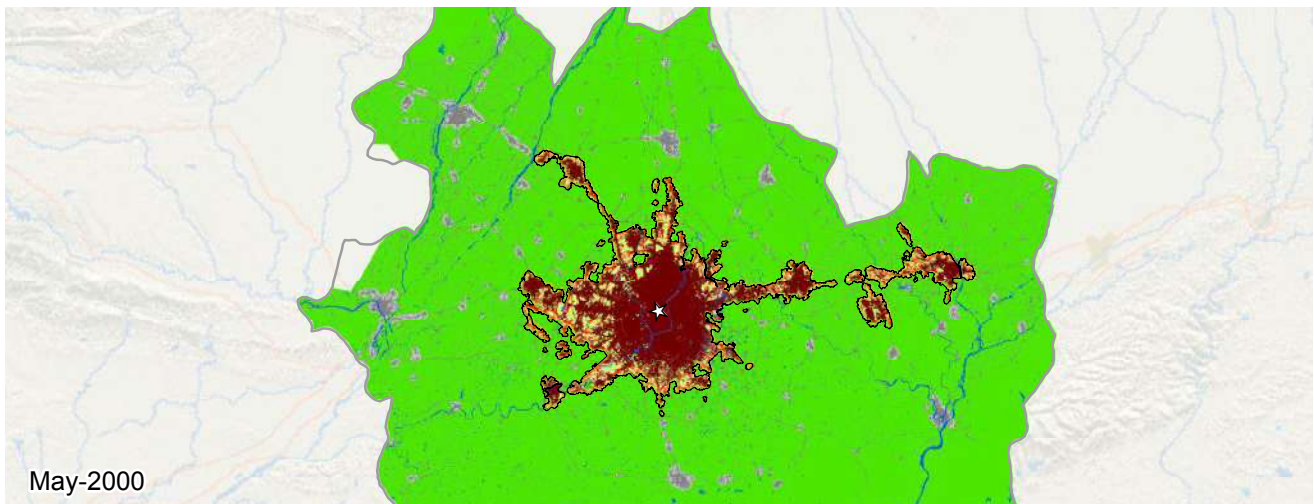
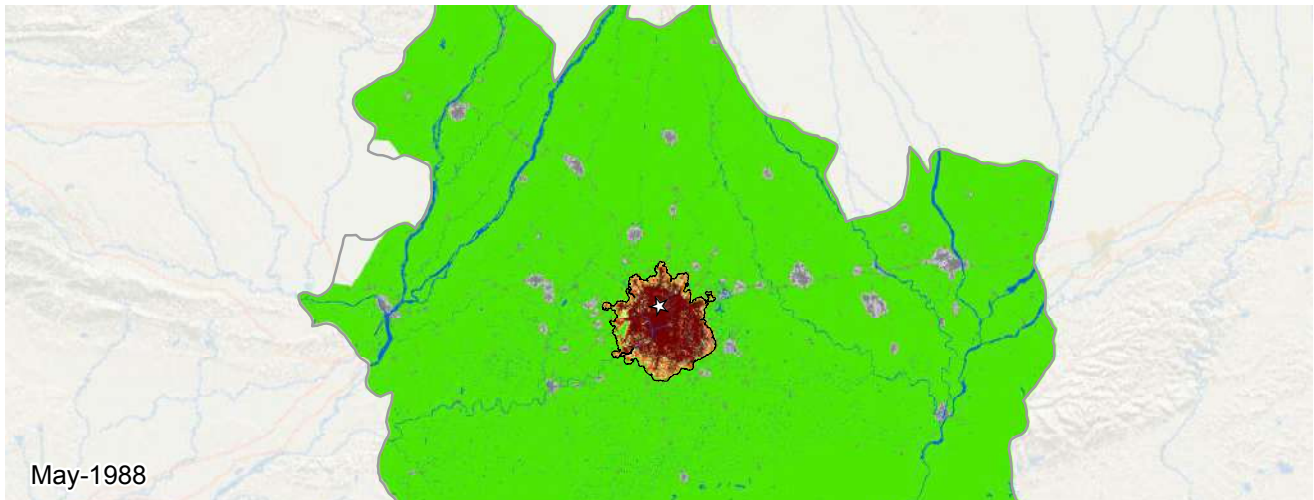


Legend for Charts
 Changzhou | Other cities in region | All other cities | Global average



Metrics	Oct 1989	Mar 2000	Mar 2014	% Annual Change ('00-'14)
Population	1,001,959	1,523,237	3,075,745	5.0
Built-up Area (Hectares)				
Total	4,801	17,577	49,225	7.4
Urban	3,568	13,386	38,358	7.5
Suburban	1,141	3,942	10,187	6.8
Rural	91	248	680	7.2
Open space (Hectares)				
Urbanized Open Space	2,601	8,083	28,474	9.0
Urban Extent	7,402	25,660	77,700	7.9
Density (Persons / Hectare)				
Built-up Area Density	208.7	86.7	62.5	-2.3
Urban Extent Density	135.3	59.4	39.6	-2.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.68	0.63	-0.6
Openness Index	0.34	0.29	0.31	0.4
Compactness (Roundness)				
Proximity	0.69	0.86	0.87	0.2
Cohesion	0.67	0.84	0.85	0.1
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	1,617	12%	4,018	12%
Extension	9,726	76%	20,132	63%
Leapfrog	0	0%	33	0%
Inclusion	1,431	11%	7,464	23%



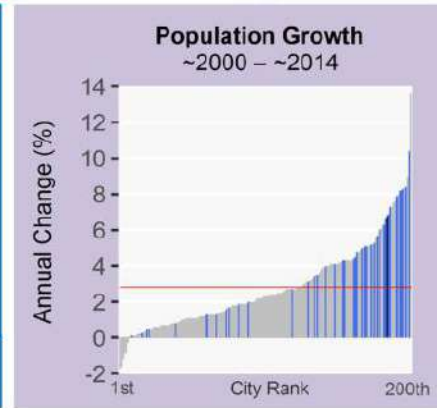


**Chengdu, Sichuan, China
1988-2009**

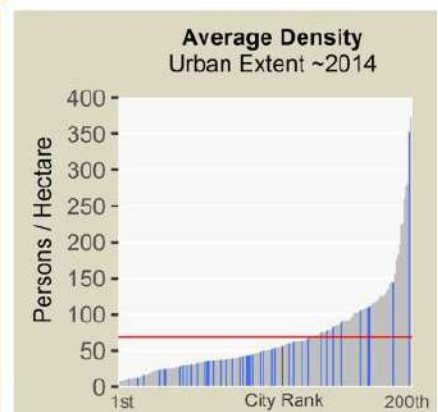
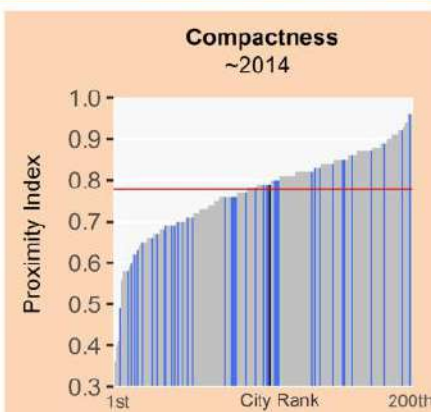
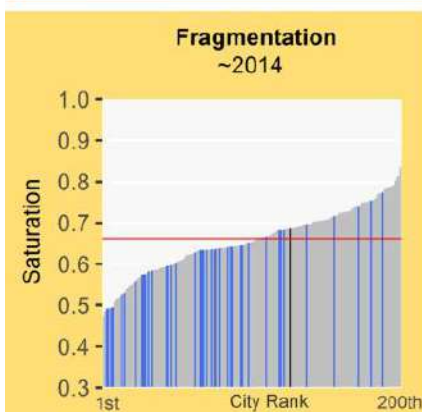
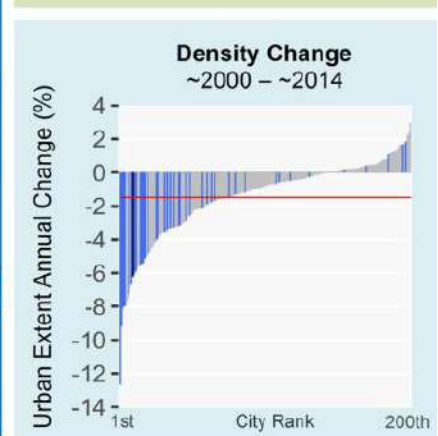
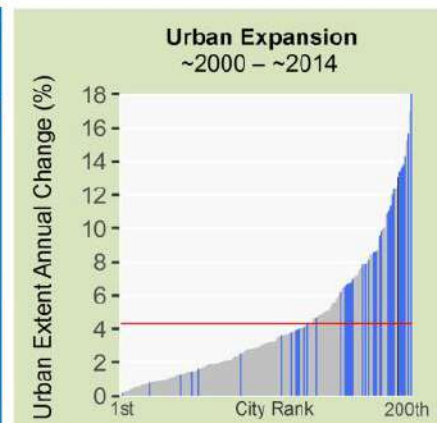
0 10 20 30 40 km

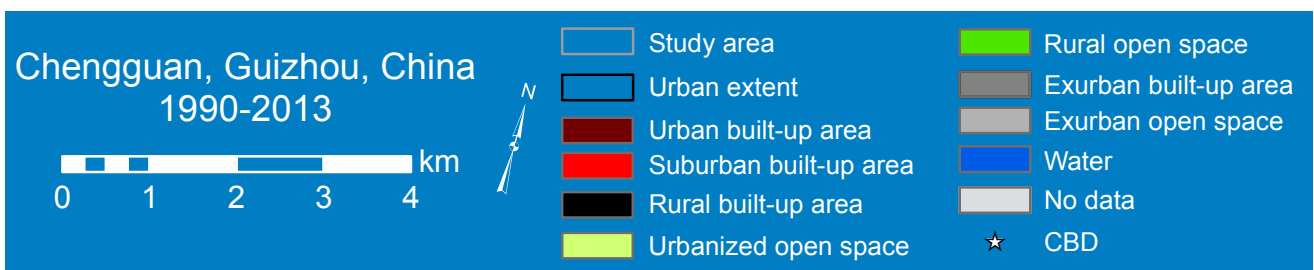
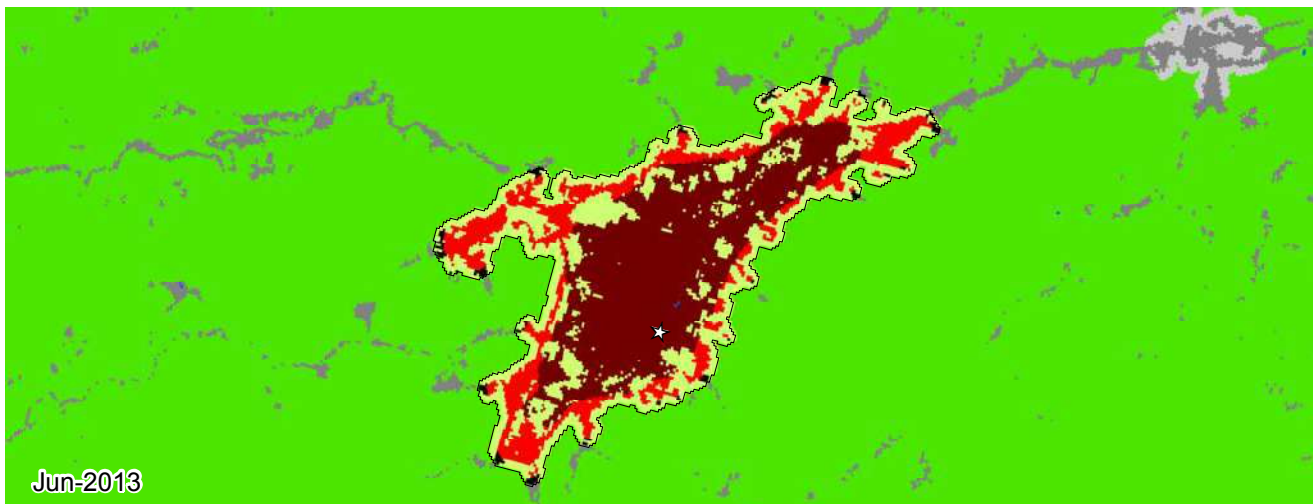
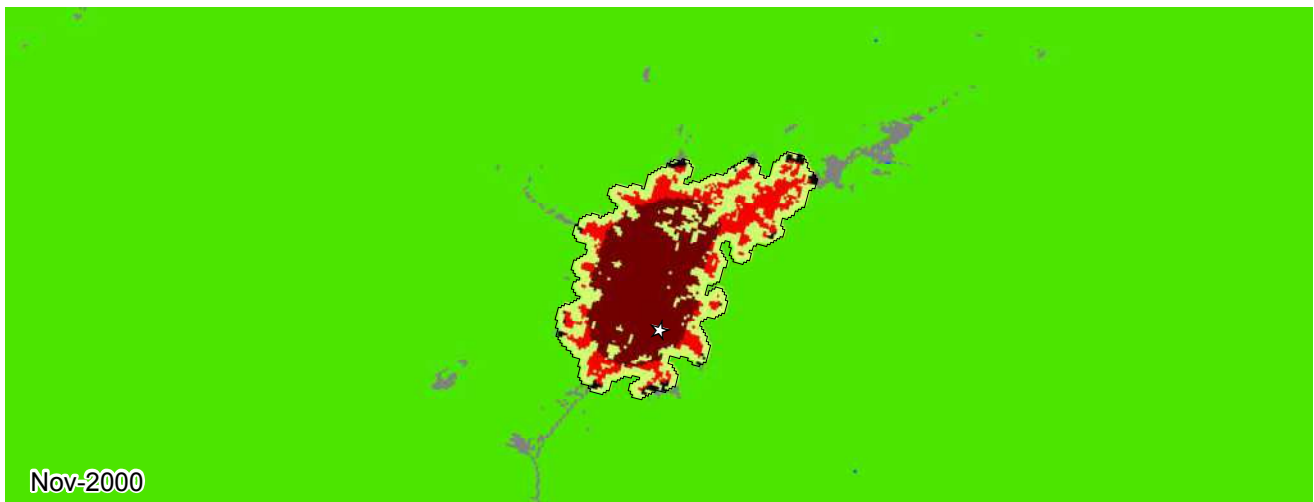
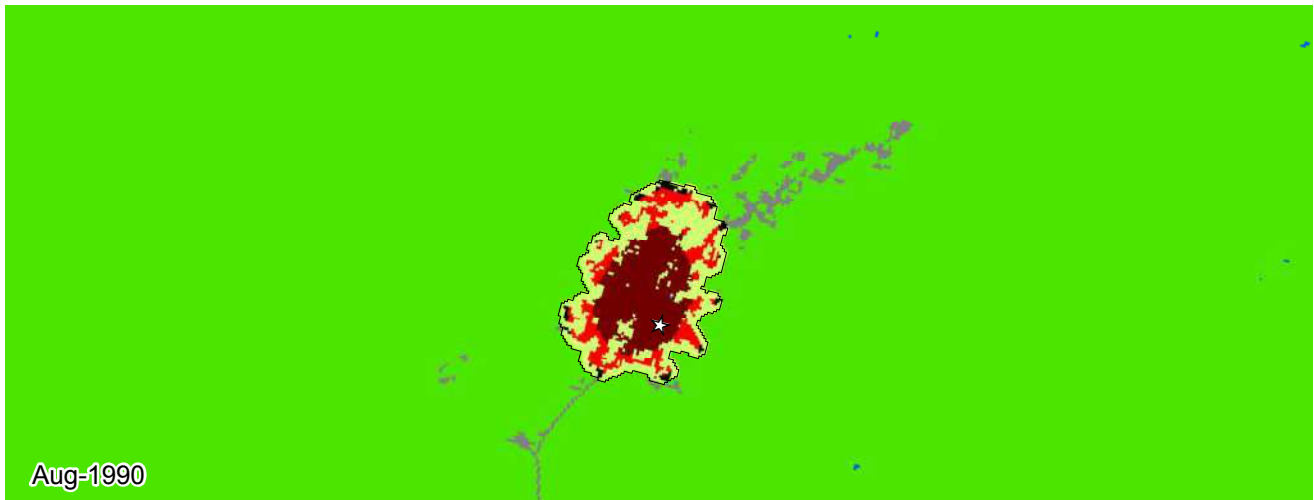
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Chengdu, Sichuan, China (East Asia and the Pacific)

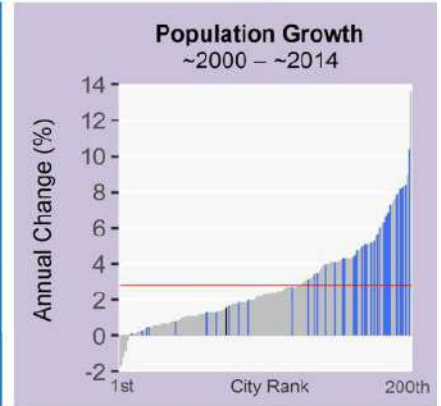


Metrics	May 1988	May 2000	Mar 2009	% Annual Change ('00-'09)
Population	2,019,420	5,117,629	9,339,733	6.8
Built-up Area (Hectares)				
Total	10,241	36,390	114,992	13.0
Urban	8,739	28,538	93,114	13.4
Suburban	1,373	7,285	20,063	11.5
Rural	127	566	1,813	13.2
Open space (Hectares)				
Urbanized Open Space	3,952	16,749	52,687	13.0
Urban Extent	14,194	53,140	167,679	13.0
Density (Persons / Hectare)				
Built-up Area Density	197.2	140.6	81.2	-6.2
Urban Extent Density	142.3	96.3	55.7	-6.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.72	0.68	0.69	0.0
Openness Index	0.23	0.26	0.25	-0.4
Compactness (Roundness)				
Proximity	0.98	0.69	0.79	1.6
Cohesion	0.98	0.66	0.76	1.6
Added Area (Hectares)	'88-'00	Share	'00-'09	Share
Infill	3,714	14%	10,372	13%
Extension	16,668	63%	53,832	68%
Leapfrog	10	0%	107	0%
Inclusion	5,755	22%	14,189	18%

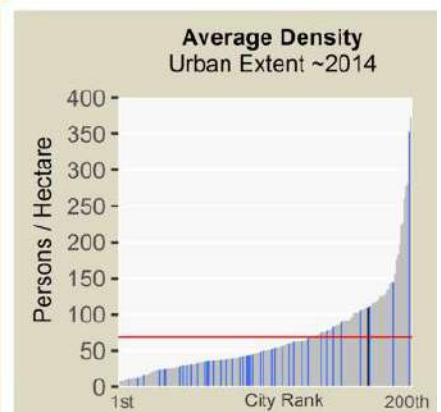
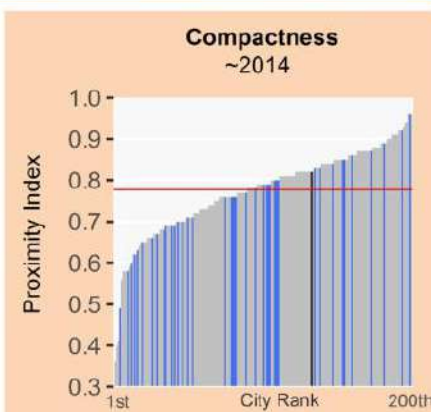
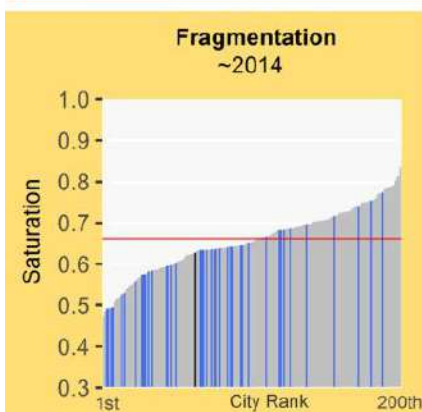
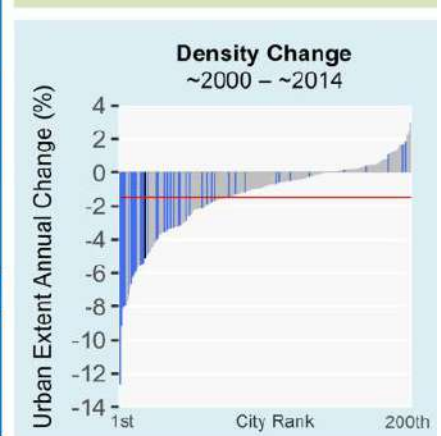
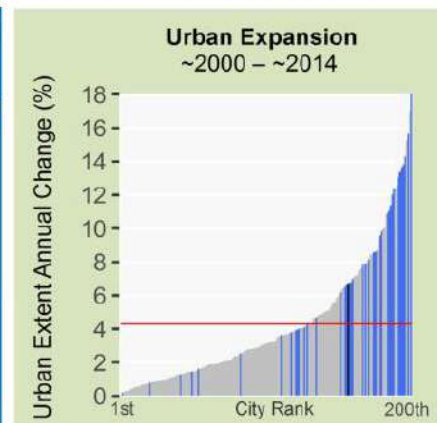


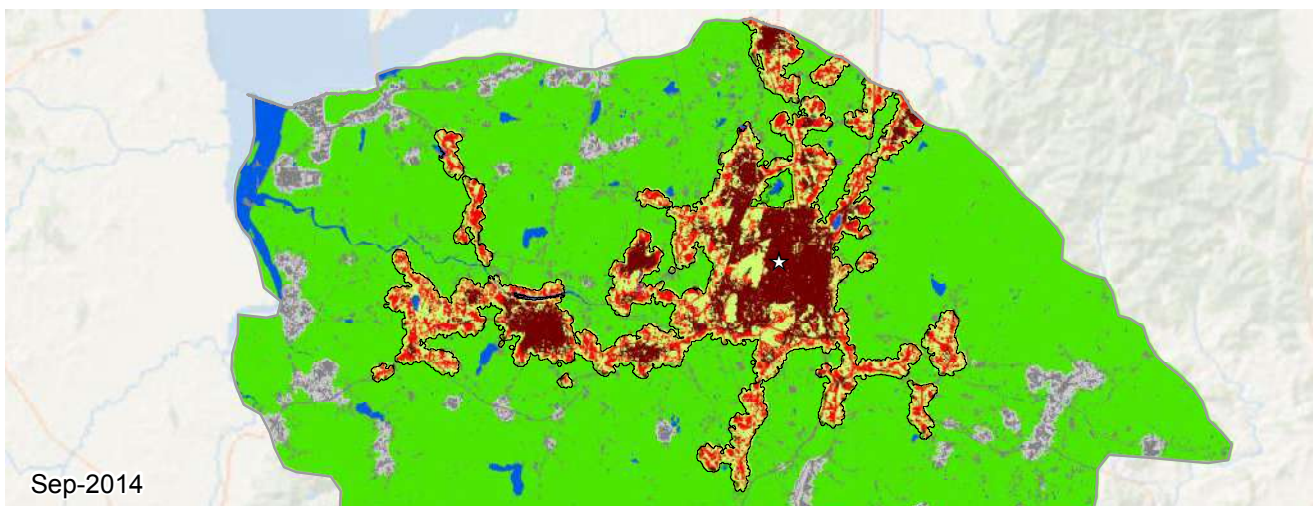
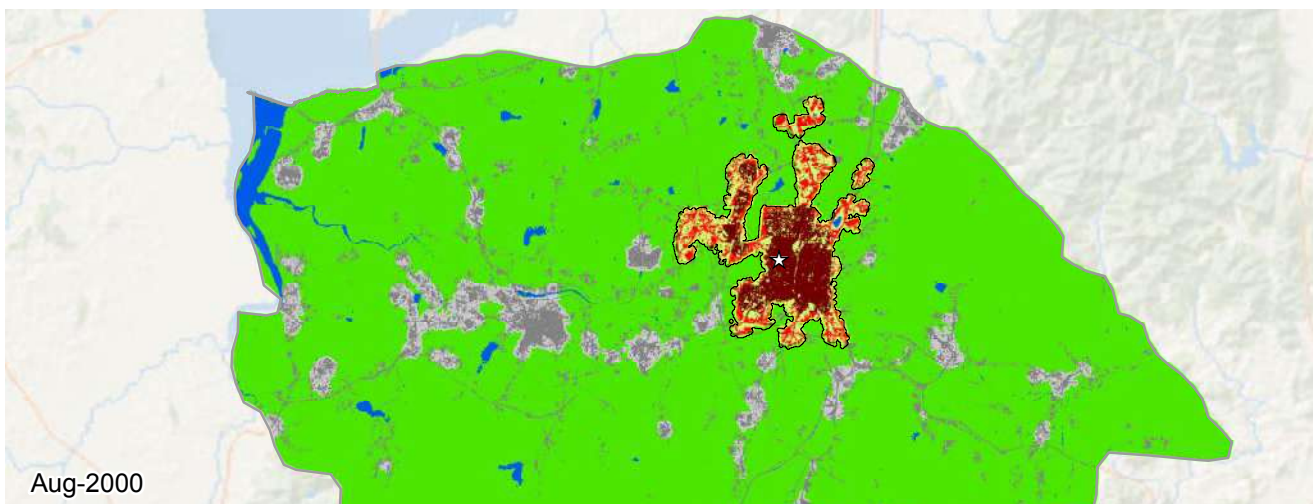


Chengguan, Guizhou, China (East Asia and the Pacific)



Metrics	Aug 1990	Nov 2000	Jun 2013	% Annual Change ('00-'13)
Population	52,551	95,956	117,082	1.6
Built-up Area (Hectares)				
Total	173	283	672	6.9
Urban	108	186	453	7.0
Suburban	56	86	204	6.8
Rural	8	9	15	3.8
Open space (Hectares)				
Urbanized Open Space	131	178	399	6.4
Urban Extent	305	461	1,072	6.7
Density (Persons / Hectare)				
Built-up Area Density	302.7	339.0	174.0	-5.3
Urban Extent Density	172.0	208.0	109.2	-5.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.57	0.61	0.63	0.2
Openness Index	0.44	0.39	0.37	-0.4
Compactness (Roundness)				
Proximity	0.96	0.90	0.82	-0.7
Cohesion	0.95	0.89	0.81	-0.8
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	37	34%	51	13%
Extension	44	40%	294	75%
Leapfrog	0	0%	0	0%
Inclusion	27	24%	43	11%

















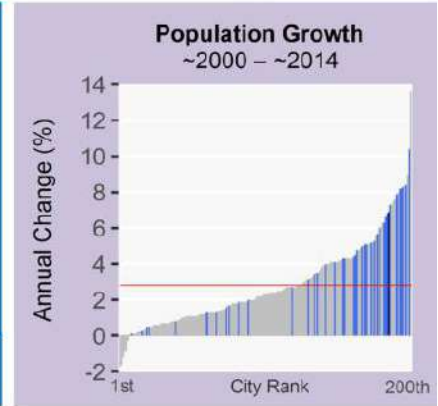
**Cheonan, Korea Rep.
1991-2014**

0 4 8 12 16 km

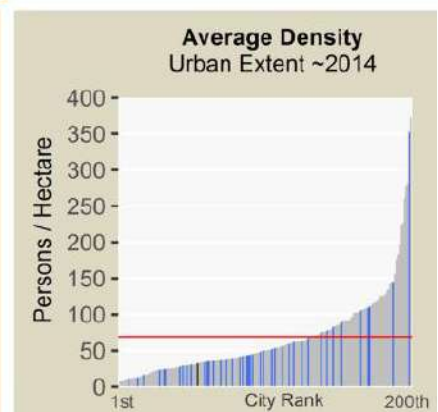
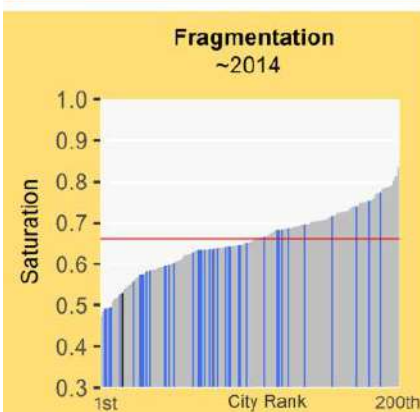
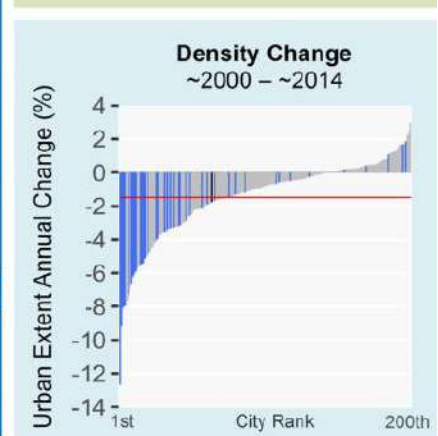
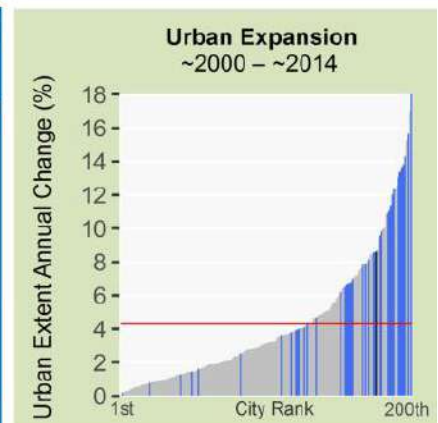
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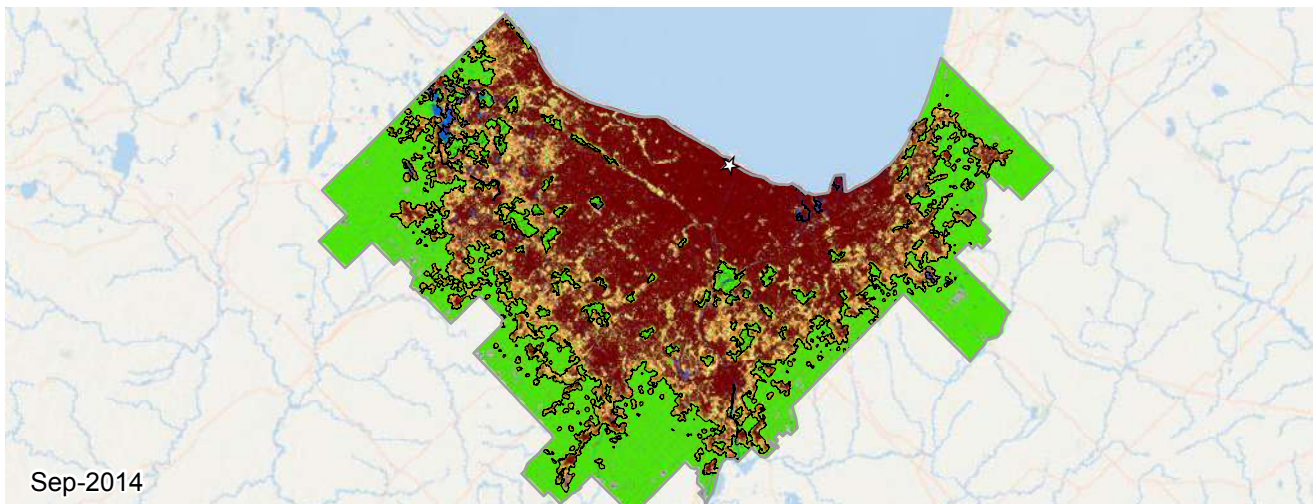
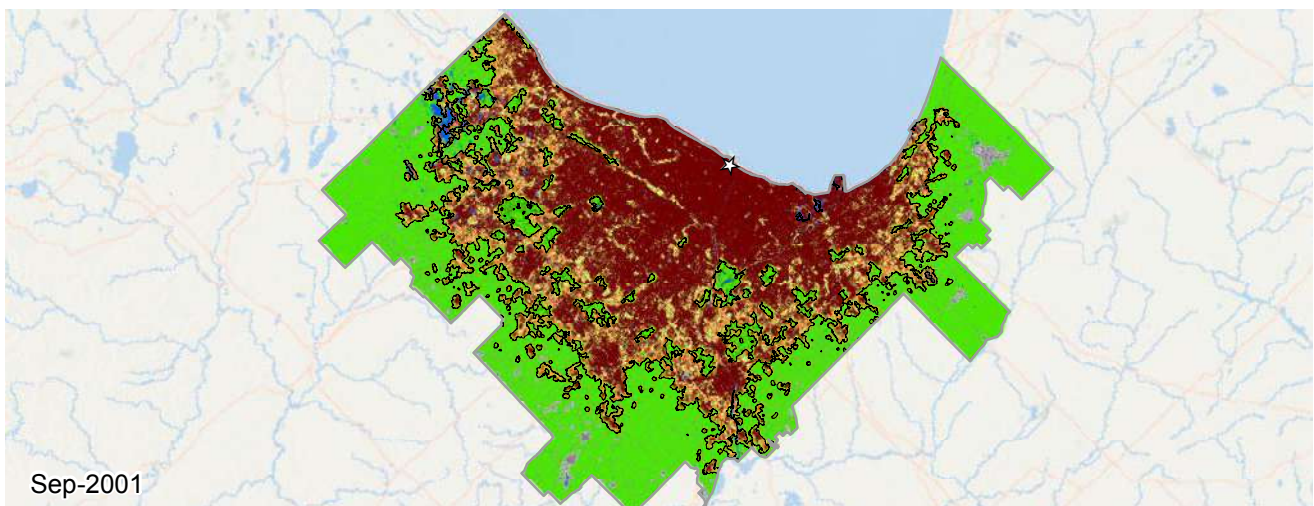
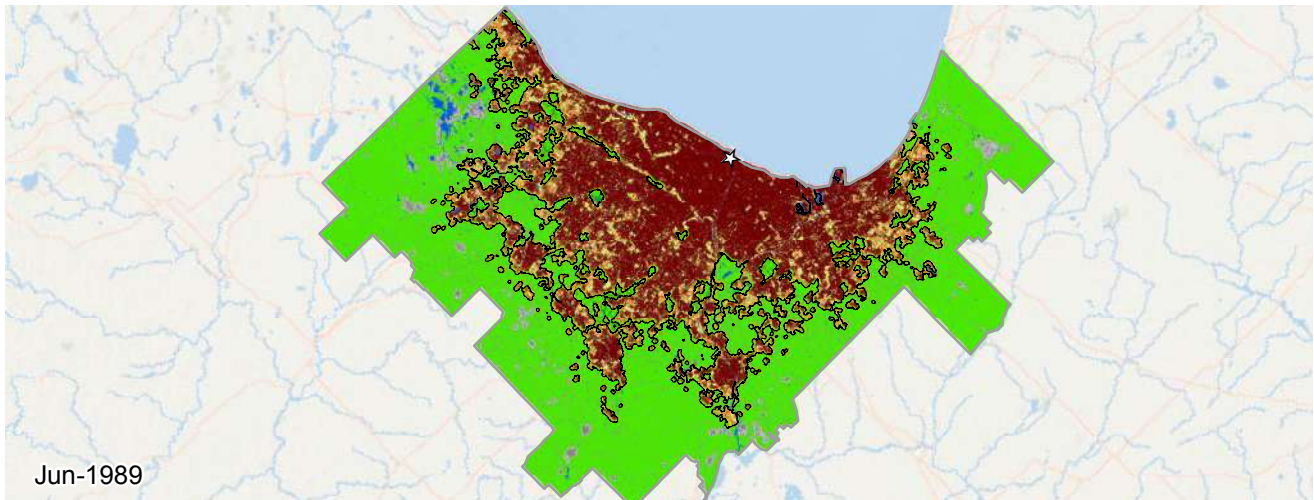
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Cheonan, Korea Rep. (East Asia and the Pacific)



Metrics	Feb 1991	Aug 2000	Sep 2014	% Annual Change ('00-'14)
Population	111,317	210,487	552,994	6.9
Built-up Area (Hectares)				
Total	916	2,899	9,037	8.1
Urban	706	1,683	4,528	7.0
Suburban	193	1,115	4,153	9.3
Rural	15	101	355	8.9
Open space (Hectares)				
Urbanized Open Space	550	2,163	8,013	9.3
Urban Extent	1,466	5,062	17,051	8.6
Density (Persons / Hectare)				
Built-up Area Density	121.5	72.6	61.2	-1.2
Urban Extent Density	75.9	41.6	32.4	-1.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.57	0.53	-0.6
Openness Index	0.32	0.39	0.44	0.8
Compactness (Roundness)				
Proximity	0.96	0.82	0.66	-1.6
Cohesion	0.95	0.80	0.64	-1.6
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	267	13%	984	16%
Extension	1,141	57%	1,634	26%
Leapfrog	0	0%	0	0%
Inclusion	574	28%	3,518	57%



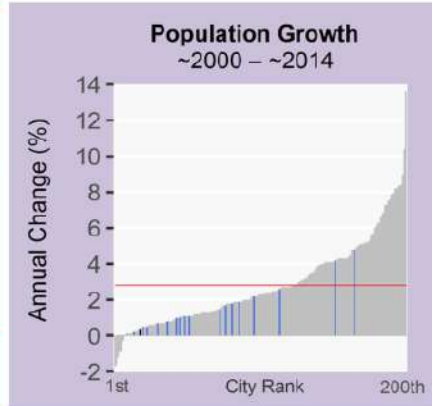


**Chicago, United States
1989-2014**

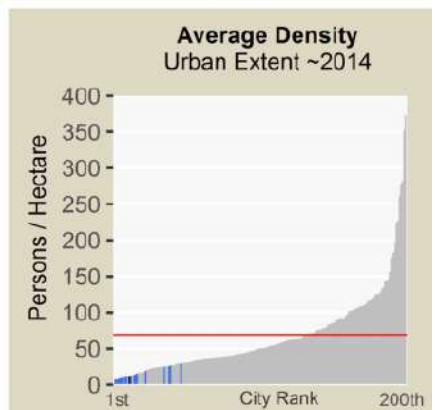
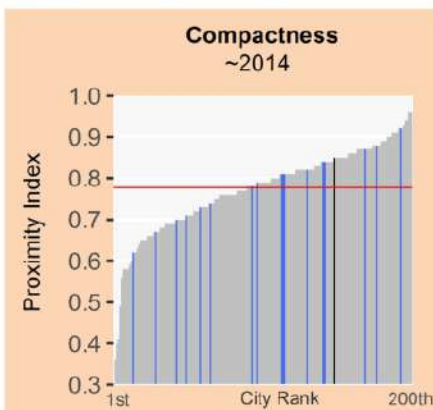
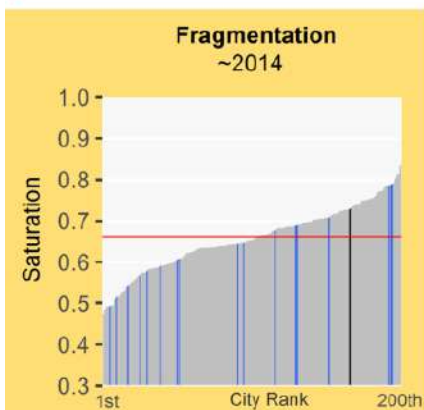
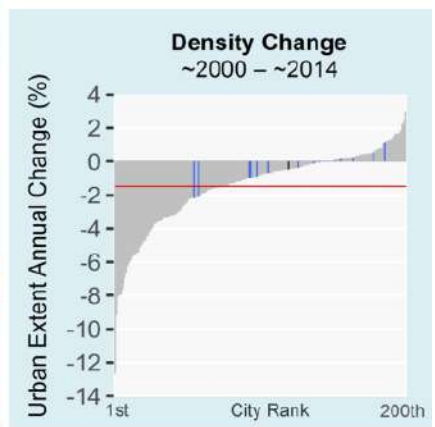
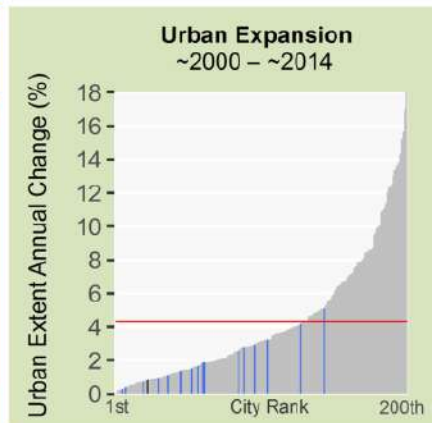
0 20 40 60 80 km

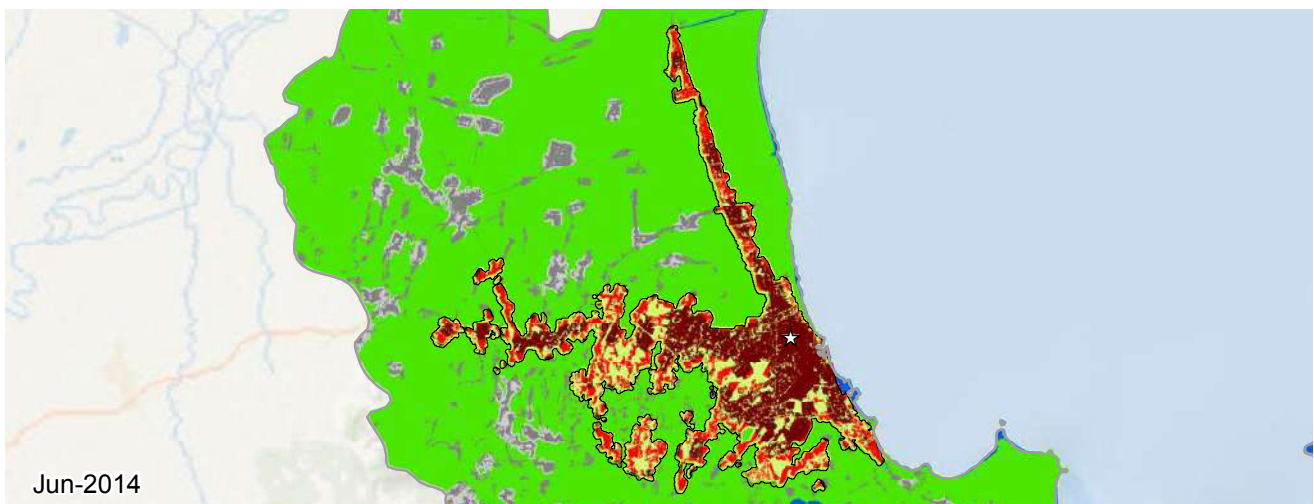
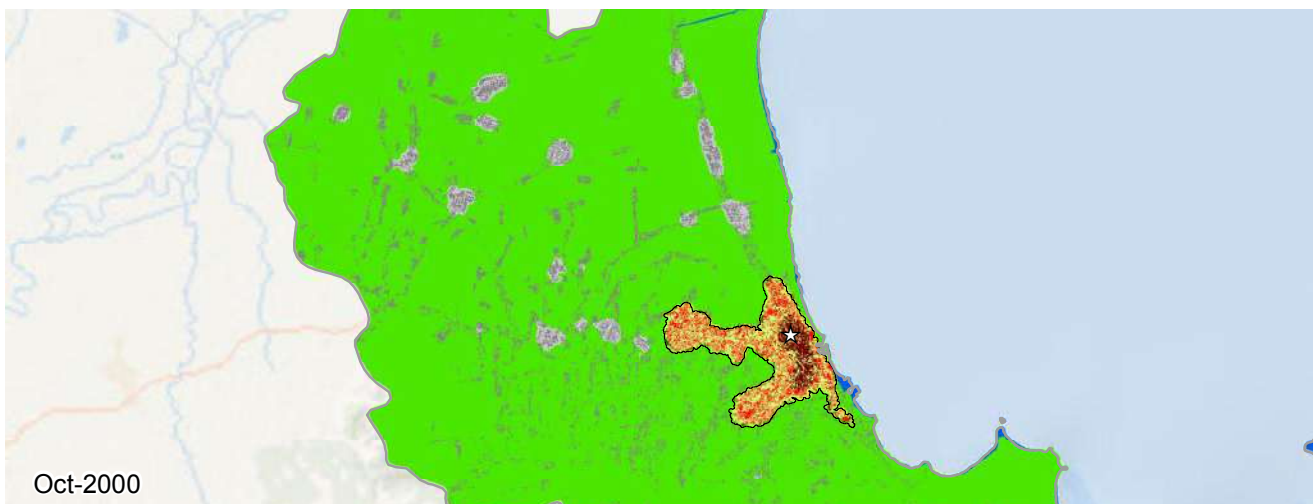
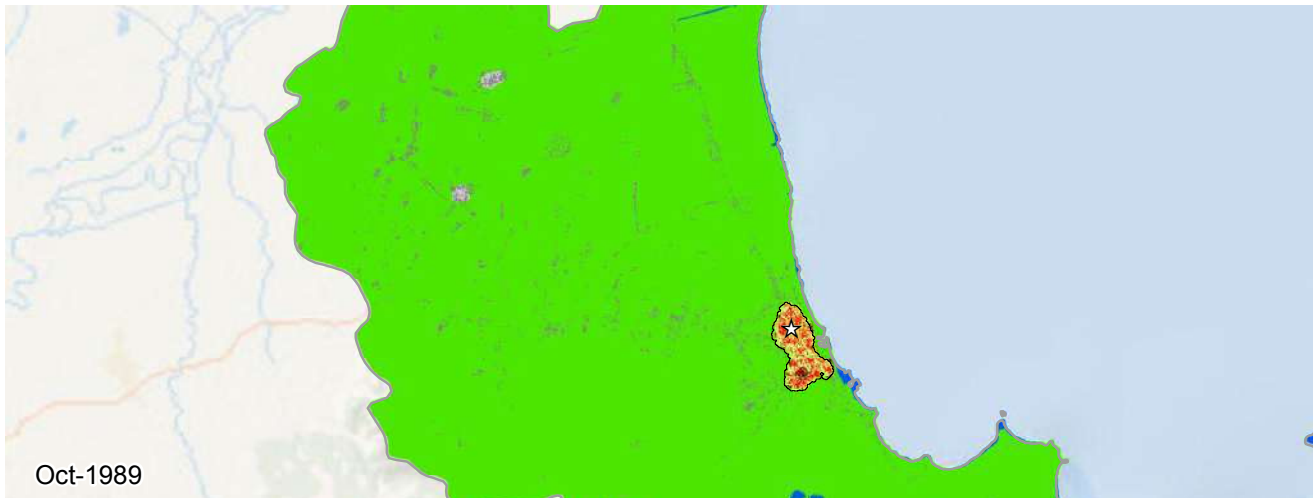
Study area
Urban extent
Urban built-up area
Suburban built-up area
Rural built-up area
Urbanized open space
Rural open space
Exurban built-up area
Exurban open space
Water
No data
CBD

Chicago, United States (Land-Rich Developed Countries)



Metrics	Jun 1989	Sep 2001	Sep 2014	% Annual Change ('01-'14)
Population	7,325,014	8,509,730	8,913,778	0.4
Built-up Area (Hectares)				
Total	340,561	452,051	510,971	0.9
Urban	295,049	387,571	440,661	1.0
Suburban	42,130	60,180	65,517	0.7
Rural	3,381	4,298	4,793	0.8
Open space (Hectares)				
Urbanized Open Space	136,571	177,800	189,866	0.5
Urban Extent	477,133	629,851	700,838	0.8
Density (Persons / Hectare)				
Built-up Area Density	21.5	18.8	17.4	-0.6
Urban Extent Density	15.4	13.5	12.7	-0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.71	0.72	0.73	0.1
Openness Index	0.22	0.21	0.21	-0.1
Compactness (Roundness)				
Proximity	0.81	0.84	0.85	0.1
Cohesion	0.80	0.82	0.84	0.1
Added Area (Hectares)	'89-'01	Share	'01-'14	Share
Infill	47,797	42%	27,833	46%
Extension	37,604	33%	15,031	25%
Leapfrog	28	0%	770	1%
Inclusion	26,058	23%	16,169	27%

















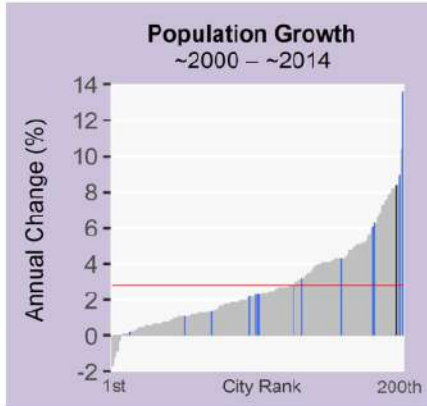
**Cirebon, Indonesia
1989-2014**

0 4 8 12 16 km

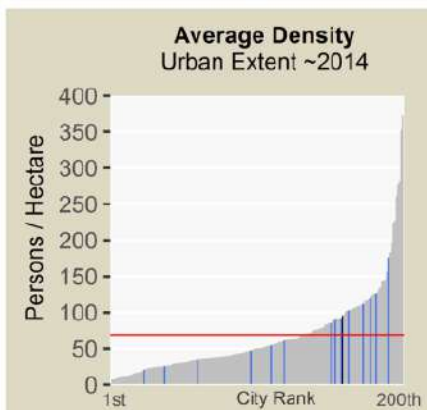
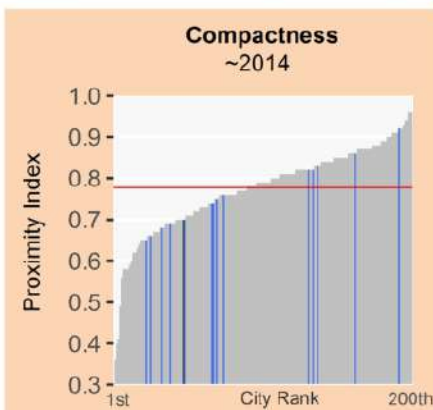
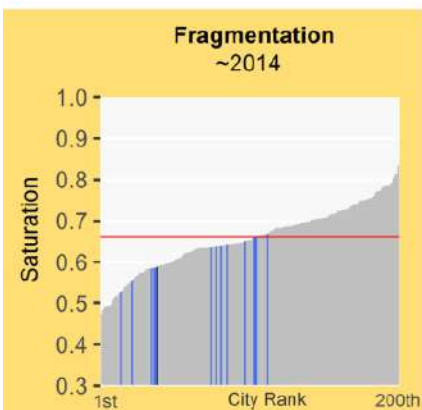
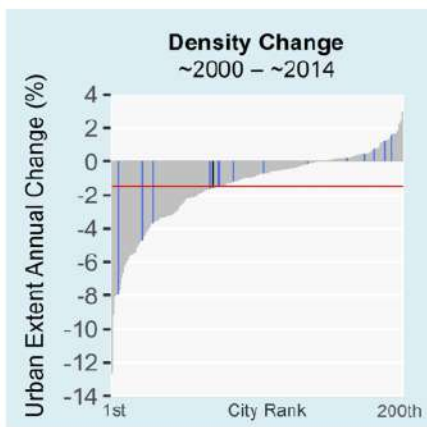
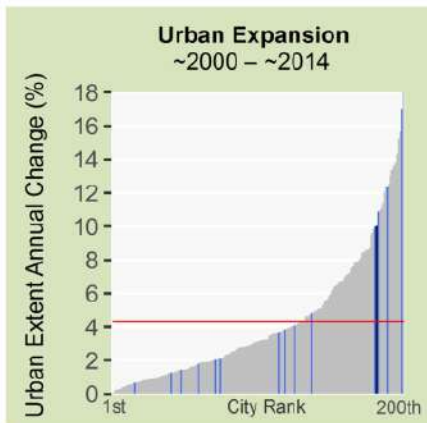
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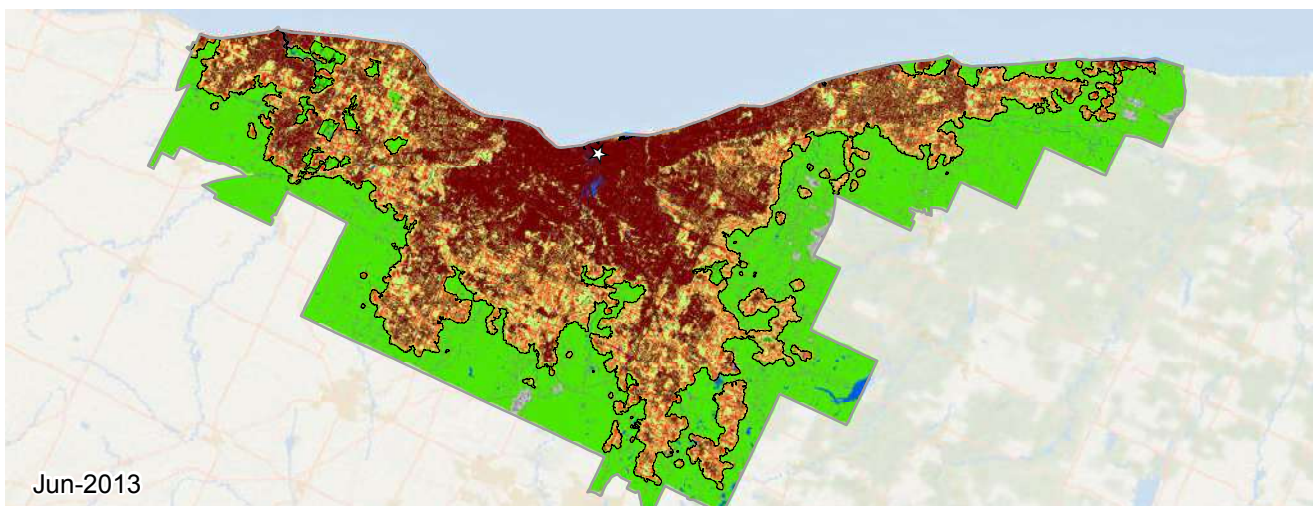
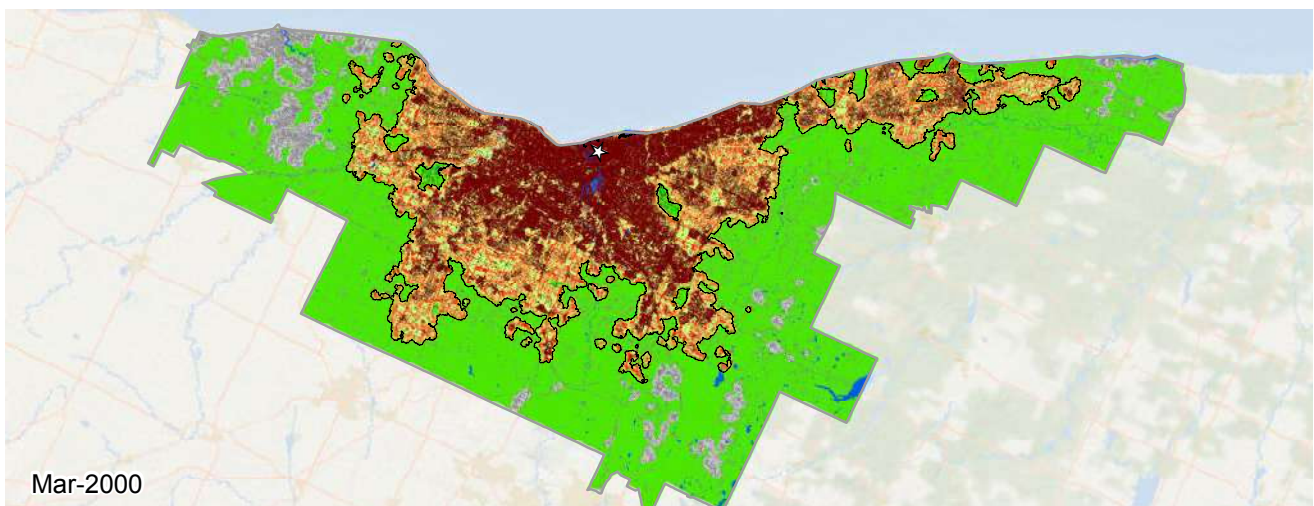
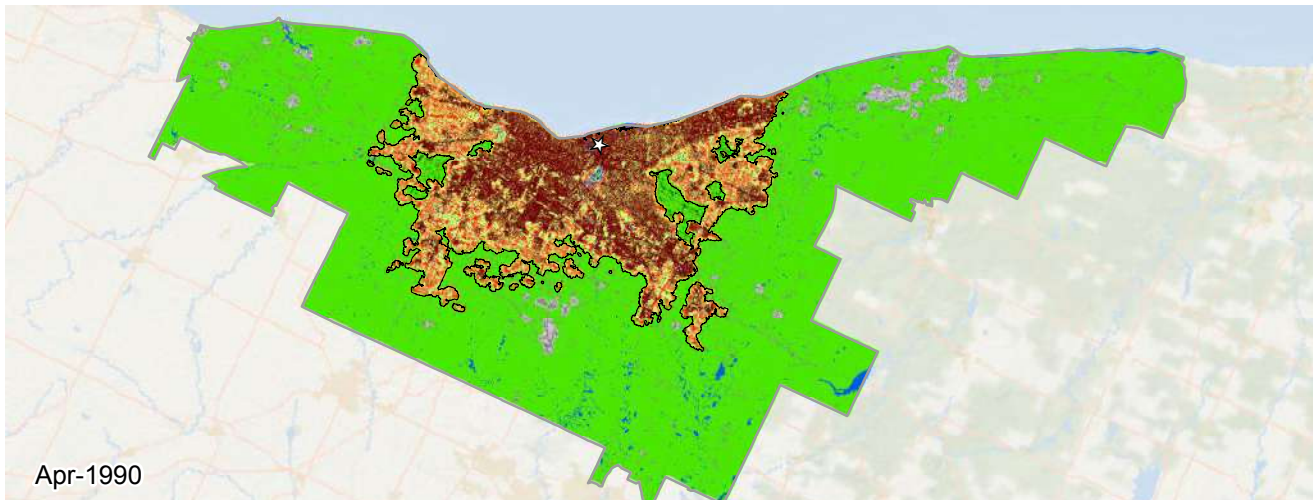
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Cirebon, Indonesia (Southeast Asia)



Metrics	Oct 1989	Oct 2000	Jun 2014	% Annual Change ('00-'14)
Population	98,400	328,368	1,044,889	8.5
Built-up Area (Hectares)				
Total	284	1,153	6,403	12.5
Urban	23	314	3,718	18.1
Suburban	241	765	2,493	8.6
Rural	19	73	191	7.0
Open space (Hectares)				
Urbanized Open Space	443	1,601	4,471	7.5
Urban Extent	728	2,755	10,874	10.0
Density (Persons / Hectare)				
Built-up Area Density	345.7	284.6	163.2	-4.1
Urban Extent Density	135.1	119.2	96.1	-1.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.39	0.42	0.59	2.5
Openness Index	0.63	0.57	0.42	-2.2
Compactness (Roundness)				
Proximity	0.85	0.77	0.70	-0.7
Cohesion	0.85	0.76	0.68	-0.9
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	126	14%	1,138	21%
Extension	504	58%	2,563	48%
Leapfrog	0	0%	12	0%
Inclusion	237	27%	1,536	29%



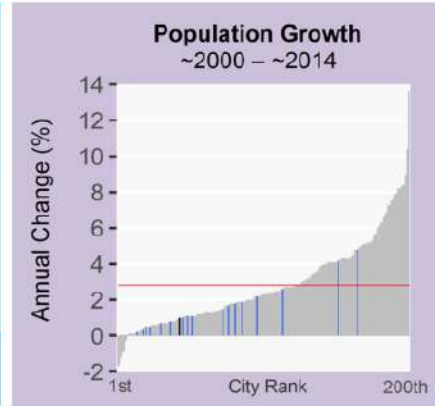


**Cleveland, United States
1990-2013**

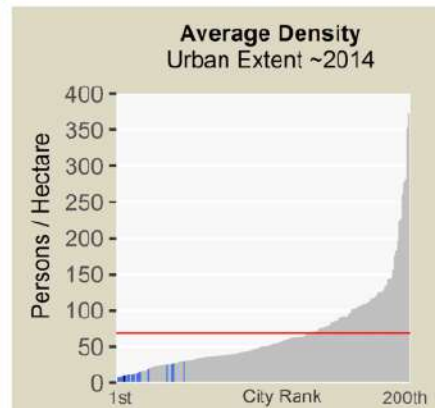
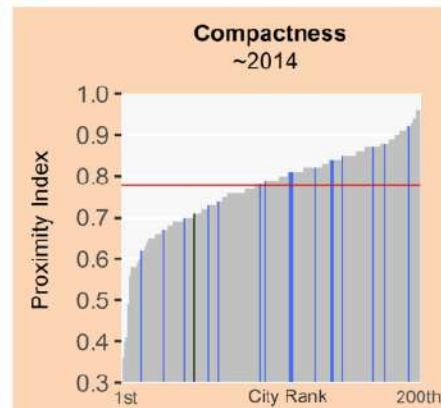
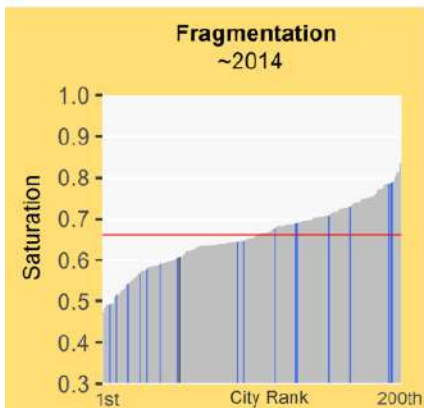
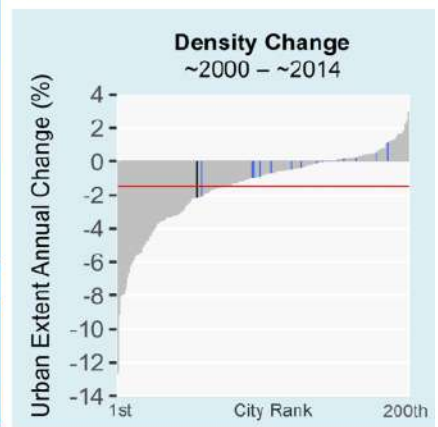
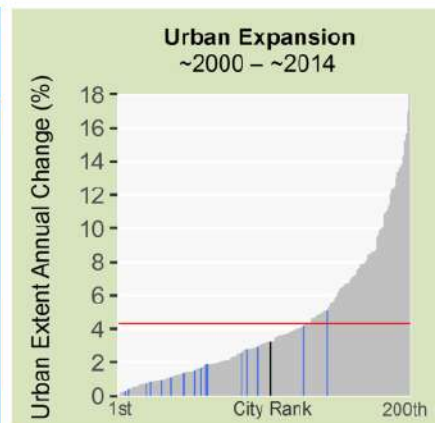
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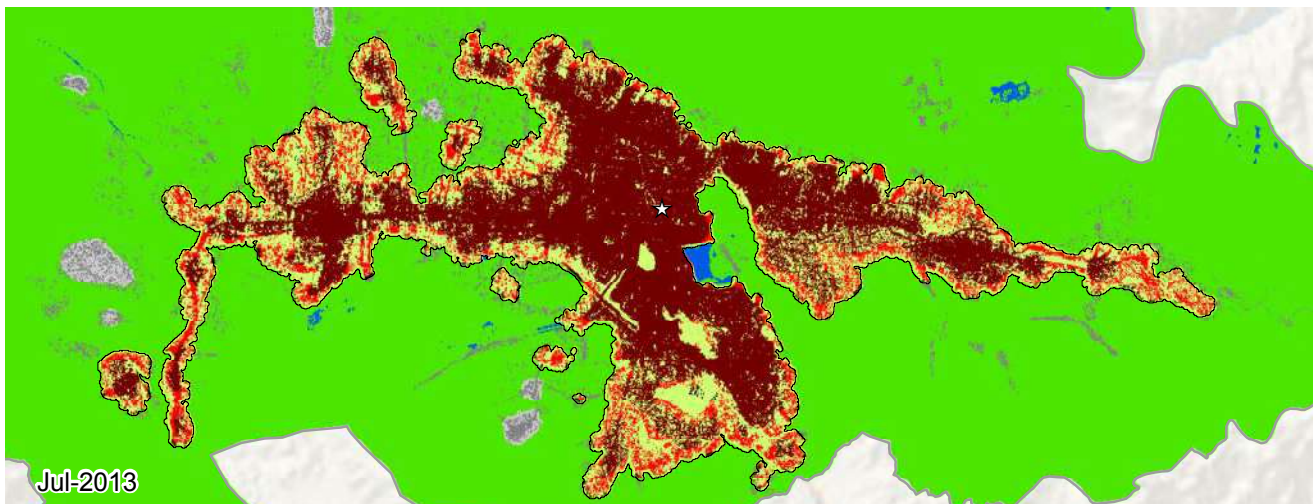
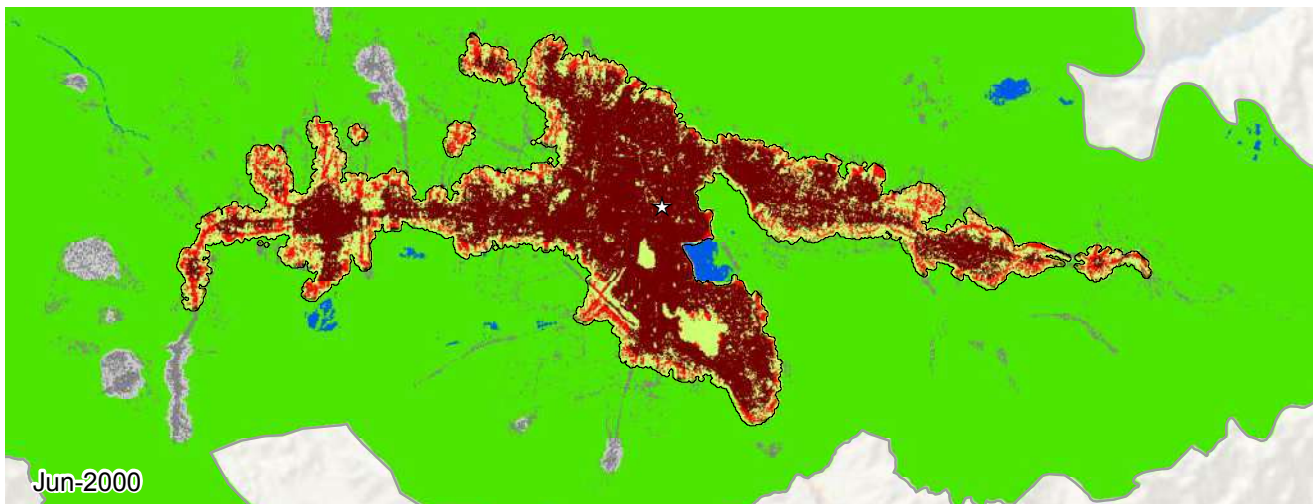
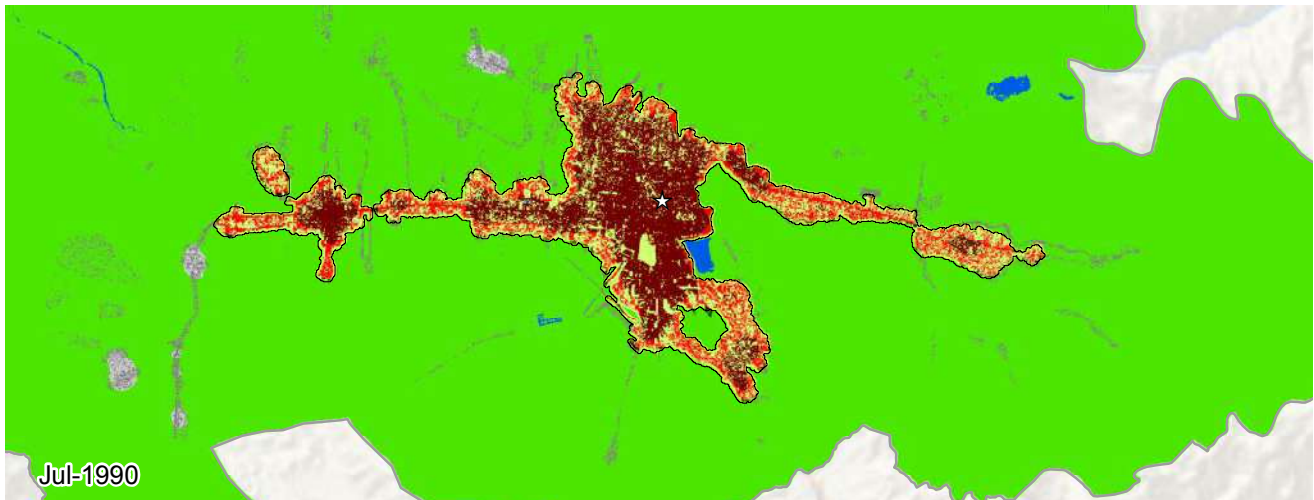
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Cleveland, United States (Land-Rich Developed Countries)



Metrics	Apr 1990	Mar 2000	Jun 2013	% Annual Change ('00-'13)
Population	1,376,230	1,622,726	1,865,023	1.1
Built-up Area (Hectares)				
Total	43,933	72,698	116,854	3.6
Urban	30,400	51,594	88,282	4.1
Suburban	12,736	19,782	26,964	2.3
Rural	796	1,321	1,608	1.5
Open space (Hectares)				
Urbanized Open Space	35,461	52,108	75,302	2.8
Urban Extent	79,395	124,806	192,156	3.3
Density (Persons / Hectare)				
Built-up Area Density	31.3	22.3	16.0	-2.5
Urban Extent Density	17.3	13.0	9.7	-2.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.55	0.58	0.61	0.3
Openness Index	0.39	0.34	0.32	-0.4
Compactness (Roundness)				
Proximity	0.80	0.70	0.71	0.1
Cohesion	0.80	0.69	0.70	0.1
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	11,426	39%	16,066	36%
Extension	11,159	38%	13,225	29%
Leapfrog	0	0%	20	0%
Inclusion	6,177	21%	14,843	33%





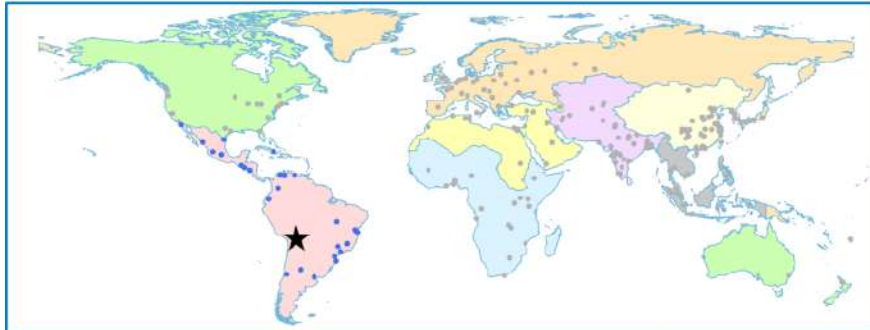
**Cochabamba, Bolivia
1990-2013**

0 3 6 9 12 km

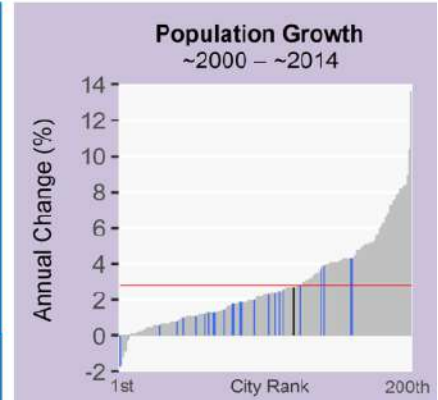
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Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

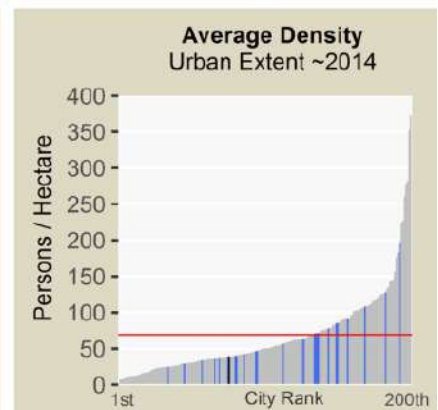
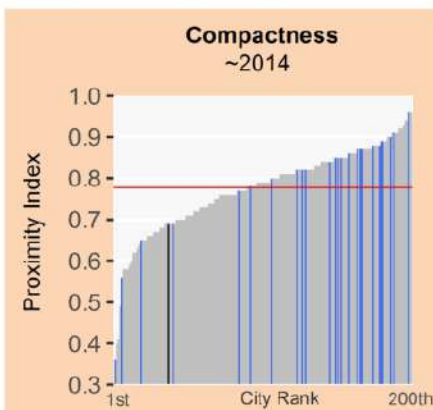
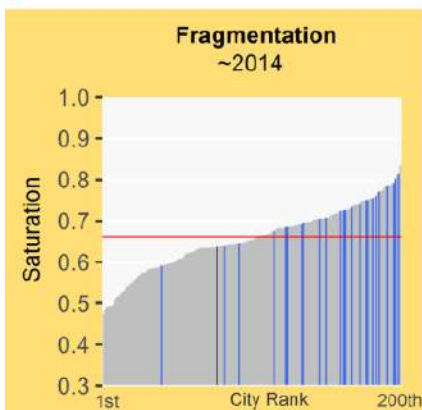
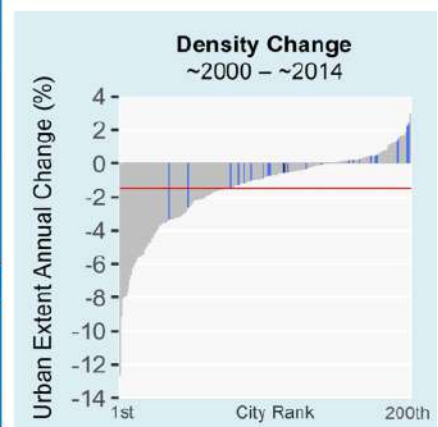
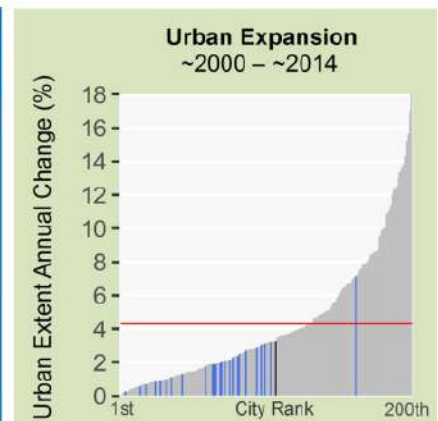
Cochabamba, Bolivia (Latin America and the Caribbean)

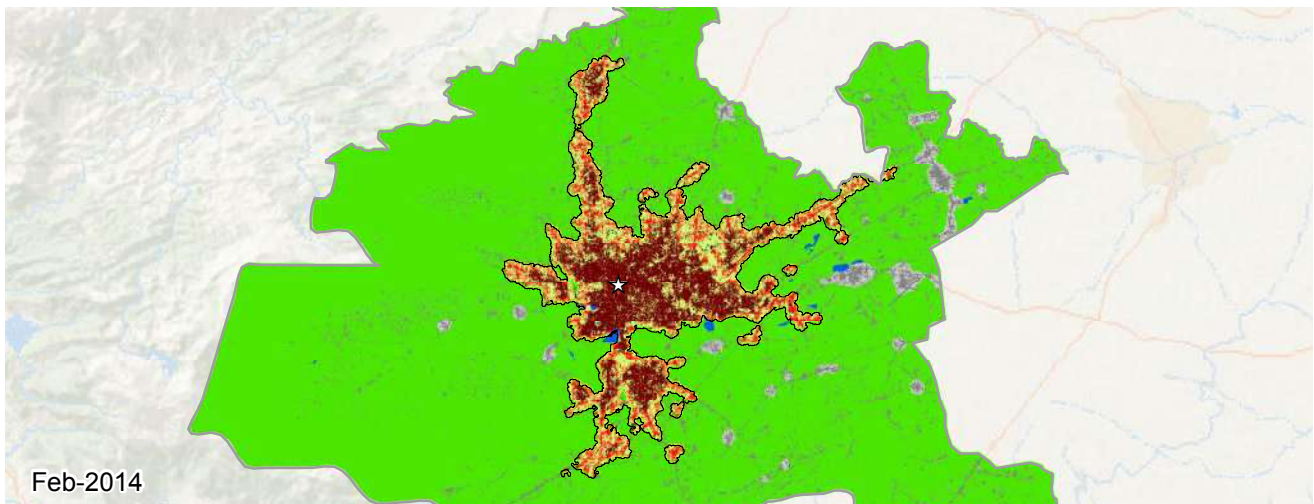
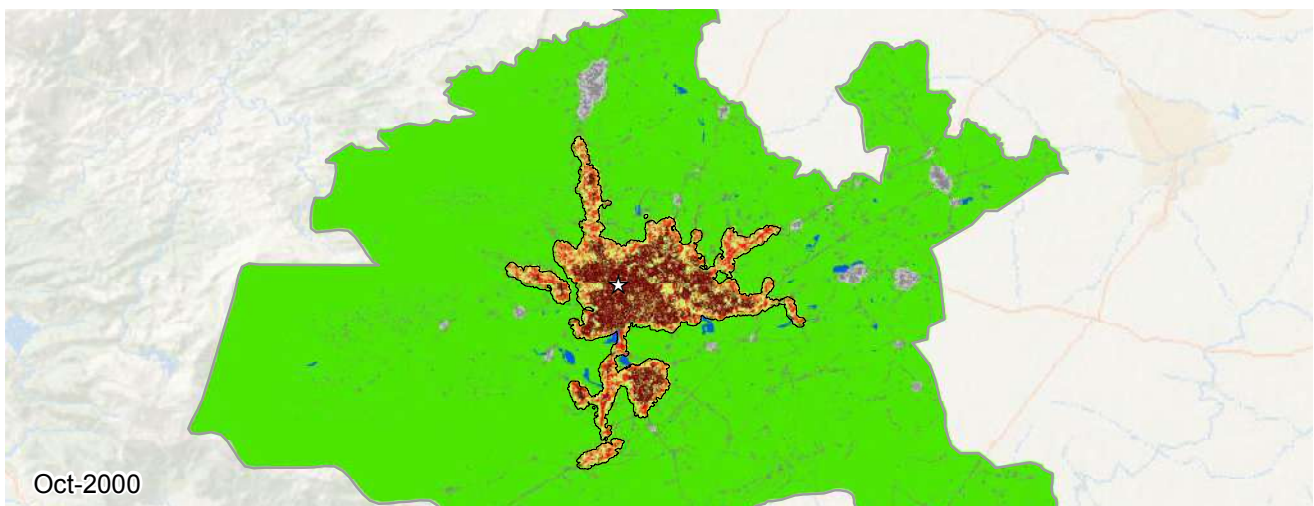
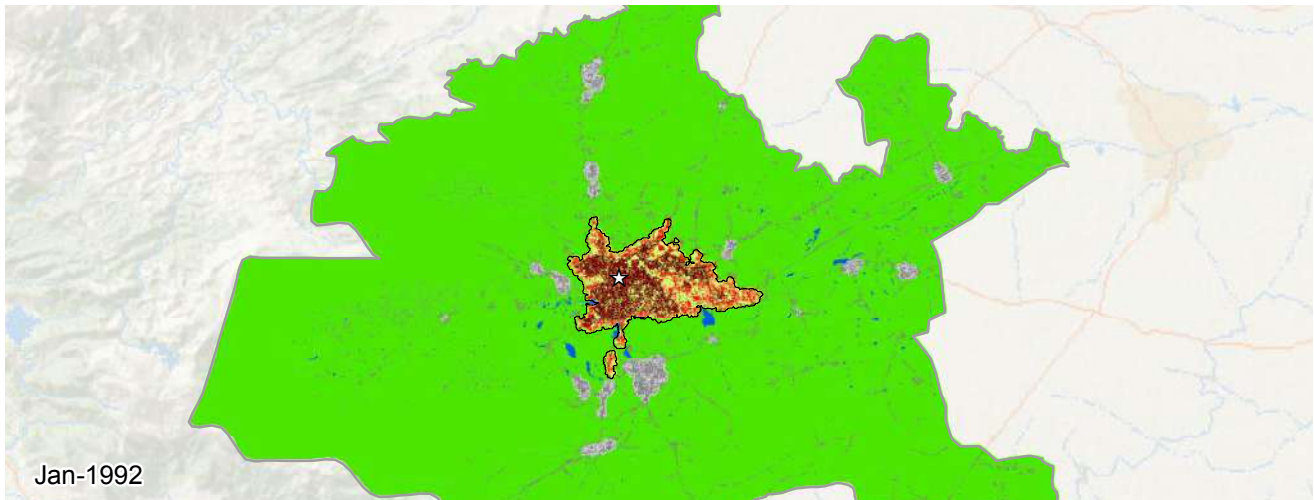


Legend for Charts
 Cochabamba | Other cities in region | All other cities | Global average



Metrics	Jul 1990	Jun 2000	Jul 2013	% Annual Change ('00-'13)
Population	485,412	723,799	1,034,943	2.7
Built-up Area (Hectares)				
Total	5,545	11,322	16,735	3.0
Urban	3,606	9,112	12,830	2.6
Suburban	1,803	2,024	3,633	4.5
Rural	136	185	271	2.9
Open space (Hectares)				
Urbanized Open Space	3,958	5,777	9,559	3.8
Urban Extent	9,504	17,100	26,294	3.3
Density (Persons / Hectare)				
Built-up Area Density	87.5	63.9	61.8	-0.3
Urban Extent Density	51.1	42.3	39.4	-0.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.58	0.66	0.64	-0.3
Openness Index	0.39	0.27	0.29	0.5
Compactness (Roundness)				
Proximity	0.61	0.66	0.69	0.4
Cohesion	0.57	0.63	0.67	0.5
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	2,030	35%	1,547	28%
Extension	3,092	53%	2,576	47%
Leapfrog	0	0%	43	0%
Inclusion	654	11%	1,245	23%





**Coimbatore, India
1992-2014**

0 6 12 18 24 km

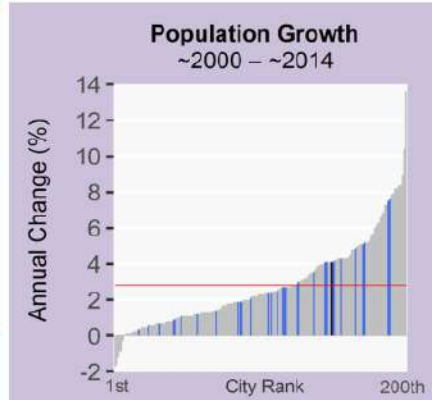
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Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

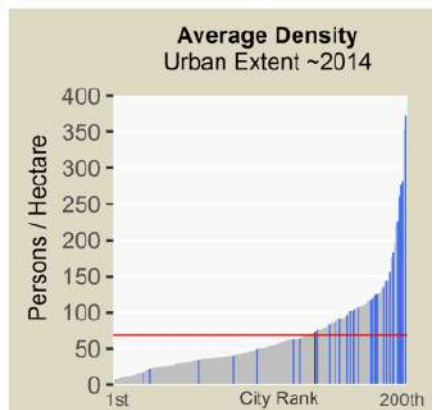
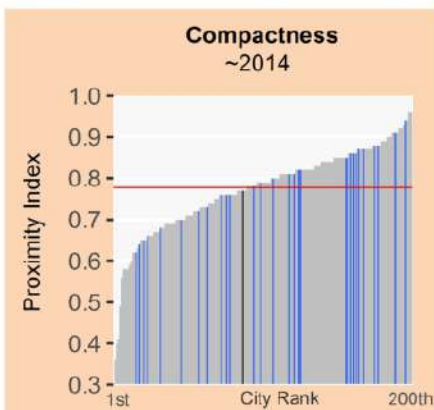
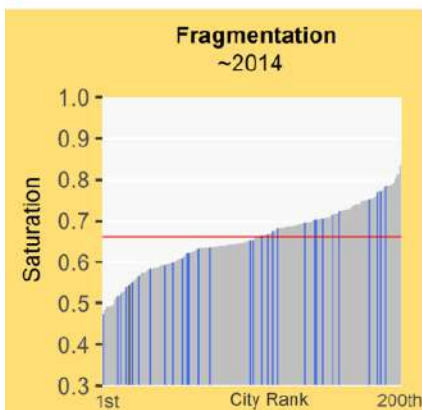
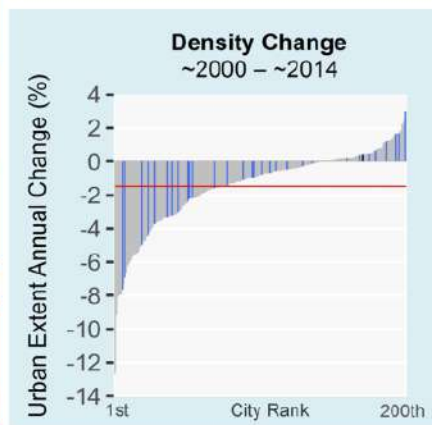
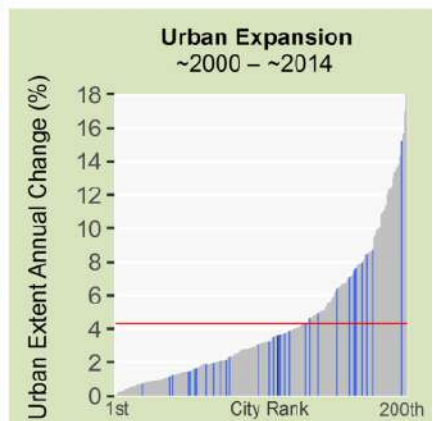
Coimbatore, India (South and Central Asia)

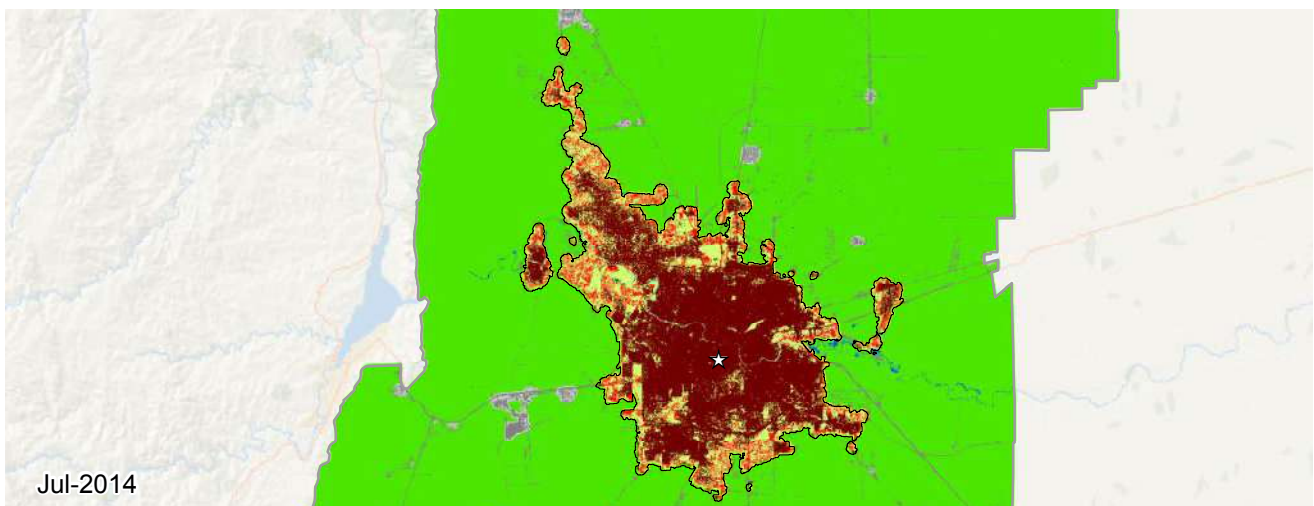
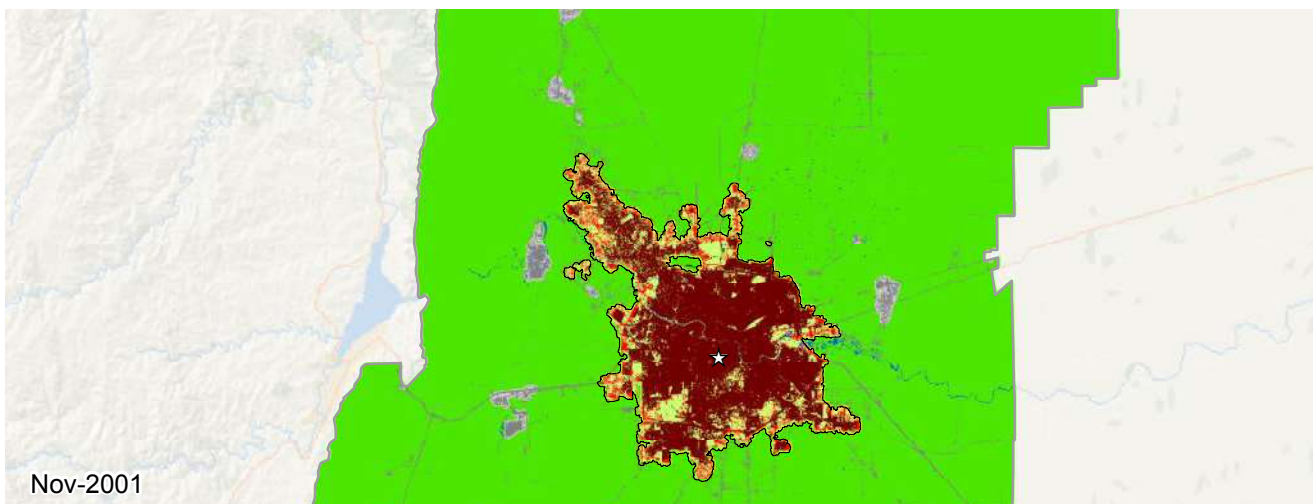
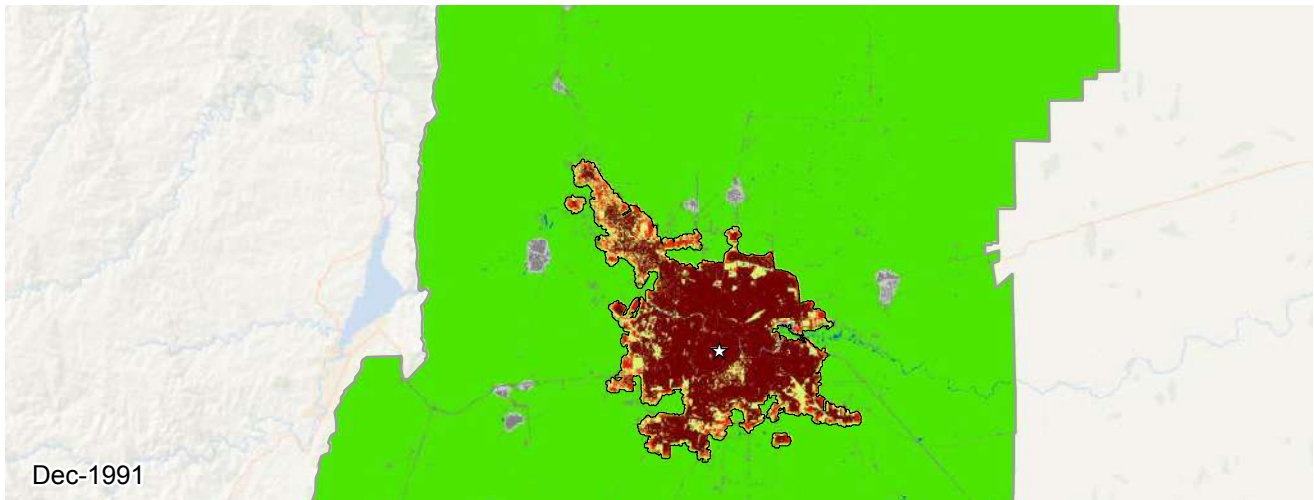


Legend for Charts
 Coimbatore | Other cities in region | All other cities | Global average



Metrics	Jan 1992	Oct 2000	Feb 2014	% Annual Change ('00-'14)
Population	528,106	959,042	1,650,079	4.1
Built-up Area (Hectares)				
Total	3,629	7,309	12,190	3.8
Urban	2,307	4,467	7,733	4.1
Suburban	1,238	2,631	4,080	3.3
Rural	83	210	376	4.4
Open space (Hectares)				
Urbanized Open Space	3,172	6,526	10,243	3.4
Urban Extent	6,802	13,836	22,434	3.6
Density (Persons / Hectare)				
Built-up Area Density	145.5	131.2	135.4	0.2
Urban Extent Density	77.6	69.3	73.6	0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.53	0.53	0.54	0.2
Openness Index	0.44	0.43	0.40	-0.6
Compactness (Roundness)				
Proximity	0.87	0.78	0.77	-0.1
Cohesion	0.86	0.76	0.75	-0.1
Added Area (Hectares)	'92-'00	Share	'00-'14	Share
Infill	966	26%	1,798	36%
Extension	1,140	30%	1,412	28%
Leapfrog	0	0%	58	1%
Inclusion	1,572	42%	1,611	33%

















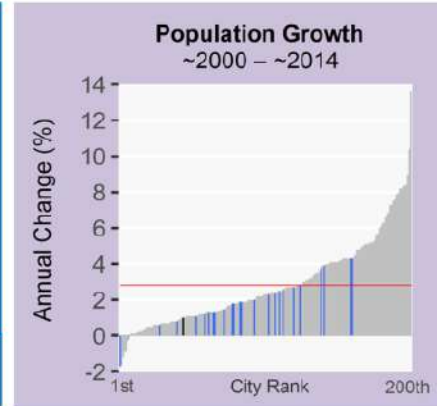
**Cordoba, Argentina
1991-2014**

0 6 12 18 24 km

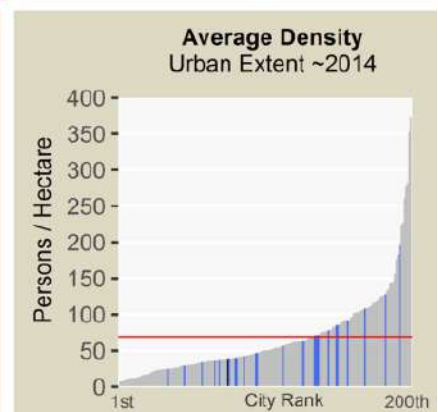
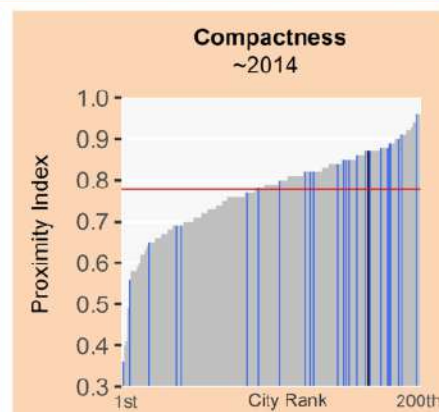
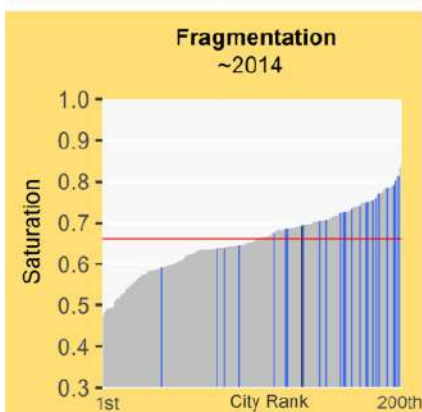
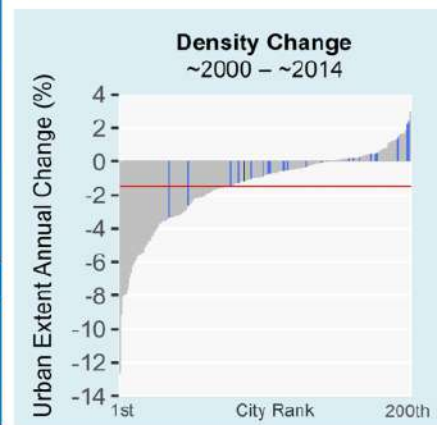
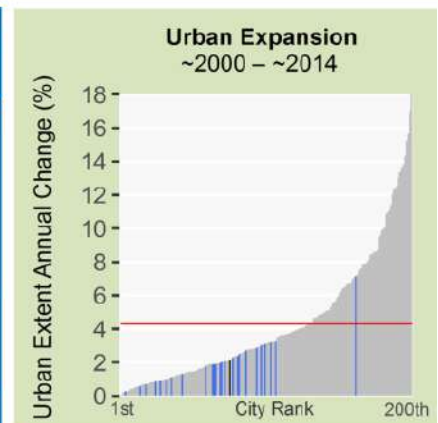
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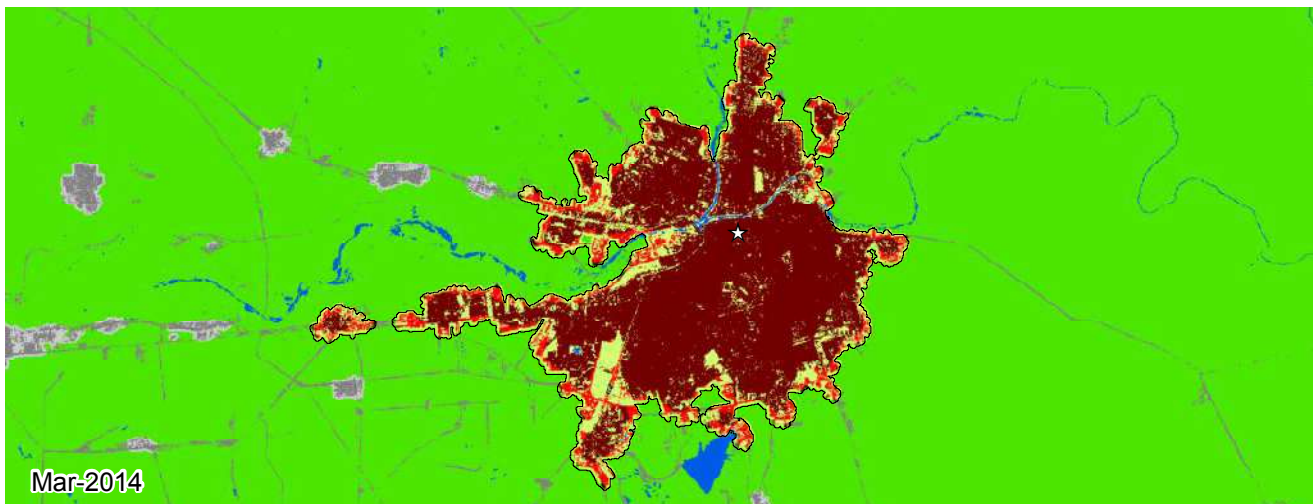
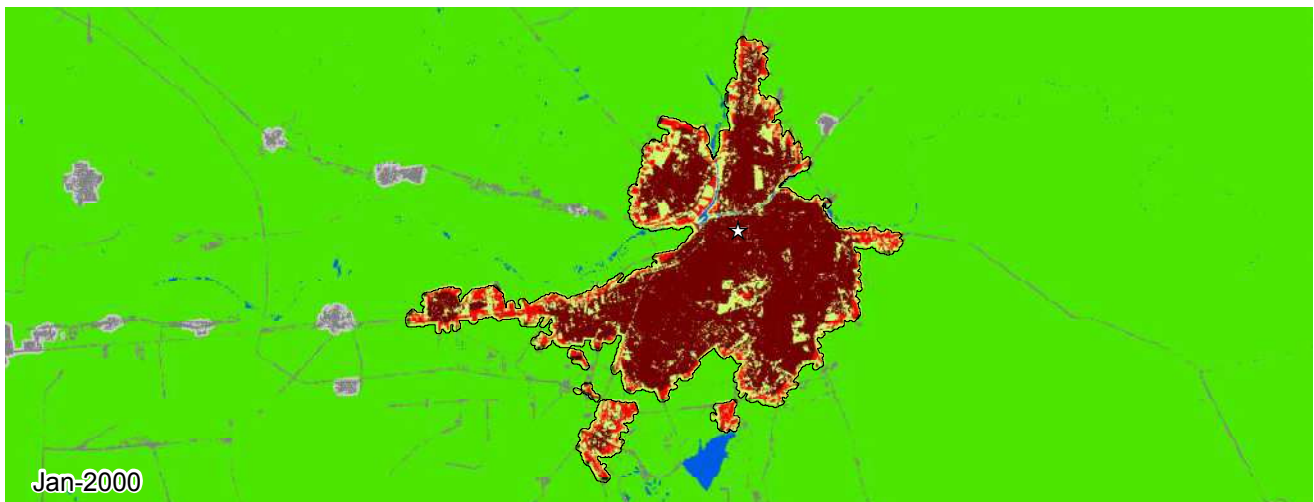
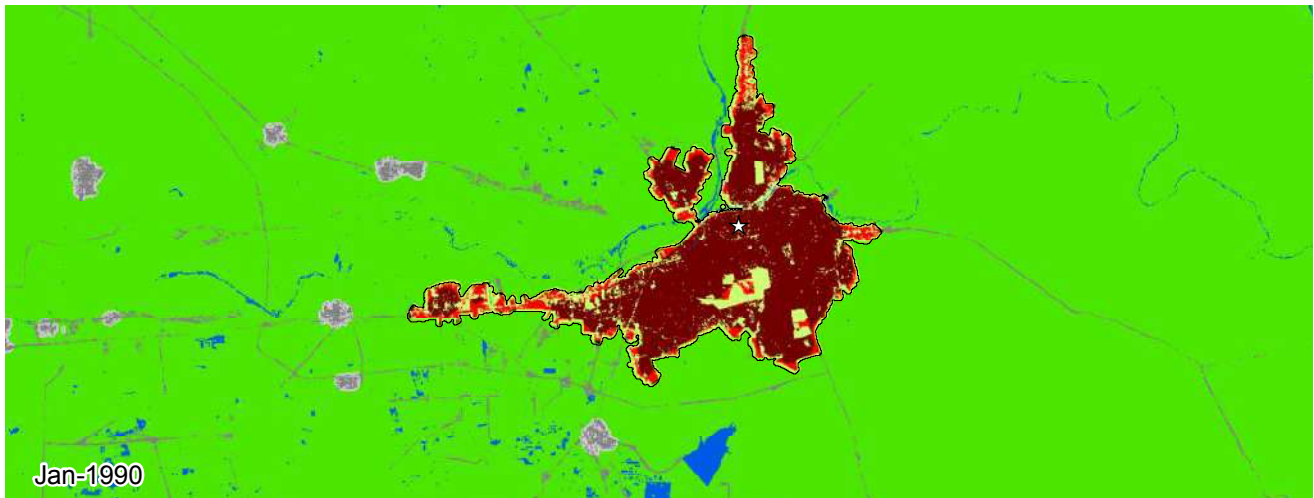
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Cordoba, Argentina (Latin America and the Caribbean)



Metrics	Dec 1991	Nov 2001	Jul 2014	% Annual Change ('01-'14)
Population	1,128,755	1,233,897	1,392,943	1.0
Built-up Area (Hectares)				
Total	15,909	19,222	24,542	1.9
Urban	13,555	16,584	20,270	1.6
Suburban	2,213	2,431	3,965	3.9
Rural	140	206	306	3.1
Open space (Hectares)				
Urbanized Open Space	5,958	7,748	10,944	2.7
Urban Extent	21,868	26,970	35,486	2.2
Density (Persons / Hectare)				
Built-up Area Density	70.9	64.2	56.8	-1.0
Urban Extent Density	51.6	45.8	39.3	-1.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.73	0.71	0.69	-0.2
Openness Index	0.22	0.21	0.23	0.5
Compactness (Roundness)				
Proximity	0.88	0.90	0.87	-0.3
Cohesion	0.87	0.90	0.86	-0.4
Added Area (Hectares)	'91-'01	Share	'01-'14	Share
Infill	1,498	45%	1,891	35%
Extension	1,213	36%	1,789	33%
Leapfrog	0	0%	5	0%
Inclusion	600	18%	1,634	30%





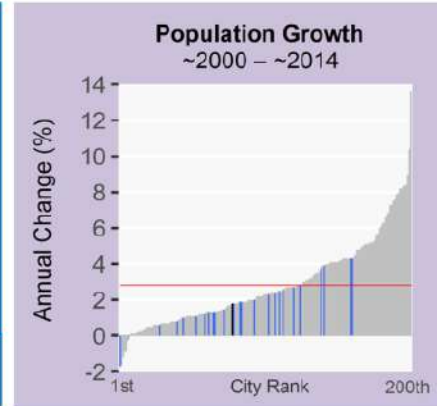
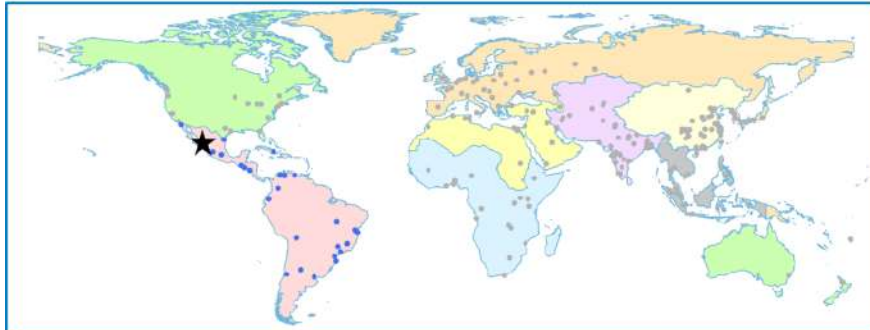
**Culiacan, Mexico
1990-2014**

0 3 6 9 12 km

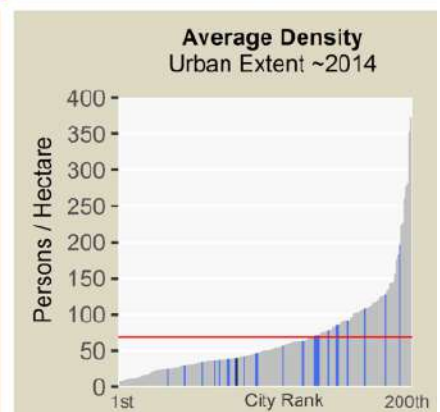
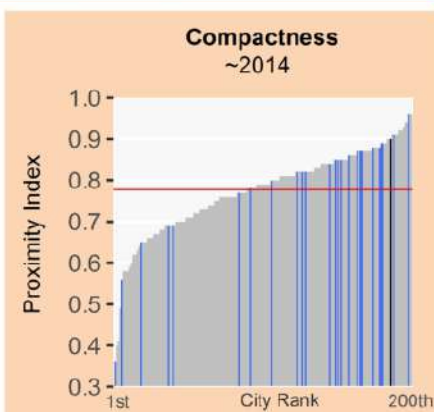
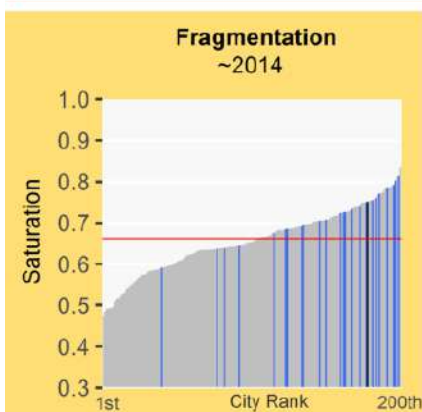
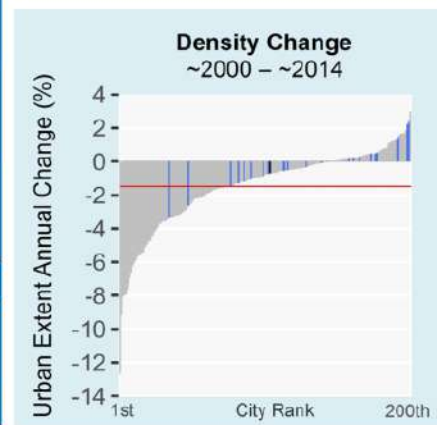
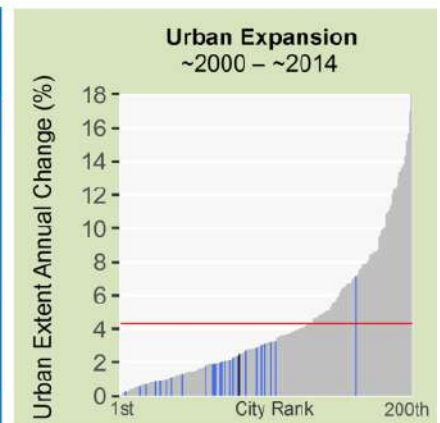
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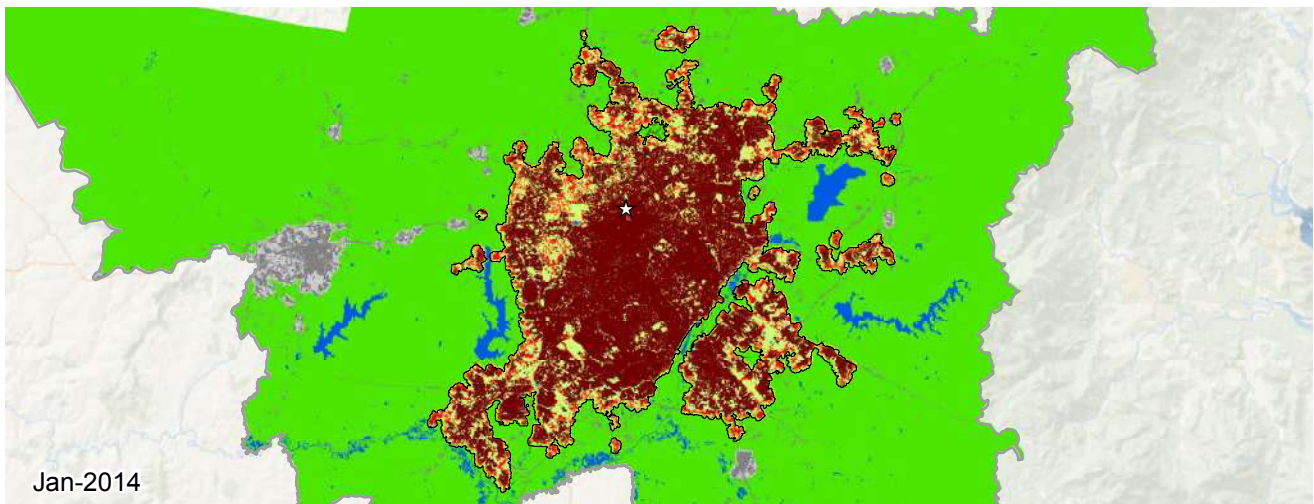
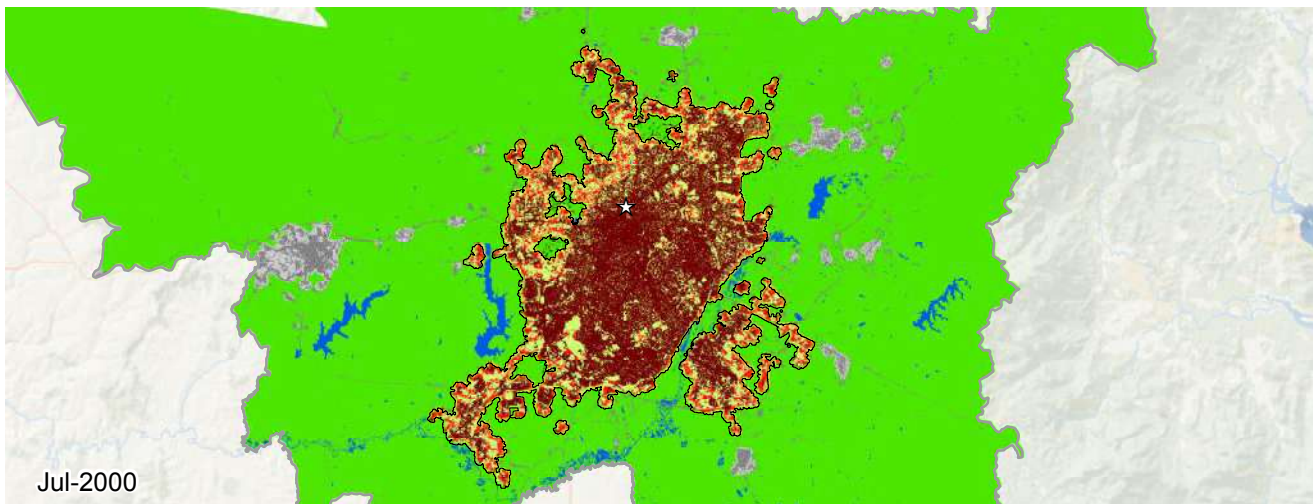
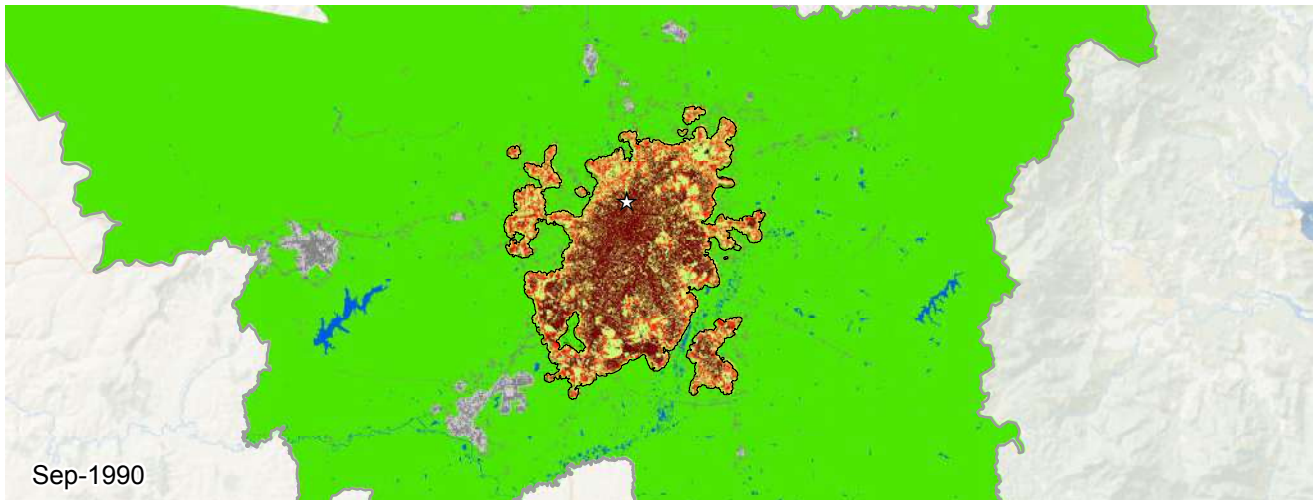
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Culiacan, Mexico (Latin America and the Caribbean)



Metrics	Jan 1990	Jan 2000	Mar 2014	% Annual Change ('00-'14)
Population	375,045	483,532	625,346	1.8
Built-up Area (Hectares)				
Total	5,741	7,895	11,562	2.7
Urban	4,921	6,628	10,008	2.9
Suburban	776	1,163	1,450	1.6
Rural	44	103	103	-0.0
Open space (Hectares)				
Urbanized Open Space	1,894	2,870	3,839	2.1
Urban Extent	7,636	10,766	15,401	2.5
Density (Persons / Hectare)				
Built-up Area Density	65.3	61.2	54.1	-0.9
Urban Extent Density	49.1	44.9	40.6	-0.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.75	0.73	0.75	0.2
Openness Index	0.23	0.23	0.21	-0.8
Compactness (Roundness)				
Proximity	0.79	0.85	0.90	0.4
Cohesion	0.77	0.84	0.89	0.4
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	330	15%	1,083	29%
Extension	1,572	72%	2,158	58%
Leapfrog	29	1%	0	0%
Inclusion	221	10%	425	11%

















**Curitiba, Brazil
1990-2014**

0 6 12 18 24 km

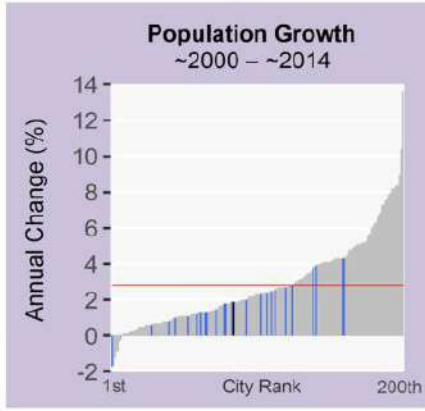
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	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

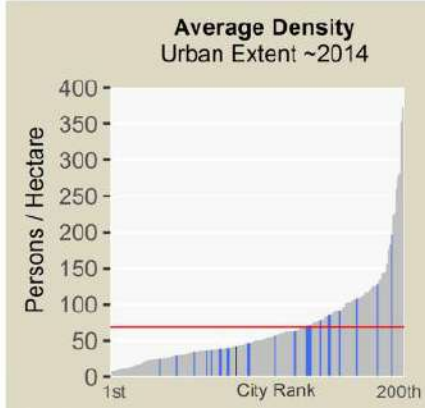
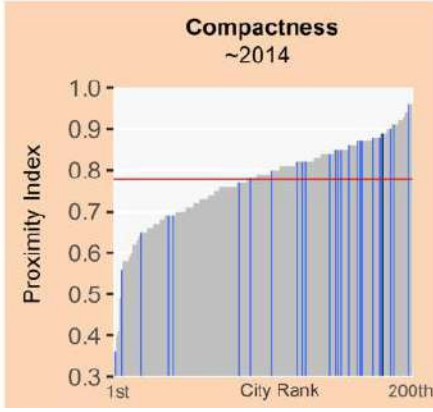
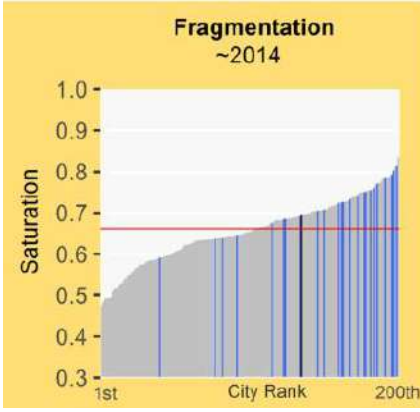
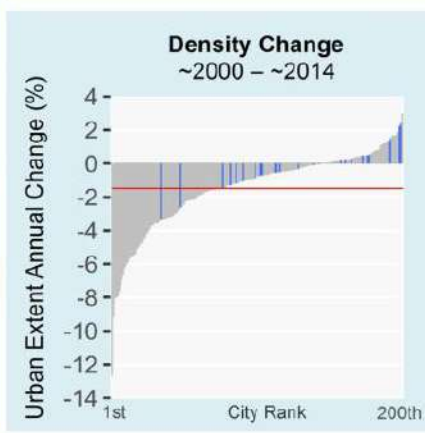
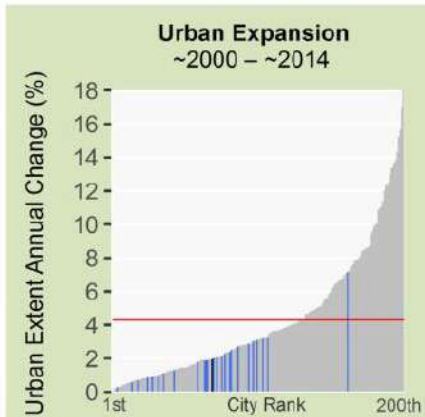
Curitiba, Brazil (Latin America and the Caribbean)

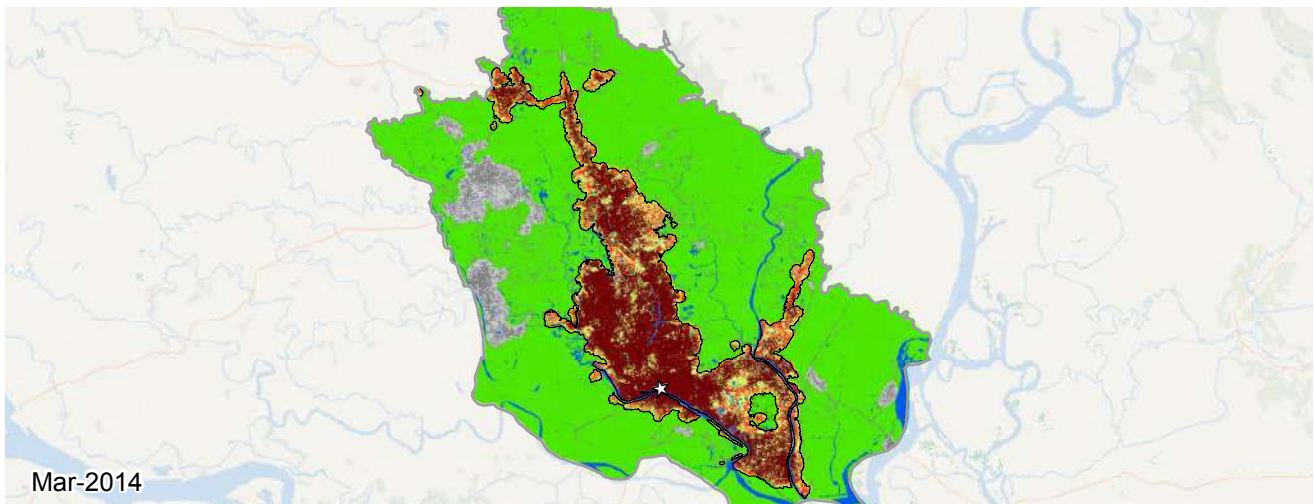
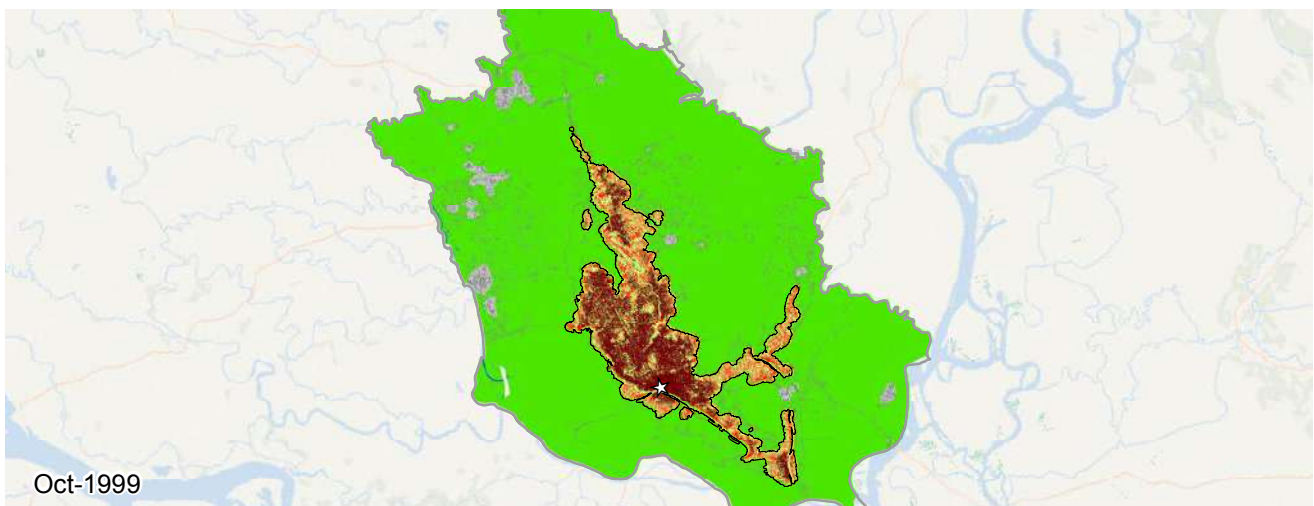
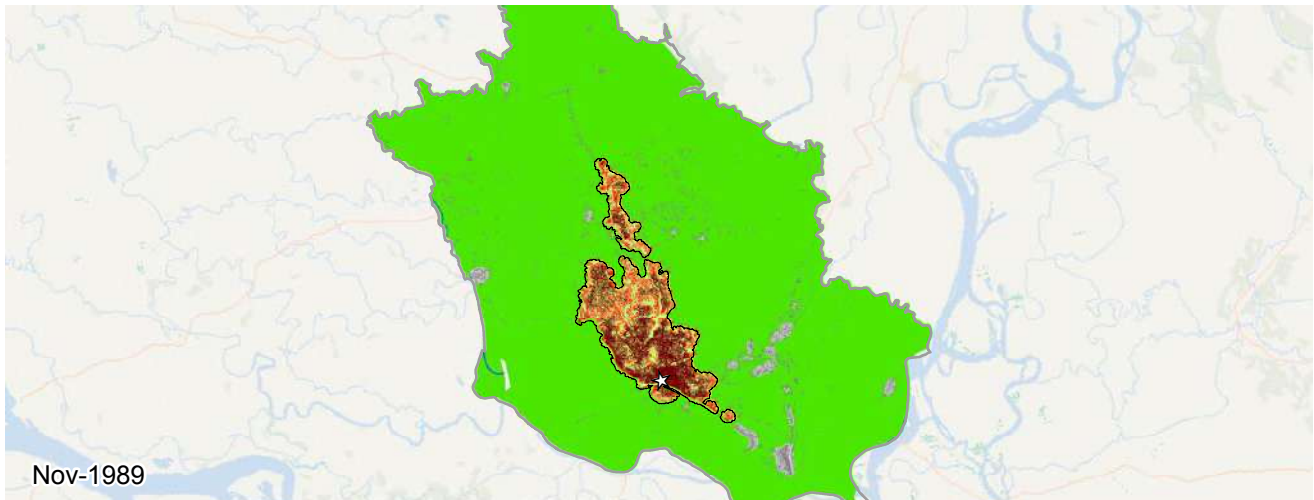


Legend for Charts
 Curitiba | Other cities in region | All other cities | Global average



Metrics	Sep 1990	Jul 2000	Jan 2014	% Annual Change ('00-'14)
Population	1,375,084	2,106,460	2,728,388	1.9
Built-up Area (Hectares)				
Total	14,909	31,150	44,527	2.6
Urban	9,646	24,028	37,503	3.3
Suburban	4,913	6,706	6,595	-0.1
Rural	350	414	428	0.2
Open space (Hectares)				
Urbanized Open Space	13,208	18,072	19,499	0.6
Urban Extent	28,117	49,222	64,026	1.9
Density (Persons / Hectare)				
Built-up Area Density	92.2	67.6	61.3	-0.7
Urban Extent Density	48.9	42.8	42.6	-0.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.53	0.63	0.70	0.7
Openness Index	0.42	0.32	0.25	-1.9
Compactness (Roundness)				
Proximity	0.91	0.88	0.89	0.0
Cohesion	0.89	0.86	0.87	0.1
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	5,863	36%	6,788	50%
Extension	7,203	44%	3,752	28%
Leapfrog	163	1%	302	2%
Inclusion	3,011	18%	2,533	18%



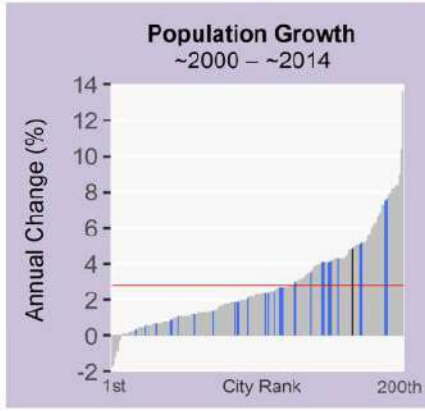


**Dhaka, Bangladesh
1989-2014**

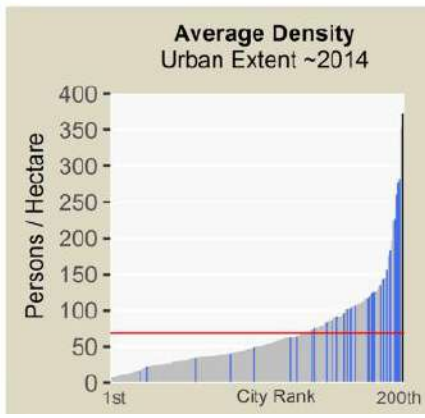
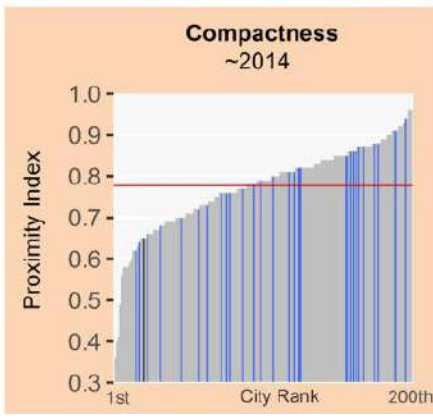
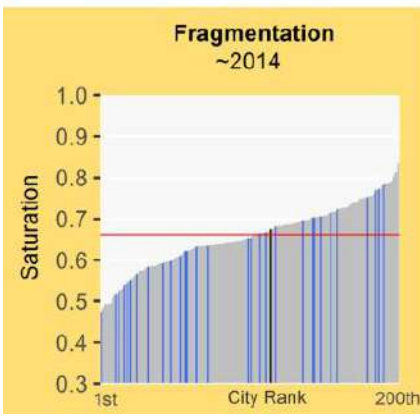
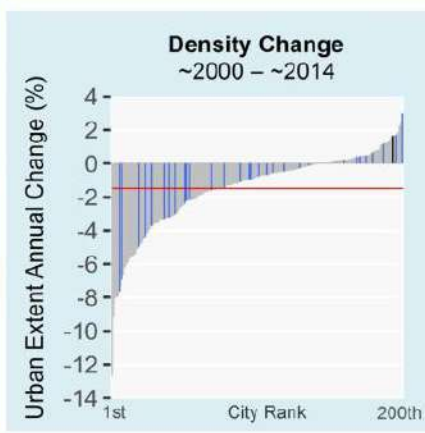
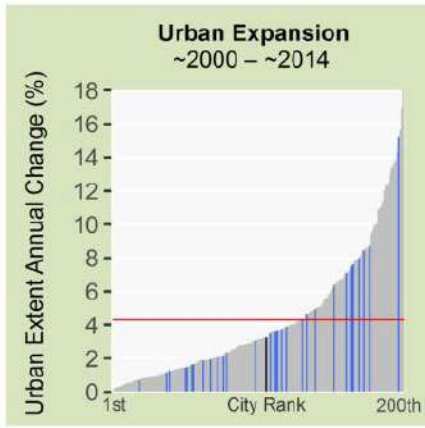
0 8 16 24 32 km

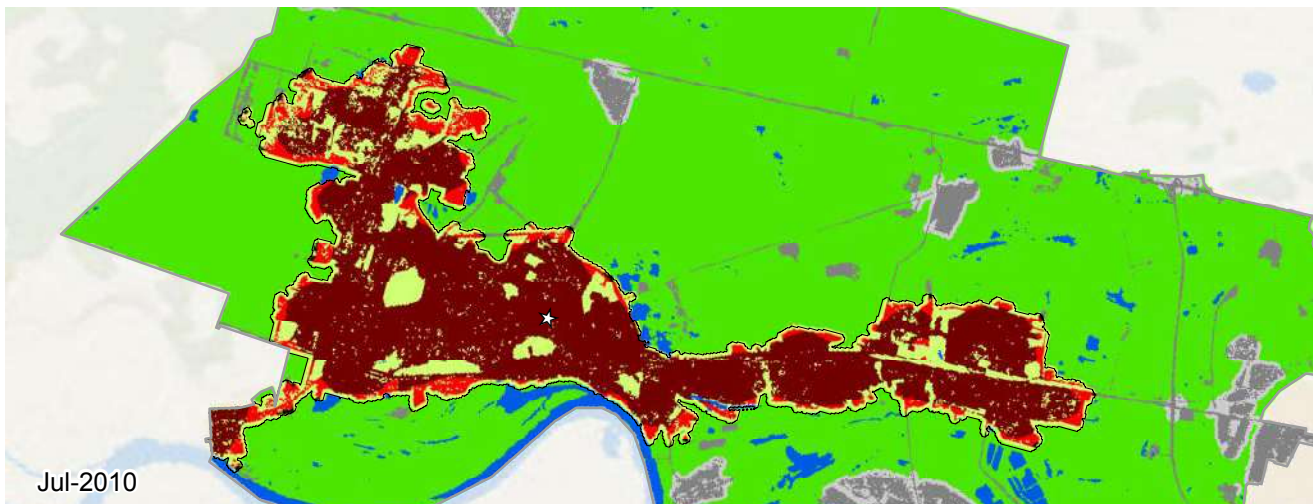
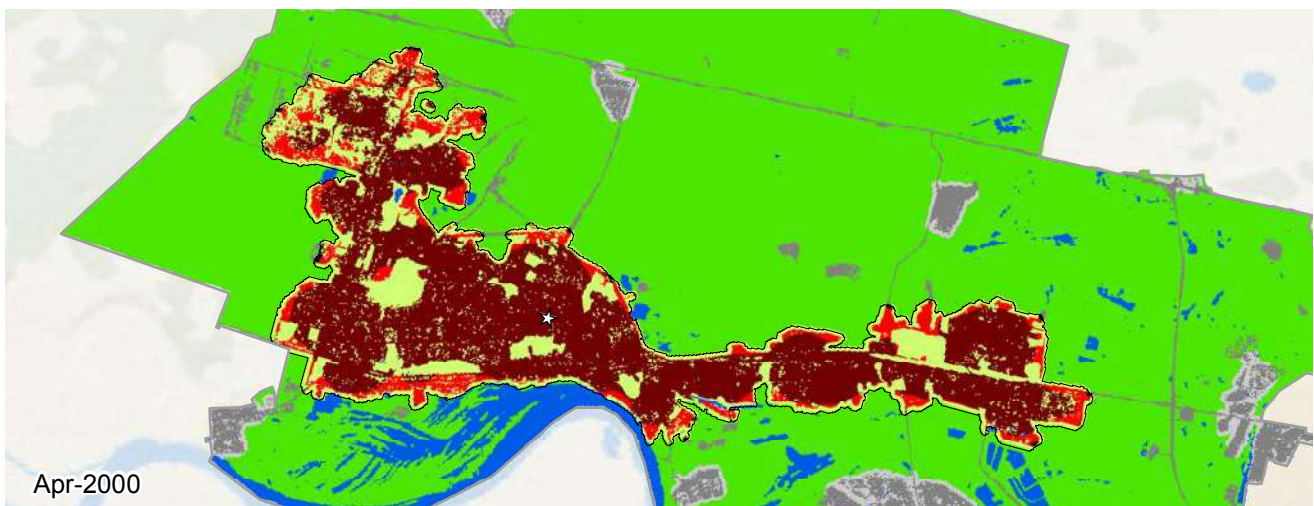
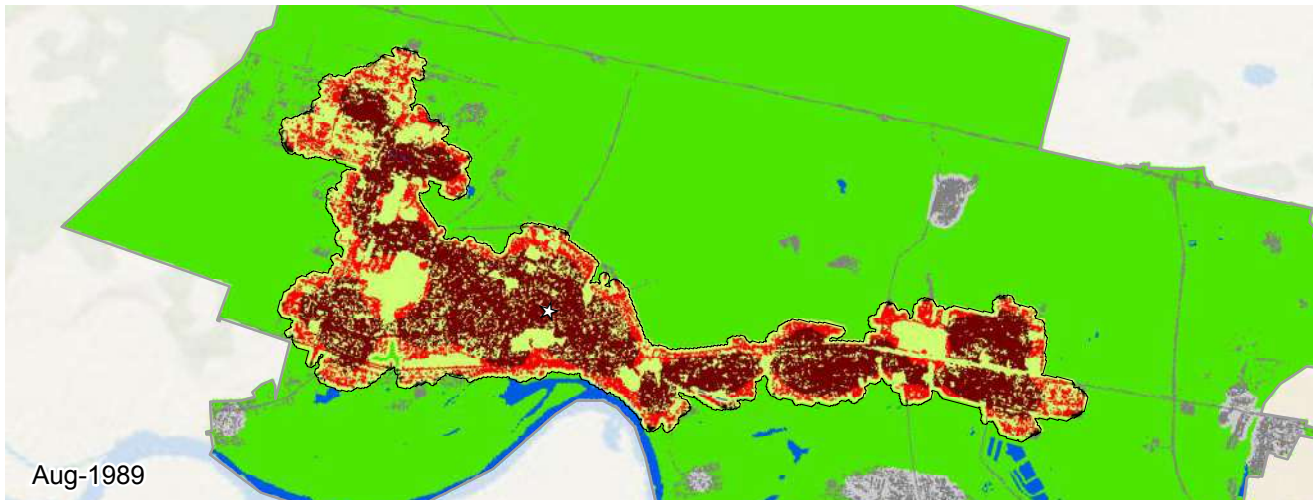
Study area
 Urban extent
 Urban built-up area
 Suburban built-up area
 Rural built-up area
 Urbanized open space
 Rural open space
 Exurban built-up area
 Exurban open space
 Water
 No data
★ CBD

Dhaka, Bangladesh (South and Central Asia)



Metrics	Nov 1989	Oct 1999	Mar 2014	% Annual Change ('99-'14)
Population	4,005,507	6,690,664	13,609,023	4.9
Built-up Area (Hectares)				
Total	7,473	12,478	24,675	4.7
Urban	4,798	8,287	19,795	6.0
Suburban	2,524	3,884	4,521	1.1
Rural	150	306	359	1.1
Open space (Hectares)				
Urbanized Open Space	6,404	10,346	11,864	0.9
Urban Extent	13,877	22,825	36,540	3.3
Density (Persons / Hectare)				
Built-up Area Density	536.0	536.2	551.5	0.2
Urban Extent Density	288.6	293.1	372.4	1.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.55	0.68	1.5
Openness Index	0.42	0.39	0.29	-2.2
Compactness (Roundness)				
Proximity	0.77	0.67	0.65	-0.2
Cohesion	0.74	0.66	0.64	-0.1
Added Area (Hectares)	'89-'99	Share	'99-'14	Share
Infill	1,799	35%	4,990	41%
Extension	1,507	30%	4,971	40%
Leapfrog	0	0%	14	0%
Inclusion	1,698	33%	2,179	17%





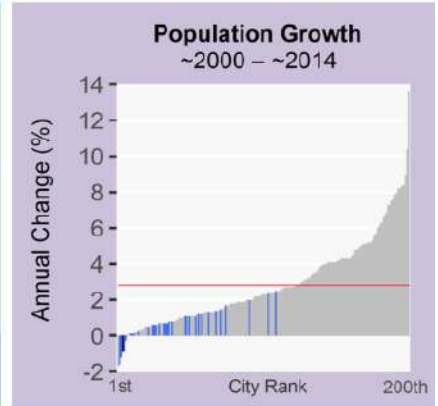
**Dzerzhinsk, Russia
1989-2010**

0 2 4 6 8 km

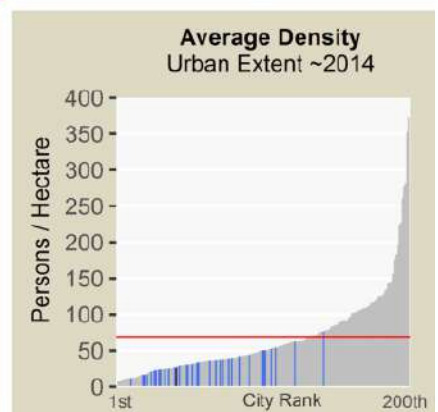
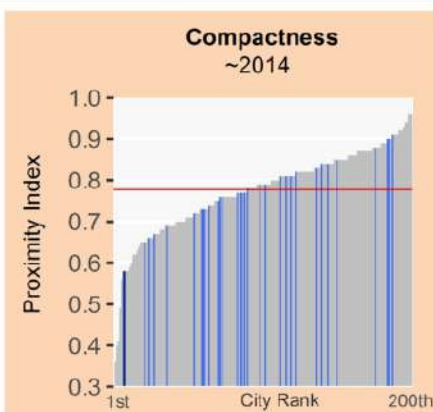
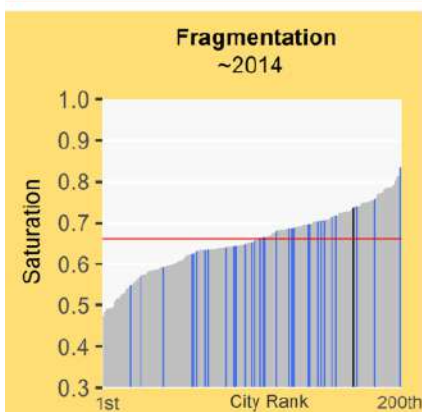
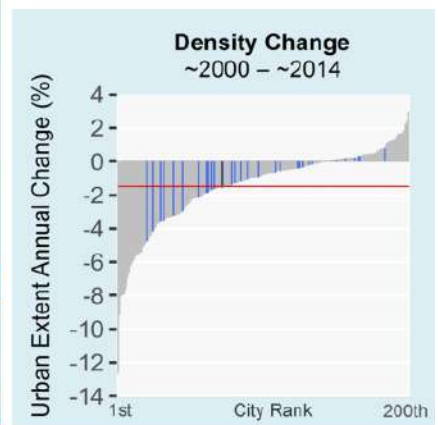
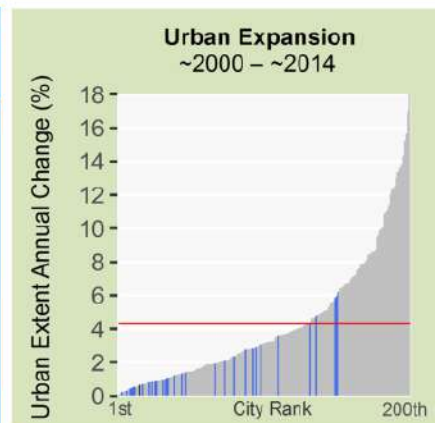
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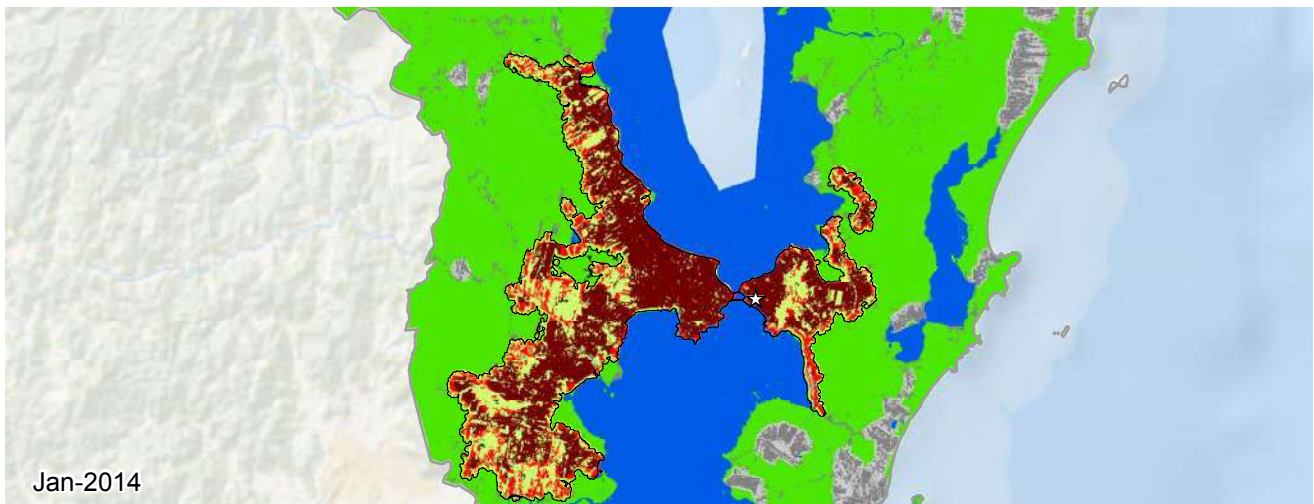
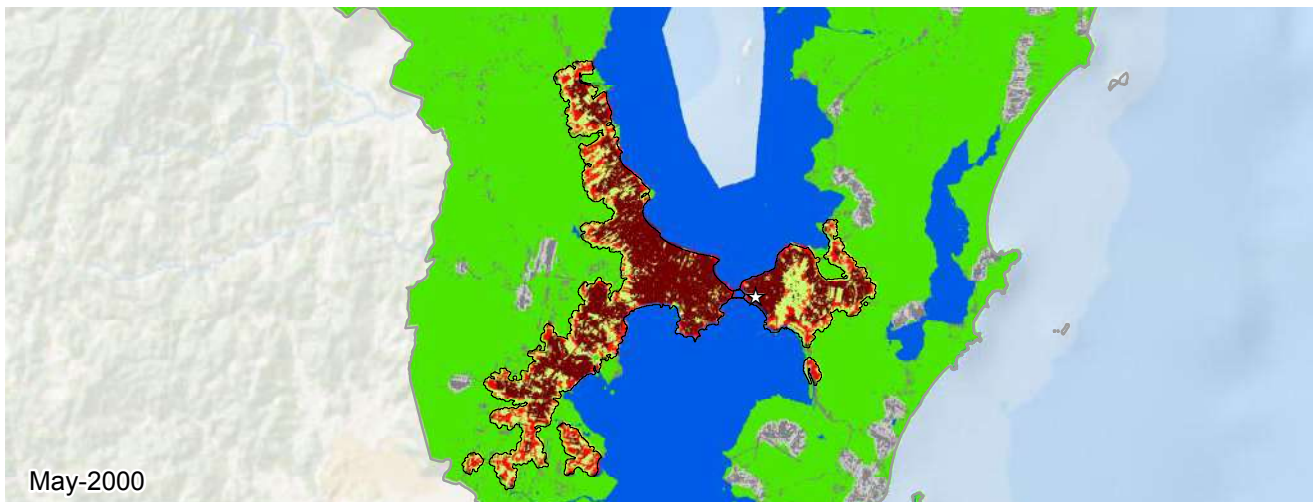
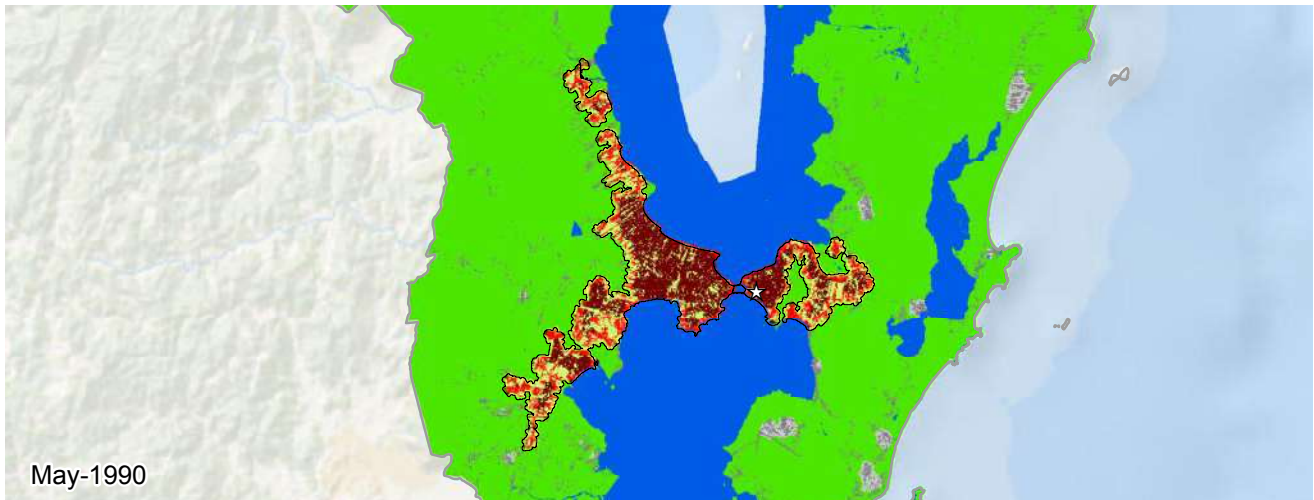
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Dzerzhinsk, Russia (Europe and Japan)



Metrics	Aug 1989	Apr 2000	Jul 2010	% Annual Change ('00-'10)
Population	225,339	201,809	183,840	-0.9
Built-up Area (Hectares)				
Total	3,278	4,447	5,047	1.2
Urban	2,263	3,683	4,353	1.6
Suburban	957	728	658	-1.0
Rural	57	36	35	-0.3
Open space (Hectares)				
Urbanized Open Space	2,483	1,973	1,813	-0.8
Urban Extent	5,762	6,421	6,860	0.6
Density (Persons / Hectare)				
Built-up Area Density	68.7	45.4	36.4	-2.1
Urban Extent Density	39.1	31.4	26.8	-1.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.57	0.69	0.74	0.6
Openness Index	0.42	0.30	0.26	-1.3
Compactness (Roundness)				
Proximity	0.55	0.58	0.58	0.0
Cohesion	0.56	0.59	0.59	0.0
Added Area (Hectares)	'89-'00	Share	'00-'10	Share
Infill	809	69%	358	59%
Extension	238	20%	113	18%
Leapfrog	0	0%	0	0%
Inclusion	121	10%	127	21%





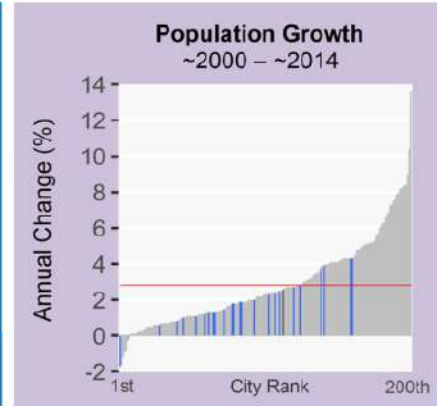
**Florianopolis, Brazil
1990-2014**

0 4 8 12 16 km

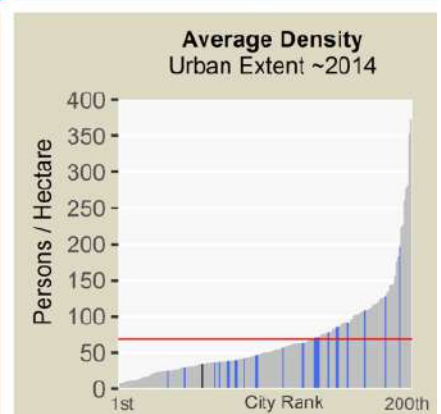
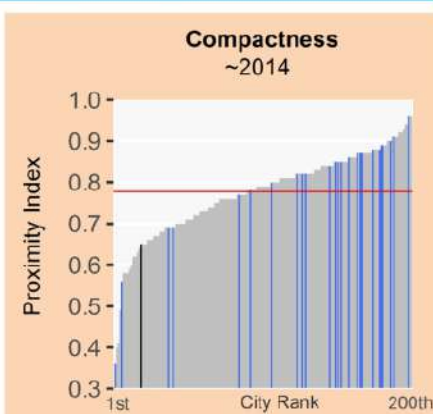
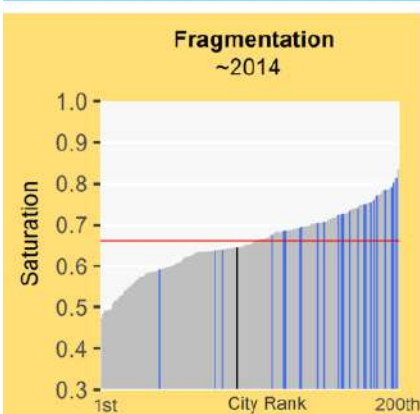
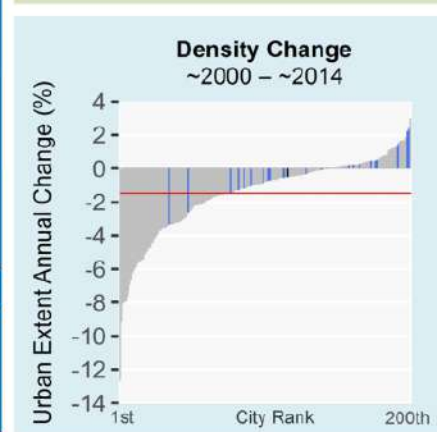
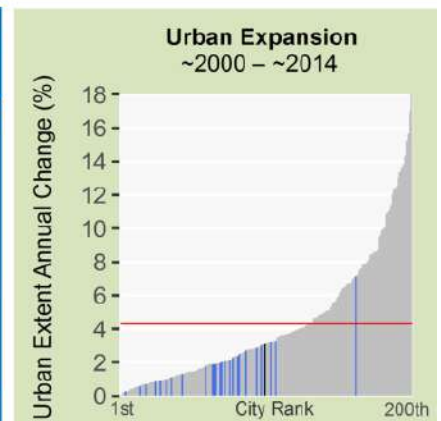
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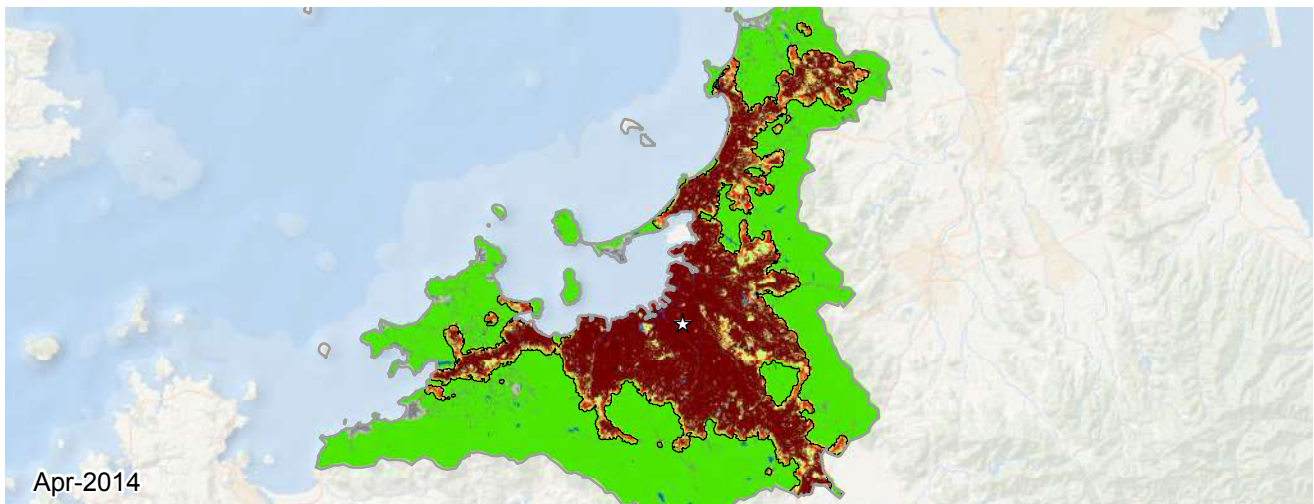
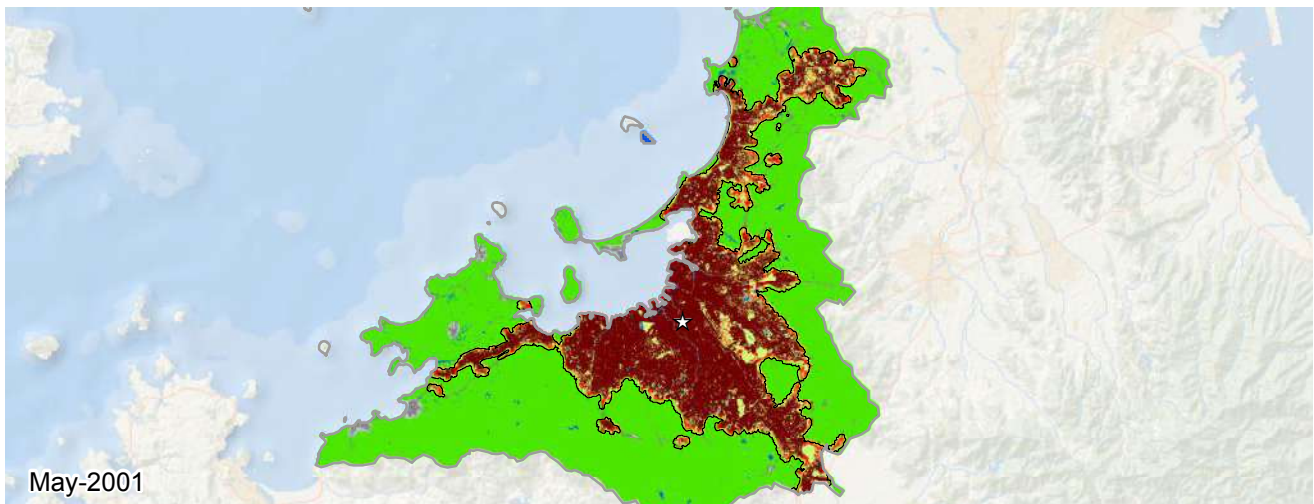
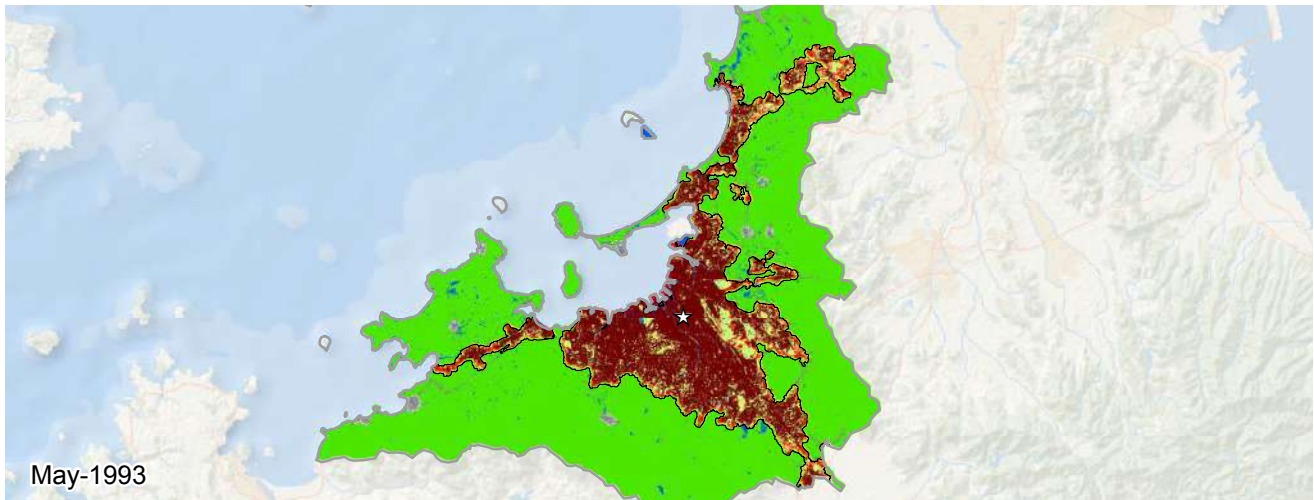
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Florianopolis, Brazil (Latin America and the Caribbean)



Metrics	May 1990	May 2000	Jan 2014	% Annual Change ('00-'14)
Population	284,463	375,071	532,951	2.6
Built-up Area (Hectares)				
Total	4,393	6,718	10,209	3.1
Urban	2,684	4,887	7,748	3.4
Suburban	1,600	1,700	2,314	2.3
Rural	108	131	147	0.8
Open space (Hectares)				
Urbanized Open Space	2,837	3,656	5,640	3.2
Urban Extent	7,231	10,375	15,849	3.1
Density (Persons / Hectare)				
Built-up Area Density	64.7	55.8	52.2	-0.5
Urban Extent Density	39.3	36.2	33.6	-0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.61	0.65	0.64	-0.0
Openness Index	0.41	0.35	0.33	-0.4
Compactness (Roundness)				
Proximity	0.57	0.58	0.65	0.8
Cohesion	0.55	0.57	0.64	0.9
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	962	41%	1,017	29%
Extension	797	34%	1,617	46%
Leapfrog	117	5%	0	0%
Inclusion	447	19%	856	24%





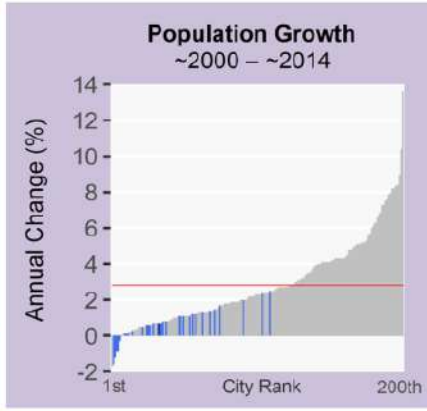
**Fukuoka, Japan
1993-2014**

0 7 14 21 28 km

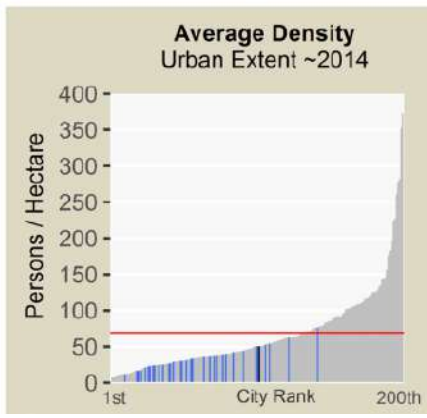
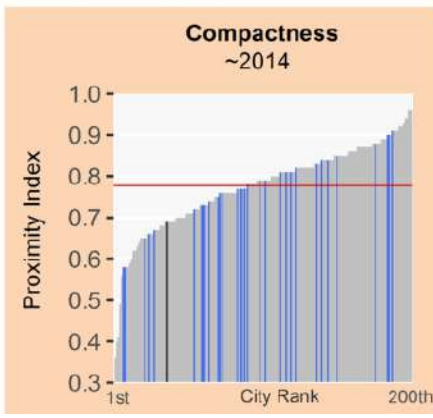
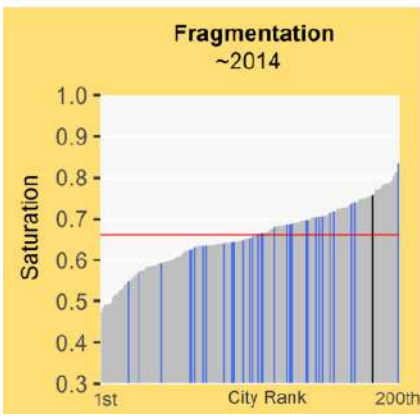
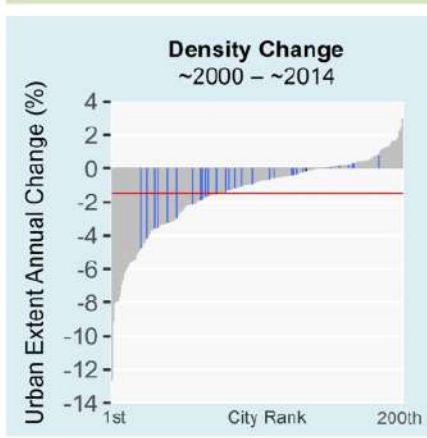
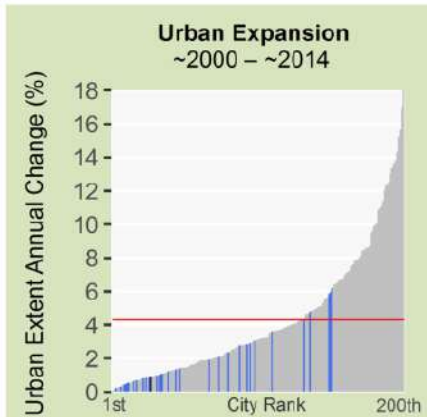
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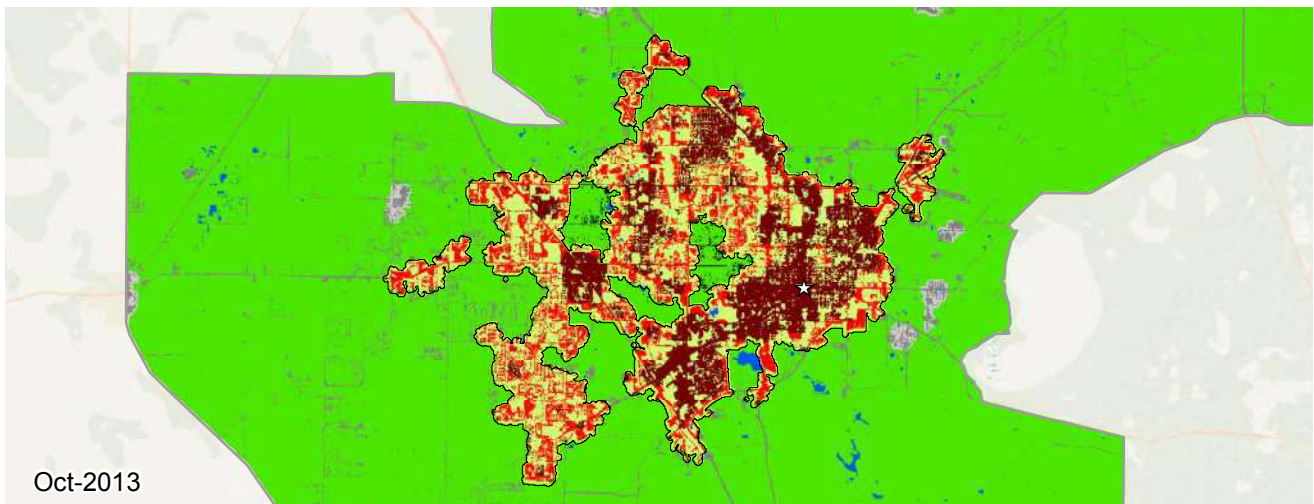
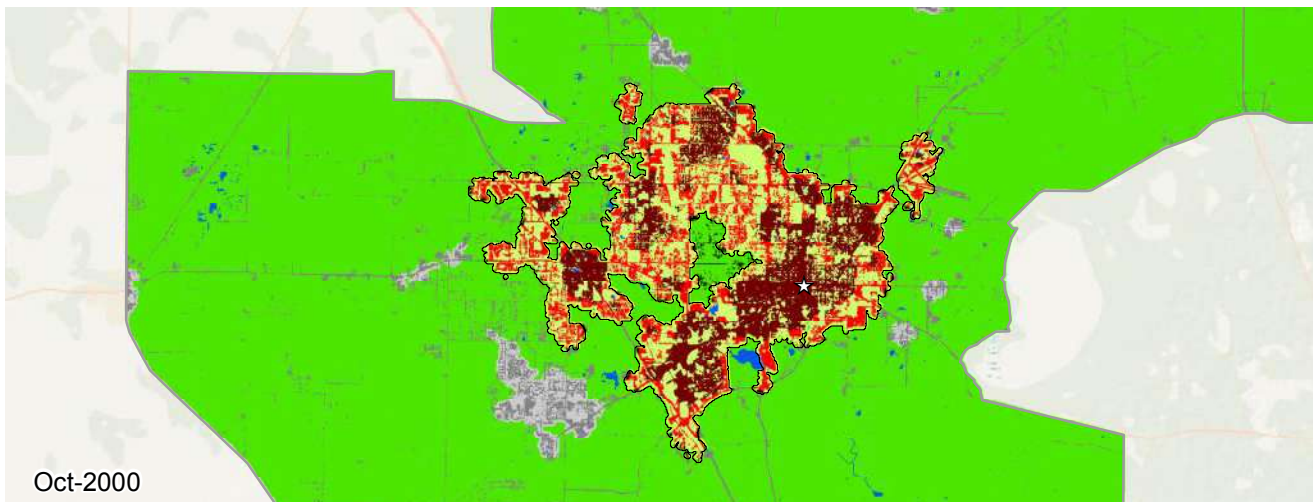
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Fukuoka, Japan (Europe and Japan)



Metrics	May 1993	May 2001	Apr 2014	% Annual Change ('01-'14)
Population	1,953,223	2,110,743	2,306,030	0.7
Built-up Area (Hectares)				
Total	23,548	30,518	34,507	1.0
Urban	19,829	26,651	30,258	1.0
Suburban	3,510	3,616	3,954	0.7
Rural	209	249	294	1.3
Open space (Hectares)				
Urbanized Open Space	8,828	10,158	10,996	0.6
Urban Extent	32,377	40,676	45,503	0.9
Density (Persons / Hectare)				
Built-up Area Density	82.9	69.2	66.8	-0.3
Urban Extent Density	60.3	51.9	50.7	-0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.73	0.75	0.76	0.1
Openness Index	0.26	0.23	0.21	-0.8
Compactness (Roundness)				
Proximity	0.67	0.70	0.69	-0.0
Cohesion	0.64	0.68	0.67	-0.1
Added Area (Hectares)	'93-'01	Share	'01-'14	Share
Infill	2,594	37%	1,971	49%
Extension	3,658	52%	1,524	38%
Leapfrog	54	0%	3	0%
Inclusion	667	9%	508	12%

















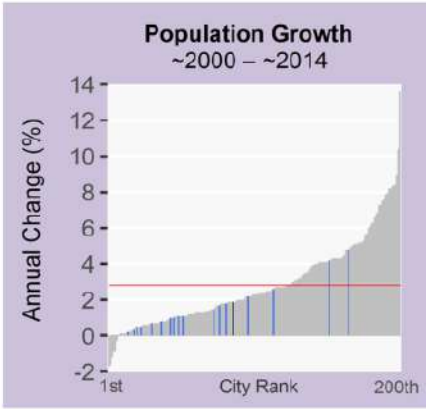
**Gainesville, FL, United States
1990-2013**

0 4 8 12 16 km

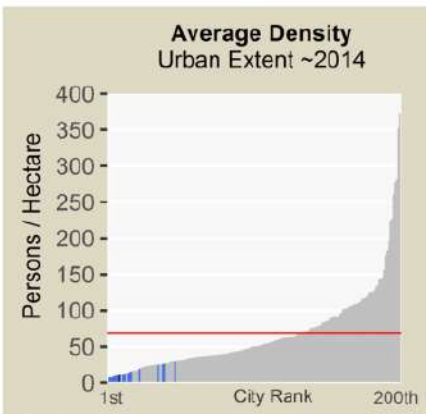
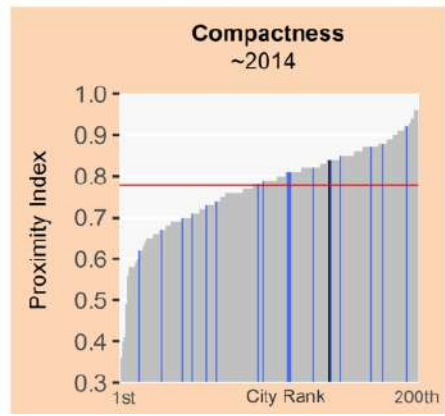
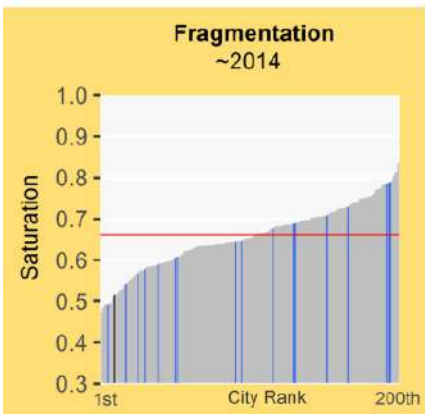
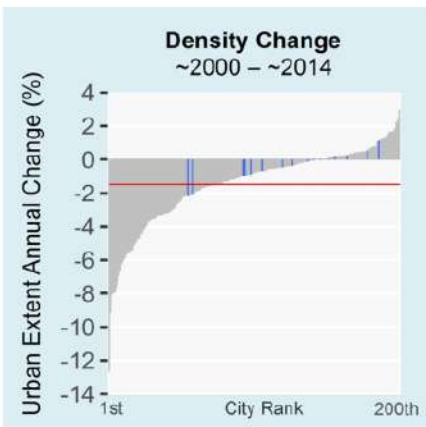
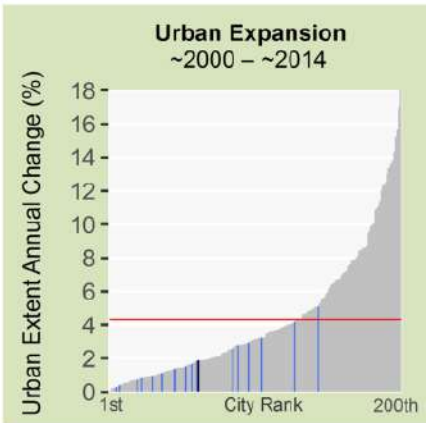
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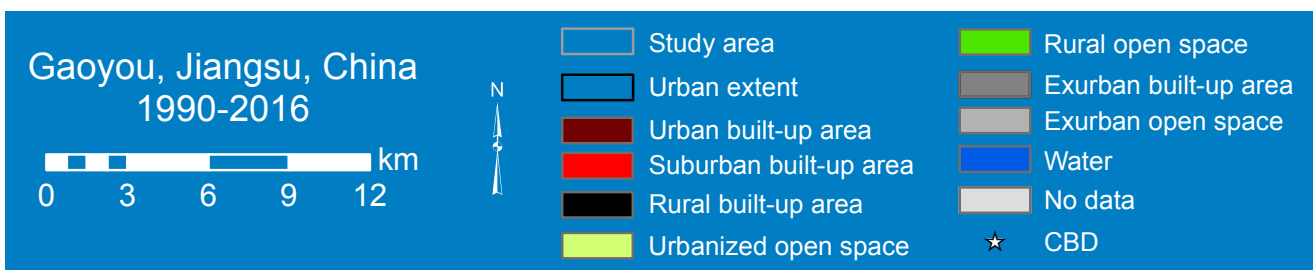
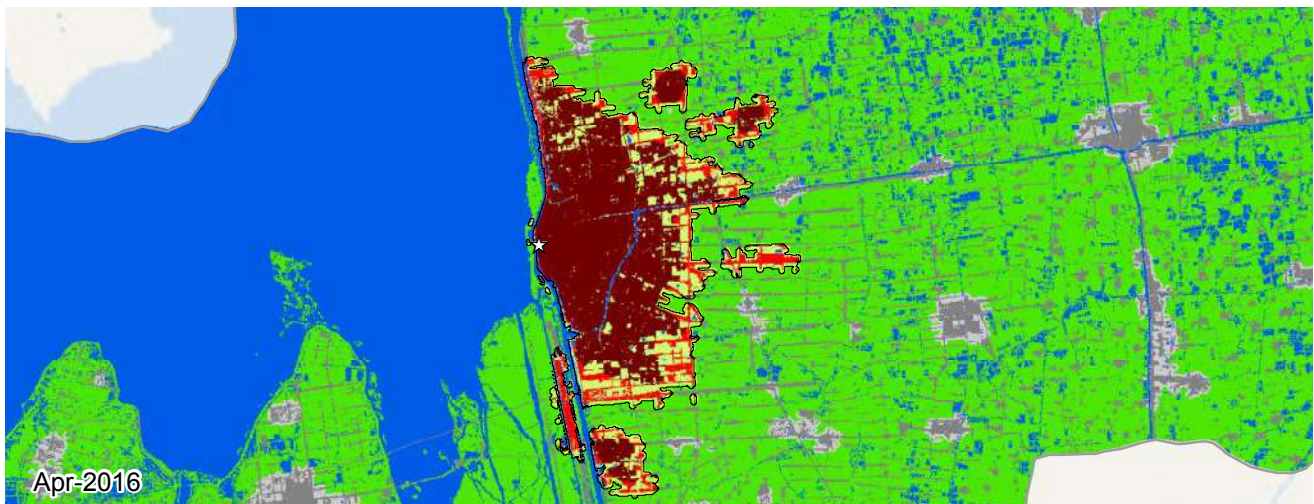
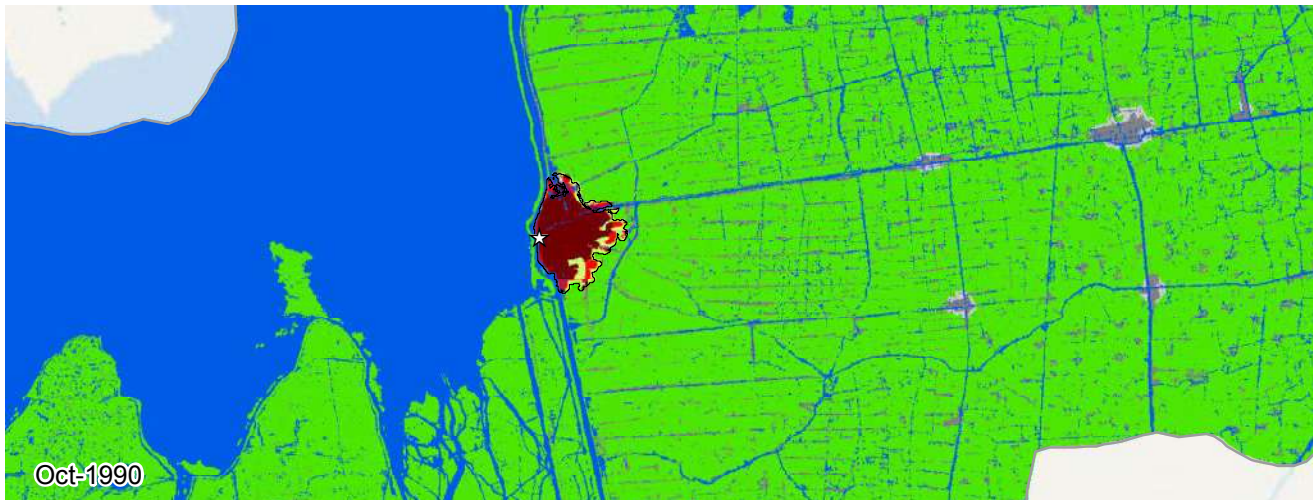
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Gainesville, FL, United States (Land-Rich Developed Countries)

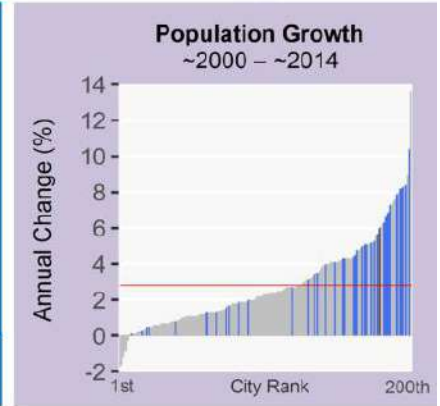


Metrics	Jul 1990	Oct 2000	Oct 2013	% Annual Change ('00-'13)
Population	112,979	137,911	175,755	1.9
Built-up Area (Hectares)				
Total	4,516	6,090	7,662	1.8
Urban	2,146	3,227	3,926	1.5
Suburban	2,235	2,704	3,539	2.1
Rural	134	158	196	1.6
Open space (Hectares)				
Urbanized Open Space	4,315	5,535	7,181	2.0
Urban Extent	8,831	11,626	14,844	1.9
Density (Persons / Hectare)				
Built-up Area Density	25.0	22.6	22.9	0.1
Urban Extent Density	12.8	11.9	11.8	-0.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.51	0.52	0.52	-0.1
Openness Index	0.48	0.46	0.47	0.1
Compactness (Roundness)				
Proximity	0.86	0.86	0.84	-0.2
Cohesion	0.86	0.85	0.83	-0.2
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	424	26%	340	21%
Extension	558	35%	217	13%
Leapfrog	14	0%	189	12%
Inclusion	577	36%	825	52%

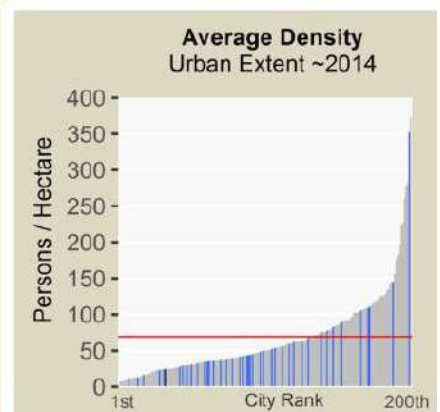
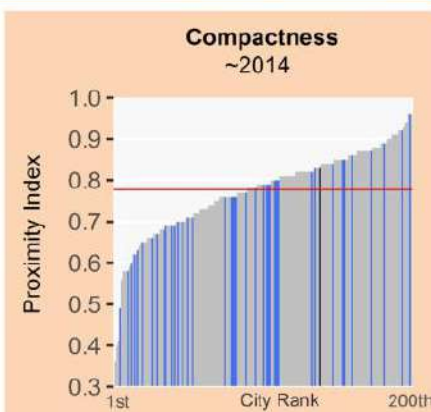
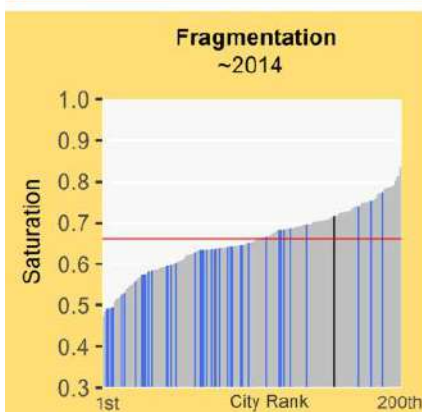
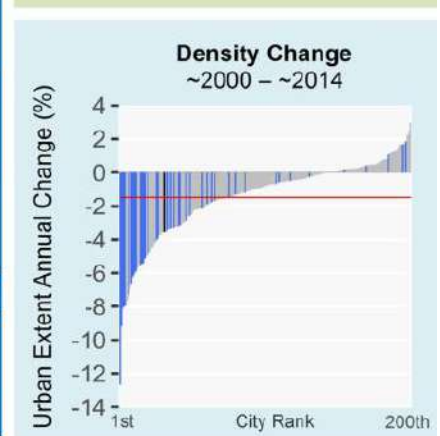
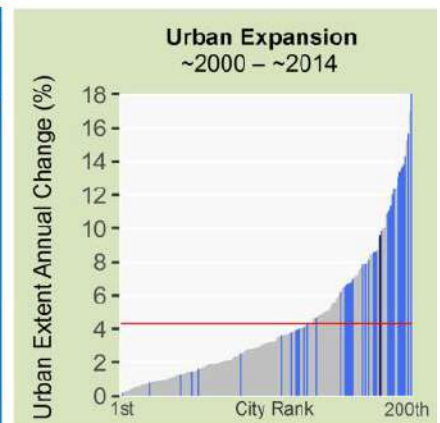


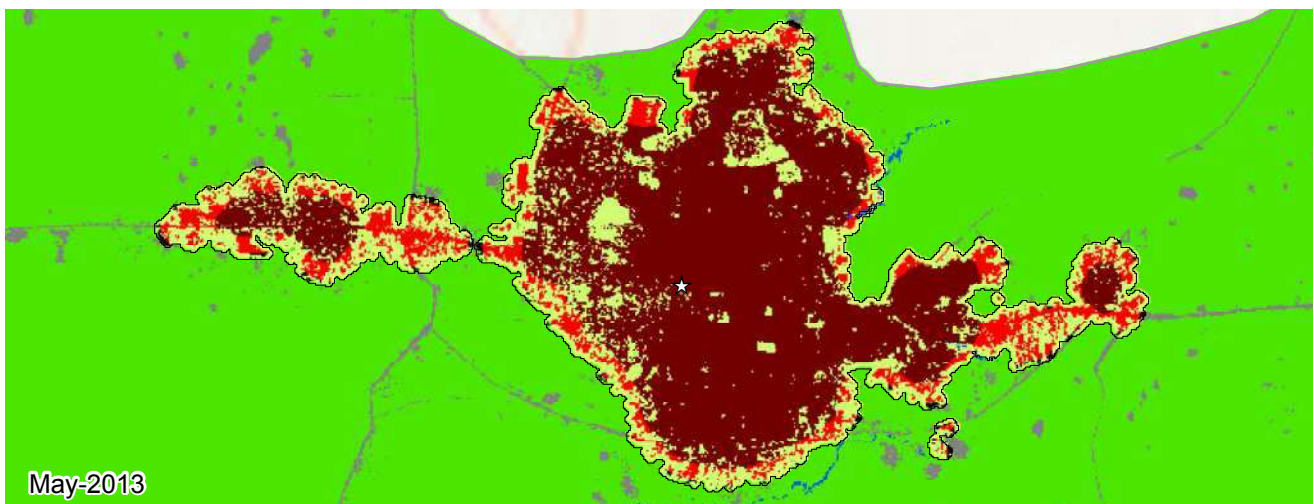
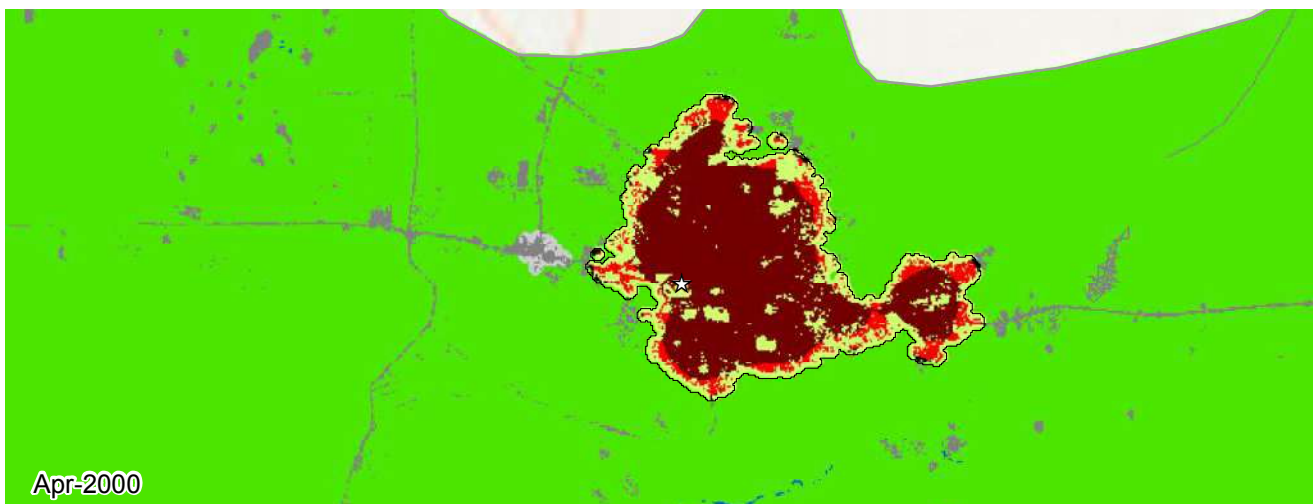
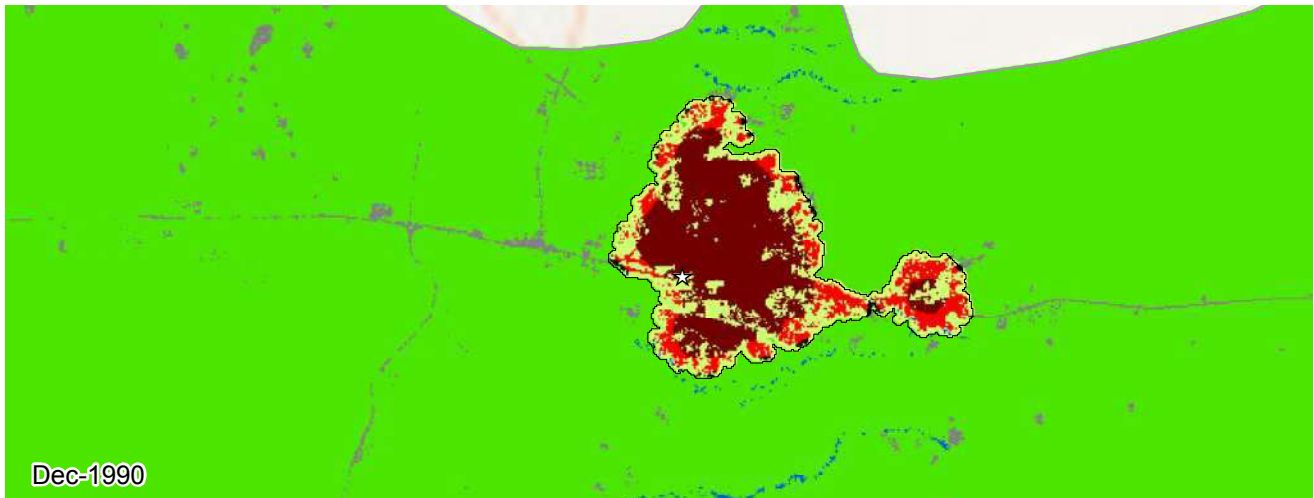


Gaoyou, Jiangsu, China (East Asia and the Pacific)



Metrics	Oct 1990	Jan 2000	Apr 2016	% Annual Change ('00-'16)
Population	86,595	70,291	186,351	6.0
Built-up Area (Hectares)				
Total	695	1,128	5,335	9.6
Urban	576	855	4,251	9.9
Suburban	105	254	1,003	8.4
Rural	13	18	80	9.2
Open space (Hectares)				
Urbanized Open Space	164	443	2,110	9.6
Urban Extent	859	1,572	7,446	9.6
Density (Persons / Hectare)				
Built-up Area Density	124.5	62.3	34.9	-3.6
Urban Extent Density	100.7	44.7	25.0	-3.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.81	0.72	0.72	-0.0
Openness Index	0.26	0.30	0.27	-0.7
Compactness (Roundness)				
Proximity	0.96	0.94	0.83	-0.8
Cohesion	0.95	0.93	0.81	-0.8
Added Area (Hectares)	'90-'00	Share	'00-'16	Share
Infill	46	10%	360	8%
Extension	306	70%	2,770	65%
Leapfrog	0	0%	3	0%
Inclusion	79	18%	1,072	25%





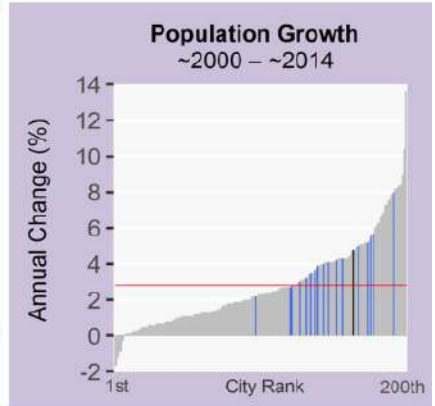
**Gombe, Nigeria
1990-2013**

0 1 2 3 4 km

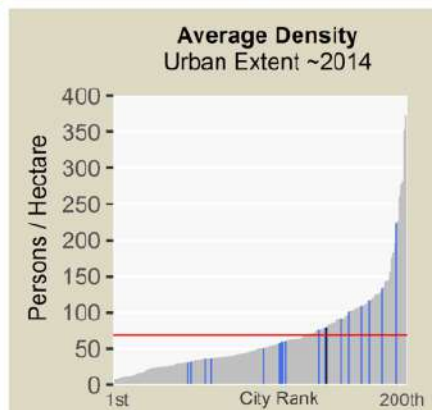
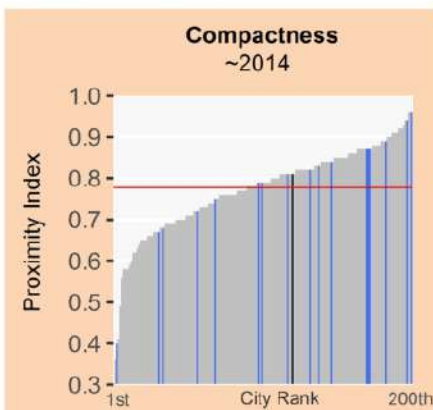
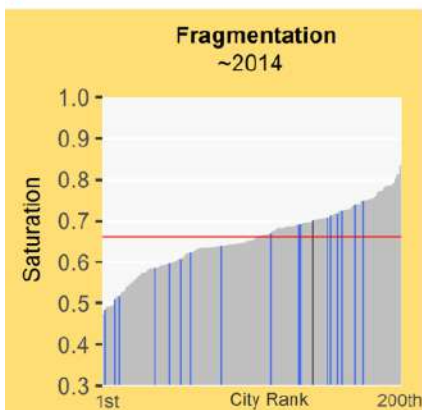
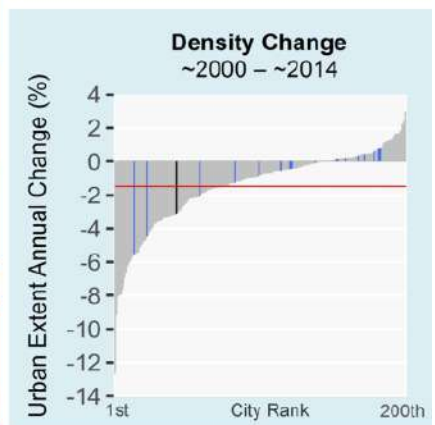
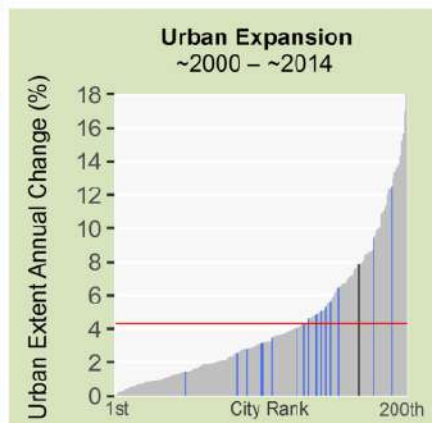
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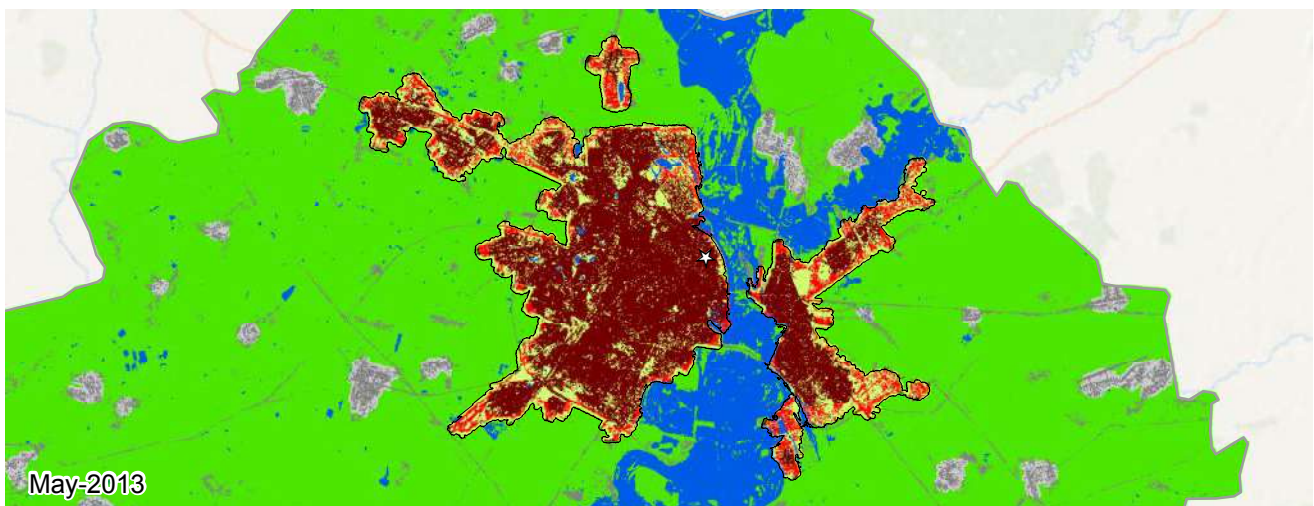
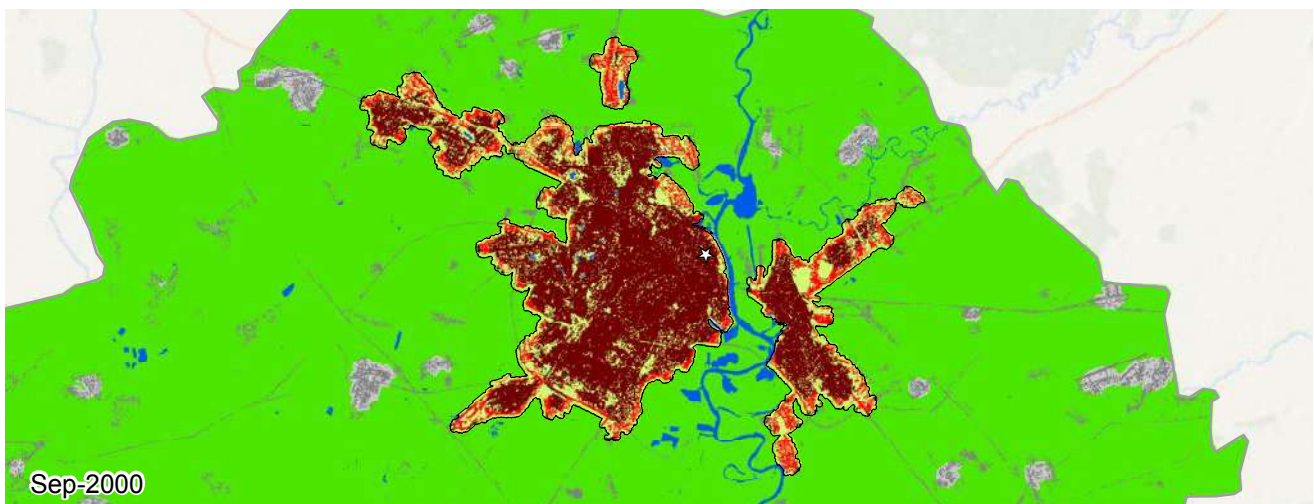
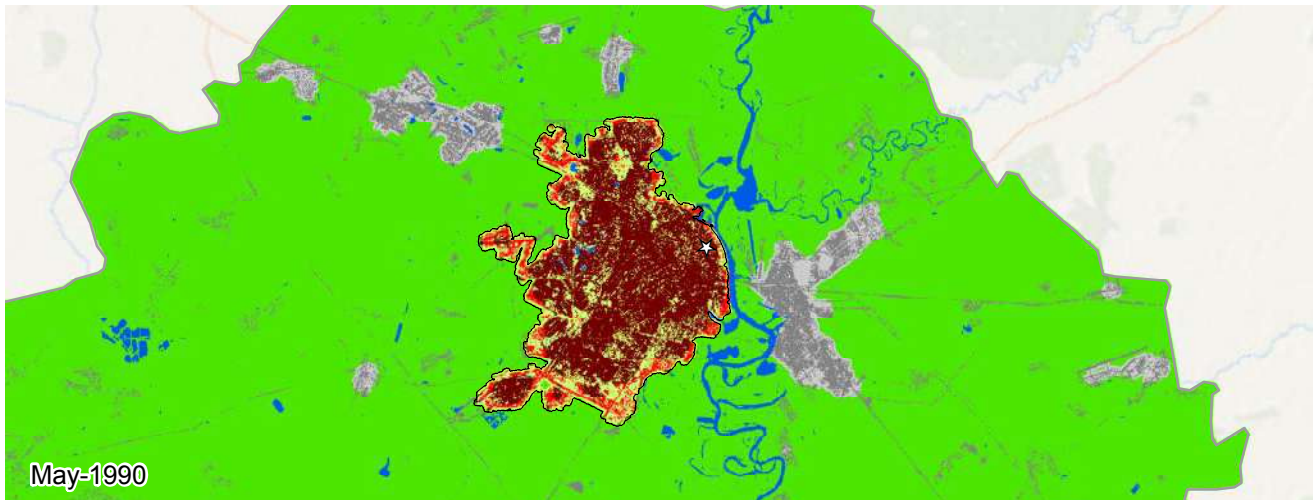
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Gombe, Nigeria (Sub-Saharan Africa)



Metrics	Dec 1990	Apr 2000	May 2013	% Annual Change ('00-'13)
Population	158,338	222,581	416,874	4.8
Built-up Area (Hectares)				
Total	949	1,326	3,699	7.8
Urban	691	1,116	3,064	7.7
Suburban	236	191	586	8.6
Rural	22	18	47	7.2
Open space (Hectares)				
Urbanized Open Space	520	544	1,563	8.1
Urban Extent	1,470	1,870	5,262	7.9
Density (Persons / Hectare)				
Built-up Area Density	166.7	167.8	112.7	-3.0
Urban Extent Density	107.6	119.0	79.2	-3.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.71	0.70	-0.1
Openness Index	0.33	0.26	0.25	-0.2
Compactness (Roundness)				
Proximity	0.86	0.90	0.81	-0.8
Cohesion	0.85	0.89	0.78	-0.9
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	182	48%	205	8%
Extension	169	44%	1,913	80%
Leapfrog	0	0%	0	0%
Inclusion	25	6%	253	10%

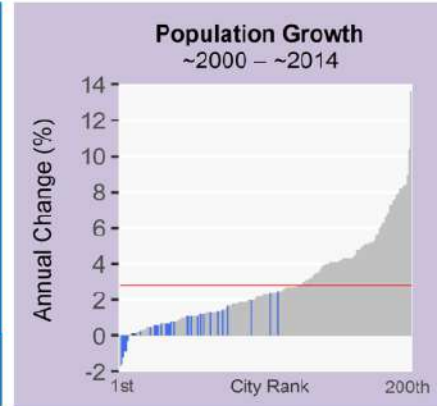
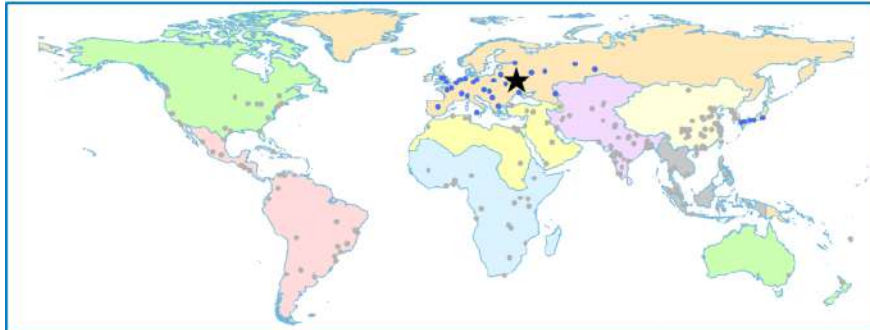




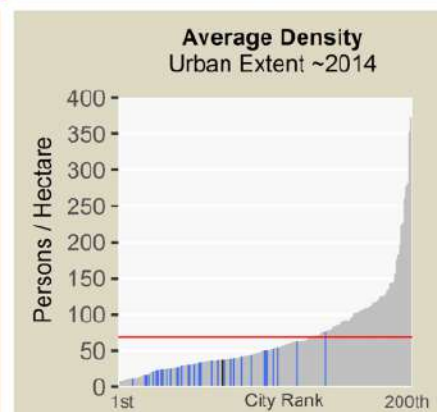
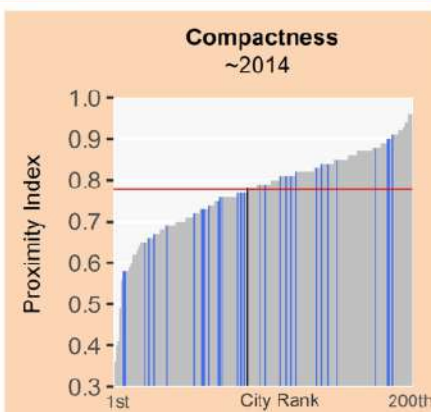
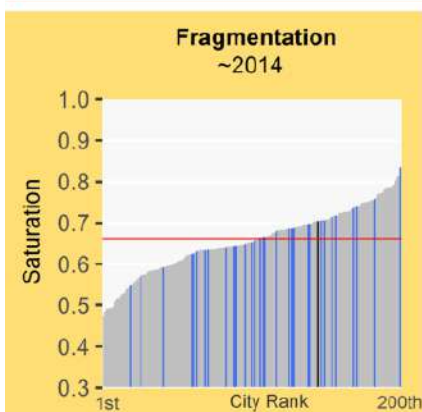
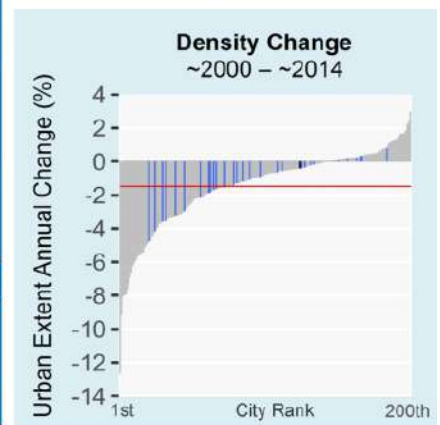
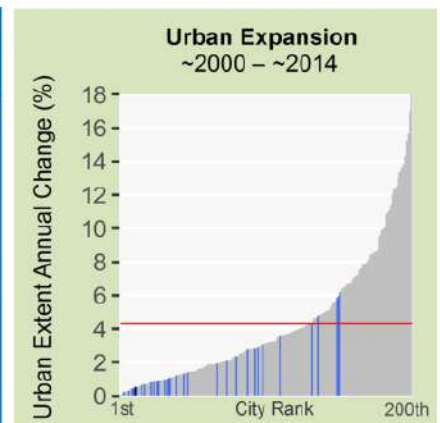
**Gomel, Belarus
1990-2013**

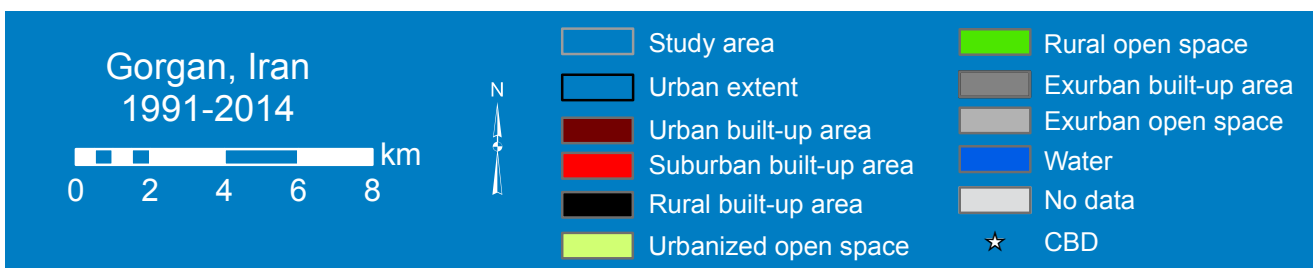
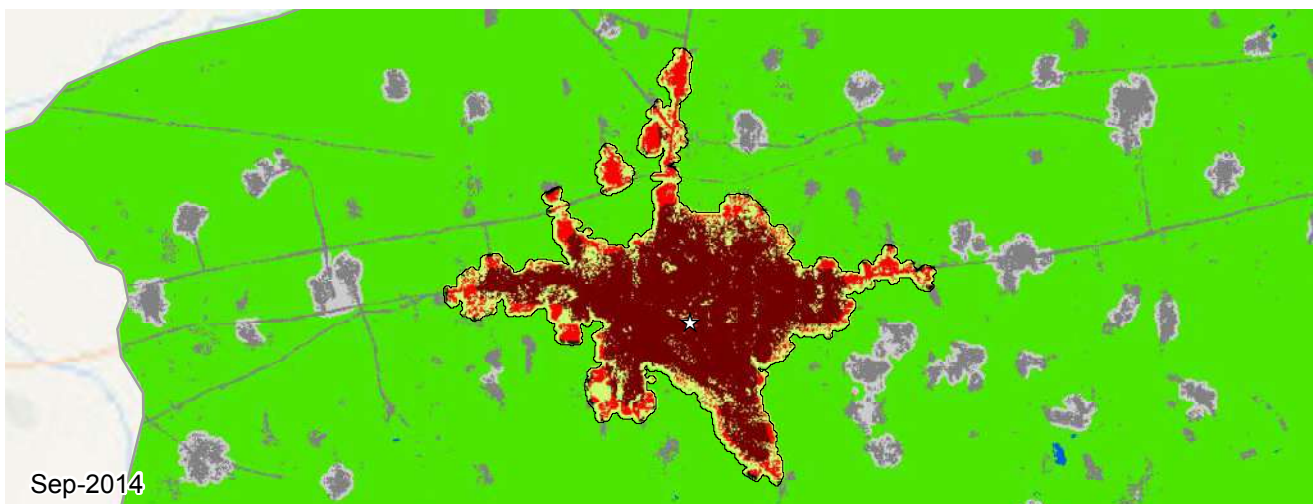
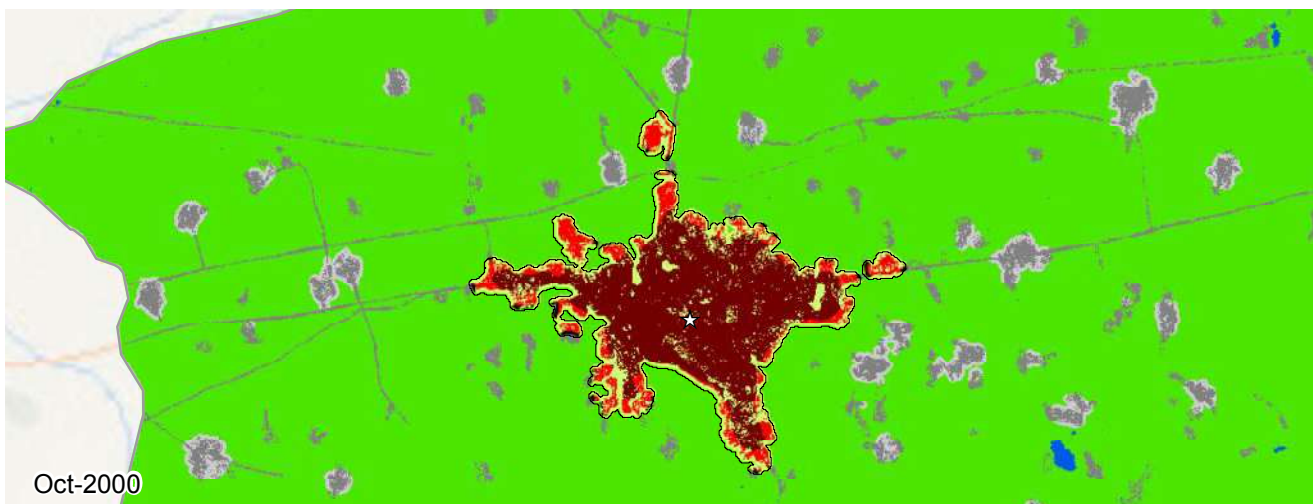
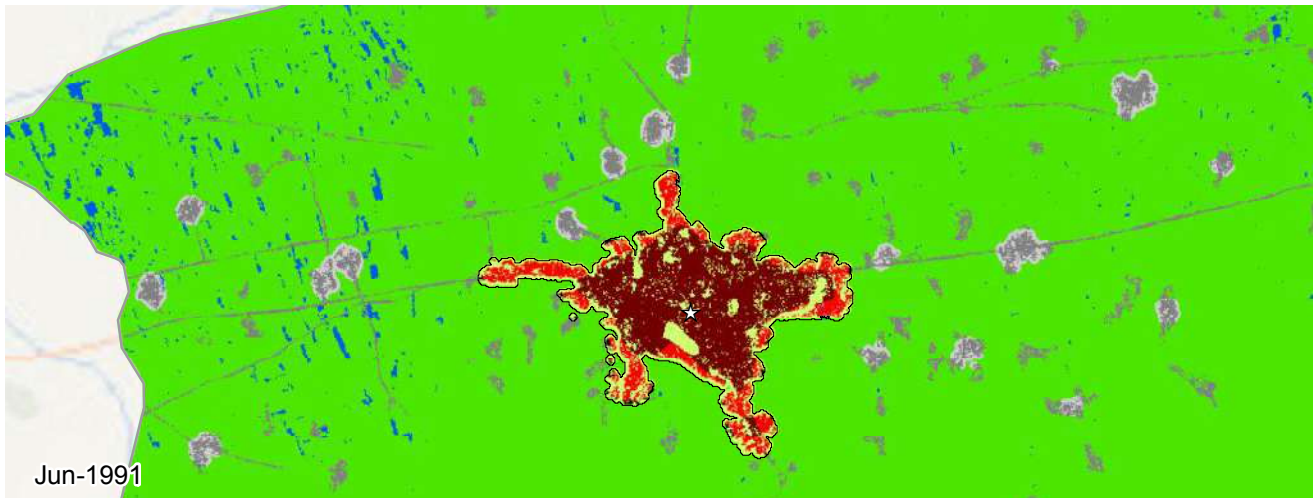
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Gomel, Belarus (Europe and Japan)

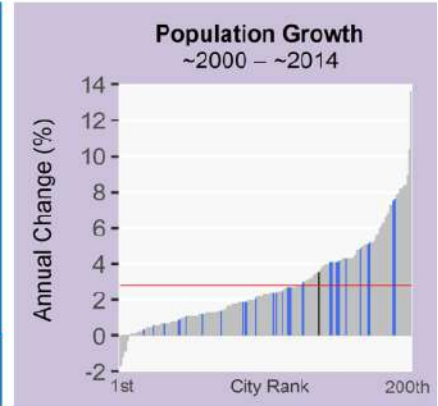


Metrics	May 1990	Sep 2000	May 2013	% Annual Change ('00-'13)
Population	434,467	501,664	508,557	0.1
Built-up Area (Hectares)				
Total	5,152	8,738	9,573	0.7
Urban	4,345	7,047	7,763	0.8
Suburban	762	1,561	1,692	0.6
Rural	43	129	116	-0.8
Open space (Hectares)				
Urbanized Open Space	2,249	3,986	4,013	0.1
Urban Extent	7,402	12,724	13,586	0.5
Density (Persons / Hectare)				
Built-up Area Density	84.3	57.4	53.1	-0.6
Urban Extent Density	58.7	39.4	37.4	-0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.70	0.69	0.70	0.2
Openness Index	0.28	0.29	0.28	-0.2
Compactness (Roundness)				
Proximity	0.93	0.78	0.78	-0.0
Cohesion	0.92	0.75	0.75	-0.0
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	897	25%	407	48%
Extension	720	20%	136	16%
Leapfrog	26	0%	118	14%
Inclusion	1,941	54%	172	20%

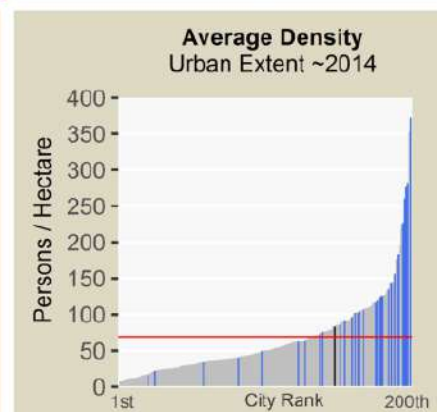
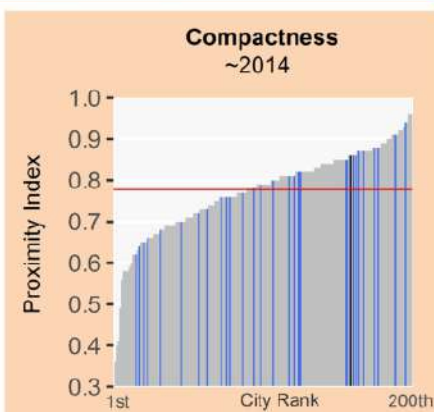
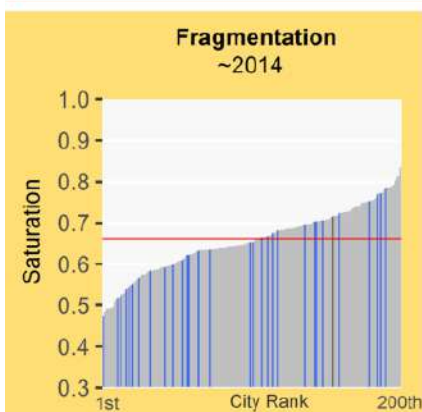
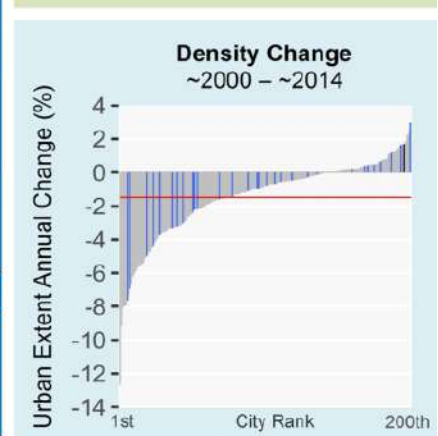
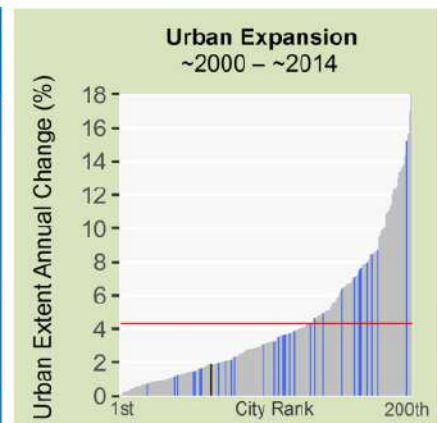


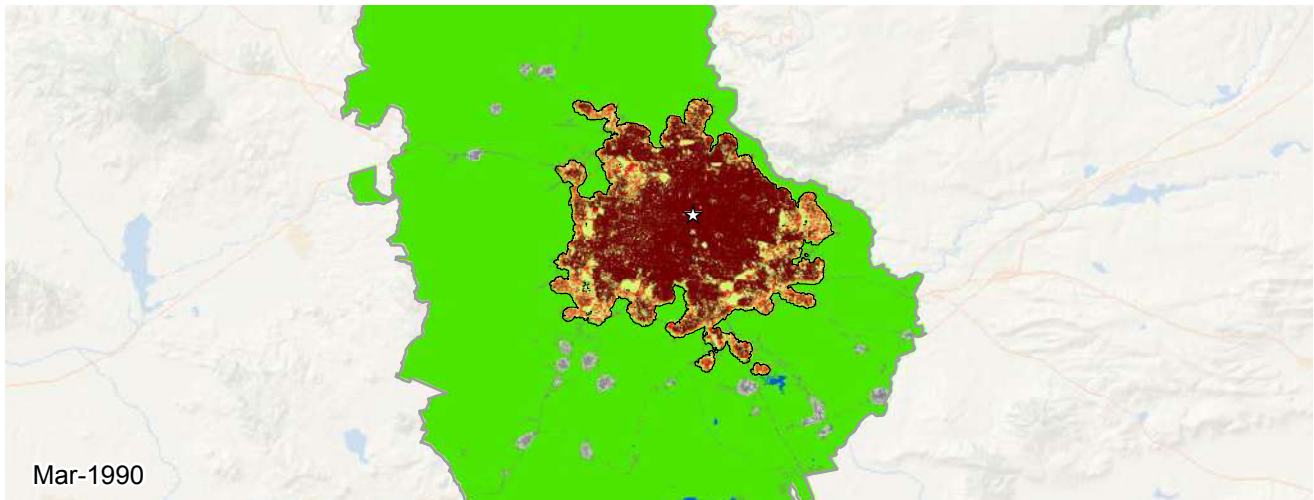


Gorgan, Iran (South and Central Asia)

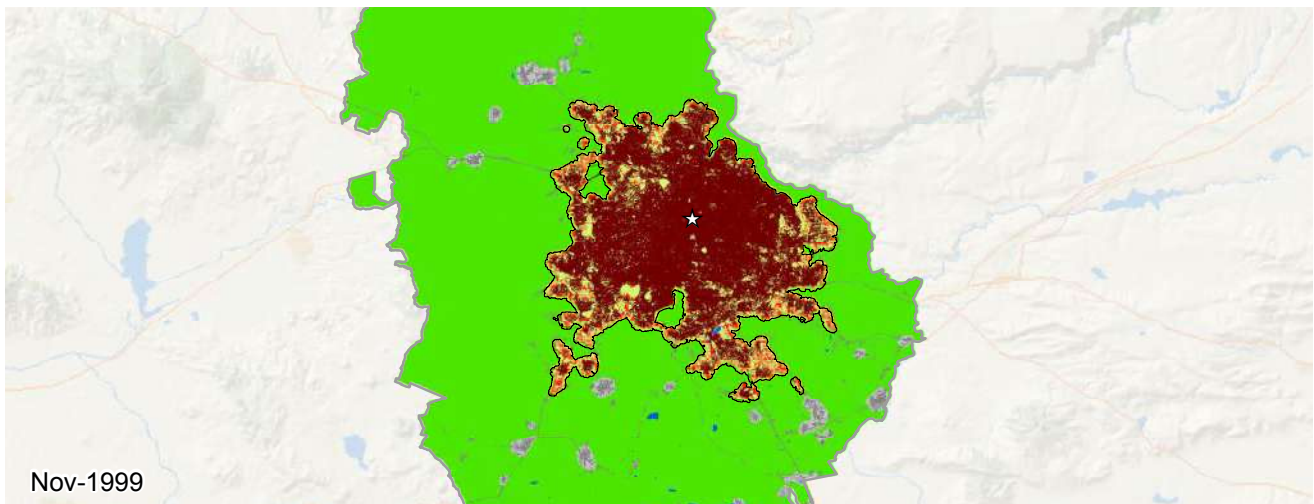


Metrics	Jun 1991	Oct 2000	Sep 2014	% Annual Change ('00-'14)
Population	142,122	227,778	375,740	3.6
Built-up Area (Hectares)				
Total	1,777	2,523	3,234	1.8
Urban	1,279	2,001	2,570	1.8
Suburban	467	472	605	1.8
Rural	30	48	58	1.3
Open space (Hectares)				
Urbanized Open Space	882	956	1,287	2.1
Urban Extent	2,660	3,479	4,522	1.9
Density (Persons / Hectare)				
Built-up Area Density	80.0	90.3	116.2	1.8
Urban Extent Density	53.4	65.5	83.1	1.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.67	0.73	0.72	-0.1
Openness Index	0.33	0.27	0.26	-0.5
Compactness (Roundness)				
Proximity	0.86	0.86	0.86	-0.0
Cohesion	0.84	0.84	0.84	0.0
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	290	38%	228	32%
Extension	310	41%	308	43%
Leapfrog	0	0%	6	0%
Inclusion	144	19%	168	23%

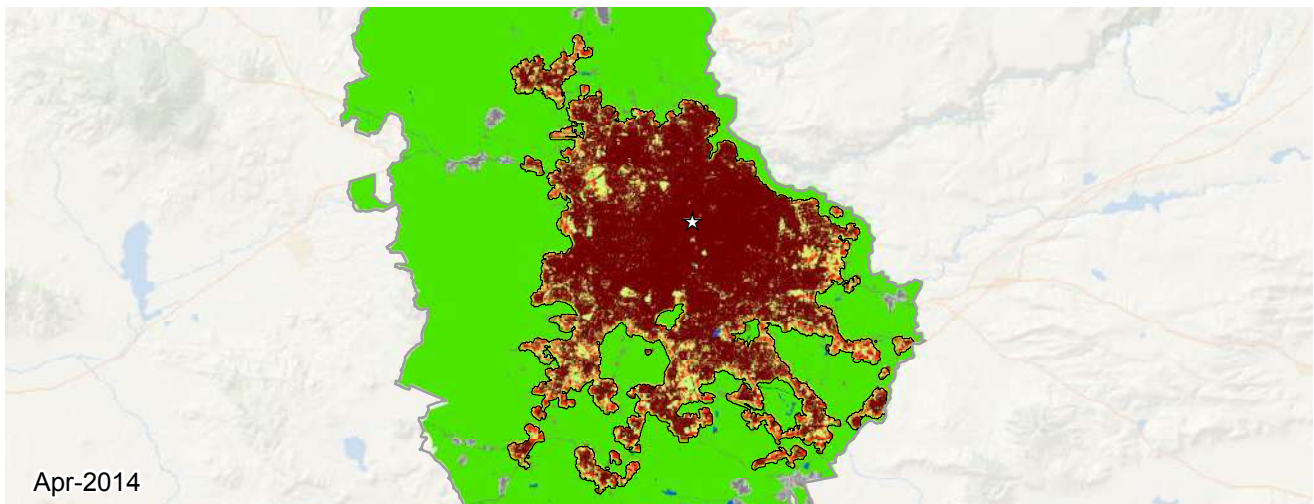




Mar-1990



Nov-1999



Apr-2014

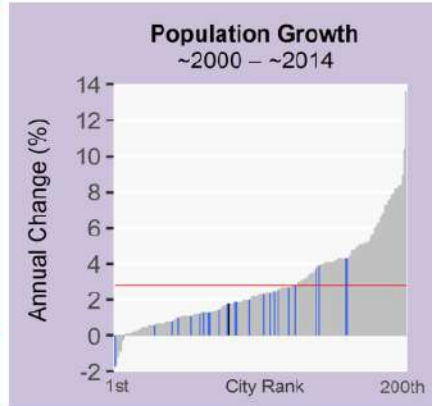
Guadalajara, Mexico
1990-2014

0 8 16 24 32 km

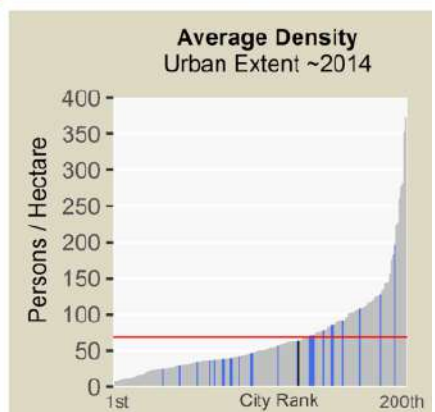
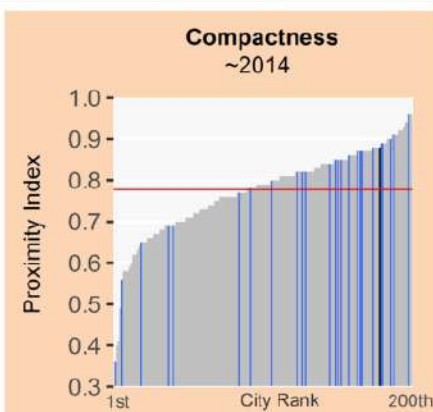
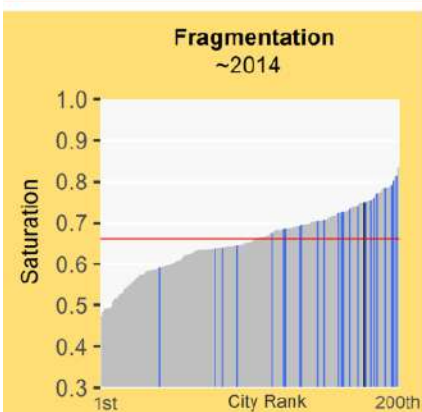
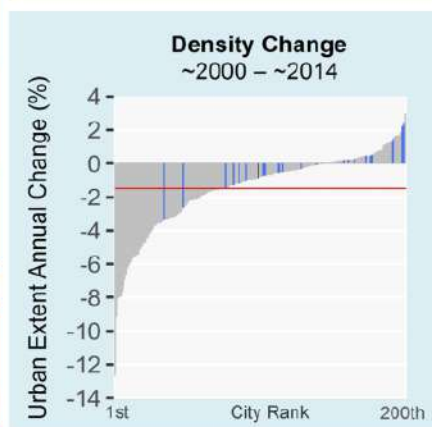
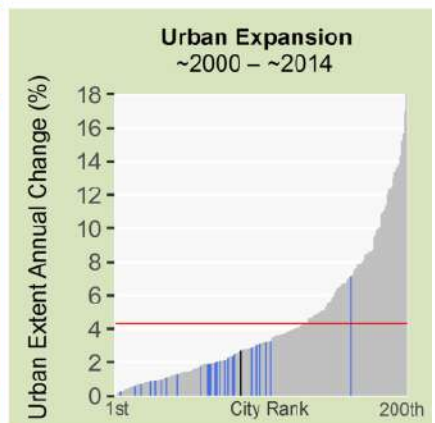
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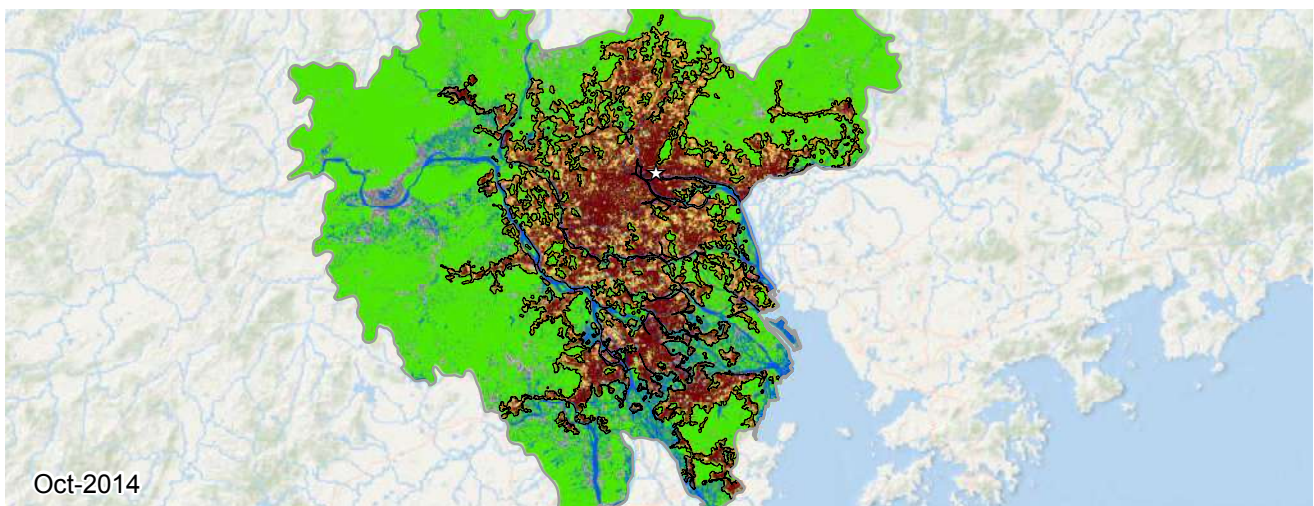
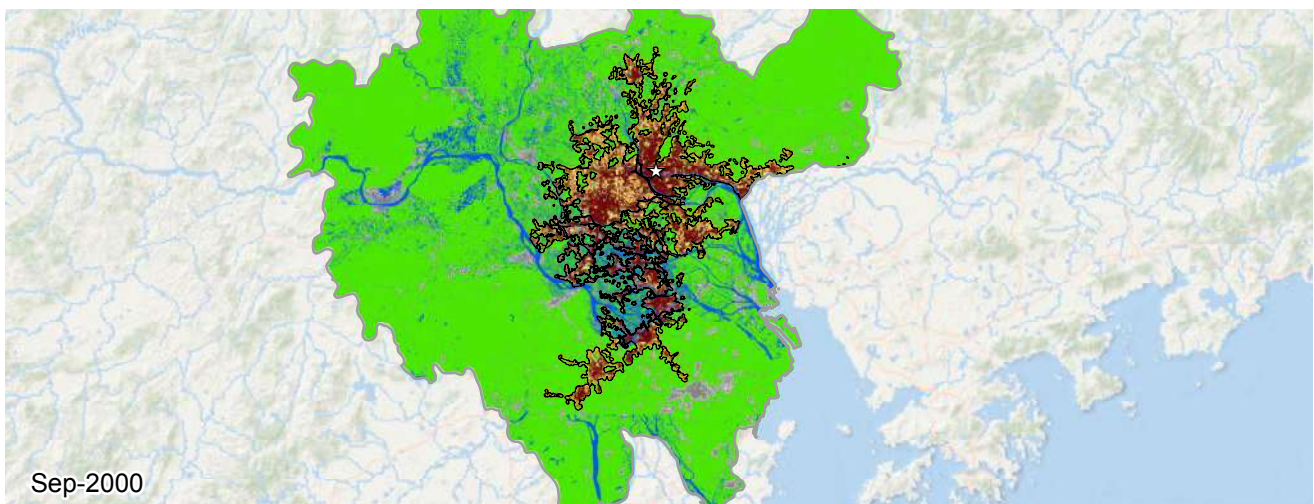
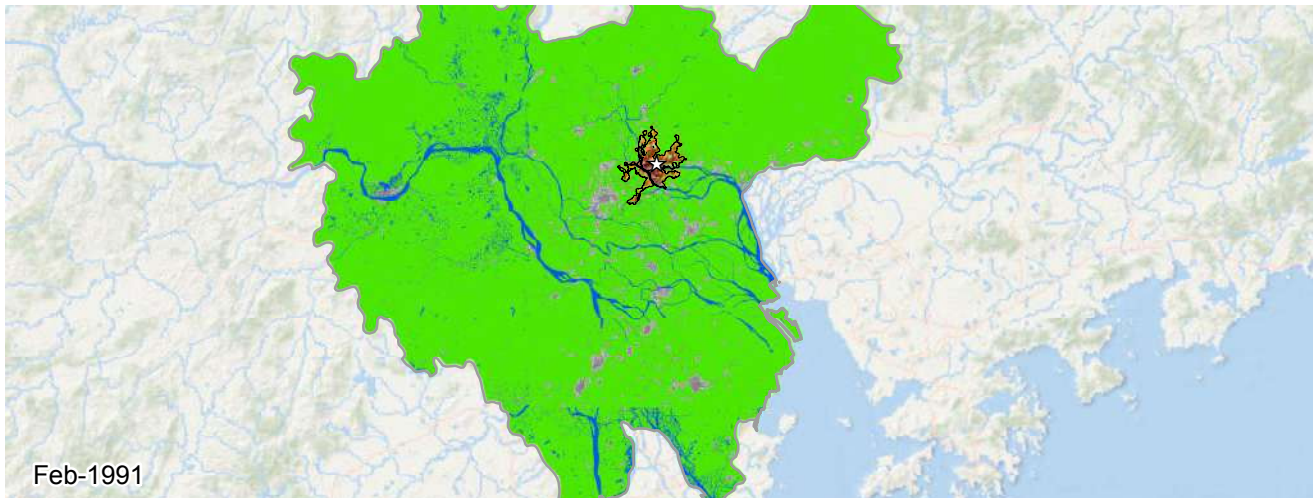
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Guadalajara, Mexico (Latin America and the Caribbean)



Metrics	Mar 1990	Nov 1999	Apr 2014	% Annual Change ('99-'14)
Population	2,802,064	3,360,858	4,375,720	1.8
Built-up Area (Hectares)				
Total	26,757	35,079	51,624	2.7
Urban	22,900	31,367	44,885	2.5
Suburban	3,619	3,453	6,278	4.1
Rural	237	259	459	4.0
Open space (Hectares)				
Urbanized Open Space	11,156	11,564	17,191	2.8
Urban Extent	37,914	46,643	68,815	2.7
Density (Persons / Hectare)				
Built-up Area Density	104.7	95.8	84.8	-0.8
Urban Extent Density	73.9	72.1	63.6	-0.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.71	0.75	0.75	-0.0
Openness Index	0.22	0.18	0.20	0.5
Compactness (Roundness)				
Proximity	0.95	0.94	0.88	-0.4
Cohesion	0.94	0.93	0.87	-0.4
Added Area (Hectares)	'90-'99	Share	'99-'14	Share
Infill	4,521	54%	5,235	31%
Extension	2,708	32%	7,905	47%
Leapfrog	24	0%	380	2%
Inclusion	1,091	13%	3,022	18%





Guangzhou, Guangdong, China
1991-2014

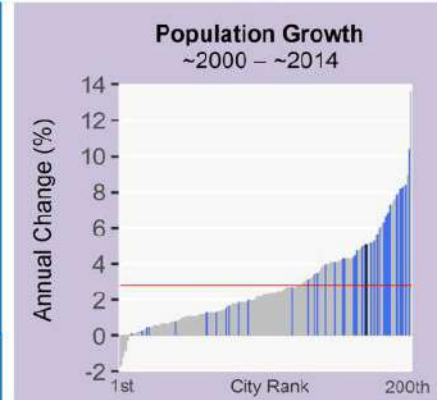


- | | |
|------------------------|-----------------------|
| Study area | Rural open space |
| Urban extent | Exurban built-up area |
| Urban built-up area | Exurban open space |
| Suburban built-up area | Water |
| Rural built-up area | No data |
| Urbanized open space | CBD |

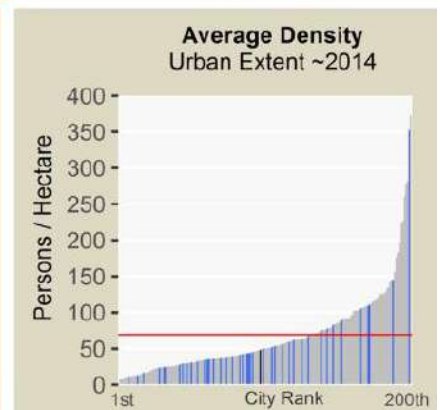
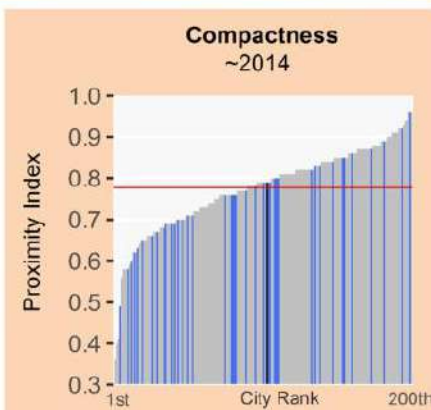
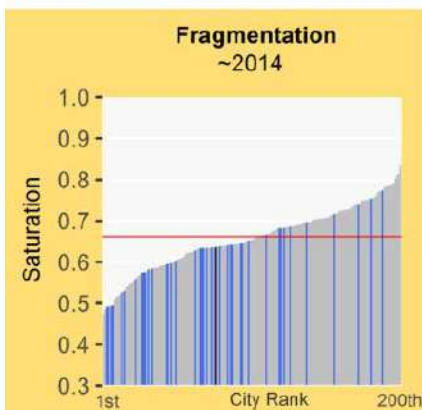
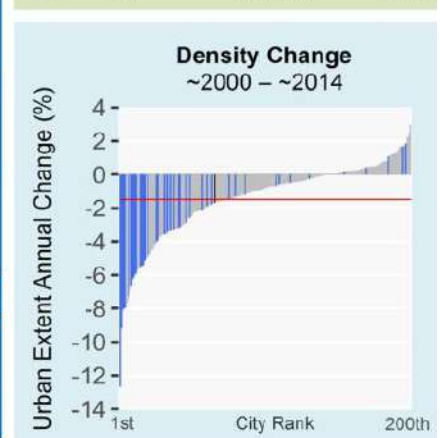
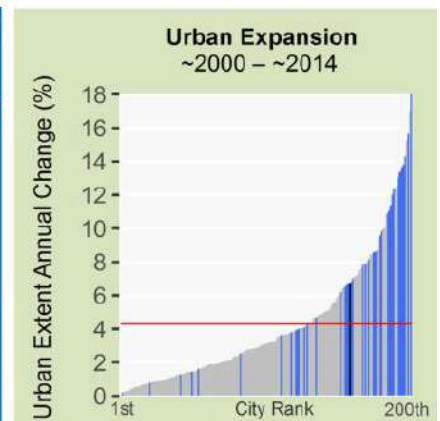
Guangzhou, Guangdong, China (East Asia and the Pacific)

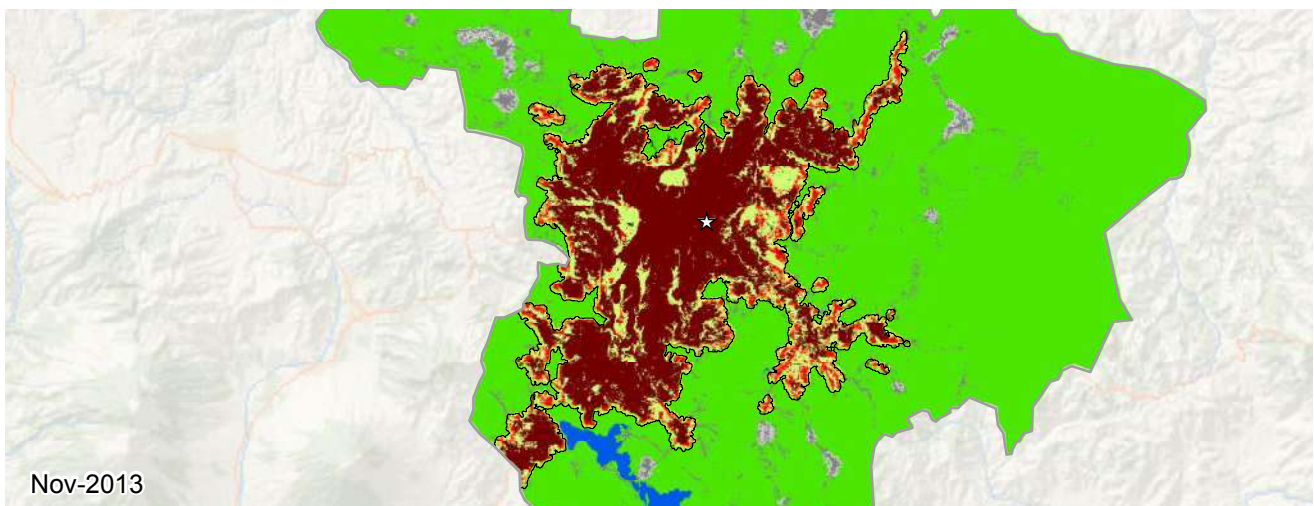
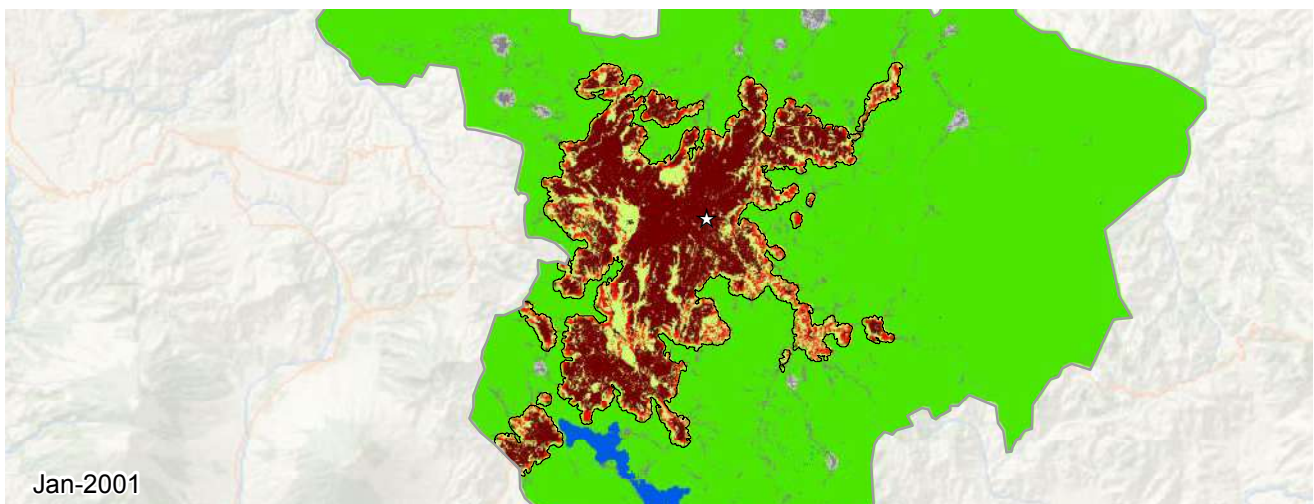
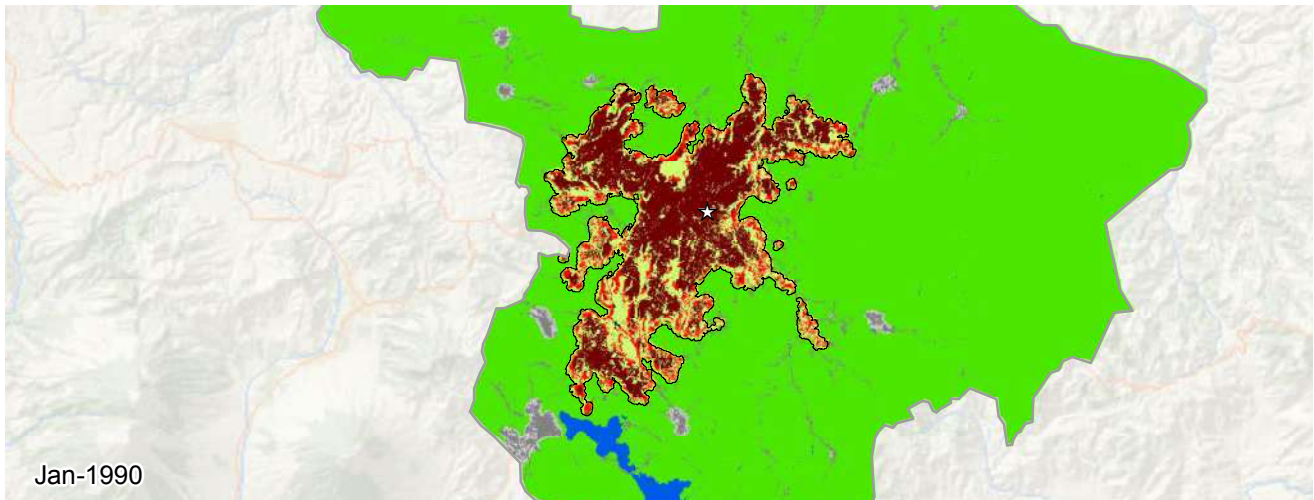


Legend for Charts
 Guangzhou | Other cities in region | All other cities | Global average



Metrics	Feb 1991	Sep 2000	Oct 2014	% Annual Change ('00-'14)
Population	2,405,071	12,039,121	24,657,220	5.1
Built-up Area (Hectares)				
Total	8,182	120,182	323,147	7.0
Urban	4,880	77,412	237,094	7.9
Suburban	3,037	39,583	80,406	5.0
Rural	264	3,186	5,647	4.1
Open space (Hectares)				
Urbanized Open Space	6,836	75,289	185,111	6.4
Urban Extent	15,019	195,471	508,259	6.8
Density (Persons / Hectare)				
Built-up Area Density	293.9	100.2	76.3	-1.9
Urban Extent Density	160.1	61.6	48.5	-1.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.61	0.64	0.2
Openness Index	0.45	0.39	0.34	-0.9
Compactness (Roundness)				
Proximity	0.82	0.71	0.79	0.8
Cohesion	0.80	0.69	0.77	0.7
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	11,302	10%	36,502	17%
Extension	70,580	63%	106,604	52%
Leapfrog	295	0%	3,602	1%
Inclusion	29,851	26%	56,252	27%





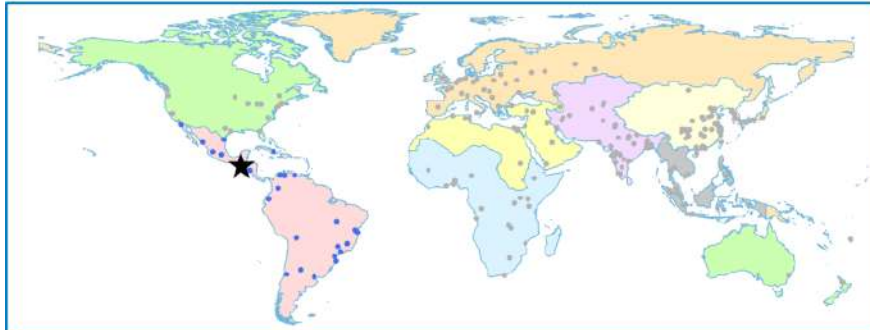
Guatemala City, Guatemala
1990-2013

0 6 12 18 24 km

Legend:

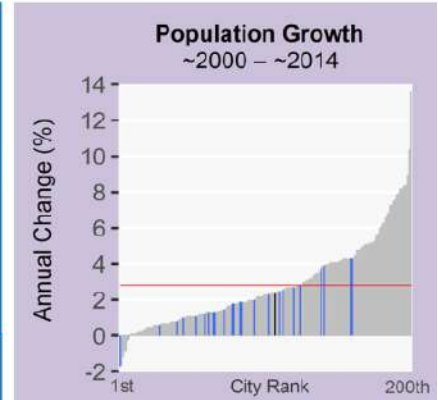
- Study area
- Urban extent
- Urban built-up area
- Suburban built-up area
- Rural built-up area
- Urbanized open space
- Rural open space
- Exurban built-up area
- Exurban open space
- Water
- No data
- CBD

Guatemala City, Guatemala (Latin America and the Caribbean)

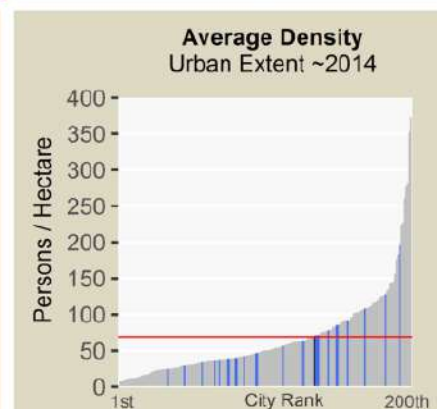
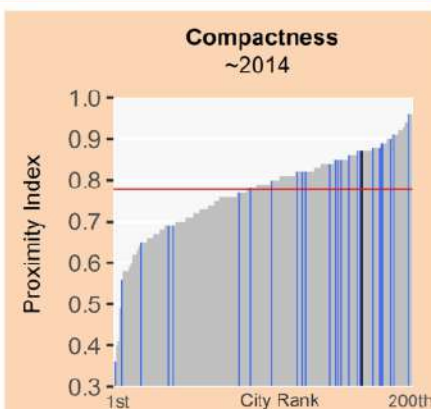
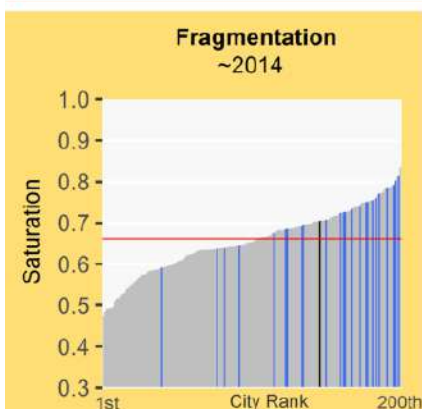
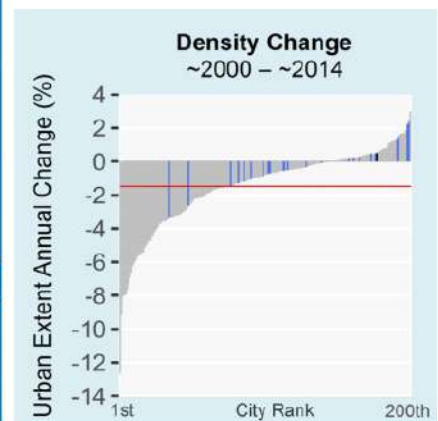
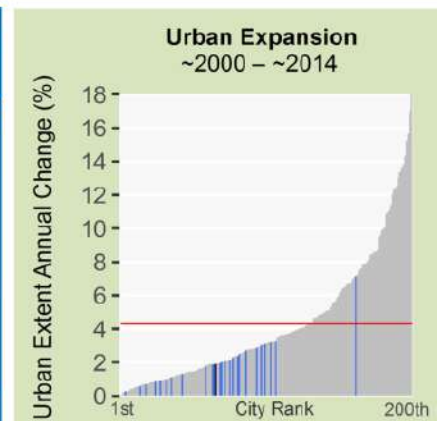


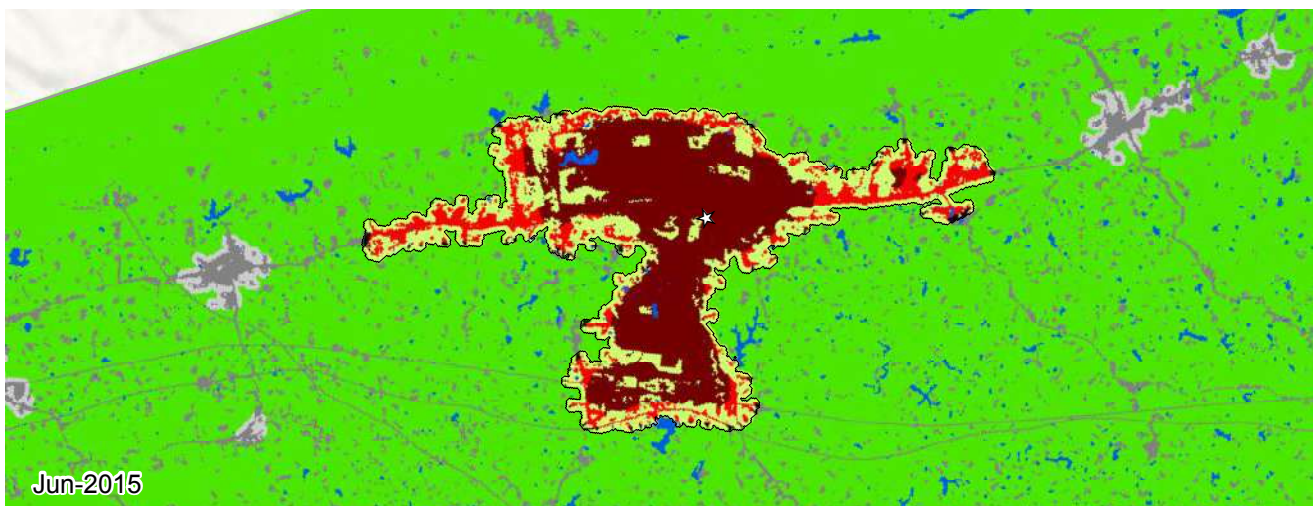
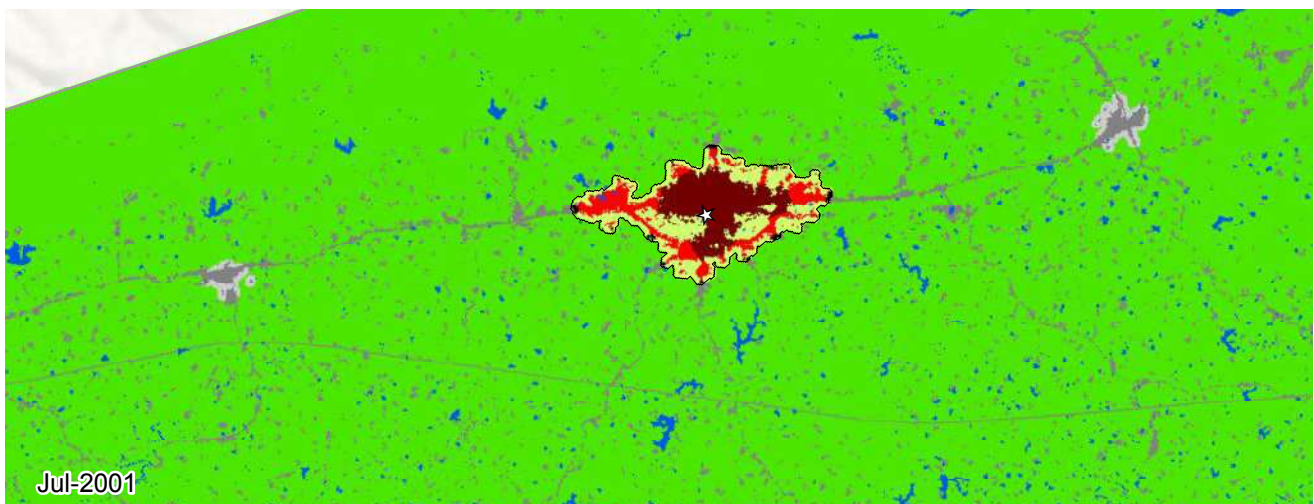
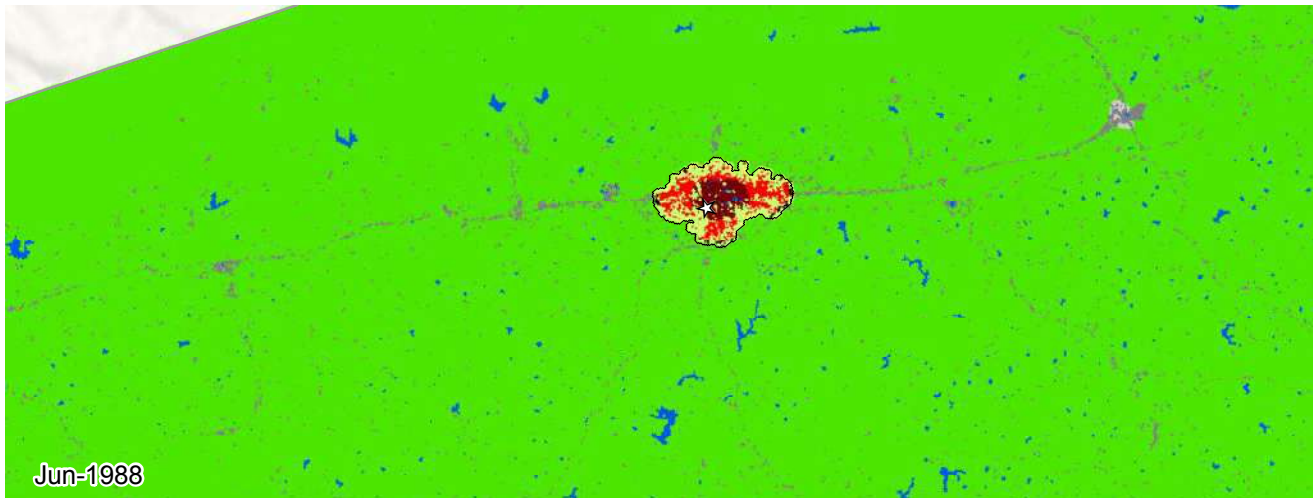
Legend for Charts

Guatemala City | Other cities in region | All other cities | Global average















Metrics	Jan 1990	Jan 2001	Nov 2013	% Annual Change ('01-'13)
Population	1,128,877	1,946,427	2,654,084	2.4
Built-up Area (Hectares)				
Total	13,307	19,229	26,506	2.5
Urban	9,830	15,212	22,401	3.0
Suburban	3,251	3,749	3,808	0.1
Rural	224	266	296	0.8
Open space (Hectares)				
Urbanized Open Space	8,281	10,243	11,059	0.6
Urban Extent	21,588	29,472	37,565	1.9
Density (Persons / Hectare)				
Built-up Area Density	84.8	101.2	100.1	-0.1
Urban Extent Density	52.3	66.0	70.7	0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.65	0.71	0.6
Openness Index	0.33	0.29	0.23	-1.8
Compactness (Roundness)				
Proximity	0.84	0.83	0.87	0.3
Cohesion	0.83	0.81	0.85	0.5
Added Area (Hectares)	'90-'01	Share	'01-'13	Share
Infill	2,051	34%	3,810	52%
Extension	2,038	34%	2,478	34%
Leapfrog	230	3%	24	0%
Inclusion	1,603	27%	963	13%



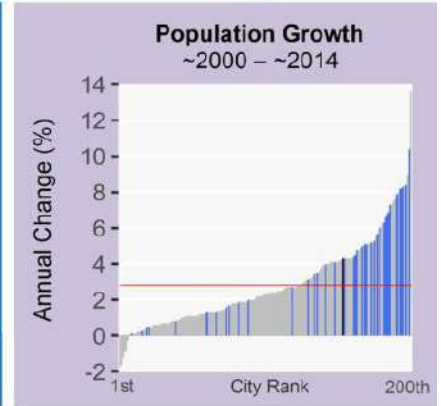


**Guixi, Chongqing, China
1988-2015**

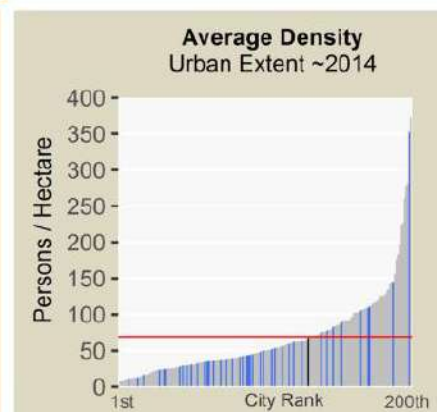
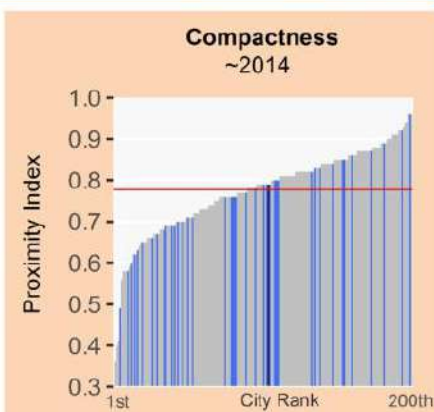
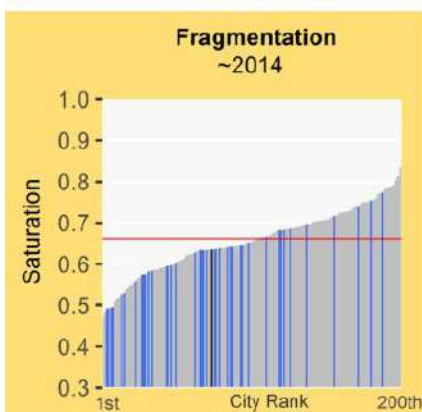
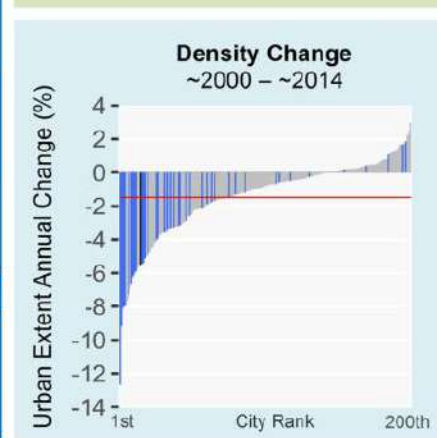
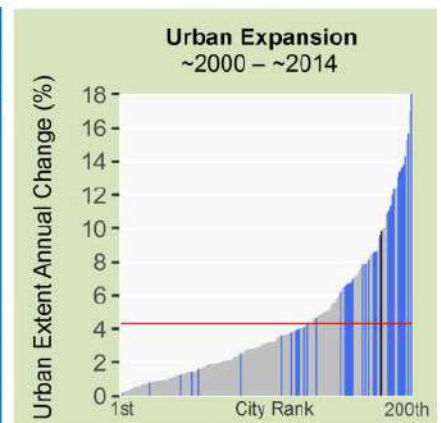
0 1.5 3 4.5 6 km

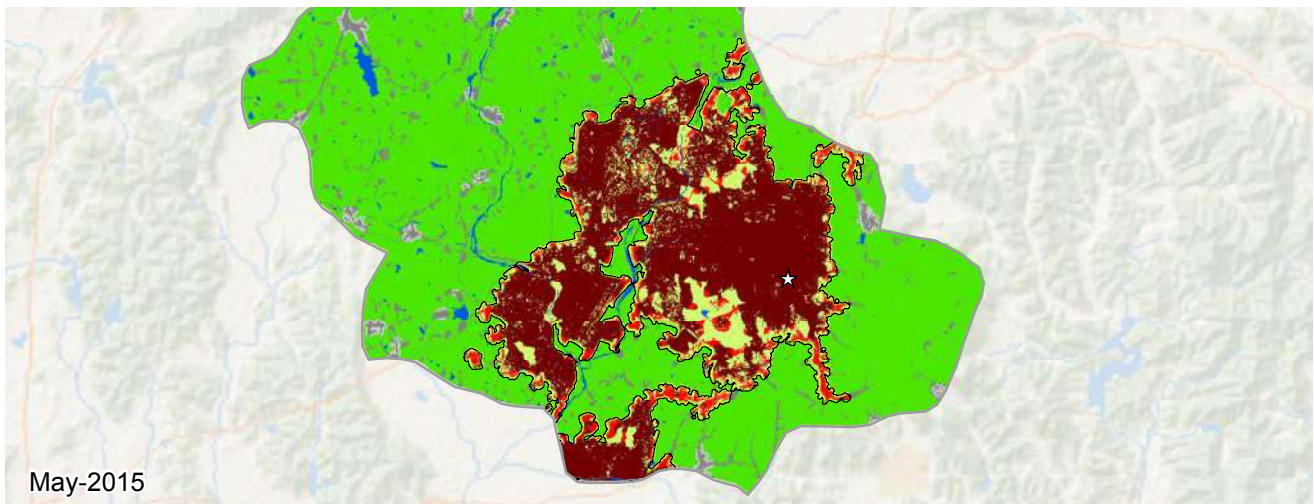
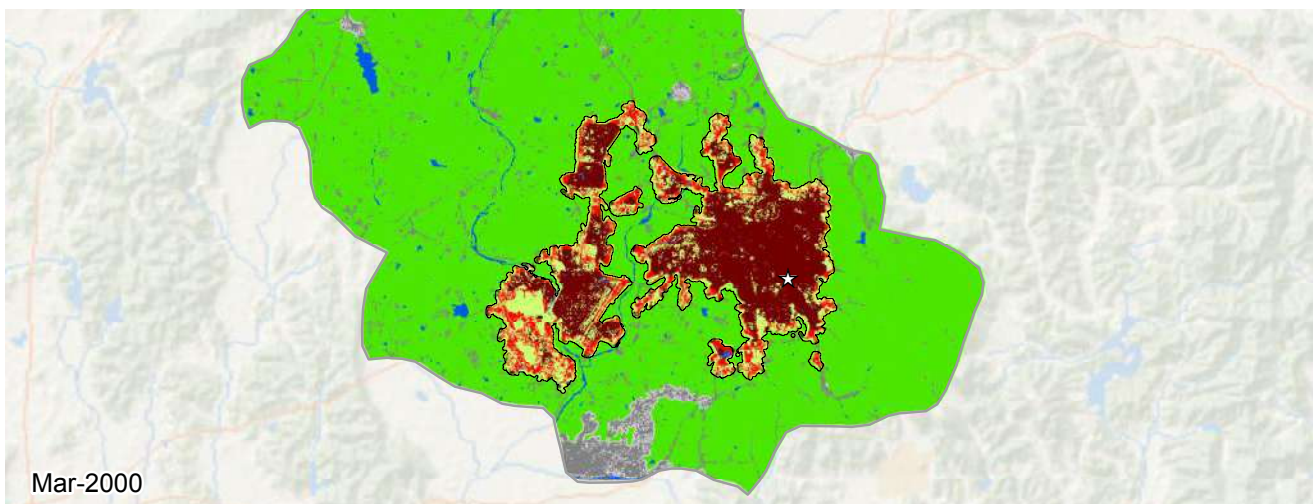
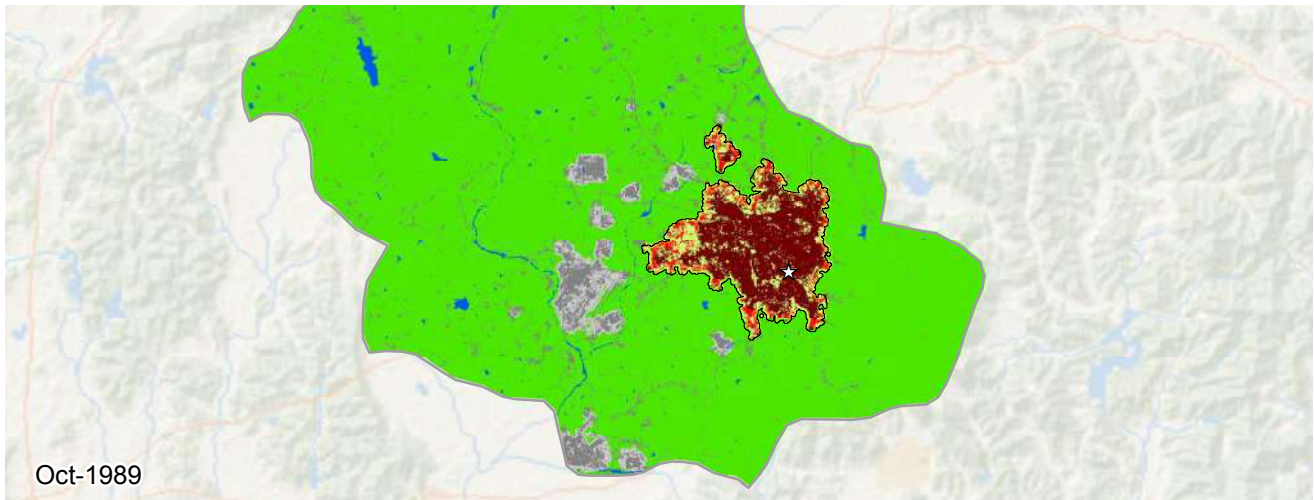
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Guixi, Chongqing, China (East Asia and the Pacific)



Metrics	Jun 1988	Jul 2001	Jun 2016	% Annual Change ('01-'16)
Population	17,184	104,710	198,120	4.3
Built-up Area (Hectares)				
Total	139	380	1,861	10.6
Urban	55	219	1,373	12.3
Suburban	76	148	448	7.4
Rural	7	12	39	7.5
Open space (Hectares)				
Urbanized Open Space	145	296	1,069	8.6
Urban Extent	285	677	2,931	9.8
Density (Persons / Hectare)				
Built-up Area Density	122.8	274.9	106.4	-6.4
Urban Extent Density	60.2	154.6	67.6	-5.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.49	0.56	0.64	0.8
Openness Index	0.53	0.44	0.32	-2.0
Compactness (Roundness)				
Proximity	0.93	0.87	0.79	-0.6
Cohesion	0.92	0.86	0.78	-0.6
Added Area (Hectares)	'88-'01	Share	'01-'16	Share
Infill	53	22%	122	8%
Extension	145	60%	1,095	73%
Leapfrog	0	0%	0	0%
Inclusion	41	17%	263	17%

















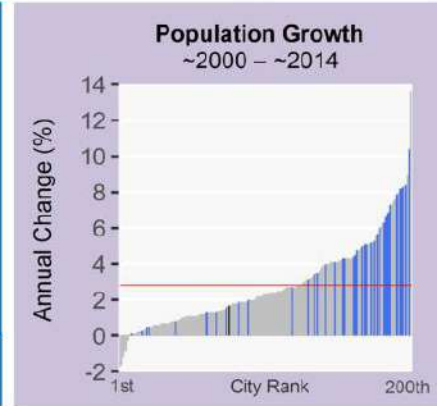
Gwangju, Korea Rep. 1989-2015

0 4 8 12 16 km

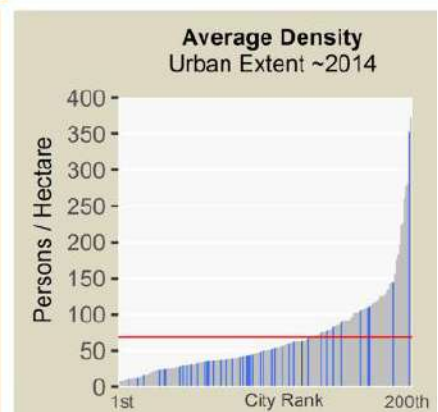
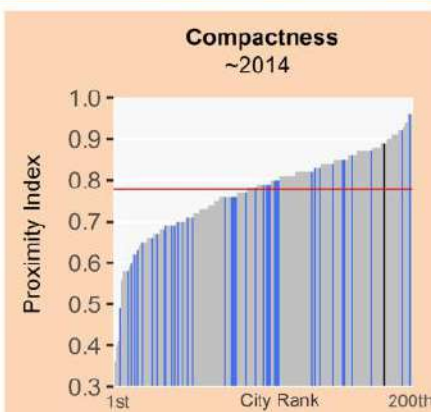
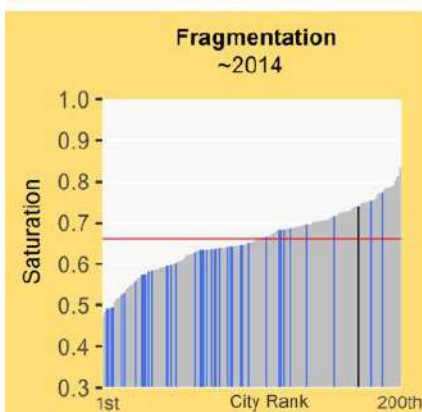
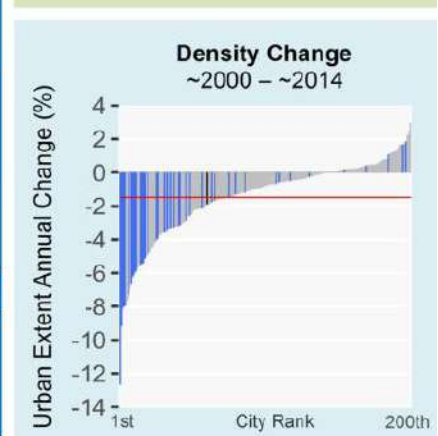
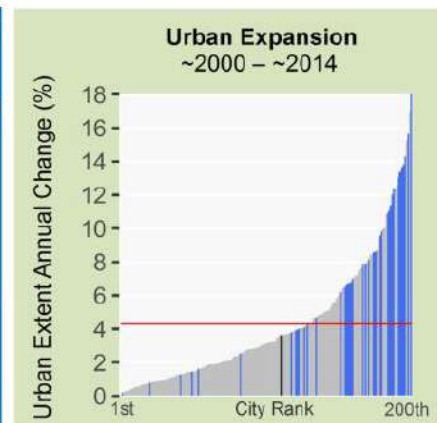
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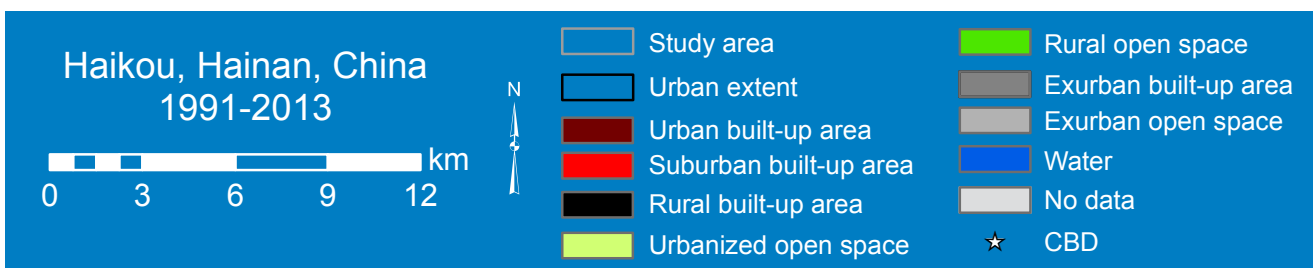
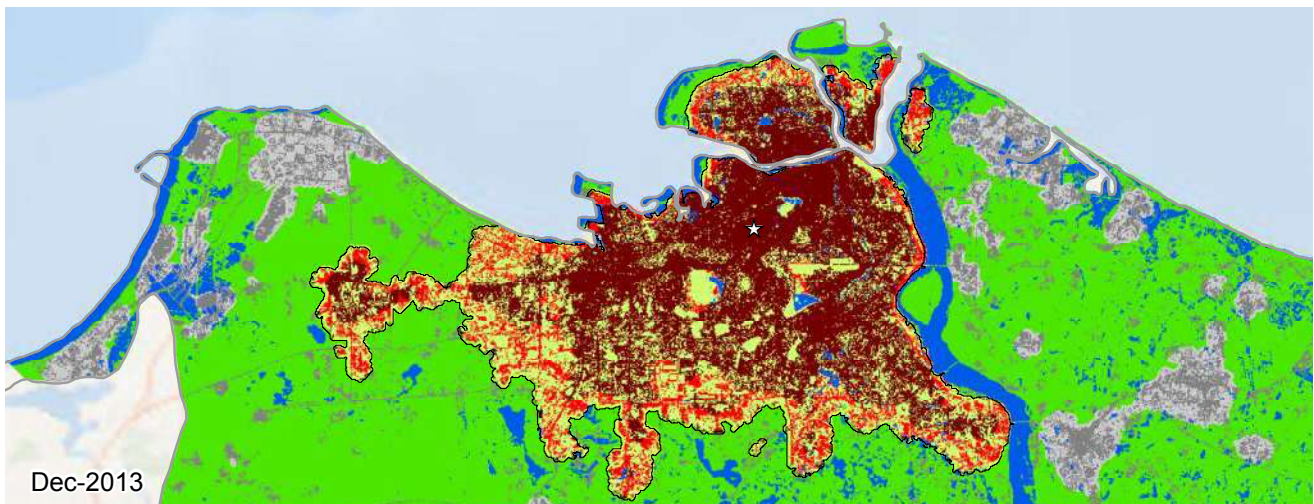
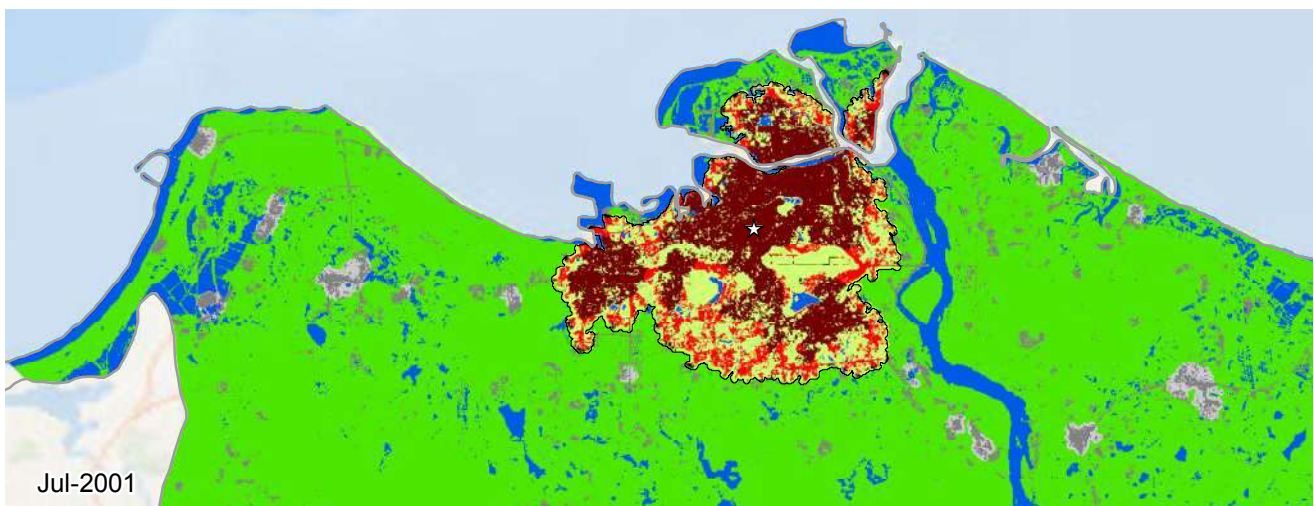
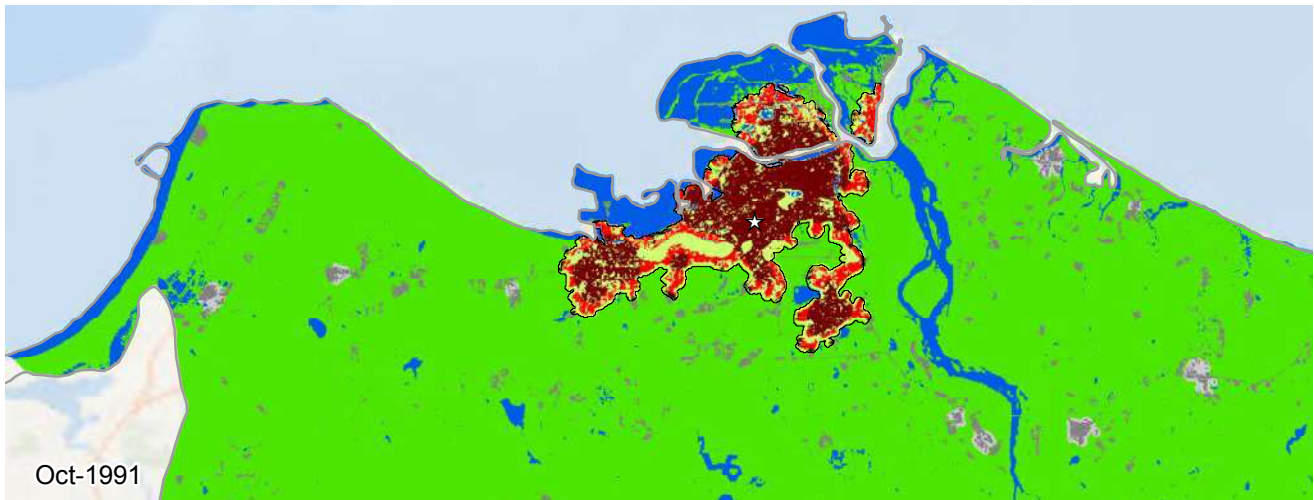
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Gwangju, Korea Rep. (East Asia and the Pacific)

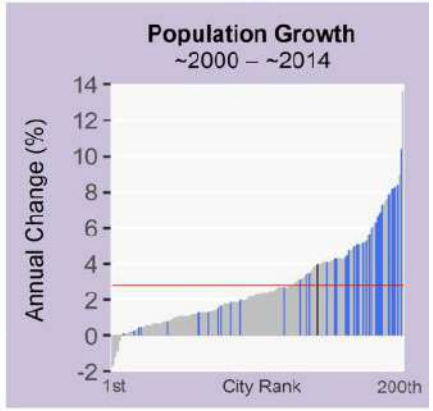


Metrics	Oct 1989	Mar 2000	May 2015	% Annual Change ('00-'15)
Population	723,576	1,054,149	1,368,715	1.7
Built-up Area (Hectares)				
Total	3,639	8,150	16,032	4.5
Urban	2,989	5,960	13,831	5.6
Suburban	598	2,013	2,056	0.1
Rural	51	177	144	-1.4
Open space (Hectares)				
Urbanized Open Space	1,637	4,343	5,631	1.7
Urban Extent	5,276	12,494	21,664	3.6
Density (Persons / Hectare)				
Built-up Area Density	198.8	129.3	85.4	-2.7
Urban Extent Density	137.1	84.4	63.2	-1.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.69	0.65	0.74	0.8
Openness Index	0.27	0.30	0.23	-2.0
Compactness (Roundness)				
Proximity	0.93	0.75	0.89	1.1
Cohesion	0.91	0.75	0.88	1.0
Added Area (Hectares)	'89-'00	Share	'00-'15	Share
Infill	1,057	23%	2,380	30%
Extension	1,858	41%	3,596	45%
Leapfrog	0	0%	26	0%
Inclusion	1,595	35%	1,877	23%

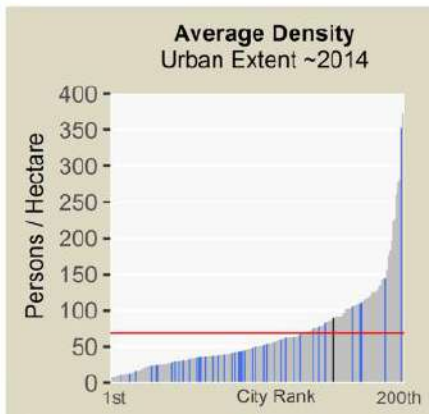
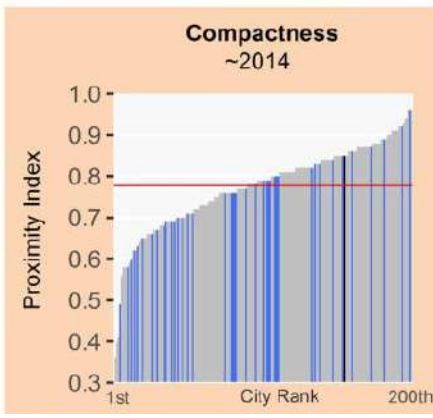
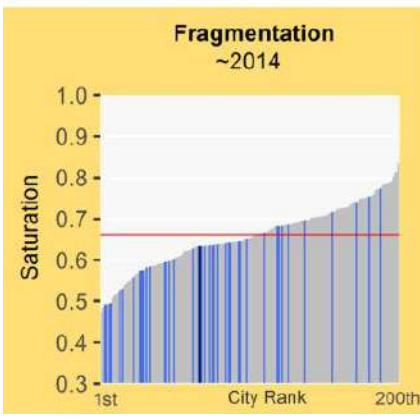
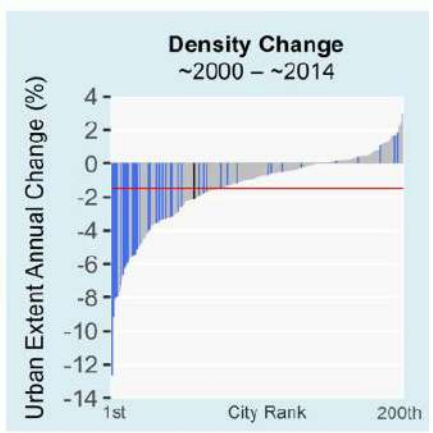
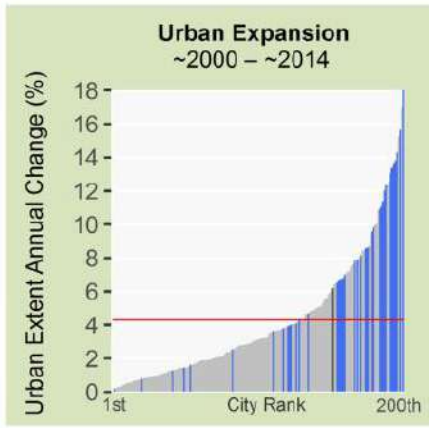


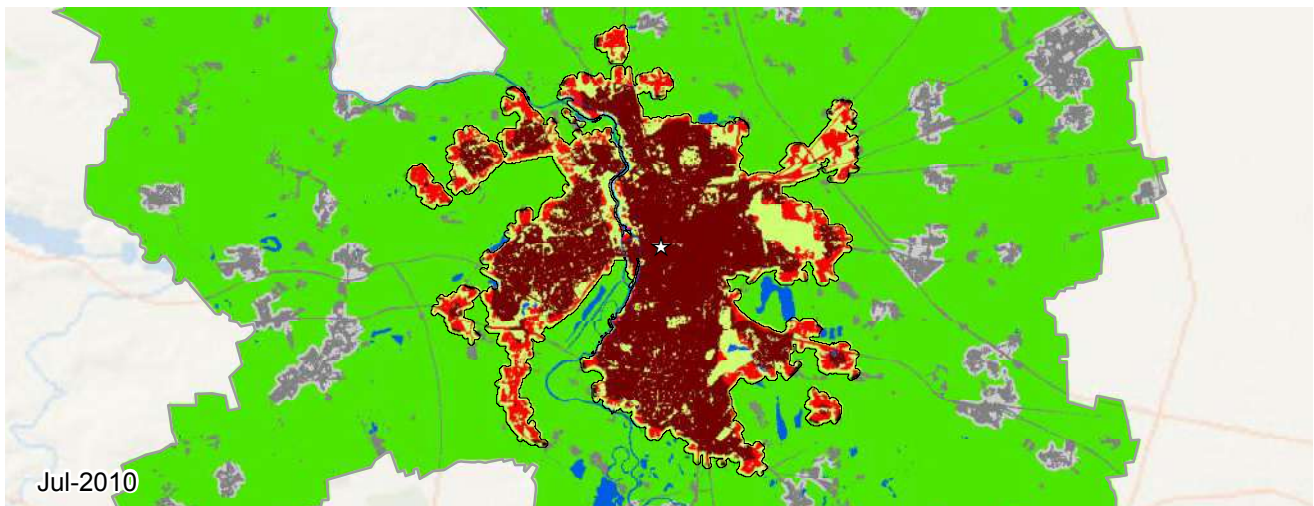
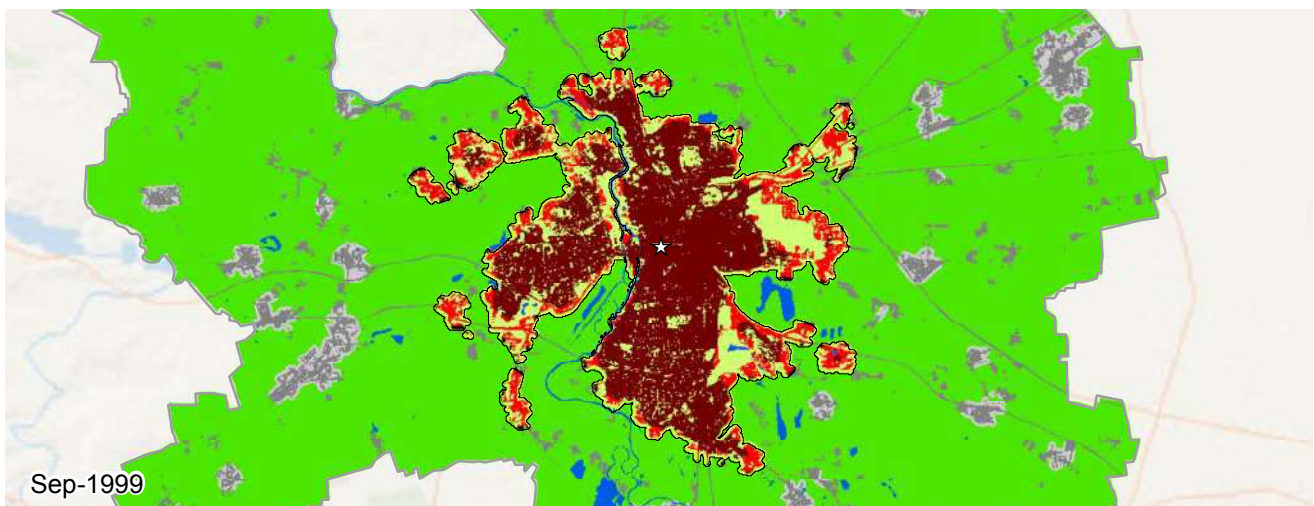
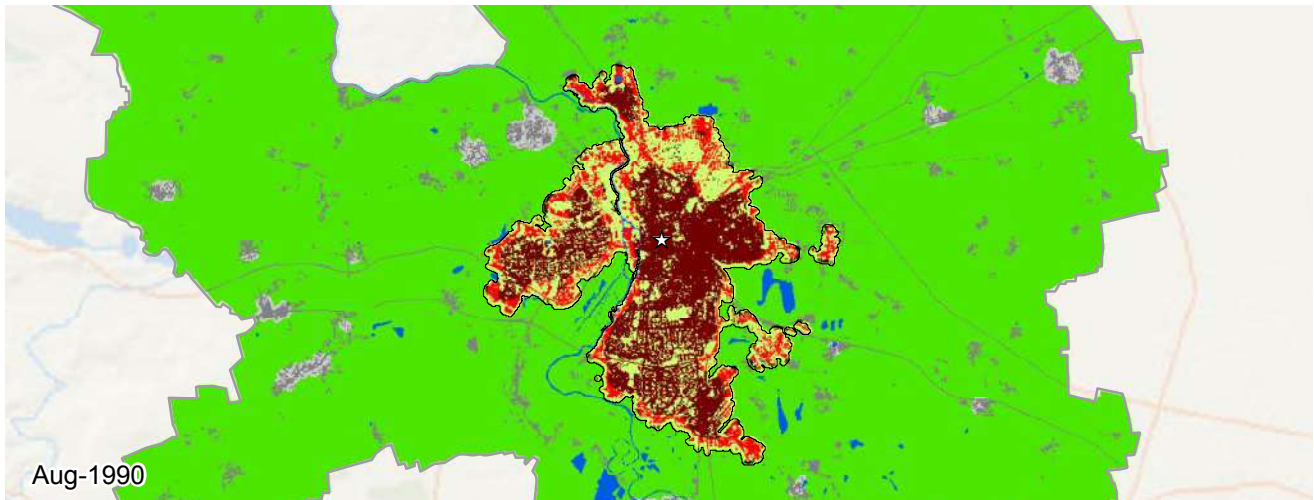


Haikou, Hainan, China (East Asia and the Pacific)



Metrics	Oct 1991	Jul 2001	Dec 2013	% Annual Change ('01-'13)
Population	501,813	756,042	1,247,662	4.0
Built-up Area (Hectares)				
Total	2,379	3,868	8,867	6.7
Urban	1,627	2,773	6,816	7.2
Suburban	691	1,019	1,942	5.2
Rural	60	74	108	3.0
Open space (Hectares)				
Urbanized Open Space	1,293	2,614	5,128	5.4
Urban Extent	3,672	6,482	13,996	6.2
Density (Persons / Hectare)				
Built-up Area Density	210.9	195.5	140.7	-2.6
Urban Extent Density	136.6	116.6	89.1	-2.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.60	0.63	0.5
Openness Index	0.38	0.36	0.35	-0.2
Compactness (Roundness)				
Proximity	0.78	0.93	0.85	-0.7
Cohesion	0.76	0.91	0.83	-0.7
Added Area (Hectares)	'91-'01	Share	'01-'13	Share
Infill	331	22%	1,093	21%
Extension	941	63%	3,149	62%
Leapfrog	0	0%	0	0%
Inclusion	215	14%	756	15%

















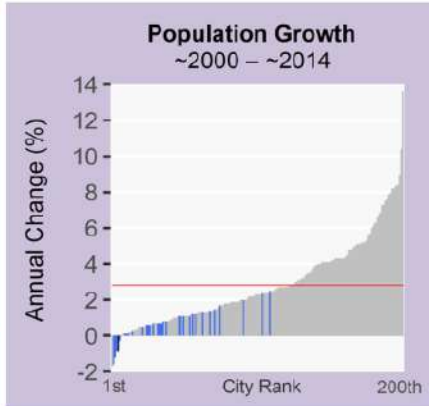
Halle, Germany
1990-2010

0 2 4 6 8 km

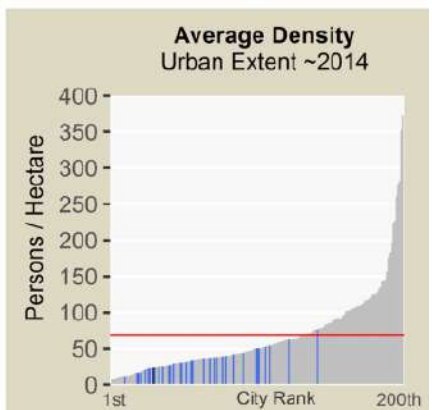
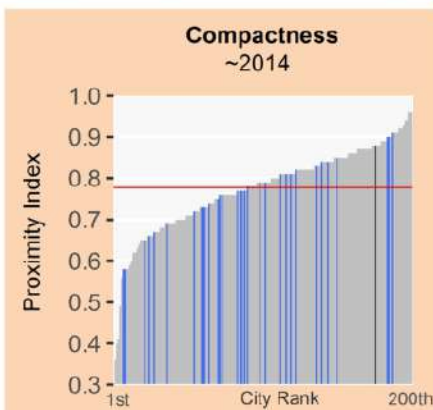
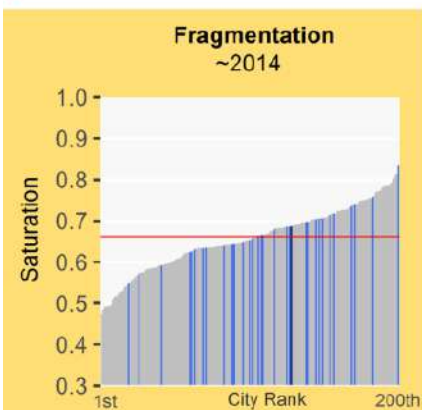
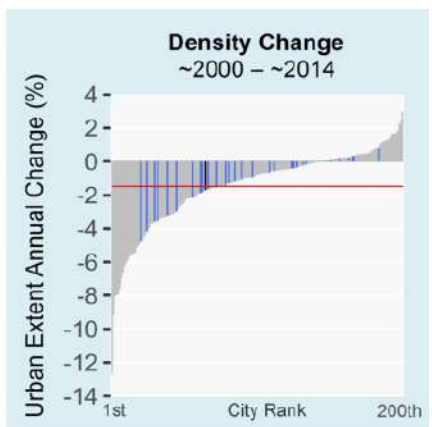
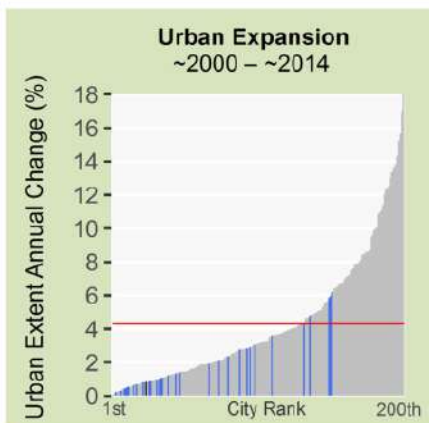
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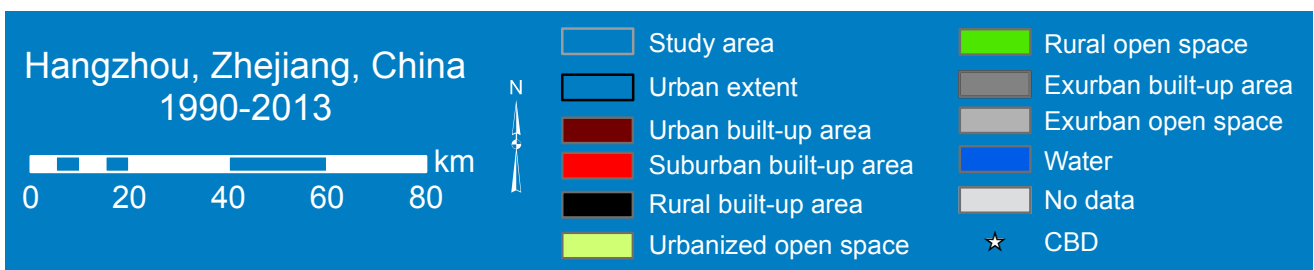
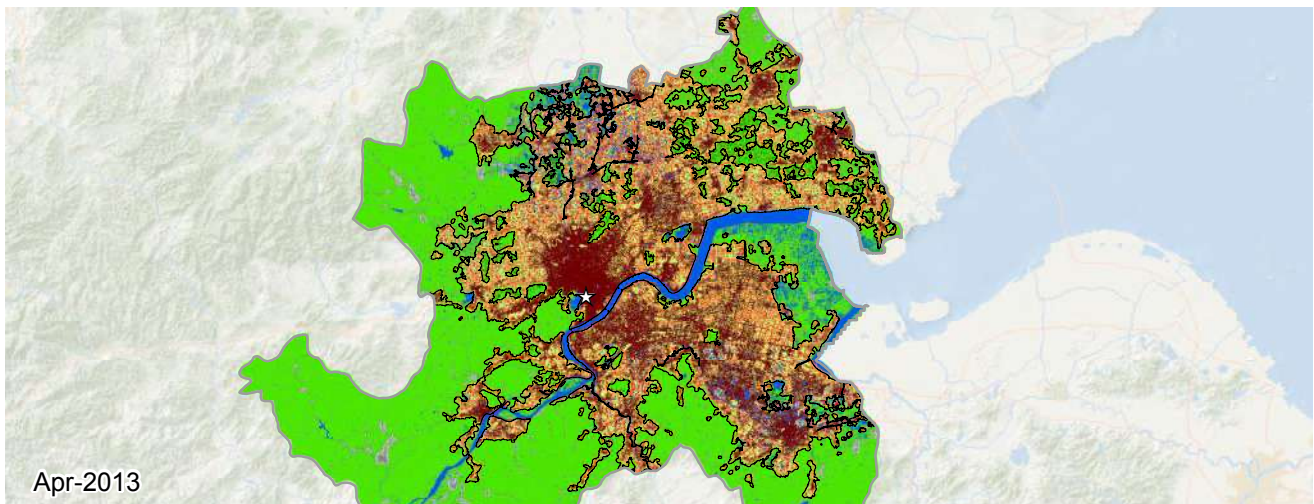
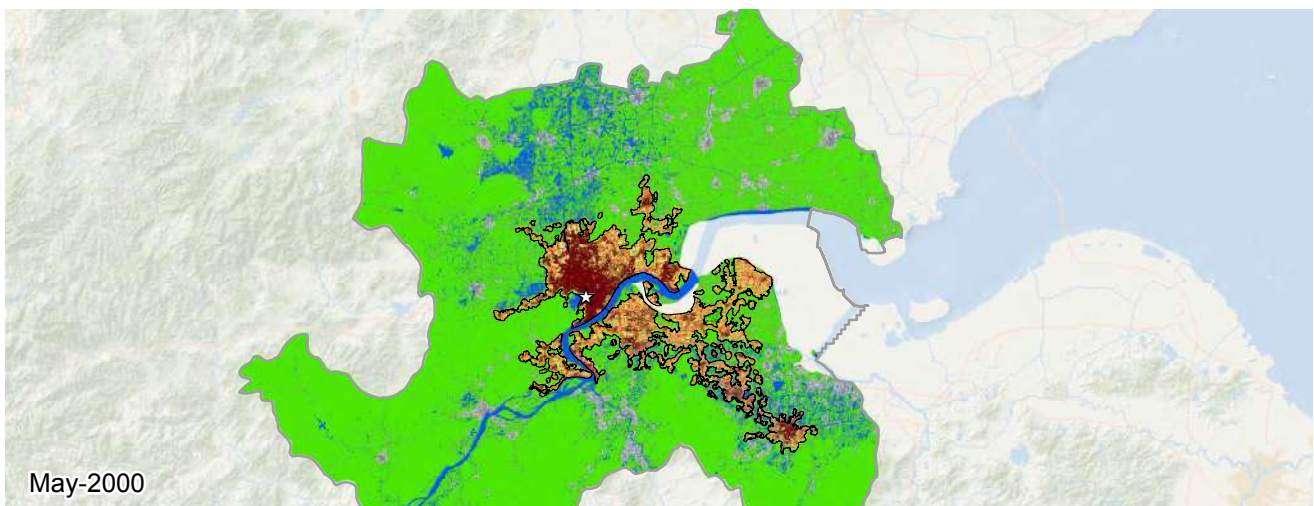
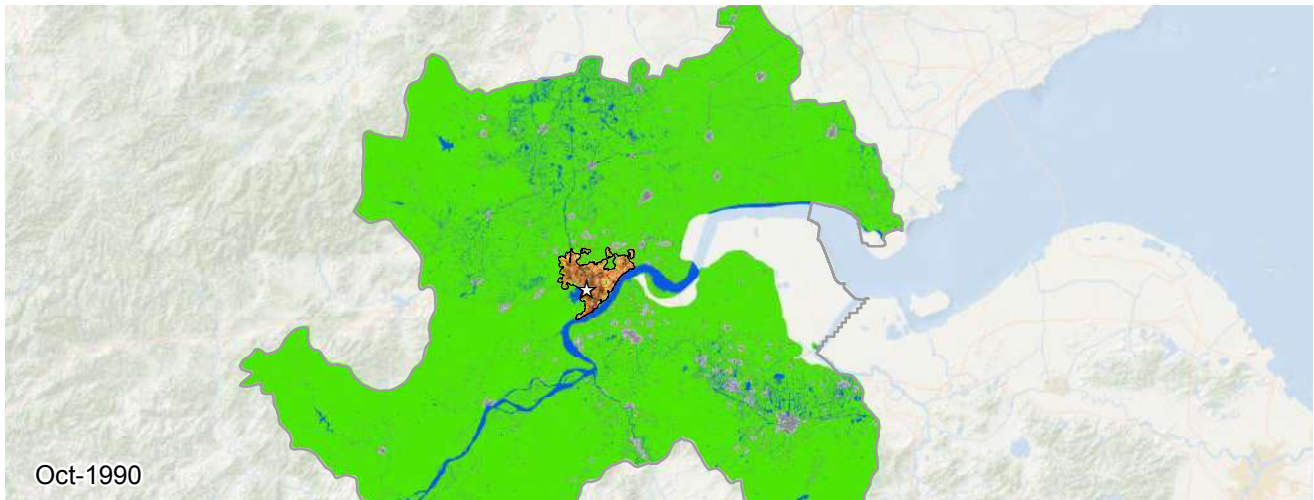
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Halle, Germany (Europe and Japan)

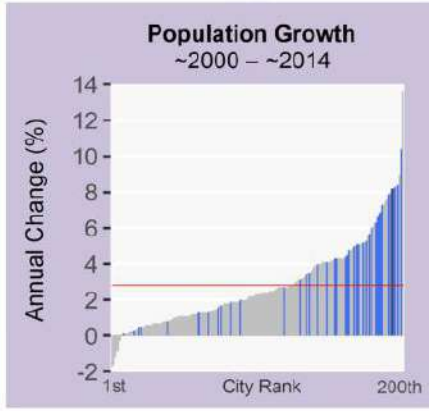


Metrics	Aug 1990	Sep 1999	Jul 2010	% Annual Change ('99-'10)
Population	283,270	258,611	235,706	-0.9
Built-up Area (Hectares)				
Total	3,587	5,893	6,720	1.2
Urban	2,505	4,409	5,130	1.4
Suburban	999	1,357	1,483	0.8
Rural	83	126	106	-1.6
Open space (Hectares)				
Urbanized Open Space	2,496	3,047	3,072	0.1
Urban Extent	6,084	8,941	9,793	0.8
Density (Persons / Hectare)				
Built-up Area Density	79.0	43.9	35.1	-2.1
Urban Extent Density	46.6	28.9	24.1	-1.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.59	0.66	0.69	0.4
Openness Index	0.38	0.31	0.29	-0.6
Compactness (Roundness)				
Proximity	0.88	0.88	0.88	0.0
Cohesion	0.87	0.87	0.86	-0.1
Added Area (Hectares)	'90-'99	Share	'99-'10	Share
Infill	1,055	45%	442	53%
Extension	693	30%	200	24%
Leapfrog	14	0%	23	2%
Inclusion	543	23%	160	19%

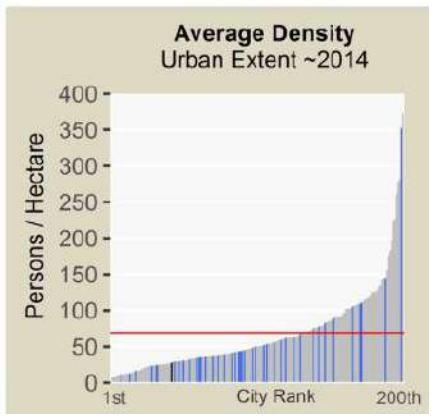
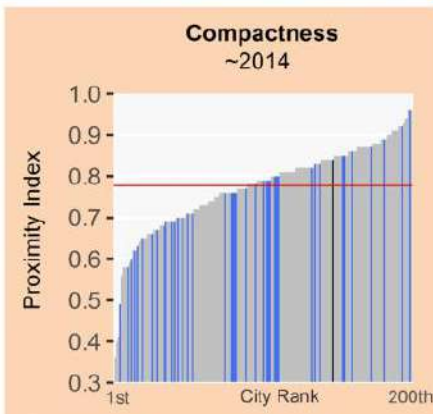
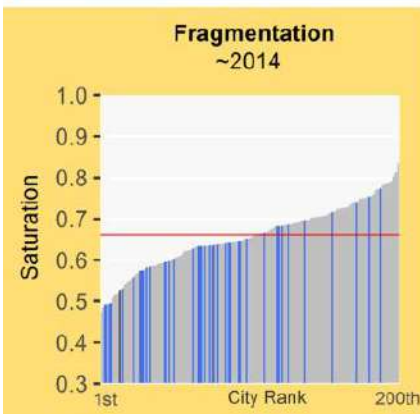
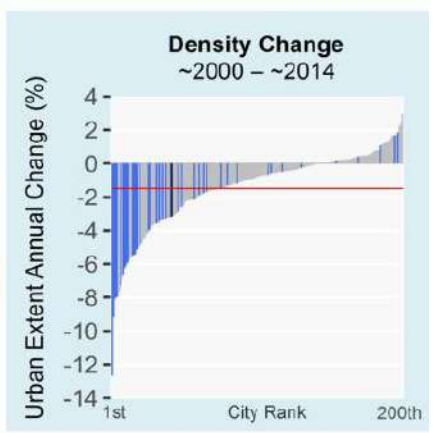
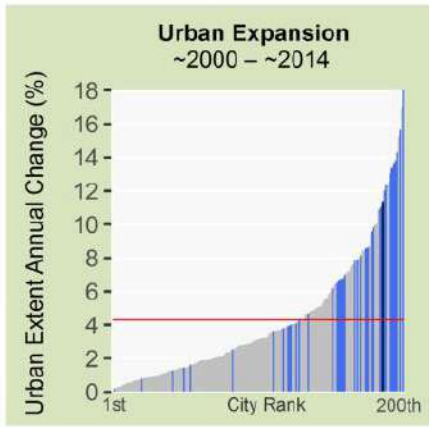


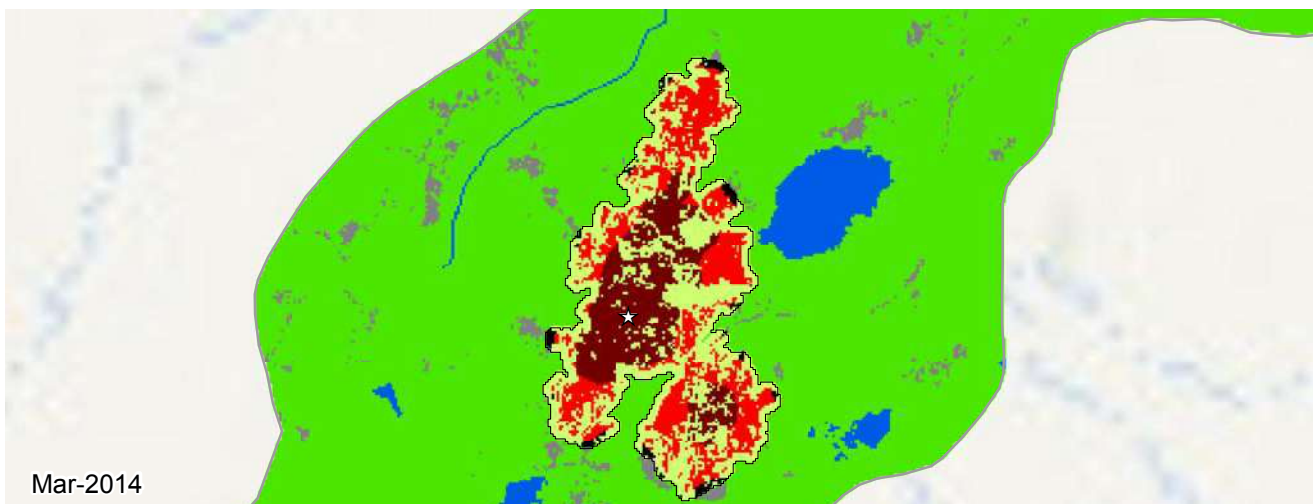
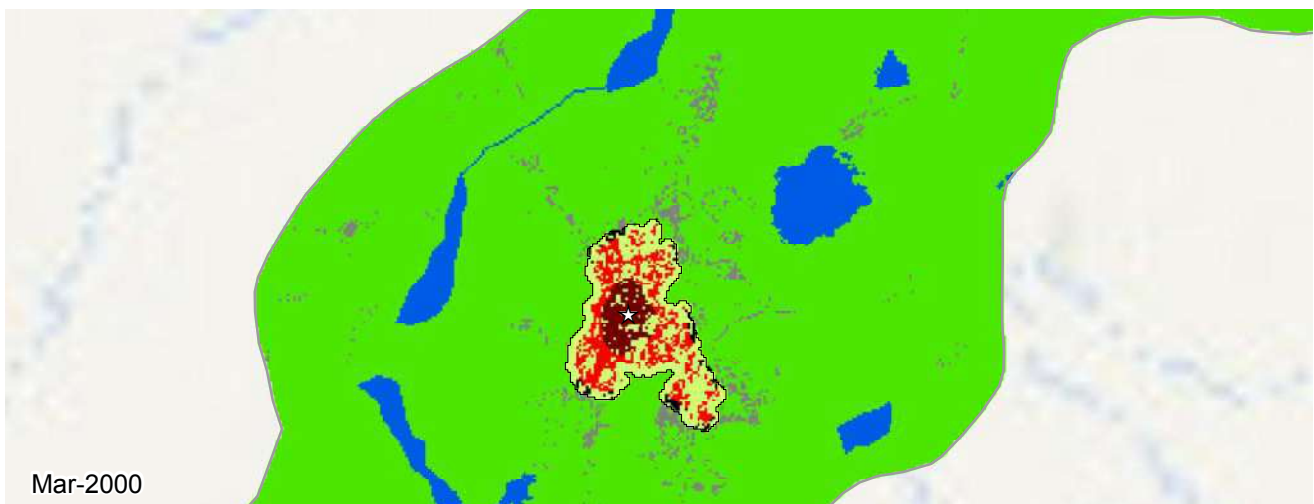
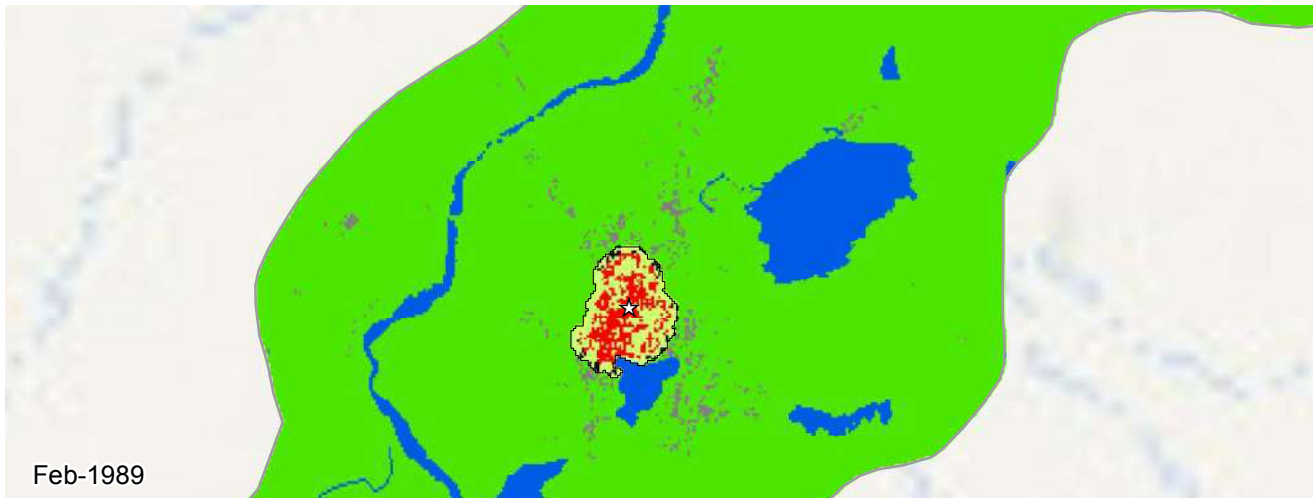


Hangzhou, Zhejiang, China (East Asia and the Pacific)



Metrics	Oct 1990	May 2000	Apr 2013	% Annual Change ('00-'13)
Population	68,584	3,603,845	10,446,328	8.2
Built-up Area (Hectares)				
Total	4,627	43,701	196,260	11.6
Urban	1,903	21,313	108,115	12.6
Suburban	2,559	20,611	82,496	10.7
Rural	164	1,776	5,648	9.0
Open space (Hectares)				
Urbanized Open Space	5,297	41,850	175,927	11.1
Urban Extent	9,924	85,552	372,188	11.4
Density (Persons / Hectare)				
Built-up Area Density	14.8	82.5	53.2	-3.4
Urban Extent Density	6.9	42.1	28.1	-3.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.47	0.51	0.53	0.2
Openness Index	0.54	0.44	0.44	-0.0
Compactness (Roundness)				
Proximity	0.86	0.67	0.84	1.8
Cohesion	0.85	0.66	0.83	1.8
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	4,899	12%	23,911	16%
Extension	21,667	55%	73,967	50%
Leapfrog	256	0%	31	0%
Inclusion	12,245	31%	47,418	32%





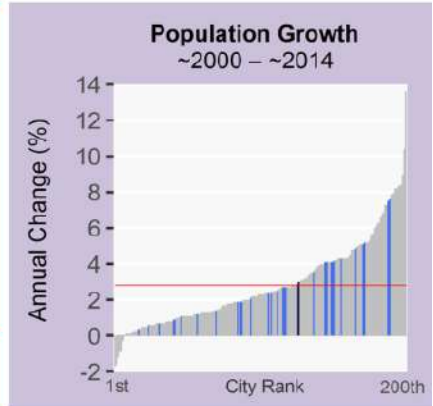
**Hindupur, India
1989-2014**

0 1 2 3 4 km

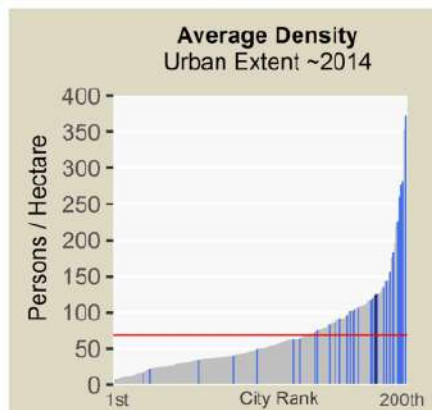
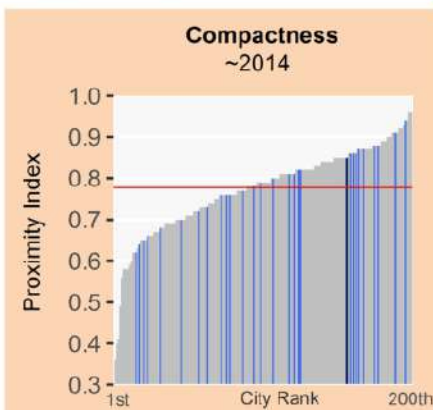
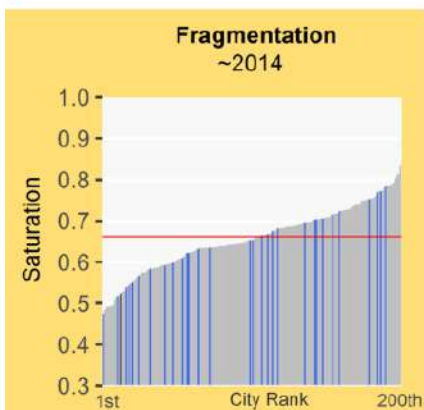
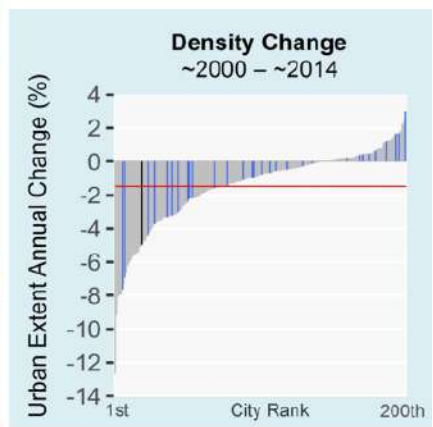
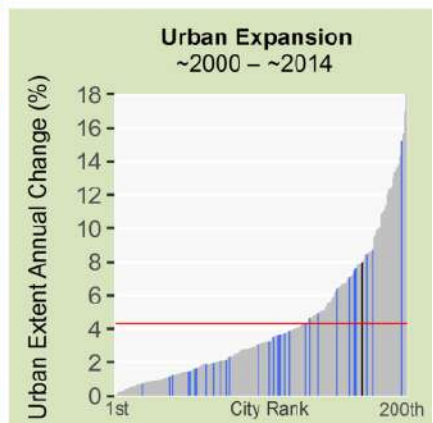
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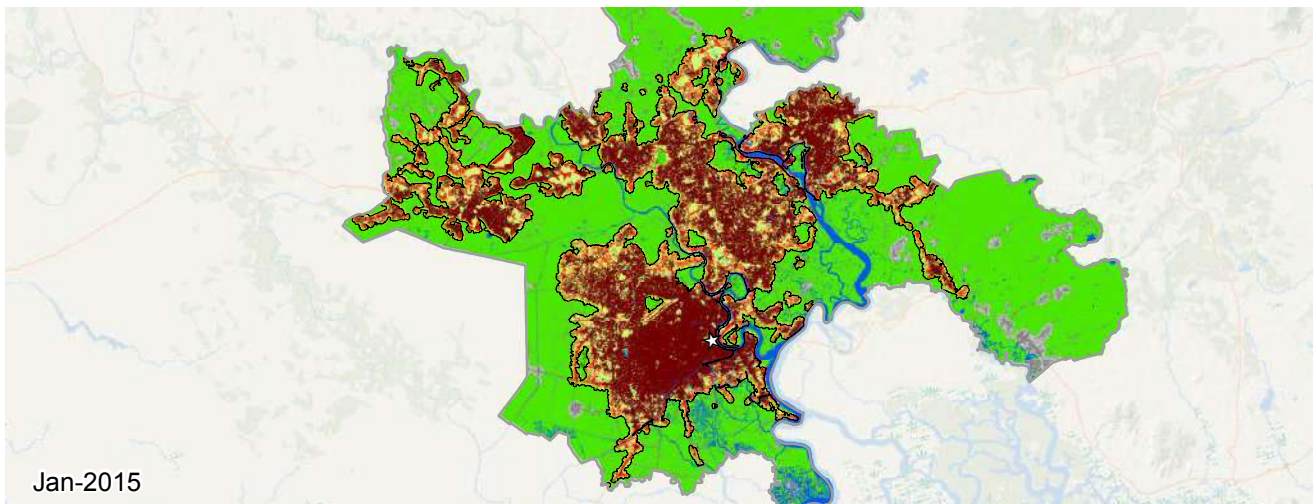
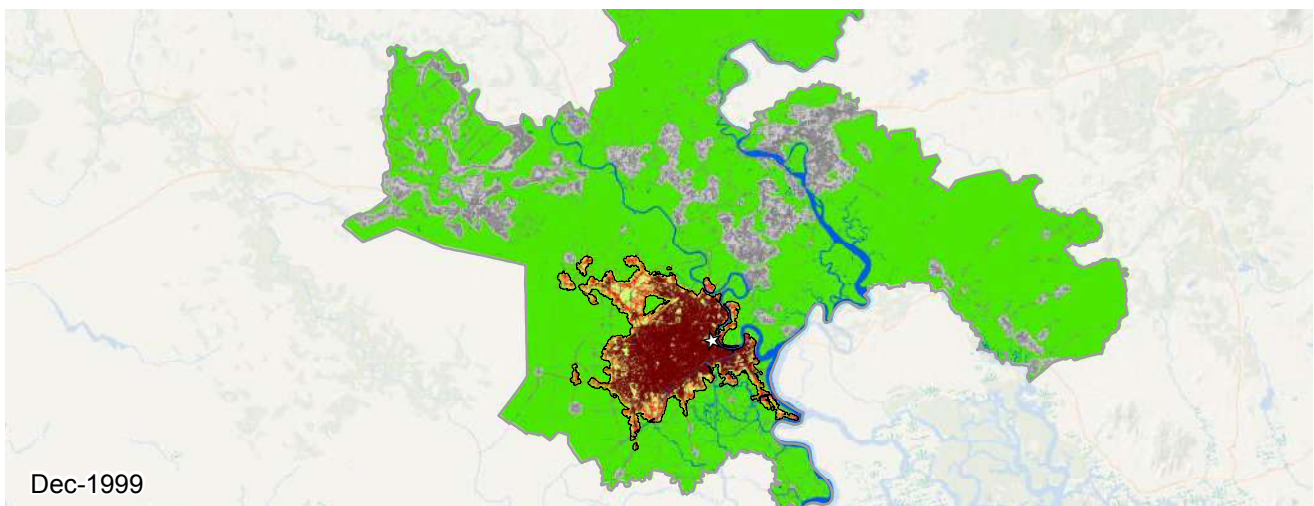
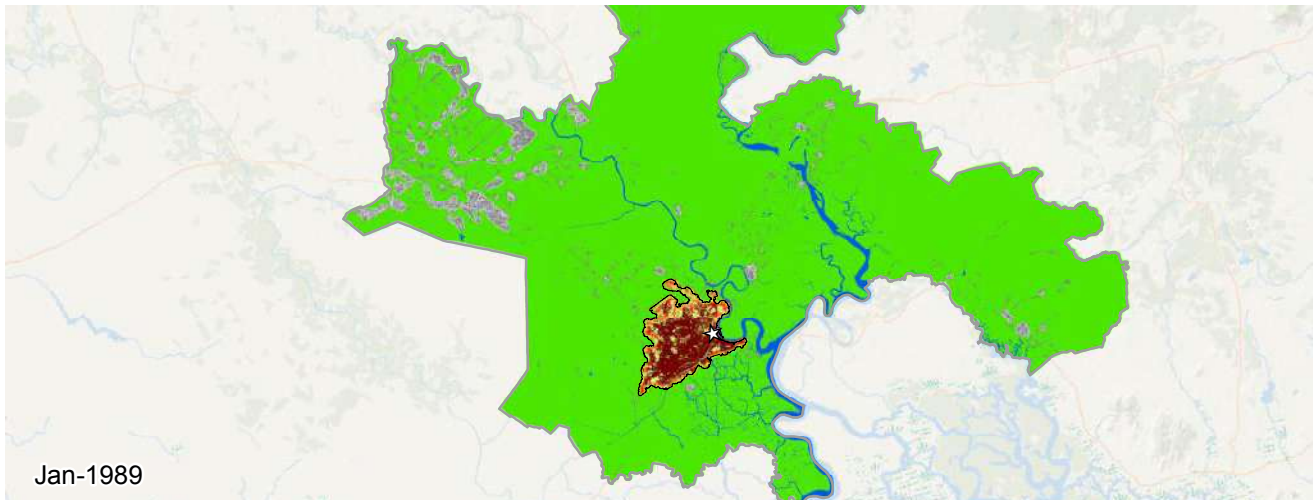
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Hindupur, India (South and Central Asia)



Metrics	Feb 1989	Mar 2000	Mar 2014	% Annual Change ('00-'14)
Population	56,003	70,223	106,830	3.0
Built-up Area (Hectares)				
Total	56	124	445	9.1
Urban	0	35	190	12.0
Suburban	50	79	236	7.8
Rural	6	10	18	4.3
Open space (Hectares)				
Urbanized Open Space	78	152	403	7.0
Urban Extent	135	277	849	8.0
Density (Persons / Hectare)				
Built-up Area Density	986.1	563.4	239.9	-6.1
Urban Extent Density	412.6	253.3	125.8	-5.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.42	0.45	0.52	1.1
Openness Index	0.66	0.58	0.51	-0.9
Compactness (Roundness)				
Proximity	0.96	0.90	0.85	-0.4
Cohesion	0.95	0.89	0.84	-0.4
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	18	26%	40	12%
Extension	24	35%	206	64%
Leapfrog	0	0%	0	0%
Inclusion	24	35%	73	22%





**Ho Chi Minh City, Vietnam
1989-2015**

0 10 20 30 40 km

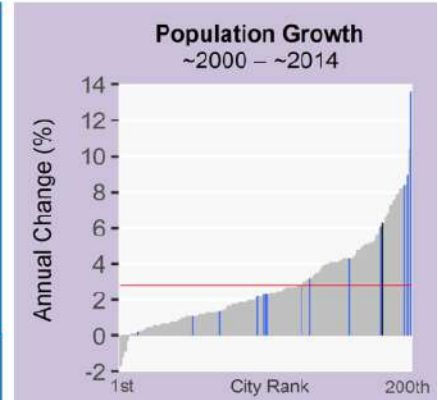
Study area
Urban extent
Urban built-up area
Suburban built-up area
Rural built-up area
Urbanized open space

Rural open space
Exurban built-up area
Exurban open space
Water
No data
CBD

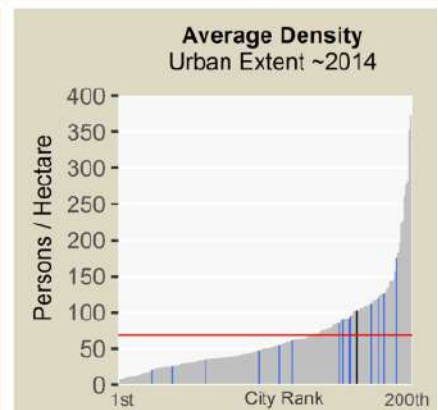
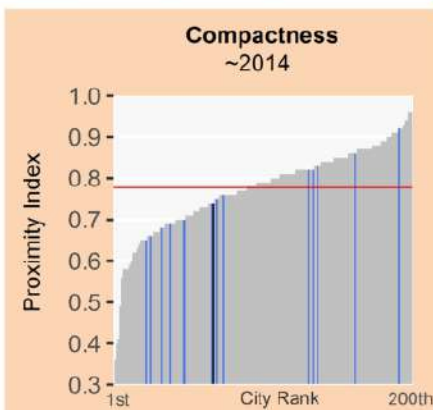
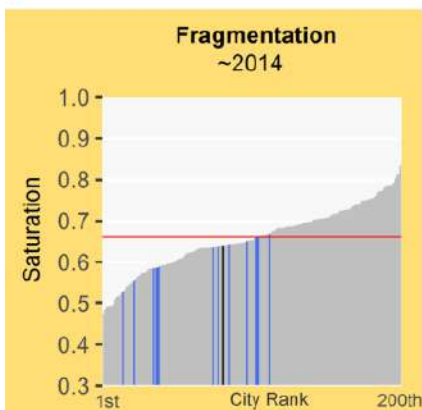
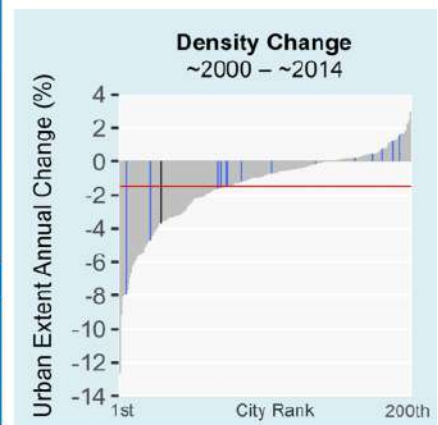
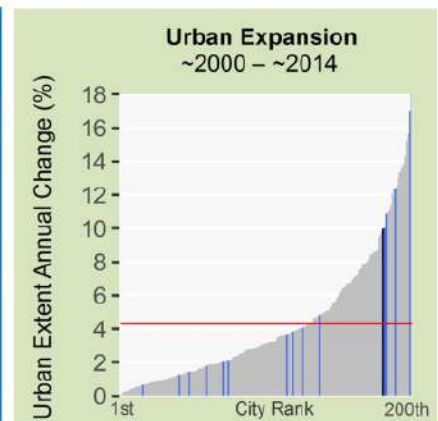
Ho Chi Minh City, Vietnam (Southeast Asia)

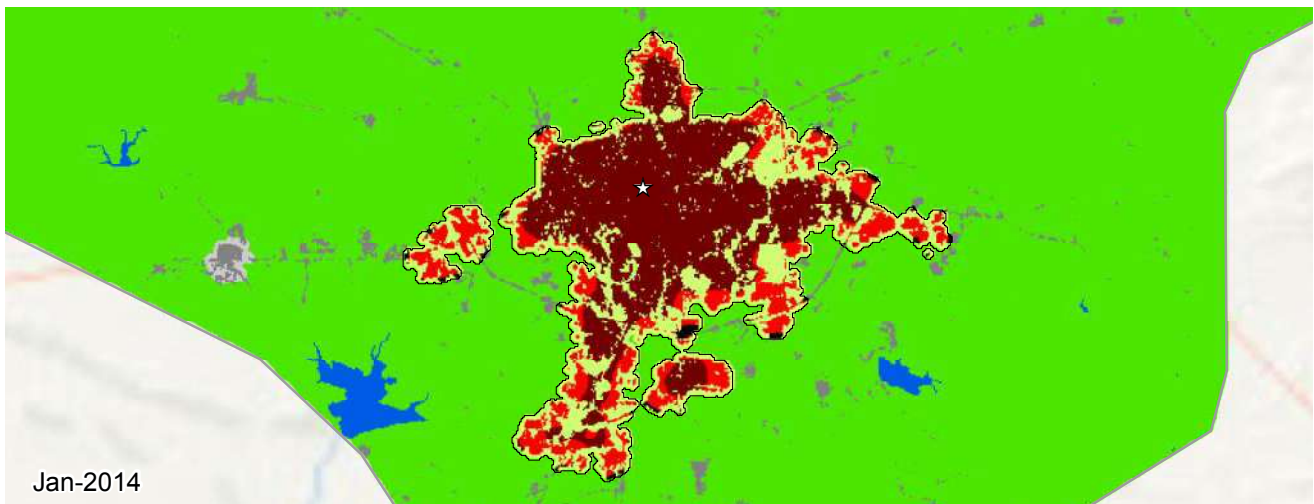
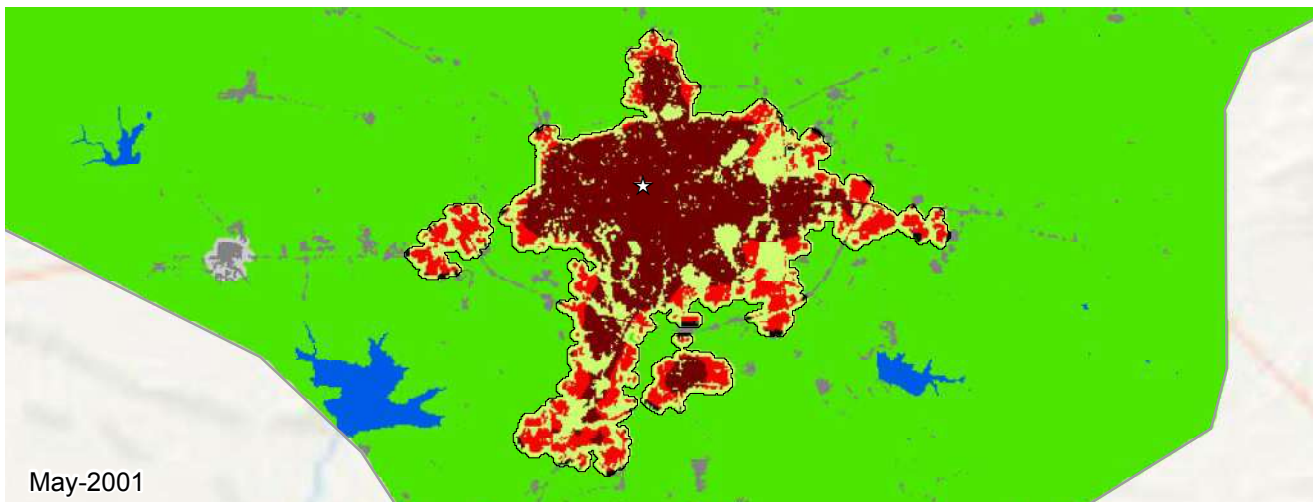
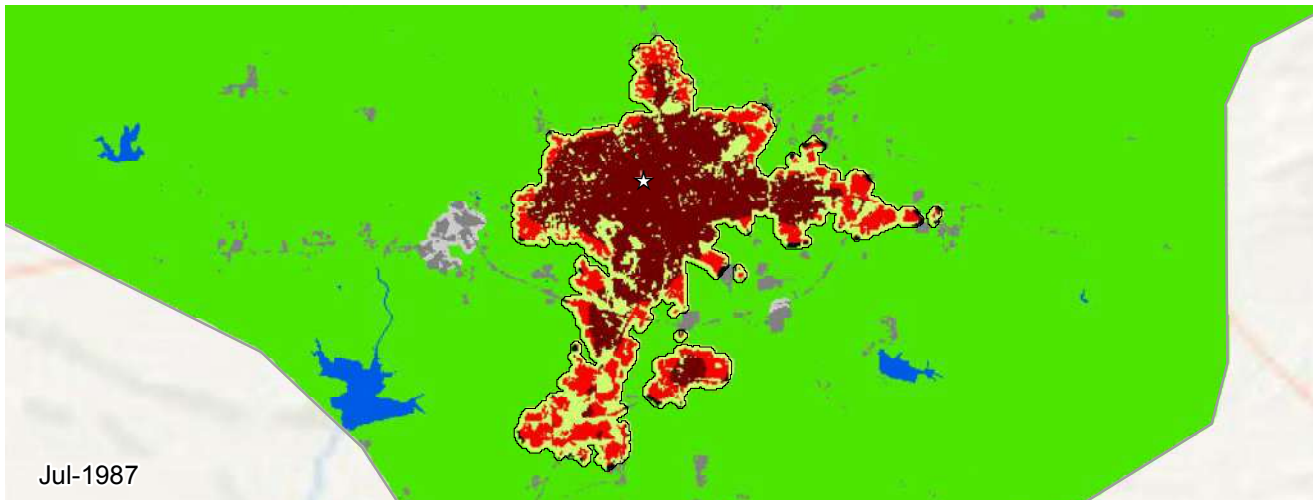


Legend for Charts
 Ho Chi Minh City | Other cities in region | All other cities | Global average



Metrics	Jan 1989	Dec 1999	Jan 2015	% Annual Change ('99-'15)
Population	2,563,621	3,950,264	10,187,671	6.3
Built-up Area (Hectares)				
Total	5,452	15,057	63,477	9.5
Urban	4,284	11,717	47,603	9.3
Suburban	1,092	3,096	14,963	10.4
Rural	74	243	910	8.7
Open space (Hectares)				
Urbanized Open Space	2,977	6,957	35,912	10.9
Urban Extent	8,430	22,015	99,390	10.0
Density (Persons / Hectare)				
Built-up Area Density	470.2	262.3	160.5	-3.3
Urban Extent Density	304.1	179.4	102.5	-3.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.68	0.64	-0.5
Openness Index	0.30	0.26	0.32	1.5
Compactness (Roundness)				
Proximity	0.94	0.88	0.74	-1.2
Cohesion	0.92	0.87	0.73	-1.1
Added Area (Hectares)	'89-'99	Share	'99-'15	Share
Infill	1,917	19%	8,756	18%
Extension	6,713	69%	19,750	40%
Leapfrog	0	0%	1	0%
Inclusion	973	10%	19,909	41%





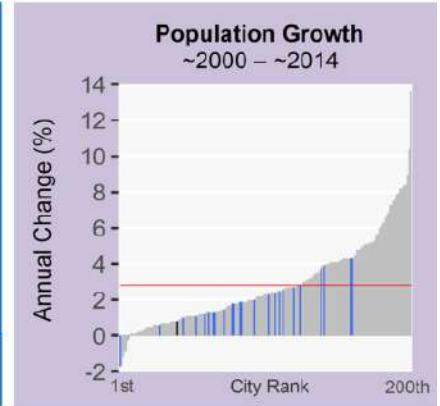
Holguin, Cuba
1987-2014

0 1 2 3 4 km

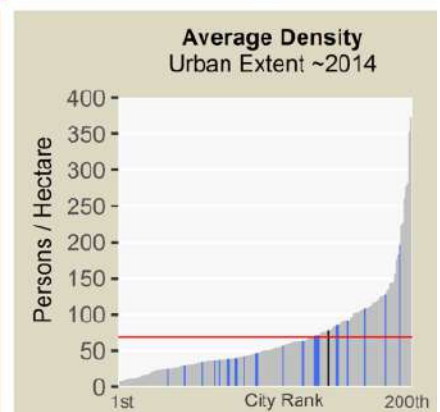
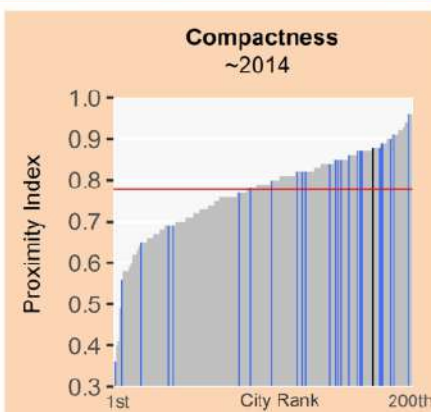
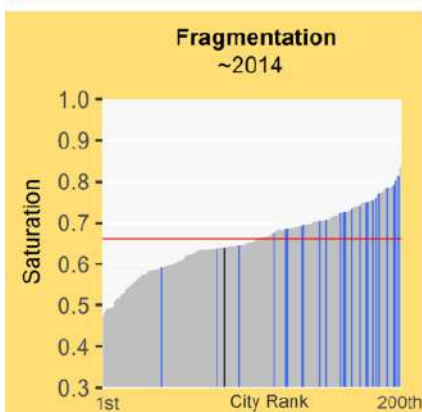
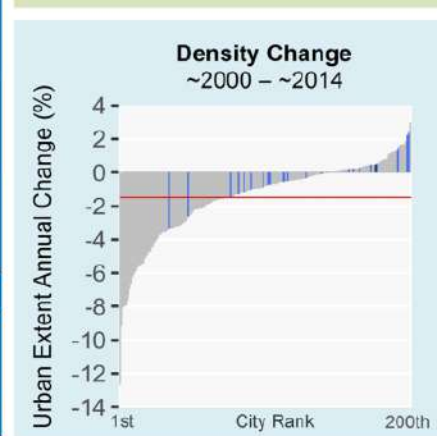
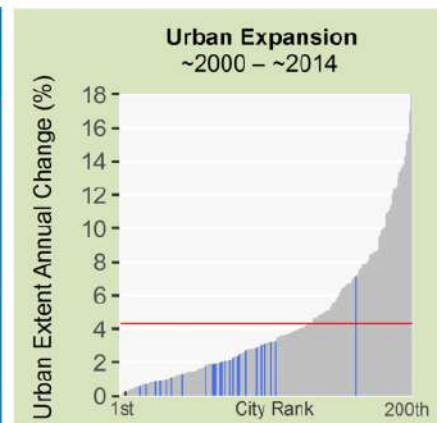
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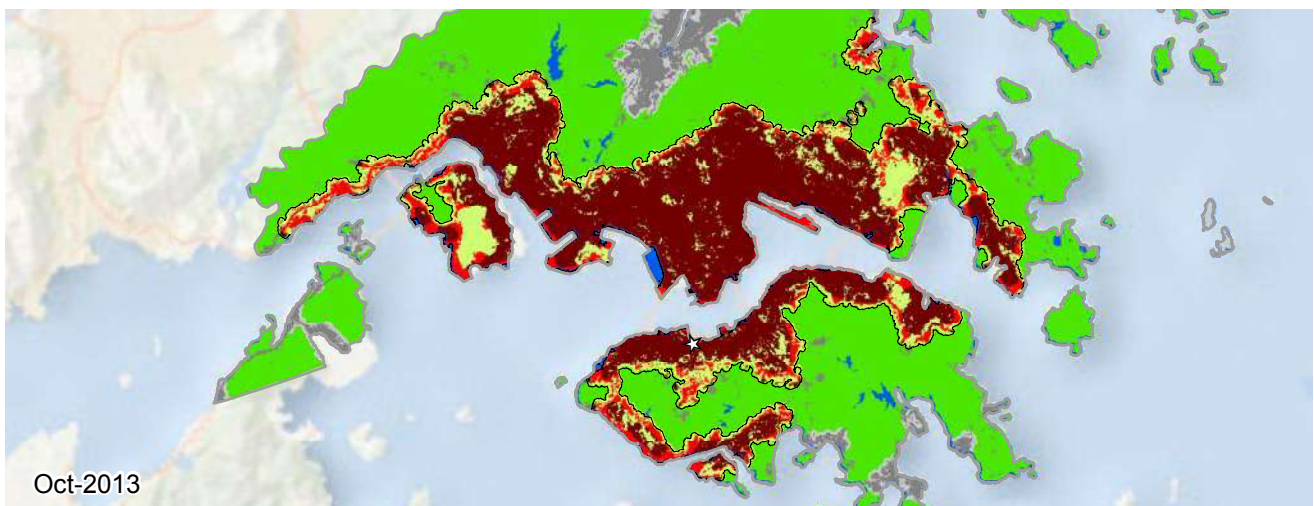
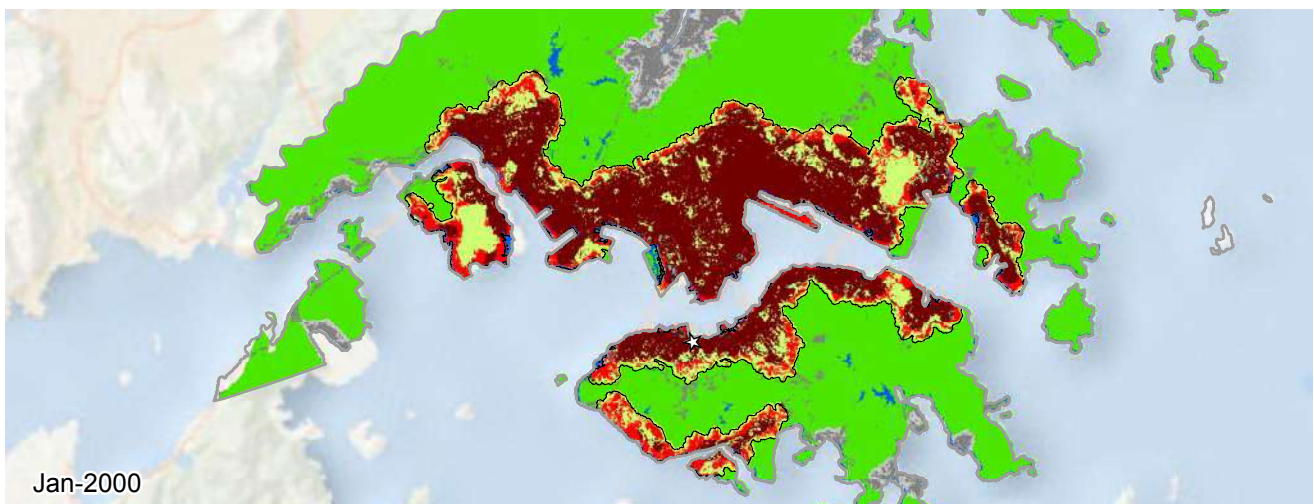
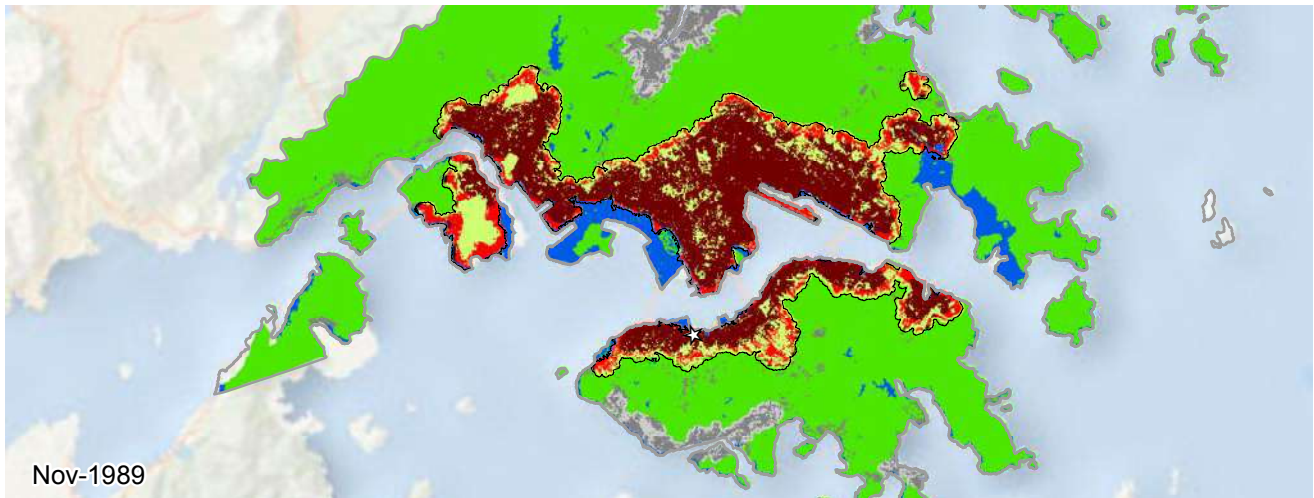
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Holguin, Cuba (Latin America and the Caribbean)



Metrics	Jul 1987	May 2001	Jan 2014	% Annual Change ('01-'14)
Population	200,230	238,531	263,344	0.8
Built-up Area (Hectares)				
Total	1,651	2,070	2,157	0.3
Urban	1,107	1,426	1,522	0.5
Suburban	509	600	589	-0.1
Rural	35	43	44	0.3
Open space (Hectares)				
Urbanized Open Space	898	1,191	1,219	0.2
Urban Extent	2,550	3,262	3,376	0.3
Density (Persons / Hectare)				
Built-up Area Density	121.2	115.2	122.1	0.5
Urban Extent Density	78.5	73.1	78.0	0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.63	0.64	0.1
Openness Index	0.36	0.35	0.34	-0.2
Compactness (Roundness)				
Proximity	0.81	0.87	0.88	0.0
Cohesion	0.80	0.85	0.86	0.0
Added Area (Hectares)	'87-'01	Share	'01-'14	Share
Infill	108	25%	44	51%
Extension	169	40%	22	25%
Leapfrog	0	0%	2	2%
Inclusion	140	33%	17	19%





Hong Kong, Hong Kong, China
1989-2013

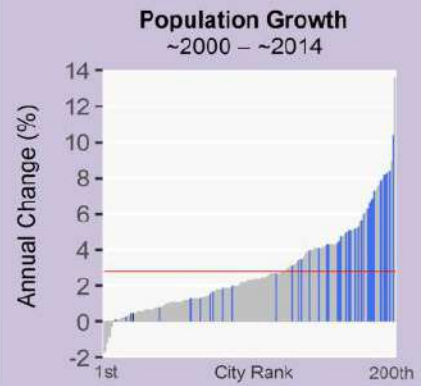


- | | | | |
|---|------------------------|---|-----------------------|
|  | Study area |  | Rural open space |
|  | Urban extent |  | Exurban built-up area |
|  | Urban built-up area |  | Exurban open space |
|  | Suburban built-up area |  | Water |
|  | Rural built-up area |  | No data |
|  | Urbanized open space |  | CBD |

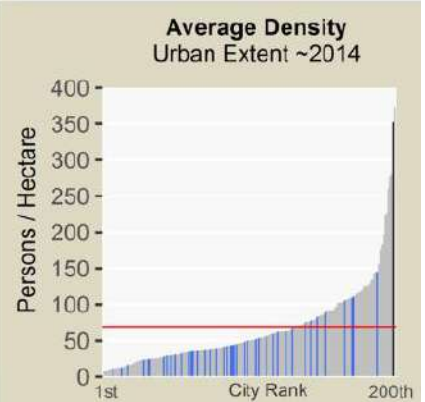
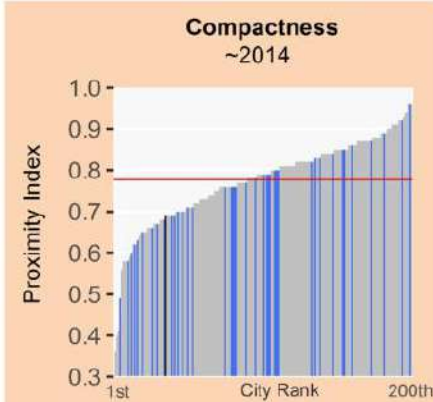
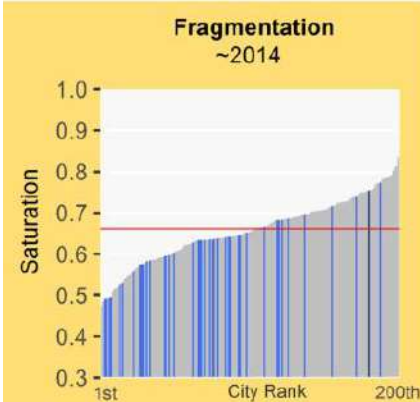
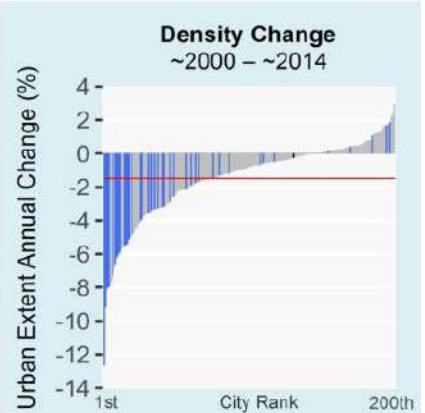
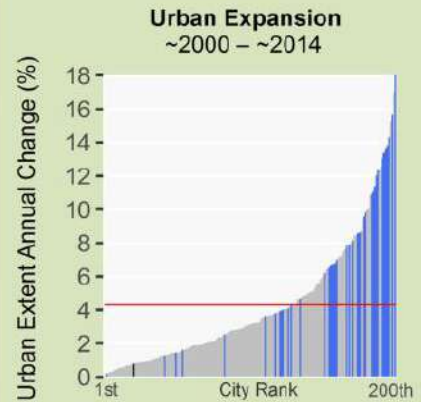
Hong Kong, Hong Kong, China (East Asia and the Pacific)

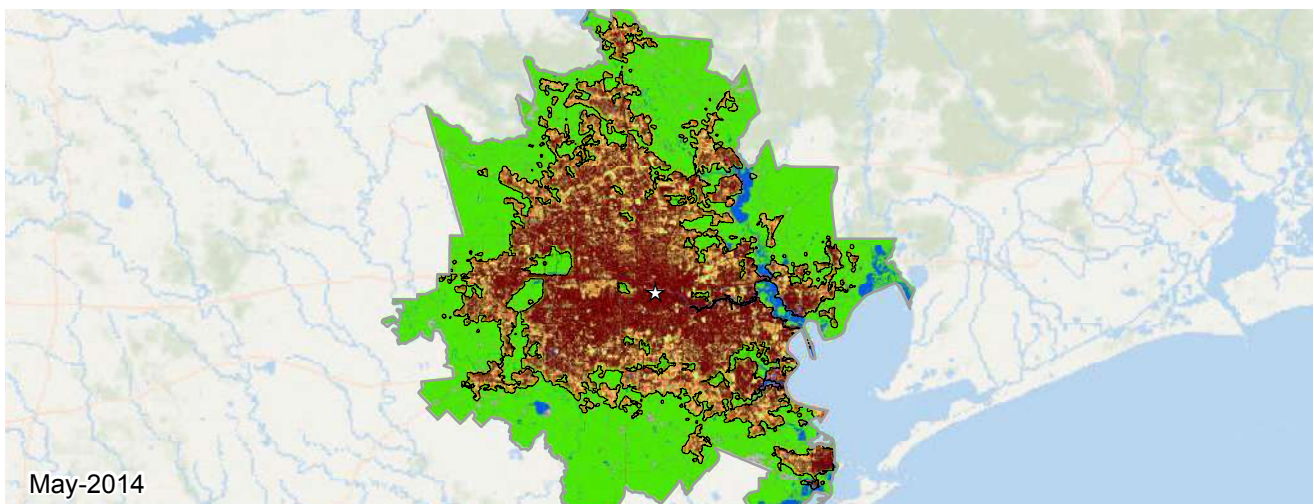
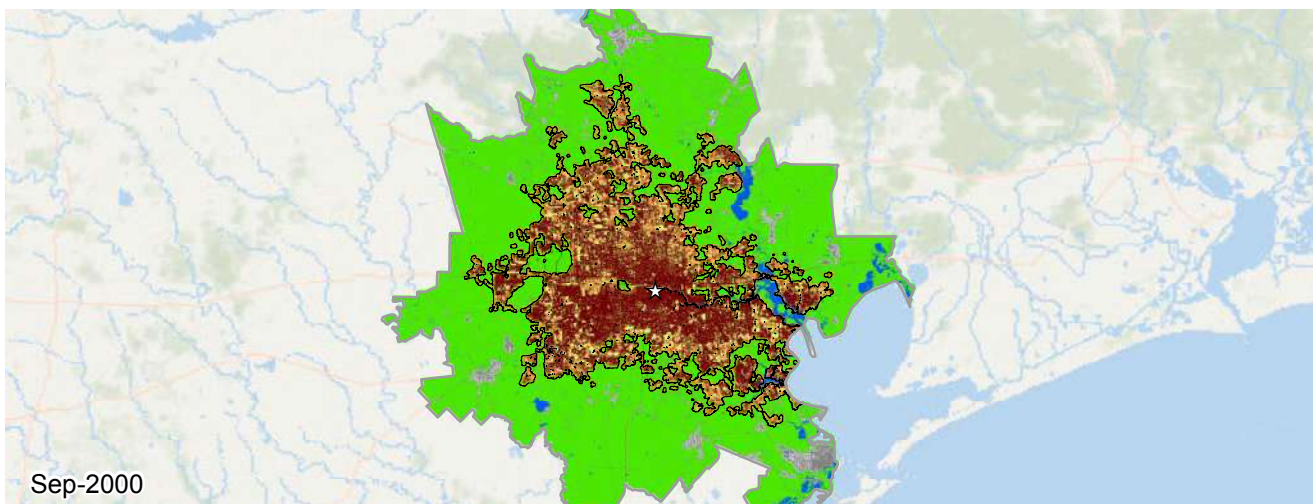
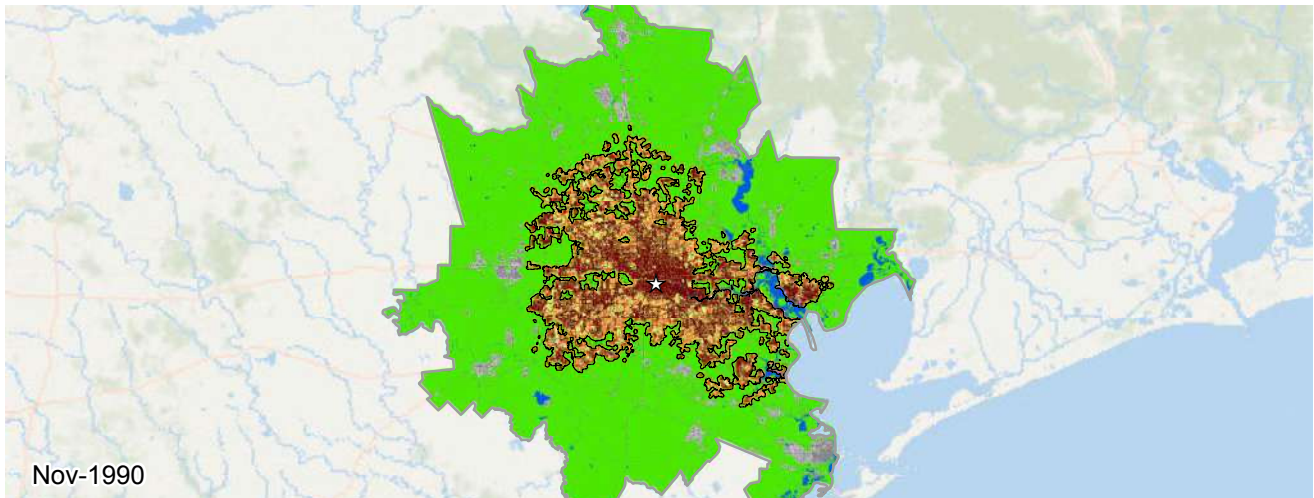


Legend for Charts
 Hong Kong | Other cities in region | All other cities | Global average



Metrics	Nov 1989	Jan 2000	Oct 2013	% Annual Change ('00-'13)
Population	3,661,992	4,017,762	4,322,118	0.5
Built-up Area (Hectares)				
Total	5,933	8,036	9,253	1.0
Urban	4,643	6,330	7,487	1.2
Suburban	1,230	1,645	1,668	0.1
Rural	60	60	97	3.5
Open space (Hectares)				
Urbanized Open Space	2,315	2,985	3,023	0.1
Urban Extent	8,249	11,022	12,277	0.8
Density (Persons / Hectare)				
Built-up Area Density	617.1	499.9	467.1	-0.5
Urban Extent Density	443.9	364.5	352.0	-0.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.72	0.73	0.75	0.2
Openness Index	0.32	0.30	0.27	-0.6
Compactness (Roundness)				
Proximity	0.66	0.69	0.69	-0.0
Cohesion	0.65	0.68	0.68	-0.1
Added Area (Hectares)	'89-'00	Share	'00-'13	Share
Infill	500	23%	619	50%
Extension	1,101	52%	197	16%
Leapfrog	112	5%	87	7%
Inclusion	395	18%	318	26%





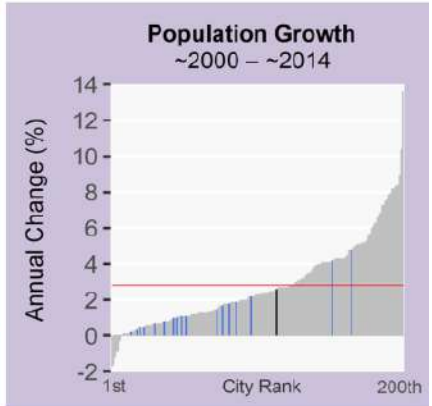
Houston, United States
1990-2014

0 20 40 60 80 km

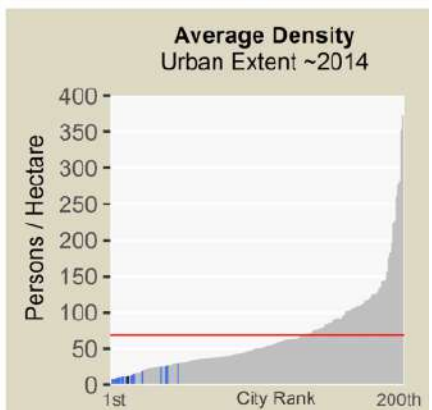
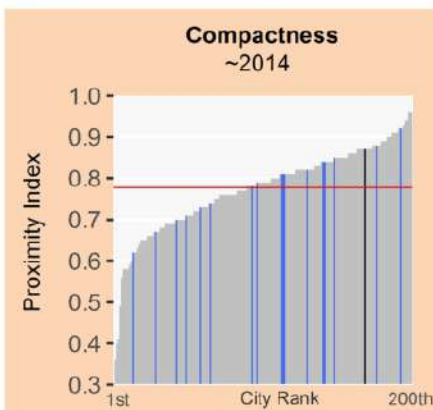
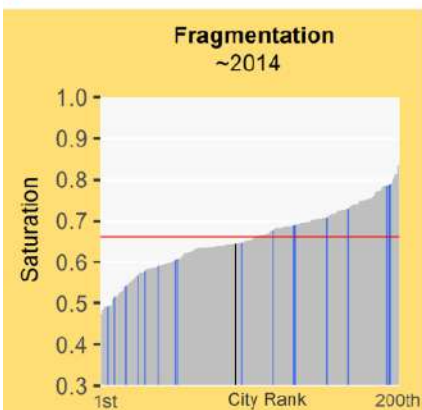
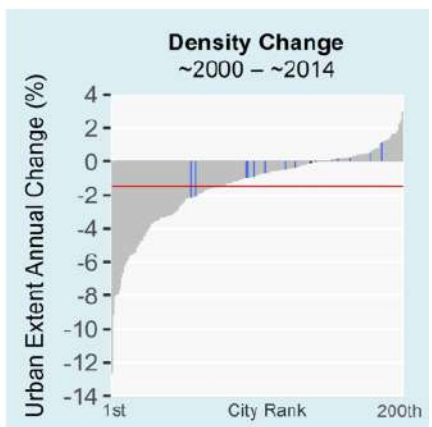
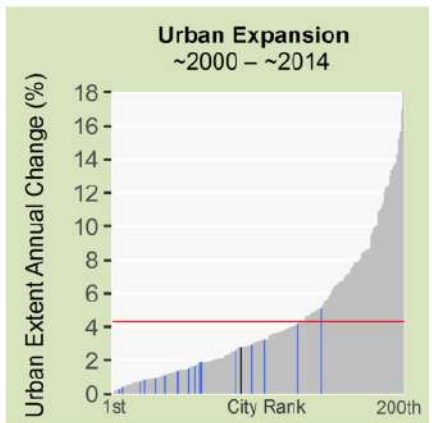
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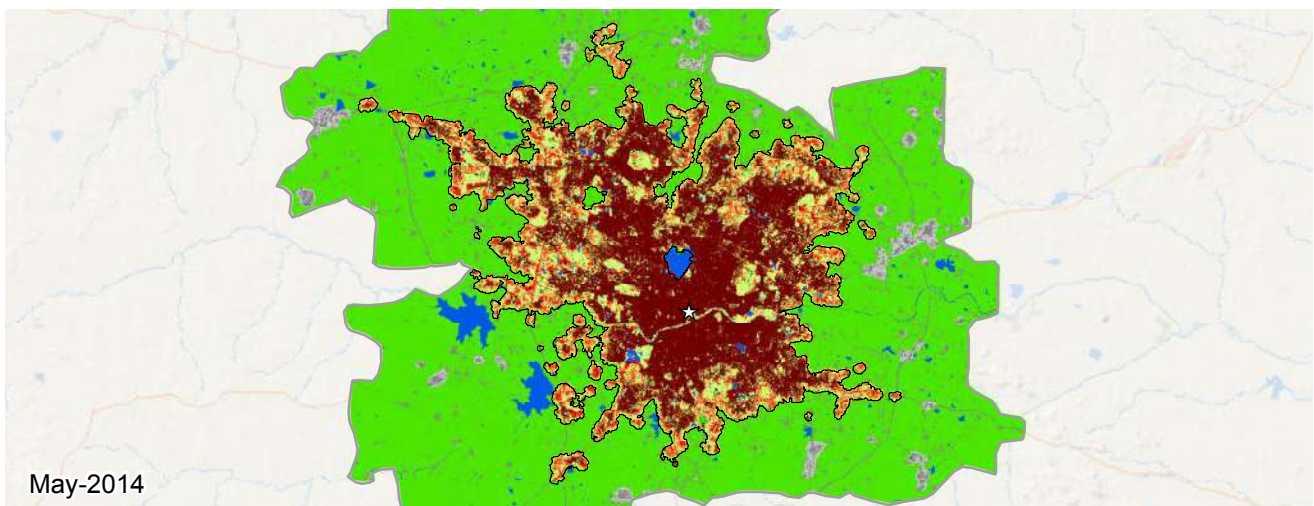
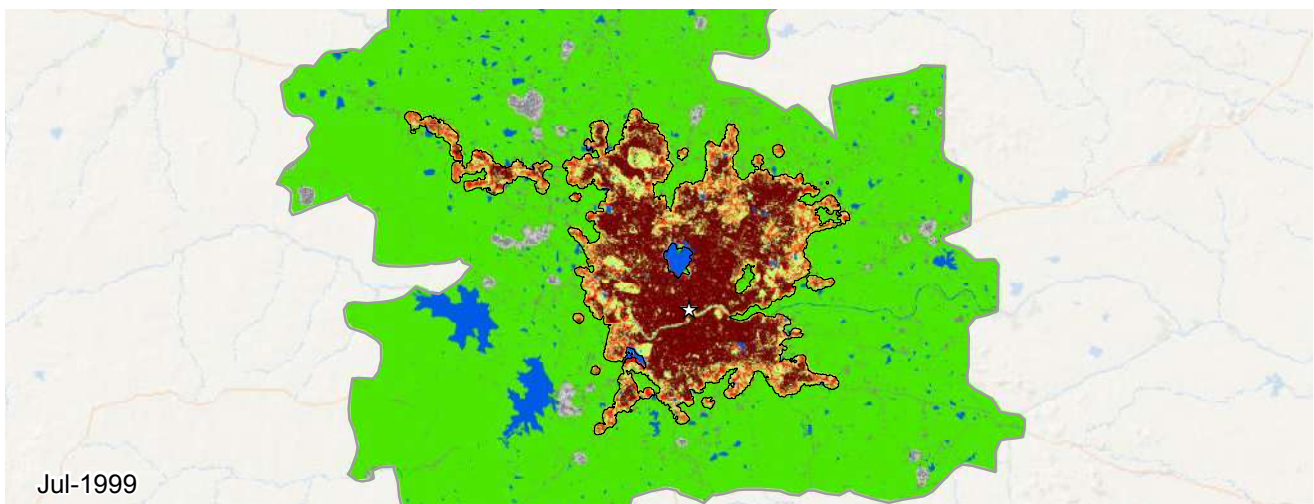
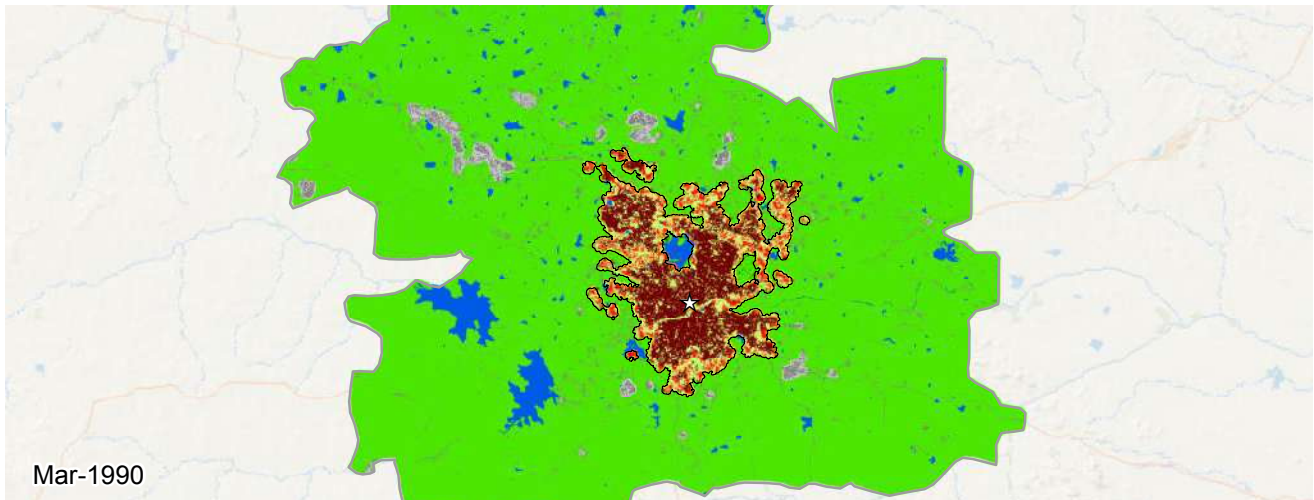
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Houston, United States (Land-Rich Developed Countries)



Metrics	Nov 1990	Sep 2000	May 2014	% Annual Change ('00-'14)
Population	2,739,736	3,758,617	5,399,337	2.7
Built-up Area (Hectares)				
Total	116,357	182,480	272,394	2.9
Urban	77,754	142,750	217,994	3.1
Suburban	36,471	37,333	51,263	2.3
Rural	2,130	2,395	3,135	2.0
Open space (Hectares)				
Urbanized Open Space	91,607	107,148	150,753	2.5
Urban Extent	207,964	289,628	423,147	2.8
Density (Persons / Hectare)				
Built-up Area Density	23.5	20.6	19.8	-0.3
Urban Extent Density	13.2	13.0	12.8	-0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.56	0.63	0.64	0.2
Openness Index	0.40	0.32	0.30	-0.3
Compactness (Roundness)				
Proximity	0.84	0.86	0.87	0.1
Cohesion	0.82	0.84	0.85	0.1
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	30,461	45%	25,543	28%
Extension	19,524	29%	40,798	45%
Leapfrog	350	0%	2,177	2%
Inclusion	16,003	24%	21,618	23%





**Hyderabad, India
1990-2014**

0 8 16 24 32 km

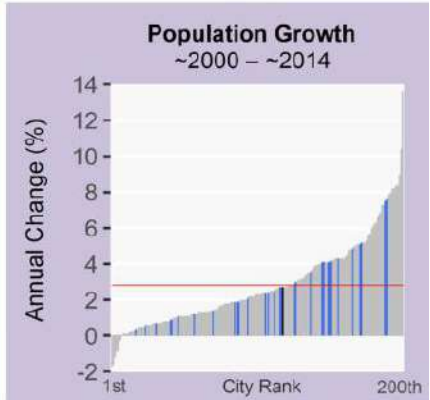
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Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

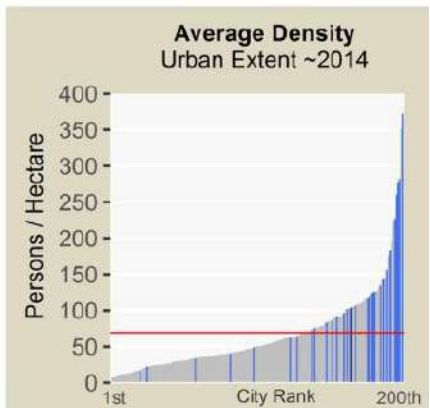
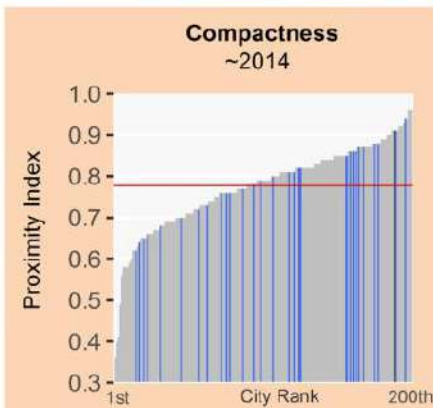
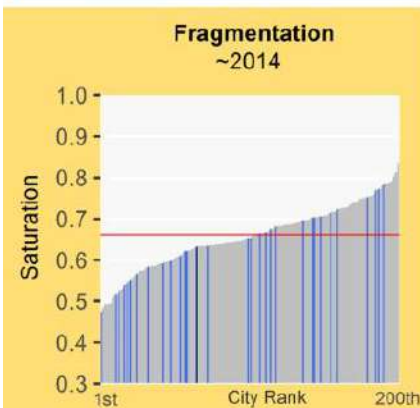
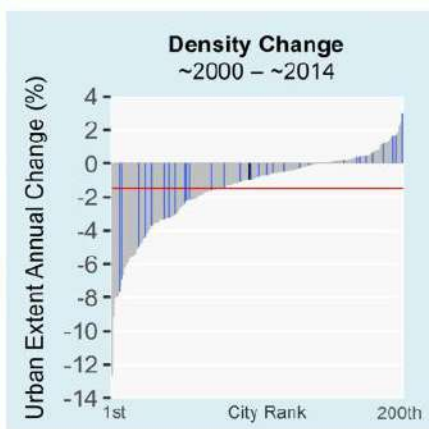
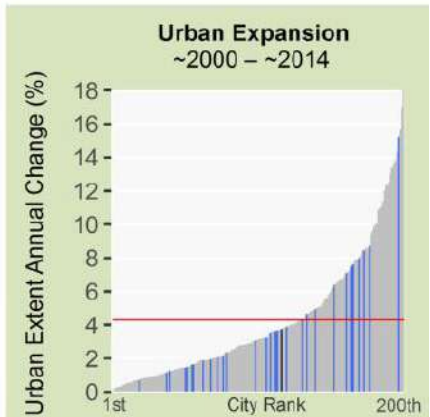
Hyderabad, India (South and Central Asia)

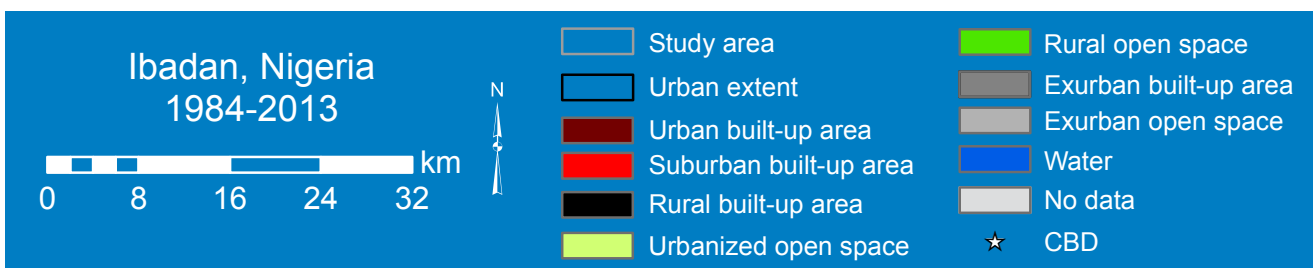
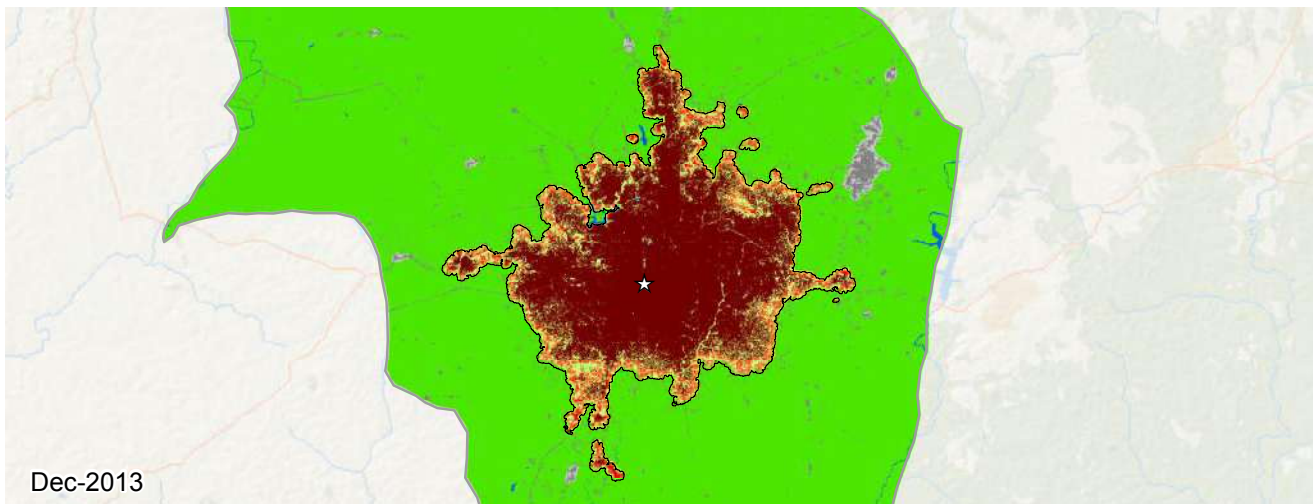
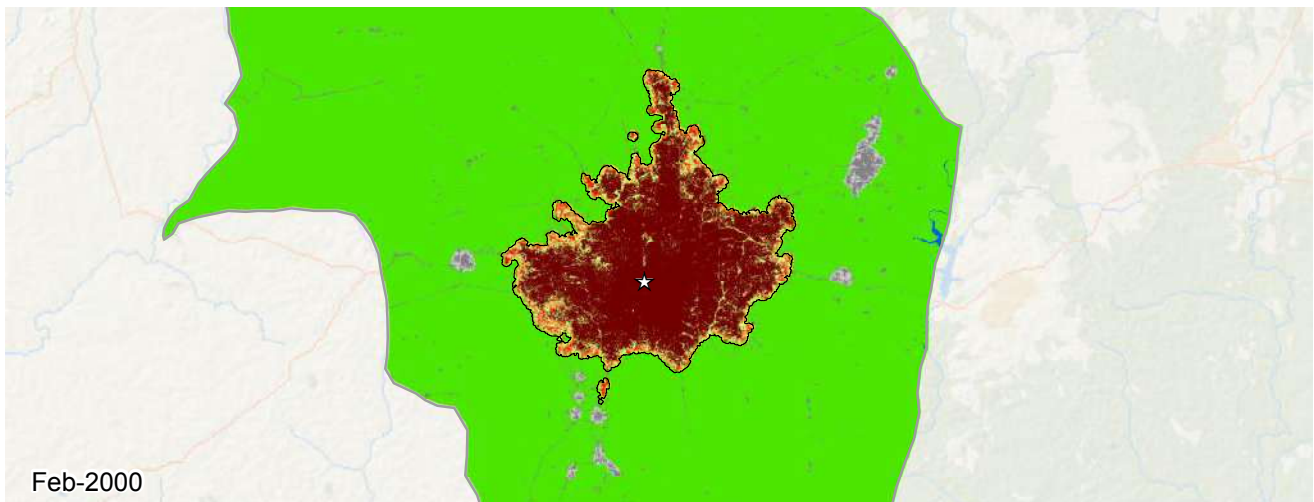
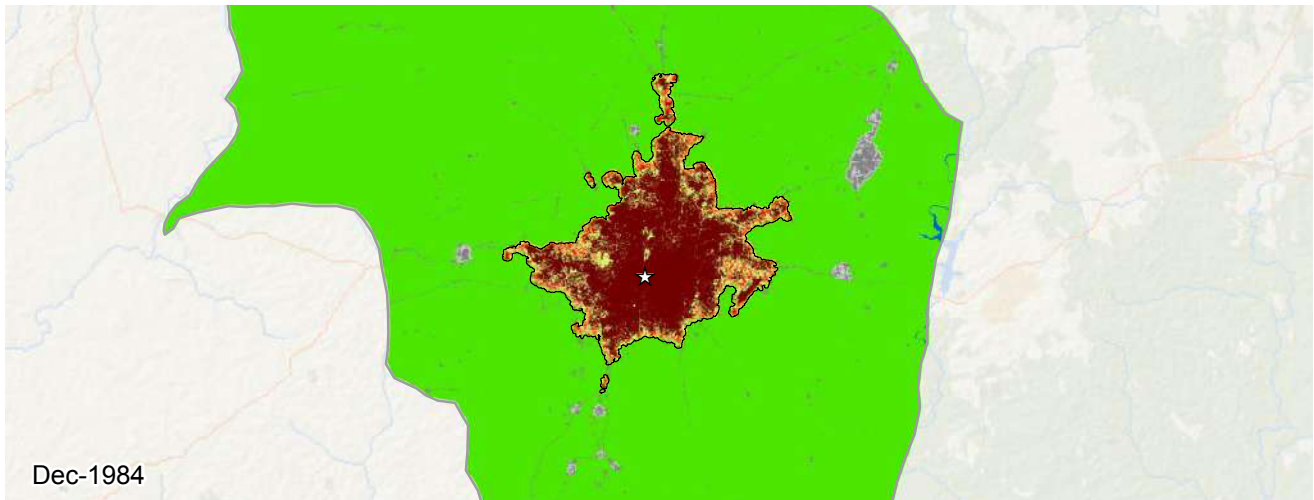


Legend for Charts
 Hyderabad | Other cities in region | All other cities | Global average

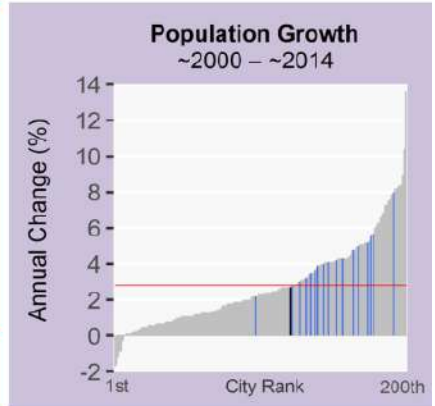
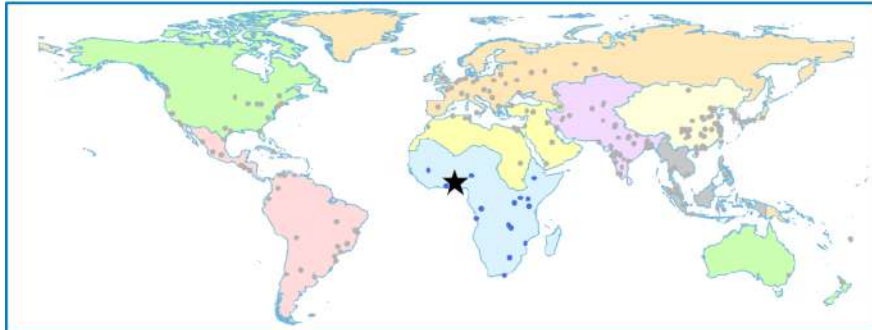


Metrics	Mar 1990	Jul 1999	May 2014	% Annual Change ('99-'14)
Population	3,906,589	5,066,999	7,609,285	2.7
Built-up Area (Hectares)				
Total	12,669	26,666	46,168	3.7
Urban	8,917	20,683	36,293	3.8
Suburban	3,486	5,594	9,098	3.3
Rural	264	388	775	4.7
Open space (Hectares)				
Urbanized Open Space	8,999	15,291	26,829	3.8
Urban Extent	21,668	41,958	72,997	3.7
Density (Persons / Hectare)				
Built-up Area Density	308.4	190.0	164.8	-1.0
Urban Extent Density	180.3	120.8	104.2	-1.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.58	0.64	0.63	-0.0
Openness Index	0.37	0.30	0.29	-0.2
Compactness (Roundness)				
Proximity	0.88	0.87	0.91	0.3
Cohesion	0.88	0.84	0.89	0.4
Added Area (Hectares)	'90-'99	Share	'99-'14	Share
Infill	4,544	32%	5,590	28%
Extension	6,345	45%	10,331	52%
Leapfrog	0	0%	13	0%
Inclusion	3,106	22%	3,566	18%

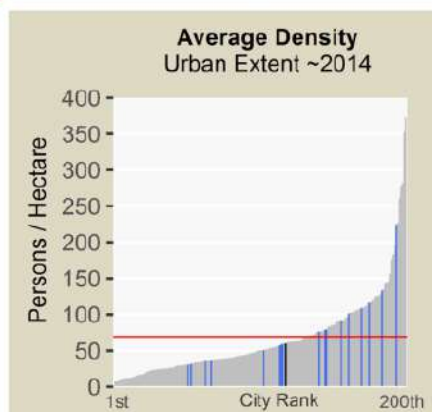
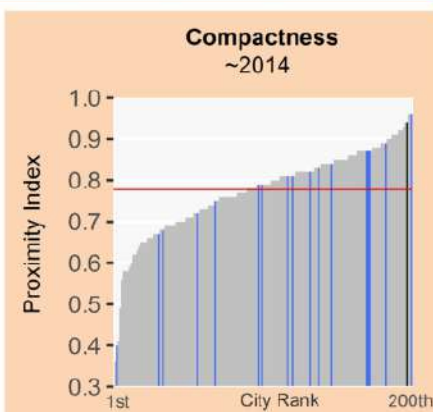
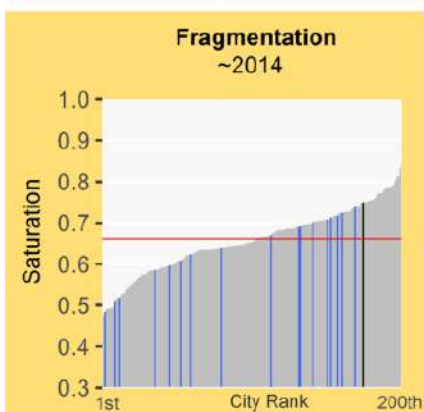
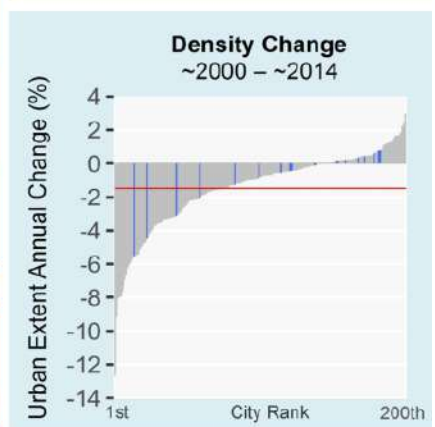
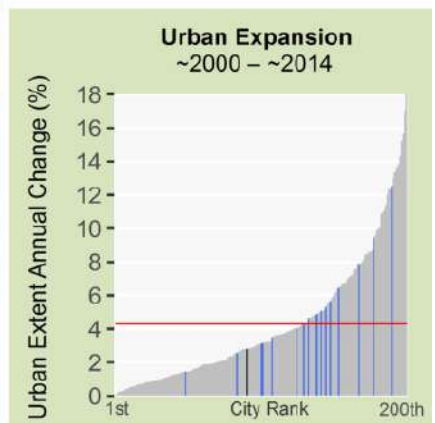


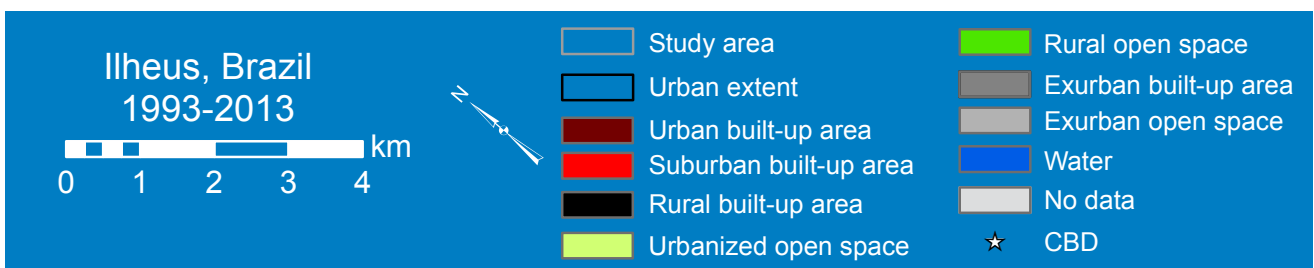
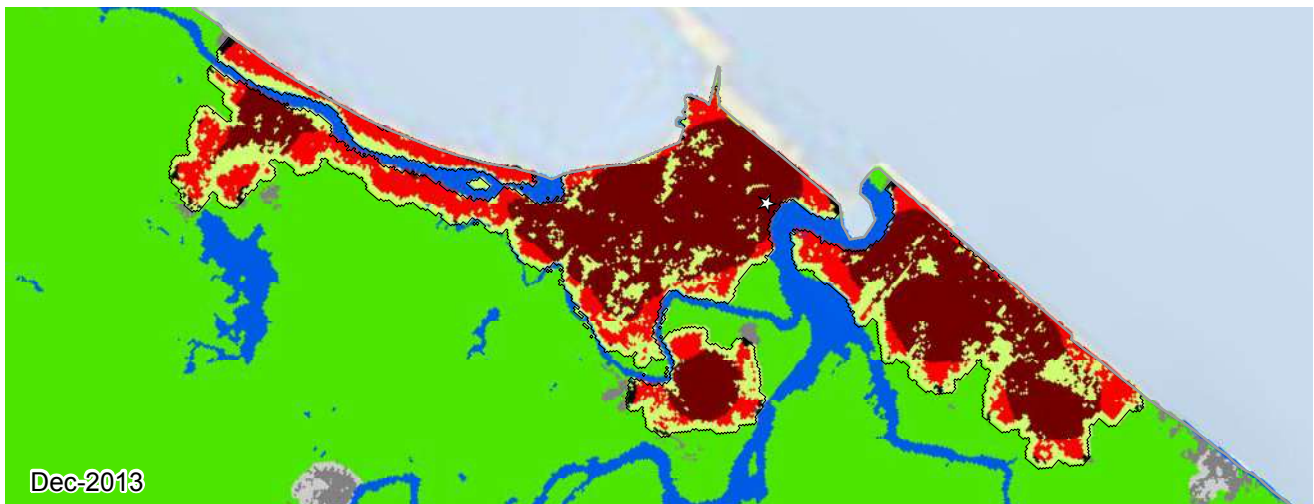
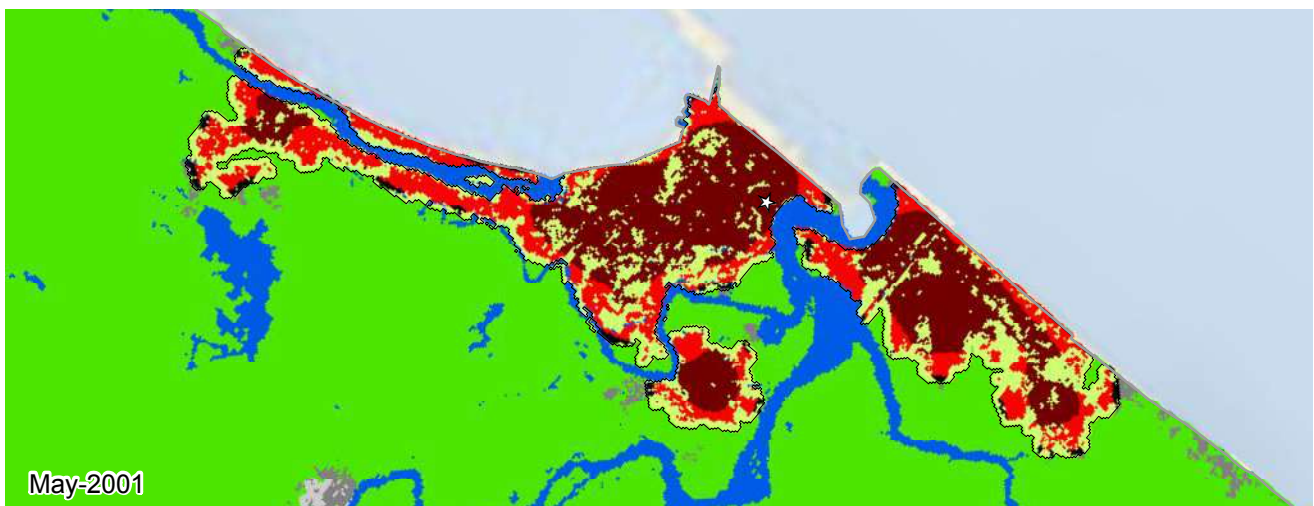
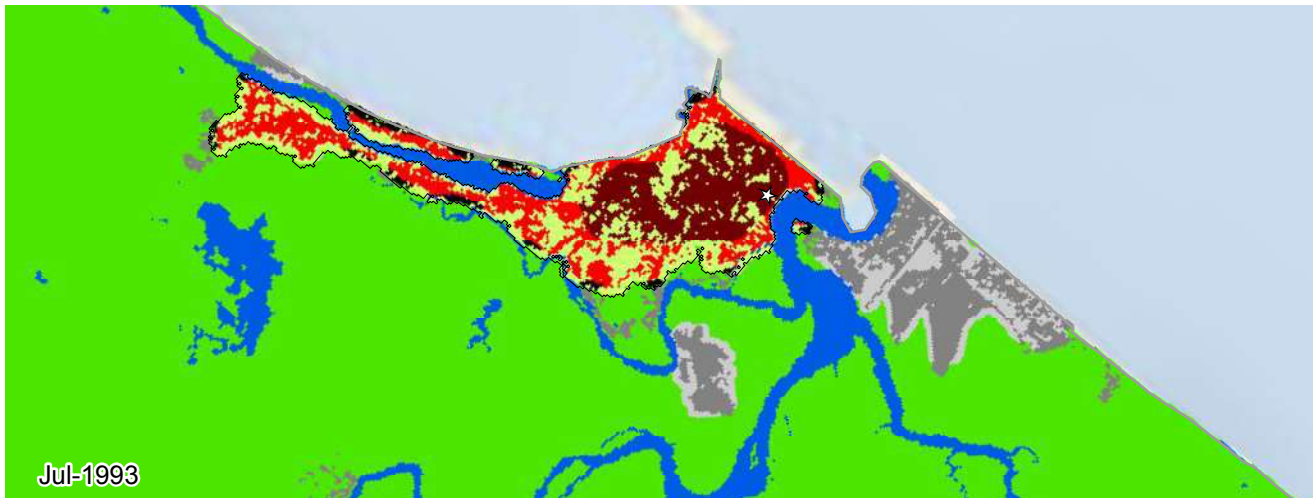


Ibadan, Nigeria (Sub-Saharan Africa)

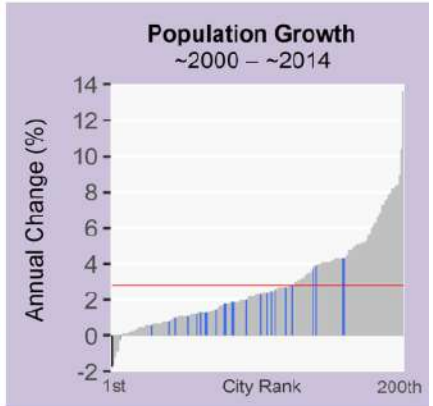
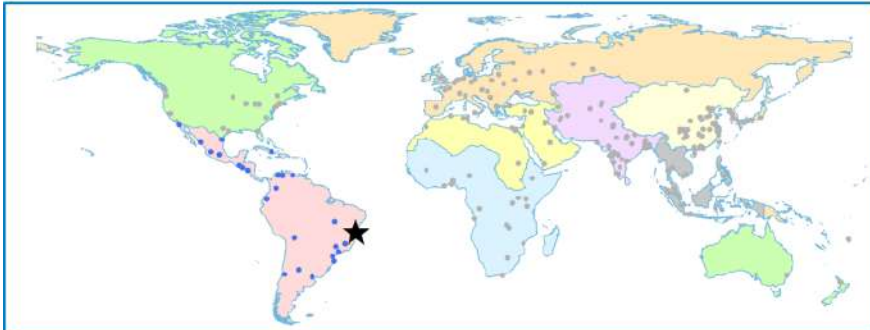


Metrics	Dec 1984	Feb 2000	Dec 2013	% Annual Change ('00-'13)
Population	1,397,390	2,041,756	2,954,967	2.7
Built-up Area (Hectares)				
Total	17,966	26,273	36,811	2.4
Urban	15,773	23,971	32,352	2.2
Suburban	2,034	2,128	4,169	4.9
Rural	158	173	288	3.7
Open space (Hectares)				
Urbanized Open Space	6,297	7,155	12,309	3.9
Urban Extent	24,263	33,428	49,120	2.8
Density (Persons / Hectare)				
Built-up Area Density	77.8	77.7	80.3	0.2
Urban Extent Density	57.6	61.1	60.2	-0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.74	0.79	0.75	-0.3
Openness Index	0.19	0.15	0.17	1.0
Compactness (Roundness)				
Proximity	0.92	0.94	0.94	-0.0
Cohesion	0.91	0.93	0.93	0.0
Added Area (Hectares)	'84-'00	Share	'00-'13	Share
Infill	3,186	38%	3,156	29%
Extension	4,666	56%	5,961	56%
Leapfrog	0	0%	0	0%
Inclusion	454	5%	1,420	13%

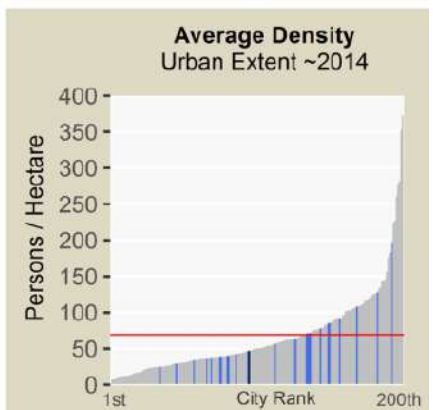
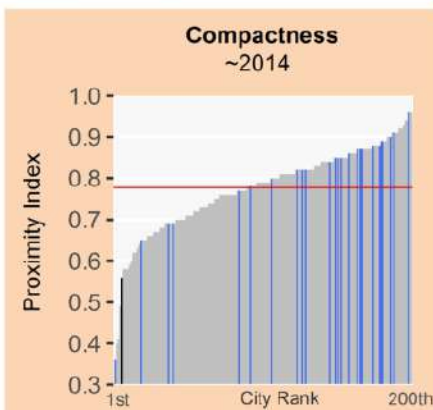
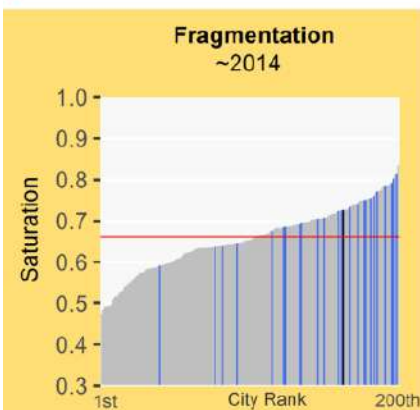
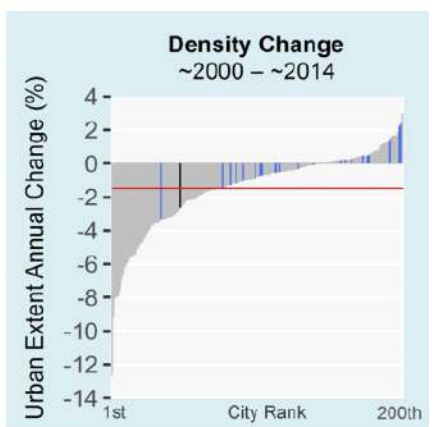
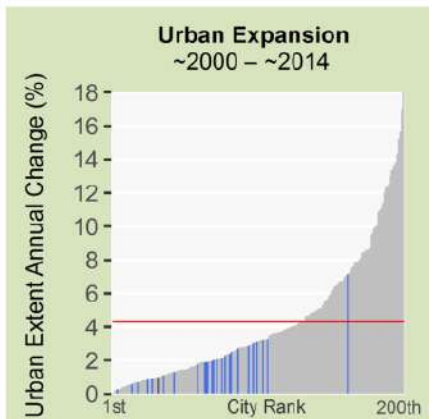


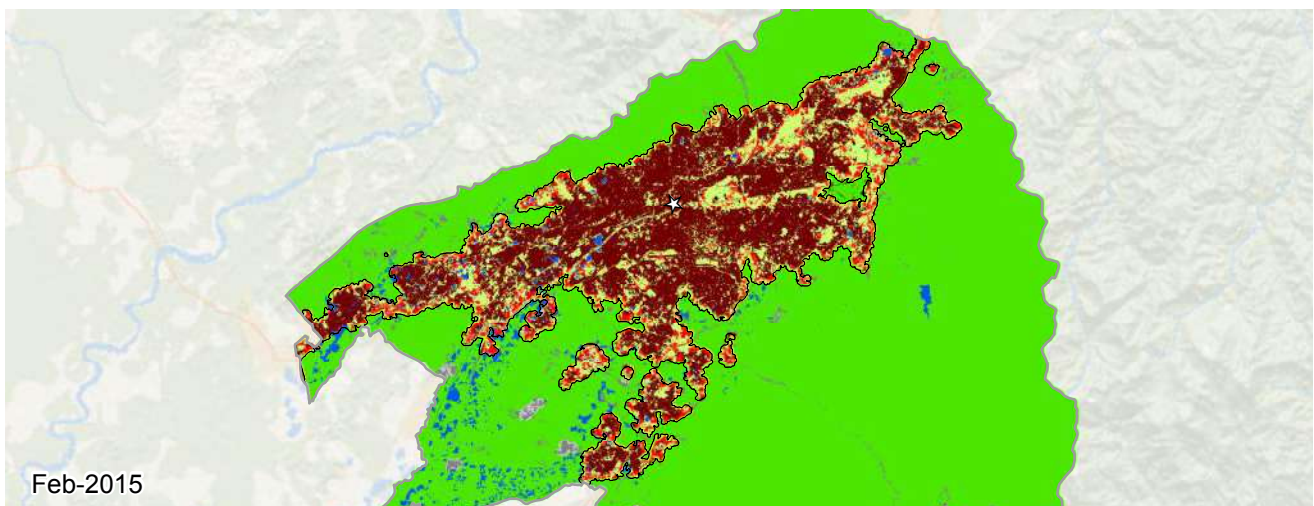
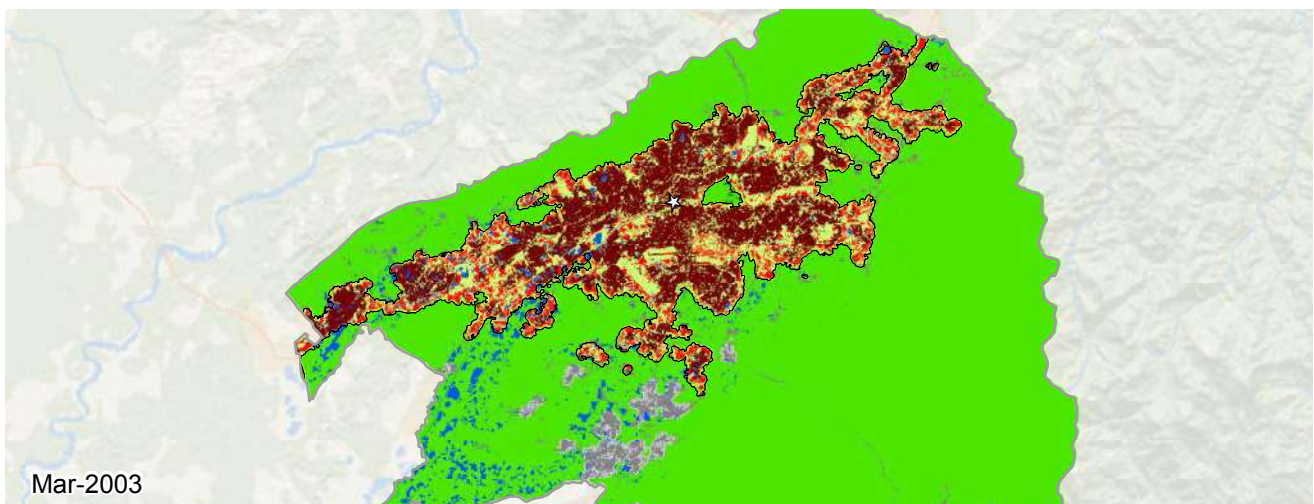
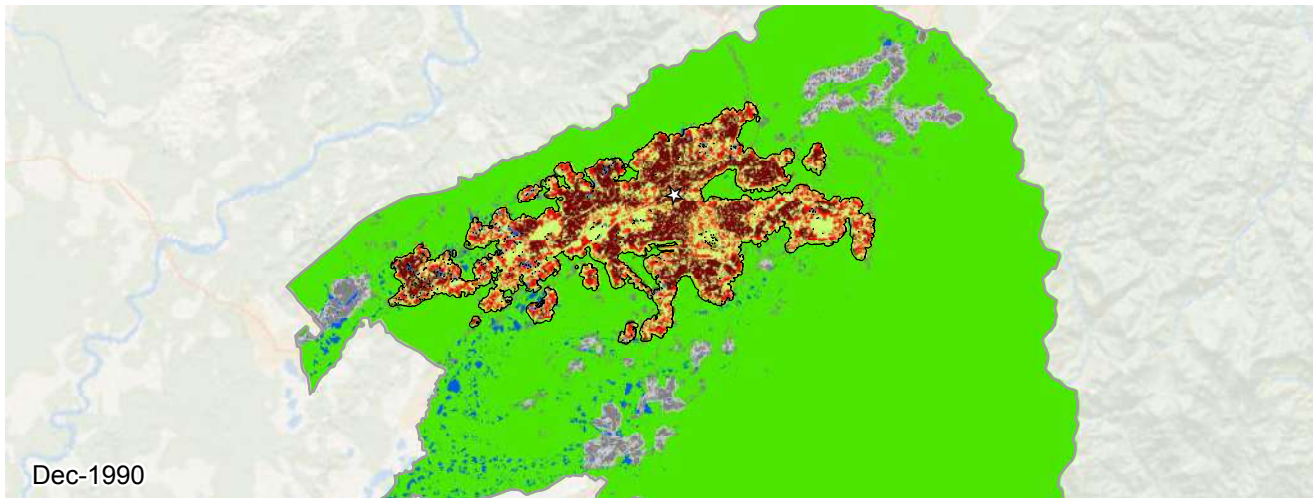


Ilheus, Brazil (Latin America and the Caribbean)



Metrics	Jul 1993	May 2001	Dec 2013	% Annual Change ('01-'13)
Population	88,775	120,999	97,887	-1.7
Built-up Area (Hectares)				
Total	531	1,249	1,513	1.5
Urban	232	746	1,023	2.5
Suburban	255	461	467	0.1
Rural	43	42	21	-5.2
Open space (Hectares)				
Urbanized Open Space	339	595	570	-0.3
Urban Extent	871	1,844	2,083	1.0
Density (Persons / Hectare)				
Built-up Area Density	166.9	96.8	64.7	-3.2
Urban Extent Density	101.9	65.6	47.0	-2.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.61	0.68	0.73	0.6
Openness Index	0.51	0.43	0.38	-1.0
Compactness (Roundness)				
Proximity	0.57	0.55	0.56	0.1
Cohesion	0.58	0.53	0.54	0.1
Added Area (Hectares)	'93-'01	Share	'01-'13	Share
Infill	156	21%	144	54%
Extension	91	12%	48	18%
Leapfrog	115	15%	33	12%
Inclusion	367	50%	37	14%



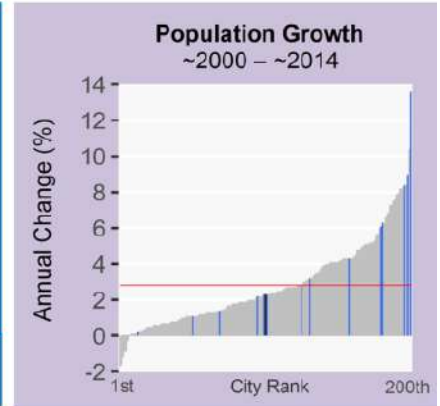


**Ipoh, Malaysia
1990-2015**

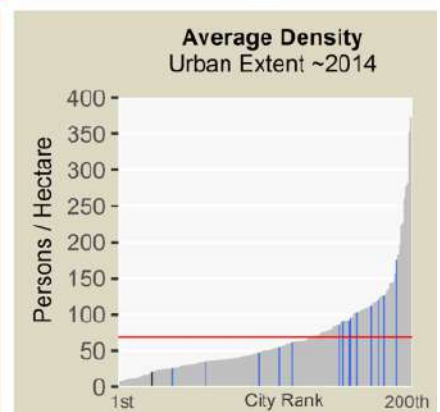
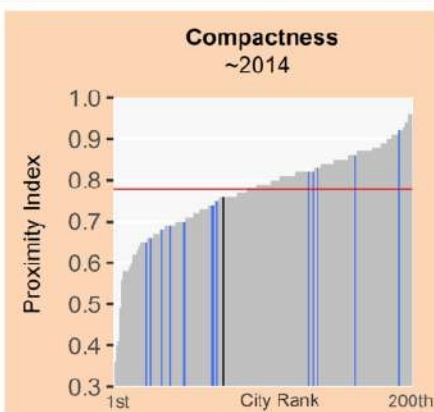
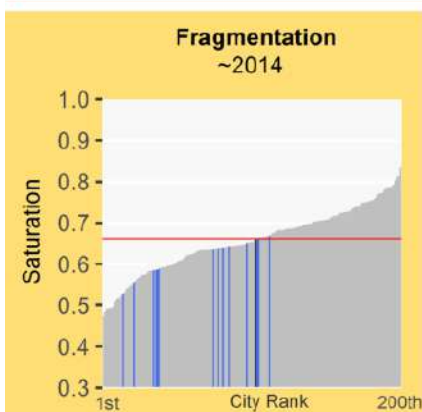
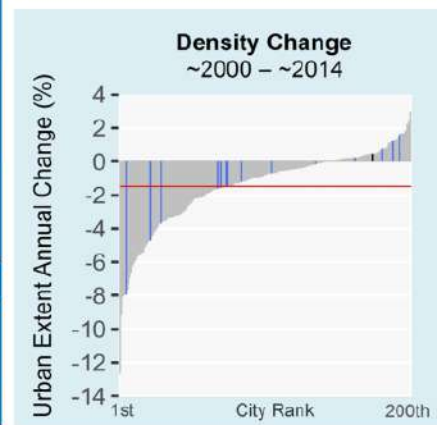
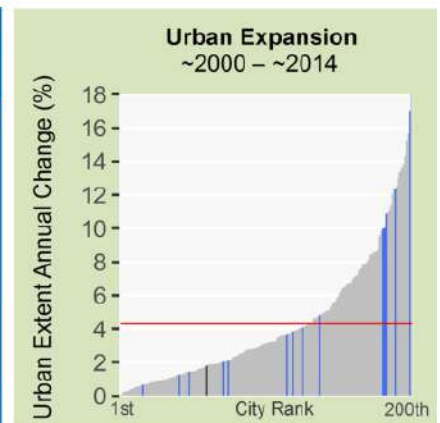
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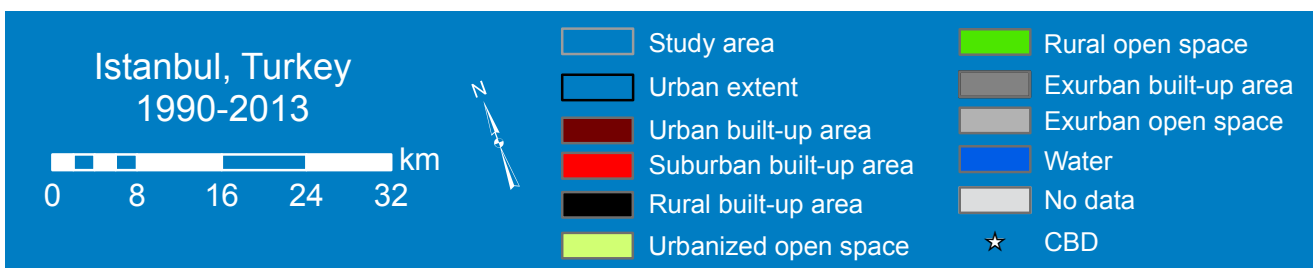
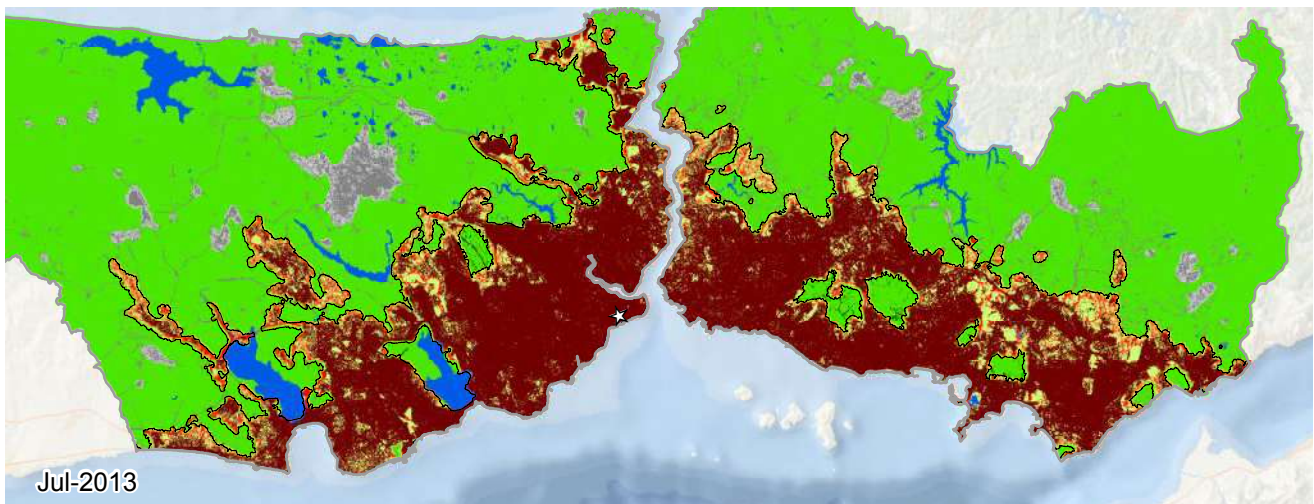
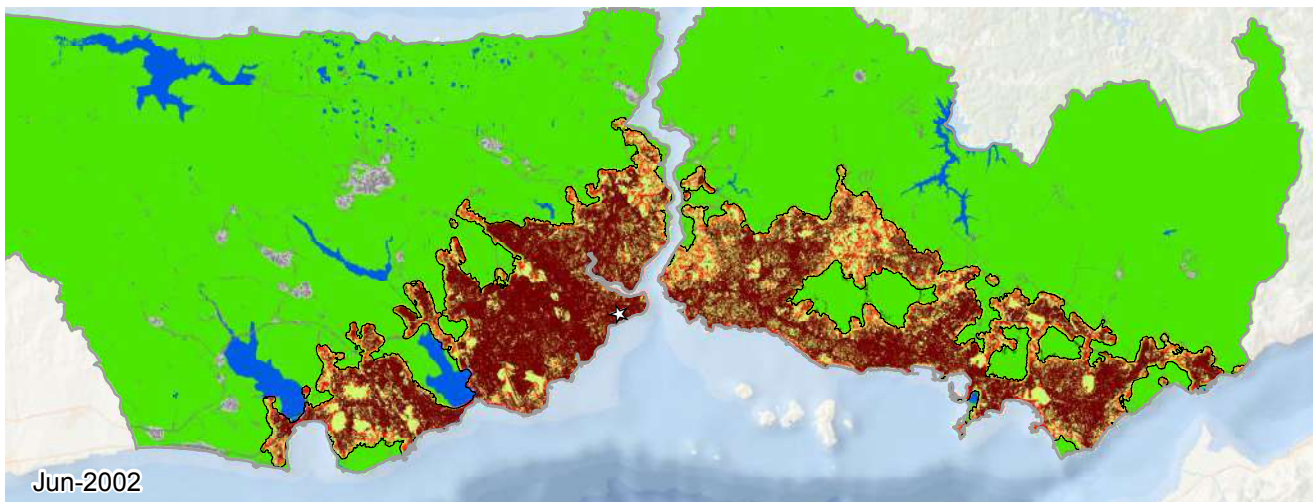
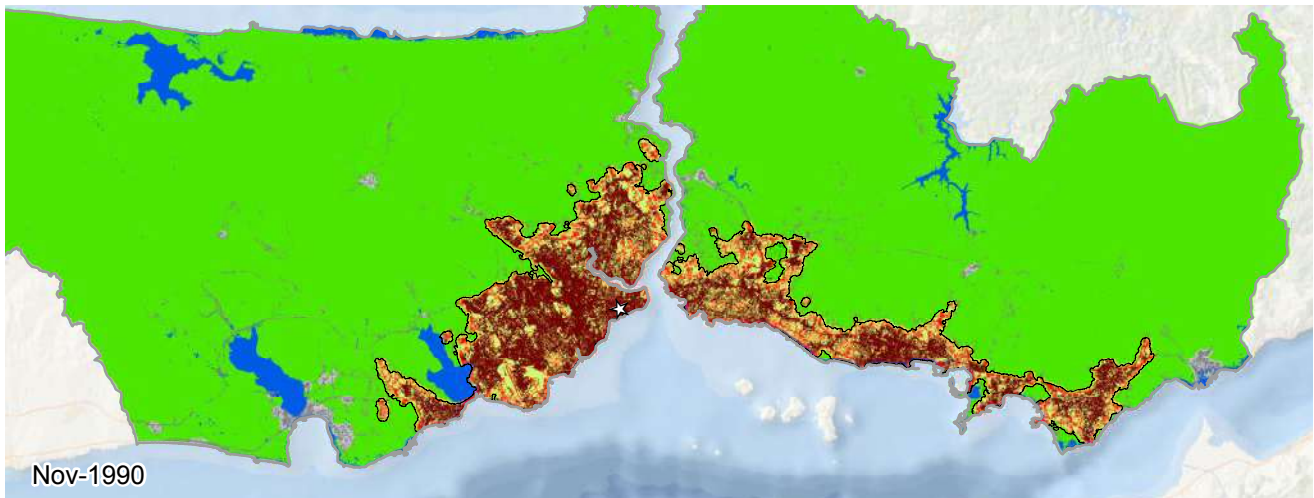
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Ipoh, Malaysia (Southeast Asia)

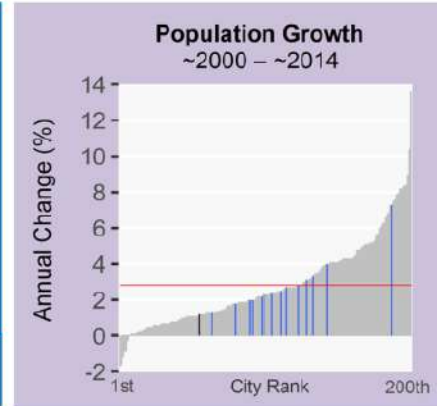
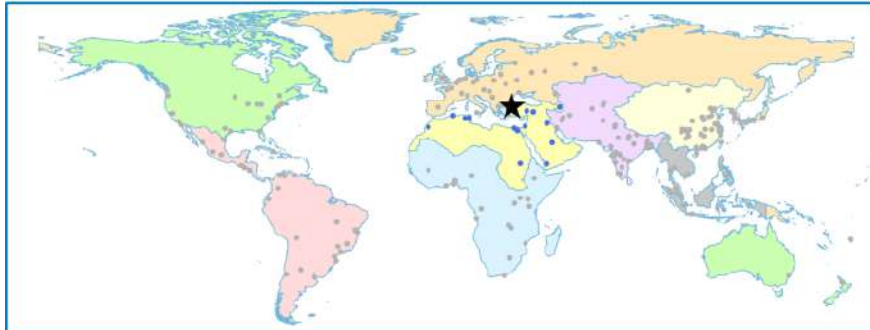


Metrics	Dec 1990	Mar 2003	Feb 2015	% Annual Change ('03-'15)
Population	409,006	605,173	793,675	2.3
Built-up Area (Hectares)				
Total	10,152	18,566	25,309	2.6
Urban	5,605	13,073	20,443	3.7
Suburban	4,217	5,189	4,533	-1.1
Rural	330	303	332	0.8
Open space (Hectares)				
Urbanized Open Space	9,373	12,450	13,064	0.4
Urban Extent	19,526	31,016	38,374	1.8
Density (Persons / Hectare)				
Built-up Area Density	40.3	32.6	31.4	-0.3
Urban Extent Density	20.9	19.5	20.7	0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.52	0.60	0.66	0.8
Openness Index	0.47	0.38	0.31	-1.7
Compactness (Roundness)				
Proximity	0.74	0.72	0.76	0.4
Cohesion	0.73	0.71	0.74	0.4
Added Area (Hectares)	'90-'03	Share	'03-'15	Share
Infill	2,919	34%	3,470	51%
Extension	2,840	33%	1,470	21%
Leapfrog	49	0%	7	0%
Inclusion	2,632	31%	1,795	26%

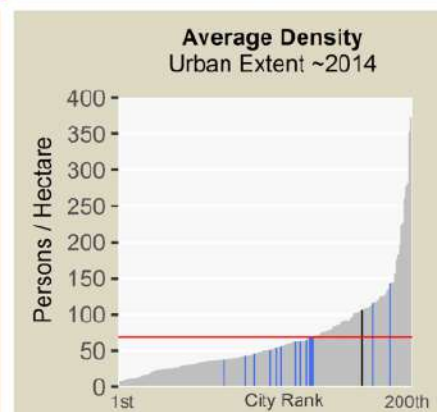
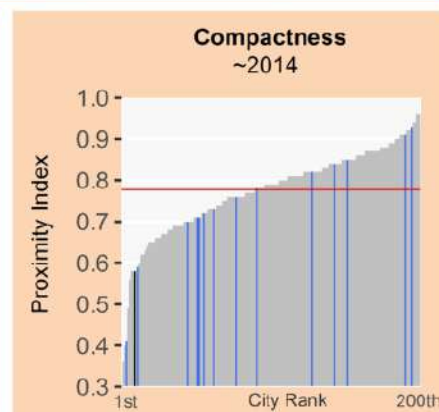
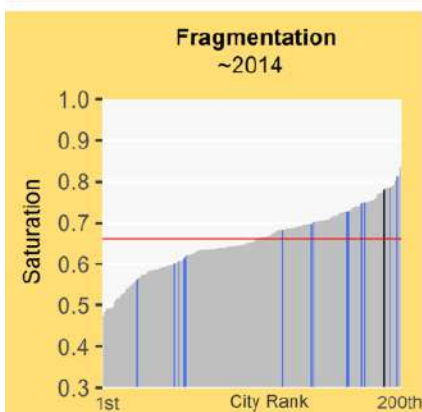
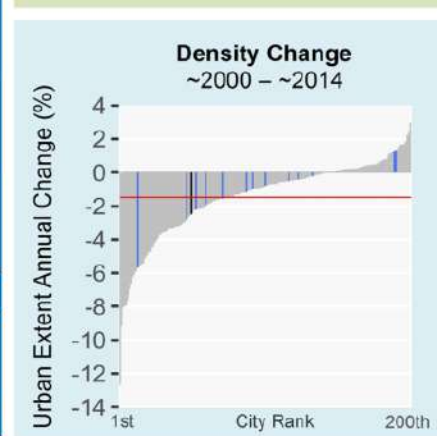
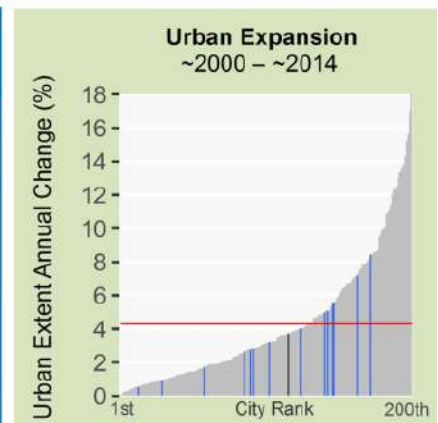


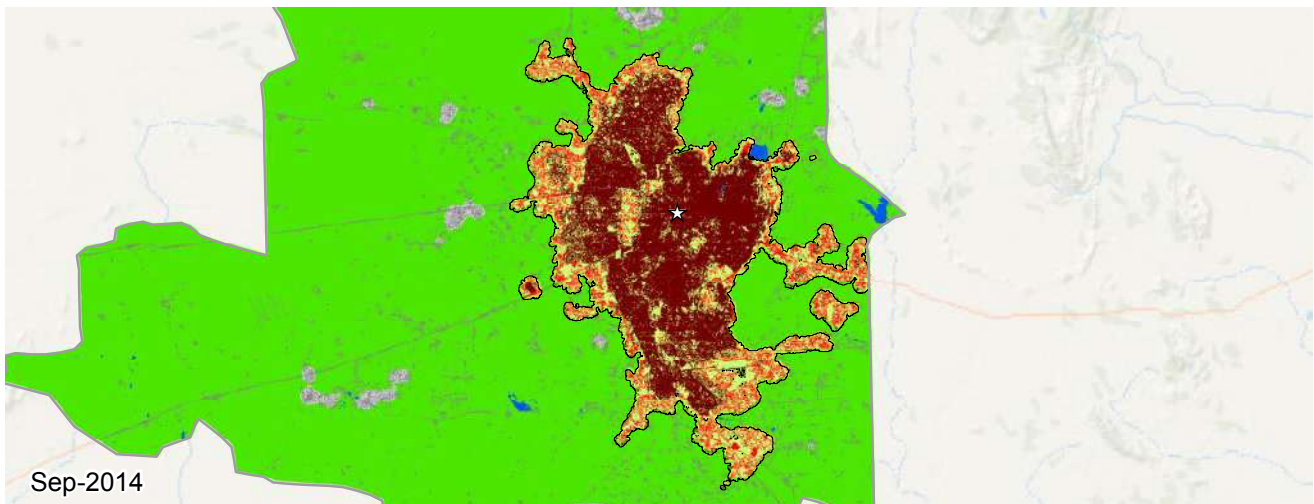
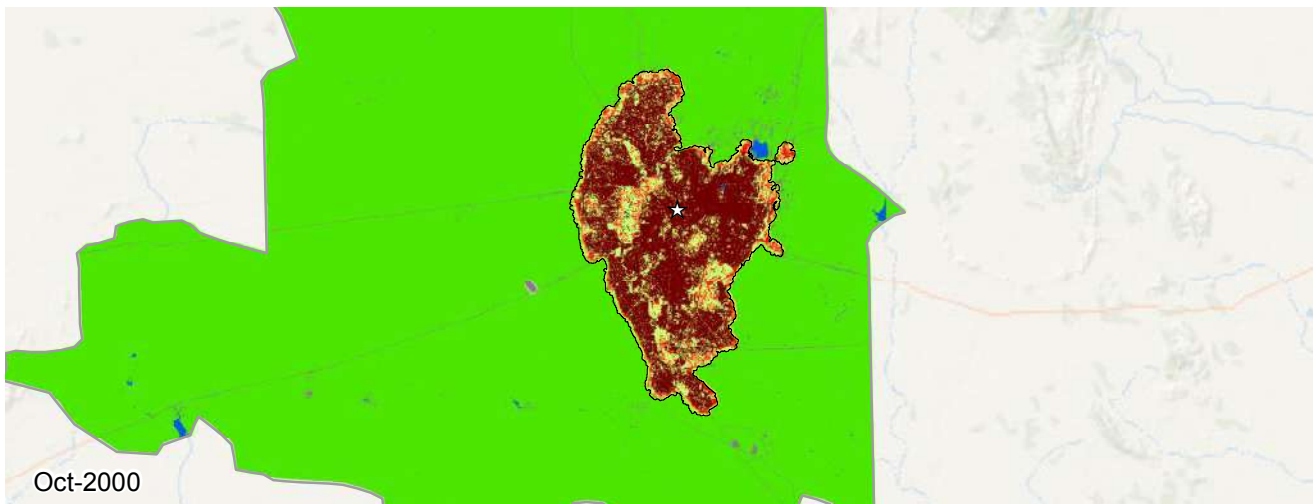
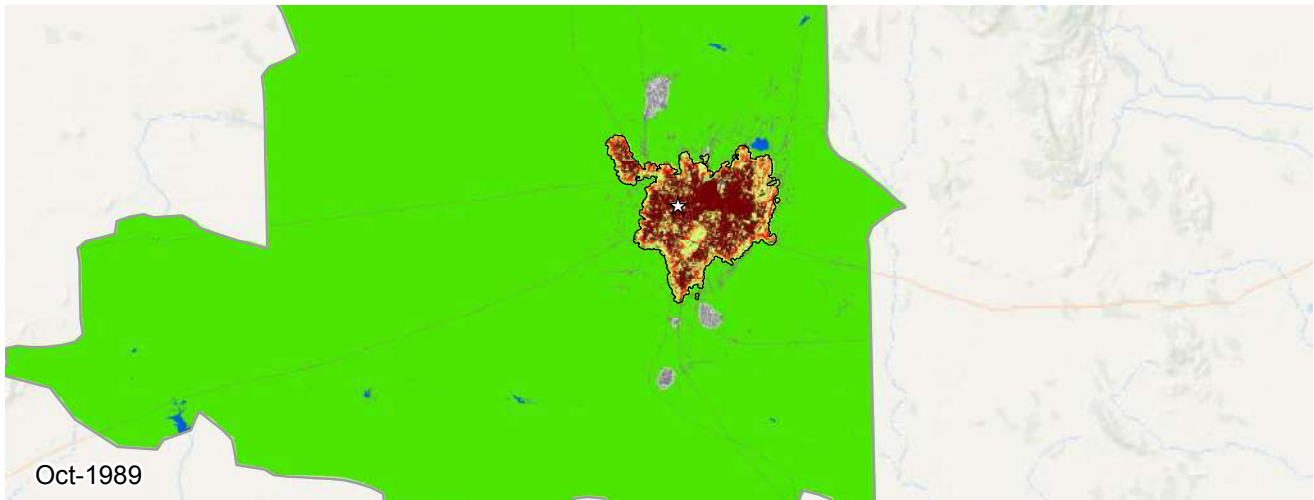


Istanbul, Turkey (Western Asia and North Africa)



Metrics	Nov 1990	Jun 2002	Jul 2013	% Annual Change ('02-'13)
Population	8,662,184	12,202,504	13,974,427	1.2
Built-up Area (Hectares)				
Total	28,372	57,758	102,589	5.2
Urban	20,855	46,999	92,508	6.1
Suburban	7,105	10,171	9,396	-0.7
Rural	411	587	684	1.4
Open space (Hectares)				
Urbanized Open Space	18,556	29,366	29,016	-0.1
Urban Extent	46,928	87,125	131,605	3.7
Density (Persons / Hectare)				
Built-up Area Density	305.3	211.3	136.2	-4.0
Urban Extent Density	184.6	140.1	106.2	-2.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.60	0.66	0.78	1.5
Openness Index	0.37	0.30	0.17	-5.2
Compactness (Roundness)				
Proximity	0.50	0.54	0.58	0.6
Cohesion	0.50	0.54	0.58	0.6
Added Area (Hectares)	'90-'02	Share	'02-'13	Share
Infill	7,727	26%	20,577	45%
Extension	17,913	60%	7,440	16%
Leapfrog	0	0%	12,718	28%
Inclusion	3,768	12%	4,119	9%





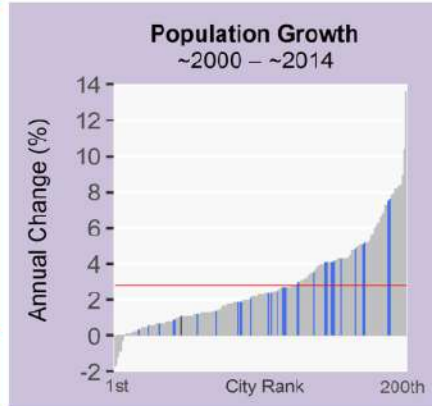
**Jaipur, India
1989-2014**

0 5 10 15 20 km

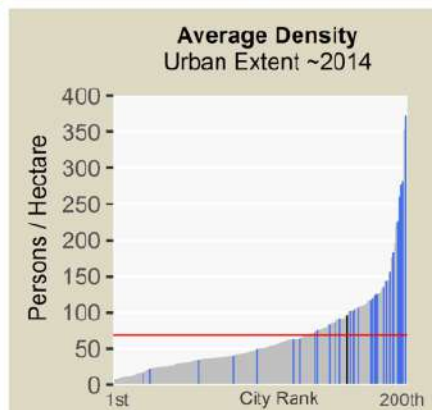
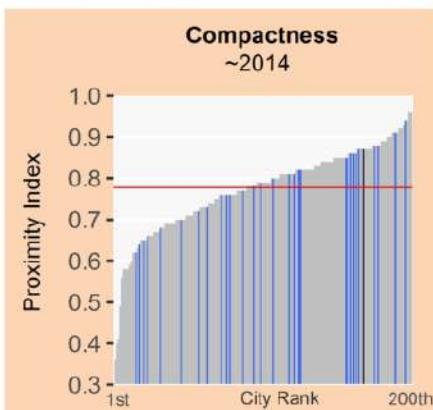
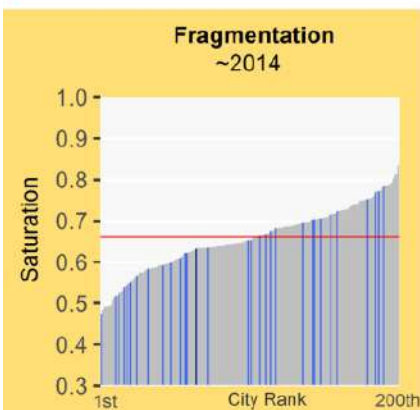
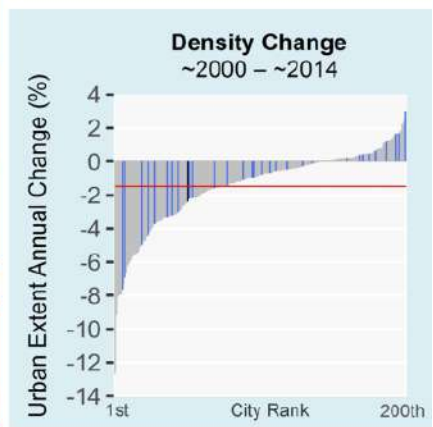
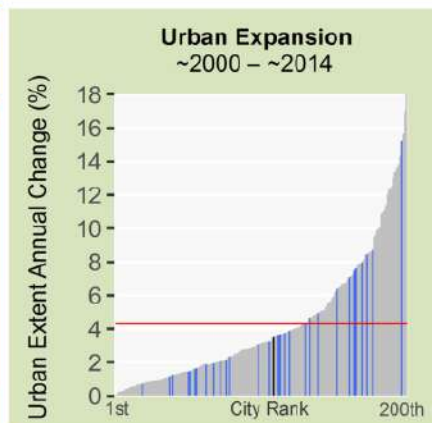
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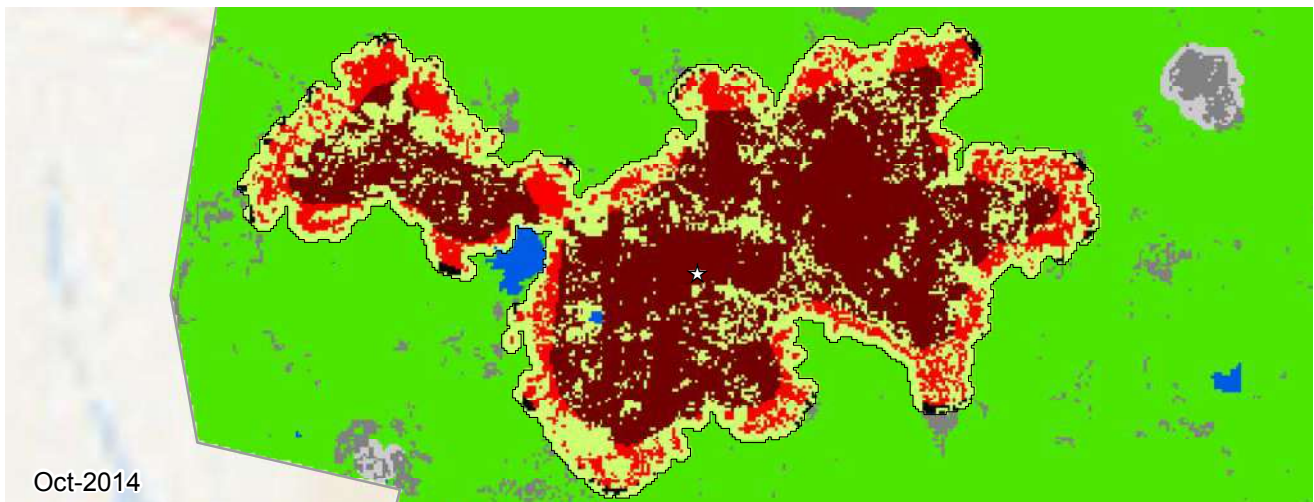
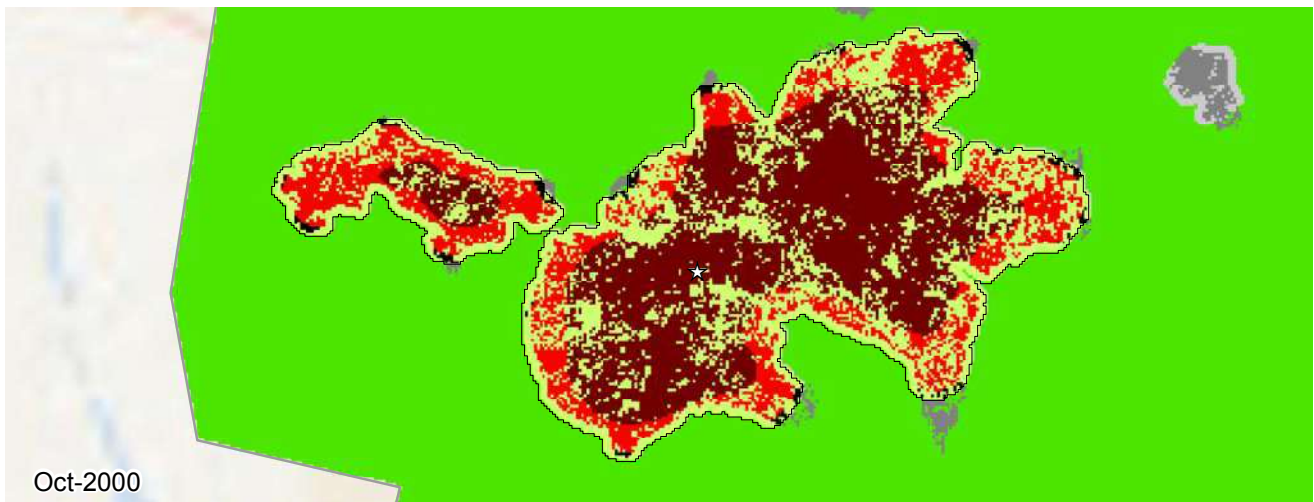
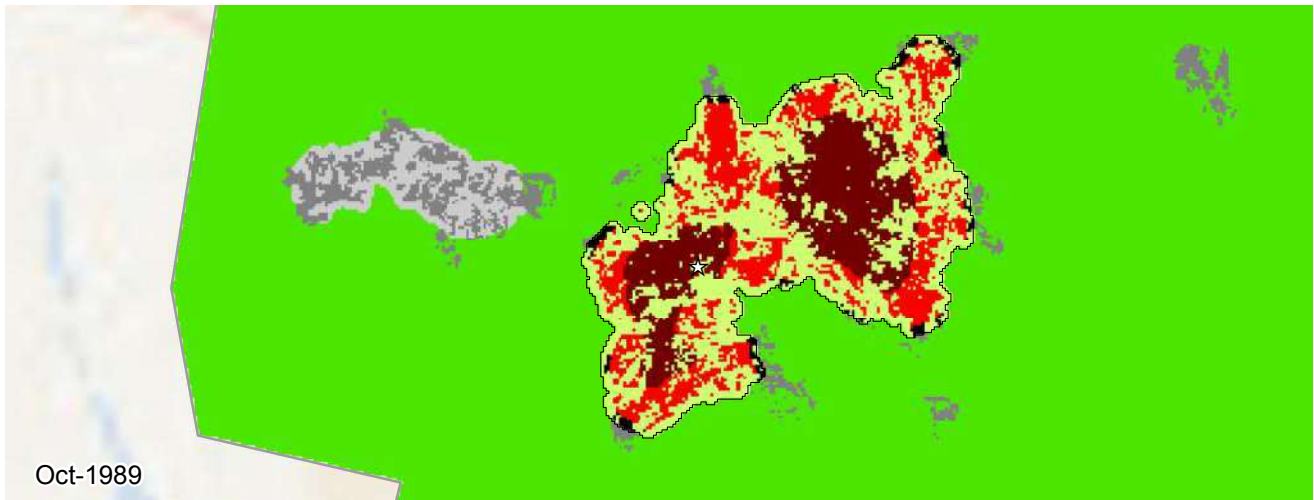
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Jaipur, India (South and Central Asia)



Metrics	Oct 1989	Oct 2000	Sep 2014	% Annual Change ('00-'14)
Population	1,555,856	2,508,689	2,938,601	1.1
Built-up Area (Hectares)				
Total	4,023	12,788	19,218	2.9
Urban	3,134	11,309	14,570	1.8
Suburban	809	1,395	4,244	8.0
Rural	80	83	403	11.3
Open space (Hectares)				
Urbanized Open Space	2,604	5,782	11,171	4.7
Urban Extent	6,627	18,570	30,390	3.5
Density (Persons / Hectare)				
Built-up Area Density	386.7	196.2	152.9	-1.8
Urban Extent Density	234.8	135.1	96.7	-2.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.61	0.69	0.63	-0.6
Openness Index	0.33	0.26	0.29	0.9
Compactness (Roundness)				
Proximity	0.92	0.91	0.87	-0.3
Cohesion	0.91	0.91	0.86	-0.4
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	1,246	14%	1,588	24%
Extension	6,517	74%	4,446	68%
Leapfrog	40	0%	0	0%
Inclusion	960	10%	436	6%

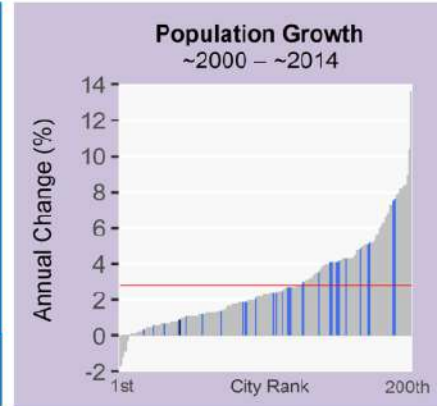




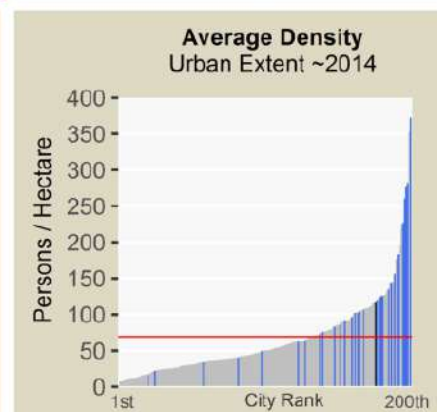
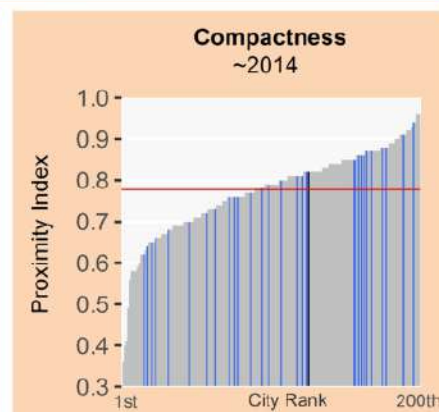
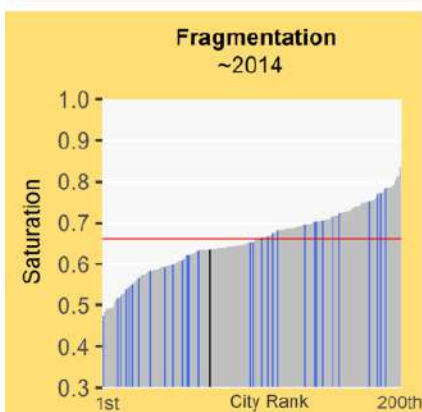
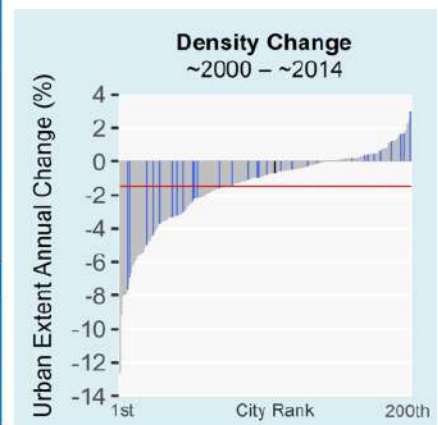
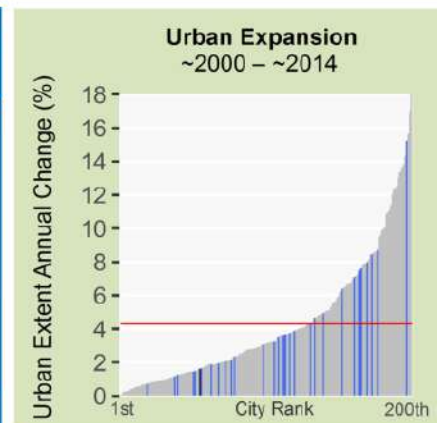
**Jalna, India
1989-2014**

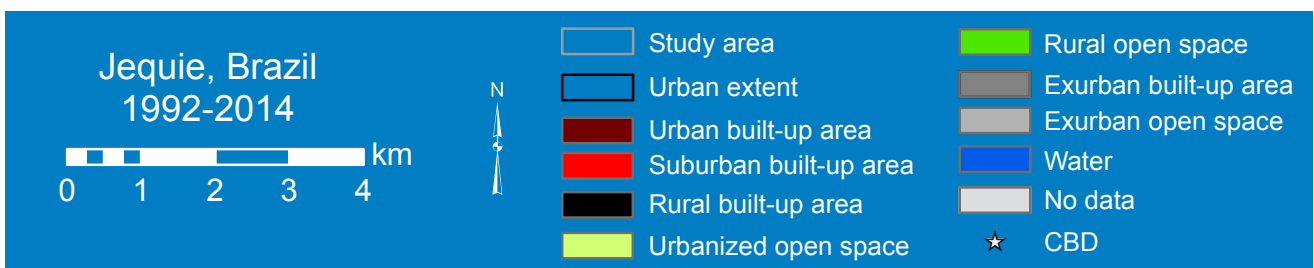
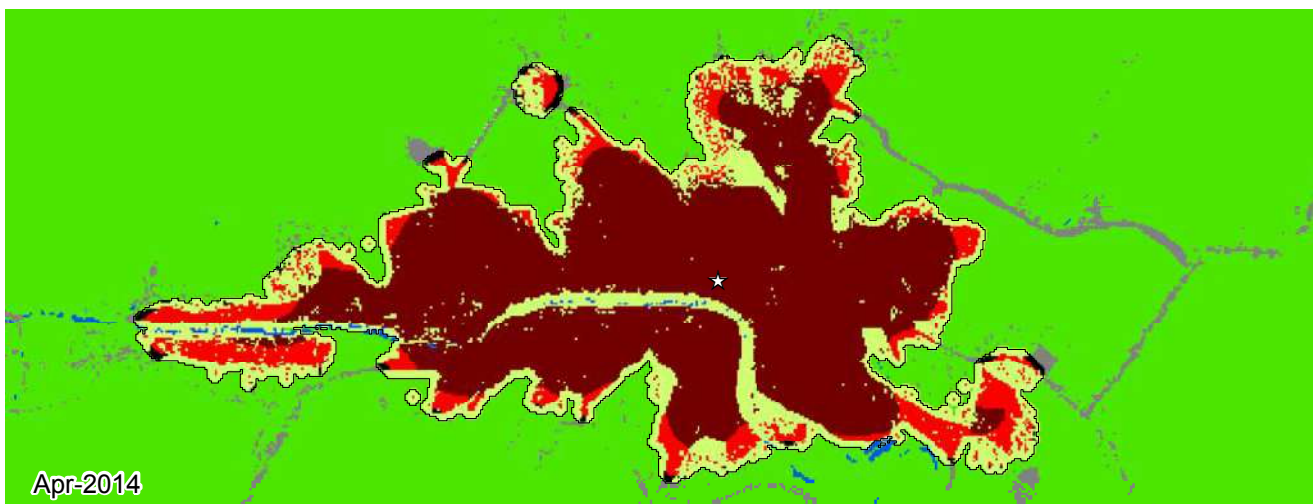
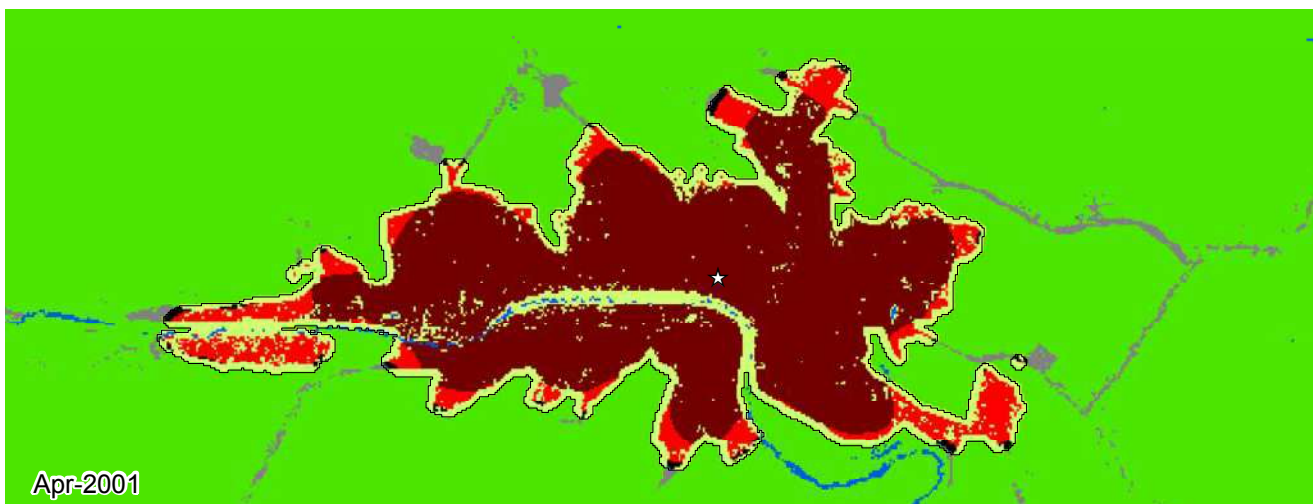
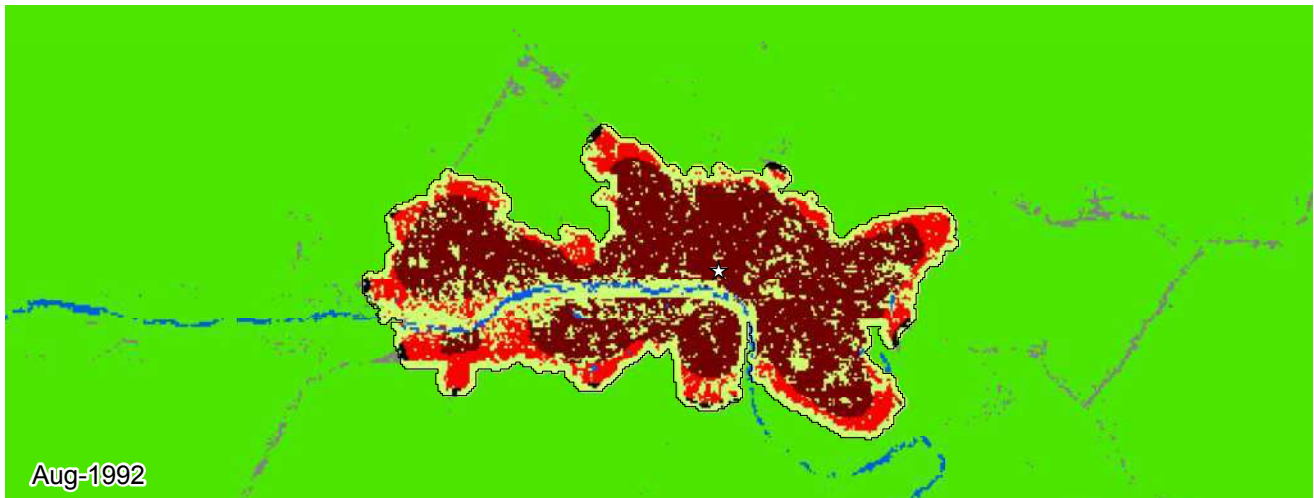
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Jalna, India (South and Central Asia)

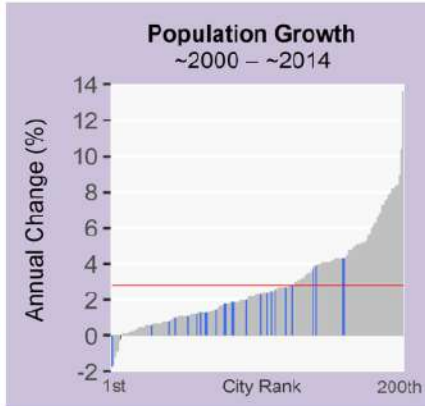
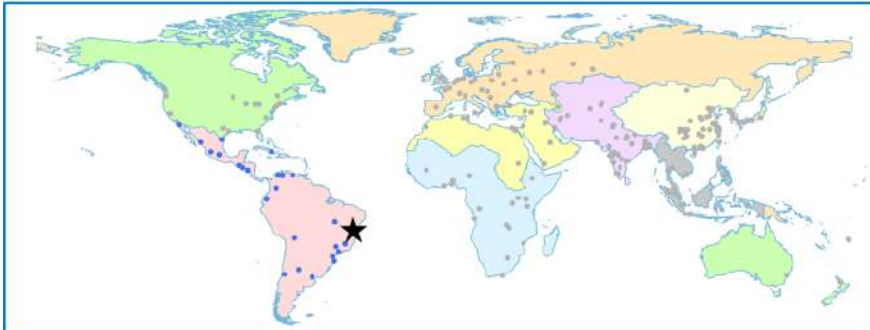


Metrics	Oct 1989	Oct 2000	Oct 2014	% Annual Change ('00-'14)
Population	186,306	244,109	278,313	0.9
Built-up Area (Hectares)				
Total	519	1,152	1,508	1.9
Urban	245	760	1,143	2.9
Suburban	248	369	341	-0.6
Rural	26	22	23	0.2
Open space (Hectares)				
Urbanized Open Space	487	740	868	1.1
Urban Extent	1,006	1,893	2,377	1.6
Density (Persons / Hectare)				
Built-up Area Density	358.6	211.8	184.5	-1.0
Urban Extent Density	185.1	128.9	117.1	-0.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.52	0.61	0.63	0.3
Openness Index	0.50	0.40	0.35	-1.0
Compactness (Roundness)				
Proximity	0.88	0.82	0.82	-0.0
Cohesion	0.88	0.81	0.81	0.0
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	204	32%	156	43%
Extension	290	45%	181	50%
Leapfrog	0	0%	0	0%
Inclusion	137	21%	17	4%

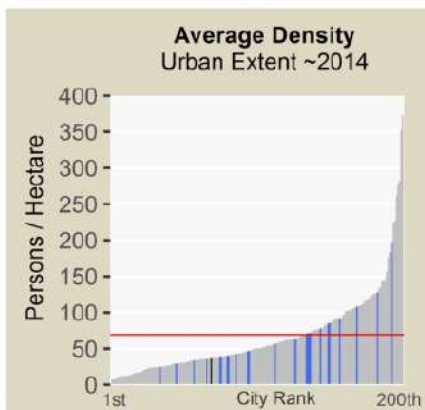
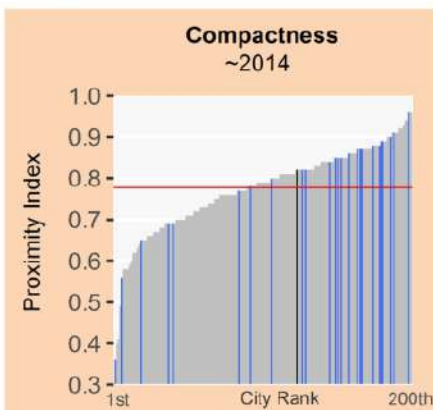
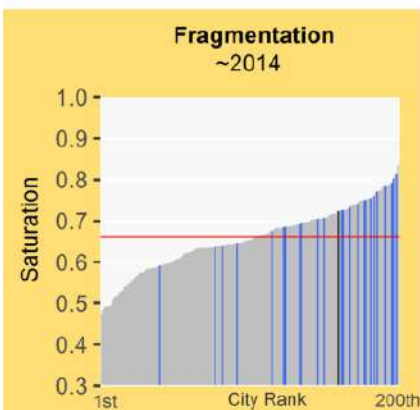
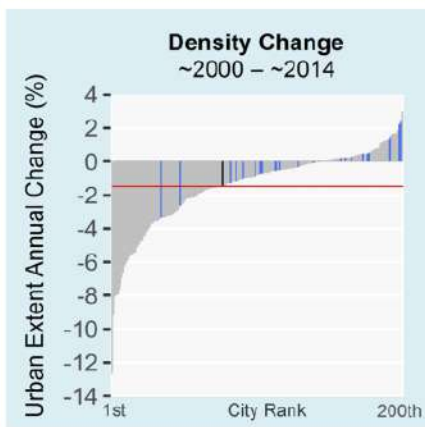
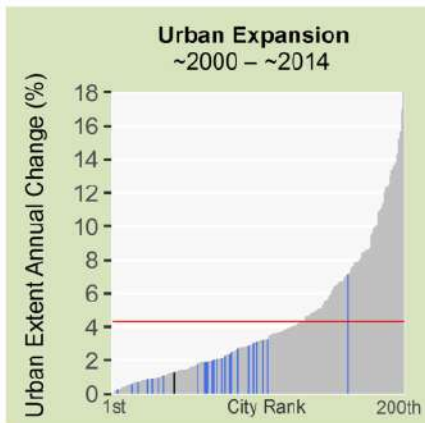


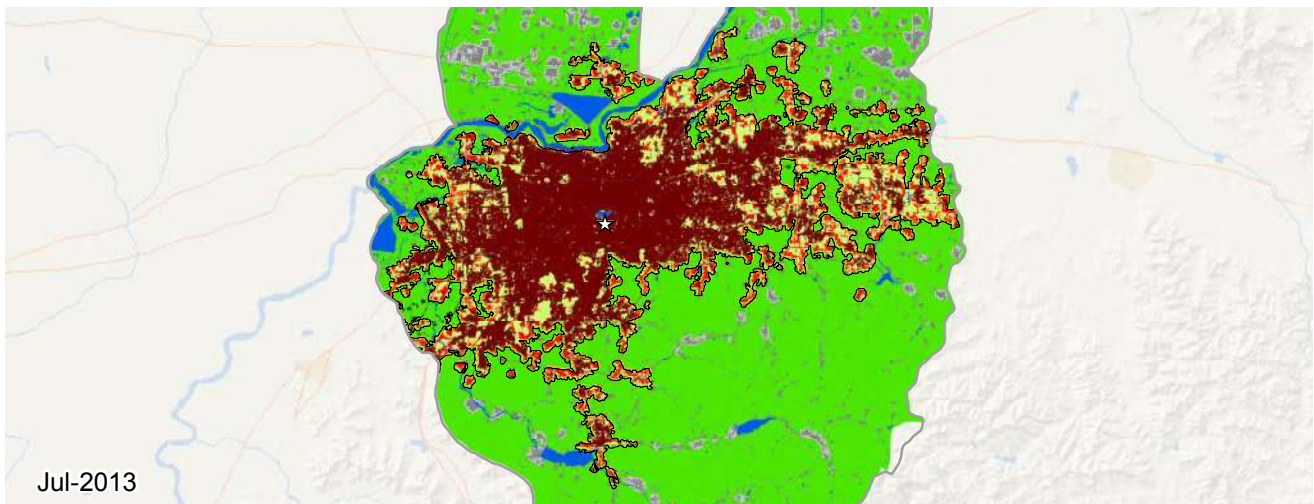
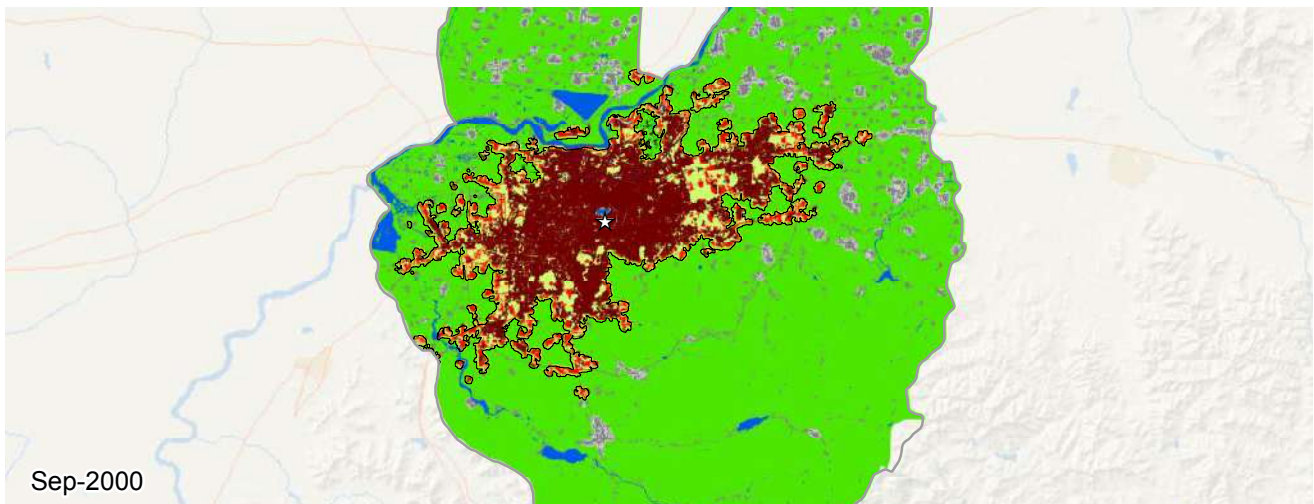
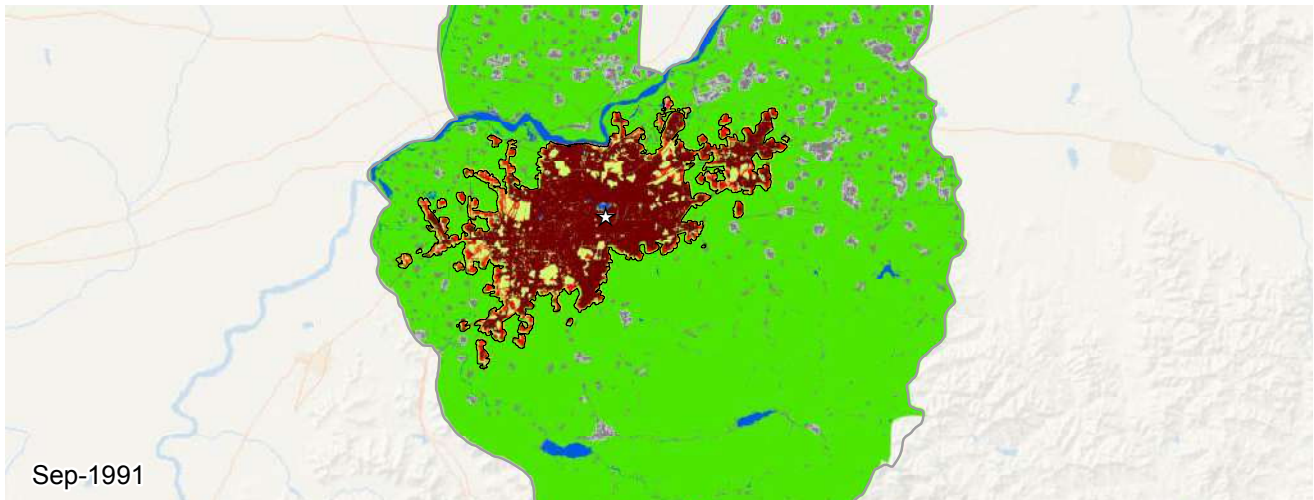


Jeque, Brazil (Latin America and the Caribbean)



Metrics	Aug 1992	Apr 2001	Apr 2014	% Annual Change ('01-'14)
Population	123,038	131,026	128,044	-0.2
Built-up Area (Hectares)				
Total	1,270	2,249	2,511	0.8
Urban	974	1,889	2,074	0.7
Suburban	280	331	401	1.5
Rural	15	28	35	1.6
Open space (Hectares)				
Urbanized Open Space	656	680	958	2.6
Urban Extent	1,927	2,929	3,470	1.3
Density (Persons / Hectare)				
Built-up Area Density	96.8	58.2	51.0	-1.0
Urban Extent Density	63.8	44.7	36.9	-1.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.66	0.77	0.72	-0.5
Openness Index	0.37	0.26	0.26	-0.1
Compactness (Roundness)				
Proximity	0.82	0.80	0.82	0.2
Cohesion	0.82	0.79	0.81	0.2
Added Area (Hectares)	'92-'01	Share	'01-'14	Share
Infill	309	31%	74	28%
Extension	651	66%	141	53%
Leapfrog	0	0%	0	0%
Inclusion	17	1%	45	17%

















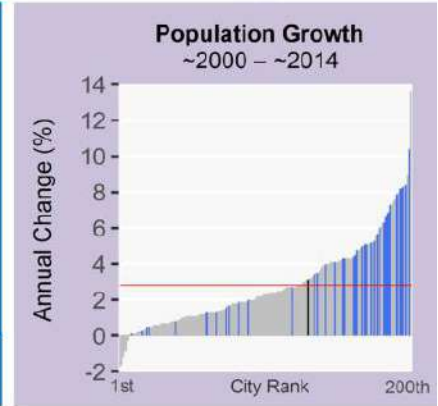
**Jinan, Shandong, China
1991-2013**

0 7 14 21 28 km

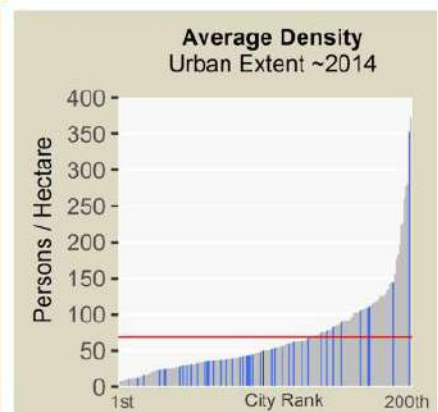
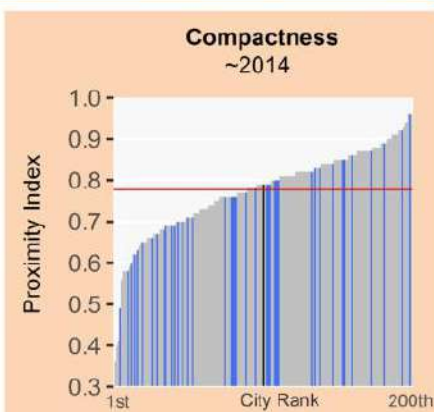
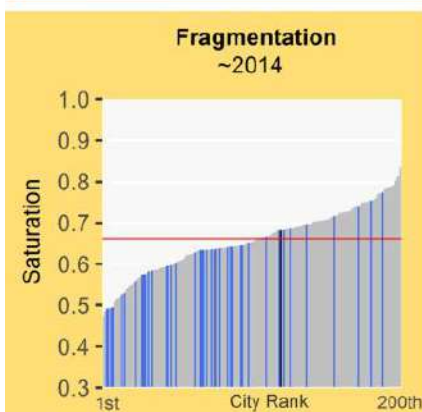
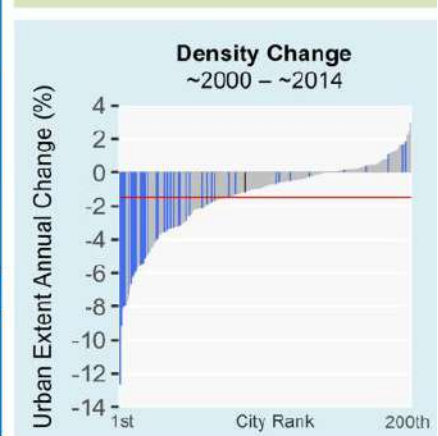
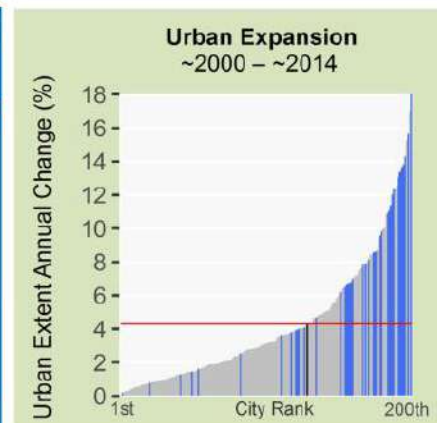
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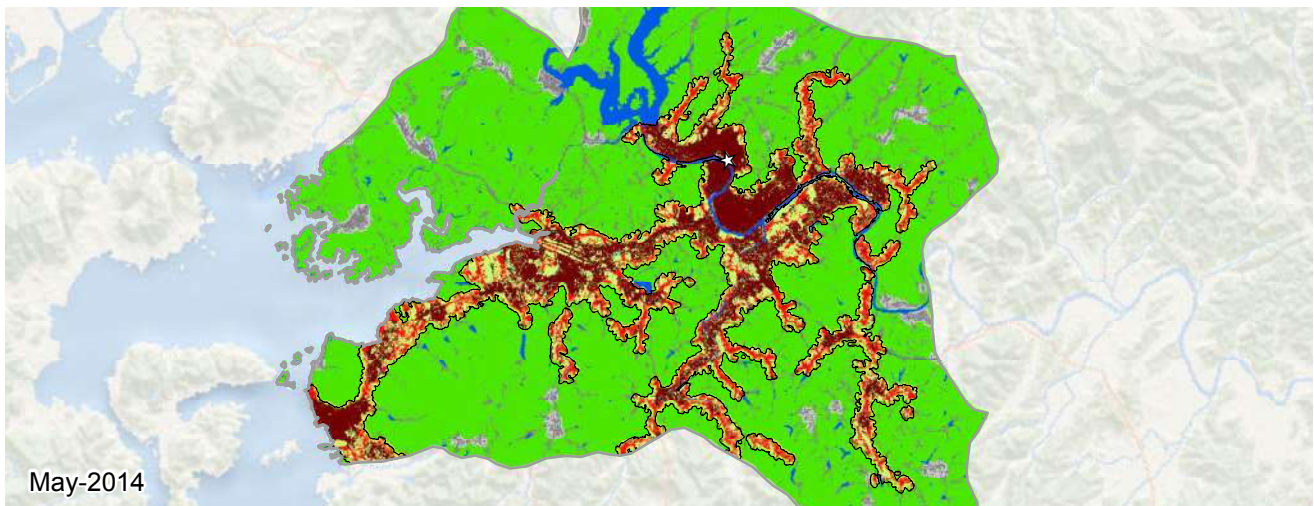
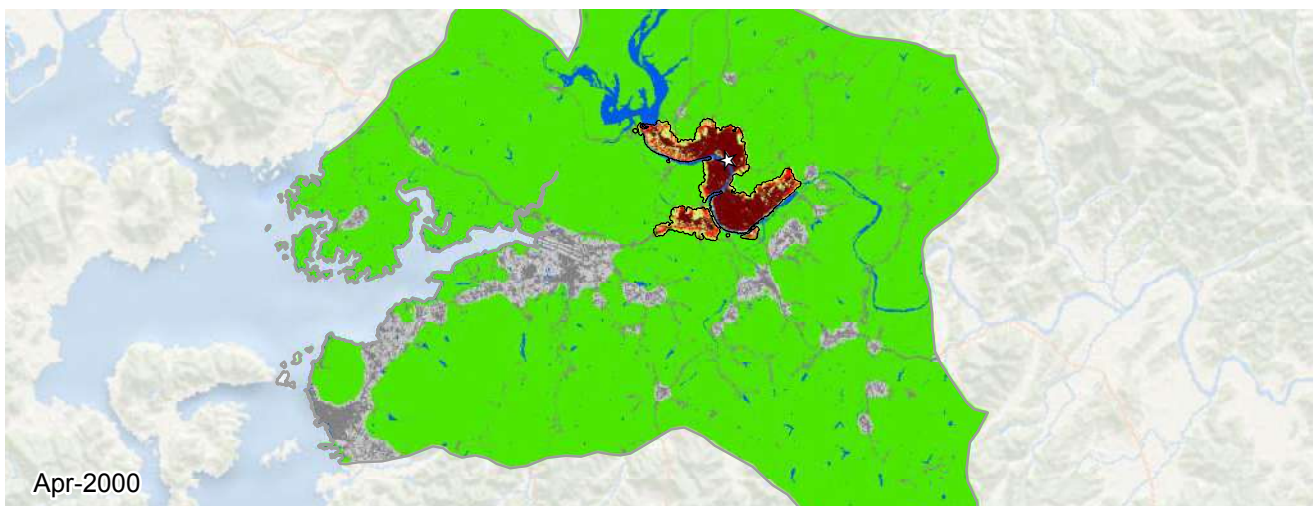
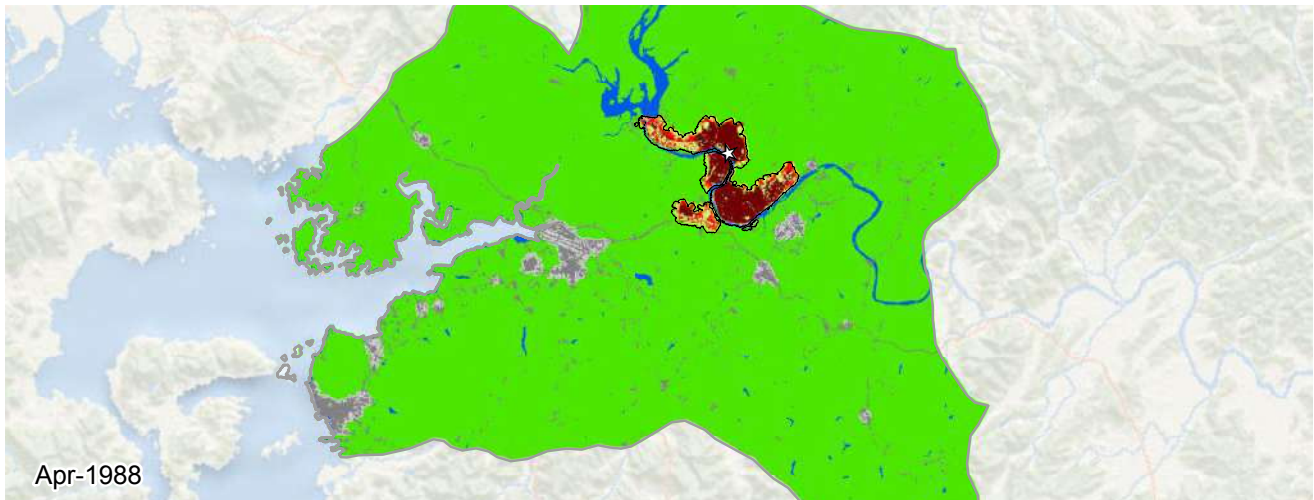
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Jinan, Shandong, China (East Asia and the Pacific)



Metrics	Sep 1991	Sep 2000	Jul 2013	% Annual Change ('00-'13)
Population	1,716,691	2,239,909	3,316,827	3.1
Built-up Area (Hectares)				
Total	19,265	26,314	45,088	4.2
Urban	15,810	20,149	34,838	4.3
Suburban	3,223	5,682	9,455	4.0
Rural	231	481	794	3.9
Open space (Hectares)				
Urbanized Open Space	7,237	11,943	20,998	4.4
Urban Extent	26,503	38,257	66,087	4.3
Density (Persons / Hectare)				
Built-up Area Density	89.1	85.1	73.6	-1.1
Urban Extent Density	64.8	58.5	50.2	-1.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.73	0.69	0.68	-0.1
Openness Index	0.25	0.27	0.27	-0.0
Compactness (Roundness)				
Proximity	0.81	0.81	0.79	-0.1
Cohesion	0.80	0.80	0.79	-0.1
Added Area (Hectares)	'91-'00	Share	'00-'13	Share
Infill	1,047	14%	4,304	22%
Extension	3,770	53%	9,266	49%
Leapfrog	174	2%	190	1%
Inclusion	2,056	29%	5,012	26%



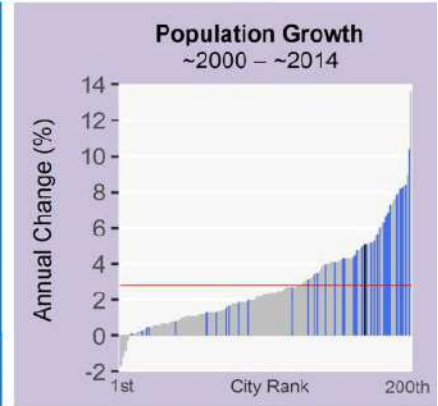


**Jinju, Korea Rep.
1988-2014**

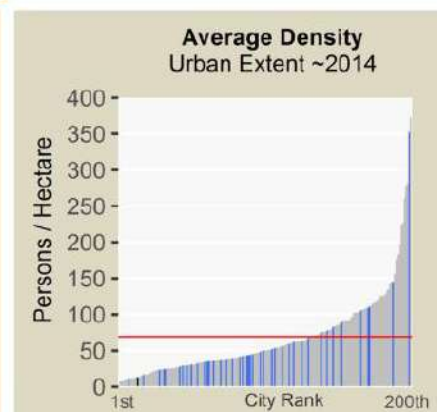
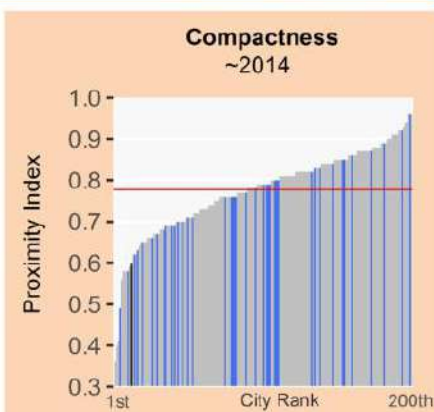
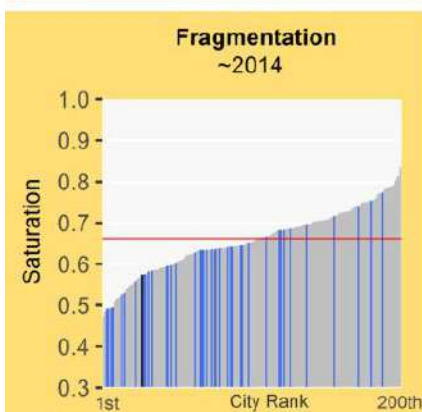
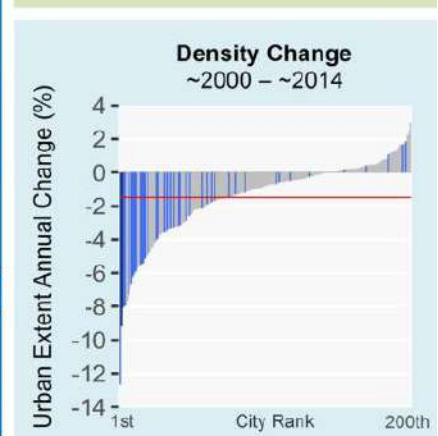
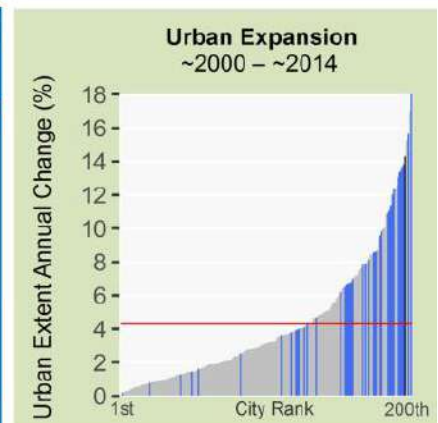
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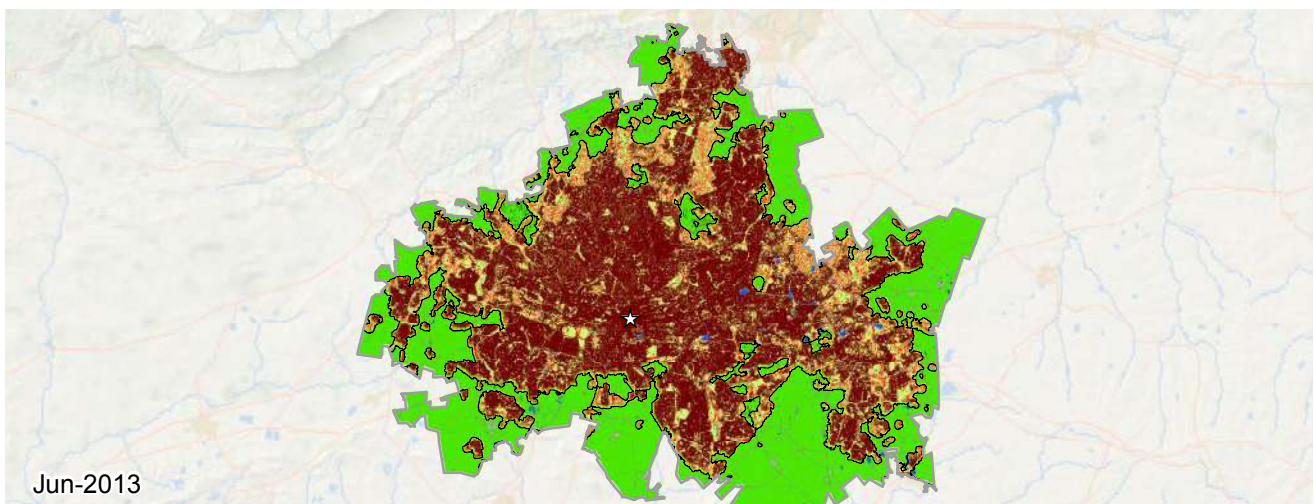
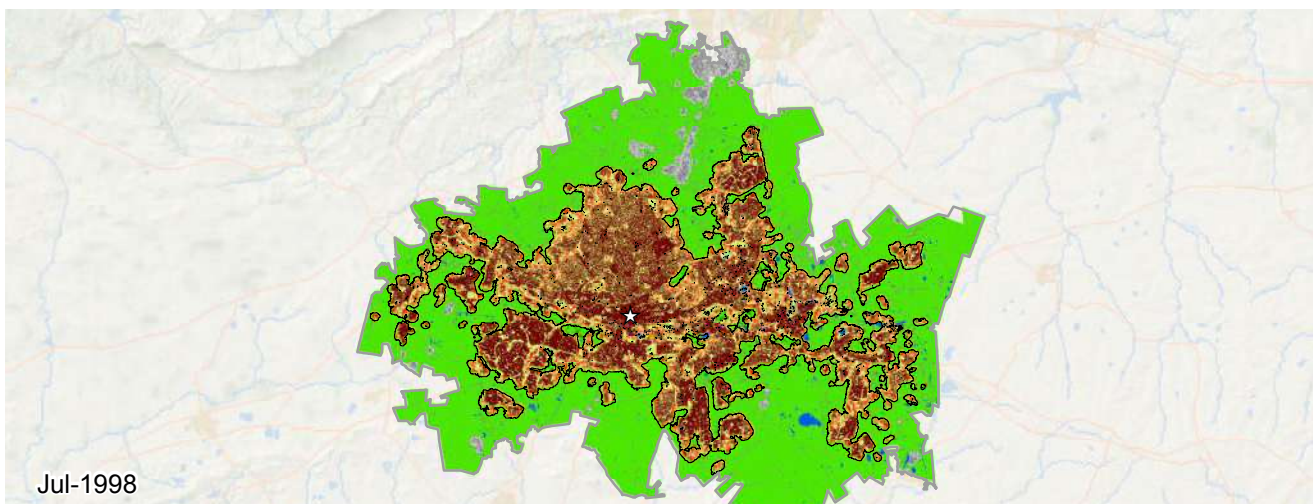
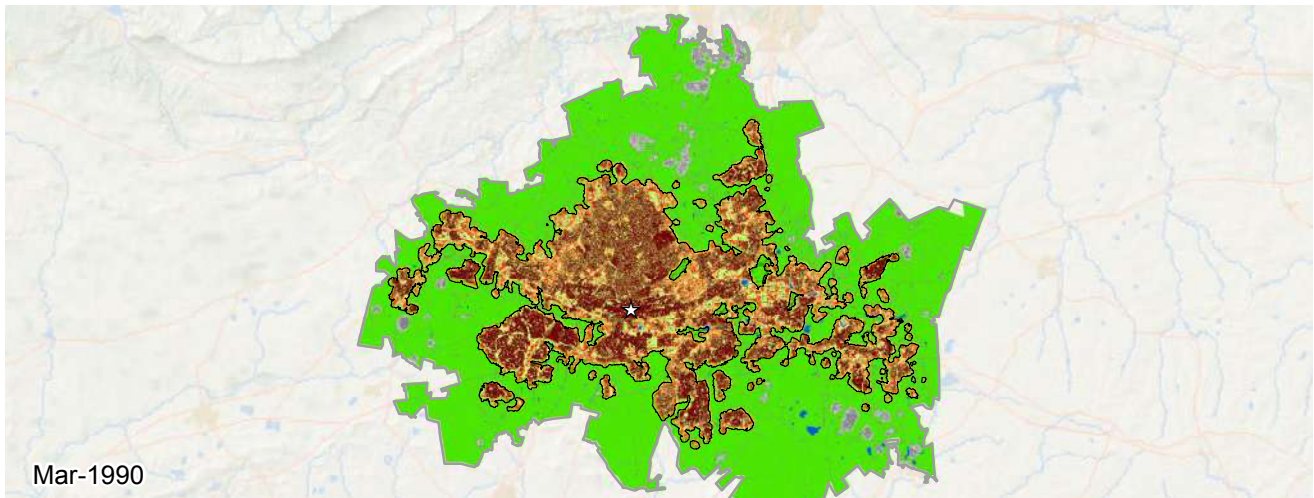
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Jinju, Korea Rep. (East Asia and the Pacific)















Metrics	Apr 1988	Apr 2000	May 2014	% Annual Change ('00-'14)
Population	200,588	154,174	317,194	5.1
Built-up Area (Hectares)				
Total	1,859	2,157	13,432	13.0
Urban	1,365	1,705	7,805	10.8
Suburban	454	418	5,217	17.9
Rural	39	34	408	17.6
Open space (Hectares)				
Urbanized Open Space	886	957	9,958	16.6
Urban Extent	2,746	3,114	23,390	14.3
Density (Persons / Hectare)				
Built-up Area Density	107.9	71.4	23.6	-7.9
Urban Extent Density	73.0	49.5	13.6	-9.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.68	0.69	0.57	-1.3
Openness Index	0.33	0.31	0.43	2.4
Compactness (Roundness)				
Proximity	0.75	0.77	0.60	-1.8
Cohesion	0.75	0.77	0.59	-1.8
Added Area (Hectares)	'88-'00	Share	'00-'14	Share
Infill	165	54%	1,397	12%
Extension	86	28%	5,132	45%
Leapfrog	0	0%	0	0%
Inclusion	51	16%	4,744	42%





**Johannesburg, South Africa
1990-2013**

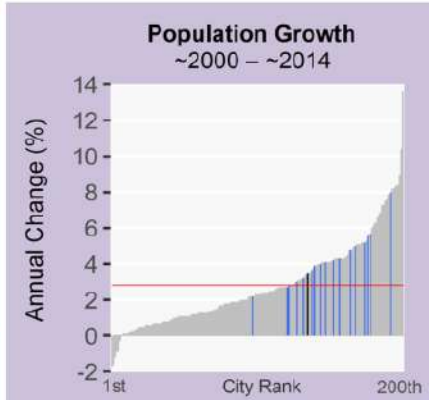
0 10 20 30 40 km

 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

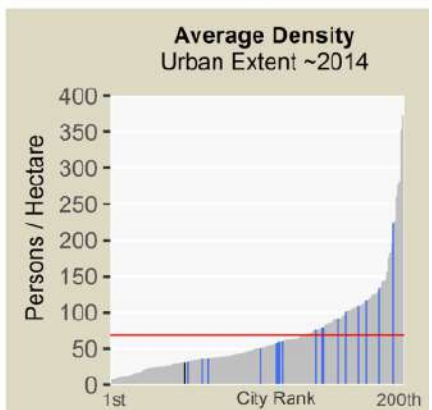
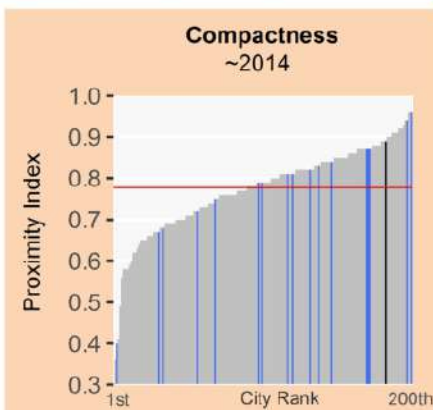
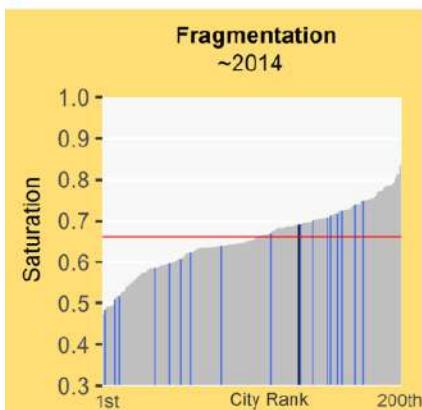
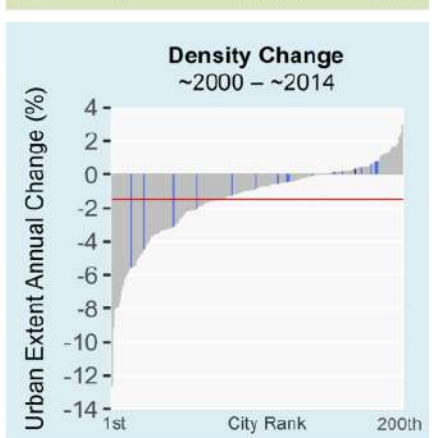
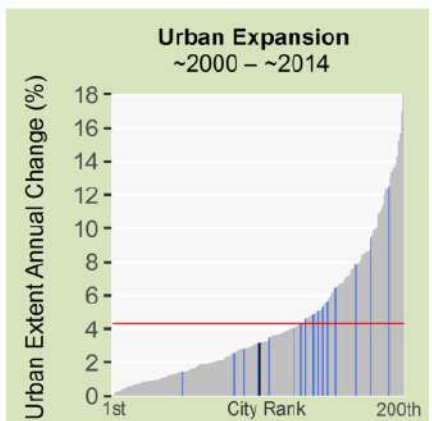
Johannesburg, South Africa (Sub-Saharan Africa)

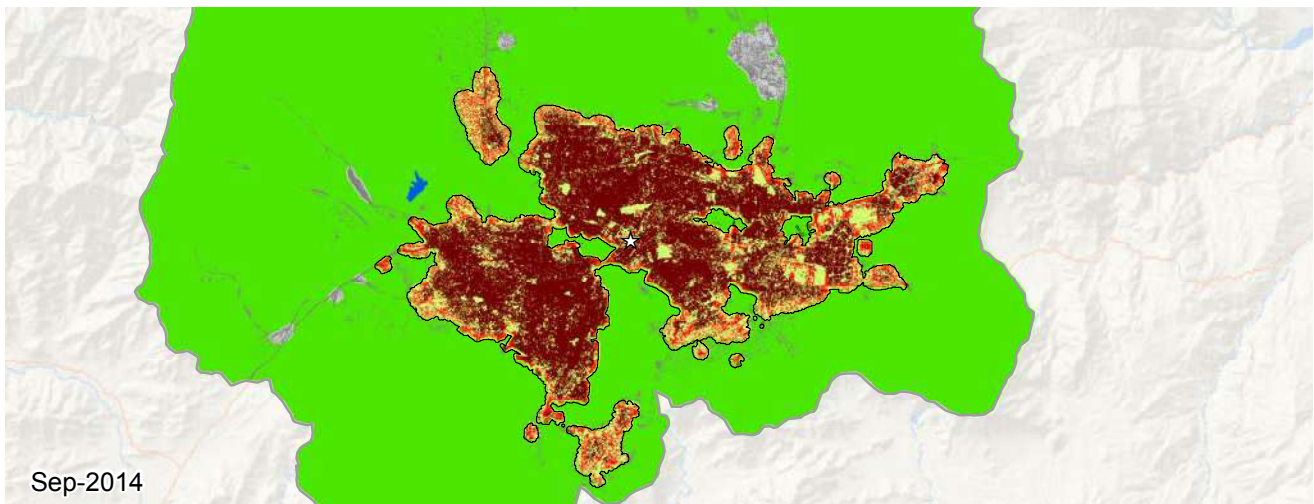
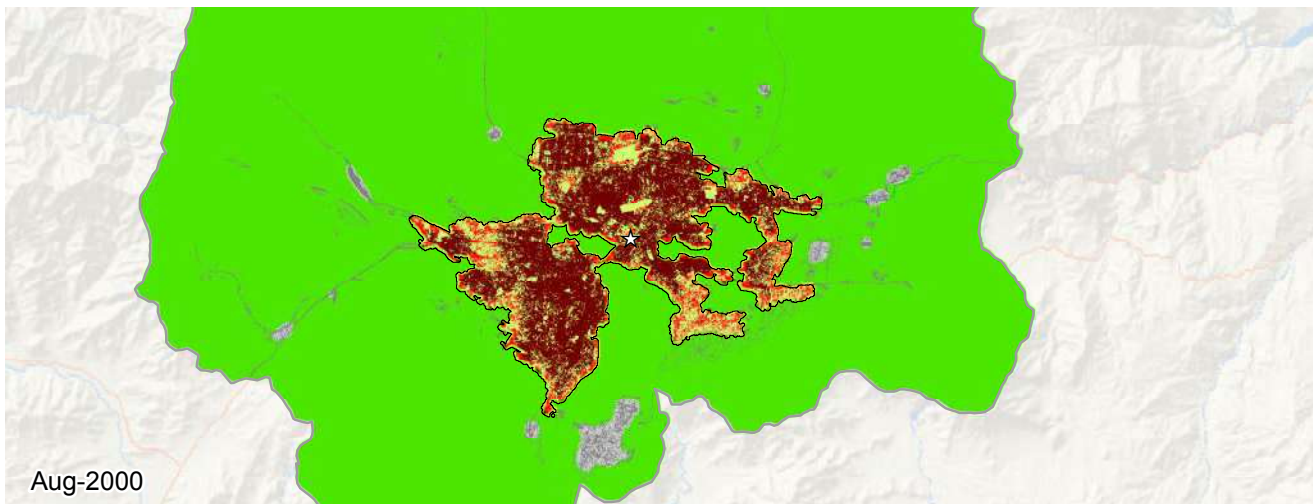
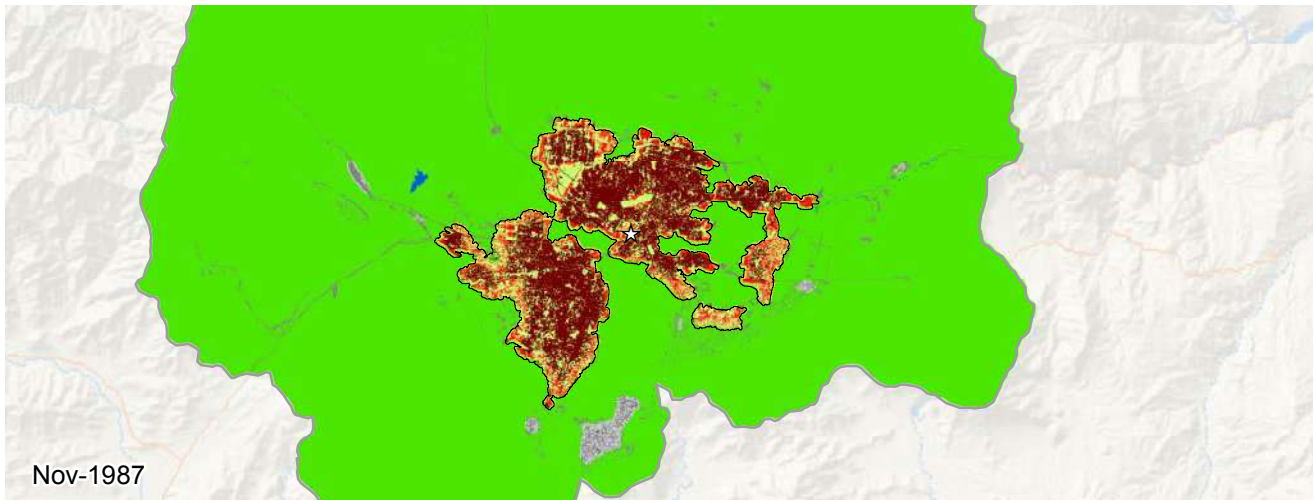


Legend for Charts
 Johannesburg | Other cities in region | All other cities | Global average



Metrics	Mar 1990	Jul 1998	Jun 2013	% Annual Change ('98-'13)
Population	3,148,133	4,726,764	8,000,158	3.5
Built-up Area (Hectares)				
Total	76,332	92,825	181,190	4.5
Urban	52,245	66,200	157,588	5.8
Suburban	22,564	24,949	22,224	-0.8
Rural	1,522	1,675	1,377	-1.3
Open space (Hectares)				
Urbanized Open Space	64,461	71,273	81,377	0.9
Urban Extent	140,794	164,099	262,567	3.2
Density (Persons / Hectare)				
Built-up Area Density	41.2	50.9	44.2	-1.0
Urban Extent Density	22.4	28.8	30.5	0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.57	0.69	1.3
Openness Index	0.41	0.39	0.25	-3.0
Compactness (Roundness)				
Proximity	0.79	0.80	0.89	0.7
Cohesion	0.77	0.79	0.87	0.6
Added Area (Hectares)	'90-'98	Share	'98-'13	Share
Infill	6,041	36%	38,190	43%
Extension	5,678	34%	37,552	42%
Leapfrog	1,013	6%	120	0%
Inclusion	3,961	23%	12,723	14%

















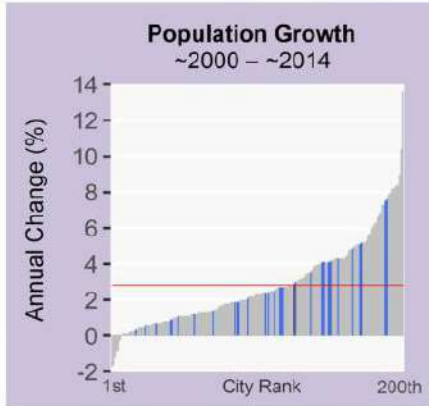
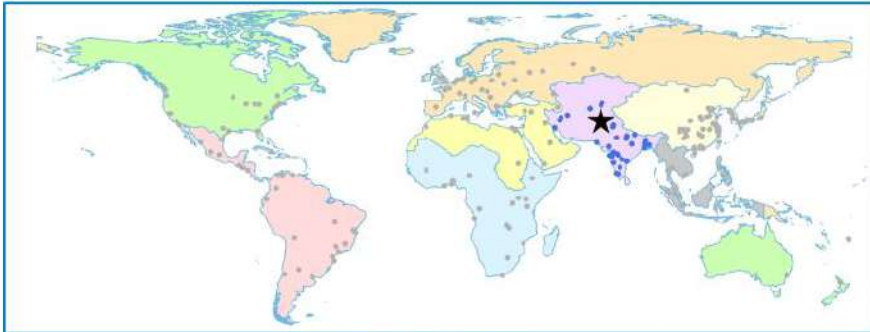
**Kabul, Afghanistan
1987-2014**

0 5 10 15 20 km

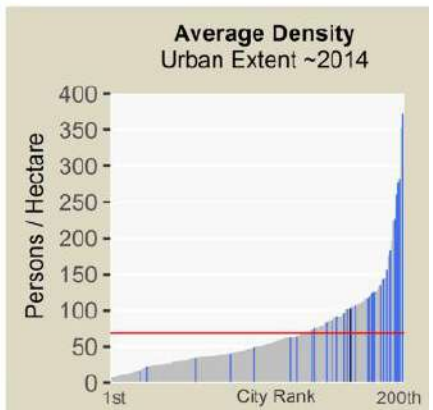
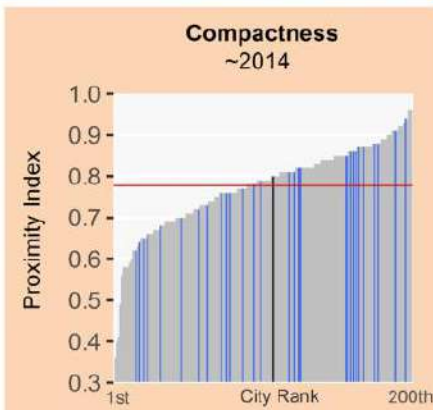
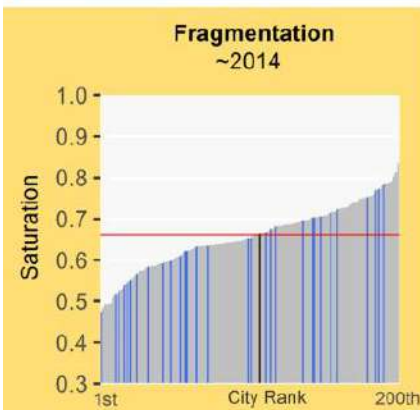
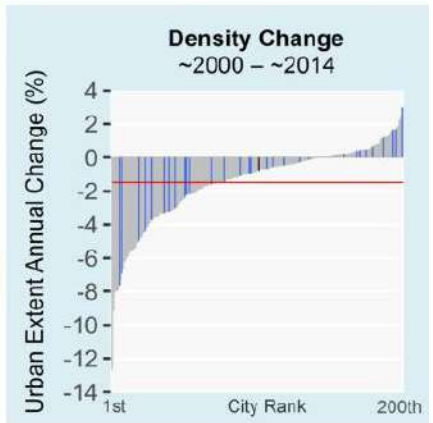
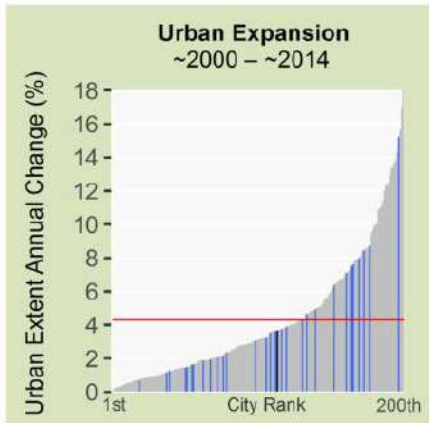
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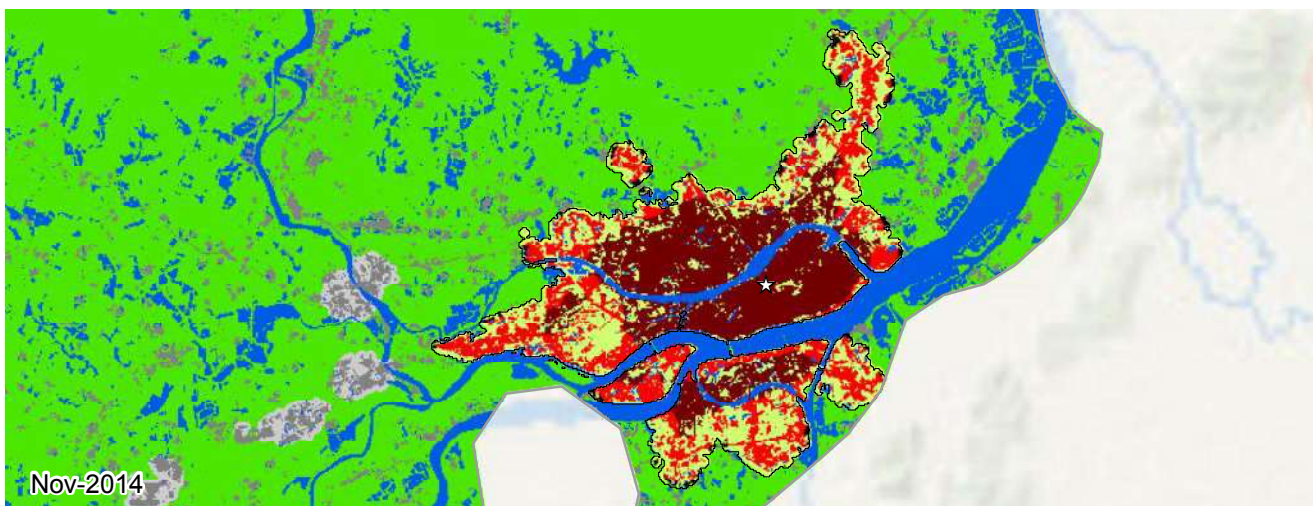
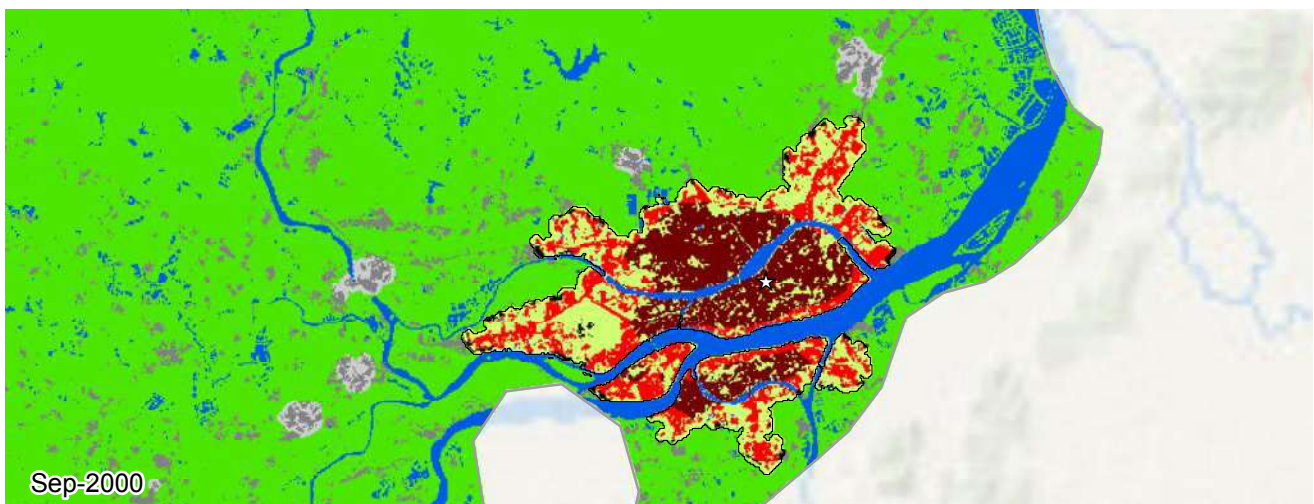
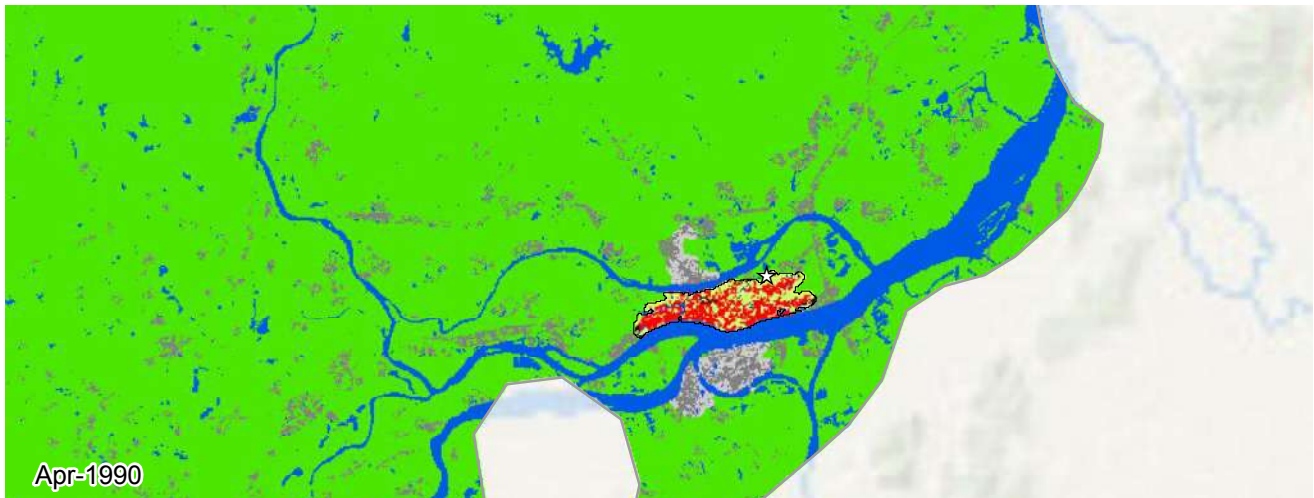
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Kabul, Afghanistan (South and Central Asia)



Metrics	Nov 1987	Aug 2000	Sep 2014	% Annual Change ('00-'14)
Population	1,176,972	2,347,809	3,536,645	2.9
Built-up Area (Hectares)				
Total	10,712	13,558	22,872	3.7
Urban	8,141	10,911	18,514	3.8
Suburban	2,388	2,501	4,070	3.5
Rural	182	145	287	4.8
Open space (Hectares)				
Urbanized Open Space	6,499	6,908	11,537	3.6
Urban Extent	17,211	20,467	34,409	3.7
Density (Persons / Hectare)				
Built-up Area Density	109.9	173.2	154.6	-0.8
Urban Extent Density	68.4	114.7	102.8	-0.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.66	0.66	0.0
Openness Index	0.34	0.30	0.28	-0.5
Compactness (Roundness)				
Proximity	0.81	0.83	0.80	-0.2
Cohesion	0.80	0.82	0.79	-0.3
Added Area (Hectares)	'87-'00	Share	'00-'14	Share
Infill	1,514	53%	2,148	23%
Extension	863	30%	5,746	61%
Leapfrog	0	0%	52	0%
Inclusion	468	16%	1,365	14%

















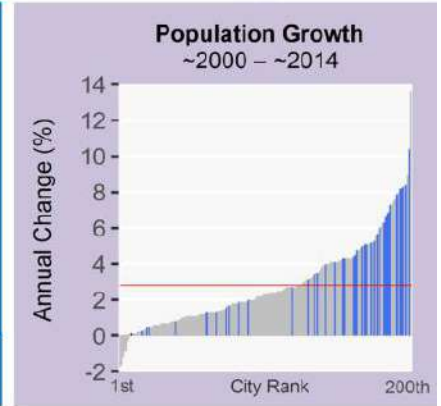
**Kaiping, Guangdong, China
1990-2014**

0 2 4 6 8 km

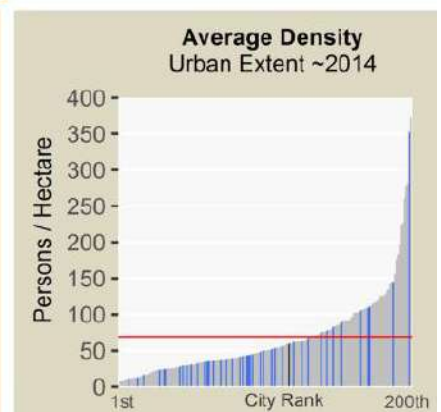
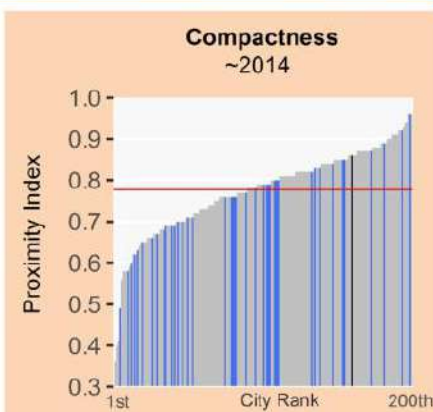
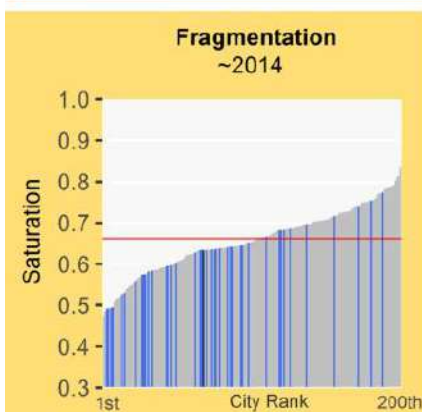
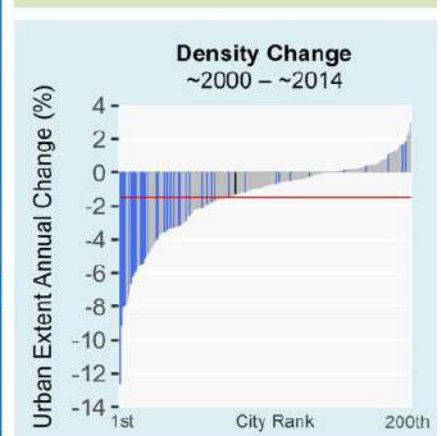
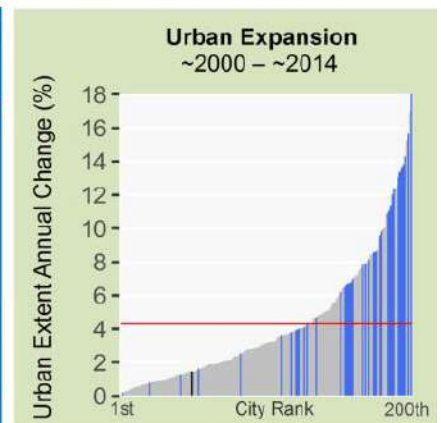
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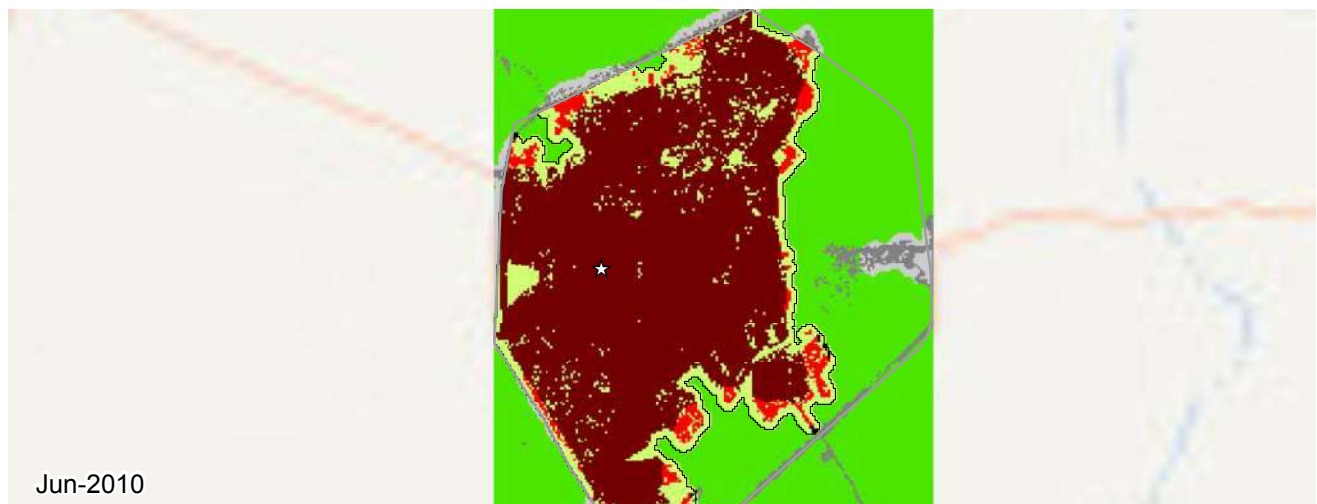
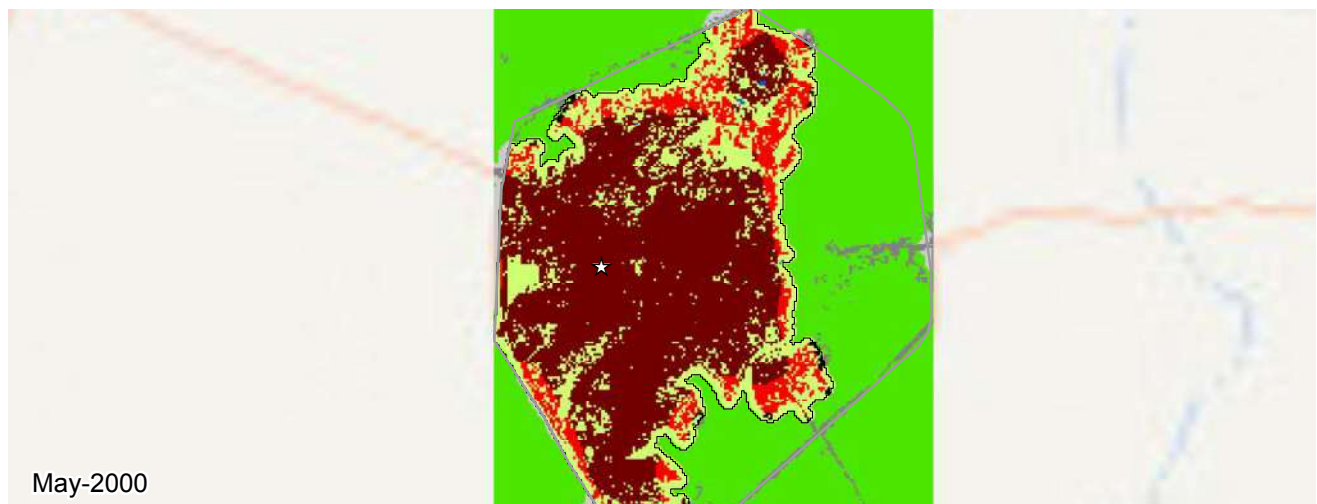
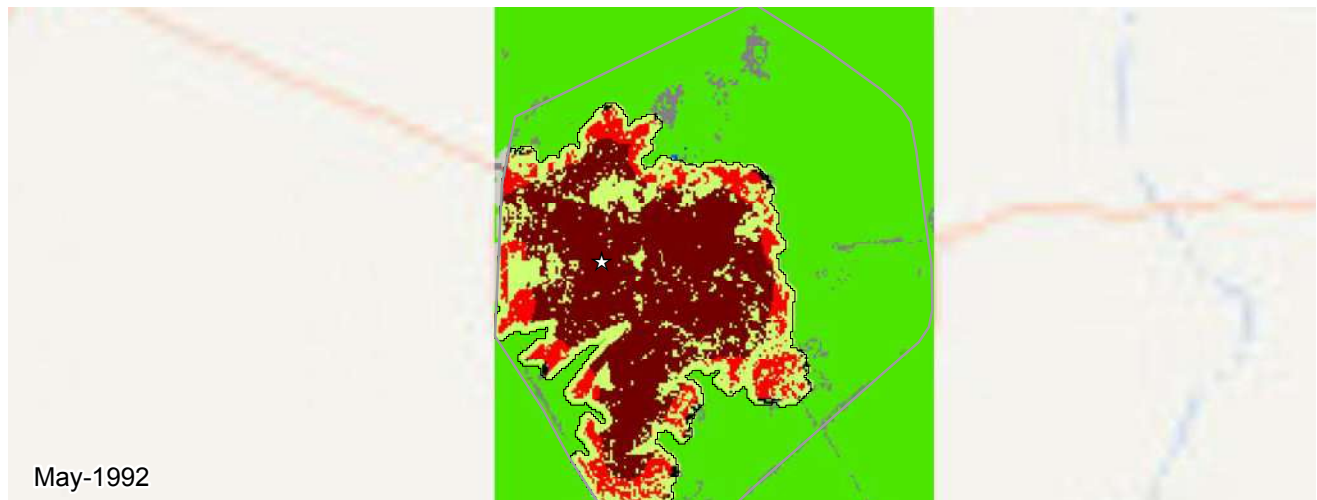
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Kaiping, Guangdong, China (East Asia and the Pacific)



Metrics	Apr 1990	Sep 2000	Nov 2014	% Annual Change ('00-'14)
Population	35,193	188,290	191,748	0.1
Built-up Area (Hectares)				
Total	136	1,537	2,044	2.0
Urban	3	803	1,196	2.8
Suburban	126	681	797	1.1
Rural	6	52	50	-0.2
Open space (Hectares)				
Urbanized Open Space	116	1,090	1,182	0.6
Urban Extent	253	2,627	3,227	1.5
Density (Persons / Hectare)				
Built-up Area Density	257.4	122.5	93.8	-1.9
Urban Extent Density	138.8	71.7	59.4	-1.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.59	0.63	0.6
Openness Index	0.62	0.47	0.43	-0.6
Compactness (Roundness)				
Proximity	0.72	0.87	0.86	-0.1
Cohesion	0.71	0.86	0.84	-0.1
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	87	6%	210	41%
Extension	942	67%	0	0%
Leapfrog	0	0%	143	28%
Inclusion	370	26%	153	30%

















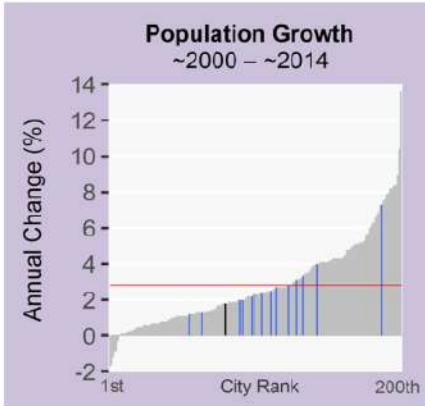
**Kairouan, Tunisia
1992-2010**

0 1 2 3 4 km

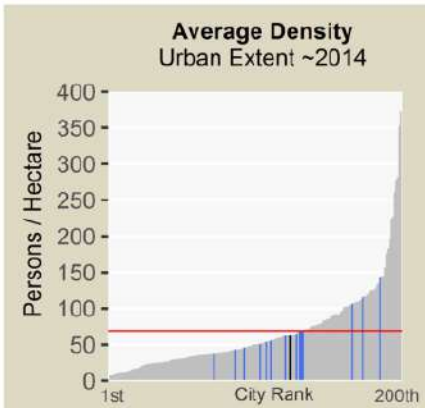
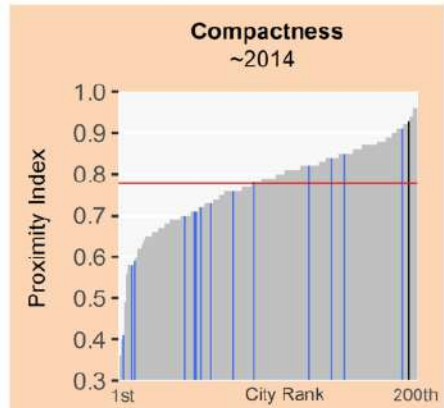
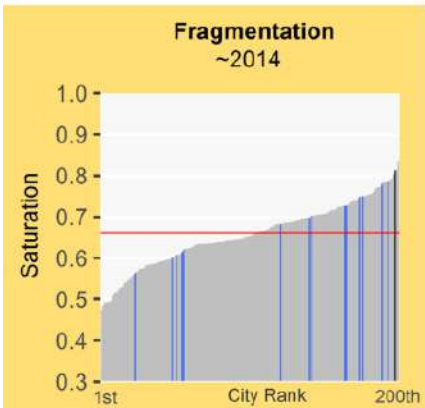
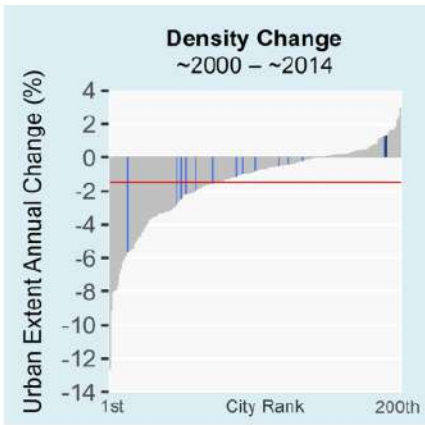
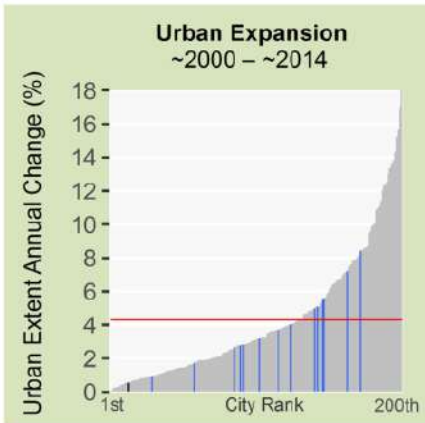
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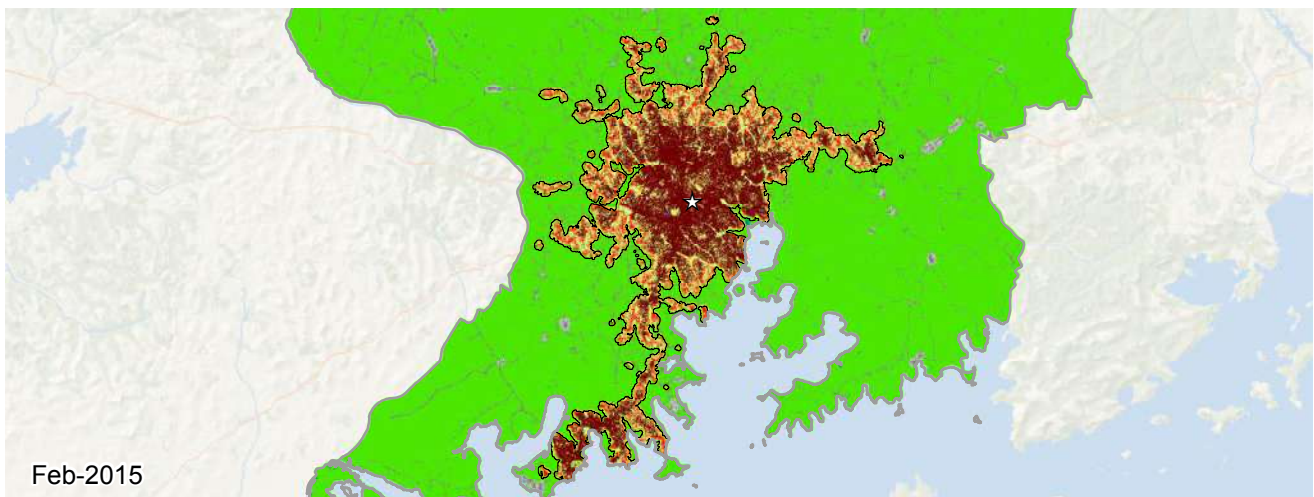
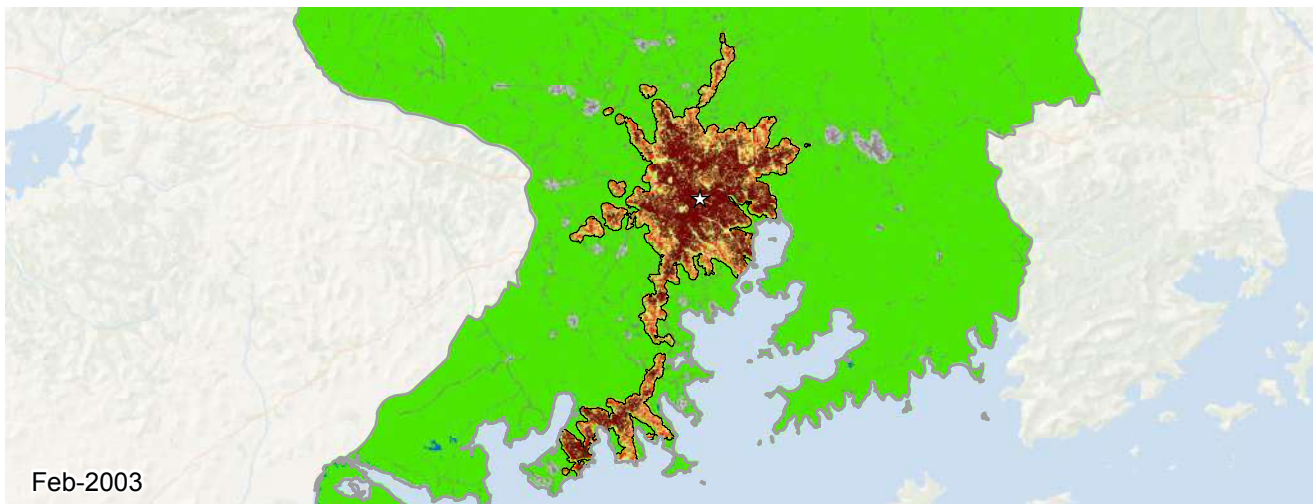
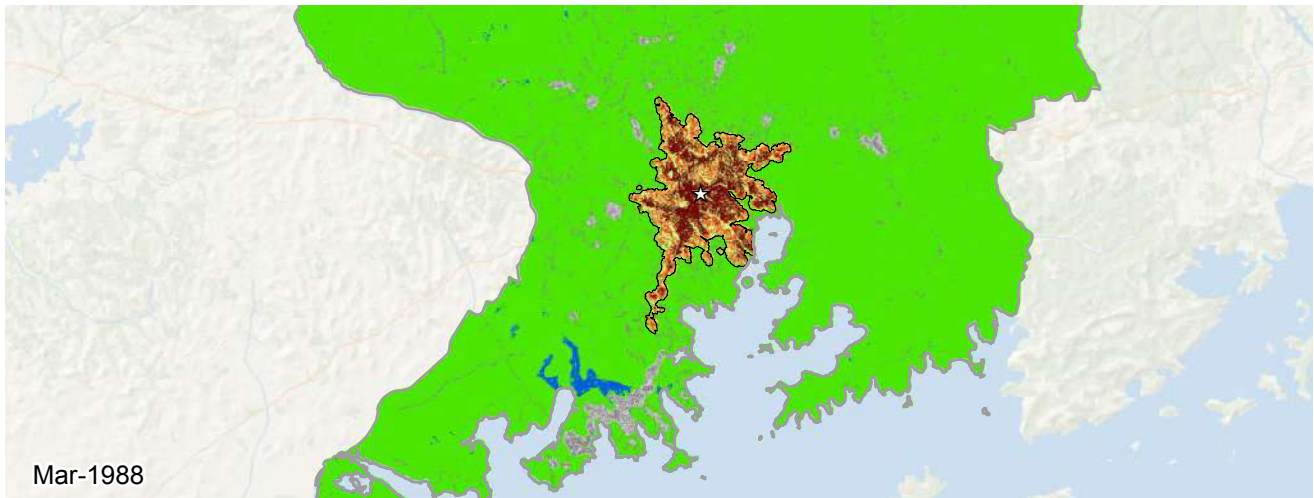
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Kairouan, Tunisia (Western Asia and North Africa)



Metrics	May 1992	May 2000	Jun 2010	% Annual Change ('00-'10)
Population	85,809	105,892	127,569	1.8
Built-up Area (Hectares)				
Total	905	1,366	1,660	1.9
Urban	702	1,136	1,554	3.1
Suburban	188	218	101	-7.6
Rural	14	12	4	-9.9
Open space (Hectares)				
Urbanized Open Space	459	569	383	-3.9
Urban Extent	1,365	1,936	2,044	0.5
Density (Persons / Hectare)				
Built-up Area Density	94.8	77.5	76.8	-0.1
Urban Extent Density	62.9	54.7	62.4	1.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.66	0.71	0.81	1.4
Openness Index	0.32	0.27	0.18	-3.8
Compactness (Roundness)				
Proximity	0.95	0.93	0.93	0.0
Cohesion	0.94	0.92	0.92	0.0
Added Area (Hectares)	'92-'00	Share	'00-'10	Share
Infill	143	31%	245	83%
Extension	274	59%	38	12%
Leapfrog	0	0%	0	0%
Inclusion	43	9%	9	3%





**Kampala, Uganda
1988-2015**

0 8 16 24 32 km

N

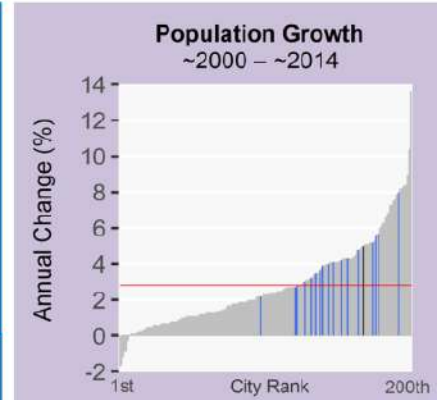
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Kampala, Uganda (Sub-Saharan Africa)

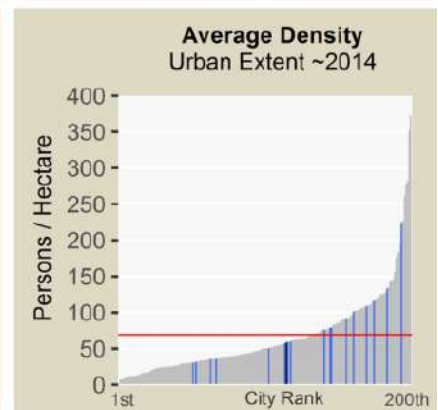
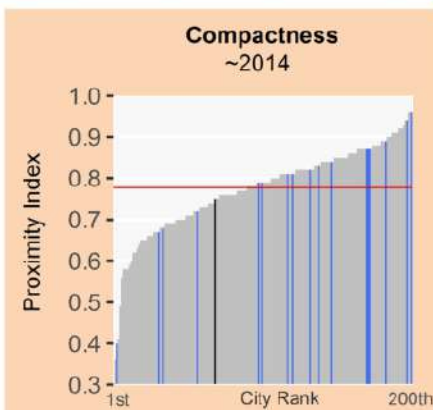
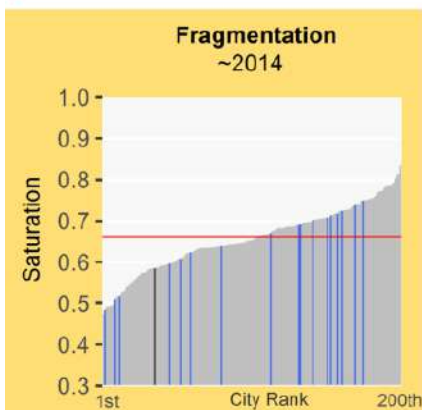
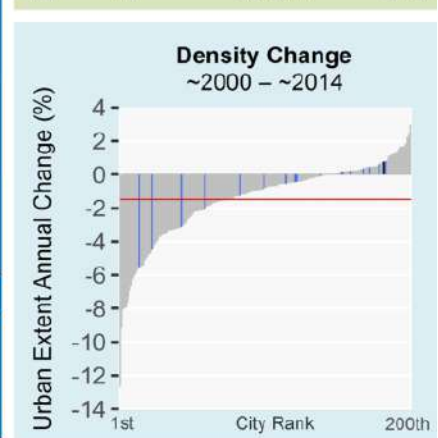
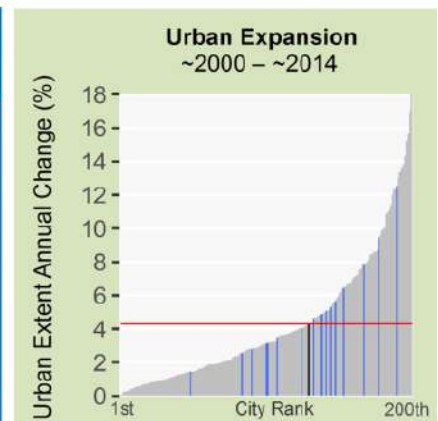


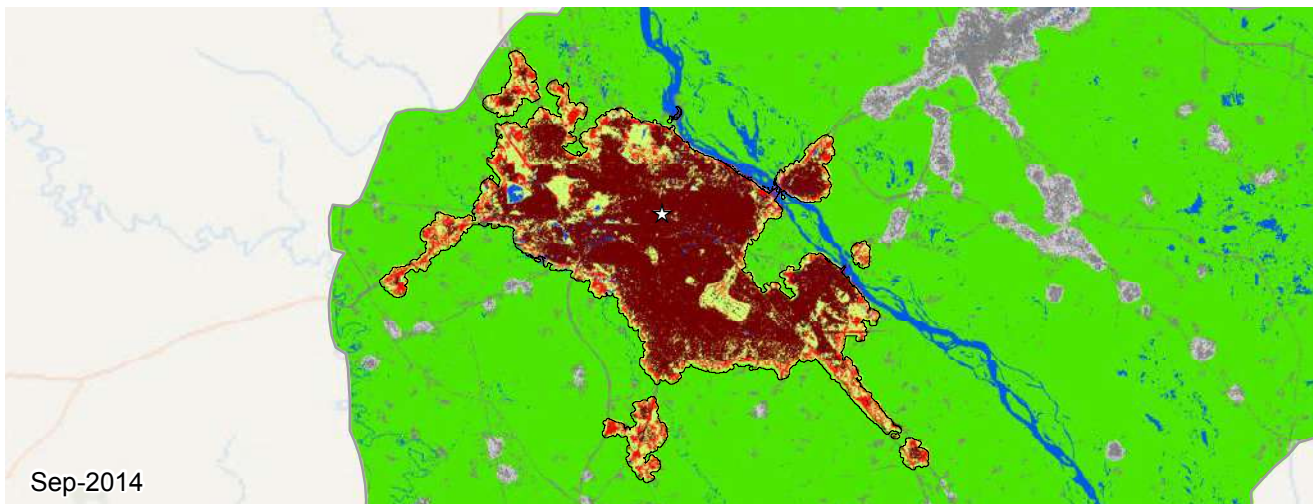
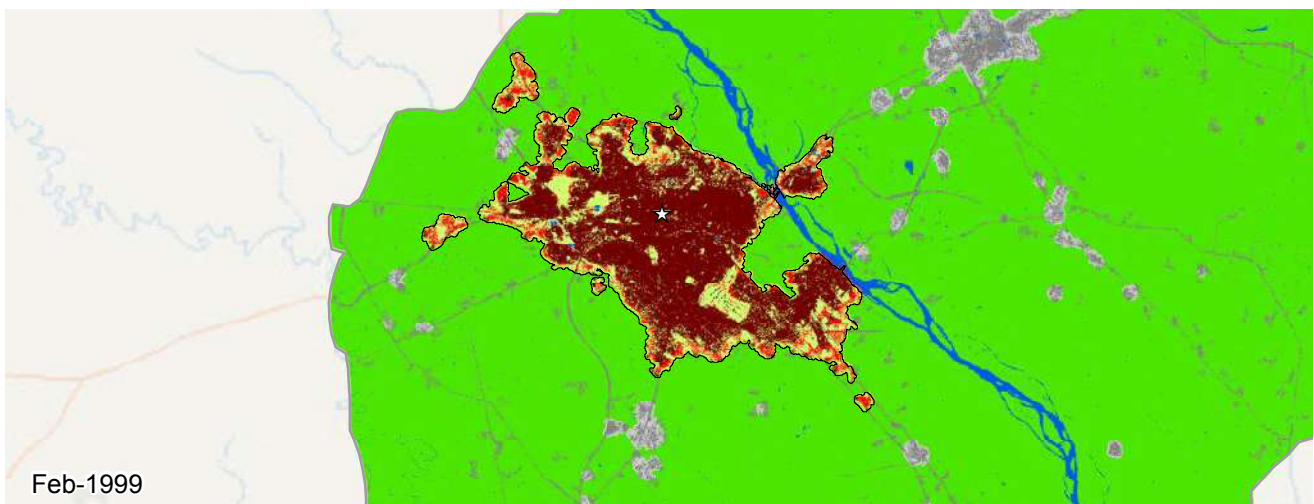
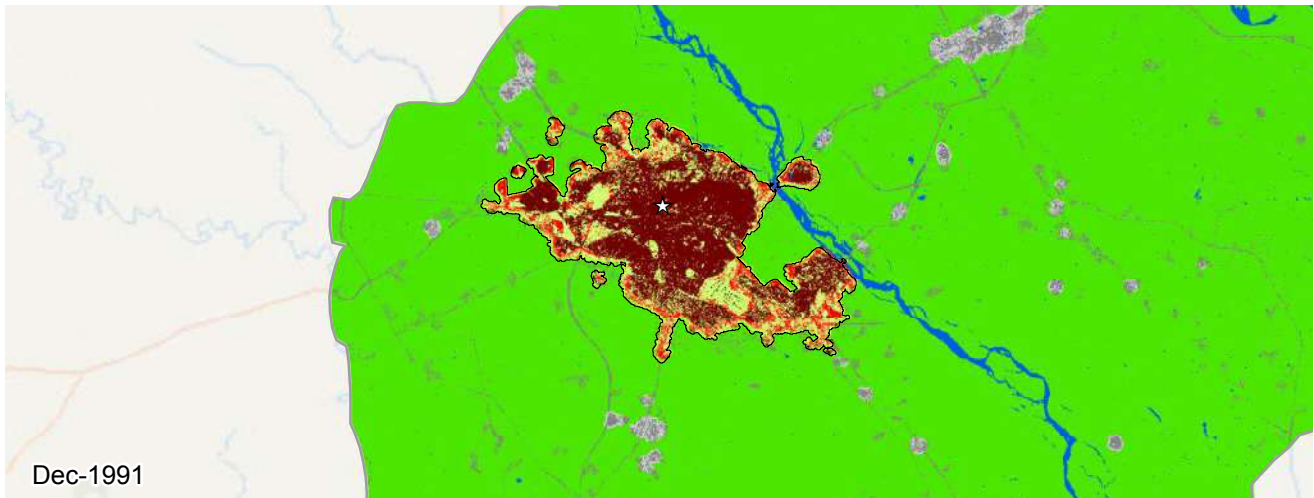
Legend for Charts

Kampala | Other cities in region | All other cities | Global average



Metrics	Mar 1988	Feb 2003	Feb 2015	% Annual Change ('03-'15)
Population	723,017	1,646,980	3,017,000	5.0
Built-up Area (Hectares)				
Total	8,804	17,953	30,040	4.3
Urban	5,668	12,540	21,222	4.4
Suburban	2,925	5,071	8,207	4.0
Rural	210	341	610	4.8
Open space (Hectares)				
Urbanized Open Space	7,687	12,744	21,280	4.3
Urban Extent	16,491	30,697	51,320	4.3
Density (Persons / Hectare)				
Built-up Area Density	82.1	91.7	100.4	0.8
Urban Extent Density	43.8	53.7	58.8	0.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.53	0.58	0.59	0.0
Openness Index	0.42	0.37	0.35	-0.3
Compactness (Roundness)				
Proximity	0.89	0.66	0.75	1.1
Cohesion	0.87	0.63	0.72	1.1
Added Area (Hectares)	'88-'03	Share	'03-'15	Share
Infill	3,329	36%	3,640	30%
Extension	2,583	28%	4,998	41%
Leapfrog	13	0%	37	0%
Inclusion	3,223	35%	3,413	28%





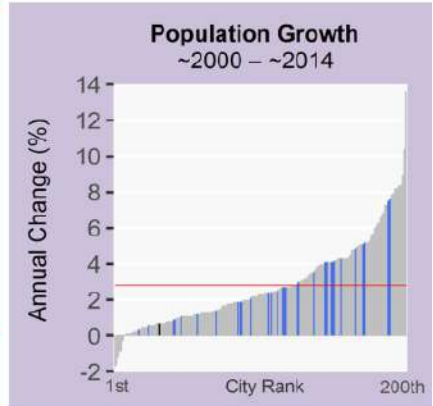
**Kanpur, India
1991-2014**

0 4 8 12 16 km

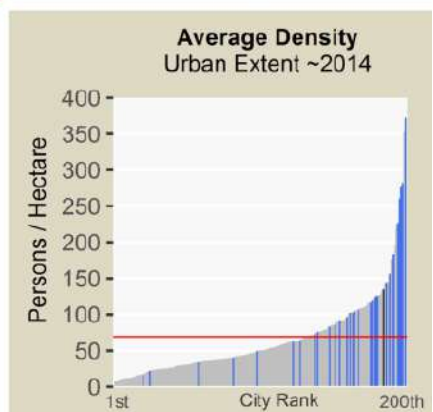
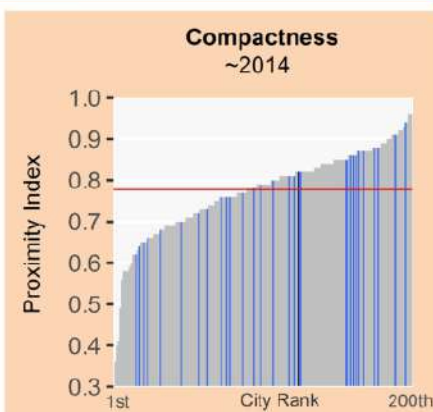
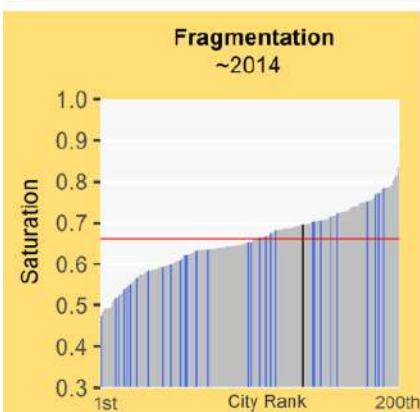
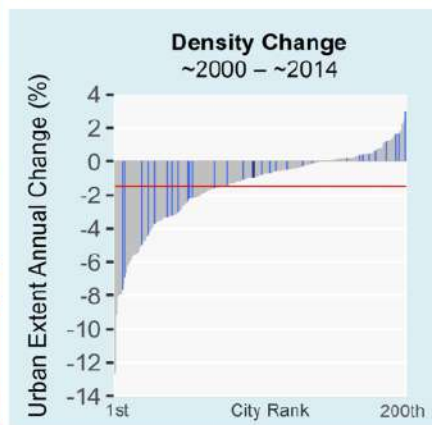
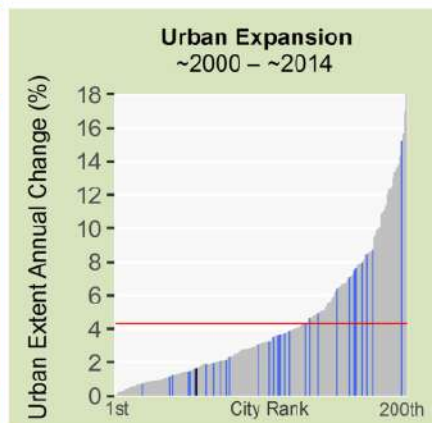
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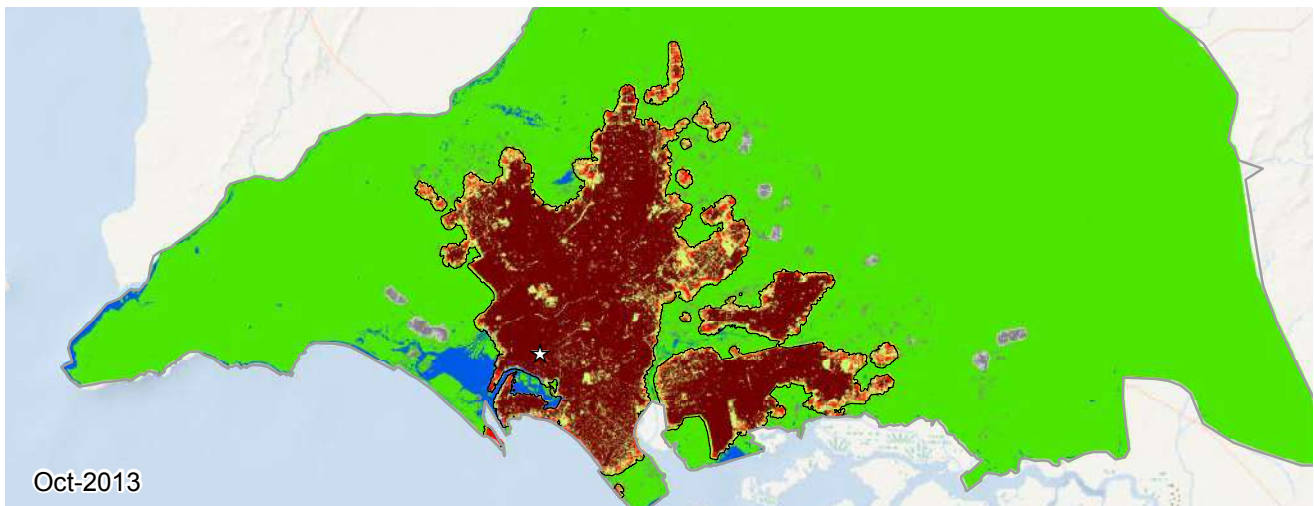
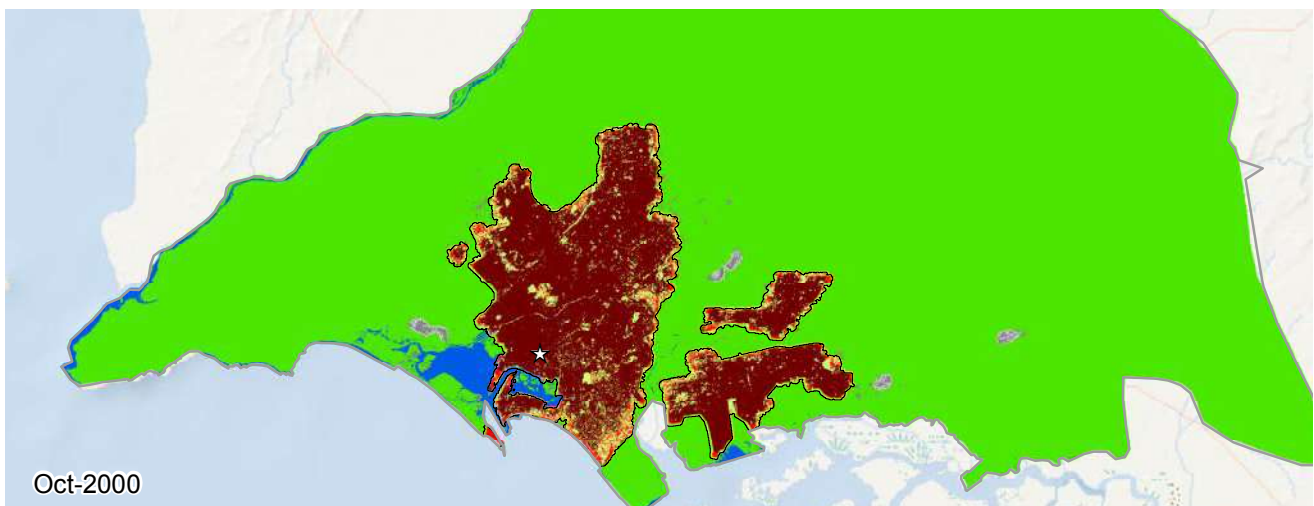
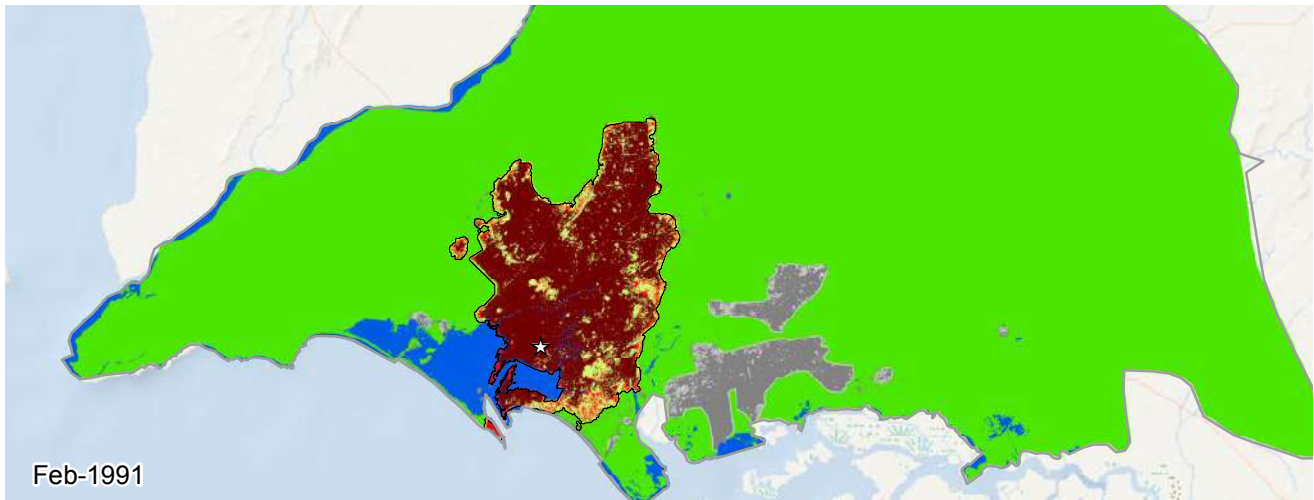
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Kanpur, India (South and Central Asia)



Metrics	Dec 1991	Feb 1999	Sep 2014	% Annual Change ('99-'14)
Population	2,101,131	2,521,487	2,795,714	0.7
Built-up Area (Hectares)				
Total	7,969	11,070	14,404	1.7
Urban	6,293	9,265	11,825	1.6
Suburban	1,553	1,660	2,374	2.3
Rural	123	145	204	2.2
Open space (Hectares)				
Urbanized Open Space	4,514	4,900	6,262	1.6
Urban Extent	12,484	15,971	20,667	1.7
Density (Persons / Hectare)				
Built-up Area Density	263.6	227.8	194.1	-1.0
Urban Extent Density	168.3	157.9	135.3	-1.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.64	0.69	0.70	0.0
Openness Index	0.31	0.25	0.25	-0.0
Compactness (Roundness)				
Proximity	0.86	0.84	0.82	-0.2
Cohesion	0.85	0.82	0.80	-0.2
Added Area (Hectares)	'91-'99	Share	'99-'14	Share
Infill	1,443	46%	1,026	30%
Extension	1,084	34%	1,328	39%
Leapfrog	23	0%	121	3%
Inclusion	549	17%	857	25%





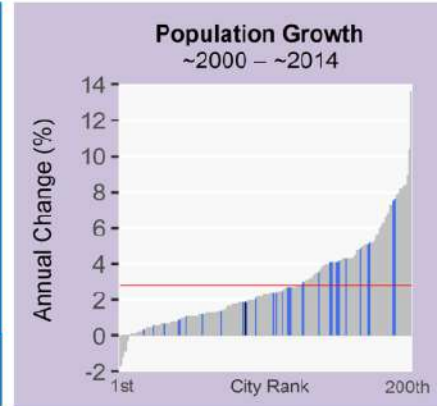
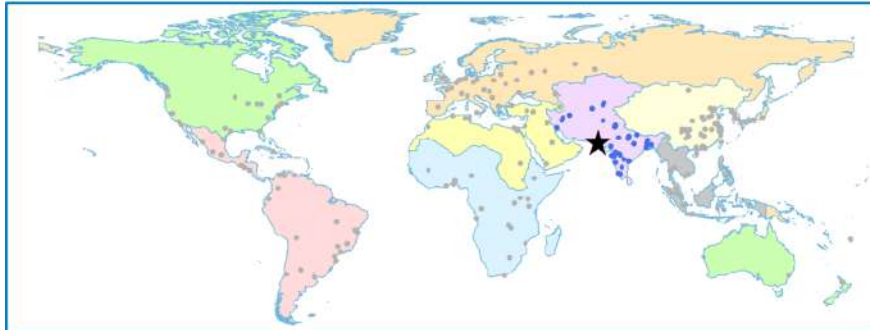
**Karachi, Pakistan
1991-2013**

0 5 10 15 20 km

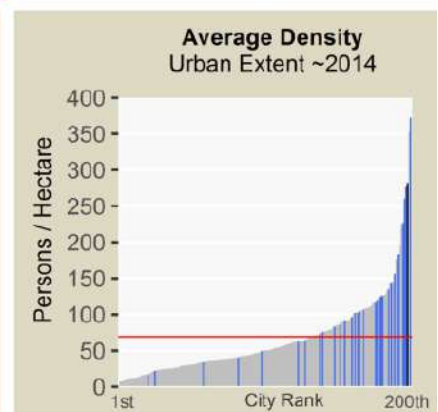
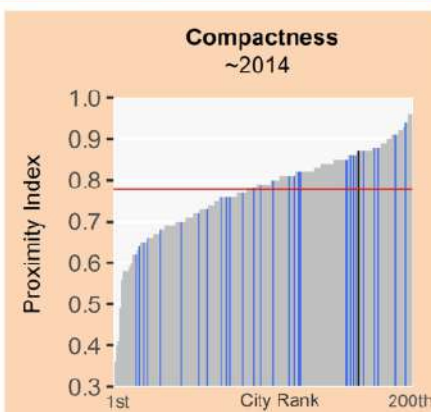
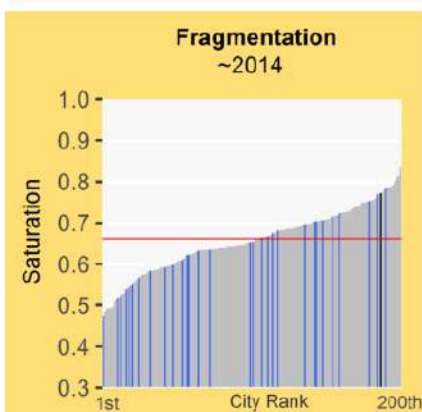
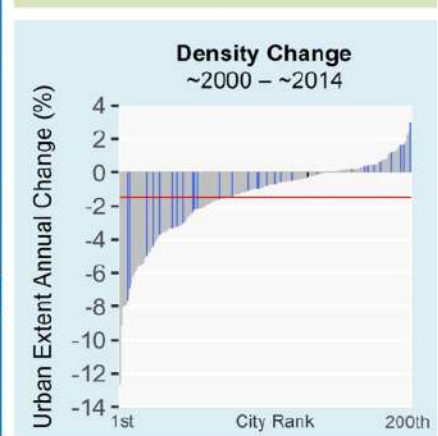
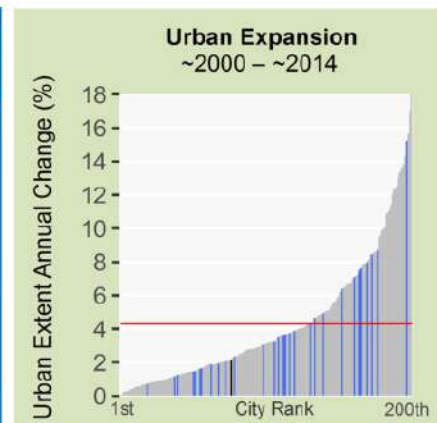
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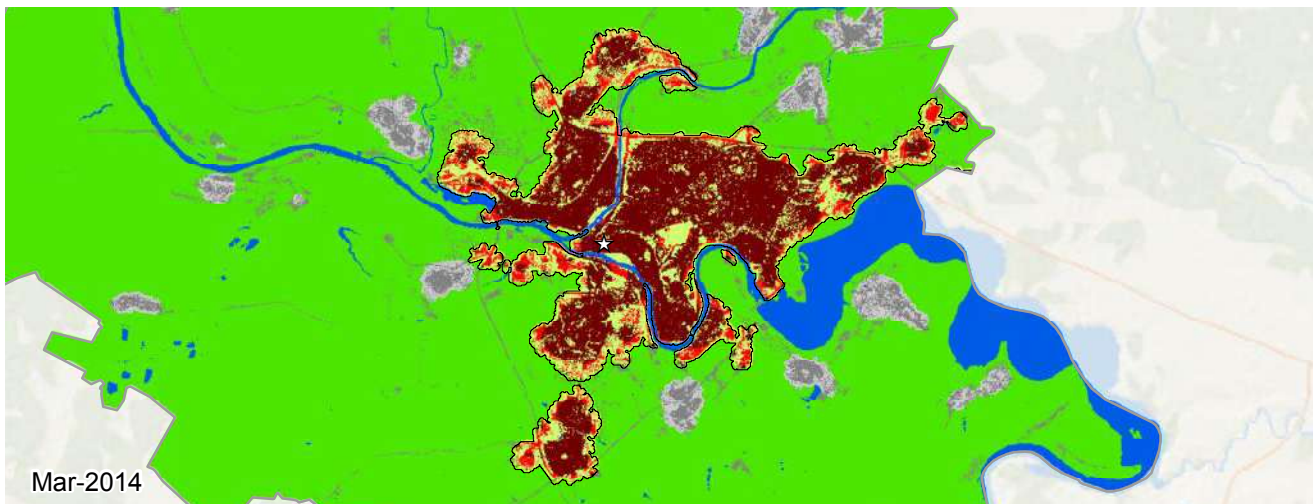
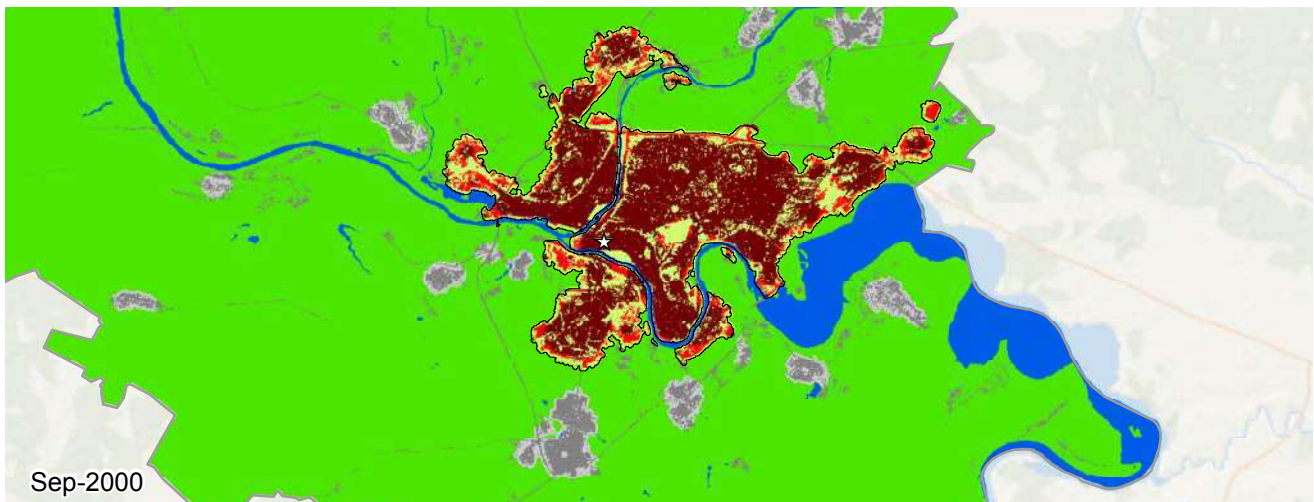
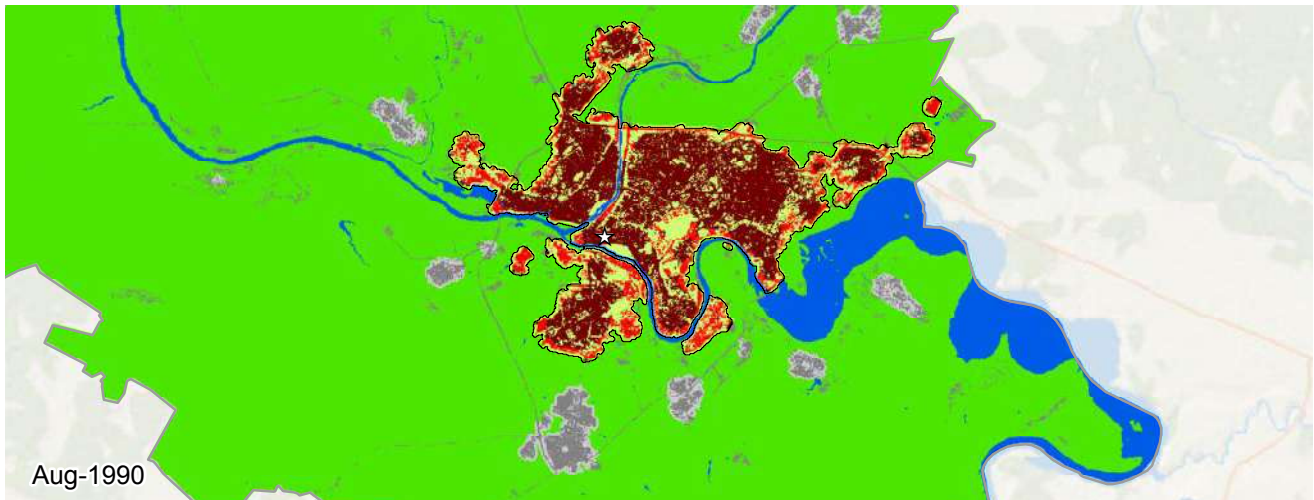
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Karachi, Pakistan (South and Central Asia)



Metrics	Feb 1991	Oct 2000	Oct 2013	% Annual Change ('00-'13)
Population	5,736,359	9,973,619	12,787,535	1.9
Built-up Area (Hectares)				
Total	18,057	27,535	35,017	1.8
Urban	16,674	25,475	31,399	1.6
Suburban	1,295	1,939	3,360	4.2
Rural	87	120	257	5.9
Open space (Hectares)				
Urbanized Open Space	4,277	6,591	10,308	3.4
Urban Extent	22,335	34,126	45,326	2.2
Density (Persons / Hectare)				
Built-up Area Density	317.7	362.2	365.2	0.1
Urban Extent Density	256.8	292.3	282.1	-0.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.81	0.81	0.77	-0.3
Openness Index	0.17	0.16	0.18	0.7
Compactness (Roundness)				
Proximity	0.93	0.83	0.87	0.3
Cohesion	0.91	0.83	0.86	0.2
Added Area (Hectares)	'91-'00	Share	'00-'13	Share
Infill	1,399	14%	1,992	26%
Extension	1,215	12%	5,030	67%
Leapfrog	502	5%	0	0%
Inclusion	6,359	67%	459	6%

















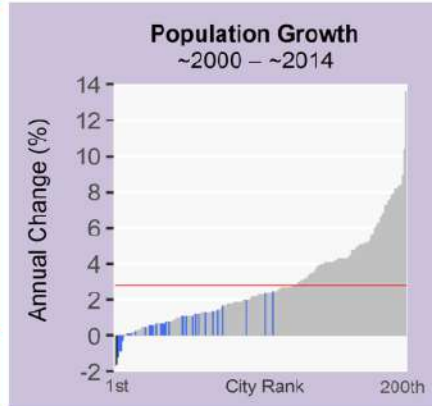
**Kaunas, Lithuania
1990-2014**

0 3 6 9 12 km

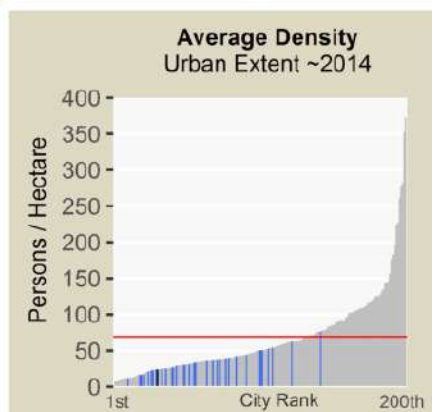
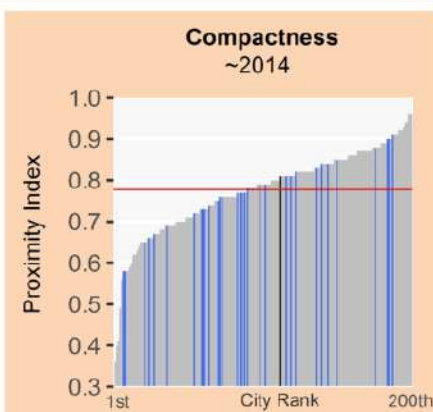
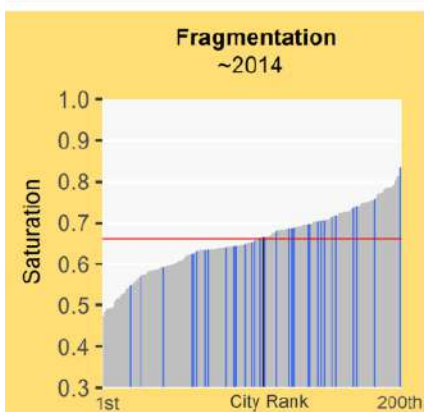
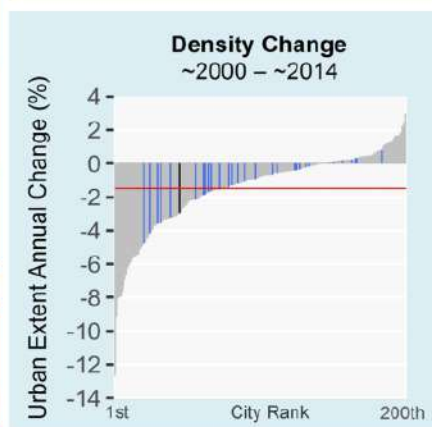
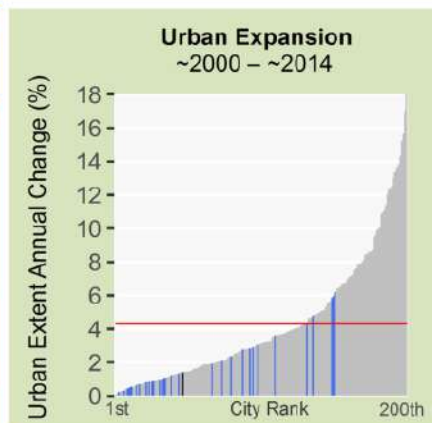
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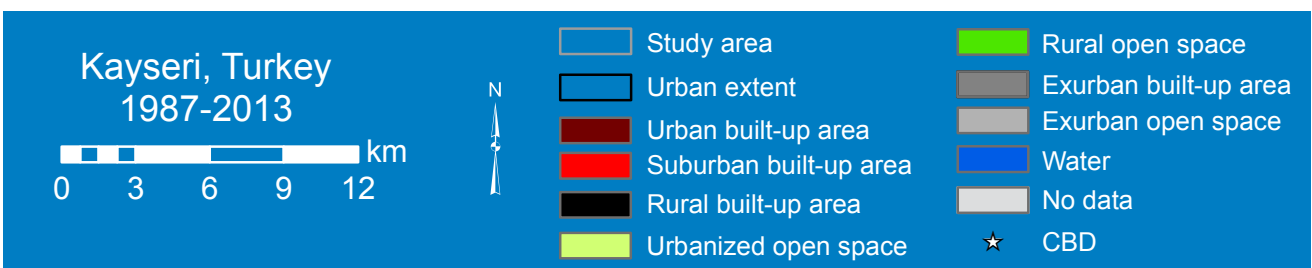
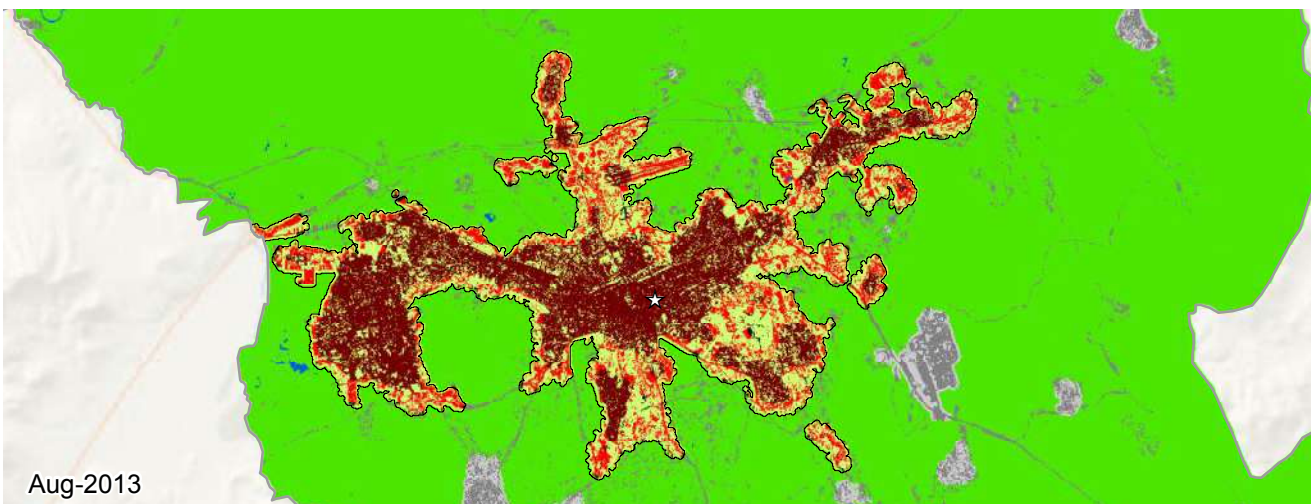
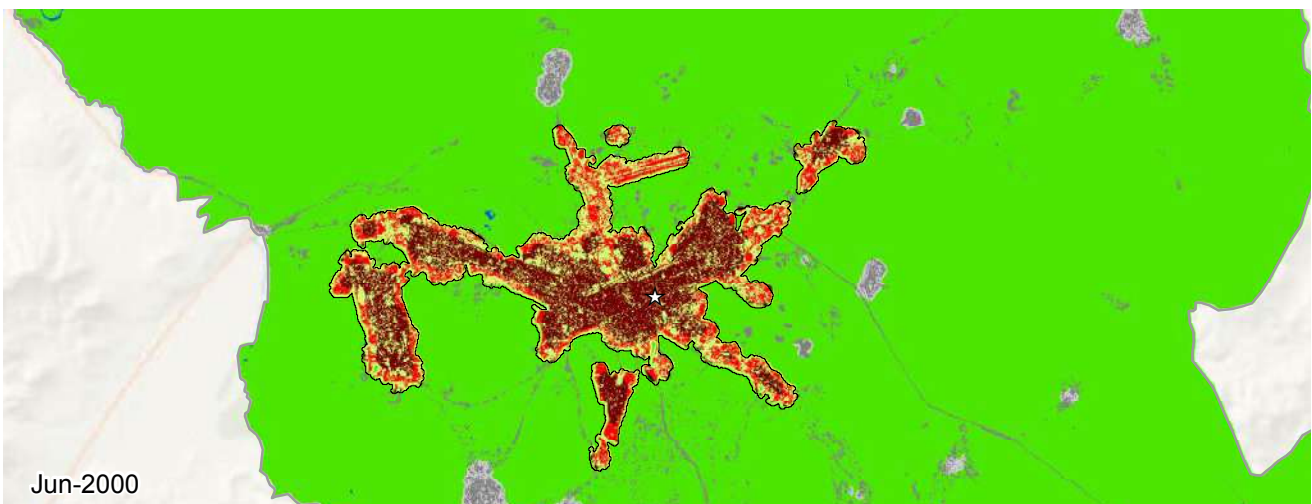
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Kaunas, Lithuania (Europe and Japan)

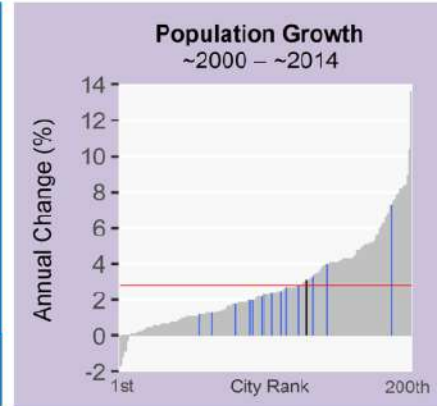


Metrics	Aug 1990	Sep 2000	Mar 2014	% Annual Change ('00-'14)
Population	402,489	369,084	298,743	-1.6
Built-up Area (Hectares)				
Total	6,125	6,908	8,089	1.2
Urban	4,629	5,692	6,478	1.0
Suburban	1,420	1,123	1,478	2.0
Rural	75	91	132	2.7
Open space (Hectares)				
Urbanized Open Space	3,398	3,147	4,064	1.9
Urban Extent	9,523	10,055	12,154	1.4
Density (Persons / Hectare)				
Built-up Area Density	65.7	53.4	36.9	-2.7
Urban Extent Density	42.3	36.7	24.6	-3.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.64	0.69	0.67	-0.2
Openness Index	0.35	0.30	0.31	0.2
Compactness (Roundness)				
Proximity	0.84	0.83	0.81	-0.2
Cohesion	0.81	0.82	0.79	-0.2
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	609	73%	227	19%
Extension	107	12%	200	16%
Leapfrog	10	1%	0	0%
Inclusion	101	12%	753	63%

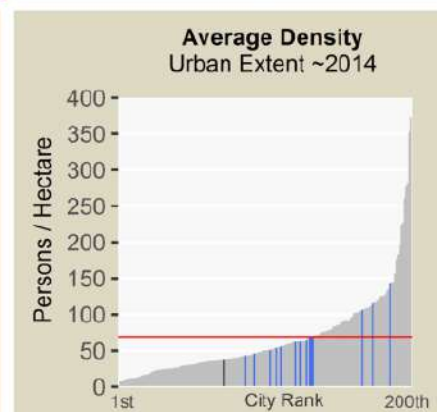
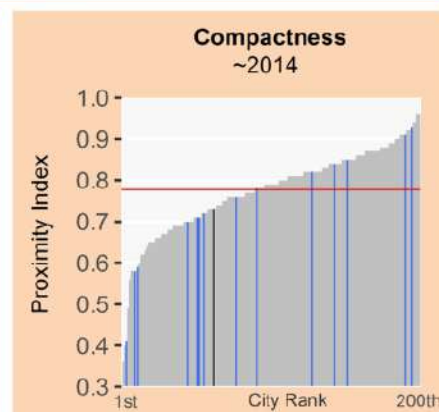
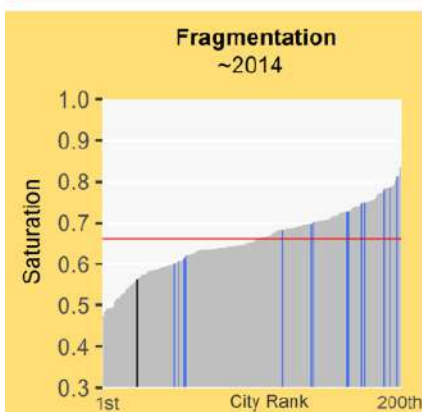
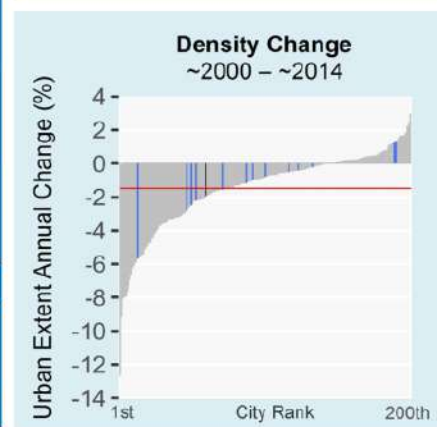
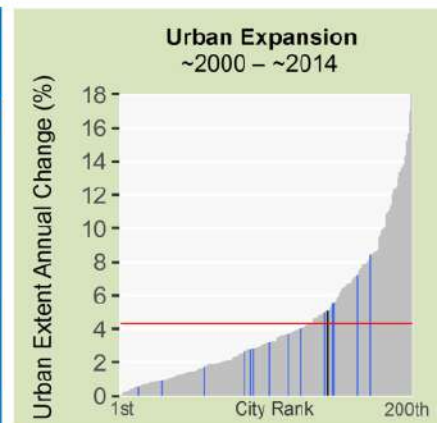


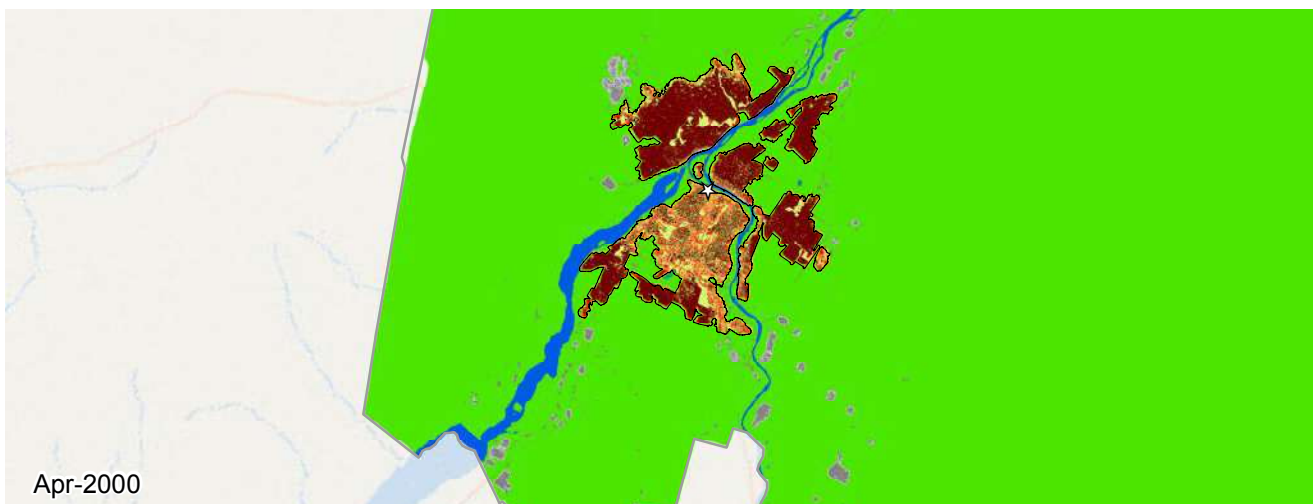
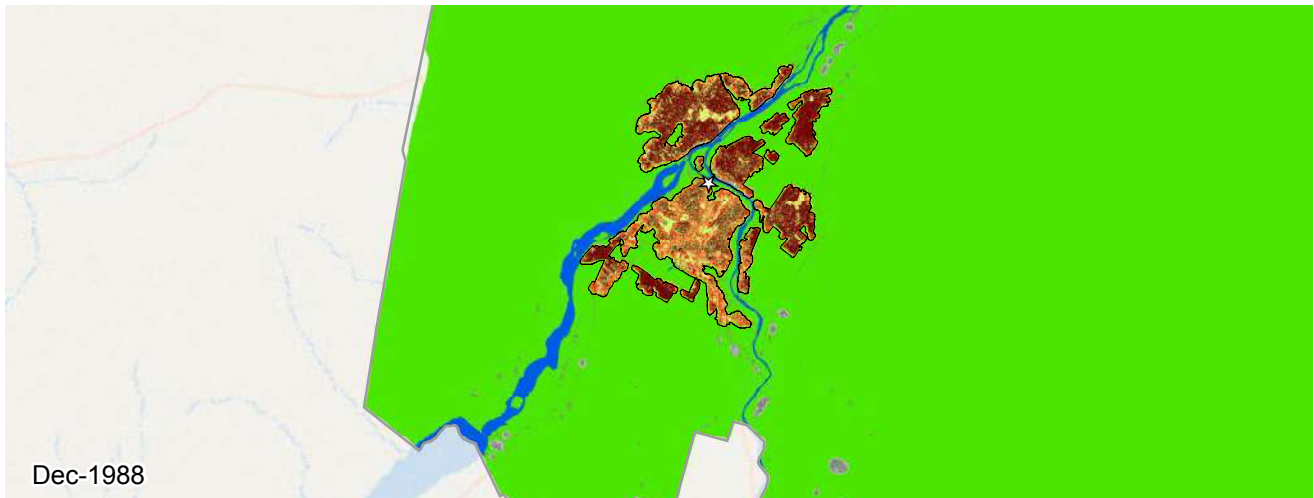


Kayseri, Turkey (Western Asia and North Africa)



Metrics	Oct 1987	Jun 2000	Aug 2013	% Annual Change ('00-'13)
Population	131,605	444,739	673,805	3.2
Built-up Area (Hectares)				
Total	608	5,155	10,053	5.1
Urban	205	3,219	6,611	5.5
Suburban	371	1,818	3,185	4.3
Rural	31	117	257	5.9
Open space (Hectares)				
Urbanized Open Space	849	3,941	7,774	5.2
Urban Extent	1,457	9,096	17,828	5.1
Density (Persons / Hectare)				
Built-up Area Density	216.3	86.3	67.0	-1.9
Urban Extent Density	90.3	48.9	37.8	-2.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.42	0.57	0.56	-0.0
Openness Index	0.57	0.43	0.39	-0.8
Compactness (Roundness)				
Proximity	0.76	0.69	0.73	0.5
Cohesion	0.75	0.67	0.72	0.6
Added Area (Hectares)	'87-'00	Share	'00-'13	Share
Infill	570	12%	1,011	20%
Extension	2,967	65%	3,012	61%
Leapfrog	0	0%	3	0%
Inclusion	1,009	22%	870	17%



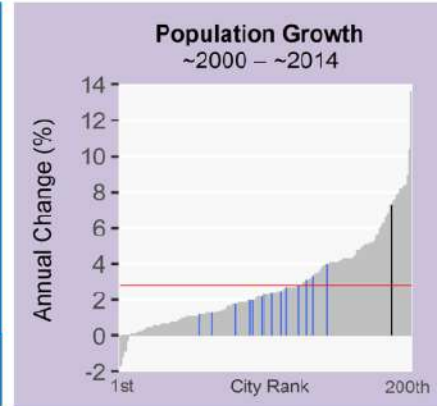


**Khartoum, Sudan
1988-2014**

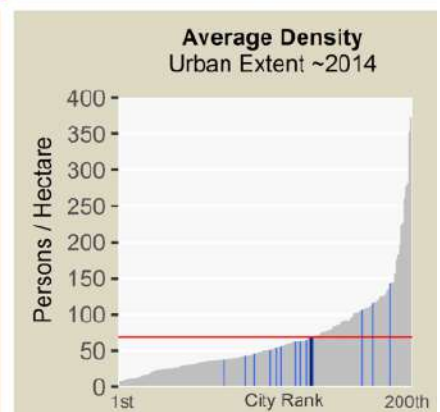
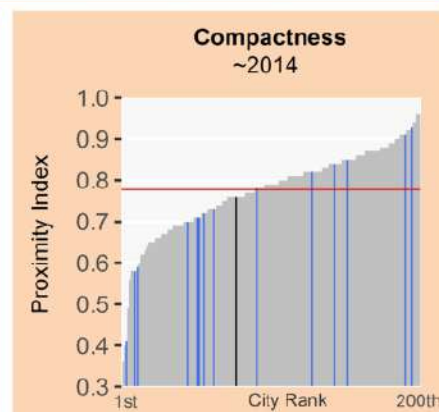
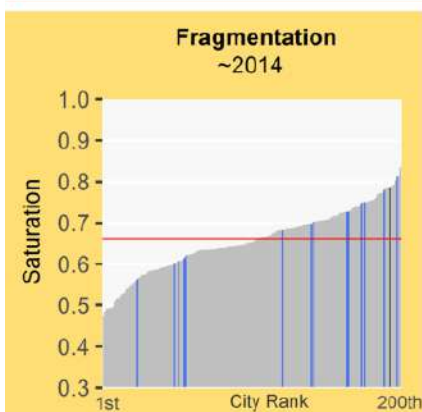
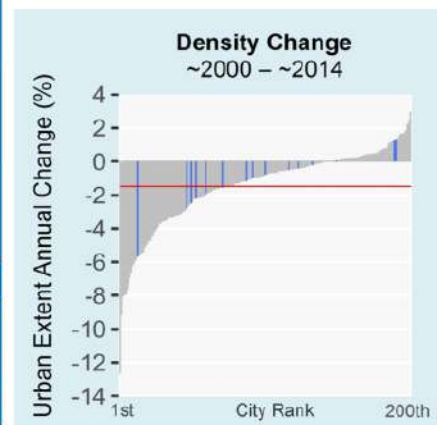
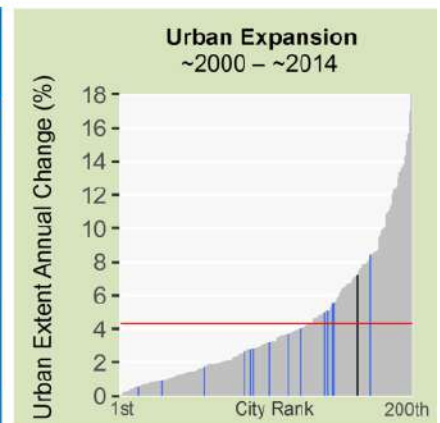
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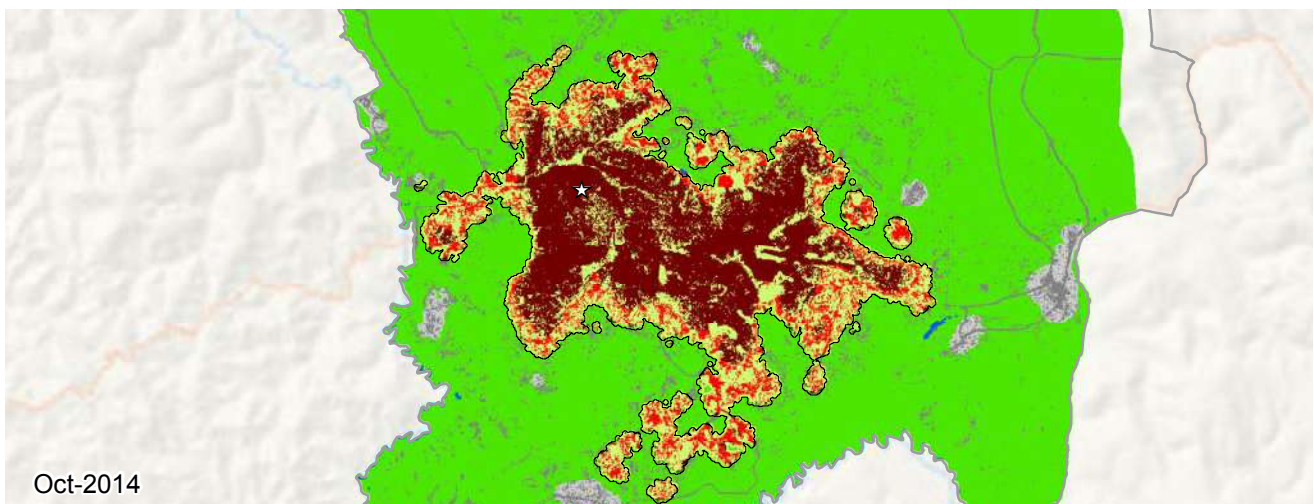
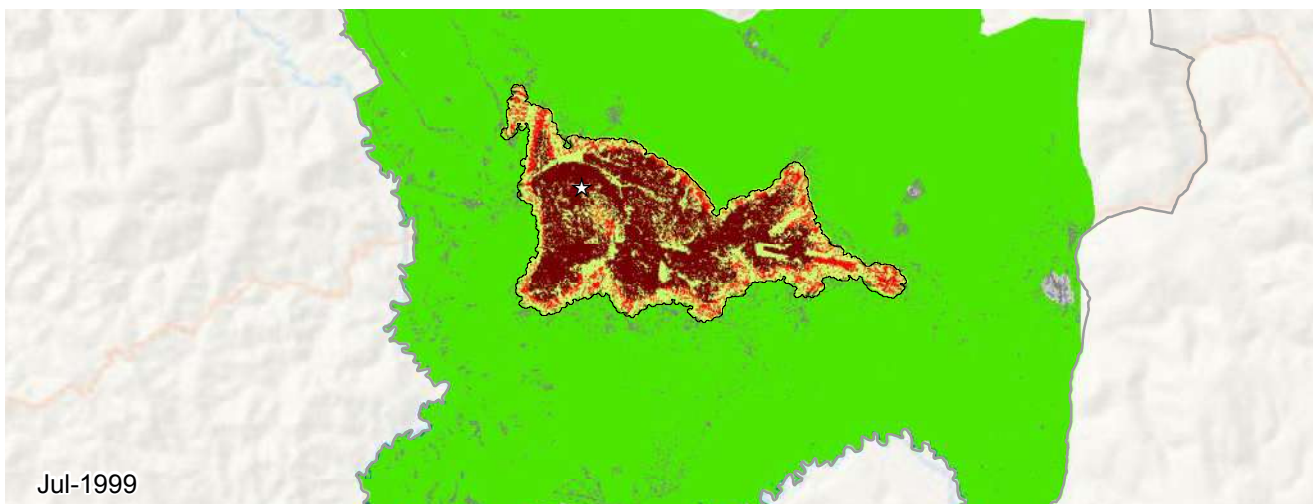
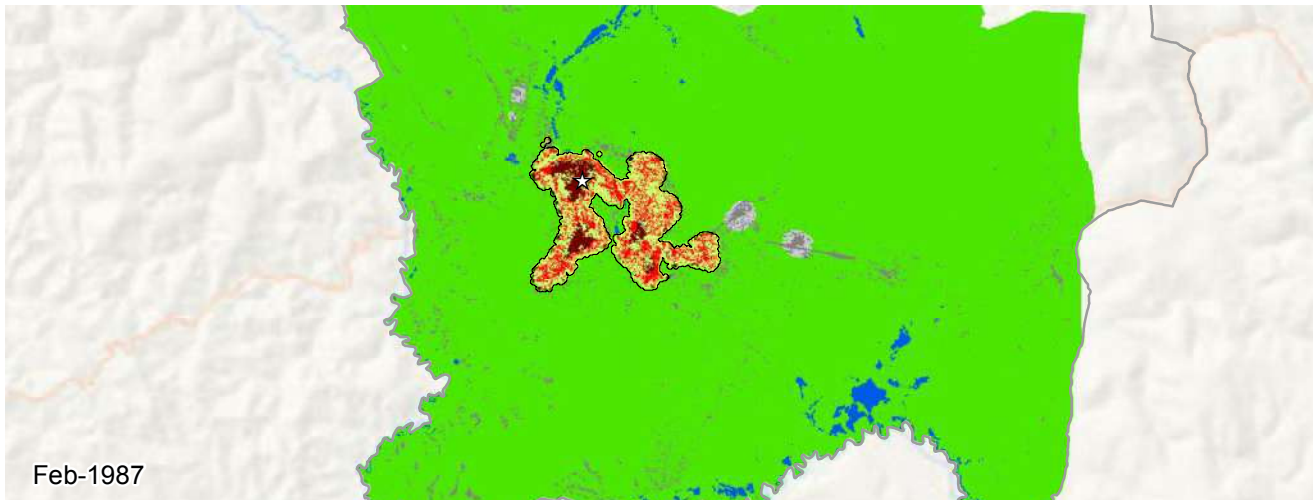
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Khartoum, Sudan (Western Asia and North Africa)



Metrics	Dec 1988	Apr 2000	Mar 2014	% Annual Change ('00-'14)
Population	1,253,183	1,844,695	5,061,792	7.3
Built-up Area (Hectares)				
Total	12,889	16,954	58,271	8.9
Urban	7,992	12,289	52,681	10.5
Suburban	4,711	4,493	5,282	1.2
Rural	185	171	306	4.2
Open space (Hectares)				
Urbanized Open Space	10,141	10,253	16,026	3.2
Urban Extent	23,030	27,208	74,297	7.2
Density (Persons / Hectare)				
Built-up Area Density	97.2	108.8	86.9	-1.6
Urban Extent Density	54.4	67.8	68.1	0.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.56	0.62	0.78	1.7
Openness Index	0.39	0.26	0.18	-2.6
Compactness (Roundness)				
Proximity	0.75	0.78	0.76	-0.2
Cohesion	0.75	0.78	0.74	-0.4
Added Area (Hectares)	'88-'00	Share	'00-'14	Share
Infill	4,149	43%	5,994	21%
Extension	4,691	49%	16,251	59%
Leapfrog	260	2%	2,398	8%
Inclusion	357	3%	2,814	10%

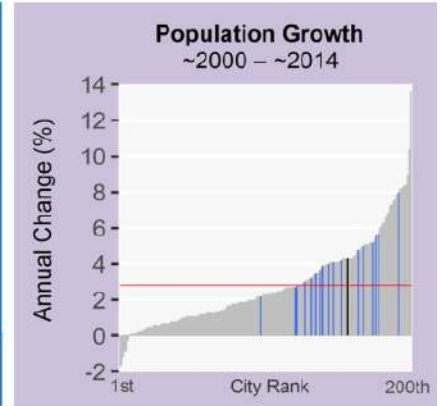




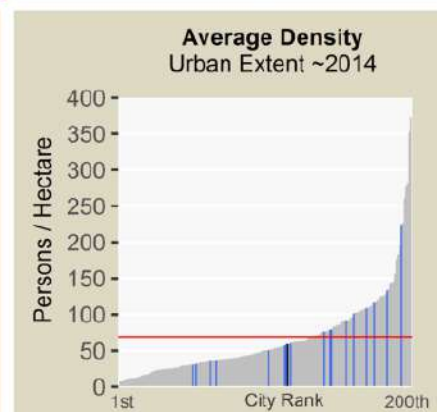
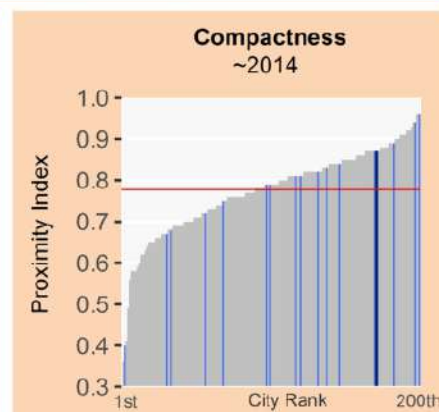
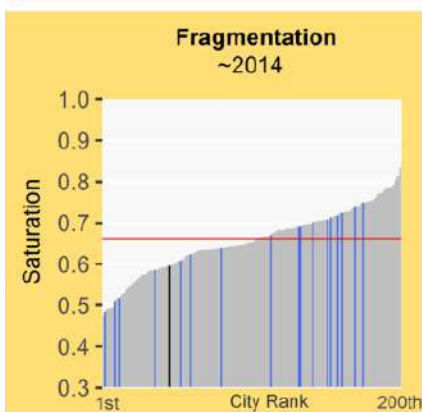
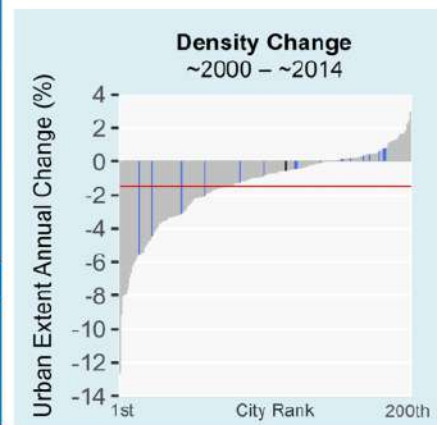
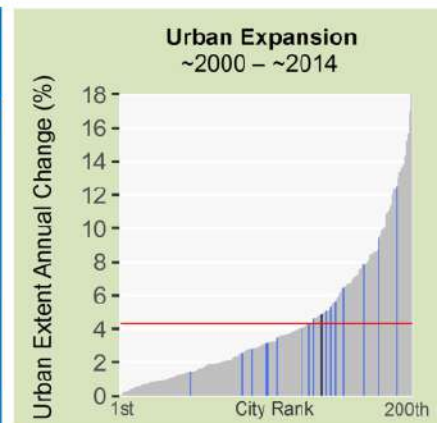
**Kigali, Rwanda
1987-2014**

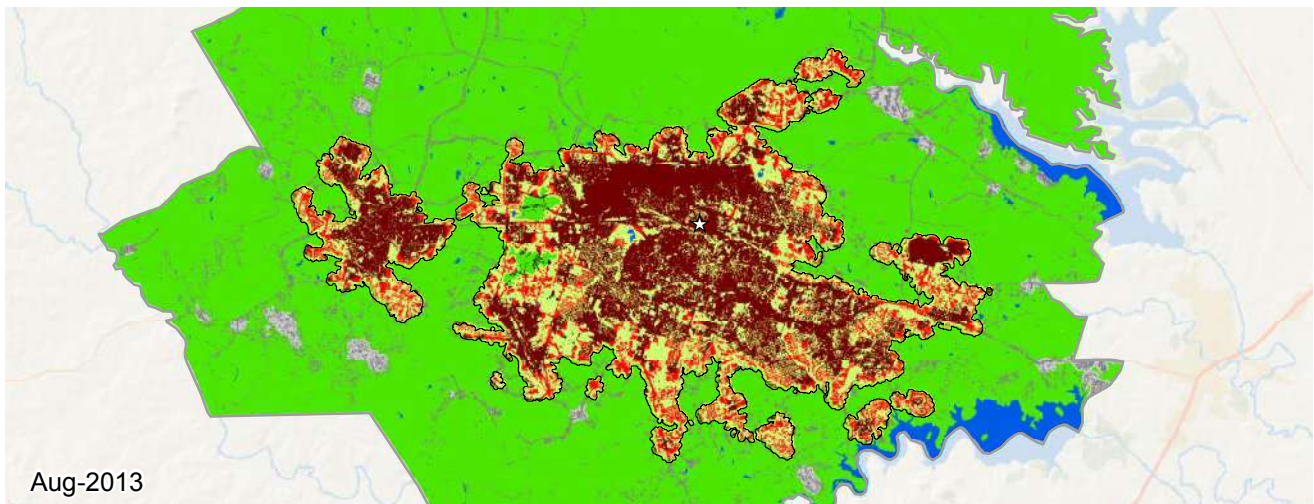
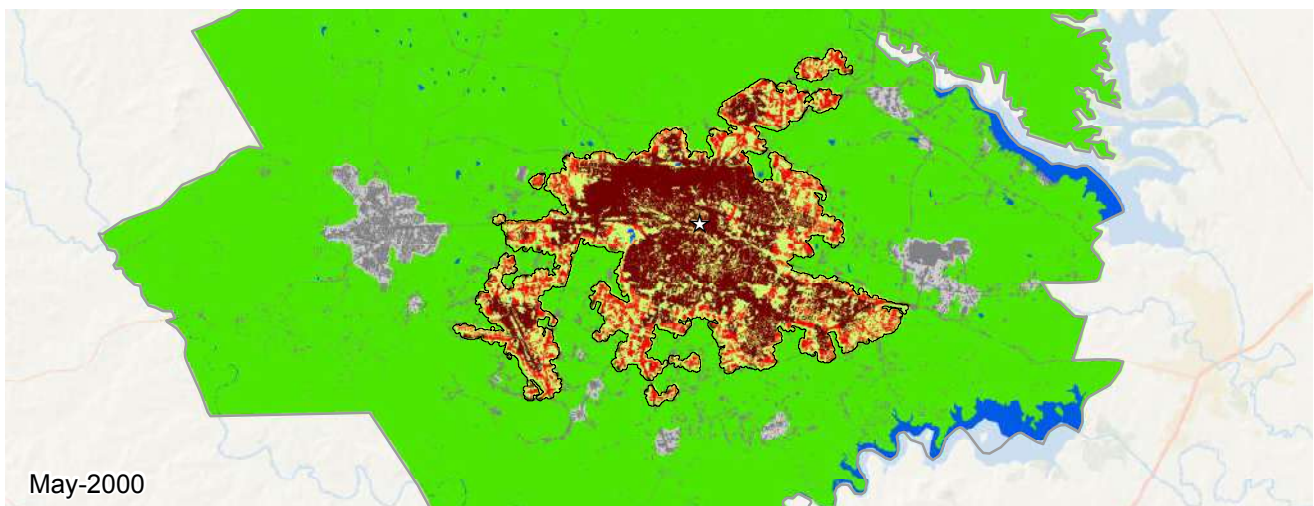
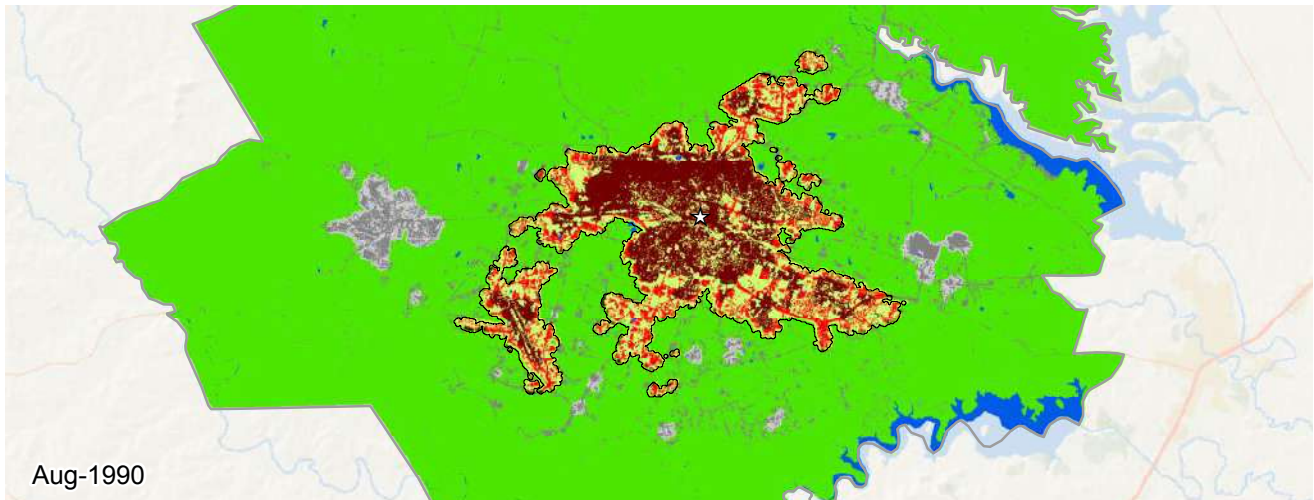
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Kigali, Rwanda (Sub-Saharan Africa)



Metrics	Feb 1987	Jul 1999	Oct 2014	% Annual Change ('99-'14)
Population	211,150	422,776	821,881	4.4
Built-up Area (Hectares)				
Total	960	3,936	8,272	4.9
Urban	256	3,104	5,987	4.3
Suburban	644	768	2,091	6.6
Rural	60	64	193	7.2
Open space (Hectares)				
Urbanized Open Space	1,242	2,625	5,607	5.0
Urban Extent	2,203	6,562	13,879	4.9
Density (Persons / Hectare)				
Built-up Area Density	219.9	107.4	99.4	-0.5
Urban Extent Density	95.8	64.4	59.2	-0.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.44	0.60	0.60	-0.0
Openness Index	0.57	0.34	0.33	-0.2
Compactness (Roundness)				
Proximity	0.82	0.82	0.87	0.4
Cohesion	0.81	0.81	0.86	0.3
Added Area (Hectares)	'87-'99	Share	'99-'14	Share
Infill	685	23%	1,023	23%
Extension	1,880	63%	2,847	65%
Leapfrog	0	0%	0	0%
Inclusion	410	13%	464	10%





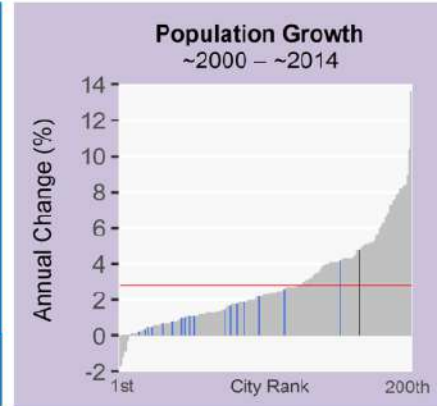
**Killeen, United States
1990-2013**

0 4 8 12 16 km

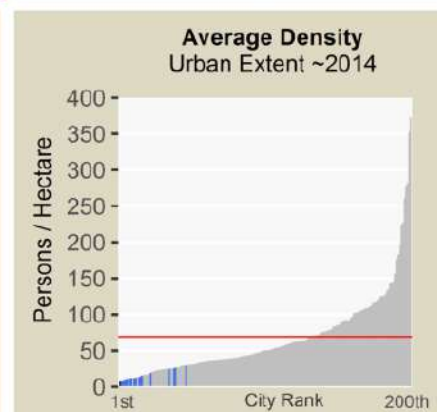
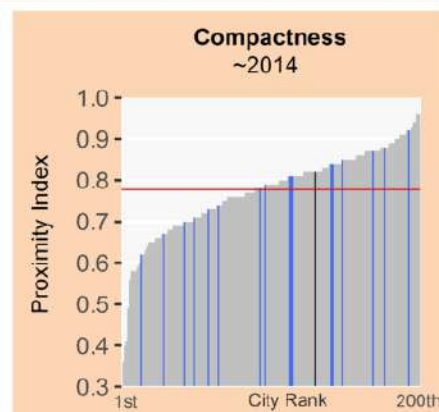
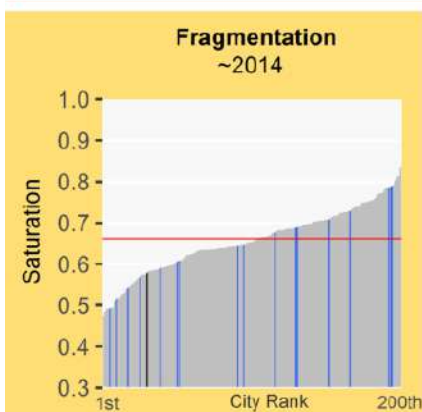
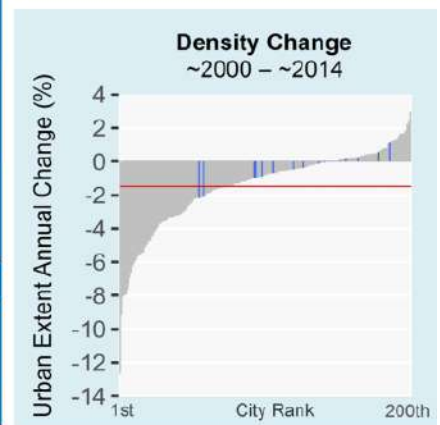
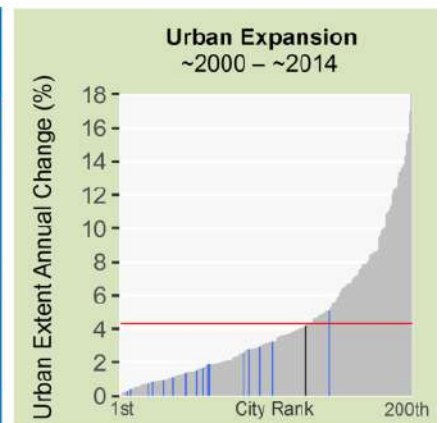
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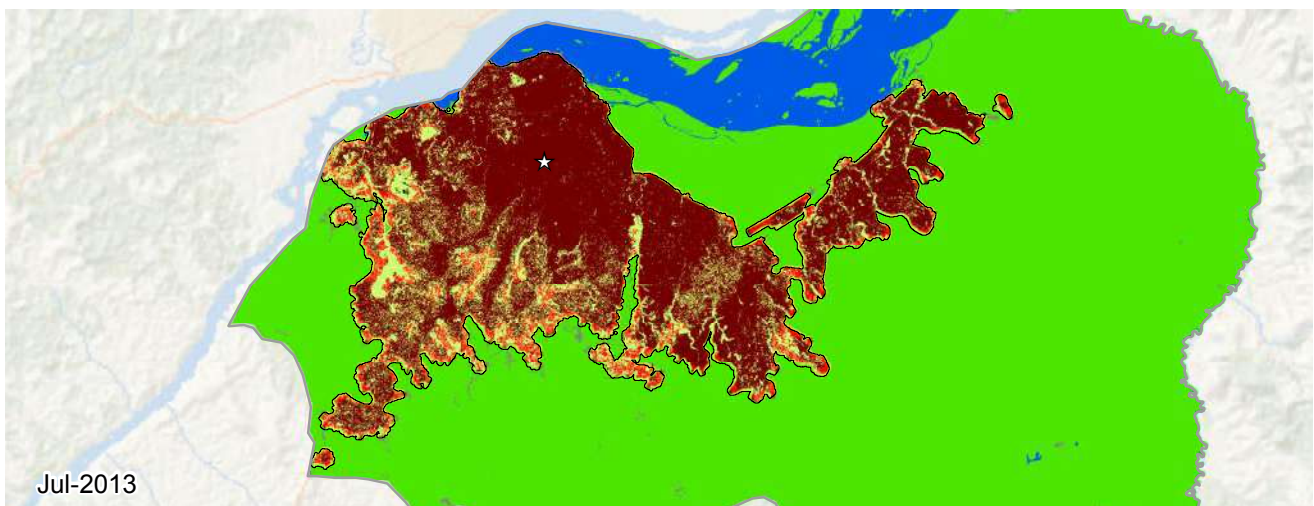
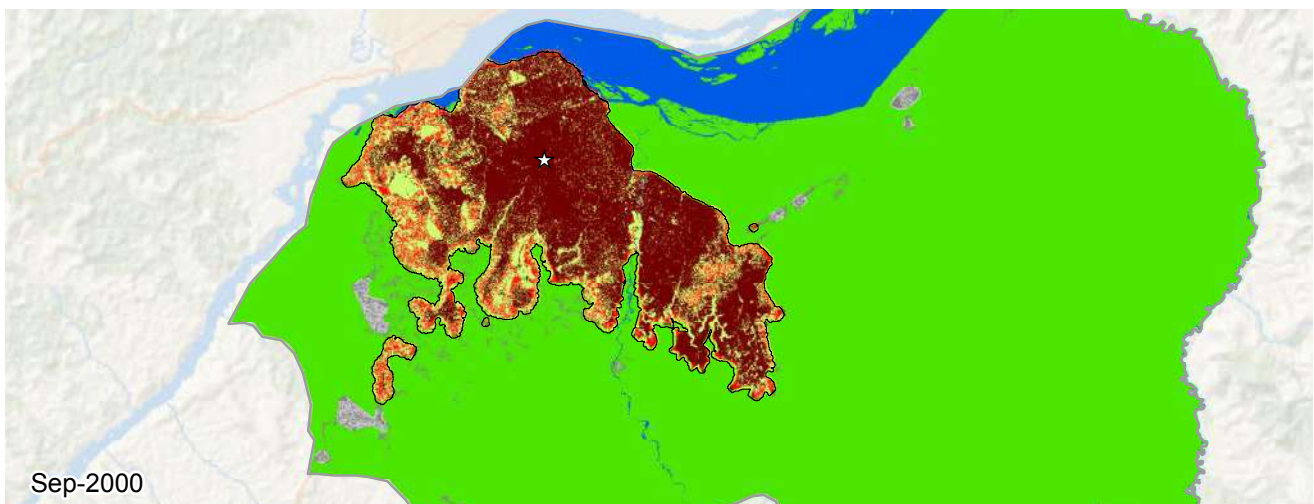
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Killeen, United States (Land-Rich Developed Countries)



Metrics	Aug 1990	May 2000	Aug 2013	% Annual Change ('00-'13)
Population	93,137	119,748	225,248	4.8
Built-up Area (Hectares)				
Total	8,141	10,037	17,685	4.3
Urban	5,187	6,767	12,421	4.6
Suburban	2,715	3,018	4,864	3.6
Rural	238	252	400	3.5
Open space (Hectares)				
Urbanized Open Space	6,574	7,523	12,880	4.1
Urban Extent	14,715	17,560	30,566	4.2
Density (Persons / Hectare)				
Built-up Area Density	11.4	11.9	12.7	0.5
Urban Extent Density	6.3	6.8	7.4	0.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.55	0.57	0.58	0.1
Openness Index	0.40	0.39	0.38	-0.2
Compactness (Roundness)				
Proximity	0.81	0.86	0.82	-0.4
Cohesion	0.79	0.84	0.80	-0.4
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	698	36%	1,351	17%
Extension	683	36%	3,609	47%
Leapfrog	27	1%	18	0%
Inclusion	487	25%	2,668	34%





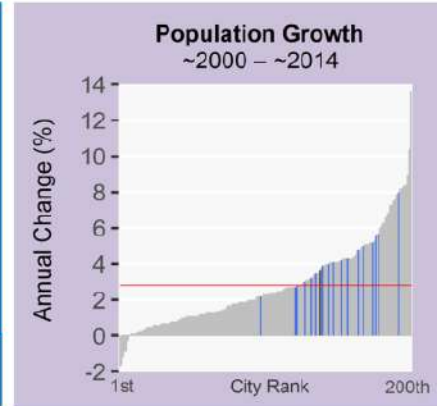
Kinshasa, Congo Dem. Rep. 1994-2013

0 5 10 15 20 km

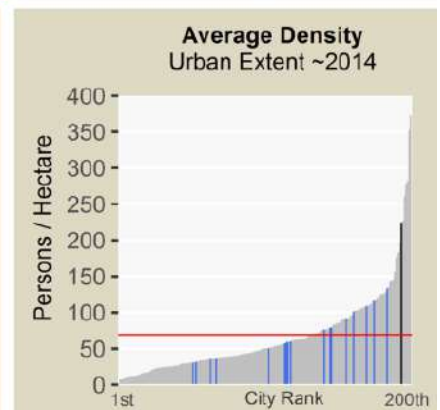
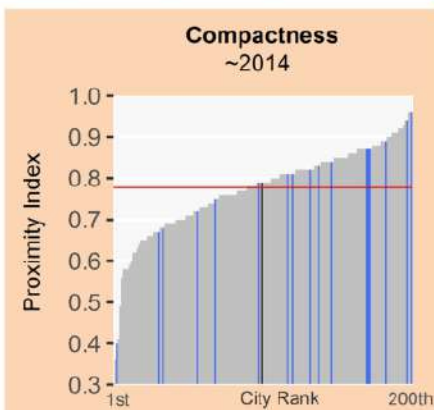
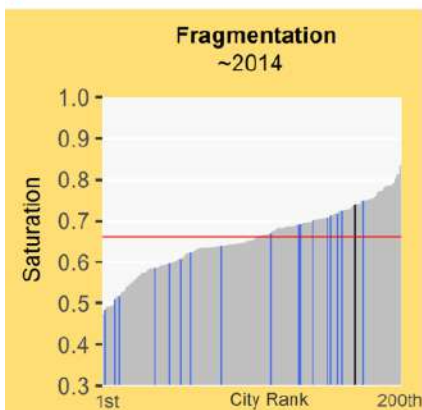
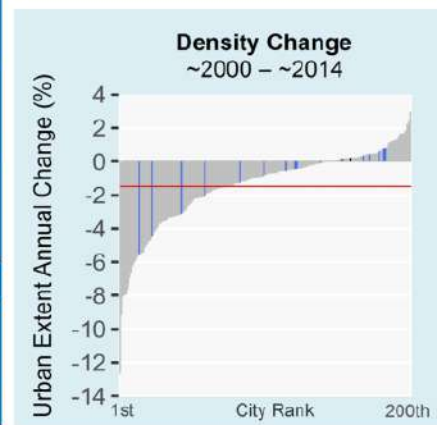
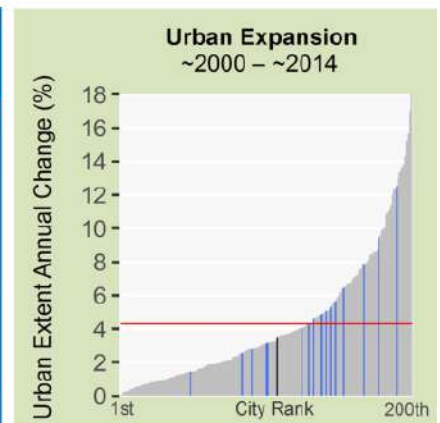
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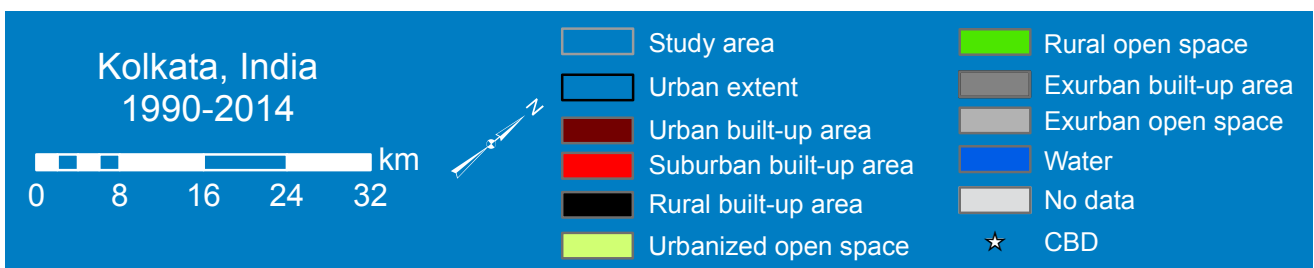
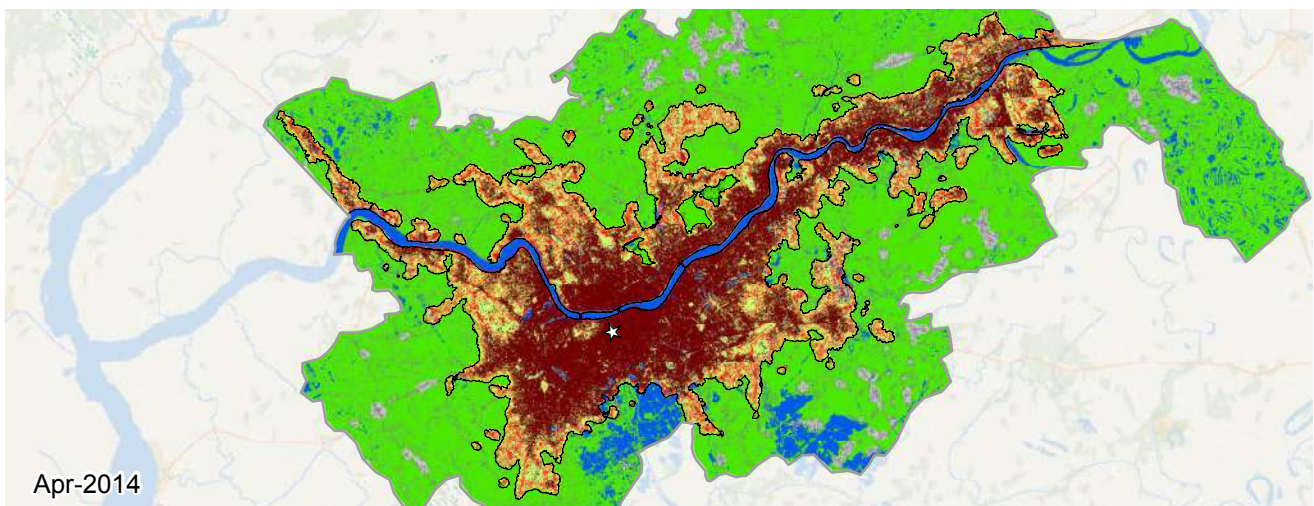
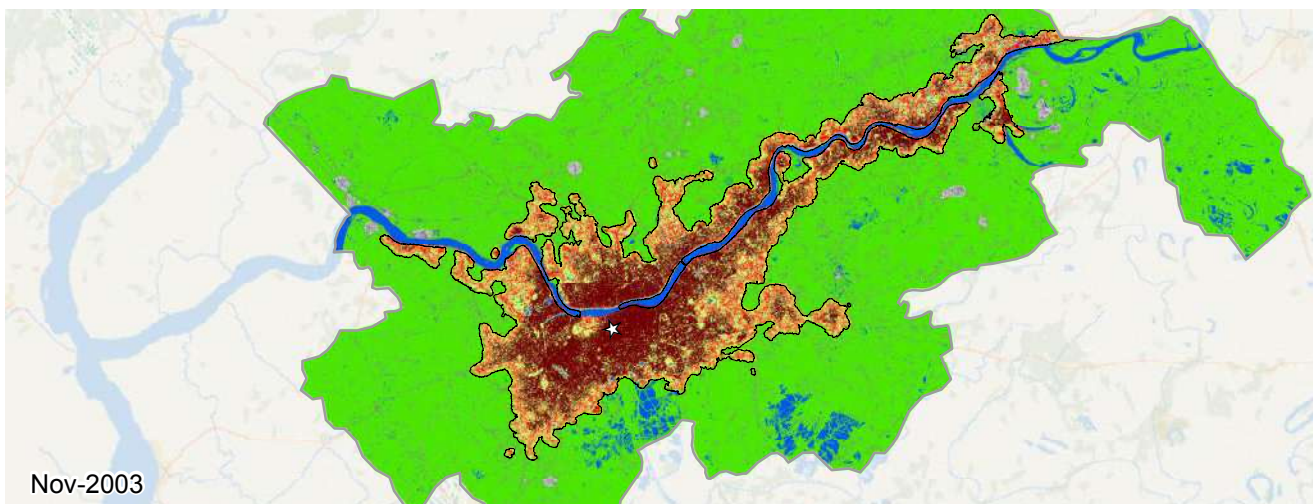
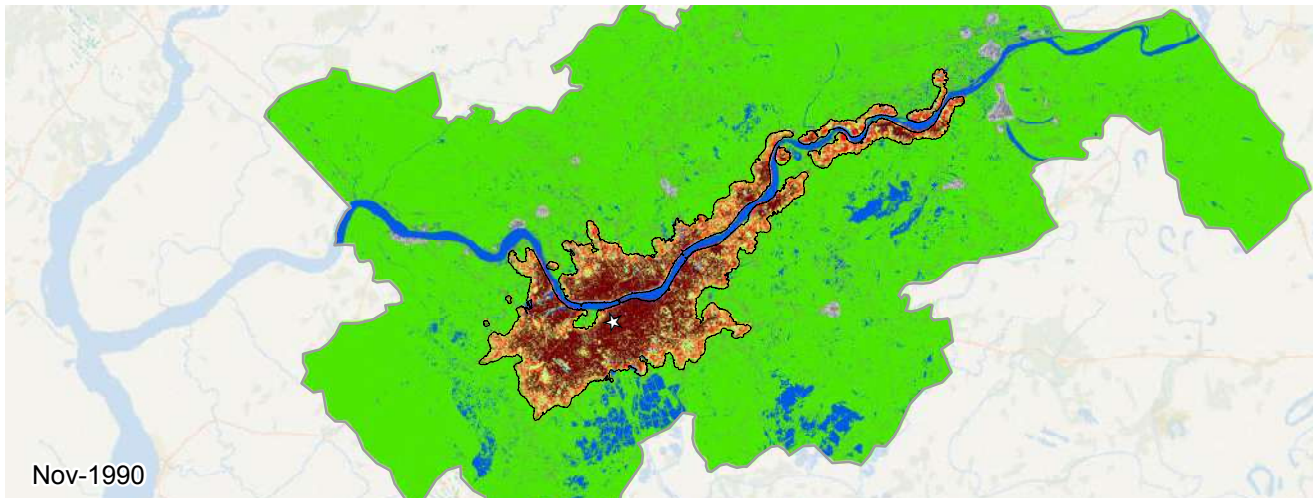
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Kinshasa, Congo Dem. Rep. (Sub-Saharan Africa)

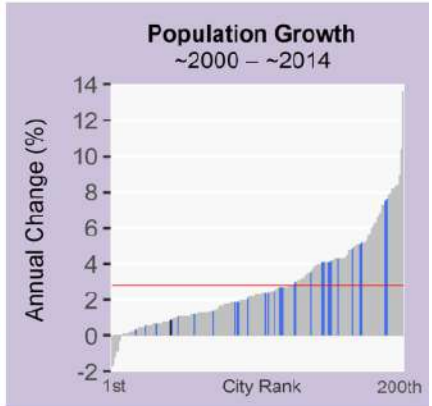


Metrics	Aug 1994	Sep 2000	Jul 2013	% Annual Change ('00-'13)
Population	4,226,052	6,379,815	10,226,182	3.7
Built-up Area (Hectares)				
Total	7,878	20,142	33,763	4.0
Urban	4,550	17,041	30,056	4.4
Suburban	3,167	2,934	3,526	1.4
Rural	160	166	180	0.6
Open space (Hectares)				
Urbanized Open Space	6,763	9,063	11,918	2.1
Urban Extent	14,641	29,205	45,681	3.5
Density (Persons / Hectare)				
Built-up Area Density	536.4	316.7	302.9	-0.3
Urban Extent Density	288.6	218.4	223.9	0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.69	0.74	0.5
Openness Index	0.42	0.25	0.22	-0.9
Compactness (Roundness)				
Proximity	0.83	0.85	0.79	-0.6
Cohesion	0.83	0.84	0.78	-0.6
Added Area (Hectares)	'94-'00	Share	'00-'13	Share
Infill	4,208	34%	3,647	26%
Extension	7,362	60%	8,618	63%
Leapfrog	0	0%	97	0%
Inclusion	692	5%	1,258	9%

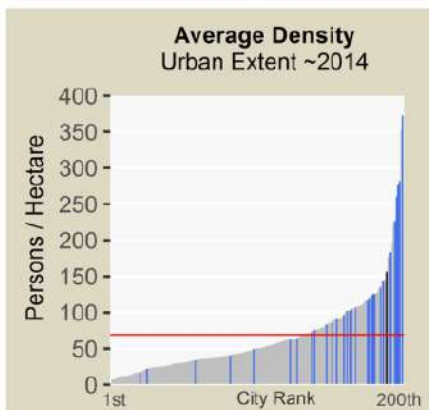
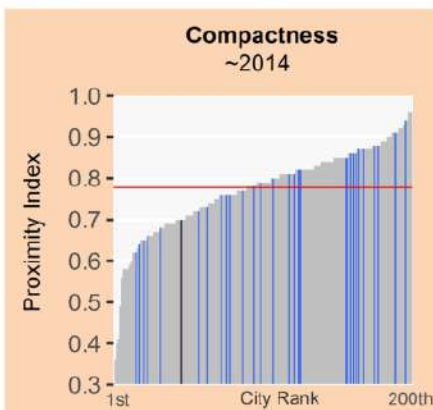
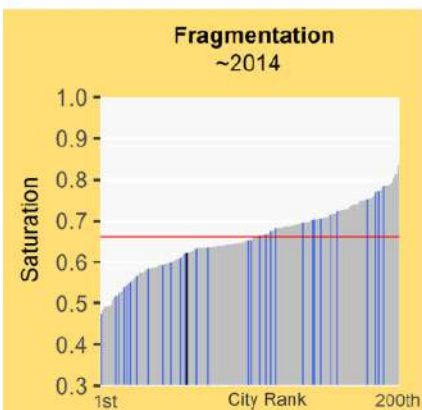
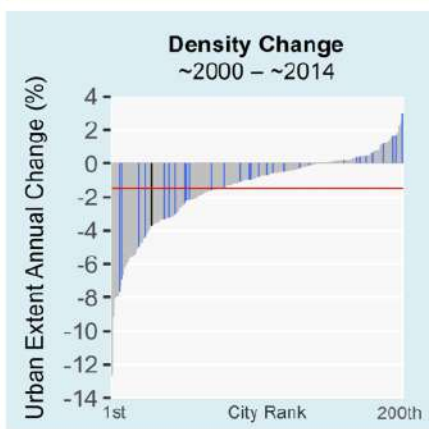
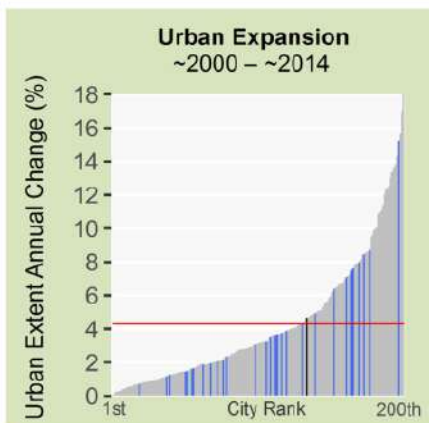


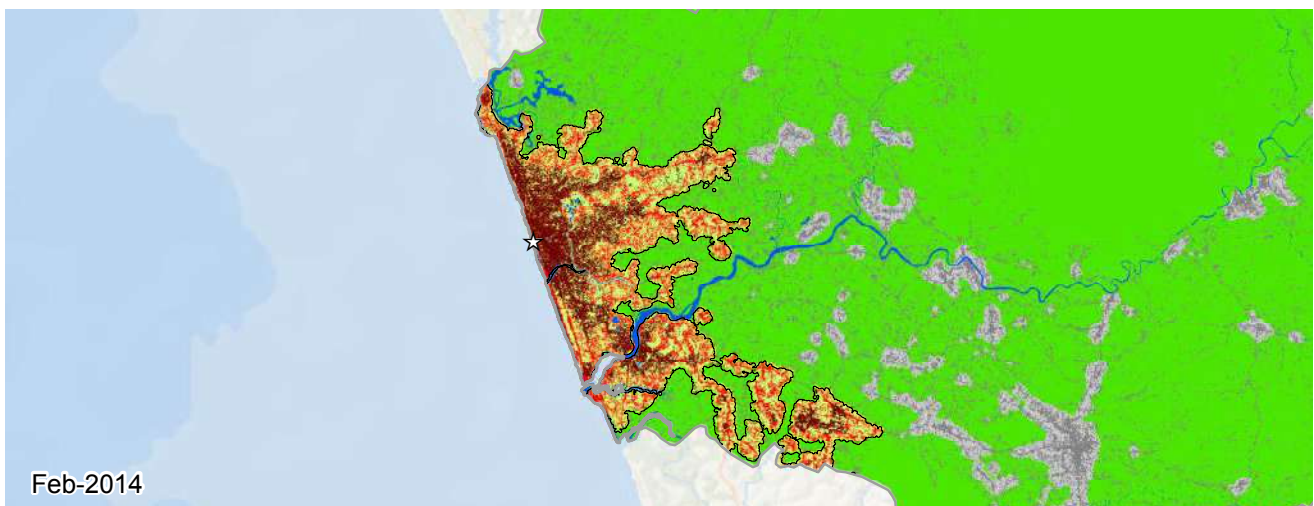
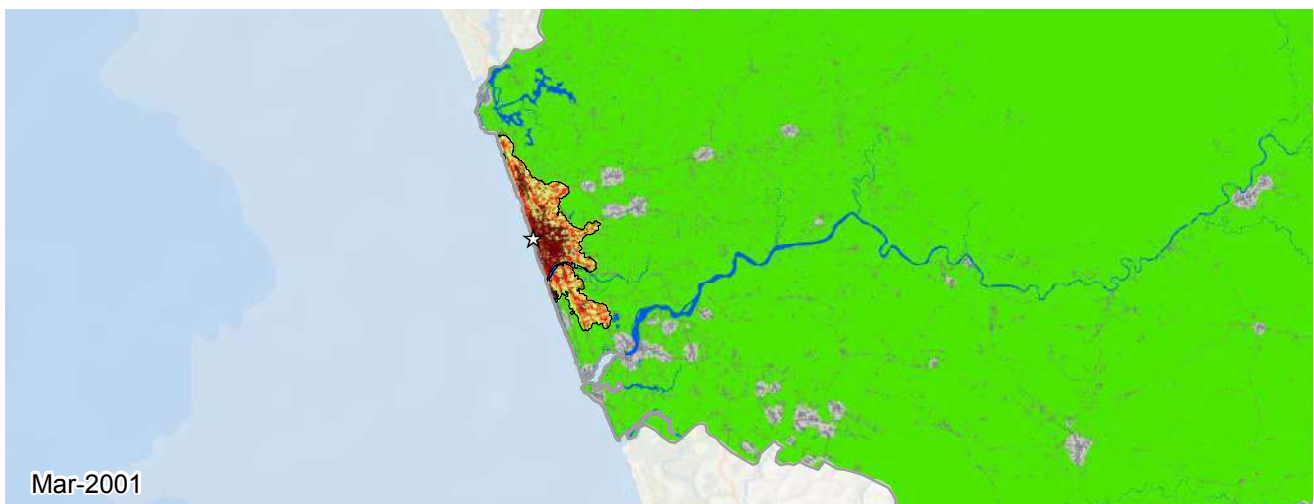


Kolkata, India (South and Central Asia)



Metrics	Nov 1990	Nov 2003	Apr 2014	% Annual Change ('03-'14)
Population	9,934,562	13,706,423	15,123,555	0.9
Built-up Area (Hectares)				
Total	18,047	33,575	60,278	5.6
Urban	11,794	21,901	44,343	6.8
Suburban	5,885	10,997	14,787	2.8
Rural	367	676	1,147	5.1
Open space (Hectares)				
Urbanized Open Space	13,271	26,024	36,589	3.3
Urban Extent	31,319	59,600	96,868	4.7
Density (Persons / Hectare)				
Built-up Area Density	550.5	408.2	250.9	-4.7
Urban Extent Density	317.2	230.0	156.1	-3.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.58	0.56	0.62	1.0
Openness Index	0.40	0.39	0.32	-1.9
Compactness (Roundness)				
Proximity	0.62	0.64	0.70	0.9
Cohesion	0.61	0.63	0.70	0.9
Added Area (Hectares)	'90-'03	Share	'03-'14	Share
Infill	4,315	29%	11,220	46%
Extension	6,490	43%	6,658	27%
Leapfrog	0	0%	42	0%
Inclusion	4,003	27%	6,258	25%





**Kozhikode, India
1991-2014**

0 5 10 15 20 km

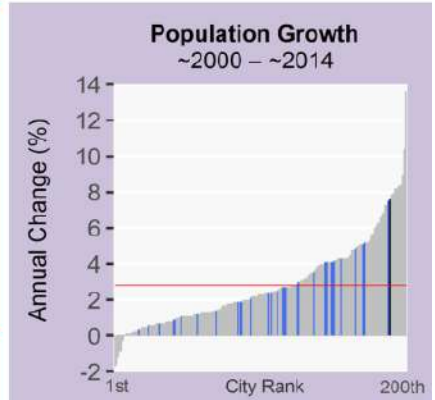
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Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

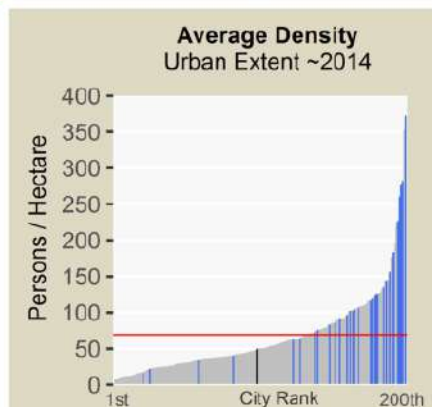
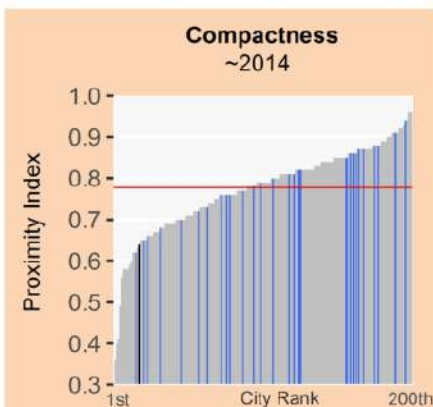
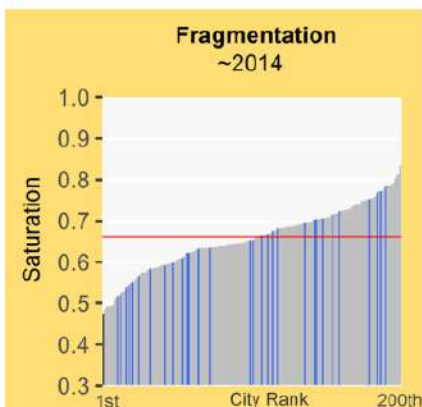
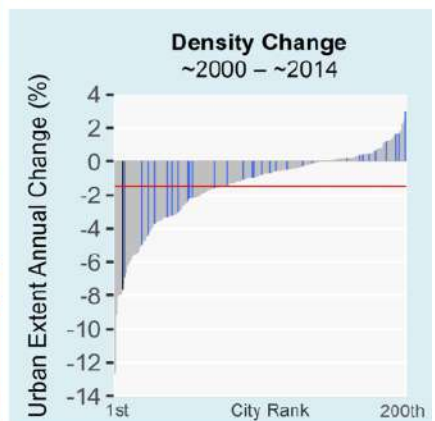
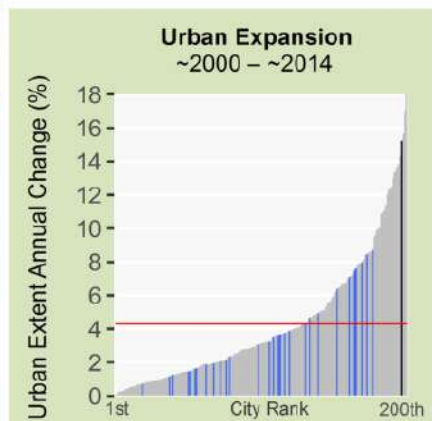
Kozhikode, India (South and Central Asia)

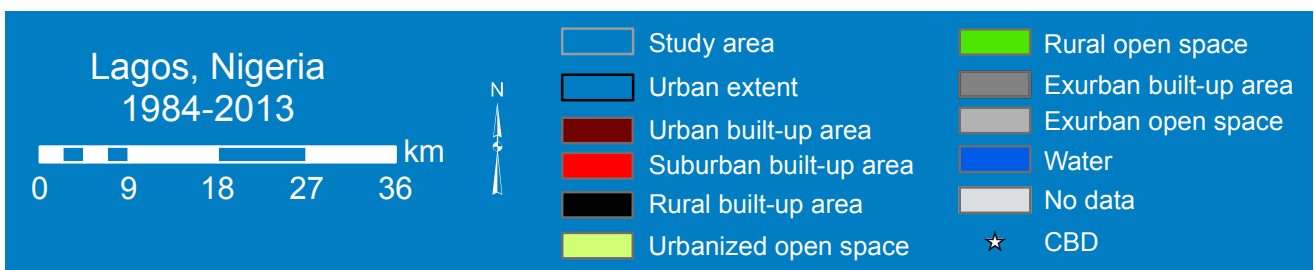
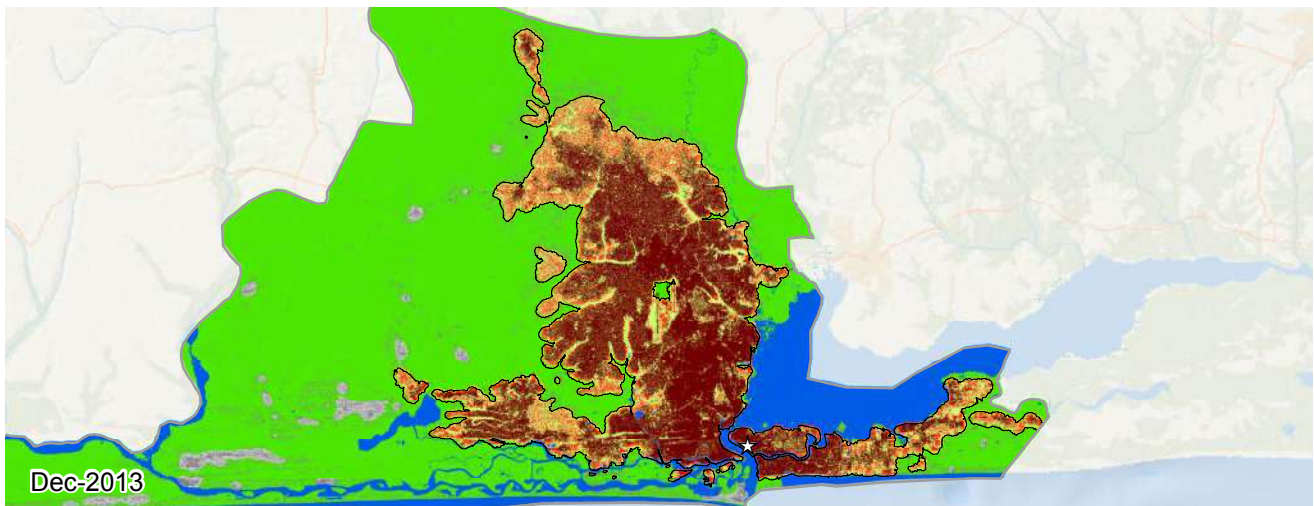
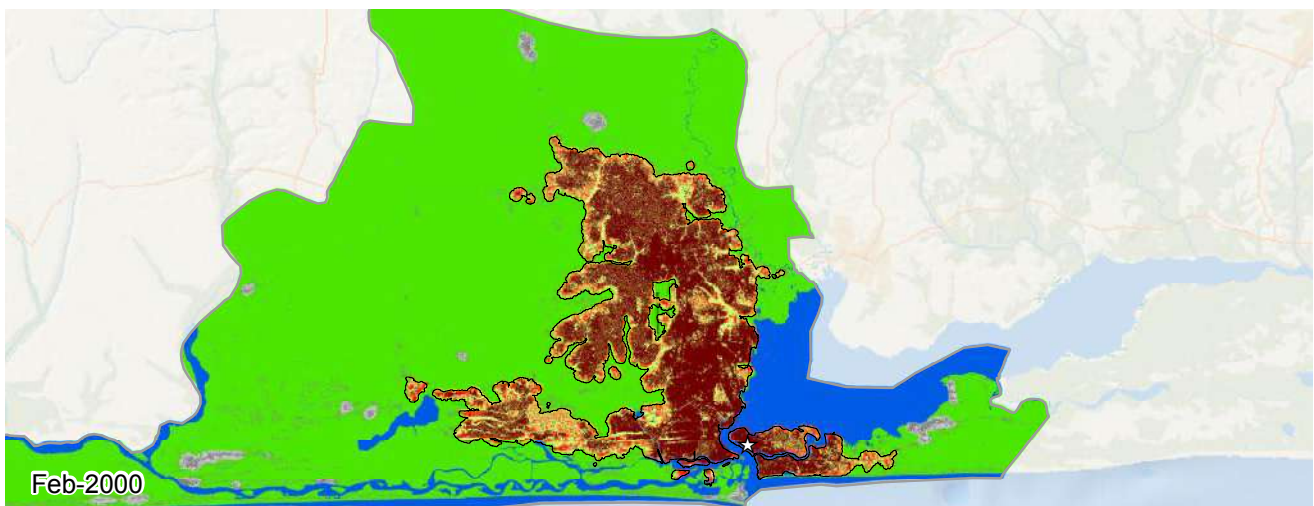
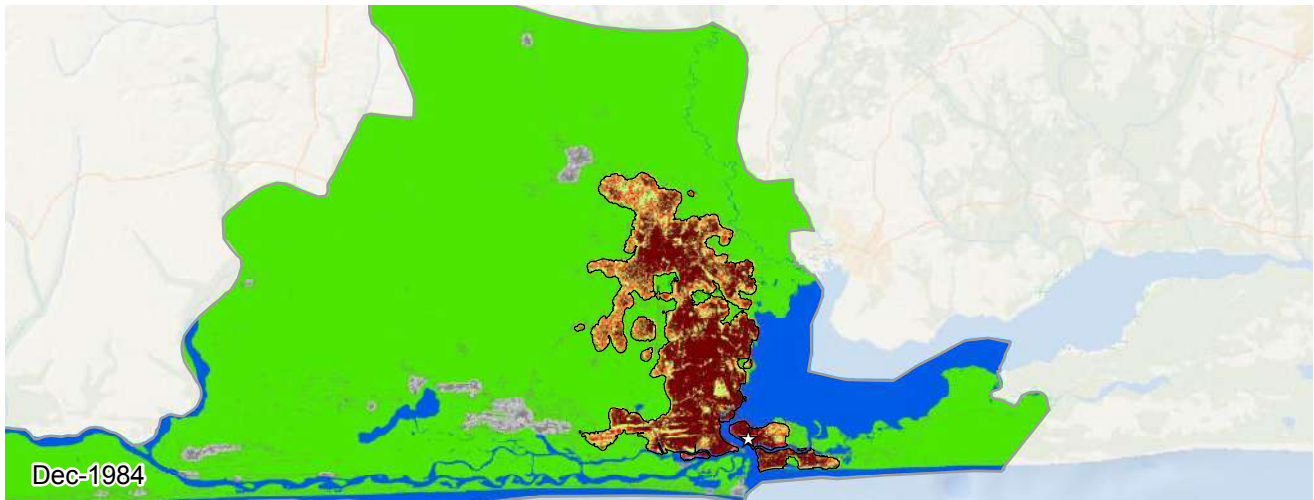


Legend for Charts
 Kozhikode | Other cities in region | All other cities | Global average

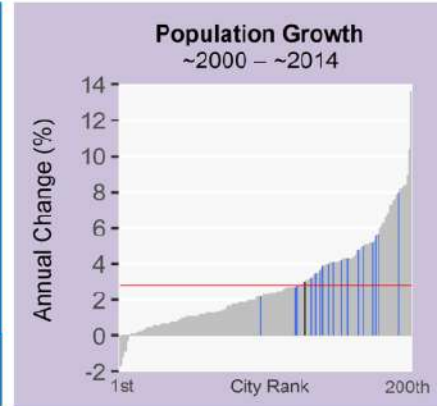
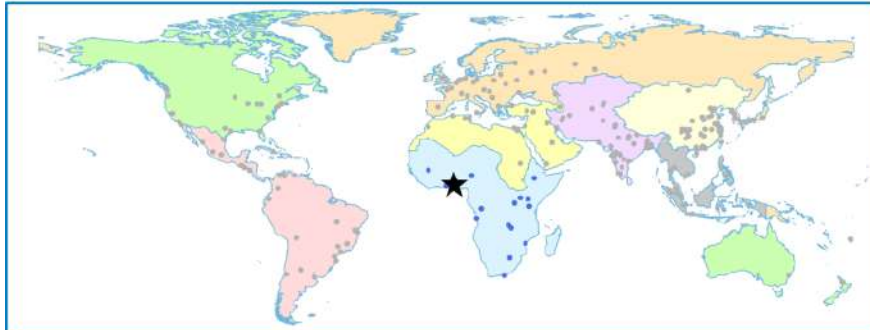


Metrics	Feb 1991	Mar 2001	Feb 2014	% Annual Change ('01-'14)
Population	202,611	440,243	1,171,852	7.6
Built-up Area (Hectares)				
Total	216	1,663	11,232	14.8
Urban	31	769	5,077	14.6
Suburban	165	825	5,710	15.0
Rural	19	69	444	14.4
Open space (Hectares)				
Urbanized Open Space	318	1,652	12,409	15.6
Urban Extent	534	3,316	23,641	15.2
Density (Persons / Hectare)				
Built-up Area Density	935.7	264.7	104.3	-7.2
Urban Extent Density	378.9	132.8	49.6	-7.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.40	0.50	0.48	-0.4
Openness Index	0.62	0.48	0.49	0.2
Compactness (Roundness)				
Proximity	0.92	0.68	0.64	-0.4
Cohesion	0.91	0.66	0.64	-0.3
Added Area (Hectares)	'91-'01	Share	'01-'14	Share
Infill	210	14%	1,174	12%
Extension	950	65%	5,176	54%
Leapfrog	0	0%	0	0%
Inclusion	285	19%	3,218	33%

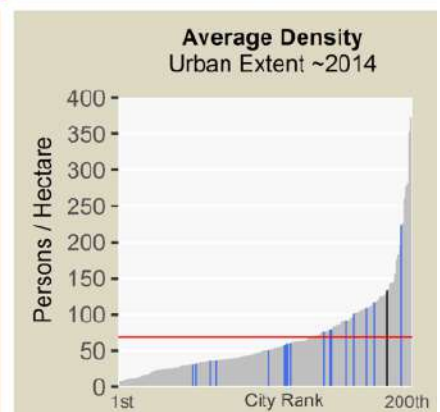
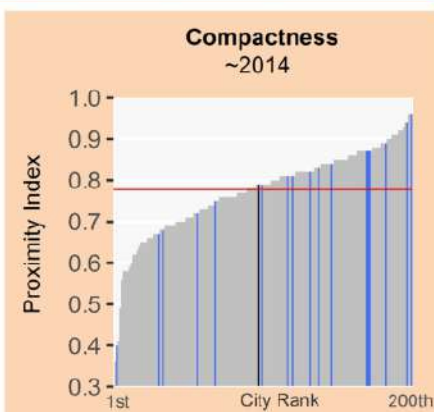
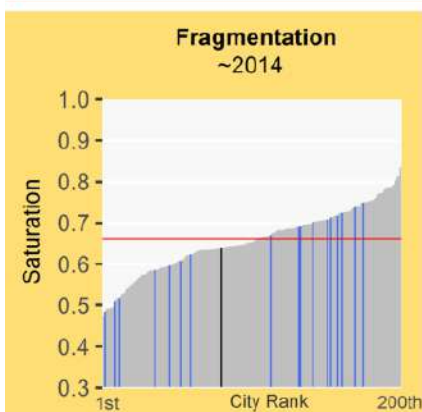
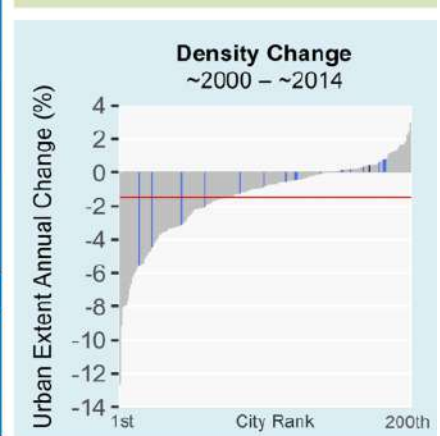
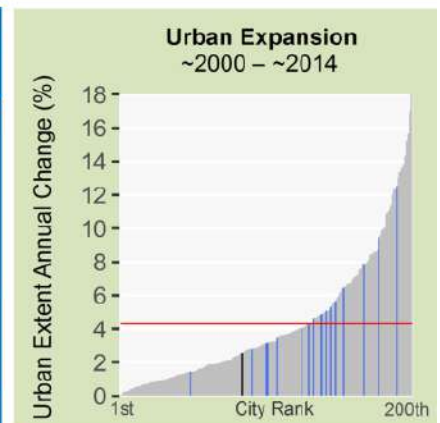


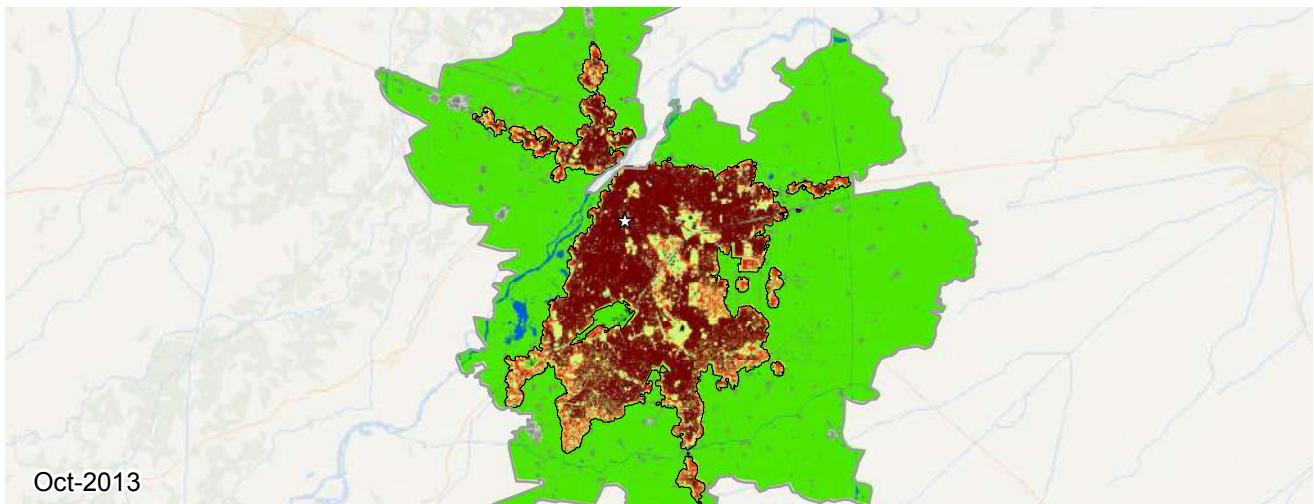
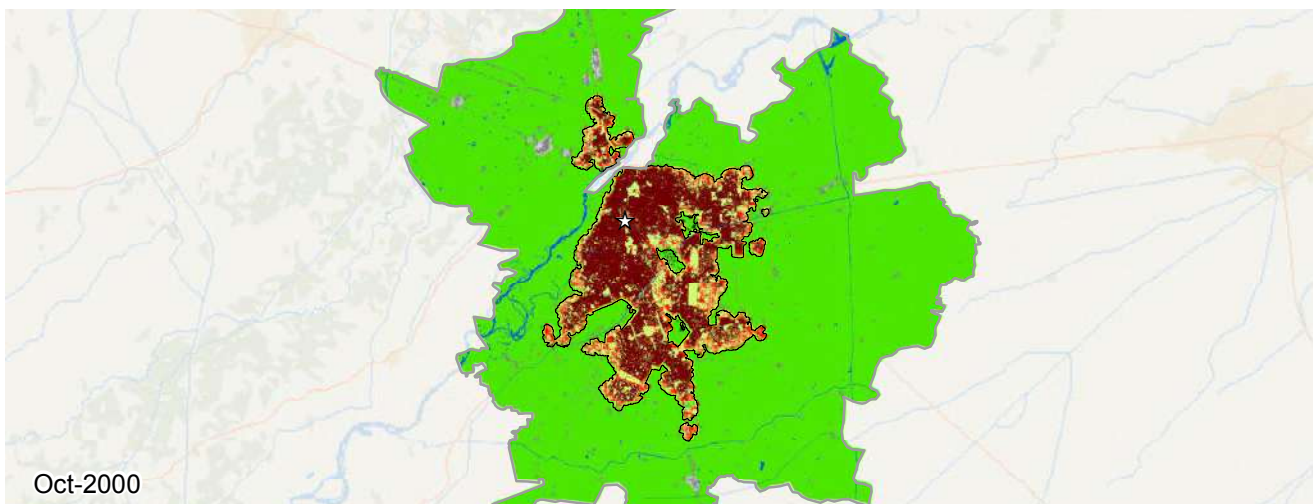
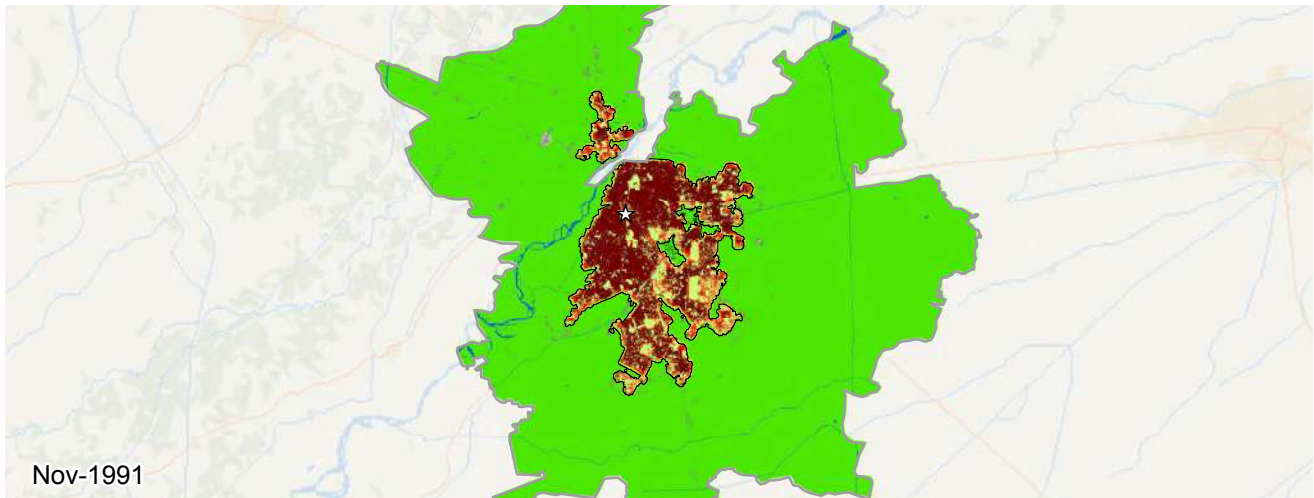


Lagos, Nigeria (Sub-Saharan Africa)



Metrics	Dec 1984	Feb 2000	Dec 2013	% Annual Change ('00-'13)
Population	3,860,487	7,254,827	11,008,356	3.0
Built-up Area (Hectares)				
Total	19,402	38,082	52,788	2.4
Urban	15,209	31,291	42,213	2.2
Suburban	3,923	6,358	9,971	3.3
Rural	269	432	603	2.4
Open space (Hectares)				
Urbanized Open Space	10,335	19,978	29,895	2.9
Urban Extent	29,737	58,060	82,683	2.6
Density (Persons / Hectare)				
Built-up Area Density	199.0	190.5	208.5	0.7
Urban Extent Density	129.8	125.0	133.1	0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.66	0.64	-0.2
Openness Index	0.30	0.30	0.30	0.2
Compactness (Roundness)				
Proximity	0.76	0.80	0.79	-0.2
Cohesion	0.75	0.79	0.76	-0.3
Added Area (Hectares)	'84-'00	Share	'00-'13	Share
Infill	3,984	21%	4,379	29%
Extension	10,363	55%	5,898	40%
Leapfrog	1,298	6%	2,095	14%
Inclusion	3,033	16%	2,333	15%

















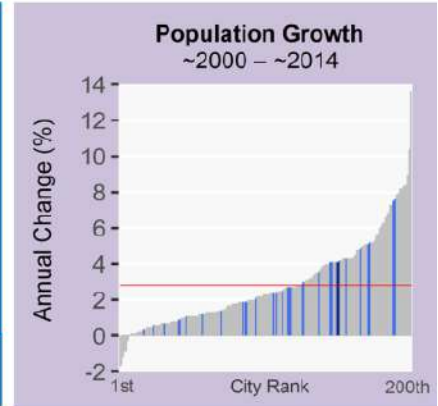
**Lahore, Pakistan
1991-2013**

0 6 12 18 24 km

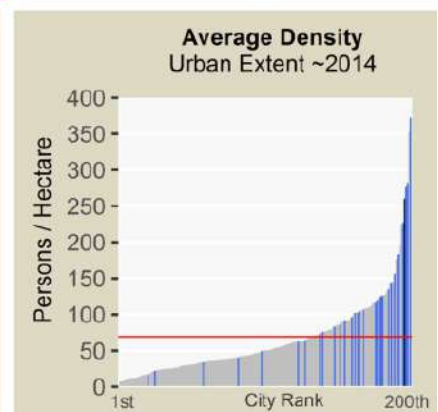
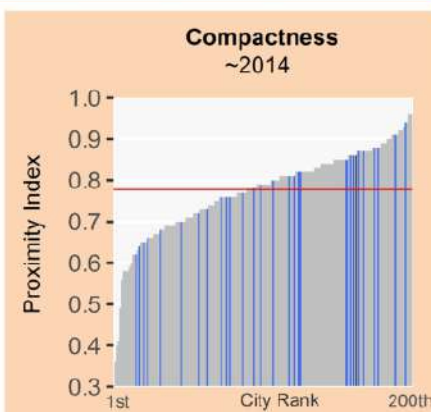
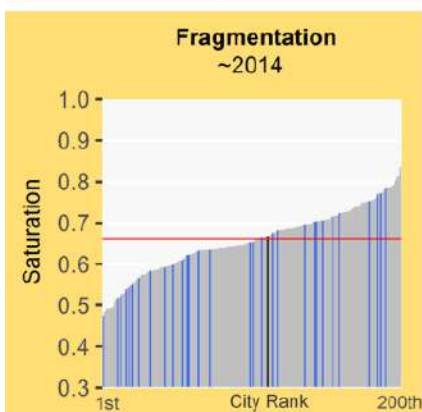
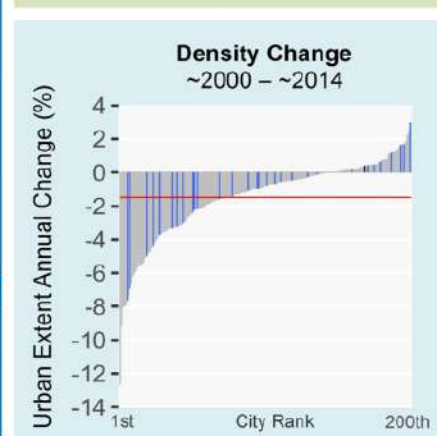
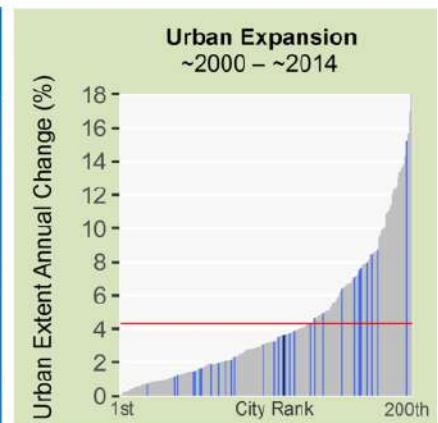
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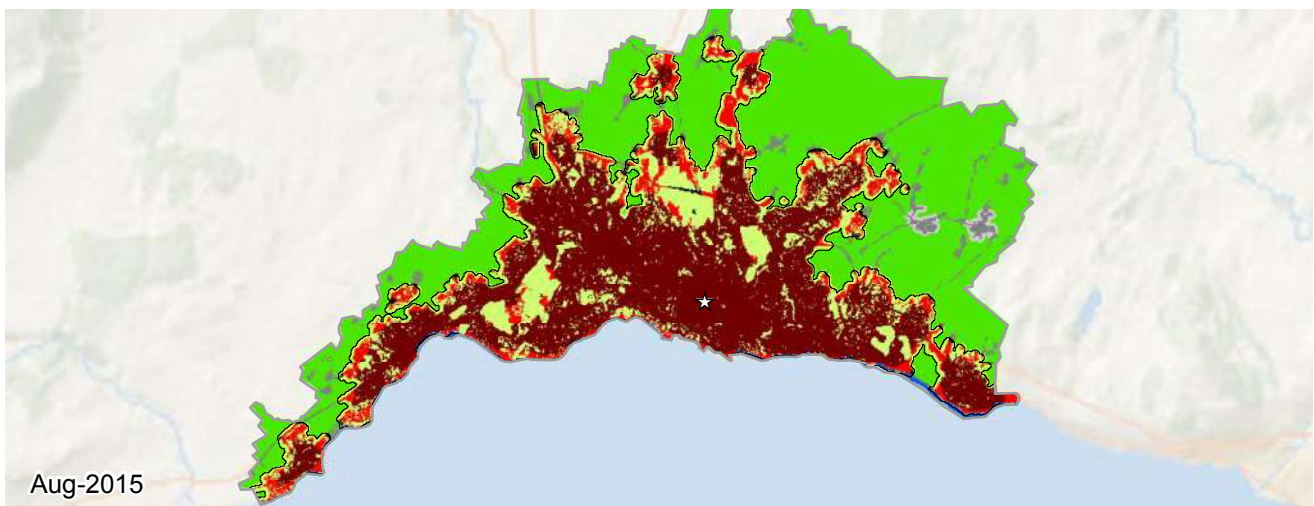
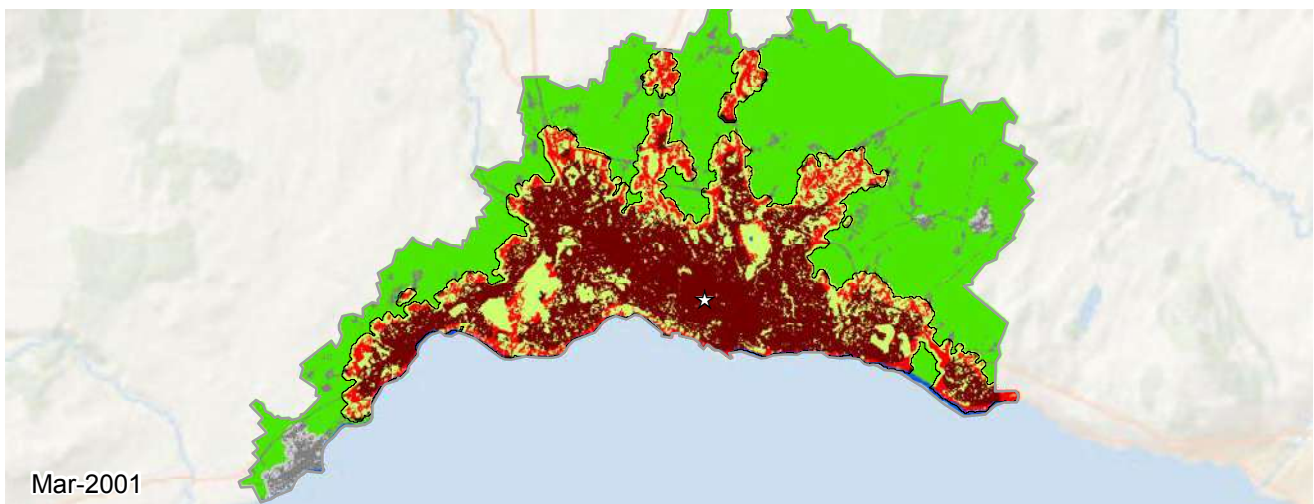
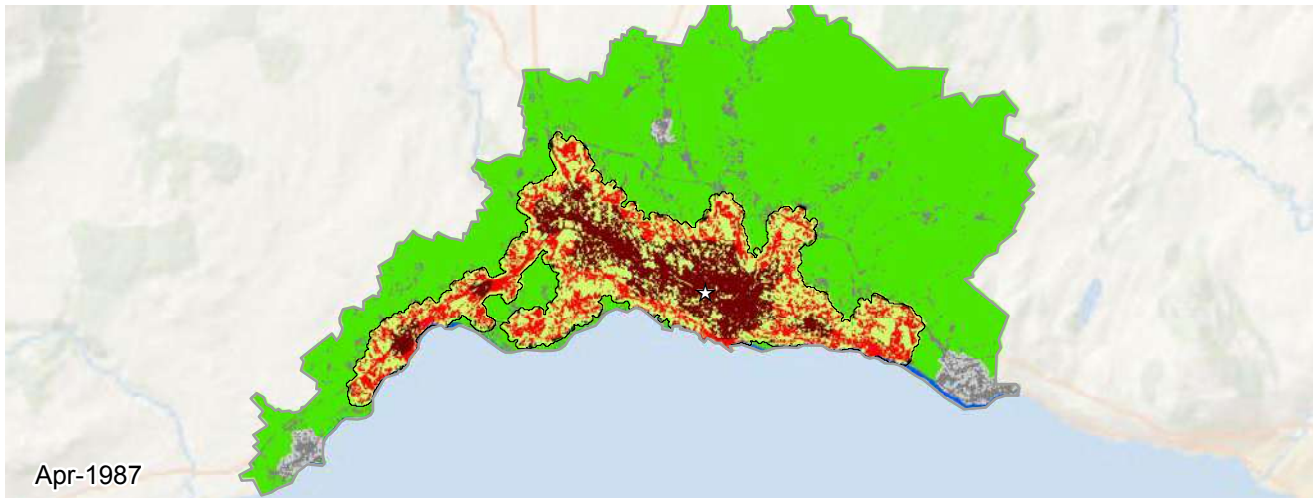
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Lahore, Pakistan (South and Central Asia)



Metrics	Nov 1991	Oct 2000	Oct 2013	% Annual Change ('00-'13)
Population	3,474,380	5,716,947	9,682,206	4.1
Built-up Area (Hectares)				
Total	11,518	14,954	24,774	3.9
Urban	9,135	11,997	20,239	4.0
Suburban	2,224	2,720	4,159	3.3
Rural	157	236	375	3.6
Open space (Hectares)				
Urbanized Open Space	6,232	8,200	12,367	3.2
Urban Extent	17,750	23,155	37,142	3.6
Density (Persons / Hectare)				
Built-up Area Density	301.6	382.3	390.8	0.2
Urban Extent Density	195.7	246.9	260.7	0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.65	0.67	0.2
Openness Index	0.31	0.30	0.28	-0.6
Compactness (Roundness)				
Proximity	0.87	0.87	0.86	-0.1
Cohesion	0.85	0.86	0.84	-0.1
Added Area (Hectares)	'91-'00	Share	'00-'13	Share
Infill	918	26%	2,755	28%
Extension	2,027	58%	5,778	58%
Leapfrog	129	3%	0	0%
Inclusion	360	10%	1,285	13%





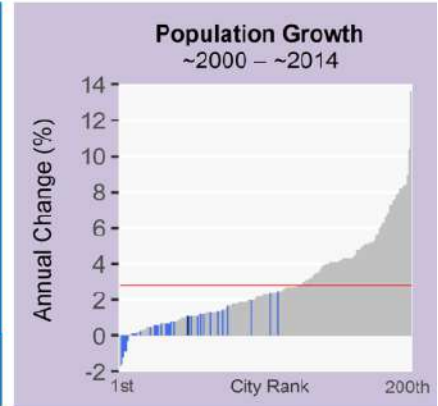
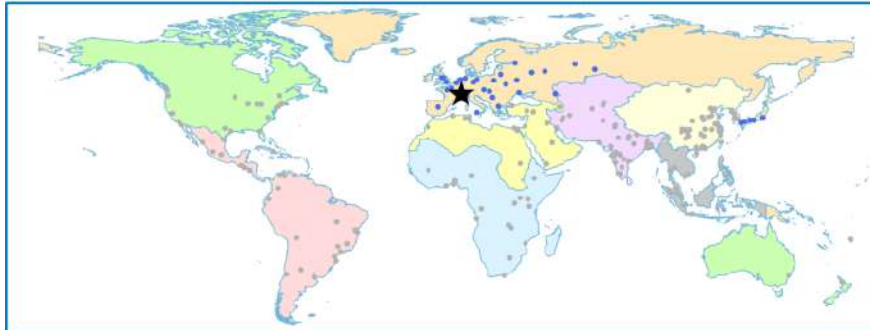
**Lausanne, Switzerland
1987-2015**

0 2 4 6 8 km

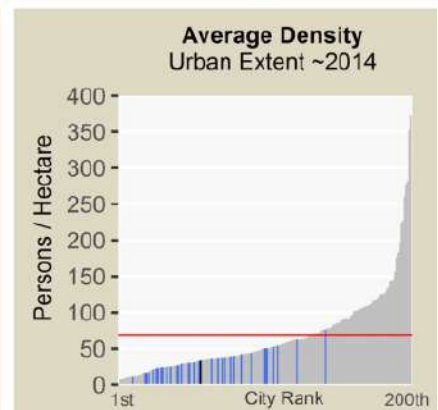
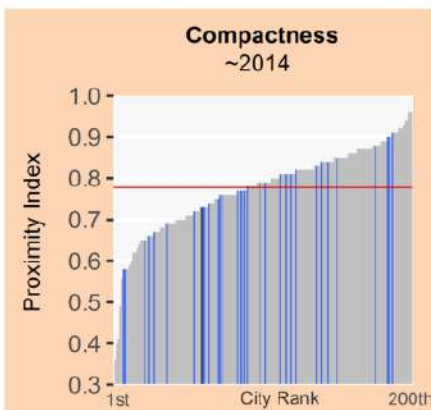
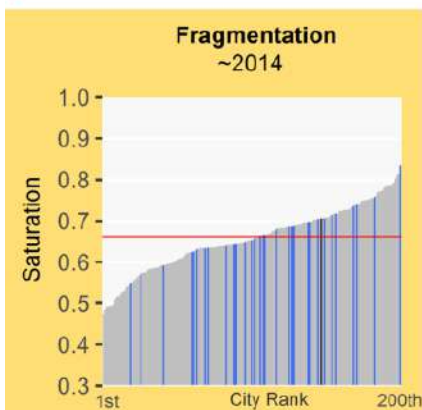
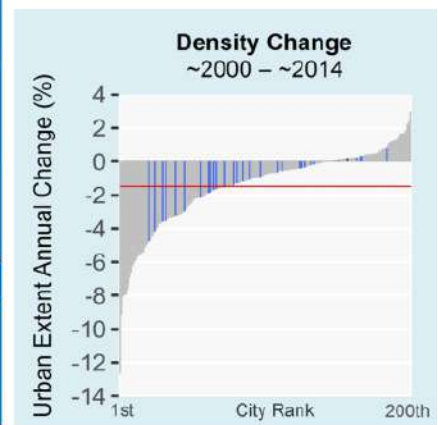
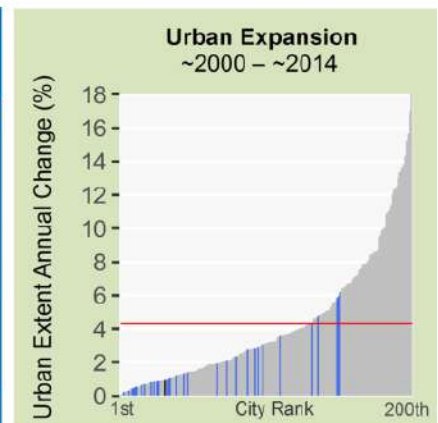
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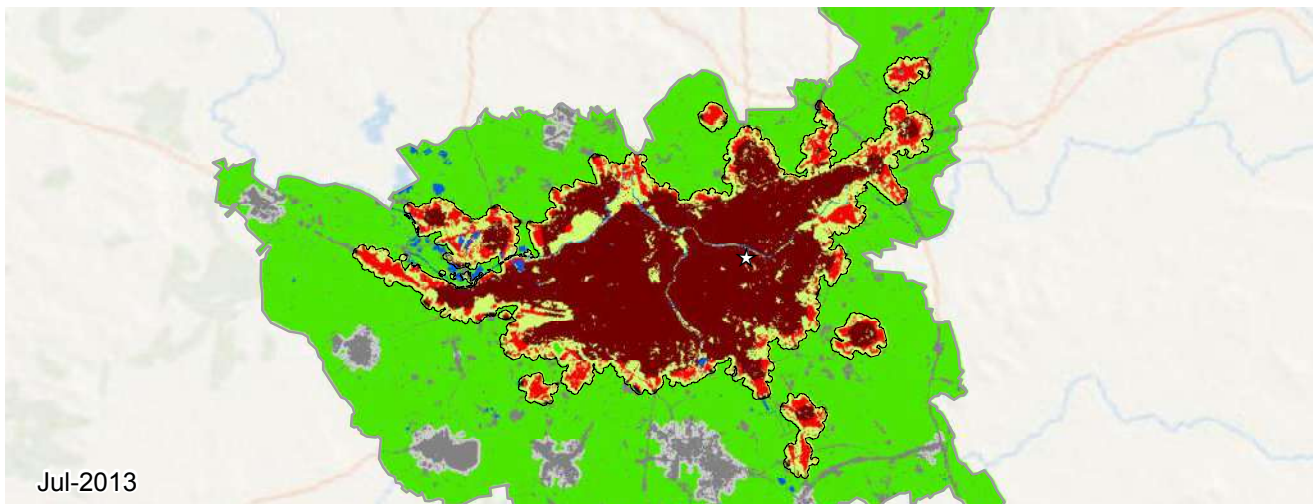
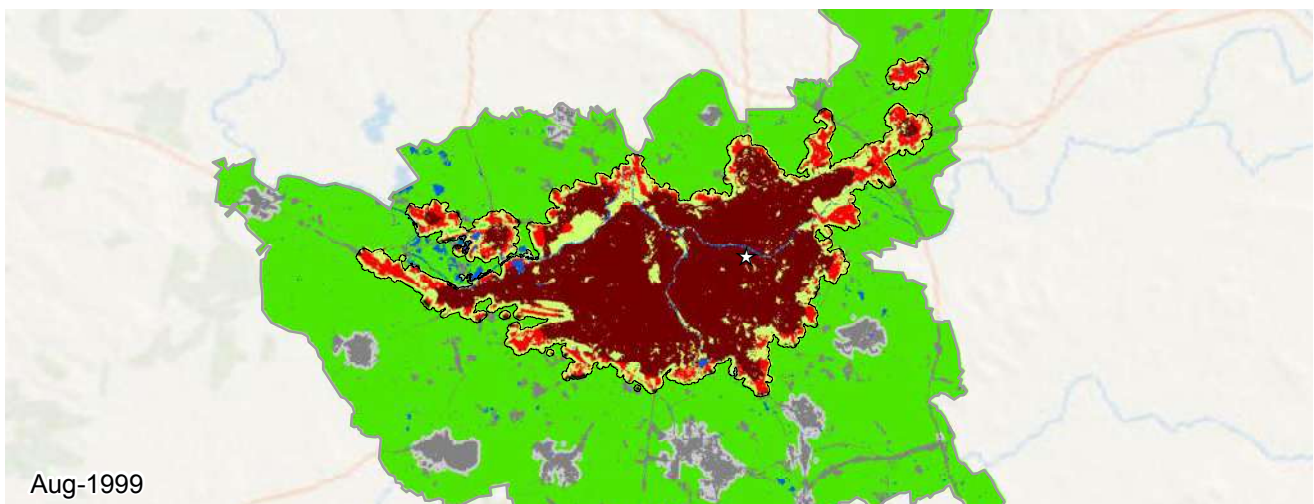
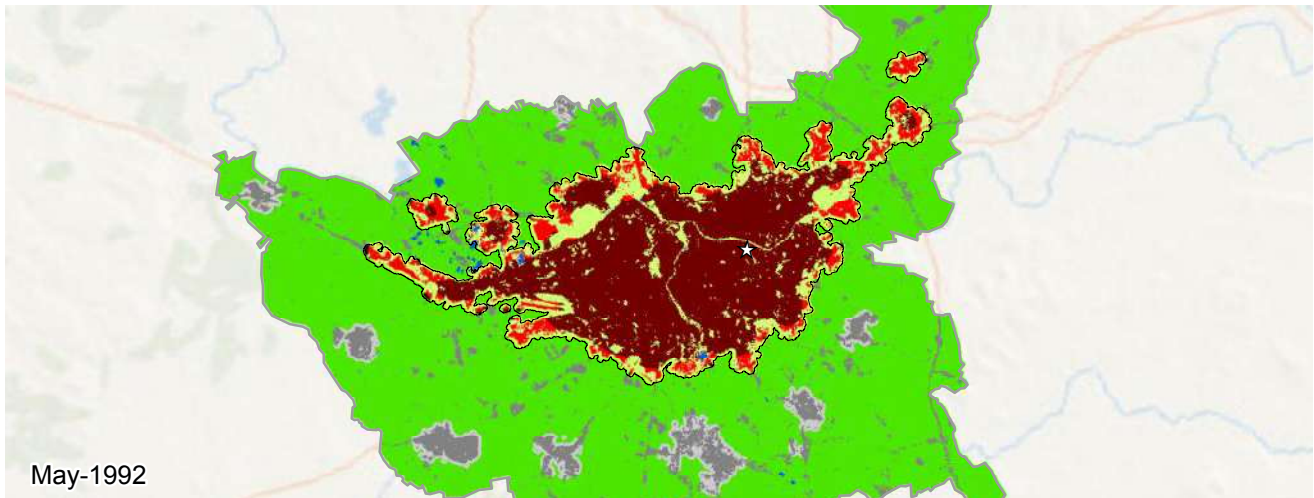
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Lausanne, Switzerland (Europe and Japan)



Metrics	Apr 1987	Mar 2001	Aug 2015	% Annual Change ('01-'15)
Population	193,460	260,180	306,228	1.1
Built-up Area (Hectares)				
Total	2,501	5,288	6,494	1.4
Urban	1,221	4,016	5,301	1.9
Suburban	1,203	1,190	1,106	-0.5
Rural	75	81	86	0.4
Open space (Hectares)				
Urbanized Open Space	2,417	2,719	2,700	-0.0
Urban Extent	4,919	8,008	9,195	1.0
Density (Persons / Hectare)				
Built-up Area Density	77.3	49.2	47.1	-0.3
Urban Extent Density	39.3	32.5	33.3	0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.51	0.66	0.71	0.5
Openness Index	0.47	0.33	0.29	-0.9
Compactness (Roundness)				
Proximity	0.68	0.74	0.73	-0.1
Cohesion	0.66	0.72	0.72	-0.0
Added Area (Hectares)	'87-'01	Share	'01-'15	Share
Infill	1,216	43%	718	59%
Extension	1,002	35%	159	13%
Leapfrog	0	0%	7	0%
Inclusion	567	20%	321	26%





**Le Mans, France
1992-2013**

0 2 4 6 8 km

Study area

Urban extent

Urban built-up area

Suburban built-up area

Rural built-up area

Urbanized open space

Rural open space

Exurban built-up area

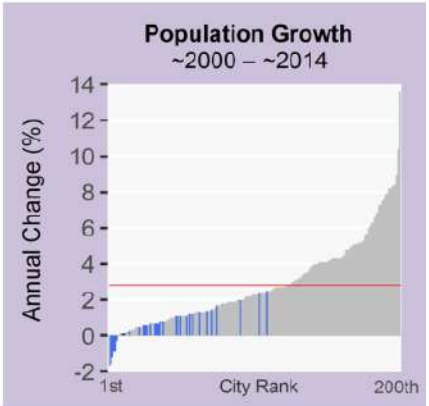
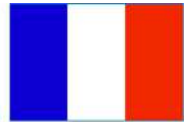
Exurban open space

Water

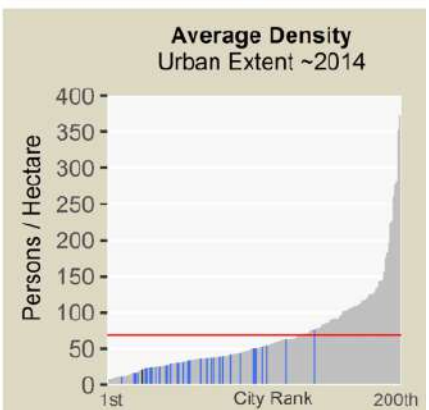
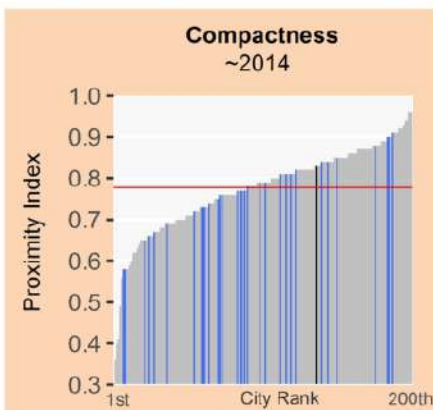
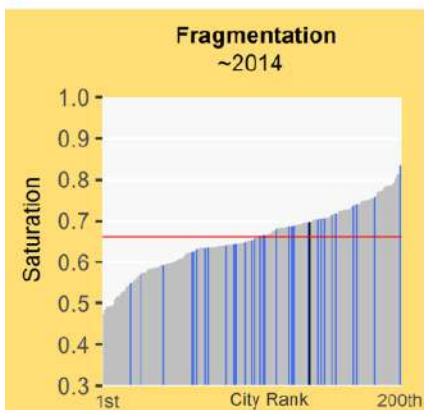
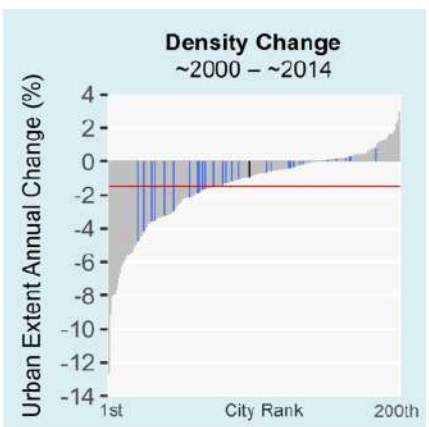
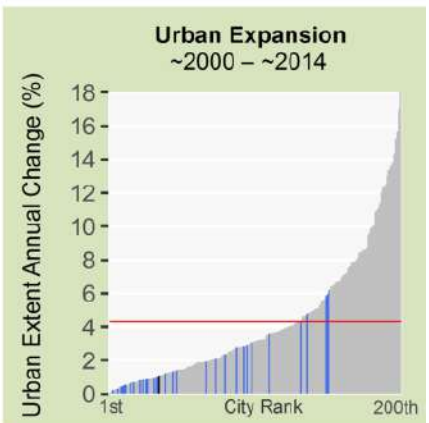
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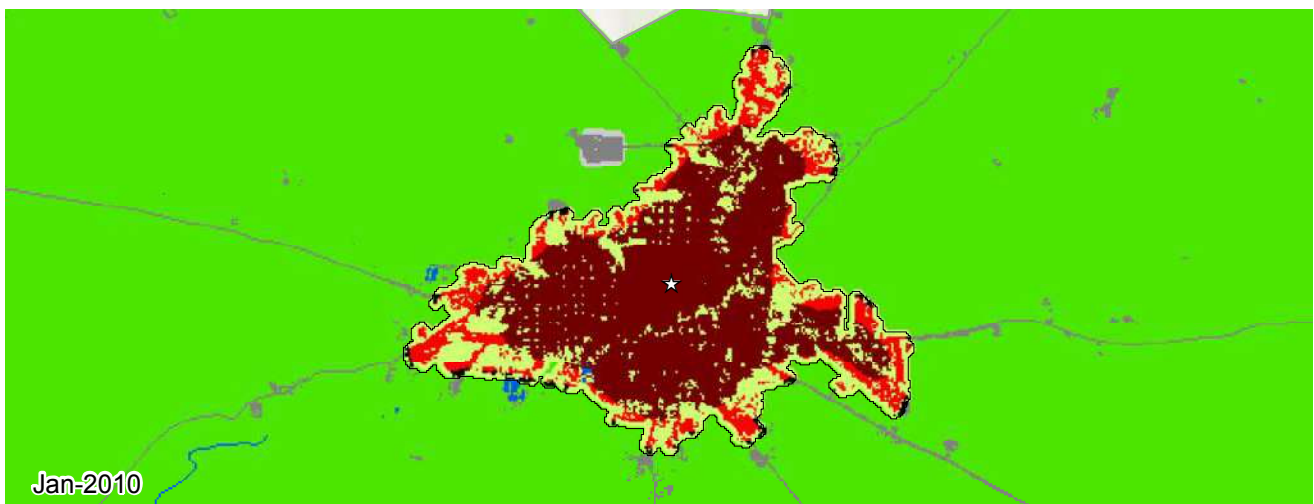
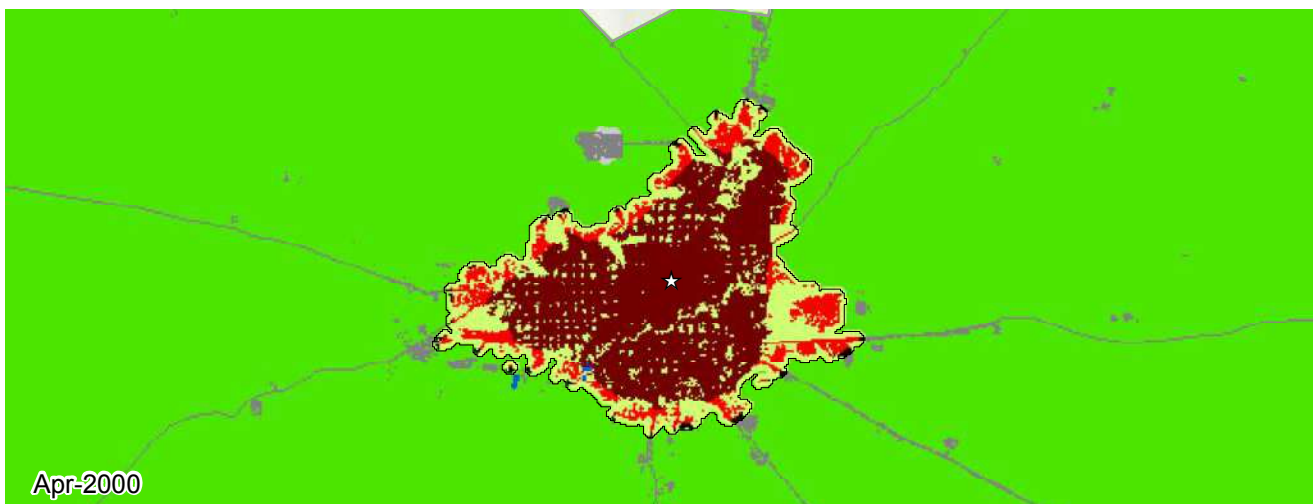
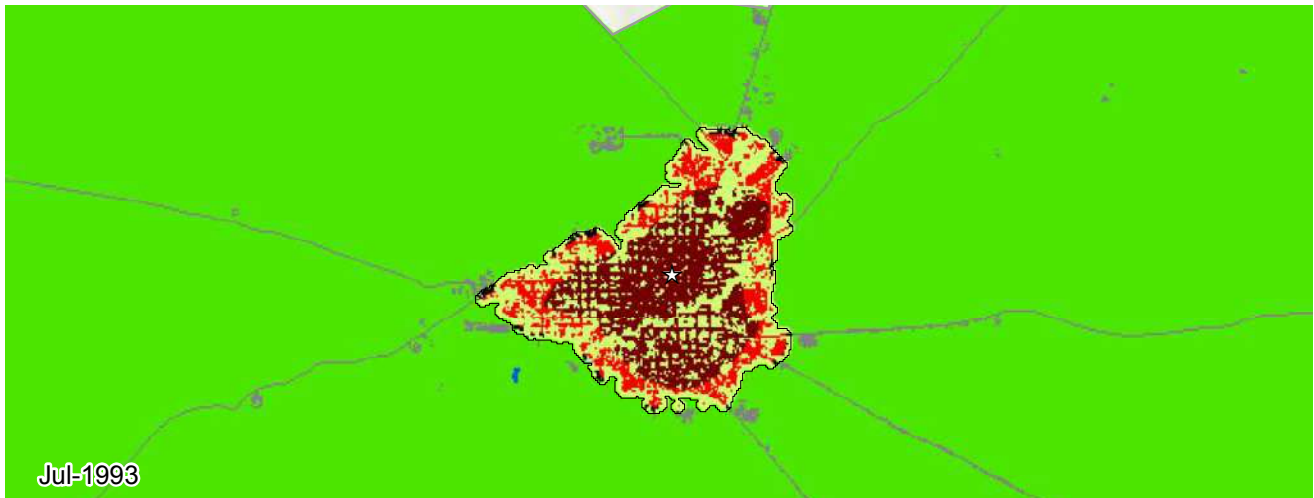
CBD

Le Mans, France (Europe and Japan)



Metrics	May 1992	Aug 1999	Jul 2013	% Annual Change ('99-'13)
Population	173,669	175,640	179,135	0.1
Built-up Area (Hectares)				
Total	4,953	5,353	5,974	0.8
Urban	4,045	4,392	4,787	0.6
Suburban	854	889	1,098	1.5
Rural	53	71	87	1.5
Open space (Hectares)				
Urbanized Open Space	2,000	1,988	2,570	1.8
Urban Extent	6,954	7,341	8,544	1.1
Density (Persons / Hectare)				
Built-up Area Density	35.1	32.8	30.0	-0.6
Urban Extent Density	25.0	23.9	21.0	-0.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.71	0.73	0.70	-0.3
Openness Index	0.24	0.24	0.25	0.5
Compactness (Roundness)				
Proximity	0.83	0.83	0.83	-0.0
Cohesion	0.82	0.81	0.82	0.0
Added Area (Hectares)	'92-'99	Share	'99-'13	Share
Infill	165	41%	143	23%
Extension	154	38%	140	22%
Leapfrog	3	0%	15	2%
Inclusion	75	18%	321	51%





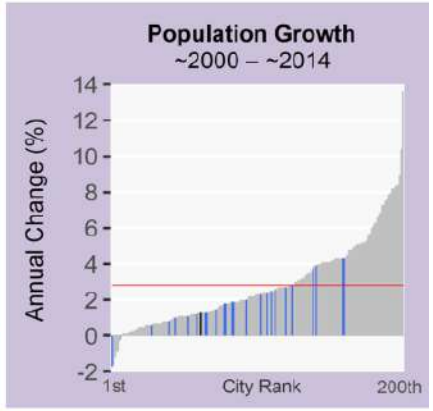
**Leon, Nicaragua
1993-2010**

0 1 2 3 4 km

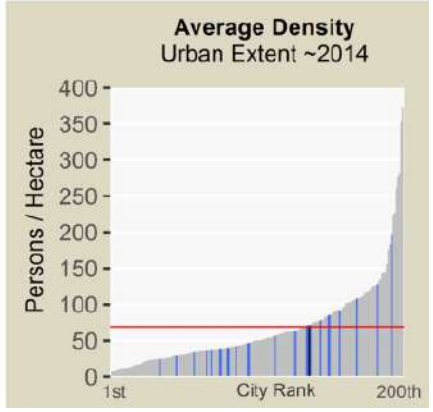
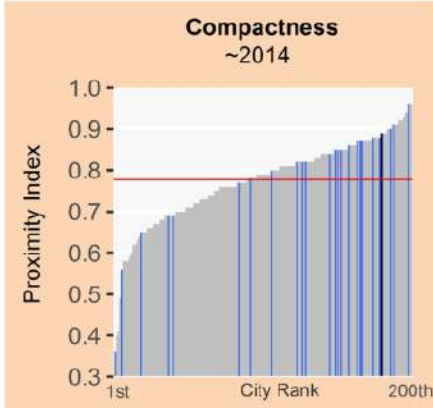
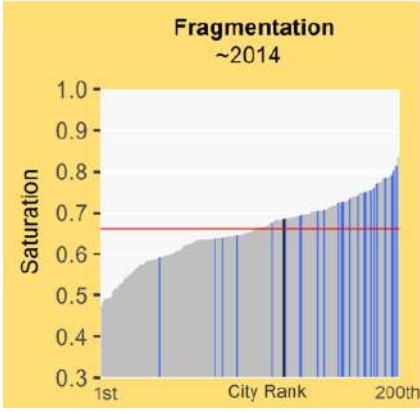
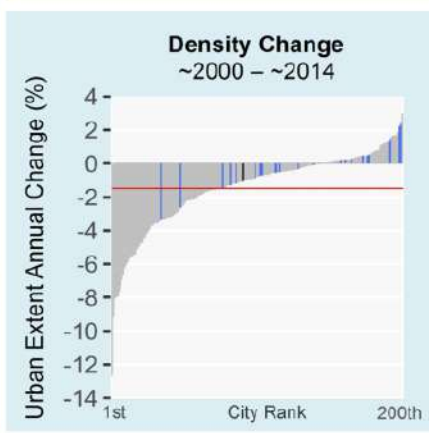
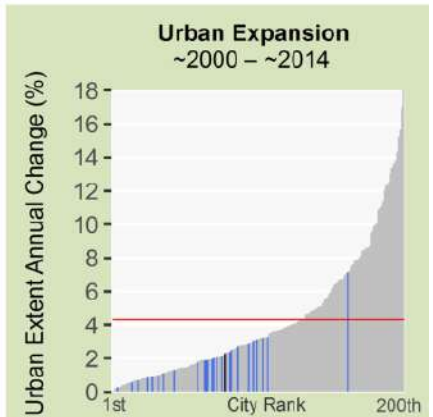
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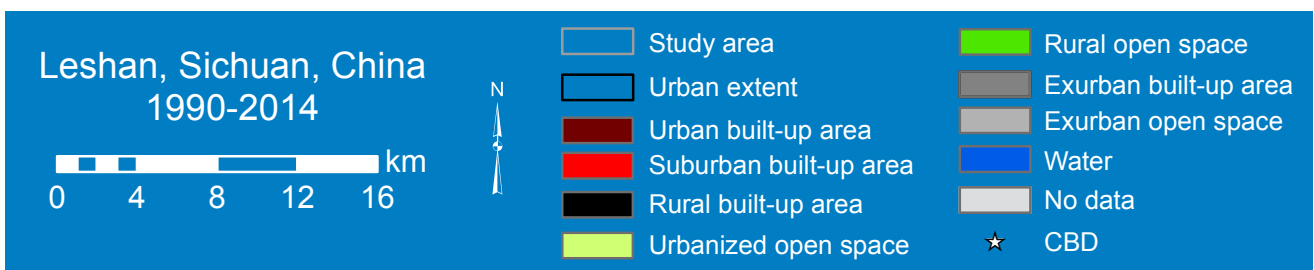
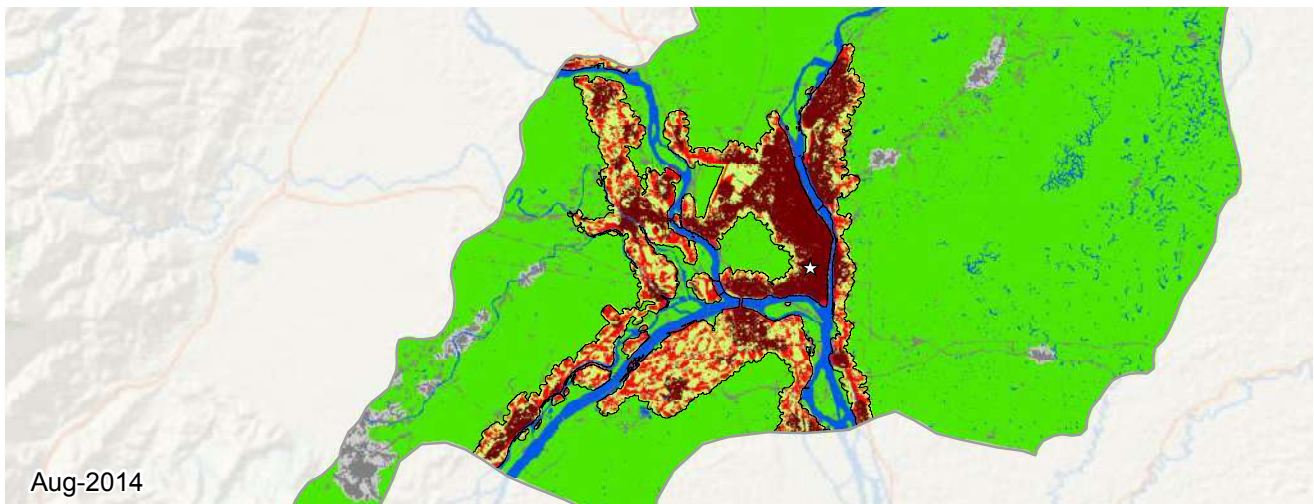
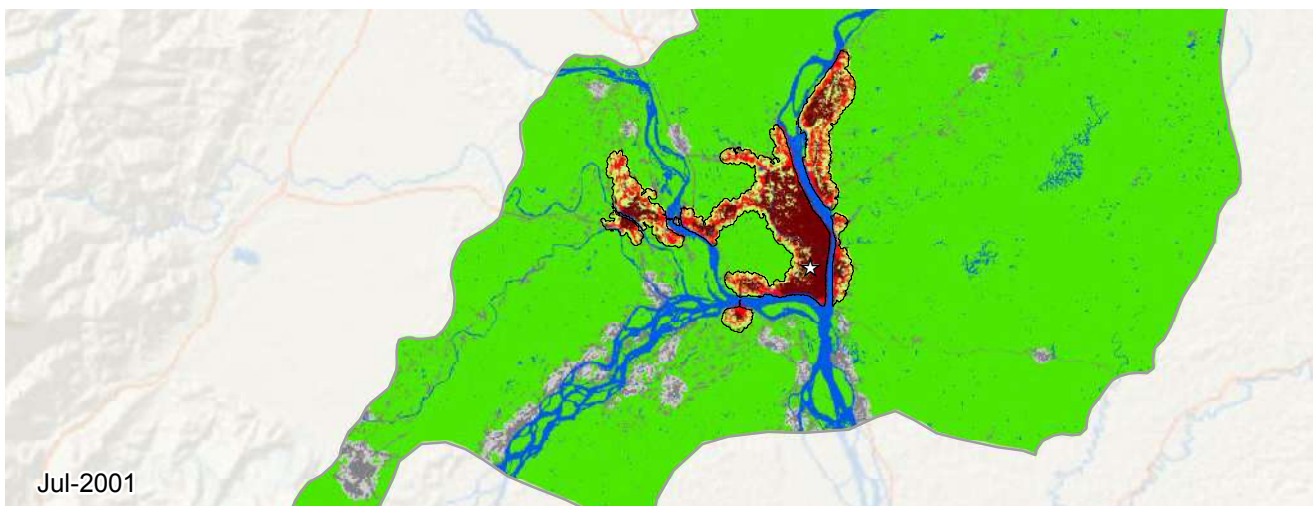
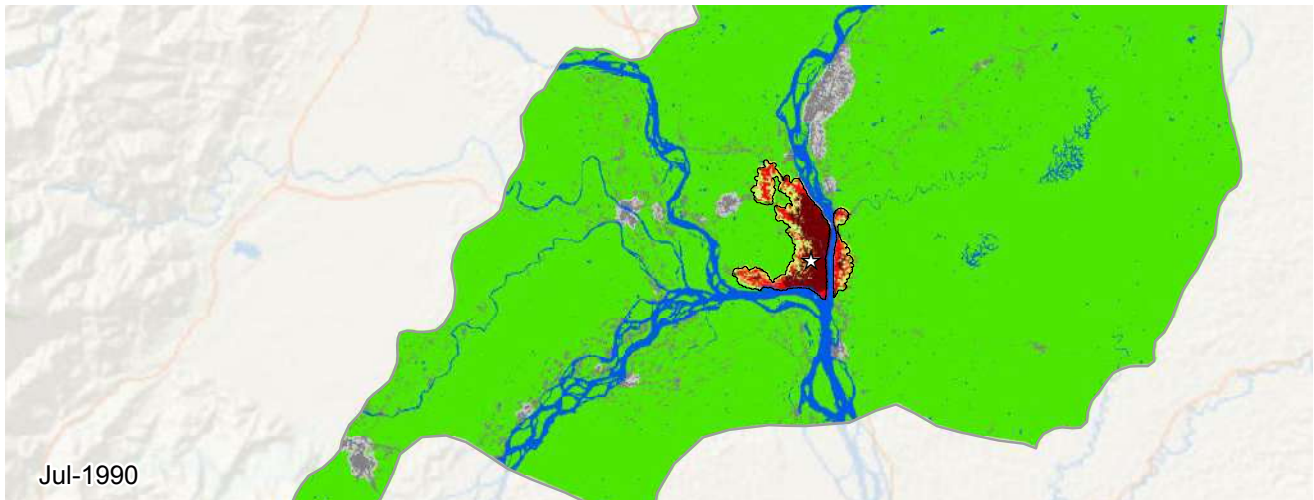
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Leon, Nicaragua (Latin America and the Caribbean)

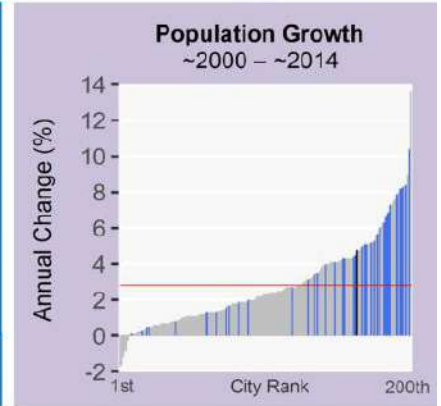


Metrics	Jul 1993	Apr 2000	Jan 2010	% Annual Change ('00-'10)
Population	135,097	141,815	160,354	1.3
Built-up Area (Hectares)				
Total	679	1,199	1,543	2.6
Urban	437	955	1,220	2.5
Suburban	221	224	290	2.6
Rural	20	19	33	5.7
Open space (Hectares)				
Urbanized Open Space	556	597	710	1.8
Urban Extent	1,236	1,796	2,254	2.3
Density (Persons / Hectare)				
Built-up Area Density	198.7	118.2	103.9	-1.3
Urban Extent Density	109.3	78.9	71.1	-1.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.55	0.67	0.68	0.3
Openness Index	0.44	0.29	0.29	-0.2
Compactness (Roundness)				
Proximity	0.94	0.93	0.89	-0.4
Cohesion	0.93	0.92	0.88	-0.5
Added Area (Hectares)	'93-'00	Share	'00-'10	Share
Infill	257	49%	124	36%
Extension	210	40%	150	43%
Leapfrog	0	0%	0	0%
Inclusion	50	9%	69	20%

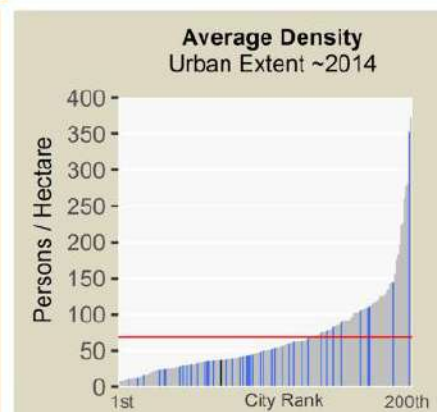
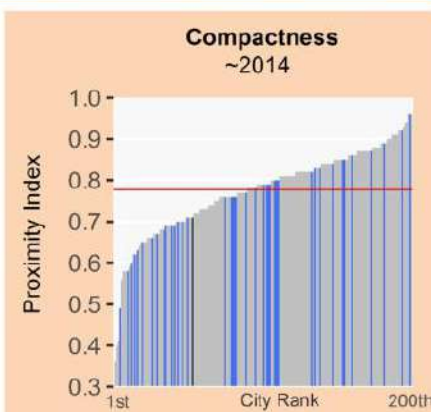
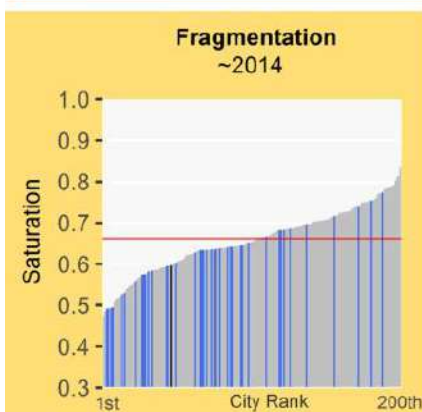
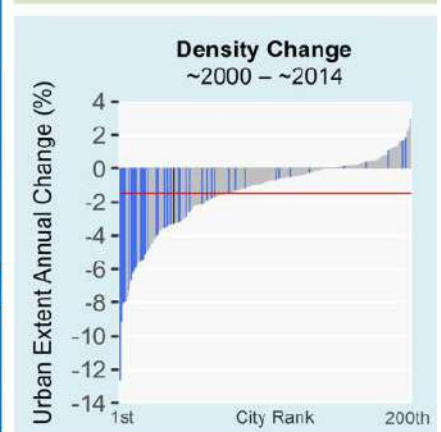
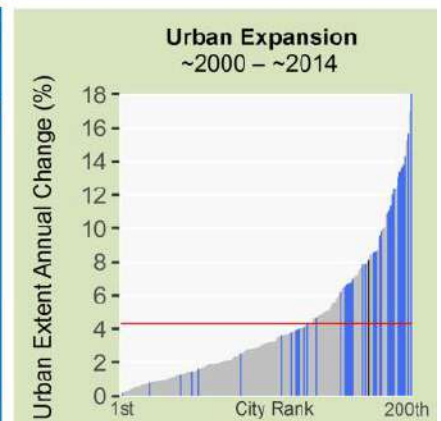


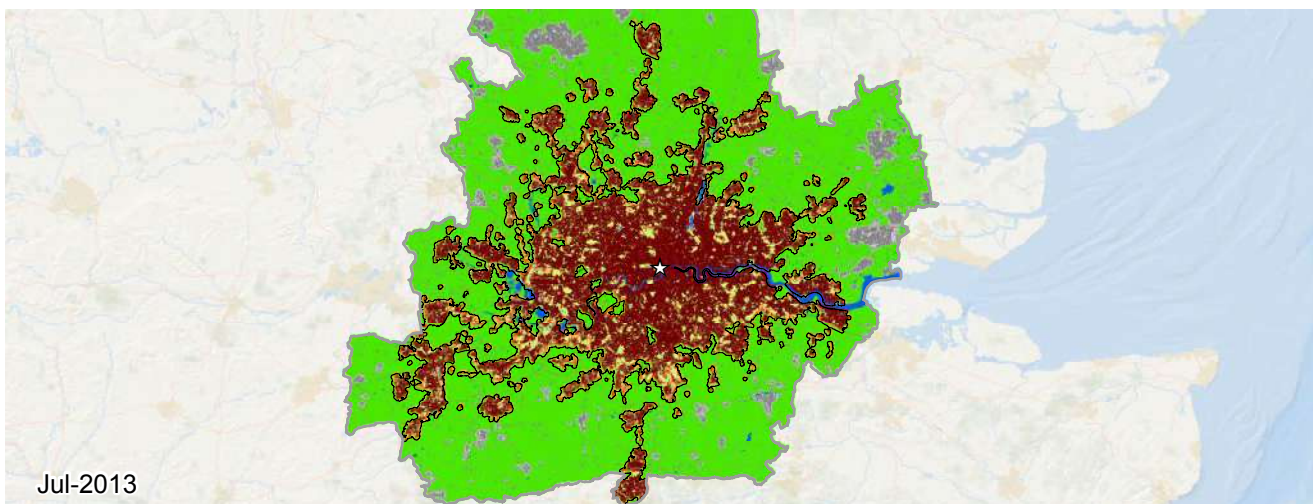
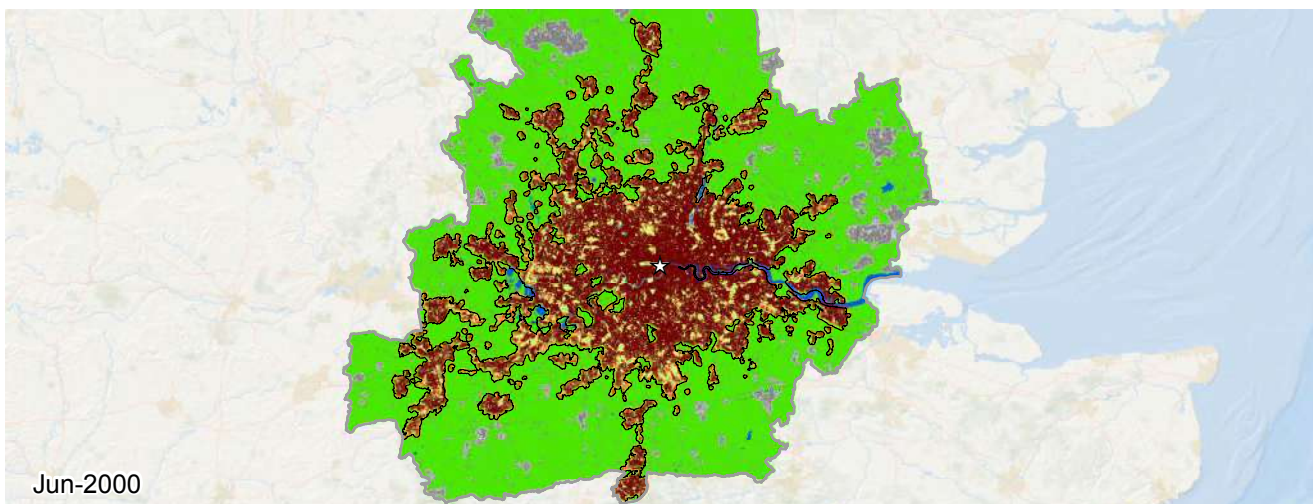
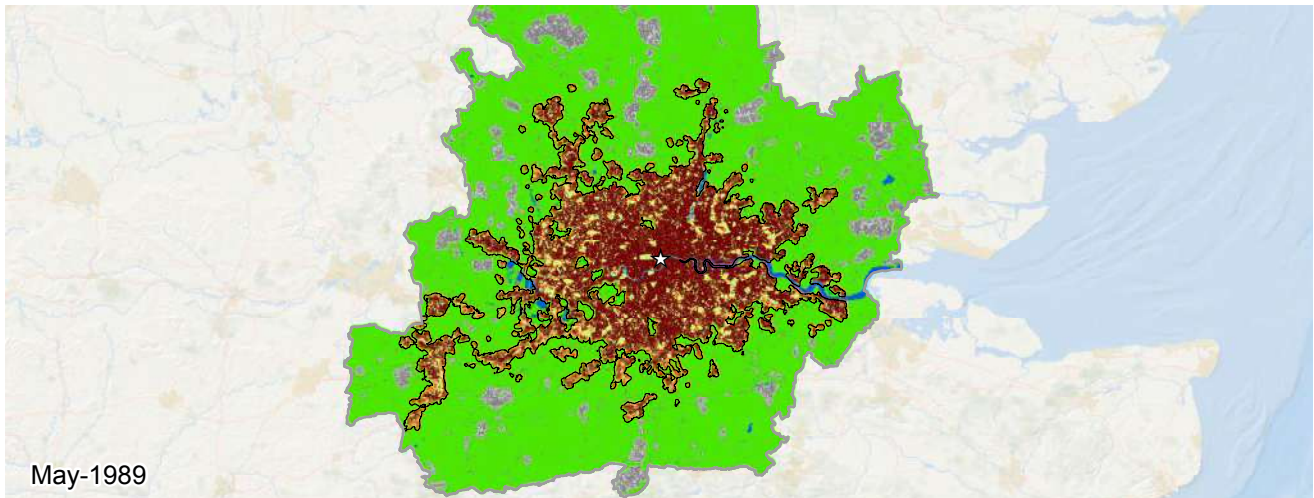


Leshan, Sichuan, China (East Asia and the Pacific)



Metrics	Jul 1990	Jul 2001	Aug 2014	% Annual Change ('01-'14)
Population	158,518	278,811	524,838	4.8
Built-up Area (Hectares)				
Total	1,061	2,963	8,390	8.0
Urban	646	1,731	4,909	8.0
Suburban	380	1,160	3,285	8.0
Rural	35	70	196	7.8
Open space (Hectares)				
Urbanized Open Space	577	1,872	5,679	8.5
Urban Extent	1,638	4,835	14,070	8.2
Density (Persons / Hectare)				
Built-up Area Density	149.4	94.1	62.6	-3.1
Urban Extent Density	96.8	57.7	37.3	-3.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.61	0.60	-0.2
Openness Index	0.40	0.42	0.41	-0.1
Compactness (Roundness)				
Proximity	0.74	0.64	0.71	0.7
Cohesion	0.74	0.63	0.70	0.8
Added Area (Hectares)	'90-'01	Share	'01-'14	Share
Infill	240	12%	992	18%
Extension	821	43%	2,503	46%
Leapfrog	0	0%	0	0%
Inclusion	840	44%	1,931	35%





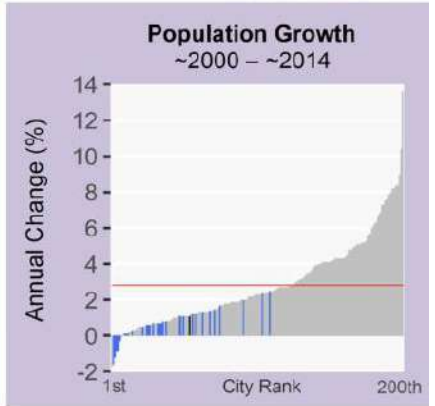
**London, United Kingdom
1989-2013**

0 20 40 60 80 km

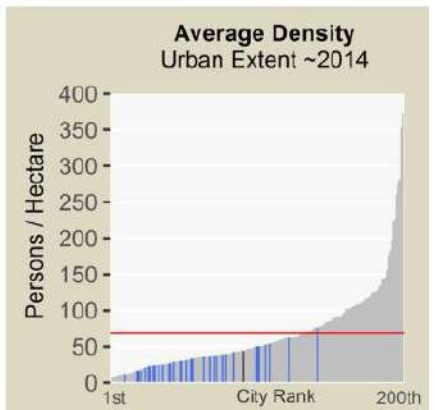
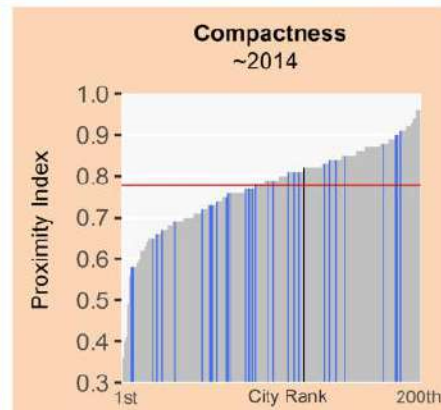
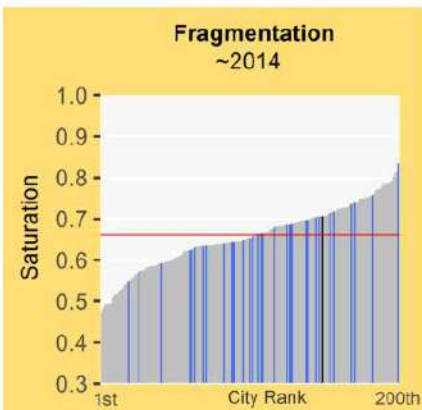
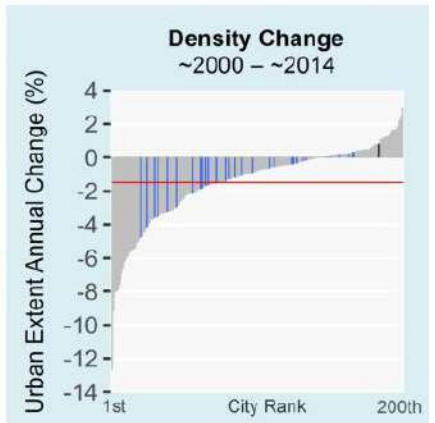
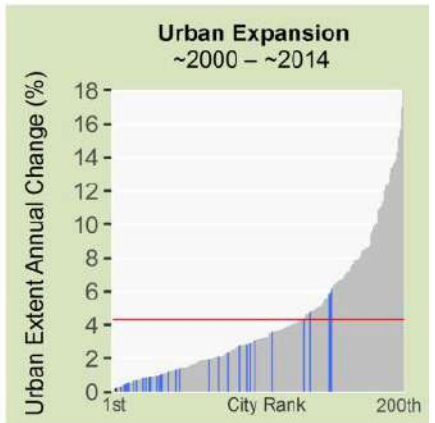
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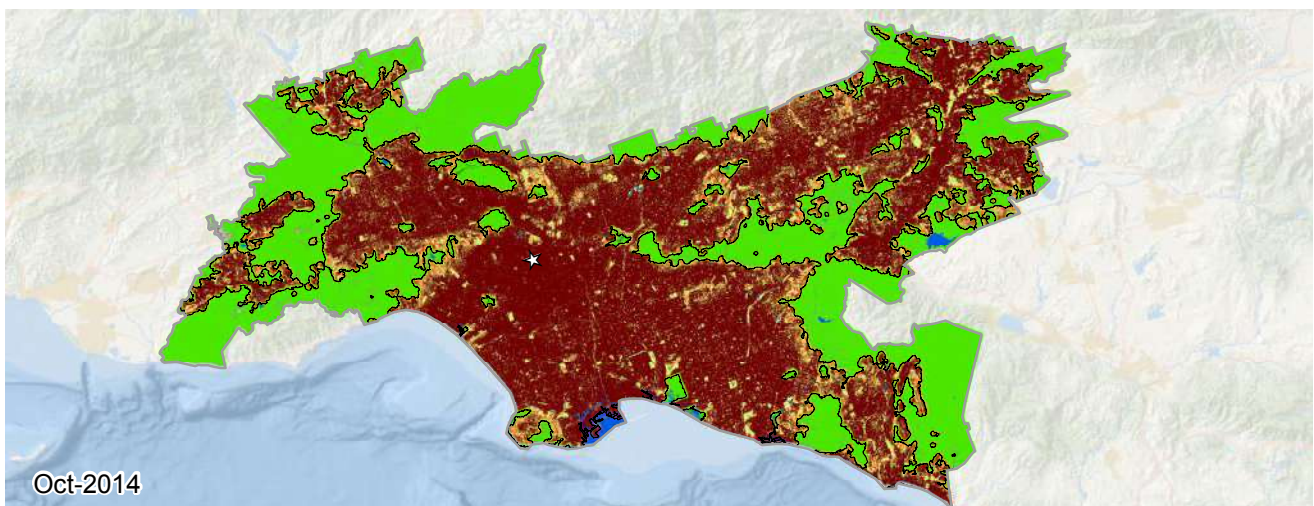
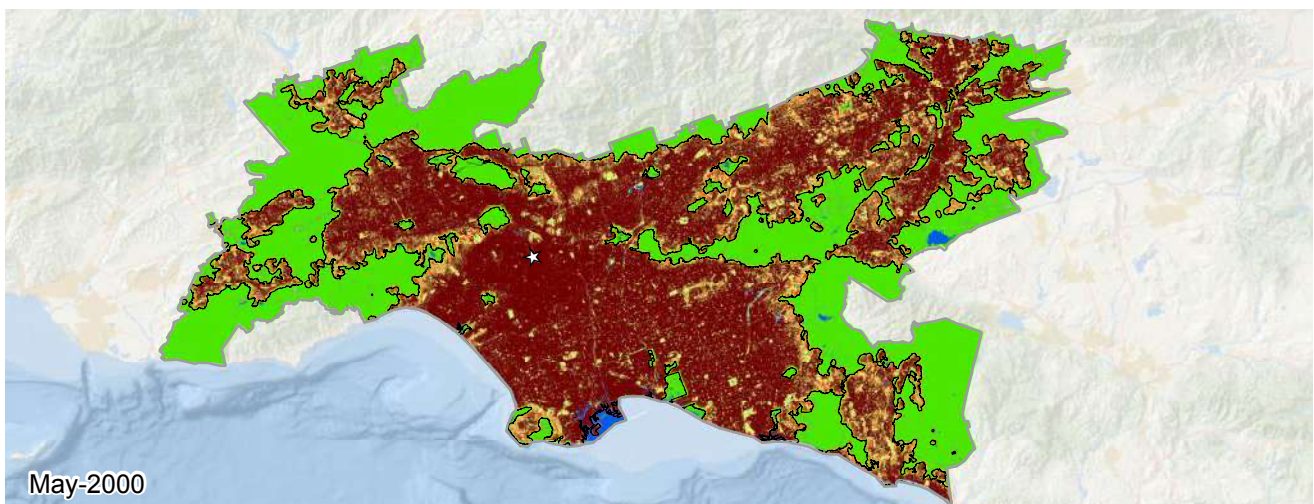
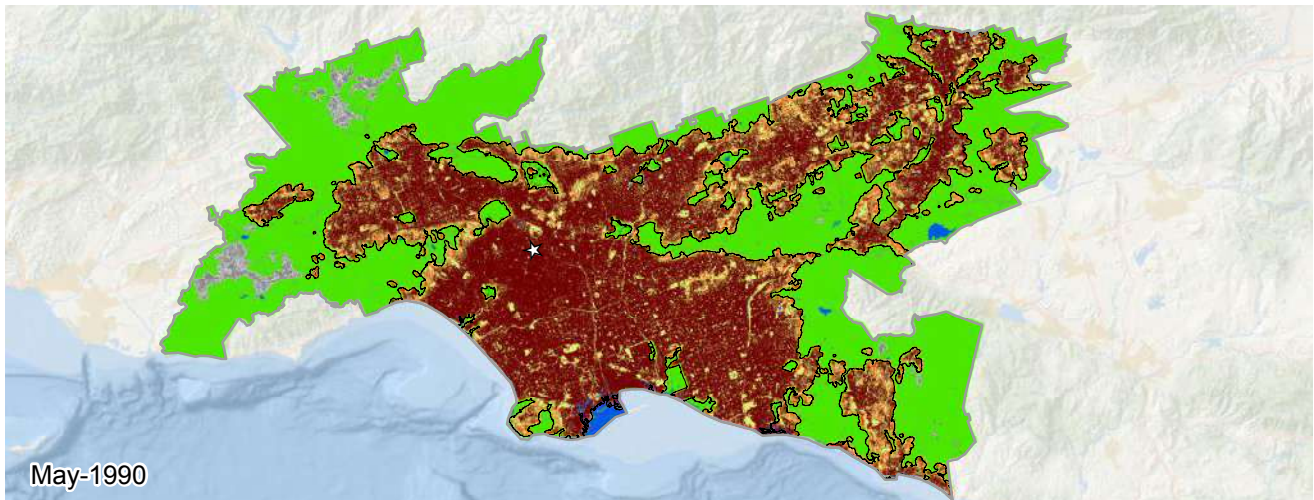
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

London, United Kingdom (Europe and Japan)



Metrics	May 1989	Jun 2000	Jul 2013	% Annual Change ('00-'13)
Population	8,520,934	9,735,666	11,197,940	1.1
Built-up Area (Hectares)				
Total	131,494	167,367	177,272	0.4
Urban	108,695	141,362	151,303	0.5
Suburban	21,420	24,311	24,261	-0.0
Rural	1,379	1,693	1,707	0.1
Open space (Hectares)				
Urbanized Open Space	65,860	75,586	73,498	-0.2
Urban Extent	197,354	242,953	250,771	0.2
Density (Persons / Hectare)				
Built-up Area Density	64.8	58.2	63.2	0.6
Urban Extent Density	43.2	40.1	44.7	0.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.67	0.69	0.71	0.2
Openness Index	0.30	0.27	0.25	-0.5
Compactness (Roundness)				
Proximity	0.83	0.82	0.82	0.0
Cohesion	0.80	0.79	0.79	0.0
Added Area (Hectares)	'89-'00	Share	'00-'13	Share
Infill	14,293	39%	6,537	65%
Extension	5,558	15%	618	6%
Leapfrog	176	0%	451	4%
Inclusion	15,846	44%	2,304	23%





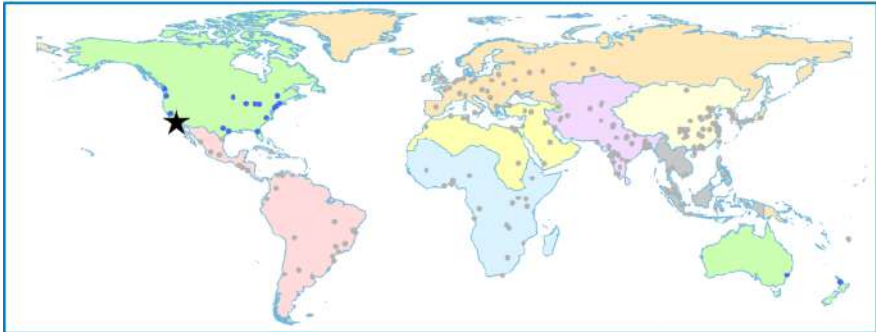
**Los Angeles, United States
1990-2014**

0 20 40 60 80 km

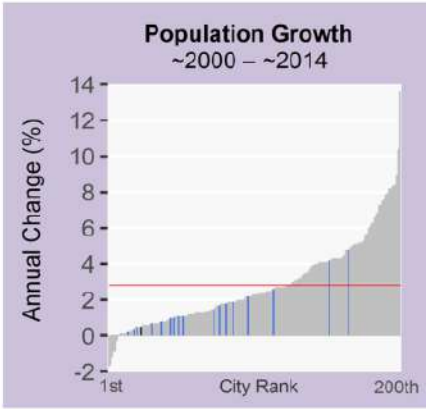
Study area
Urban extent
Urban built-up area
Suburban built-up area
Rural built-up area
Urbanized open space

Rural open space
Exurban built-up area
Exurban open space
Water
No data
CBD

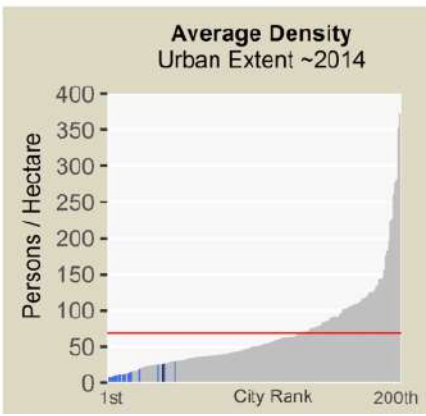
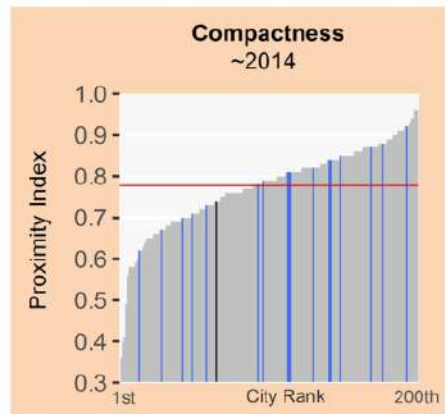
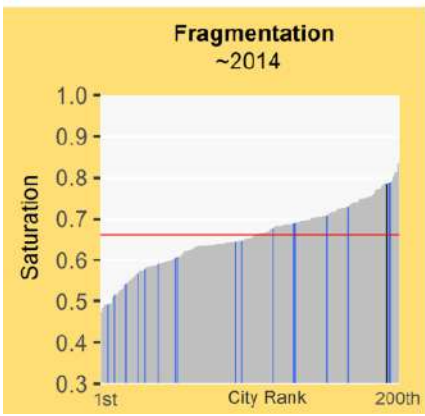
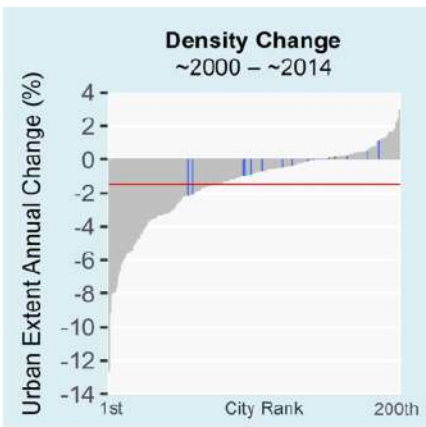
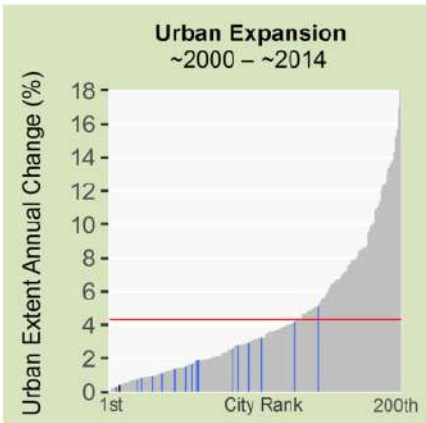
Los Angeles, United States (Land-Rich Developed Countries)

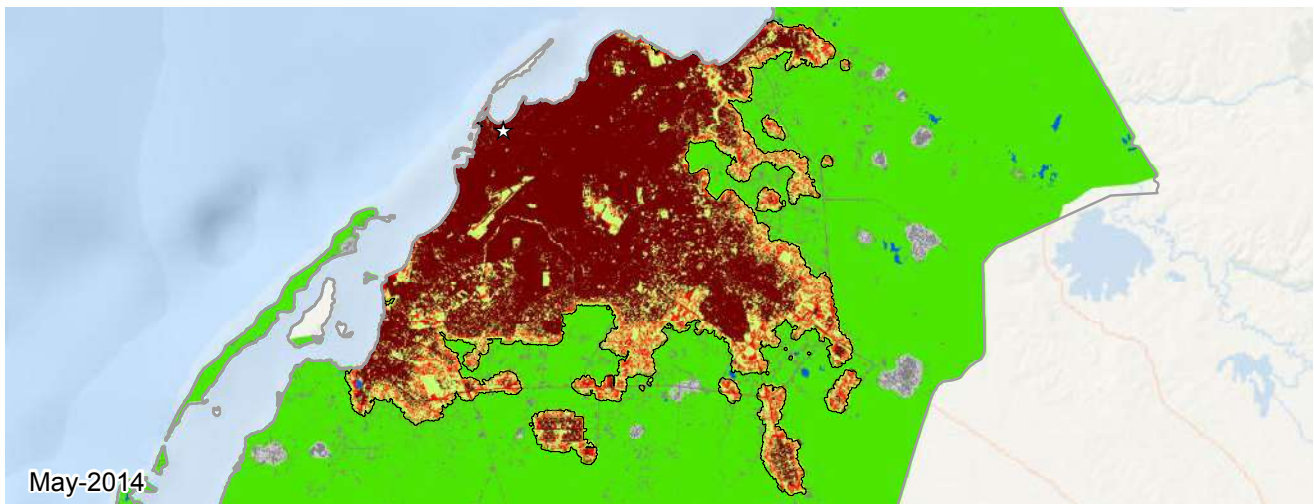
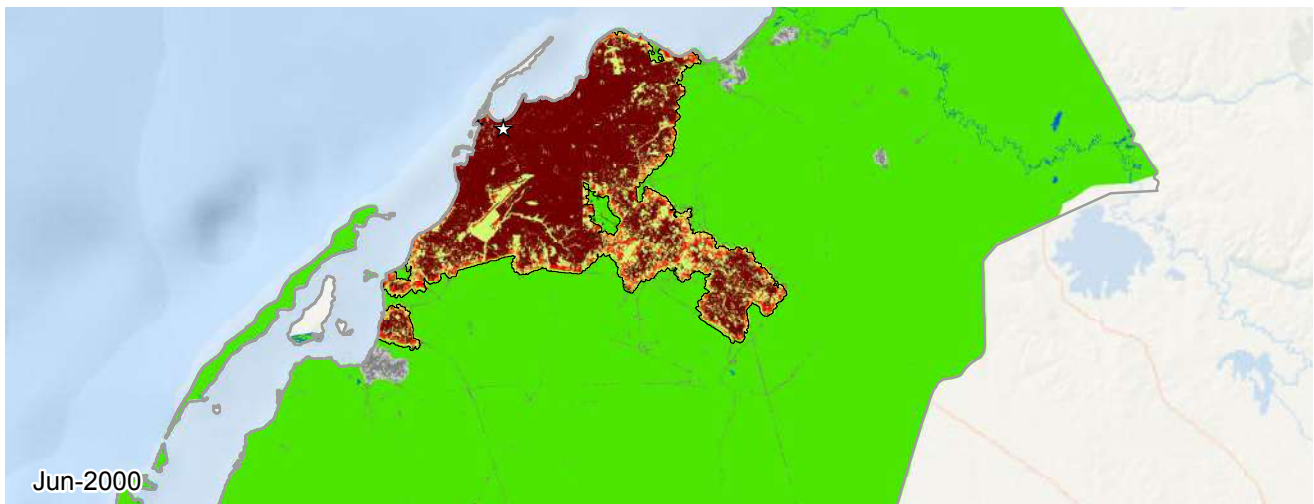
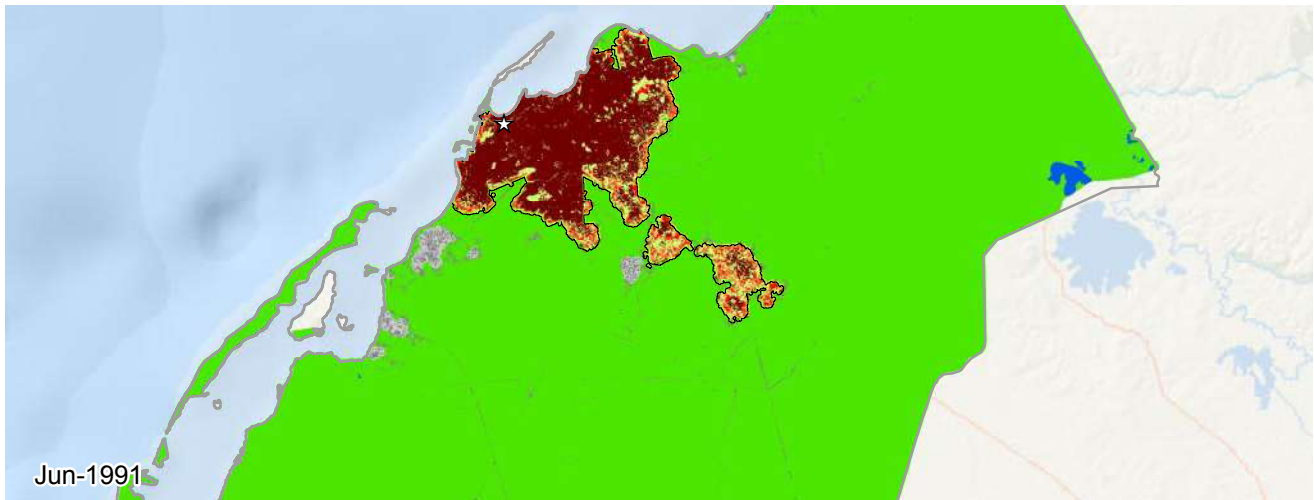


Legend for Charts
 Los Angeles | Other cities in region | All other cities | Global average



Metrics	May 1990	May 2000	Oct 2014	% Annual Change ('00-'14)
Population	12,355,295	14,091,412	15,138,972	0.5
Built-up Area (Hectares)				
Total	353,940	417,725	459,046	0.7
Urban	314,393	378,971	424,453	0.8
Suburban	37,396	36,573	32,733	-0.8
Rural	2,151	2,181	1,860	-1.1
Open space (Hectares)				
Urbanized Open Space	134,324	133,976	126,855	-0.4
Urban Extent	488,264	551,702	585,901	0.4
Density (Persons / Hectare)				
Built-up Area Density	34.9	33.7	33.0	-0.2
Urban Extent Density	25.3	25.5	25.8	0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.72	0.76	0.78	0.2
Openness Index	0.22	0.19	0.17	-0.9
Compactness (Roundness)				
Proximity	0.75	0.75	0.74	-0.0
Cohesion	0.73	0.73	0.73	-0.0
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	34,870	54%	25,569	61%
Extension	15,842	24%	10,170	24%
Leapfrog	60	0%	2,093	5%
Inclusion	13,015	20%	3,650	8%





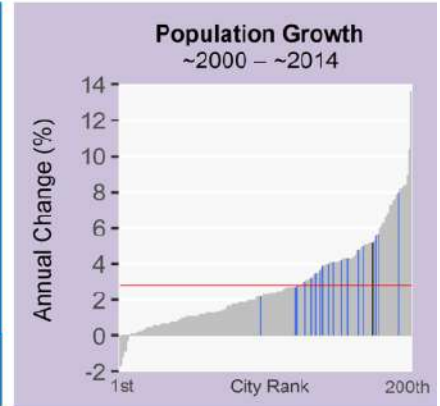
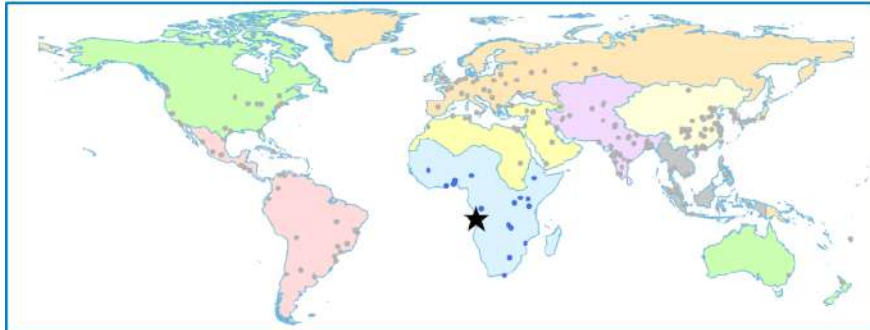
Luanda, Angola
1991-2014

0 6 12 18 24 km

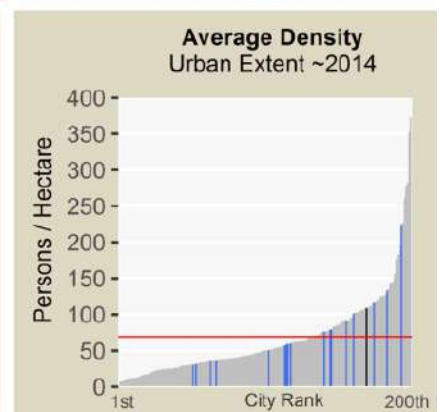
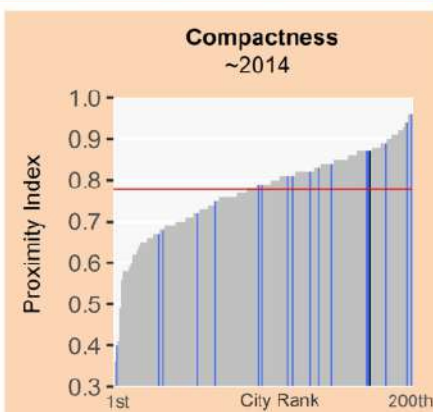
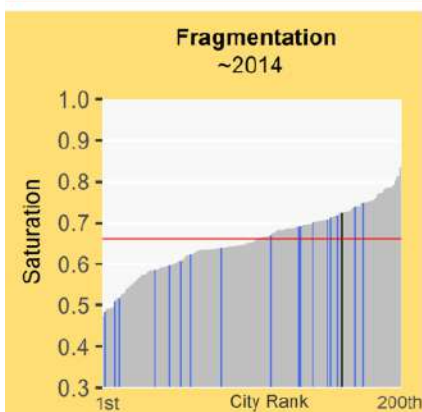
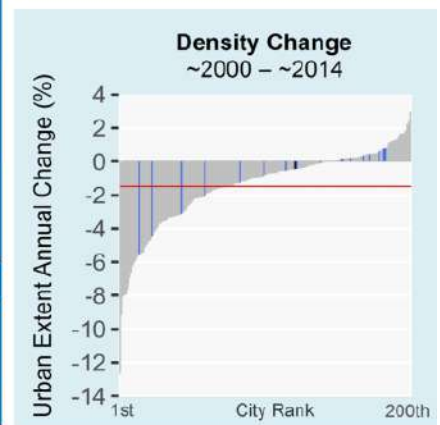
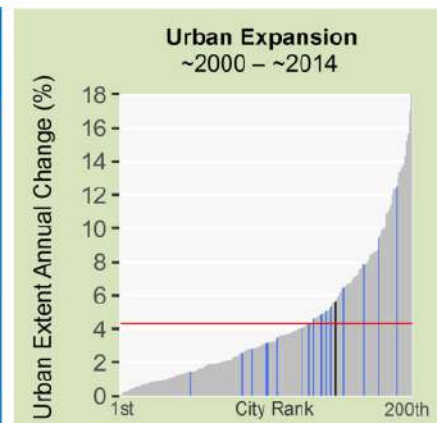
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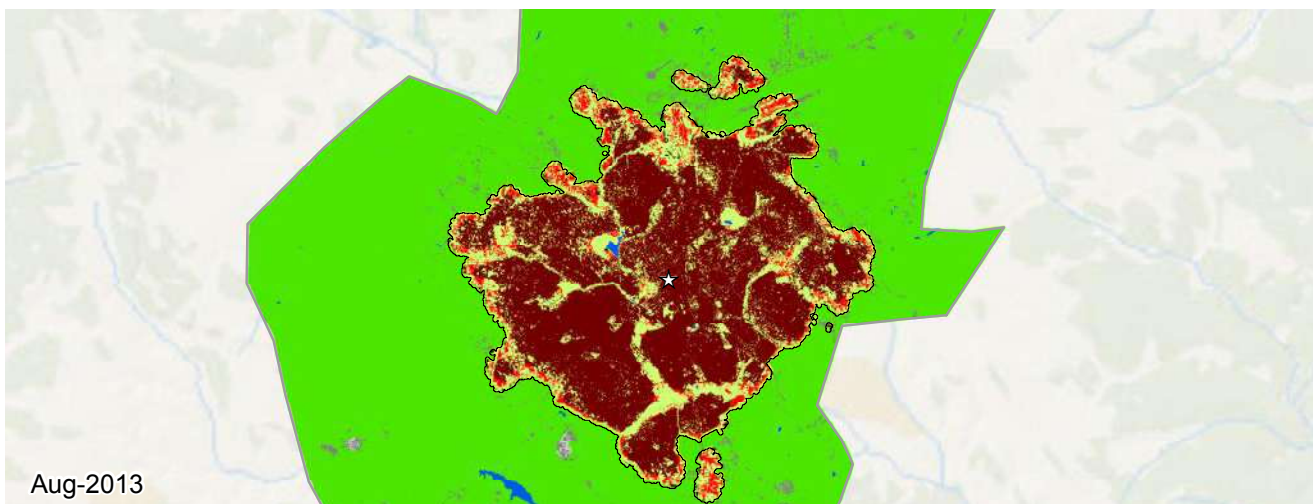
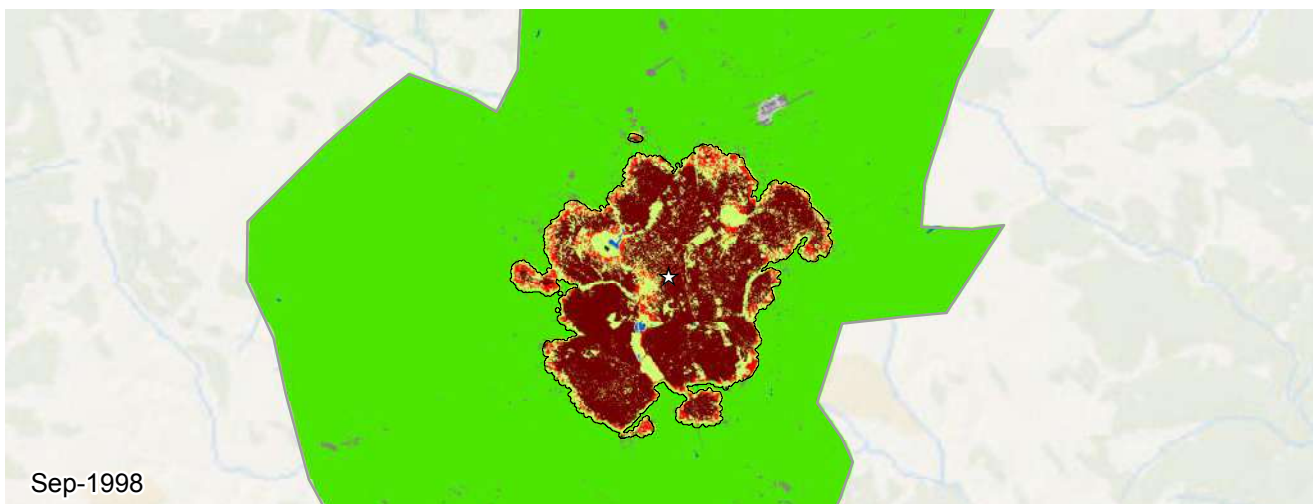
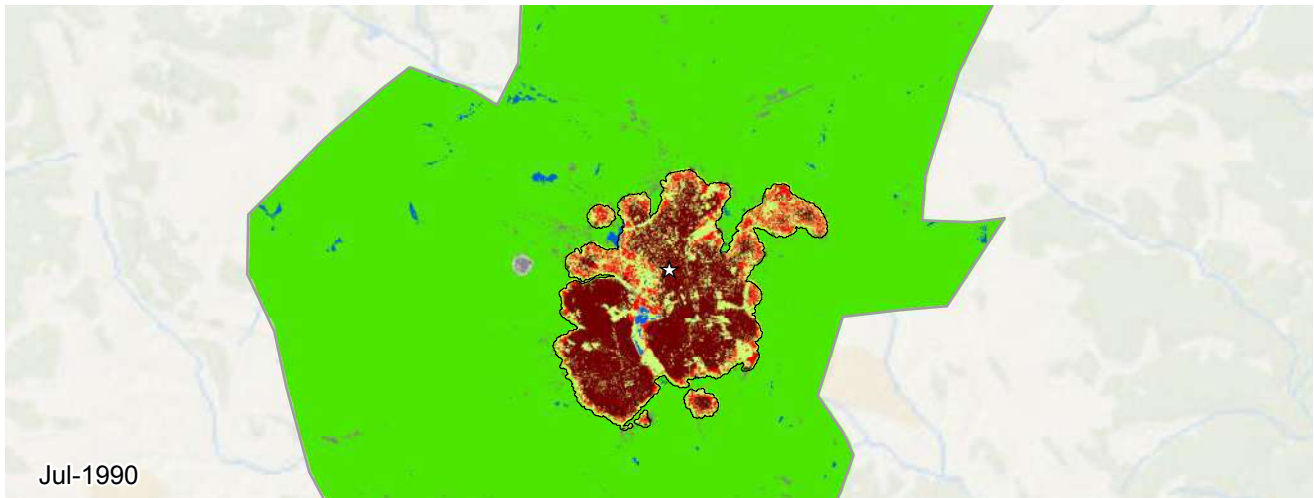
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Luanda, Angola (Sub-Saharan Africa)



Metrics	Jun 1991	Jun 2000	May 2014	% Annual Change ('00-'14)
Population	1,572,721	2,690,396	5,555,024	5.2
Built-up Area (Hectares)				
Total	10,410	17,175	36,890	5.5
Urban	8,941	15,187	31,701	5.3
Suburban	1,345	1,877	4,826	6.8
Rural	122	110	362	8.5
Open space (Hectares)				
Urbanized Open Space	3,627	6,006	14,076	6.1
Urban Extent	14,038	23,181	50,966	5.7
Density (Persons / Hectare)				
Built-up Area Density	151.1	156.6	150.6	-0.3
Urban Extent Density	112.0	116.1	109.0	-0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.74	0.74	0.72	-0.2
Openness Index	0.21	0.21	0.20	-0.3
Compactness (Roundness)				
Proximity	0.77	0.82	0.87	0.4
Cohesion	0.75	0.80	0.86	0.5
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	1,492	22%	3,739	18%
Extension	4,350	64%	14,717	74%
Leapfrog	0	0%	0	0%
Inclusion	921	13%	1,259	6%

















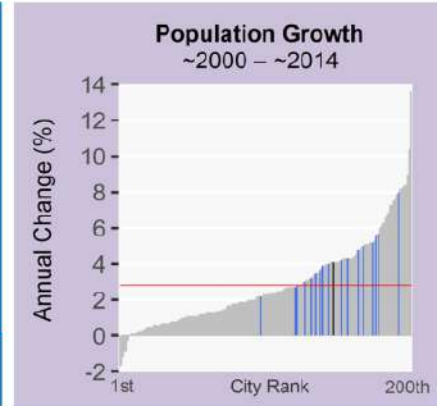
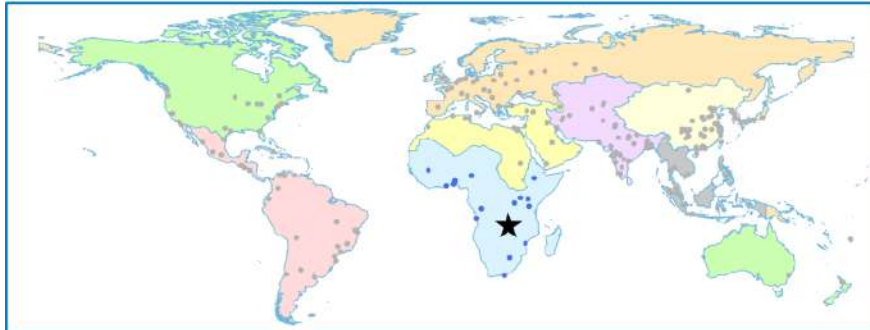
Lubumbashi, Congo Dem. Rep.
1990-2013

0 4 8 12 16 km

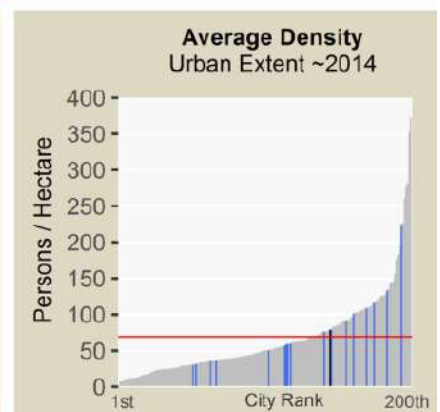
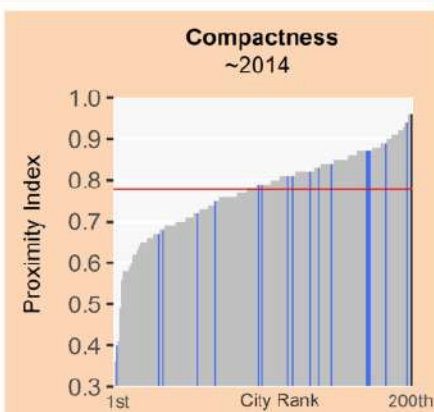
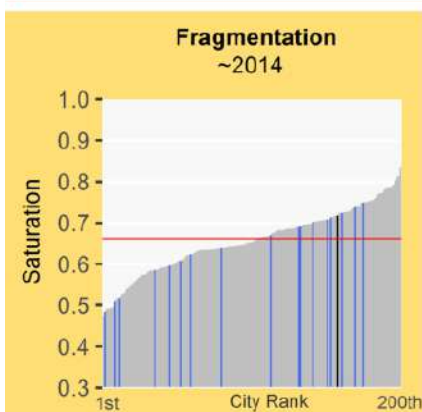
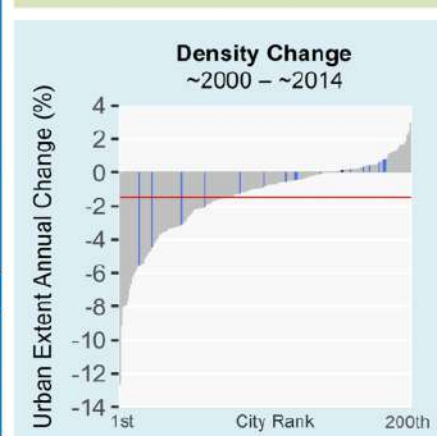
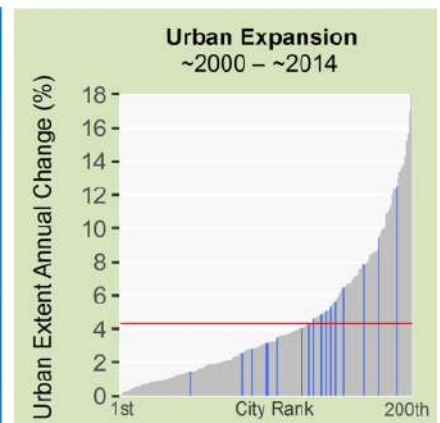
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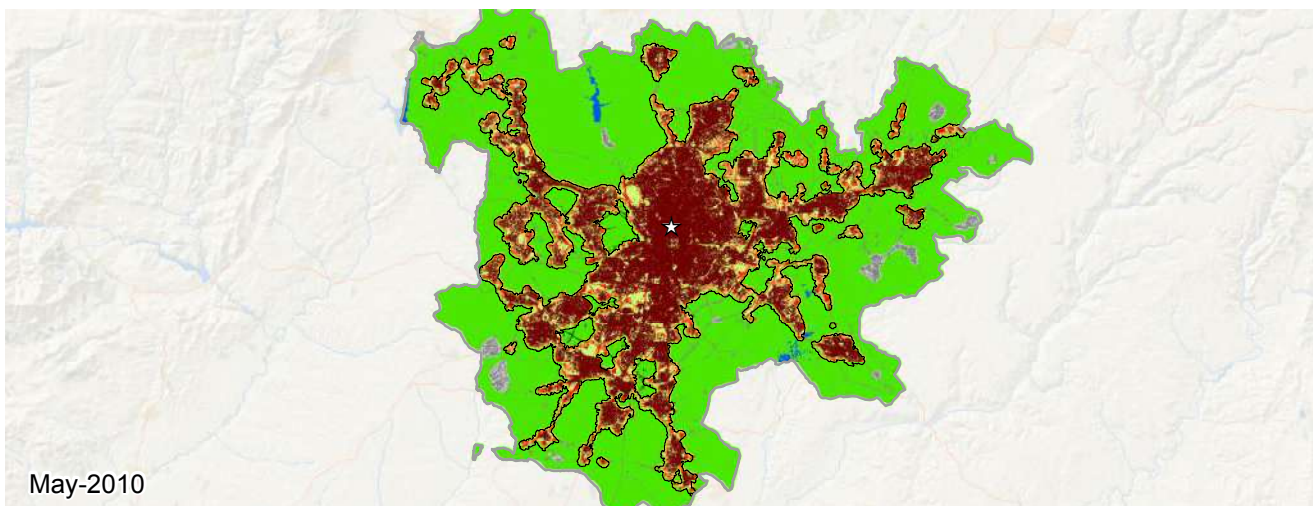
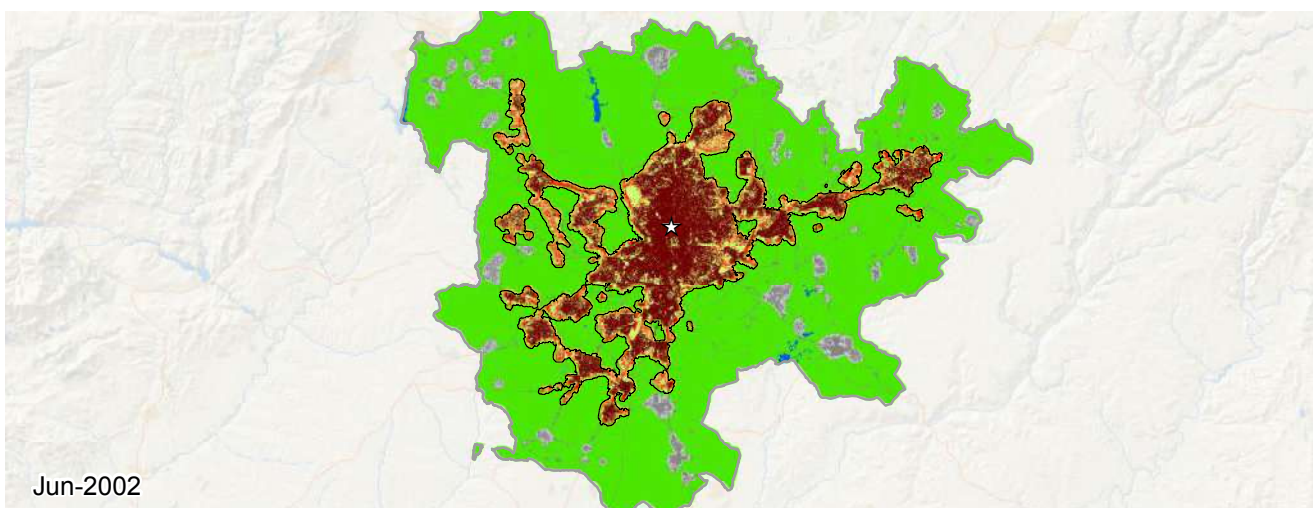
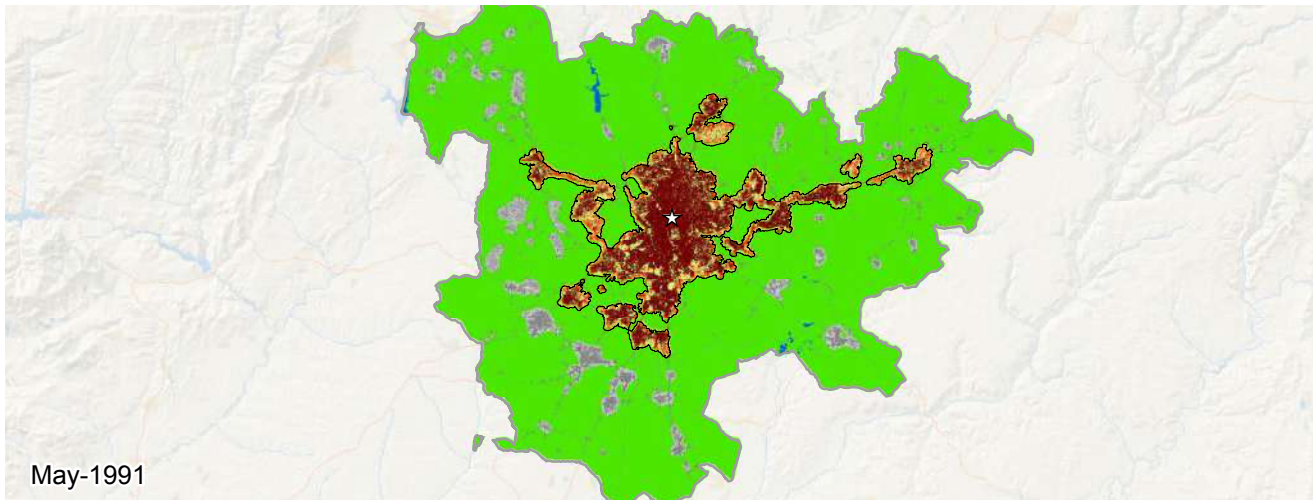
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Lubumbashi, Congo Dem. Rep. (Sub-Saharan Africa)



Metrics	Jul 1990	Sep 1998	Aug 2013	% Annual Change ('98-'13)
Population	660,735	942,351	1,746,414	4.1
Built-up Area (Hectares)				
Total	5,508	8,434	15,864	4.2
Urban	4,325	7,425	14,178	4.3
Suburban	1,121	954	1,559	3.3
Rural	61	54	126	5.6
Open space (Hectares)				
Urbanized Open Space	3,136	3,691	6,233	3.5
Urban Extent	8,645	12,126	22,098	4.0
Density (Persons / Hectare)				
Built-up Area Density	119.9	111.7	110.1	-0.1
Urban Extent Density	76.4	77.7	79.0	0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.64	0.70	0.72	0.2
Openness Index	0.31	0.25	0.22	-0.9
Compactness (Roundness)				
Proximity	0.93	0.96	0.96	0.0
Cohesion	0.93	0.96	0.96	-0.0
Added Area (Hectares)	'90-'98	Share	'98-'13	Share
Infill	1,061	36%	1,152	15%
Extension	1,633	55%	5,953	80%
Leapfrog	0	0%	0	0%
Inclusion	231	7%	323	4%





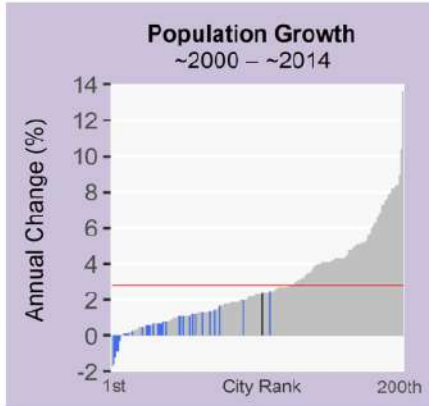
**Madrid, Spain
1991-2010**

0 10 20 30 40 km

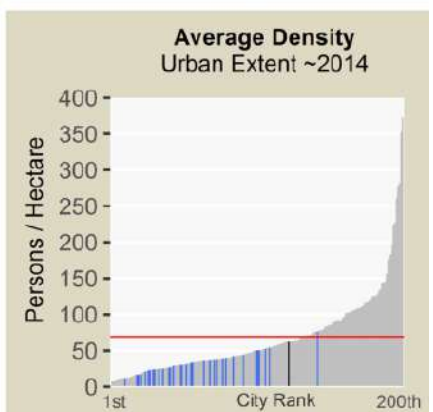
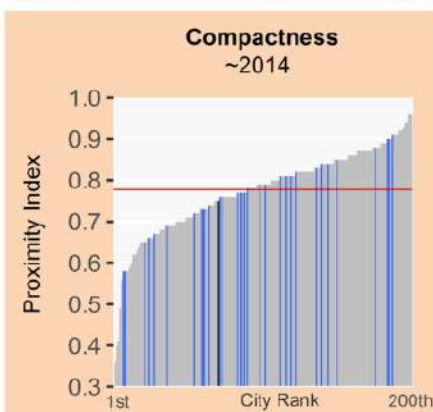
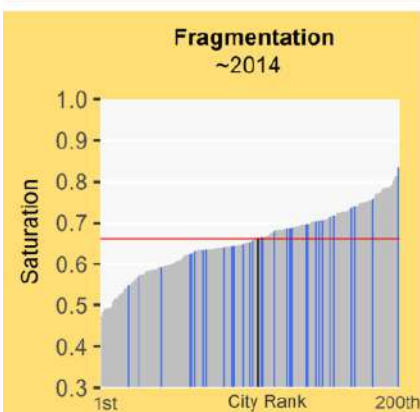
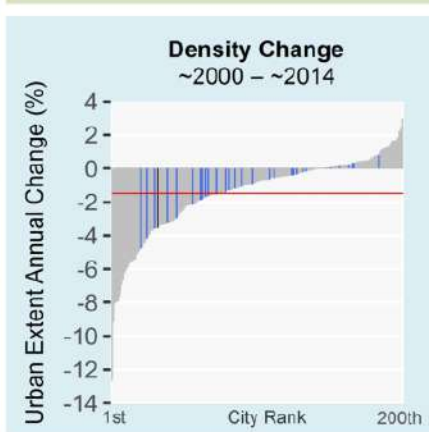
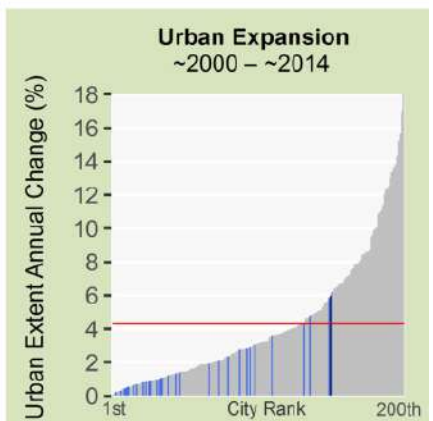
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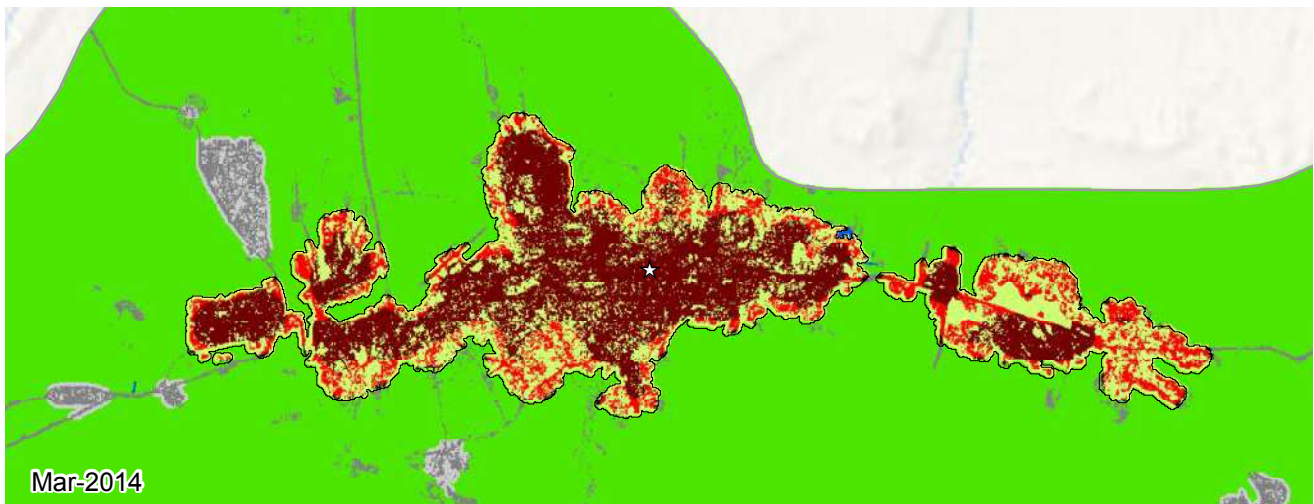
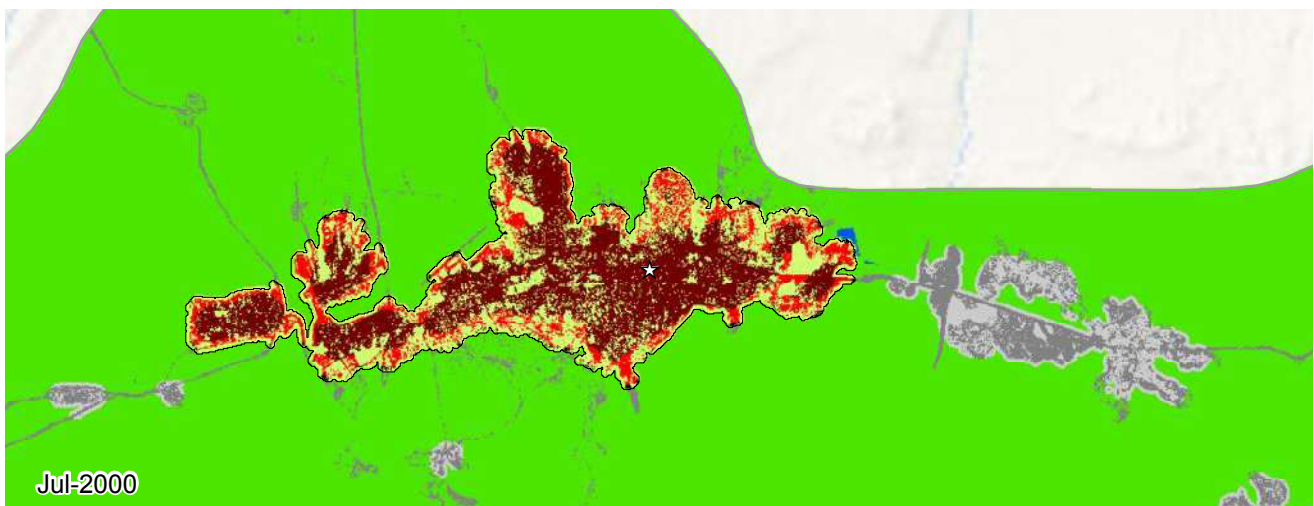
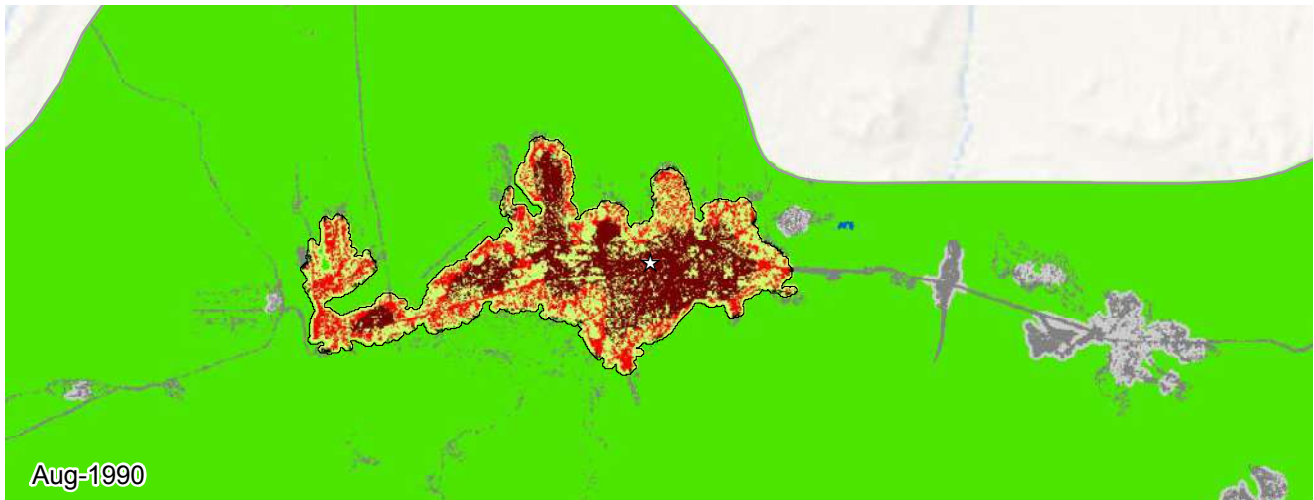
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Madrid, Spain (Europe and Japan)



Metrics	May 1991	Jun 2002	May 2010	% Annual Change ('02-'10)
Population	3,641,937	4,337,697	5,256,249	2.4
Built-up Area (Hectares)				
Total	20,632	32,970	56,019	6.7
Urban	16,072	24,628	44,305	7.4
Suburban	4,241	7,848	10,927	4.2
Rural	317	493	786	5.9
Open space (Hectares)				
Urbanized Open Space	11,243	19,579	28,387	4.7
Urban Extent	31,876	52,550	84,406	6.0
Density (Persons / Hectare)				
Built-up Area Density	176.5	131.6	93.8	-4.3
Urban Extent Density	114.3	82.5	62.3	-3.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.63	0.66	0.7
Openness Index	0.31	0.32	0.28	-1.5
Compactness (Roundness)				
Proximity	0.72	0.72	0.75	0.5
Cohesion	0.69	0.69	0.73	0.7
Added Area (Hectares)	'91-'02	Share	'02-'10	Share
Infill	2,884	23%	8,283	35%
Extension	4,773	38%	7,934	34%
Leapfrog	112	0%	18	0%
Inclusion	4,568	37%	6,812	29%





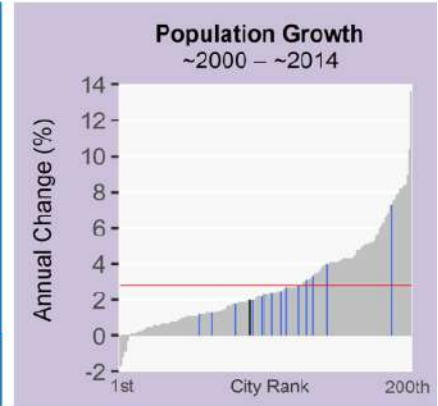
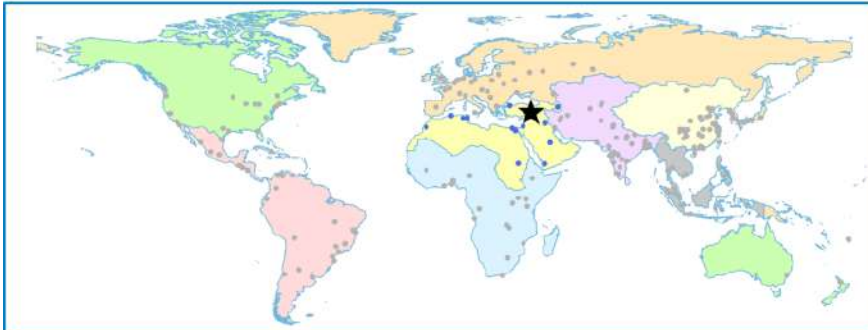
Malatya, Turkey
1990-2014

0 2 4 6 8 km

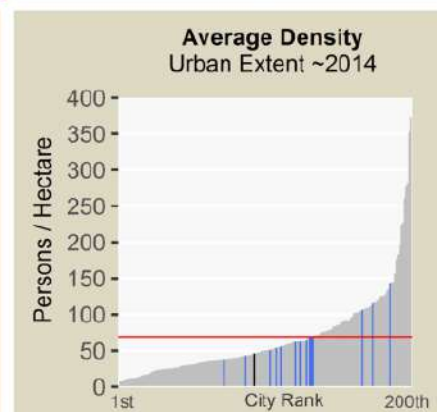
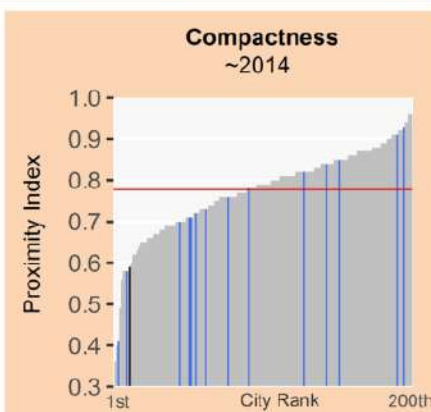
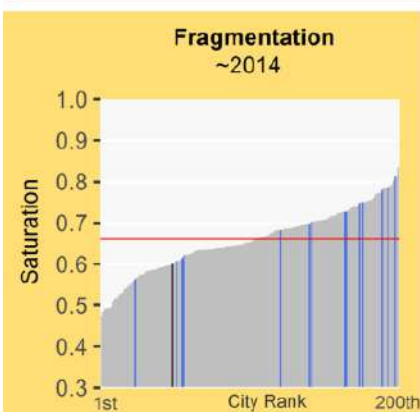
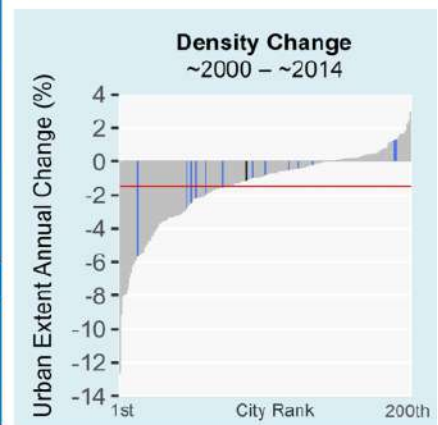
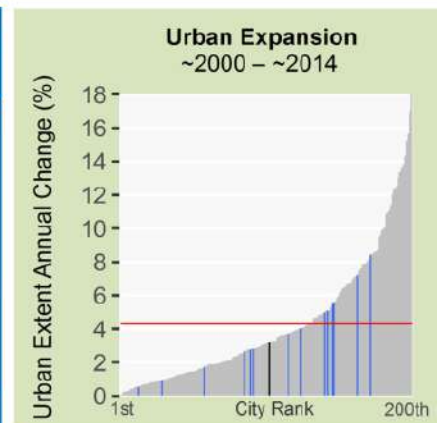
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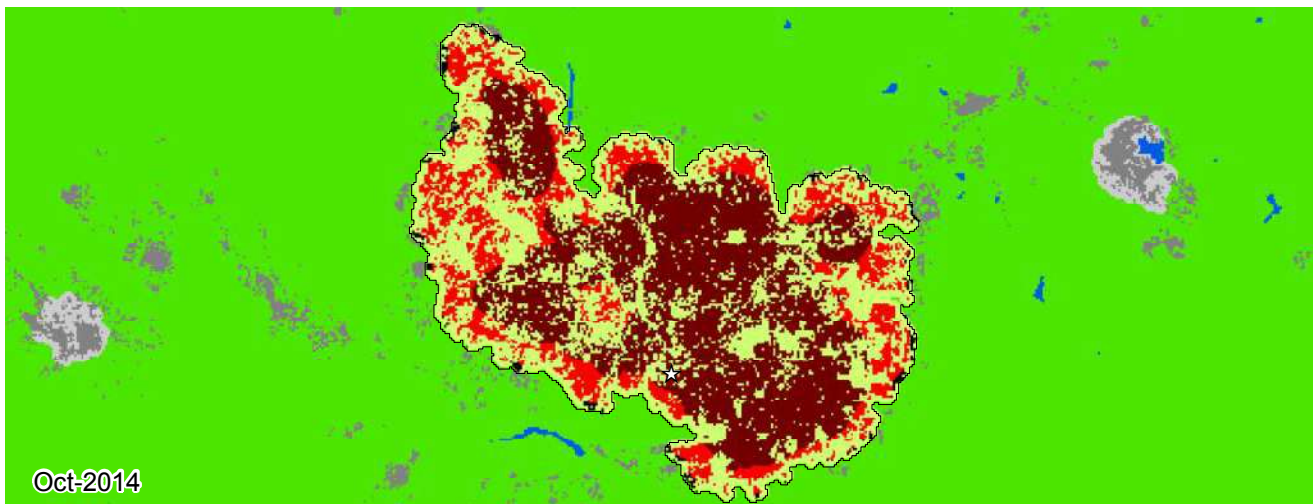
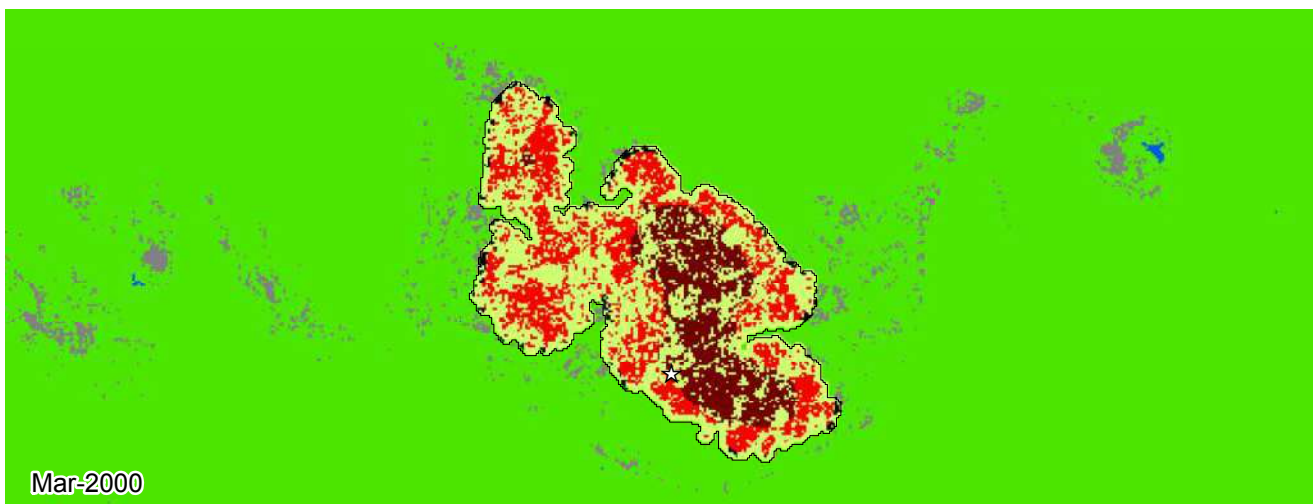
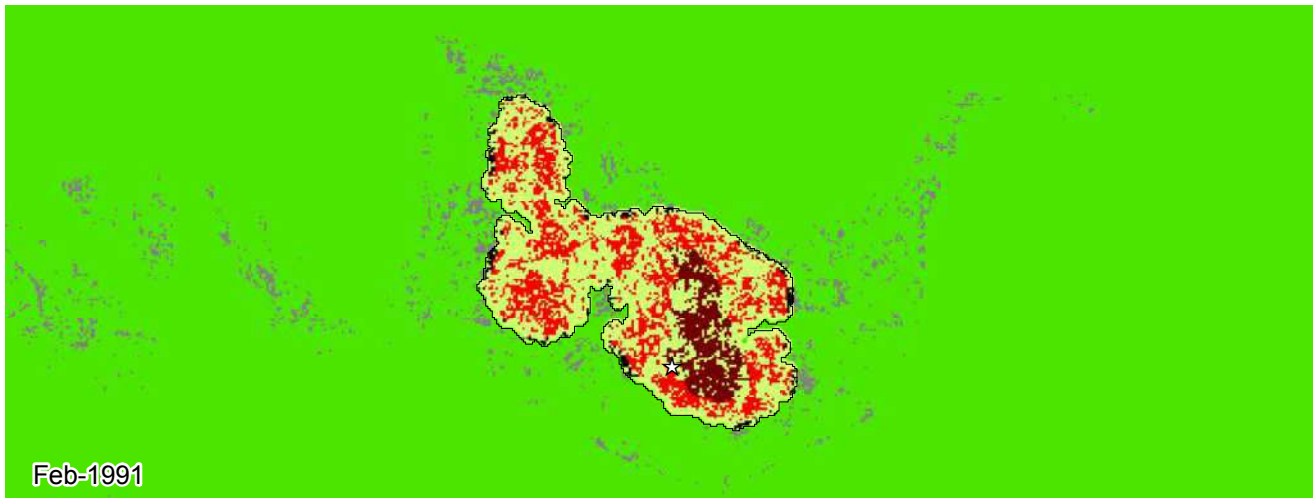
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Malatya, Turkey (Western Asia and North Africa)



Metrics	Aug 1990	Jul 2000	Mar 2014	% Annual Change ('00-'14)
Population	184,772	299,753	394,722	2.0
Built-up Area (Hectares)				
Total	1,922	3,296	5,146	3.3
Urban	1,104	2,385	3,652	3.1
Suburban	756	856	1,394	3.6
Rural	61	53	99	4.5
Open space (Hectares)				
Urbanized Open Space	1,724	2,232	3,396	3.1
Urban Extent	3,646	5,528	8,543	3.2
Density (Persons / Hectare)				
Built-up Area Density	96.1	90.9	76.7	-1.2
Urban Extent Density	50.7	54.2	46.2	-1.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.53	0.60	0.60	0.1
Openness Index	0.45	0.38	0.37	-0.2
Compactness (Roundness)				
Proximity	0.72	0.69	0.59	-1.2
Cohesion	0.71	0.68	0.58	-1.2
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	463	33%	467	25%
Extension	633	46%	401	21%
Leapfrog	0	0%	39	2%
Inclusion	276	20%	941	50%

















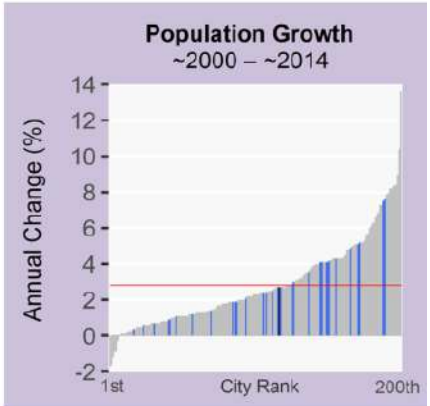
Malegaon, India
1991-2014

0 1 2 3 4 km

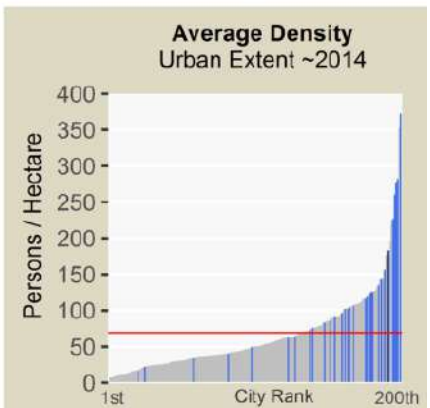
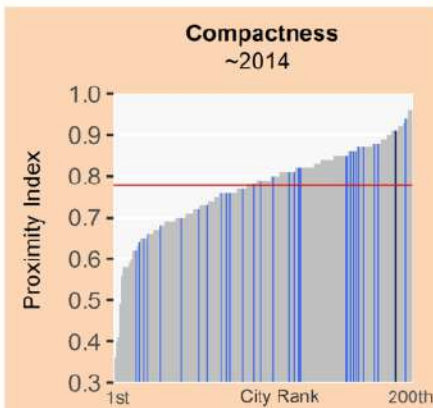
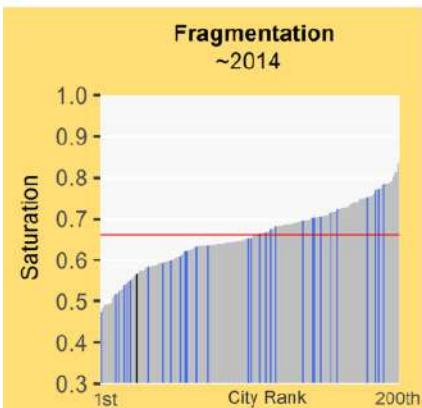
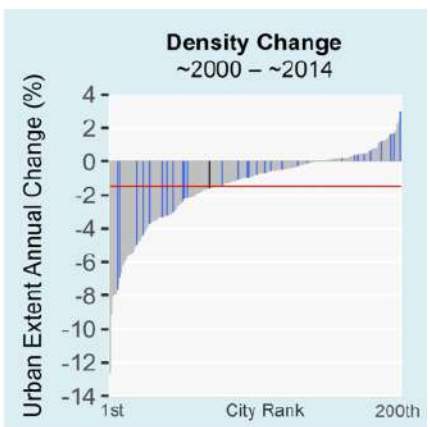
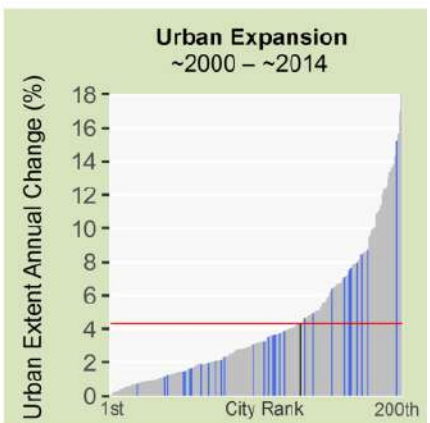
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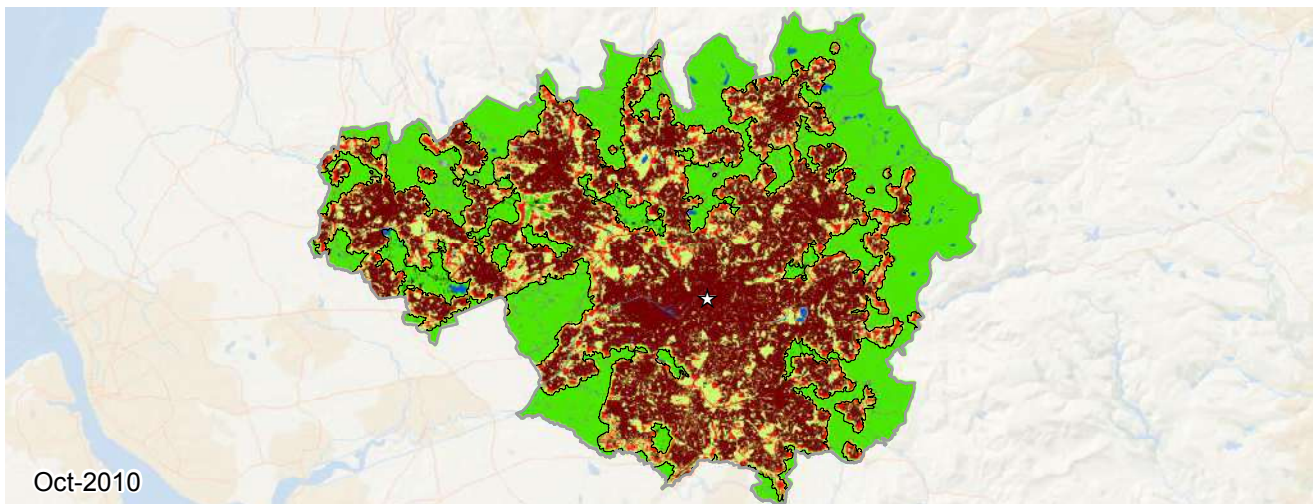
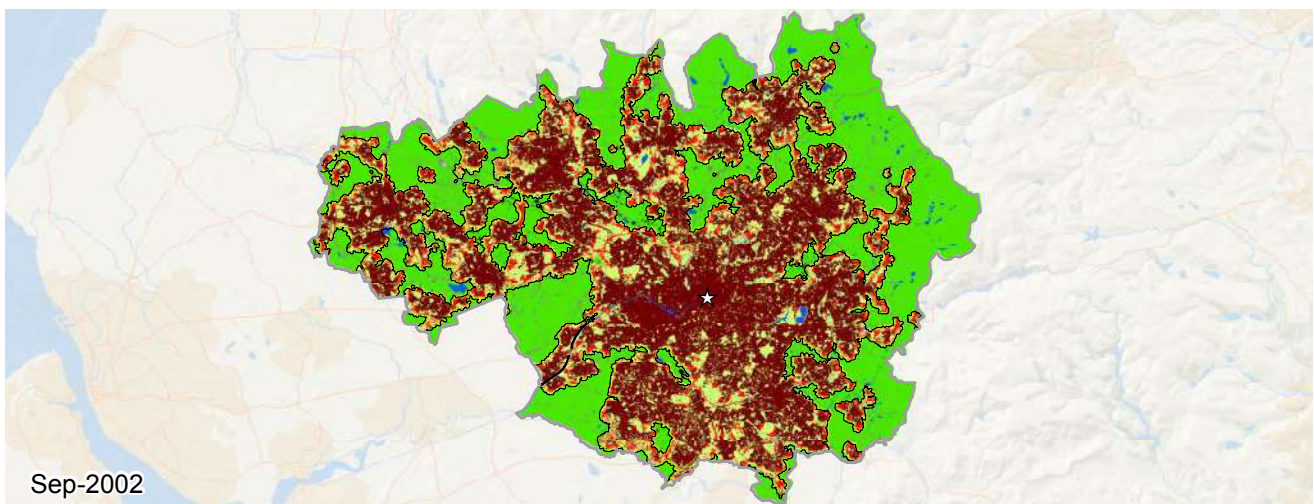
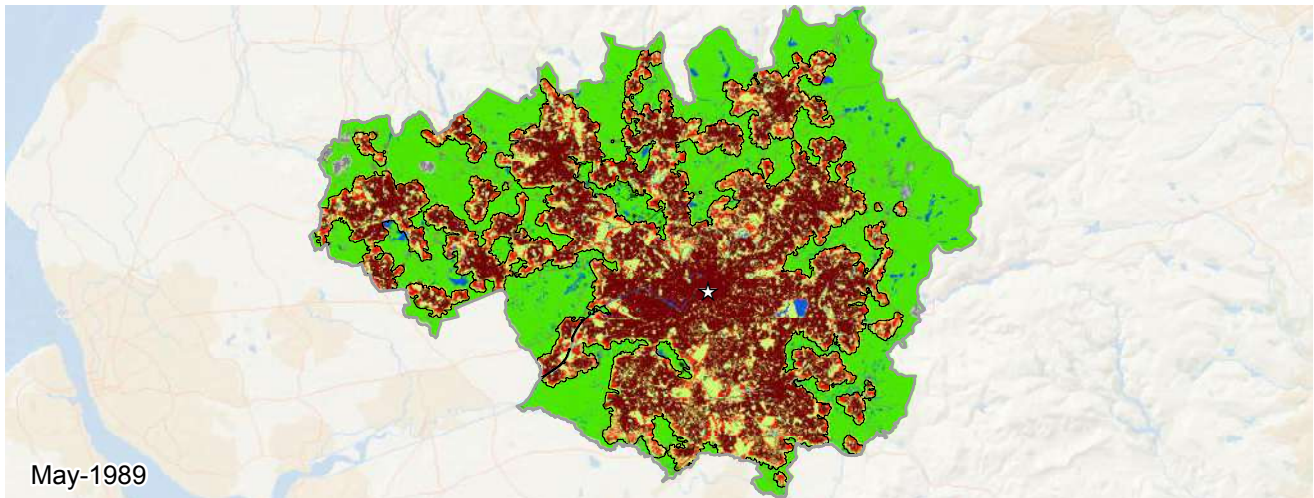
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Malegaon, India (South and Central Asia)















Metrics	Feb 1991	Mar 2000	Oct 2014	% Annual Change ('00-'14)
Population	253,608	311,045	461,737	2.7
Built-up Area (Hectares)				
Total	405	634	1,431	5.6
Urban	98	239	995	9.8
Suburban	280	368	411	0.8
Rural	26	25	25	-0.2
Open space (Hectares)				
Urbanized Open Space	580	711	1,094	3.0
Urban Extent	986	1,345	2,525	4.3
Density (Persons / Hectare)				
Built-up Area Density	624.7	490.5	322.5	-2.9
Urban Extent Density	257.0	231.2	182.8	-1.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.41	0.47	0.57	1.3
Openness Index	0.59	0.53	0.41	-1.8
Compactness (Roundness)				
Proximity	0.83	0.88	0.91	0.2
Cohesion	0.83	0.88	0.91	0.2
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	71	31%	214	26%
Extension	113	49%	491	61%
Leapfrog	0	0%	0	0%
Inclusion	43	18%	91	11%



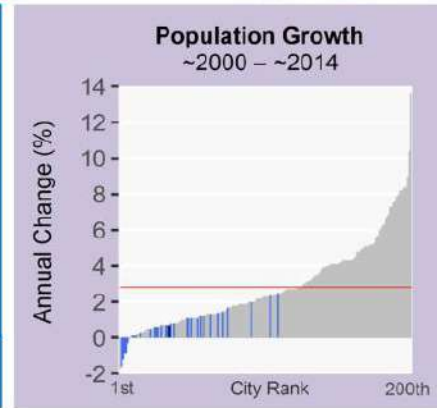


**Manchester, United Kingdom
1989-2010**

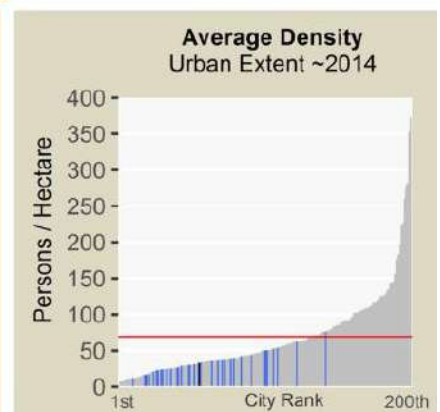
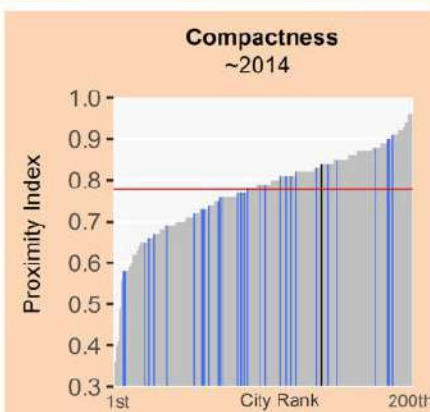
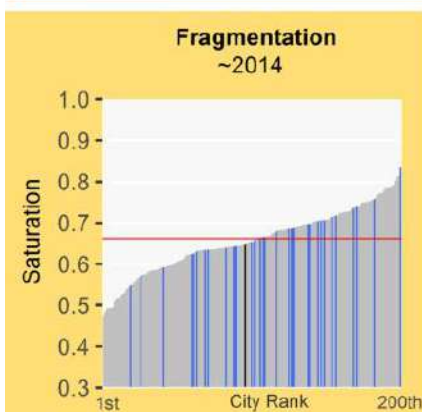
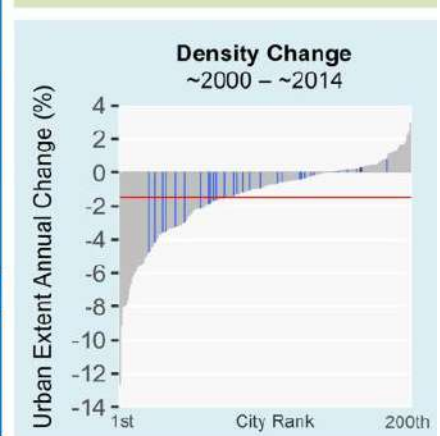
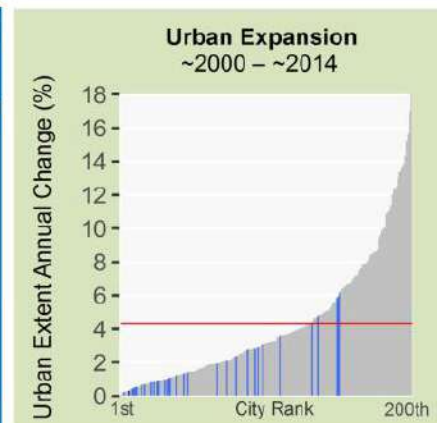
0 7 14 21 28 km

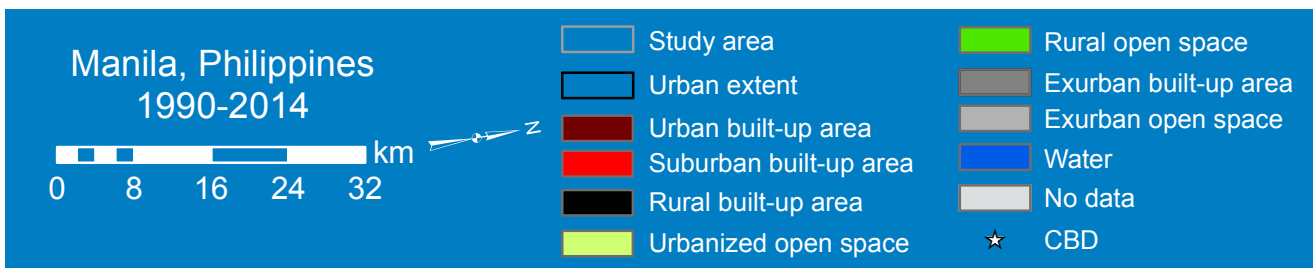
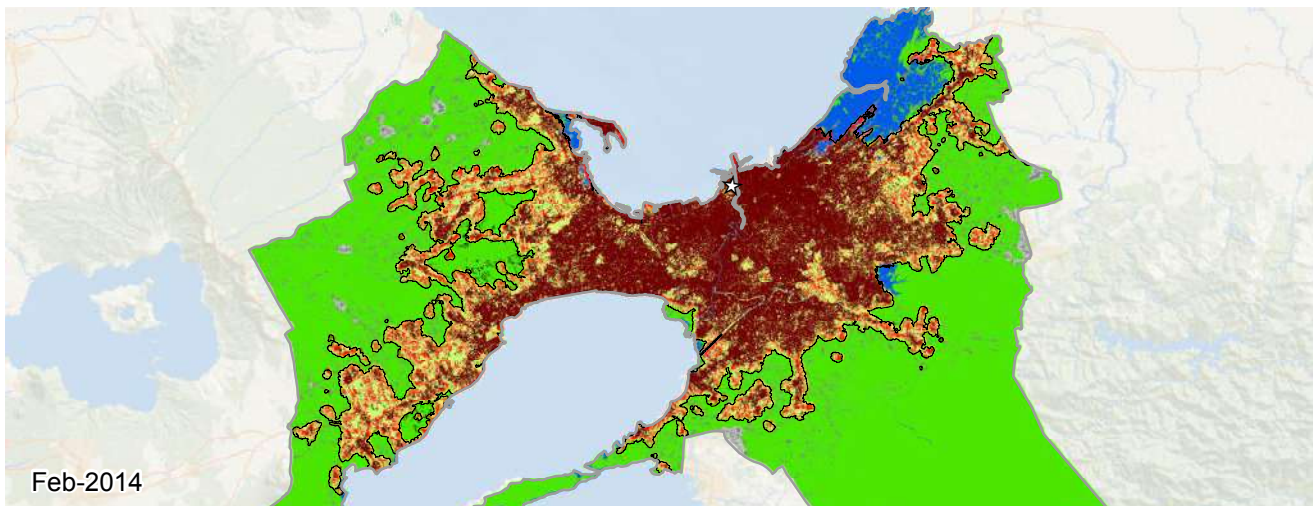
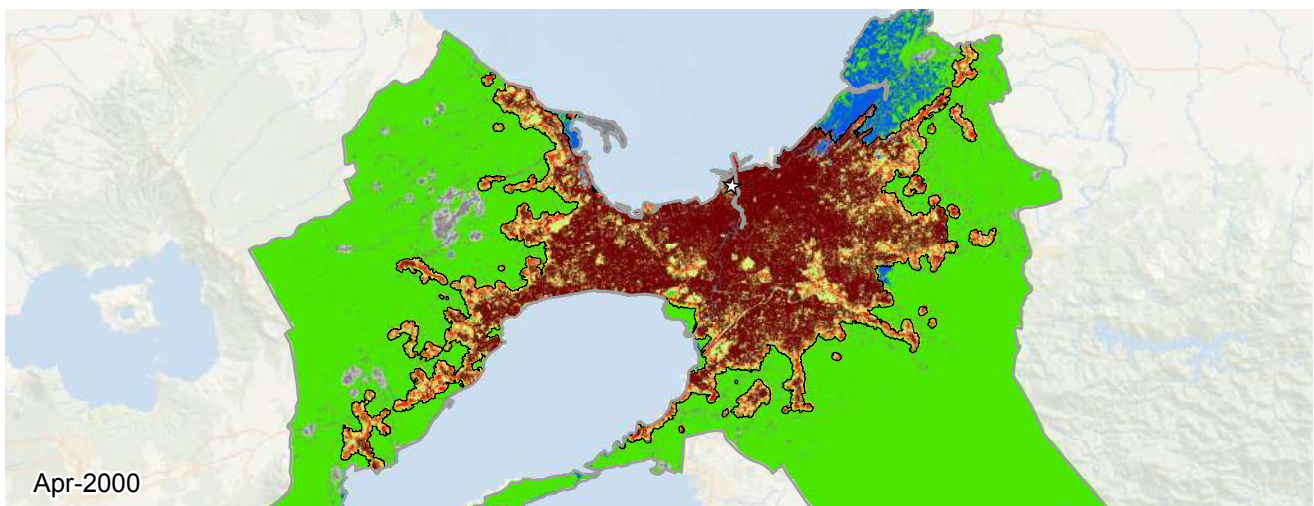
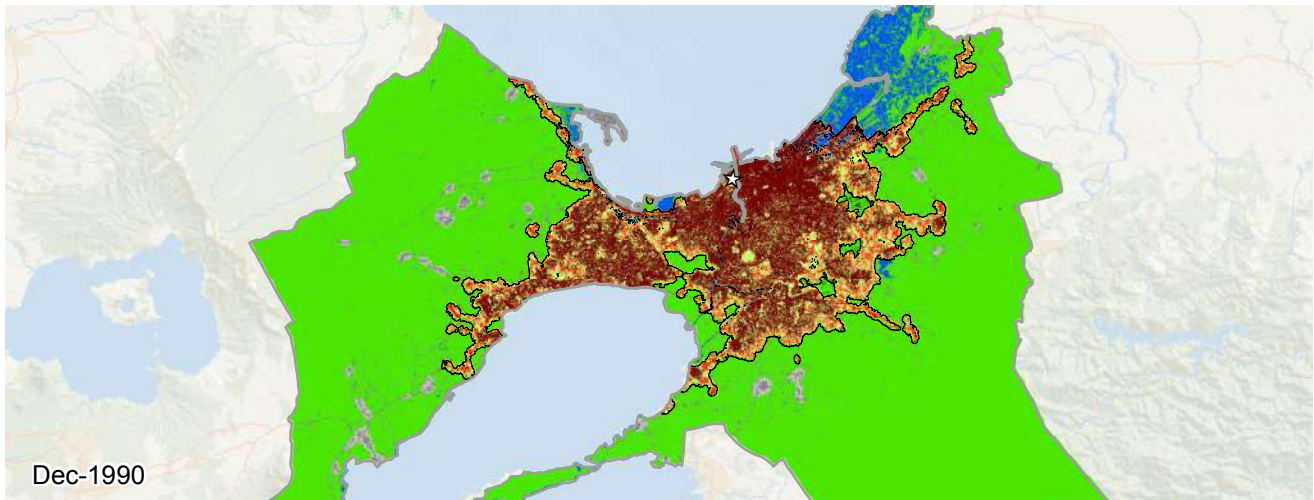
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Manchester, United Kingdom (Europe and Japan)

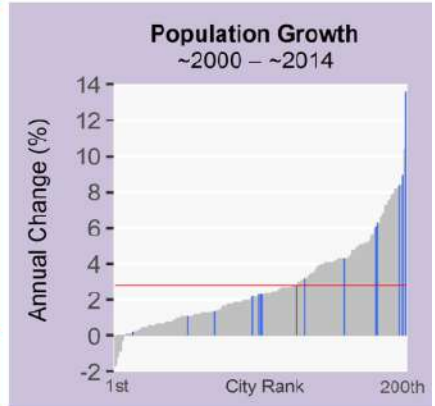


Metrics	May 1989	Sep 2002	Oct 2010	% Annual Change ('02-'10)
Population	2,452,872	2,448,231	2,585,614	0.7
Built-up Area (Hectares)				
Total	43,128	49,554	51,040	0.4
Urban	32,896	39,970	41,674	0.5
Suburban	9,666	9,086	8,840	-0.3
Rural	565	497	524	0.7
Open space (Hectares)				
Urbanized Open Space	25,656	27,124	27,656	0.2
Urban Extent	68,785	76,679	78,696	0.3
Density (Persons / Hectare)				
Built-up Area Density	56.9	49.4	50.7	0.3
Urban Extent Density	35.7	31.9	32.9	0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.63	0.65	0.65	0.0
Openness Index	0.35	0.32	0.31	-0.4
Compactness (Roundness)				
Proximity	0.82	0.84	0.84	0.1
Cohesion	0.81	0.83	0.83	0.1
Added Area (Hectares)	'89-'02	Share	'02-'10	Share
Infill	3,730	58%	1,025	69%
Extension	1,568	24%	271	18%
Leapfrog	11	0%	9	0%
Inclusion	1,120	17%	178	11%

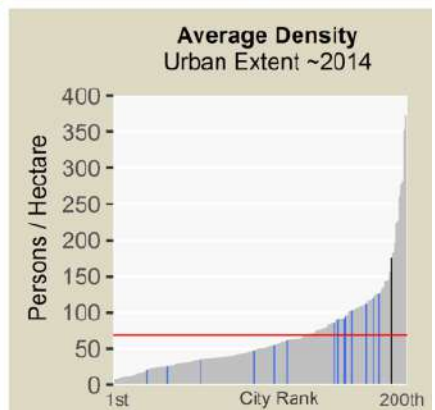
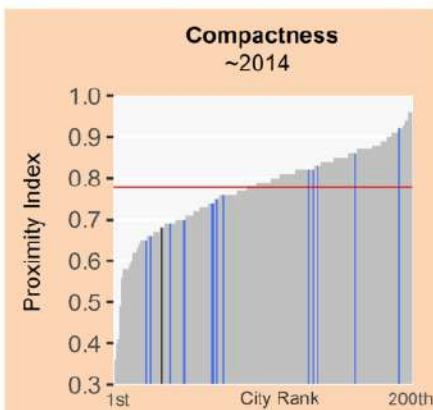
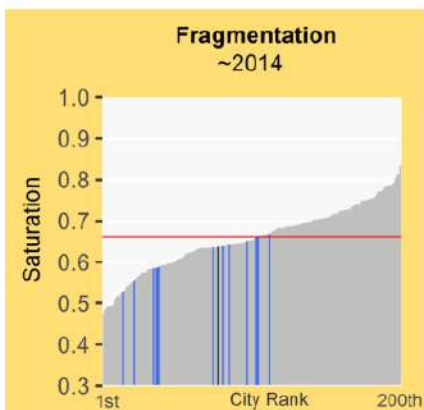
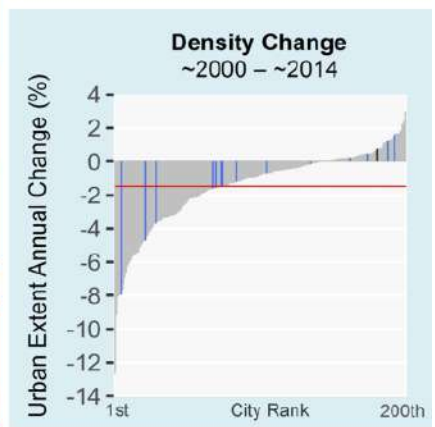
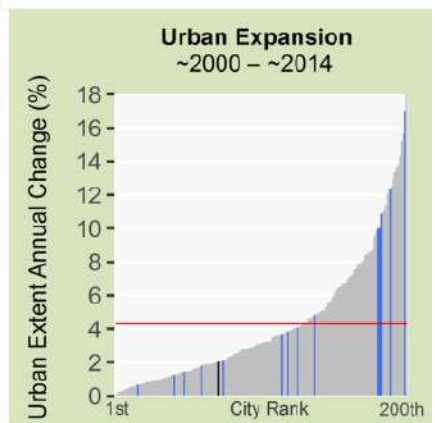


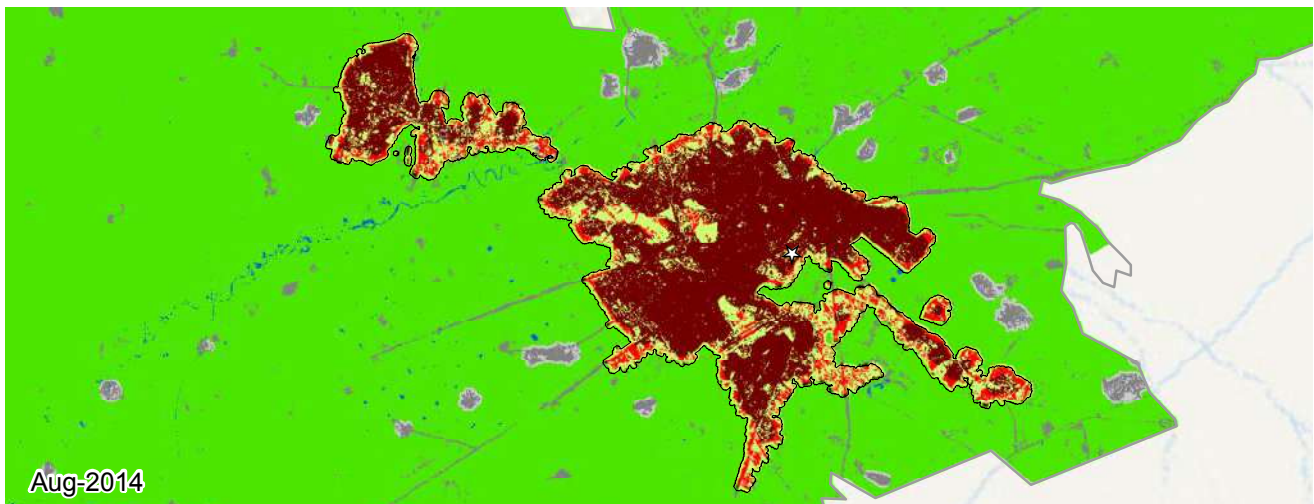
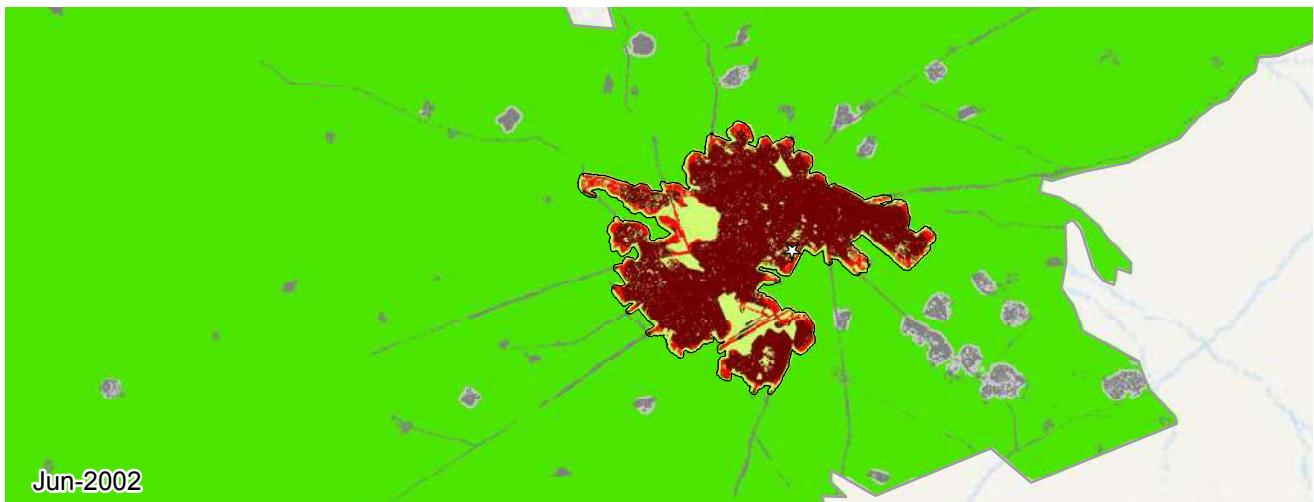
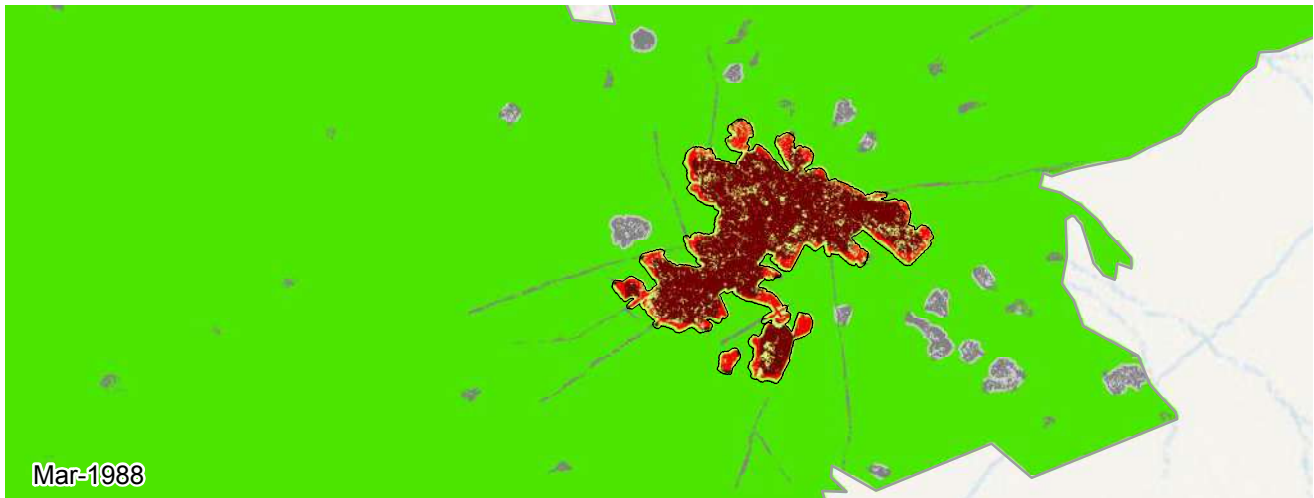


Manila, Philippines (Southeast Asia)



Metrics	Dec 1990	Apr 2000	Feb 2014	% Annual Change ('00-'14)
Population	9,031,508	13,252,150	19,485,398	2.8
Built-up Area (Hectares)				
Total	35,668	56,295	70,334	1.6
Urban	27,209	45,971	53,882	1.1
Suburban	7,844	9,615	15,297	3.4
Rural	615	708	1,153	3.5
Open space (Hectares)				
Urbanized Open Space	22,317	27,125	40,077	2.8
Urban Extent	57,986	83,420	110,411	2.0
Density (Persons / Hectare)				
Built-up Area Density	253.2	235.4	277.0	1.2
Urban Extent Density	155.8	158.9	176.5	0.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.67	0.64	-0.4
Openness Index	0.35	0.27	0.30	0.6
Compactness (Roundness)				
Proximity	0.74	0.71	0.68	-0.4
Cohesion	0.72	0.70	0.68	-0.2
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	9,309	44%	3,630	25%
Extension	7,427	35%	5,442	38%
Leapfrog	183	0%	17	0%
Inclusion	3,888	18%	4,969	35%



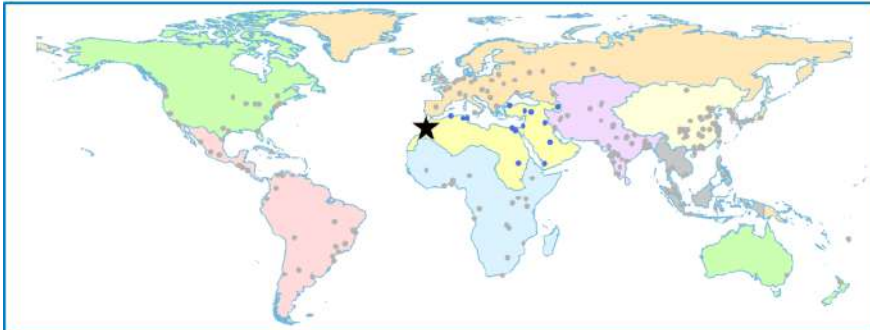


**Marrakesh, Morocco
1988-2014**

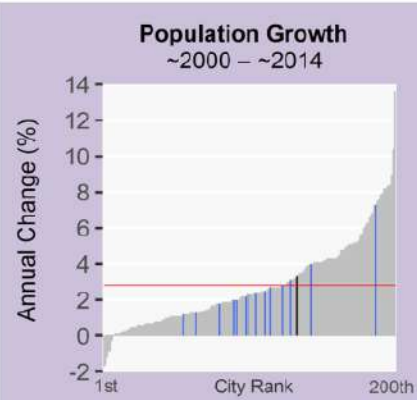
0 3 6 9 12 km

Study area
 Urban extent
 Urban built-up area
 Suburban built-up area
 Rural built-up area
 Urbanized open space
 Rural open space
 Exurban built-up area
 Exurban open space
 Water
 No data
★ CBD

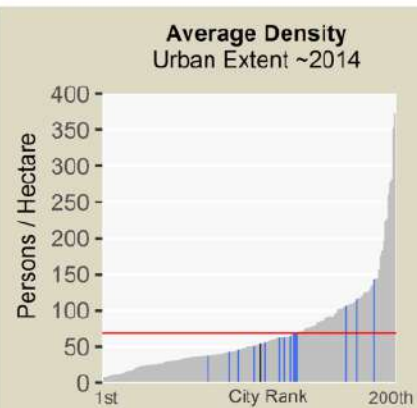
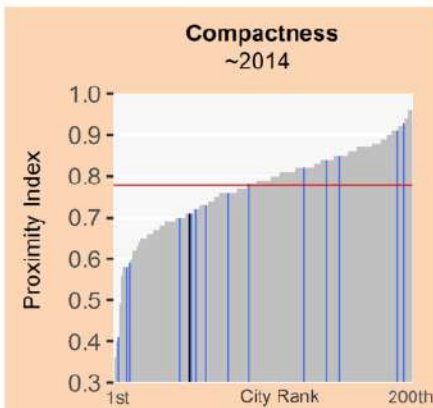
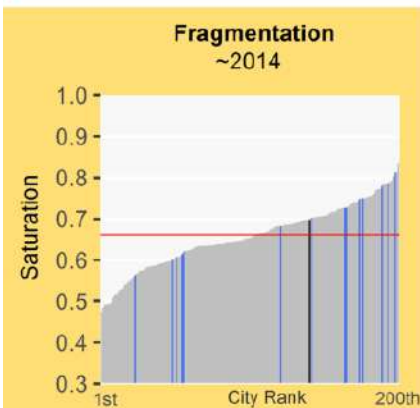
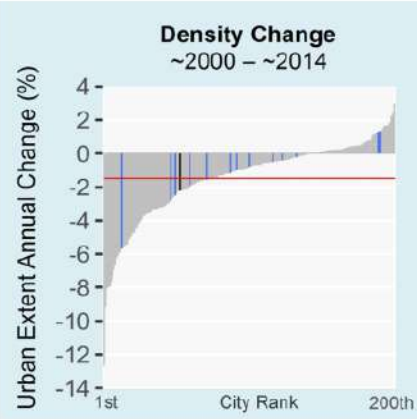
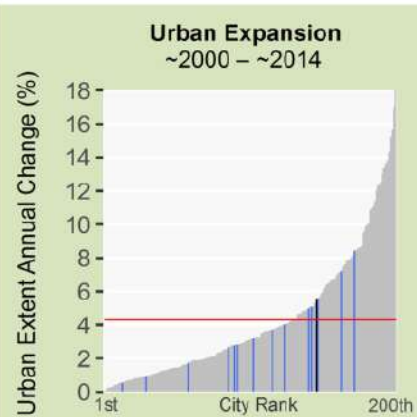
Marrakesh, Morocco (Western Asia and North Africa)

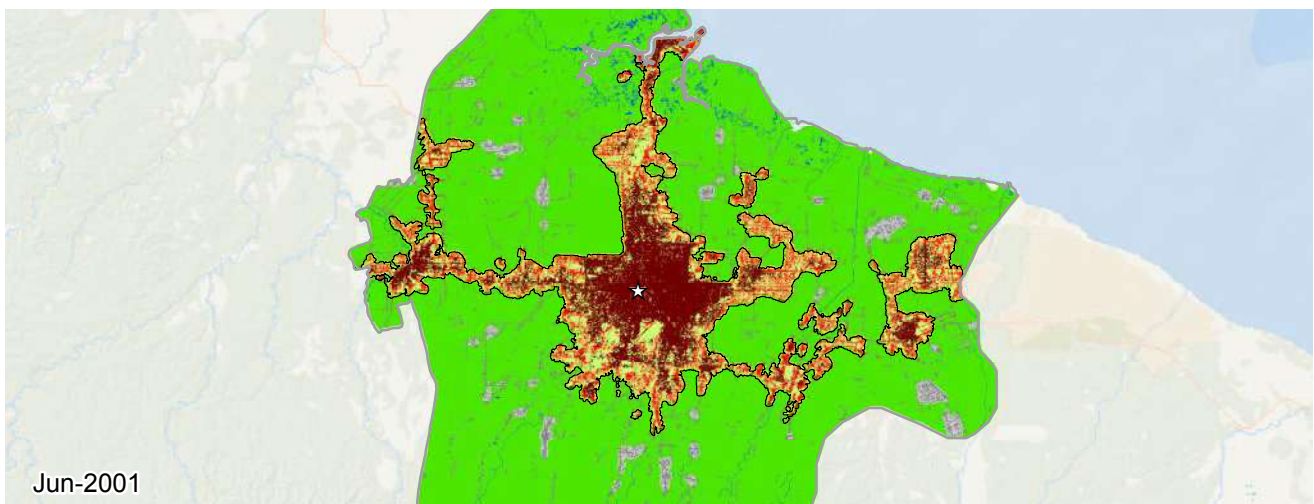
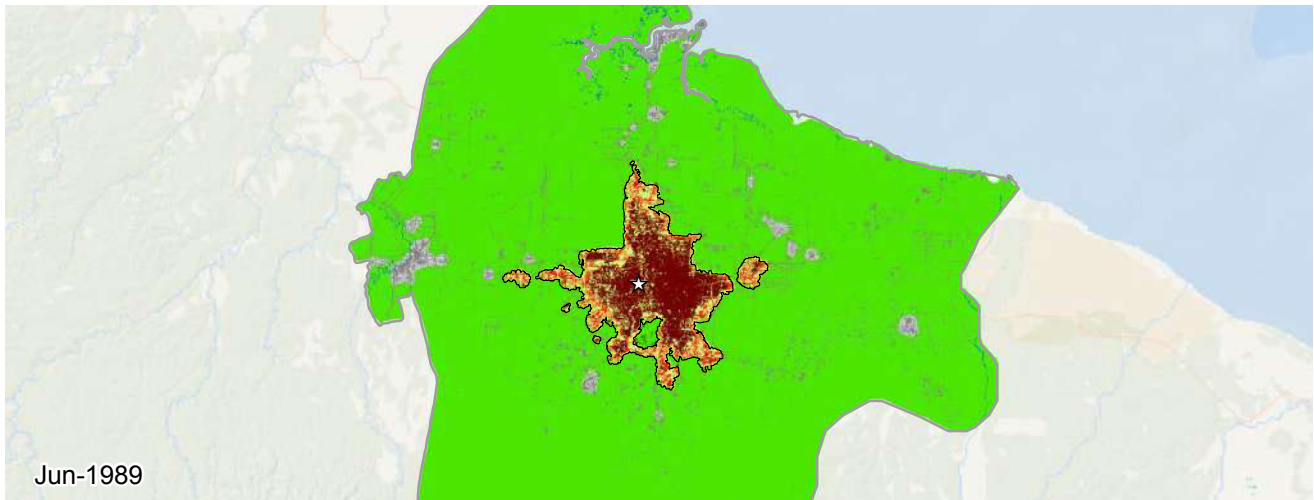


Legend for Charts
 Marrakesh | Other cities in region | All other cities | Global average



Metrics	Mar 1988	Jun 2002	Aug 2014	% Annual Change ('02-'14)
Population	371,584	514,030	770,422	3.3
Built-up Area (Hectares)				
Total	3,824	5,447	9,999	5.0
Urban	3,124	4,734	8,252	4.6
Suburban	666	675	1,621	7.2
Rural	32	36	125	10.1
Open space (Hectares)				
Urbanized Open Space	1,339	1,813	4,302	7.1
Urban Extent	5,163	7,260	14,301	5.6
Density (Persons / Hectare)				
Built-up Area Density	97.2	94.4	77.0	-1.7
Urban Extent Density	72.0	70.8	53.9	-2.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.74	0.75	0.70	-0.6
Openness Index	0.28	0.22	0.26	1.3
Compactness (Roundness)				
Proximity	0.82	0.91	0.71	-2.0
Cohesion	0.81	0.90	0.70	-2.1
Added Area (Hectares)	'88-'02	Share	'02-'14	Share
Infill	404	24%	527	11%
Extension	1,050	64%	3,311	72%
Leapfrog	0	0%	1	0%
Inclusion	167	10%	711	15%





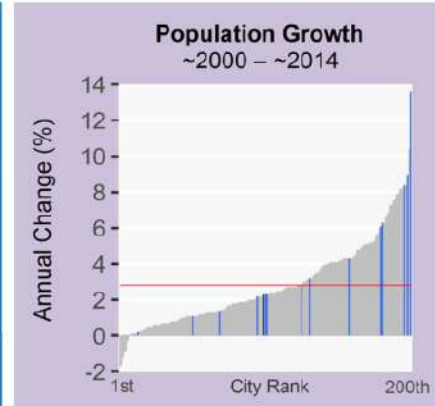
**Medan, Indonesia
1989-2013**

0 6 12 18 24 km

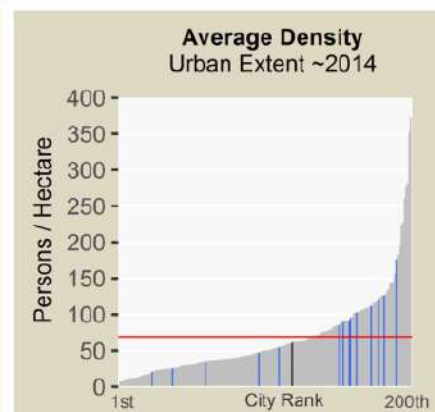
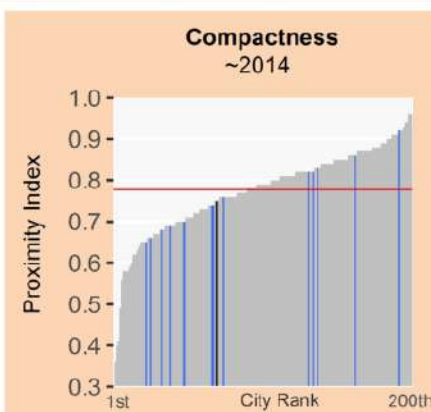
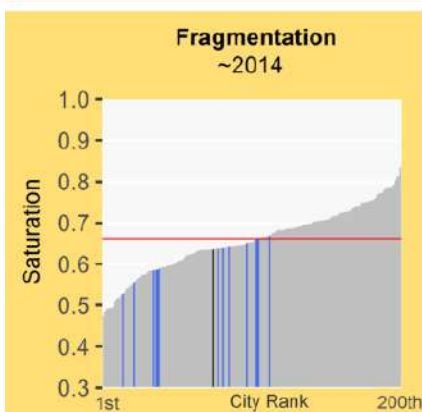
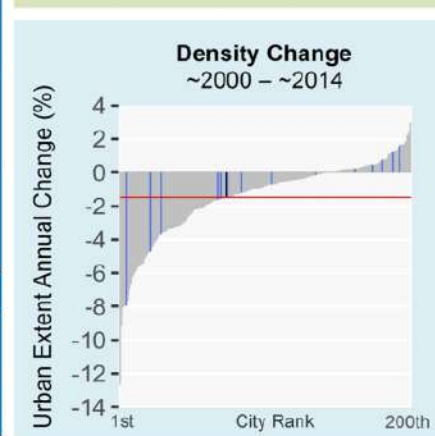
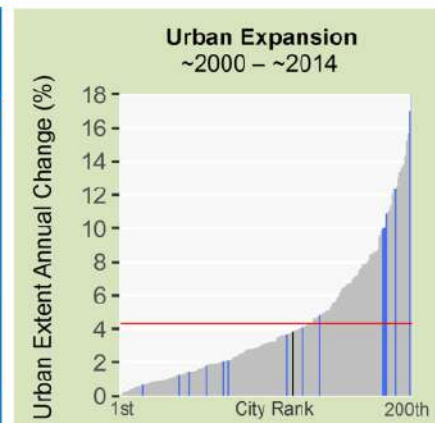
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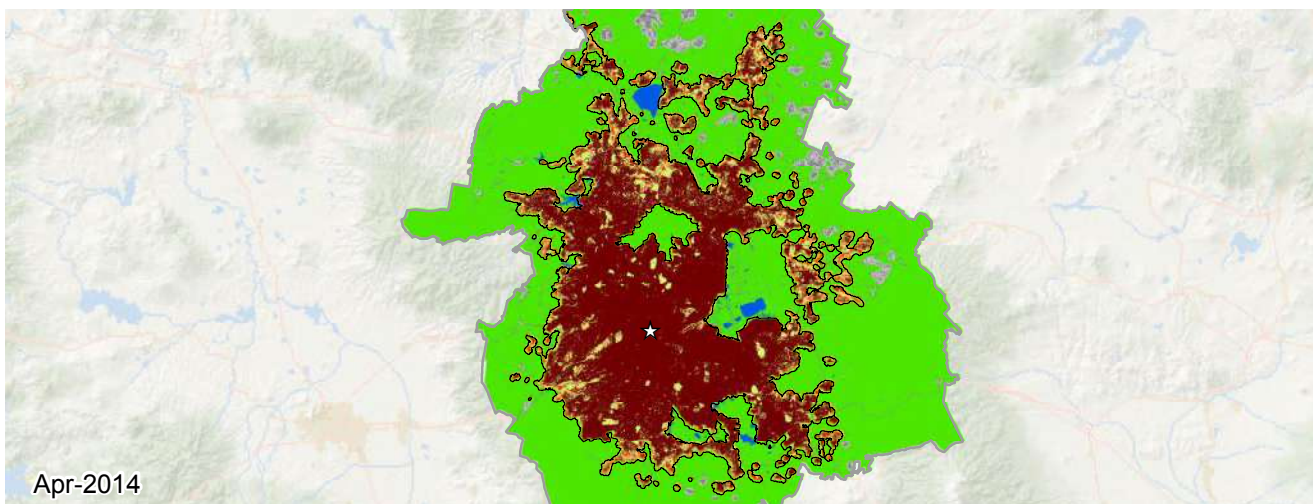
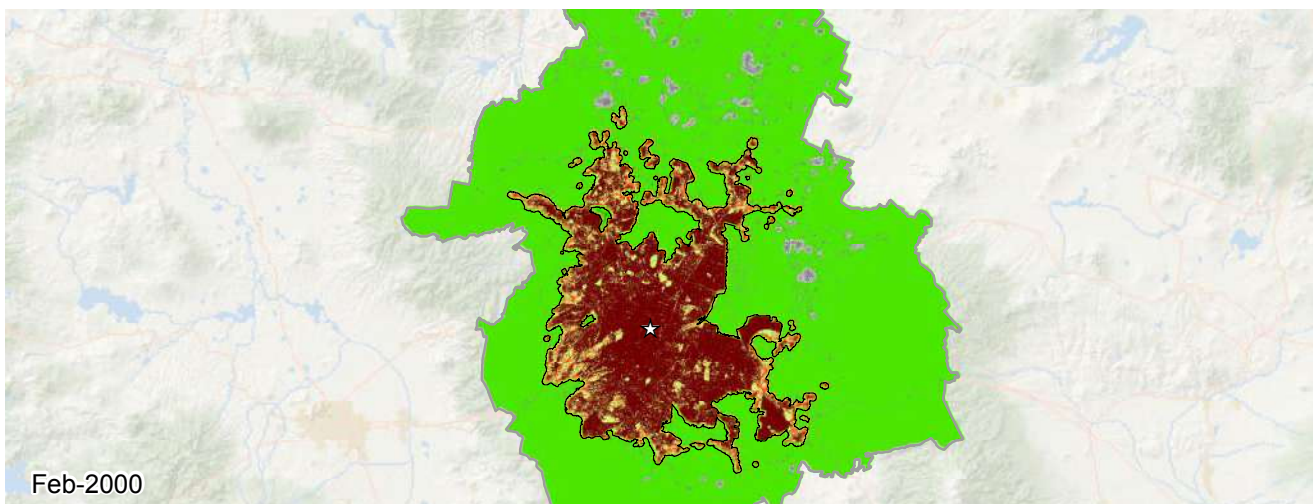
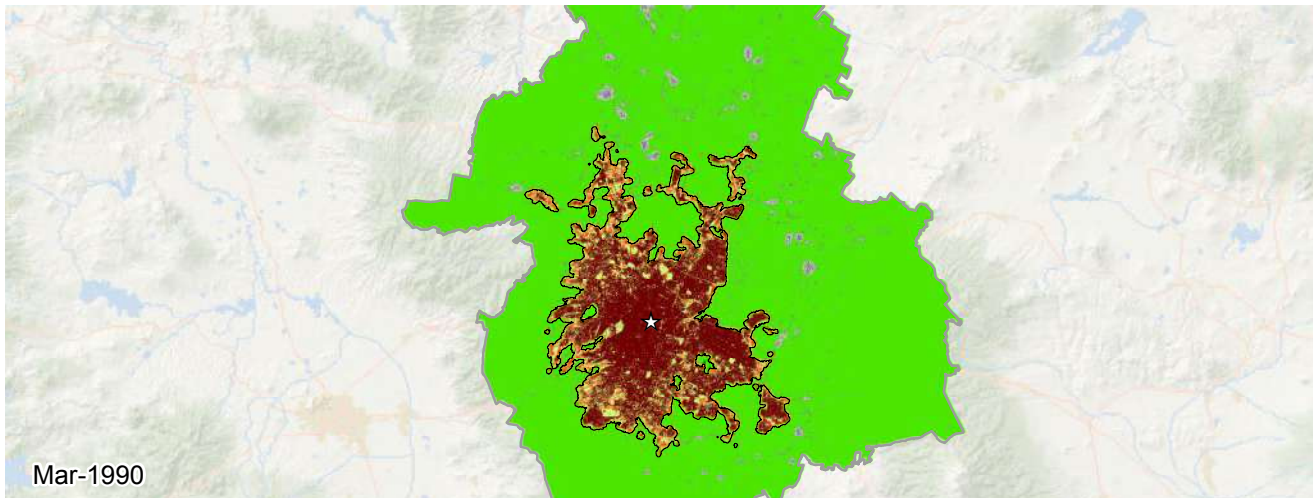
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Medan, Indonesia (Southeast Asia)



Metrics	Jun 1989	Jun 2001	Jun 2013	% Annual Change ('01-'13)
Population	1,214,039	2,863,705	3,771,803	2.3
Built-up Area (Hectares)				
Total	8,062	21,439	39,096	5.0
Urban	6,011	12,657	28,464	6.8
Suburban	1,877	8,132	9,933	1.7
Rural	173	649	698	0.6
Open space (Hectares)				
Urbanized Open Space	5,121	17,448	22,460	2.1
Urban Extent	13,184	38,888	61,556	3.8
Density (Persons / Hectare)				
Built-up Area Density	150.6	133.6	96.5	-2.7
Urban Extent Density	92.1	73.6	61.3	-1.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.61	0.55	0.64	1.2
Openness Index	0.31	0.39	0.31	-1.8
Compactness (Roundness)				
Proximity	0.88	0.66	0.75	1.1
Cohesion	0.86	0.64	0.73	1.1
Added Area (Hectares)	'89-'01	Share	'01-'13	Share
Infill	2,563	19%	7,256	41%
Extension	6,706	50%	6,363	36%
Leapfrog	14	0%	18	0%
Inclusion	4,091	30%	4,019	22%

















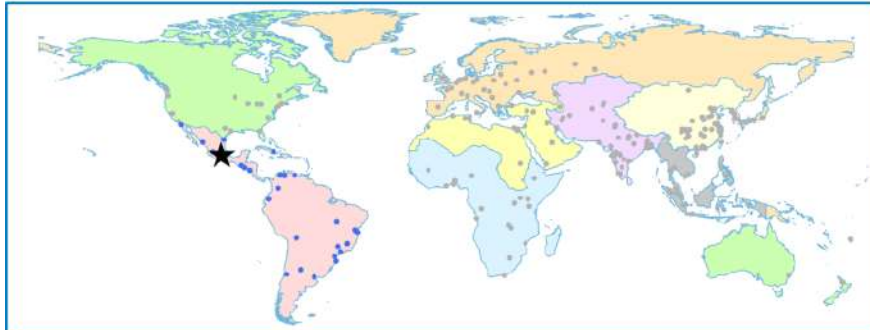
**Mexico City, Mexico
1990-2014**

0 10 20 30 40 km

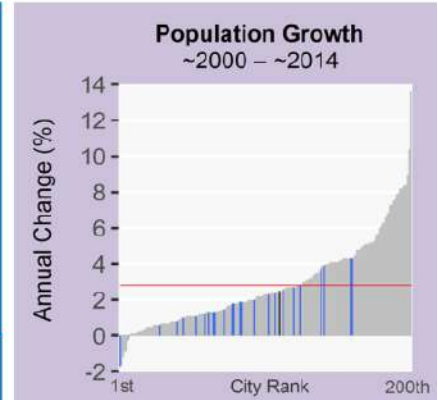
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	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

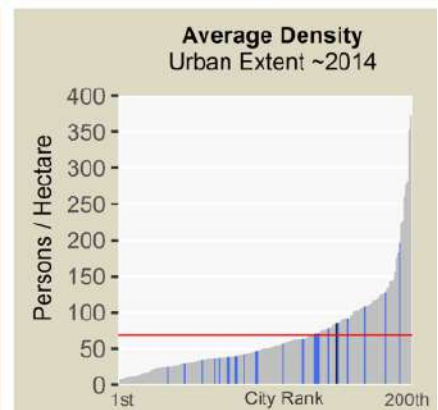
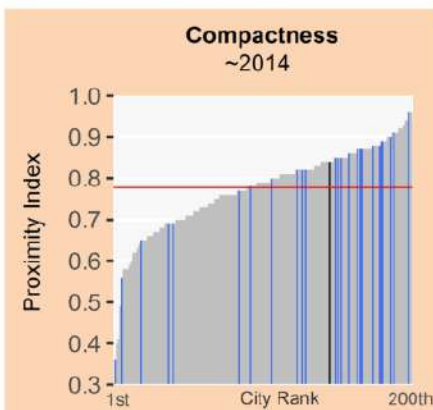
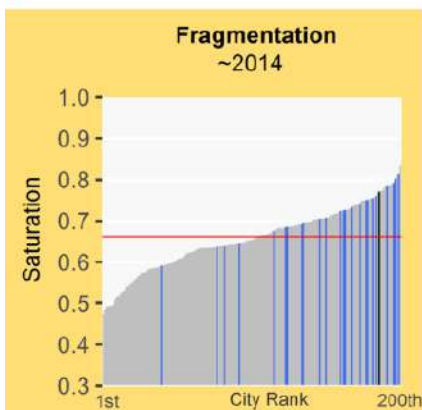
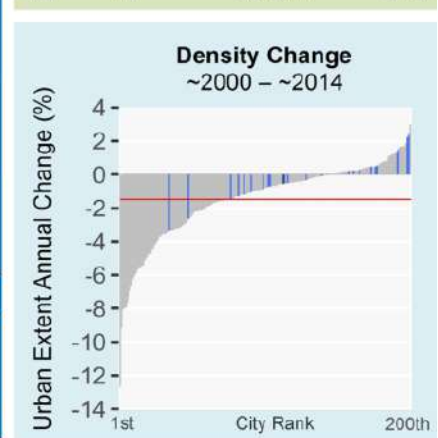
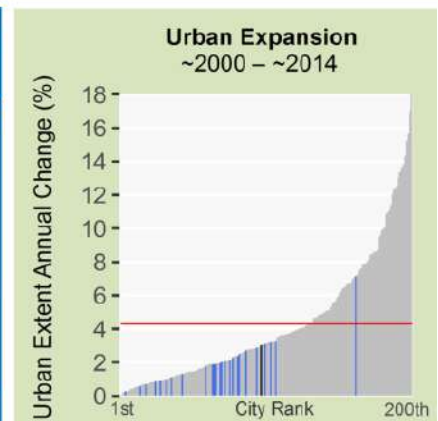
Mexico City, Mexico (Latin America and the Caribbean)

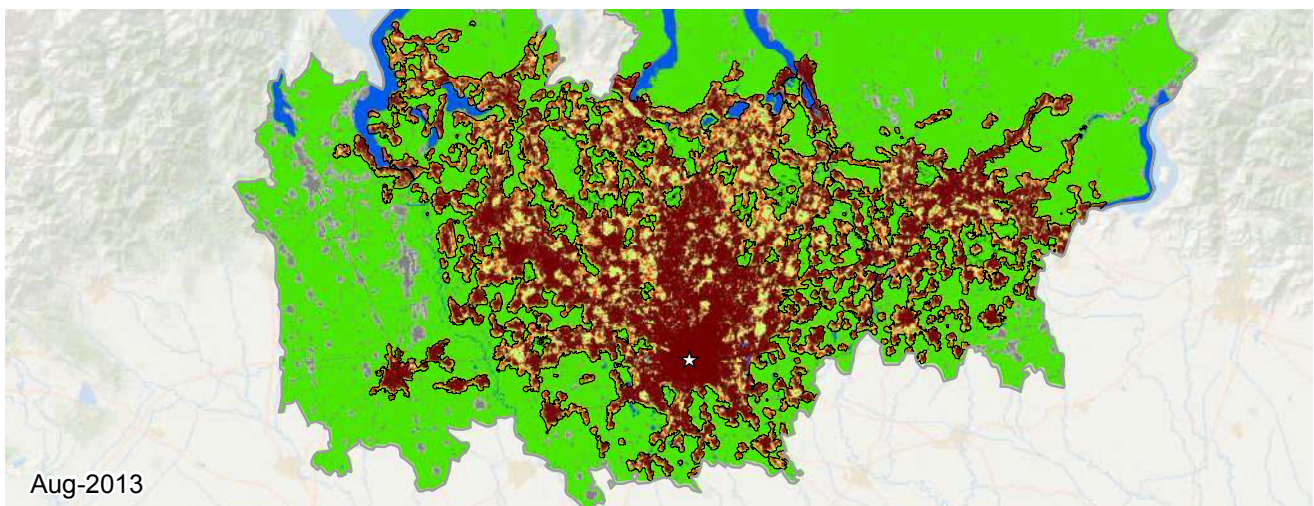
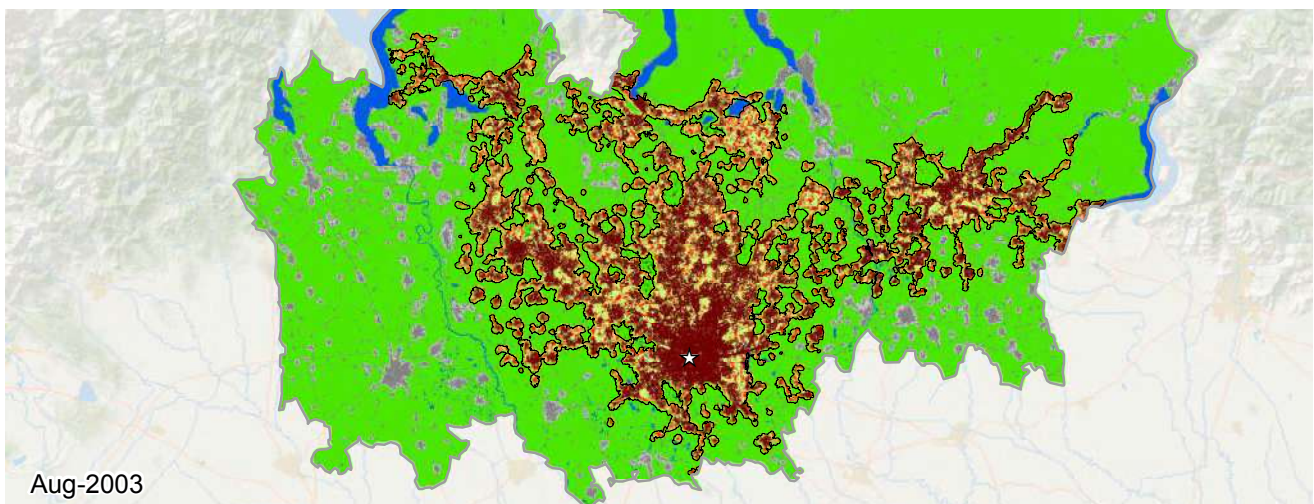
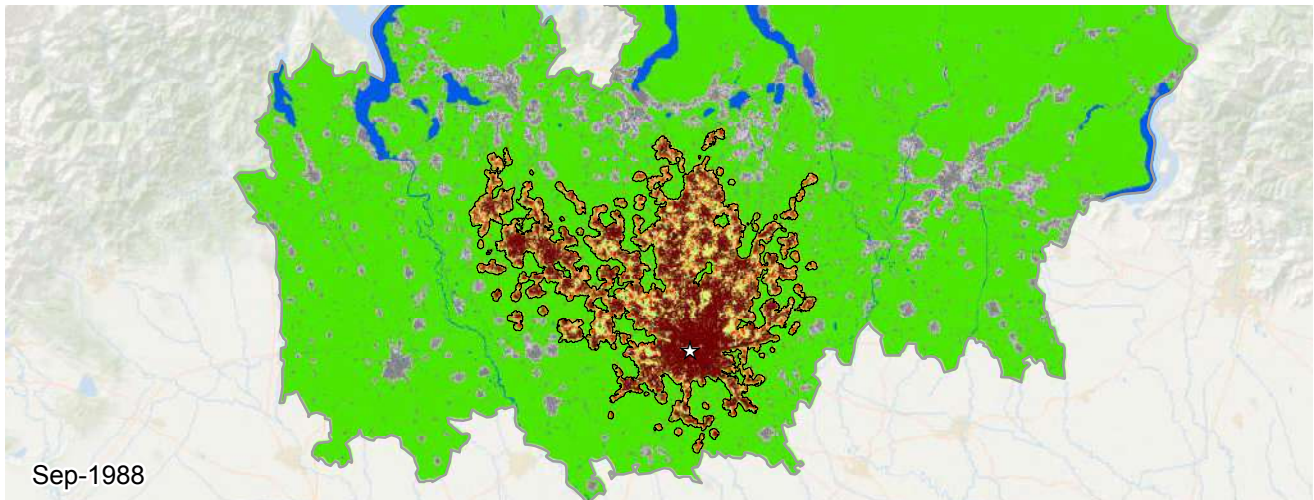


Legend for Charts
 Mexico City | Other cities in region | All other cities | Global average



Metrics	Mar 1990	Feb 2000	Apr 2014	% Annual Change ('00-'14)
Population	9,781,971	12,514,238	17,765,120	2.5
Built-up Area (Hectares)				
Total	70,948	99,113	161,821	3.5
Urban	60,525	87,725	144,222	3.5
Suburban	9,765	10,612	16,363	3.1
Rural	657	775	1,235	3.3
Open space (Hectares)				
Urbanized Open Space	32,514	37,363	48,198	1.8
Urban Extent	103,462	136,476	210,019	3.0
Density (Persons / Hectare)				
Built-up Area Density	137.9	126.3	109.8	-1.0
Urban Extent Density	94.5	91.7	84.6	-0.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.69	0.73	0.77	0.4
Openness Index	0.25	0.20	0.16	-1.5
Compactness (Roundness)				
Proximity	0.87	0.87	0.84	-0.3
Cohesion	0.85	0.86	0.82	-0.3
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	12,360	43%	23,297	37%
Extension	11,733	41%	30,938	49%
Leapfrog	216	0%	502	0%
Inclusion	3,854	13%	7,969	12%





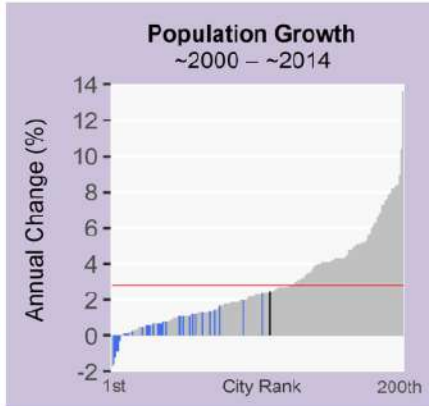
**Milan, Italy
1988-2013**

0 10 20 30 40 km

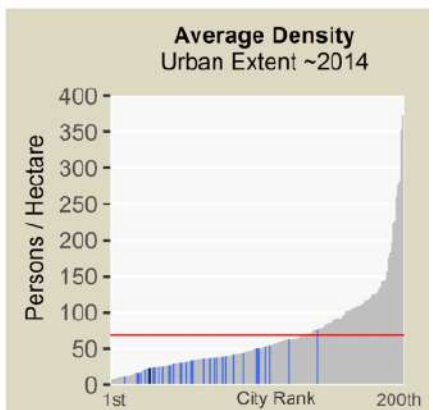
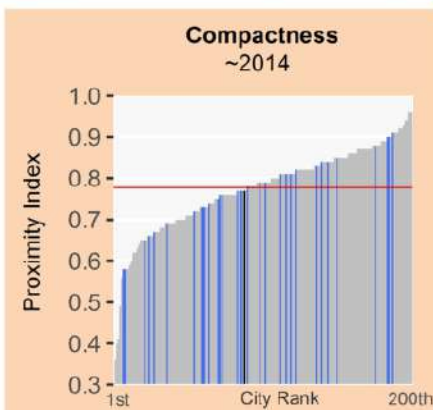
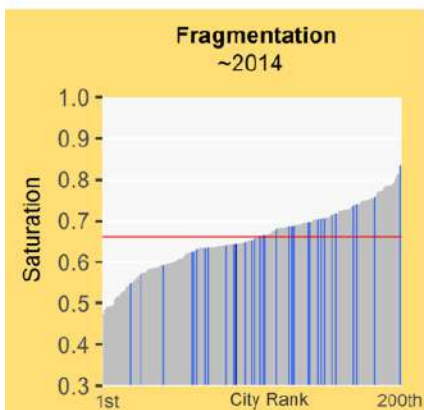
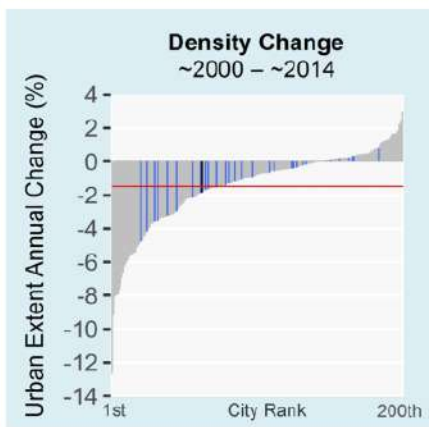
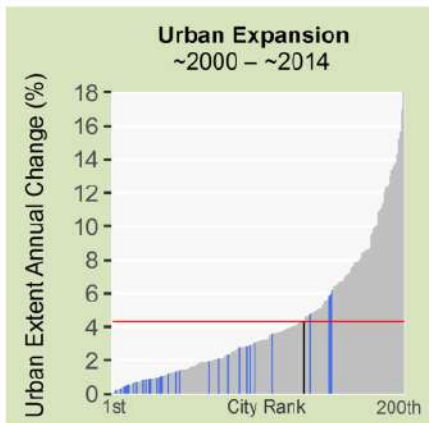
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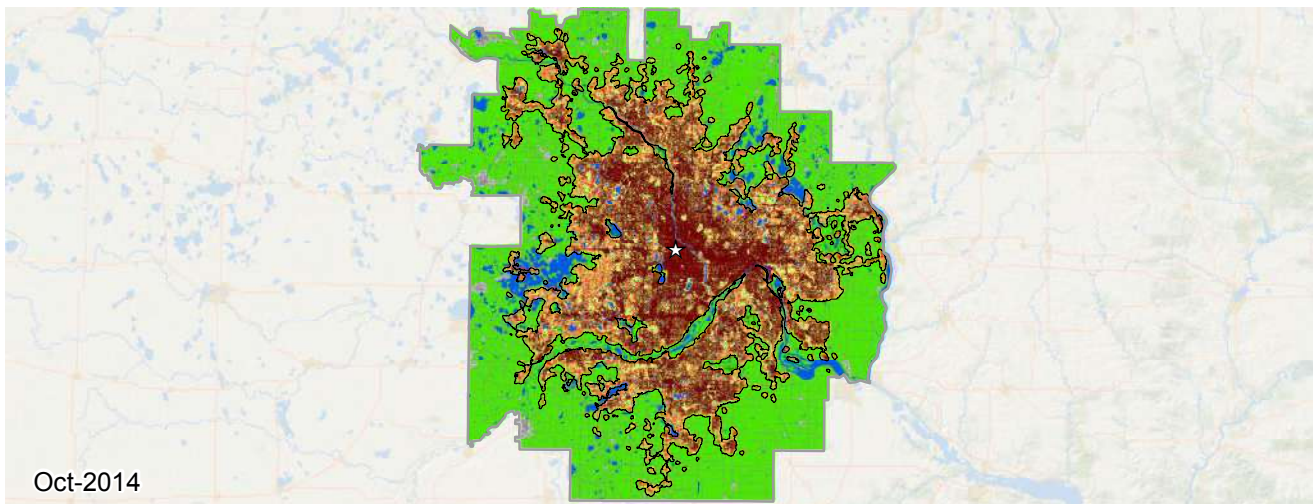
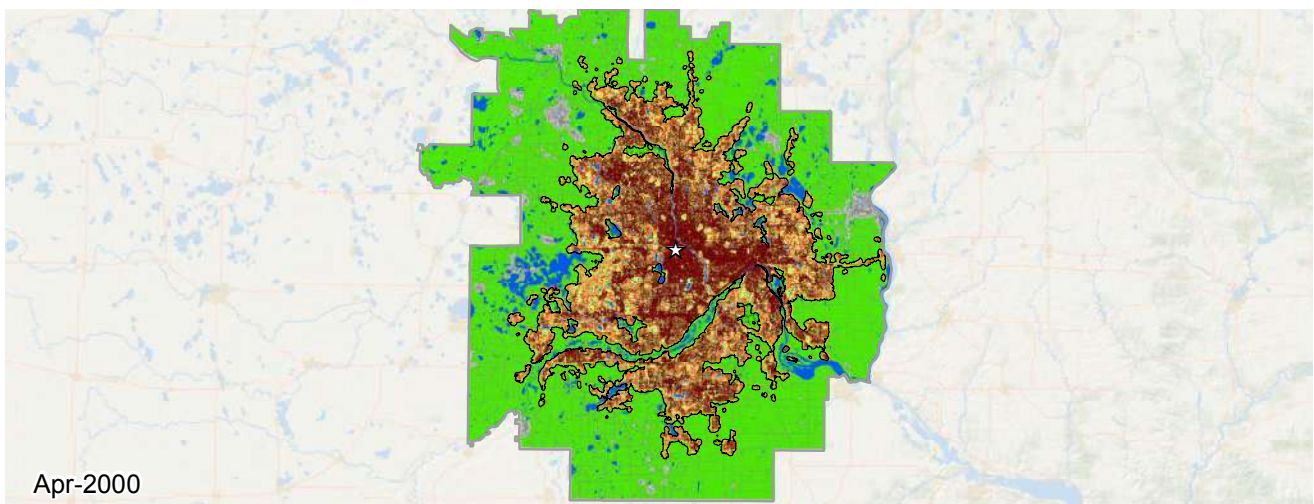
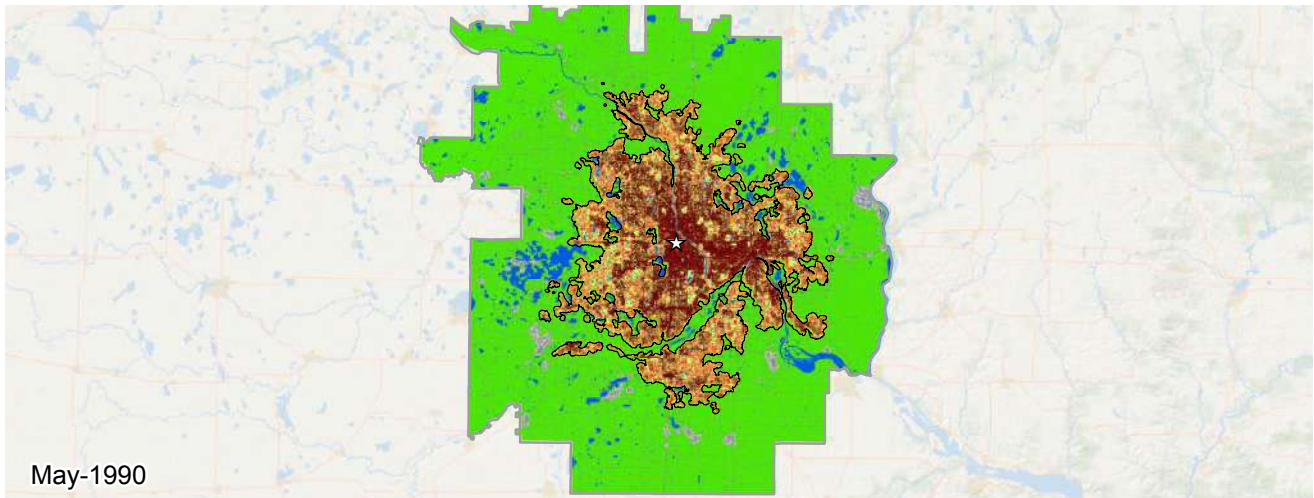
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Milan, Italy (Europe and Japan)



Metrics	Sep 1988	Aug 2003	Aug 2013	% Annual Change ('03-'13)
Population	3,506,838	4,971,192	6,402,051	2.5
Built-up Area (Hectares)				
Total	51,115	102,617	178,364	5.5
Urban	34,810	67,958	136,813	7.0
Suburban	15,124	32,224	38,760	1.8
Rural	1,180	2,433	2,790	1.4
Open space (Hectares)				
Urbanized Open Space	37,302	76,384	98,812	2.6
Urban Extent	88,417	179,001	277,177	4.4
Density (Persons / Hectare)				
Built-up Area Density	68.6	48.4	35.9	-3.0
Urban Extent Density	39.7	27.8	23.1	-1.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.58	0.57	0.64	1.2
Openness Index	0.37	0.39	0.31	-2.1
Compactness (Roundness)				
Proximity	0.81	0.69	0.77	1.1
Cohesion	0.80	0.67	0.76	1.2
Added Area (Hectares)	'88-'03	Share	'03-'13	Share
Infill	11,292	21%	31,516	41%
Extension	11,685	22%	18,090	23%
Leapfrog	542	1%	515	0%
Inclusion	27,981	54%	25,628	33%

















**Minneapolis, United States
1990-2014**

0 20 40 60 80 km

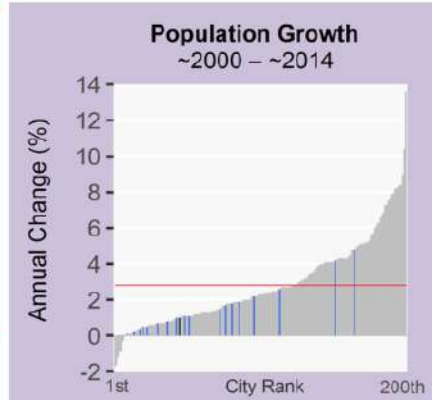
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	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

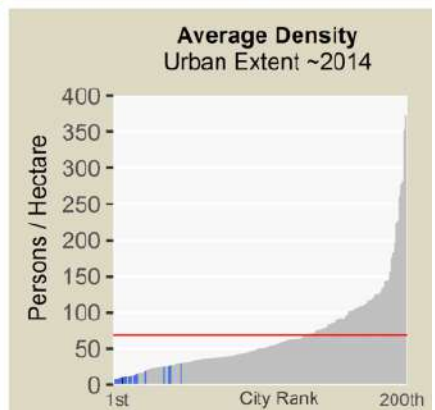
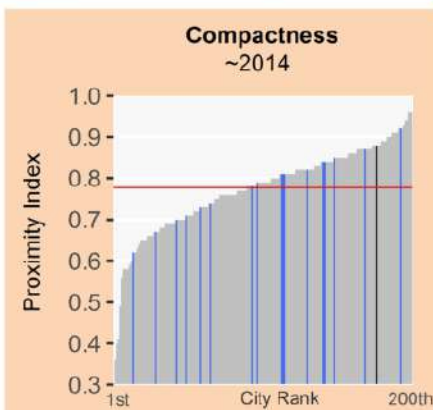
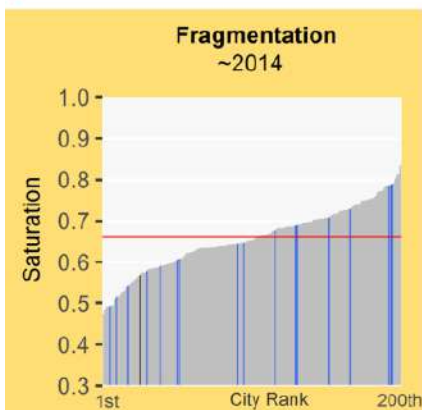
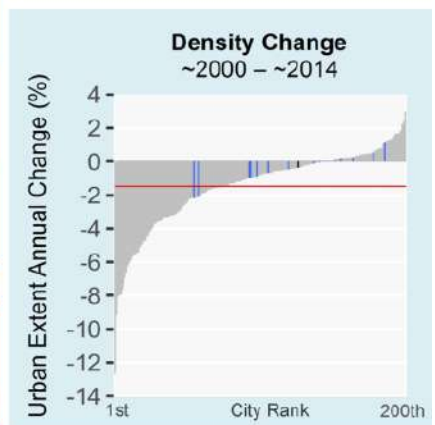
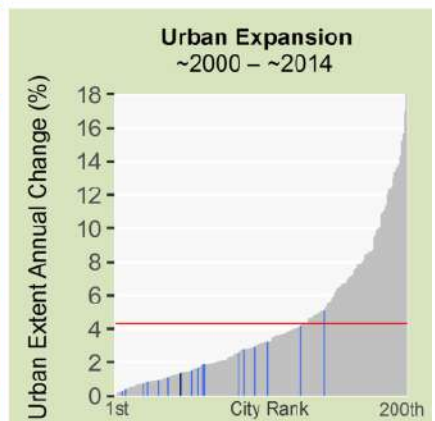
Minneapolis, United States (Land-Rich Developed Countries)

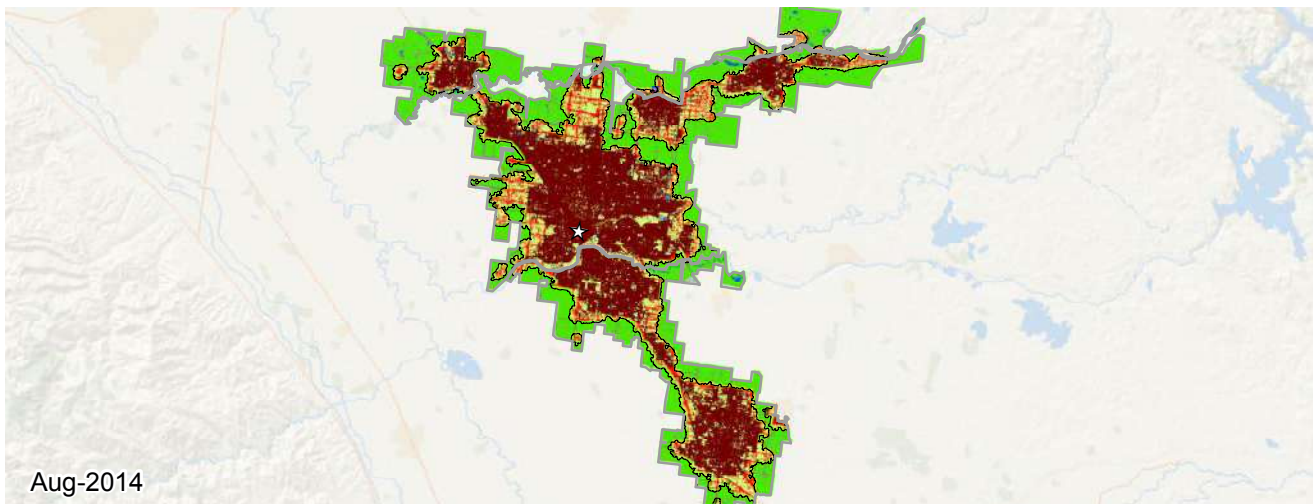
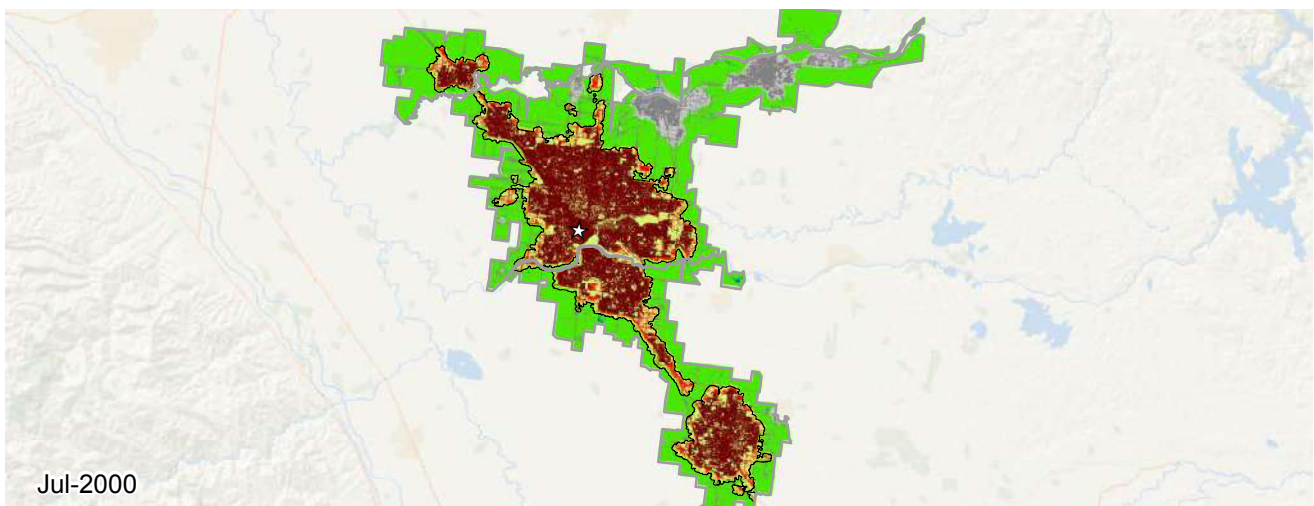
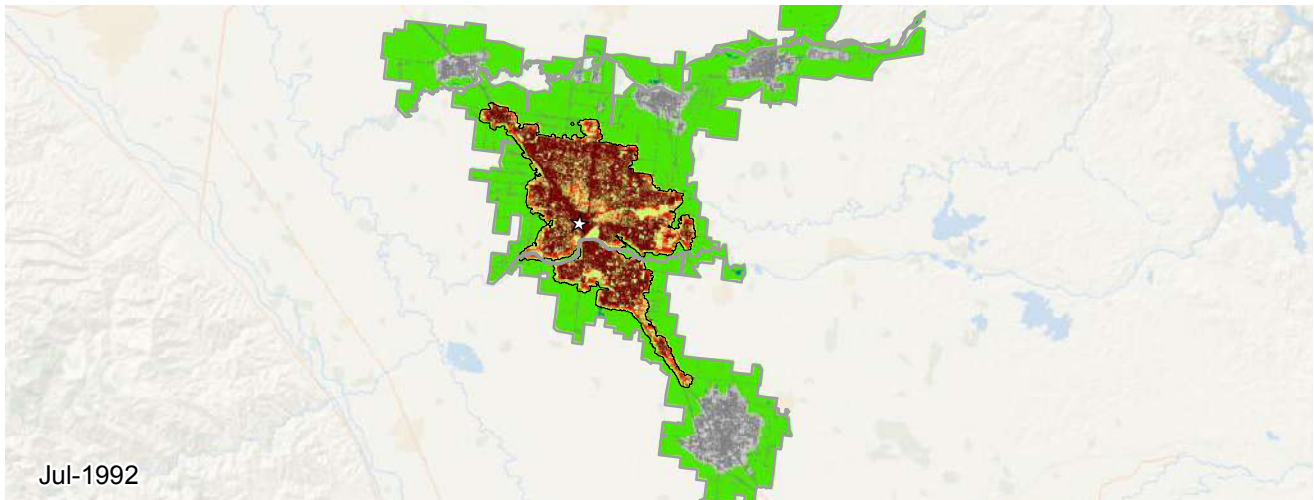


Legend for Charts
 Minneapolis | Other cities in region | All other cities | Global average



Metrics	May 1990	Apr 2000	Oct 2014	% Annual Change ('00-'14)
Population	1,899,162	2,281,581	2,626,919	1.0
Built-up Area (Hectares)				
Total	83,672	117,302	142,873	1.4
Urban	52,233	81,360	98,967	1.4
Suburban	29,609	33,676	40,845	1.3
Rural	1,829	2,265	3,059	2.1
Open space (Hectares)				
Urbanized Open Space	71,915	89,217	108,382	1.3
Urban Extent	155,587	206,520	251,256	1.4
Density (Persons / Hectare)				
Built-up Area Density	22.7	19.5	18.4	-0.4
Urban Extent Density	12.2	11.0	10.5	-0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.57	0.57	0.0
Openness Index	0.41	0.38	0.38	0.0
Compactness (Roundness)				
Proximity	0.90	0.90	0.88	-0.1
Cohesion	0.89	0.88	0.87	-0.1
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	12,915	38%	9,349	36%
Extension	11,571	34%	3,375	13%
Leapfrog	45	0%	2,199	8%
Inclusion	9,096	27%	10,646	41%





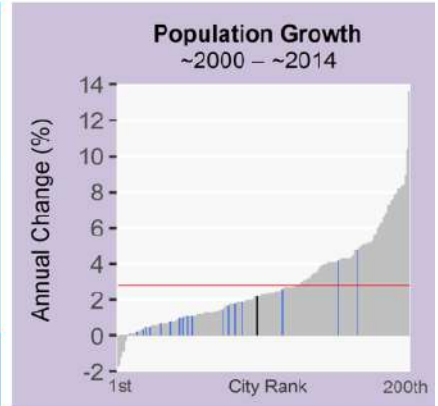
Modesto, United States
1992-2014

0 6 12 18 24 km

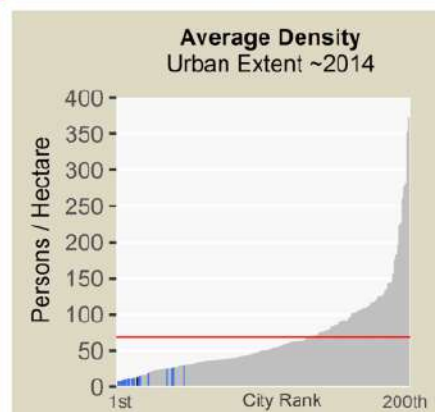
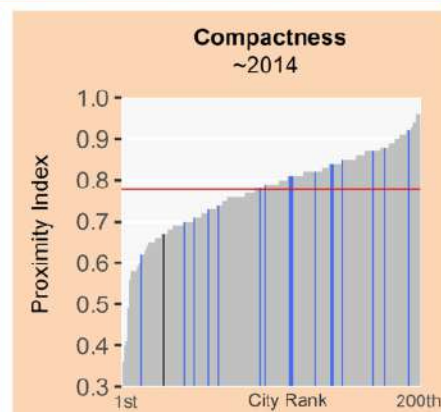
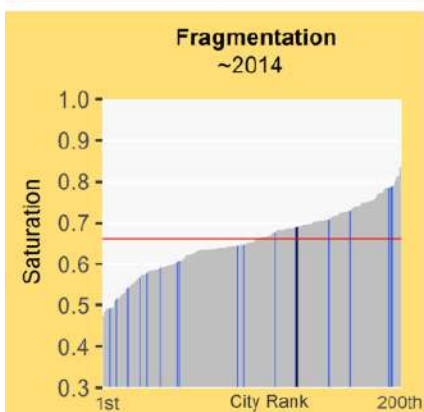
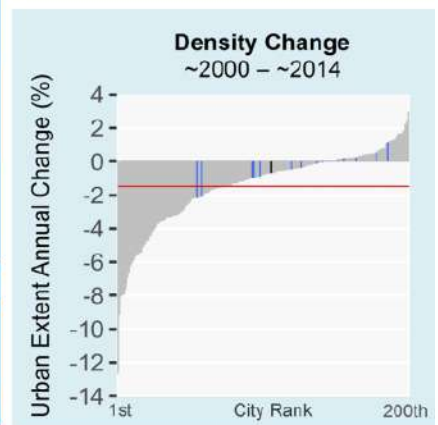
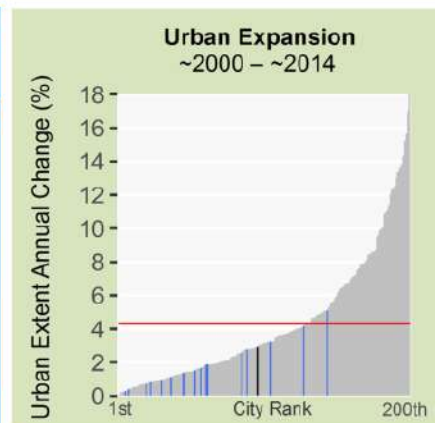
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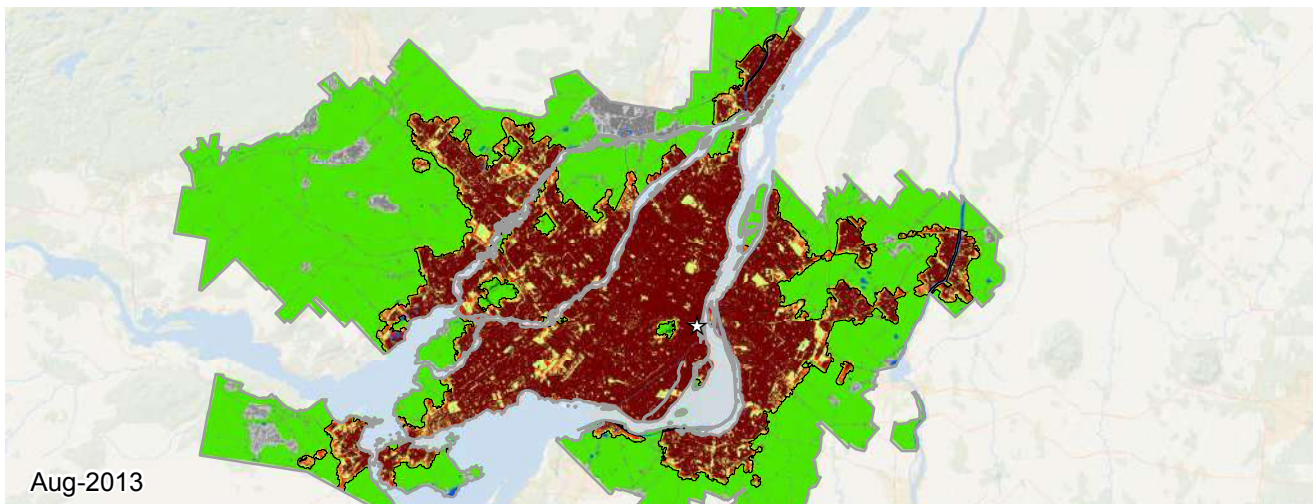
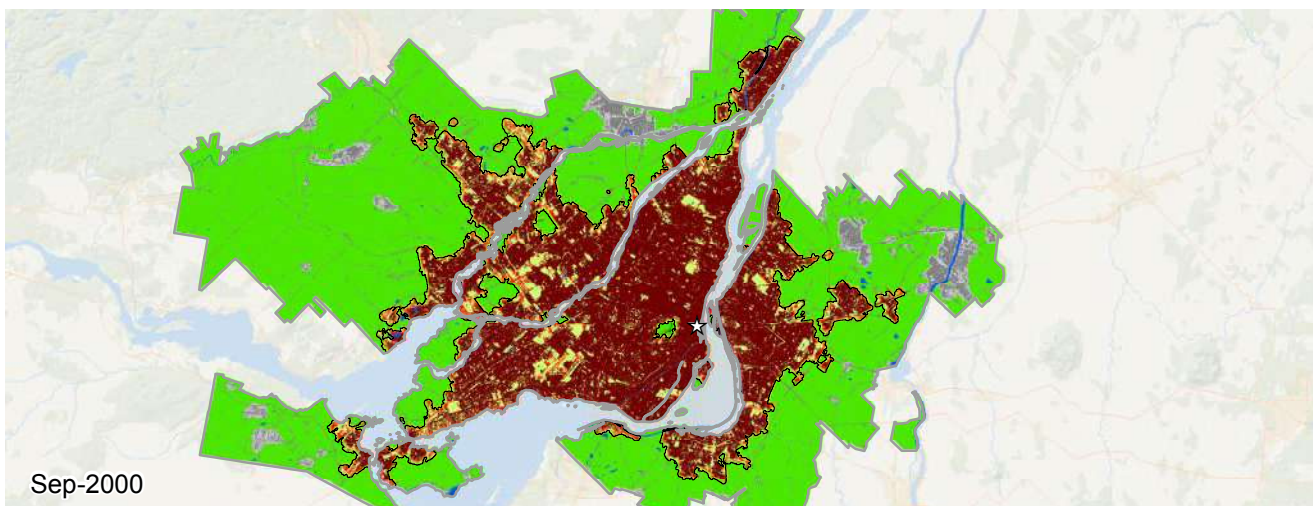
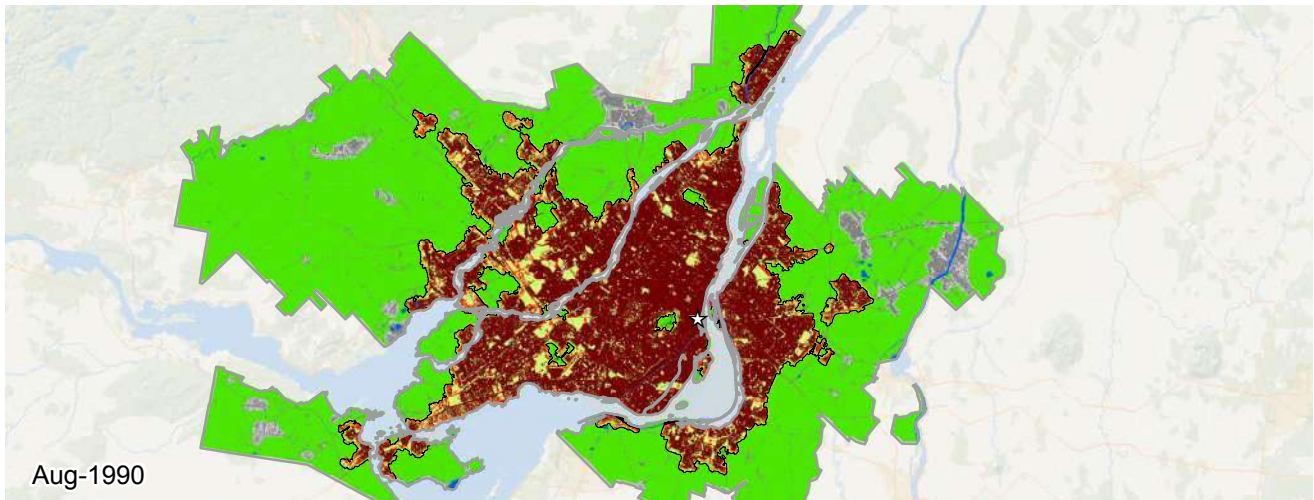
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Modesto, United States (Land-Rich Developed Countries)



Metrics	Jul 1992	Jul 2000	Aug 2014	% Annual Change ('00-'14)
Population	232,878	334,839	458,145	2.2
Built-up Area (Hectares)				
Total	8,769	14,852	22,728	3.0
Urban	7,052	12,526	18,629	2.8
Suburban	1,640	2,117	3,772	4.1
Rural	76	208	325	3.2
Open space (Hectares)				
Urbanized Open Space	5,167	6,996	10,247	2.7
Urban Extent	13,937	21,849	32,975	2.9
Density (Persons / Hectare)				
Built-up Area Density	26.6	22.5	20.2	-0.8
Urban Extent Density	16.7	15.3	13.9	-0.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.63	0.68	0.69	0.1
Openness Index	0.34	0.27	0.25	-0.6
Compactness (Roundness)				
Proximity	0.87	0.63	0.67	0.4
Cohesion	0.86	0.61	0.64	0.3
Added Area (Hectares)	'92-'00	Share	'00-'14	Share
Infill	2,138	35%	2,481	31%
Extension	1,175	19%	2,141	27%
Leapfrog	0	0%	0	0%
Inclusion	2,769	45%	3,259	41%





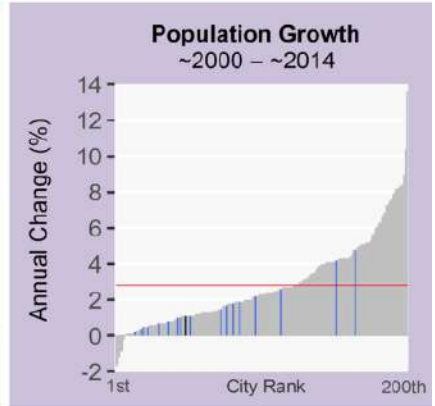
**Montreal, Canada
1990-2013**

0 8 16 24 32 km

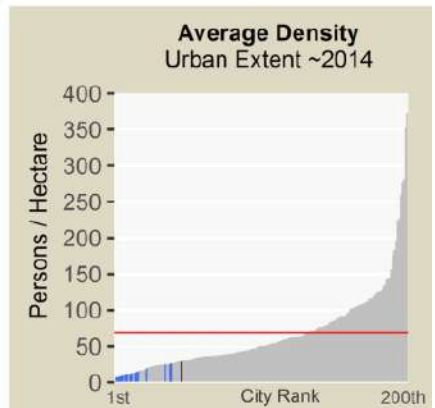
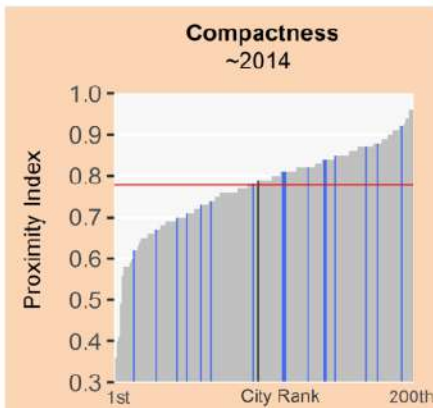
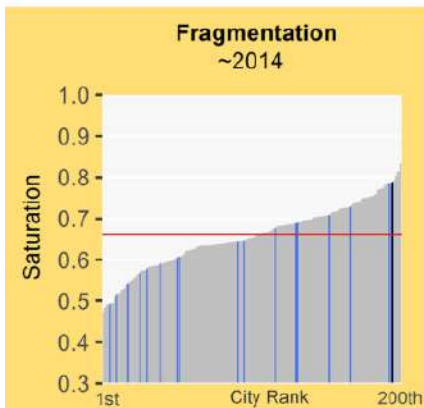
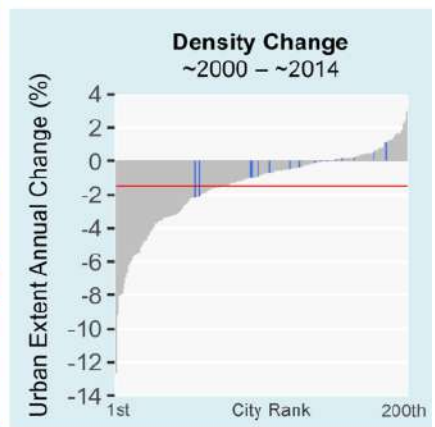
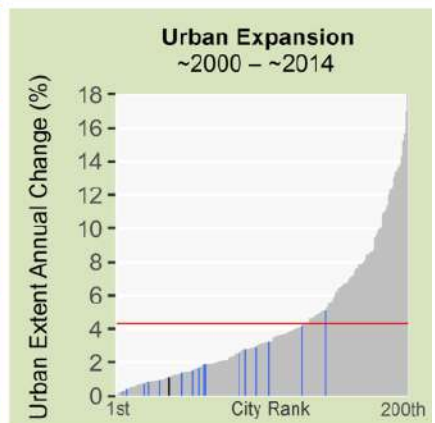
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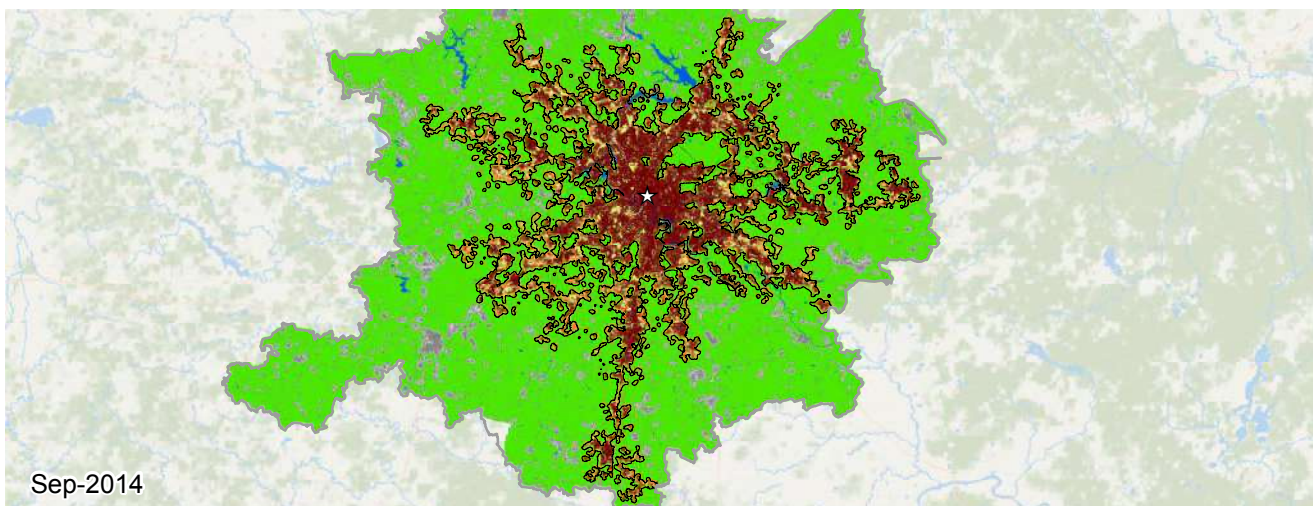
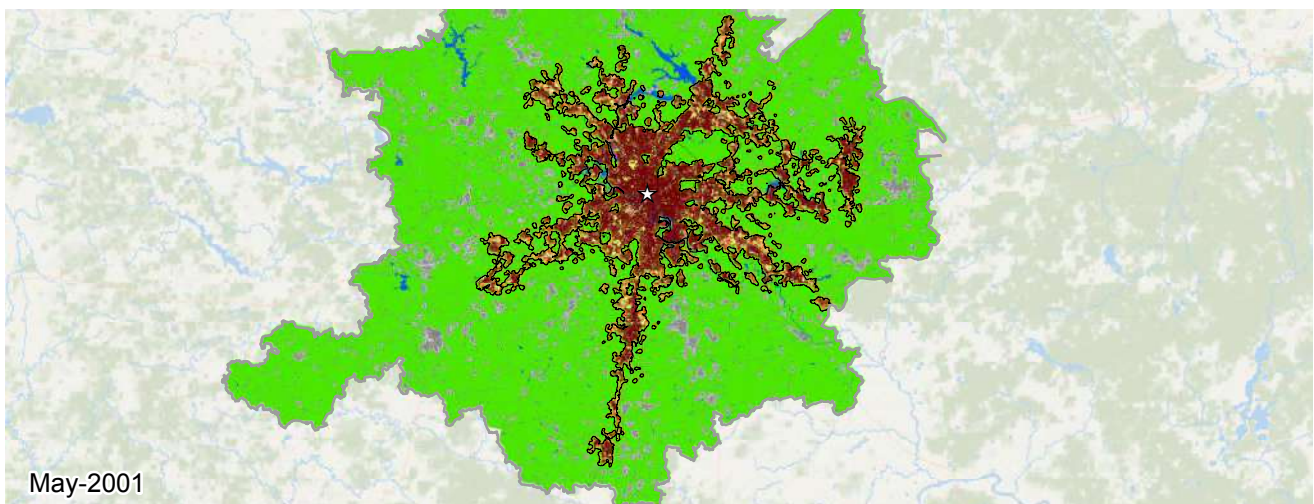
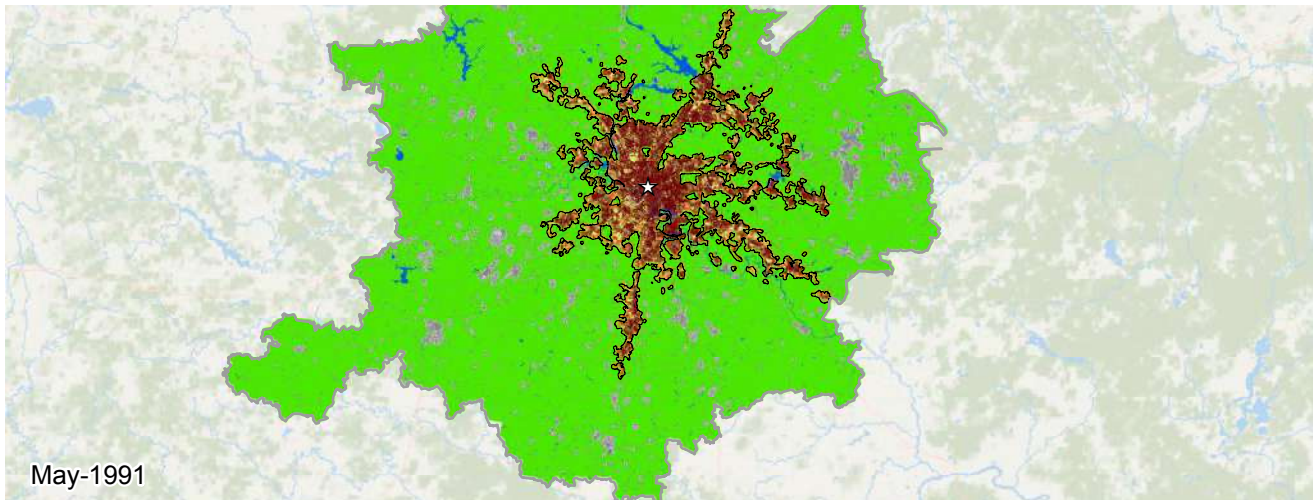
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Montreal, Canada (Land-Rich Developed Countries)



Metrics	Aug 1990	Sep 2000	Aug 2013	% Annual Change ('00-'13)
Population	2,719,908	2,870,229	3,317,850	1.1
Built-up Area (Hectares)				
Total	68,677	74,830	89,185	1.4
Urban	61,307	67,096	81,092	1.5
Suburban	6,969	7,257	7,606	0.4
Rural	399	476	486	0.2
Open space (Hectares)				
Urbanized Open Space	21,908	22,730	23,814	0.4
Urban Extent	90,585	97,560	112,999	1.1
Density (Persons / Hectare)				
Built-up Area Density	39.6	38.4	37.2	-0.2
Urban Extent Density	30.0	29.4	29.4	-0.0
Fragmentation				
Saturation (Built-up Area / Urb. Ext.)	0.76	0.77	0.79	0.2
Openness Index	0.22	0.21	0.19	-0.7
Compactness (Roundness)				
Proximity	0.82	0.82	0.79	-0.2
Cohesion	0.80	0.80	0.77	-0.4
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	3,005	48%	5,903	41%
Extension	1,529	24%	3,670	25%
Leapfrog	240	3%	733	5%
Inclusion	1,377	22%	4,046	28%





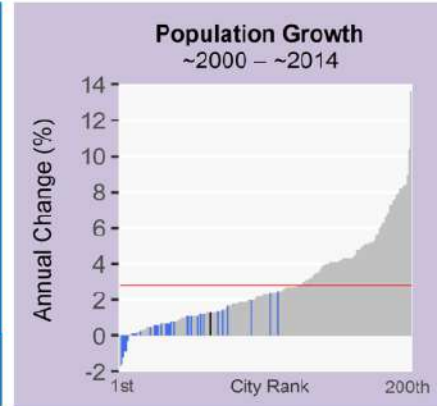
**Moscow, Russia
1991-2014**

0 20 40 60 80 km

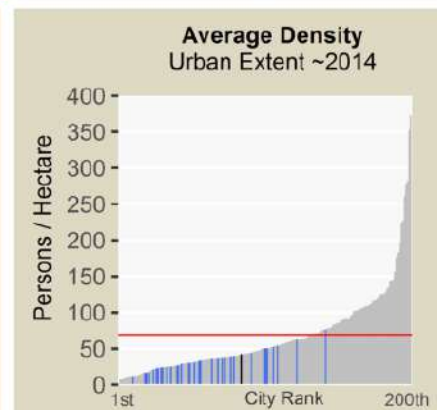
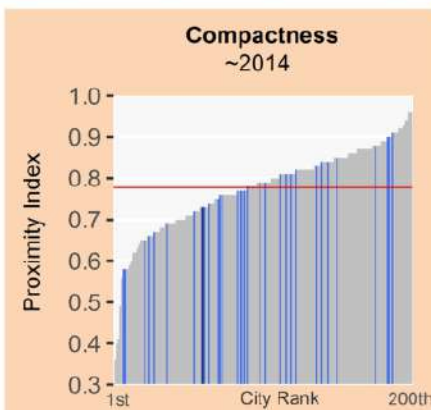
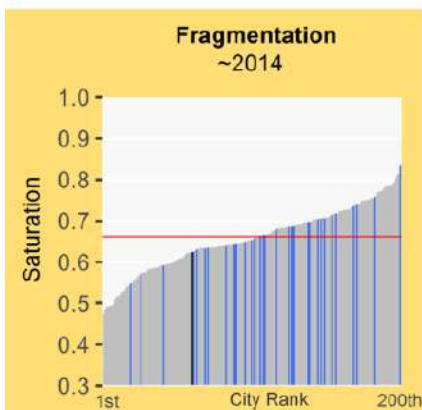
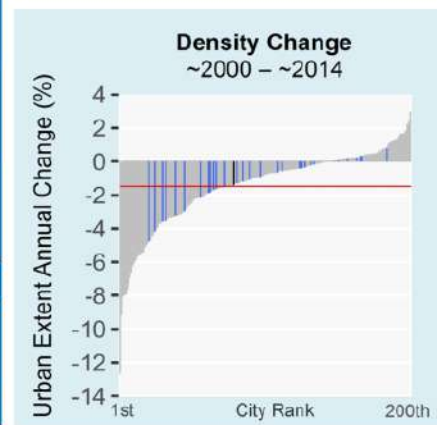
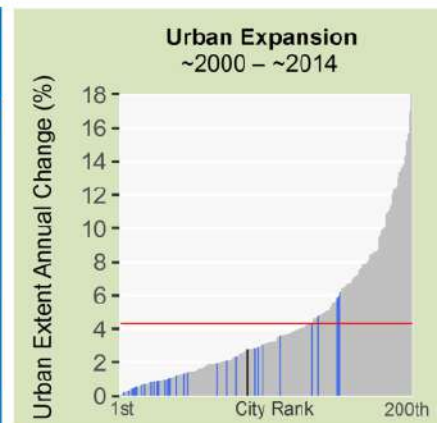
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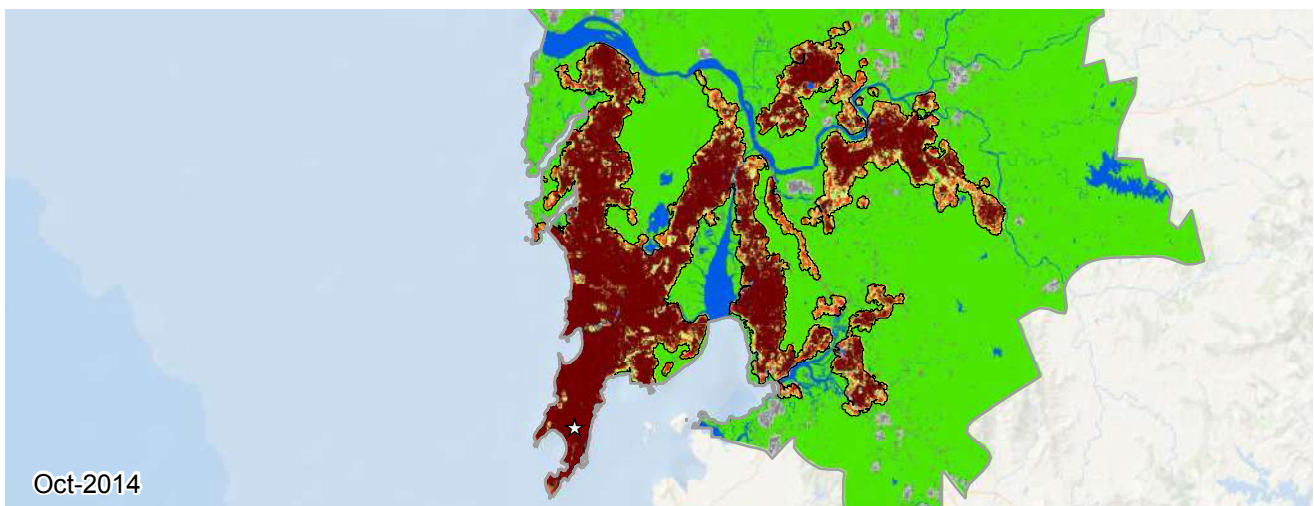
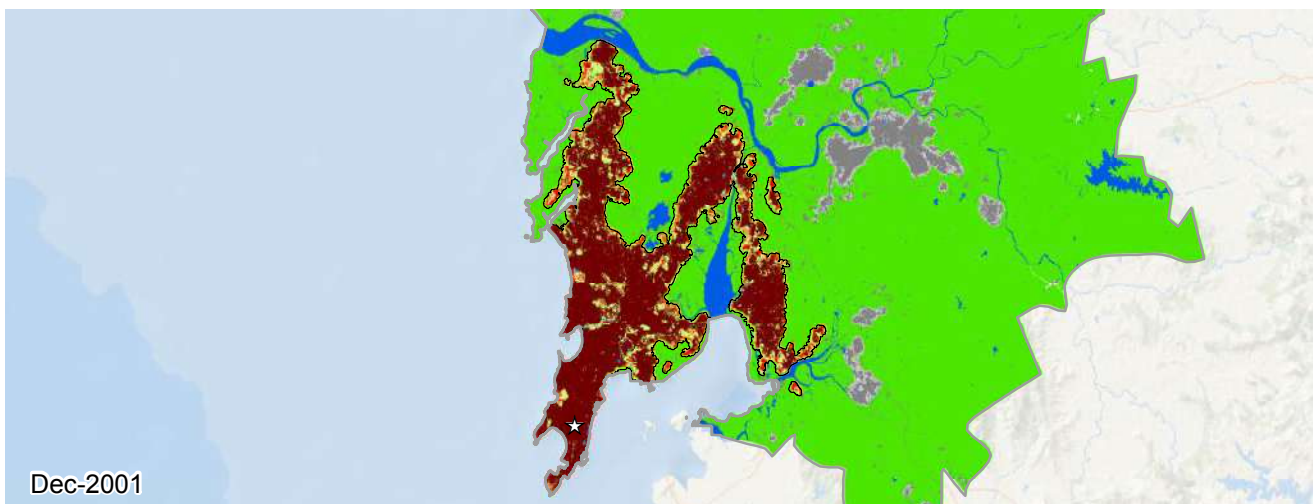
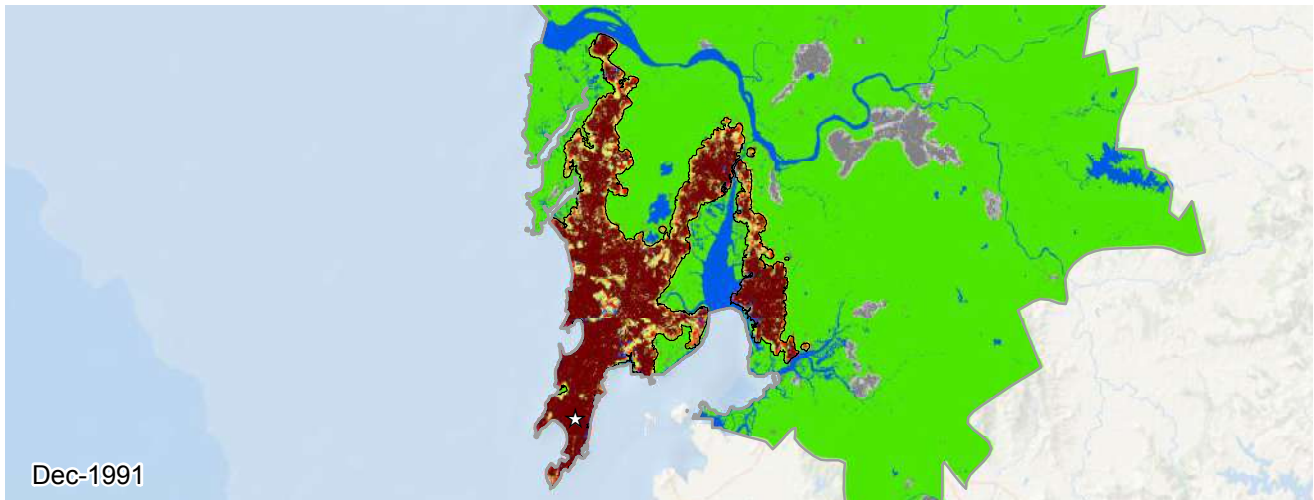
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Moscow, Russia (Europe and Japan)



Metrics	May 1991	May 2001	Sep 2014	% Annual Change ('01-'14)
Population	10,377,113	12,726,302	15,220,986	1.3
Built-up Area (Hectares)				
Total	108,908	160,019	223,435	2.5
Urban	79,370	120,685	160,937	2.2
Suburban	27,559	36,430	57,829	3.5
Rural	1,978	2,903	4,669	3.6
Open space (Hectares)				
Urbanized Open Space	67,361	87,547	134,159	3.2
Urban Extent	176,270	247,566	357,595	2.8
Density (Persons / Hectare)				
Built-up Area Density	95.3	79.5	68.1	-1.2
Urban Extent Density	58.9	51.4	42.6	-1.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.65	0.62	-0.3
Openness Index	0.36	0.33	0.34	0.3
Compactness (Roundness)				
Proximity	0.74	0.72	0.73	0.1
Cohesion	0.72	0.69	0.71	0.2
Added Area (Hectares)	'91-'01	Share	'01-'14	Share
Infill	18,610	36%	13,724	21%
Extension	10,795	21%	16,963	26%
Leapfrog	1,689	3%	2,939	4%
Inclusion	20,014	39%	29,788	46%





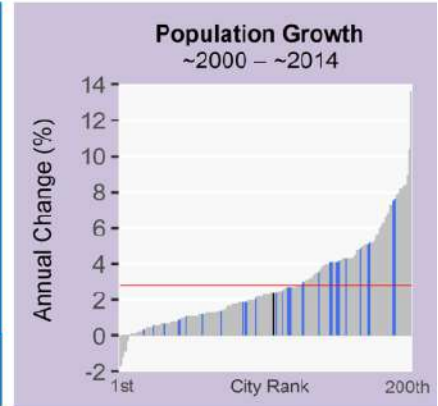
**Mumbai, India
1991-2014**

0 9 18 27 36 km

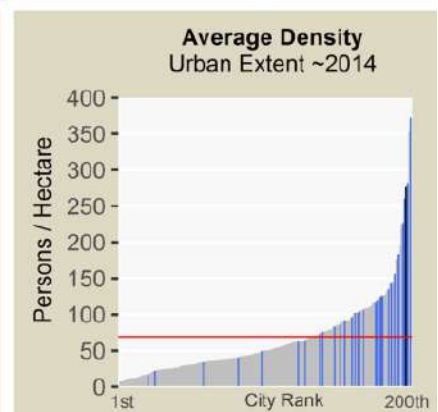
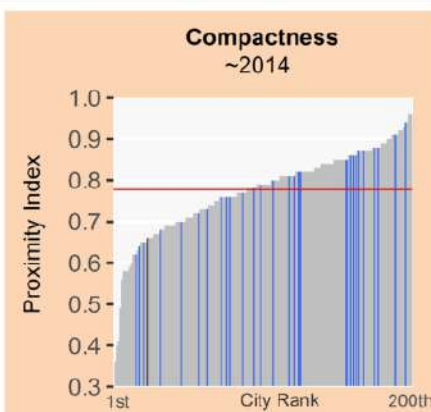
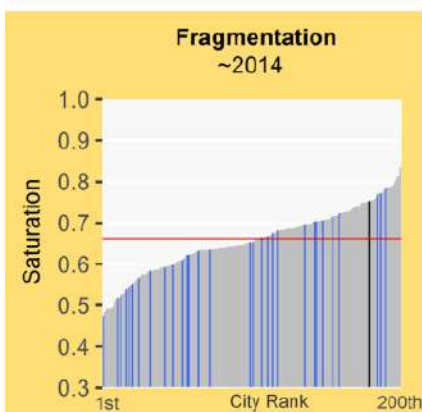
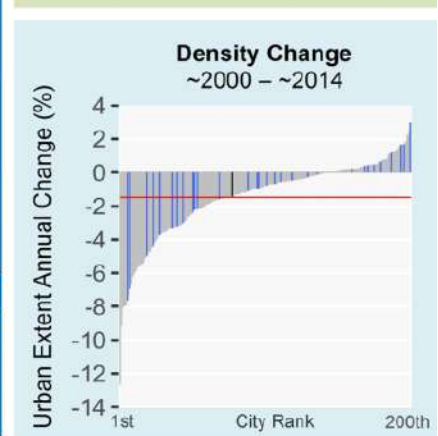
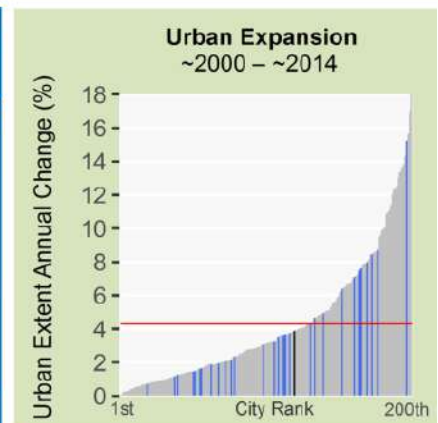
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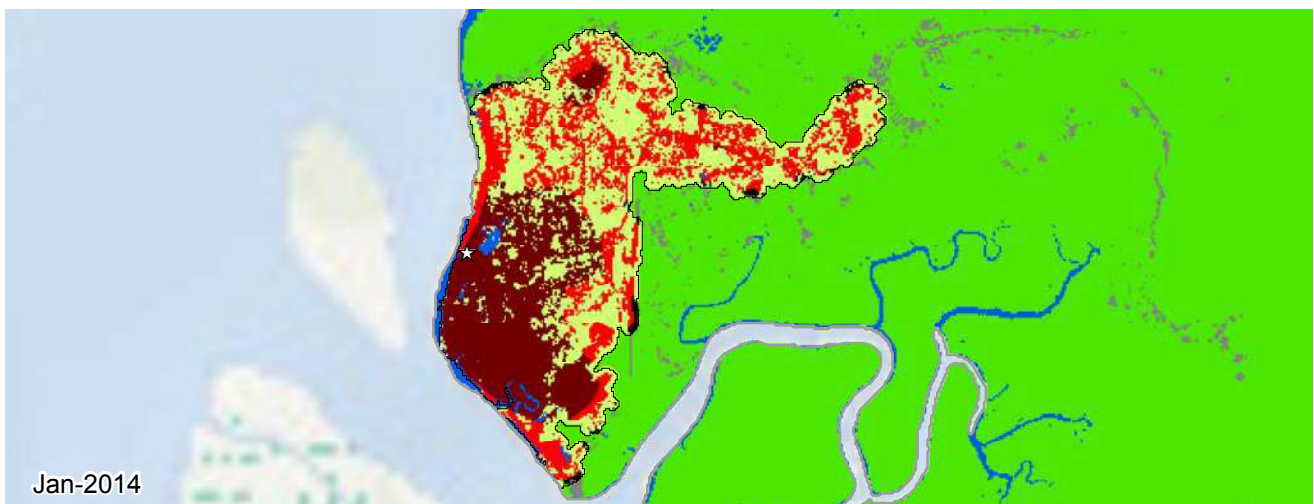
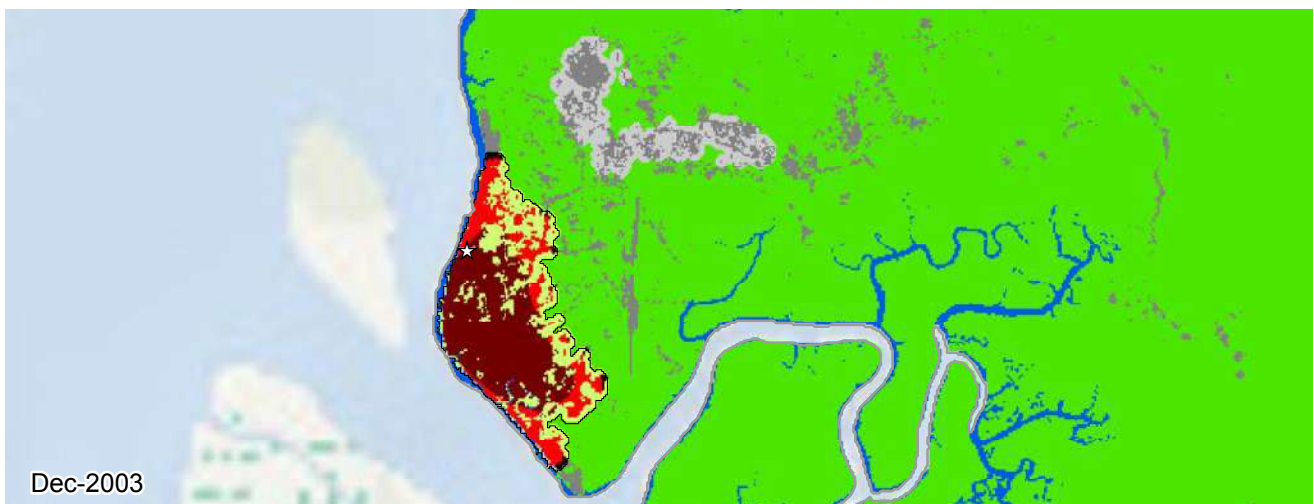
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Mumbai, India (South and Central Asia)



Metrics	Dec 1991	Dec 2001	Oct 2014	% Annual Change ('01-'14)
Population	11,786,684	14,344,153	19,601,844	2.4
Built-up Area (Hectares)				
Total	27,805	33,417	53,135	3.6
Urban	24,417	29,883	45,590	3.3
Suburban	3,193	3,318	6,957	5.8
Rural	195	215	587	7.8
Open space (Hectares)				
Urbanized Open Space	8,874	9,583	17,397	4.6
Urban Extent	36,680	43,000	70,532	3.9
Density (Persons / Hectare)				
Built-up Area Density	423.9	429.2	368.9	-1.2
Urban Extent Density	321.3	333.6	277.9	-1.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.76	0.78	0.75	-0.2
Openness Index	0.22	0.19	0.21	0.7
Compactness (Roundness)				
Proximity	0.69	0.71	0.66	-0.5
Cohesion	0.68	0.70	0.66	-0.4
Added Area (Hectares)	'91-'01	Share	'01-'14	Share
Infill	2,722	48%	3,868	19%
Extension	2,182	38%	3,524	17%
Leapfrog	72	1%	3,073	15%
Inclusion	634	11%	9,295	47%





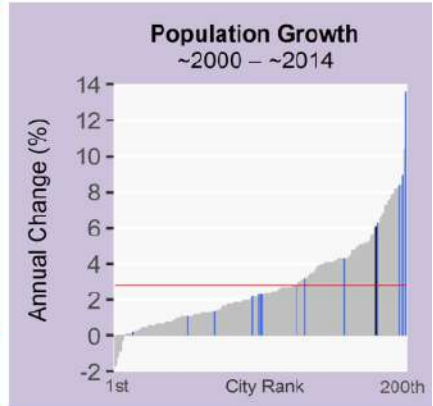
**Myeik, Myanmar
1991-2014**

0 1 2 3 4 km

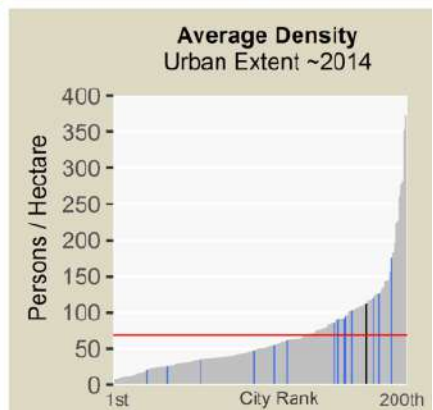
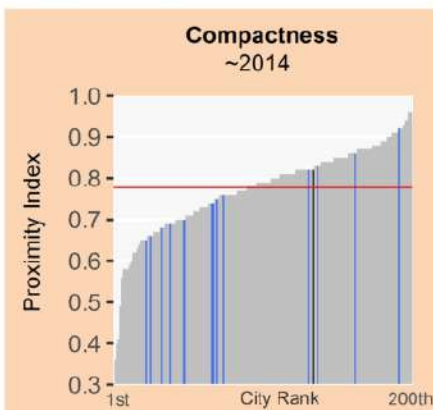
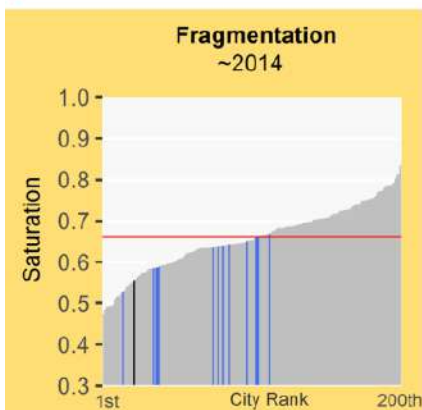
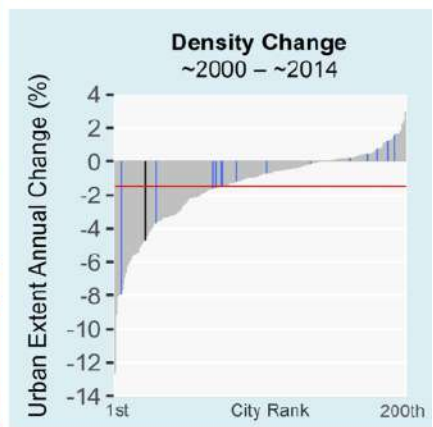
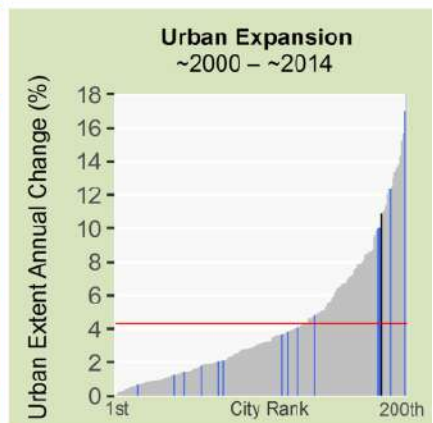
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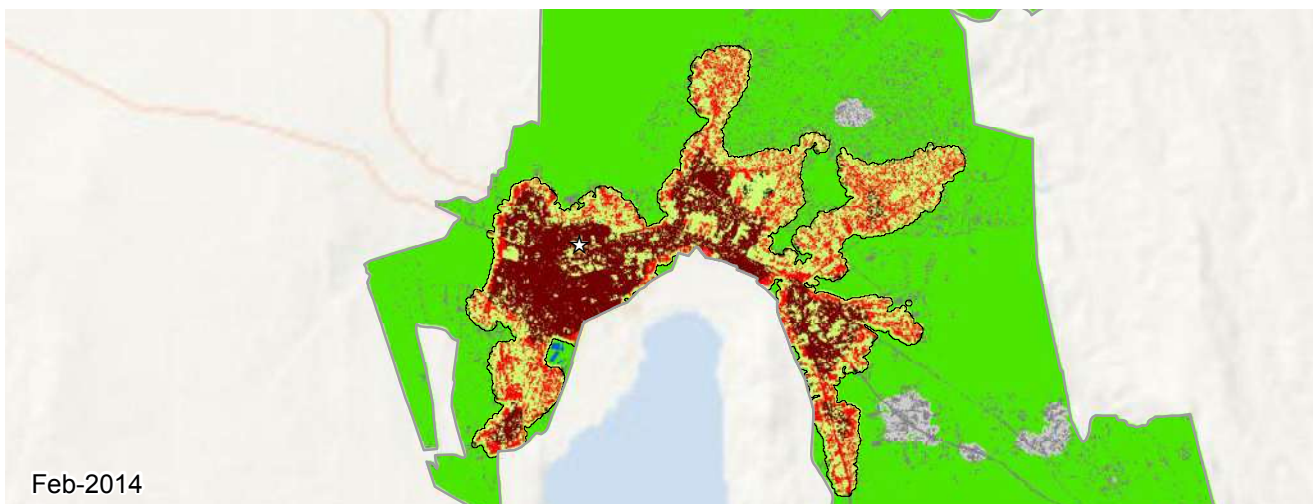
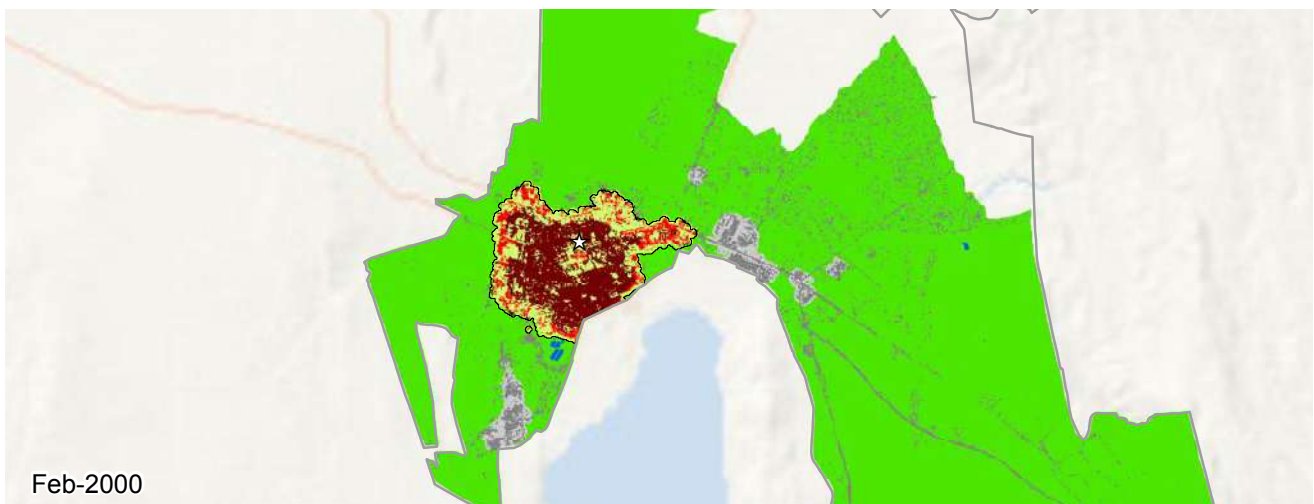
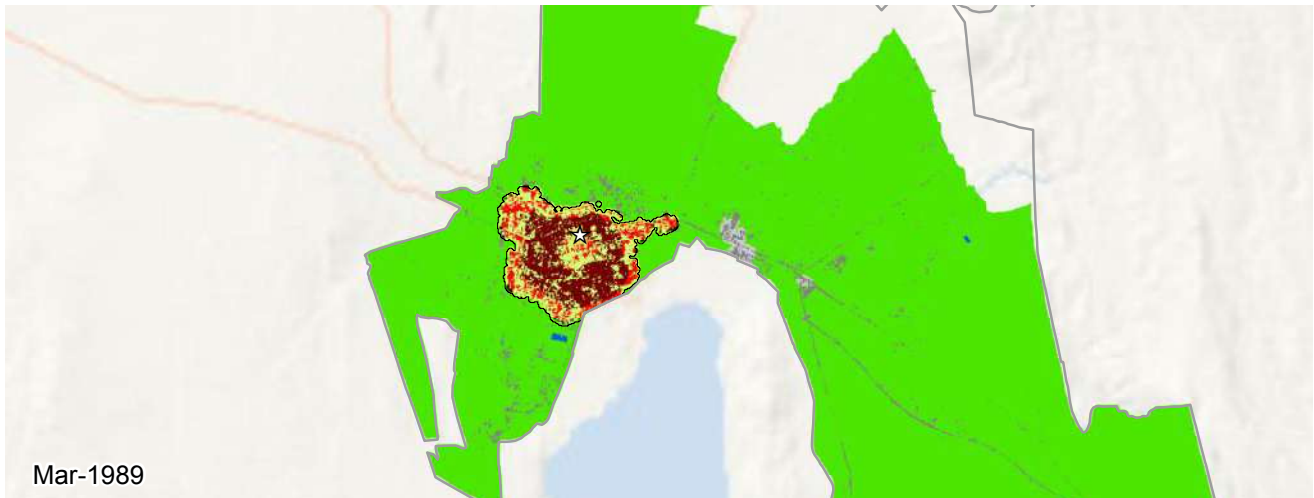
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Myeik, Myanmar (Southeast Asia)



Metrics	Feb 1991	Dec 2003	Jan 2014	% Annual Change ('03-'14)
Population	109,650	116,527	216,733	6.2
Built-up Area (Hectares)				
Total	320	430	1,079	9.1
Urban	217	296	553	6.2
Suburban	95	125	495	13.6
Rural	7	8	30	13.1
Open space (Hectares)				
Urbanized Open Space	164	216	860	13.7
Urban Extent	485	647	1,940	10.9
Density (Persons / Hectare)				
Built-up Area Density	341.8	270.7	200.8	-3.0
Urban Extent Density	226.0	180.1	111.7	-4.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.66	0.67	0.56	-1.8
Openness Index	0.42	0.38	0.44	1.6
Compactness (Roundness)				
Proximity	0.87	0.85	0.82	-0.4
Cohesion	0.86	0.85	0.81	-0.5
Added Area (Hectares)	'91-'03	Share	'03-'14	Share
Infill	35	31%	96	14%
Extension	52	47%	271	41%
Leapfrog	0	0%	0	0%
Inclusion	22	20%	281	43%

















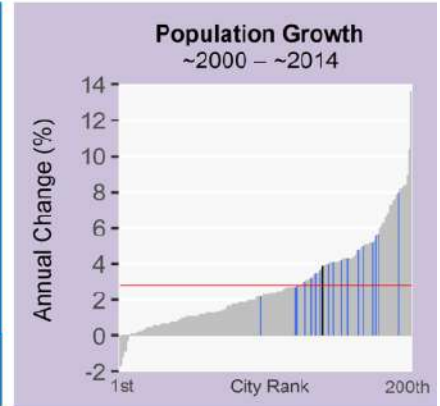
**Nakuru, Kenya
1989-2014**

0 3 6 9 12 km

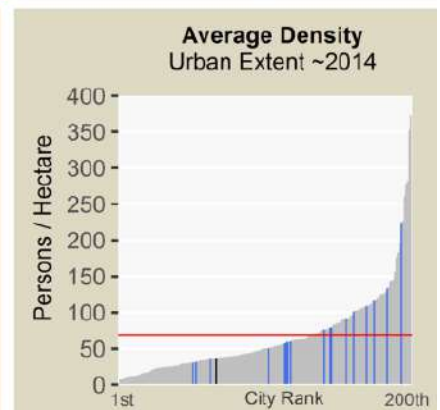
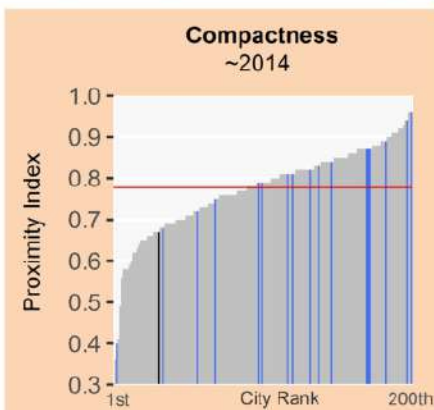
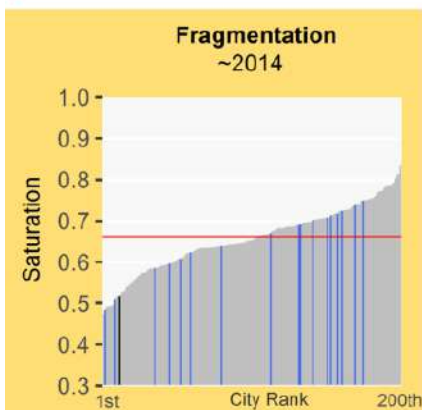
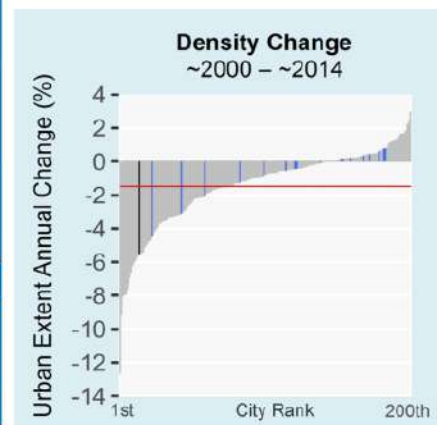
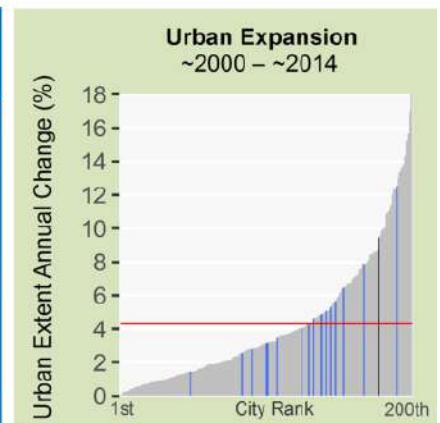
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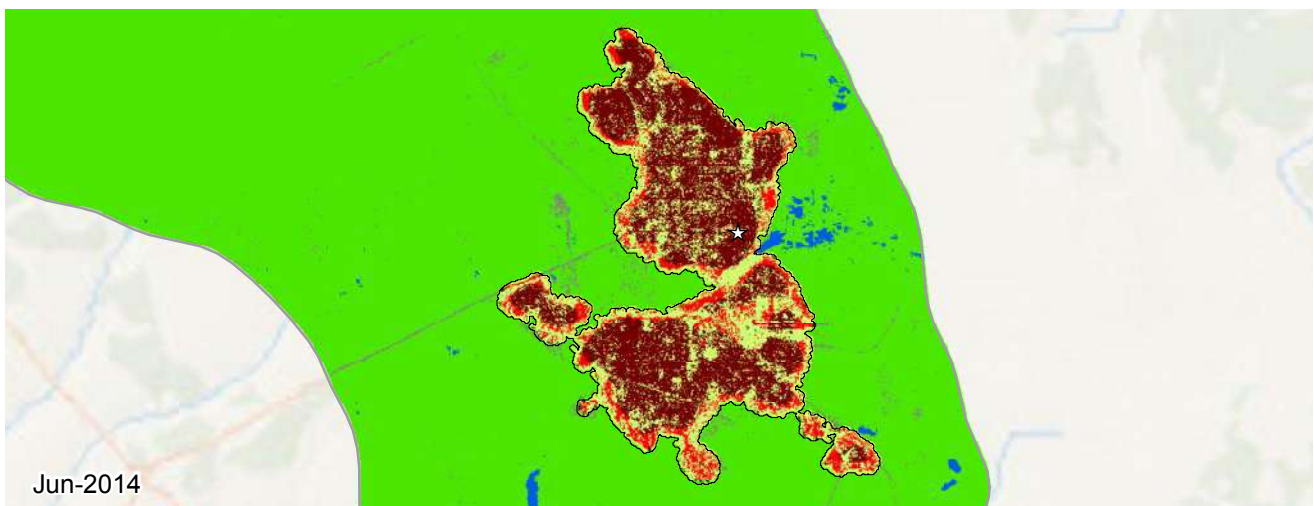
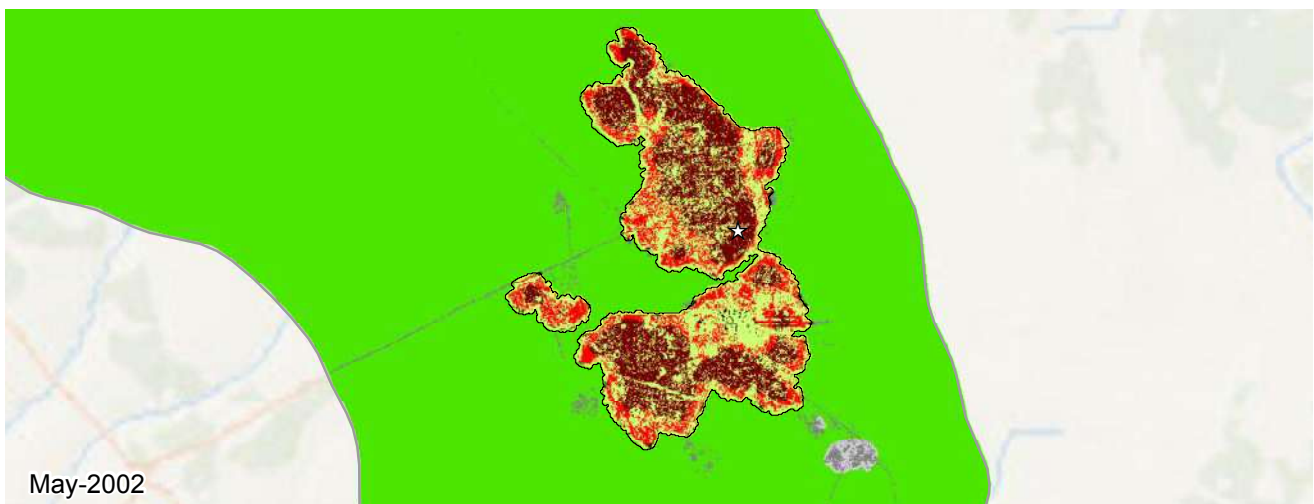
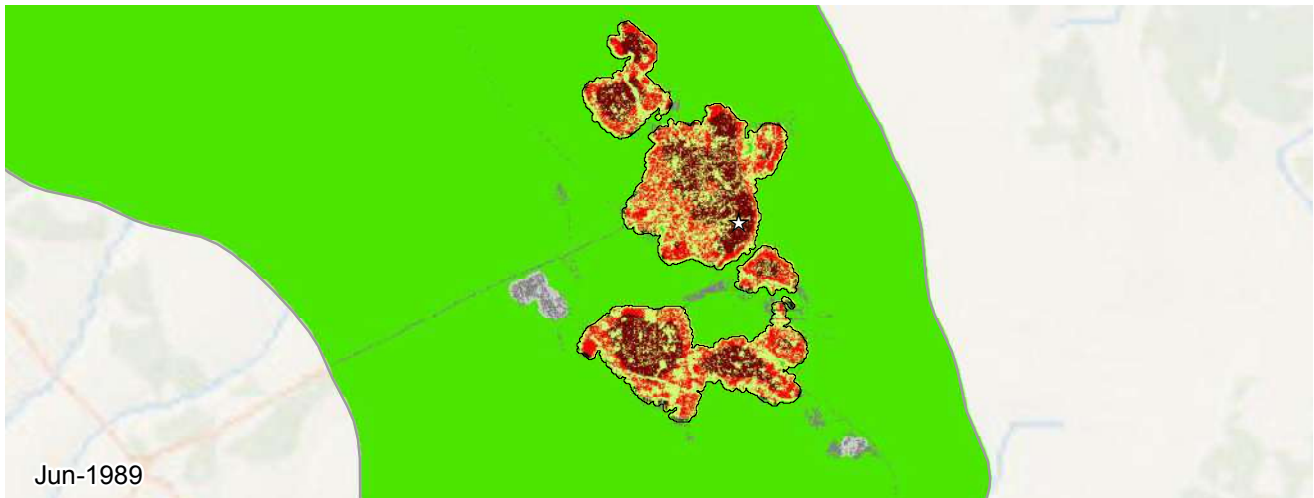
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Nakuru, Kenya (Sub-Saharan Africa)



Metrics	Mar 1989	Feb 2000	Feb 2014	% Annual Change ('00-'14)
Population	122,761	189,556	326,159	3.9
Built-up Area (Hectares)				
Total	1,030	1,493	4,728	8.2
Urban	702	1,131	2,761	6.4
Suburban	295	329	1,833	12.3
Rural	32	32	133	10.1
Open space (Hectares)				
Urbanized Open Space	798	933	4,395	11.1
Urban Extent	1,828	2,427	9,123	9.5
Density (Persons / Hectare)				
Built-up Area Density	119.1	126.9	69.0	-4.4
Urban Extent Density	67.1	78.1	35.7	-5.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.56	0.62	0.52	-1.2
Openness Index	0.42	0.34	0.43	1.7
Compactness (Roundness)				
Proximity	0.95	0.94	0.67	-2.4
Cohesion	0.94	0.94	0.68	-2.3
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	239	51%	355	11%
Extension	148	31%	1,849	58%
Leapfrog	0	0%	0	0%
Inclusion	75	16%	945	30%





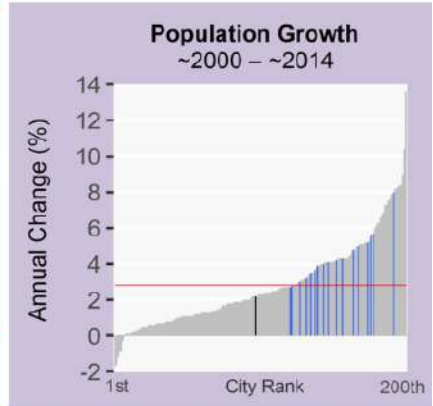
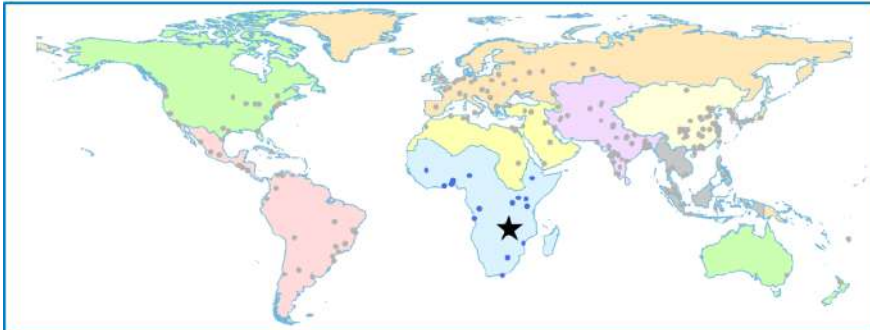
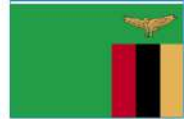
**Ndola, Zambia
1989-2014**

0 2 4 6 8 km

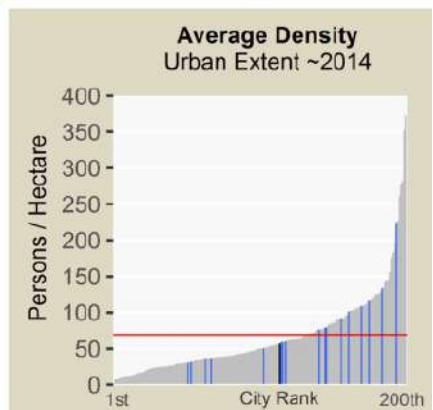
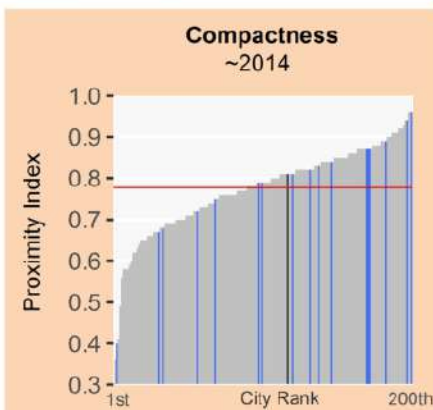
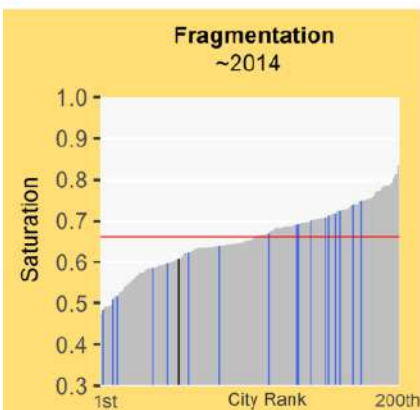
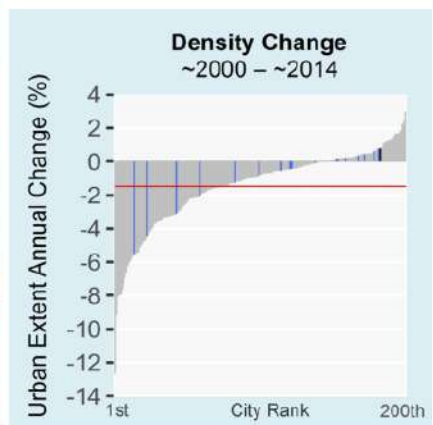
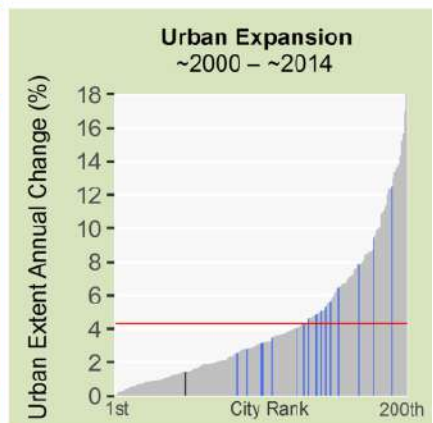
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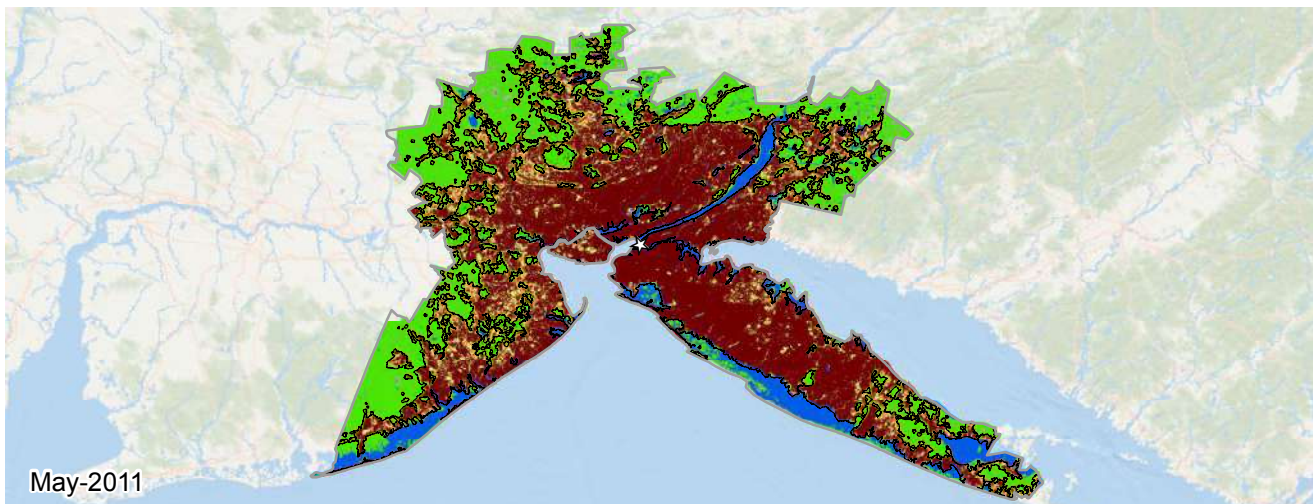
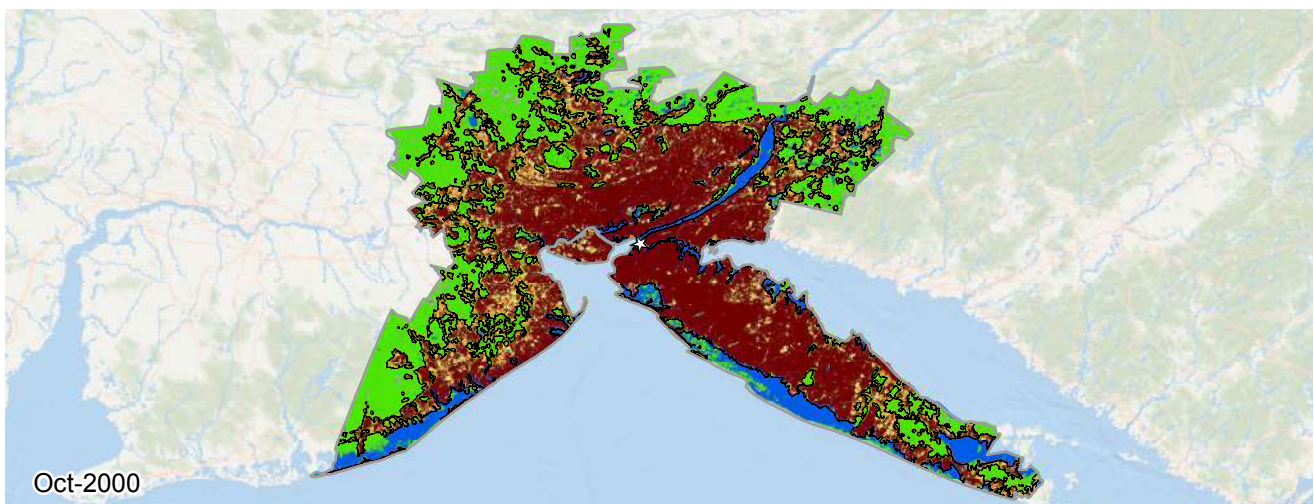
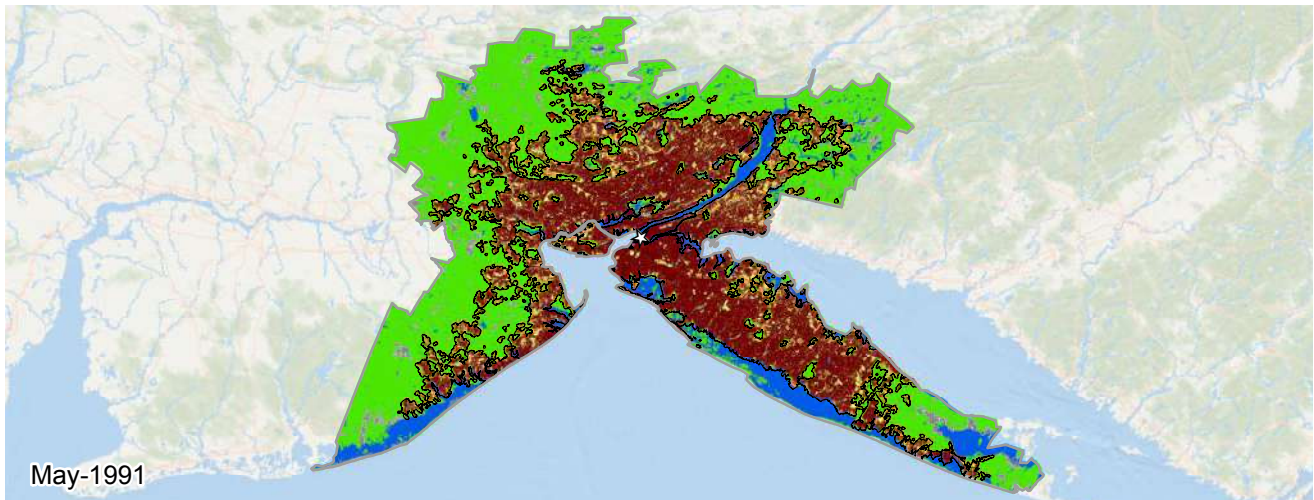
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Ndola, Zambia (Sub-Saharan Africa)



Metrics	Jun 1989	May 2002	Jun 2014	% Annual Change ('02-'14)
Population	275,484	338,144	443,326	2.2
Built-up Area (Hectares)				
Total	2,354	3,480	4,738	2.6
Urban	1,137	2,174	3,702	4.4
Suburban	1,148	1,241	988	-1.9
Rural	68	64	47	-2.5
Open space (Hectares)				
Urbanized Open Space	2,283	3,066	3,047	-0.1
Urban Extent	4,637	6,547	7,785	1.4
Density (Persons / Hectare)				
Built-up Area Density	117.0	97.1	93.6	-0.3
Urban Extent Density	59.4	51.6	56.9	0.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.51	0.53	0.61	1.1
Openness Index	0.50	0.45	0.36	-1.9
Compactness (Roundness)				
Proximity	0.71	0.79	0.81	0.2
Cohesion	0.71	0.80	0.80	0.0
Added Area (Hectares)	'89-'02	Share	'02-'14	Share
Infill	316	28%	824	65%
Extension	555	49%	253	20%
Leapfrog	49	4%	2	0%
Inclusion	204	18%	177	14%





**New York, United States
1991-2011**

0 25 50 75 100 km

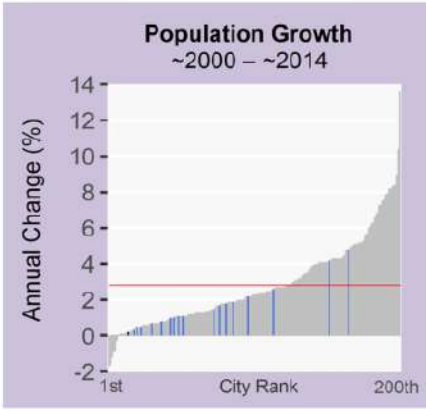
Legend:

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

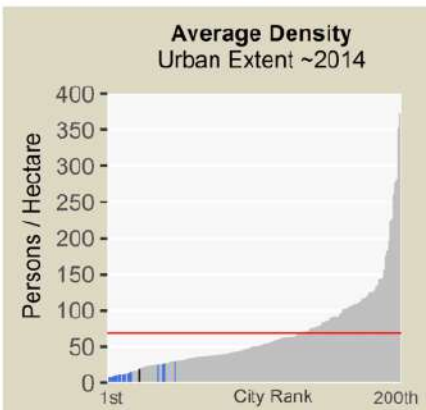
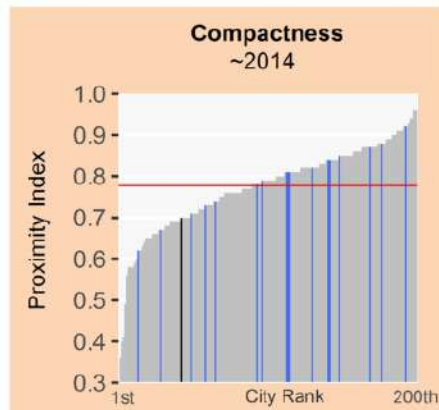
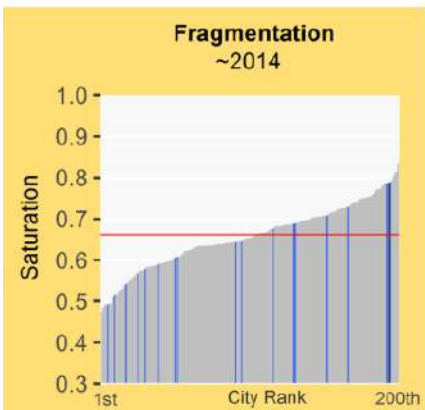
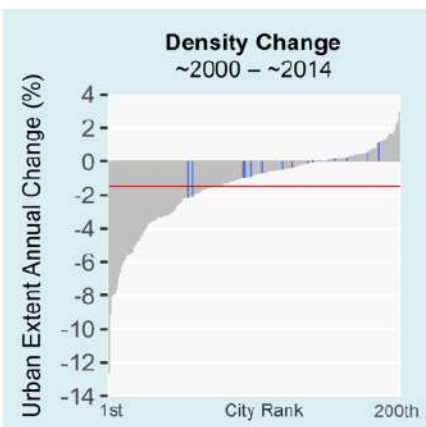
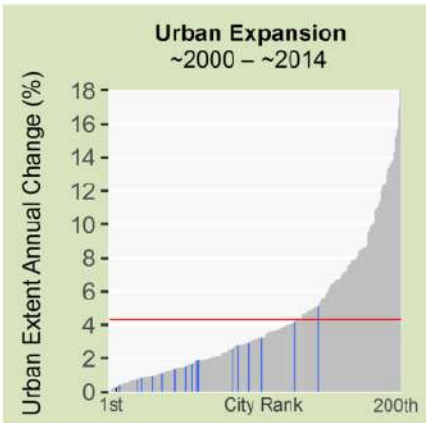
New York, United States (Land-Rich Developed Countries)

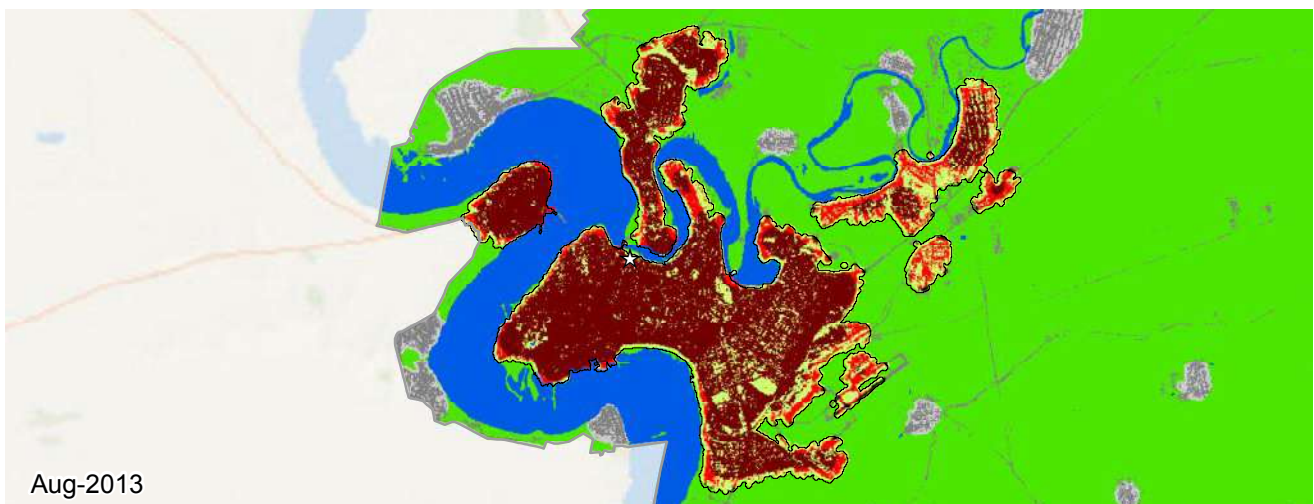
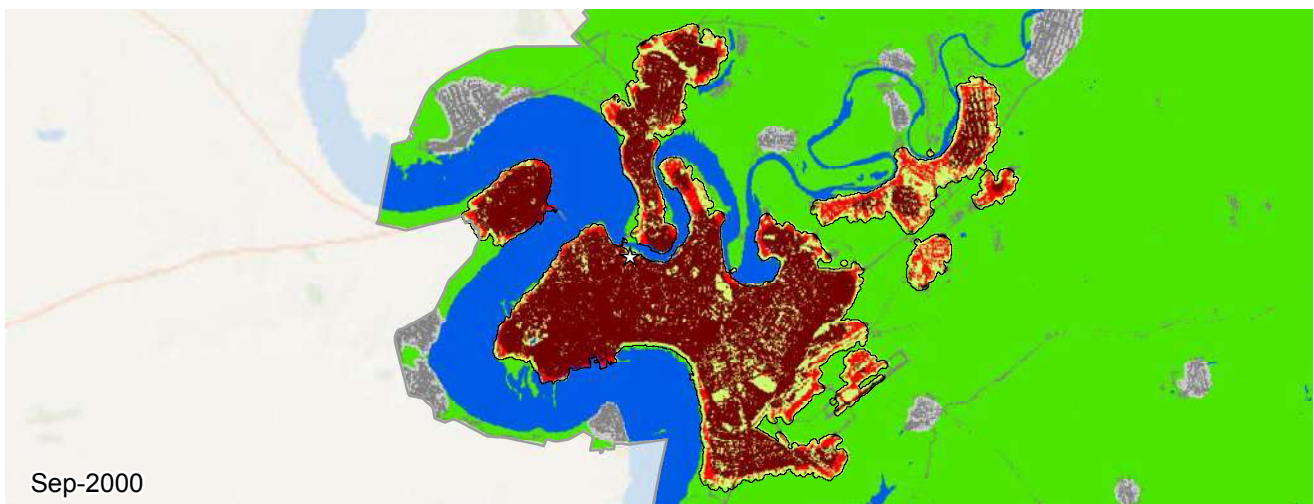
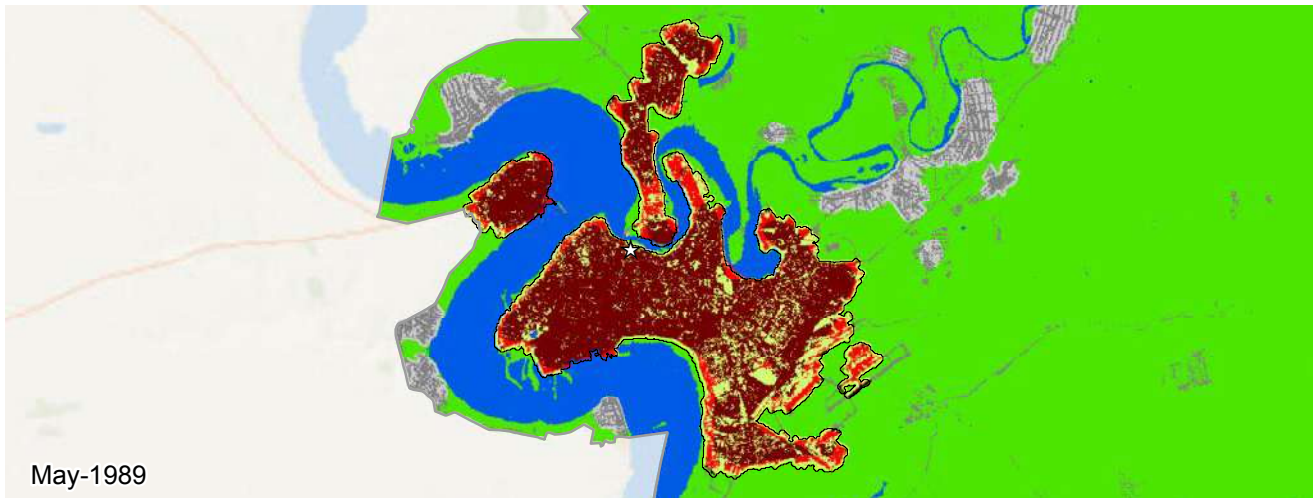


Legend for Charts
 New York | Other cities in region | All other cities | Global average



Metrics	May 1991	Oct 2000	May 2011	% Annual Change ('00-'11)
Population	16,235,289	17,955,548	18,412,093	0.2
Built-up Area (Hectares)				
Total	509,235	720,862	747,852	0.3
Urban	445,869	638,564	666,184	0.4
Suburban	59,541	76,814	76,474	-0.0
Rural	3,824	5,482	5,192	-0.5
Open space (Hectares)				
Urbanized Open Space	179,640	201,855	203,250	0.1
Urban Extent	688,875	922,717	951,102	0.3
Density (Persons / Hectare)				
Built-up Area Density	31.9	24.9	24.6	-0.1
Urban Extent Density	23.6	19.5	19.4	-0.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.74	0.78	0.79	0.1
Openness Index	0.23	0.18	0.18	-0.2
Compactness (Roundness)				
Proximity	0.69	0.70	0.70	0.1
Cohesion	0.67	0.69	0.69	0.0
Added Area (Hectares)	'91-'00	Share	'00-'11	Share
Infill	90,528	42%	13,798	51%
Extension	82,437	38%	6,194	22%
Leapfrog	151	0%	2,572	9%
Inclusion	38,540	18%	4,454	16%





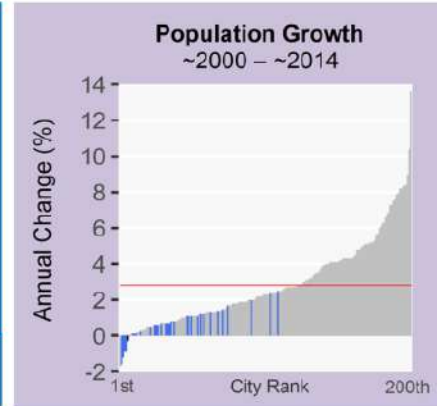
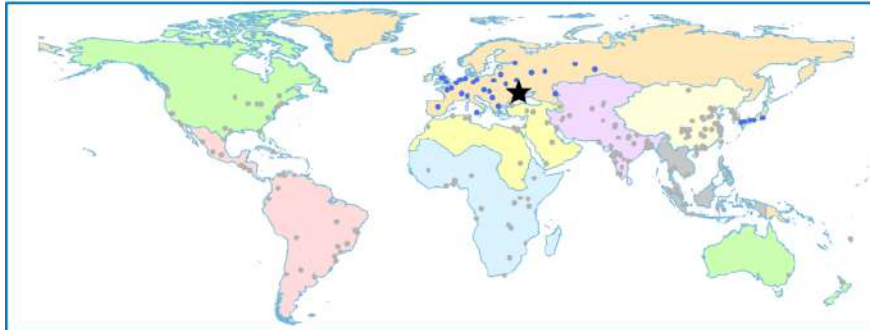
**Nikolaev, Ukraine
1989-2013**

0 3 6 9 12 km

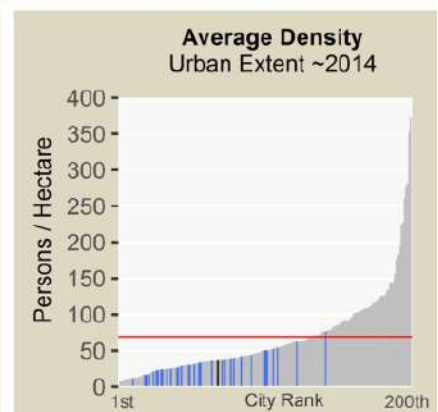
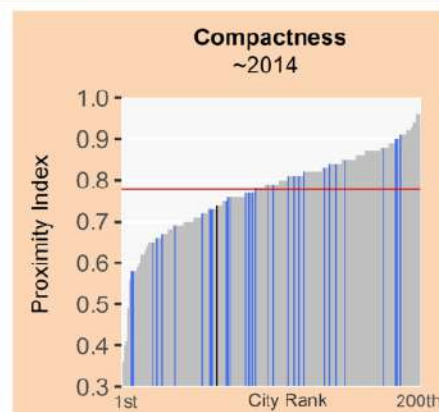
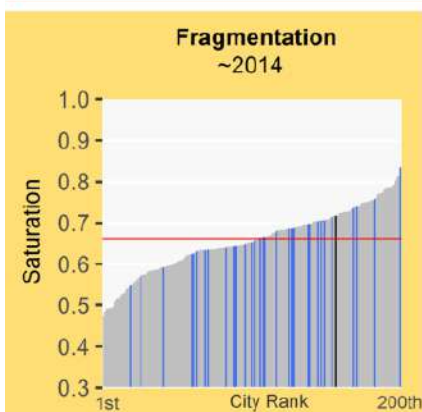
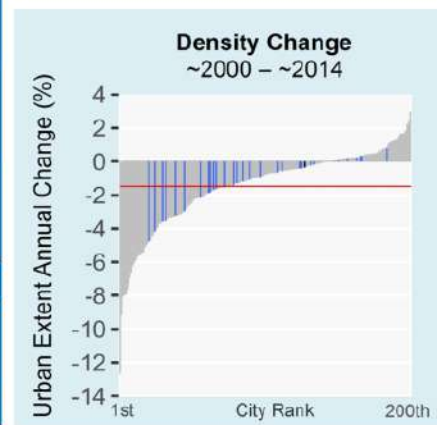
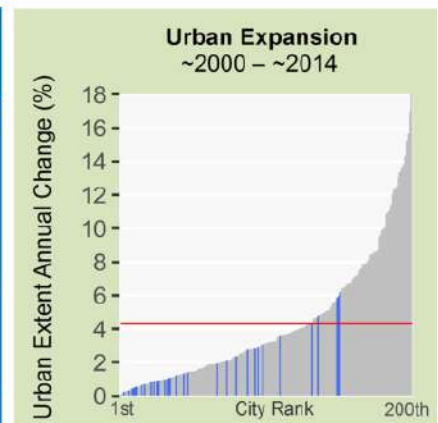
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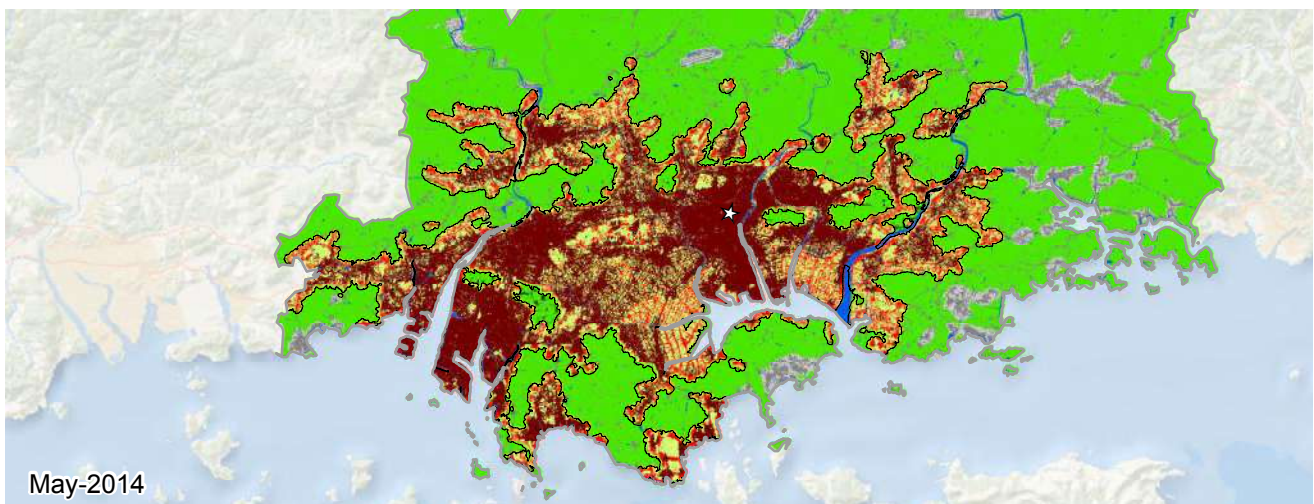
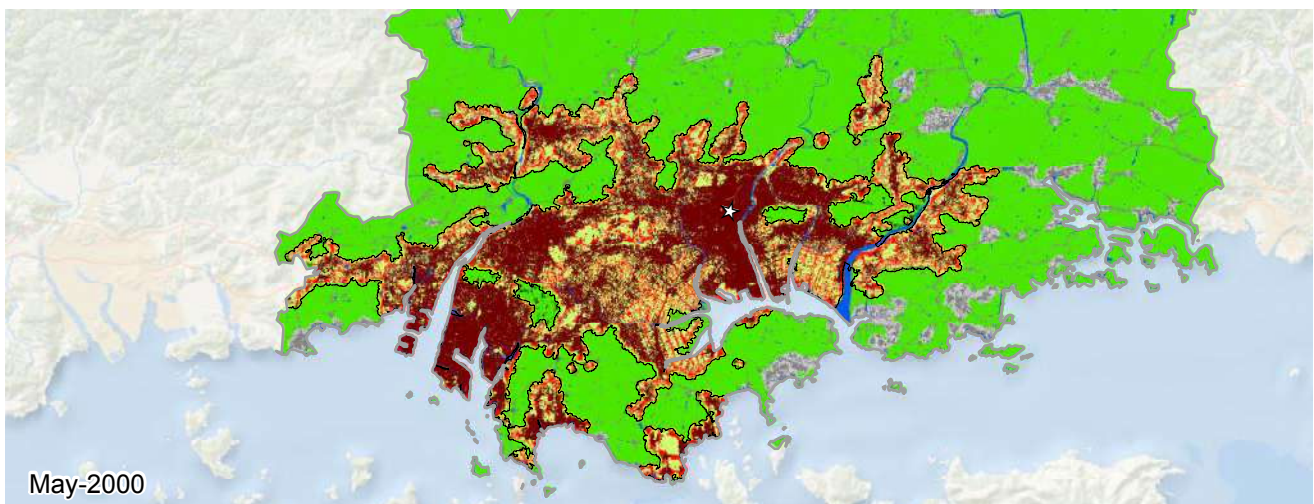
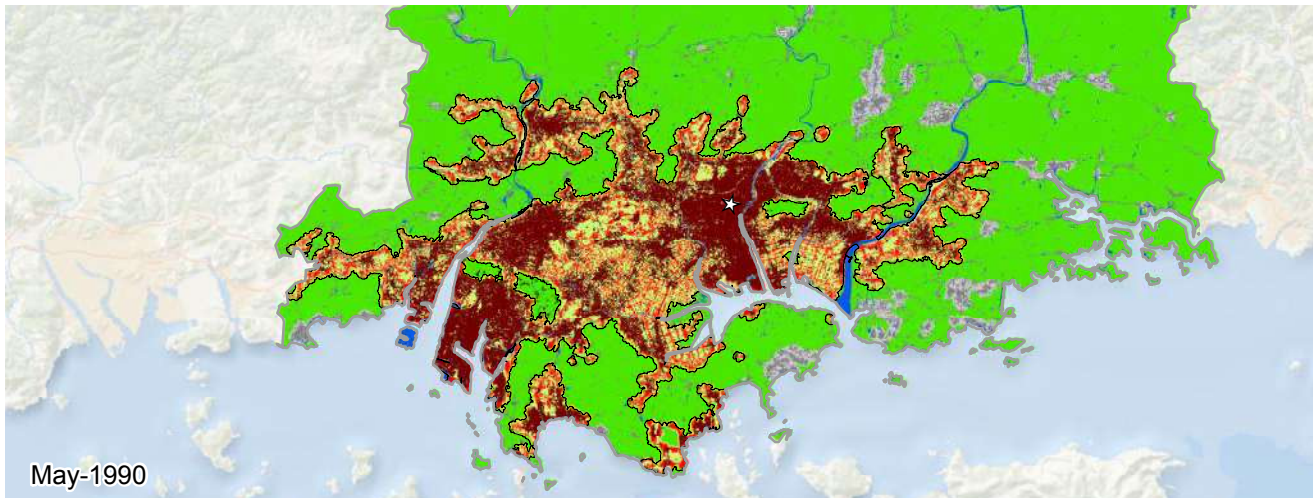
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Nikolaev, Ukraine (Europe and Japan)



Metrics	May 1989	Sep 2000	Aug 2013	% Annual Change ('00-'13)
Population	351,234	347,485	334,690	-0.3
Built-up Area (Hectares)				
Total	5,166	6,512	6,565	0.1
Urban	4,323	5,318	5,375	0.1
Suburban	804	1,116	1,114	-0.0
Rural	38	77	75	-0.2
Open space (Hectares)				
Urbanized Open Space	2,024	2,564	2,583	0.1
Urban Extent	7,191	9,076	9,148	0.1
Density (Persons / Hectare)				
Built-up Area Density	68.0	53.4	51.0	-0.4
Urban Extent Density	48.8	38.3	36.6	-0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.72	0.72	0.72	0.0
Openness Index	0.29	0.28	0.28	-0.1
Compactness (Roundness)				
Proximity	0.78	0.74	0.74	0.0
Cohesion	0.77	0.72	0.72	0.0
Added Area (Hectares)	'89-'00	Share	'00-'13	Share
Infill	503	36%	37	67%
Extension	292	21%	8	14%
Leapfrog	9	0%	0	0%
Inclusion	566	41%	8	14%



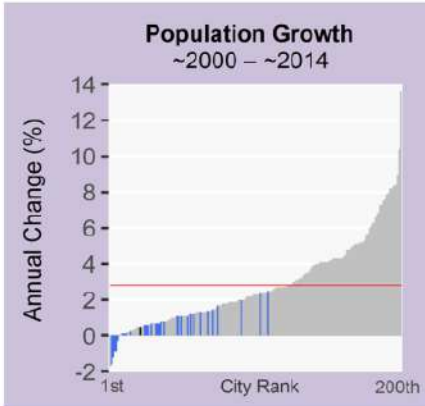


**Okayama, Japan
1990-2014**

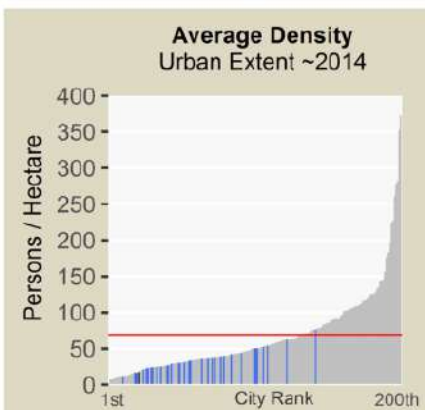
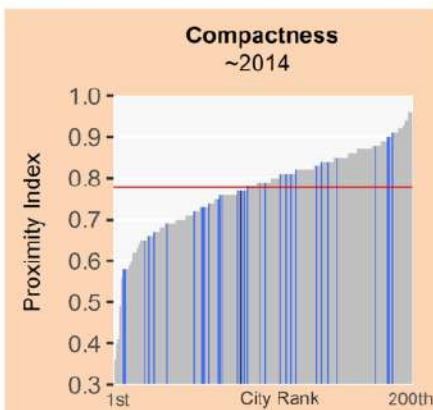
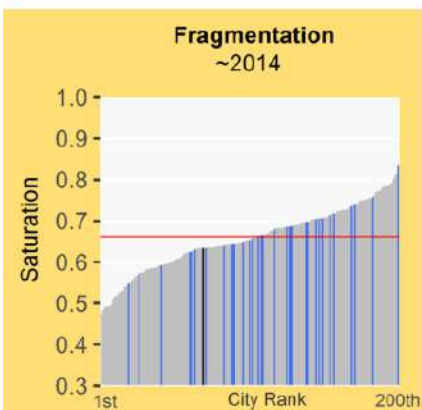
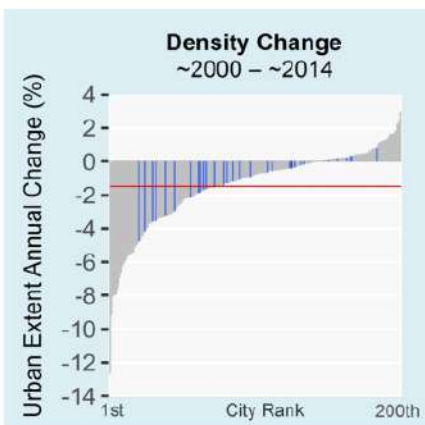
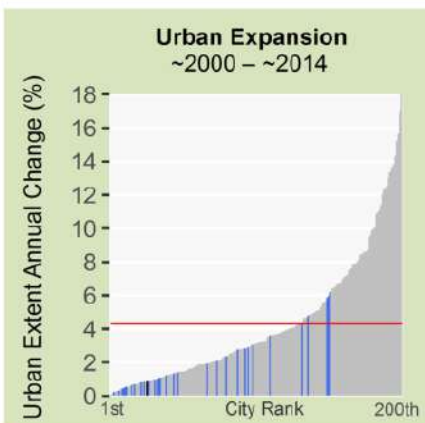
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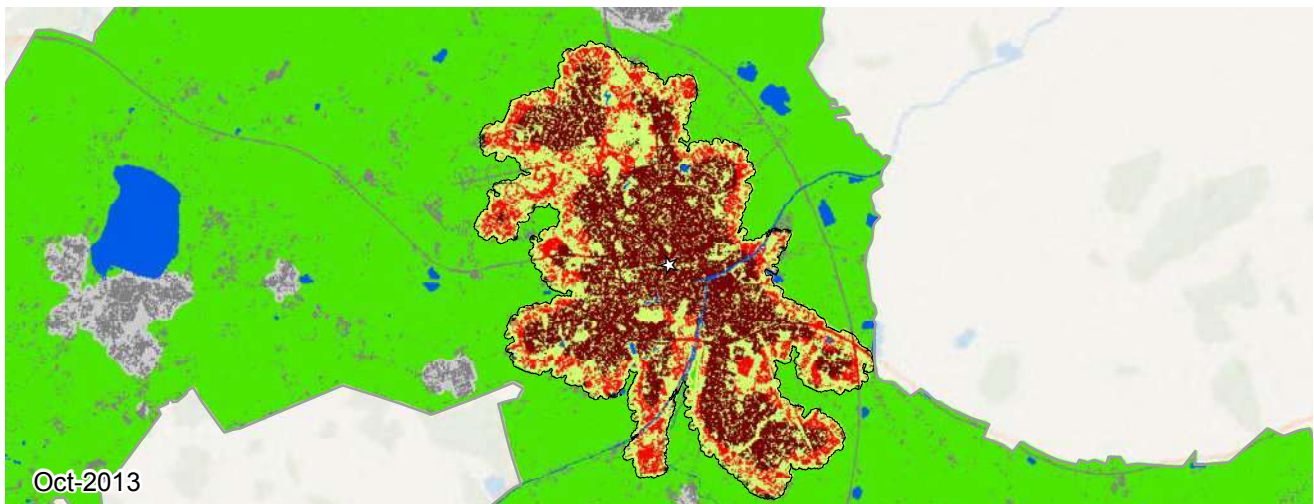
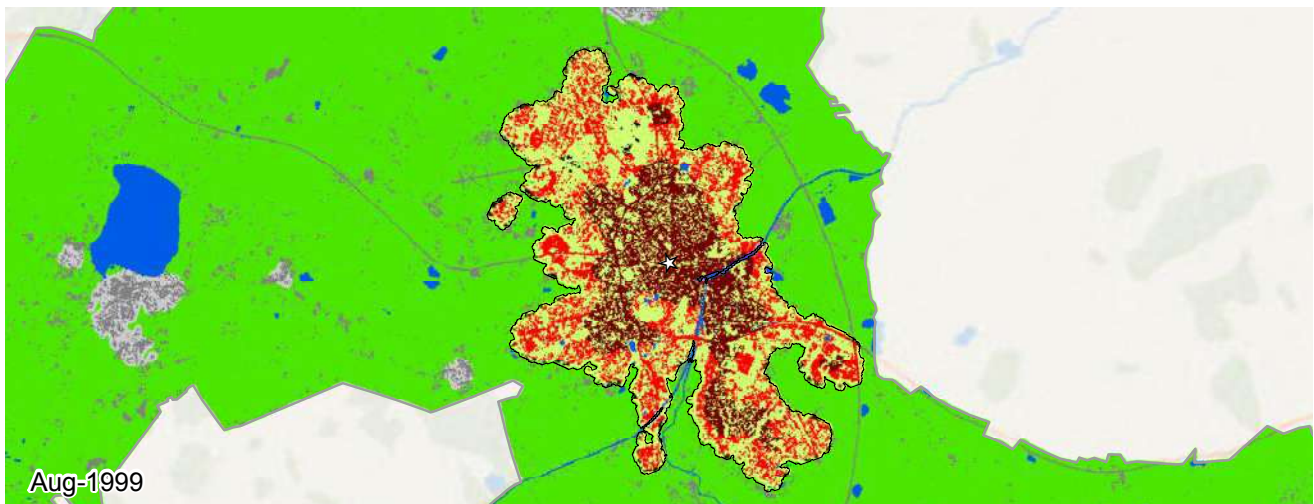
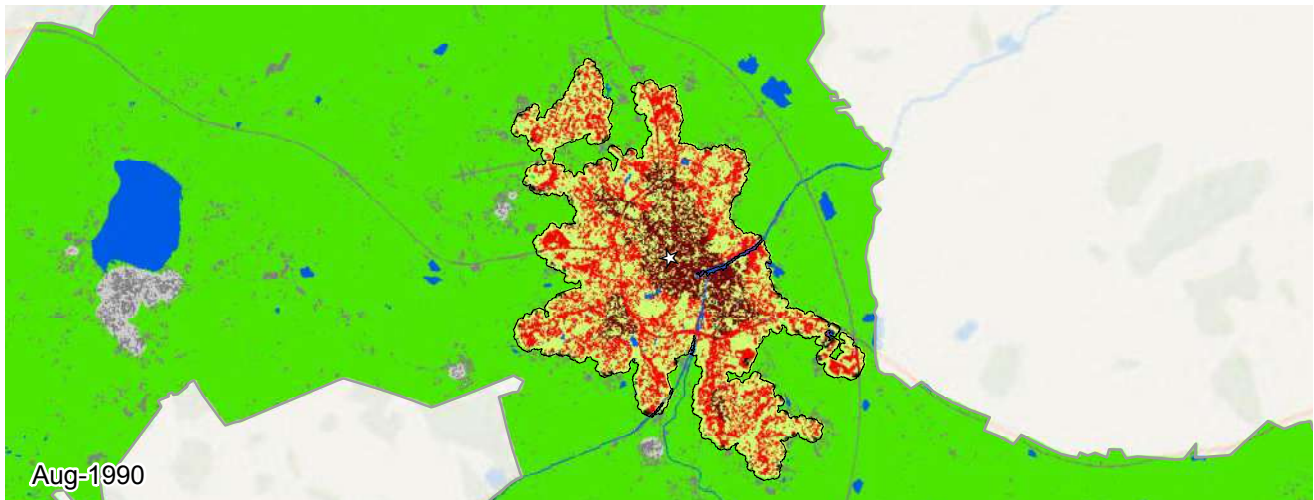
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Okayama, Japan (Europe and Japan)



Metrics	May 1990	May 2000	May 2014	% Annual Change ('00-'14)
Population	1,156,304	1,196,567	1,277,185	0.5
Built-up Area (Hectares)				
Total	36,681	40,169	45,925	1.0
Urban	24,939	28,959	33,464	1.0
Suburban	11,052	10,549	11,755	0.8
Rural	689	660	705	0.5
Open space (Hectares)				
Urbanized Open Space	24,311	24,132	26,516	0.7
Urban Extent	60,992	64,302	72,441	0.9
Density (Persons / Hectare)				
Built-up Area Density	31.5	29.8	27.8	-0.5
Urban Extent Density	19.0	18.6	17.6	-0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.60	0.62	0.63	0.1
Openness Index	0.37	0.35	0.34	-0.1
Compactness (Roundness)				
Proximity	0.77	0.77	0.77	-0.0
Cohesion	0.76	0.75	0.75	0.0
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	2,072	59%	2,703	46%
Extension	487	13%	774	13%
Leapfrog	31	0%	30	0%
Inclusion	917	26%	2,247	39%

















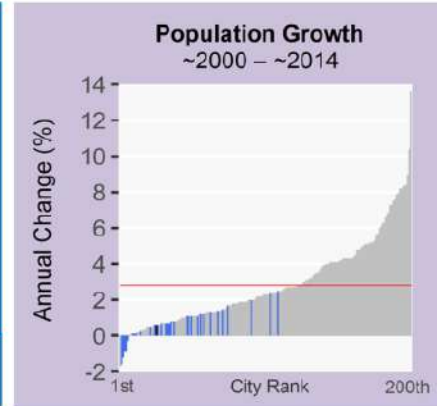
**Oldenburg, Germany
1990-2013**

0 2 4 6 8 km

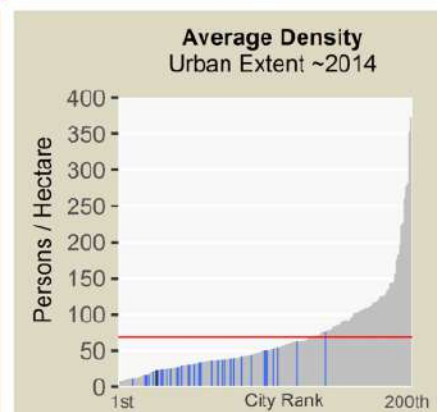
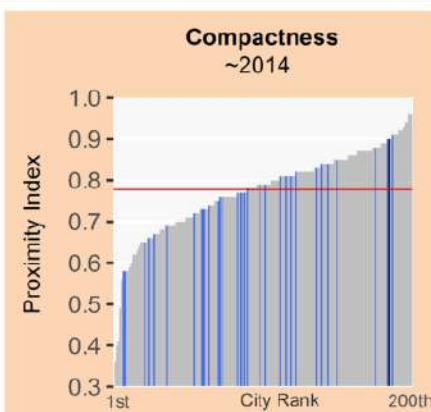
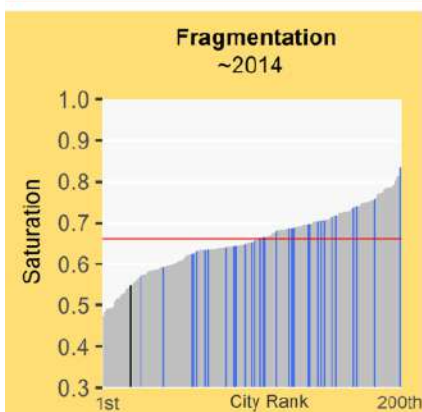
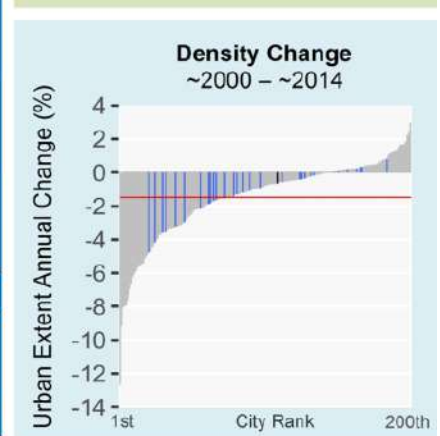
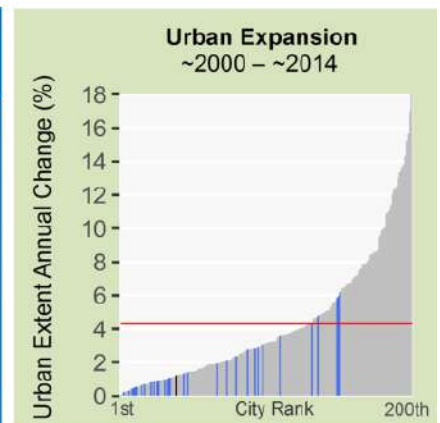
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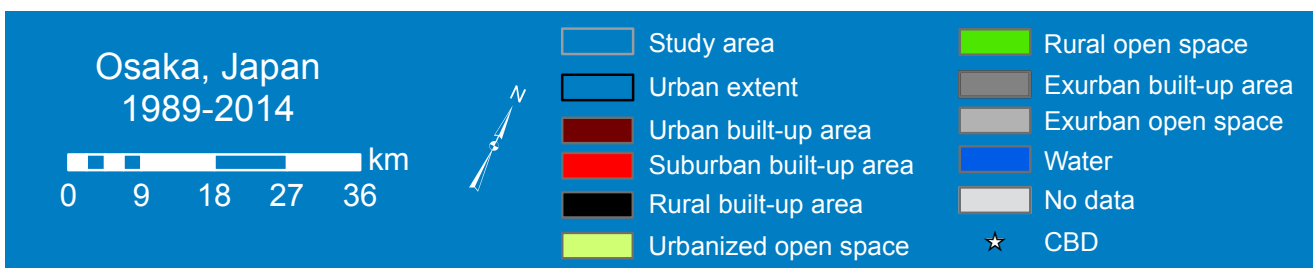
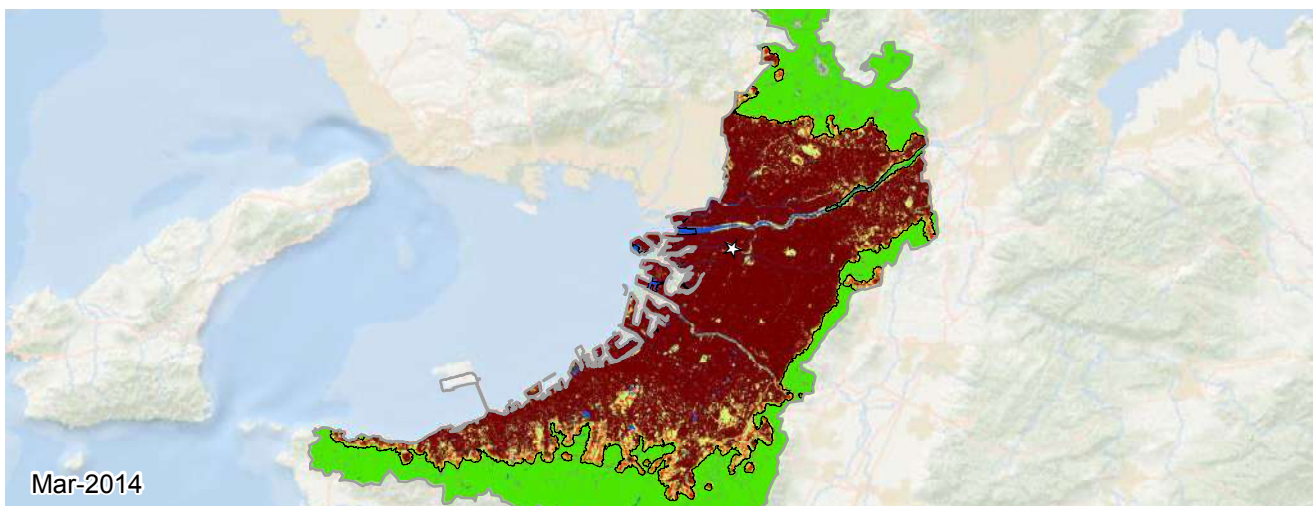
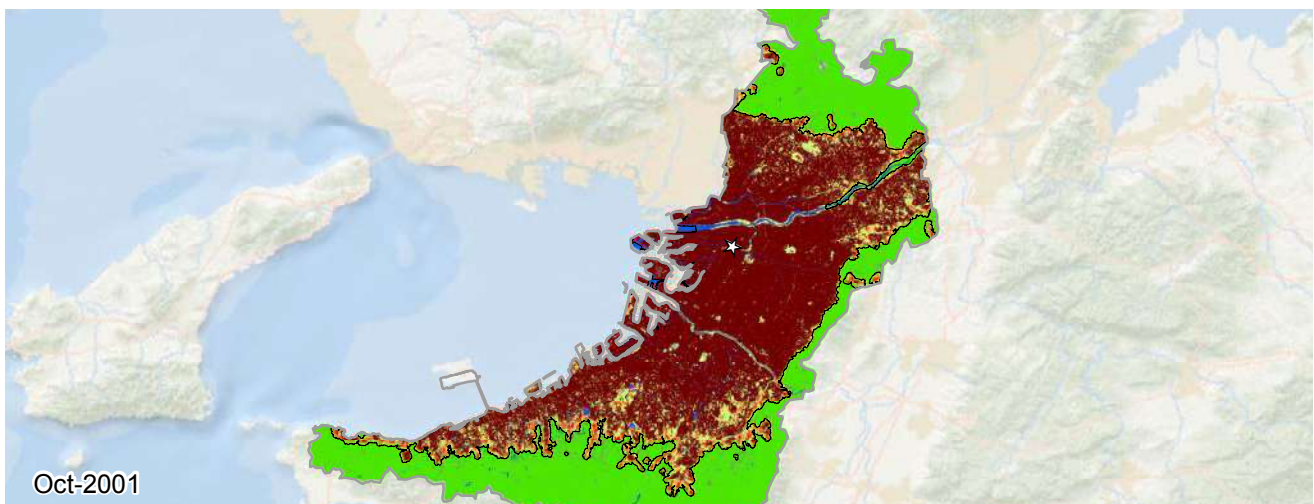
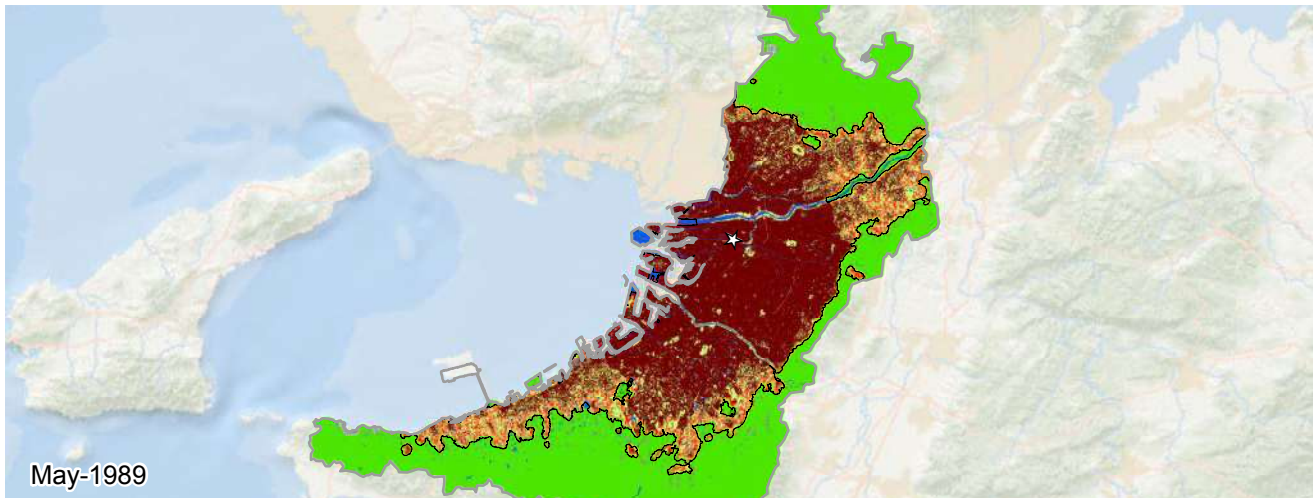
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Oldenburg, Germany (Europe and Japan)

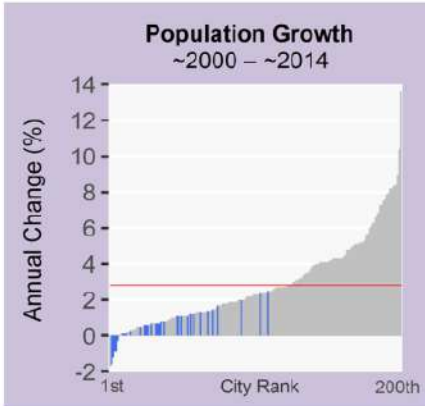


Metrics	Aug 1990	Aug 1999	Oct 2013	% Annual Change ('99-'13)
Population	129,511	145,877	158,329	0.6
Built-up Area (Hectares)				
Total	2,026	2,731	3,780	2.3
Urban	556	1,200	2,545	5.3
Suburban	1,383	1,424	1,167	-1.4
Rural	85	106	67	-3.2
Open space (Hectares)				
Urbanized Open Space	2,652	3,063	3,119	0.1
Urban Extent	4,678	5,795	6,900	1.2
Density (Persons / Hectare)				
Built-up Area Density	63.9	53.4	41.9	-1.7
Urban Extent Density	27.7	25.2	22.9	-0.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.43	0.47	0.55	1.1
Openness Index	0.57	0.52	0.43	-1.3
Compactness (Roundness)				
Proximity	0.87	0.88	0.90	0.2
Cohesion	0.86	0.87	0.89	0.1
Added Area (Hectares)	'90-'99	Share	'99-'13	Share
Infill	338	47%	676	64%
Extension	0	0%	204	19%
Leapfrog	155	21%	0	0%
Inclusion	211	29%	168	16%

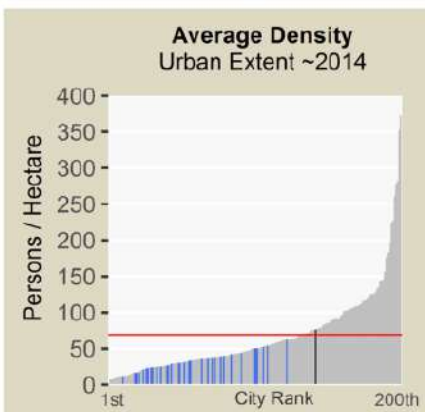
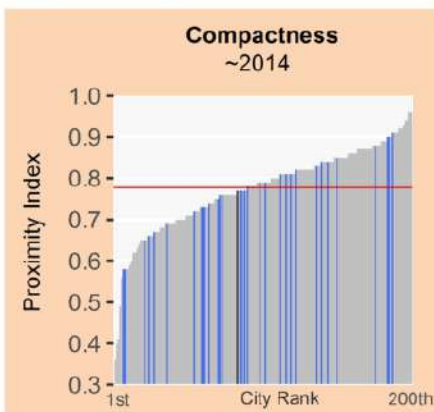
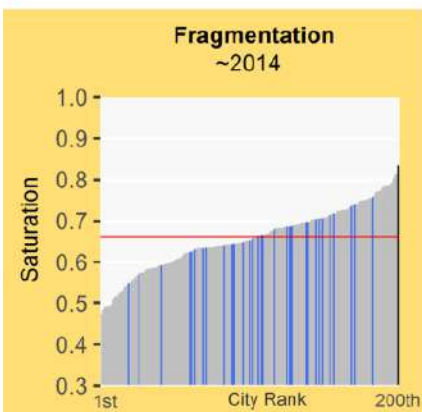
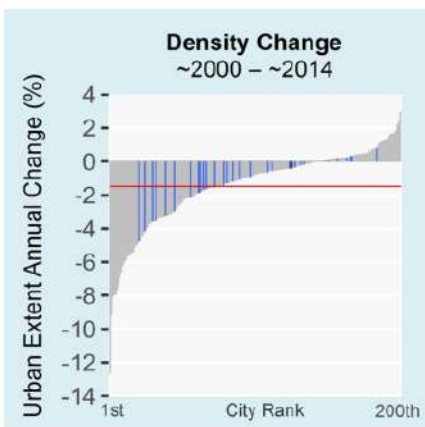
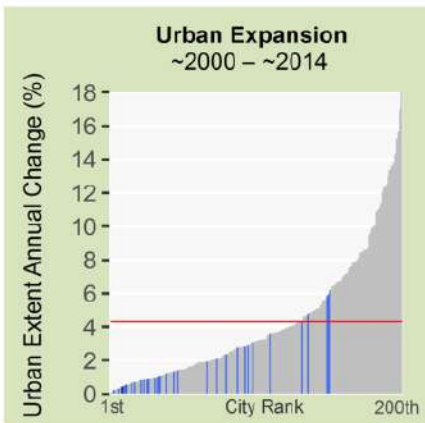


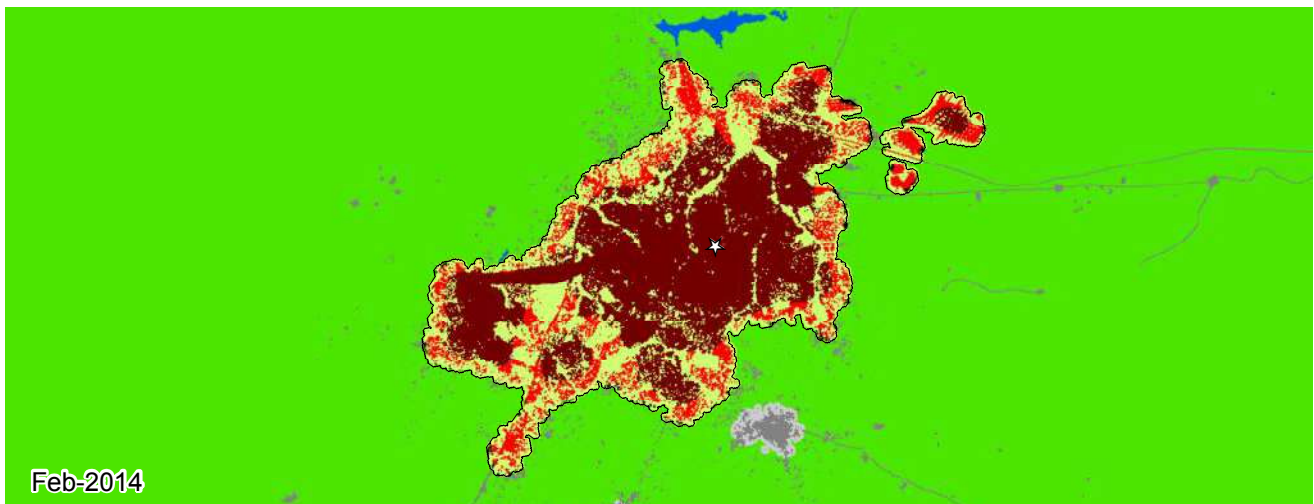
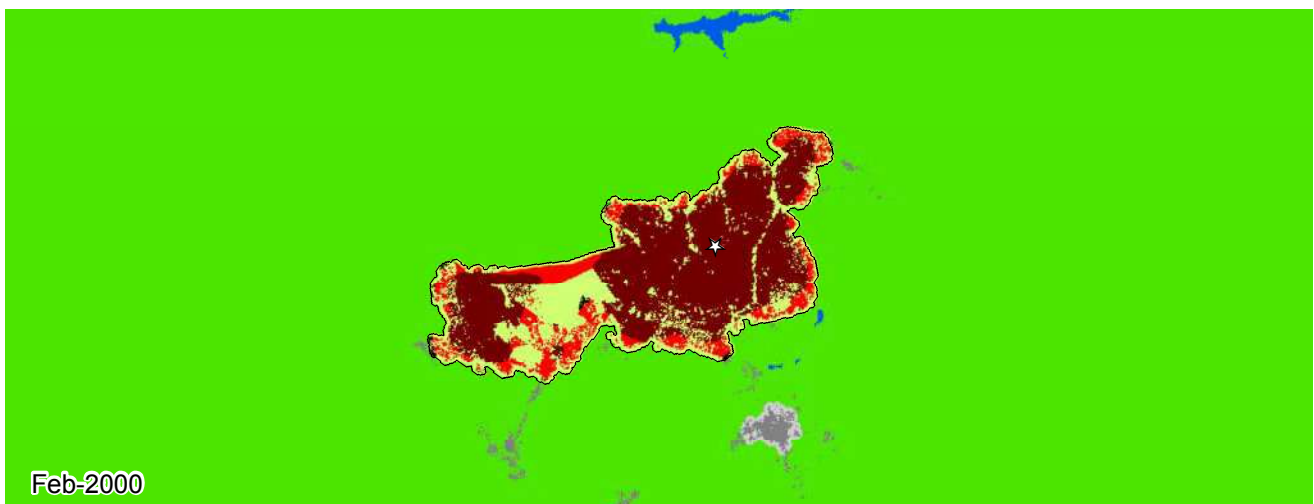
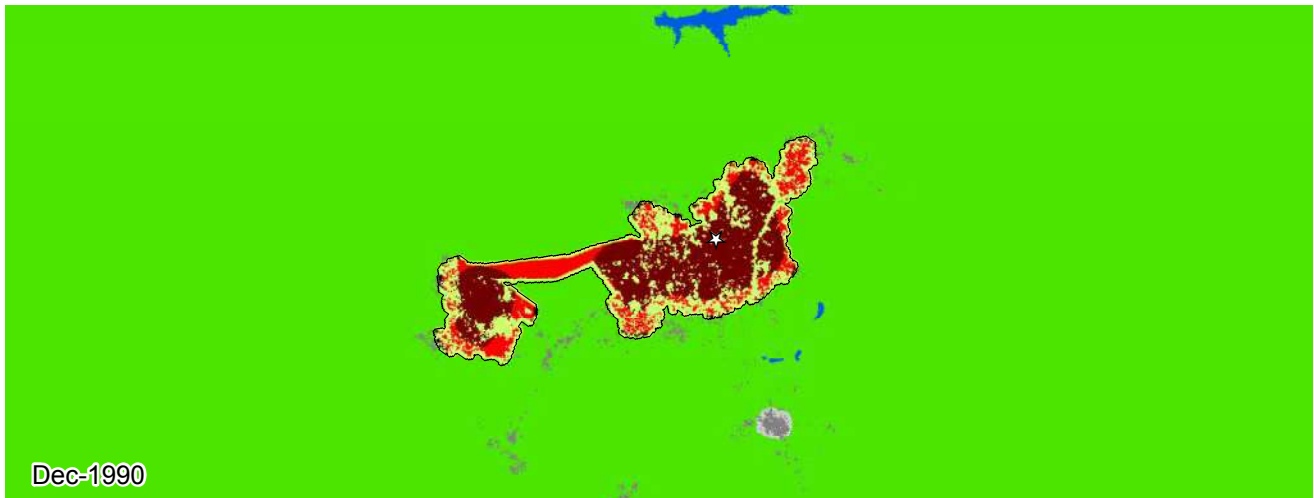


Osaka, Japan (Europe and Japan)



Metrics	May 1989	Oct 2001	Mar 2014	% Annual Change ('01-'14)
Population	8,505,622	8,674,622	8,709,527	0.0
Built-up Area (Hectares)				
Total	72,025	87,894	95,077	0.6
Urban	62,911	81,538	89,229	0.7
Suburban	8,675	5,977	5,547	-0.6
Rural	438	378	300	-1.9
Open space (Hectares)				
Urbanized Open Space	23,402	19,868	18,680	-0.5
Urban Extent	95,427	107,763	113,757	0.4
Density (Persons / Hectare)				
Built-up Area Density	118.1	98.7	91.6	-0.6
Urban Extent Density	89.1	80.5	76.6	-0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.75	0.82	0.84	0.2
Openness Index	0.20	0.16	0.14	-1.1
Compactness (Roundness)				
Proximity	0.78	0.77	0.77	-0.0
Cohesion	0.77	0.76	0.76	0.1
Added Area (Hectares)	'89-'01	Share	'01-'14	Share
Infill	10,047	63%	4,718	65%
Extension	4,006	25%	1,614	22%
Leapfrog	204	1%	120	1%
Inclusion	1,611	10%	728	10%



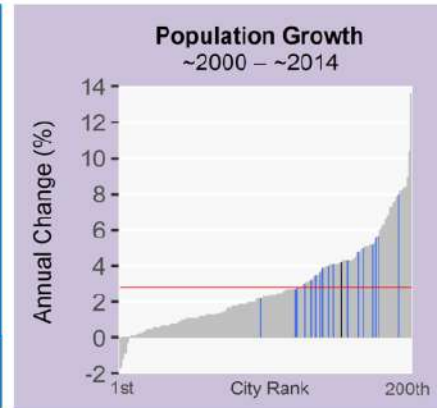
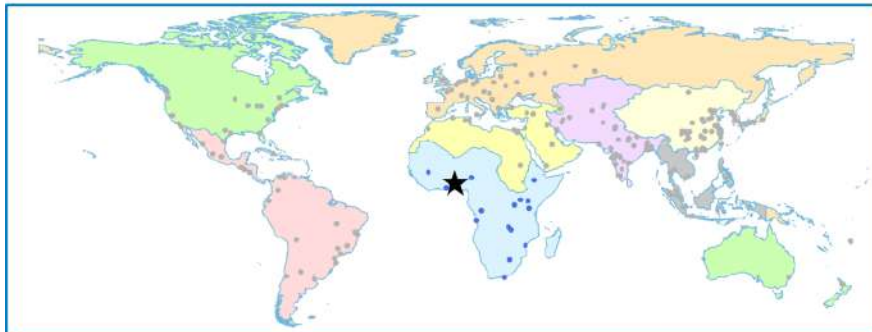


Oyo, Nigeria
1990-2014

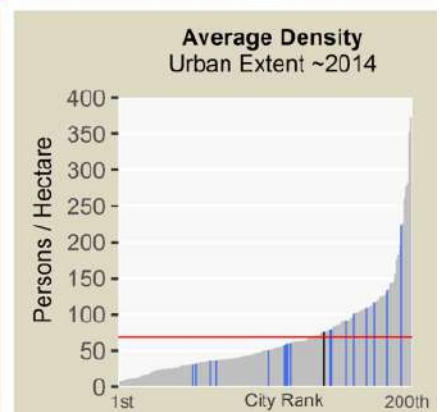
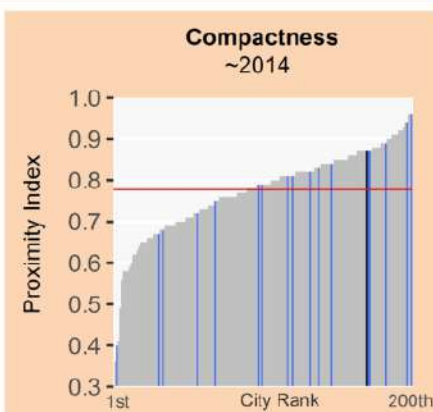
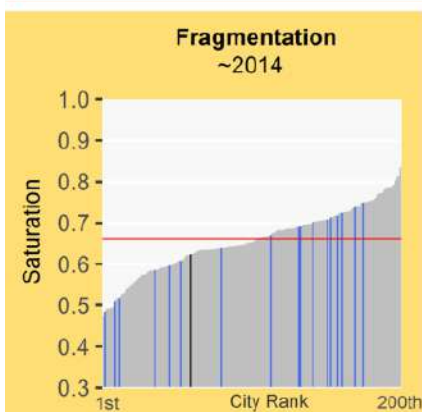
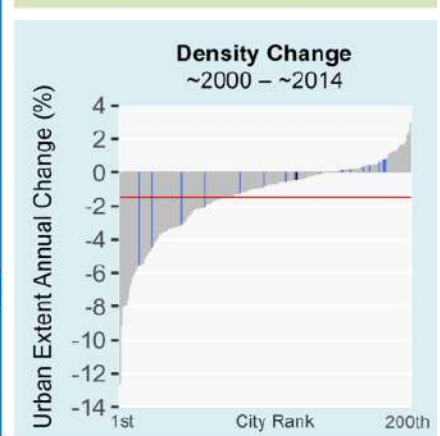
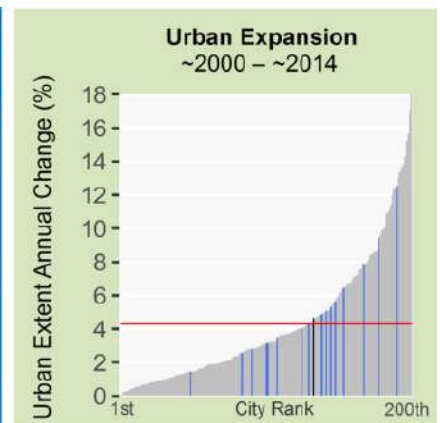
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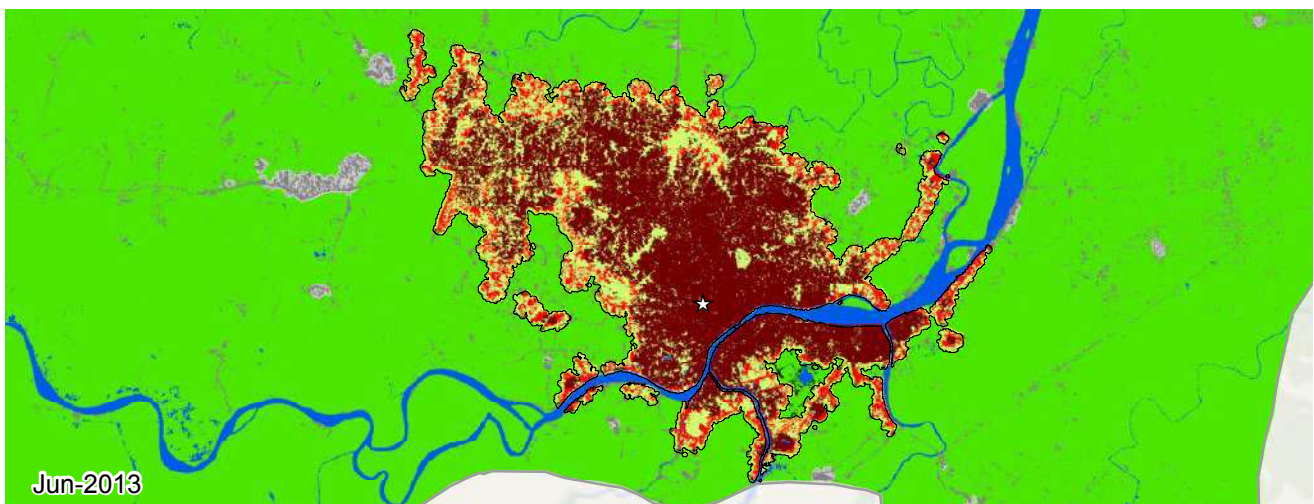
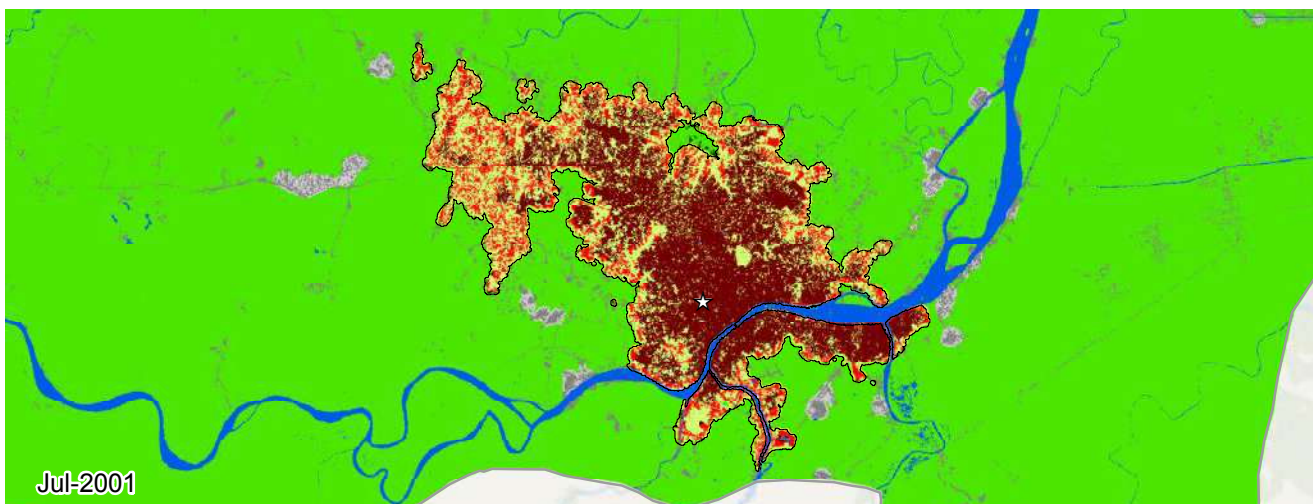
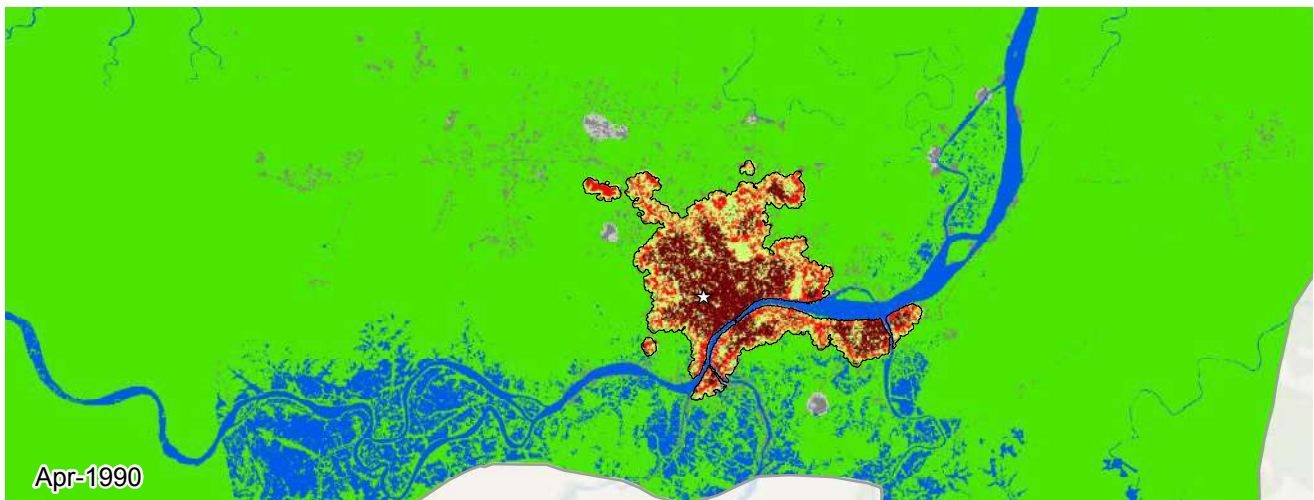
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Oyo, Nigeria (Sub-Saharan Africa)



Metrics	Dec 1990	Feb 2000	Feb 2014	% Annual Change ('00-'14)
Population	145,716	250,281	452,476	4.2
Built-up Area (Hectares)				
Total	1,230	2,123	3,703	4.0
Urban	835	1,703	2,776	3.5
Suburban	368	401	865	5.5
Rural	27	17	61	8.9
Open space (Hectares)				
Urbanized Open Space	754	965	2,229	6.0
Urban Extent	1,985	3,088	5,932	4.7
Density (Persons / Hectare)				
Built-up Area Density	118.4	117.9	122.2	0.3
Urban Extent Density	73.4	81.0	76.3	-0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.69	0.62	-0.7
Openness Index	0.38	0.27	0.31	1.0
Compactness (Roundness)				
Proximity	0.66	0.79	0.87	0.7
Cohesion	0.66	0.79	0.87	0.7
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	326	36%	177	11%
Extension	494	55%	1,362	86%
Leapfrog	0	0%	0	0%
Inclusion	71	7%	41	2%





**Palembang, Indonesia
1990-2013**

0 4 8 12 16 km

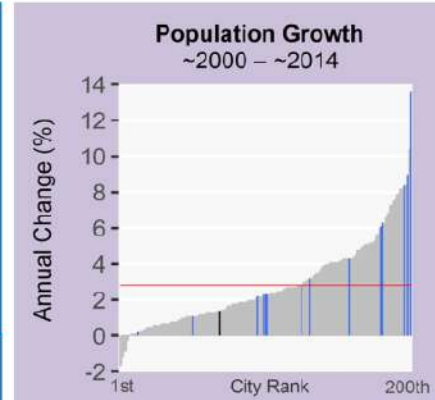
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Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

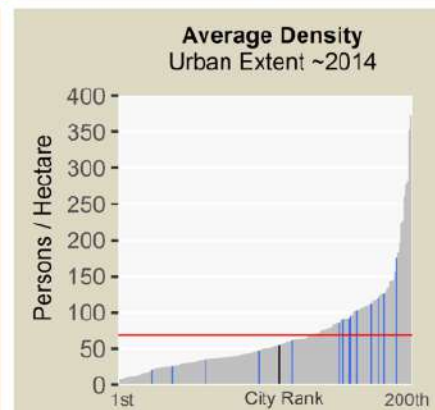
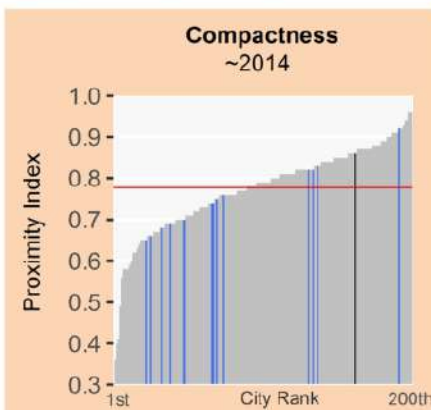
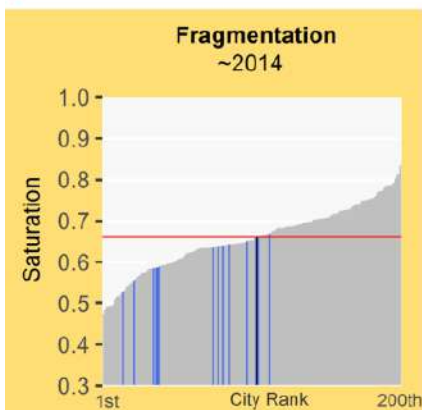
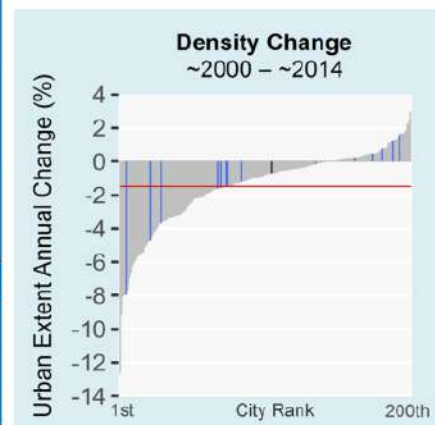
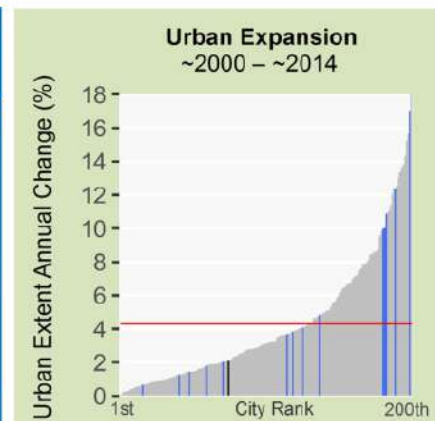
Palembang, Indonesia (Southeast Asia)

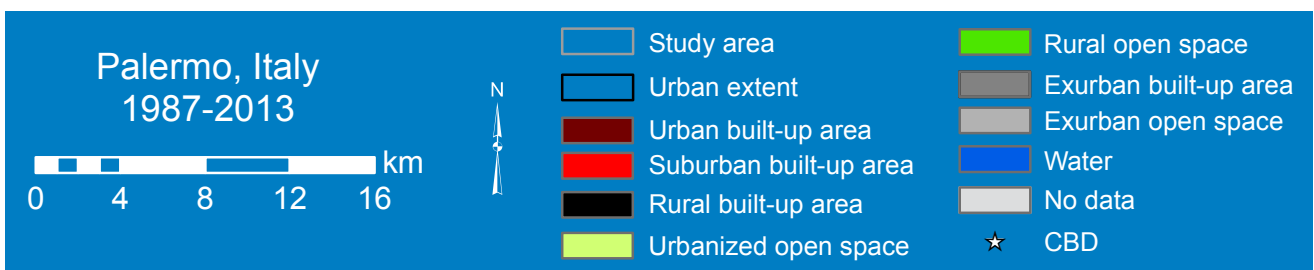
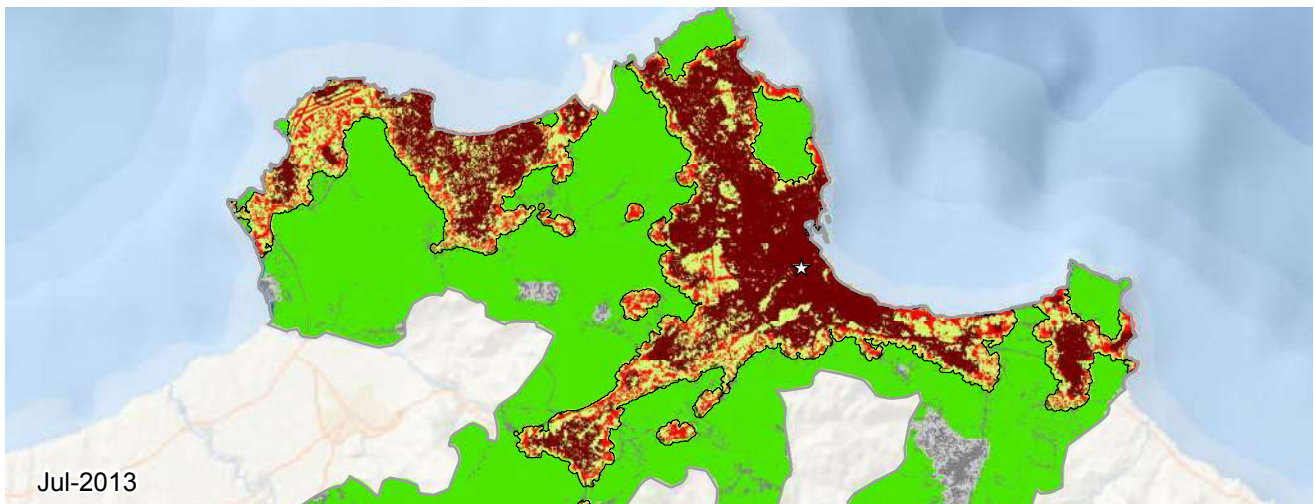
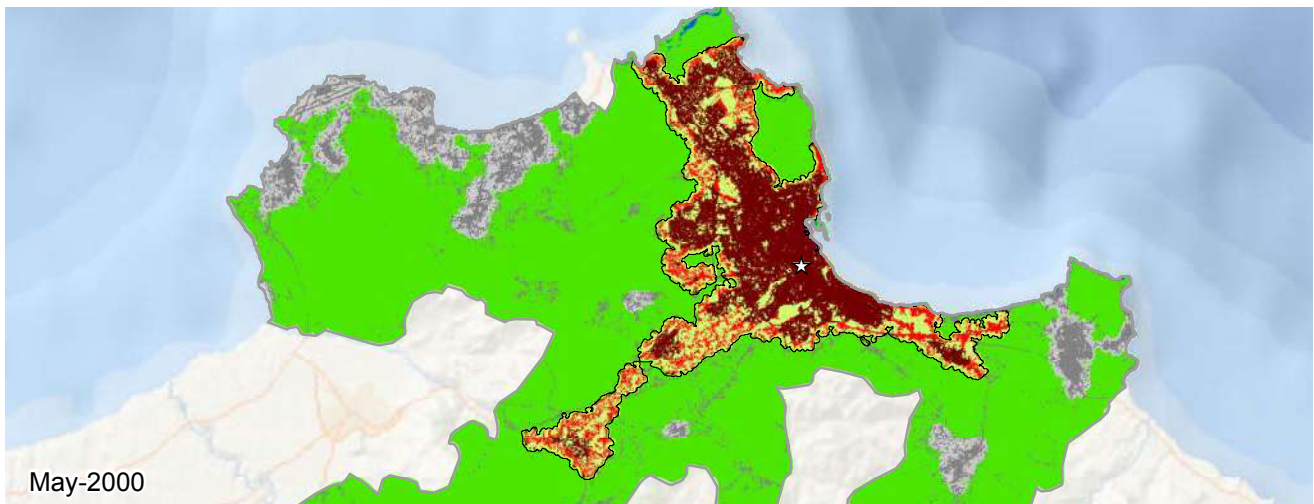
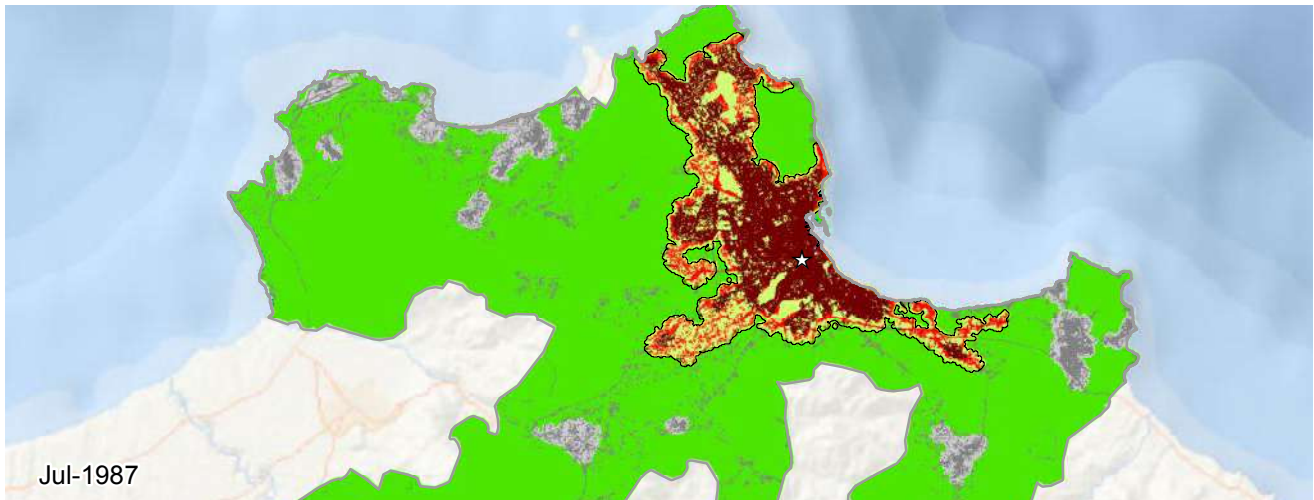


Legend for Charts
 Palembang | Other cities in region | All other cities | Global average

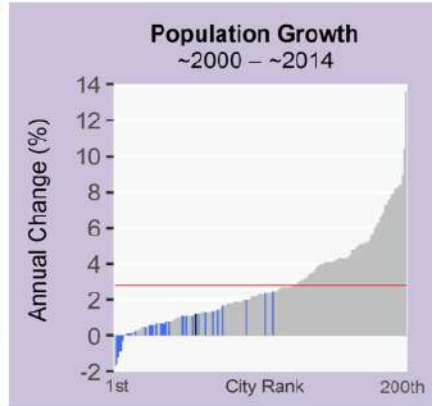


Metrics	Apr 1990	Jul 2001	Jun 2013	% Annual Change ('01-'13)
Population	1,195,955	1,454,196	1,721,220	1.4
Built-up Area (Hectares)				
Total	4,734	15,089	20,959	2.8
Urban	2,813	10,979	16,507	3.4
Suburban	1,815	3,866	4,168	0.6
Rural	106	242	284	1.3
Open space (Hectares)				
Urbanized Open Space	3,874	9,580	10,787	1.0
Urban Extent	8,609	24,669	31,747	2.1
Density (Persons / Hectare)				
Built-up Area Density	252.6	96.4	82.1	-1.3
Urban Extent Density	138.9	58.9	54.2	-0.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.55	0.61	0.66	0.6
Openness Index	0.43	0.35	0.29	-1.4
Compactness (Roundness)				
Proximity	0.85	0.83	0.86	0.3
Cohesion	0.83	0.83	0.84	0.2
Added Area (Hectares)	'90-'01	Share	'01-'13	Share
Infill	2,189	21%	3,103	52%
Extension	6,594	63%	1,289	21%
Leapfrog	0	0%	3	0%
Inclusion	1,570	15%	1,473	25%

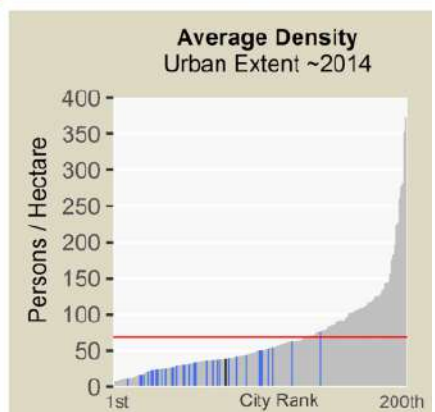
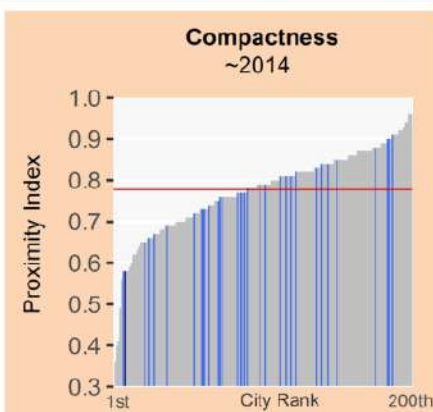
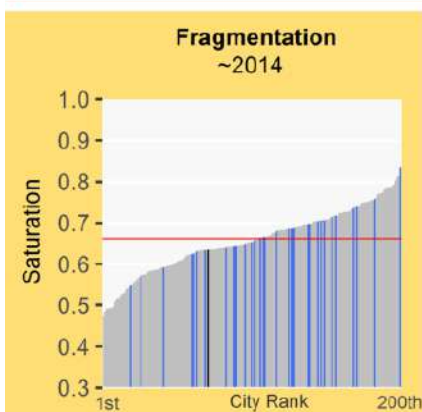
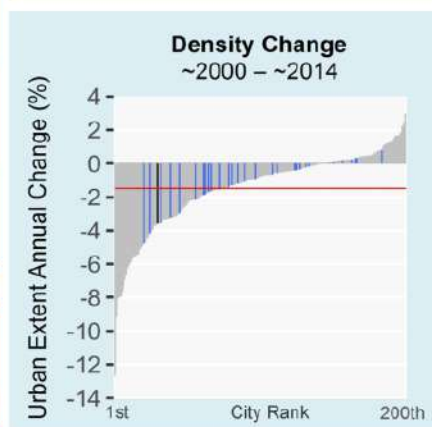
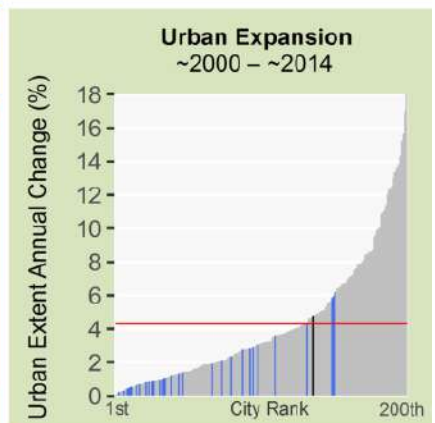


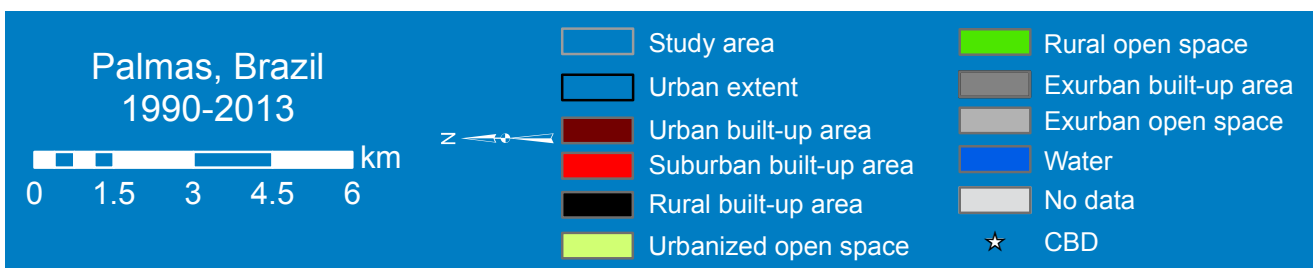
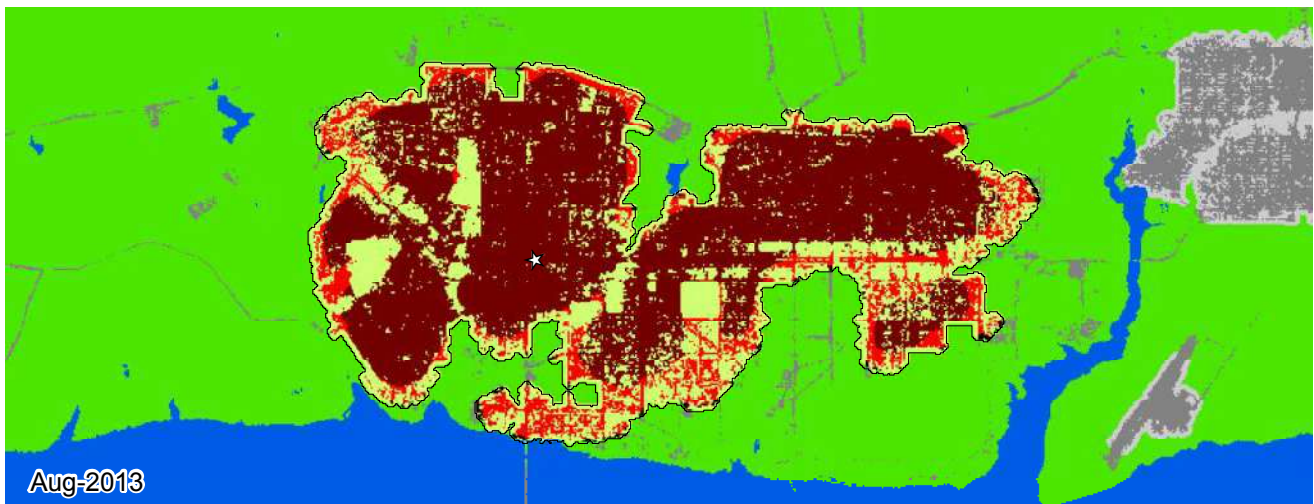
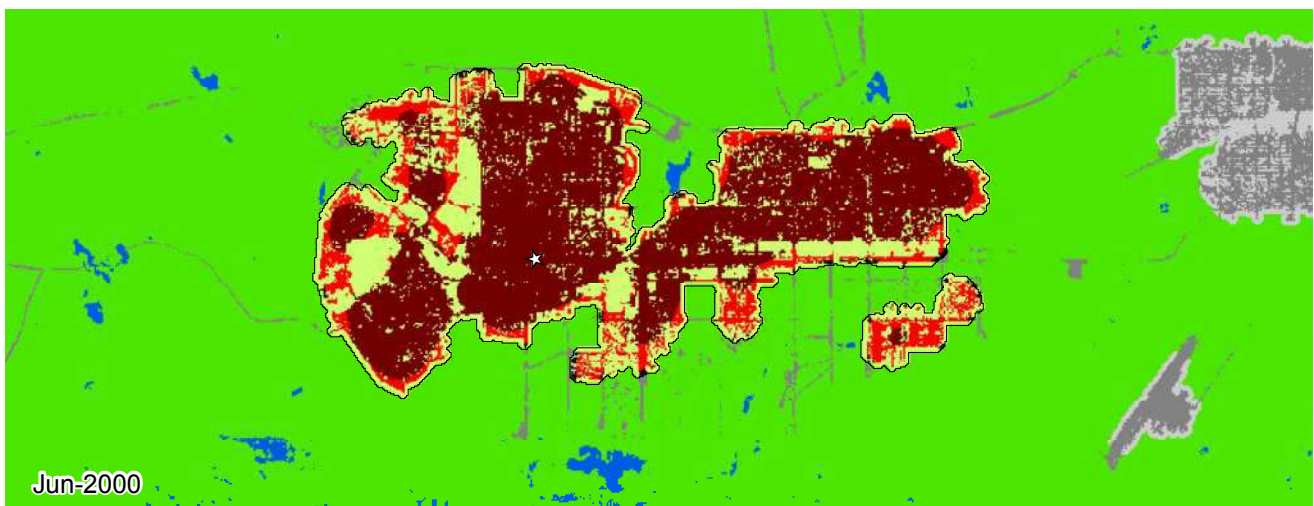
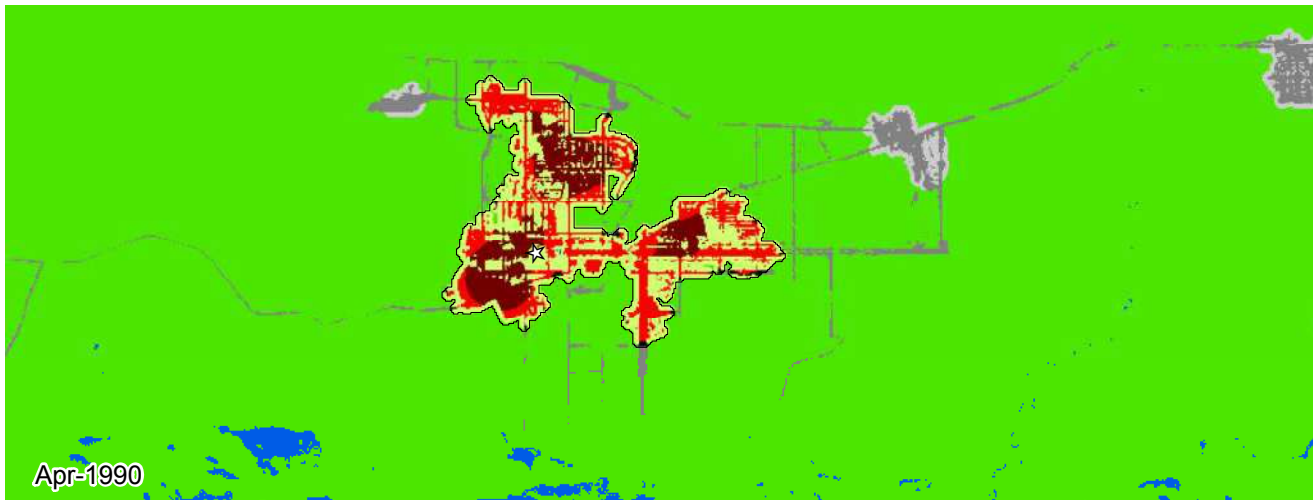


Palermo, Italy (Europe and Japan)

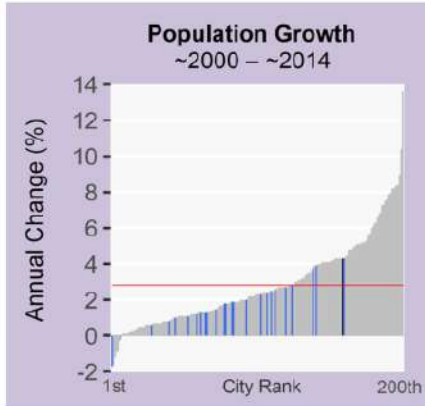


Metrics	Jul 1987	May 2000	Jul 2013	% Annual Change ('00-'13)
Population	696,749	702,461	822,939	1.2
Built-up Area (Hectares)				
Total	5,761	6,917	13,248	4.9
Urban	4,217	5,020	9,887	5.1
Suburban	1,460	1,784	3,127	4.3
Rural	83	112	233	5.5
Open space (Hectares)				
Urbanized Open Space	3,499	4,184	7,639	4.6
Urban Extent	9,260	11,101	20,888	4.8
Density (Persons / Hectare)				
Built-up Area Density	120.9	101.5	62.1	-3.7
Urban Extent Density	75.2	63.3	39.4	-3.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.62	0.63	0.1
Openness Index	0.34	0.33	0.32	-0.2
Compactness (Roundness)				
Proximity	0.75	0.70	0.58	-1.4
Cohesion	0.73	0.67	0.57	-1.3
Added Area (Hectares)	'87-'00	Share	'00-'13	Share
Infill	488	42%	1,913	30%
Extension	301	26%	1,241	19%
Leapfrog	0	0%	24	0%
Inclusion	366	31%	3,138	49%

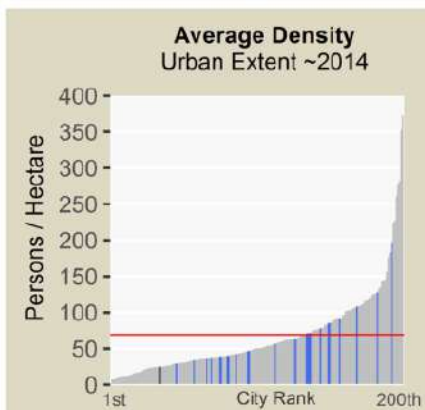
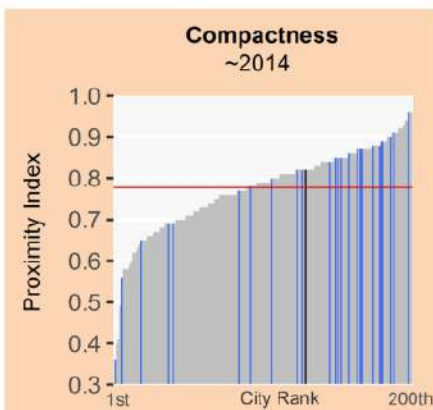
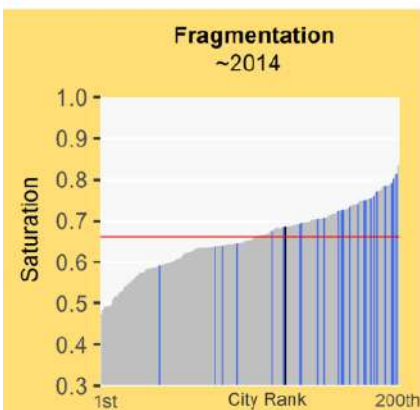
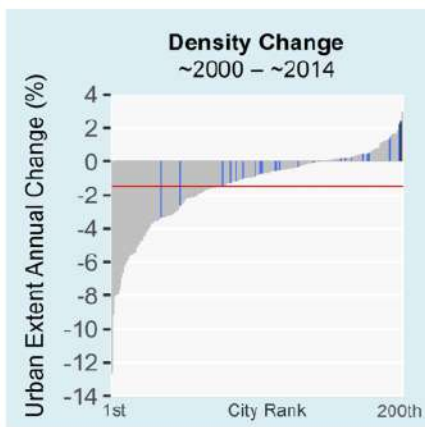
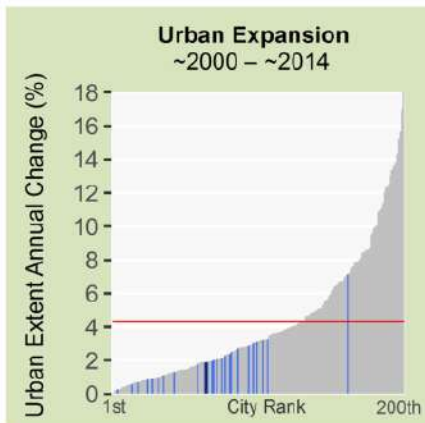


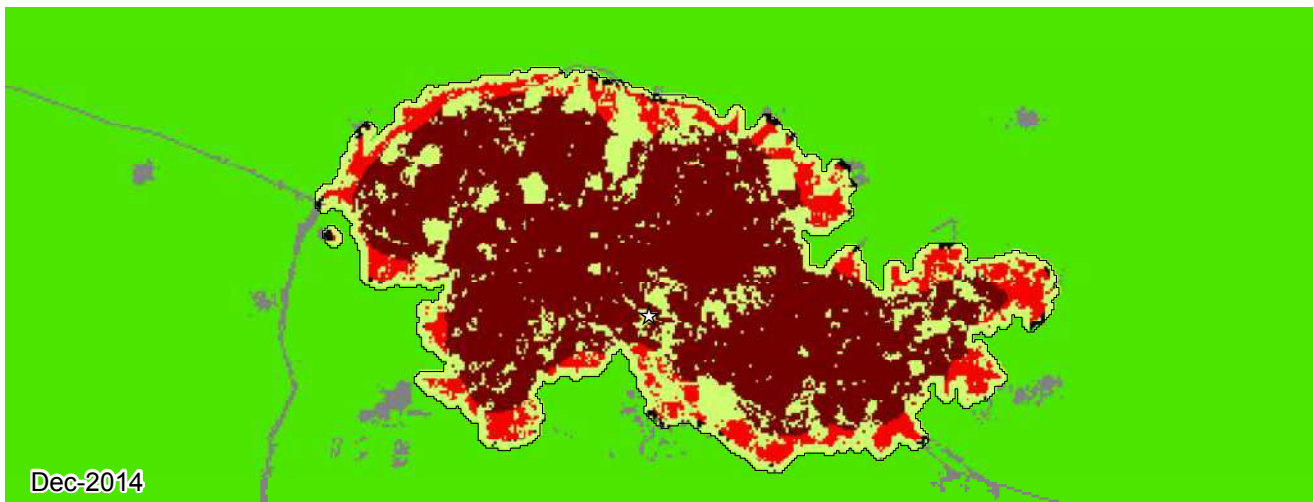
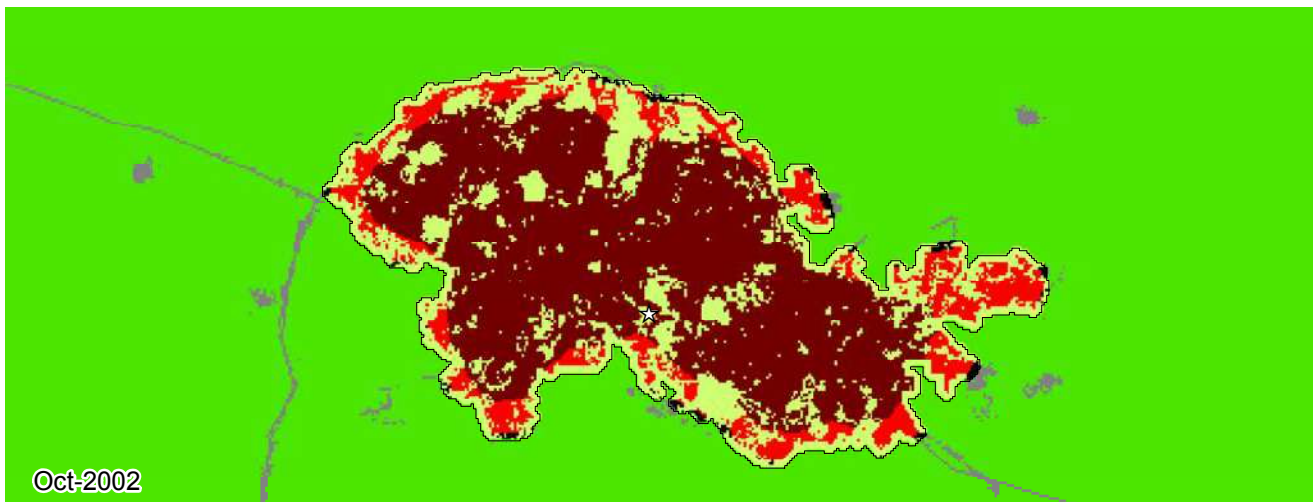
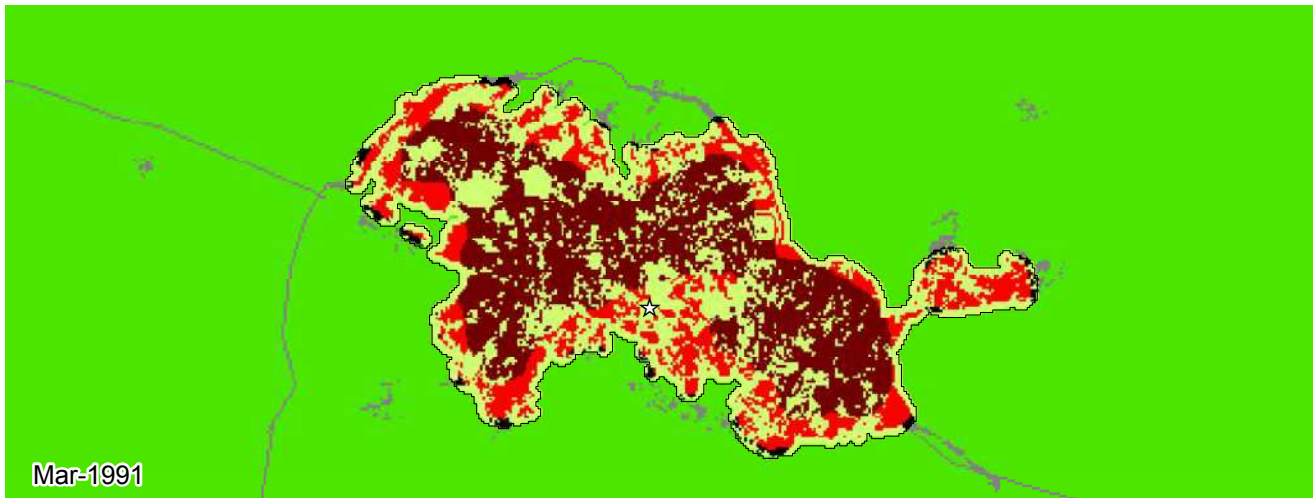


Palmas, Brazil (Latin America and the Caribbean)



Metrics	Apr 1990	Jun 2000	Aug 2013	% Annual Change ('00-'13)
Population	6,440	88,194	154,872	4.3
Built-up Area (Hectares)				
Total	725	3,214	4,228	2.1
Urban	308	2,552	3,509	2.4
Suburban	395	619	674	0.6
Rural	21	42	44	0.3
Open space (Hectares)				
Urbanized Open Space	691	1,595	1,943	1.5
Urban Extent	1,416	4,810	6,172	1.9
Density (Persons / Hectare)				
Built-up Area Density	8.9	27.4	36.6	2.2
Urban Extent Density	4.5	18.3	25.1	2.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.51	0.67	0.69	0.2
Openness Index	0.52	0.30	0.27	-0.7
Compactness (Roundness)				
Proximity	0.80	0.77	0.82	0.5
Cohesion	0.80	0.77	0.82	0.5
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	328	13%	391	38%
Extension	1,872	75%	520	51%
Leapfrog	0	0%	0	0%
Inclusion	288	11%	101	9%





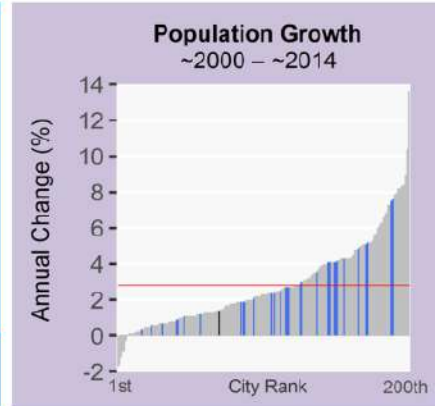
**Parbhani, India
1991-2014**

0 1 2 3 4 km

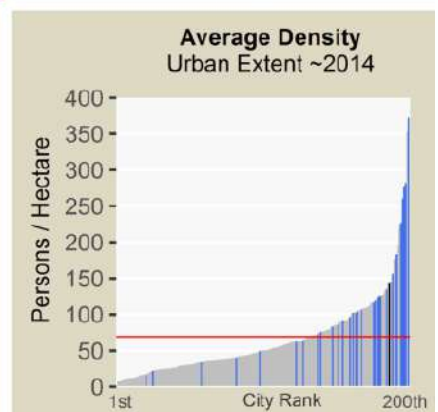
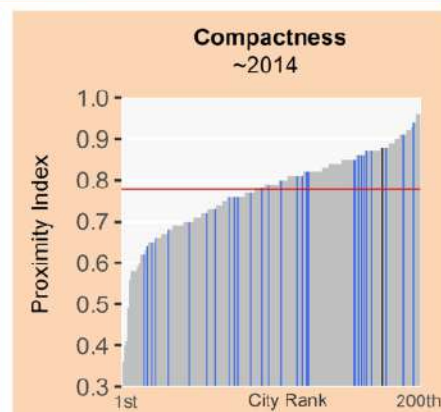
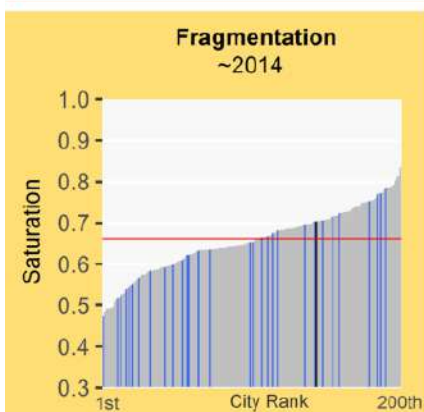
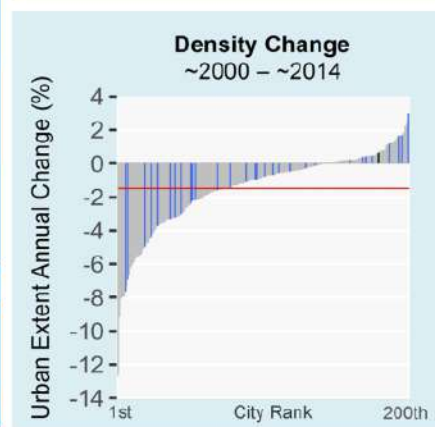
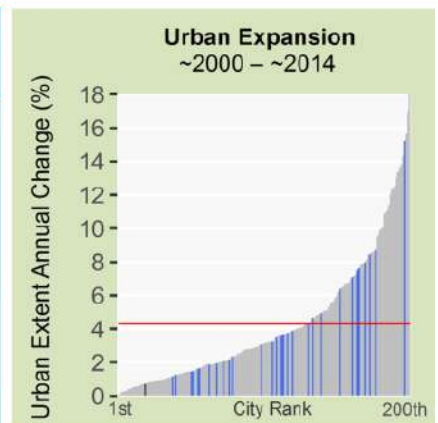
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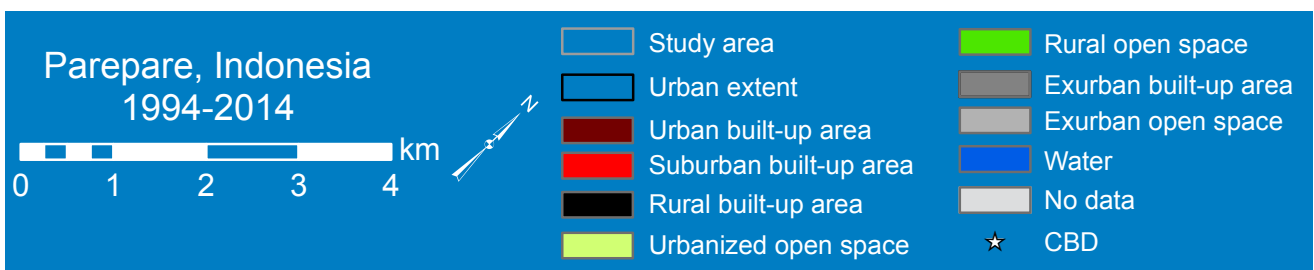
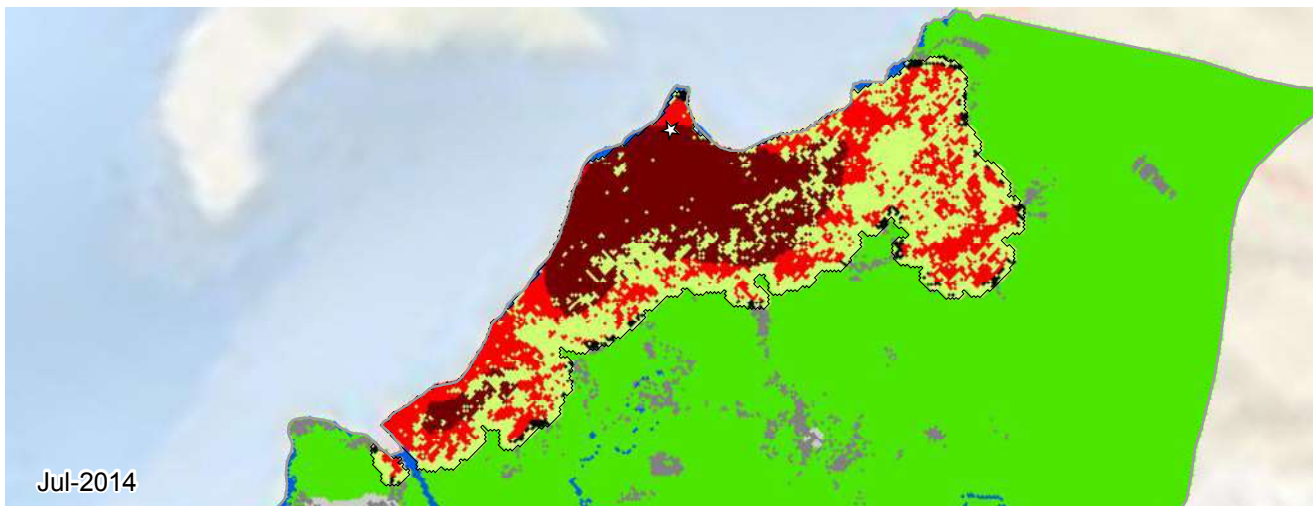
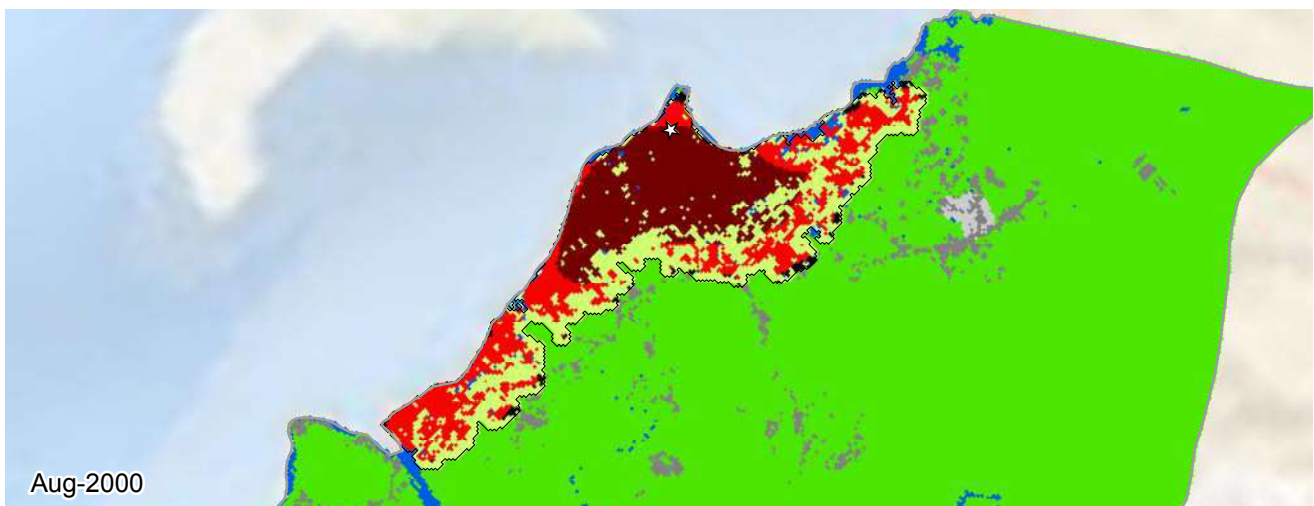
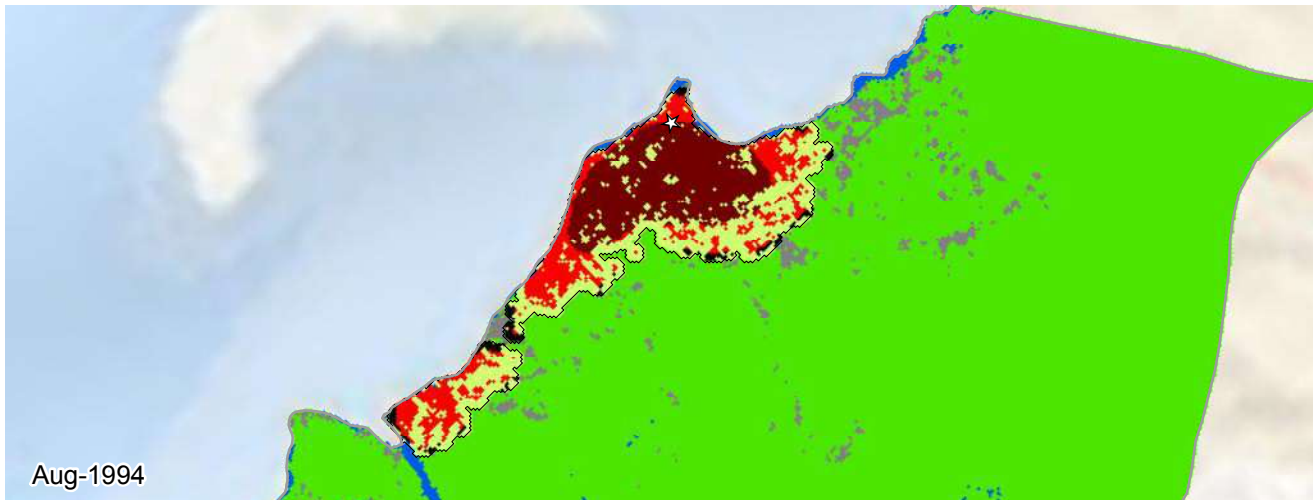
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Parbhani, India (South and Central Asia)

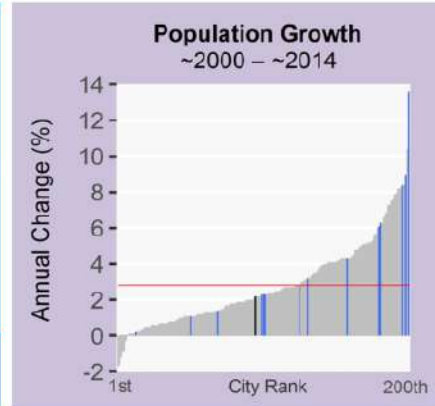


Metrics	Mar 1991	Oct 2002	Dec 2014	% Annual Change ('02-'14)
Population	267,977	324,330	382,635	1.4
Built-up Area (Hectares)				
Total	1,135	1,693	1,868	0.8
Urban	736	1,370	1,549	1.0
Suburban	365	298	297	-0.0
Rural	32	24	21	-1.1
Open space (Hectares)				
Urbanized Open Space	831	742	784	0.5
Urban Extent	1,966	2,436	2,653	0.7
Density (Persons / Hectare)				
Built-up Area Density	236.1	191.5	204.8	0.6
Urban Extent Density	136.2	133.1	144.2	0.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.58	0.70	0.70	0.1
Openness Index	0.43	0.29	0.27	-0.4
Compactness (Roundness)				
Proximity	0.84	0.87	0.88	0.1
Cohesion	0.83	0.87	0.88	0.1
Added Area (Hectares)	'91-'02	Share	'02-'14	Share
Infill	311	55%	75	43%
Extension	204	36%	81	46%
Leapfrog	0	0%	0	0%
Inclusion	42	7%	17	9%

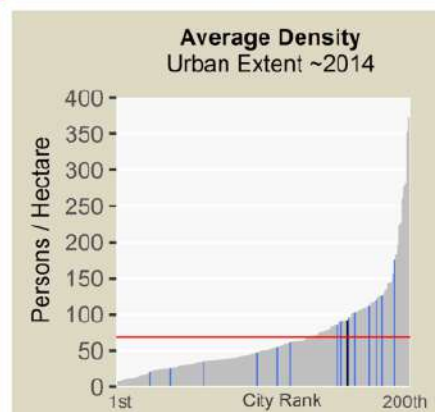
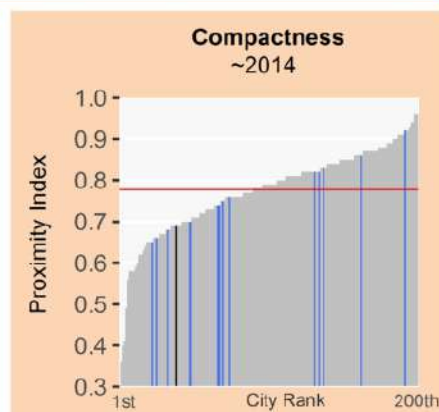
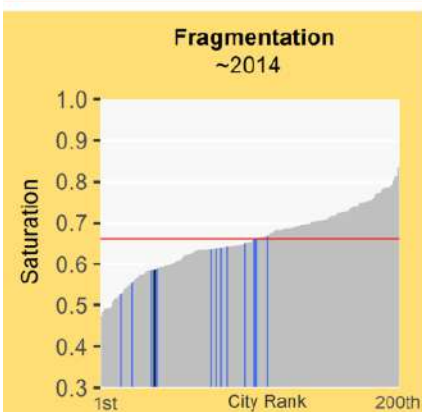
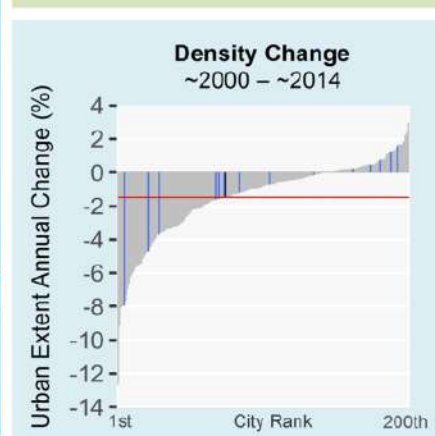
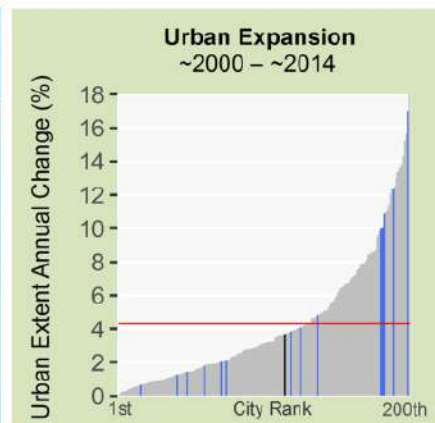


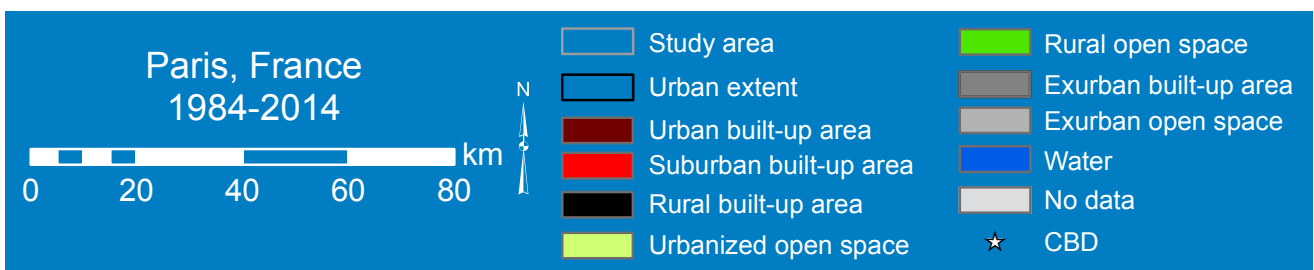
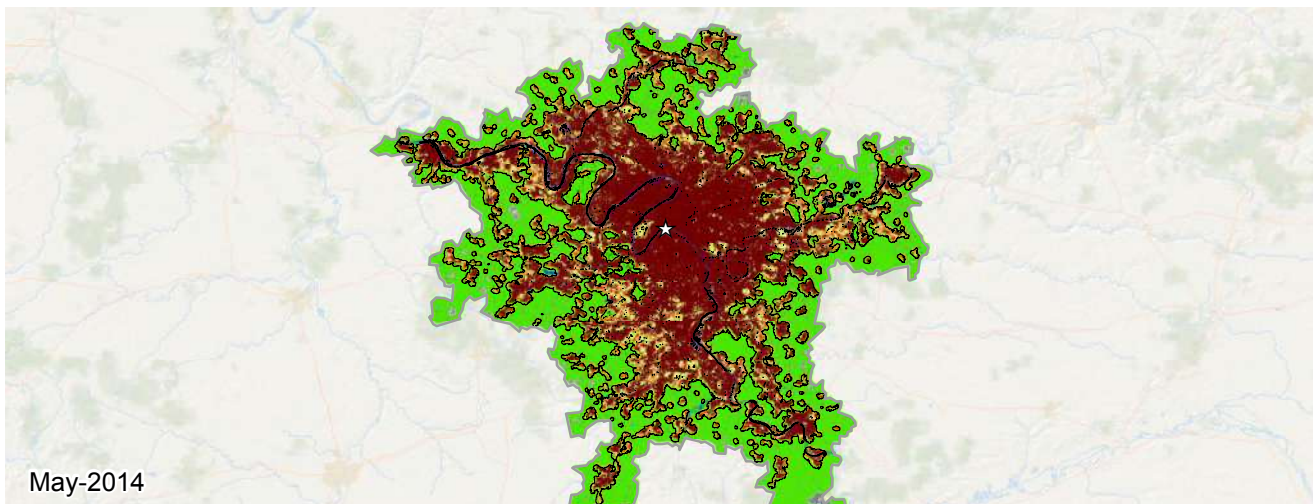
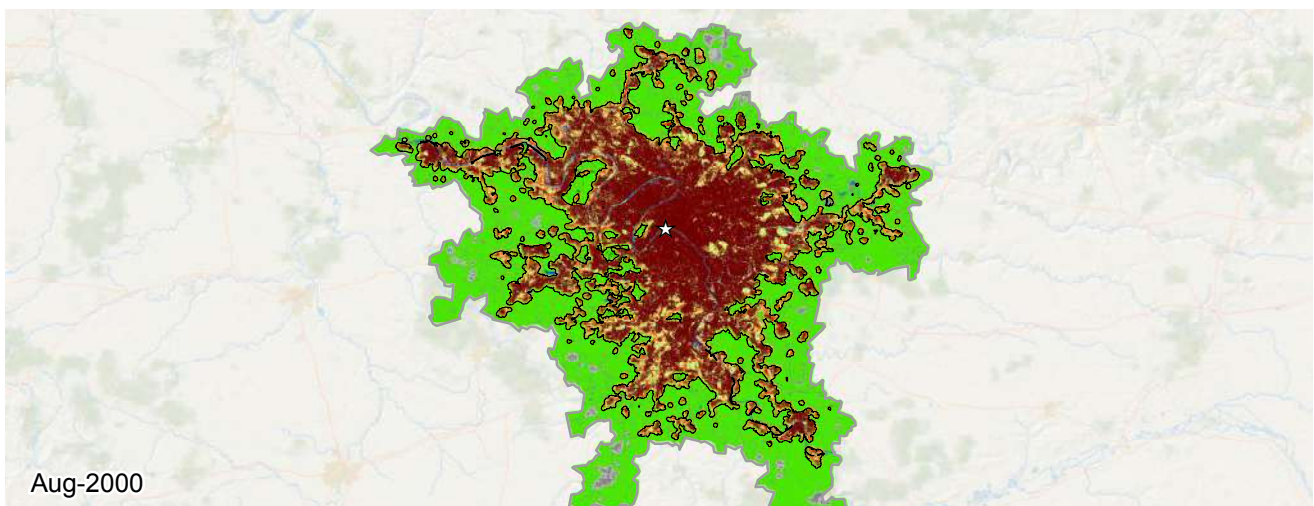
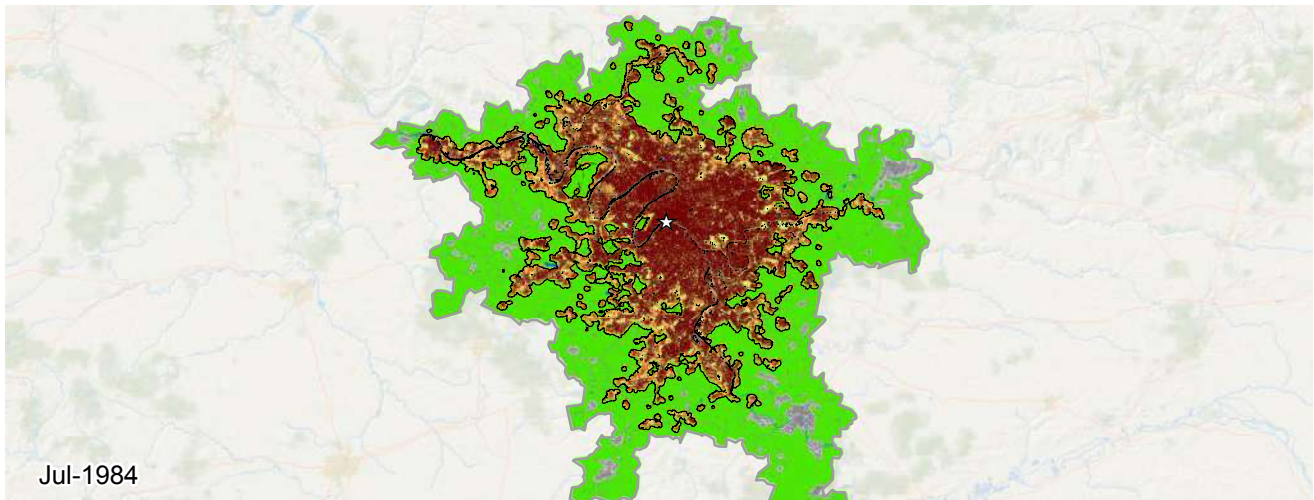


Parepare, Indonesia (Southeast Asia)

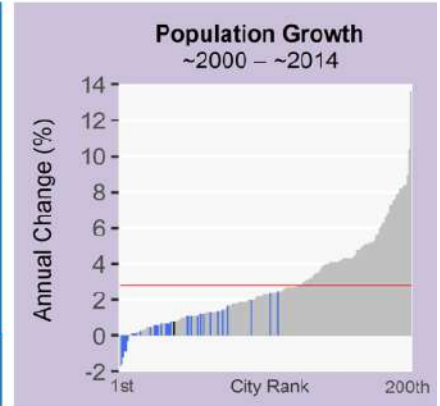
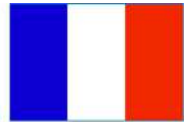


Metrics	Aug 1994	Aug 2000	Jul 2014	% Annual Change ('00-'14)
Population	70,609	77,220	104,562	2.2
Built-up Area (Hectares)				
Total	301	426	662	3.2
Urban	169	223	348	3.2
Suburban	114	190	290	3.0
Rural	17	11	22	4.7
Open space (Hectares)				
Urbanized Open Space	185	250	467	4.5
Urban Extent	487	676	1,129	3.7
Density (Persons / Hectare)				
Built-up Area Density	233.9	181.2	157.9	-1.0
Urban Extent Density	144.8	114.2	92.6	-1.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.63	0.59	-0.5
Openness Index	0.47	0.46	0.45	-0.2
Compactness (Roundness)				
Proximity	0.64	0.66	0.69	0.3
Cohesion	0.64	0.66	0.69	0.4
Added Area (Hectares)	'94-'00	Share	'00-'14	Share
Infill	37	29%	65	27%
Extension	42	33%	97	41%
Leapfrog	0	0%	0	0%
Inclusion	45	36%	73	30%

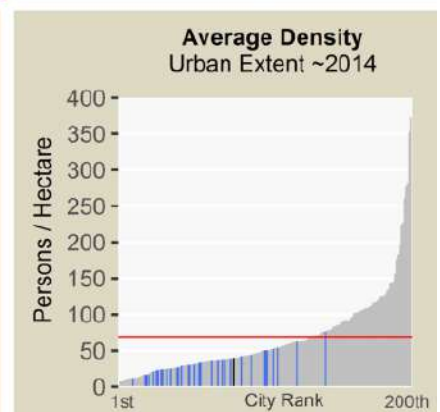
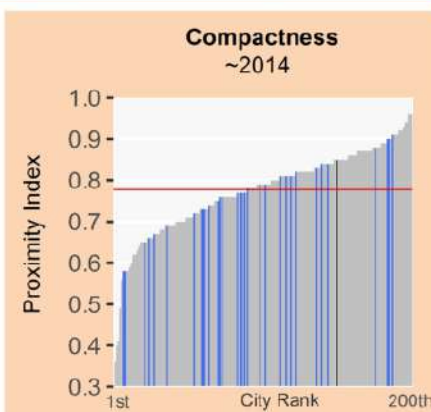
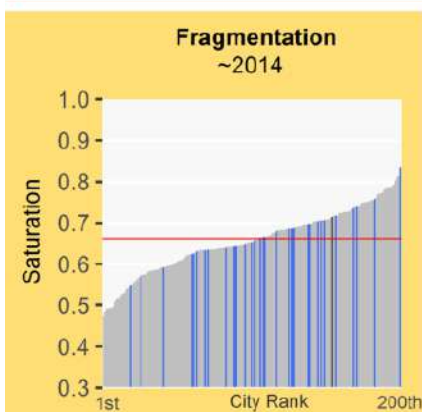
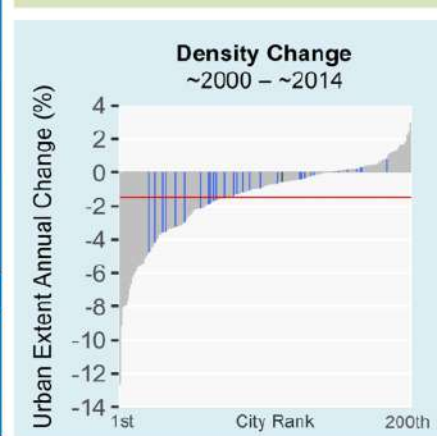
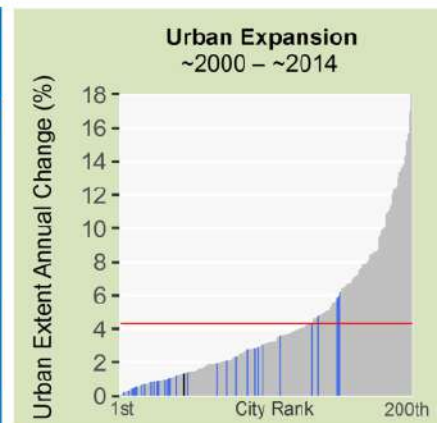


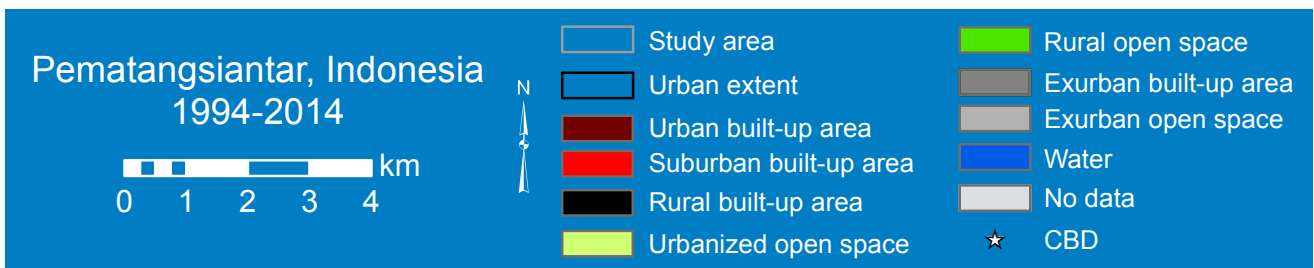
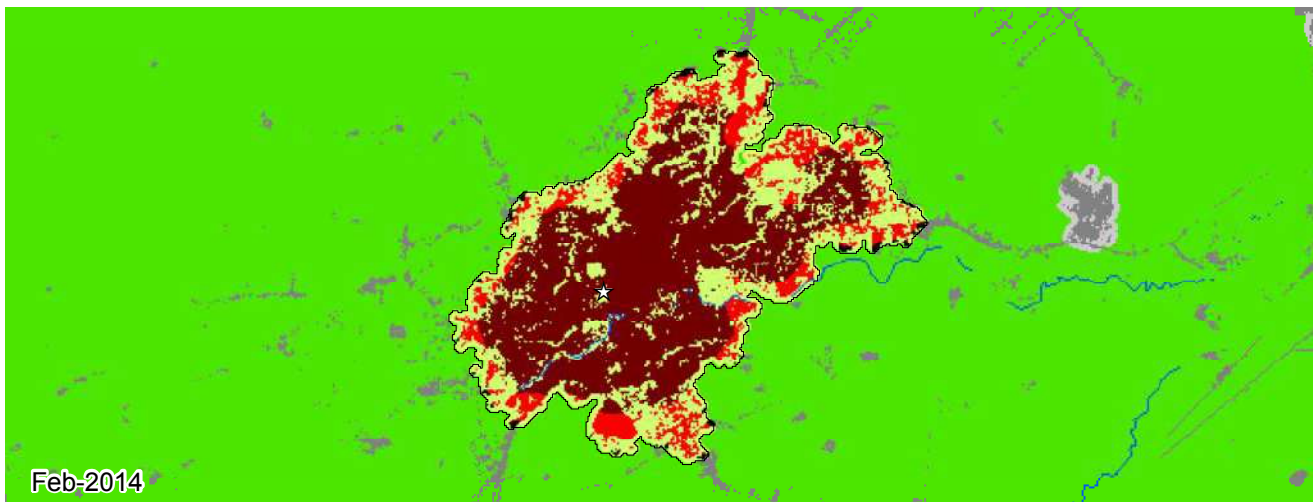
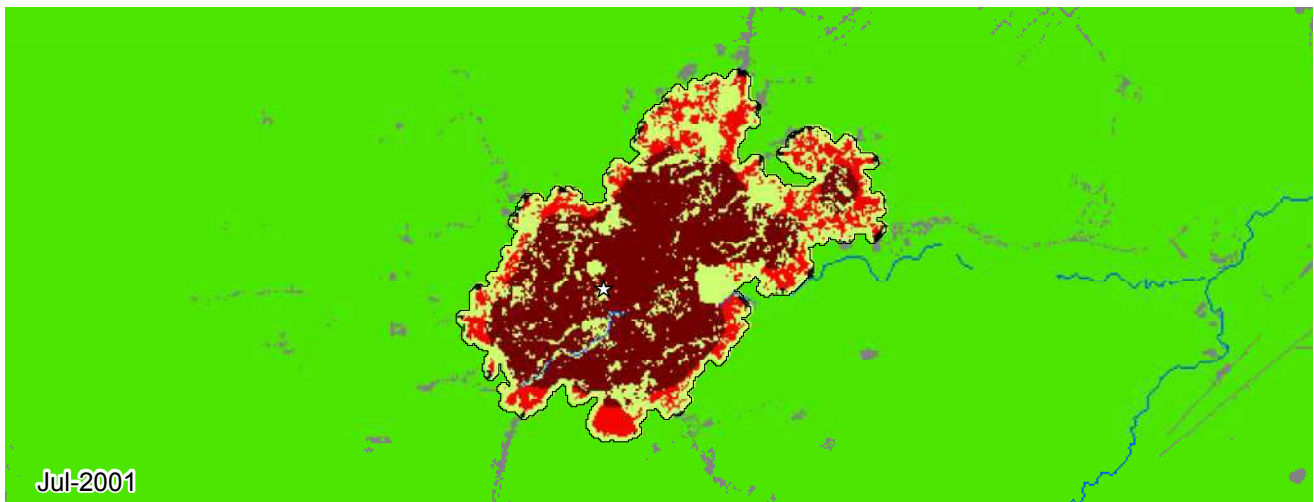
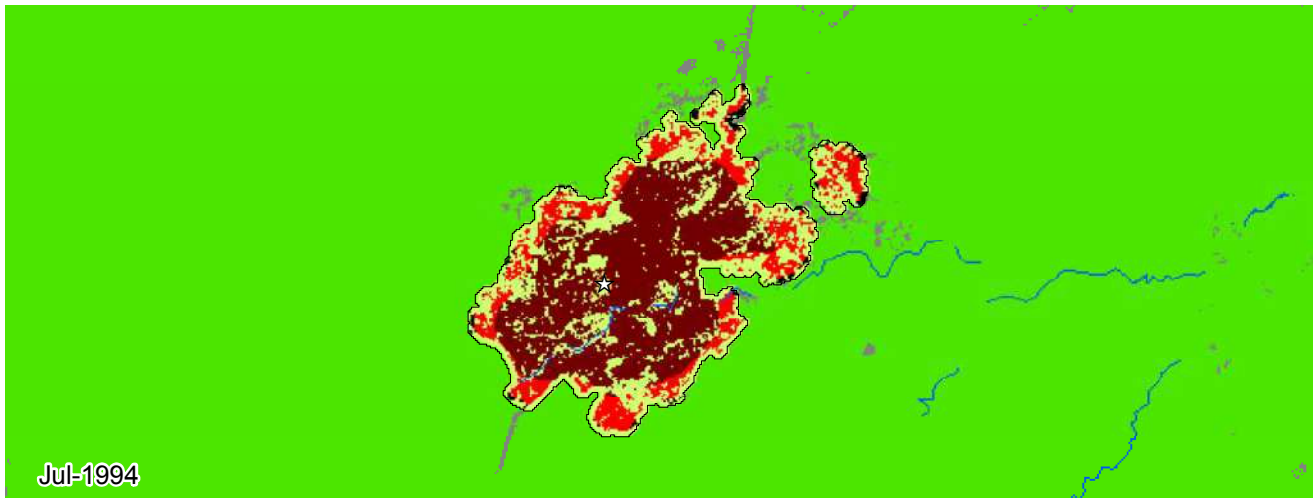


Paris, France (Europe and Japan)



Metrics	May 1987	Aug 2000	May 2014	% Annual Change ('00-'14)
Population	9,265,733	10,009,893	11,114,025	0.8
Built-up Area (Hectares)				
Total	127,790	158,629	198,625	1.6
Urban	101,931	131,083	166,725	1.7
Suburban	24,057	25,608	29,219	1.0
Rural	1,800	1,937	2,681	2.4
Open space (Hectares)				
Urbanized Open Space	69,420	72,727	79,221	0.6
Urban Extent	197,210	231,356	277,847	1.3
Density (Persons / Hectare)				
Built-up Area Density	72.5	63.1	56.0	-0.9
Urban Extent Density	47.0	43.3	40.0	-0.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.69	0.71	0.3
Openness Index	0.30	0.25	0.23	-0.6
Compactness (Roundness)				
Proximity	0.86	0.85	0.85	0.1
Cohesion	0.84	0.82	0.83	0.1
Added Area (Hectares)	'87-'00	Share	'00-'14	Share
Infill	16,010	51%	20,200	49%
Extension	4,748	15%	9,281	22%
Leapfrog	648	2%	697	1%
Inclusion	9,638	31%	10,296	25%

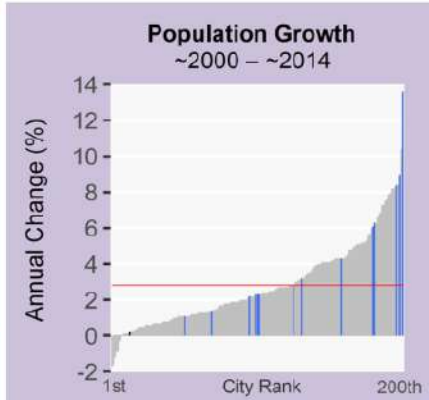




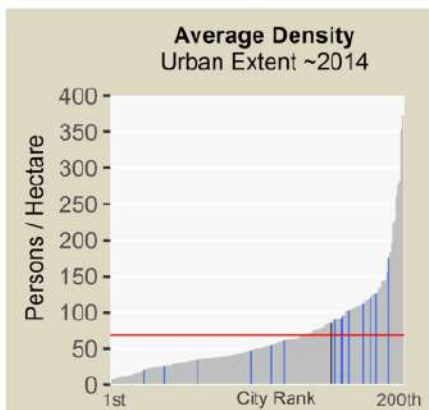
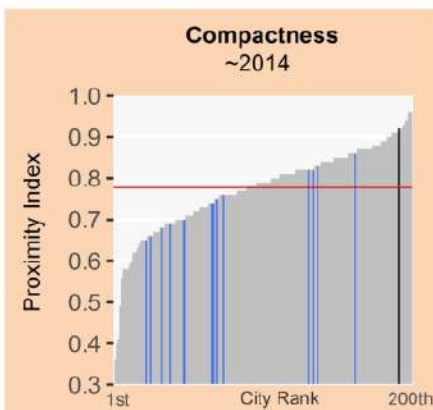
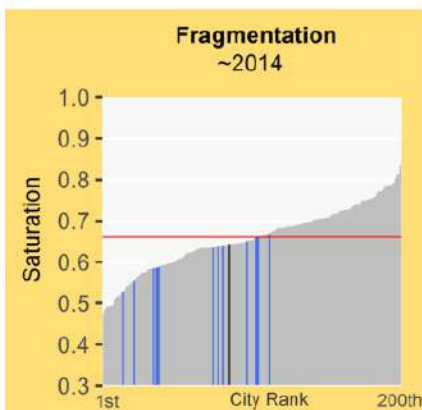
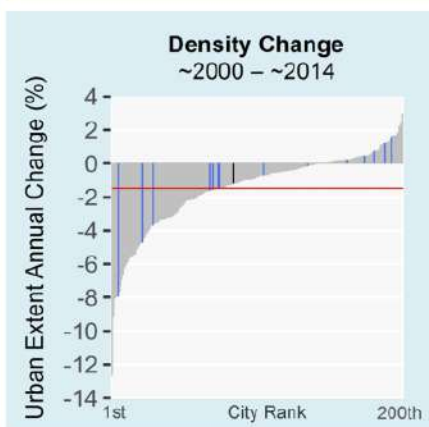
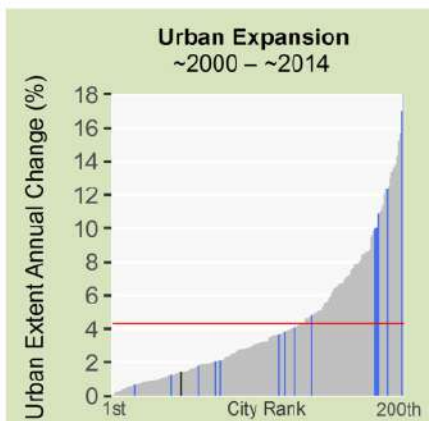
Pematangsiantar, Indonesia (Southeast Asia)

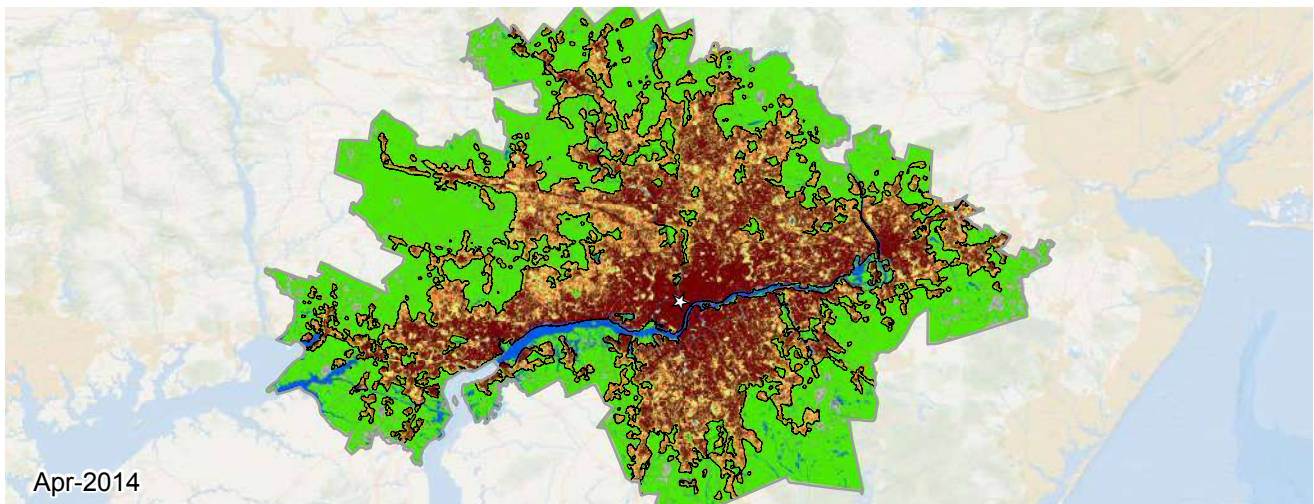
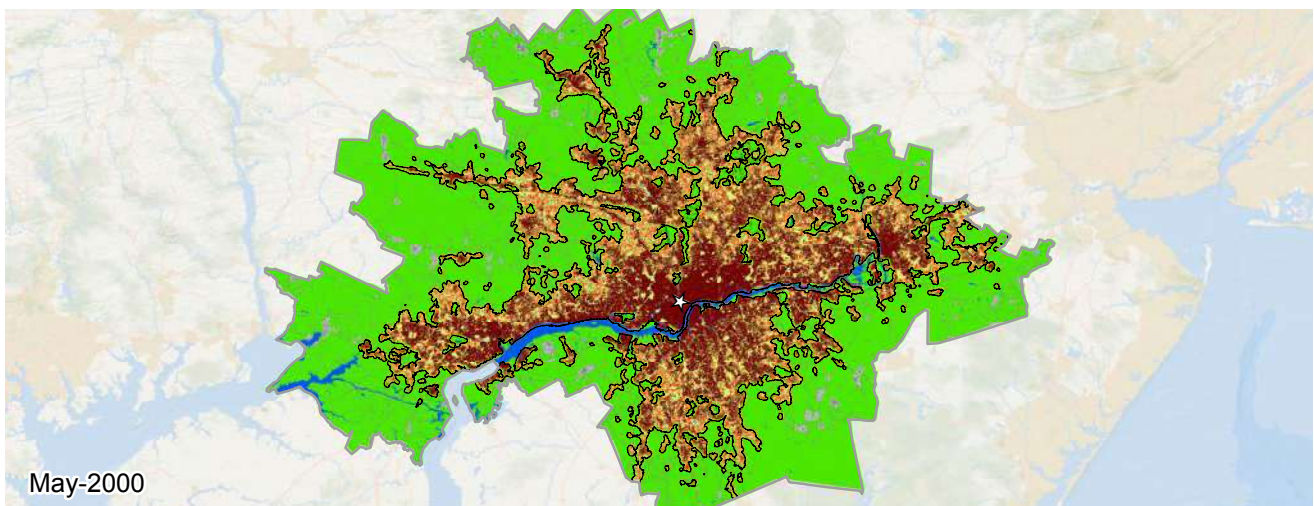
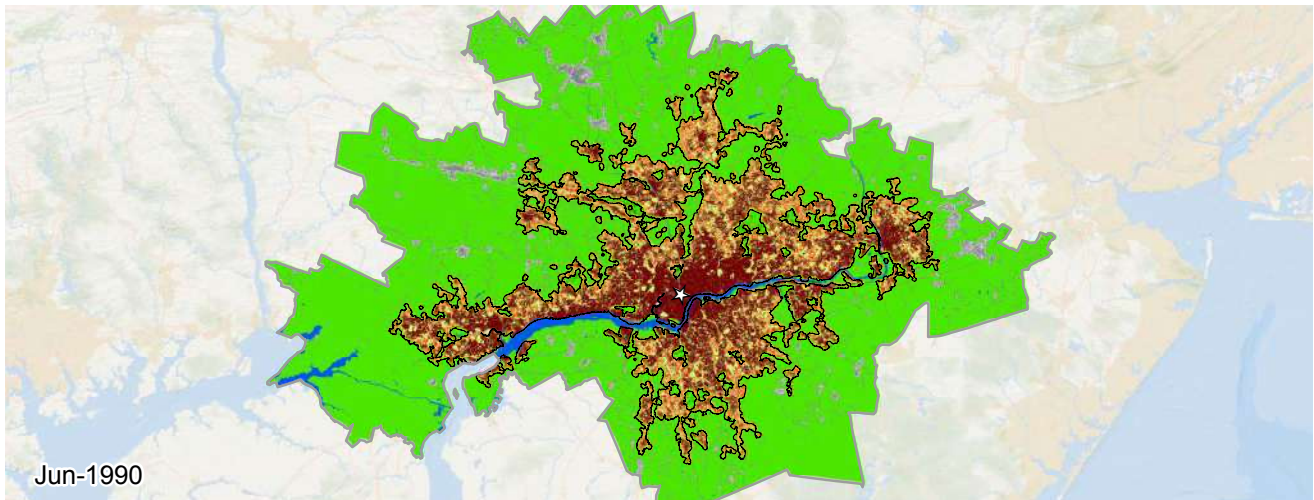


Legend for Charts
 Pematangsiantar | Other cities in region | All other cities | Global average



Metrics	Jul 1994	Jul 2001	Feb 2014	% Annual Change ('01-'14)
Population	233,506	214,274	219,790	0.2
Built-up Area (Hectares)				
Total	1,089	1,369	1,650	1.5
Urban	798	1,024	1,296	1.9
Suburban	261	319	322	0.1
Rural	29	25	31	1.9
Open space (Hectares)				
Urbanized Open Space	651	778	920	1.3
Urban Extent	1,740	2,148	2,570	1.4
Density (Persons / Hectare)				
Built-up Area Density	214.2	156.5	133.2	-1.3
Urban Extent Density	134.1	99.7	85.5	-1.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.63	0.64	0.64	0.1
Openness Index	0.37	0.34	0.32	-0.5
Compactness (Roundness)				
Proximity	0.91	0.91	0.92	0.0
Cohesion	0.90	0.91	0.91	0.0
Added Area (Hectares)	'94-'01	Share	'01-'14	Share
Infill	124	44%	131	46%
Extension	0	0%	98	34%
Leapfrog	96	34%	0	0%
Inclusion	57	20%	50	17%





**Philadelphia, United States
1990-2014**

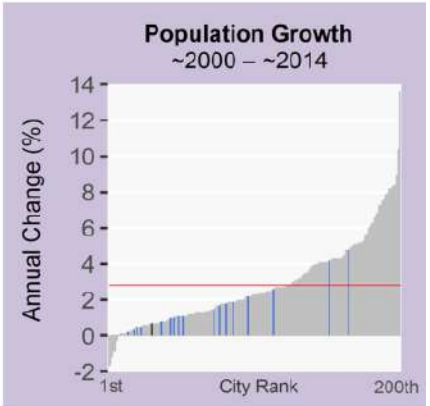
0 20 40 60 80 km

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

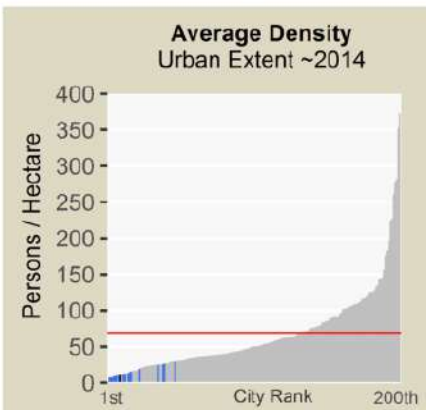
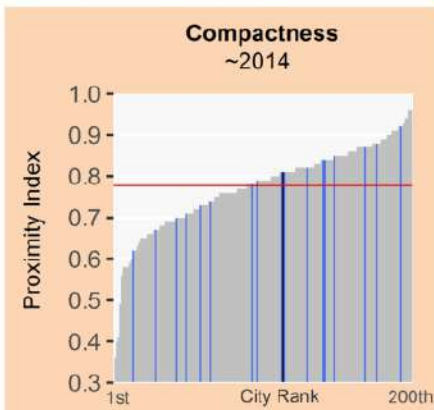
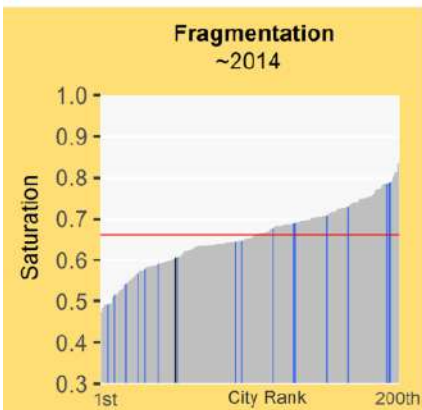
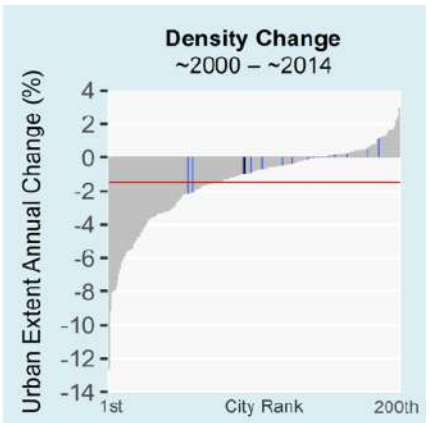
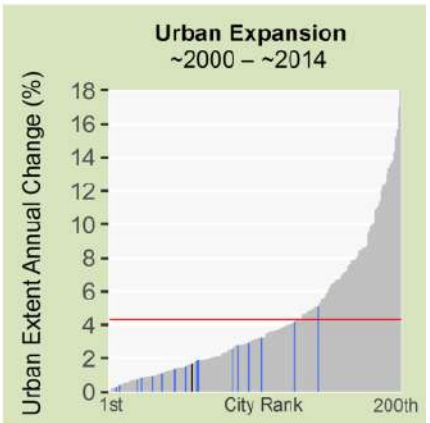
Philadelphia, United States (Land-Rich Developed Countries)

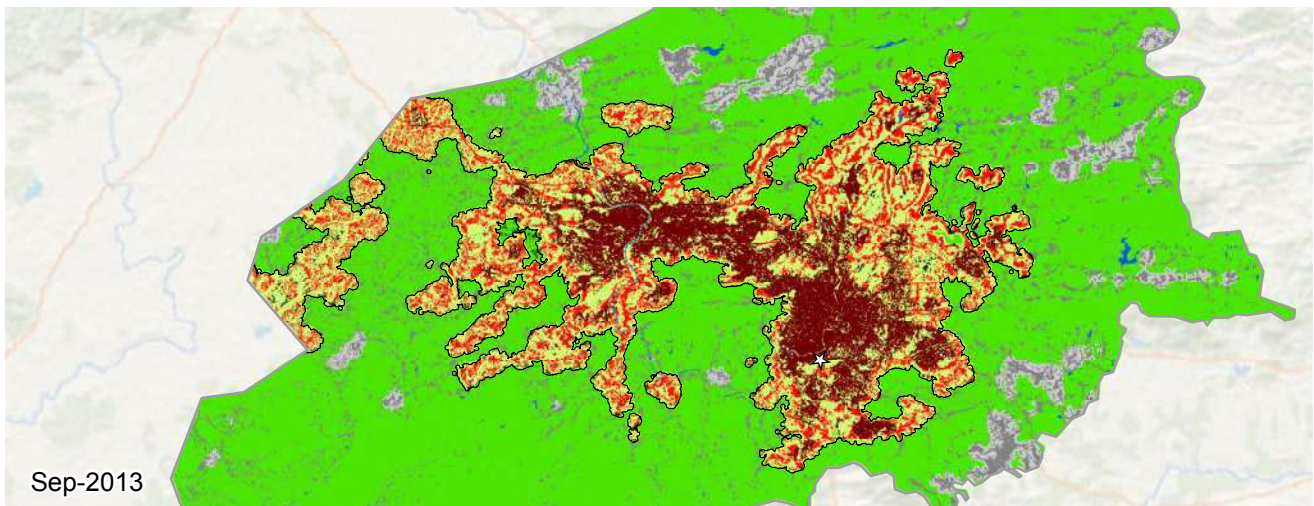
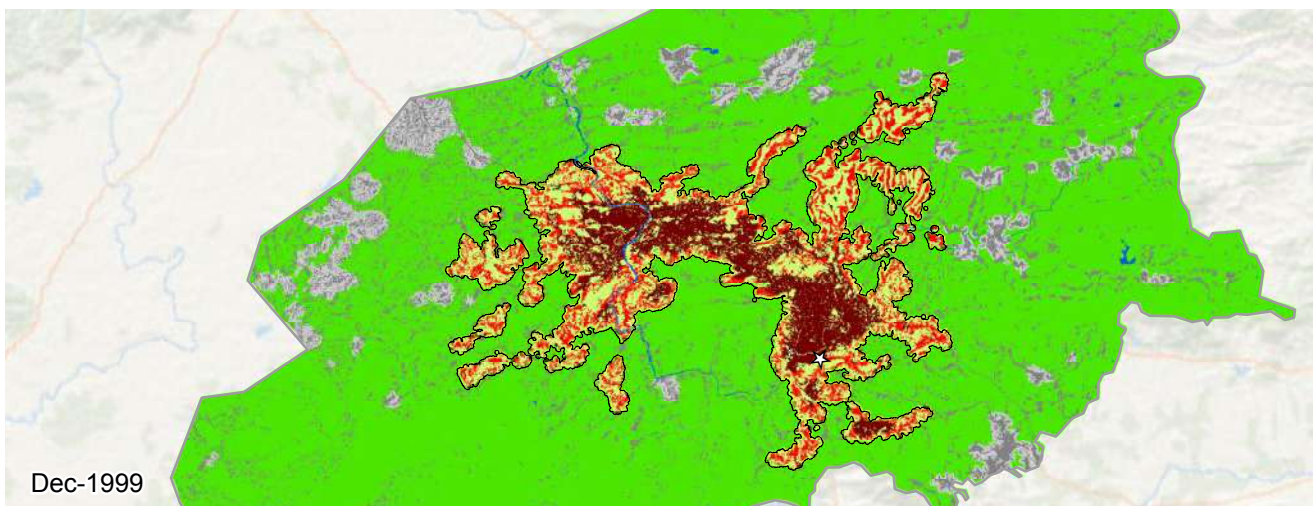
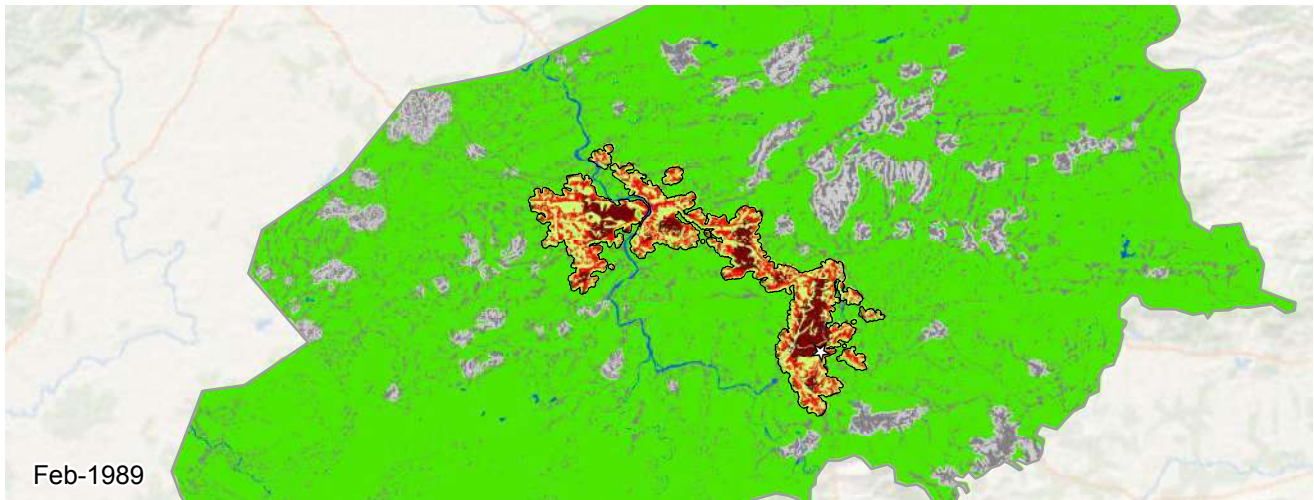


Legend for Charts
 Philadelphia | Other cities in region | All other cities | Global average



Metrics	Jun 1990	May 2000	Apr 2014	% Annual Change ('00-'14)
Population	4,760,535	5,329,829	5,852,880	0.7
Built-up Area (Hectares)				
Total	163,084	223,015	298,213	2.1
Urban	111,804	155,082	222,642	2.6
Suburban	48,218	63,622	70,673	0.8
Rural	3,061	4,310	4,897	0.9
Open space (Hectares)				
Urbanized Open Space	123,315	166,522	193,646	1.1
Urban Extent	286,400	389,537	491,859	1.7
Density (Persons / Hectare)				
Built-up Area Density	29.2	23.9	19.6	-1.4
Urban Extent Density	16.6	13.7	11.9	-1.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.57	0.57	0.61	0.4
Openness Index	0.38	0.37	0.34	-0.6
Compactness (Roundness)				
Proximity	0.77	0.79	0.81	0.2
Cohesion	0.74	0.77	0.79	0.2
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	20,383	34%	36,703	48%
Extension	18,653	31%	18,249	24%
Leapfrog	709	1%	1,174	1%
Inclusion	20,184	33%	19,135	25%

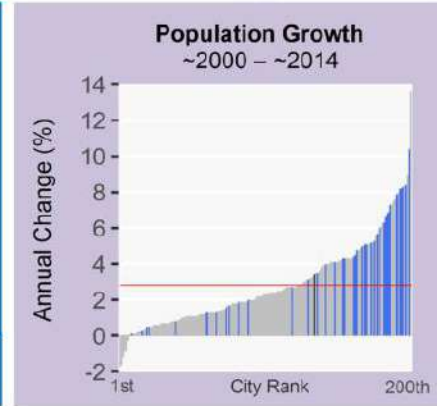




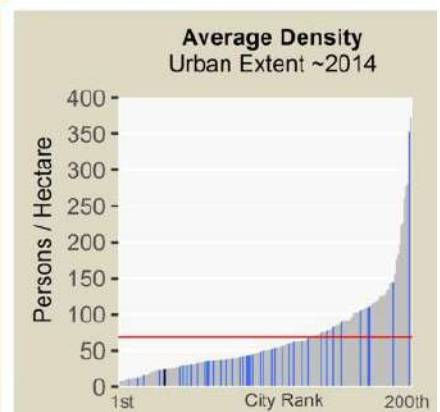
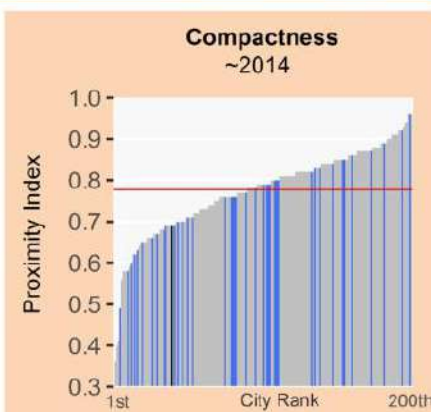
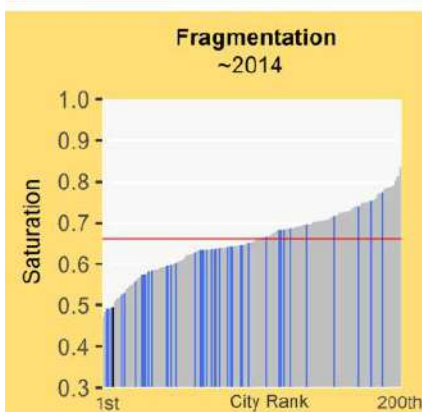
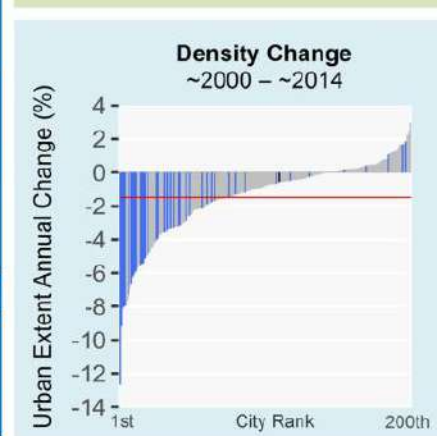
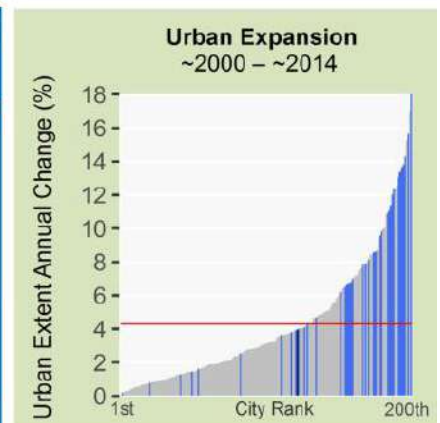
**Pingxiang, Jiangxi, China
1989-2013**

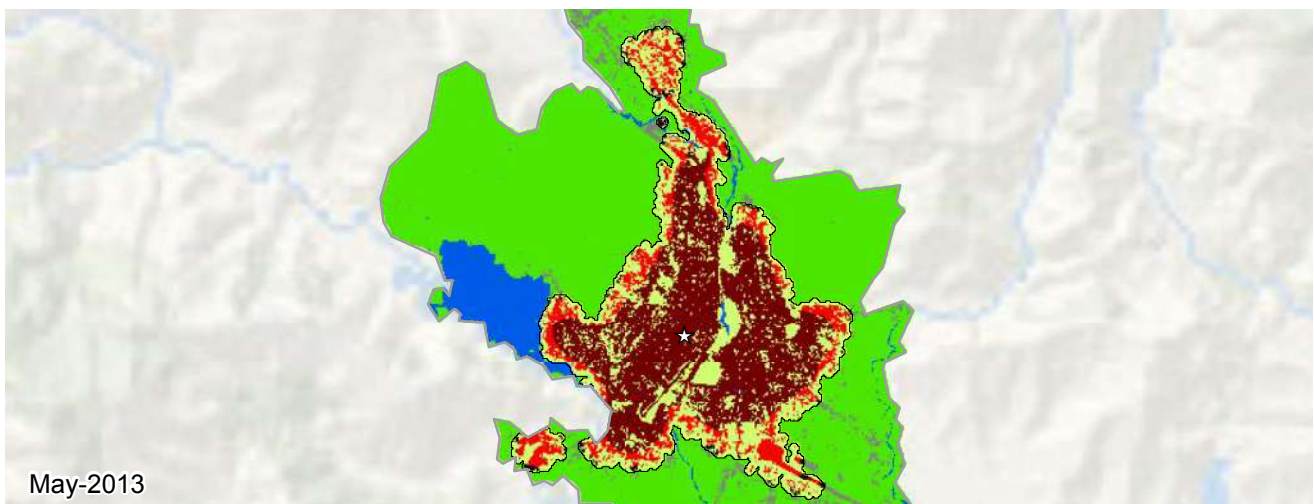
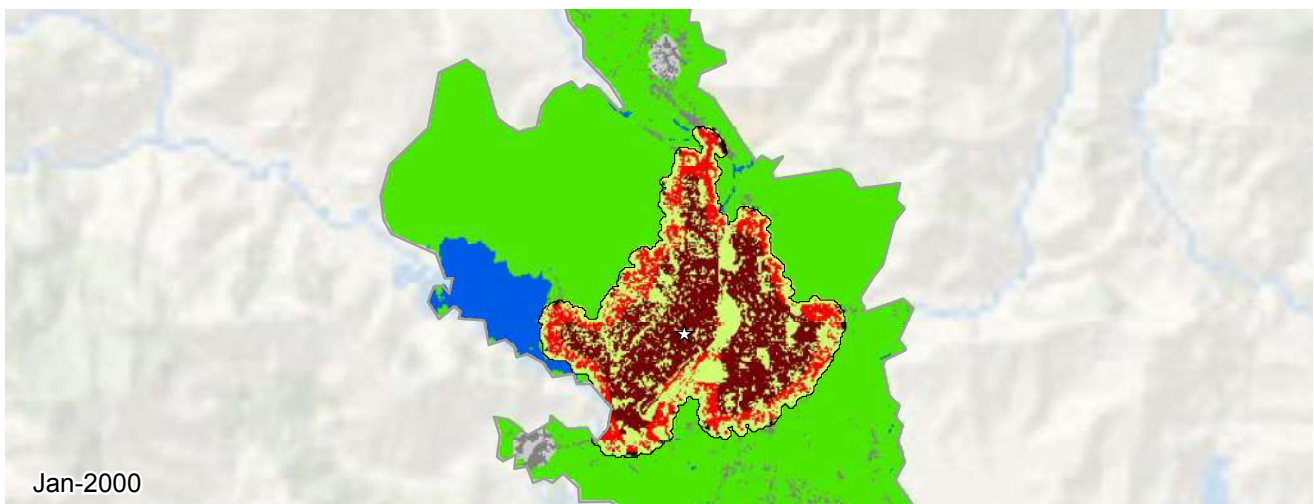
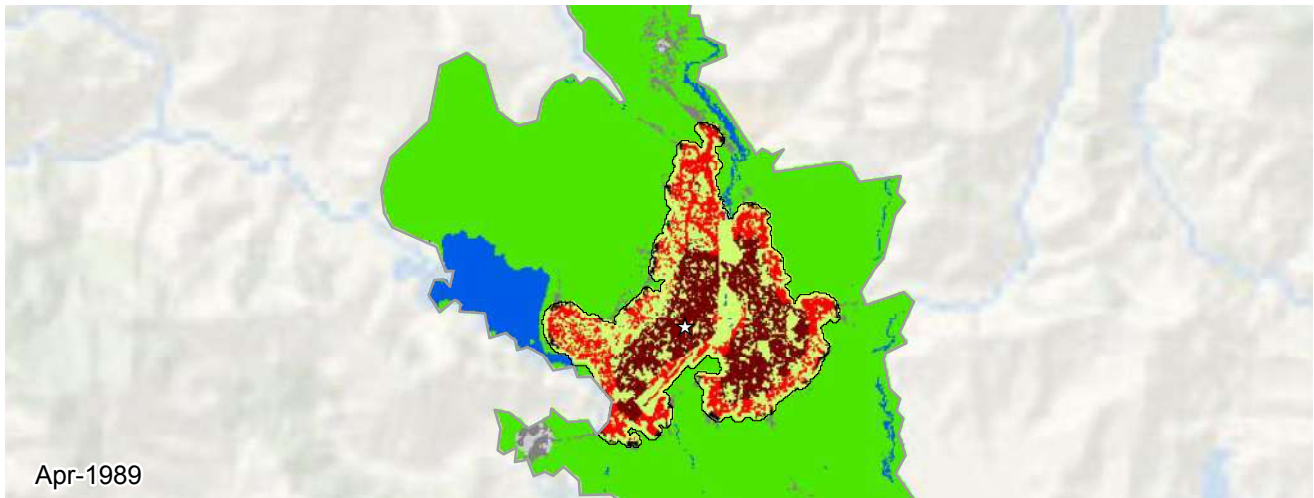
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Pingxiang, Jiangxi, China (East Asia and the Pacific)



Metrics	Feb 1989	Dec 1999	Sep 2013	% Annual Change ('99-'13)
Population	192,627	475,925	757,572	3.4
Built-up Area (Hectares)				
Total	2,746	8,943	15,265	3.9
Urban	1,017	4,295	7,894	4.4
Suburban	1,582	4,202	6,754	3.5
Rural	147	445	616	2.4
Open space (Hectares)				
Urbanized Open Space	3,090	8,914	15,549	4.0
Urban Extent	5,836	17,858	30,815	4.0
Density (Persons / Hectare)				
Built-up Area Density	70.1	53.2	49.6	-0.5
Urban Extent Density	33.0	26.6	24.6	-0.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.47	0.50	0.50	-0.1
Openness Index	0.53	0.47	0.45	-0.2
Compactness (Roundness)				
Proximity	0.53	0.69	0.69	-0.0
Cohesion	0.55	0.70	0.70	0.0
Added Area (Hectares)	'89-'99	Share	'99-'13	Share
Infill	953	15%	1,377	21%
Extension	2,203	35%	2,085	32%
Leapfrog	14	0%	3	0%
Inclusion	3,025	48%	2,855	45%

















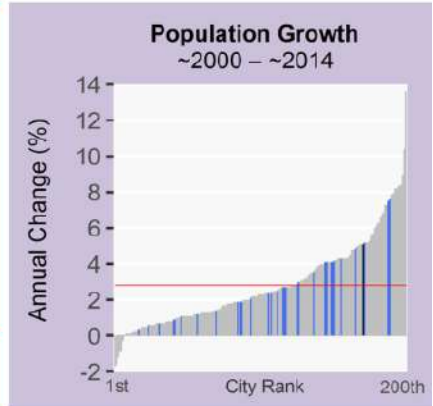
**Pokhara, Nepal
1989-2013**

0 1.5 3 4.5 6 km

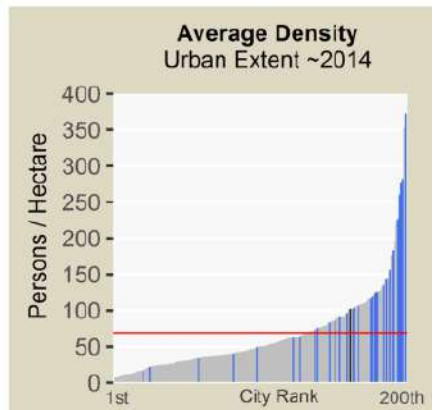
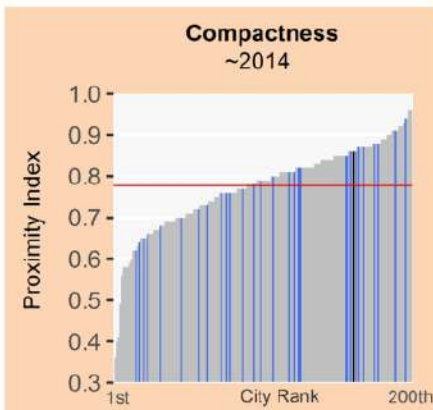
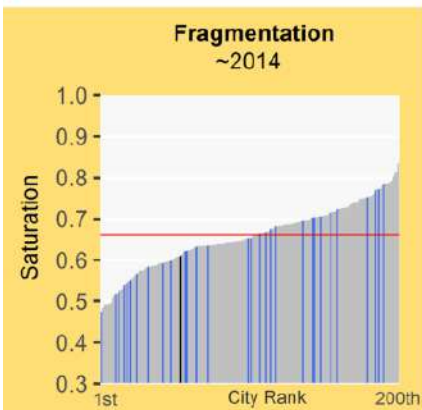
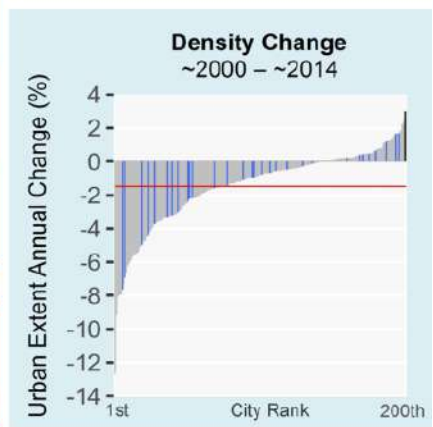
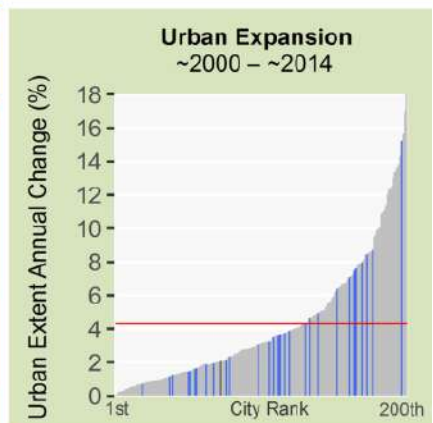
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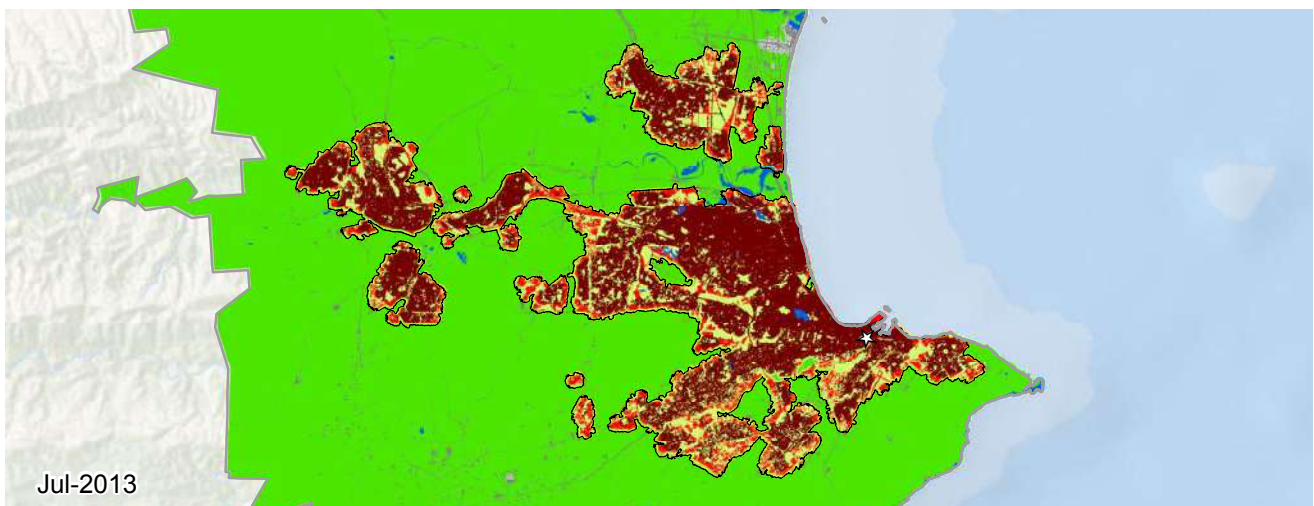
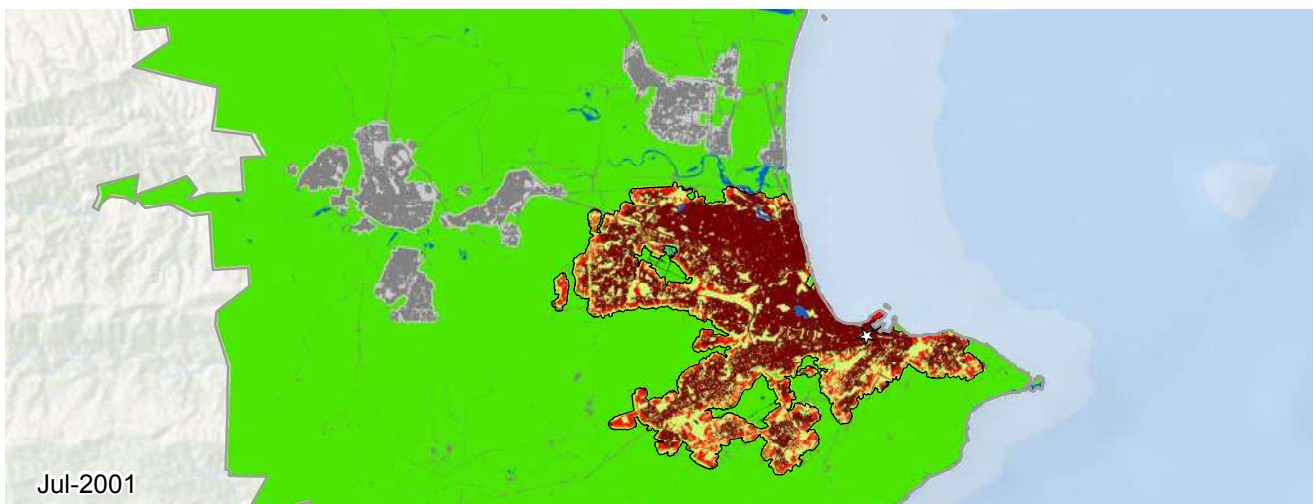
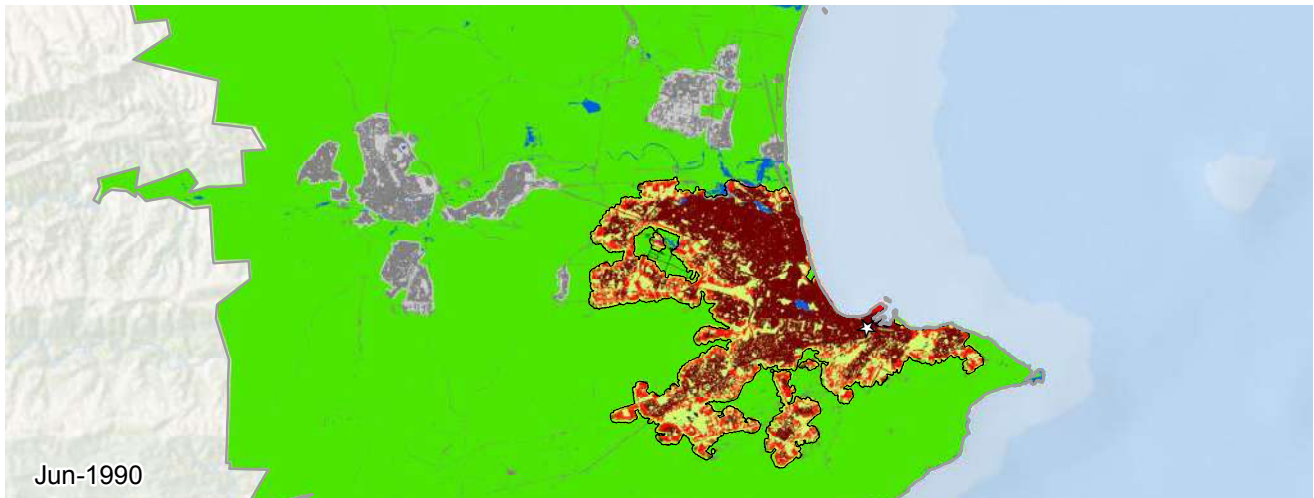
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Pokhara, Nepal (South and Central Asia)



Metrics	Apr 1989	Jan 2000	May 2013	% Annual Change ('00-'13)
Population	80,222	138,941	272,830	5.1
Built-up Area (Hectares)				
Total	934	1,160	1,630	2.6
Urban	494	786	1,212	3.2
Suburban	404	351	377	0.5
Rural	36	22	39	4.4
Open space (Hectares)				
Urbanized Open Space	806	862	1,036	1.4
Urban Extent	1,741	2,022	2,666	2.1
Density (Persons / Hectare)				
Built-up Area Density	85.8	119.7	167.4	2.5
Urban Extent Density	46.1	68.7	102.3	3.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.57	0.61	0.5
Openness Index	0.49	0.43	0.37	-1.1
Compactness (Roundness)				
Proximity	0.90	0.94	0.86	-0.7
Cohesion	0.88	0.93	0.84	-0.7
Added Area (Hectares)	'89-'00	Share	'00-'13	Share
Infill	128	56%	218	46%
Extension	65	28%	146	31%
Leapfrog	0	0%	0	0%
Inclusion	31	13%	104	22%



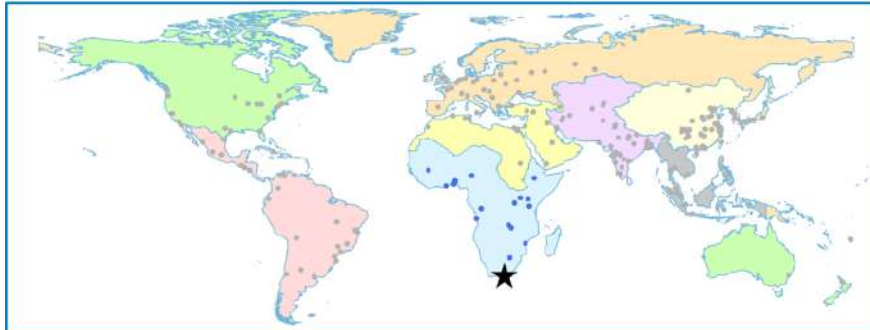


**Port Elizabeth, South Africa
1990-2013**

0 5 10 15 20 km

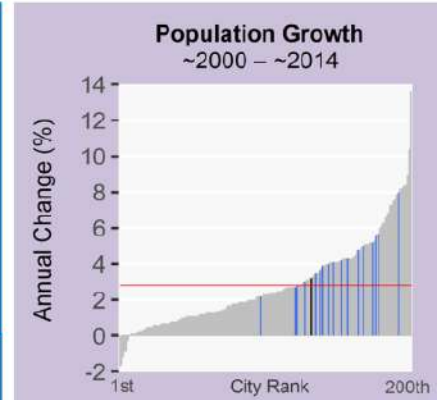
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Port Elizabeth, South Africa (Sub-Saharan Africa)

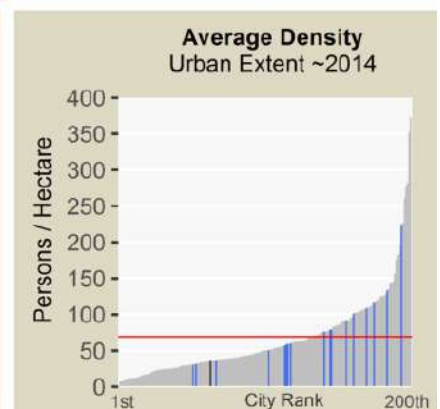
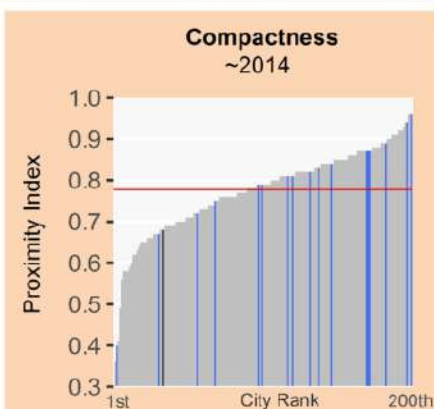
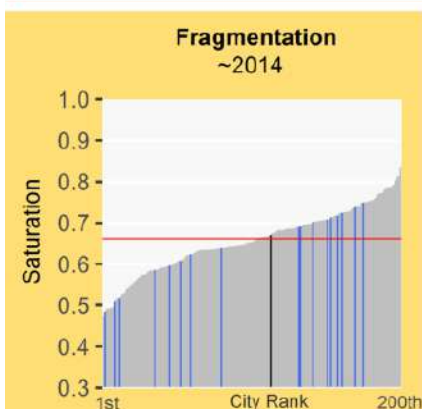
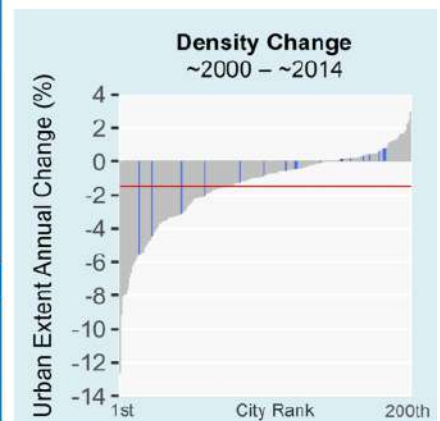
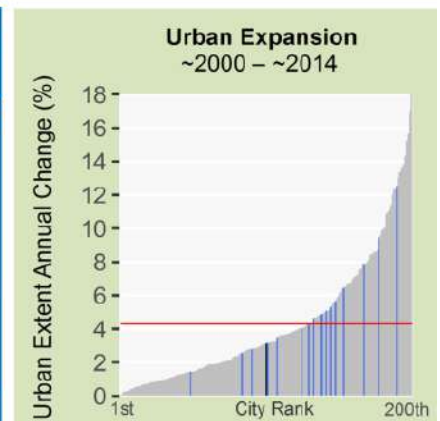


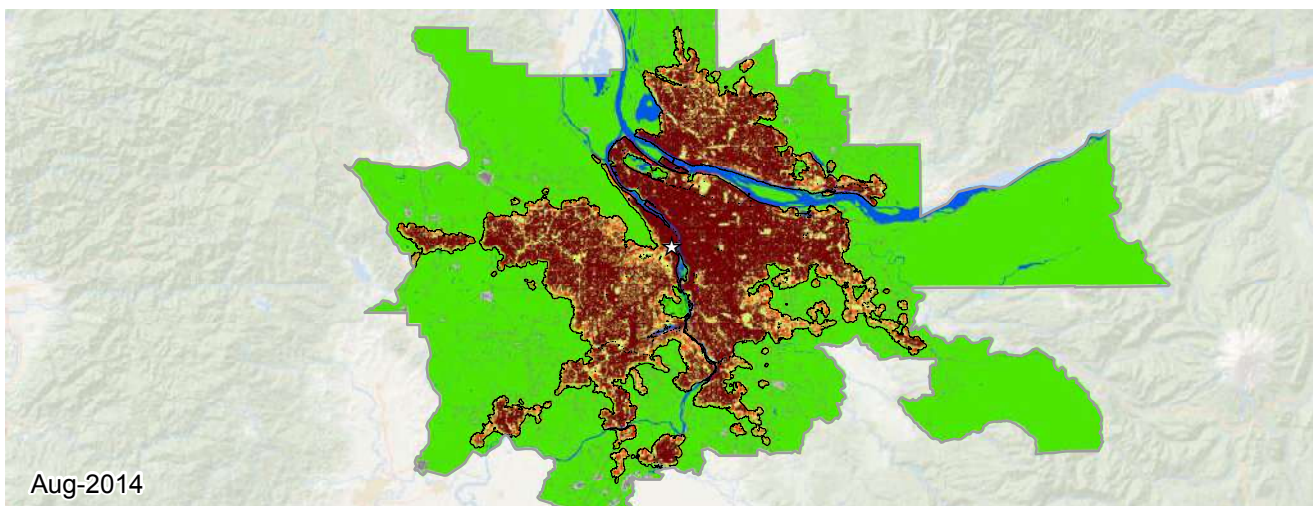
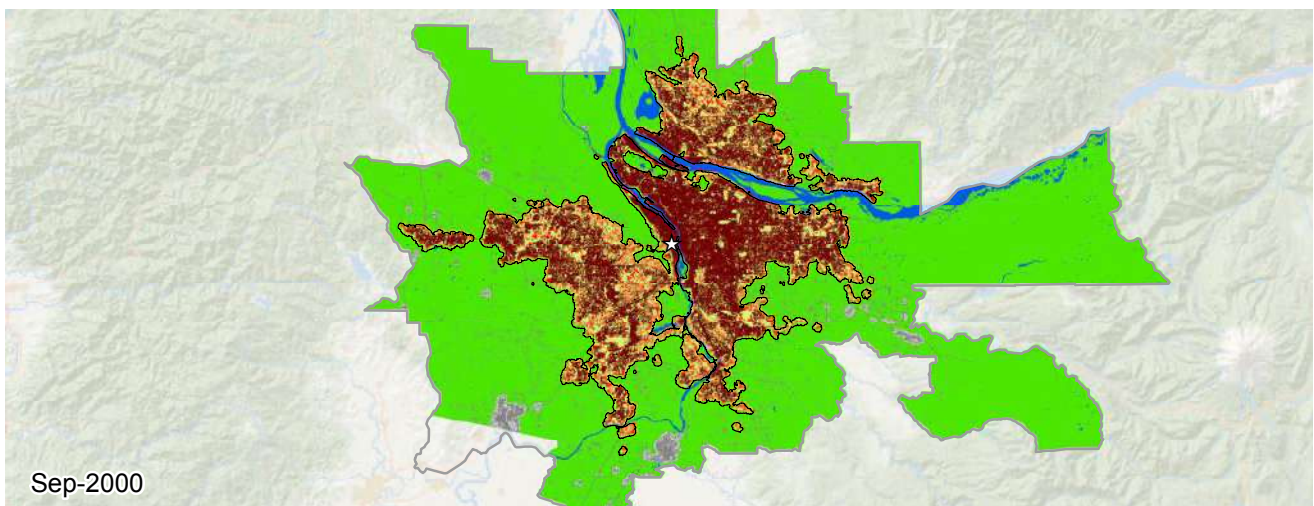
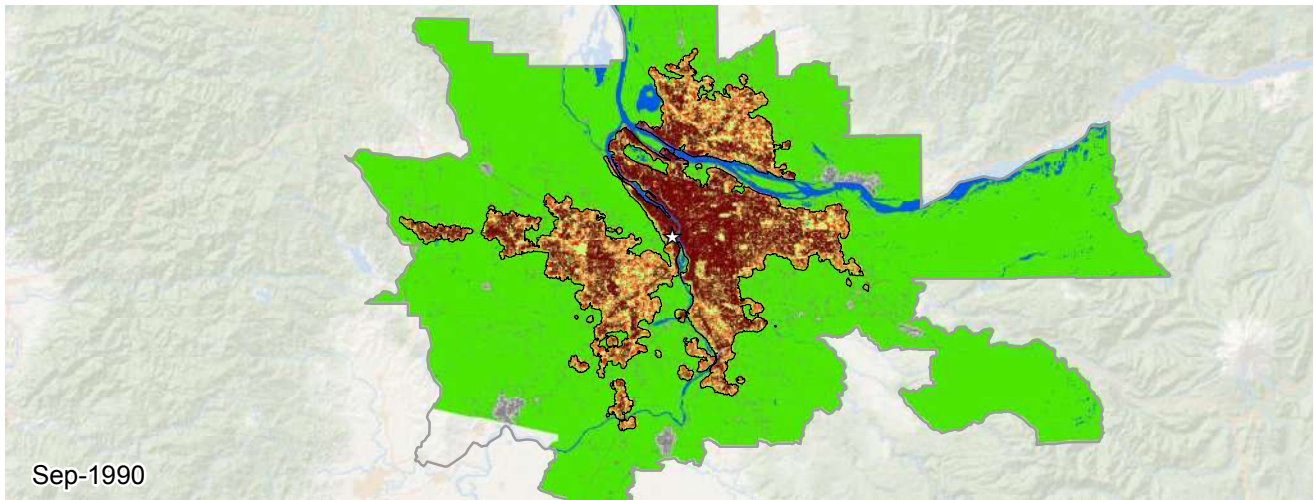
Legend for Charts

Port Elizabeth | Other cities in region | All other cities | Global average



Metrics	Jun 1990	Jul 2001	Jul 2013	% Annual Change ('01-'13)
Population	608,112	645,909	952,746	3.2
Built-up Area (Hectares)				
Total	10,348	12,137	18,141	3.3
Urban	7,386	9,534	14,667	3.6
Suburban	2,806	2,481	3,443	2.7
Rural	155	121	30	-11.6
Open space (Hectares)				
Urbanized Open Space	6,378	6,436	8,909	2.7
Urban Extent	16,727	18,573	27,050	3.1
Density (Persons / Hectare)				
Built-up Area Density	58.8	53.2	52.5	-0.1
Urban Extent Density	36.4	34.8	35.2	0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.65	0.67	0.2
Openness Index	0.35	0.32	0.31	-0.2
Compactness (Roundness)				
Proximity	0.82	0.83	0.68	-1.6
Cohesion	0.81	0.82	0.67	-1.7
Added Area (Hectares)	'90-'01	Share	'01-'13	Share
Infill	854	47%	1,071	12%
Extension	728	40%	1,078	12%
Leapfrog	6	0%	769	8%
Inclusion	198	11%	5,669	66%





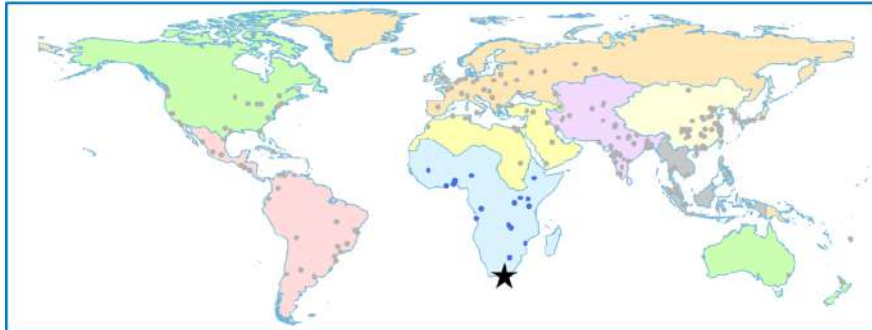
Portland, OR, United States
1990-2014

0 10 20 30 40 km

Study area
 Urban extent
 Urban built-up area
 Suburban built-up area
 Rural built-up area
 Urbanized open space

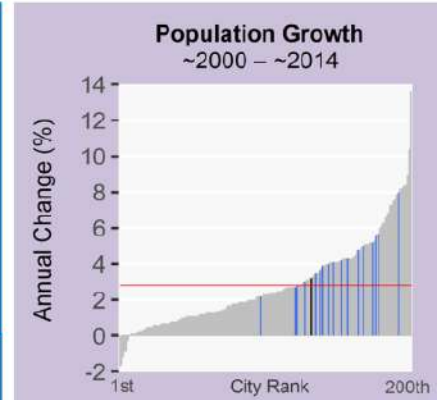
Rural open space
 Exurban built-up area
 Exurban open space
 Water
 No data
★ CBD

Port Elizabeth, South Africa (Sub-Saharan Africa)

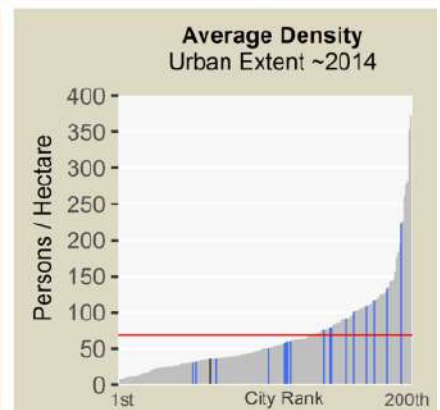
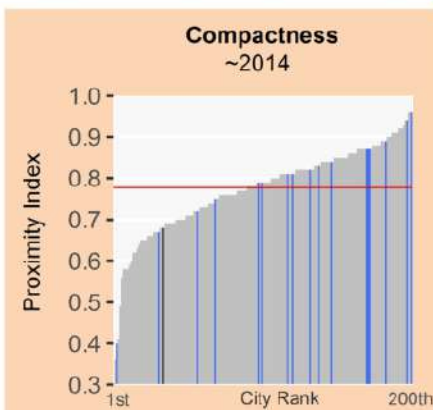
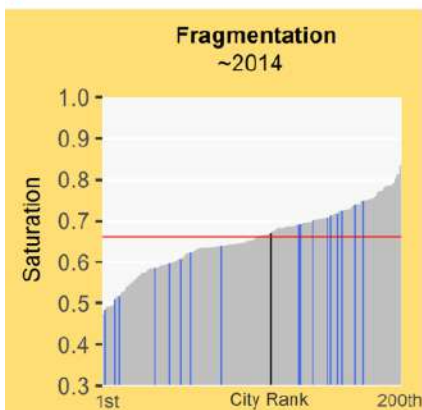
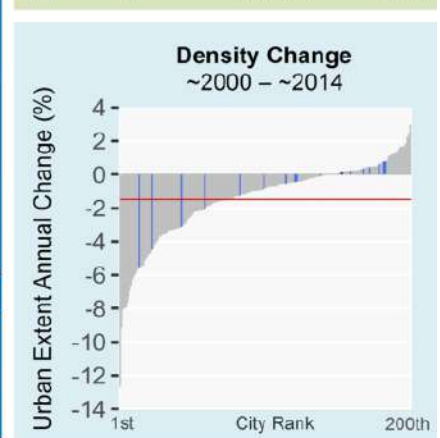
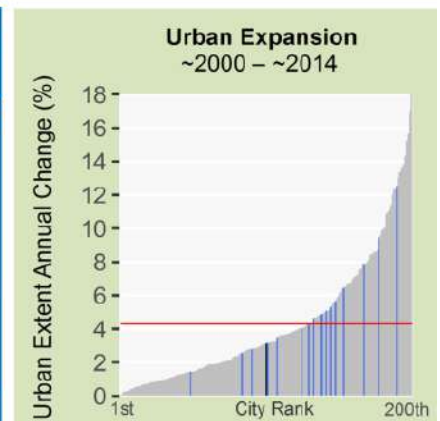


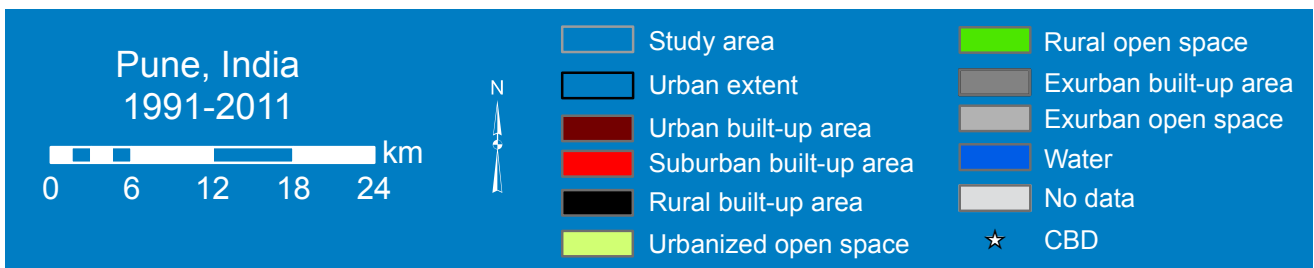
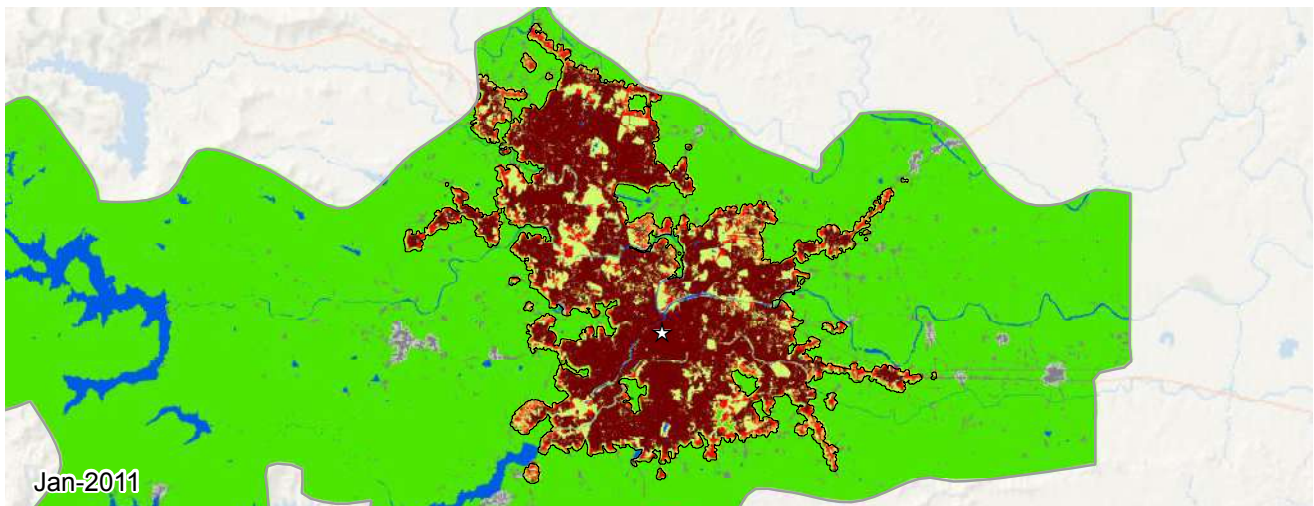
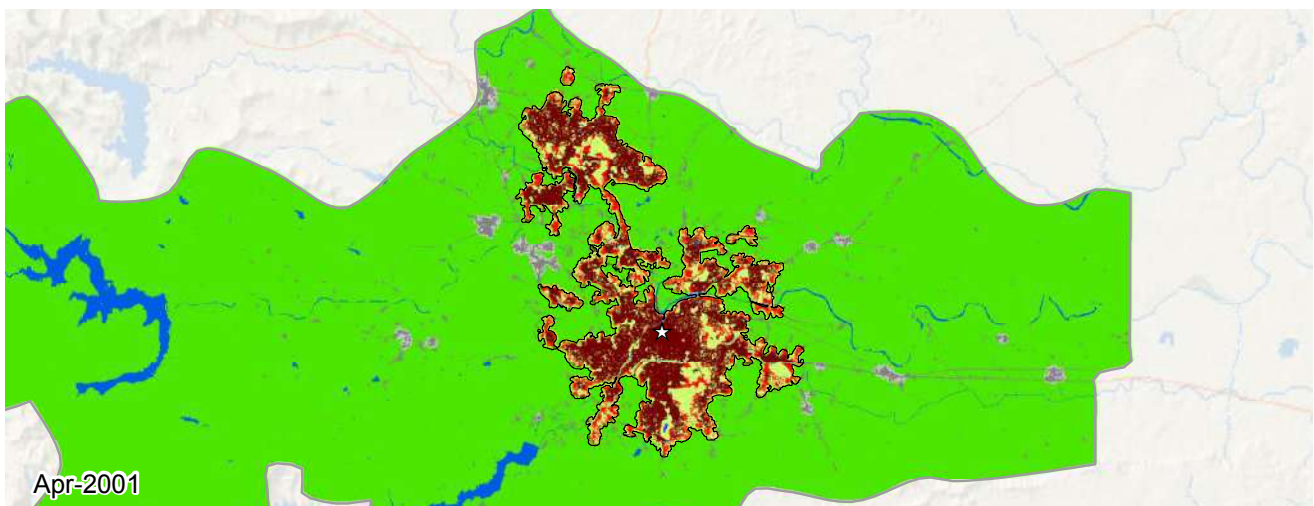
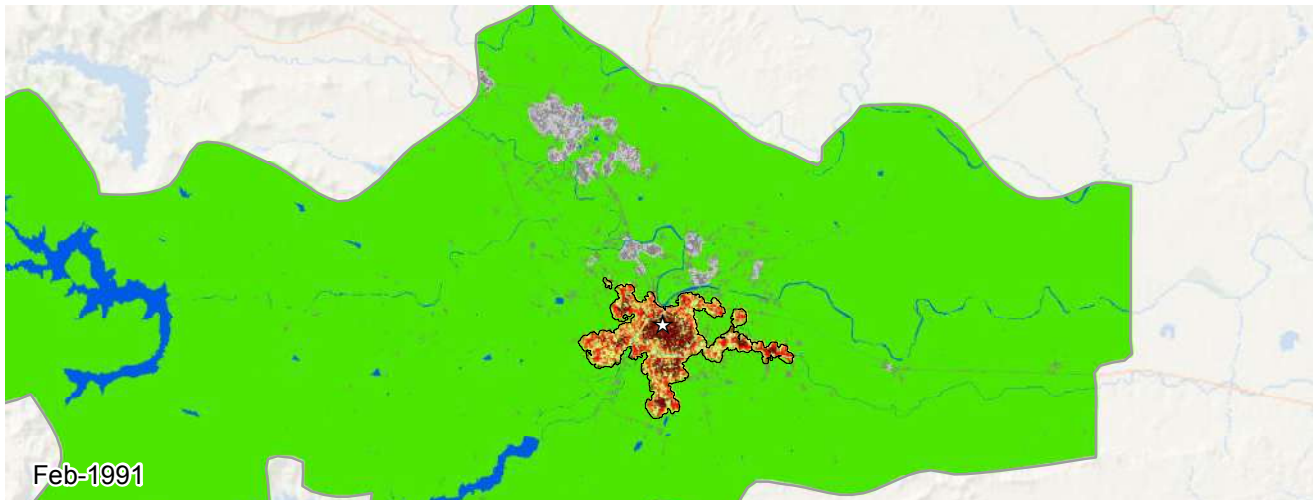
Legend for Charts

Port Elizabeth | Other cities in region | All other cities | Global average

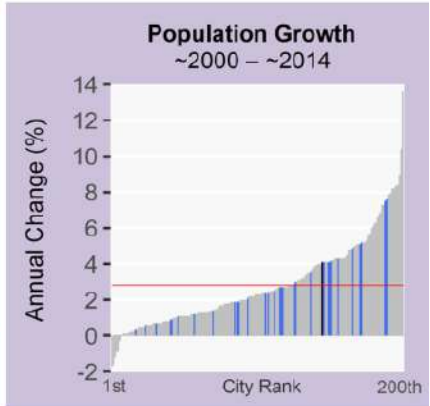


Metrics	Jun 1990	Jul 2001	Jul 2013	% Annual Change ('01-'13)
Population	608,112	645,909	952,746	3.2
Built-up Area (Hectares)				
Total	10,348	12,137	18,141	3.3
Urban	7,386	9,534	14,667	3.6
Suburban	2,806	2,481	3,443	2.7
Rural	155	121	30	-11.6
Open space (Hectares)				
Urbanized Open Space	6,378	6,436	8,909	2.7
Urban Extent	16,727	18,573	27,050	3.1
Density (Persons / Hectare)				
Built-up Area Density	58.8	53.2	52.5	-0.1
Urban Extent Density	36.4	34.8	35.2	0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.65	0.67	0.2
Openness Index	0.35	0.32	0.31	-0.2
Compactness (Roundness)				
Proximity	0.82	0.83	0.68	-1.6
Cohesion	0.81	0.82	0.67	-1.7
Added Area (Hectares)	'90-'01	Share	'01-'13	Share
Infill	854	47%	1,071	12%
Extension	728	40%	1,078	12%
Leapfrog	6	0%	769	8%
Inclusion	198	11%	5,669	66%

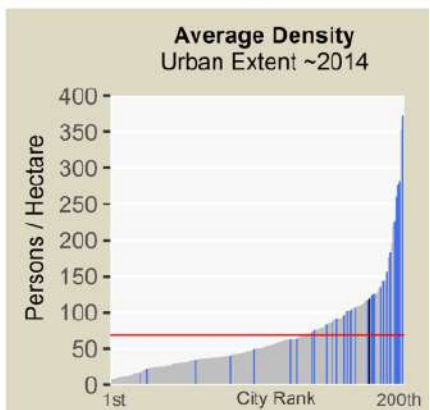
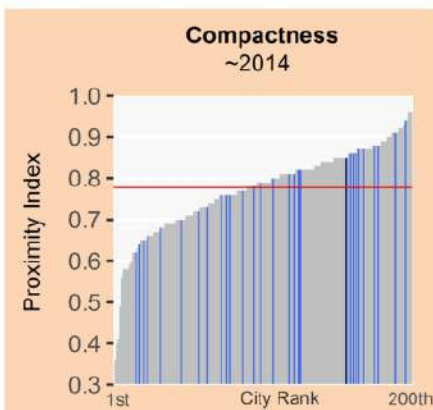
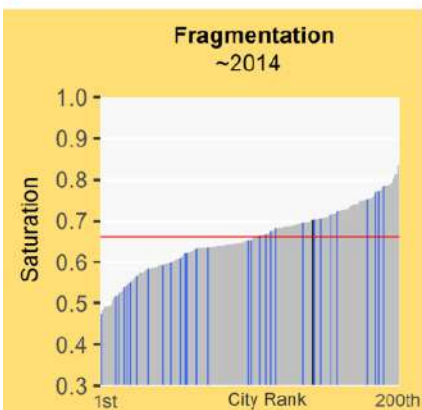
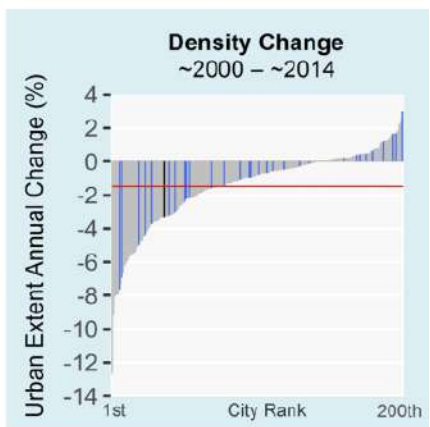
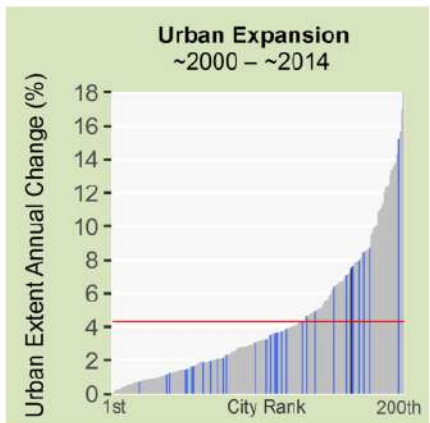


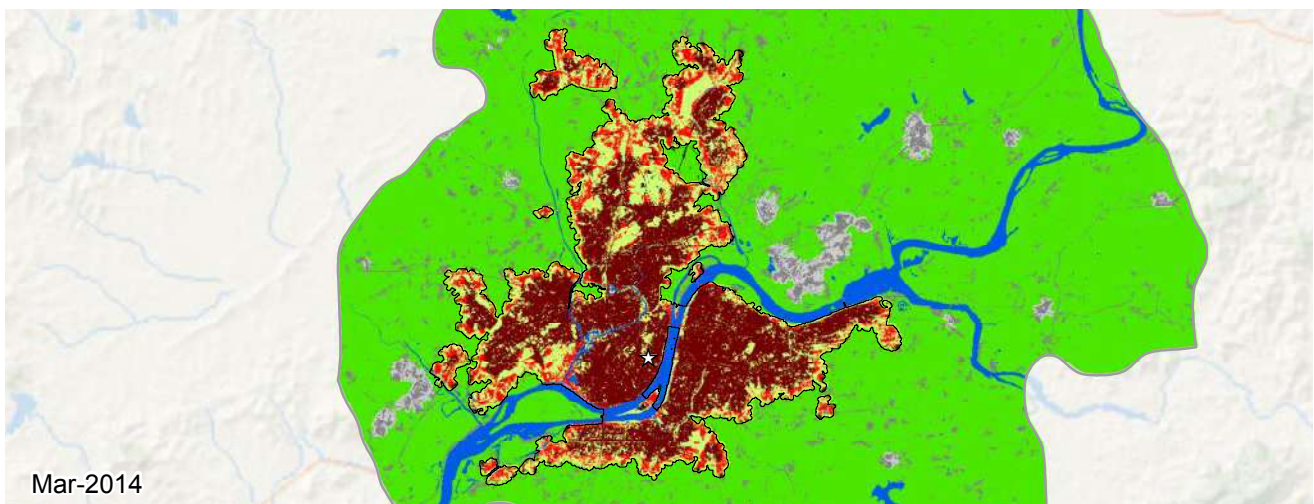
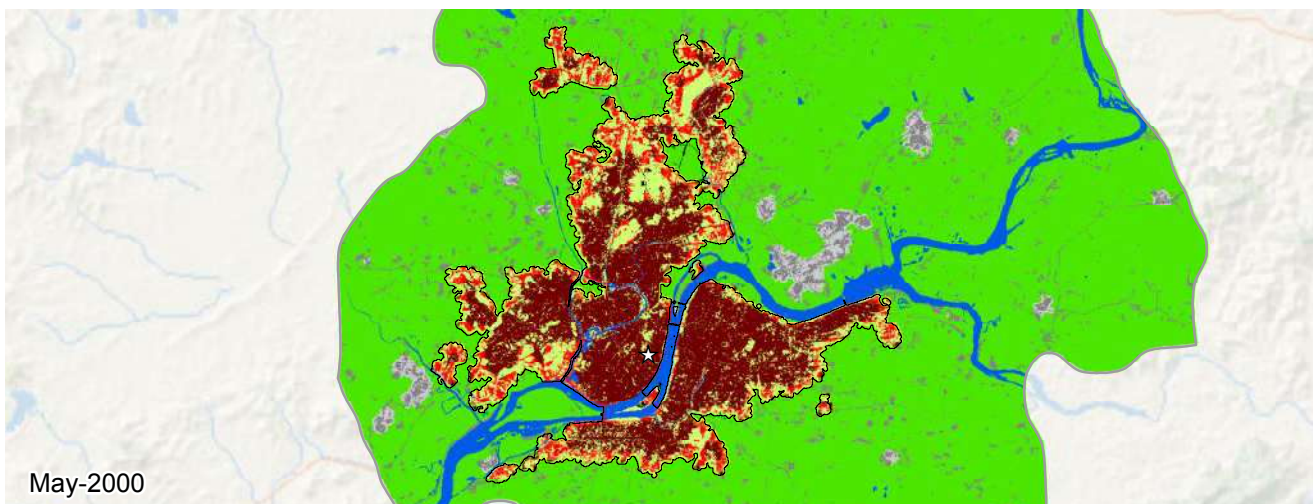
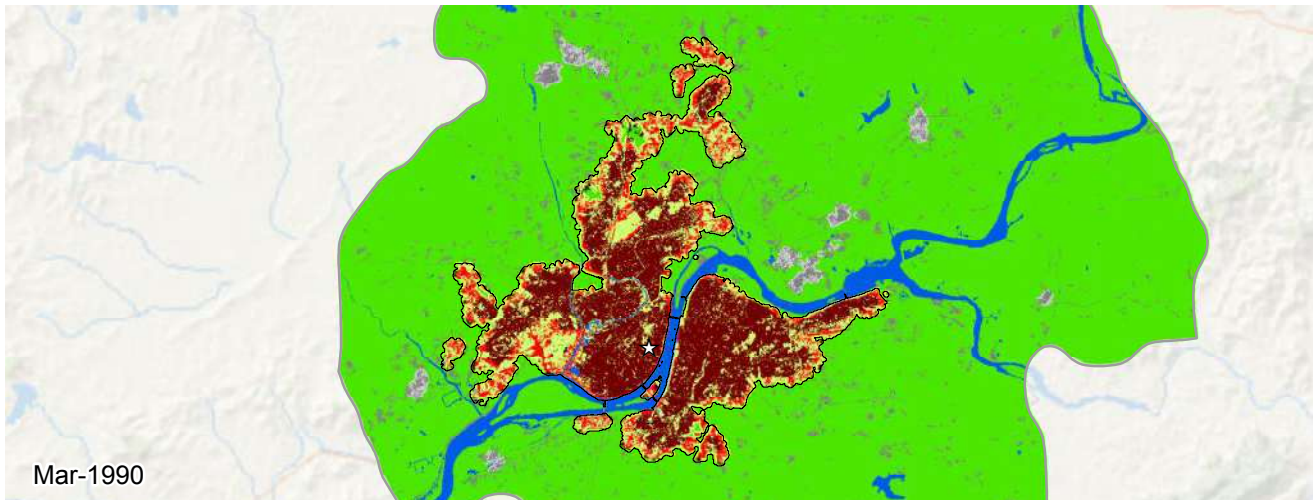


Pune, India (South and Central Asia)



Metrics	Feb 1991	Apr 2001	Jan 2011	% Annual Change ('01-'11)
Population	1,752,854	3,676,766	5,509,160	4.1
Built-up Area (Hectares)				
Total	2,622	13,479	32,337	9.0
Urban	1,028	9,406	27,021	10.8
Suburban	1,484	3,811	4,944	2.7
Rural	109	261	371	3.6
Open space (Hectares)				
Urbanized Open Space	2,804	8,585	13,606	4.7
Urban Extent	5,427	22,064	45,944	7.5
Density (Persons / Hectare)				
Built-up Area Density	668.3	272.8	170.4	-4.8
Urban Extent Density	323.0	166.6	119.9	-3.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.48	0.61	0.70	1.5
Openness Index	0.51	0.37	0.26	-3.6
Compactness (Roundness)				
Proximity	0.80	0.72	0.85	1.7
Cohesion	0.78	0.72	0.85	1.6
Added Area (Hectares)	'91-'01	Share	'01-'11	Share
Infill	2,432	22%	4,357	23%
Extension	5,670	52%	11,538	61%
Leapfrog	0	0%	150	0%
Inclusion	2,753	25%	2,812	14%





Pyongyang, Korea Dem. Rep. 1990-2014

0 4 8 12 16 km

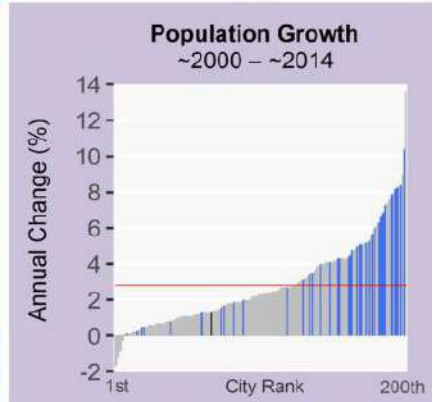
N

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

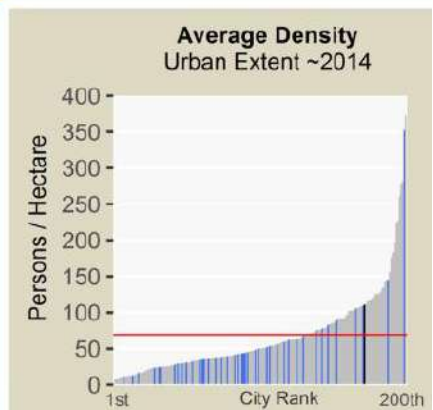
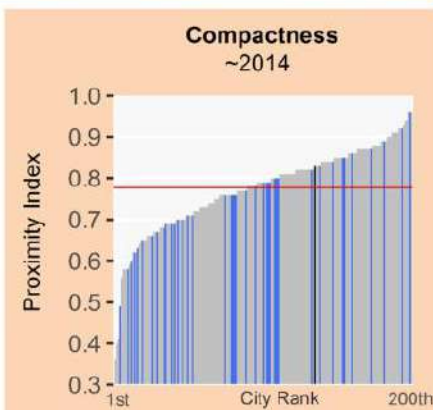
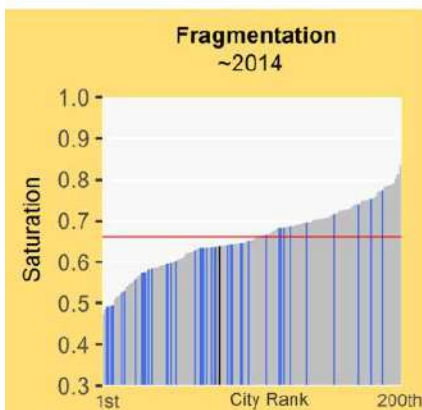
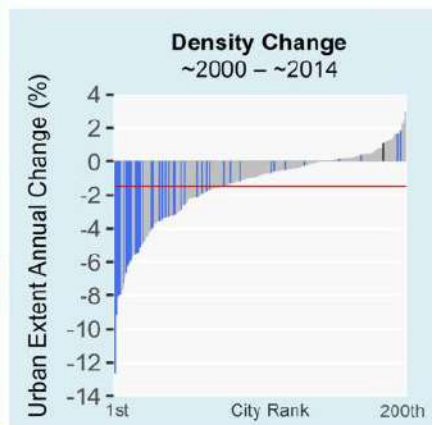
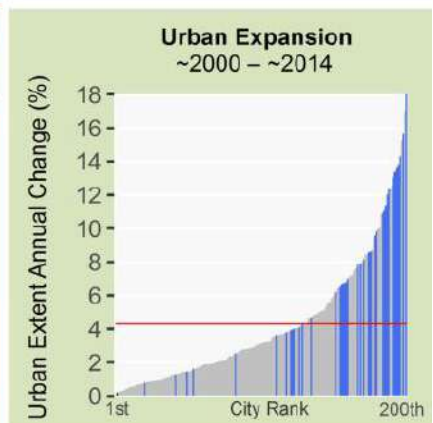
Pyongyang, Korea Dem. Rep. (East Asia and the Pacific)

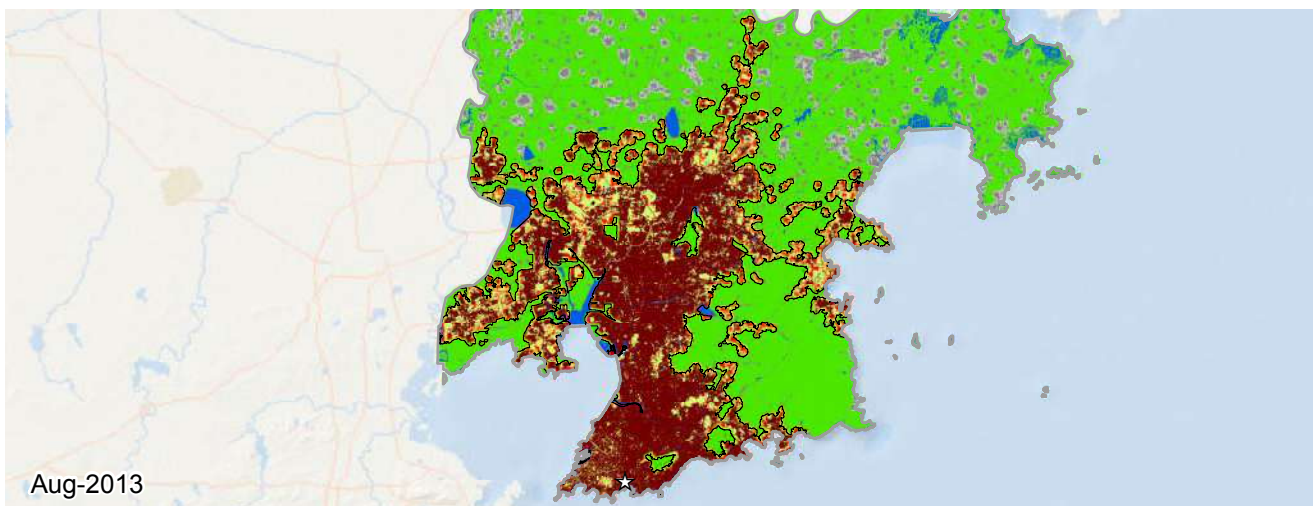
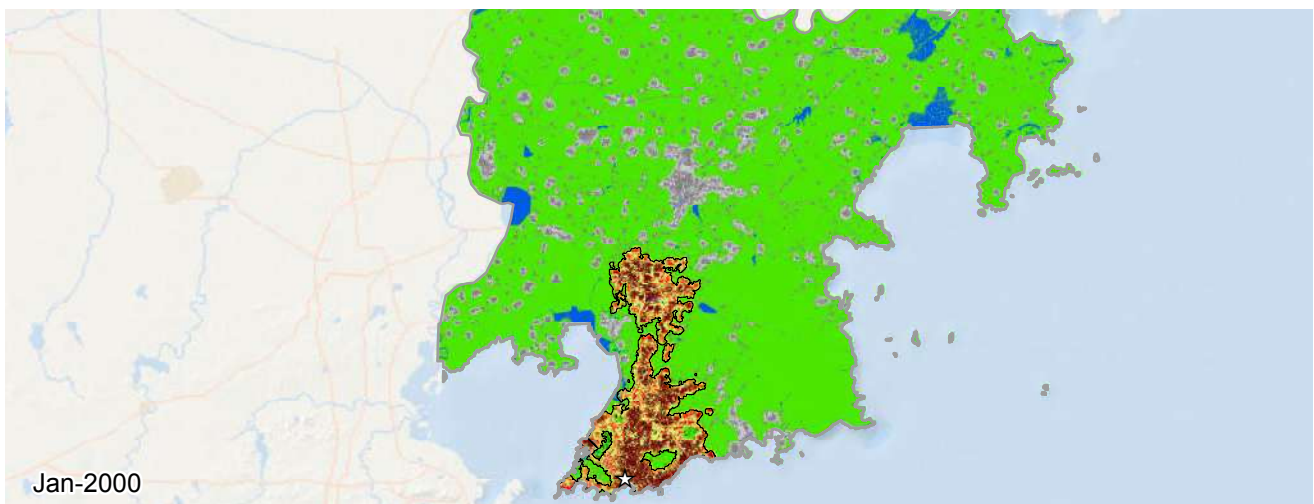
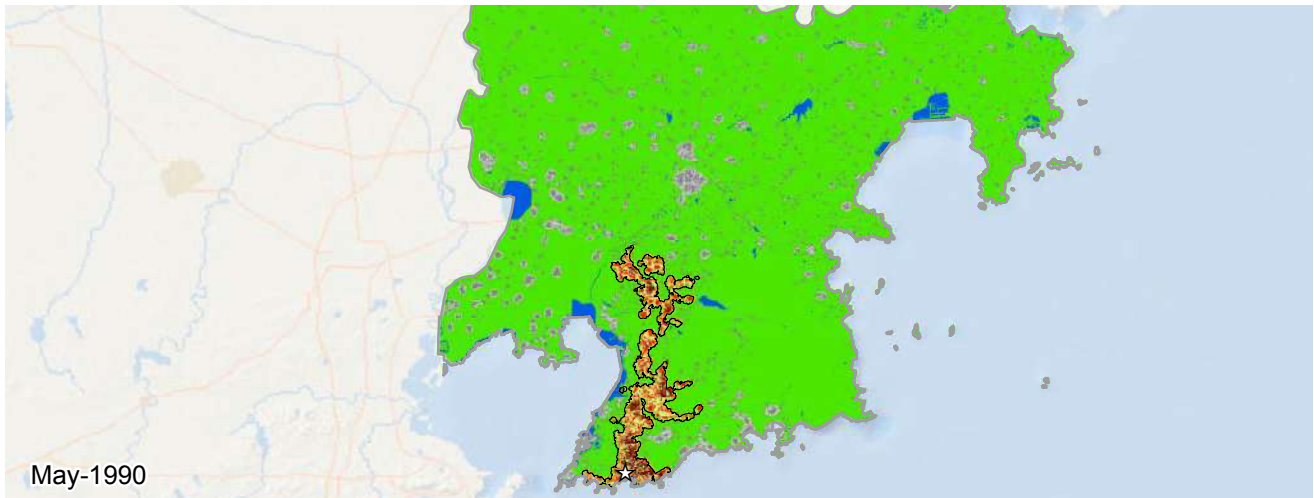


Legend for Charts
 Pyongyang | Other cities in region | All other cities | Global average



Metrics	Mar 1990	May 2000	Mar 2014	% Annual Change ('00-'14)
Population	1,524,988	1,674,292	1,996,172	1.3
Built-up Area (Hectares)				
Total	8,694	11,241	11,462	0.1
Urban	6,566	8,498	8,641	0.1
Suburban	1,941	2,538	2,601	0.2
Rural	185	205	220	0.5
Open space (Hectares)				
Urbanized Open Space	5,029	6,292	6,522	0.3
Urban Extent	13,724	17,533	17,985	0.2
Density (Persons / Hectare)				
Built-up Area Density	175.4	148.9	174.1	1.1
Urban Extent Density	111.1	95.5	111.0	1.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.63	0.64	0.64	-0.0
Openness Index	0.34	0.33	0.33	0.1
Compactness (Roundness)				
Proximity	0.82	0.82	0.83	0.0
Cohesion	0.80	0.82	0.82	0.0
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	1,012	39%	80	36%
Extension	850	33%	33	14%
Leapfrog	25	0%	7	3%
Inclusion	658	25%	99	44%

















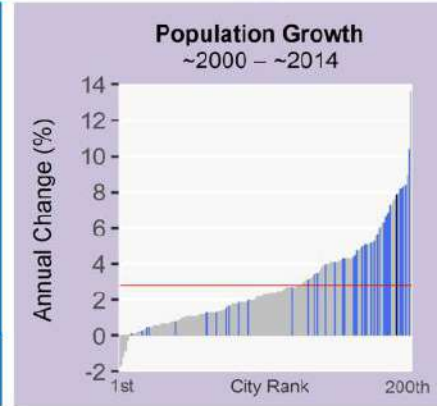
**Qingdao, Shandong, China
1990-2013**

0 10 20 30 40 km

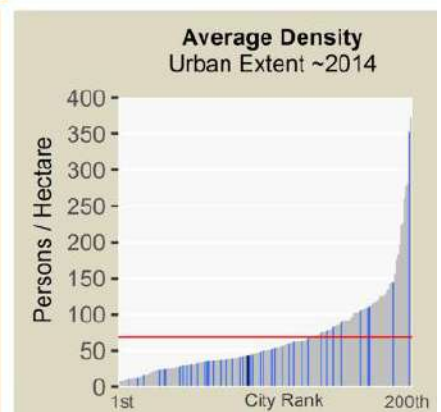
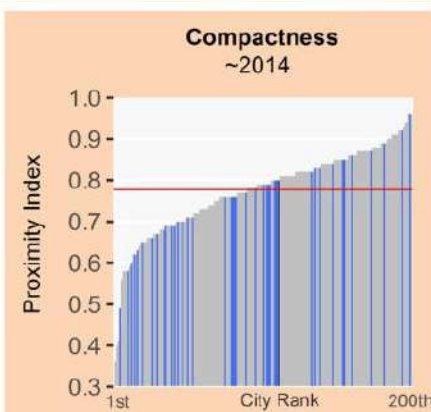
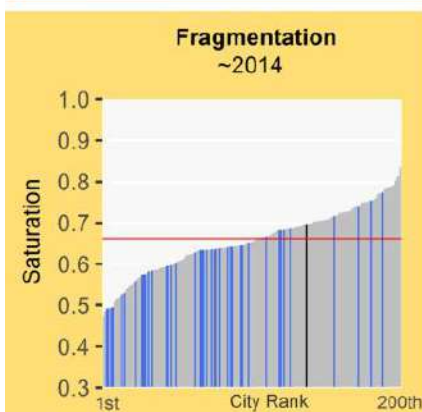
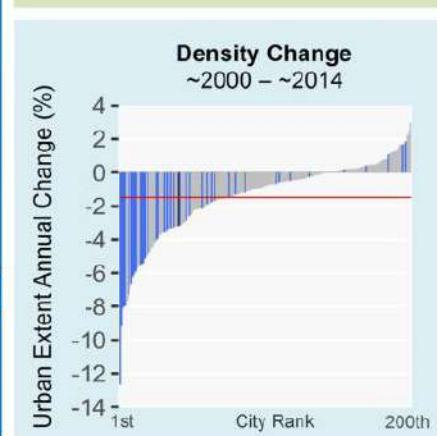
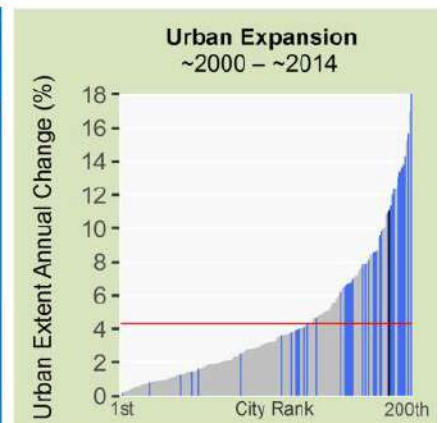
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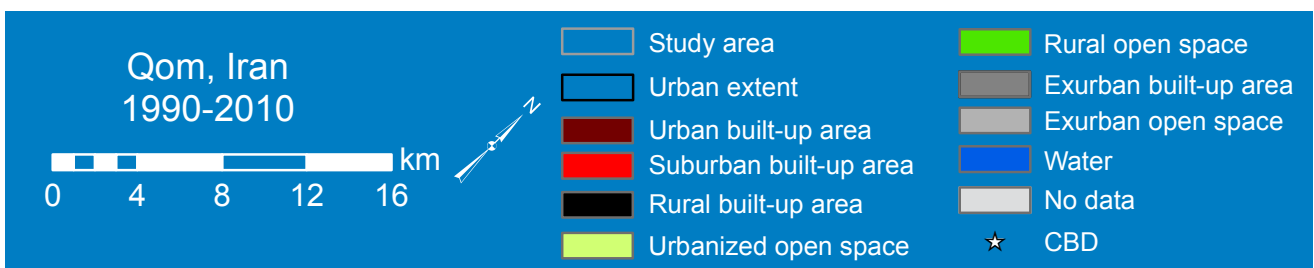
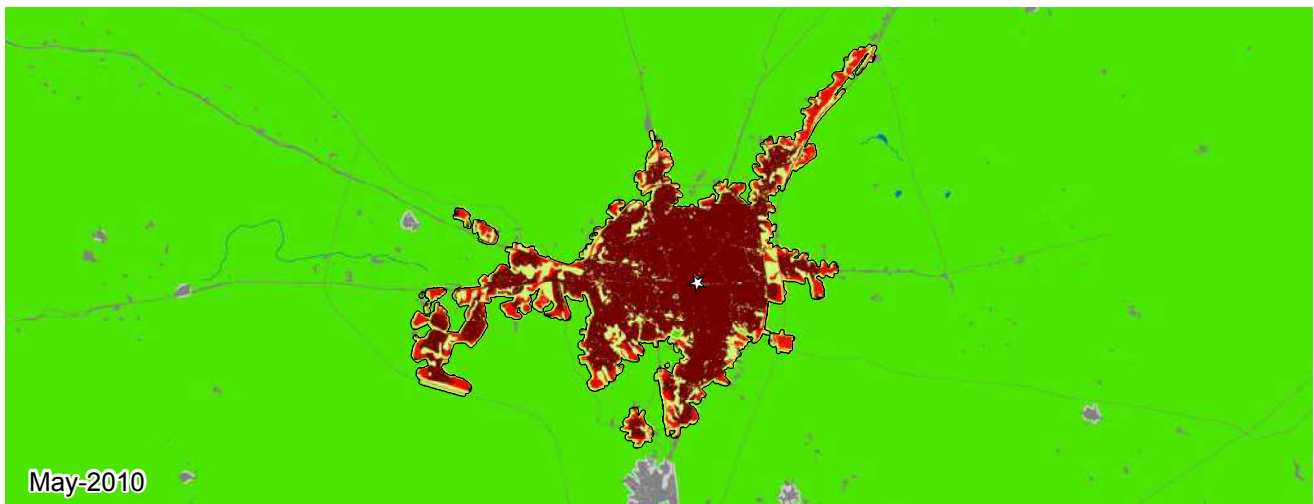
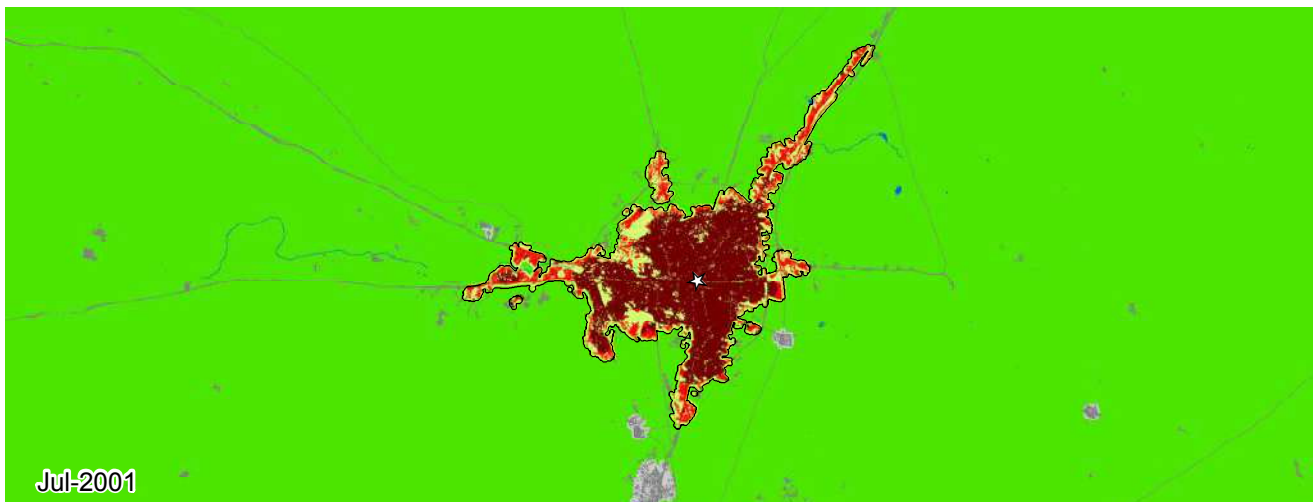
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Qingdao, Shandong, China (East Asia and the Pacific)

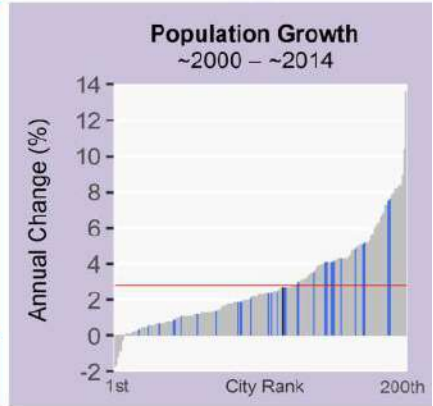
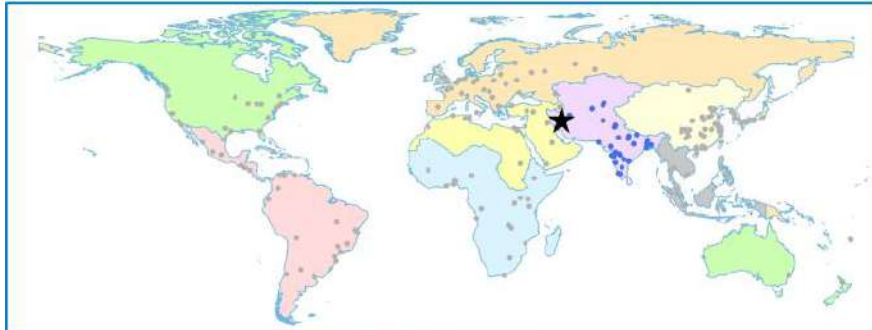


Metrics	May 1990	Jan 2000	Aug 2013	% Annual Change ('00-'13)
Population	853,483	1,540,788	4,501,931	7.9
Built-up Area (Hectares)				
Total	4,813	11,752	71,527	13.3
Urban	1,325	6,828	58,007	15.8
Suburban	3,230	4,553	12,591	7.5
Rural	256	370	928	6.8
Open space (Hectares)				
Urbanized Open Space	5,940	10,987	30,971	7.6
Urban Extent	10,754	22,739	102,498	11.1
Density (Persons / Hectare)				
Built-up Area Density	177.3	131.1	62.9	-5.4
Urban Extent Density	79.4	67.8	43.9	-3.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.45	0.52	0.70	2.2
Openness Index	0.57	0.46	0.26	-4.1
Compactness (Roundness)				
Proximity	0.48	0.66	0.80	1.4
Cohesion	0.49	0.68	0.79	1.1
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	1,611	23%	11,196	18%
Extension	3,340	48%	32,849	54%
Leapfrog	7	0%	293	0%
Inclusion	1,979	28%	15,437	25%

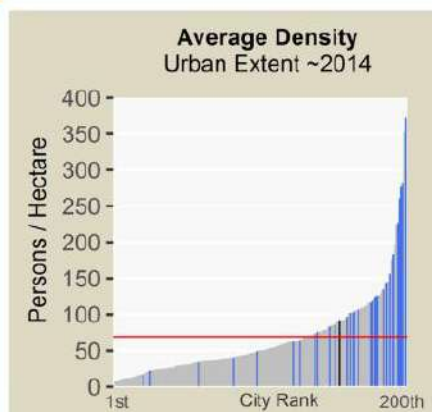
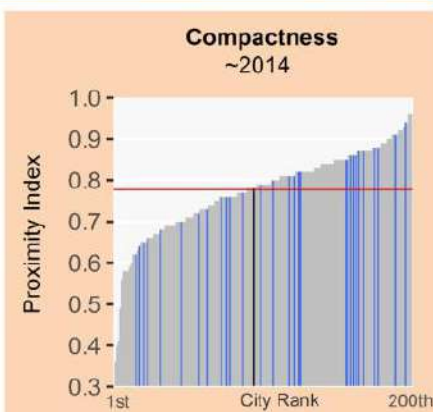
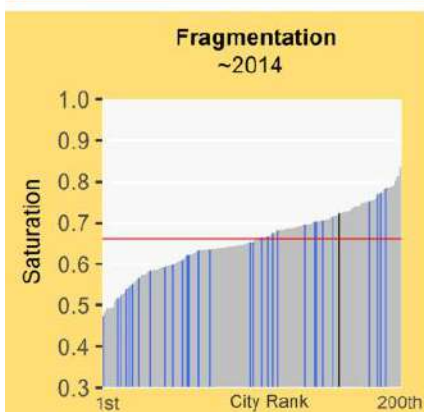
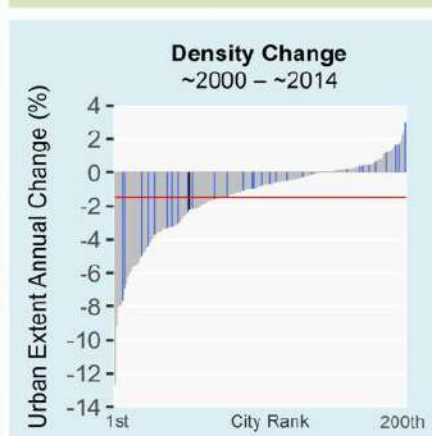
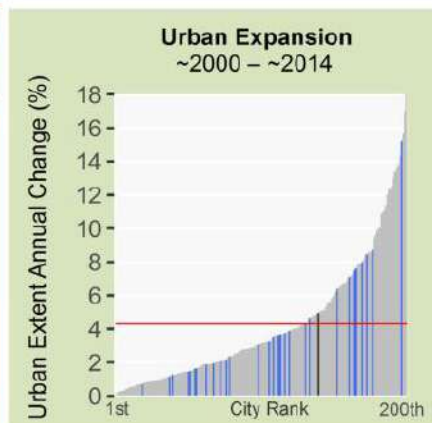


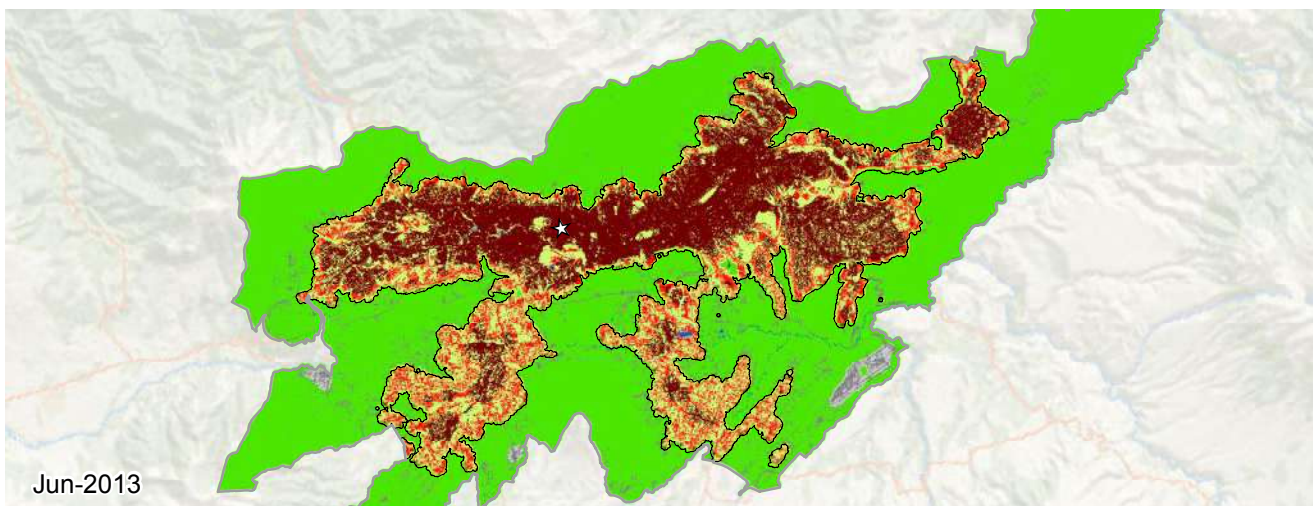
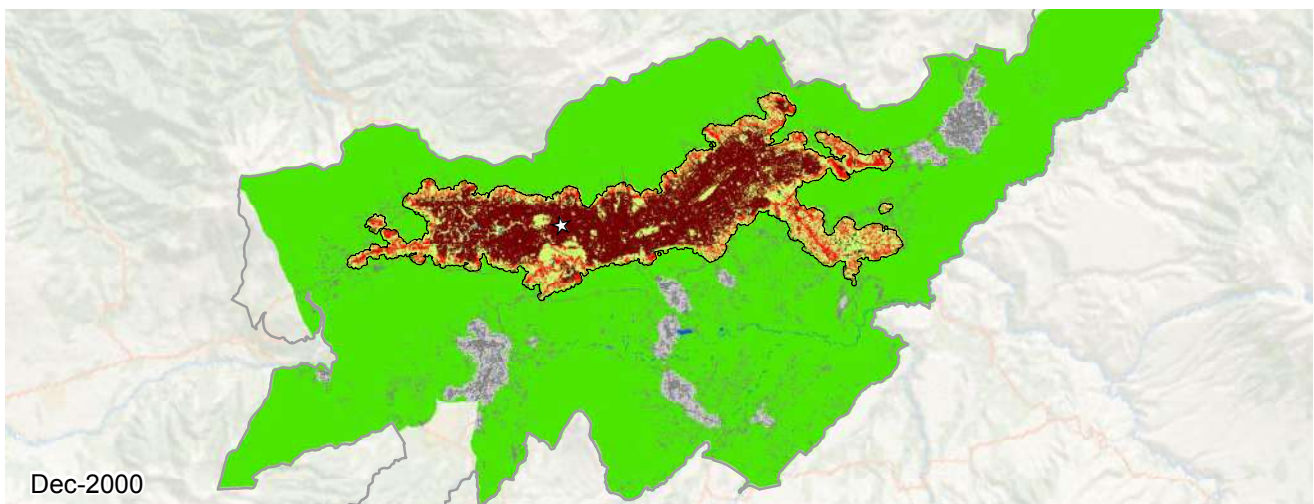
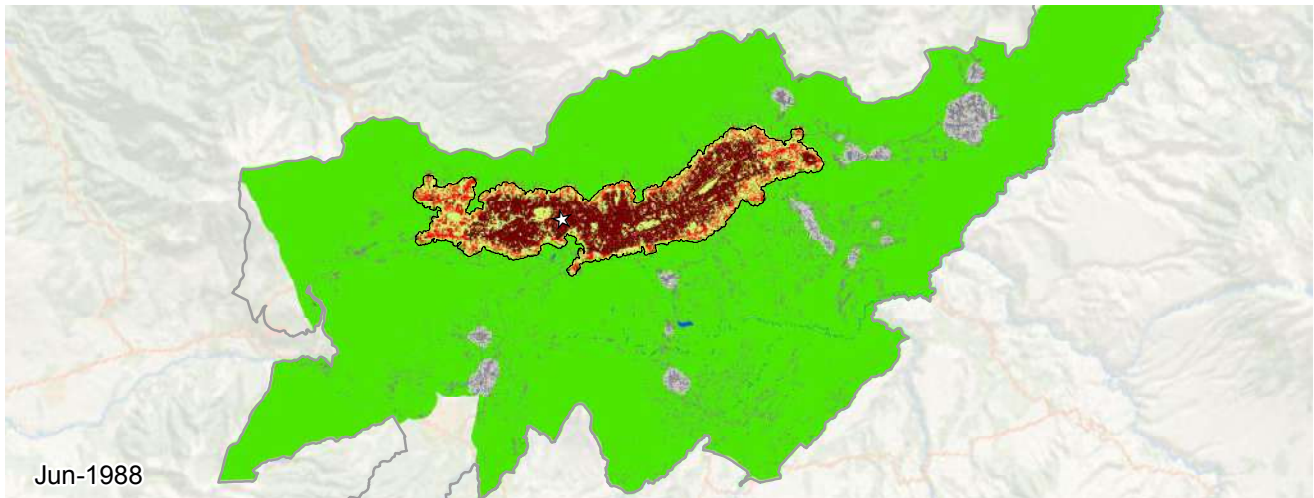


Qom, Iran (South and Central Asia)



Metrics	Jan 1990	Jul 2001	May 2010	% Annual Change ('01-'10)
Population	597,132	847,703	1,071,783	2.7
Built-up Area (Hectares)				
Total	3,104	5,123	8,403	5.6
Urban	2,455	3,887	6,777	6.3
Suburban	599	1,142	1,504	3.1
Rural	49	93	122	3.0
Open space (Hectares)				
Urbanized Open Space	1,625	2,407	3,215	3.3
Urban Extent	4,730	7,530	11,619	4.9
Density (Persons / Hectare)				
Built-up Area Density	192.4	165.5	127.5	-2.9
Urban Extent Density	126.2	112.6	92.2	-2.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.66	0.68	0.72	0.7
Openness Index	0.30	0.27	0.25	-0.8
Compactness (Roundness)				
Proximity	0.91	0.80	0.78	-0.2
Cohesion	0.89	0.77	0.76	-0.1
Added Area (Hectares)	'90-'01	Share	'01-'10	Share
Infill	762	37%	801	24%
Extension	688	34%	1,966	59%
Leapfrog	26	1%	49	1%
Inclusion	541	26%	462	14%



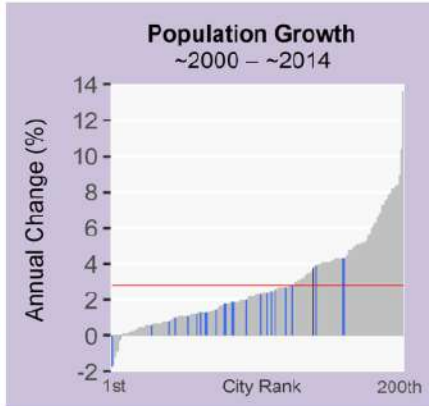
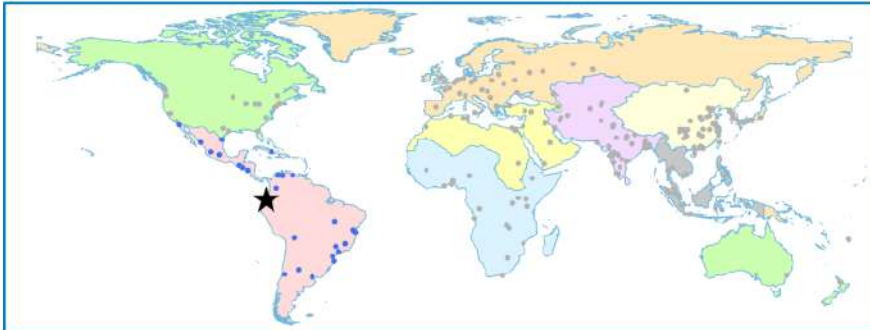


**Quito, Ecuador
1988-2013**

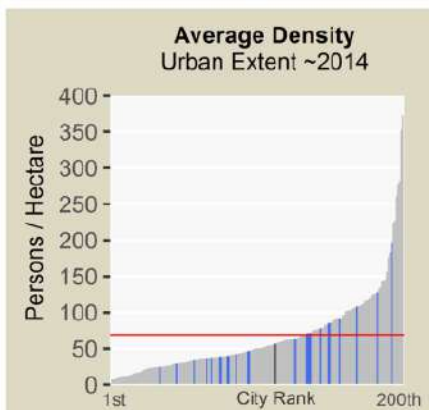
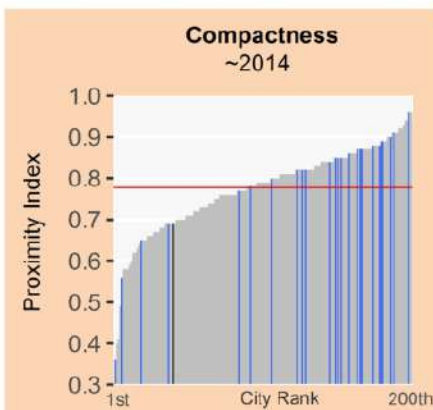
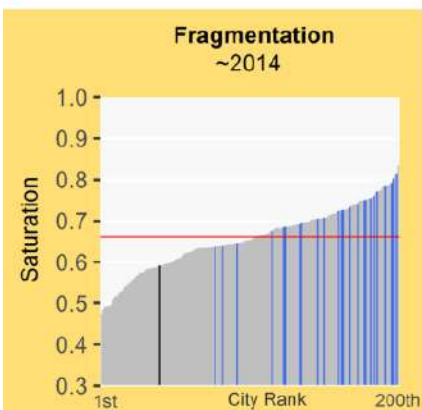
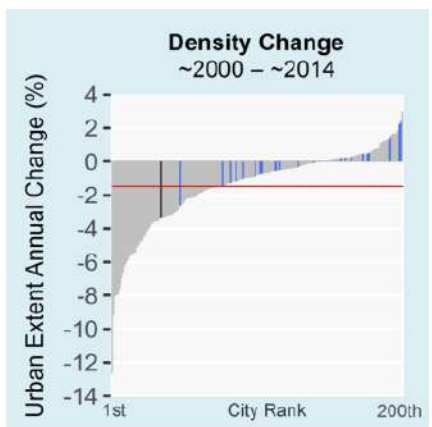
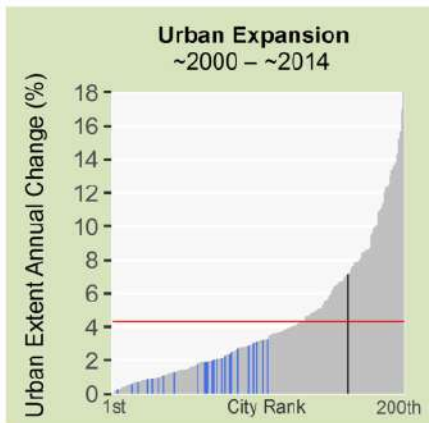
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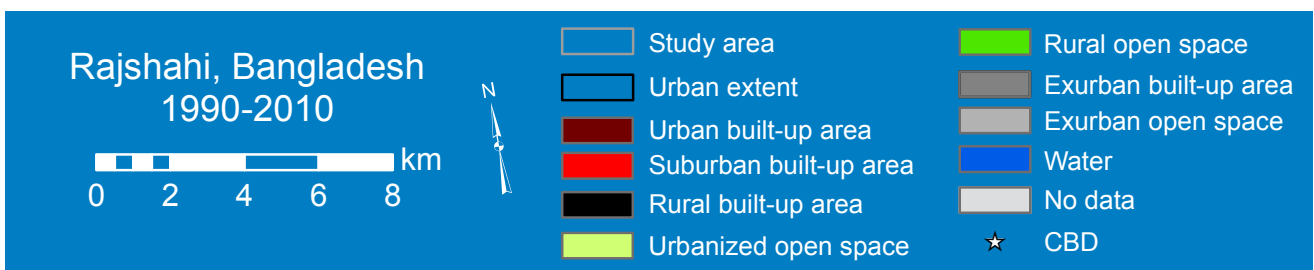
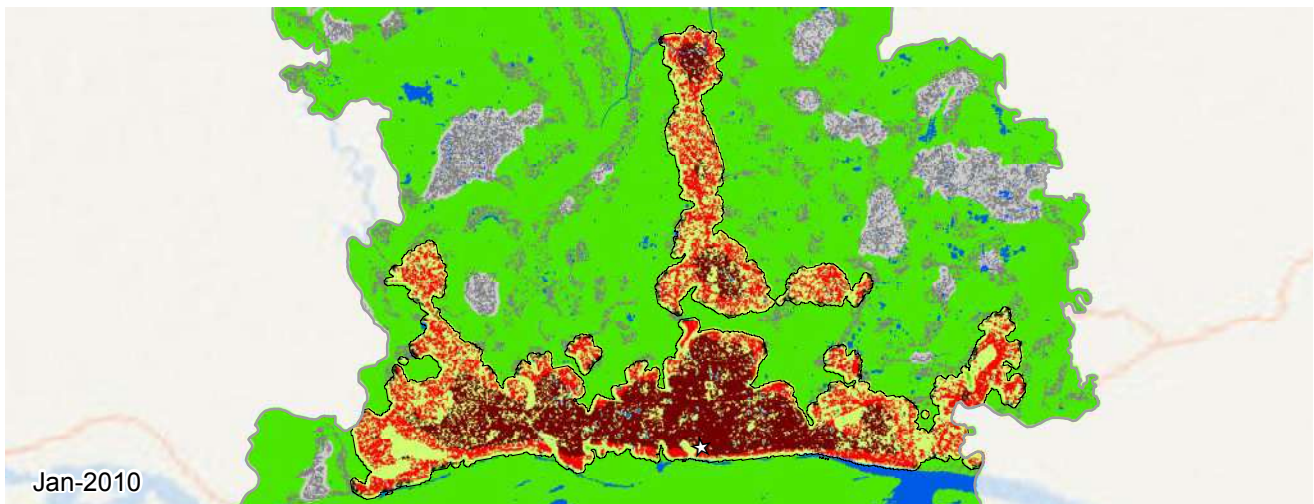
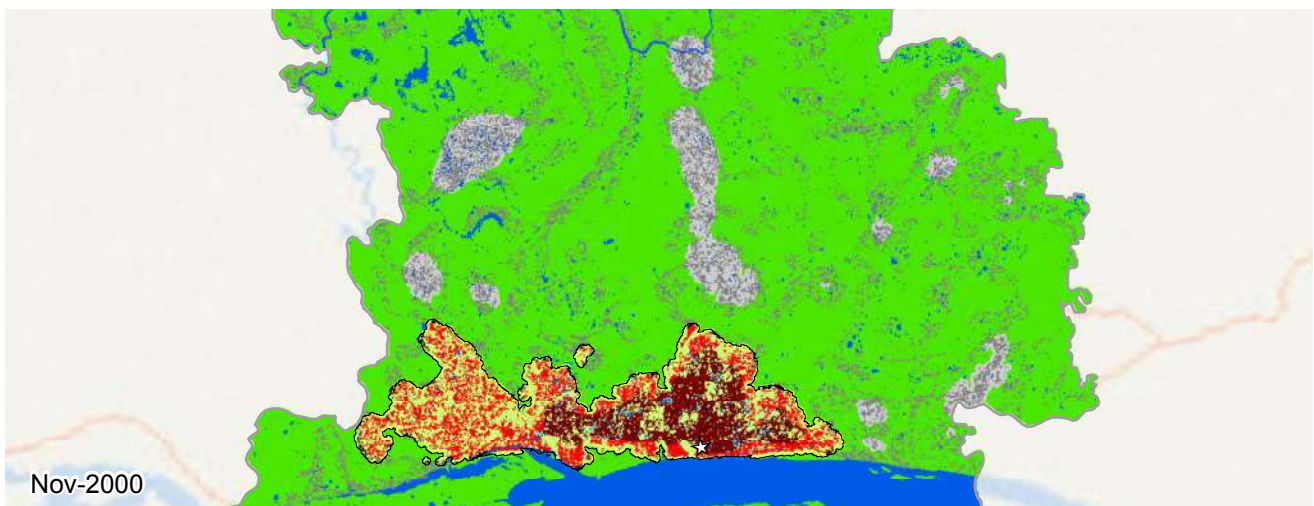
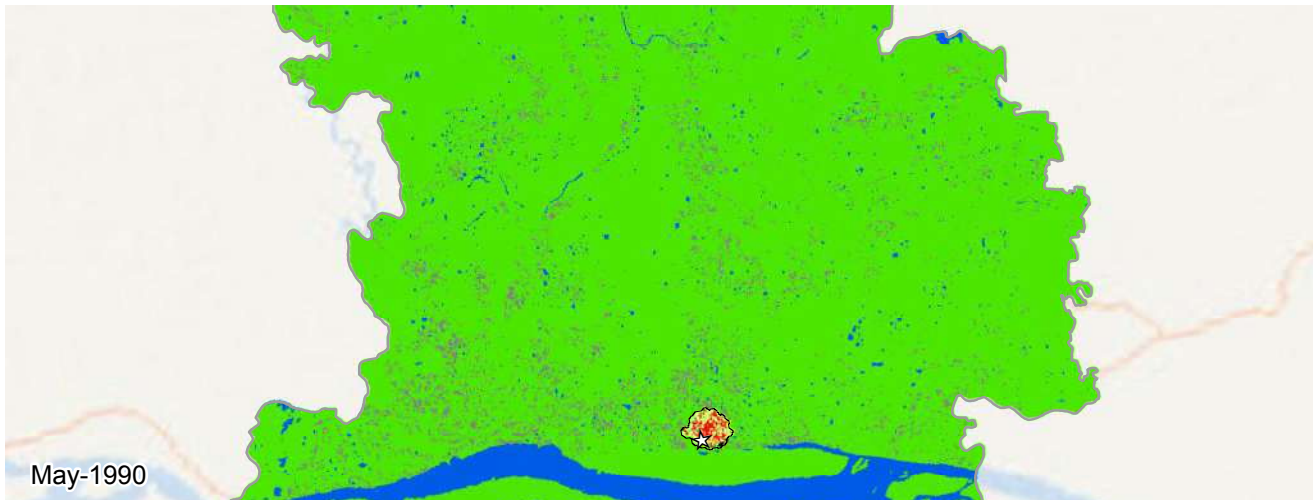
Study area
 Urban extent
 Urban built-up area
 Suburban built-up area
 Rural built-up area
 Urbanized open space
 Rural open space
 Exurban built-up area
 Exurban open space
 Water
 No data
★ CBD

Quito, Ecuador (Latin America and the Caribbean)

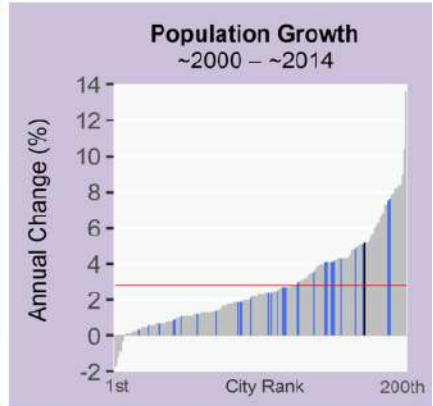


Metrics	Jun 1988	Dec 2000	Jun 2013	% Annual Change ('00-'13)
Population	854,477	1,358,277	2,173,696	3.8
Built-up Area (Hectares)				
Total	5,585	9,791	22,665	6.7
Urban	4,219	7,412	16,056	6.2
Suburban	1,267	2,181	6,178	8.3
Rural	98	197	430	6.2
Open space (Hectares)				
Urbanized Open Space	3,745	5,897	15,643	7.8
Urban Extent	9,330	15,688	38,308	7.1
Density (Persons / Hectare)				
Built-up Area Density	153.0	138.7	95.9	-3.0
Urban Extent Density	91.6	86.6	56.7	-3.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.60	0.62	0.59	-0.4
Openness Index	0.34	0.30	0.34	1.0
Compactness (Roundness)				
Proximity	0.60	0.61	0.69	1.0
Cohesion	0.61	0.61	0.69	0.9
Added Area (Hectares)	'88-'00	Share	'00-'13	Share
Infill	1,628	38%	2,627	21%
Extension	1,581	37%	6,017	48%
Leapfrog	0	0%	19	0%
Inclusion	996	23%	3,684	29%

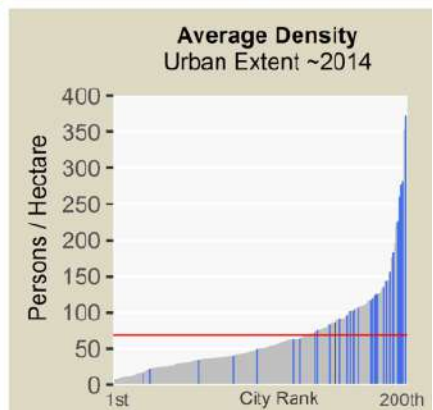
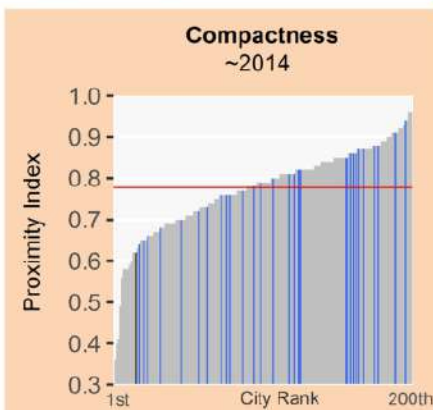
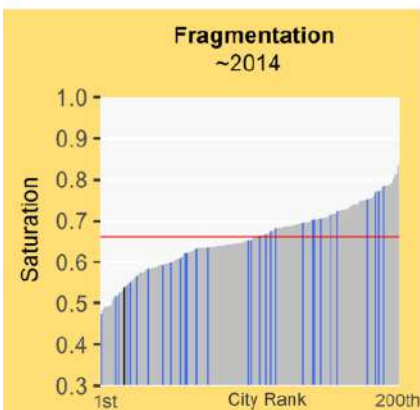
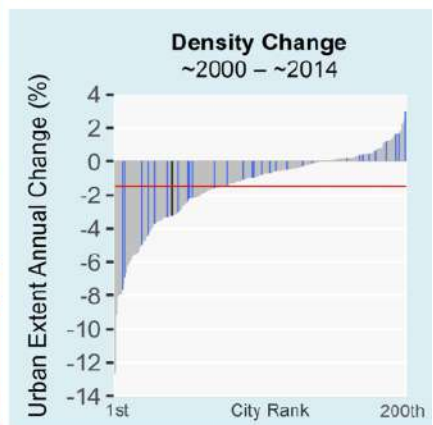
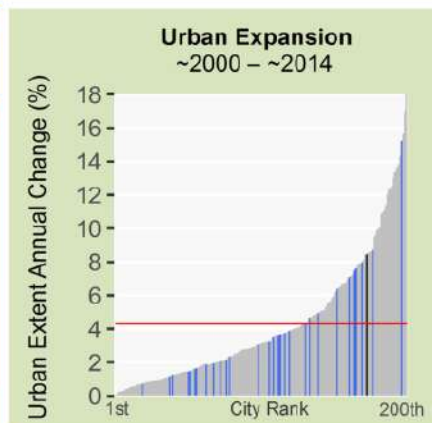


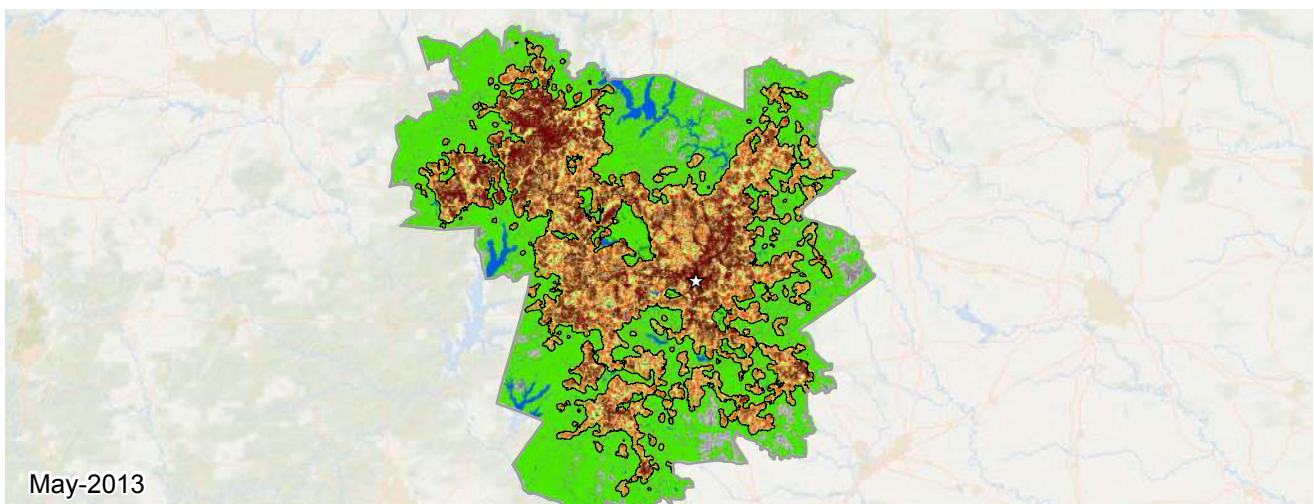
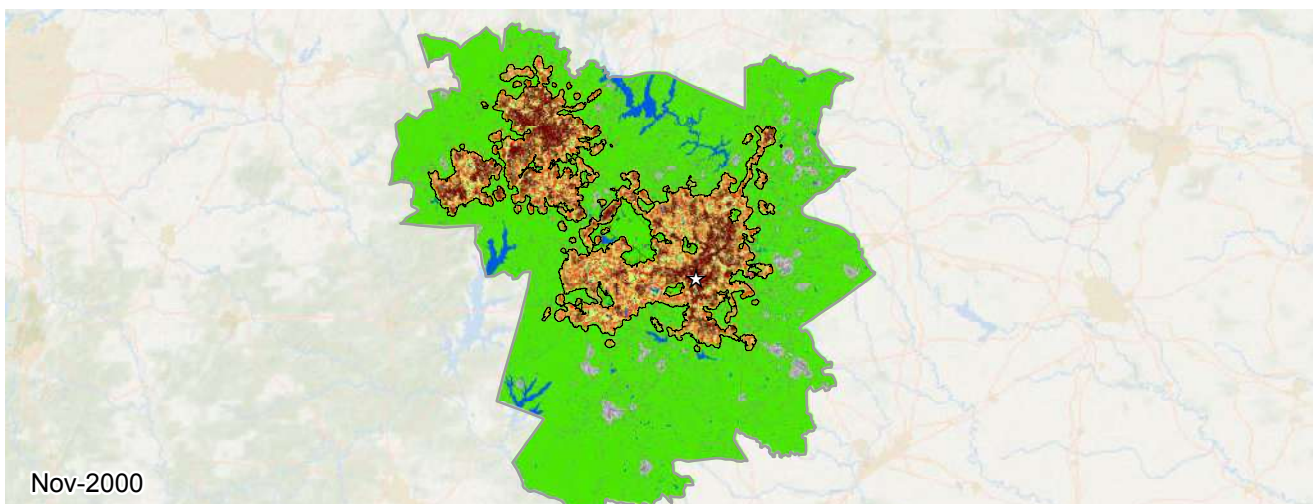
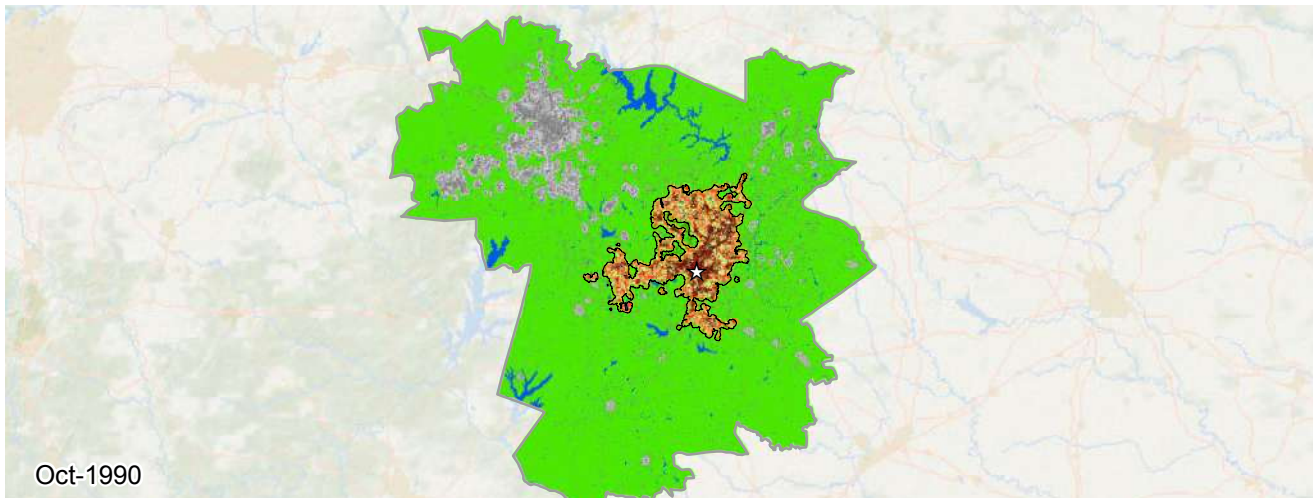


Rajshahi, Bangladesh (South and Central Asia)



Metrics	May 1990	Nov 2000	Jan 2010	% Annual Change ('00-'10)
Population	26,943	320,085	517,052	5.2
Built-up Area (Hectares)				
Total	36	1,401	3,234	9.1
Urban	0	619	1,668	10.8
Suburban	31	727	1,437	7.4
Rural	4	54	128	9.3
Open space (Hectares)				
Urbanized Open Space	66	1,357	2,775	7.8
Urban Extent	103	2,759	6,009	8.5
Density (Persons / Hectare)				
Built-up Area Density	744.7	228.4	159.9	-3.9
Urban Extent Density	261.2	116.0	86.0	-3.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.35	0.51	0.54	0.6
Openness Index	0.70	0.51	0.47	-1.1
Compactness (Roundness)				
Proximity	0.99	0.64	0.62	-0.4
Cohesion	0.98	0.65	0.61	-0.7
Added Area (Hectares)	'90-'00	Share	'00-'10	Share
Infill	31	2%	554	30%
Extension	926	67%	452	24%
Leapfrog	3	0%	10	0%
Inclusion	403	29%	815	44%

















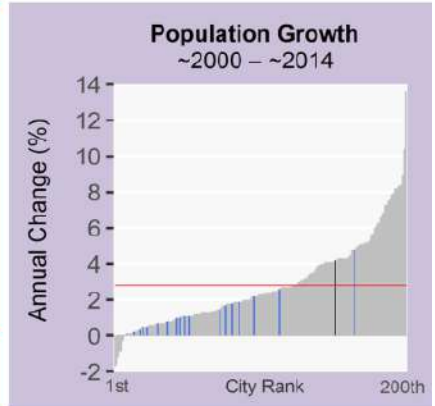
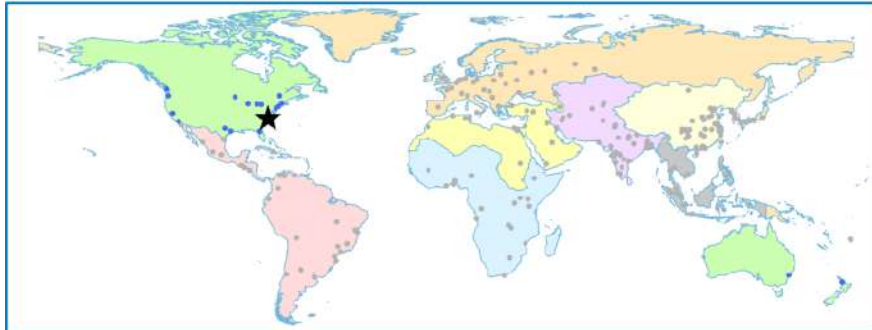
**Raleigh, United States
1990-2013**

0 10 20 30 40 km

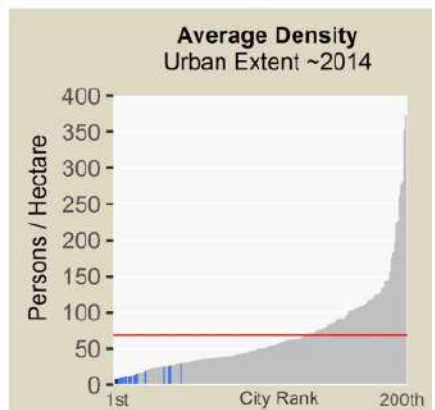
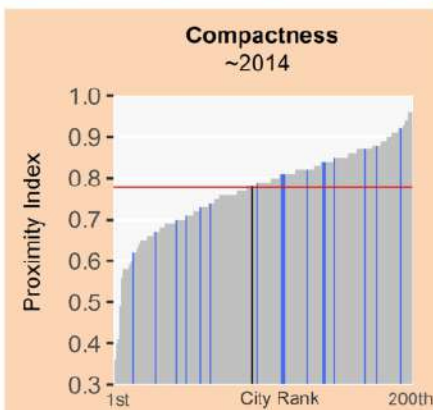
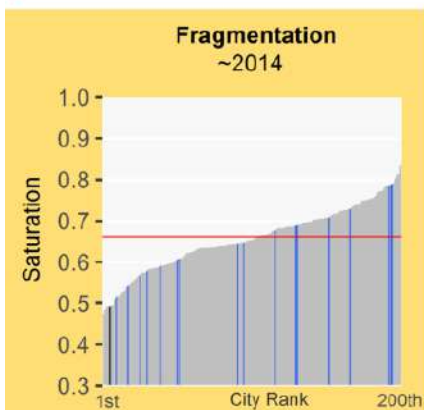
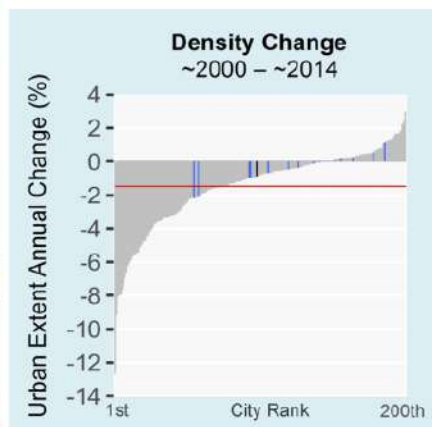
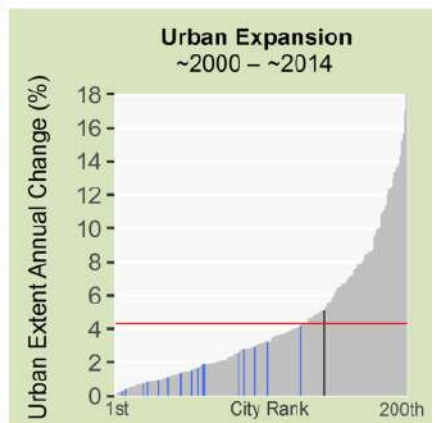
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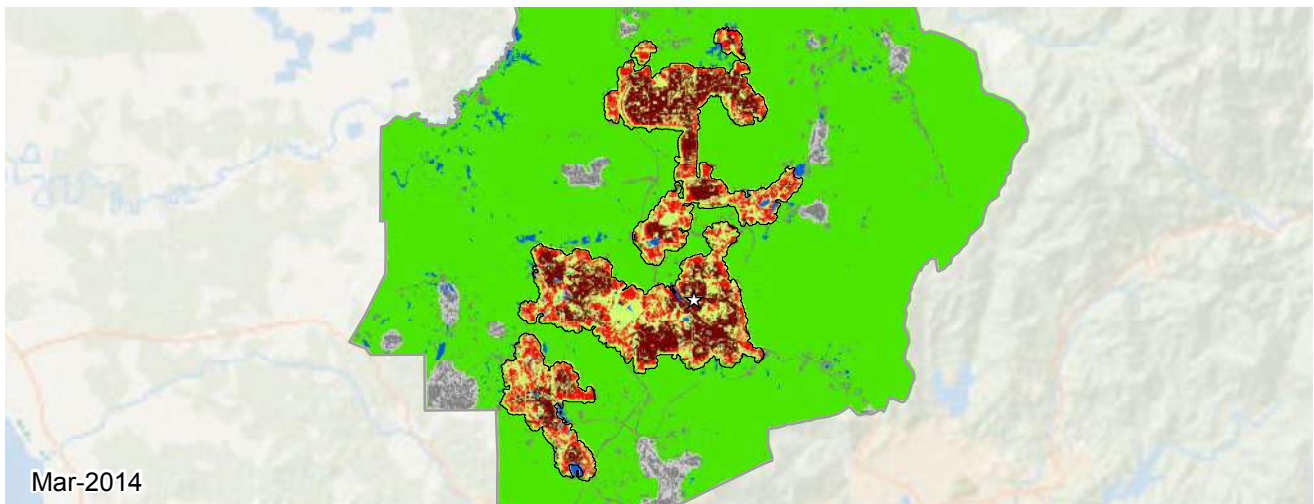
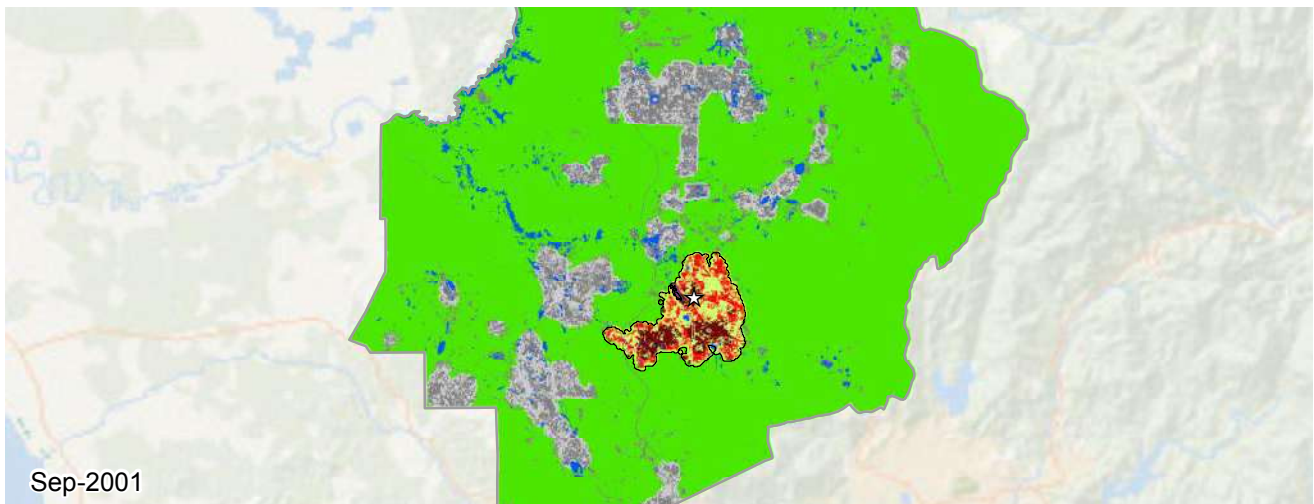
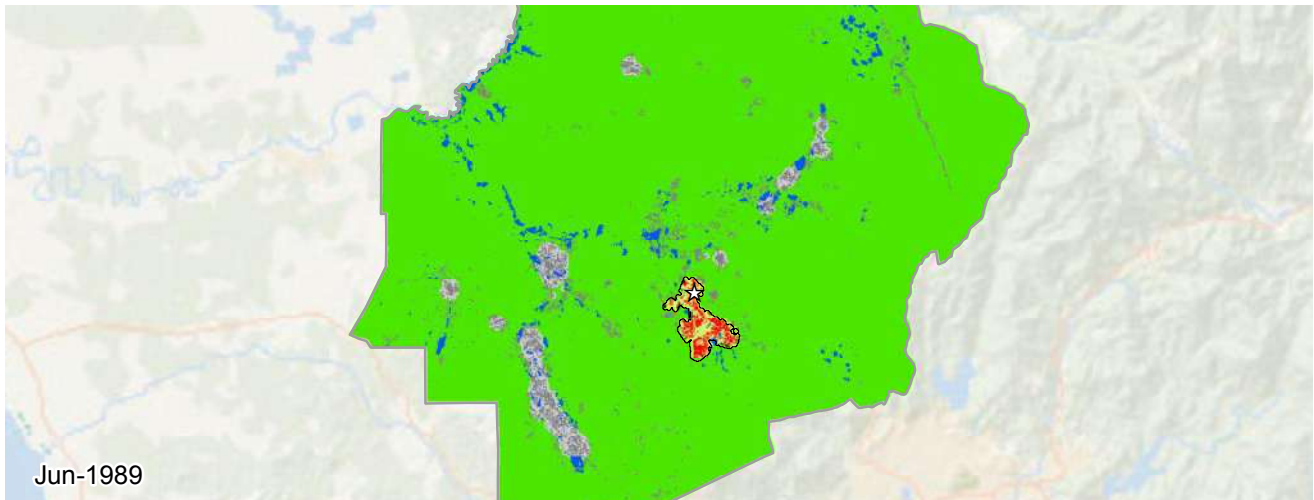
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Raleigh, United States (Land-Rich Developed Countries)



Metrics	Oct 1990	Nov 2000	May 2013	% Annual Change ('00-'13)
Population	262,551	702,157	1,188,416	4.2
Built-up Area (Hectares)				
Total	12,142	40,683	78,269	5.2
Urban	5,209	19,740	41,155	5.9
Suburban	6,543	19,576	34,480	4.5
Rural	389	1,365	2,634	5.3
Open space (Hectares)				
Urbanized Open Space	14,012	43,161	80,657	5.0
Urban Extent	26,154	83,844	158,927	5.1
Density (Persons / Hectare)				
Built-up Area Density	21.6	17.3	15.2	-1.0
Urban Extent Density	10.0	8.4	7.5	-0.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.46	0.49	0.49	0.1
Openness Index	0.51	0.48	0.47	-0.2
Compactness (Roundness)				
Proximity	0.81	0.68	0.78	1.1
Cohesion	0.80	0.69	0.77	0.9
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	4,323	15%	7,889	20%
Extension	7,286	25%	18,125	48%
Leapfrog	802	2%	99	0%
Inclusion	16,127	56%	11,472	30%





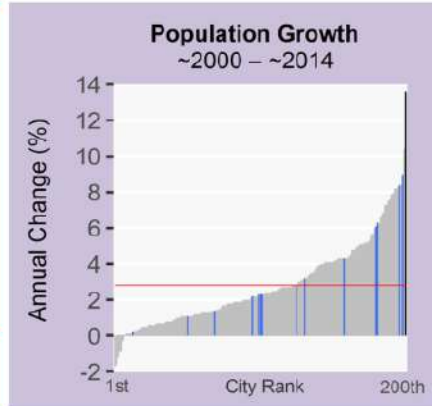
**Rawang, Malaysia
1989-2014**

0 4 8 12 16 km

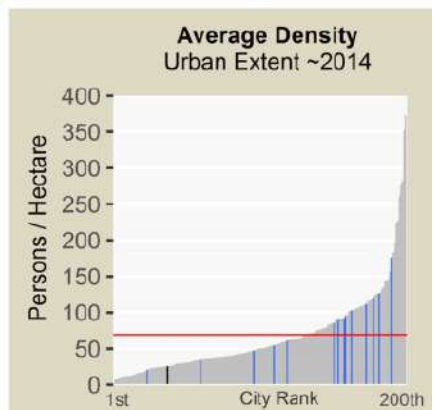
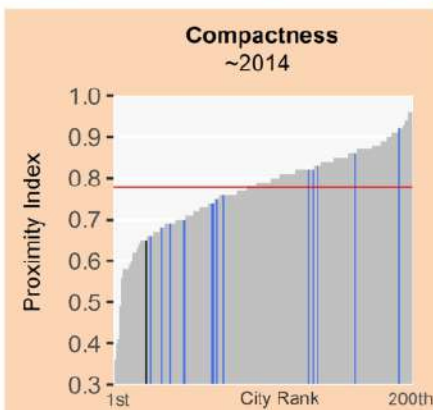
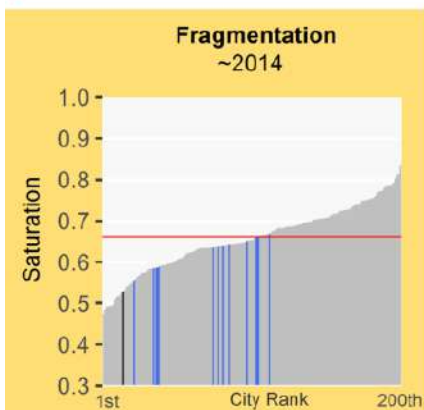
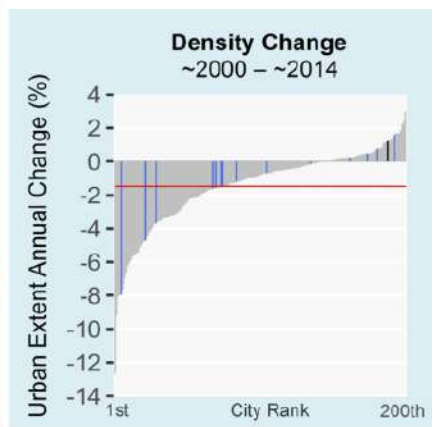
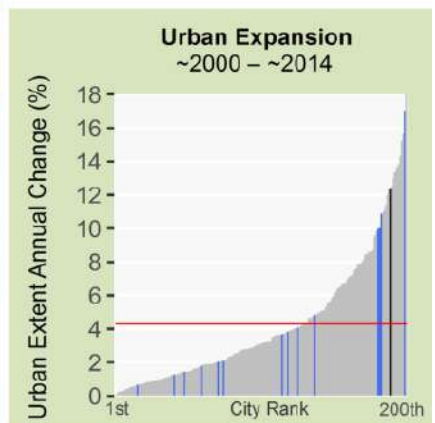
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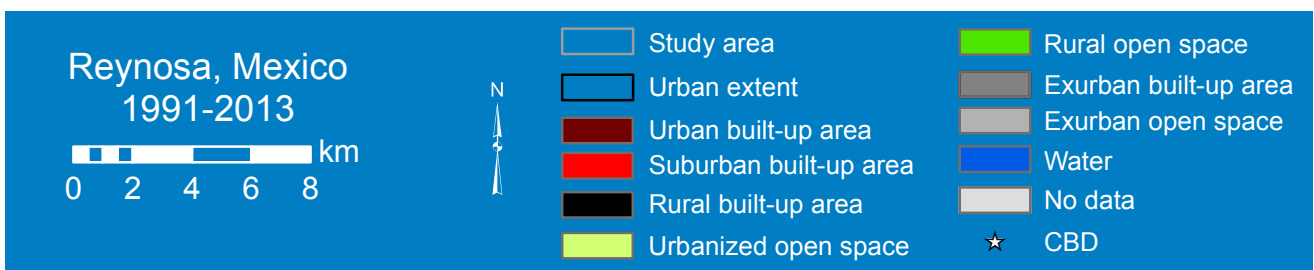
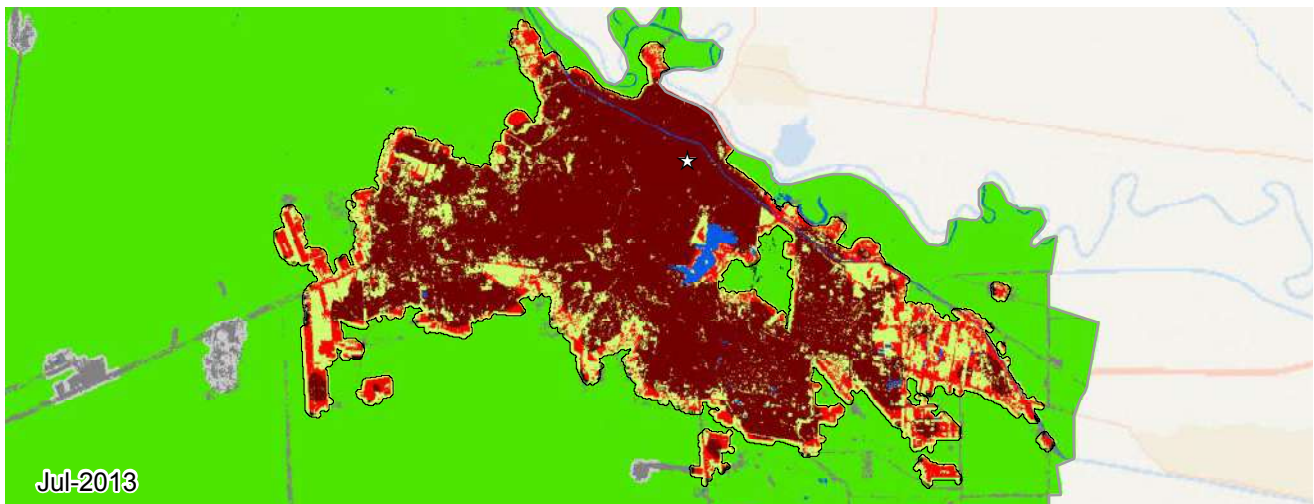
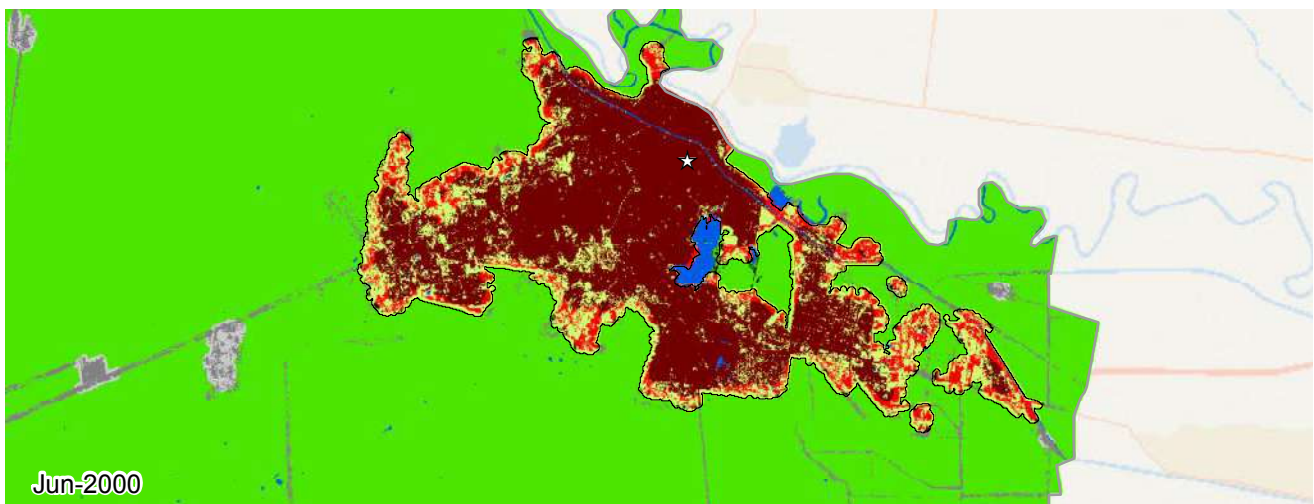
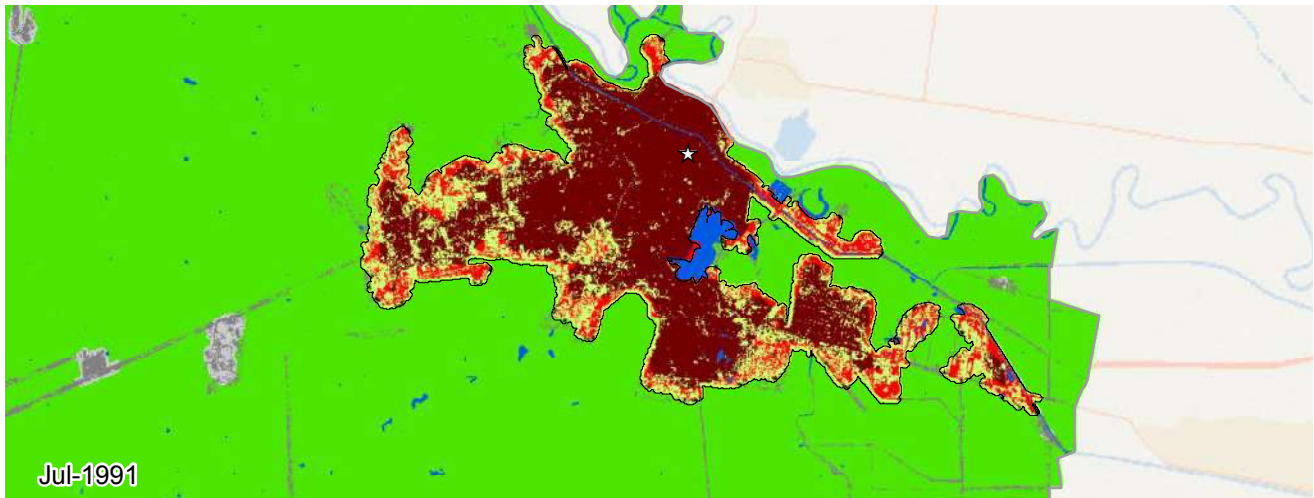
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Rawang, Malaysia (Southeast Asia)

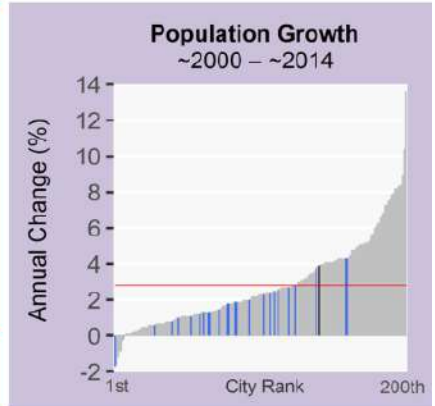


Metrics	Jun 1989	Sep 2001	Mar 2014	% Annual Change ('01-'14)
Population	13,532	43,521	236,967	13.6
Built-up Area (Hectares)				
Total	242	968	4,875	12.9
Urban	0	403	2,610	14.9
Suburban	221	538	2,130	11.0
Rural	21	26	135	13.1
Open space (Hectares)				
Urbanized Open Space	338	1,003	4,343	11.7
Urban Extent	581	1,971	9,219	12.3
Density (Persons / Hectare)				
Built-up Area Density	55.7	45.0	48.6	0.6
Urban Extent Density	23.3	22.1	25.7	1.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.42	0.49	0.53	0.6
Openness Index	0.64	0.51	0.48	-0.5
Compactness (Roundness)				
Proximity	0.83	0.90	0.65	-2.5
Cohesion	0.82	0.89	0.65	-2.5
Added Area (Hectares)	'89-'01	Share	'01-'14	Share
Infill	80	11%	549	14%
Extension	489	67%	652	16%
Leapfrog	0	0%	20	0%
Inclusion	154	21%	2,686	68%

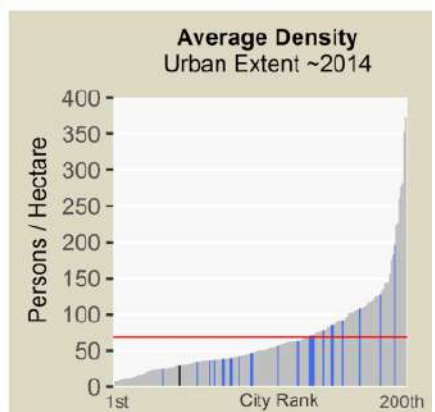
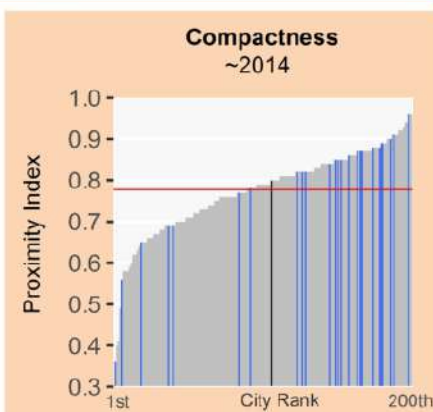
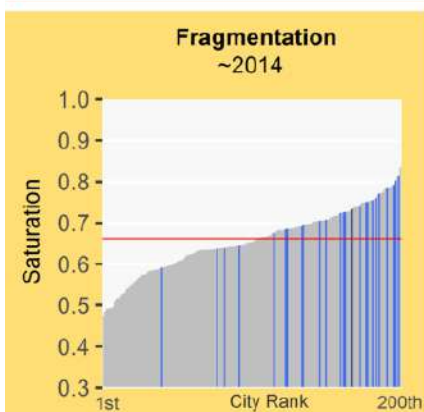
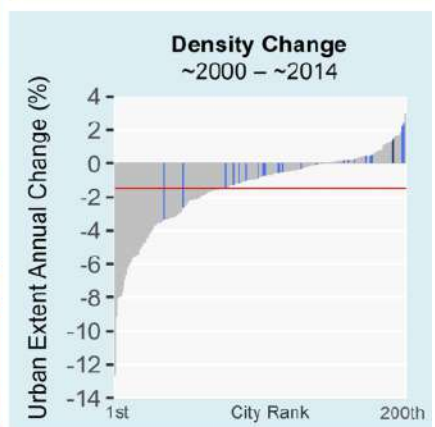
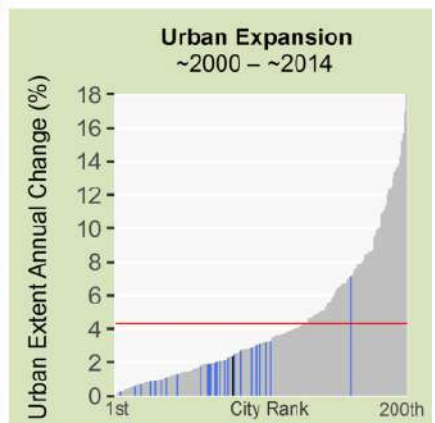


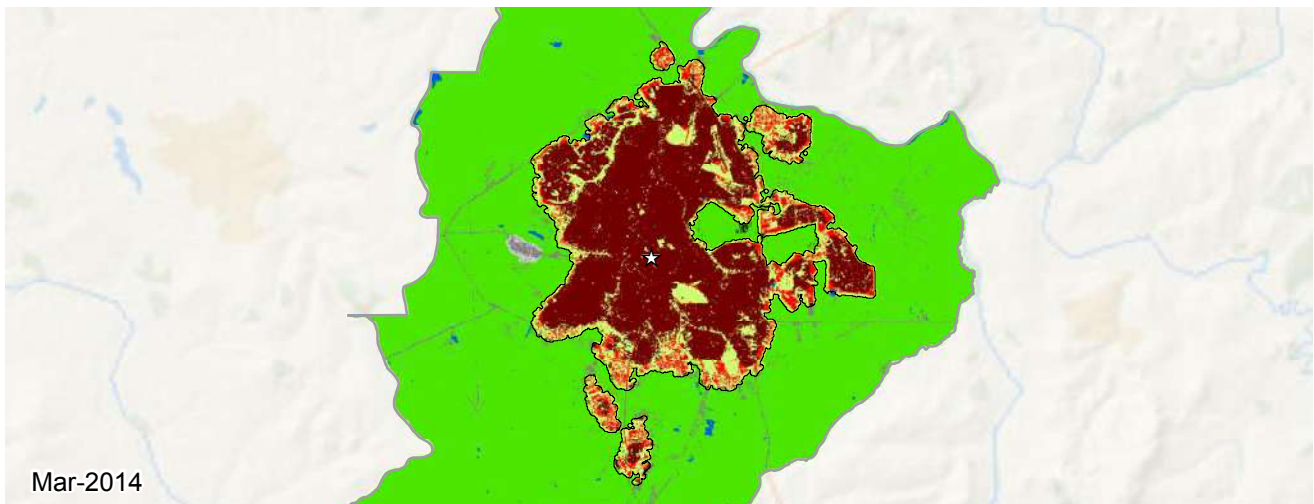
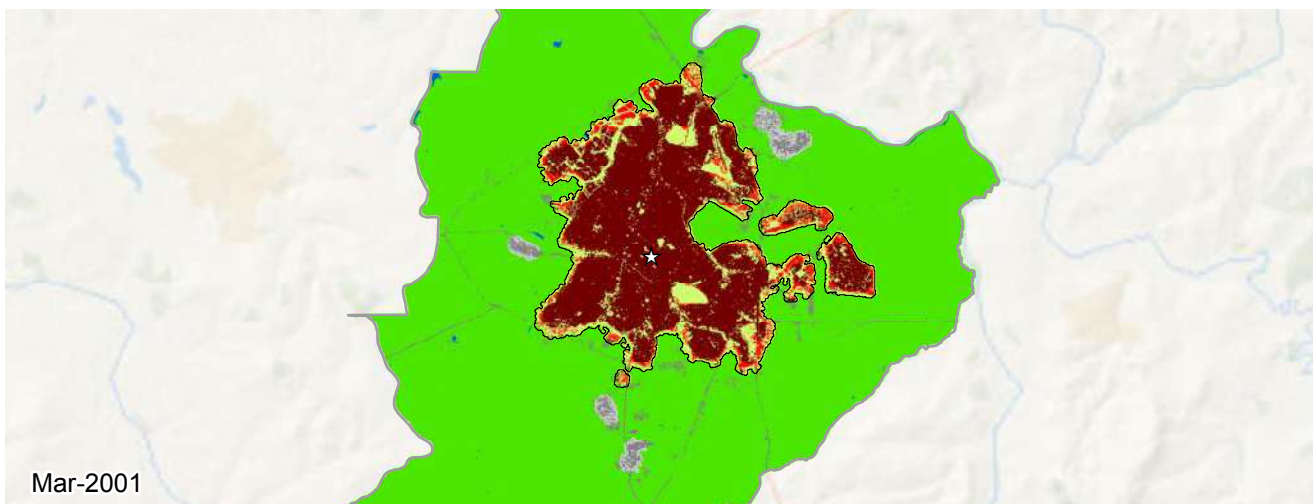
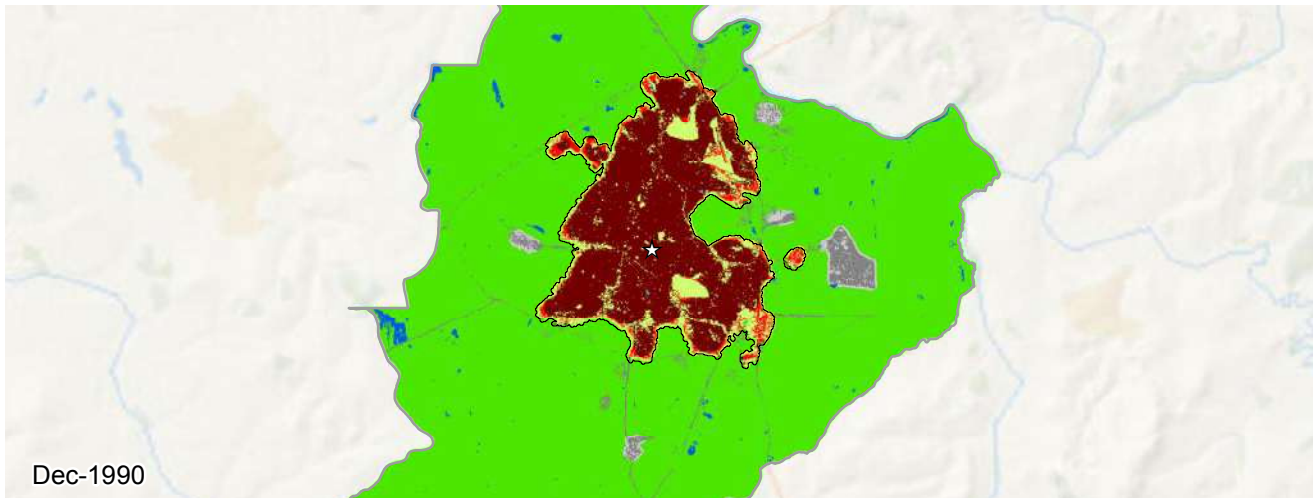


Reynosa, Mexico (Latin America and the Caribbean)



Metrics	Jul 1991	Jun 2000	Jul 2013	% Annual Change ('00-'13)
Population	197,216	286,782	479,078	3.9
Built-up Area (Hectares)				
Total	7,488	8,640	12,027	2.5
Urban	5,858	7,176	10,005	2.5
Suburban	1,537	1,367	1,906	2.5
Rural	93	96	115	1.4
Open space (Hectares)				
Urbanized Open Space	3,317	3,321	4,356	2.1
Urban Extent	10,805	11,961	16,383	2.4
Density (Persons / Hectare)				
Built-up Area Density	26.3	33.2	39.8	1.4
Urban Extent Density	18.3	24.0	29.2	1.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.69	0.72	0.73	0.1
Openness Index	0.27	0.24	0.23	-0.4
Compactness (Roundness)				
Proximity	0.76	0.78	0.80	0.2
Cohesion	0.75	0.77	0.79	0.3
Added Area (Hectares)	'91-'00	Share	'00-'13	Share
Infill	587	50%	840	24%
Extension	480	41%	2,207	65%
Leapfrog	0	0%	102	3%
Inclusion	83	7%	237	6%

















Ribeirão Preto, Brazil
1990-2014

0 4 8 12 16 km

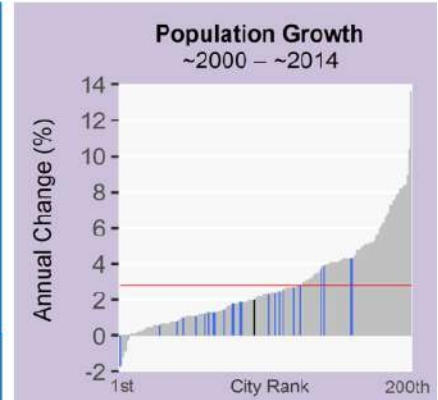
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	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

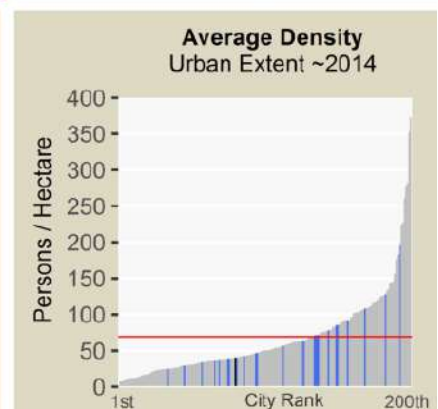
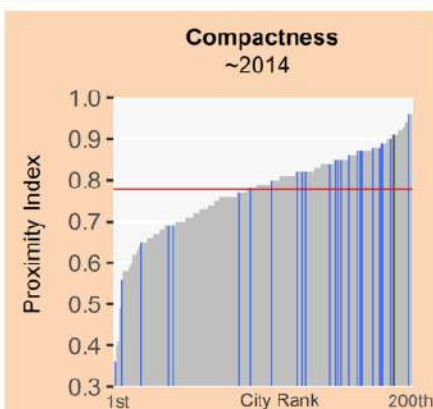
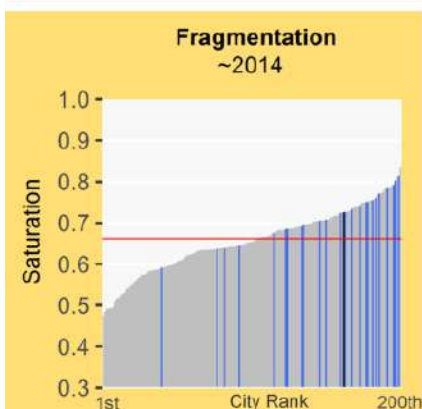
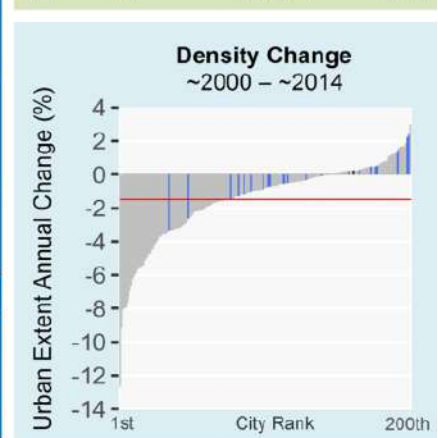
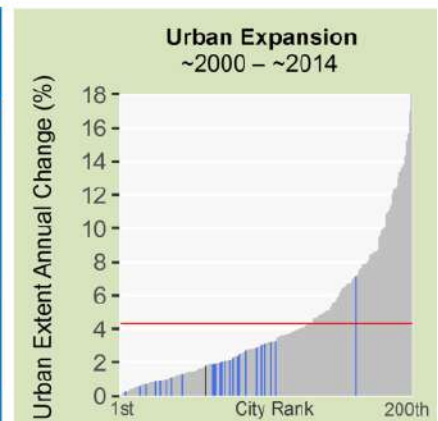
Ribeirão Preto, Brazil (Latin America and the Caribbean)

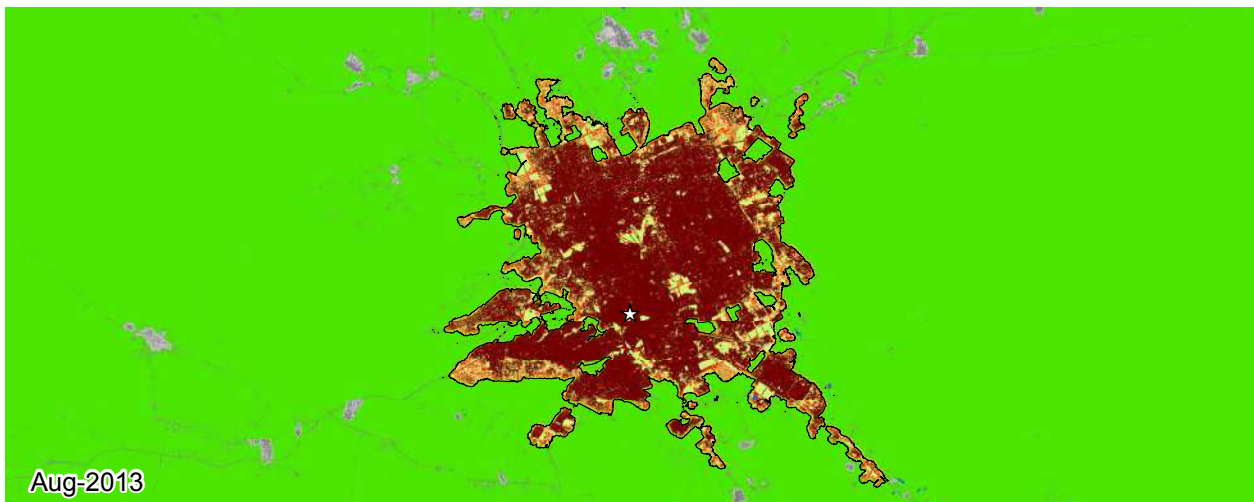
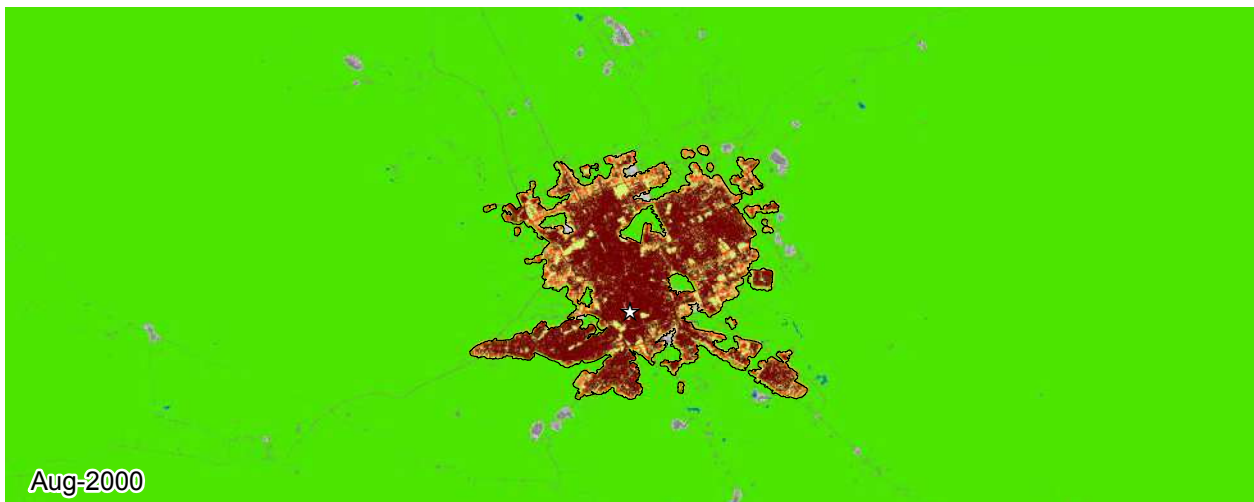
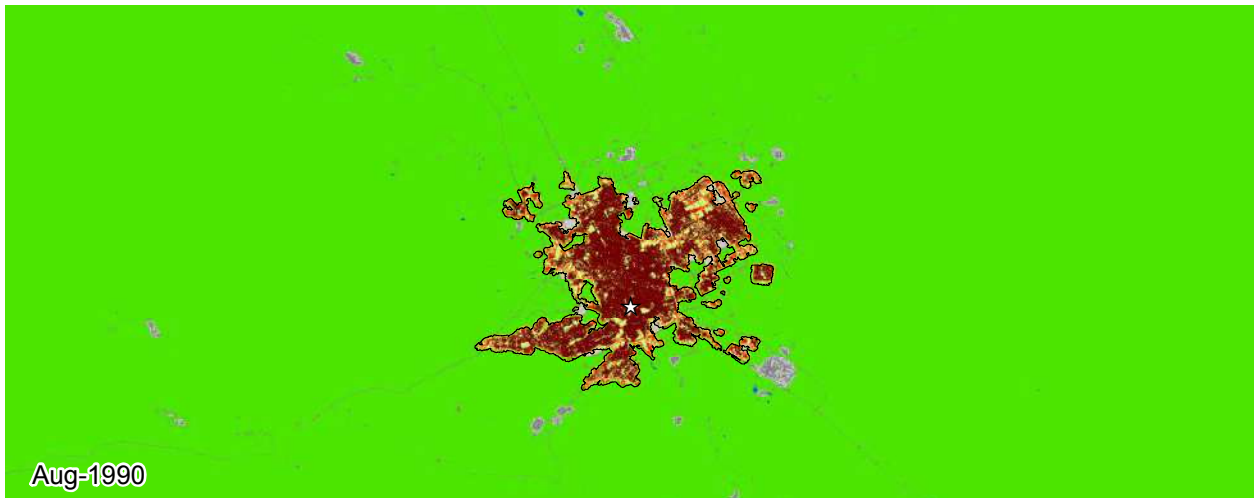


Legend for Charts
 Ribeirão Preto | Other cities in region | All other cities | Global average —



Metrics	Dec 1990	Mar 2001	Mar 2014	% Annual Change ('01-'14)
Population	372,764	468,284	607,350	2.0
Built-up Area (Hectares)				
Total	7,365	8,937	10,916	1.5
Urban	6,713	7,924	9,384	1.3
Suburban	608	943	1,418	3.1
Rural	43	69	113	3.8
Open space (Hectares)				
Urbanized Open Space	2,207	2,993	4,127	2.5
Urban Extent	9,572	11,931	15,043	1.8
Density (Persons / Hectare)				
Built-up Area Density	50.6	52.4	55.6	0.5
Urban Extent Density	38.9	39.2	40.4	0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.77	0.75	0.73	-0.2
Openness Index	0.19	0.21	0.22	0.4
Compactness (Roundness)				
Proximity	0.91	0.90	0.91	0.0
Cohesion	0.91	0.90	0.90	-0.0
Added Area (Hectares)	'90-'01	Share	'01-'14	Share
Infill	279	17%	624	31%
Extension	778	49%	851	42%
Leapfrog	0	0%	0	0%
Inclusion	513	32%	503	25%

















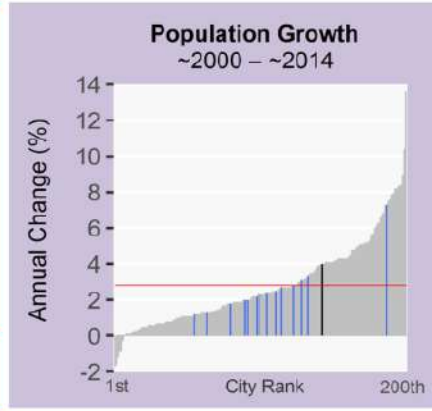
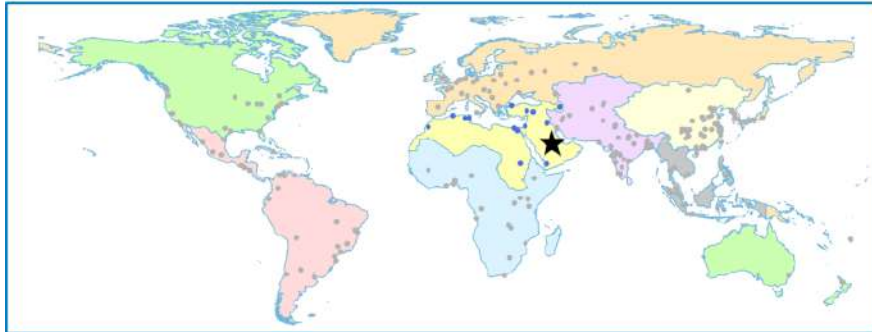
**Riyadh, Saudi Arabia
1990-2013**

0 10 20 30 40 km

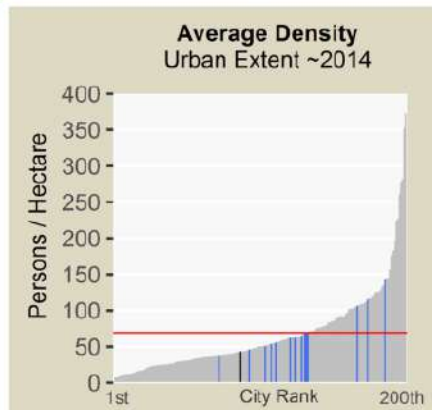
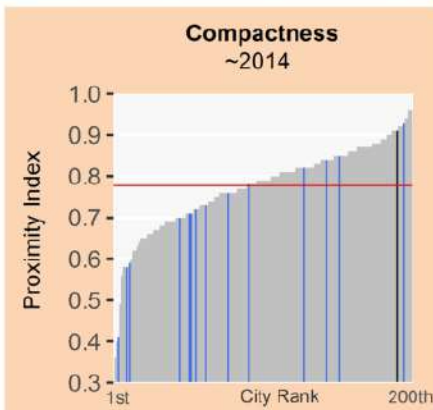
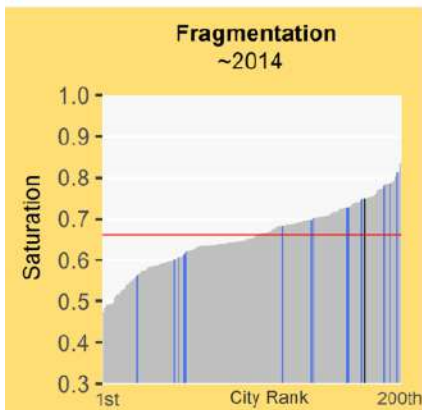
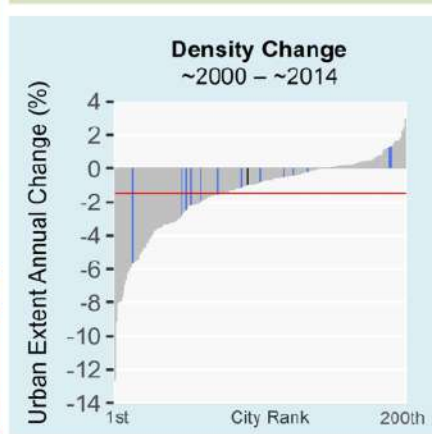
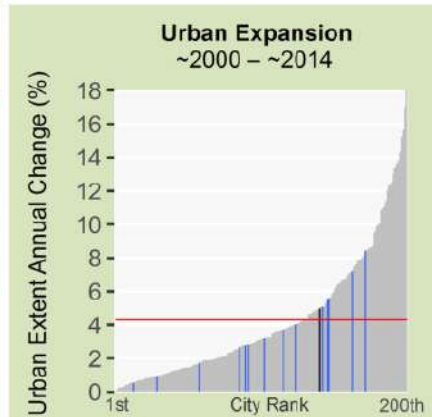
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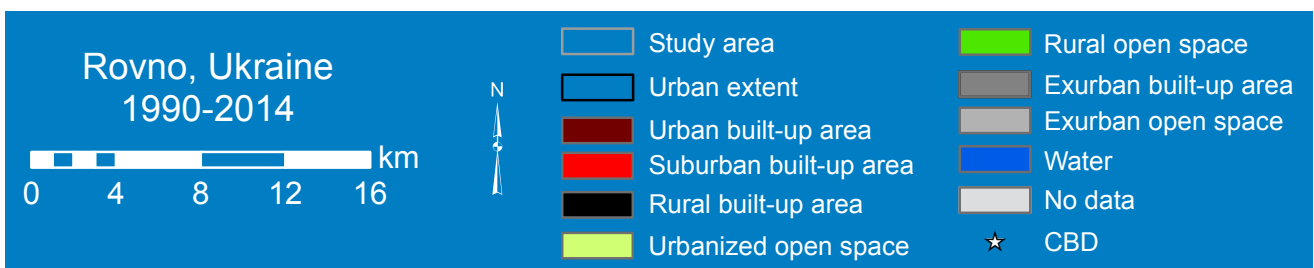
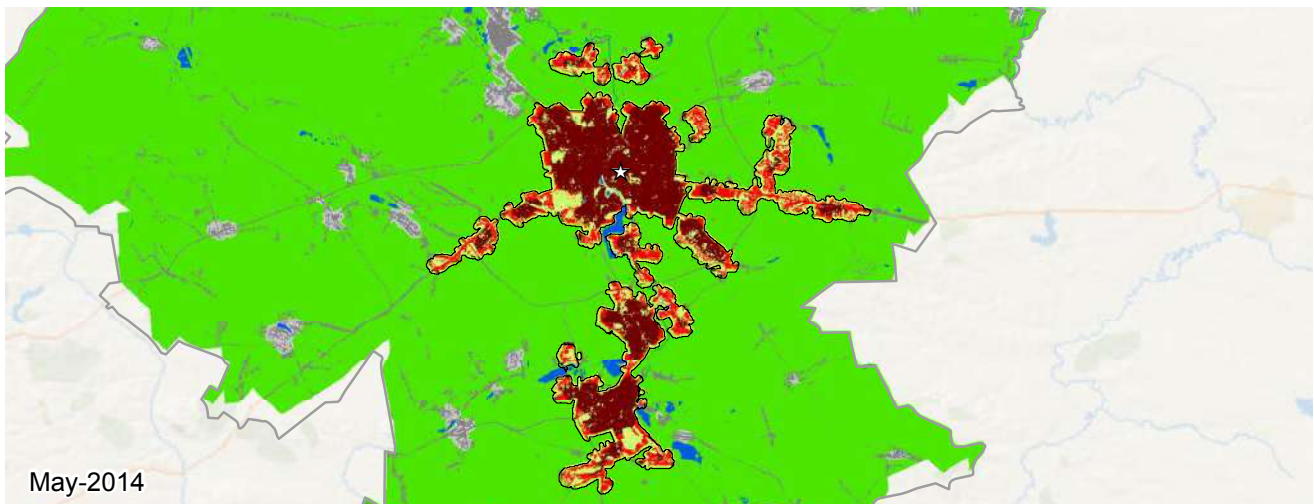
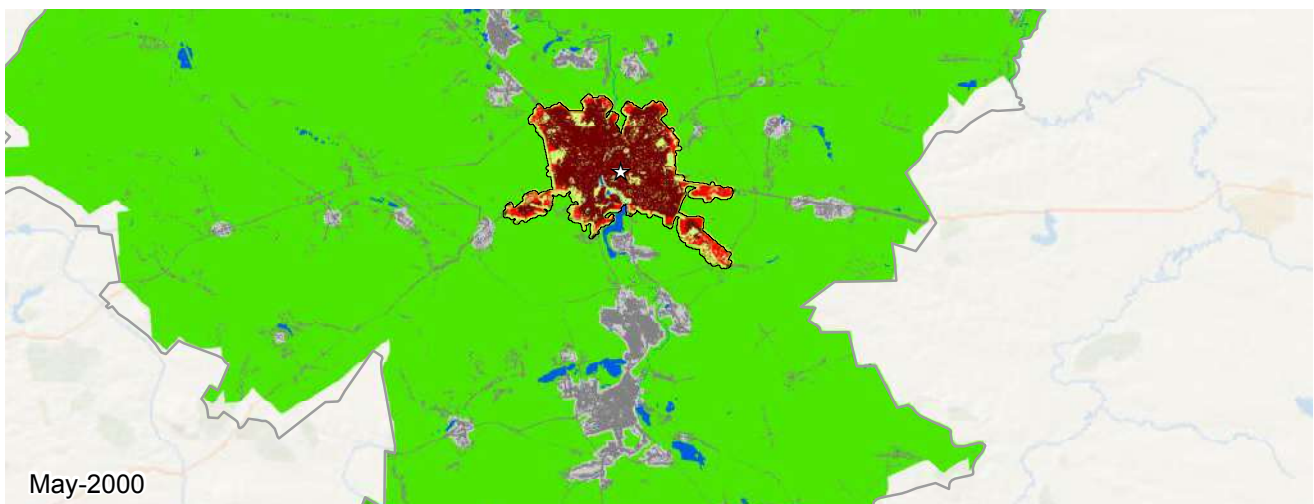
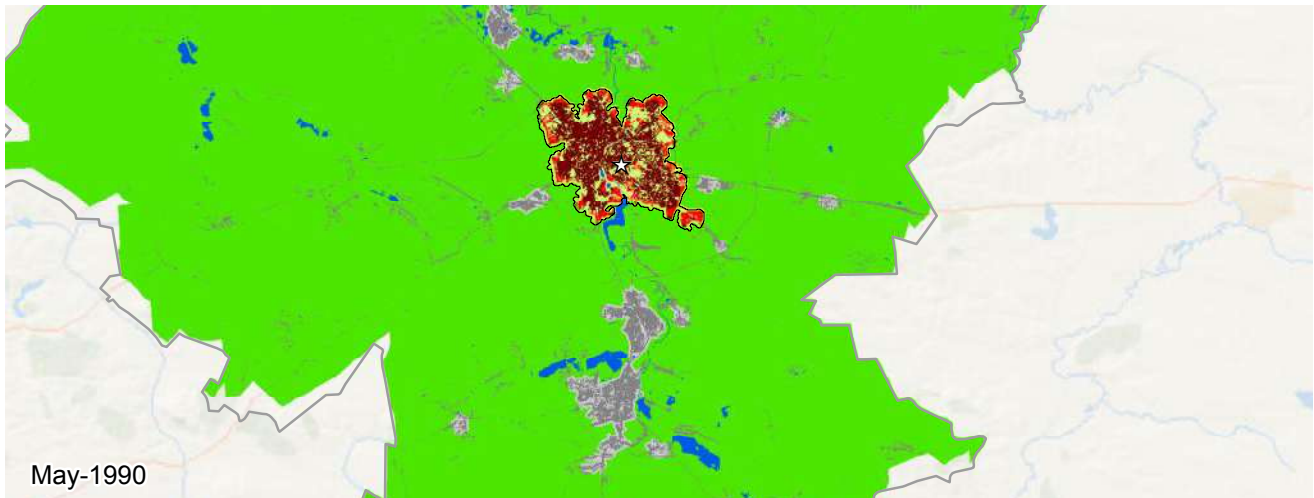
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Riyadh, Saudi Arabia (Western Asia and North Africa)

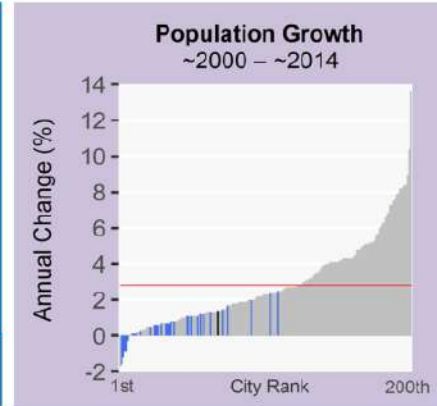


Metrics	Aug 1990	Aug 2000	Aug 2013	% Annual Change ('00-'13)
Population	2,210,739	3,311,355	5,552,240	4.0
Built-up Area (Hectares)				
Total	30,304	45,495	95,860	5.7
Urban	24,250	37,740	84,857	6.2
Suburban	5,630	7,254	10,777	3.0
Rural	423	500	226	-6.1
Open space (Hectares)				
Urbanized Open Space	15,581	21,314	31,944	3.1
Urban Extent	45,886	66,810	127,805	5.0
Density (Persons / Hectare)				
Built-up Area Density	72.9	72.8	57.9	-1.8
Urban Extent Density	48.2	49.6	43.4	-1.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.66	0.68	0.75	0.7
Openness Index	0.29	0.26	0.19	-2.4
Compactness (Roundness)				
Proximity	0.83	0.88	0.91	0.3
Cohesion	0.82	0.87	0.90	0.3
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	5,492	36%	12,767	25%
Extension	6,541	43%	33,179	65%
Leapfrog	1	0%	2	0%
Inclusion	3,154	20%	4,472	8%

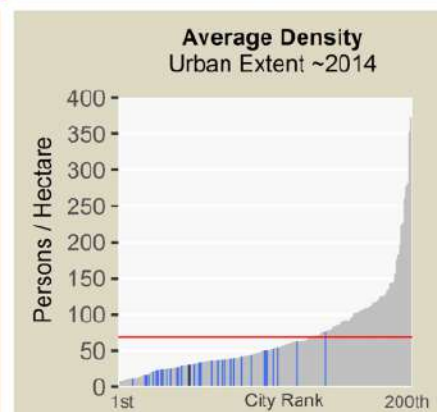
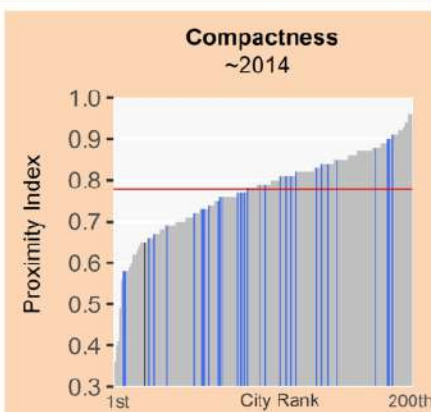
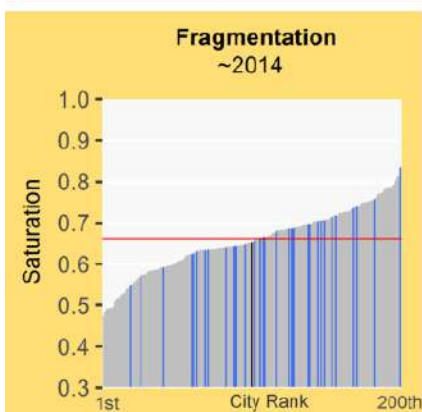
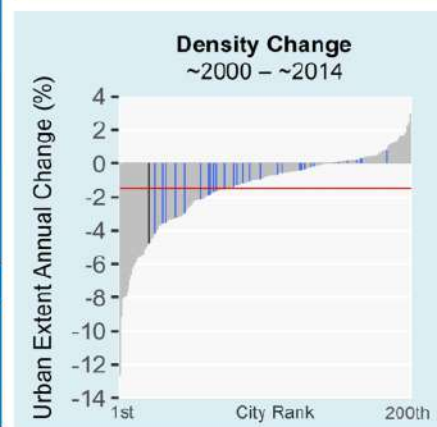
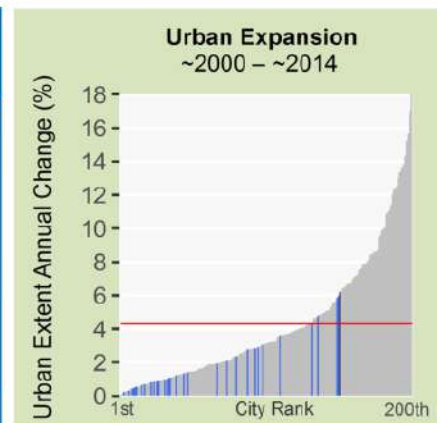


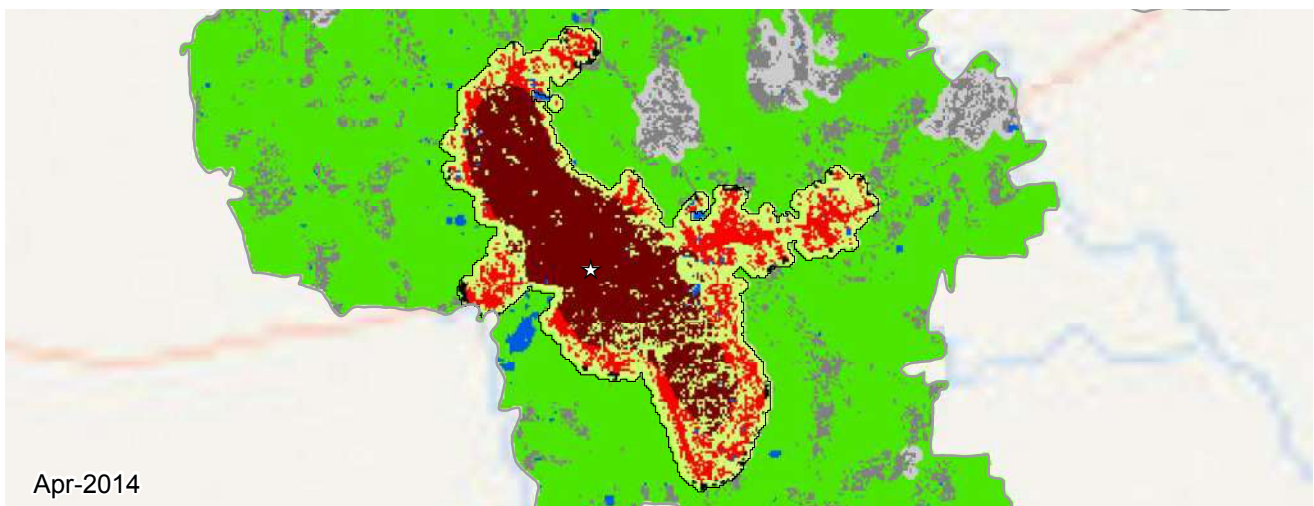
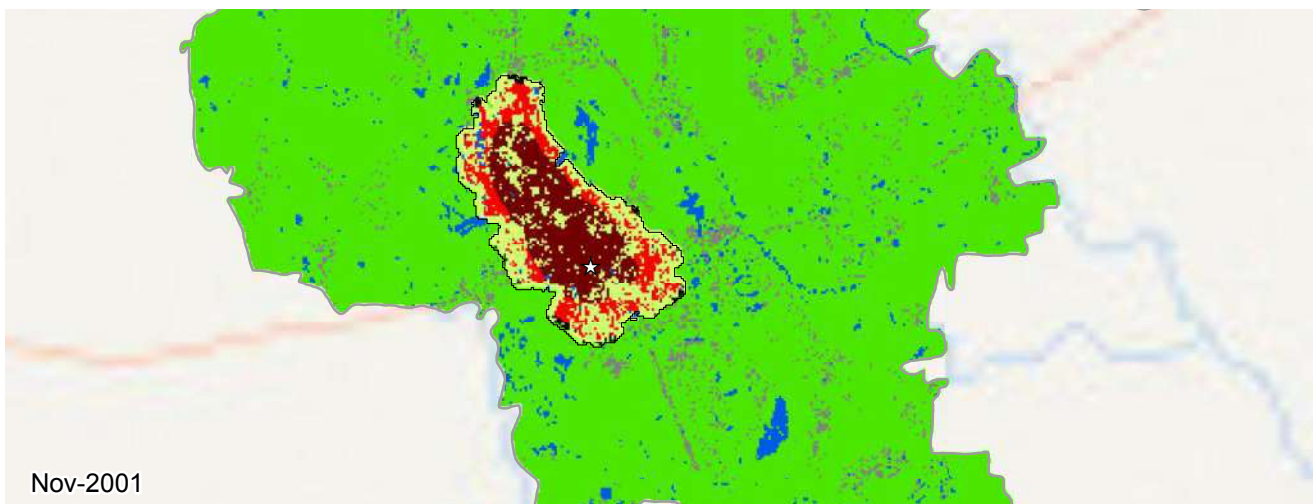
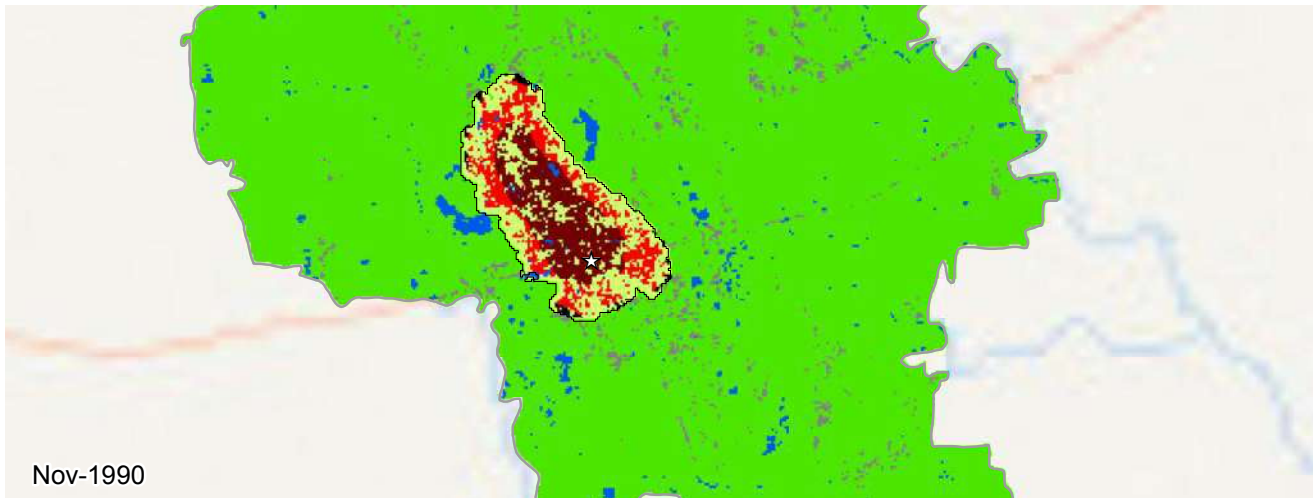


Rovno, Ukraine (Europe and Japan)



Metrics	May 1990	May 2000	May 2014	% Annual Change ('00-'14)
Population	207,138	235,249	286,691	1.4
Built-up Area (Hectares)				
Total	1,953	2,837	6,200	5.6
Urban	1,463	2,270	4,126	4.3
Suburban	459	540	1,917	9.0
Rural	30	26	156	12.7
Open space (Hectares)				
Urbanized Open Space	1,160	1,145	3,276	7.5
Urban Extent	3,113	3,982	9,477	6.2
Density (Persons / Hectare)				
Built-up Area Density	106.0	82.9	46.2	-4.2
Urban Extent Density	66.5	59.1	30.2	-4.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.63	0.71	0.65	-0.6
Openness Index	0.38	0.28	0.34	1.4
Compactness (Roundness)				
Proximity	0.93	0.87	0.65	-2.1
Cohesion	0.93	0.85	0.64	-2.0
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	489	55%	512	15%
Extension	177	20%	627	18%
Leapfrog	14	1%	36	1%
Inclusion	202	22%	2,187	65%





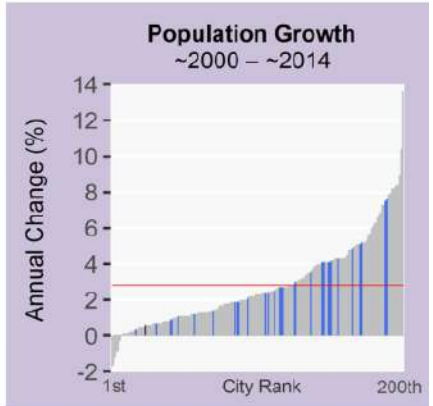
Saidpur, Bangladesh
1990-2014

0 1 2 3 4 km

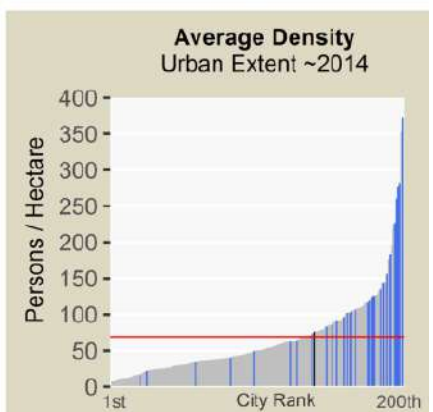
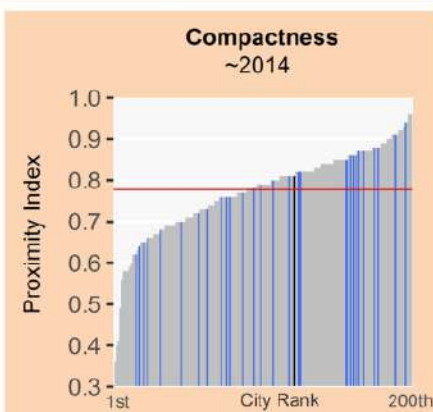
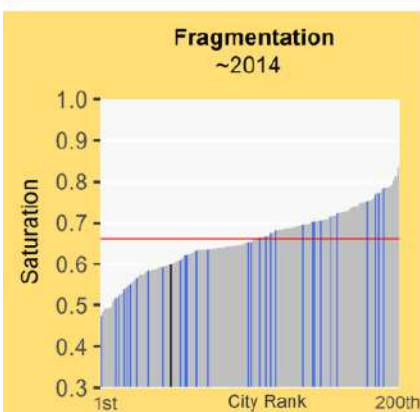
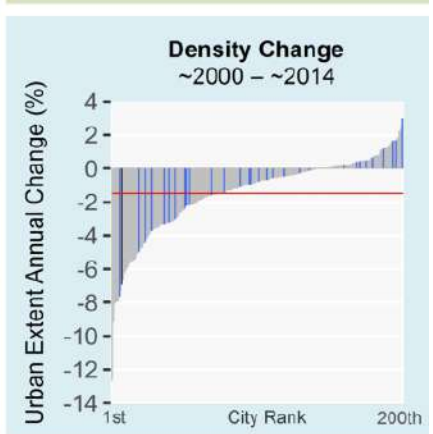
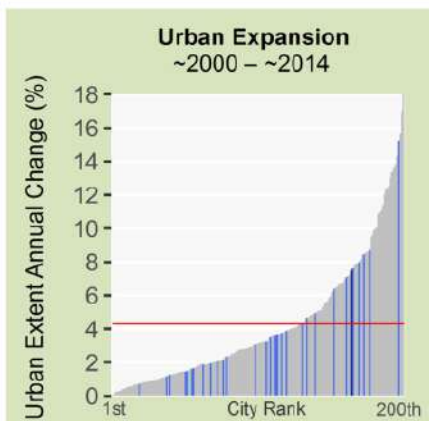
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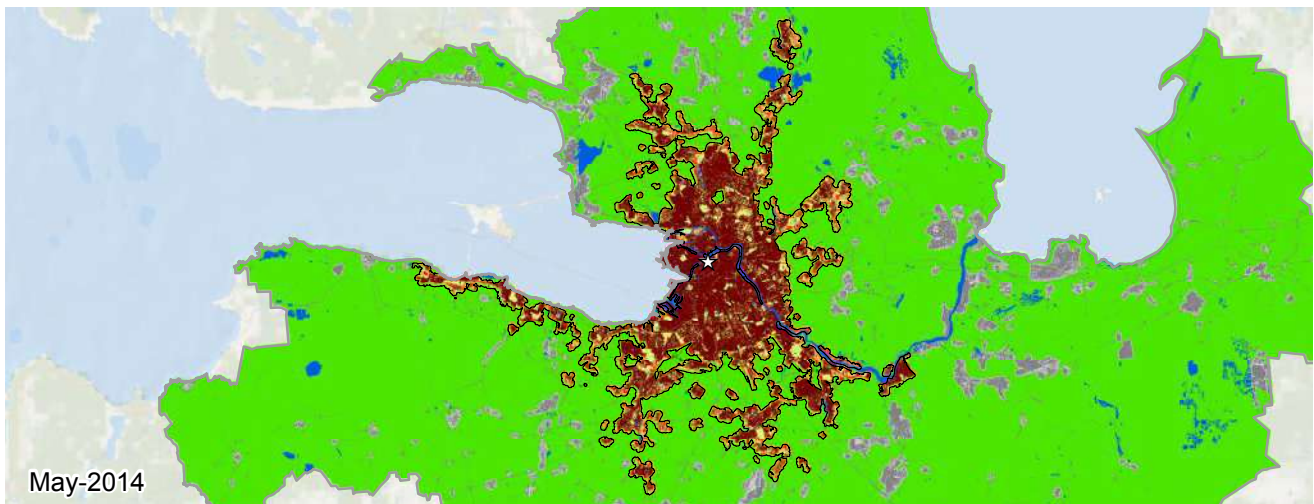
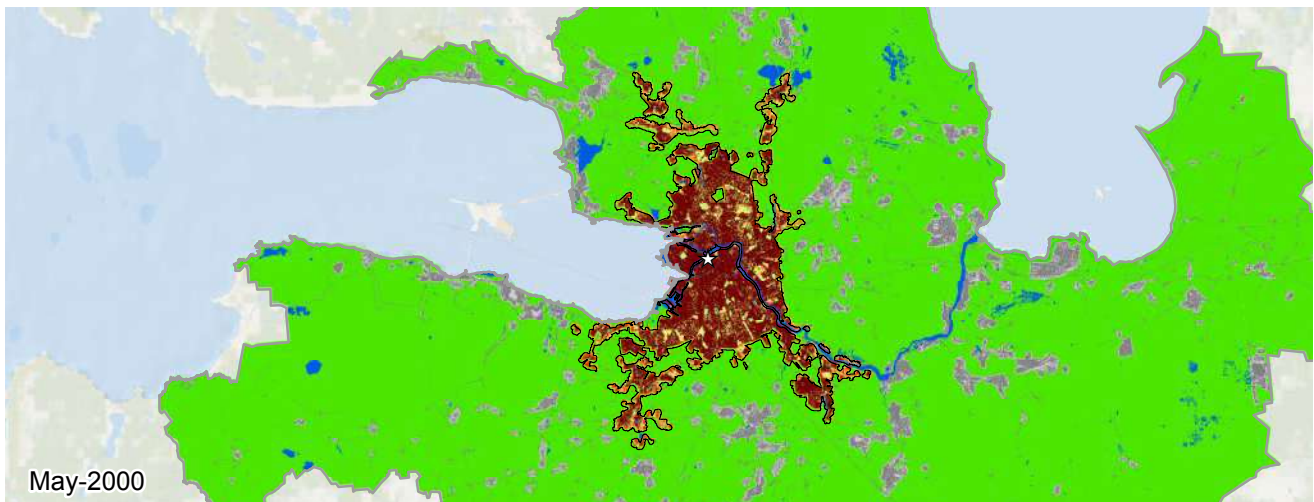
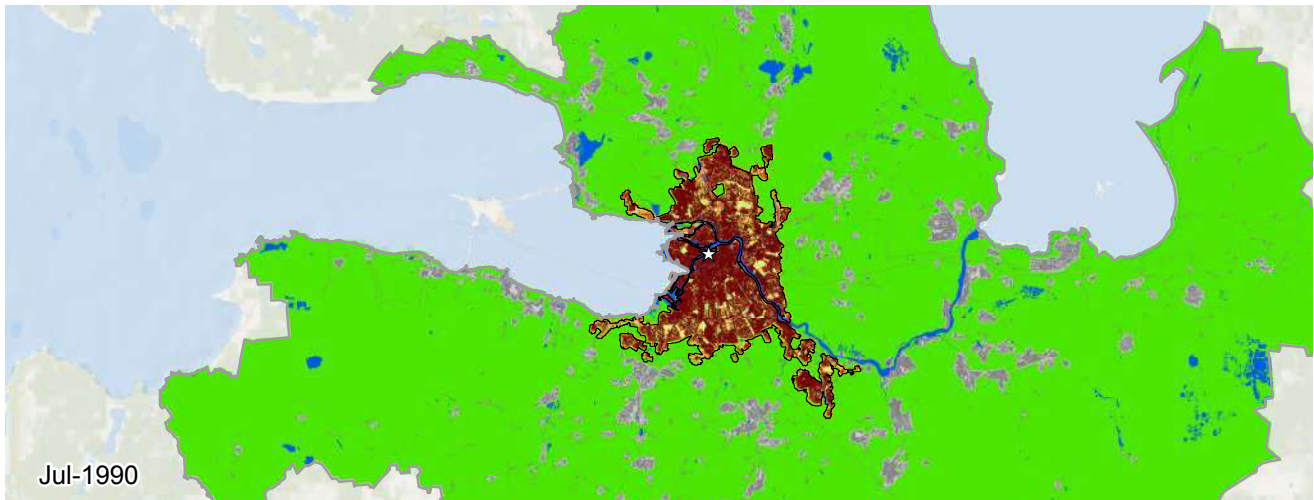
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Saidpur, Bangladesh (South and Central Asia)



Metrics	Nov 1990	Nov 2001	Apr 2014	% Annual Change ('01-'14)
Population	104,934	102,620	111,028	0.6
Built-up Area (Hectares)				
Total	267	322	871	8.0
Urban	144	200	572	8.5
Suburban	111	112	277	7.3
Rural	11	10	21	5.7
Open space (Hectares)				
Urbanized Open Space	224	246	585	7.0
Urban Extent	492	569	1,456	7.6
Density (Persons / Hectare)				
Built-up Area Density	392.7	317.9	127.4	-7.4
Urban Extent Density	213.3	180.3	76.2	-6.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.57	0.60	0.4
Openness Index	0.48	0.44	0.38	-1.3
Compactness (Roundness)				
Proximity	0.86	0.86	0.81	-0.4
Cohesion	0.86	0.86	0.80	-0.5
Added Area (Hectares)	'90-'01	Share	'01-'14	Share
Infill	30	54%	120	21%
Extension	13	23%	330	60%
Leapfrog	0	0%	0	0%
Inclusion	11	20%	96	17%

















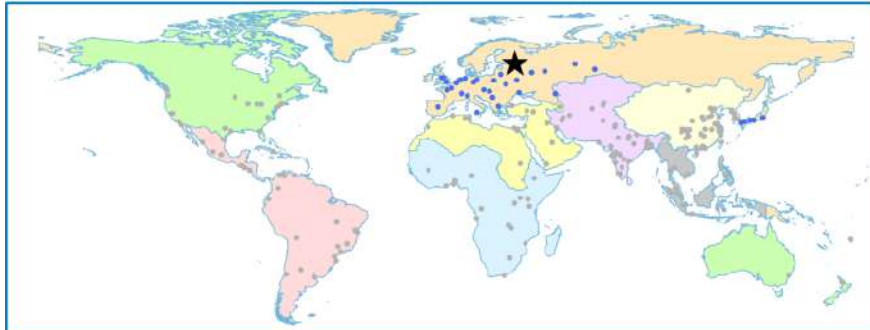
**Saint Petersburg, Russia
1990-2014**

0 10 20 30 40 km

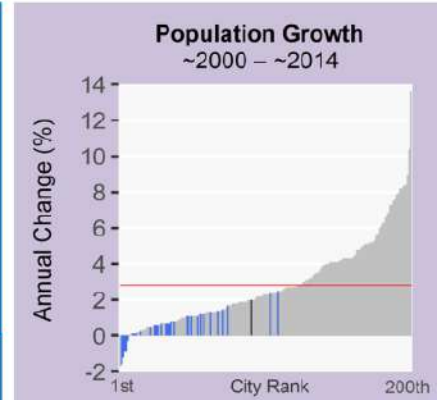
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	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

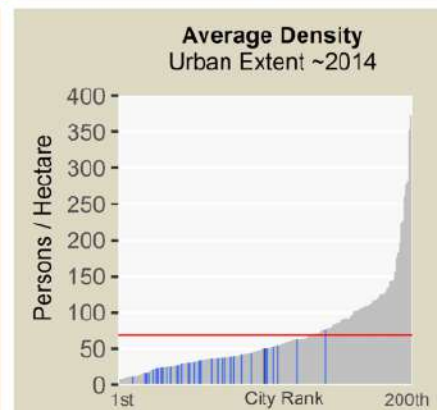
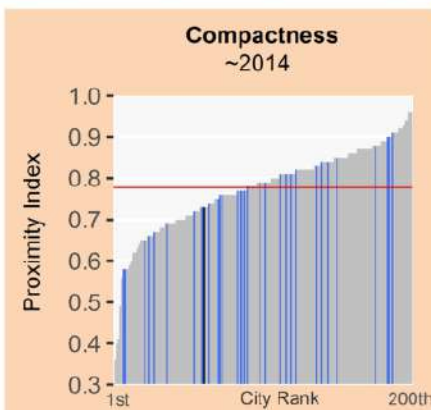
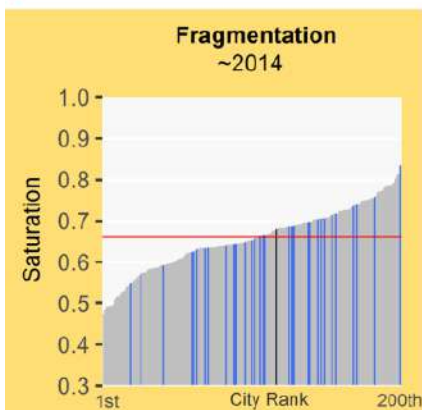
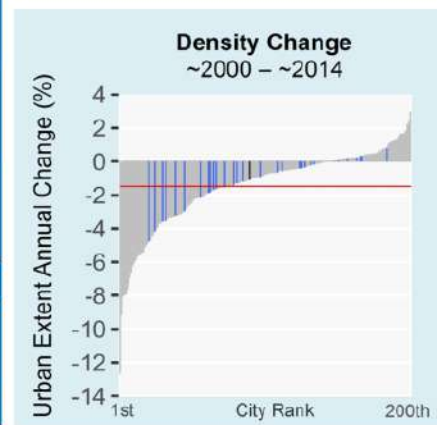
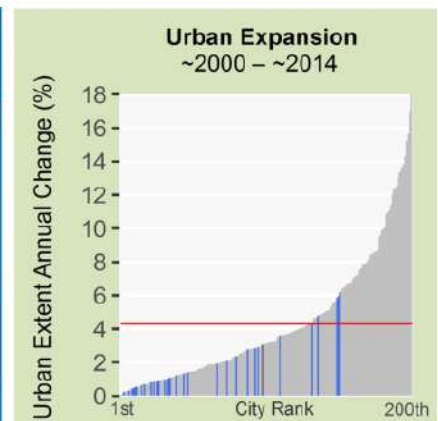
Saint Petersburg, Russia (Europe and Japan)

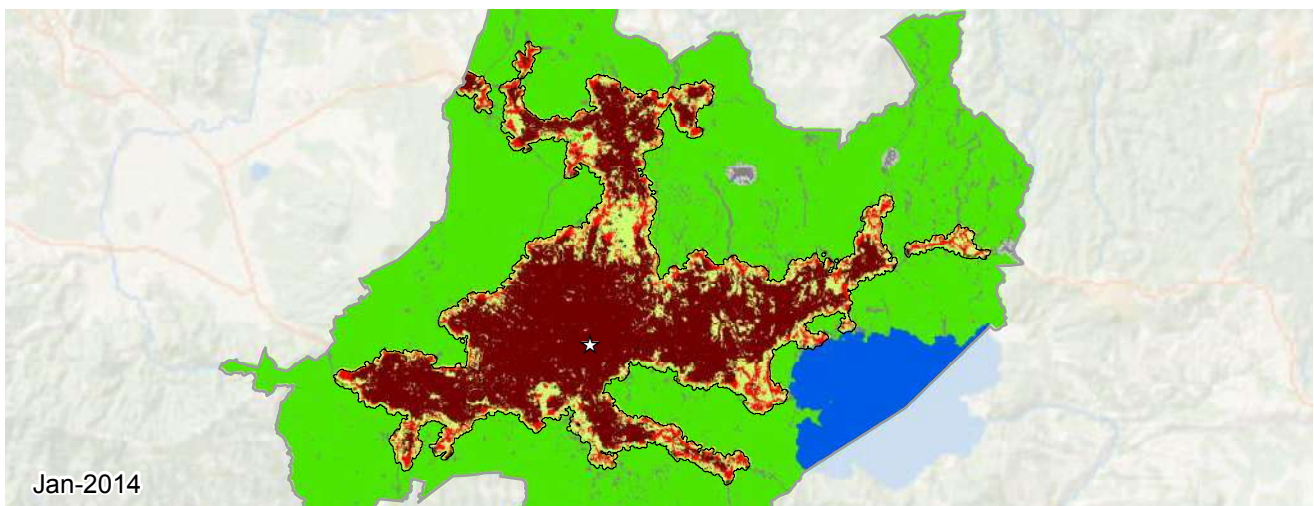
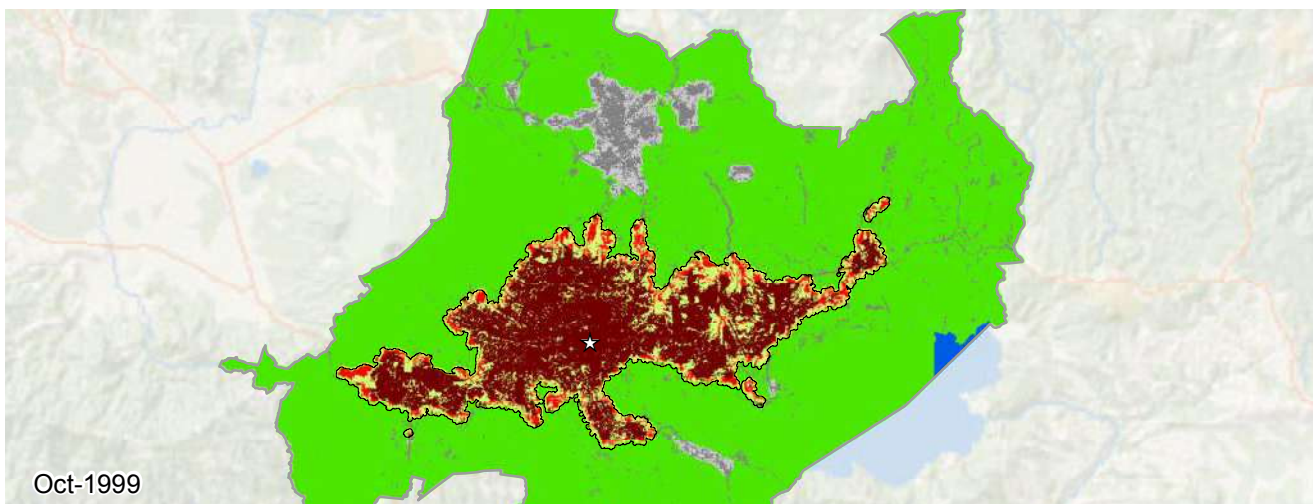
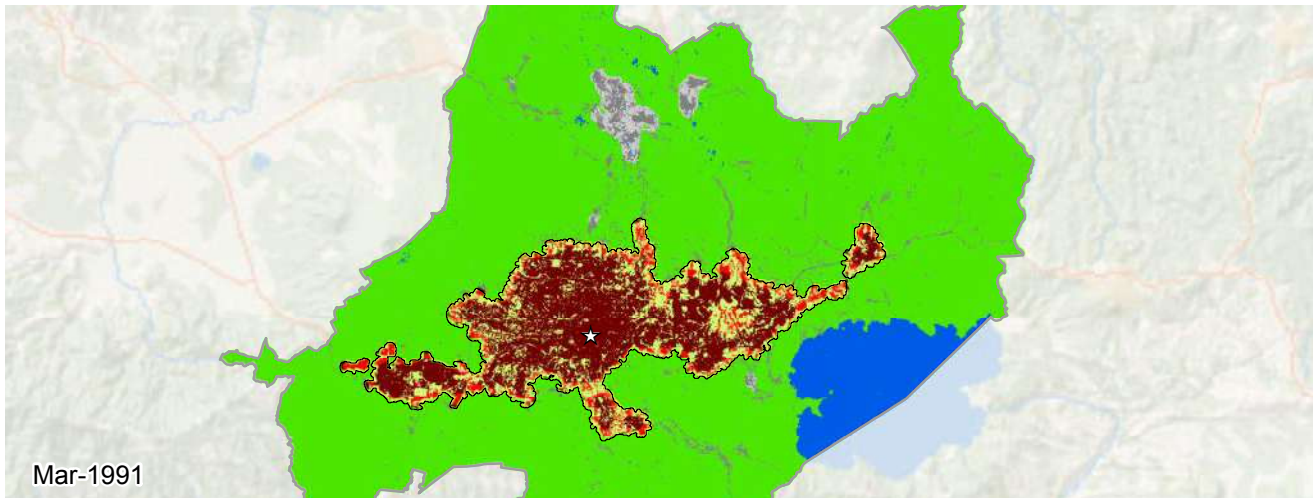


Legend for Charts
 Saint Petersburg | Other cities in region | All other cities | Global average



Metrics	Jul 1990	May 2000	May 2014	% Annual Change ('00-'14)
Population	3,871,639	3,855,457	5,070,516	2.0
Built-up Area (Hectares)				
Total	36,039	46,787	68,500	2.7
Urban	31,360	39,026	54,050	2.3
Suburban	4,436	7,261	13,530	4.4
Rural	242	499	919	4.4
Open space (Hectares)				
Urbanized Open Space	13,242	18,884	32,234	3.8
Urban Extent	49,282	65,672	100,735	3.1
Density (Persons / Hectare)				
Built-up Area Density	107.4	82.4	74.0	-0.8
Urban Extent Density	78.6	58.7	50.3	-1.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.73	0.71	0.68	-0.3
Openness Index	0.27	0.28	0.30	0.4
Compactness (Roundness)				
Proximity	0.81	0.73	0.73	-0.1
Cohesion	0.79	0.71	0.70	-0.1
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	2,735	25%	3,326	15%
Extension	2,120	19%	6,246	28%
Leapfrog	461	4%	529	2%
Inclusion	5,431	50%	11,610	53%





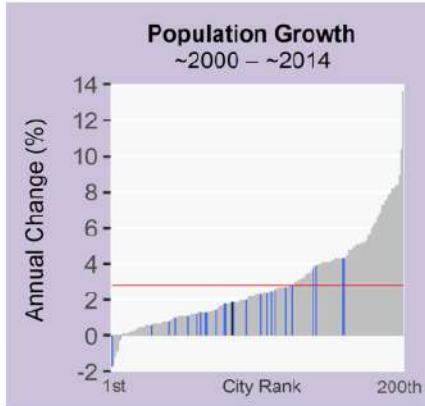
**San Salvador, El Salvador
1991-2014**

0 4 8 12 16 km

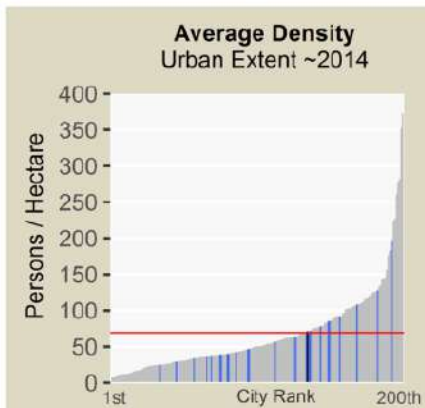
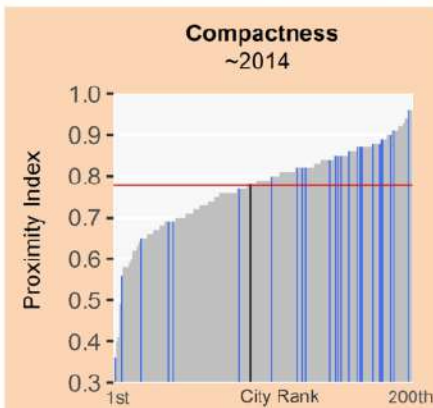
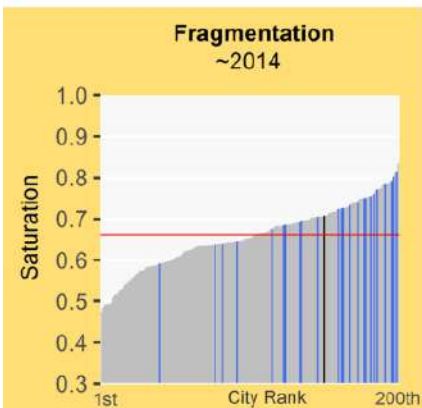
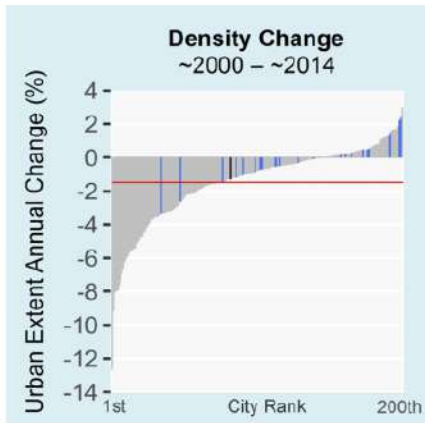
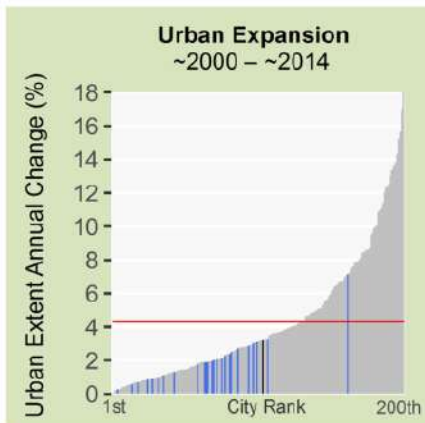
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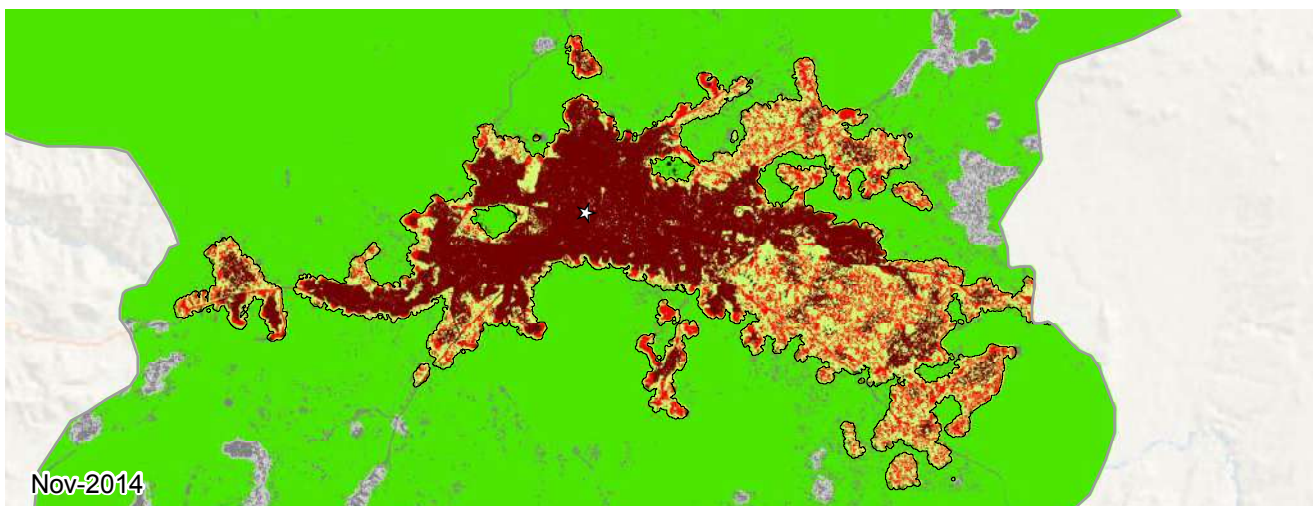
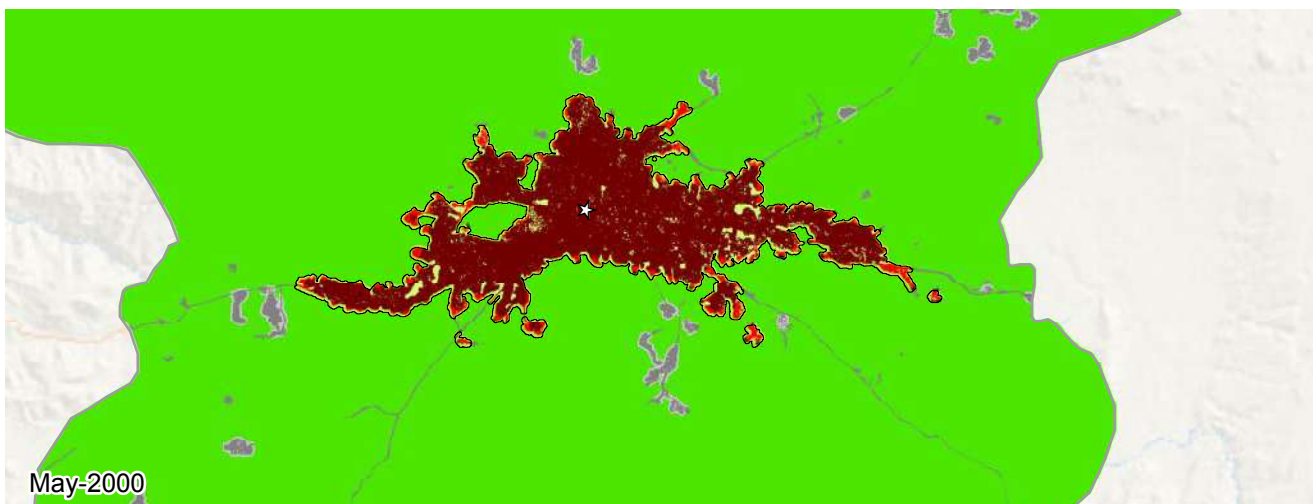
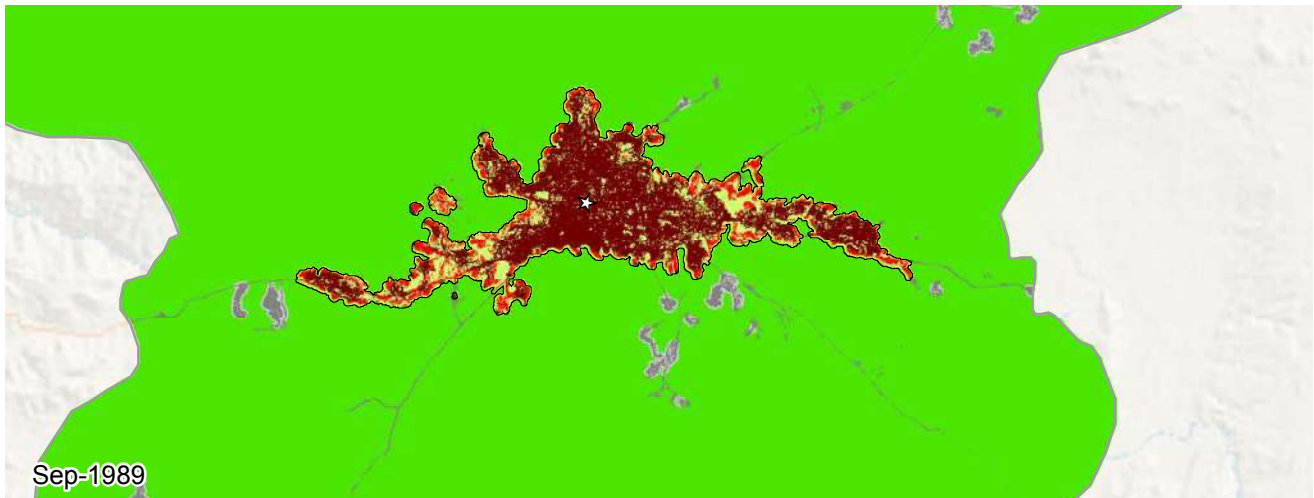
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

San Salvador, El Salvador (Latin America and the Caribbean)



Metrics	Mar 1991	Oct 1999	Jan 2014	% Annual Change ('99-'14)
Population	1,242,224	1,293,519	1,693,747	1.9
Built-up Area (Hectares)				
Total	8,216	10,501	16,888	3.3
Urban	6,677	8,876	14,154	3.3
Suburban	1,429	1,509	2,534	3.6
Rural	109	115	199	3.8
Open space (Hectares)				
Urbanized Open Space	4,312	4,591	6,969	2.9
Urban Extent	12,528	15,092	23,858	3.2
Density (Persons / Hectare)				
Built-up Area Density	151.2	123.2	100.3	-1.4
Urban Extent Density	99.1	85.7	71.0	-1.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.66	0.70	0.71	0.1
Openness Index	0.30	0.25	0.23	-0.8
Compactness (Roundness)				
Proximity	0.75	0.76	0.78	0.1
Cohesion	0.73	0.75	0.75	0.0
Added Area (Hectares)	'91-'99	Share	'99-'14	Share
Infill	1,071	46%	2,290	35%
Extension	901	39%	1,863	29%
Leapfrog	0	0%	0	0%
Inclusion	311	13%	2,233	34%





**Sana, Yemen
1989-2014**

0 4 8 12 16 km

Study area

Urban extent

Urban built-up area

Suburban built-up area

Rural built-up area

Urbanized open space

Rural open space

Exurban built-up area

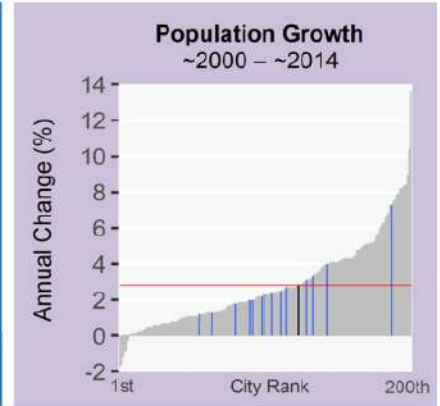
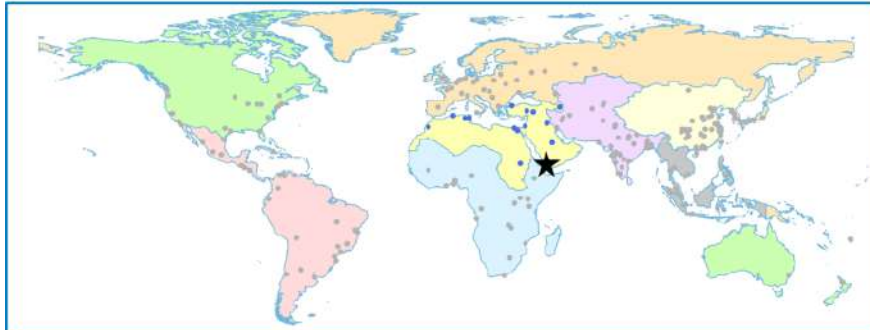
Exurban open space

Water

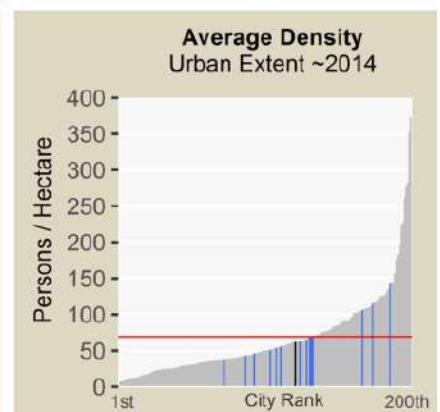
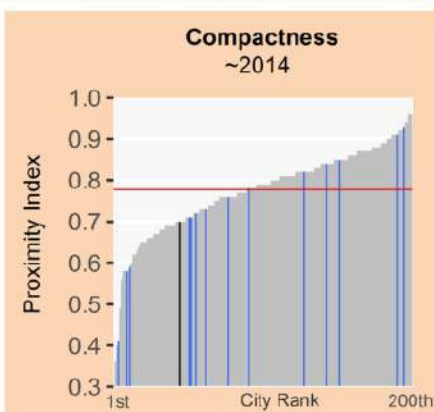
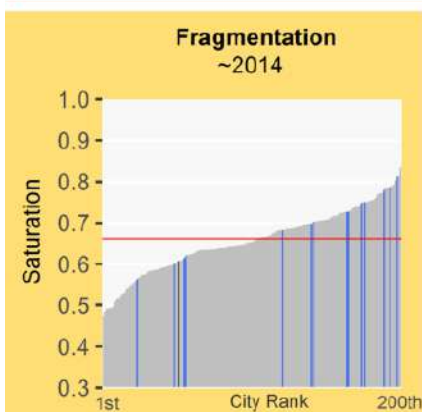
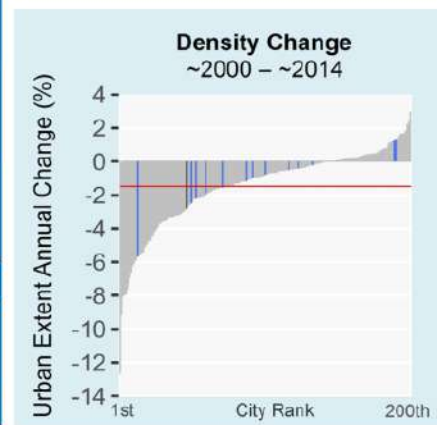
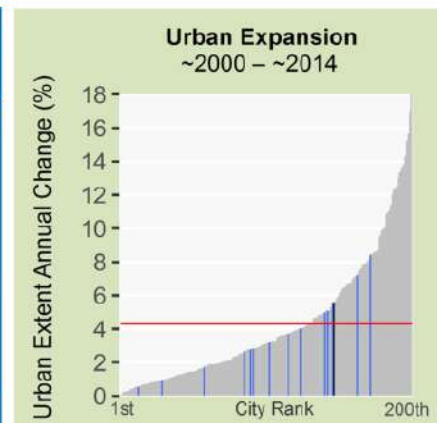
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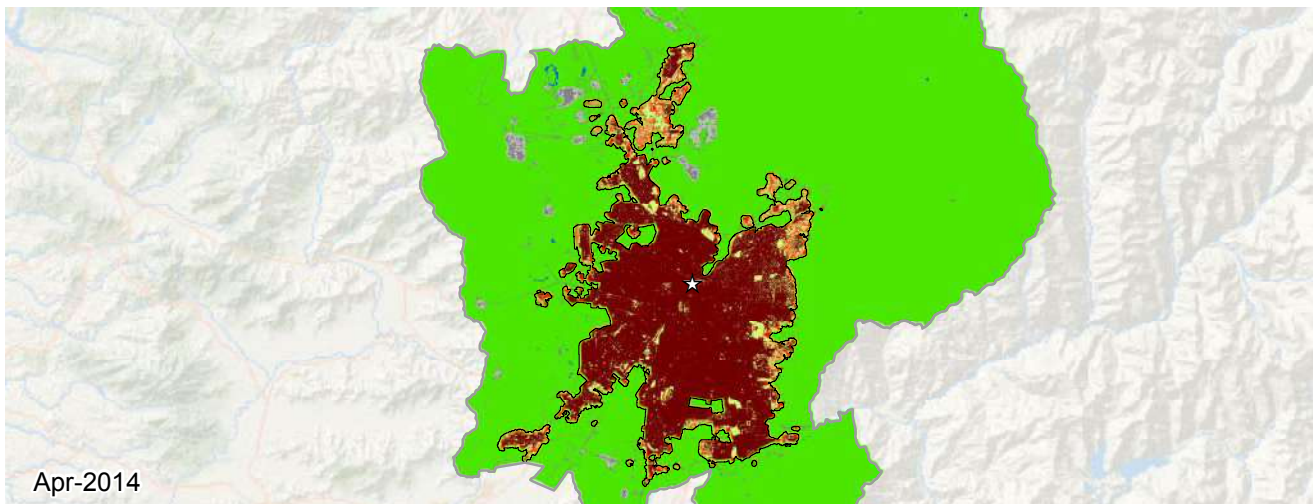
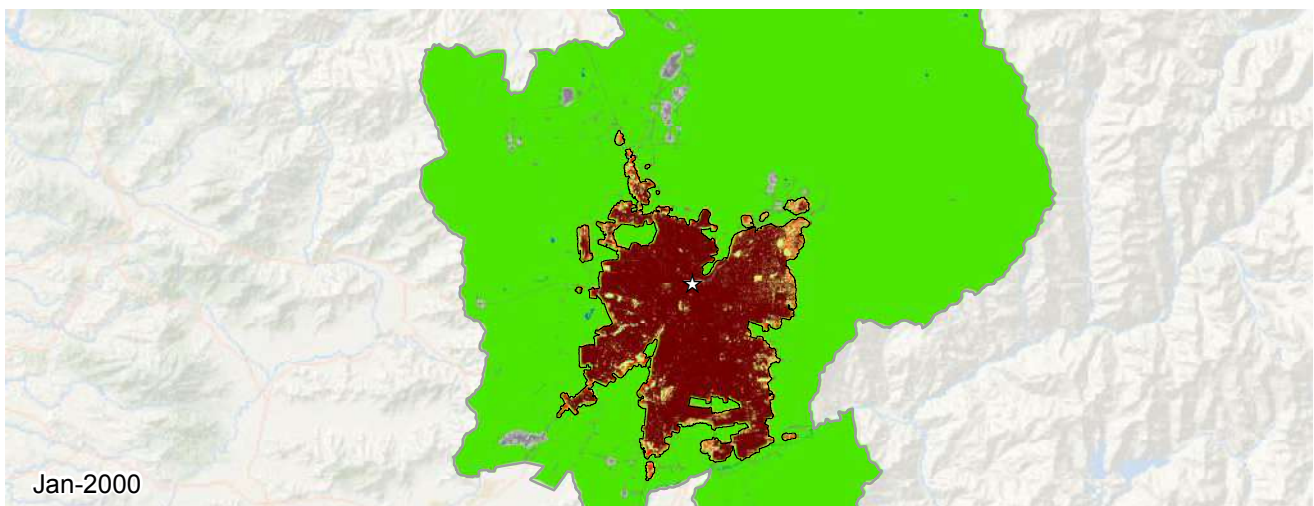
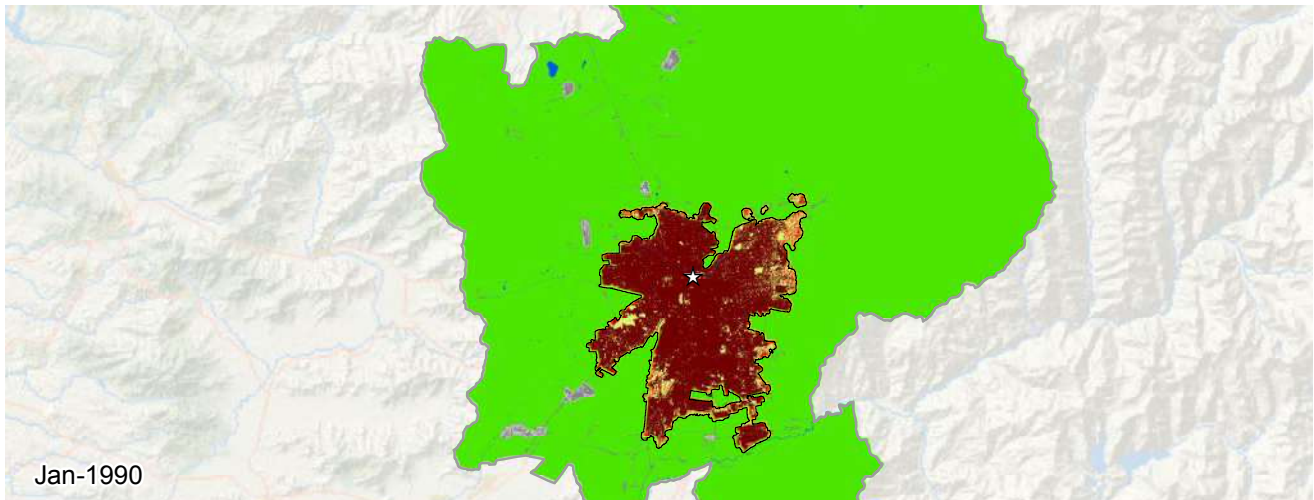
CBD

Sana, Yemen (Western Asia and North Africa)



Metrics	Sep 1989	May 2000	Nov 2014	% Annual Change ('00-'14)
Population	929,645	1,513,993	2,258,322	2.8
Built-up Area (Hectares)				
Total	9,051	13,467	22,113	3.4
Urban	7,123	12,120	15,395	1.6
Suburban	1,818	1,256	6,302	11.1
Rural	109	90	415	10.5
Open space (Hectares)				
Urbanized Open Space	4,048	2,768	14,276	11.3
Urban Extent	13,100	16,236	36,389	5.6
Density (Persons / Hectare)				
Built-up Area Density	102.7	112.4	102.1	-0.7
Urban Extent Density	71.0	93.2	62.1	-2.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.69	0.83	0.61	-2.1
Openness Index	0.30	0.18	0.31	3.8
Compactness (Roundness)				
Proximity	0.67	0.71	0.70	-0.1
Cohesion	0.65	0.70	0.69	-0.1
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	2,061	46%	180	2%
Extension	1,876	42%	7,027	81%
Leapfrog	117	2%	0	0%
Inclusion	361	8%	1,437	16%

















**Santiago, Chile
1990-2014**

0 8 16 24 32 km

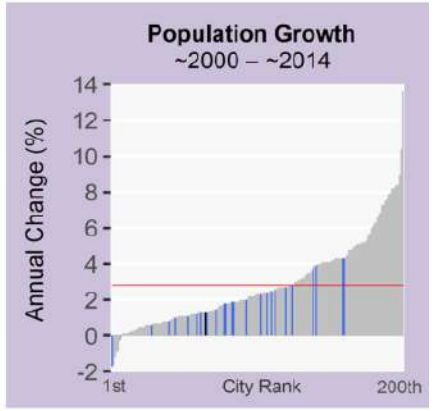
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	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

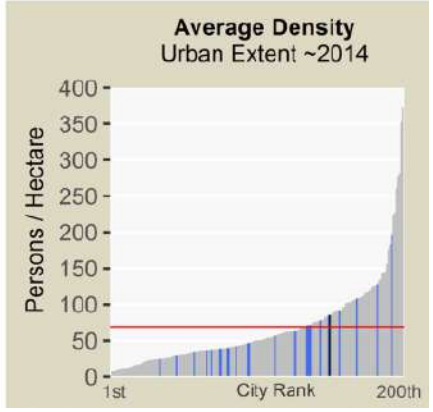
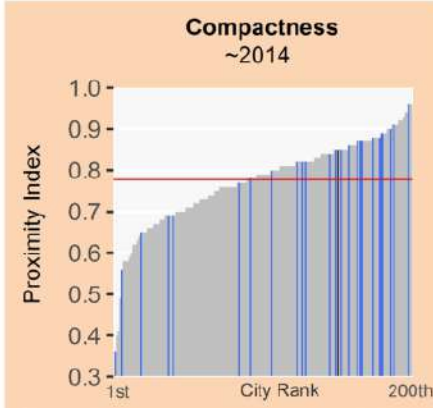
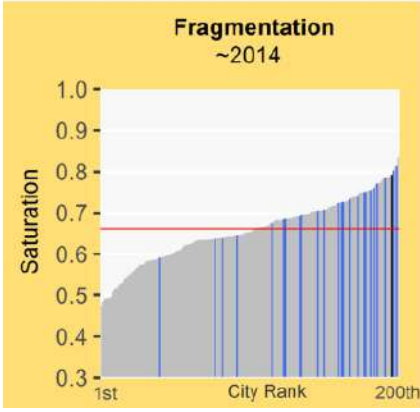
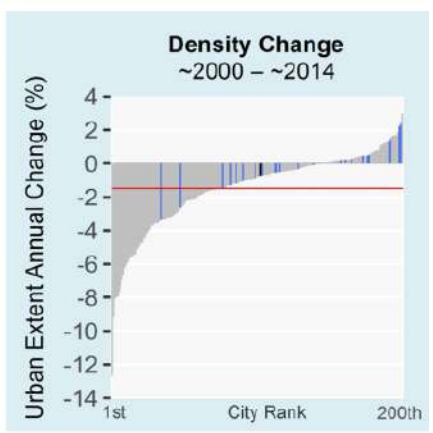
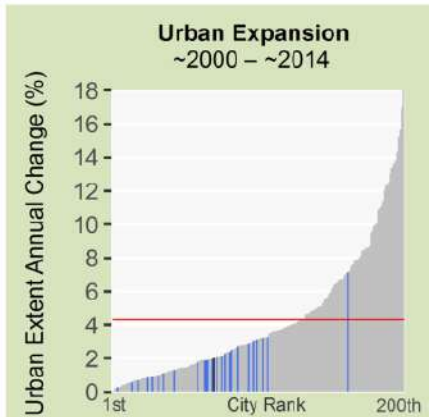
Santiago, Chile (Latin America and the Caribbean)

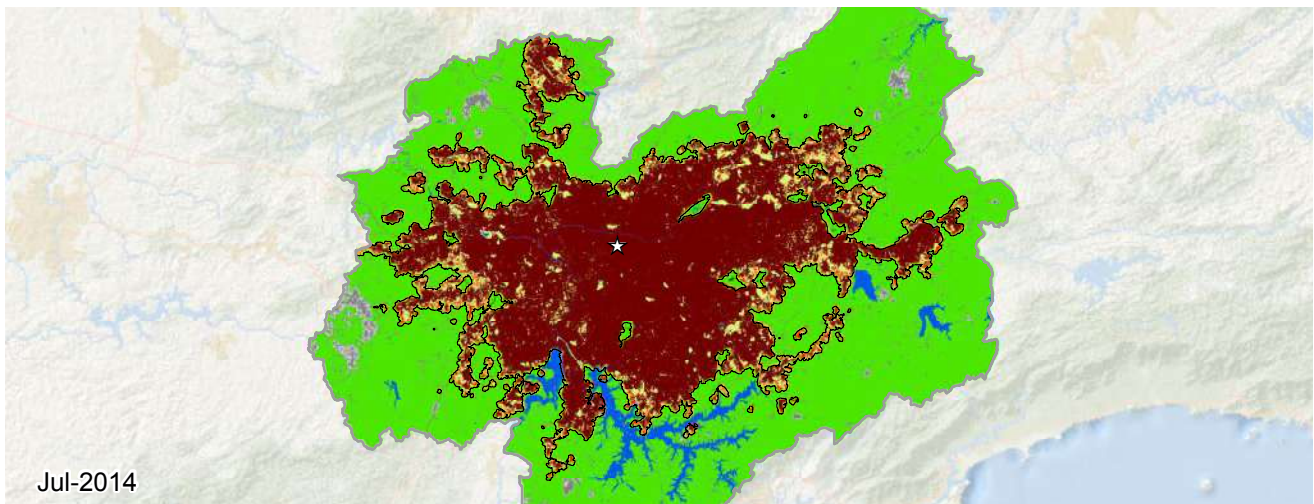
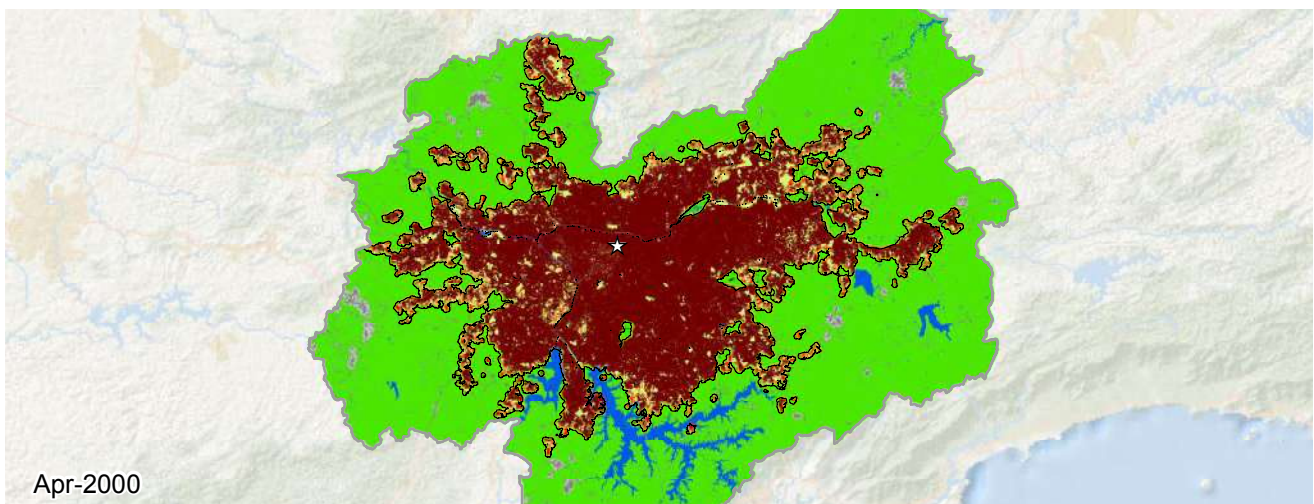
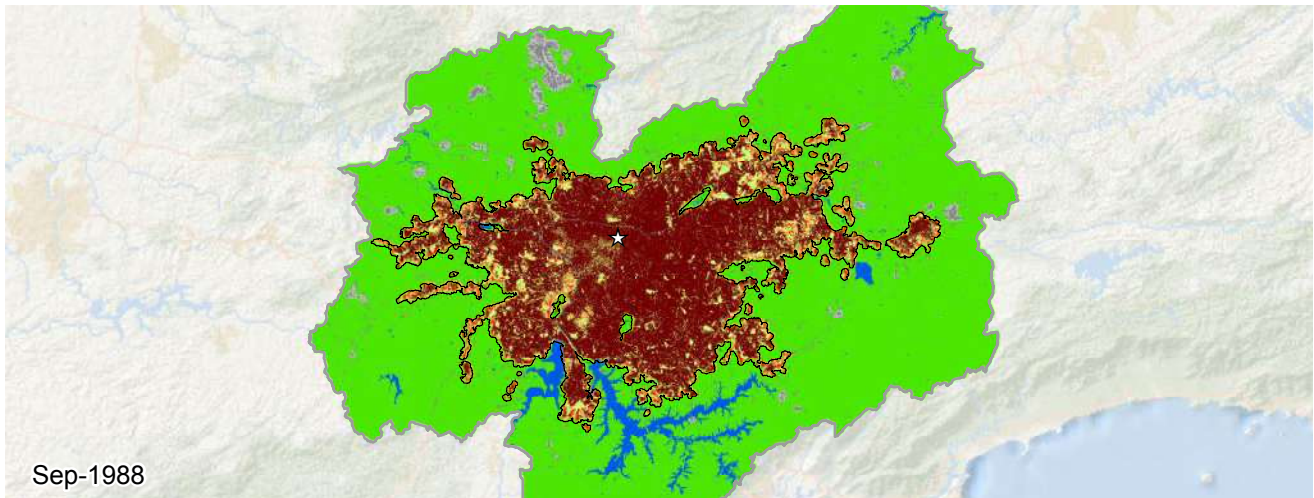


Legend for Charts
 Santiago | Other cities in region | All other cities | Global average



Metrics	Jan 1990	Jan 2000	Apr 2014	% Annual Change ('00-'14)
Population	4,499,499	5,396,622	6,486,534	1.3
Built-up Area (Hectares)				
Total	37,861	47,273	60,380	1.7
Urban	35,303	43,639	53,984	1.5
Suburban	2,412	3,407	5,890	3.8
Rural	146	226	505	5.6
Open space (Hectares)				
Urbanized Open Space	7,851	9,855	15,726	3.3
Urban Extent	45,713	57,129	76,107	2.0
Density (Persons / Hectare)				
Built-up Area Density	118.8	114.2	107.4	-0.4
Urban Extent Density	98.4	94.5	85.2	-0.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.83	0.83	0.79	-0.3
Openness Index	0.14	0.14	0.15	0.9
Compactness (Roundness)				
Proximity	0.92	0.91	0.85	-0.4
Cohesion	0.90	0.90	0.83	-0.5
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	2,310	24%	2,983	22%
Extension	5,828	61%	7,313	55%
Leapfrog	79	0%	168	1%
Inclusion	1,192	12%	2,641	20%

















**Sao Paulo, Brazil
1988-2014**

0 10 20 30 40 km

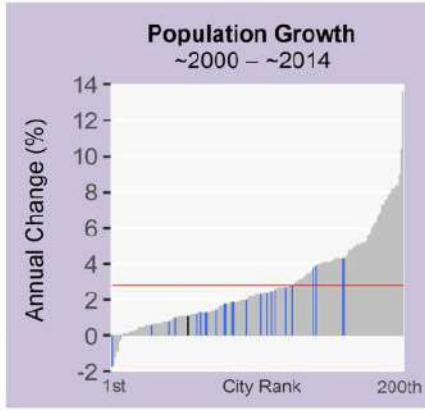
N

 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

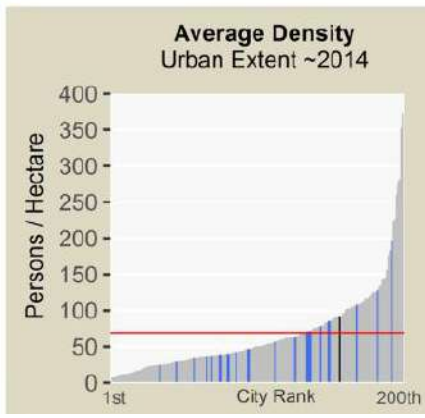
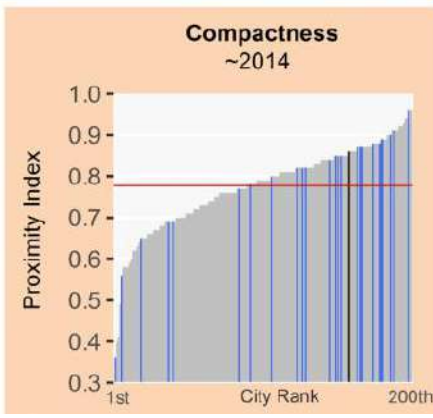
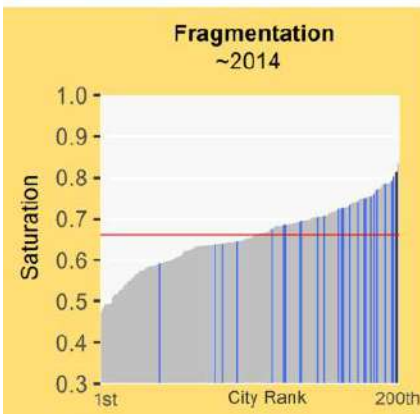
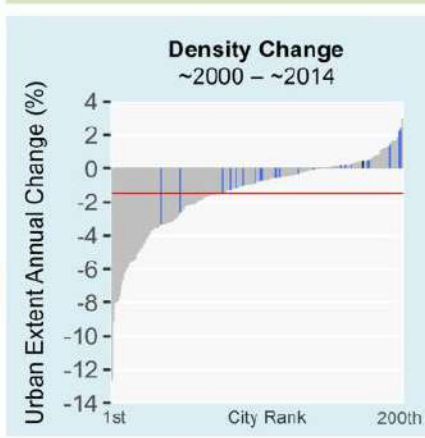
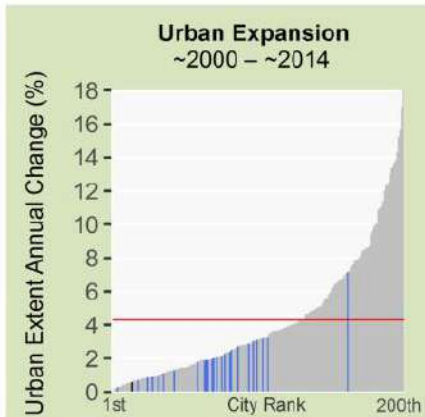
Sao Paulo, Brazil (Latin America and the Caribbean)

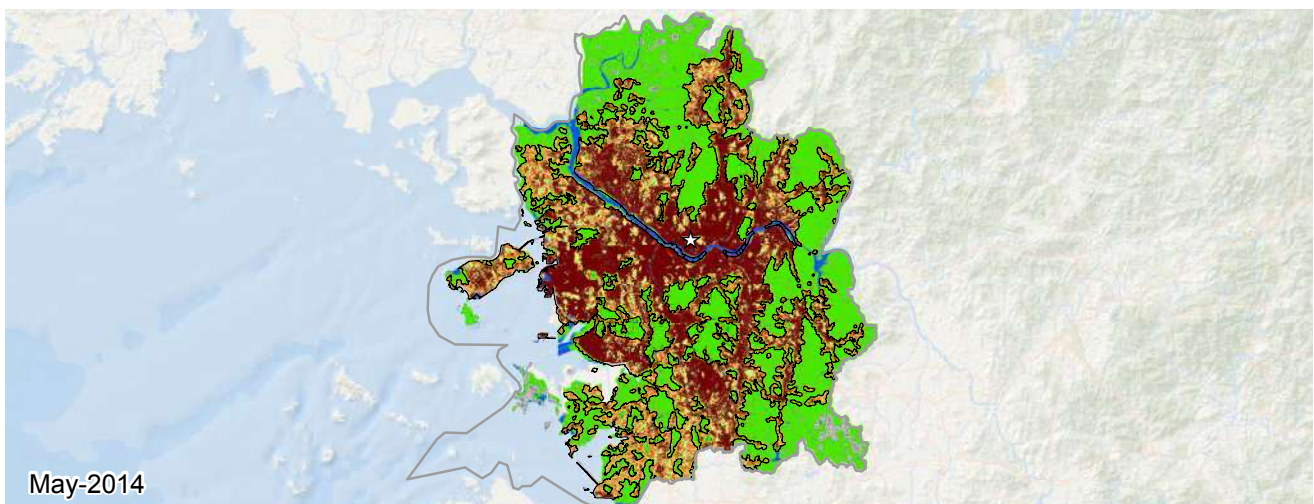
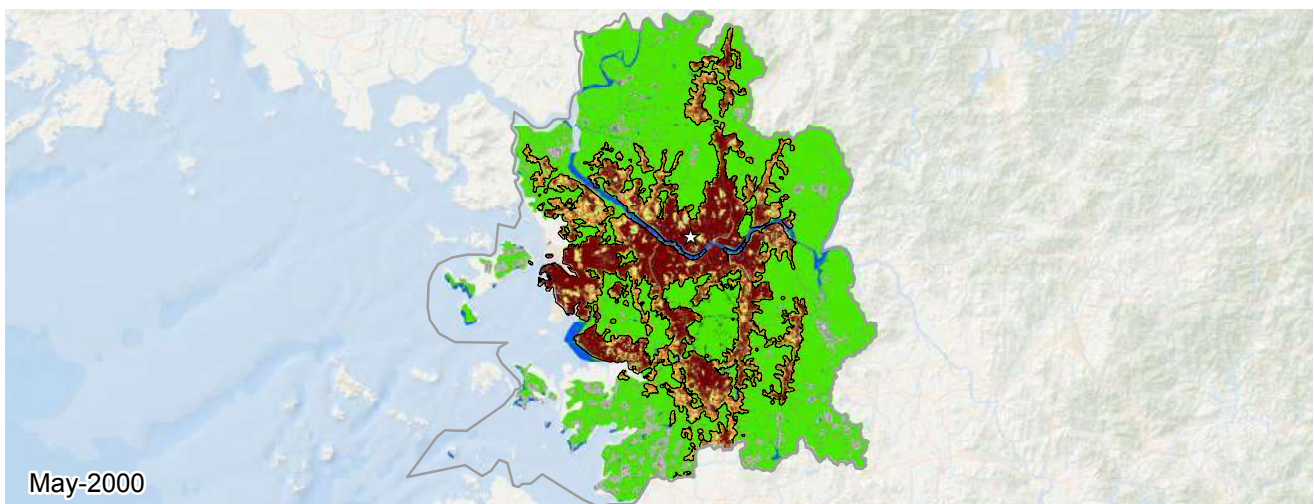
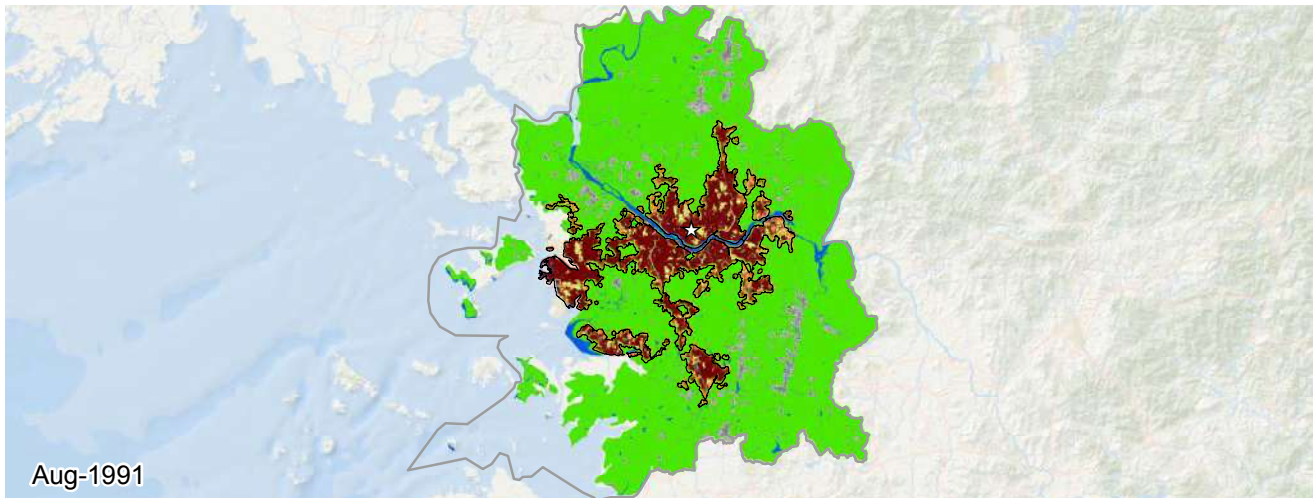


Legend for Charts
 Sao Paulo | Other cities in region | All other cities | Global average



Metrics	Sep 1988	Apr 2000	Jul 2014	% Annual Change ('00-'14)
Population	13,654,119	16,866,431	19,609,221	1.1
Built-up Area (Hectares)				
Total	113,866	156,400	172,427	0.7
Urban	100,054	142,463	158,290	0.7
Suburban	12,896	12,945	13,170	0.1
Rural	916	991	967	-0.2
Open space (Hectares)				
Urbanized Open Space	41,666	38,589	39,479	0.2
Urban Extent	155,533	194,990	211,907	0.6
Density (Persons / Hectare)				
Built-up Area Density	119.9	107.8	113.7	0.4
Urban Extent Density	87.8	86.5	92.5	0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.73	0.80	0.81	0.1
Openness Index	0.21	0.16	0.14	-0.7
Compactness (Roundness)				
Proximity	0.86	0.86	0.86	0.0
Cohesion	0.85	0.84	0.85	0.1
Added Area (Hectares)	'88-'00	Share	'00-'14	Share
Infill	22,628	53%	9,531	59%
Extension	11,918	27%	3,580	22%
Leapfrog	1,141	2%	356	2%
Inclusion	6,949	16%	2,625	16%

















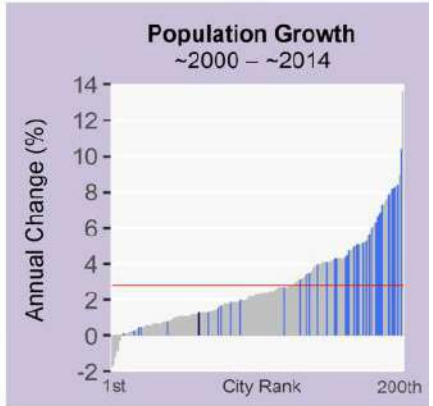
Seoul, Korea Rep.
1991-2014

0 20 40 60 80 km

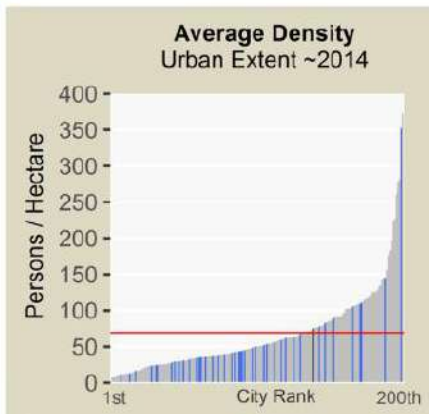
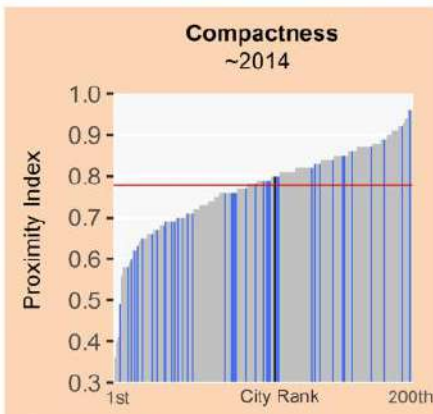
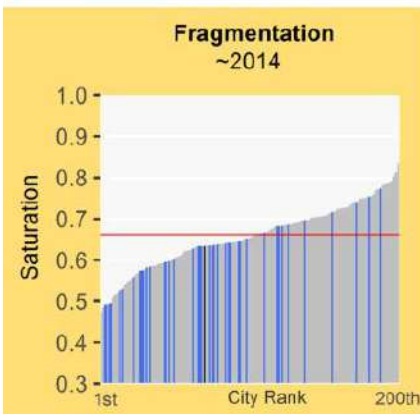
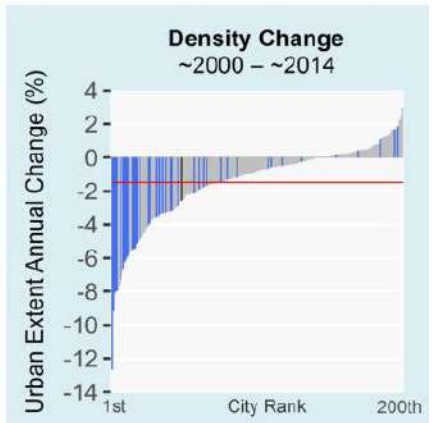
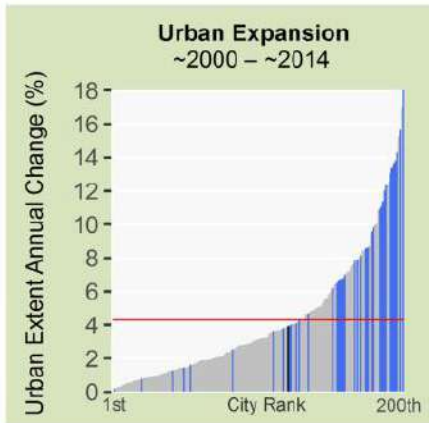
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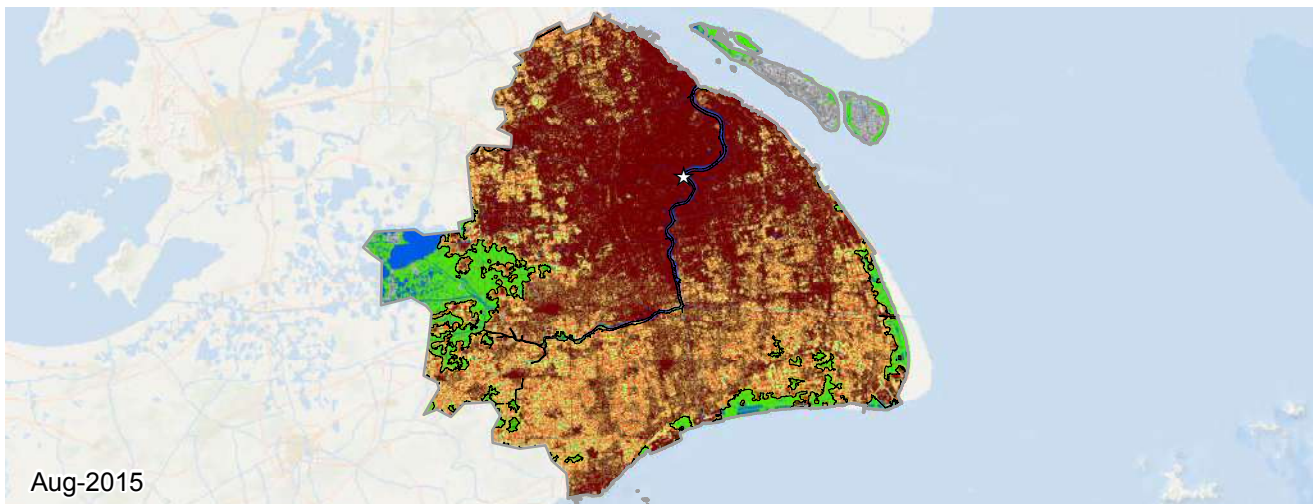
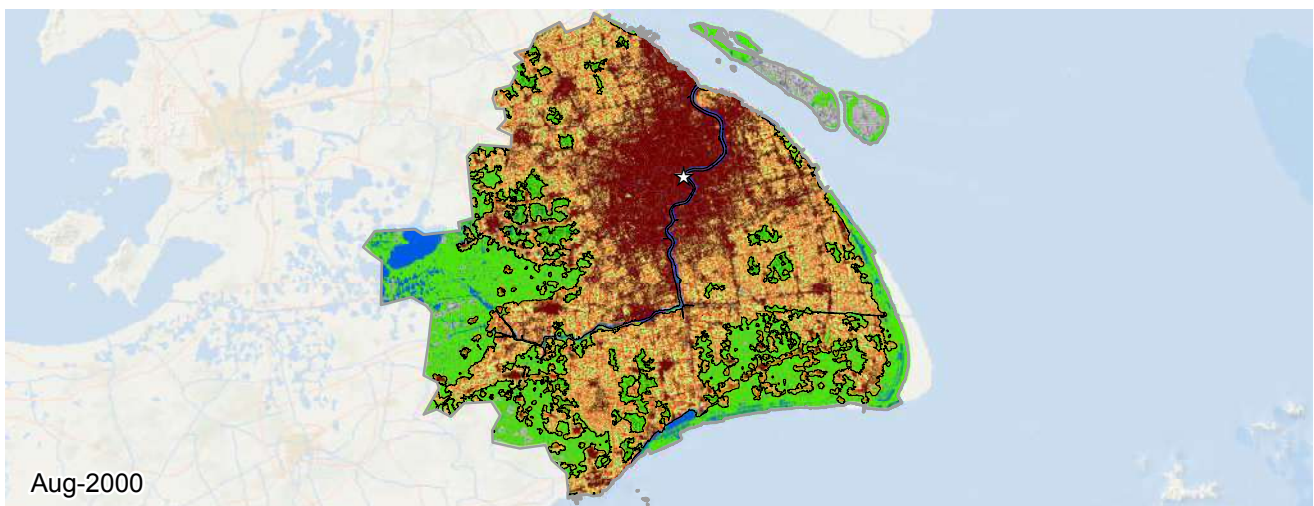
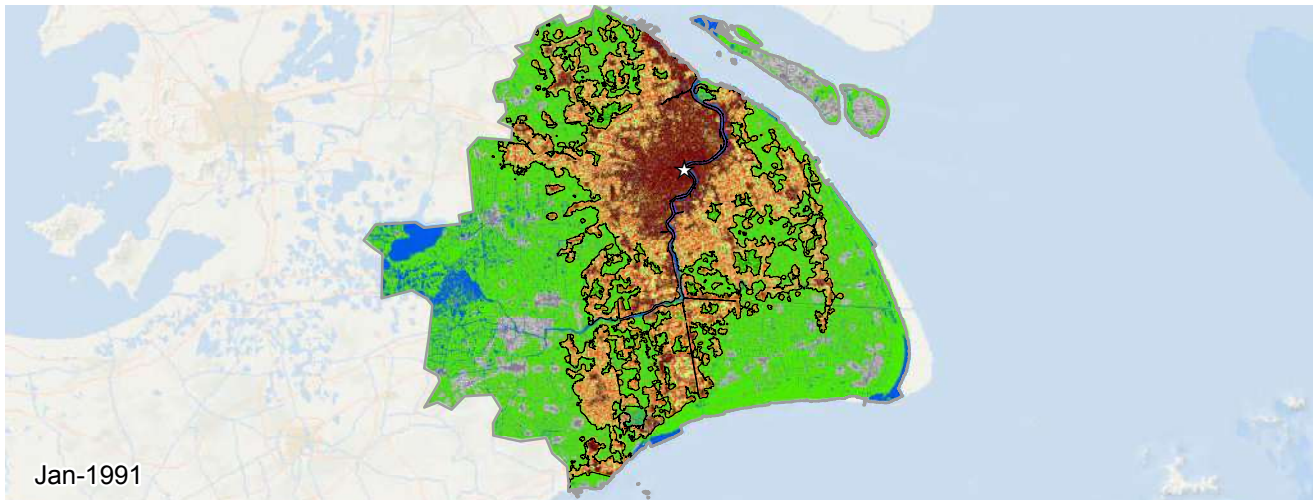
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Seoul, Korea Rep. (East Asia and the Pacific)



Metrics	Aug 1991	May 2000	May 2014	% Annual Change ('00-'14)
Population	17,106,932	19,696,141	23,711,623	1.3
Built-up Area (Hectares)				
Total	67,573	116,422	199,577	3.9
Urban	56,046	88,311	151,051	3.8
Suburban	10,683	25,947	45,113	4.0
Rural	844	2,163	3,413	3.3
Open space (Hectares)				
Urbanized Open Space	28,229	65,328	115,170	4.1
Urban Extent	95,803	181,751	314,748	3.9
Density (Persons / Hectare)				
Built-up Area Density	253.2	169.2	118.8	-2.5
Urban Extent Density	178.6	108.4	75.3	-2.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.71	0.64	0.63	-0.1
Openness Index	0.25	0.30	0.30	0.2
Compactness (Roundness)				
Proximity	0.70	0.75	0.80	0.5
Cohesion	0.69	0.73	0.79	0.6
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	9,027	18%	21,711	28%
Extension	24,254	49%	32,453	42%
Leapfrog	42	0%	1,001	1%
Inclusion	15,524	31%	21,229	27%





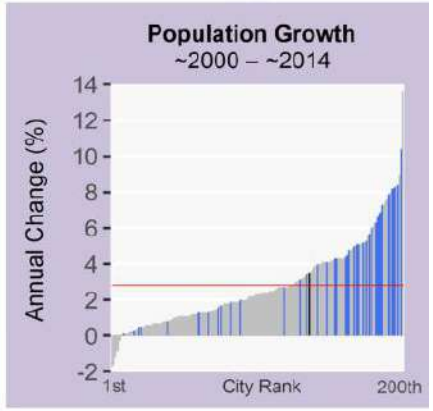
Shanghai, Shanghai, China
1991-2015

0 20 40 60 80 km

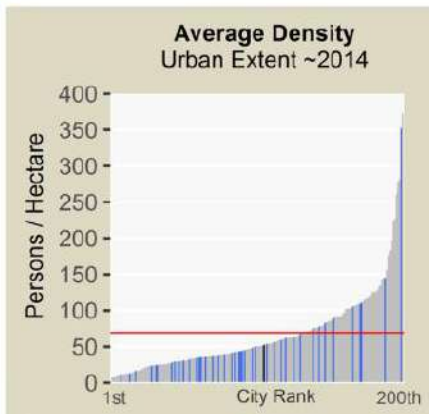
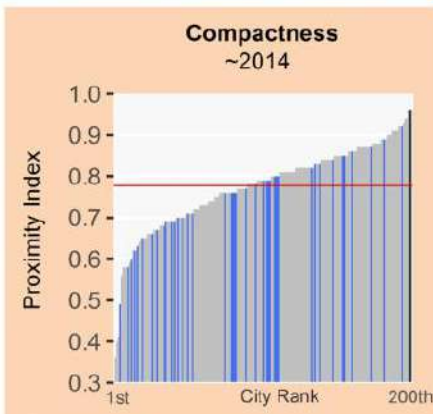
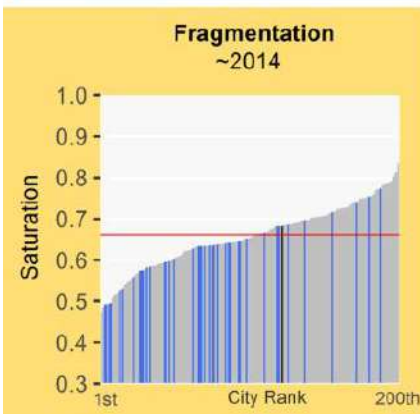
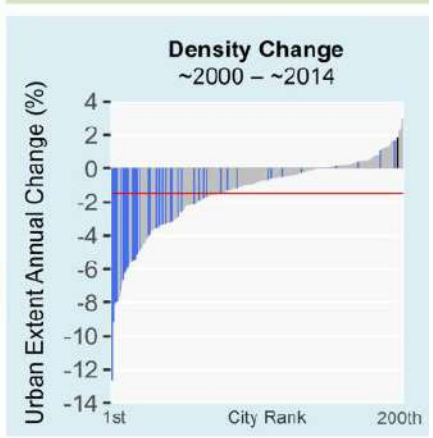
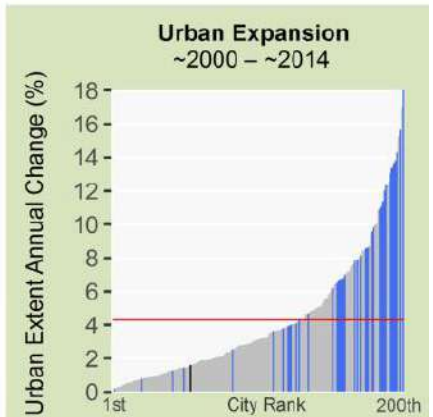
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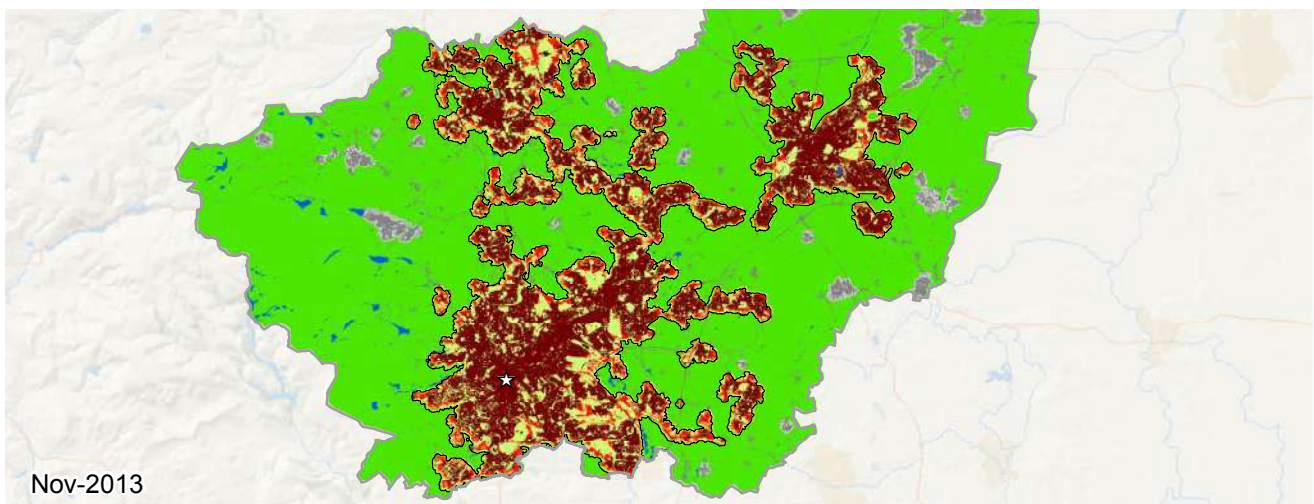
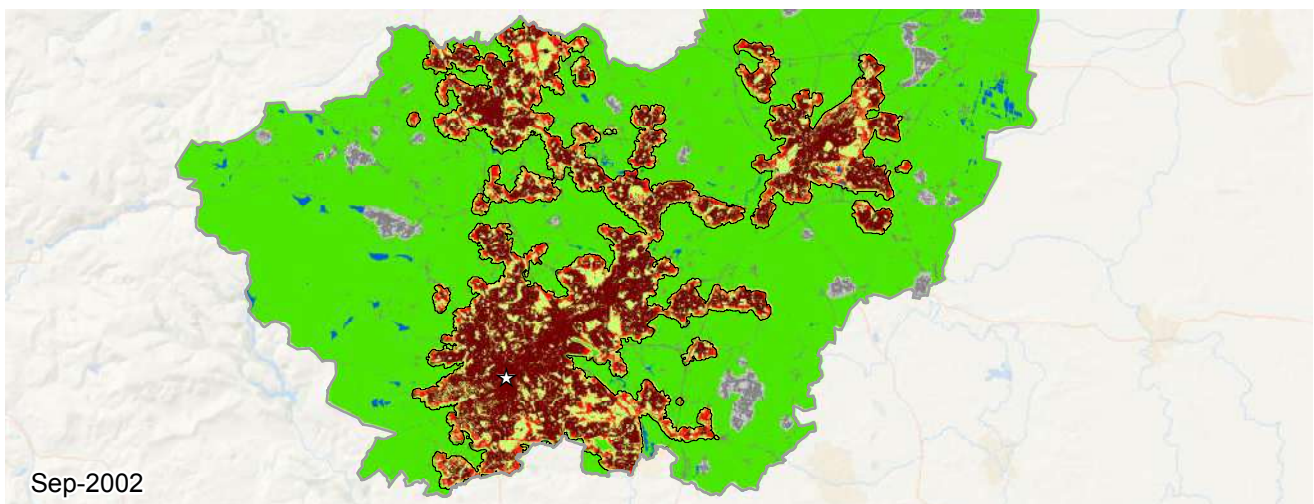
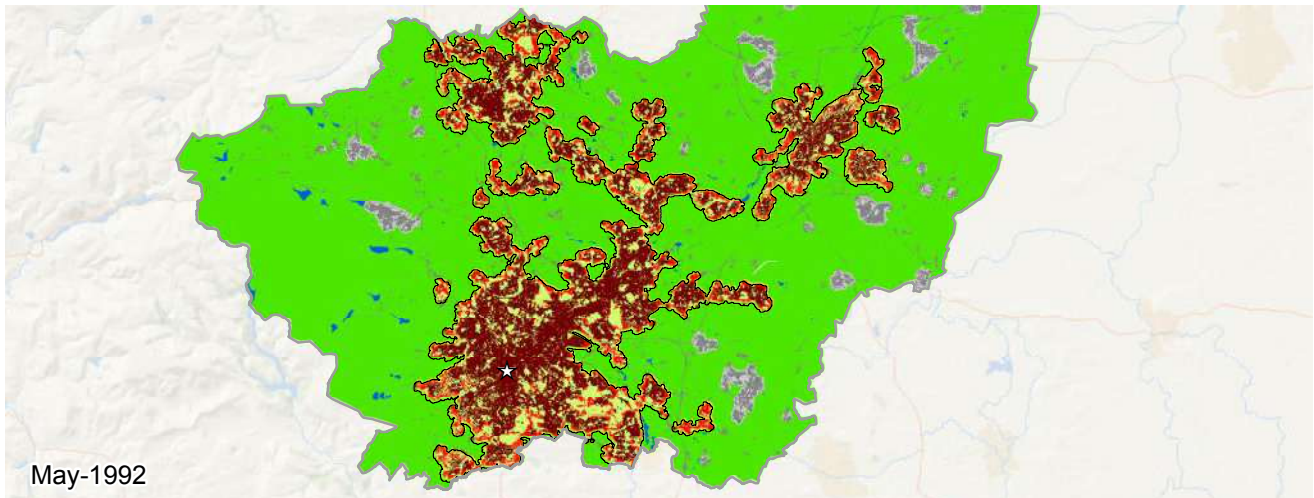
- Study area
- Urban extent
- Urban built-up area
- Suburban built-up area
- Rural built-up area
- Urbanized open space
- Rural open space
- Exurban built-up area
- Exurban open space
- Water
- No data
- CBD

Shanghai, Shanghai, China (East Asia and the Pacific)



Metrics	Jan 1991	Aug 2000	Aug 2015	% Annual Change ('00-'15)
Population	10,044,522	14,460,677	24,387,271	3.5
Built-up Area (Hectares)				
Total	95,071	200,977	320,046	3.1
Urban	45,677	126,665	269,340	5.0
Suburban	45,621	69,465	49,025	-2.3
Rural	3,771	4,846	1,680	-7.1
Open space (Hectares)				
Urbanized Open Space	100,509	166,581	148,826	-0.8
Urban Extent	195,581	367,559	468,872	1.6
Density (Persons / Hectare)				
Built-up Area Density	105.7	72.0	76.2	0.4
Urban Extent Density	51.4	39.3	52.0	1.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.49	0.55	0.68	1.5
Openness Index	0.47	0.37	0.25	-2.7
Compactness (Roundness)				
Proximity	0.80	0.90	0.96	0.4
Cohesion	0.79	0.90	0.95	0.4
Added Area (Hectares)	'91-'00	Share	'00-'15	Share
Infill	38,013	35%	66,455	55%
Extension	33,213	31%	37,585	31%
Leapfrog	219	0%	110	0%
Inclusion	34,459	32%	14,889	12%





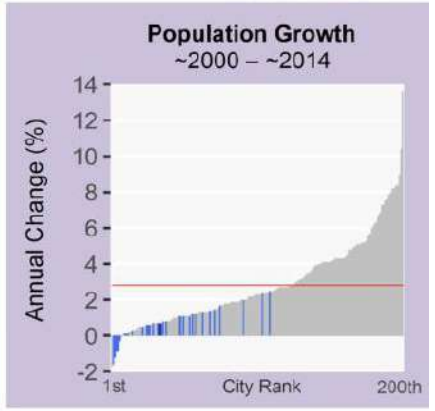
**Sheffield, United Kingdom
1992-2013**

0 6 12 18 24 km

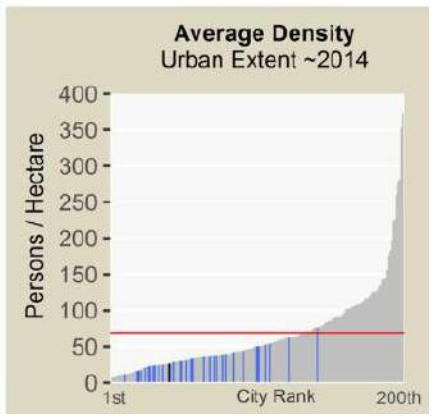
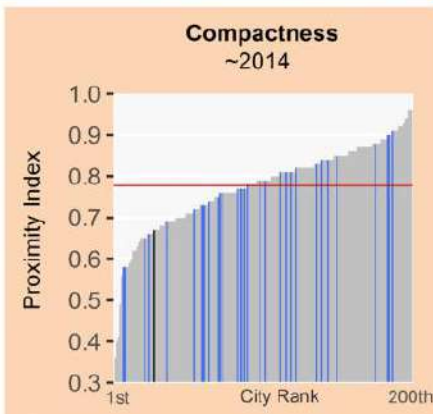
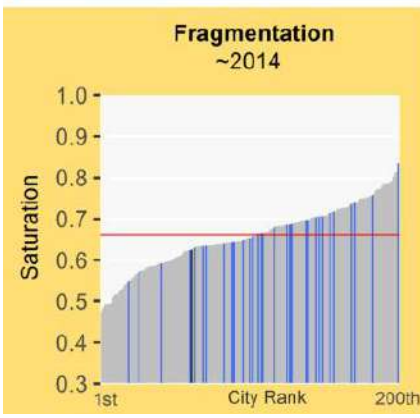
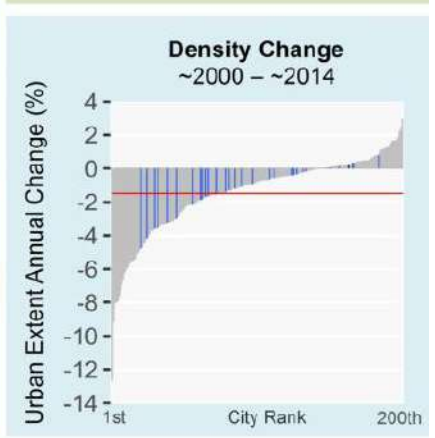
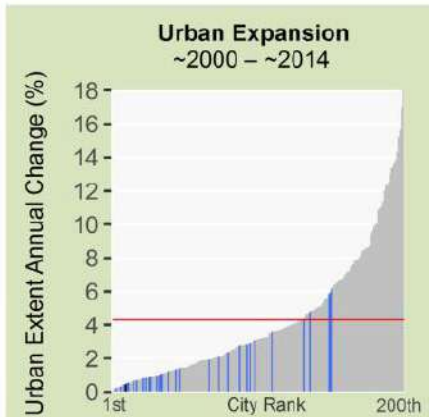
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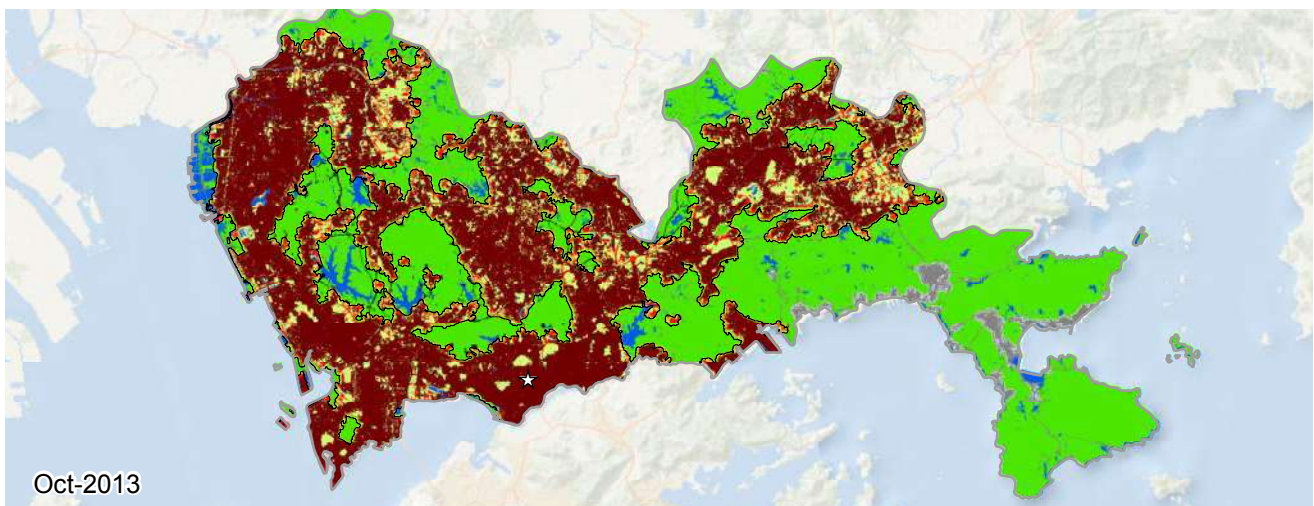
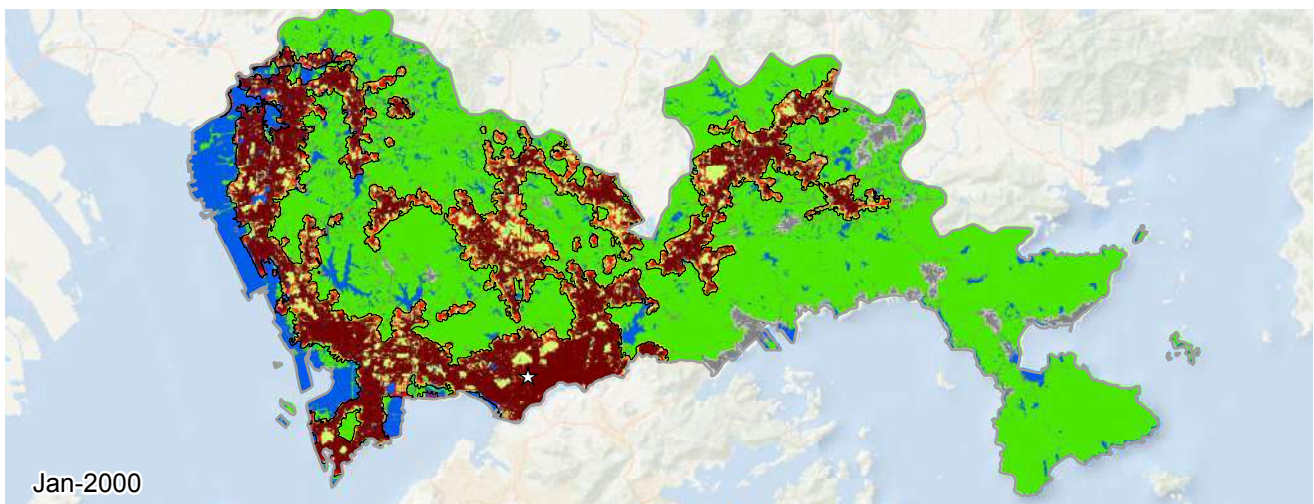
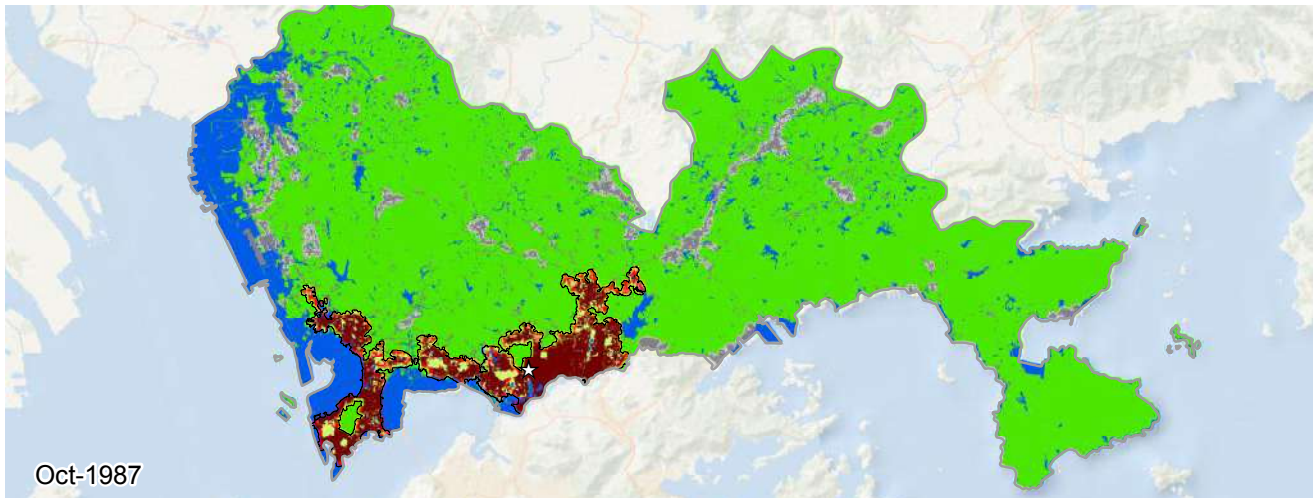
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Sheffield, United Kingdom (Europe and Japan)



Metrics	May 1992	Sep 2002	Nov 2013	% Annual Change ('02-'13)
Population	1,048,926	1,077,867	1,166,836	0.7
Built-up Area (Hectares)				
Total	21,757	25,686	27,393	0.6
Urban	15,244	19,140	20,907	0.8
Suburban	6,189	6,220	6,161	-0.1
Rural	323	326	325	-0.0
Open space (Hectares)				
Urbanized Open Space	14,151	15,896	16,391	0.3
Urban Extent	35,909	41,583	43,784	0.5
Density (Persons / Hectare)				
Built-up Area Density	48.2	42.0	42.6	0.1
Urban Extent Density	29.2	25.9	26.6	0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.61	0.62	0.63	0.1
Openness Index	0.39	0.36	0.35	-0.3
Compactness (Roundness)				
Proximity	0.65	0.67	0.67	0.1
Cohesion	0.64	0.67	0.67	0.1
Added Area (Hectares)	'92-'02	Share	'02-'13	Share
Infill	1,689	42%	725	42%
Extension	542	13%	114	6%
Leapfrog	449	11%	222	13%
Inclusion	1,247	31%	644	37%

















**Shenzhen, Guangdong, China
1987-2013**

0 8 16 24 32 km

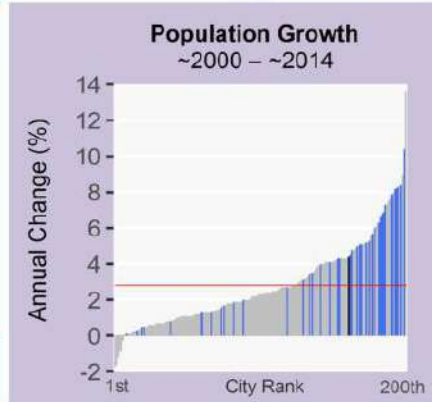
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 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

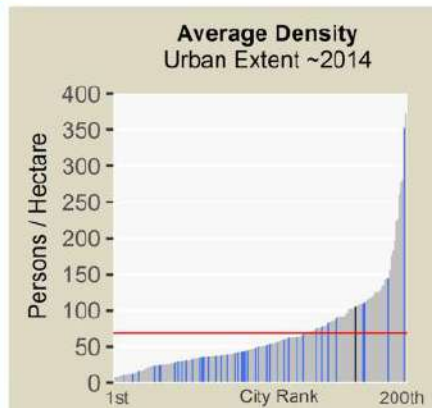
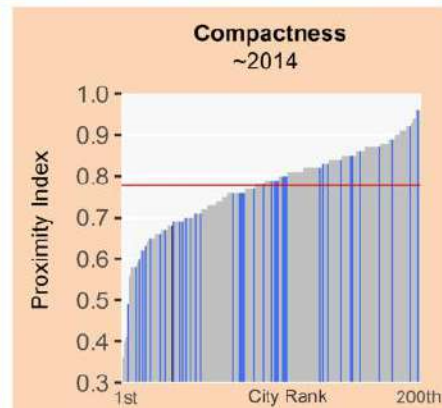
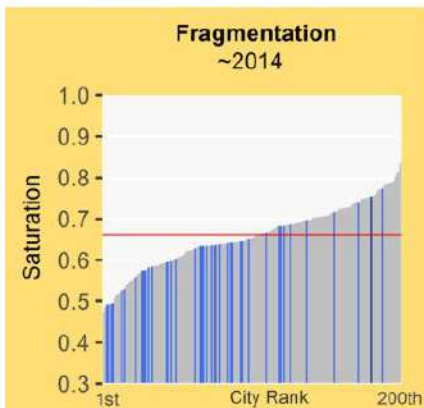
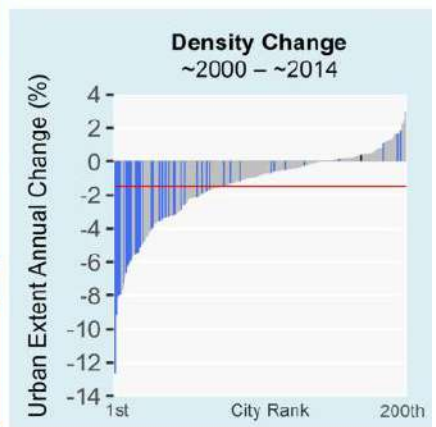
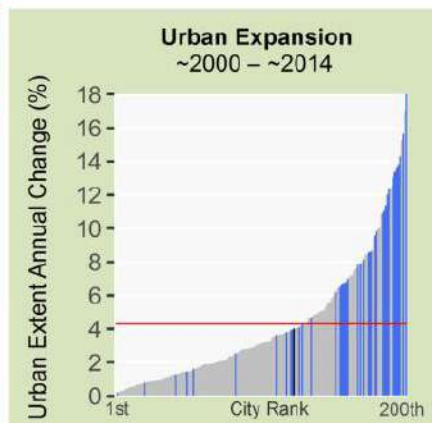
Shenzhen, Guangdong, China (East Asia and the Pacific)

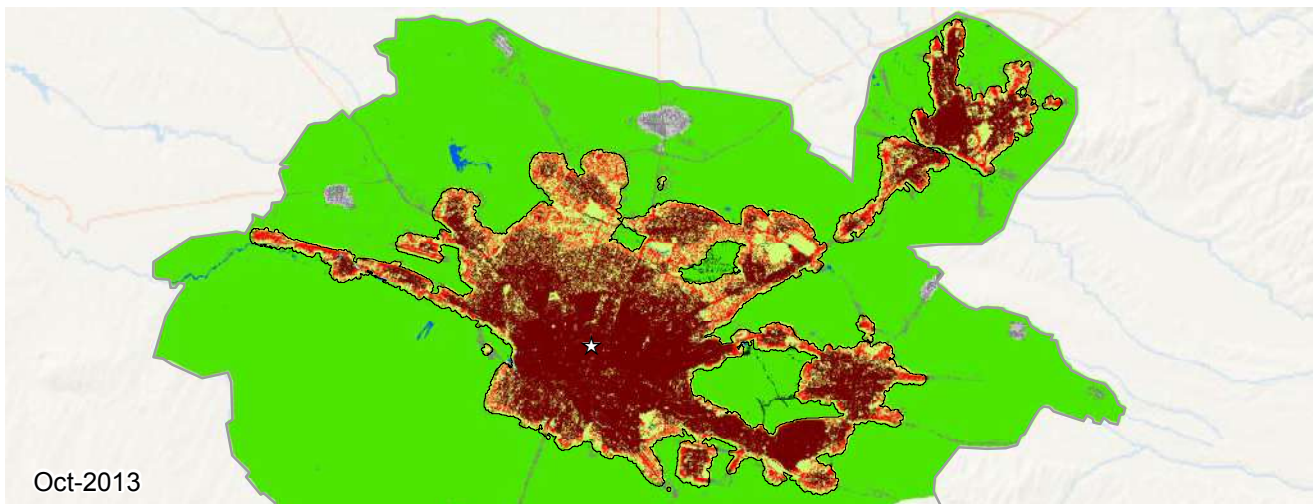
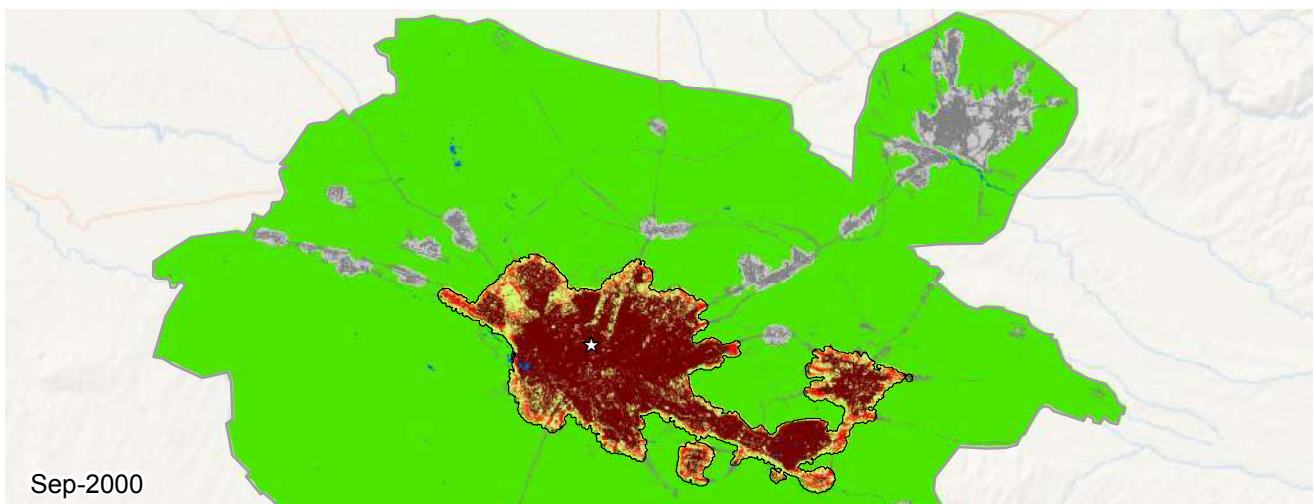
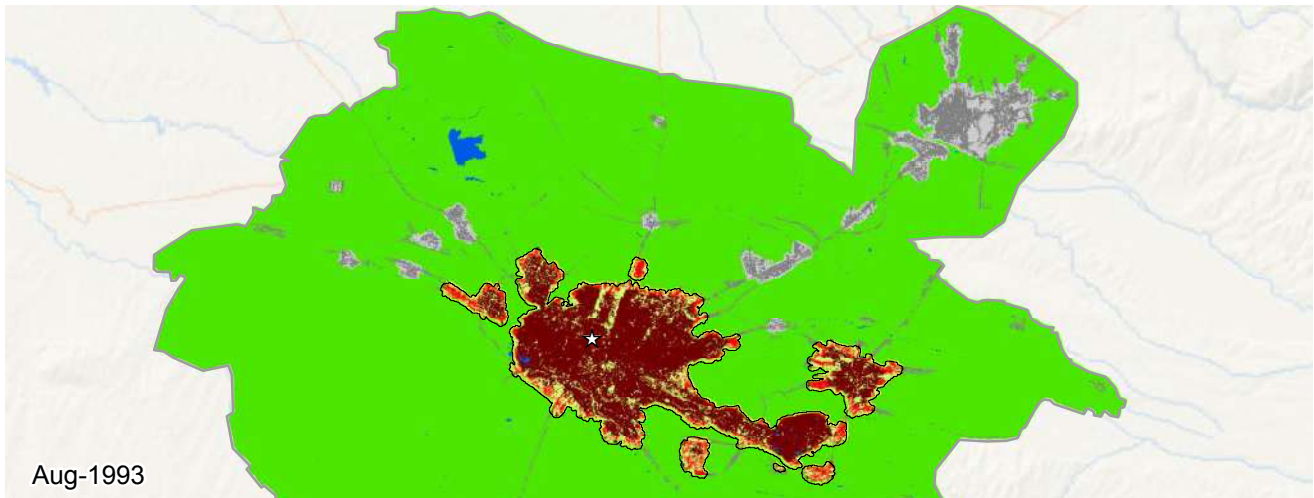


Legend for Charts
 Shenzhen | Other cities in region | All other cities | Global average















Metrics	Oct 1987	Jan 2000	Oct 2013	% Annual Change ('00-'13)
Population	455,781	5,955,494	10,945,125	4.4
Built-up Area (Hectares)				
Total	10,017	41,941	78,520	4.6
Urban	7,983	33,088	70,152	5.5
Suburban	1,900	8,200	7,861	-0.3
Rural	132	652	506	-1.8
Open space (Hectares)				
Urbanized Open Space	3,782	18,150	25,597	2.5
Urban Extent	13,799	60,092	104,118	4.0
Density (Persons / Hectare)				
Built-up Area Density	45.5	142.0	139.4	-0.1
Urban Extent Density	33.0	99.1	105.1	0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.73	0.70	0.75	0.6
Openness Index	0.31	0.30	0.21	-2.5
Compactness (Roundness)				
Proximity	0.49	0.57	0.68	1.3
Cohesion	0.50	0.57	0.67	1.2
Added Area (Hectares)	'87-'00	Share	'00-'13	Share
Infill	2,939	9%	8,109	22%
Extension	21,316	66%	23,638	64%
Leapfrog	25	0%	454	1%
Inclusion	7,662	23%	4,381	11%



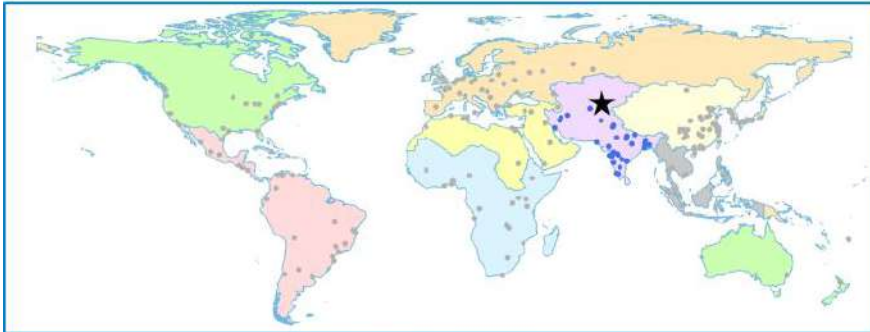


**Shymkent, Kazakhstan
1993-2013**

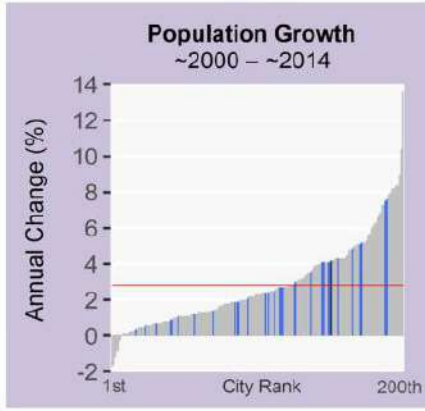
0 4 8 12 16 km

	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

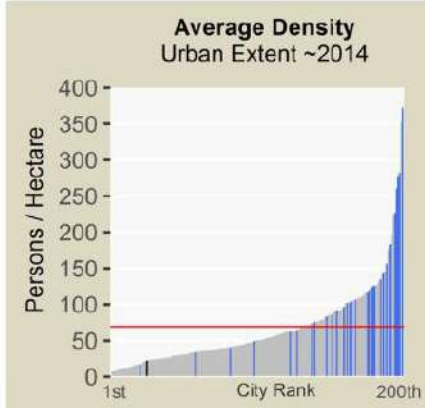
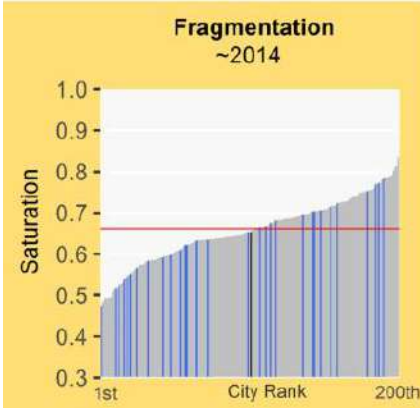
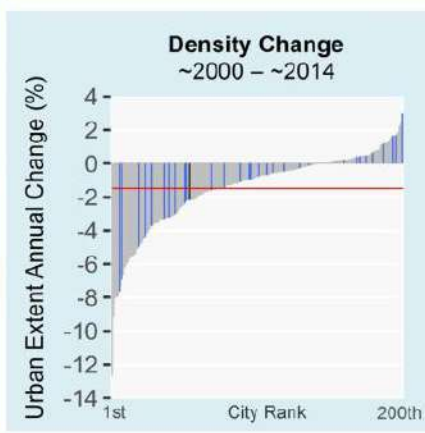
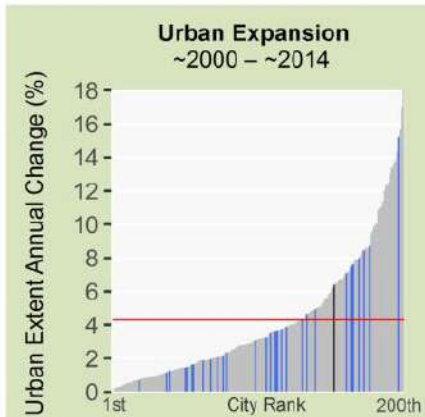
Shymkent, Kazakhstan (South and Central Asia)

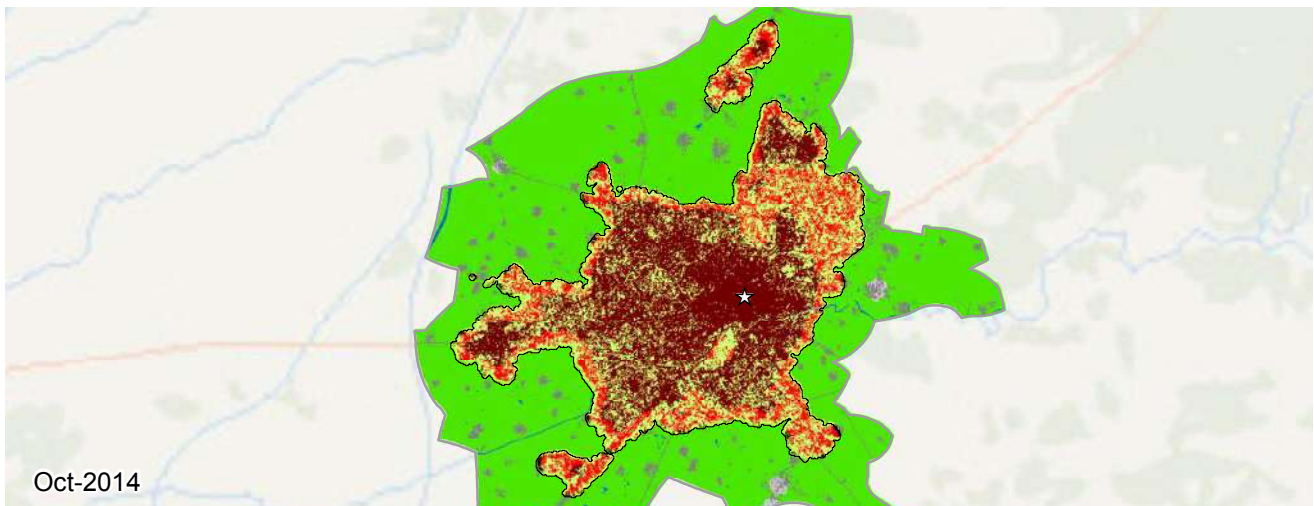
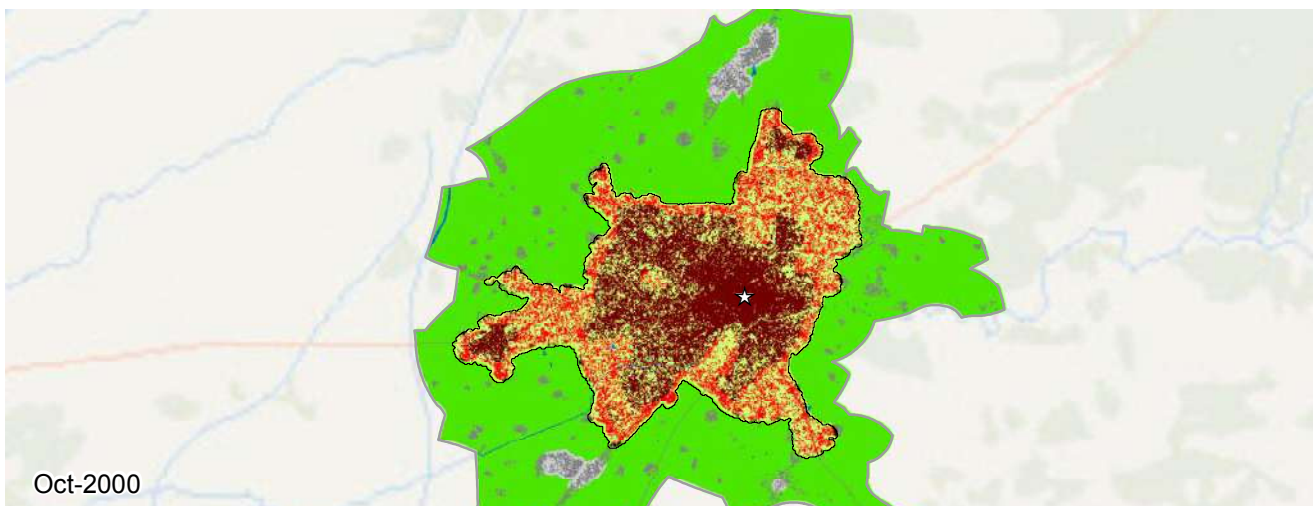
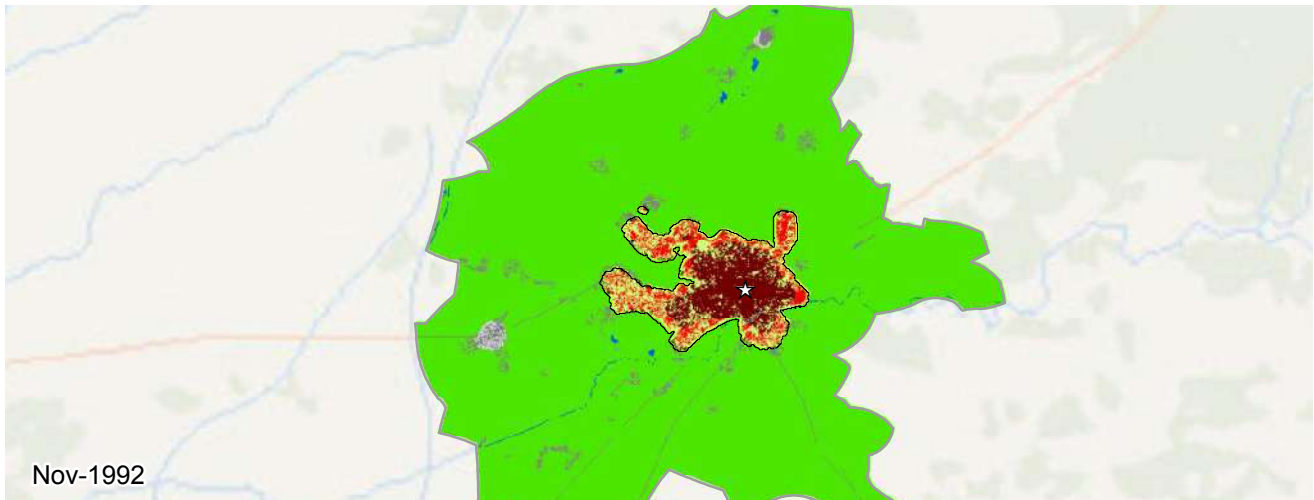


Legend for Charts
 Shymkent | Other cities in region | All other cities | Global average



Metrics	Aug 1993	Sep 2000	Oct 2013	% Annual Change ('00-'13)
Population	334,601	376,601	651,613	4.2
Built-up Area (Hectares)				
Total	7,969	9,239	19,457	5.7
Urban	6,695	7,931	15,178	5.0
Suburban	1,186	1,205	4,005	9.2
Rural	87	101	273	7.5
Open space (Hectares)				
Urbanized Open Space	3,024	3,642	10,278	7.9
Urban Extent	10,993	12,882	29,736	6.4
Density (Persons / Hectare)				
Built-up Area Density	42.0	40.8	33.5	-1.5
Urban Extent Density	30.4	29.2	21.9	-2.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.72	0.72	0.65	-0.7
Openness Index	0.25	0.23	0.28	1.5
Compactness (Roundness)				
Proximity	0.71	0.74	0.72	-0.2
Cohesion	0.70	0.73	0.70	-0.3
Added Area (Hectares)	'93-'00	Share	'00-'13	Share
Infill	511	40%	1,897	18%
Extension	635	50%	4,945	48%
Leapfrog	0	0%	0	0%
Inclusion	123	9%	3,374	33%

















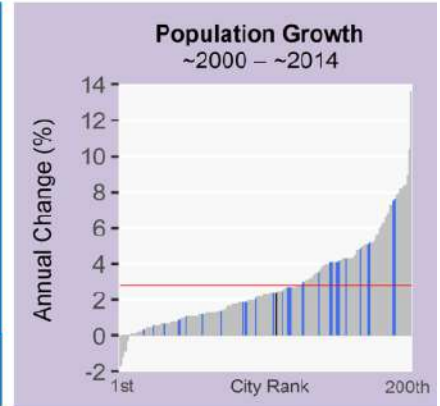
**Sialkot, Pakistan
1992-2014**

0 2 4 6 8 km

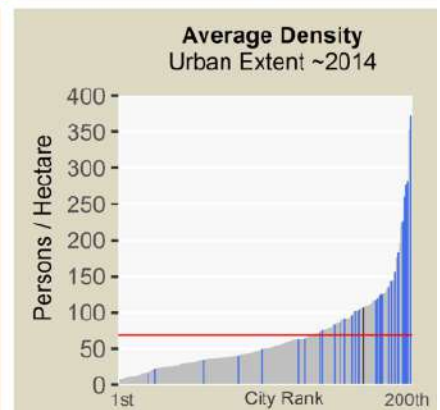
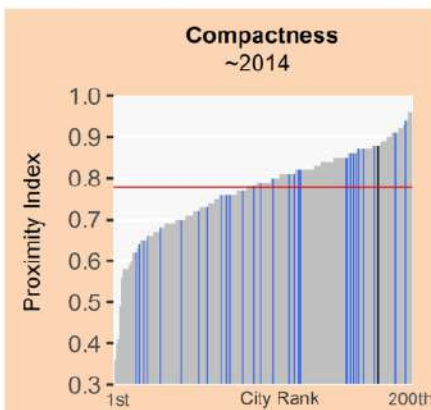
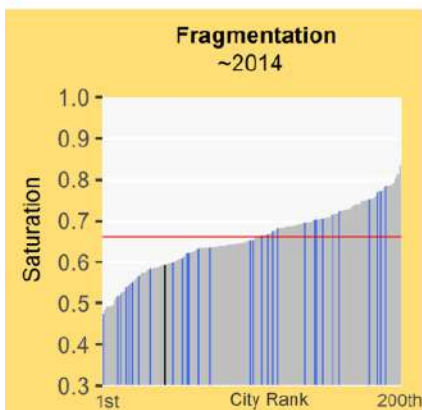
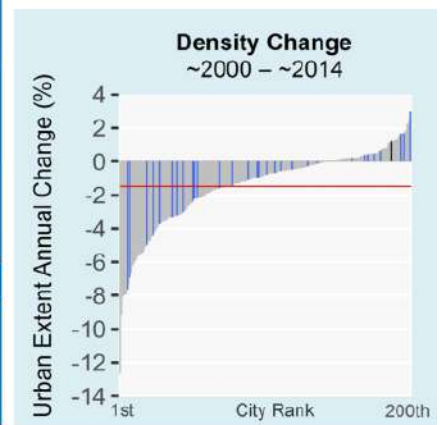
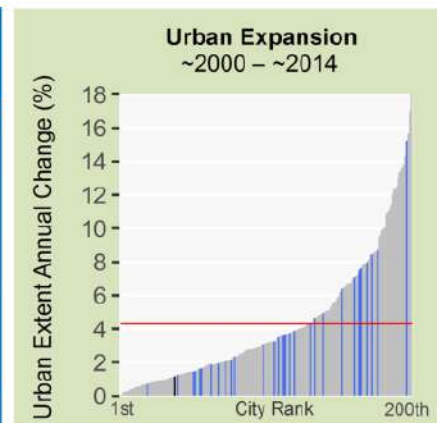
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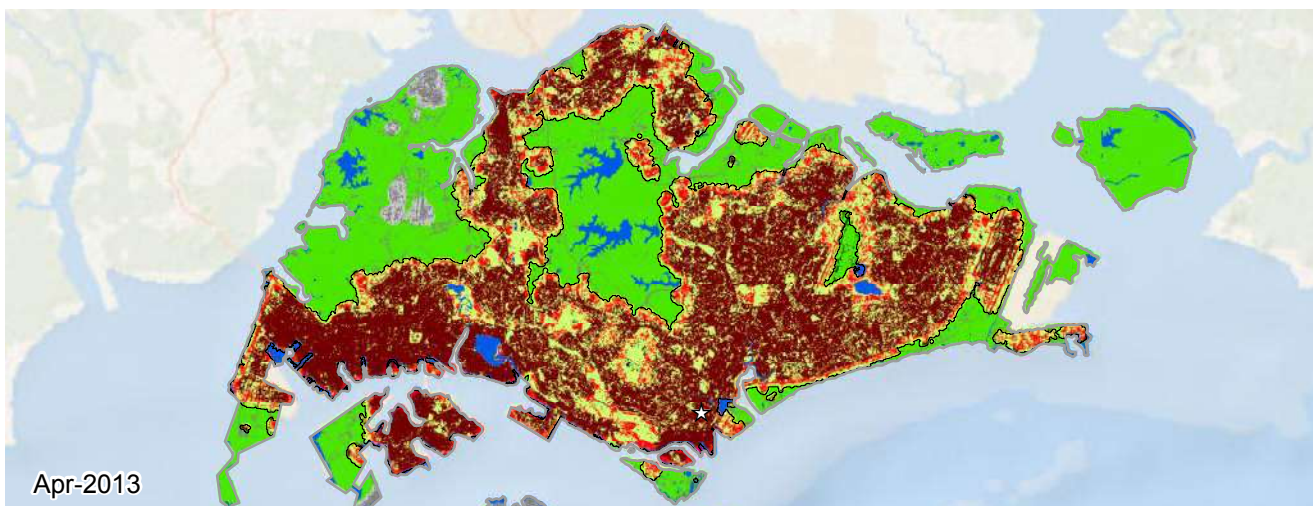
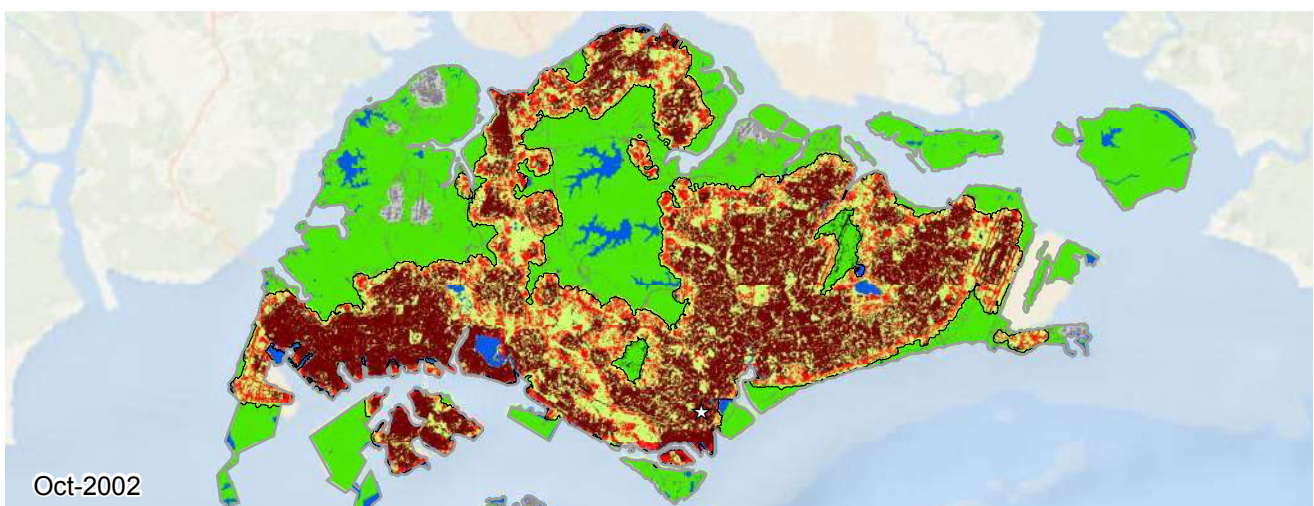
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Sialkot, Pakistan (South and Central Asia)



Metrics	Nov 1992	Oct 2000	Oct 2014	% Annual Change ('00-'14)
Population	413,631	736,094	1,023,264	2.4
Built-up Area (Hectares)				
Total	1,194	4,581	5,698	1.6
Urban	744	2,835	4,017	2.5
Suburban	414	1,671	1,588	-0.4
Rural	35	74	91	1.5
Open space (Hectares)				
Urbanized Open Space	843	3,586	3,921	0.6
Urban Extent	2,038	8,168	9,620	1.2
Density (Persons / Hectare)				
Built-up Area Density	346.2	160.7	179.6	0.8
Urban Extent Density	203.0	90.1	106.4	1.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.59	0.56	0.59	0.4
Openness Index	0.38	0.40	0.37	-0.6
Compactness (Roundness)				
Proximity	0.87	0.90	0.88	-0.1
Cohesion	0.86	0.89	0.87	-0.2
Added Area (Hectares)	'92-'00	Share	'00-'14	Share
Infill	348	10%	524	46%
Extension	2,751	81%	252	22%
Leapfrog	0	0%	8	0%
Inclusion	287	8%	331	29%





**Singapore, Singapore
1990-2013**

0 4 8 12 16 km

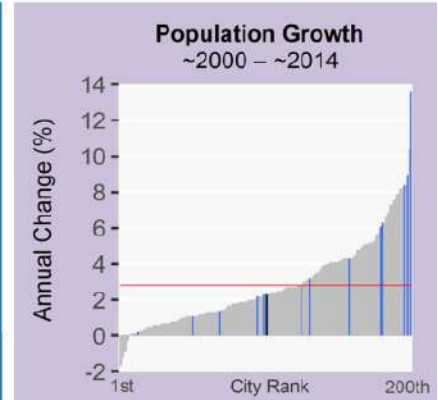
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Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

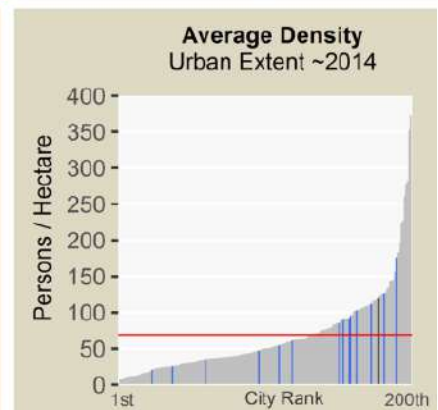
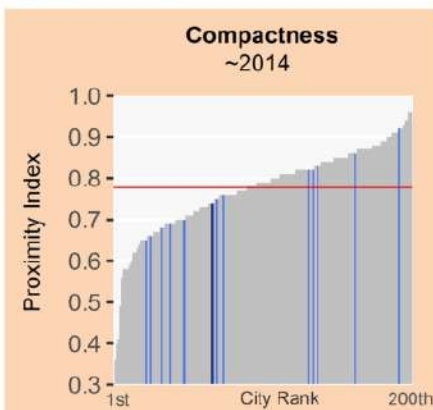
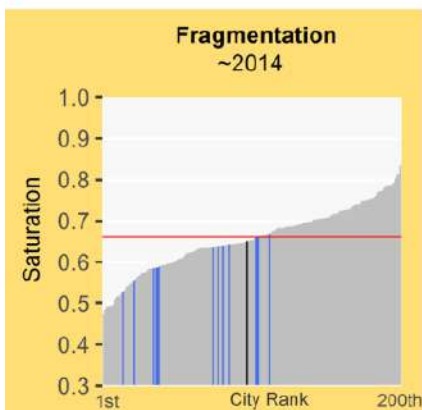
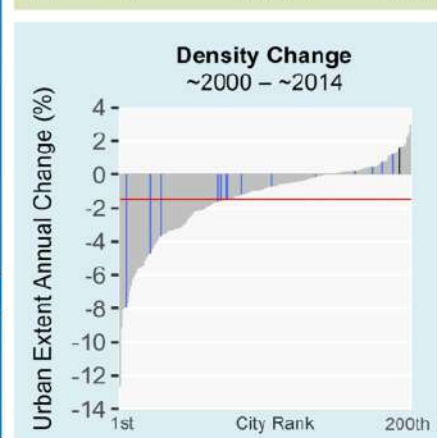
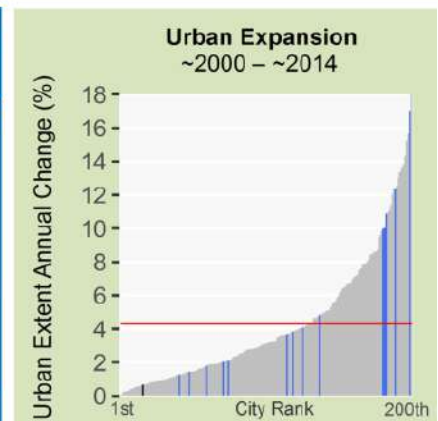
Singapore, Singapore (Southeast Asia)

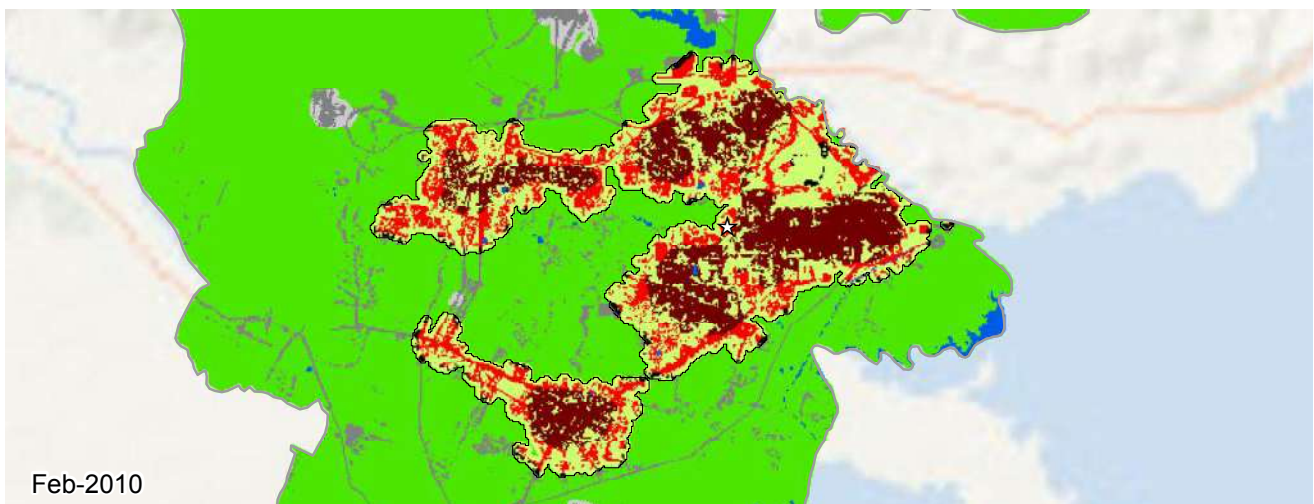
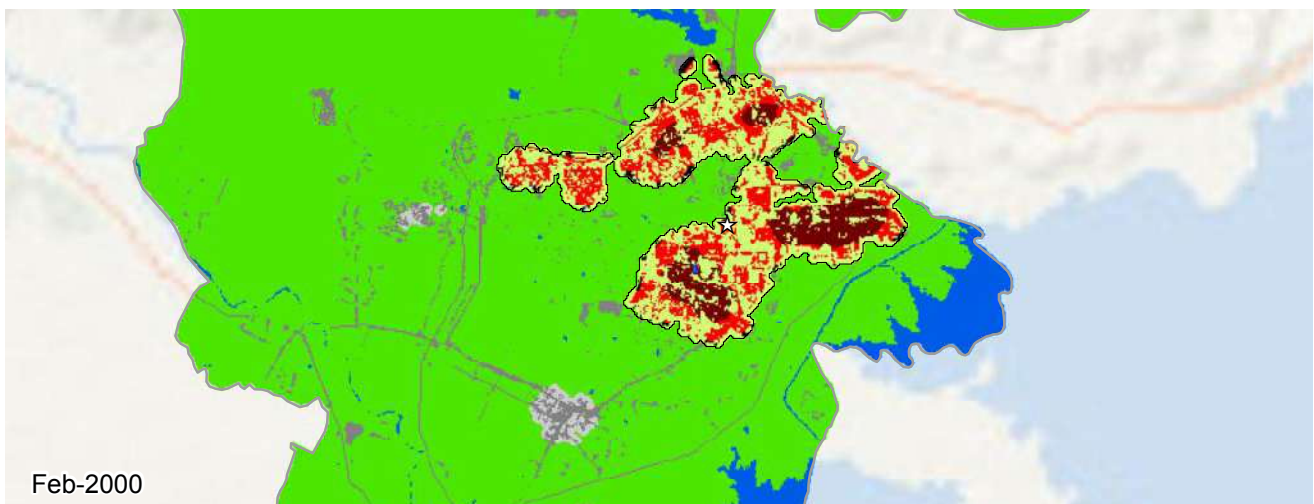
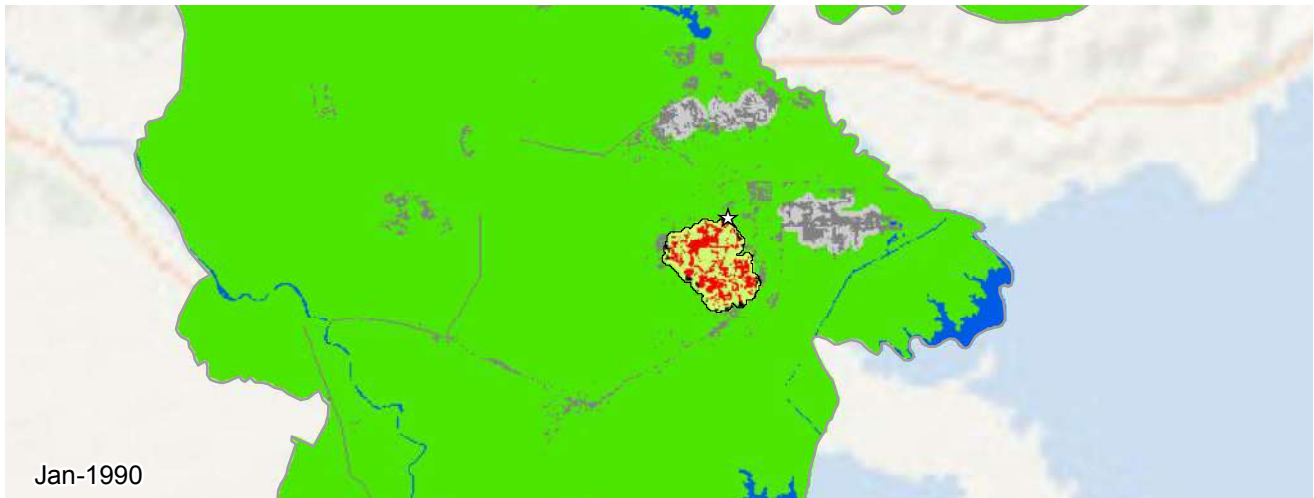


Legend for Charts
 Singapore | Other cities in region | All other cities | Global average



Metrics	Apr 1990	Oct 2002	Apr 2013	% Annual Change ('02-'13)
Population	2,700,539	4,006,612	5,085,788	2.3
Built-up Area (Hectares)				
Total	15,759	23,617	27,392	1.4
Urban	9,379	17,595	22,311	2.3
Suburban	6,007	5,710	4,787	-1.7
Rural	372	311	293	-0.5
Open space (Hectares)				
Urbanized Open Space	14,221	15,614	14,646	-0.6
Urban Extent	29,980	39,232	42,038	0.7
Density (Persons / Hectare)				
Built-up Area Density	171.4	169.6	185.7	0.9
Urban Extent Density	90.1	102.1	121.0	1.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.53	0.60	0.65	0.8
Openness Index	0.44	0.37	0.33	-1.2
Compactness (Roundness)				
Proximity	0.68	0.72	0.74	0.3
Cohesion	0.69	0.72	0.75	0.3
Added Area (Hectares)	'90-'02	Share	'02-'13	Share
Infill	3,097	39%	2,617	69%
Extension	2,683	34%	540	14%
Leapfrog	505	6%	151	4%
Inclusion	1,571	19%	464	12%





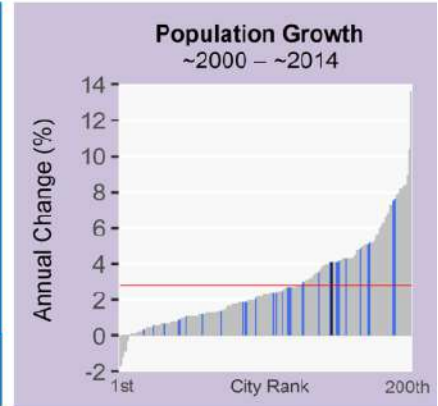
**Singrauli, India
1990-2010**

0 1 2 3 4 km

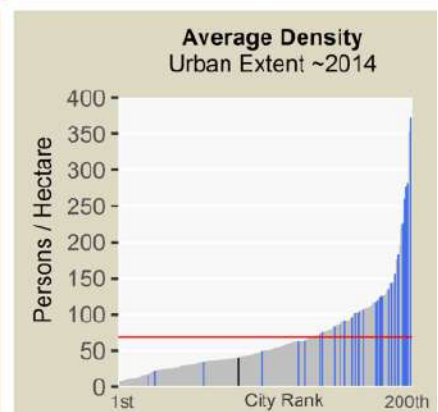
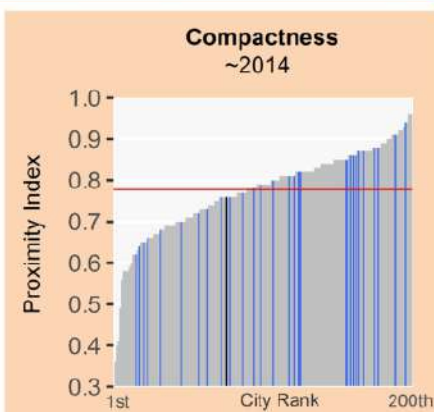
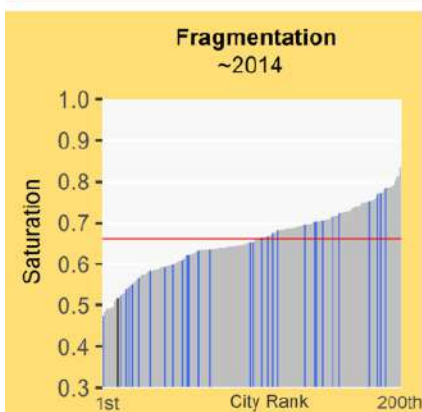
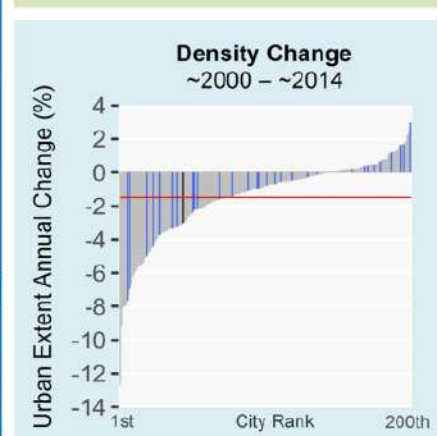
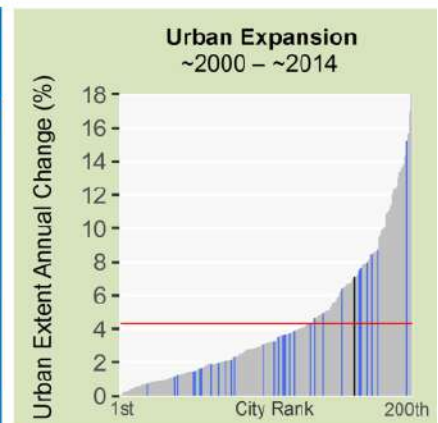
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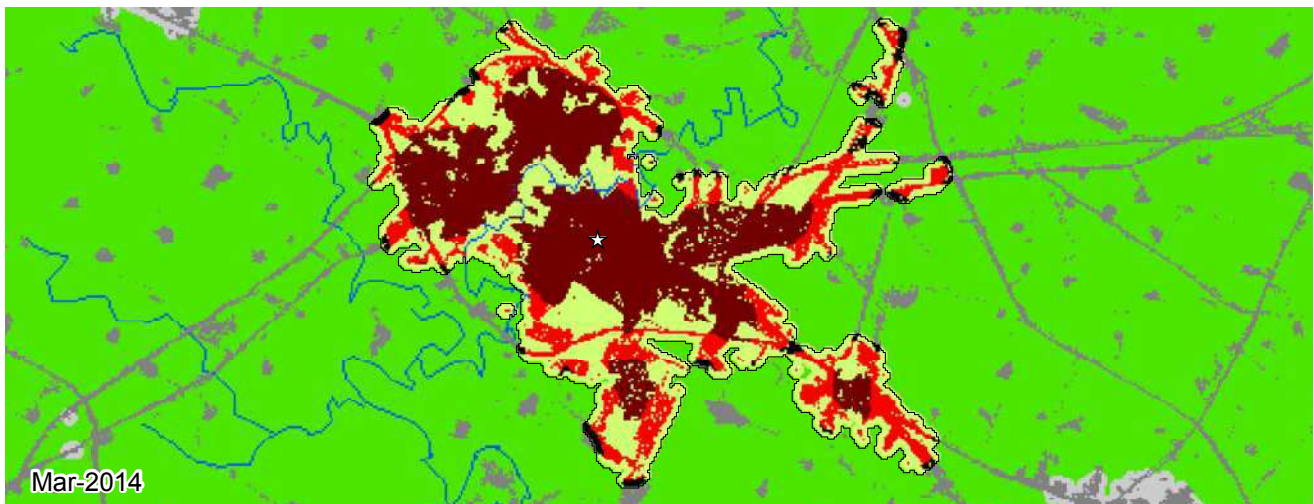
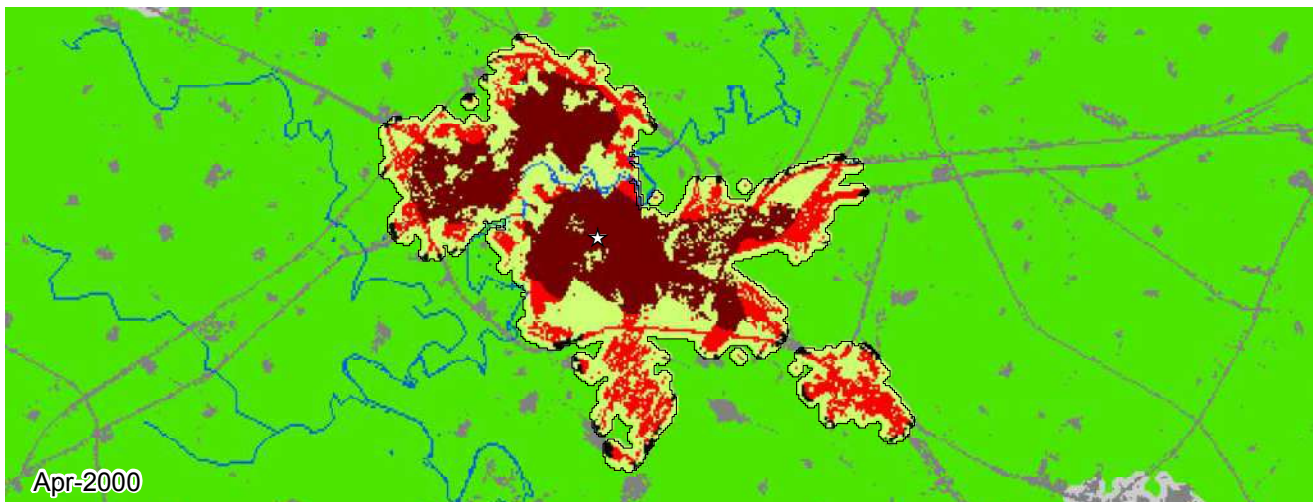
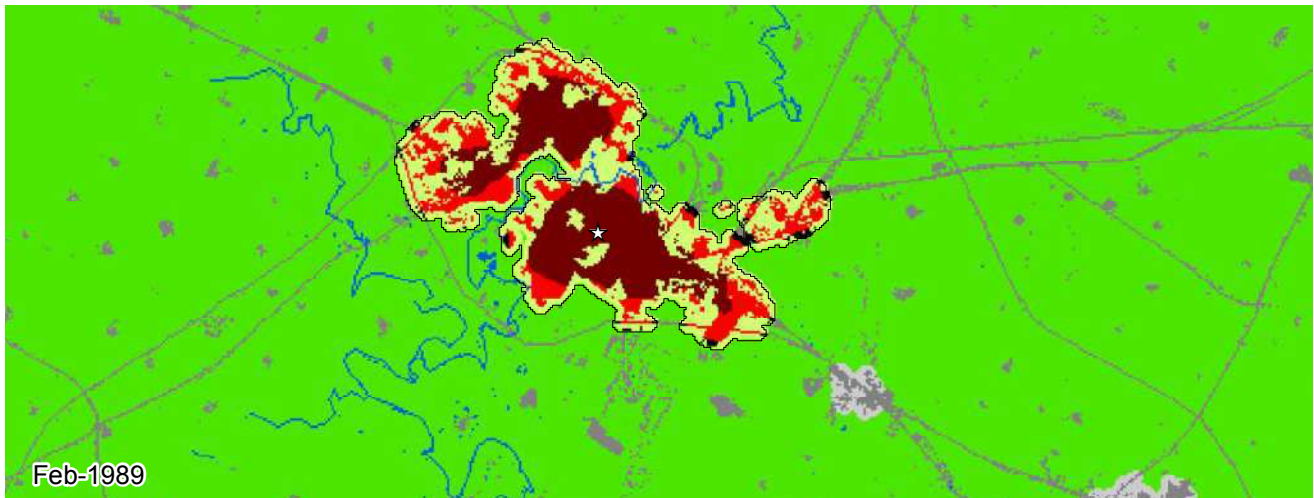
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Singrauli, India (South and Central Asia)



Metrics	Jan 1990	Feb 2000	Feb 2010	% Annual Change ('00-'10)
Population	8,272	90,805	136,936	4.1
Built-up Area (Hectares)				
Total	81	748	1,738	8.4
Urban	0	248	968	13.6
Suburban	71	455	704	4.4
Rural	10	44	65	3.8
Open space (Hectares)				
Urbanized Open Space	132	897	1,617	5.9
Urban Extent	214	1,646	3,355	7.1
Density (Persons / Hectare)				
Built-up Area Density	100.9	121.3	78.8	-4.3
Urban Extent Density	38.6	55.1	40.8	-3.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.38	0.45	0.52	1.3
Openness Index	0.68	0.56	0.47	-1.7
Compactness (Roundness)				
Proximity	0.97	0.80	0.76	-0.5
Cohesion	0.96	0.80	0.76	-0.5
Added Area (Hectares)	'90-'00	Share	'00-'10	Share
Infill	57	8%	227	22%
Extension	368	55%	503	50%
Leapfrog	0	0%	0	0%
Inclusion	240	36%	258	26%





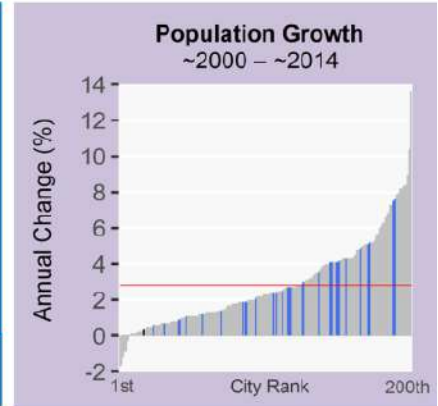
**Sitapur, India
1989-2014**

0 1 2 3 4 km

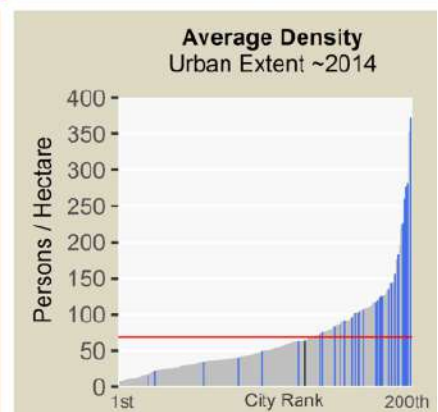
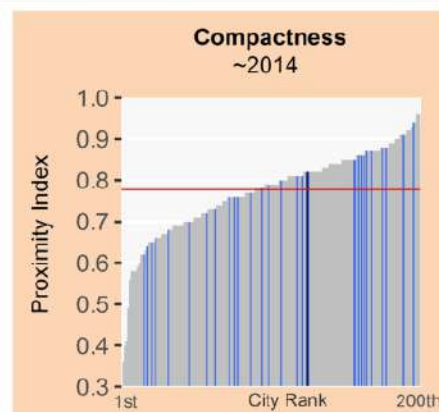
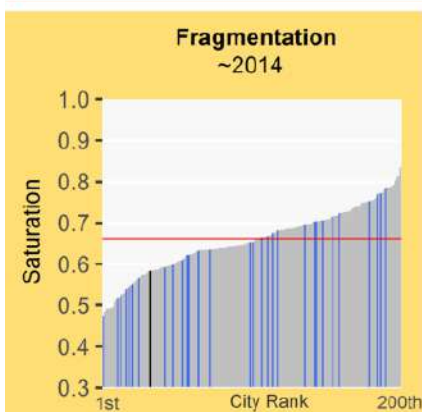
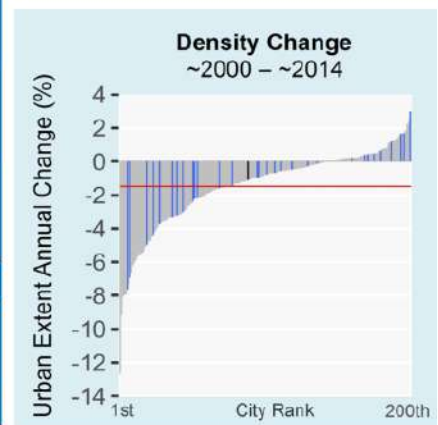
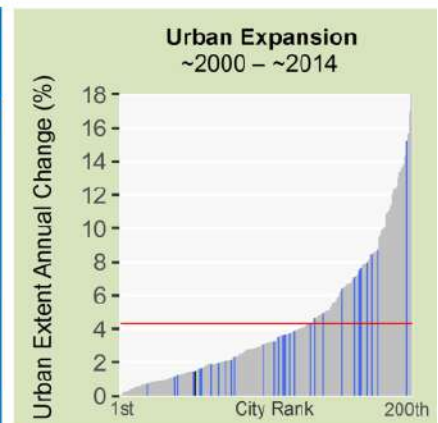
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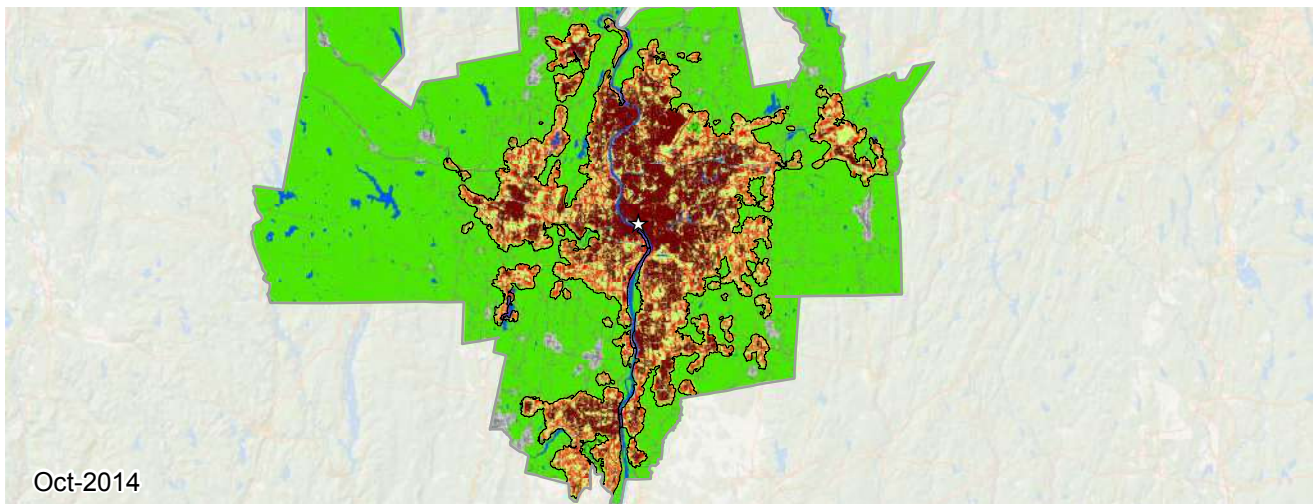
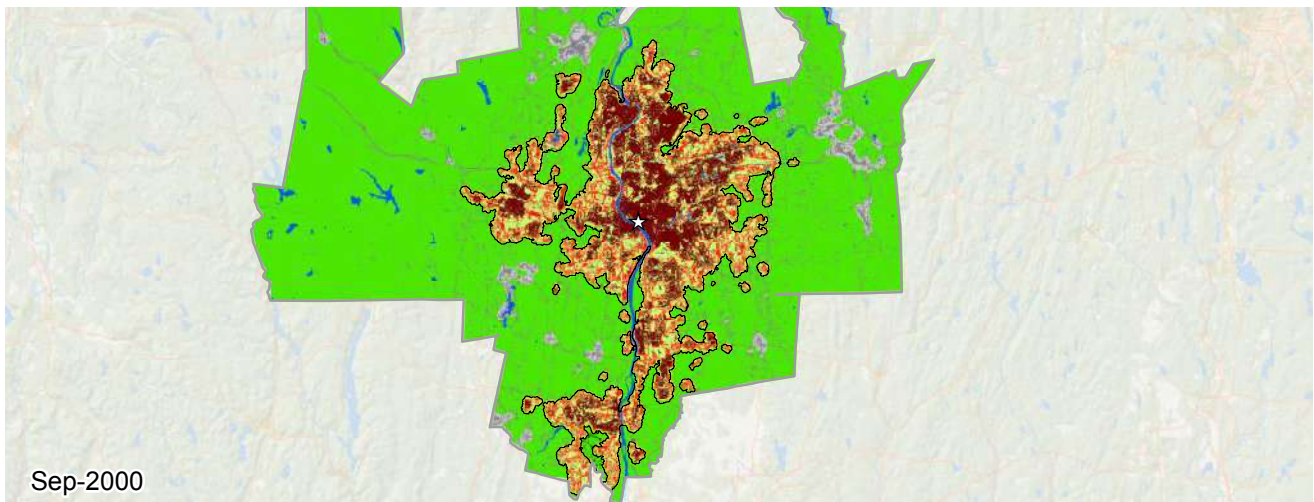
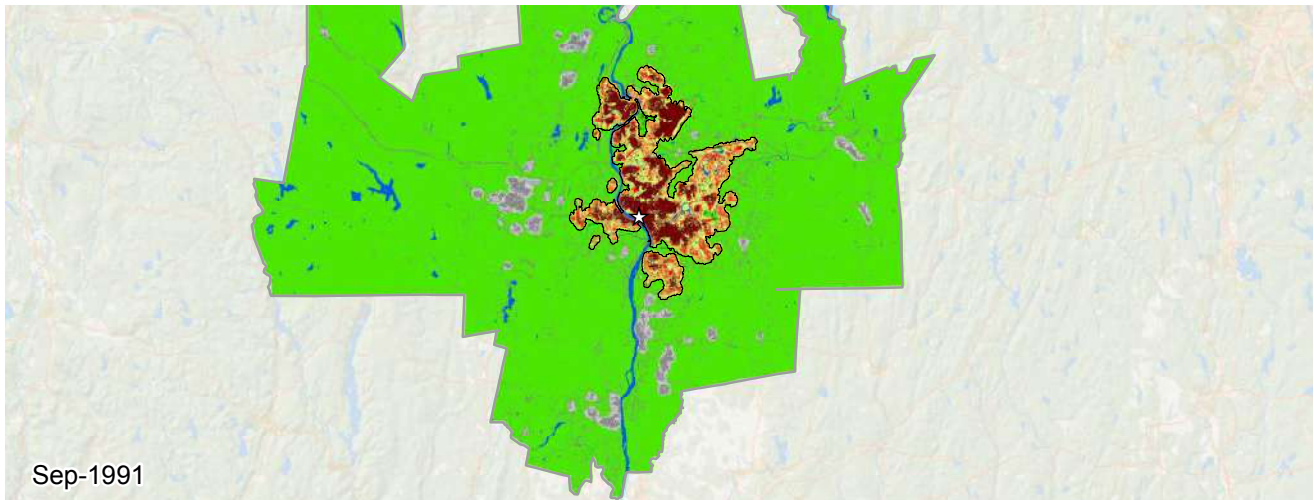
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Sitapur, India (South and Central Asia)



Metrics	Feb 1989	Apr 2000	Mar 2014	% Annual Change ('00-'14)
Population	107,700	132,115	139,272	0.4
Built-up Area (Hectares)				
Total	613	983	1,270	1.8
Urban	366	586	822	2.4
Suburban	223	355	389	0.7
Rural	23	41	58	2.5
Open space (Hectares)				
Urbanized Open Space	481	788	906	1.0
Urban Extent	1,095	1,772	2,177	1.5
Density (Persons / Hectare)				
Built-up Area Density	175.4	134.3	109.6	-1.5
Urban Extent Density	98.4	74.5	64.0	-1.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.56	0.56	0.58	0.4
Openness Index	0.45	0.44	0.41	-0.5
Compactness (Roundness)				
Proximity	0.83	0.83	0.82	-0.1
Cohesion	0.82	0.82	0.81	-0.1
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	99	26%	133	46%
Extension	146	39%	62	21%
Leapfrog	0	0%	0	0%
Inclusion	124	33%	90	31%





Springfield, MA, United States
1991-2014

0 8 16 24 32 km

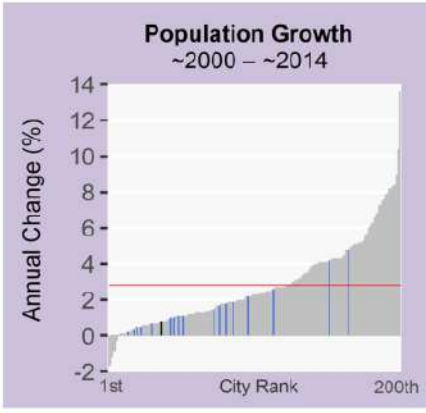
Study area
 Urban extent
 Urban built-up area
 Suburban built-up area
 Rural built-up area
 Urbanized open space

Rural open space
 Exurban built-up area
 Exurban open space
 Water
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★ CBD

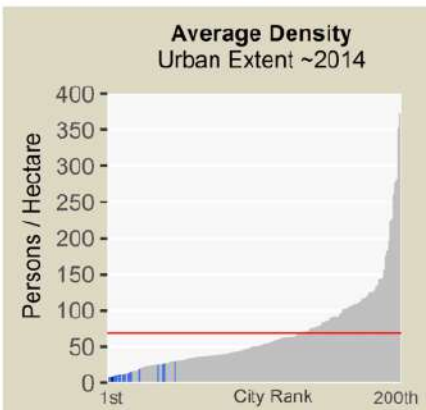
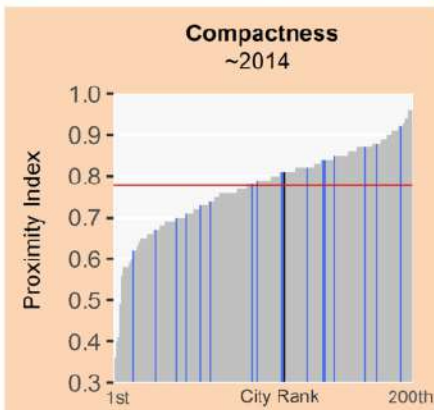
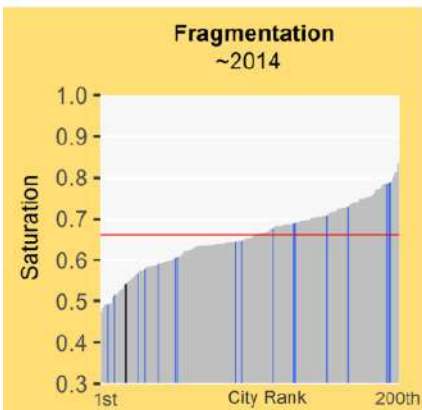
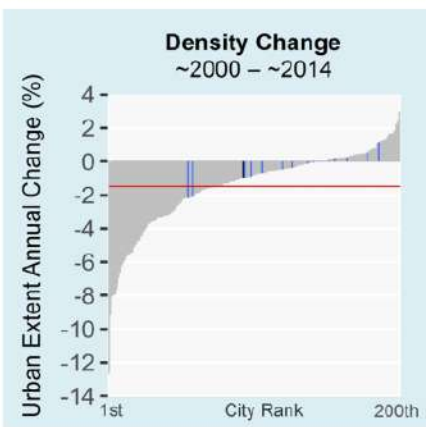
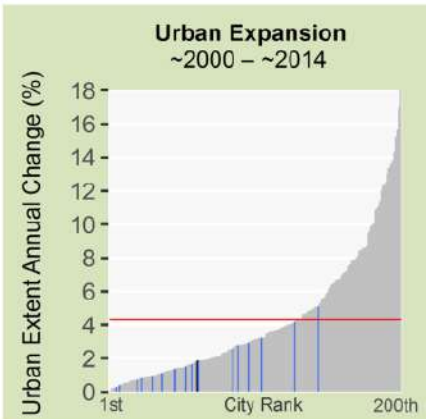
Springfield, MA, United States (Land-Rich Developed Countries)

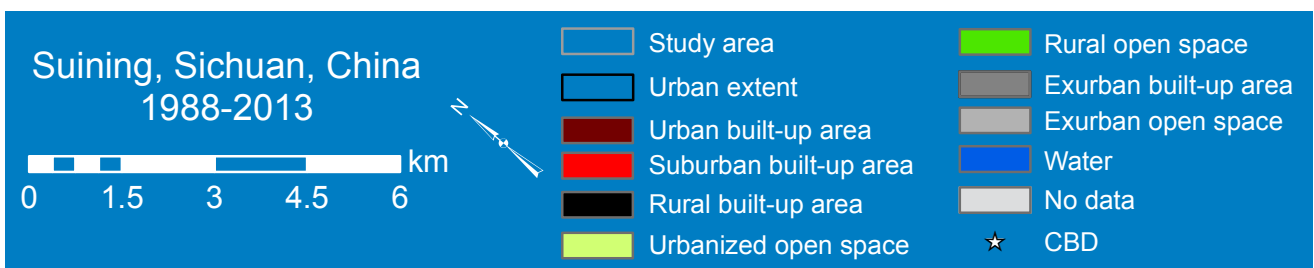
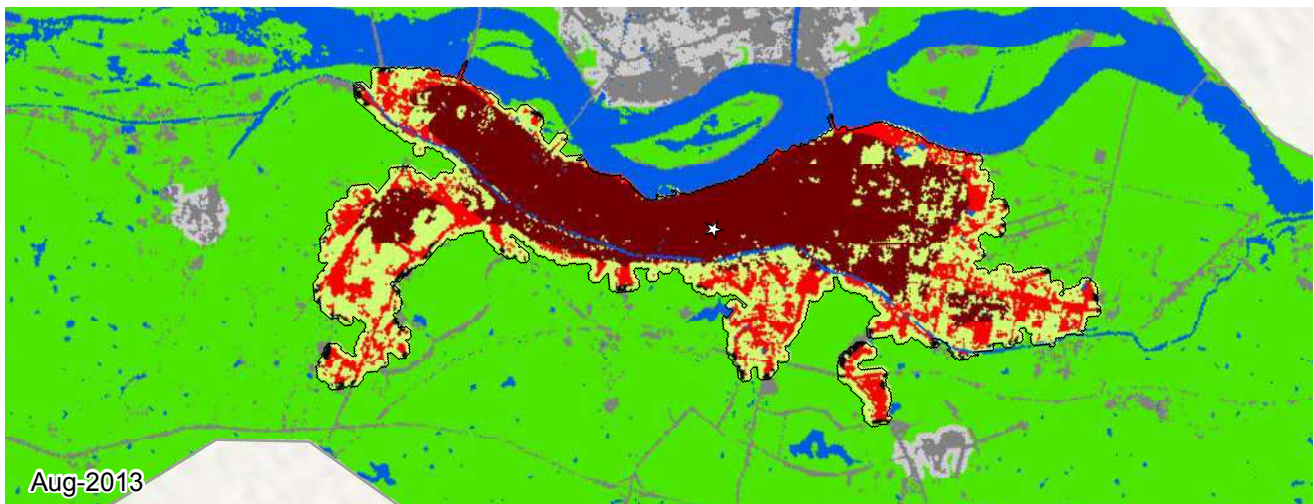
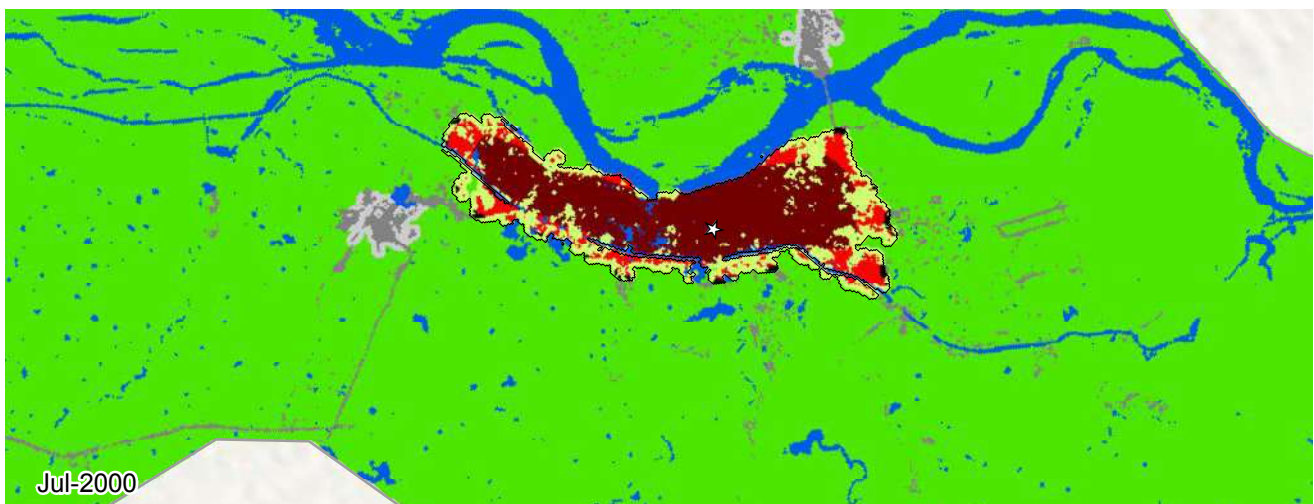
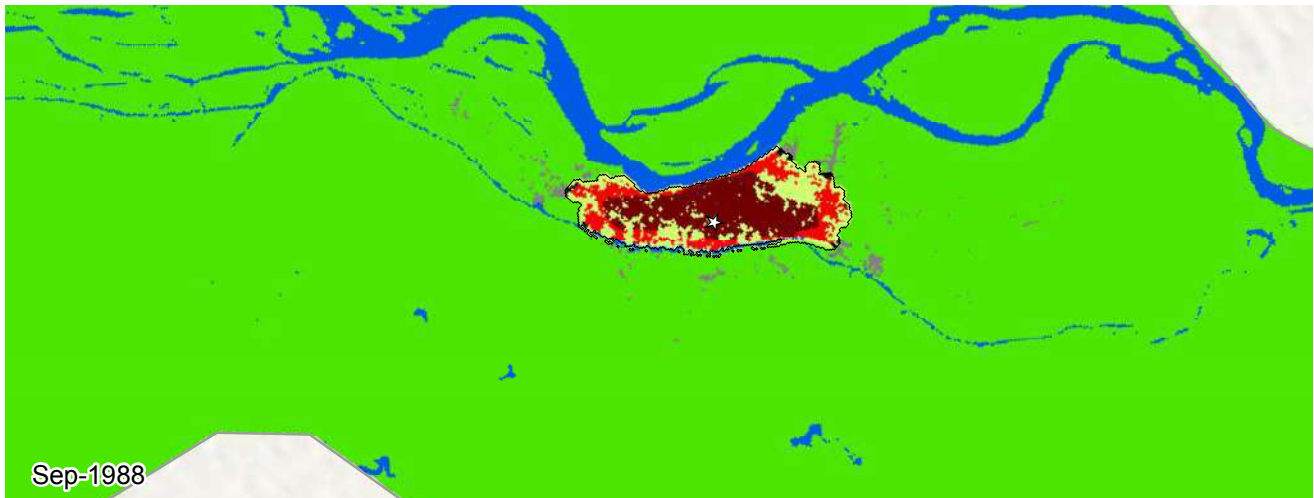


Legend for Charts
 Springfield | Other cities in region | All other cities | Global average —

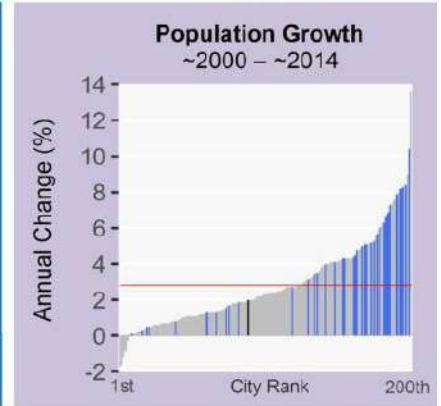


Metrics	Sep 1991	Sep 2000	Oct 2014	% Annual Change ('00-'14)
Population	303,221	470,384	530,271	0.9
Built-up Area (Hectares)				
Total	9,184	26,790	36,636	2.2
Urban	5,412	15,529	22,210	2.5
Suburban	3,426	10,552	13,523	1.8
Rural	345	708	902	1.7
Open space (Hectares)				
Urbanized Open Space	8,823	25,271	31,016	1.5
Urban Extent	18,008	52,062	67,653	1.9
Density (Persons / Hectare)				
Built-up Area Density	33.0	17.6	14.5	-1.4
Urban Extent Density	16.8	9.0	7.8	-1.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.51	0.51	0.54	0.4
Openness Index	0.42	0.43	0.41	-0.3
Compactness (Roundness)				
Proximity	0.82	0.79	0.81	0.1
Cohesion	0.82	0.77	0.79	0.1
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	3,814	21%	4,288	43%
Extension	7,677	43%	1,284	13%
Leapfrog	0	0%	26	0%
Inclusion	6,114	34%	4,248	43%

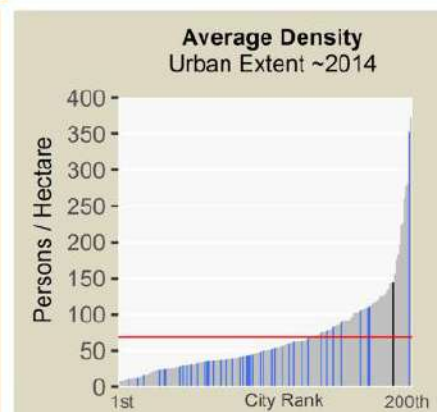
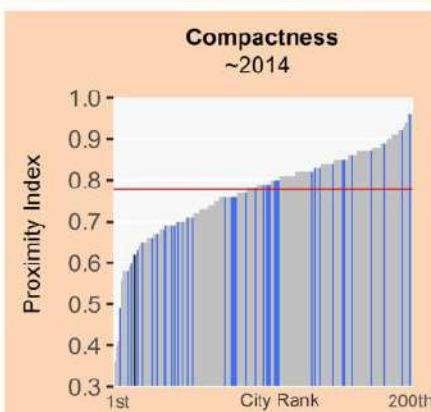
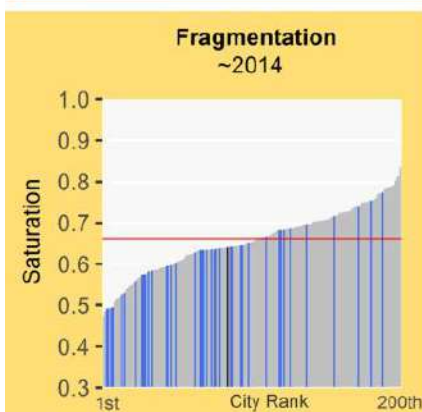
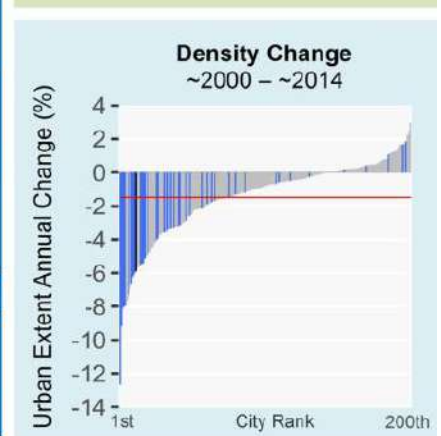
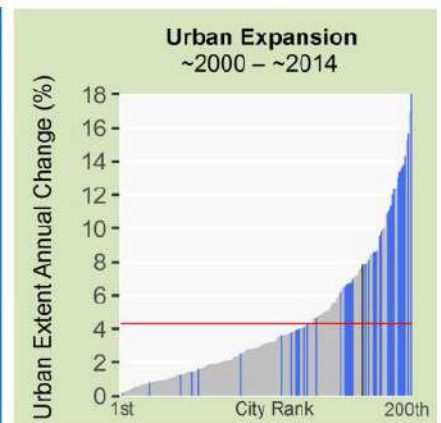


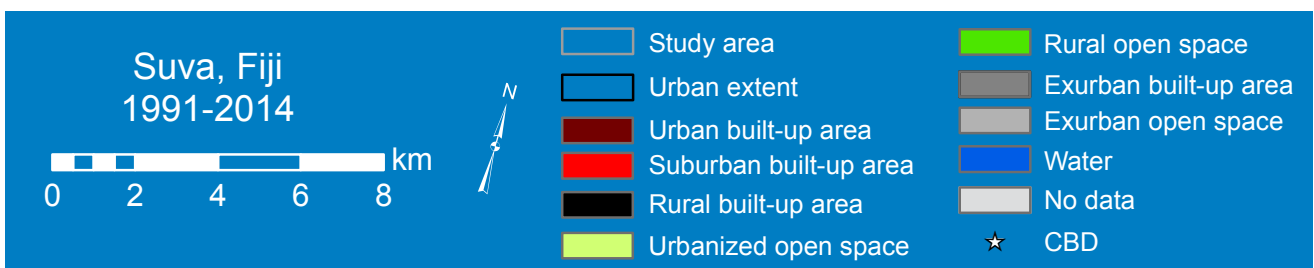
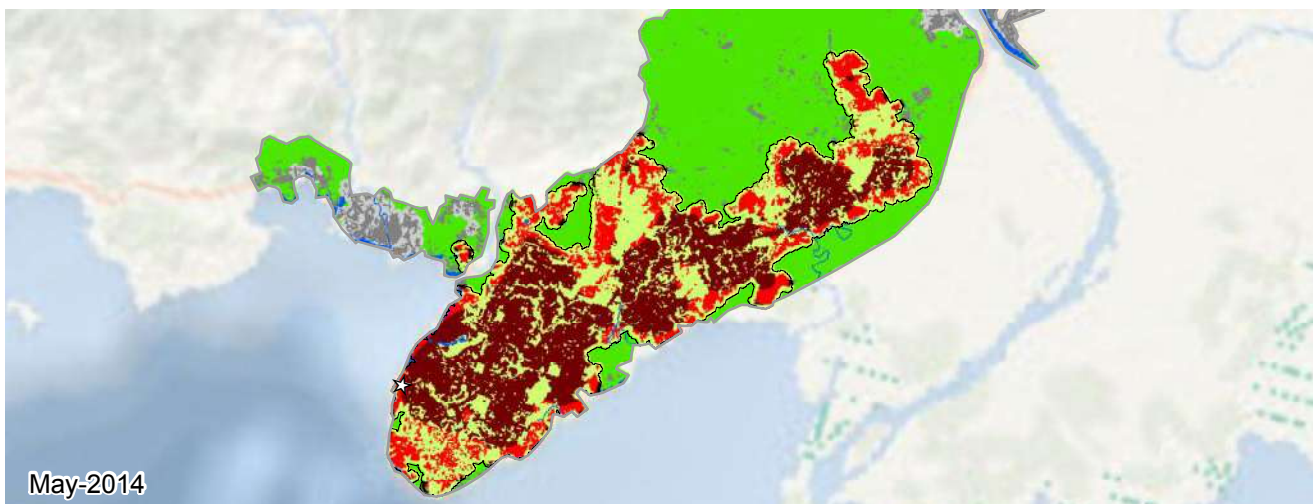
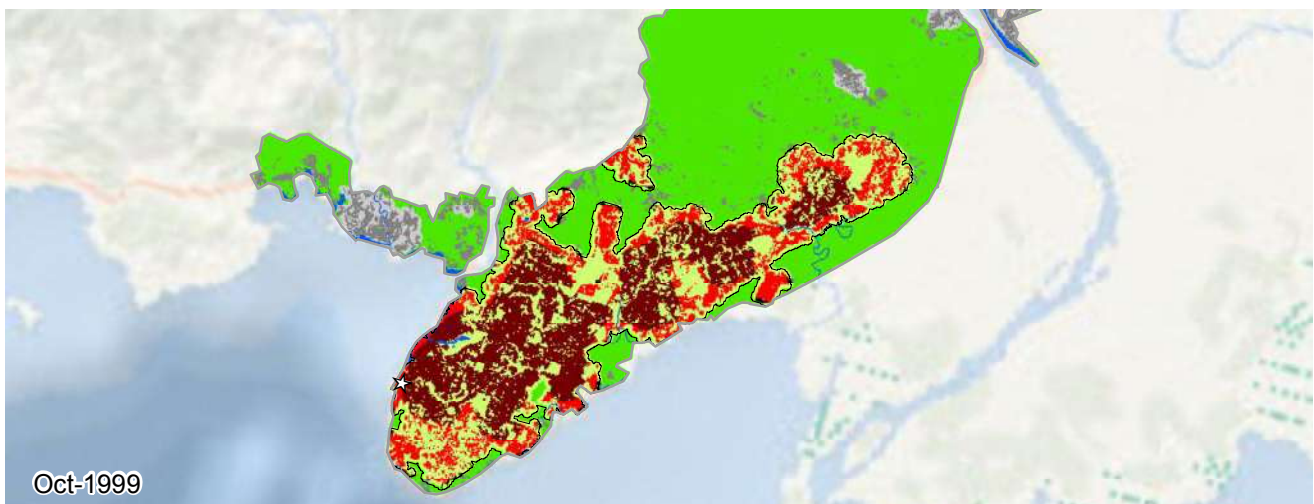
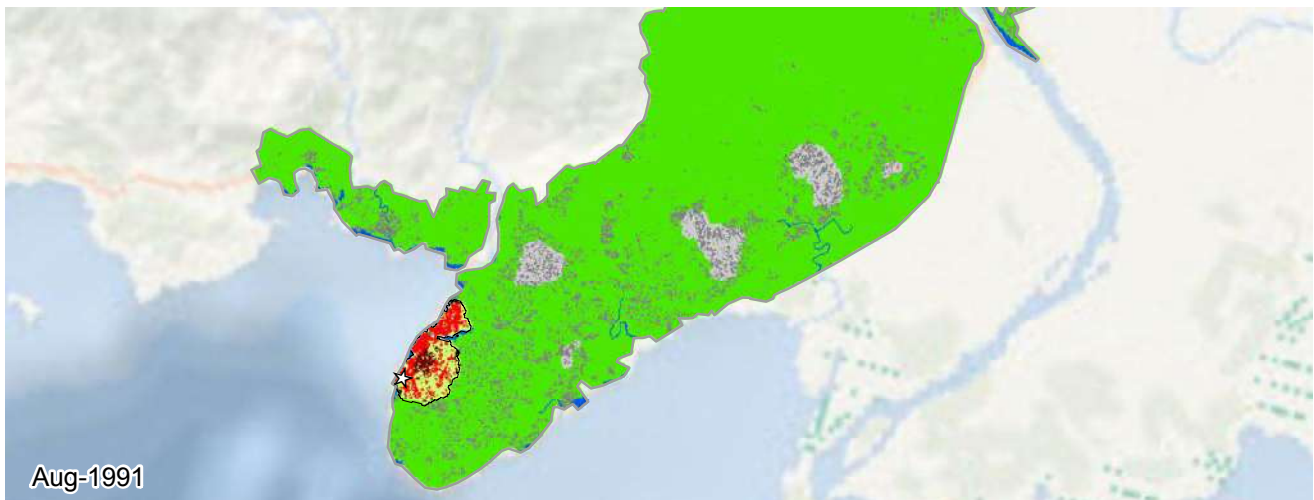


Suining, Sichuan, China (East Asia and the Pacific)

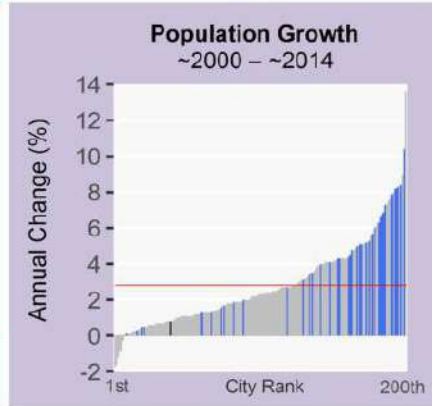


Metrics	Sep 1988	Jul 2000	Aug 2013	% Annual Change ('00-'13)
Population	57,706	340,355	439,801	2.0
Built-up Area (Hectares)				
Total	319	757	1,939	7.2
Urban	207	591	1,335	6.2
Suburban	105	149	552	10.0
Rural	6	16	51	8.8
Open space (Hectares)				
Urbanized Open Space	173	320	1,087	9.3
Urban Extent	492	1,077	3,026	7.9
Density (Persons / Hectare)				
Built-up Area Density	180.7	449.6	226.7	-5.2
Urban Extent Density	117.1	315.8	145.3	-5.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.70	0.64	-0.7
Openness Index	0.43	0.34	0.36	0.2
Compactness (Roundness)				
Proximity	0.73	0.64	0.62	-0.1
Cohesion	0.74	0.65	0.64	-0.1
Added Area (Hectares)	'88-'00	Share	'00-'13	Share
Infill	91	20%	147	12%
Extension	298	68%	870	73%
Leapfrog	0	0%	0	0%
Inclusion	47	10%	164	13%

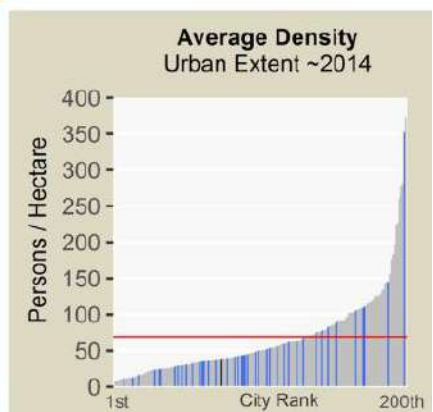
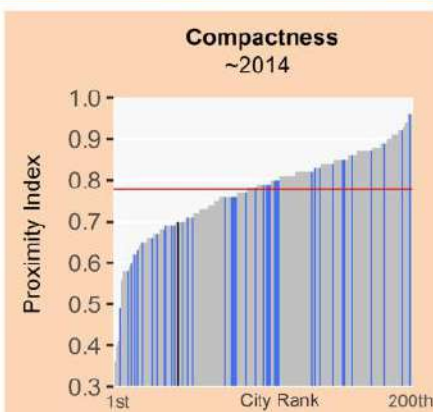
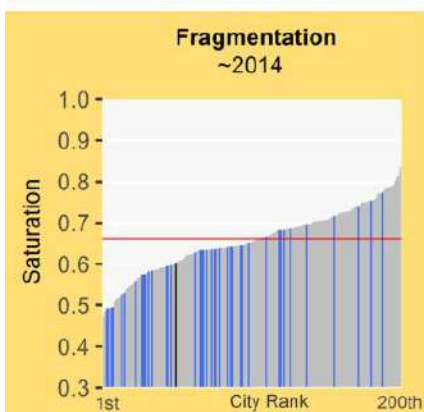
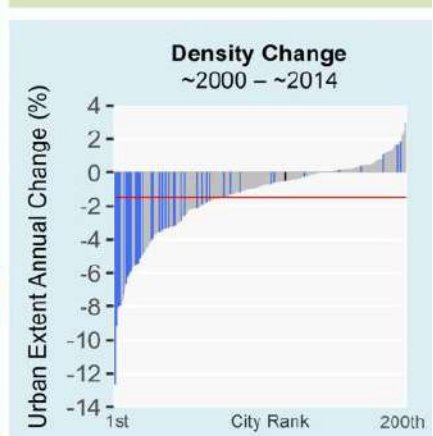
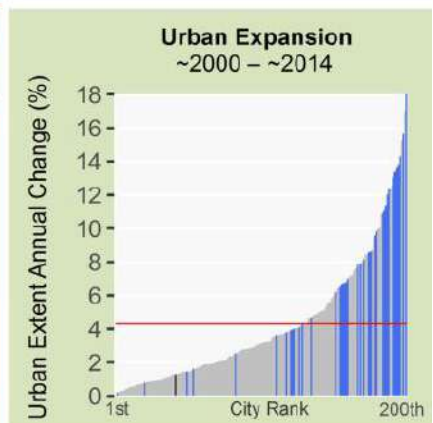


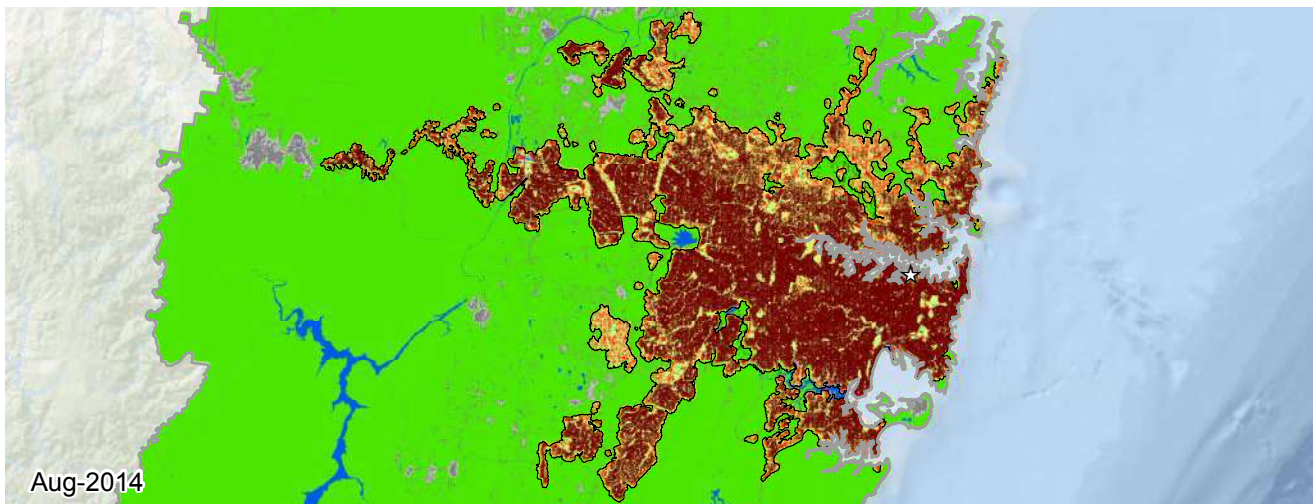
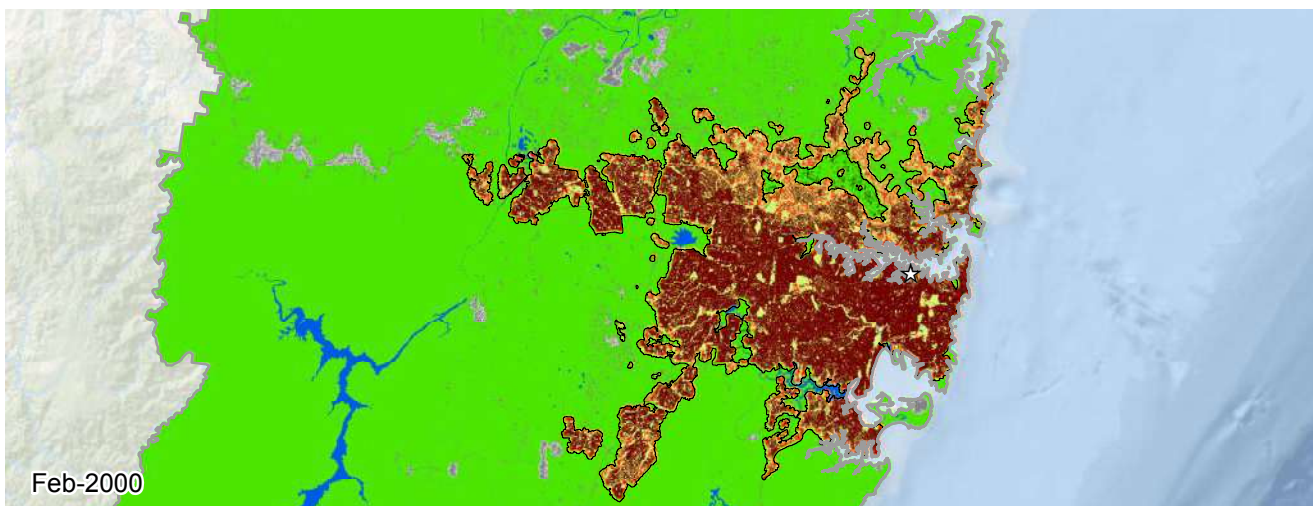
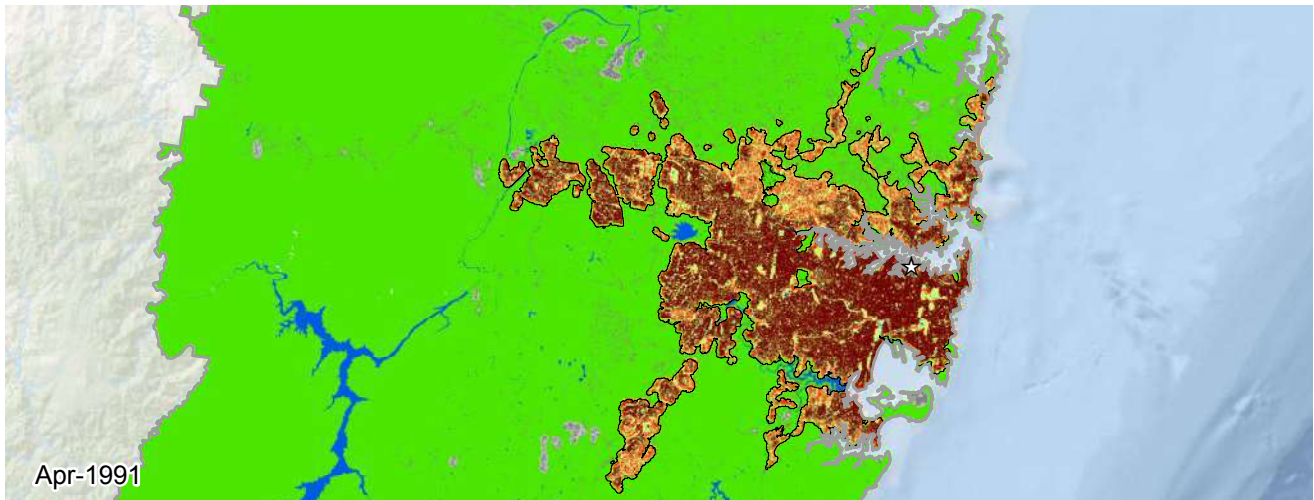


Suva, Fiji (East Asia and the Pacific)



Metrics	Aug 1991	Oct 1999	May 2014	% Annual Change ('99-'14)
Population	25,573	162,384	182,140	0.8
Built-up Area (Hectares)				
Total	126	2,258	2,846	1.6
Urban	21	1,420	1,962	2.2
Suburban	97	792	845	0.4
Rural	7	45	38	-1.1
Open space (Hectares)				
Urbanized Open Space	118	1,651	1,875	0.9
Urban Extent	244	3,909	4,721	1.3
Density (Persons / Hectare)				
Built-up Area Density	202.1	71.9	64.0	-0.8
Urban Extent Density	104.5	41.5	38.6	-0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.52	0.58	0.60	0.3
Openness Index	0.60	0.44	0.40	-0.7
Compactness (Roundness)				
Proximity	0.86	0.70	0.70	0.1
Cohesion	0.85	0.70	0.70	0.0
Added Area (Hectares)	'91-'99	Share	'99-'14	Share
Infill	152	7%	266	45%
Extension	1,330	62%	202	34%
Leapfrog	0	0%	0	0%
Inclusion	648	30%	119	20%





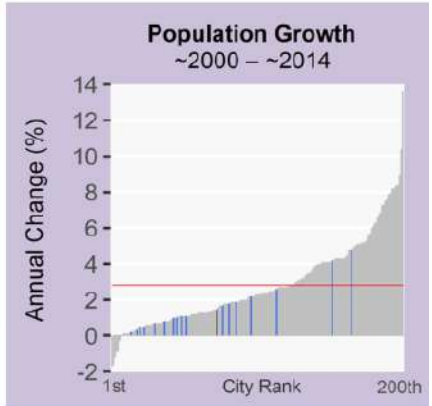
**Sydney, Australia
1991-2014**

0 8 16 24 32 km

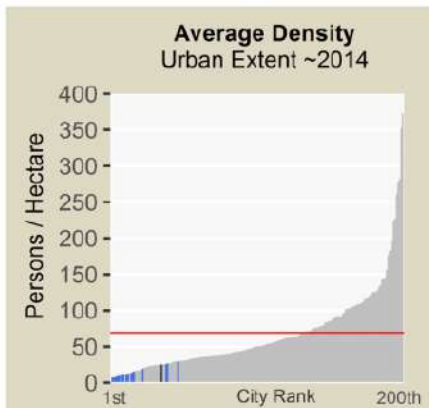
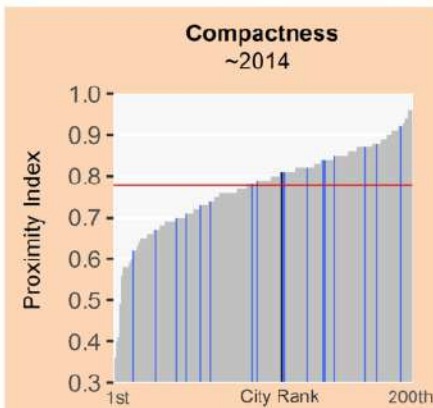
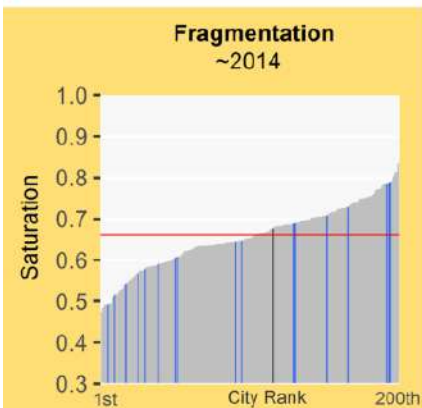
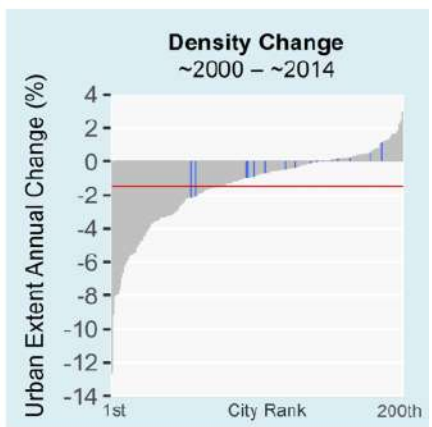
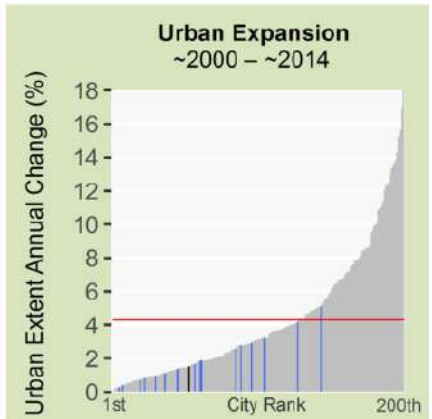
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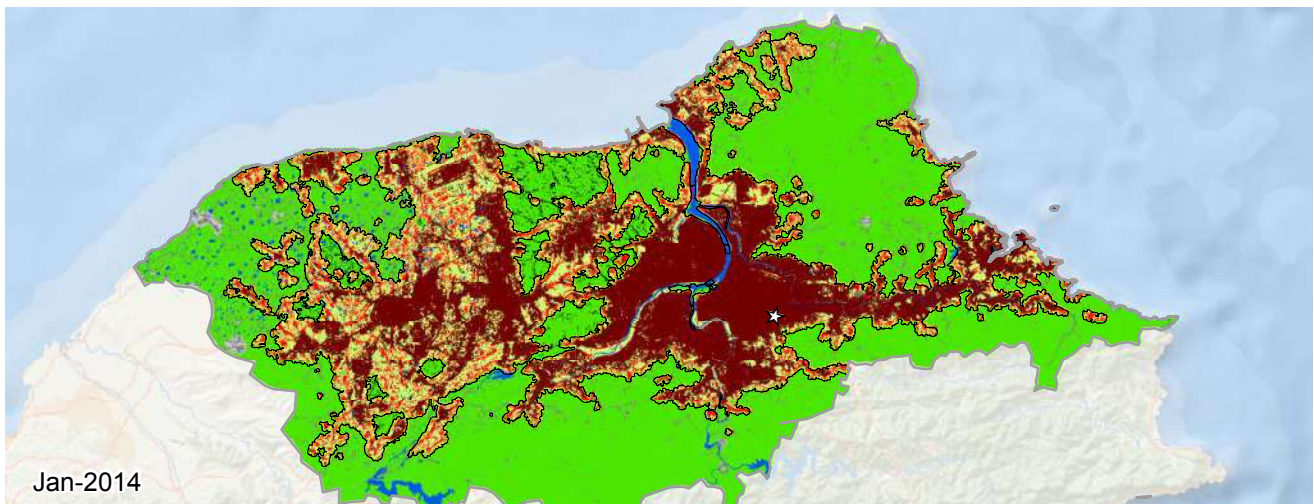
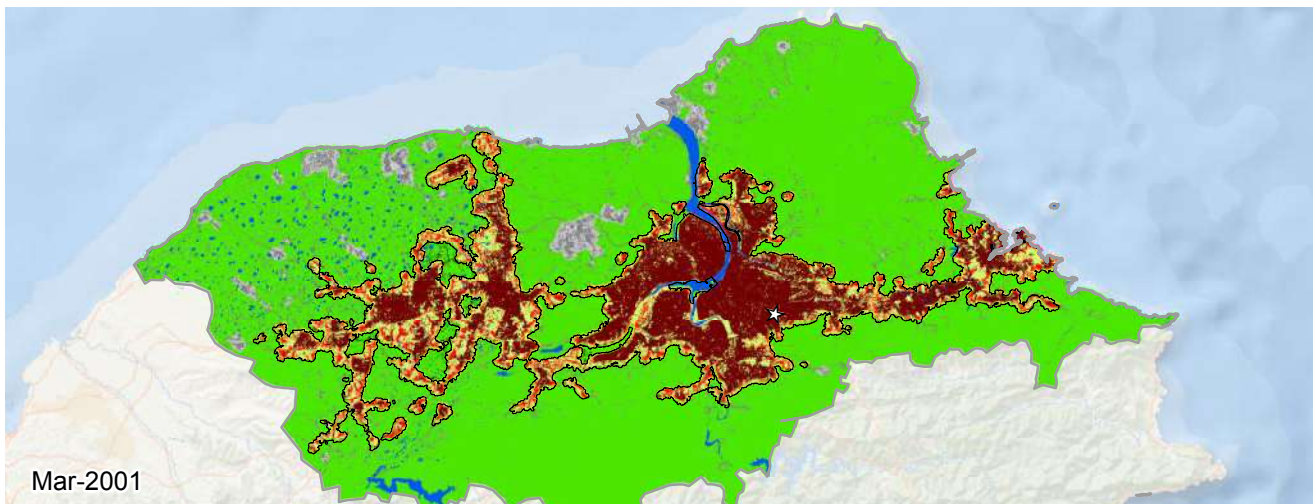
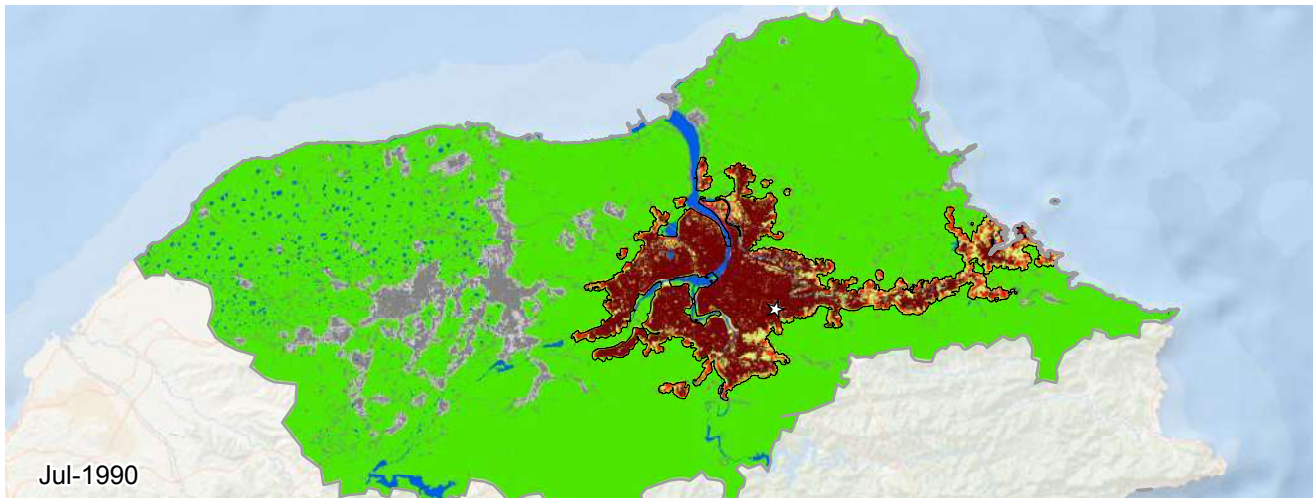
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Sydney, Australia (Land-Rich Developed Countries)



Metrics	Apr 1991	Feb 2000	Aug 2014	% Annual Change ('00-'14)
Population	2,871,960	3,318,262	4,114,435	1.5
Built-up Area (Hectares)				
Total	69,122	86,547	110,033	1.7
Urban	51,773	70,447	90,789	1.7
Suburban	16,371	15,131	18,000	1.2
Rural	977	968	1,243	1.7
Open space (Hectares)				
Urbanized Open Space	43,912	43,764	52,493	1.3
Urban Extent	113,035	130,312	162,526	1.5
Density (Persons / Hectare)				
Built-up Area Density	41.5	38.3	37.4	-0.2
Urban Extent Density	25.4	25.5	25.3	-0.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.61	0.66	0.68	0.1
Openness Index	0.35	0.30	0.28	-0.5
Compactness (Roundness)				
Proximity	0.80	0.81	0.81	-0.0
Cohesion	0.78	0.79	0.79	-0.0
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	10,107	57%	10,099	42%
Extension	3,755	21%	6,449	27%
Leapfrog	1,002	5%	342	1%
Inclusion	2,598	14%	6,657	28%

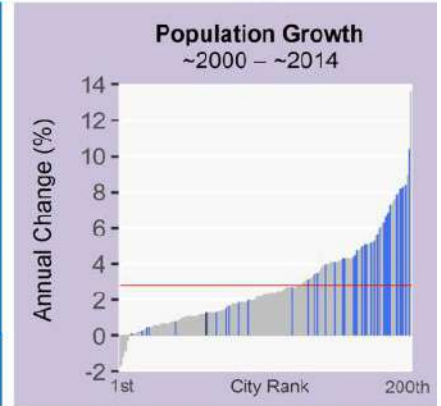




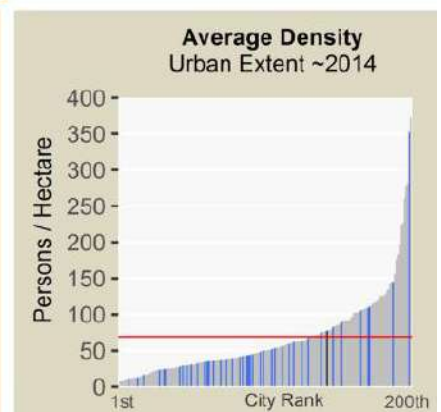
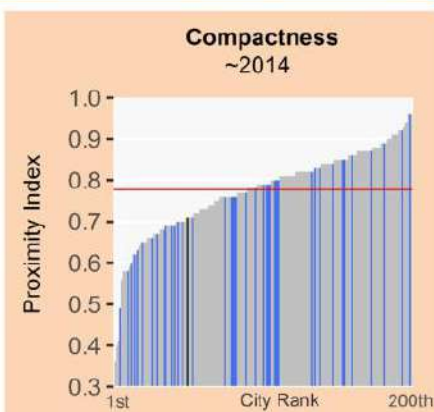
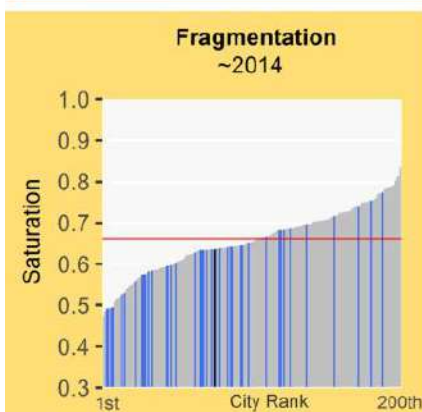
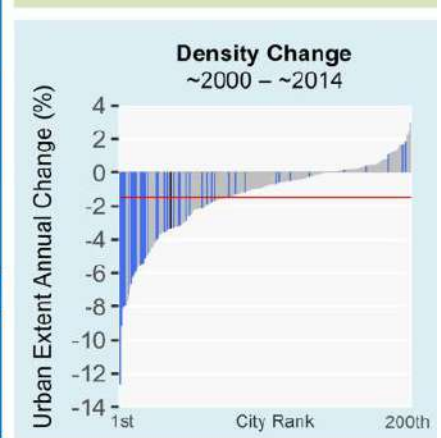
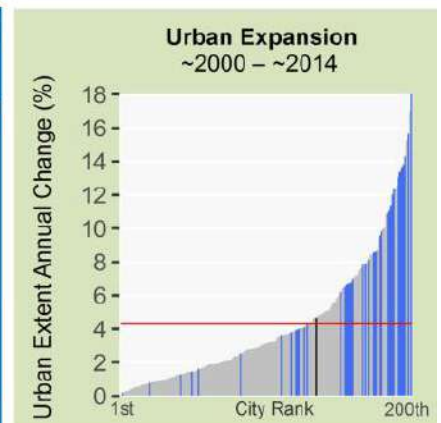
Taipei, Taiwan, China
1990-2014

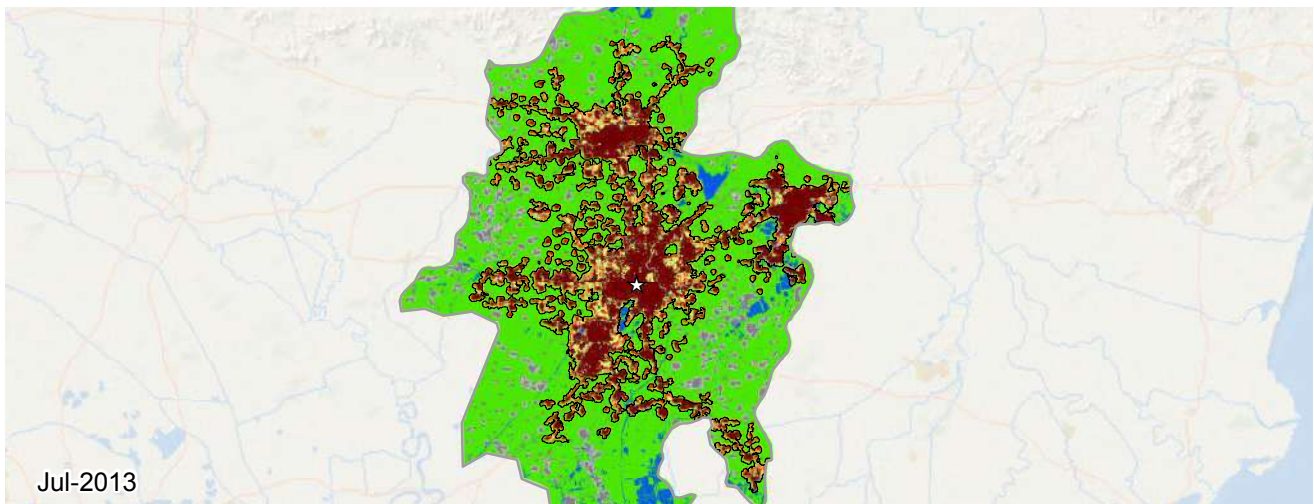
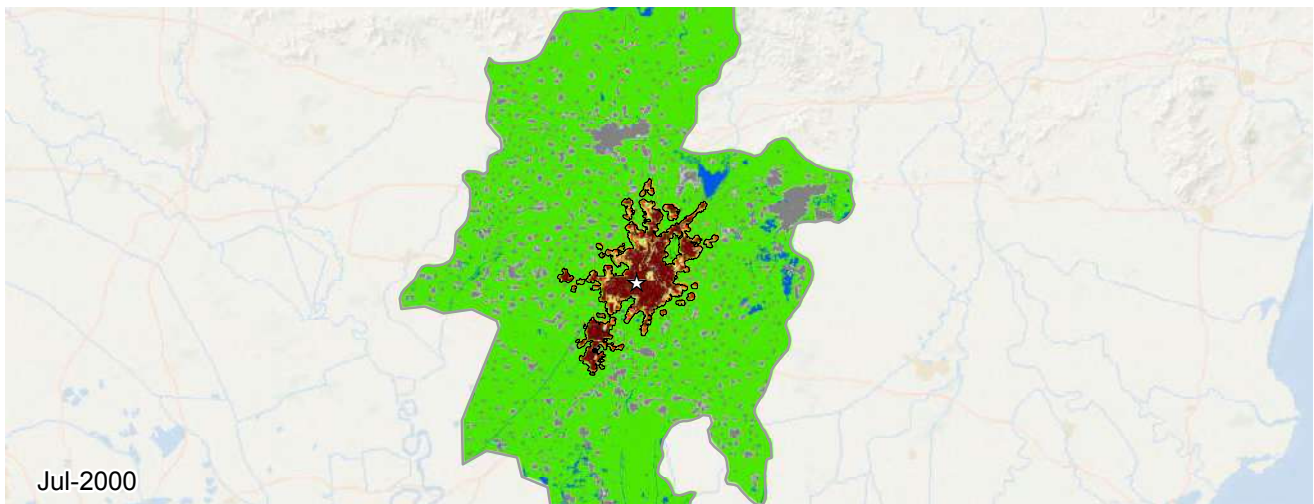
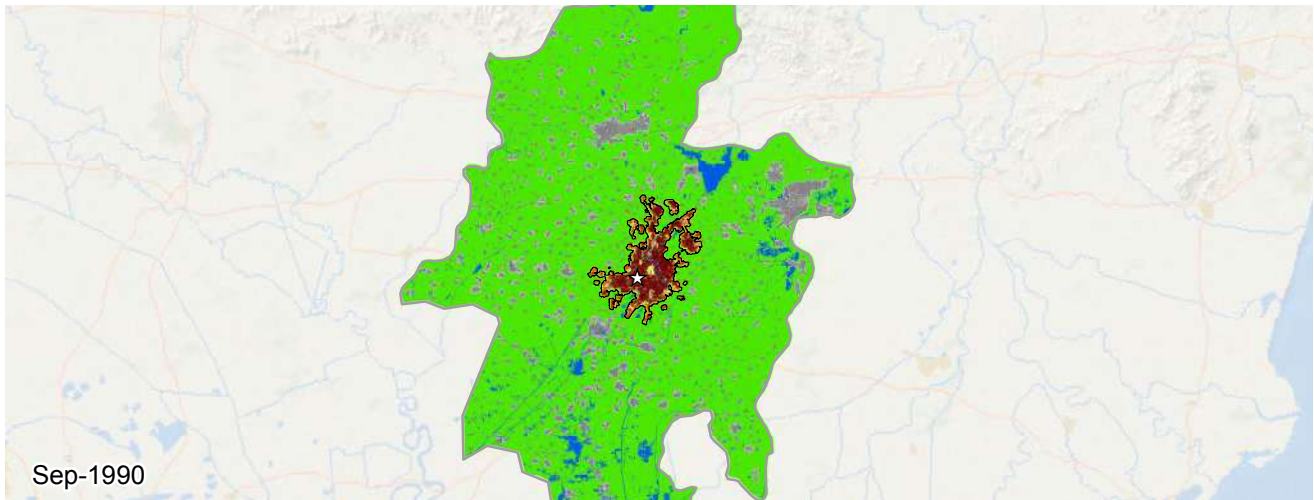
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Taipei, Taiwan, China (East Asia and the Pacific)



Metrics	Jul 1990	Mar 2001	Jan 2014	% Annual Change ('01-'14)
Population	5,541,393	7,266,319	8,591,169	1.3
Built-up Area (Hectares)				
Total	21,852	38,042	70,234	4.8
Urban	17,828	27,928	52,098	4.9
Suburban	3,760	9,328	16,733	4.6
Rural	263	784	1,402	4.5
Open space (Hectares)				
Urbanized Open Space	8,270	22,735	40,290	4.5
Urban Extent	30,123	60,777	110,525	4.7
Density (Persons / Hectare)				
Built-up Area Density	253.6	191.0	122.3	-3.5
Urban Extent Density	184.0	119.6	77.7	-3.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.73	0.63	0.64	0.1
Openness Index	0.27	0.32	0.30	-0.4
Compactness (Roundness)				
Proximity	0.69	0.57	0.71	1.6
Cohesion	0.67	0.57	0.70	1.7
Added Area (Hectares)	'90-'01	Share	'01-'14	Share
Infill	1,988	12%	10,982	34%
Extension	3,551	21%	12,472	38%
Leapfrog	18	0%	9	0%
Inclusion	10,631	65%	8,727	27%

















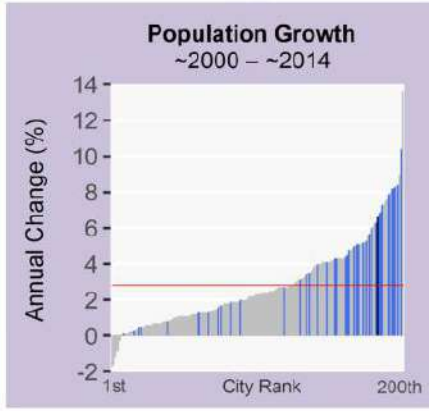
**Tangshan, Hebei, China
1990-2013**

0 10 20 30 40 km

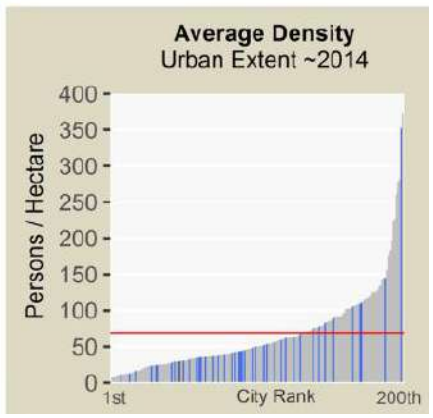
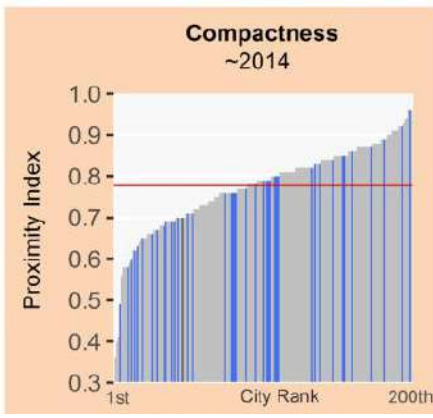
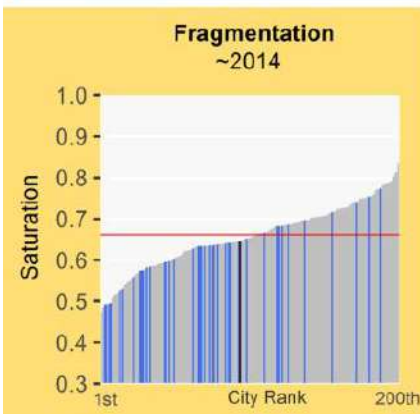
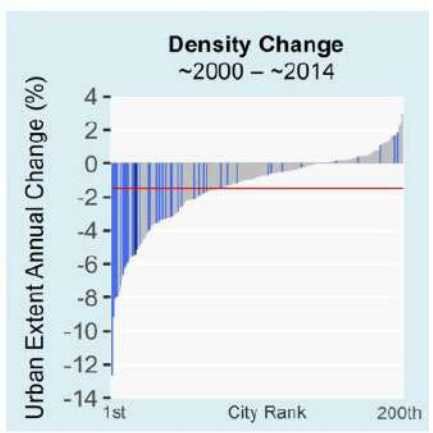
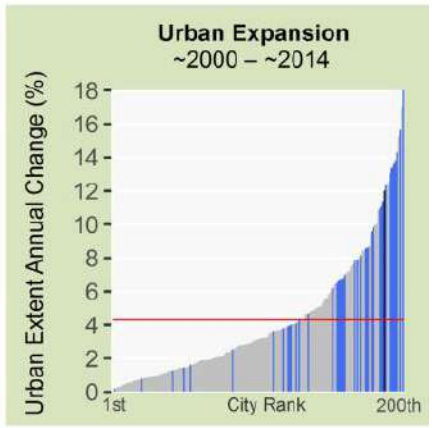
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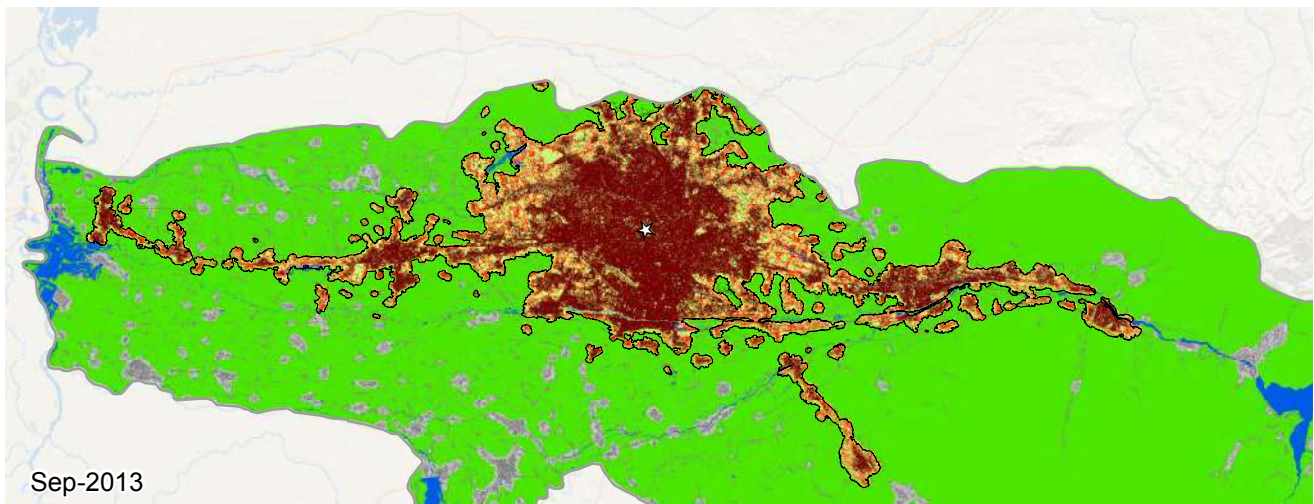
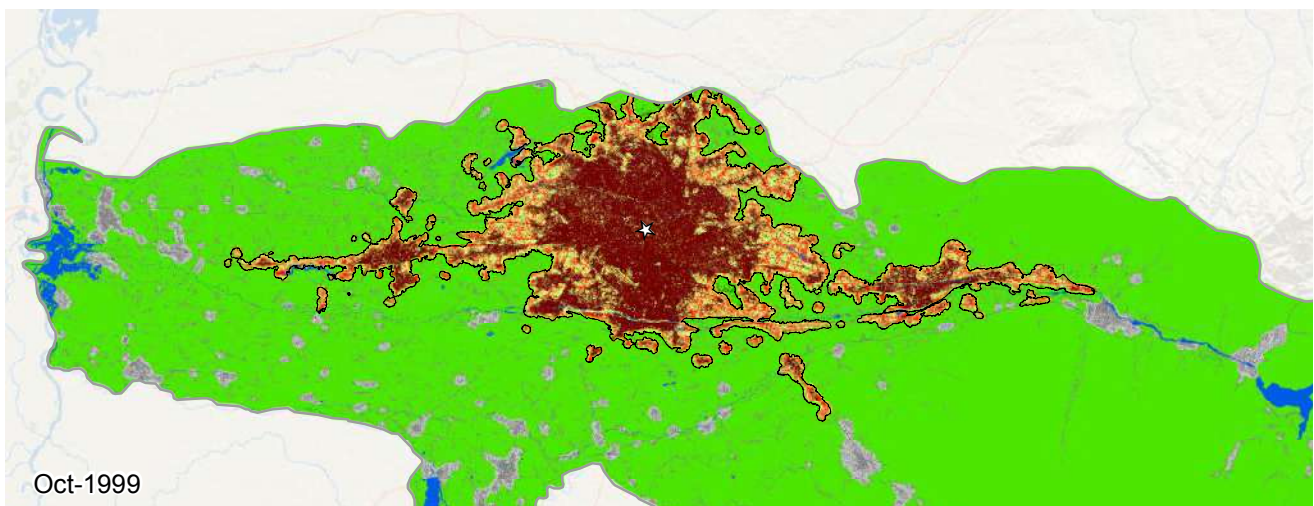
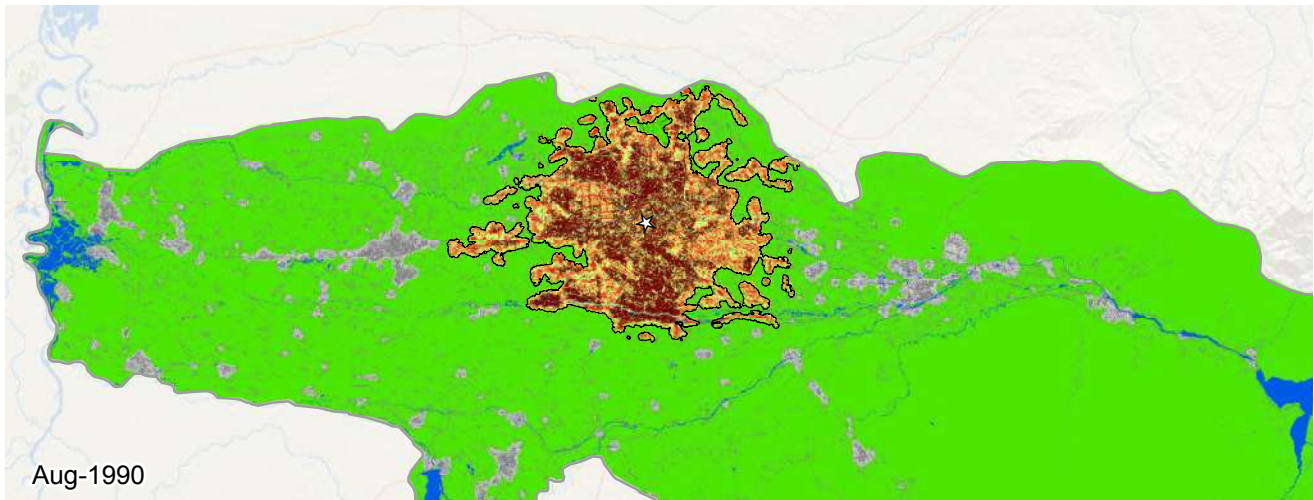
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Tangshan, Hebei, China (East Asia and the Pacific)



Metrics	Sep 1990	Jul 2000	Jul 2013	% Annual Change ('00-'13)
Population	819,327	1,139,997	2,699,869	6.6
Built-up Area (Hectares)				
Total	7,766	12,568	58,221	11.8
Urban	5,677	9,131	39,210	11.2
Suburban	1,934	3,196	17,903	13.3
Rural	155	239	1,106	11.8
Open space (Hectares)				
Urbanized Open Space	3,749	6,313	32,013	12.5
Urban Extent	11,516	18,881	90,235	12.0
Density (Persons / Hectare)				
Built-up Area Density	105.5	90.7	46.4	-5.2
Urban Extent Density	71.1	60.4	29.9	-5.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.67	0.67	0.65	-0.2
Openness Index	0.33	0.32	0.36	0.8
Compactness (Roundness)				
Proximity	0.81	0.77	0.70	-0.7
Cohesion	0.80	0.75	0.69	-0.7
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	935	19%	2,845	6%
Extension	1,741	36%	20,706	45%
Leapfrog	49	1%	803	1%
Inclusion	2,074	43%	21,297	46%



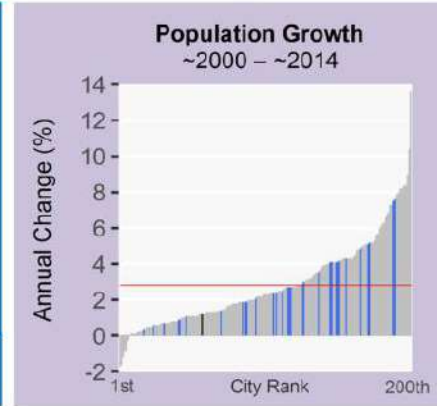
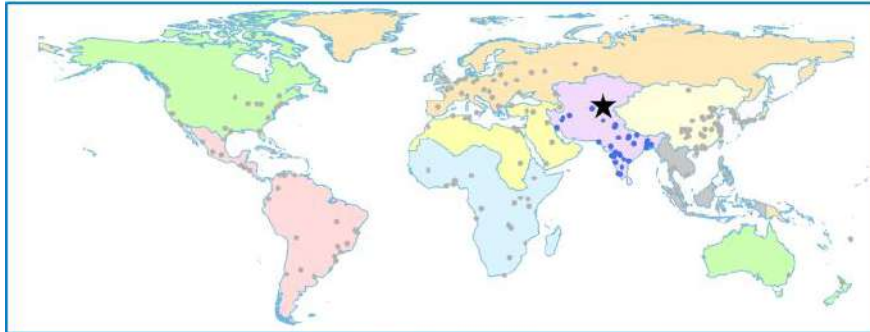


**Tashkent, Uzbekistan
1990-2013**

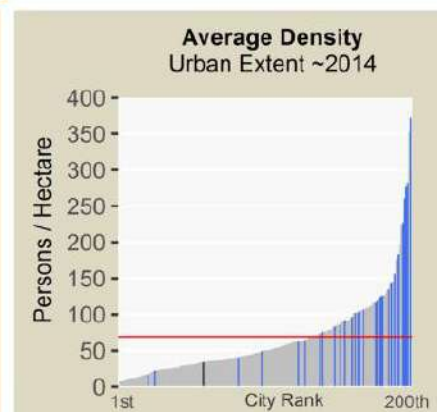
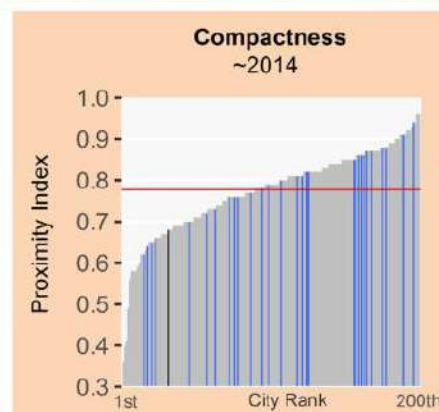
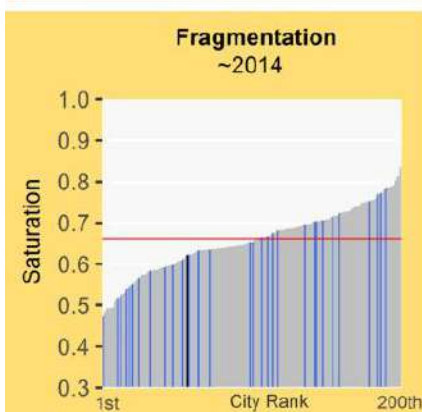
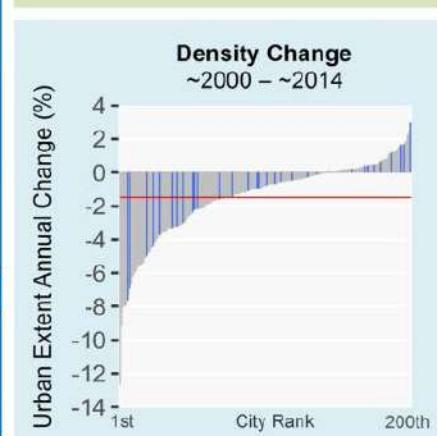
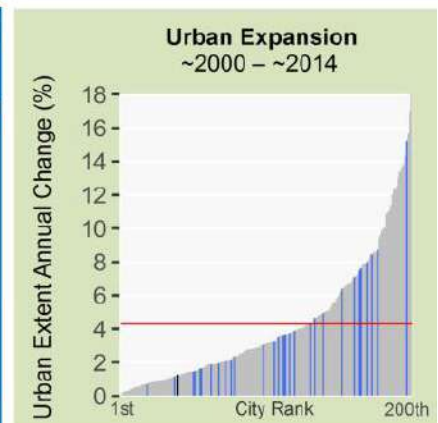
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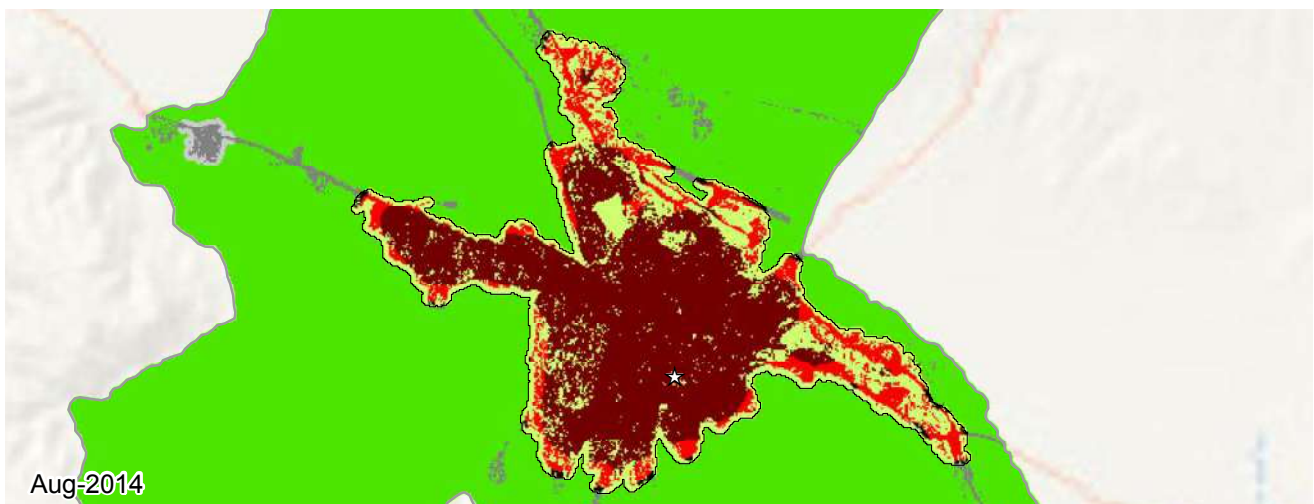
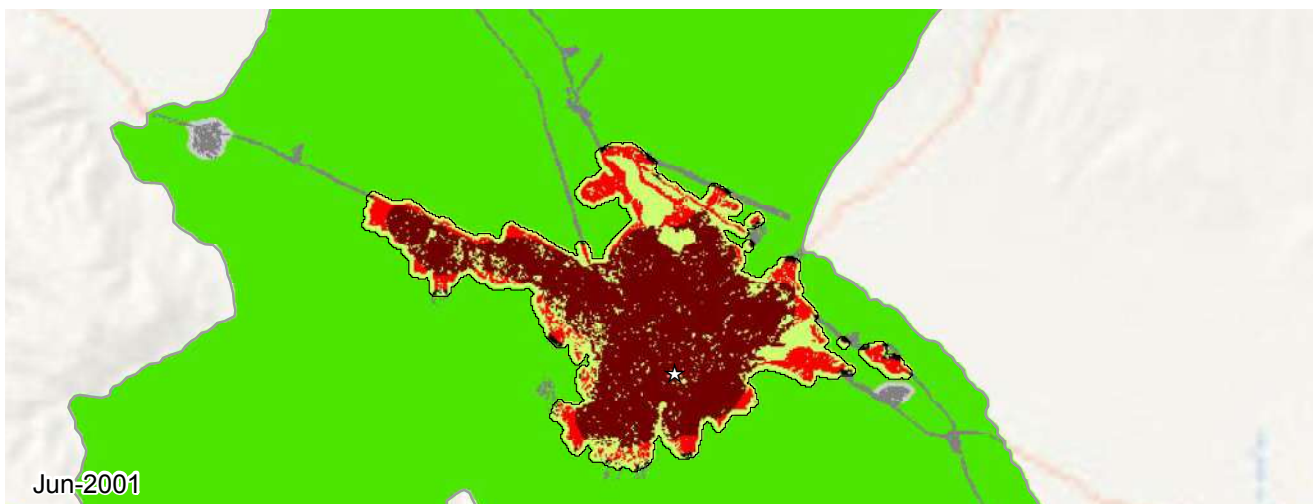
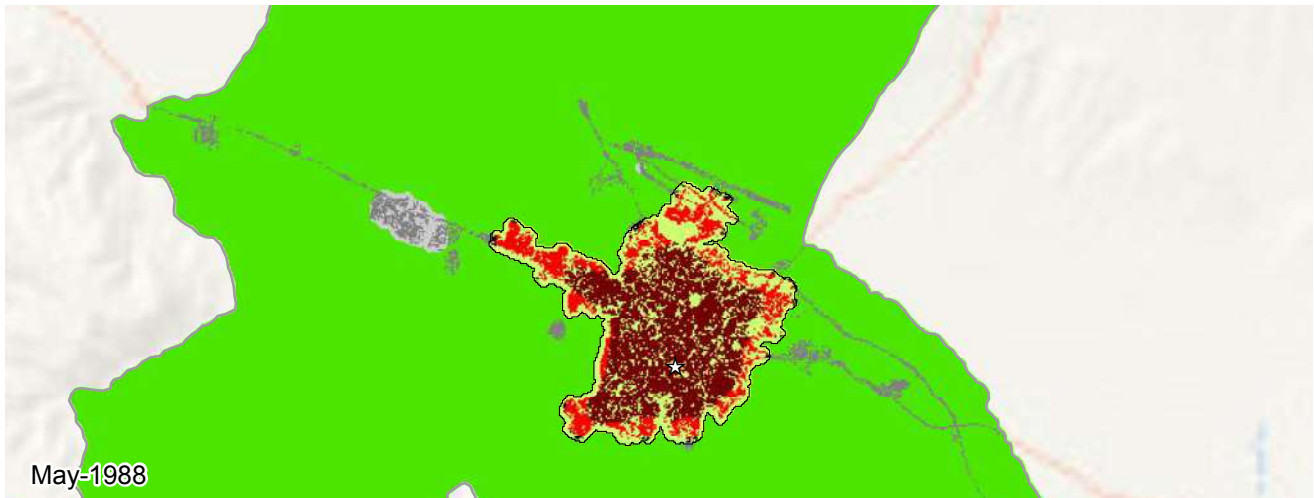
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Tashkent, Uzbekistan (South and Central Asia)



Metrics	Aug 1990	Oct 1999	Sep 2013	% Annual Change ('99-'13)
Population	2,314,219	2,886,114	3,428,914	1.2
Built-up Area (Hectares)				
Total	26,207	52,030	63,449	1.4
Urban	16,331	37,571	47,173	1.6
Suburban	9,259	13,500	15,216	0.9
Rural	615	958	1,059	0.7
Open space (Hectares)				
Urbanized Open Space	24,413	33,589	38,550	1.0
Urban Extent	50,620	85,619	102,000	1.3
Density (Persons / Hectare)				
Built-up Area Density	88.3	55.5	54.0	-0.2
Urban Extent Density	45.7	33.7	33.6	-0.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.52	0.61	0.62	0.2
Openness Index	0.43	0.32	0.31	-0.0
Compactness (Roundness)				
Proximity	0.93	0.74	0.68	-0.7
Cohesion	0.92	0.71	0.64	-0.7
Added Area (Hectares)	'90-'99	Share	'99-'13	Share
Infill	11,713	45%	5,128	44%
Extension	4,649	18%	919	8%
Leapfrog	105	0%	243	2%
Inclusion	9,355	36%	5,127	44%

















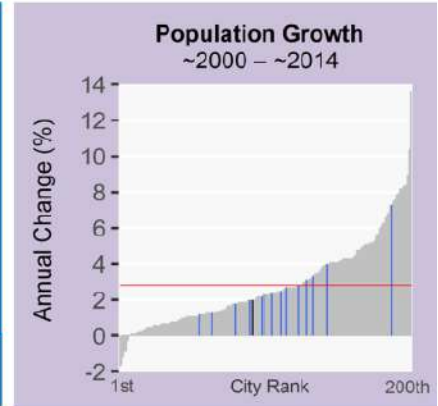
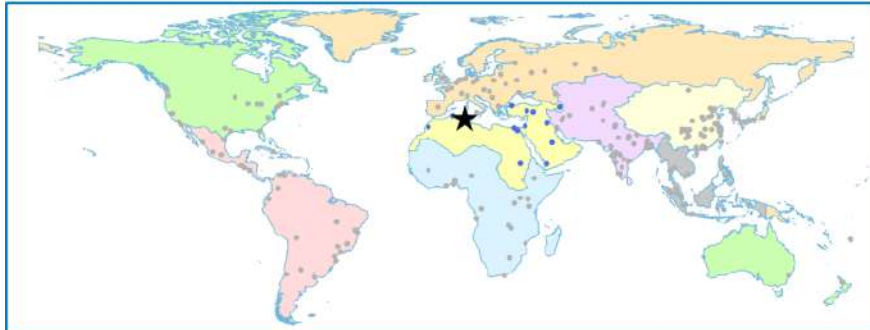
**Tebessa, Algeria
1988-2014**

0 1 2 3 4 km

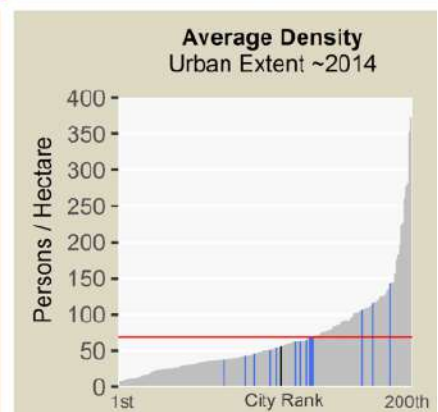
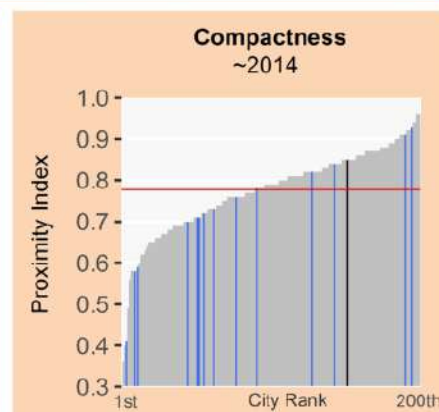
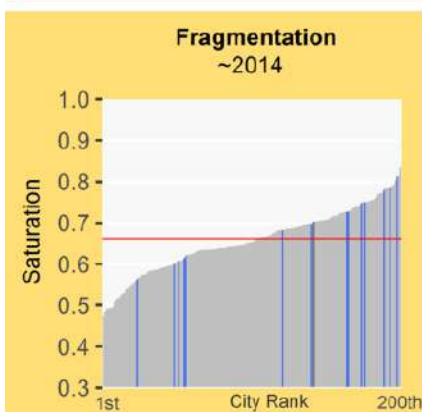
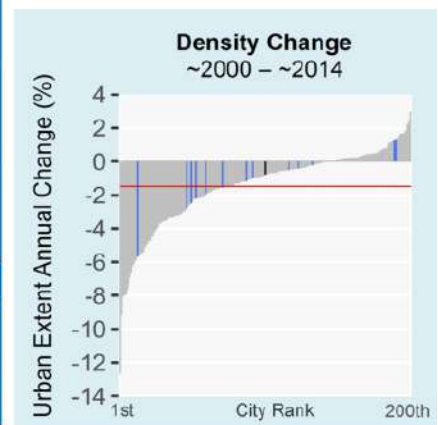
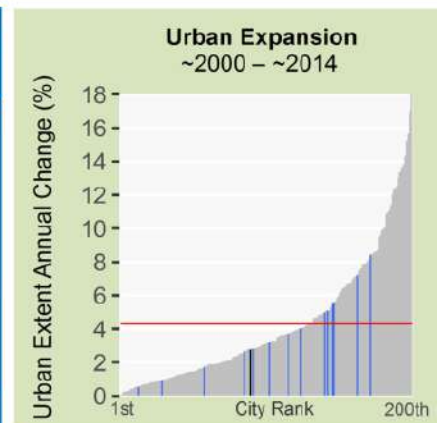
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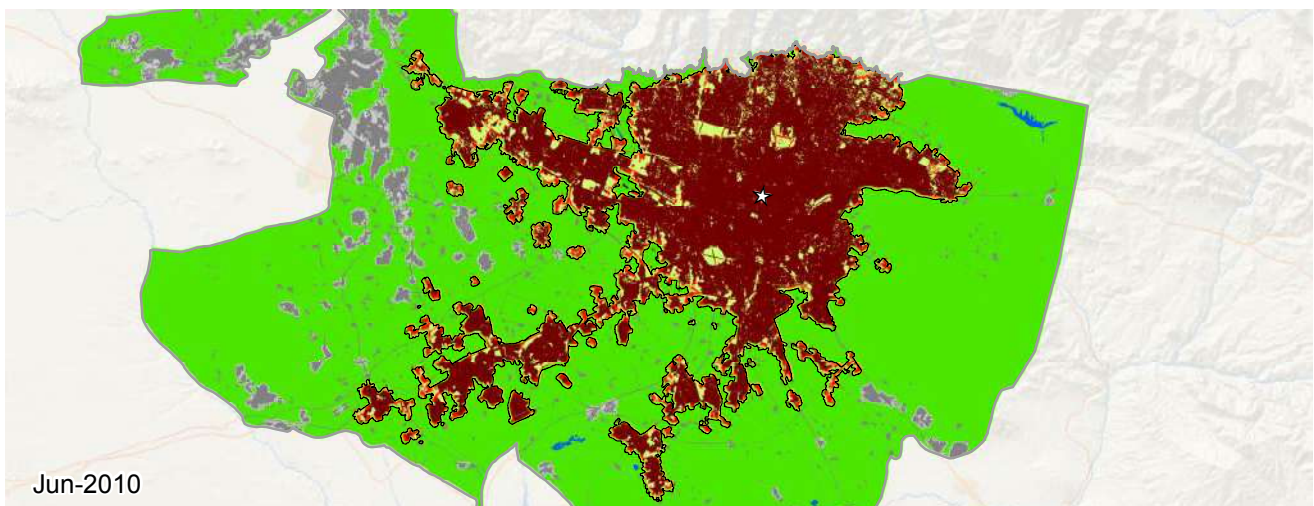
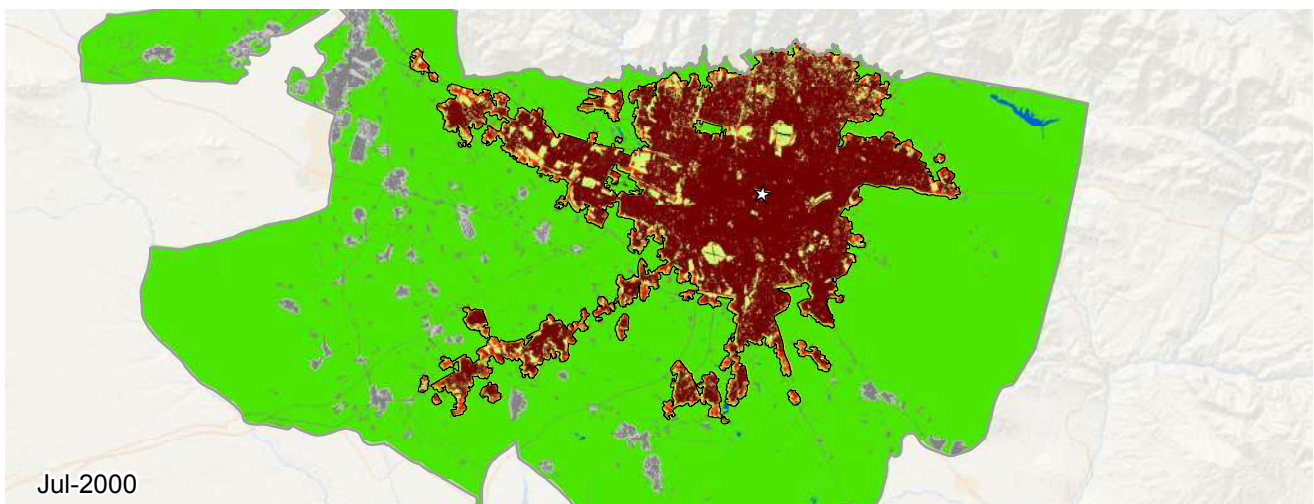
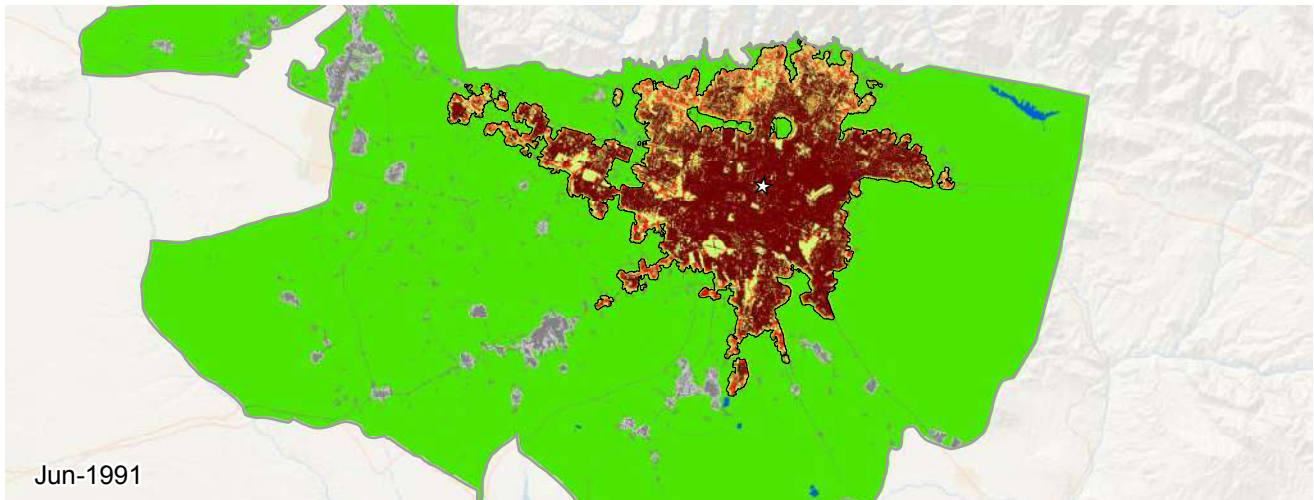
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Tebessa, Algeria (Western Asia and North Africa)



Metrics	May 1988	Jun 2001	Aug 2014	% Annual Change ('01-'14)
Population	100,969	156,741	203,542	2.0
Built-up Area (Hectares)				
Total	919	1,795	2,578	2.7
Urban	642	1,414	2,022	2.7
Suburban	259	348	517	3.0
Rural	17	33	39	1.2
Open space (Hectares)				
Urbanized Open Space	600	748	1,087	2.8
Urban Extent	1,520	2,544	3,666	2.8
Density (Persons / Hectare)				
Built-up Area Density	109.8	87.3	78.9	-0.8
Urban Extent Density	66.4	61.6	55.5	-0.8
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.60	0.71	0.70	-0.0
Openness Index	0.40	0.28	0.27	-0.2
Compactness (Roundness)				
Proximity	0.93	0.86	0.85	-0.0
Cohesion	0.92	0.83	0.83	-0.0
Added Area (Hectares)	'88-'01	Share	'01-'14	Share
Infill	318	36%	176	22%
Extension	390	44%	459	58%
Leapfrog	0	0%	0	0%
Inclusion	167	19%	147	18%

















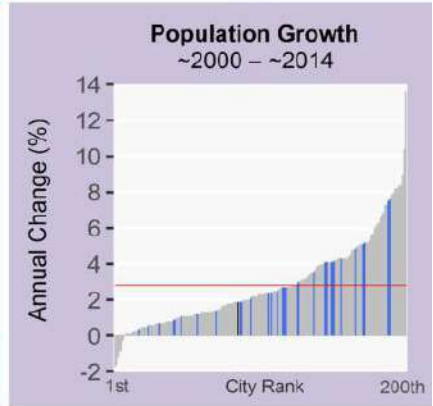
**Tehran, Iran
1991-2010**

0 6 12 18 24 km

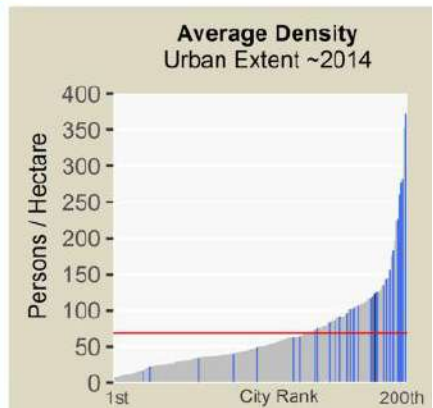
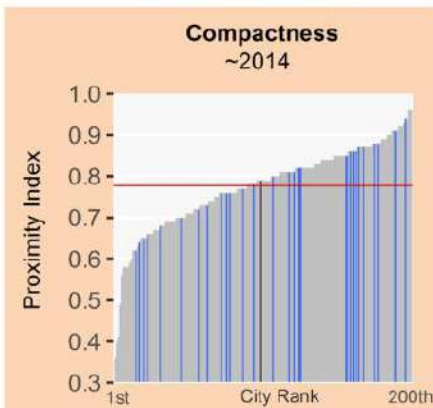
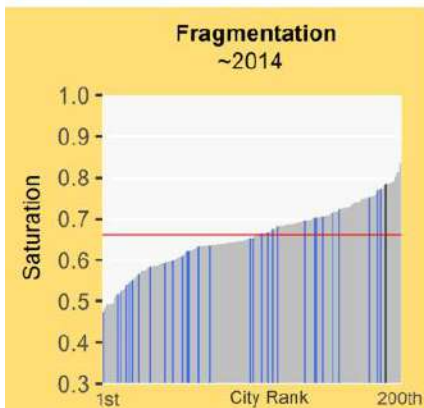
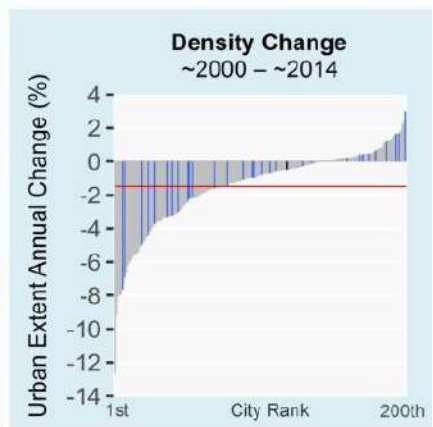
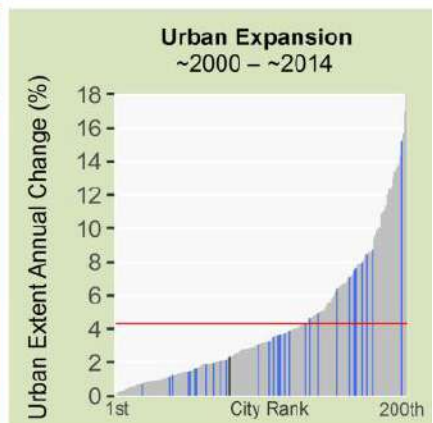
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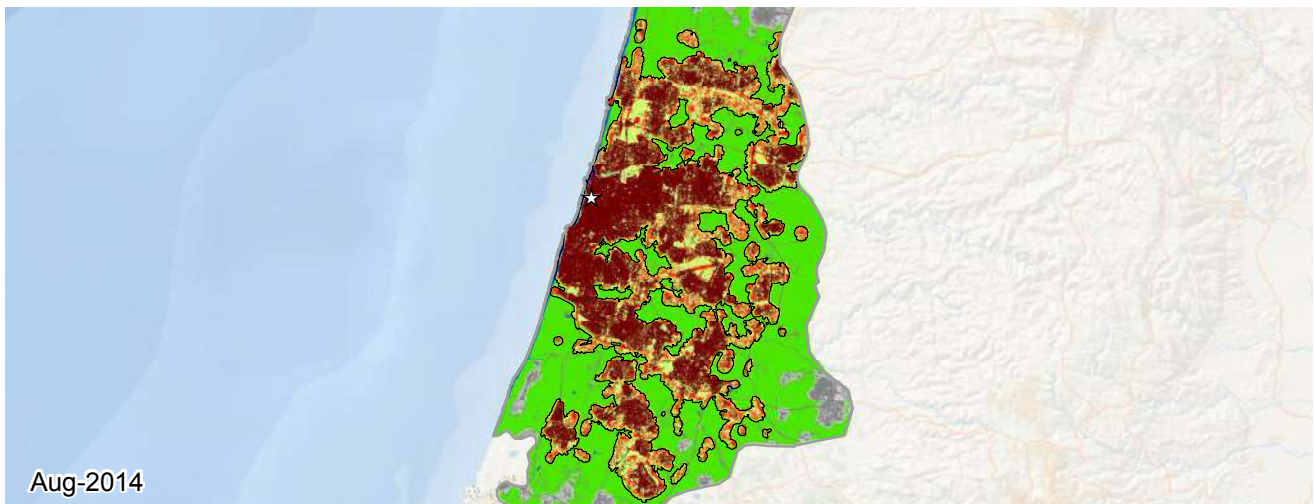
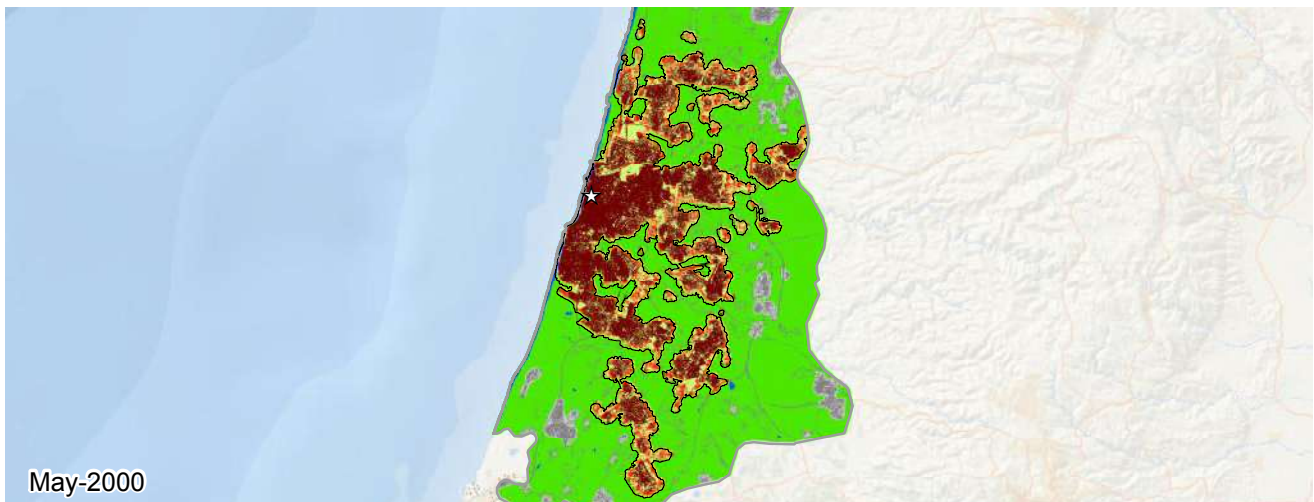
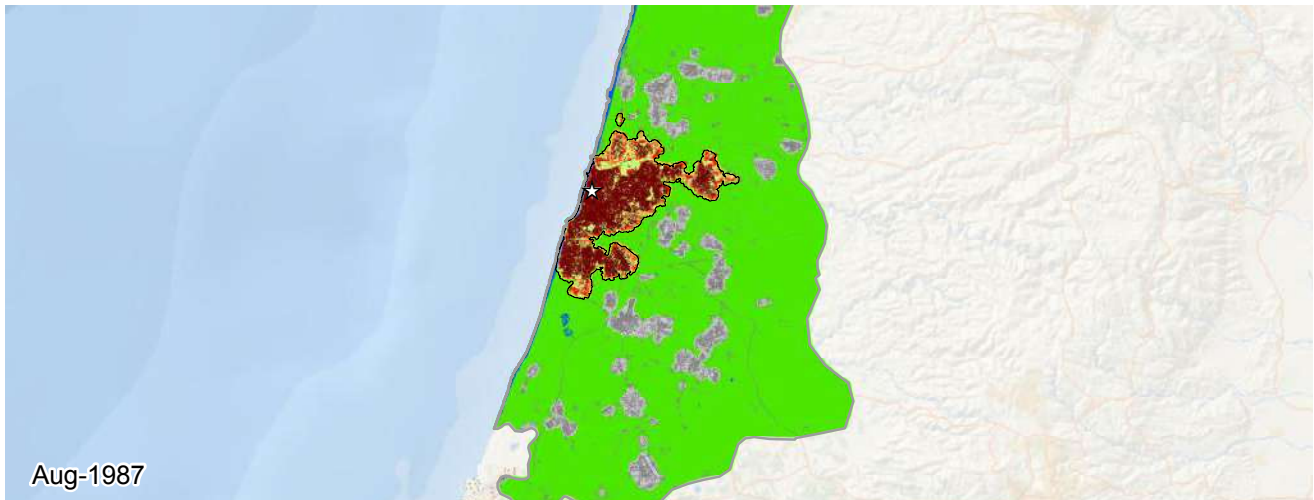
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Tehran, Iran (South and Central Asia)



Metrics	Jun 1991	Jul 2000	Jun 2010	% Annual Change ('00-'10)
Population	6,254,309	8,025,064	9,675,929	1.9
Built-up Area (Hectares)				
Total	32,148	47,429	61,367	2.6
Urban	26,722	41,825	54,161	2.6
Suburban	5,041	5,157	6,647	2.6
Rural	384	446	558	2.2
Open space (Hectares)				
Urbanized Open Space	14,954	14,575	17,030	1.6
Urban Extent	47,103	62,004	78,397	2.4
Density (Persons / Hectare)				
Built-up Area Density	194.5	169.2	157.7	-0.7
Urban Extent Density	132.8	129.4	123.4	-0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.68	0.76	0.78	0.2
Openness Index	0.26	0.20	0.19	-0.4
Compactness (Roundness)				
Proximity	0.87	0.81	0.79	-0.3
Cohesion	0.85	0.79	0.77	-0.2
Added Area (Hectares)	'91-'00	Share	'00-'10	Share
Infill	7,384	48%	4,487	32%
Extension	4,548	29%	4,228	30%
Leapfrog	232	1%	2,264	16%
Inclusion	3,115	20%	2,956	21%





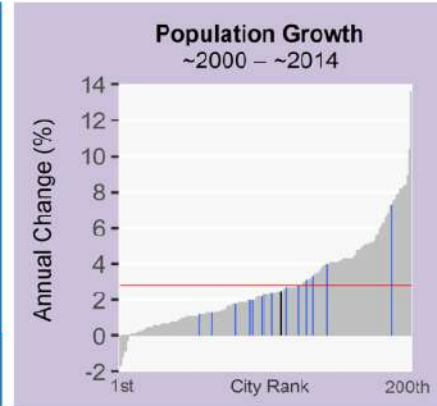
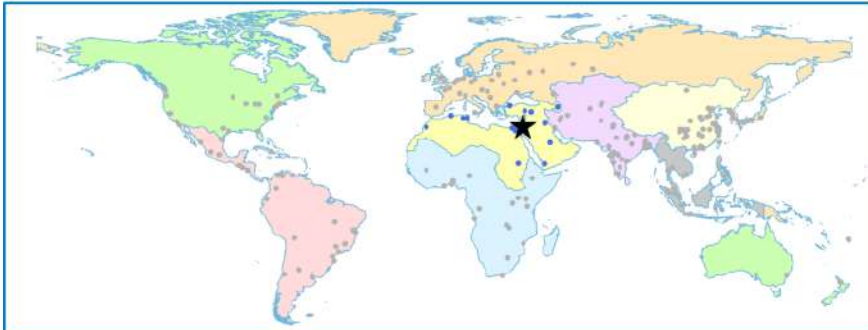
**Tel Aviv, Israel
1987-2014**

0 5 10 15 20 km

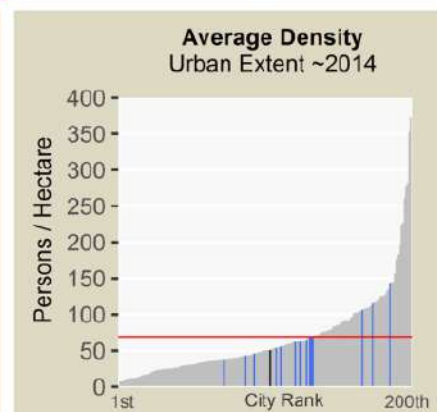
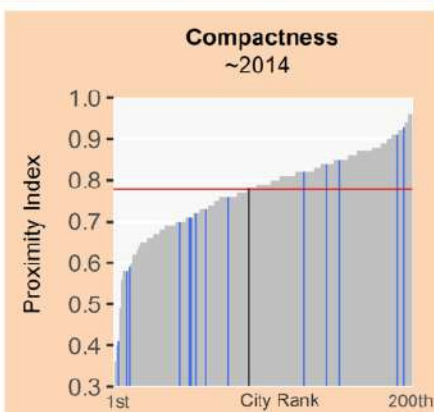
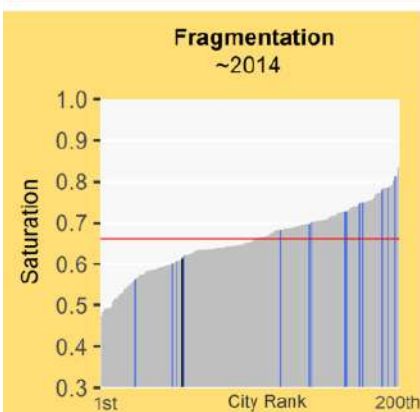
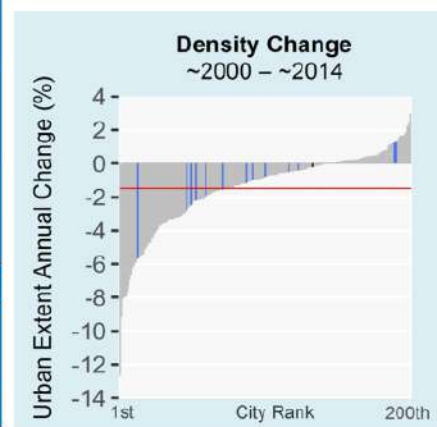
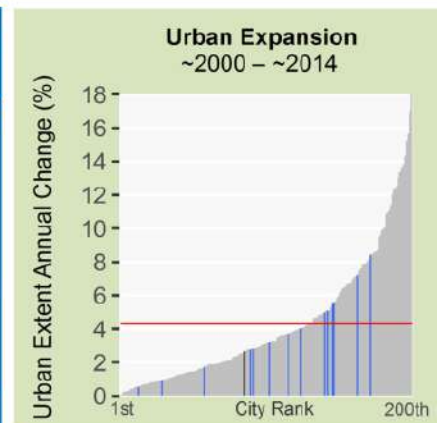
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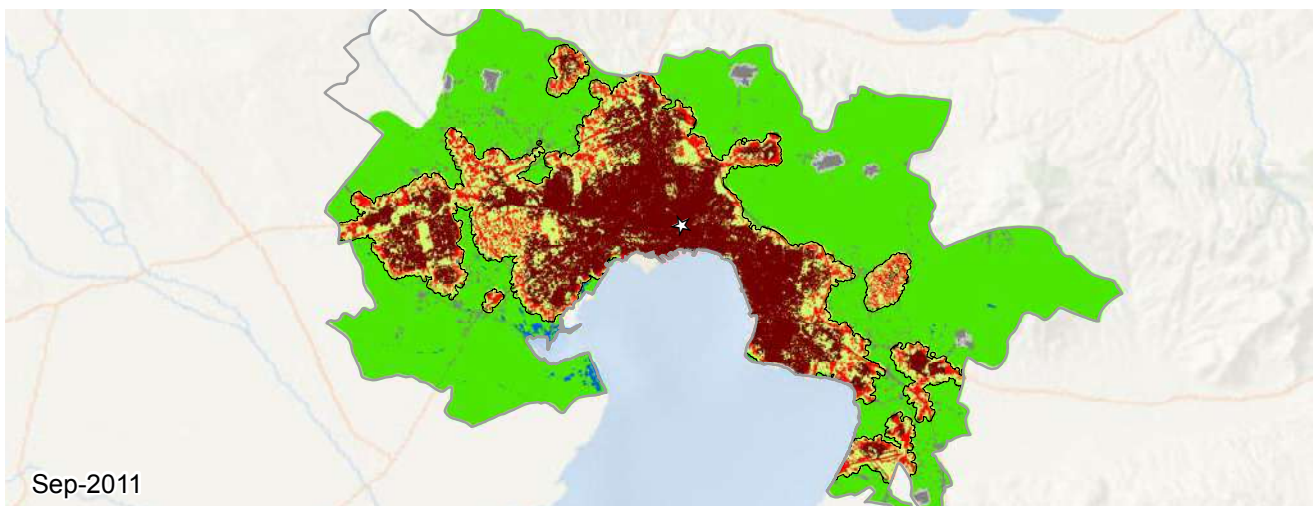
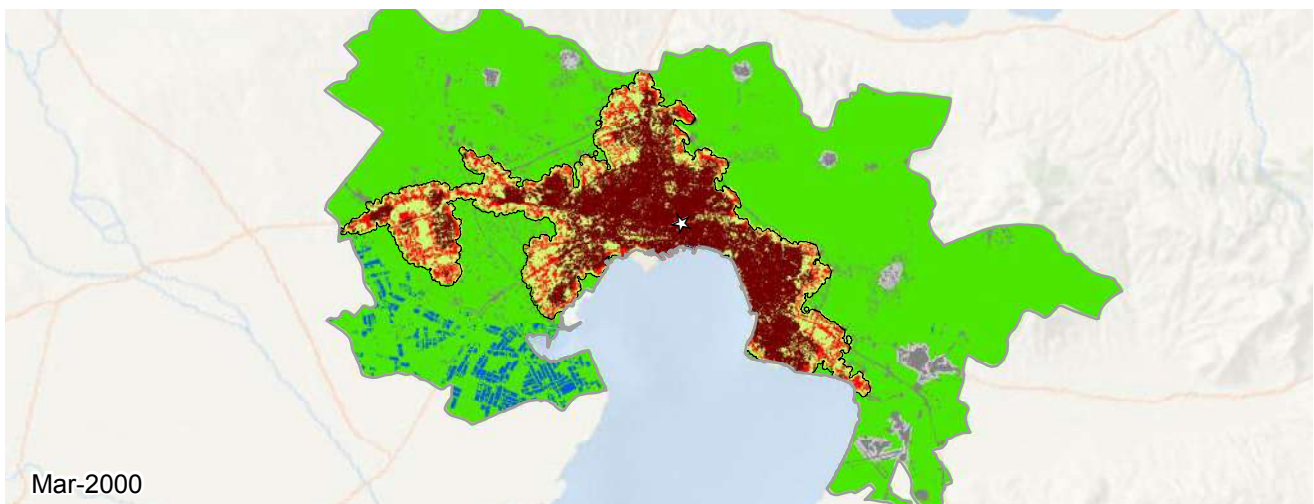
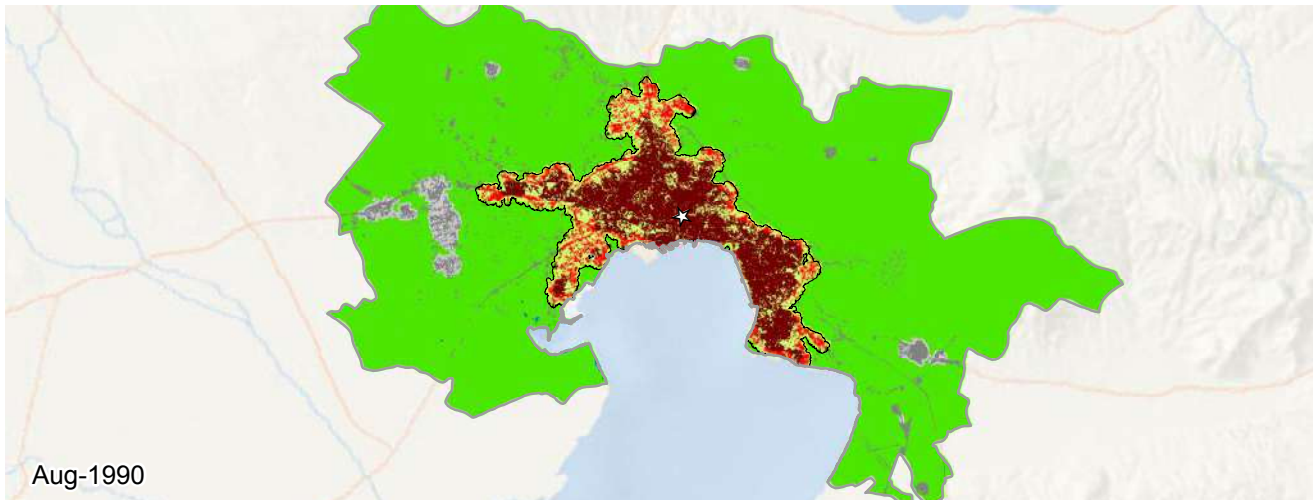
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Tel Aviv, Israel (Western Asia and North Africa)



Metrics	Aug 1987	May 2000	Aug 2014	% Annual Change ('00-'14)
Population	967,661	1,953,108	2,774,395	2.5
Built-up Area (Hectares)				
Total	7,303	22,665	33,397	2.7
Urban	5,858	16,766	24,418	2.6
Suburban	1,362	5,437	8,281	3.0
Rural	82	462	696	2.9
Open space (Hectares)				
Urbanized Open Space	3,659	14,359	20,921	2.6
Urban Extent	10,963	37,024	54,318	2.7
Density (Persons / Hectare)				
Built-up Area Density	132.5	86.2	83.1	-0.3
Urban Extent Density	88.3	52.8	51.1	-0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.67	0.61	0.61	0.0
Openness Index	0.28	0.34	0.32	-0.3
Compactness (Roundness)				
Proximity	0.79	0.72	0.78	0.6
Cohesion	0.78	0.71	0.77	0.6
Added Area (Hectares)	'87-'00	Share	'00-'14	Share
Infill	3,017	19%	3,679	34%
Extension	6,147	40%	3,563	33%
Leapfrog	0	0%	61	0%
Inclusion	6,196	40%	3,426	31%

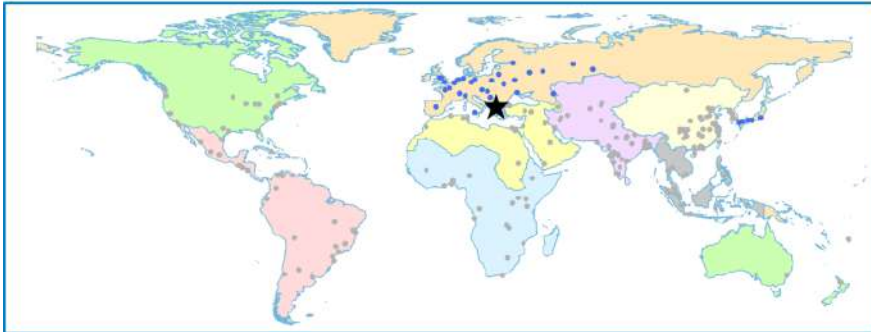




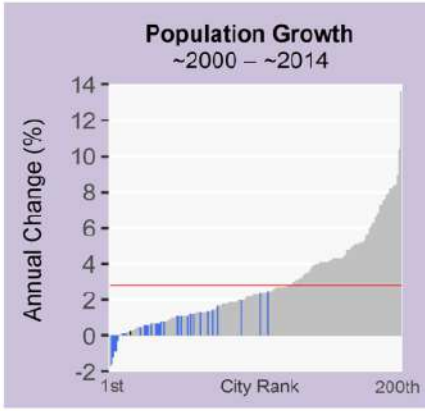
**Thessaloniki, Greece
1990-2011**

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

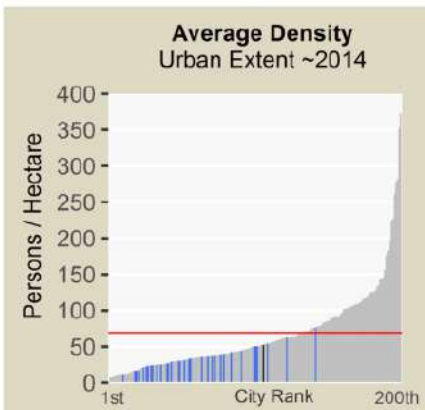
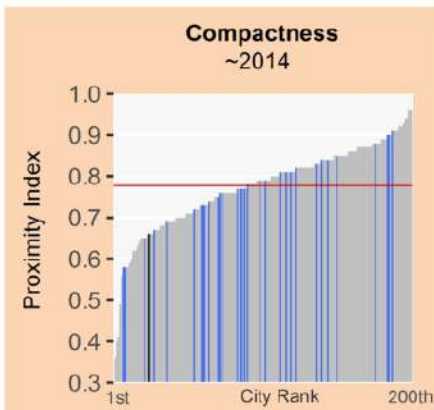
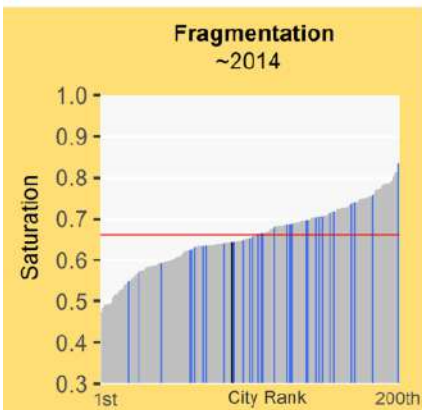
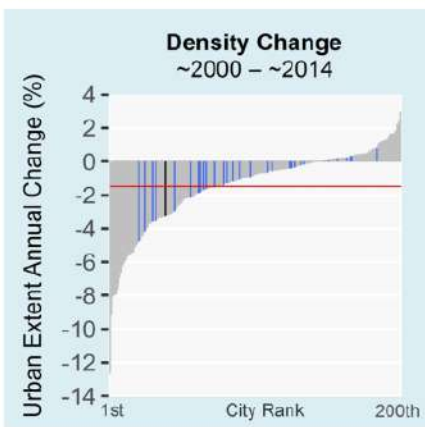
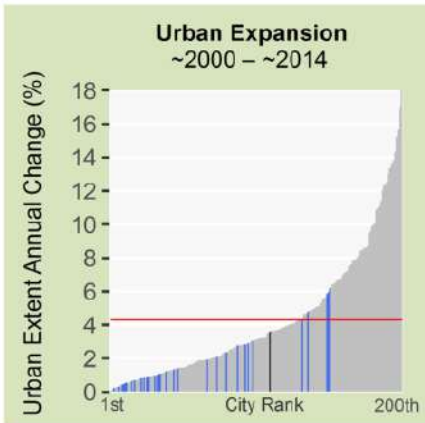
Thessaloniki, Greece (Europe and Japan)

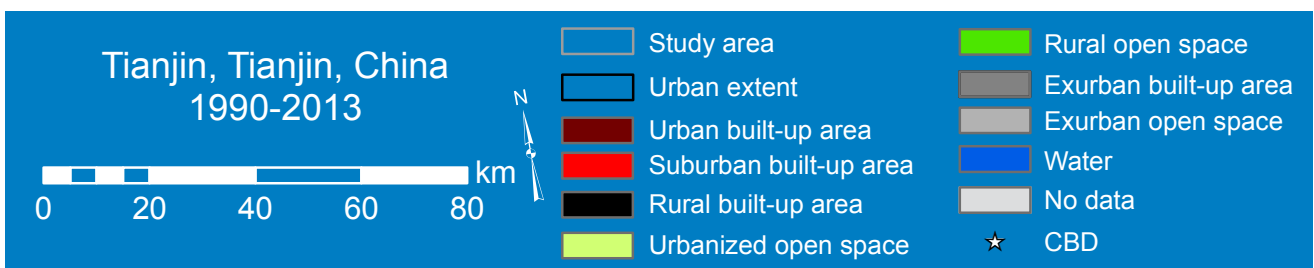
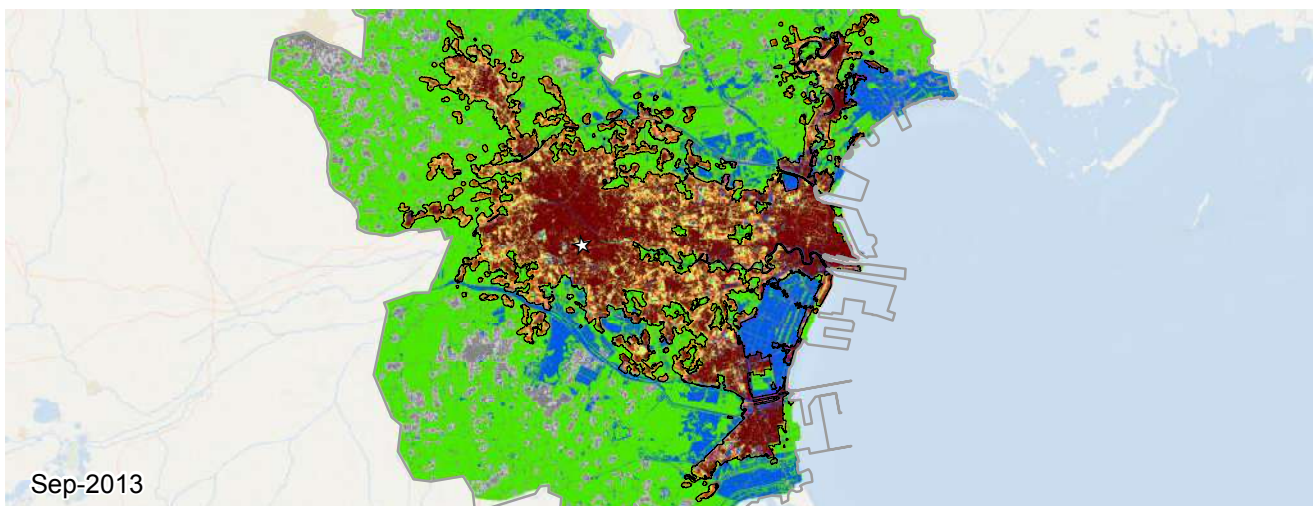
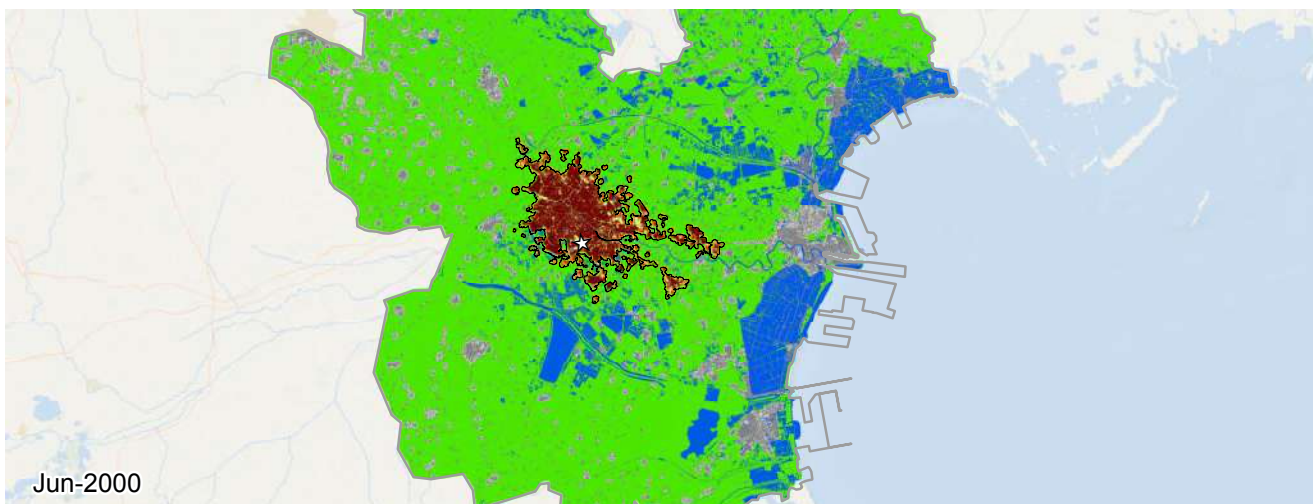
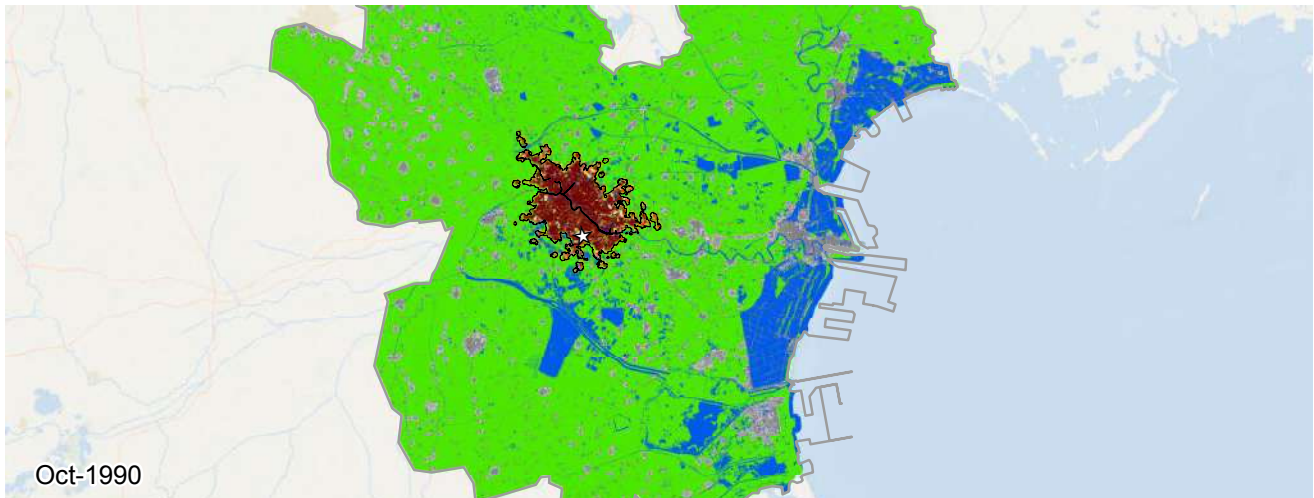



Legend for Charts
 Thessaloniki | Other cities in region | All other cities | Global average —

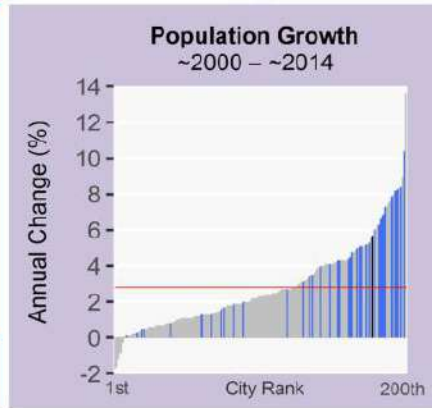


Metrics	Aug 1990	Mar 2000	Sep 2011	% Annual Change ('00-'11)
Population	744,993	828,396	859,430	0.3
Built-up Area (Hectares)				
Total	4,542	6,887	10,567	3.7
Urban	3,428	5,195	8,008	3.8
Suburban	1,046	1,591	2,401	3.6
Rural	68	100	157	3.9
Open space (Hectares)				
Urbanized Open Space	2,464	4,000	5,879	3.3
Urban Extent	7,007	10,888	16,446	3.6
Density (Persons / Hectare)				
Built-up Area Density	164.0	120.3	81.3	-3.4
Urban Extent Density	106.3	76.1	52.3	-3.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.65	0.63	0.64	0.1
Openness Index	0.32	0.31	0.30	-0.2
Compactness (Roundness)				
Proximity	0.73	0.68	0.66	-0.2
Cohesion	0.71	0.67	0.66	-0.1
Added Area (Hectares)	'90-'00	Share	'00-'11	Share
Infill	844	35%	1,282	34%
Extension	869	36%	1,346	36%
Leapfrog	0	0%	0	0%
Inclusion	649	27%	1,054	28%

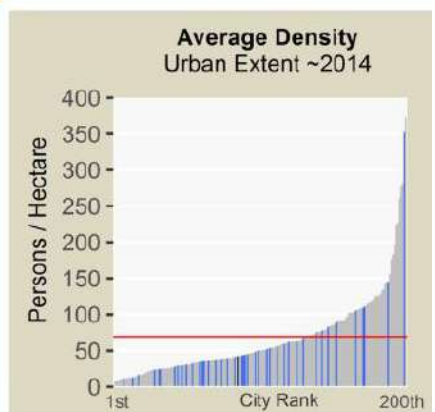
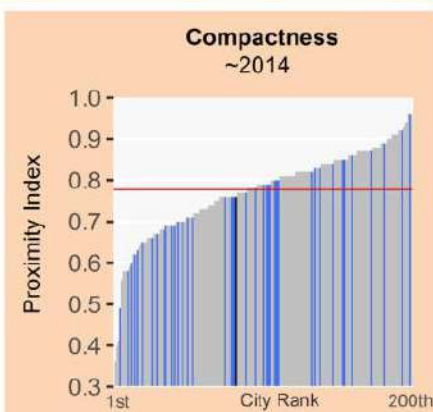
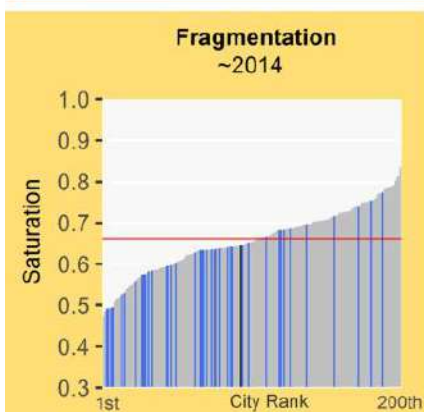
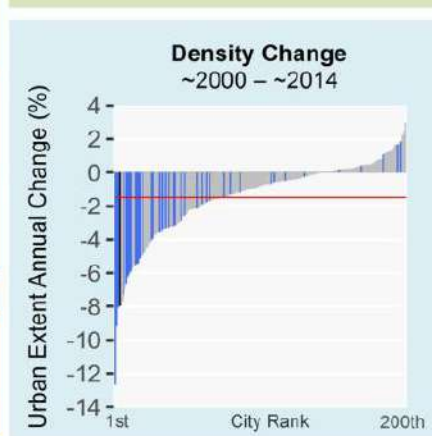
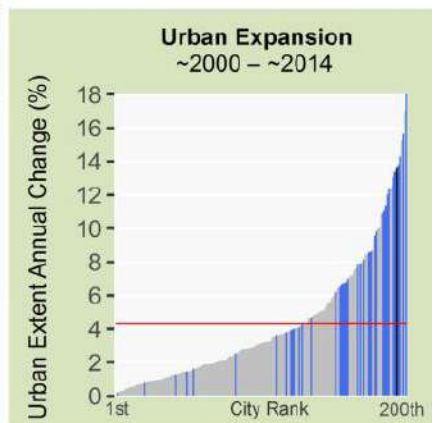


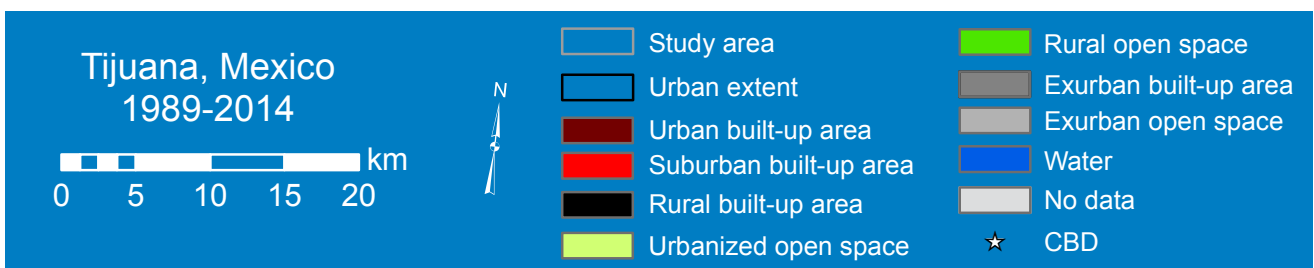
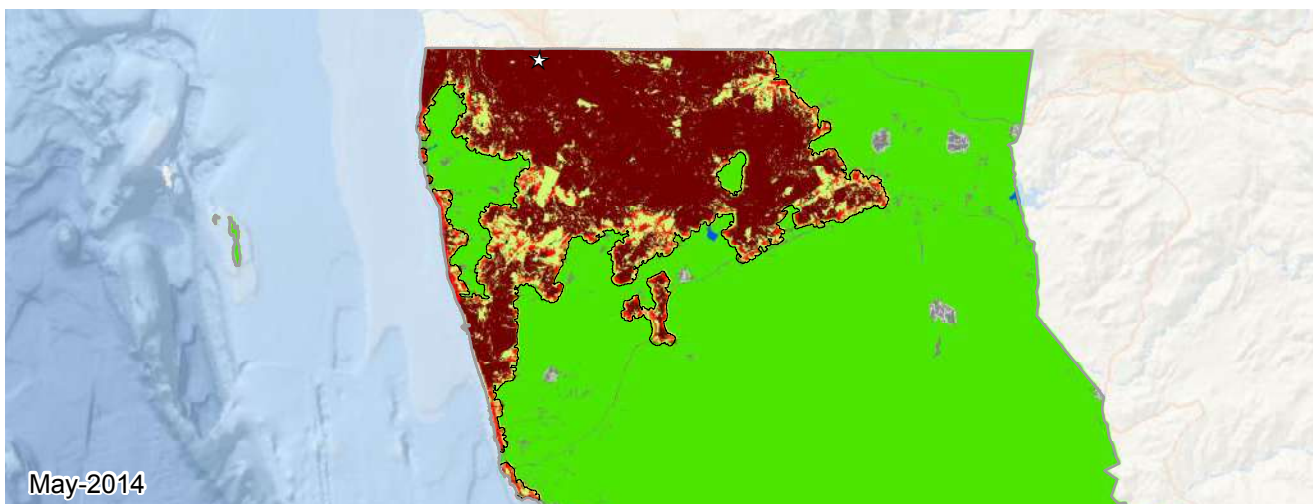
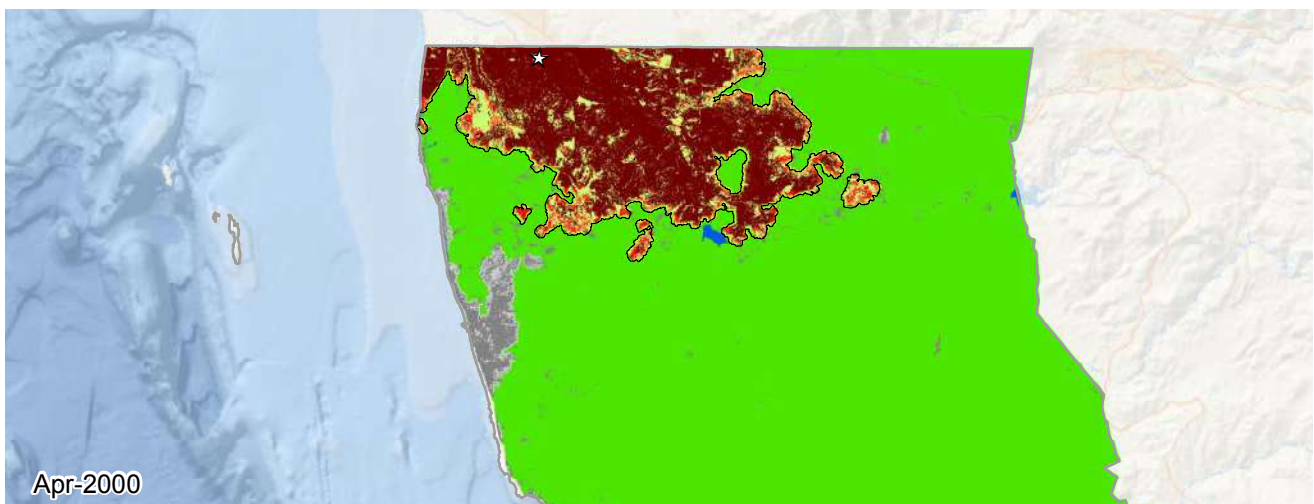
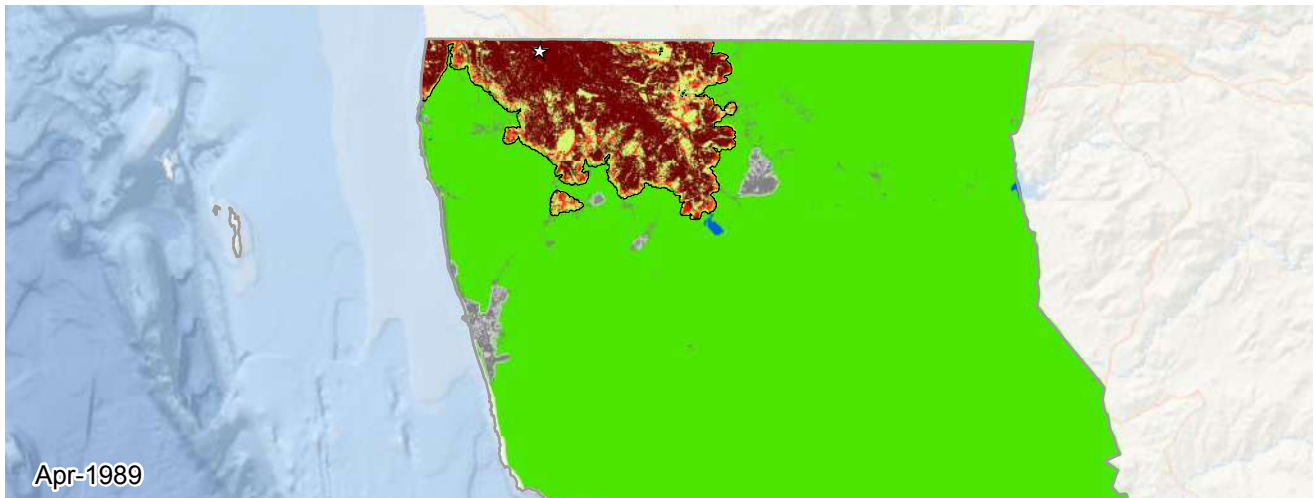


Tianjin, Tianjin, China (East Asia and the Pacific)

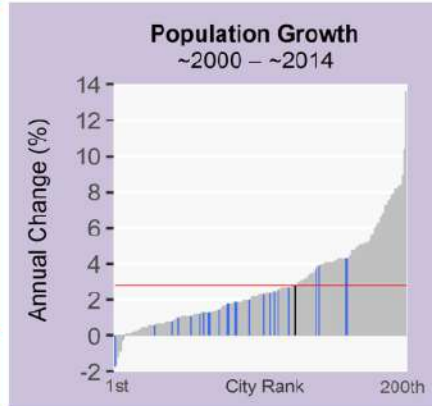


Metrics	Oct 1990	Jun 2000	Sep 2013	% Annual Change ('00-'13)
Population	4,335,420	4,723,410	10,056,077	5.7
Built-up Area (Hectares)				
Total	20,124	27,331	152,442	13.0
Urban	16,723	22,037	111,532	12.2
Suburban	3,145	4,872	38,192	15.5
Rural	254	421	2,717	14.1
Open space (Hectares)				
Urbanized Open Space	7,120	11,033	83,849	15.3
Urban Extent	27,244	38,365	236,291	13.7
Density (Persons / Hectare)				
Built-up Area Density	215.4	172.8	66.0	-7.3
Urban Extent Density	159.1	123.1	42.6	-8.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.74	0.71	0.65	-0.7
Openness Index	0.27	0.28	0.33	1.4
Compactness (Roundness)				
Proximity	0.89	0.80	0.76	-0.4
Cohesion	0.88	0.78	0.74	-0.4
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	861	11%	11,091	8%
Extension	2,463	34%	75,376	60%
Leapfrog	613	8%	174	0%
Inclusion	3,268	45%	38,467	30%

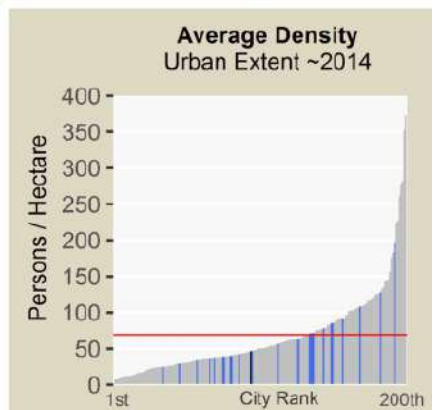
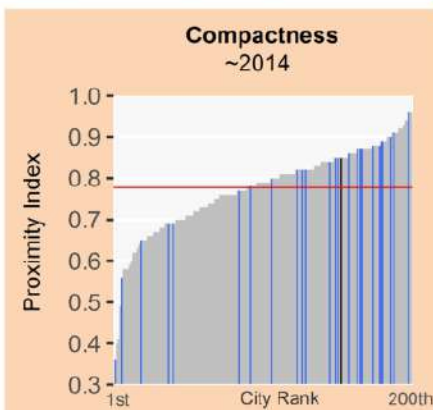
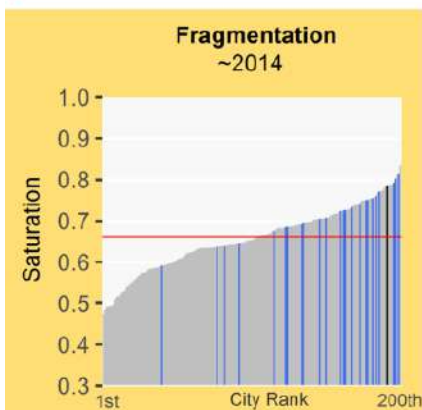
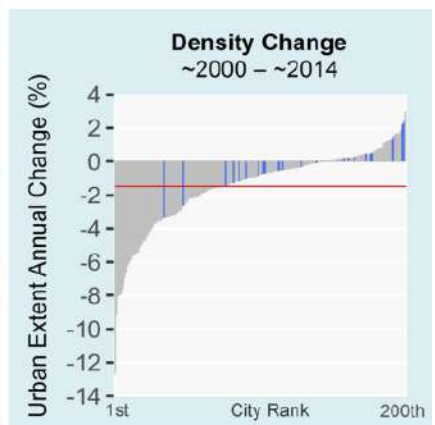
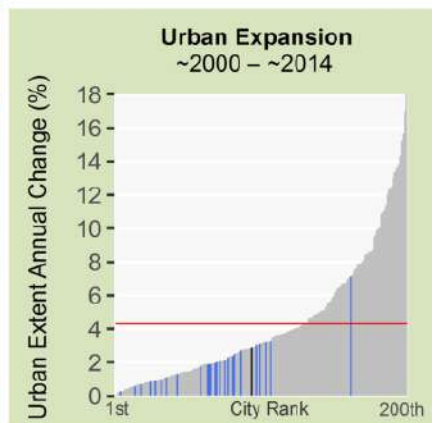


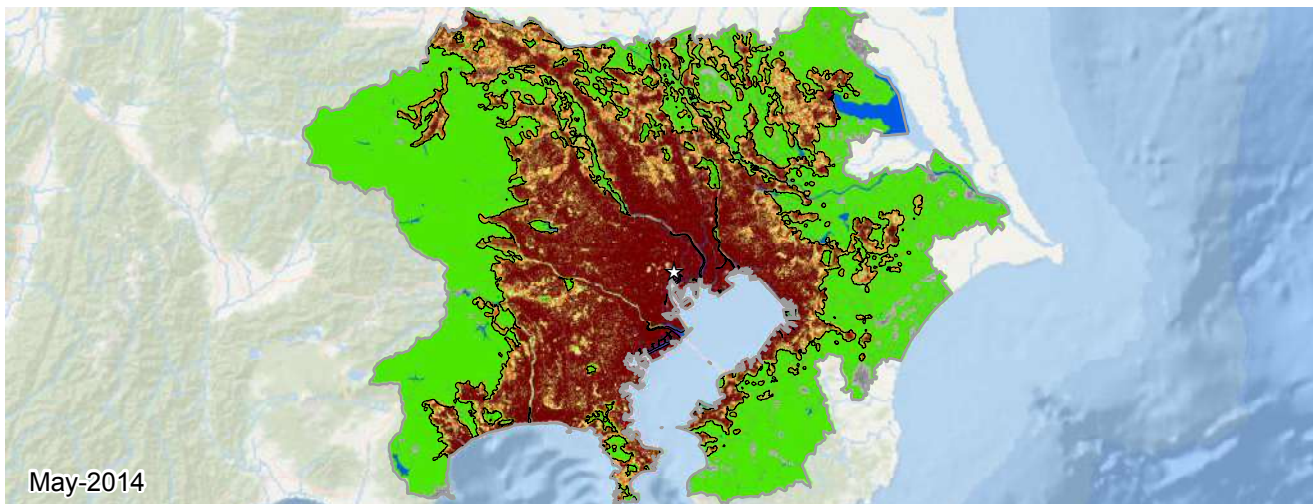
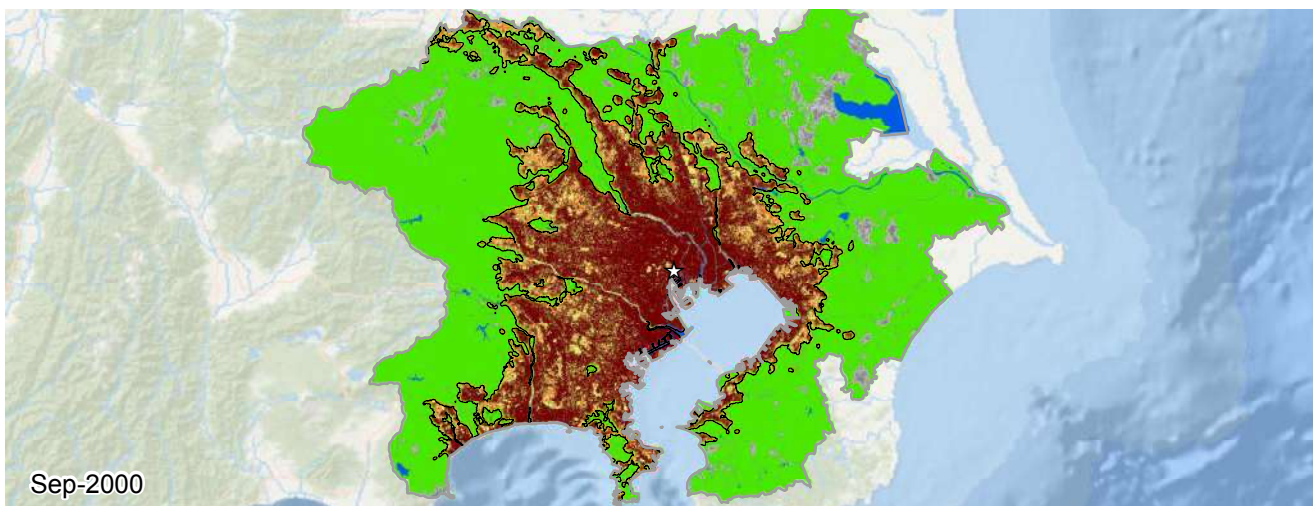
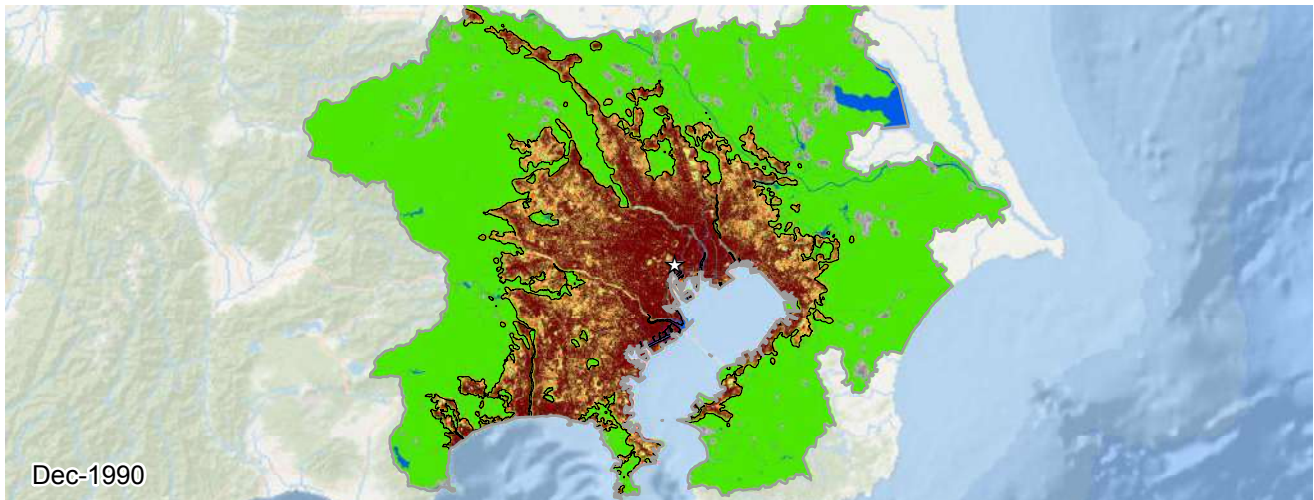


Tijuana, Mexico (Latin America and the Caribbean)



Metrics	Apr 1989	Apr 2000	May 2014	% Annual Change ('00-'14)
Population	605,335	1,156,319	1,706,084	2.8
Built-up Area (Hectares)				
Total	10,753	18,798	28,626	3.0
Urban	9,368	17,032	25,718	2.9
Suburban	1,296	1,638	2,731	3.6
Rural	88	127	176	2.3
Open space (Hectares)				
Urbanized Open Space	4,791	5,622	7,916	2.4
Urban Extent	15,544	24,420	36,542	2.9
Density (Persons / Hectare)				
Built-up Area Density	56.3	61.5	59.6	-0.2
Urban Extent Density	38.9	47.3	46.7	-0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.69	0.77	0.78	0.1
Openness Index	0.26	0.19	0.17	-0.7
Compactness (Roundness)				
Proximity	0.88	0.86	0.85	-0.1
Cohesion	0.87	0.85	0.83	-0.2
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	2,560	31%	3,143	32%
Extension	4,587	56%	3,791	38%
Leapfrog	3	0%	465	4%
Inclusion	901	11%	2,352	24%





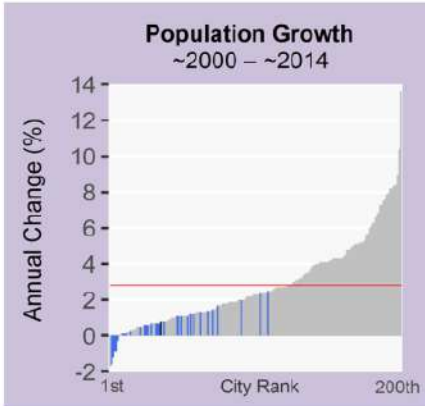
**Tokyo, Japan
1990-2014**

0 20 40 60 80 km

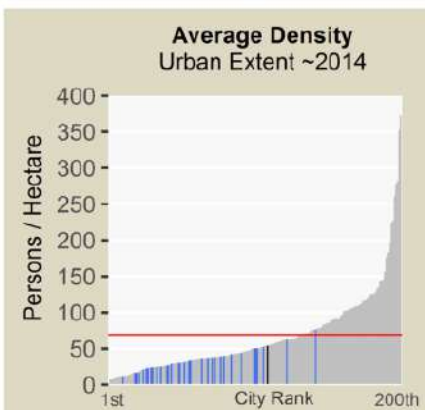
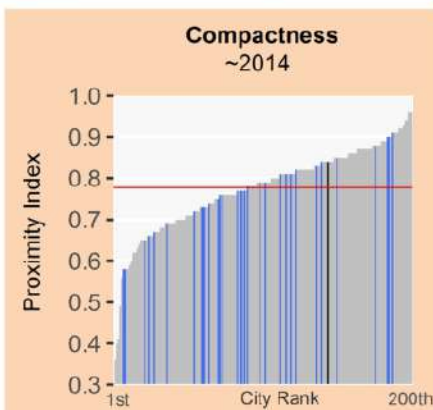
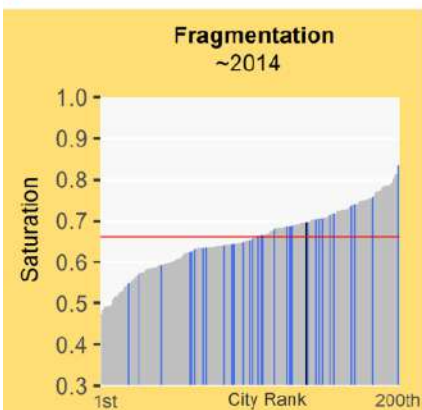
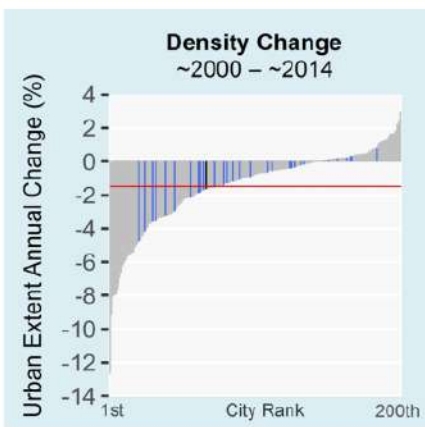
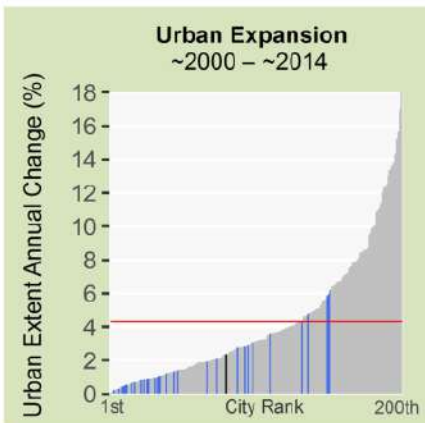
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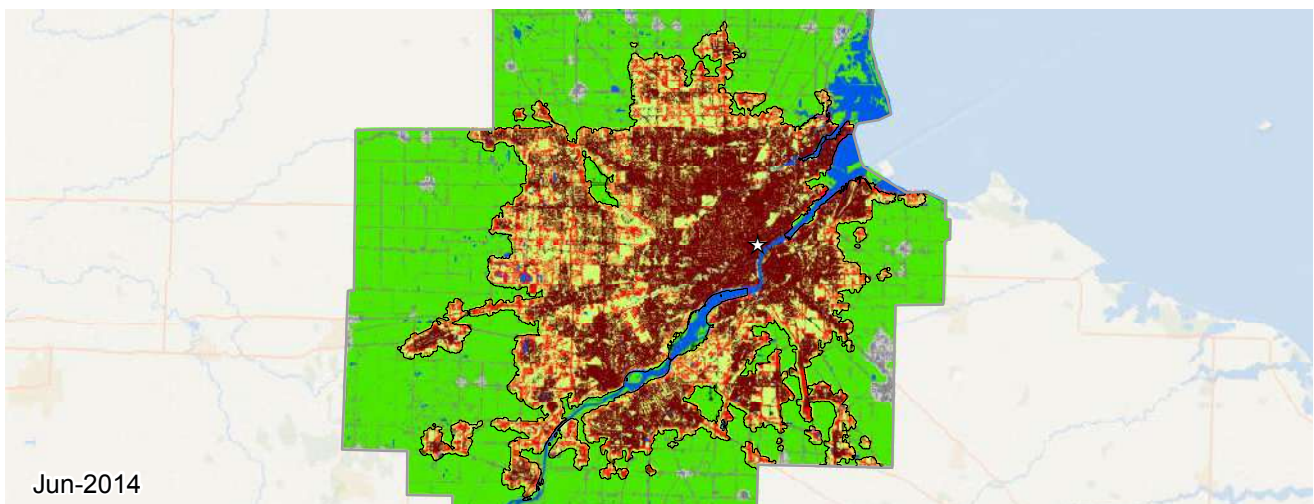
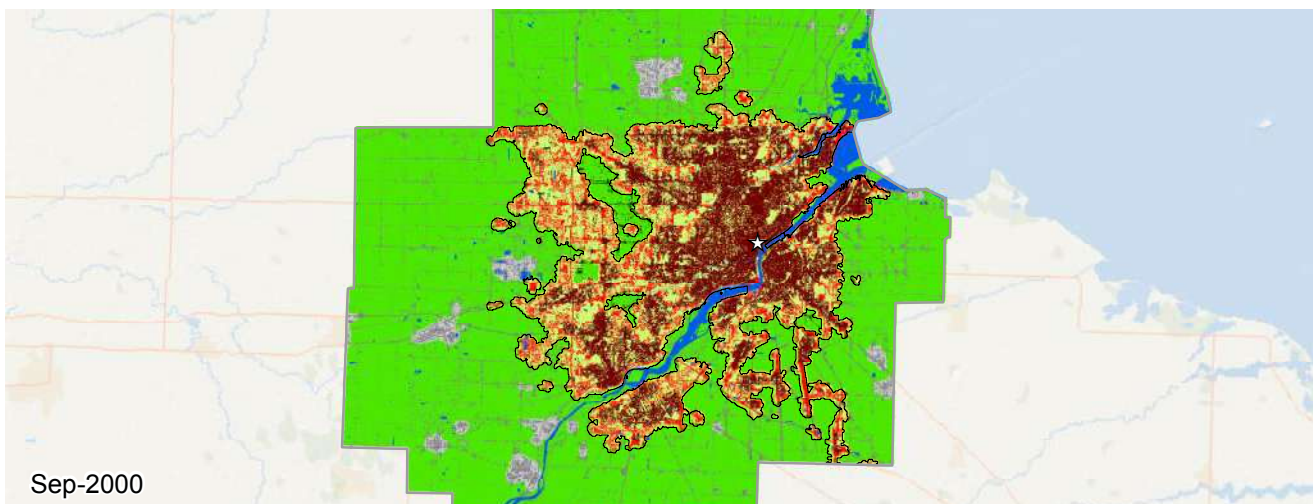
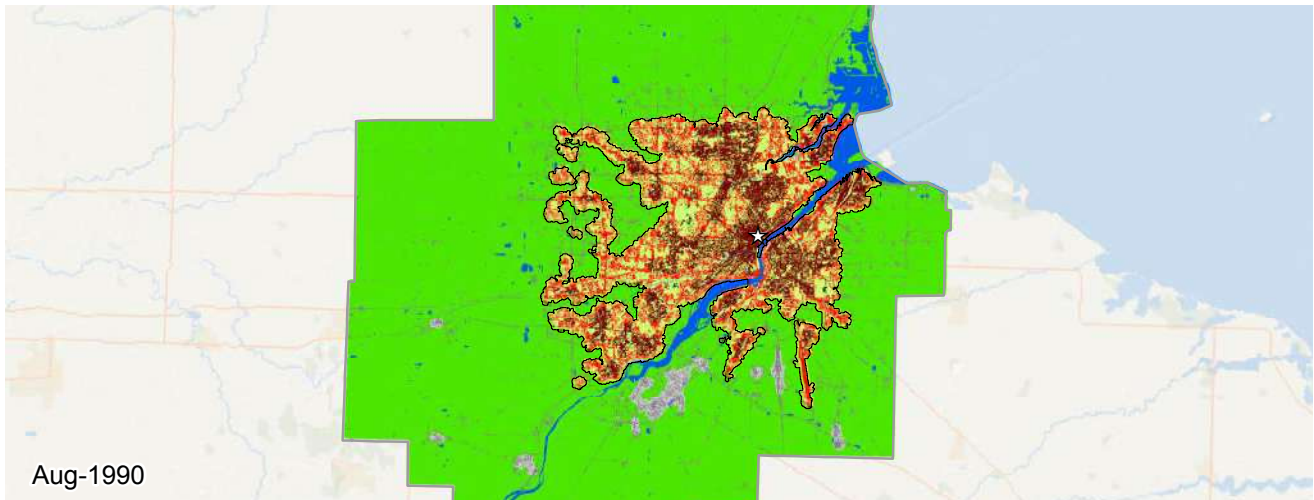
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Tokyo, Japan (Europe and Japan)



Metrics	Dec 1990	Sep 2000	May 2014	% Annual Change ('00-'14)
Population	29,181,160	31,349,977	34,765,638	0.8
Built-up Area (Hectares)				
Total	278,694	324,835	448,929	2.4
Urban	233,259	281,859	380,755	2.2
Suburban	43,068	40,276	63,408	3.3
Rural	2,366	2,699	4,765	4.2
Open space (Hectares)				
Urbanized Open Space	139,208	139,054	194,310	2.4
Urban Extent	417,903	463,889	643,240	2.4
Density (Persons / Hectare)				
Built-up Area Density	104.7	96.5	77.4	-1.6
Urban Extent Density	69.8	67.6	54.0	-1.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.67	0.70	0.70	-0.0
Openness Index	0.28	0.25	0.23	-0.4
Compactness (Roundness)				
Proximity	0.84	0.83	0.84	0.1
Cohesion	0.83	0.81	0.82	0.1
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	28,172	60%	52,176	42%
Extension	8,917	19%	44,314	35%
Leapfrog	1,088	2%	67	0%
Inclusion	8,042	17%	27,643	22%

















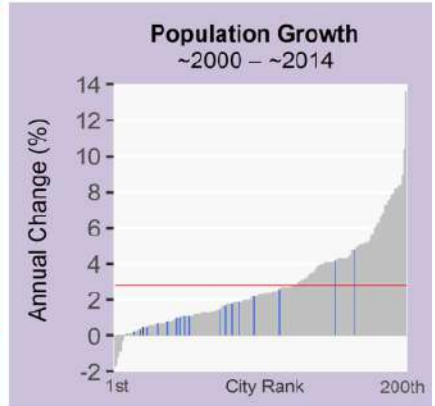
**Toledo, United States
1990-2014**

0 5 10 15 20 km

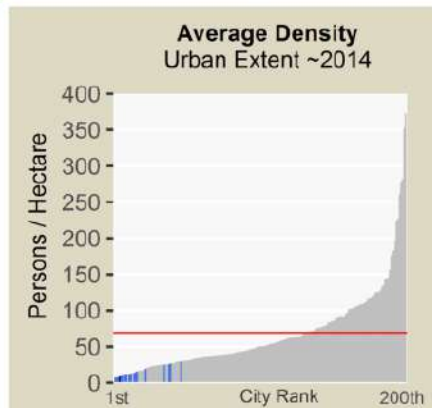
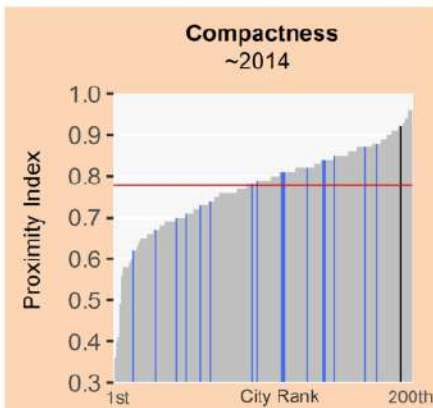
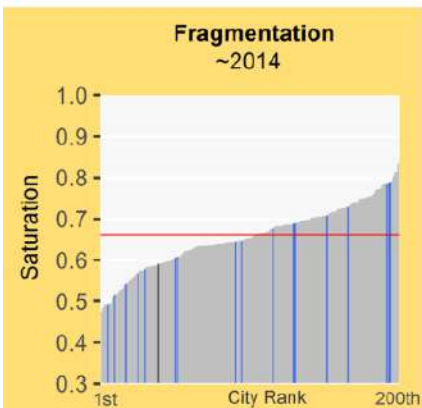
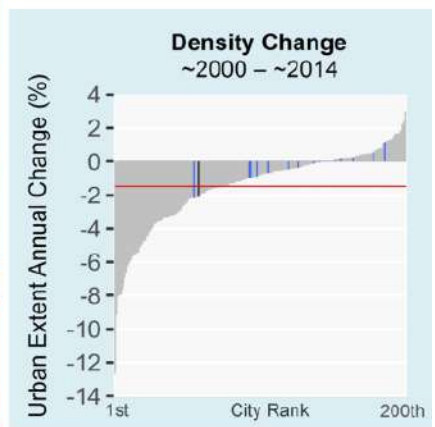
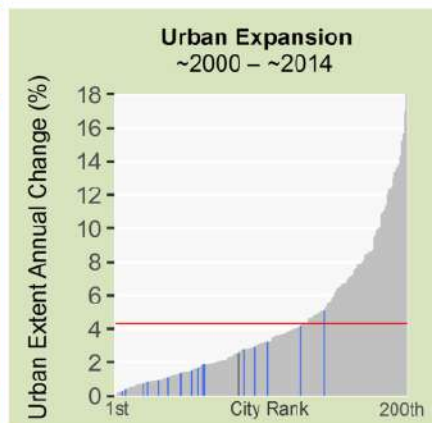
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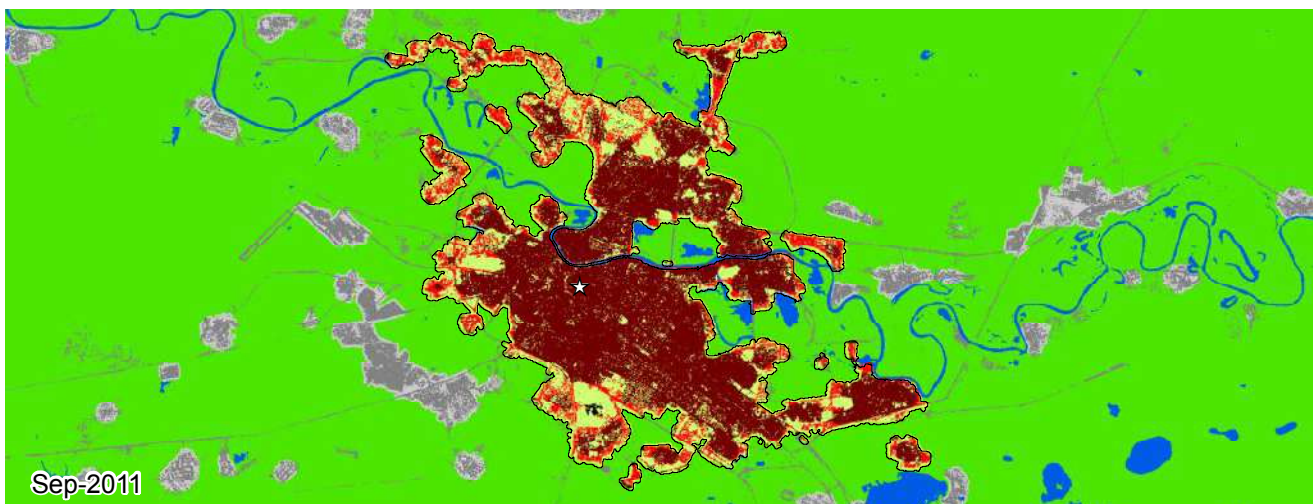
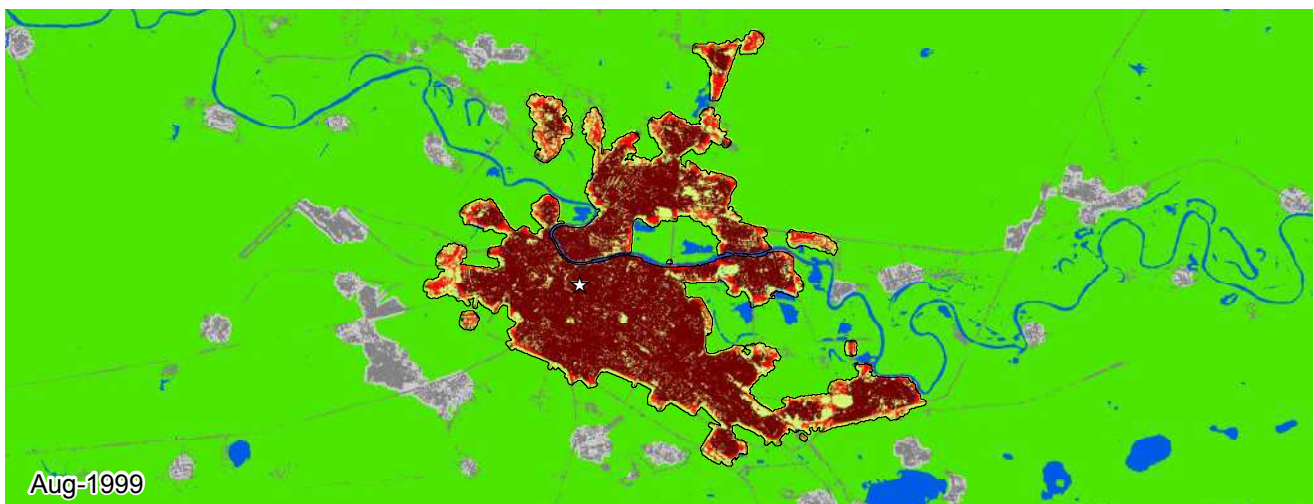
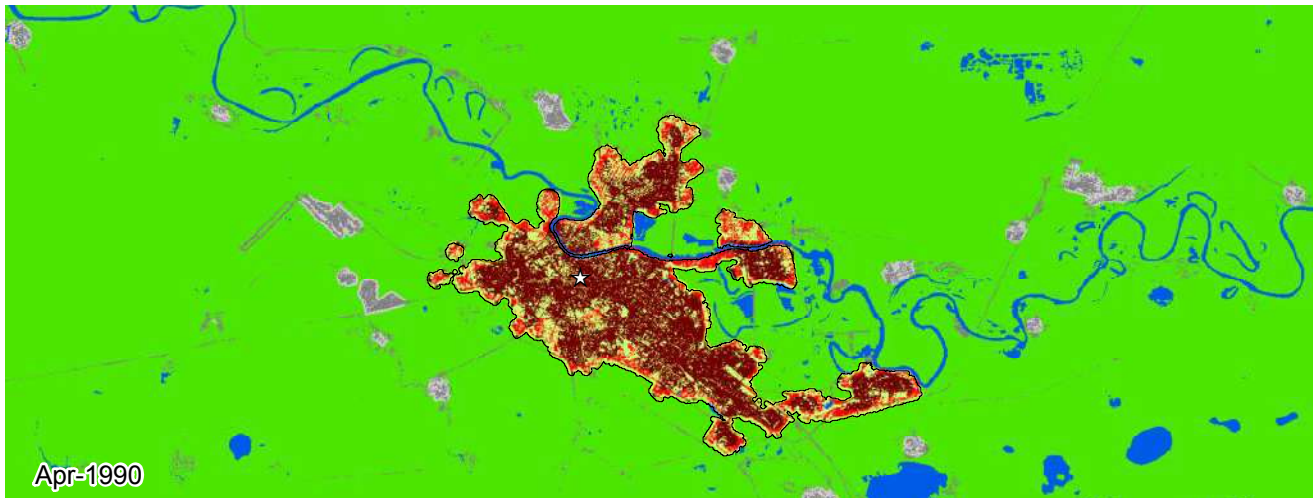
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Toledo, United States (Land-Rich Developed Countries)



Metrics	Aug 1990	Sep 2000	Jun 2014	% Annual Change ('00-'14)
Population	402,895	458,977	489,973	0.5
Built-up Area (Hectares)				
Total	12,963	21,485	33,057	3.1
Urban	6,219	13,601	23,668	4.0
Suburban	6,355	7,383	8,744	1.2
Rural	389	500	644	1.8
Open space (Hectares)				
Urbanized Open Space	13,776	17,950	22,984	1.8
Urban Extent	26,740	39,436	56,041	2.6
Density (Persons / Hectare)				
Built-up Area Density	31.1	21.4	14.8	-2.7
Urban Extent Density	15.1	11.6	8.7	-2.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.48	0.54	0.59	0.6
Openness Index	0.50	0.42	0.37	-0.9
Compactness (Roundness)				
Proximity	0.88	0.89	0.92	0.2
Cohesion	0.87	0.88	0.91	0.3
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	3,617	42%	5,126	44%
Extension	2,871	33%	3,126	27%
Leapfrog	0	0%	16	0%
Inclusion	2,032	23%	3,302	28%

















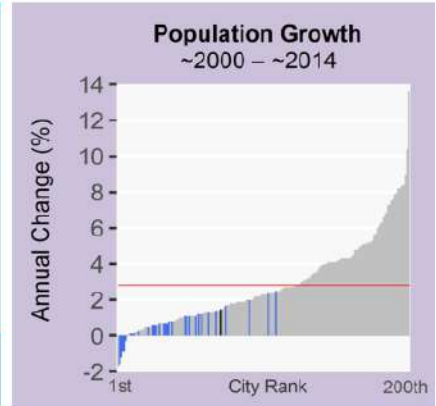
**Tyumen, Russia
1990-2011**

0 3 6 9 12 km

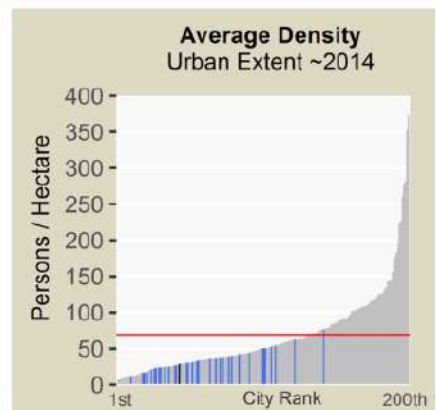
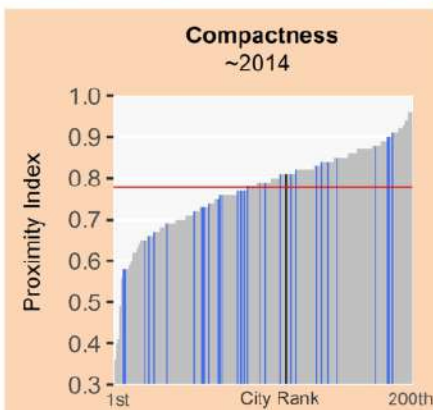
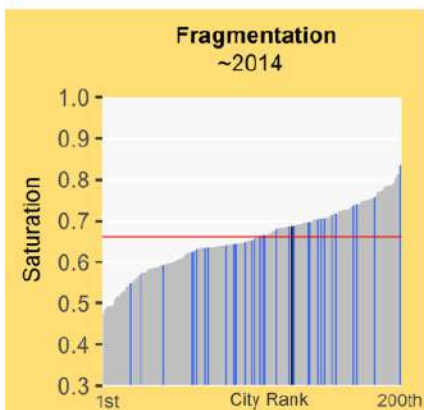
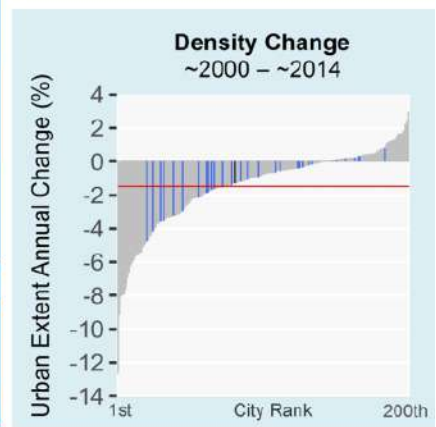
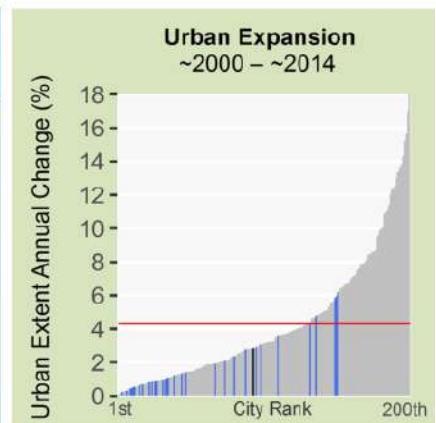
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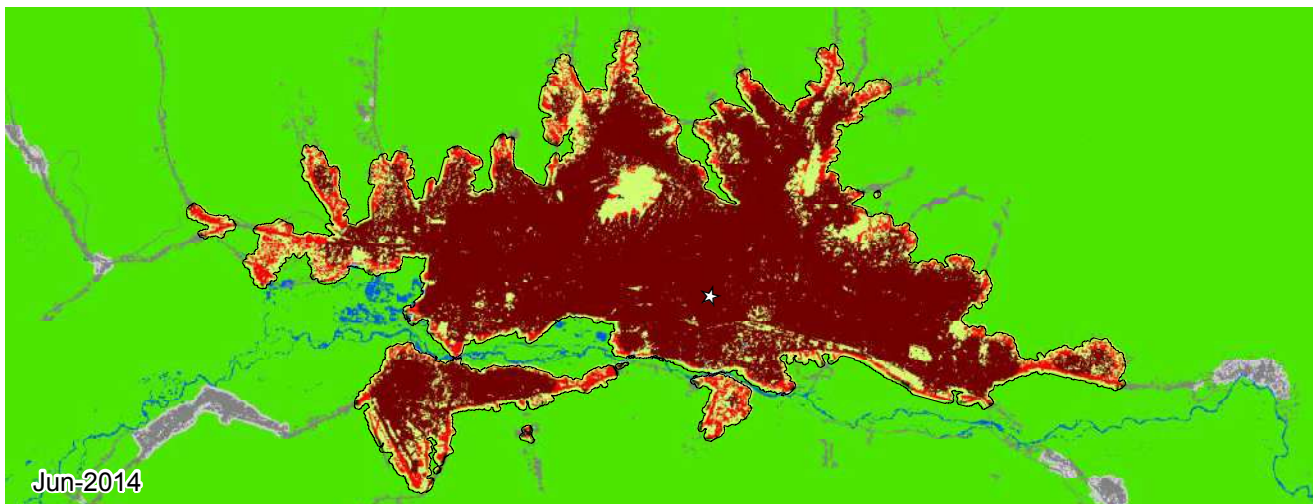
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Tyumen, Russia (Europe and Japan)



Metrics	Apr 1990	Aug 1999	Sep 2011	% Annual Change ('99-'11)
Population	419,521	464,410	557,794	1.5
Built-up Area (Hectares)				
Total	6,670	9,979	13,170	2.3
Urban	5,087	8,381	10,295	1.7
Suburban	1,492	1,481	2,656	4.8
Rural	90	116	218	5.2
Open space (Hectares)				
Urbanized Open Space	3,707	3,647	6,029	4.2
Urban Extent	10,378	13,626	19,199	2.8
Density (Persons / Hectare)				
Built-up Area Density	62.9	46.5	42.4	-0.8
Urban Extent Density	40.4	34.1	29.1	-1.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.64	0.73	0.69	-0.5
Openness Index	0.36	0.26	0.28	0.6
Compactness (Roundness)				
Proximity	0.76	0.78	0.81	0.3
Cohesion	0.75	0.77	0.79	0.3
Added Area (Hectares)	'90-'99	Share	'99-'11	Share
Infill	1,694	51%	796	24%
Extension	1,160	35%	1,394	43%
Leapfrog	0	0%	45	1%
Inclusion	454	13%	954	29%





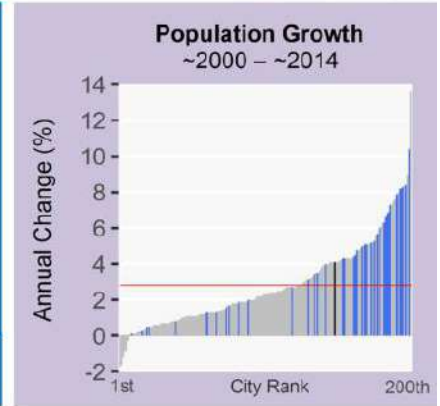
**Ulaanbaatar, Mongolia
1990-2014**

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

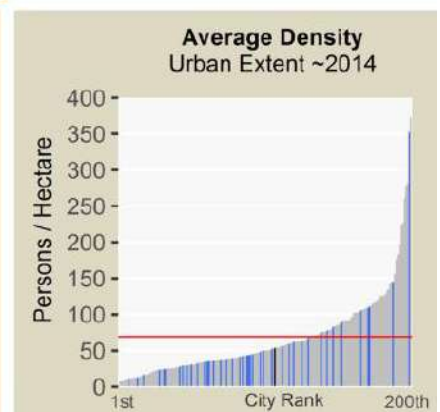
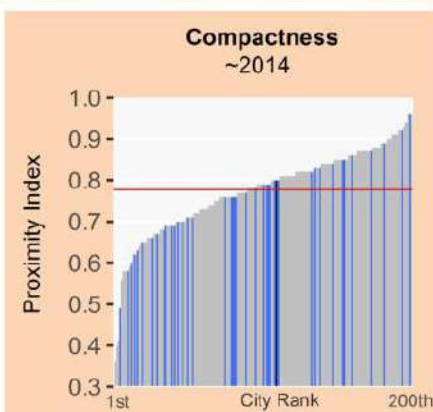
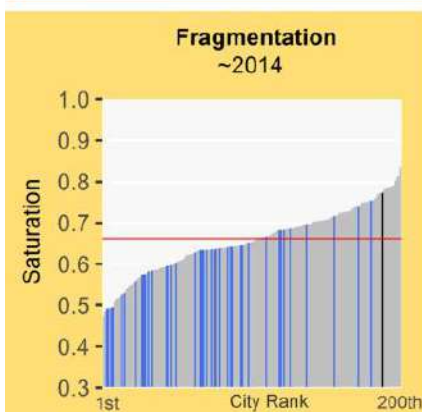
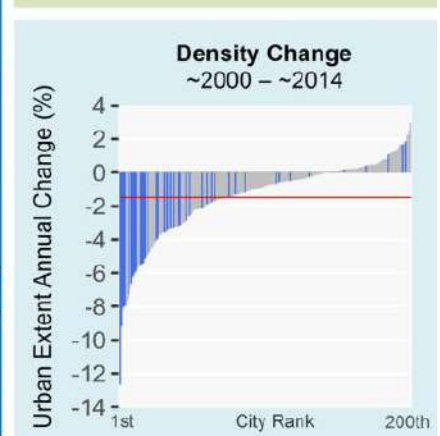
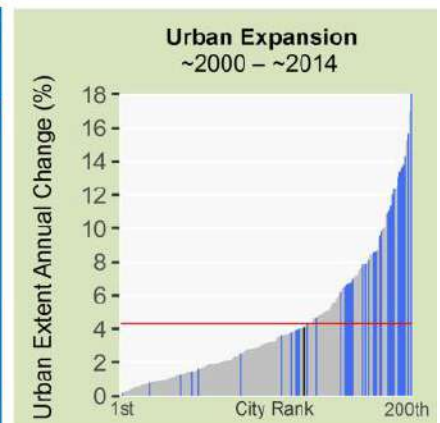
Ulaanbaatar, Mongolia (East Asia and the Pacific)

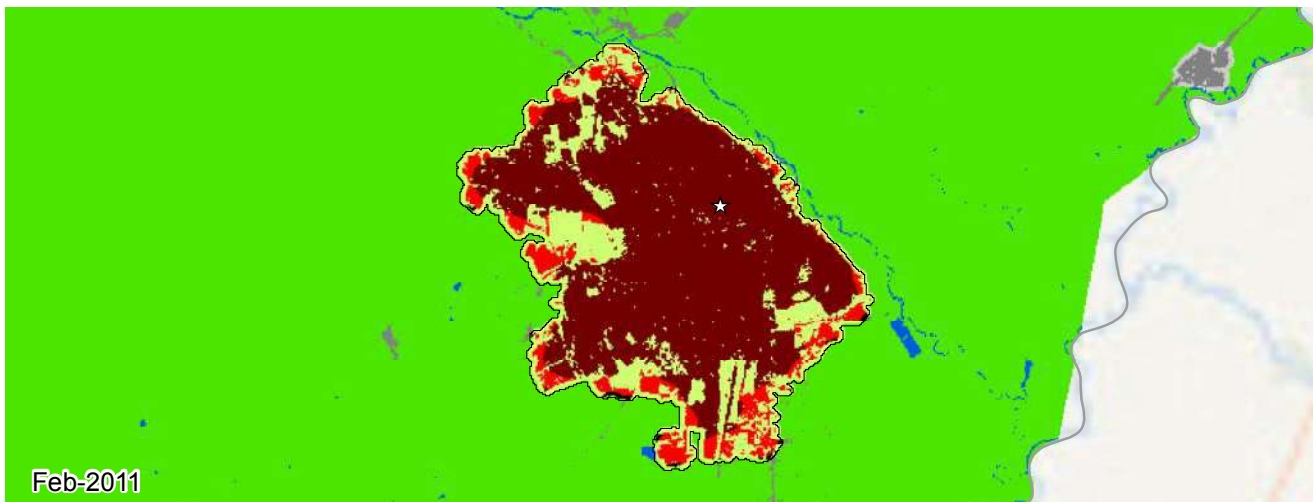
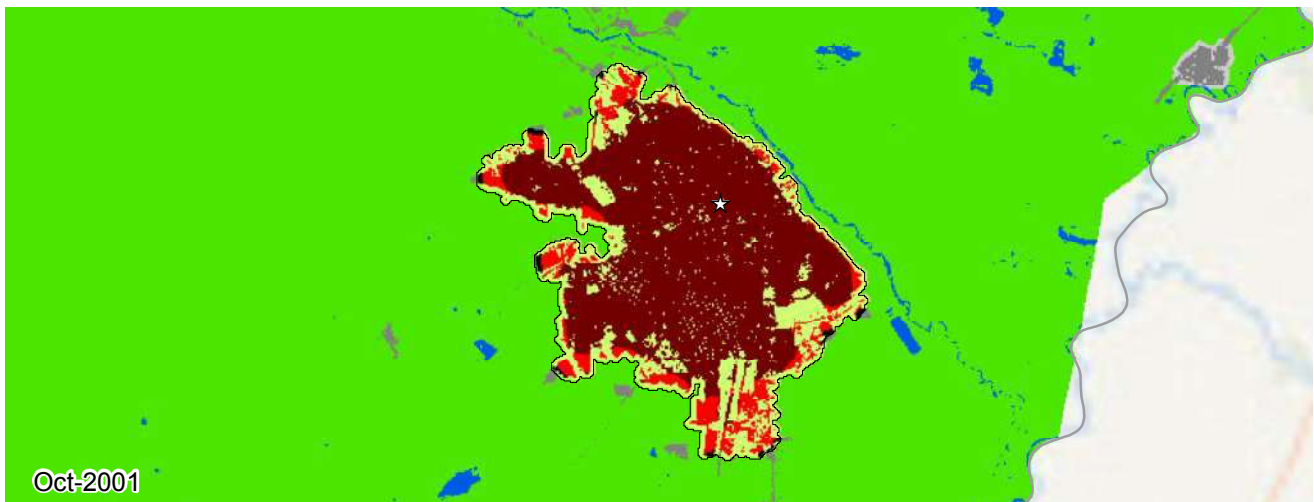
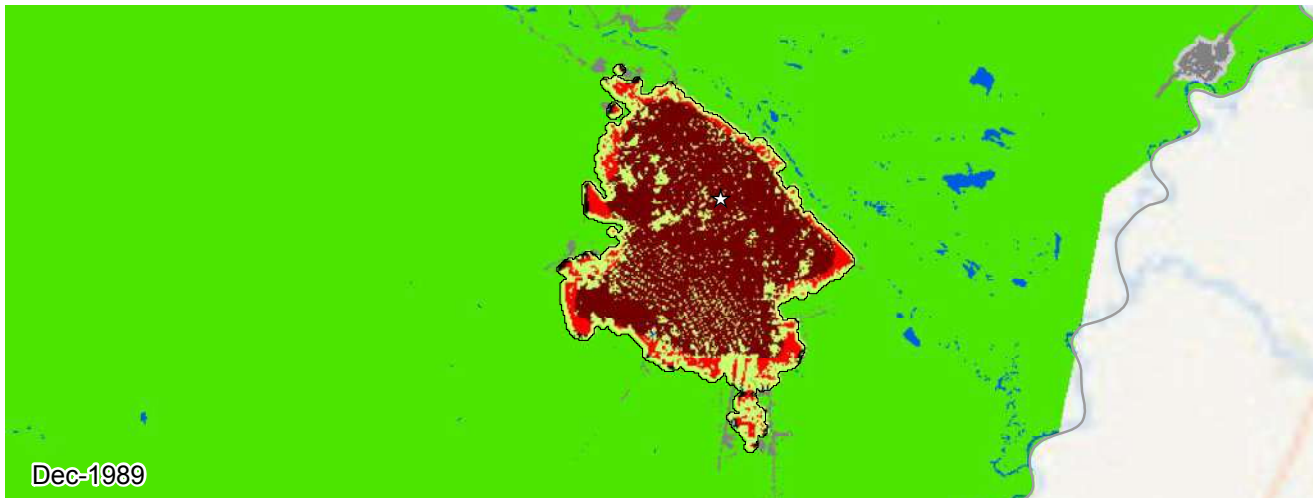


Legend for Charts
 Ulaanbaatar | Other cities in region | All other cities | Global average



Metrics	Sep 1990	Aug 2001	Jun 2014	% Annual Change ('01-'14)
Population	426,959	633,615	1,070,573	4.1
Built-up Area (Hectares)				
Total	7,268	9,282	15,493	4.0
Urban	6,349	8,401	13,566	3.7
Suburban	863	830	1,789	6.0
Rural	55	50	136	7.7
Open space (Hectares)				
Urbanized Open Space	2,594	2,611	4,558	4.3
Urban Extent	9,863	11,893	20,051	4.1
Density (Persons / Hectare)				
Built-up Area Density	58.7	68.3	69.1	0.1
Urban Extent Density	43.3	53.3	53.4	0.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.74	0.78	0.77	-0.1
Openness Index	0.25	0.18	0.19	0.1
Compactness (Roundness)				
Proximity	0.73	0.77	0.80	0.2
Cohesion	0.72	0.76	0.78	0.2
Added Area (Hectares)	'90-'01	Share	'01-'14	Share
Infill	915	45%	1,399	22%
Extension	1,018	50%	3,583	57%
Leapfrog	0	0%	12	0%
Inclusion	85	4%	1,214	19%

















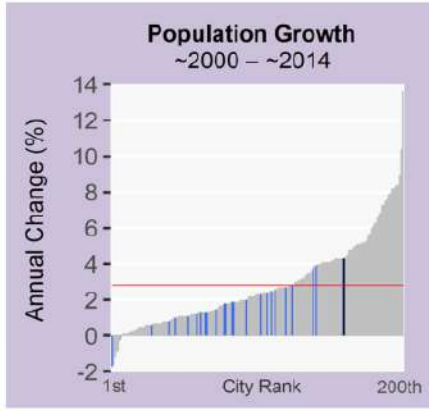
**Valledupar, Colombia
1989-2011**

0 1 2 3 4 km

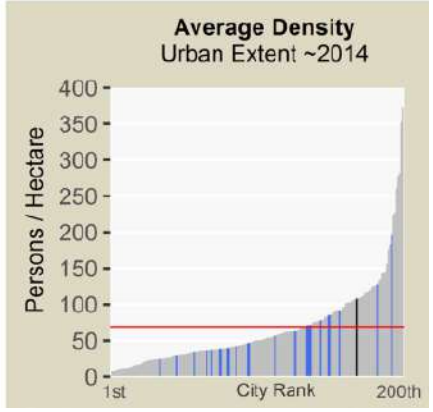
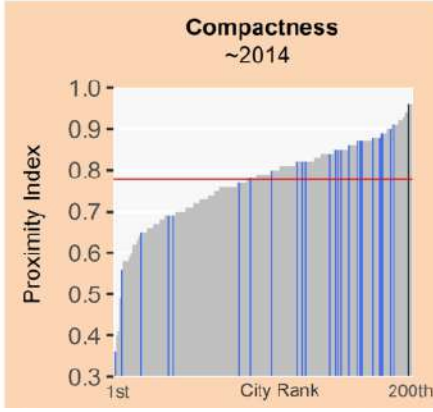
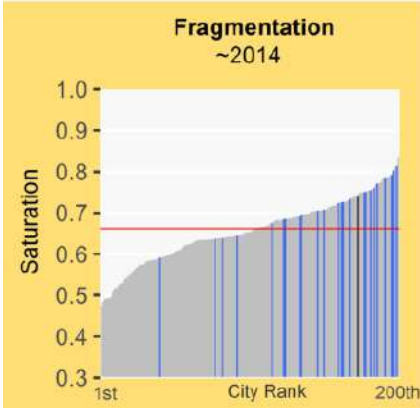
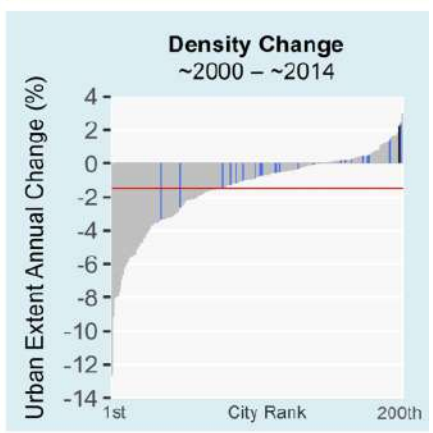
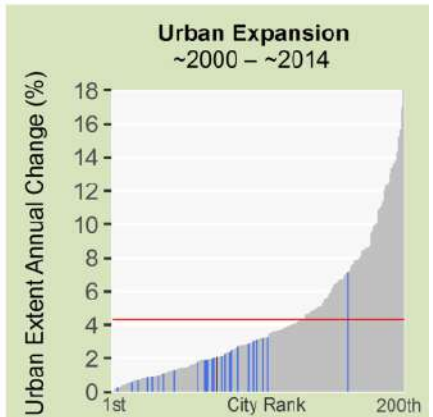
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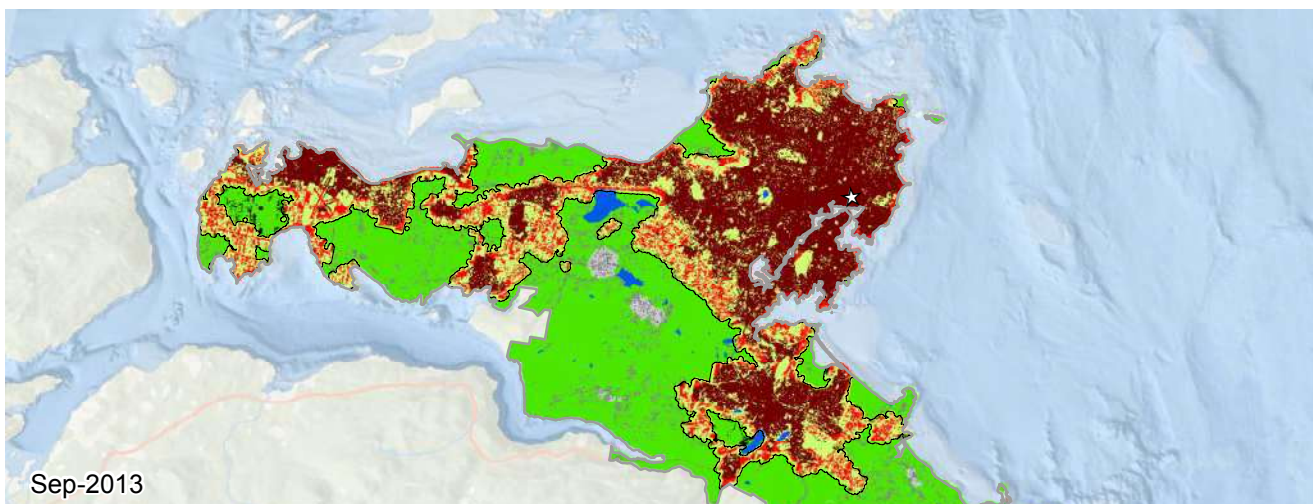
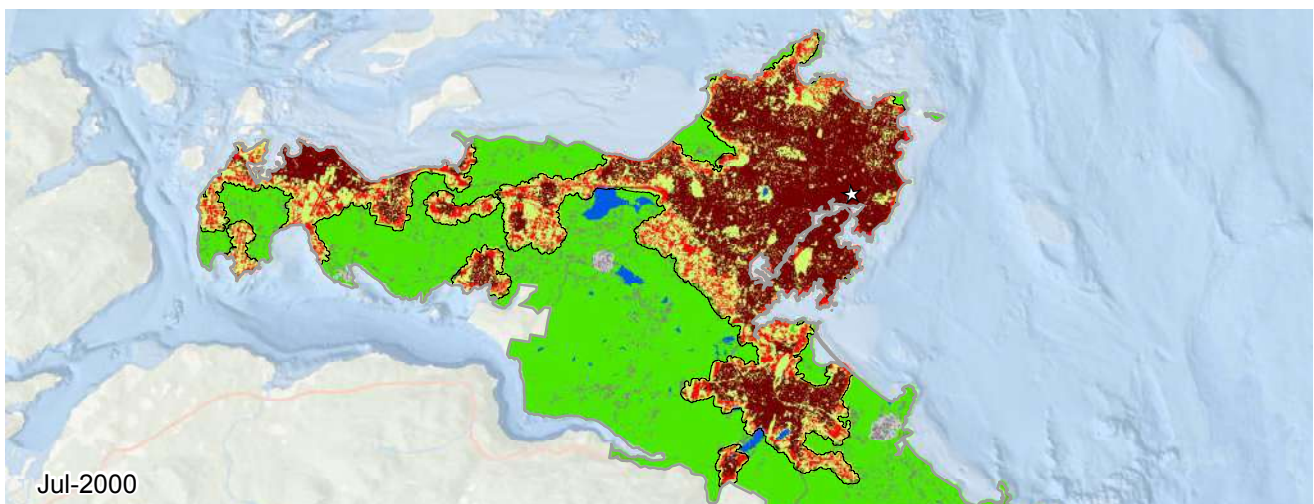
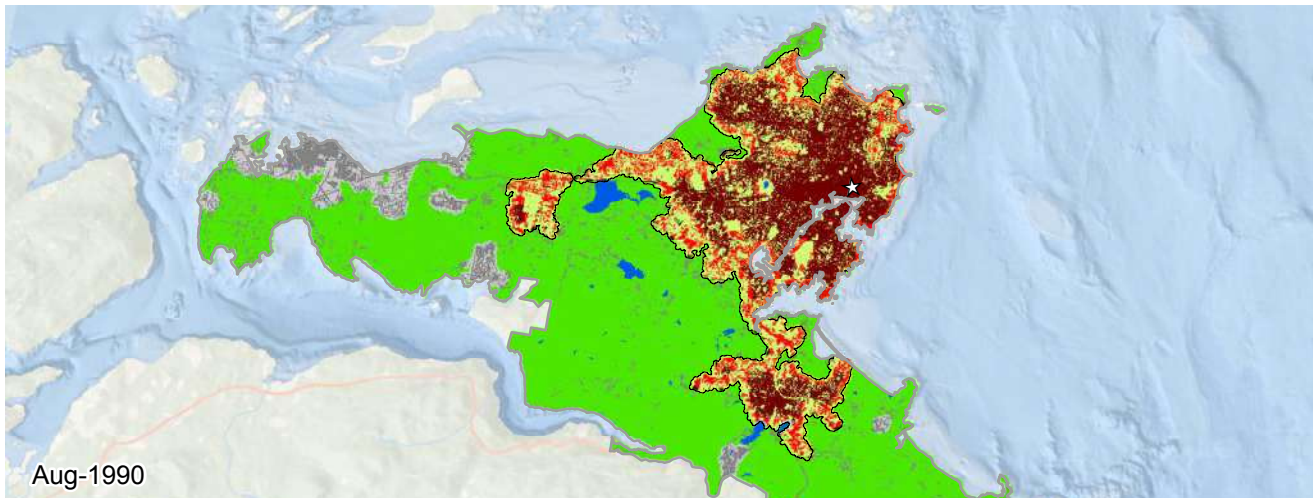
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Valledupar, Colombia (Latin America and the Caribbean)



Metrics	Dec 1989	Oct 2001	Feb 2011	% Annual Change ('01-'11)
Population	171,356	263,543	392,934	4.3
Built-up Area (Hectares)				
Total	1,516	2,236	2,688	2.0
Urban	1,286	1,923	2,335	2.1
Suburban	202	288	333	1.6
Rural	27	24	19	-2.5
Open space (Hectares)				
Urbanized Open Space	632	757	936	2.3
Urban Extent	2,148	2,993	3,625	2.0
Density (Persons / Hectare)				
Built-up Area Density	113.0	117.8	146.2	2.3
Urban Extent Density	79.7	88.0	108.4	2.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.71	0.75	0.74	-0.1
Openness Index	0.27	0.22	0.22	-0.3
Compactness (Roundness)				
Proximity	0.95	0.95	0.96	0.1
Cohesion	0.95	0.95	0.96	0.1
Added Area (Hectares)	'89-'01	Share	'01-'11	Share
Infill	235	32%	113	25%
Extension	438	60%	294	65%
Leapfrog	0	0%	0	0%
Inclusion	45	6%	44	9%



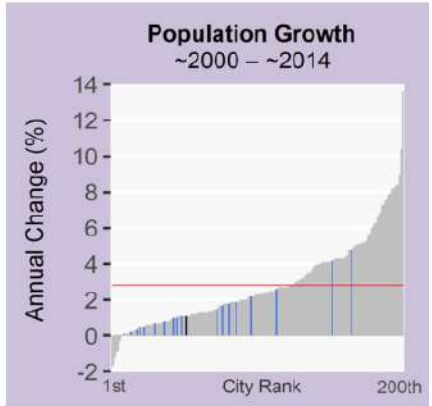


Victoria, Canada
1990-2013

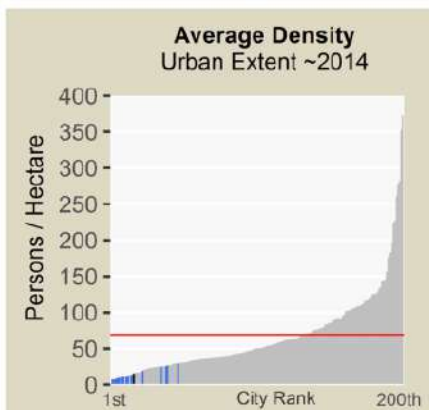
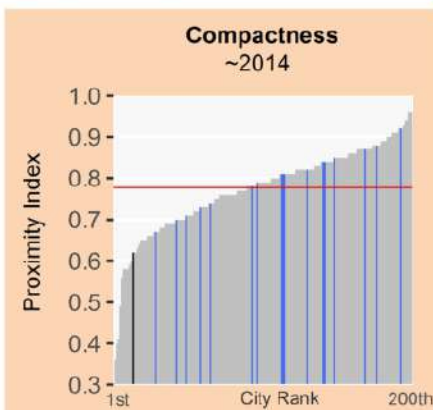
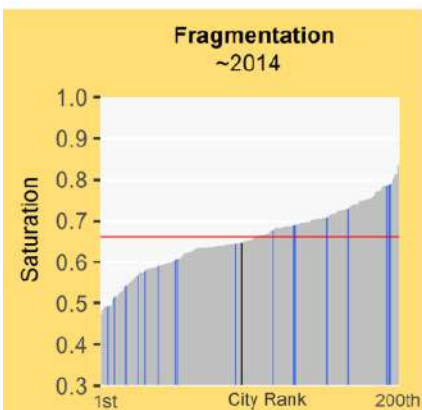
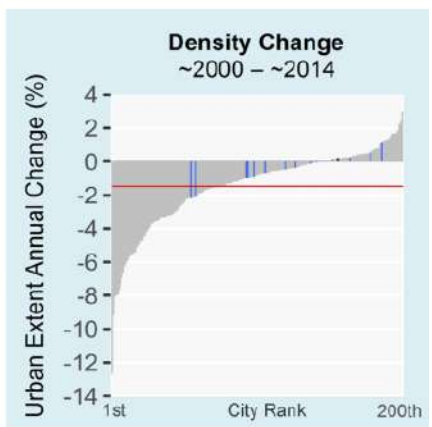
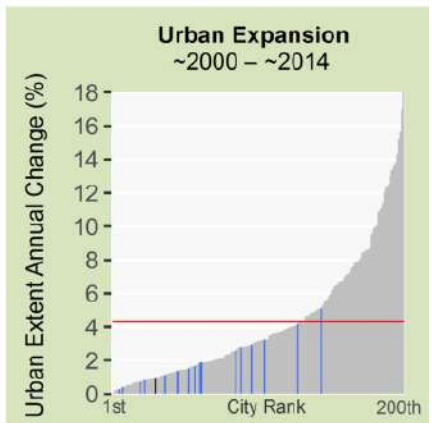
0 3 6 9 12 km

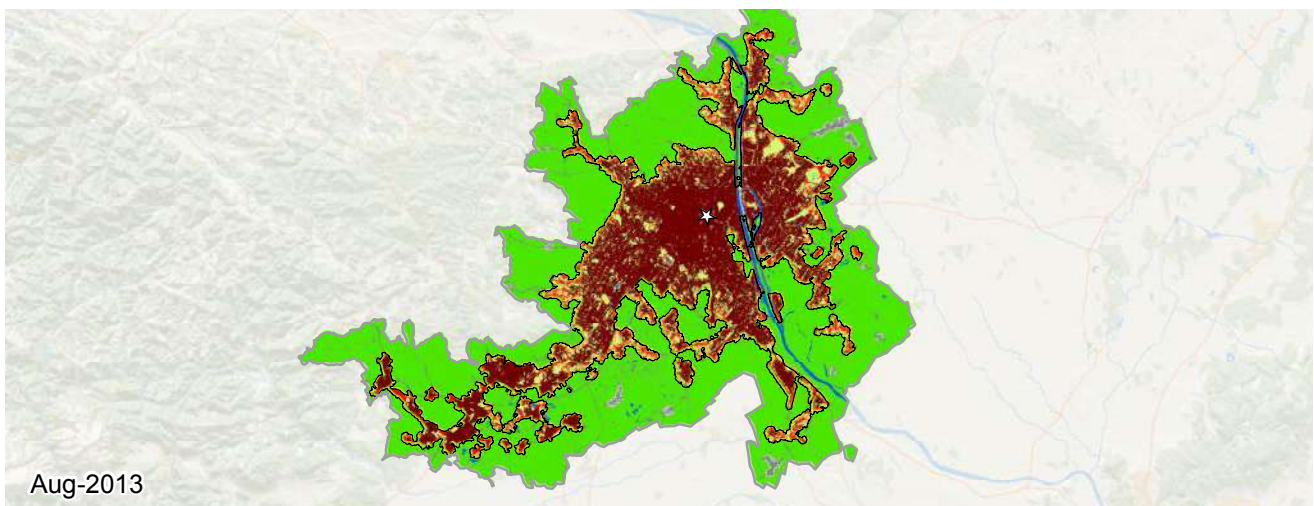
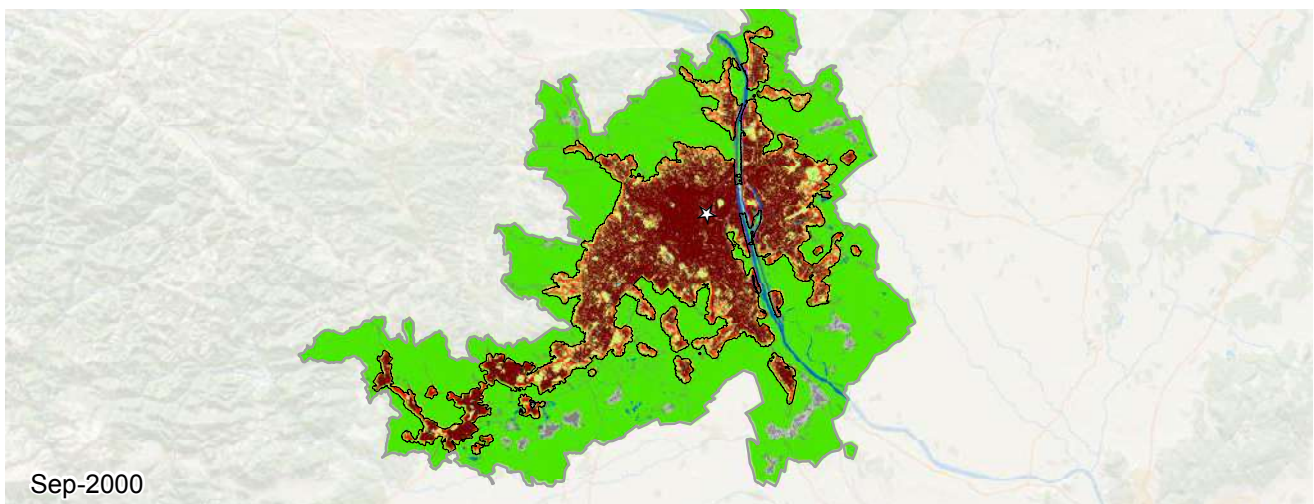
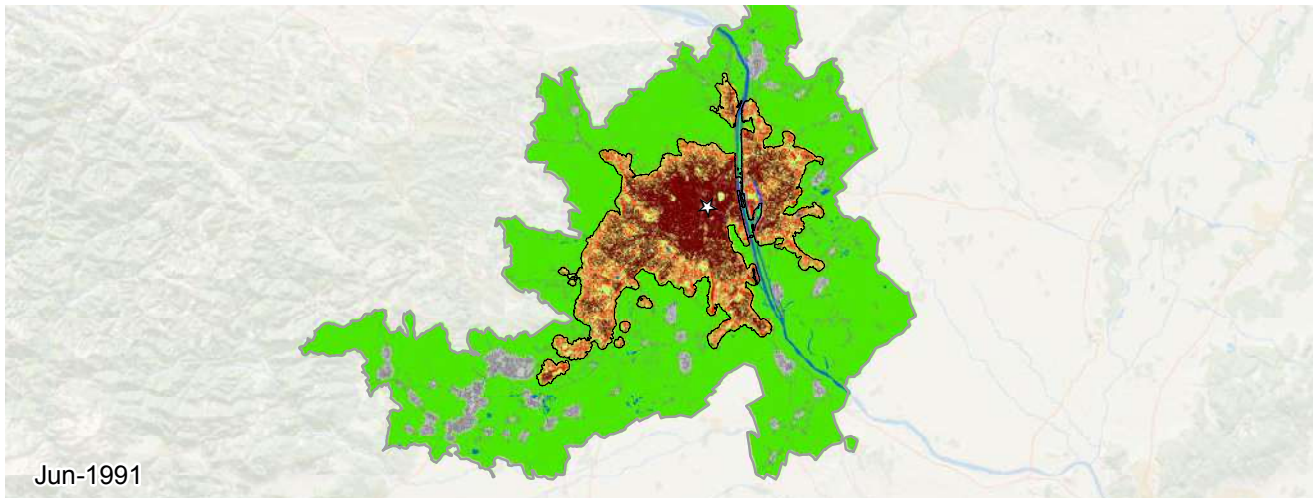
Study area
 Urban extent
 Urban built-up area
 Suburban built-up area
 Rural built-up area
 Urbanized open space
 Rural open space
 Exurban built-up area
 Exurban open space
 Water
 No data
★ CBD

Victoria, Canada (Land-Rich Developed Countries)



Metrics	Aug 1990	Jul 2000	Sep 2013	% Annual Change ('00-'13)
Population	224,424	275,202	318,267	1.1
Built-up Area (Hectares)				
Total	7,218	11,612	13,350	1.1
Urban	4,916	8,680	10,149	1.2
Suburban	2,149	2,767	3,008	0.6
Rural	153	165	192	1.1
Open space (Hectares)				
Urbanized Open Space	4,989	6,606	7,294	0.8
Urban Extent	12,208	18,219	20,645	0.9
Density (Persons / Hectare)				
Built-up Area Density	31.1	23.7	23.8	0.0
Urban Extent Density	18.4	15.1	15.4	0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.59	0.64	0.65	0.1
Openness Index	0.38	0.33	0.32	-0.4
Compactness (Roundness)				
Proximity	0.79	0.60	0.62	0.2
Cohesion	0.76	0.60	0.61	0.2
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	1,792	40%	908	51%
Extension	864	19%	441	25%
Leapfrog	0	0%	4	0%
Inclusion	1,744	39%	405	23%



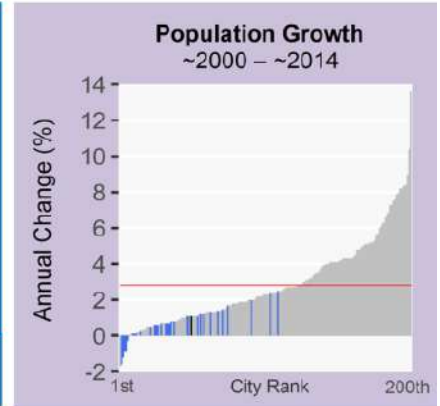


**Vienna, Austria
1991-2013**

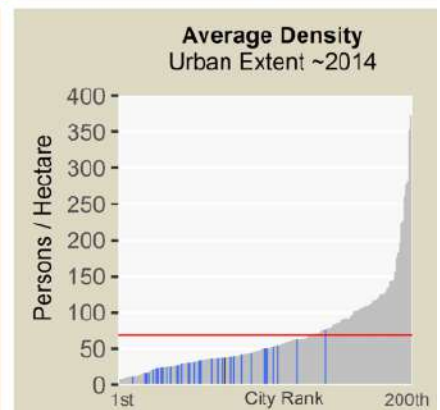
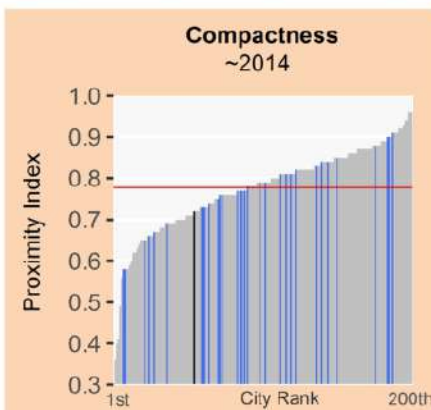
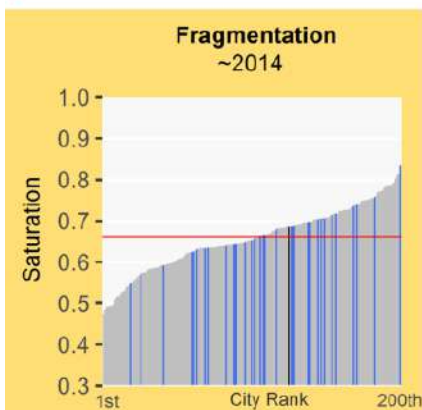
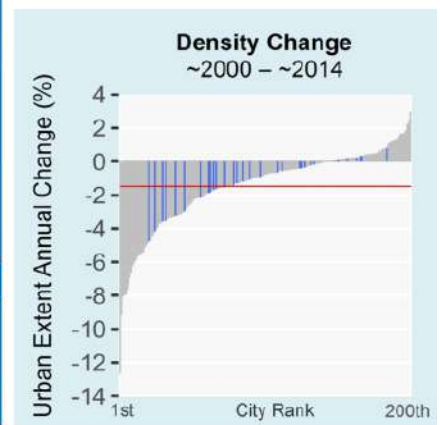
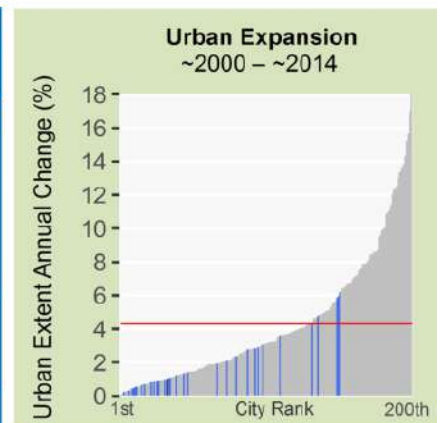
0 6 12 18 24 km

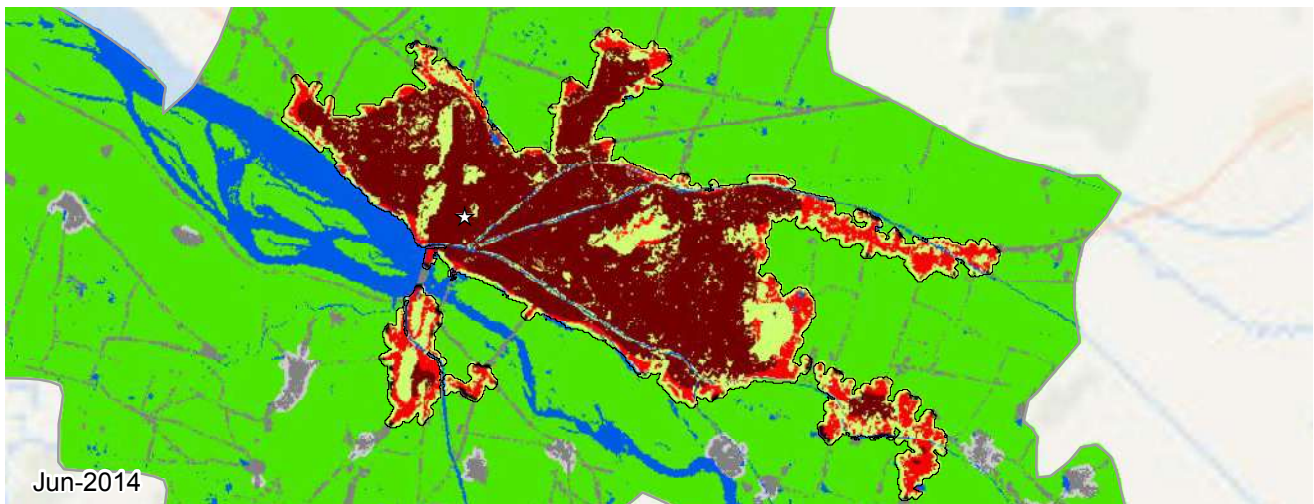
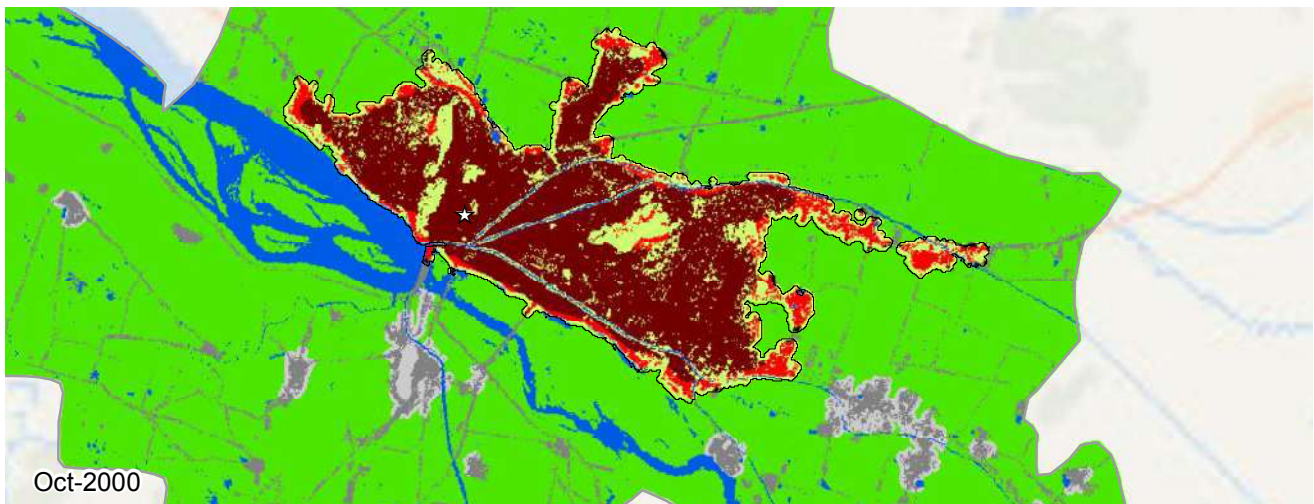
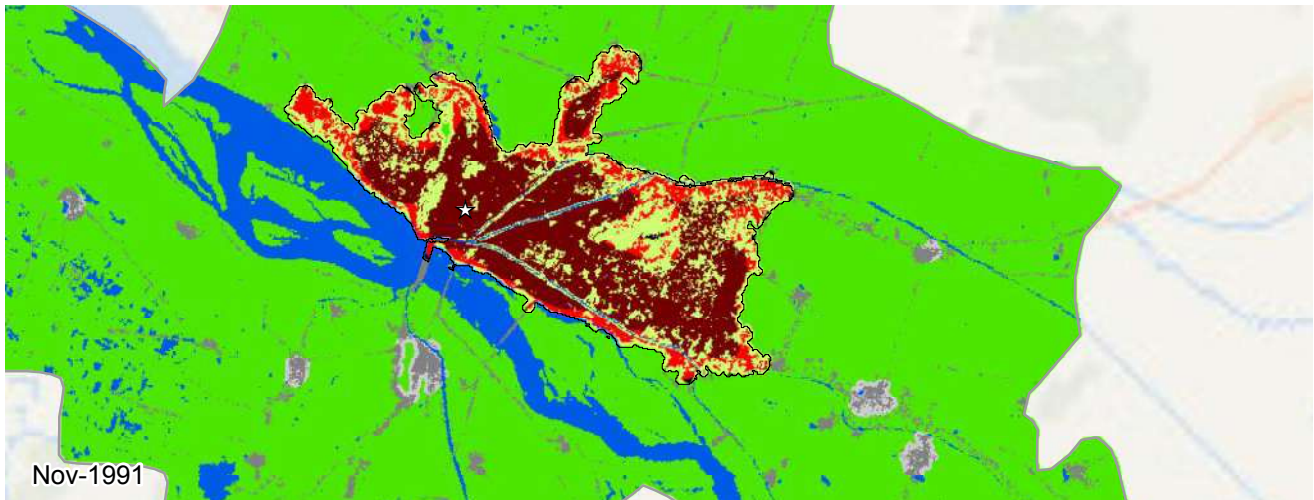
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Vienna, Austria (Europe and Japan)



Metrics	Jun 1991	Sep 2000	Aug 2013	% Annual Change ('00-'13)
Population	1,551,705	1,760,685	2,025,194	1.1
Built-up Area (Hectares)				
Total	17,226	30,977	36,562	1.3
Urban	11,276	24,164	28,832	1.4
Suburban	5,598	6,350	7,224	1.0
Rural	350	462	504	0.7
Open space (Hectares)				
Urbanized Open Space	13,294	15,719	16,784	0.5
Urban Extent	30,520	46,697	53,347	1.0
Density (Persons / Hectare)				
Built-up Area Density	90.1	56.8	55.4	-0.2
Urban Extent Density	50.8	37.7	38.0	0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.56	0.66	0.69	0.3
Openness Index	0.38	0.31	0.29	-0.6
Compactness (Roundness)				
Proximity	0.83	0.73	0.72	-0.1
Cohesion	0.82	0.70	0.70	0.0
Added Area (Hectares)	'91-'00	Share	'00-'13	Share
Infill	6,457	46%	2,804	50%
Extension	2,460	17%	805	14%
Leapfrog	261	1%	94	1%
Inclusion	4,571	33%	1,880	33%





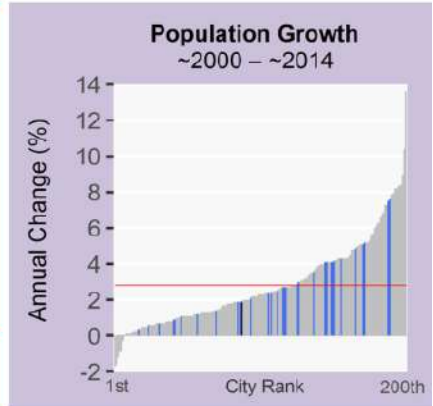
Vijayawada, India
1991-2014

0 2 4 6 8 km

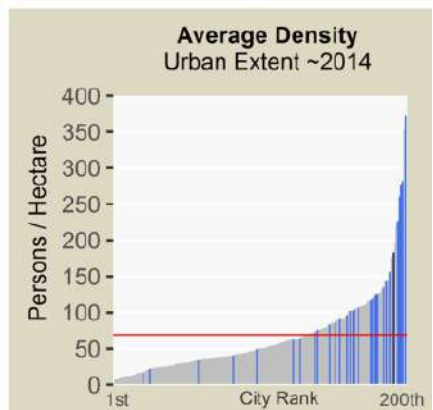
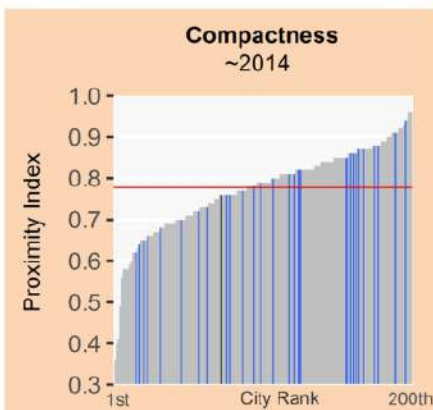
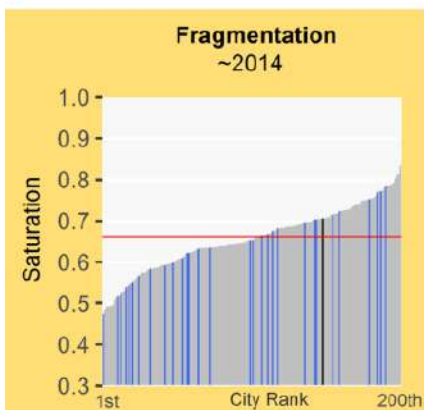
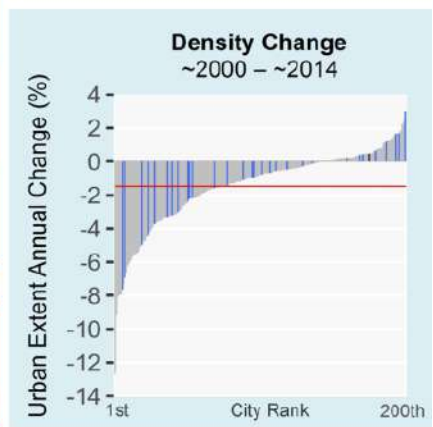
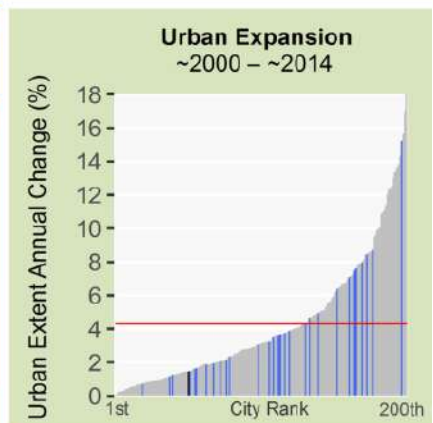
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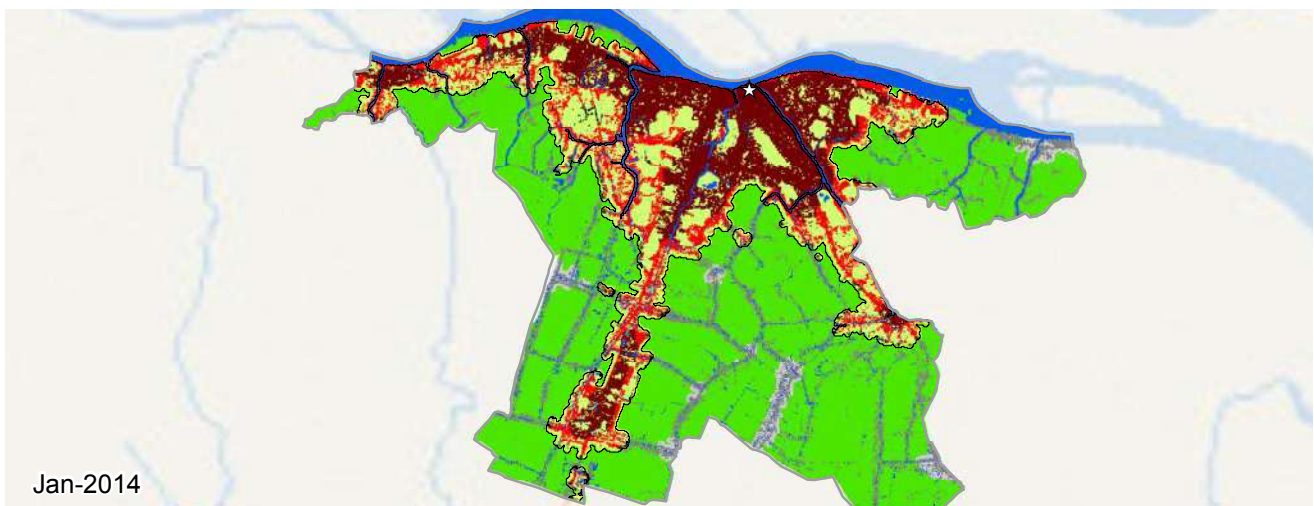
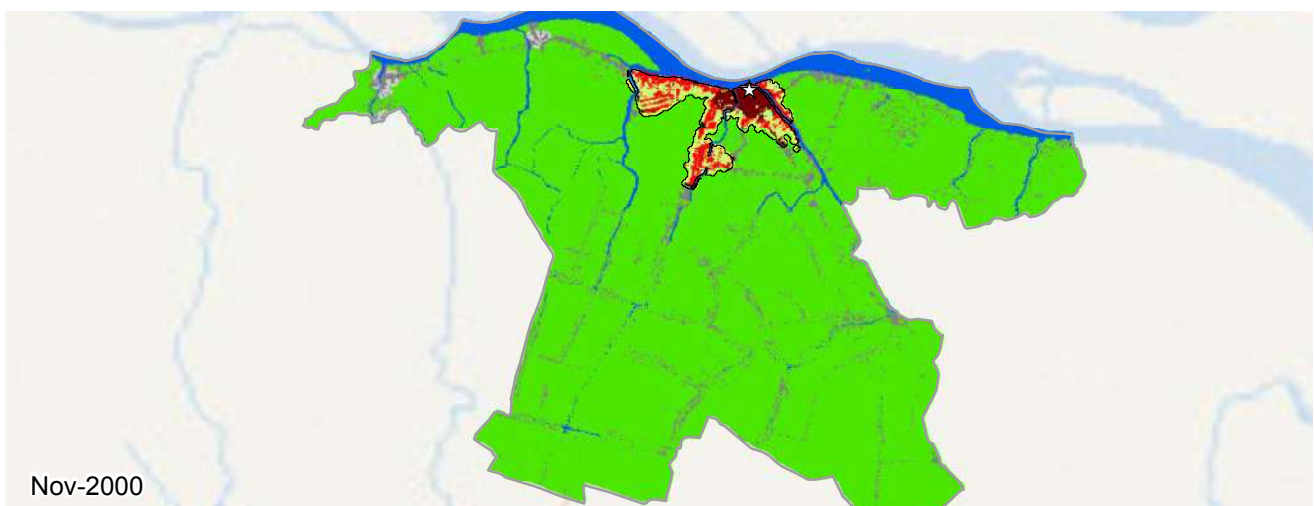
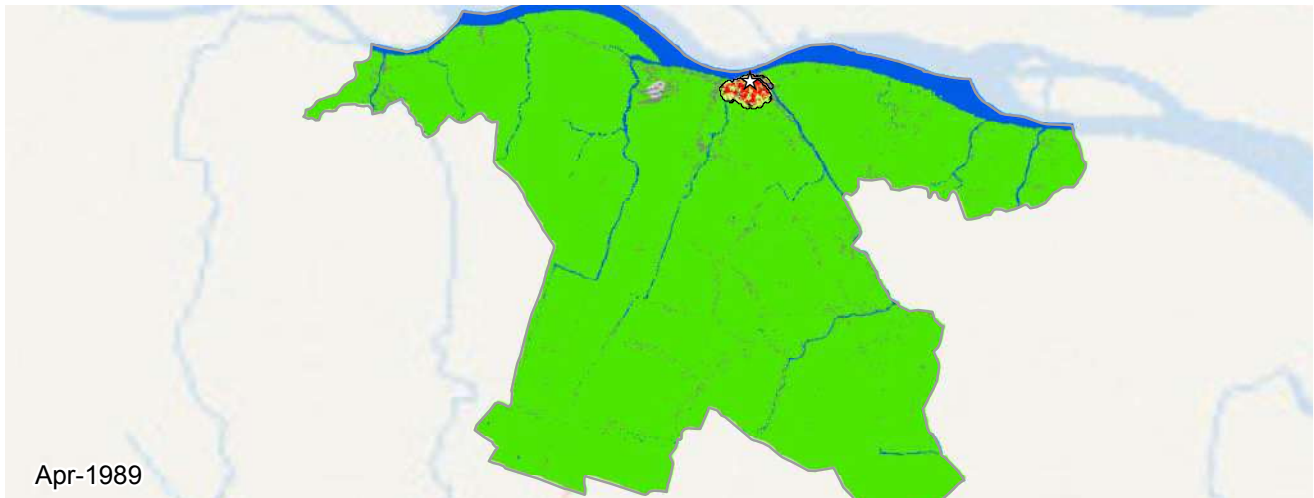
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Vijayawada, India (South and Central Asia)



Metrics	Nov 1991	Oct 2000	Jun 2014	% Annual Change ('00-'14)
Population	824,158	926,989	1,210,498	2.0
Built-up Area (Hectares)				
Total	2,723	3,873	4,664	1.4
Urban	2,040	3,249	3,662	0.9
Suburban	646	581	926	3.4
Rural	36	42	75	4.3
Open space (Hectares)				
Urbanized Open Space	1,563	1,531	1,935	1.7
Urban Extent	4,286	5,405	6,599	1.5
Density (Persons / Hectare)				
Built-up Area Density	302.6	239.3	259.5	0.6
Urban Extent Density	192.2	171.5	183.4	0.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.64	0.72	0.71	-0.1
Openness Index	0.36	0.29	0.29	0.2
Compactness (Roundness)				
Proximity	0.82	0.79	0.76	-0.4
Cohesion	0.81	0.79	0.74	-0.4
Added Area (Hectares)	'91-'00	Share	'00-'14	Share
Infill	561	48%	273	34%
Extension	448	38%	60	7%
Leapfrog	0	0%	27	3%
Inclusion	139	12%	429	54%





Vinh Long, Vietnam
1989-2014

0 2 4 6 8 km

N

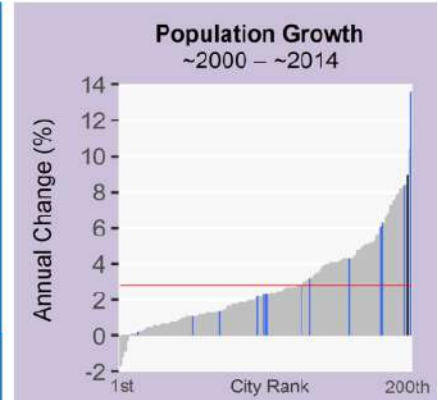
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Vinh Long, Vietnam (Southeast Asia)

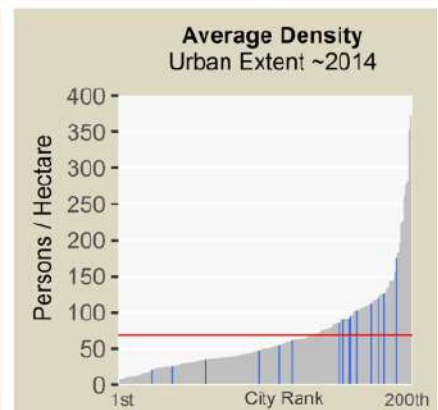
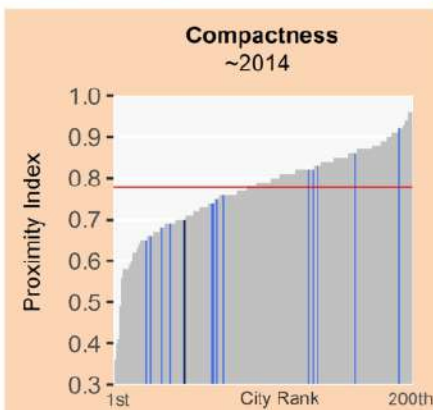
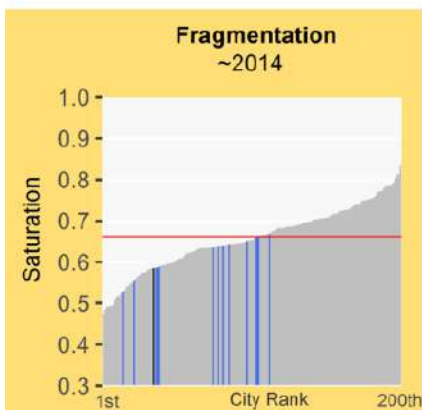
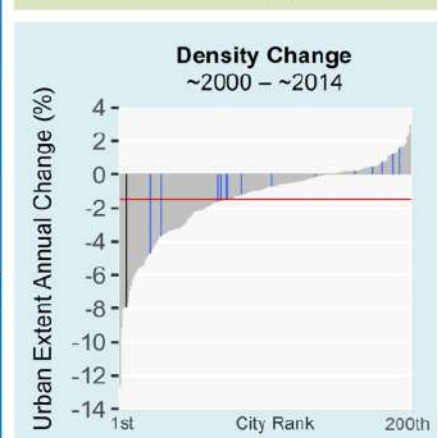
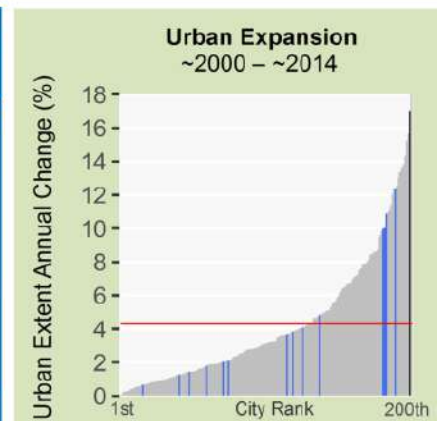


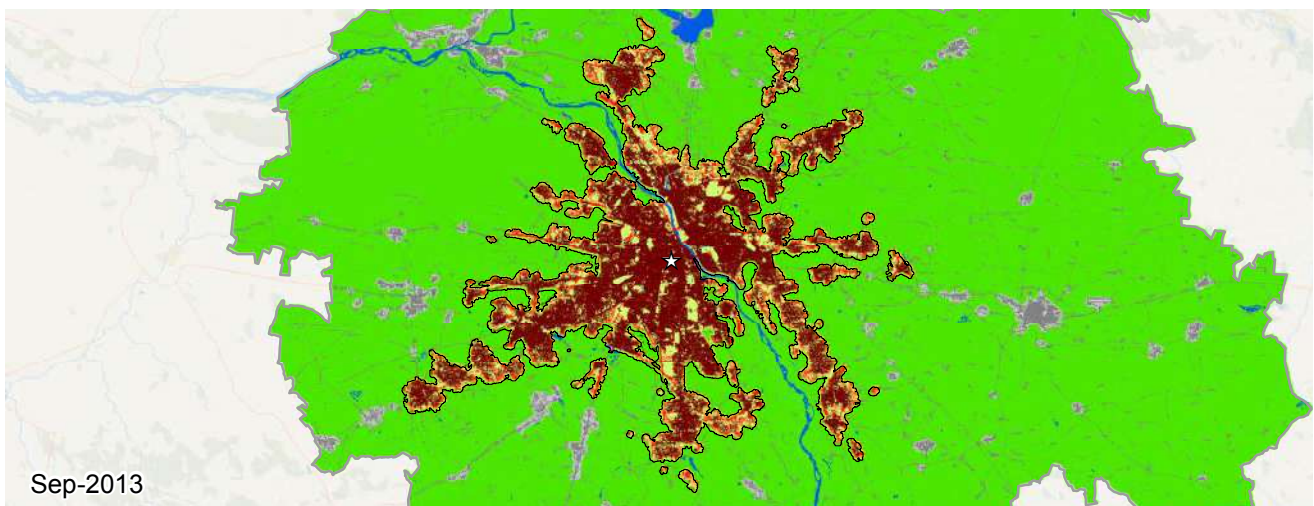
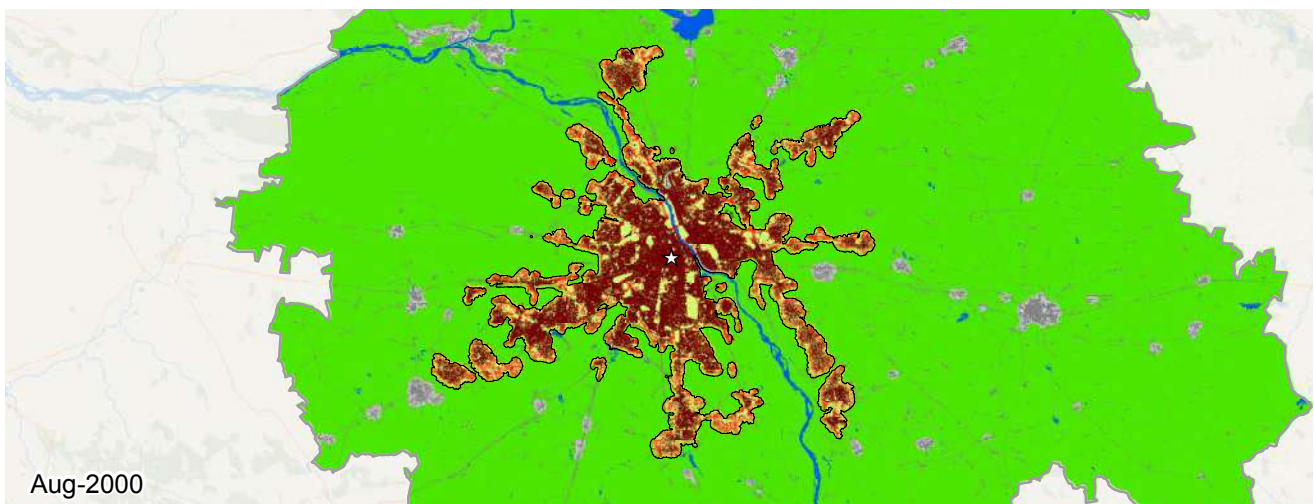
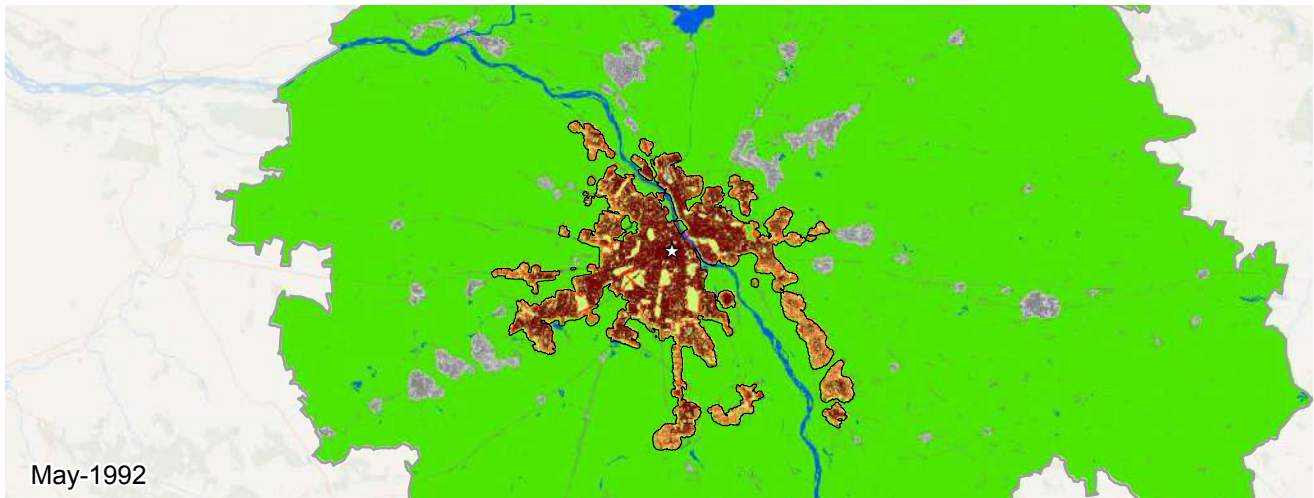
Legend for Charts

Vinh Long | Other cities in region | All other cities | Global average



Metrics	Apr 1989	Nov 2000	Jan 2014	% Annual Change ('00-'14)
Population	22,433	67,416	222,220	9.1
Built-up Area (Hectares)				
Total	54	373	3,793	17.6
Urban	0	119	2,323	22.6
Suburban	49	230	1,372	13.5
Rural	5	23	97	10.8
Open space (Hectares)				
Urbanized Open Space	62	313	2,688	16.3
Urban Extent	117	686	6,482	17.1
Density (Persons / Hectare)				
Built-up Area Density	412.7	180.6	58.6	-8.6
Urban Extent Density	191.3	98.2	34.3	-8.0
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.46	0.54	0.59	0.6
Openness Index	0.66	0.56	0.43	-1.9
Compactness (Roundness)				
Proximity	0.94	0.69	0.70	0.1
Cohesion	0.93	0.69	0.68	-0.1
Added Area (Hectares)	'89-'00	Share	'00-'14	Share
Infill	38	11%	179	5%
Extension	194	60%	2,748	80%
Leapfrog	0	0%	0	0%
Inclusion	85	26%	492	14%





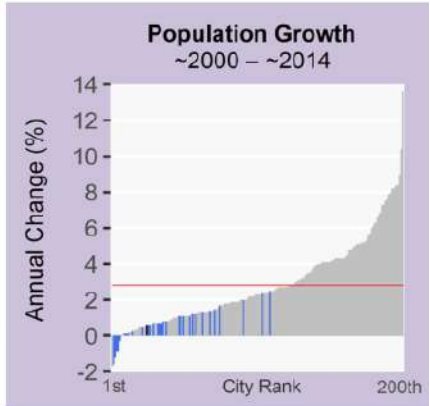
**Warsaw, Poland
1992-2013**

0 7 14 21 28 km

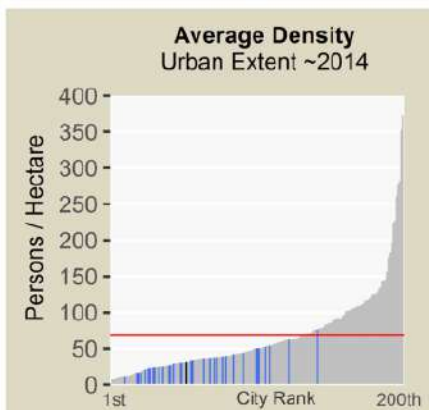
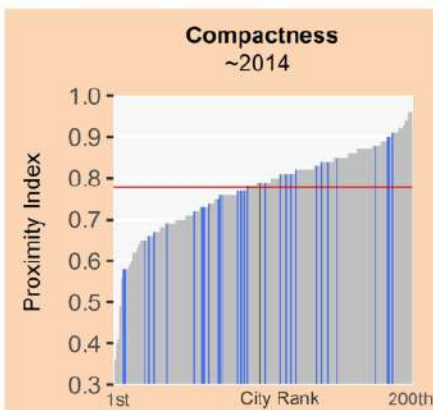
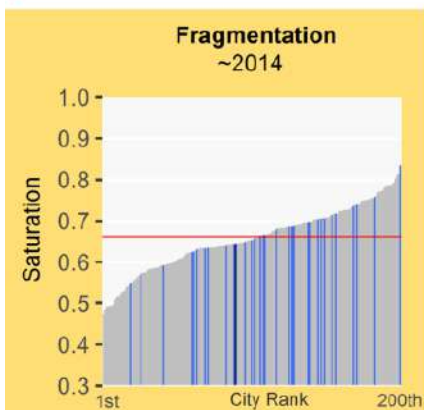
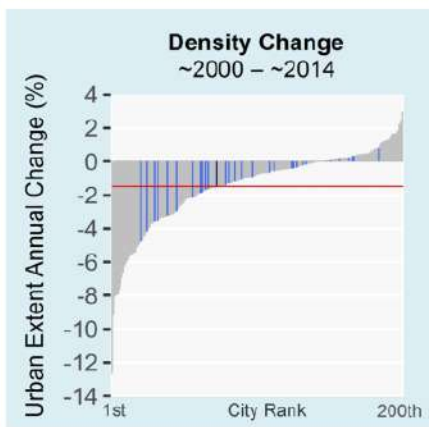
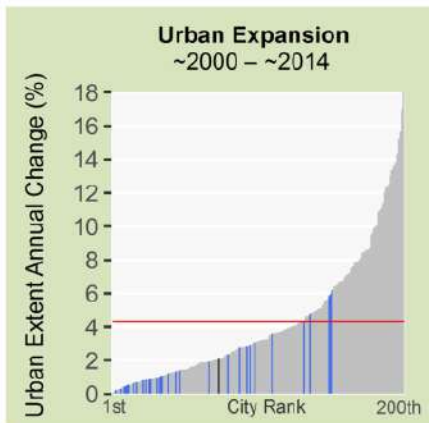
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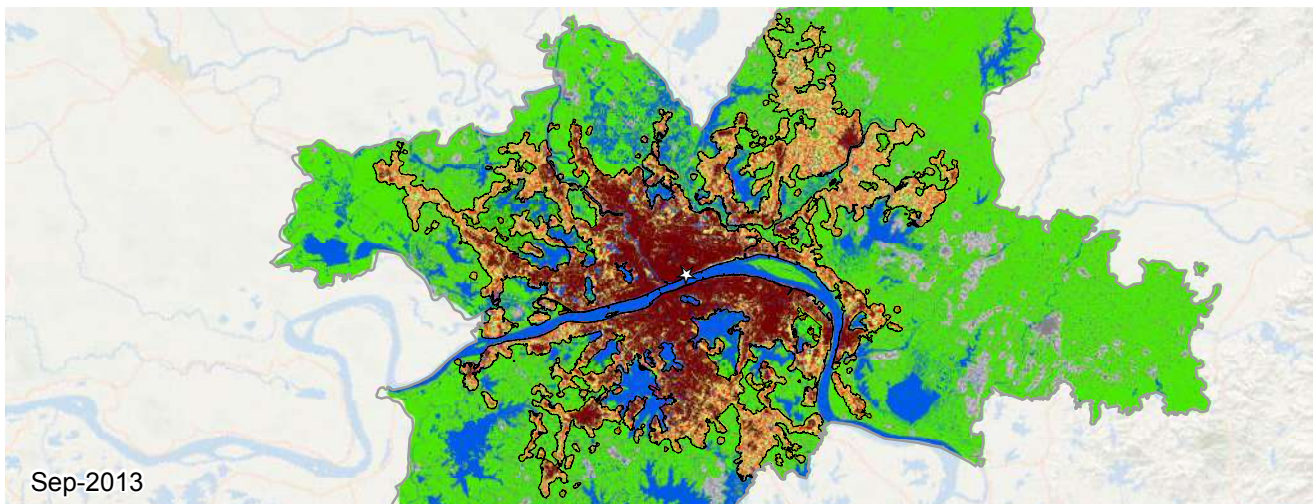
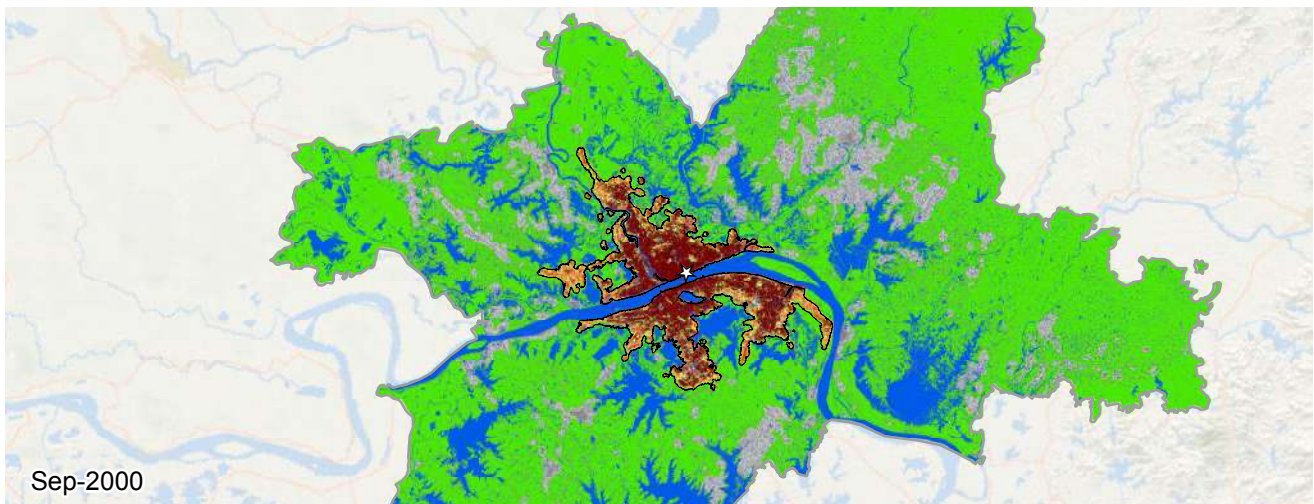
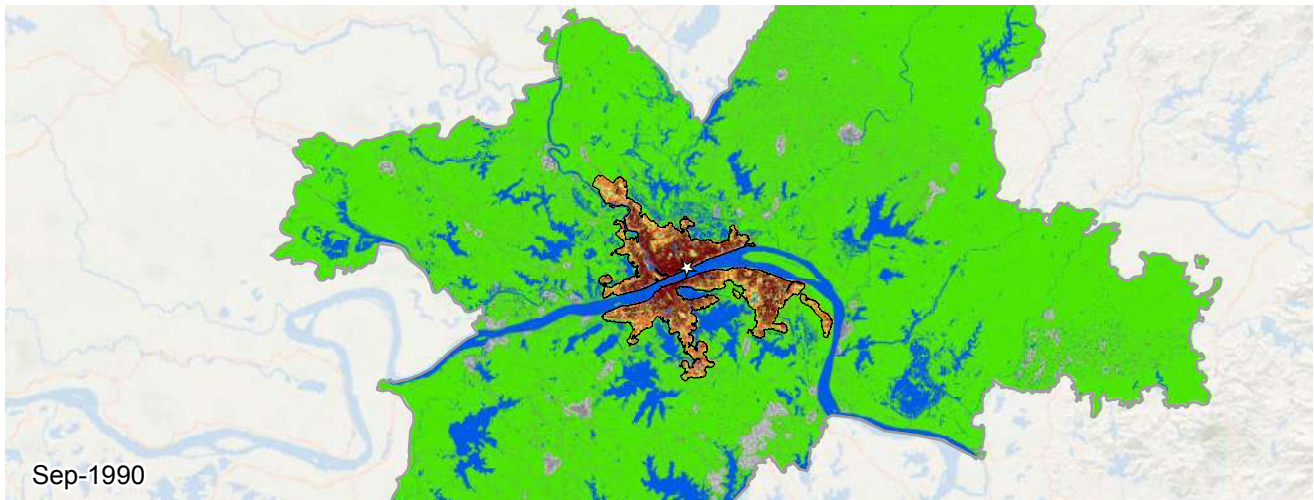
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Warsaw, Poland (Europe and Japan)



Metrics	May 1992	Aug 2000	Sep 2013	% Annual Change ('00-'13)
Population	1,833,480	2,128,104	2,298,450	0.6
Built-up Area (Hectares)				
Total	21,129	33,864	47,779	2.6
Urban	14,189	24,409	37,141	3.2
Suburban	6,460	8,833	9,903	0.9
Rural	480	621	733	1.3
Open space (Hectares)				
Urbanized Open Space	15,497	22,409	26,499	1.3
Urban Extent	36,626	56,273	74,278	2.1
Density (Persons / Hectare)				
Built-up Area Density	86.8	62.8	48.1	-2.0
Urban Extent Density	50.1	37.8	30.9	-1.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.58	0.60	0.64	0.5
Openness Index	0.40	0.36	0.31	-1.1
Compactness (Roundness)				
Proximity	0.75	0.76	0.79	0.3
Cohesion	0.73	0.73	0.76	0.3
Added Area (Hectares)	'92-'00	Share	'00-'13	Share
Infill	4,496	35%	6,592	47%
Extension	2,968	23%	4,128	29%
Leapfrog	117	0%	58	0%
Inclusion	5,151	40%	3,135	22%



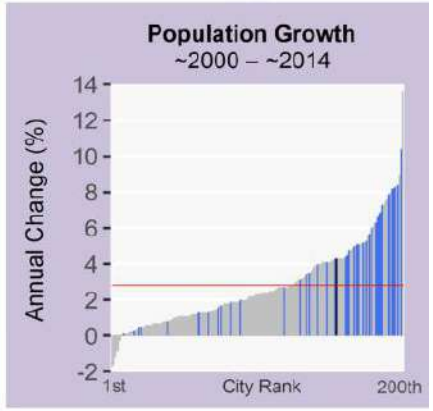


**Wuhan, Hubei, China
1990-2013**

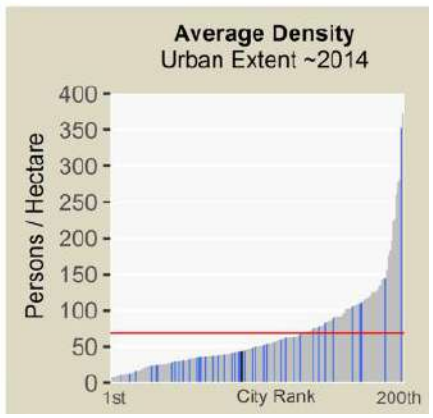
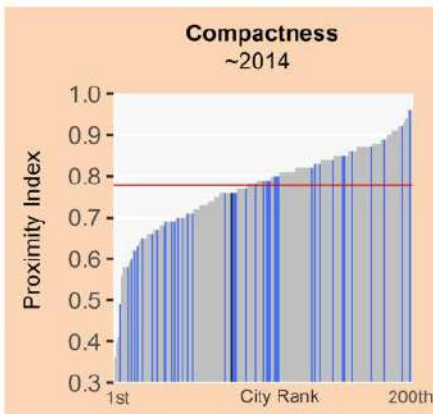
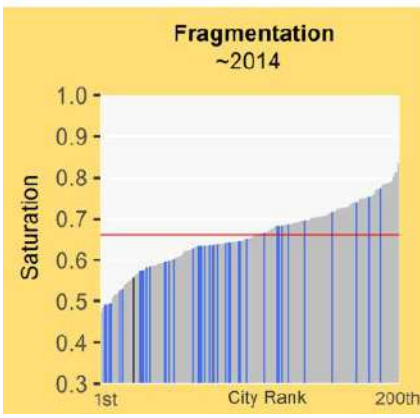
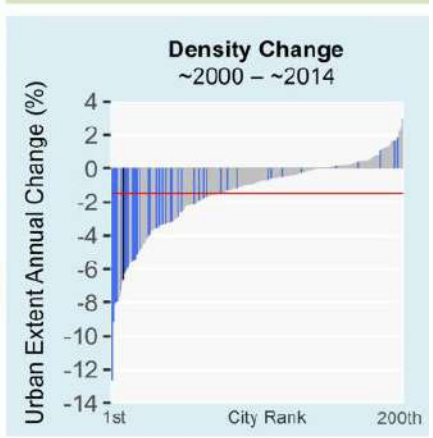
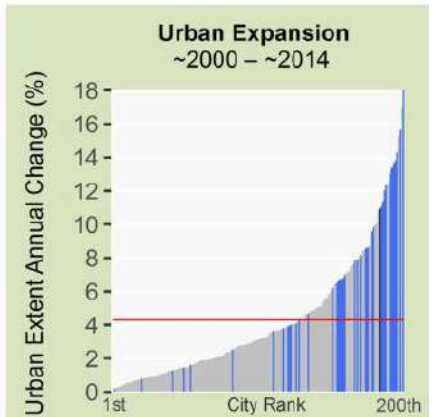
0 10 20 30 40 km

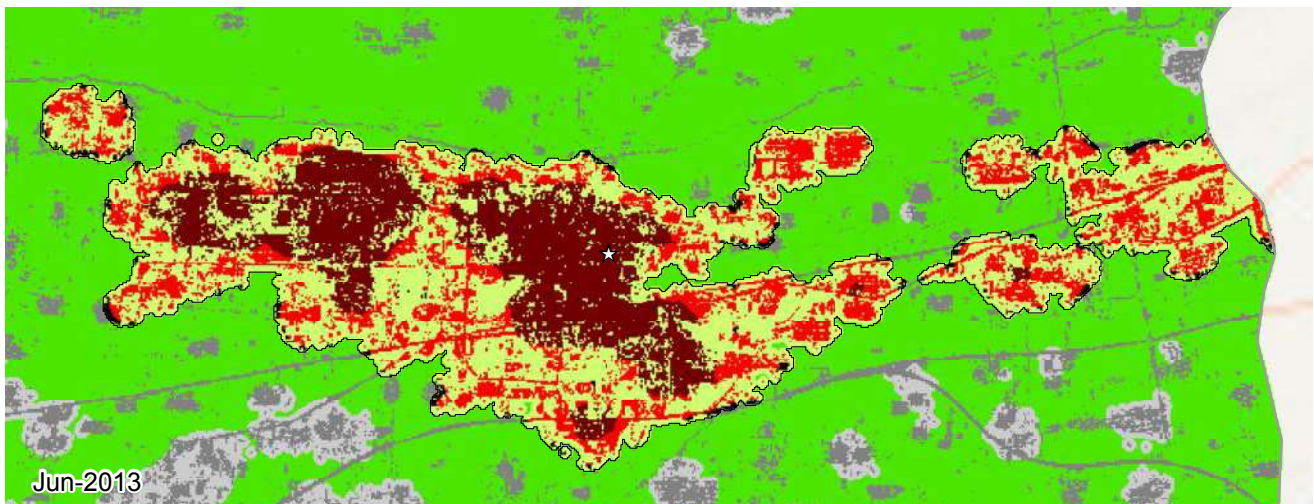
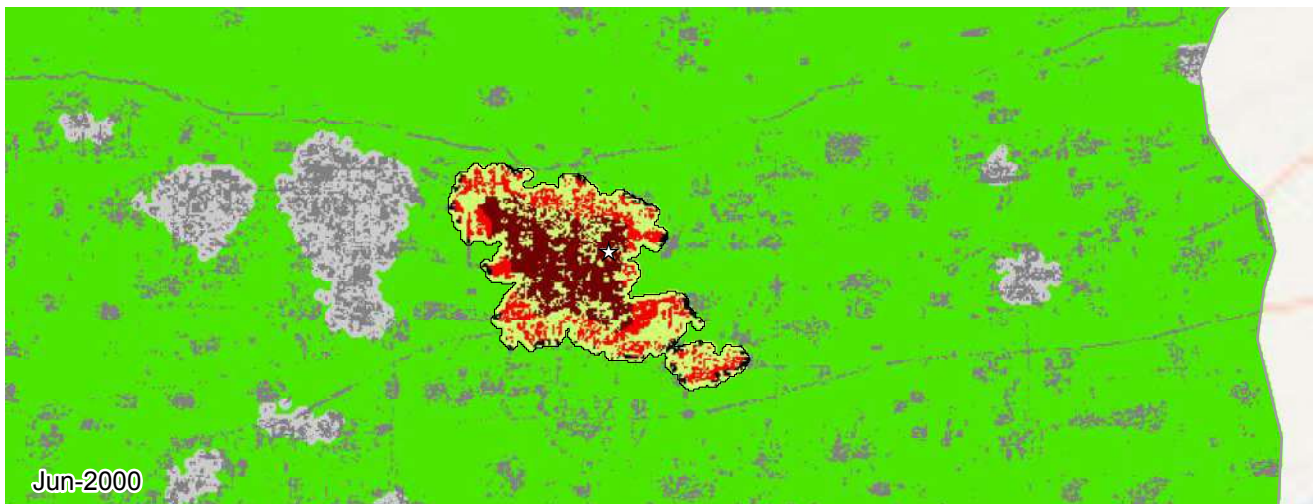
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Wuhan, Hubei, China (East Asia and the Pacific)



Metrics	Sep 1990	Sep 2000	Sep 2013	% Annual Change ('00-'13)
Population	2,112,069	4,674,398	8,174,062	4.3
Built-up Area (Hectares)				
Total	17,460	28,916	102,832	9.8
Urban	11,360	21,782	63,008	8.2
Suburban	5,711	6,652	36,490	13.1
Rural	388	480	3,334	14.9
Open space (Hectares)				
Urbanized Open Space	12,886	15,357	80,890	12.8
Urban Extent	30,346	44,273	183,723	10.9
Density (Persons / Hectare)				
Built-up Area Density	121.0	161.7	79.5	-5.5
Urban Extent Density	69.6	105.6	44.5	-6.6
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.58	0.65	0.56	-1.2
Openness Index	0.41	0.32	0.38	1.3
Compactness (Roundness)				
Proximity	0.71	0.75	0.76	0.0
Cohesion	0.70	0.74	0.75	0.0
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	4,919	42%	12,088	16%
Extension	4,292	37%	31,050	42%
Leapfrog	9	0%	98	0%
Inclusion	2,235	19%	30,676	41%

















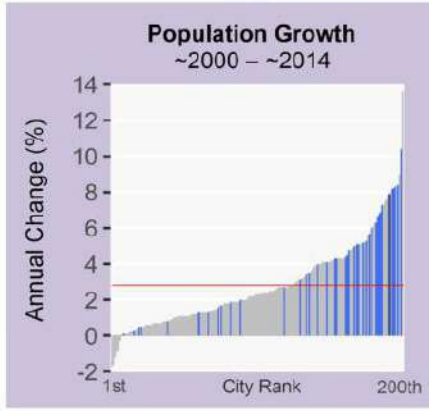
**Xingping, Shaanxi, China
1992-2013**

0 1 2 3 4 km

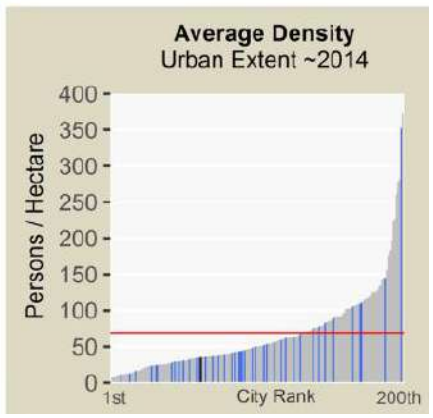
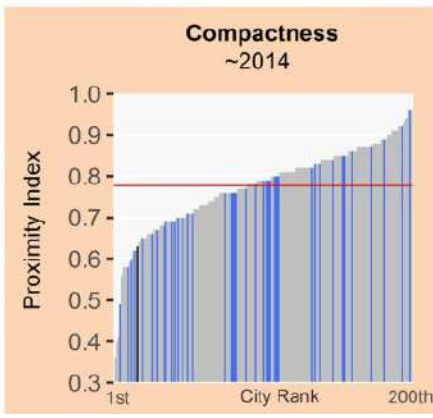
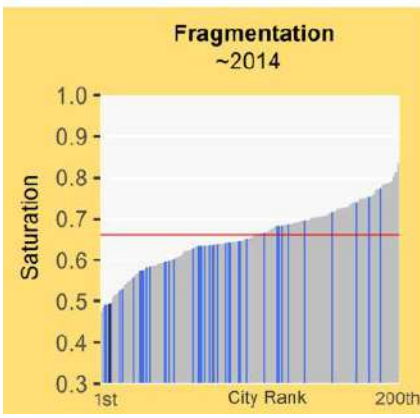
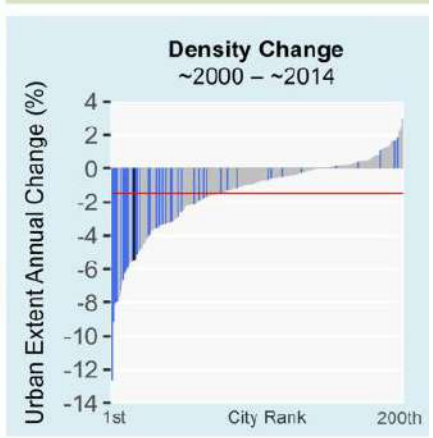
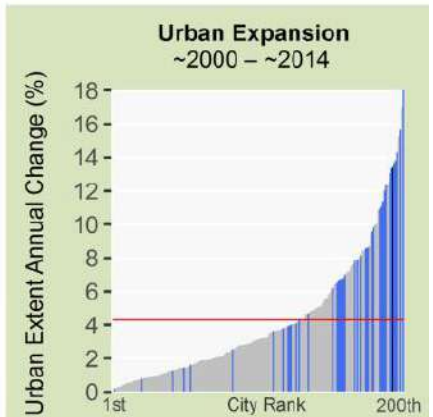
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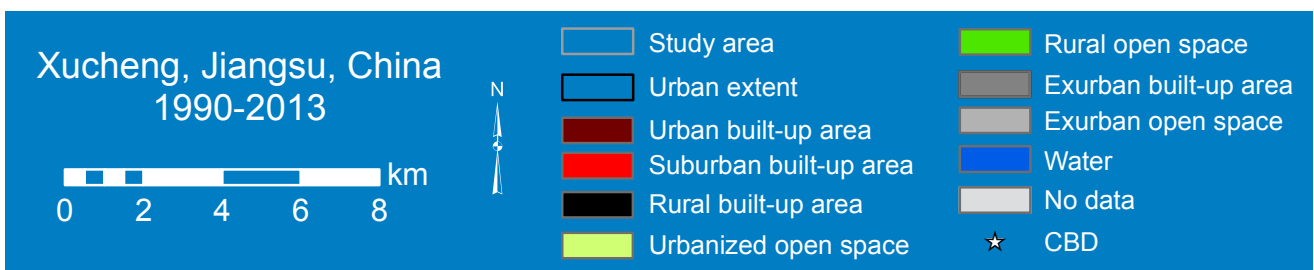
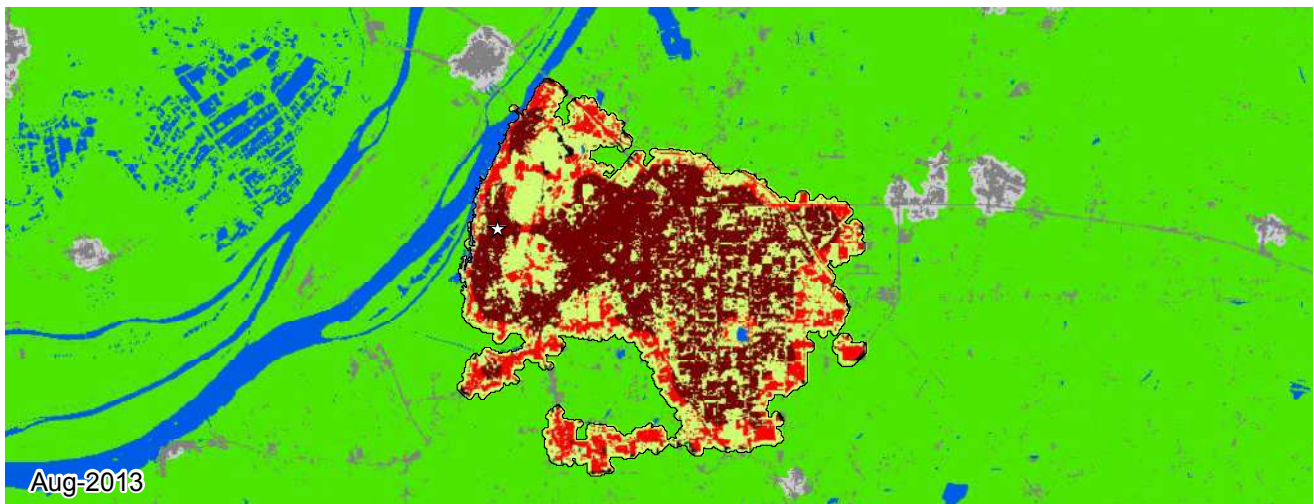
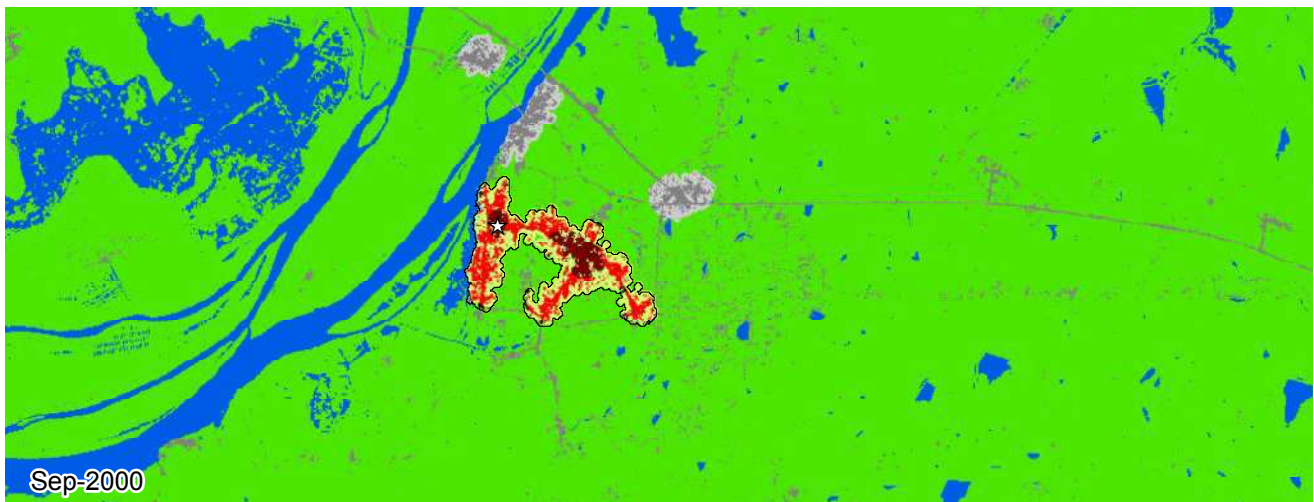
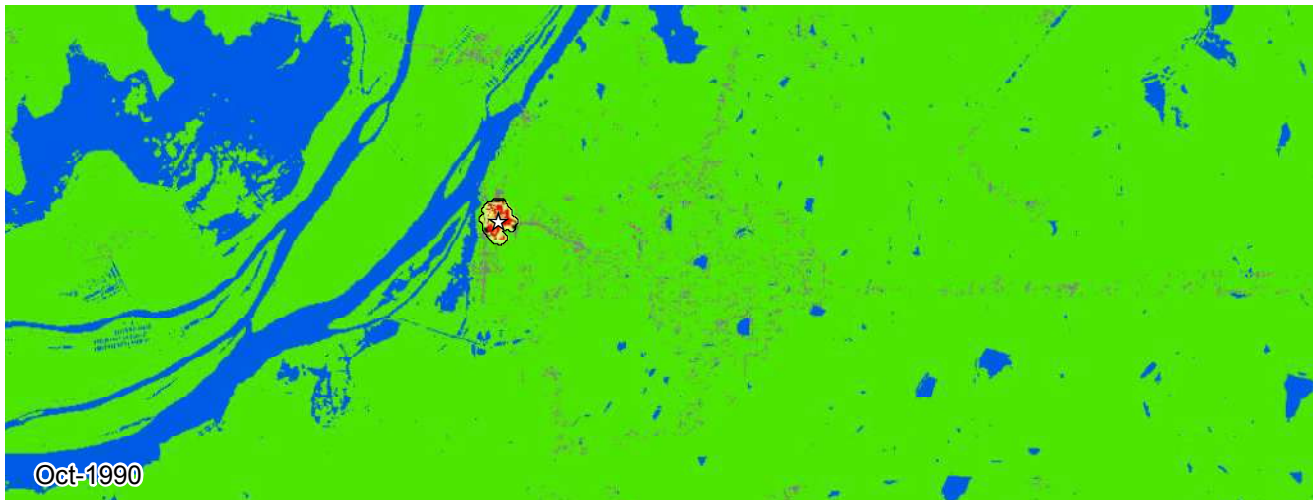
	Study area		Rural open space
	Urban extent		Exurban built-up area
	Urban built-up area		Exurban open space
	Suburban built-up area		Water
	Rural built-up area		No data
	Urbanized open space		CBD

Xingping, Shaanxi, China (East Asia and the Pacific)

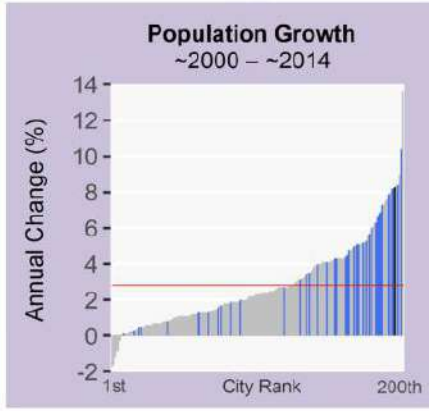


Metrics	Jul 1992	Jun 2000	Jun 2013	% Annual Change ('00-'13)
Population	39,457	68,812	193,390	7.9
Built-up Area (Hectares)				
Total	270	502	2,727	13.0
Urban	28	265	1,288	12.2
Suburban	216	201	1,328	14.5
Rural	25	35	111	8.7
Open space (Hectares)				
Urbanized Open Space	386	464	2,793	13.8
Urban Extent	657	967	5,521	13.4
Density (Persons / Hectare)				
Built-up Area Density	145.7	136.9	70.9	-5.1
Urban Extent Density	60.0	71.1	35.0	-5.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.41	0.52	0.49	-0.4
Openness Index	0.62	0.49	0.47	-0.3
Compactness (Roundness)				
Proximity	0.92	0.87	0.63	-2.5
Cohesion	0.91	0.86	0.61	-2.6
Added Area (Hectares)	'92-'00	Share	'00-'13	Share
Infill	92	39%	383	17%
Extension	67	29%	874	39%
Leapfrog	2	0%	48	2%
Inclusion	69	29%	919	41%

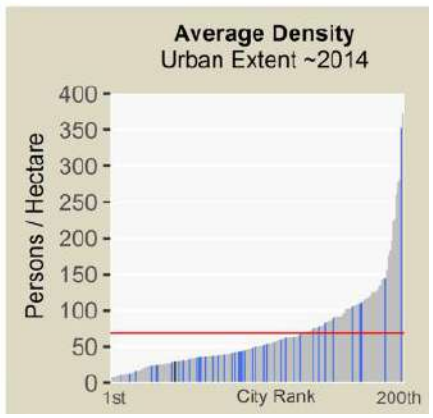
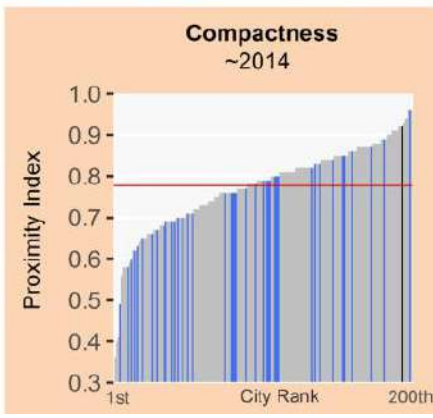
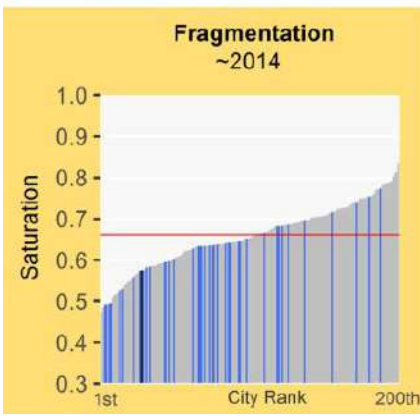
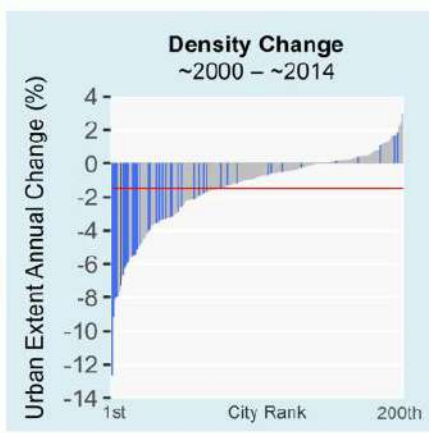
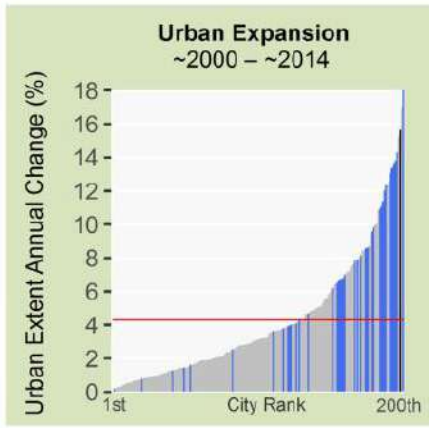


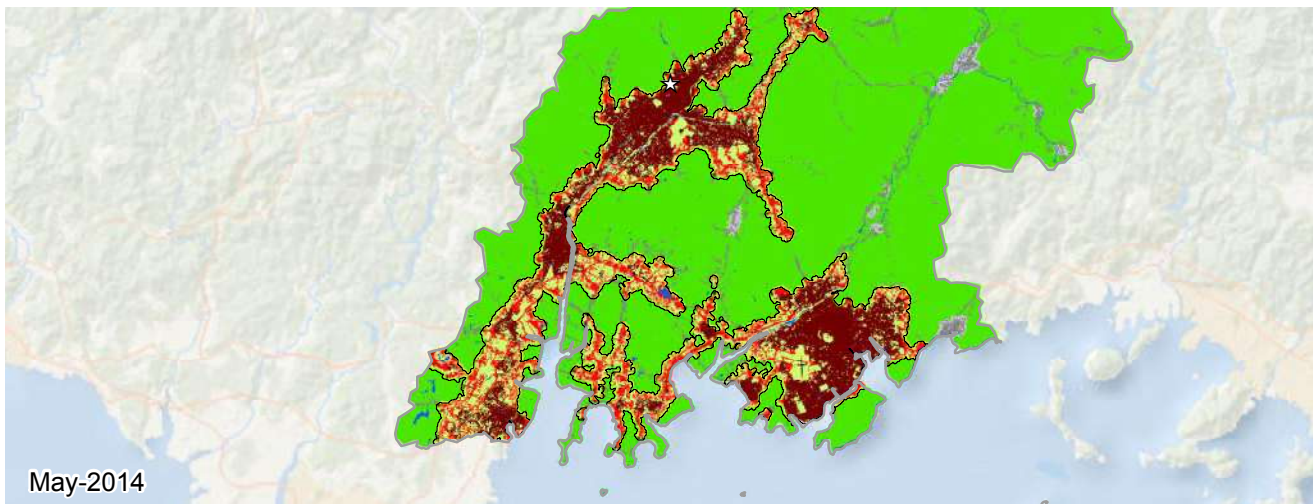
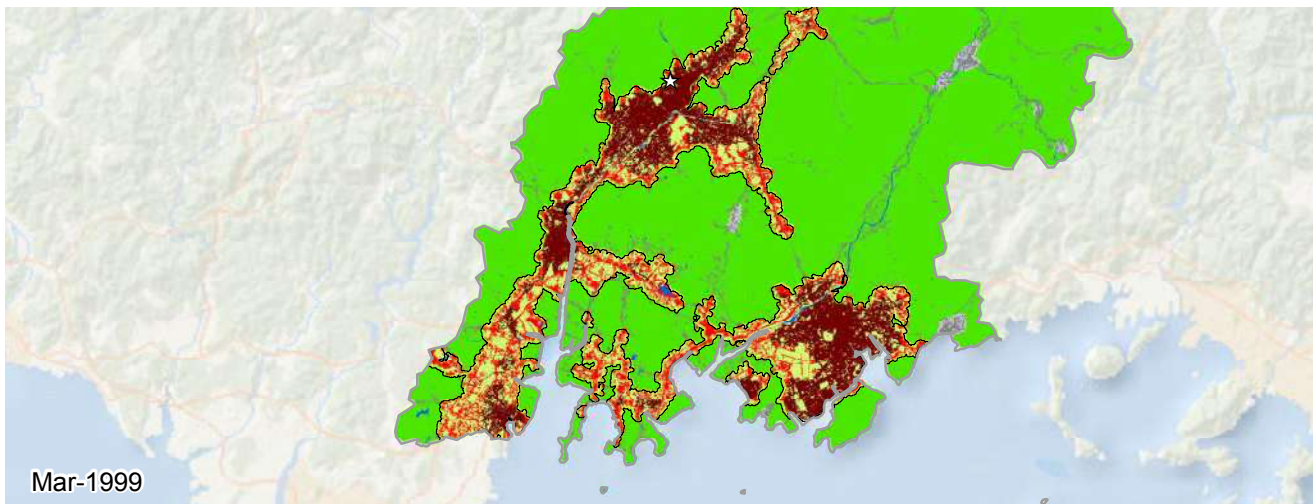
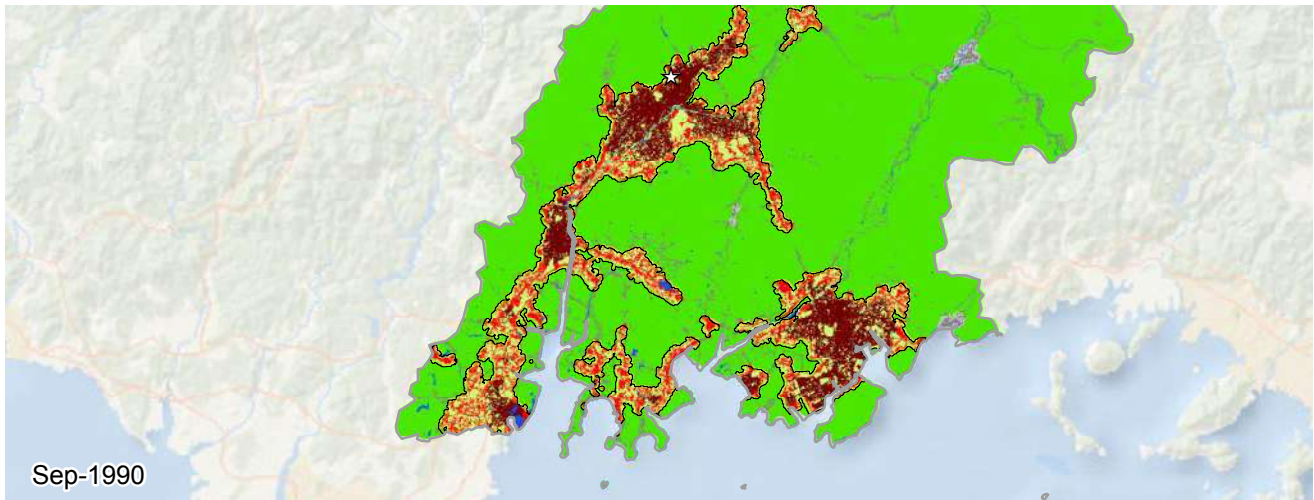


Xucheng, Jiangsu, China (East Asia and the Pacific)



Metrics	Oct 1990	Sep 2000	Aug 2013	% Annual Change ('00-'13)
Population	11,599	60,224	176,752	8.3
Built-up Area (Hectares)				
Total	31	382	3,479	17.1
Urban	0	101	2,419	24.5
Suburban	25	264	988	10.2
Rural	6	16	71	11.6
Open space (Hectares)				
Urbanized Open Space	44	422	2,572	14.0
Urban Extent	76	805	6,052	15.6
Density (Persons / Hectare)				
Built-up Area Density	369.3	157.4	50.8	-8.8
Urban Extent Density	152.3	74.8	29.2	-7.3
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.41	0.48	0.57	1.5
Openness Index	0.70	0.57	0.40	-2.7
Compactness (Roundness)				
Proximity	0.97	0.74	0.92	1.7
Cohesion	0.95	0.74	0.92	1.6
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	11	3%	198	6%
Extension	0	0%	2,357	76%
Leapfrog	244	69%	0	0%
Inclusion	95	27%	541	17%





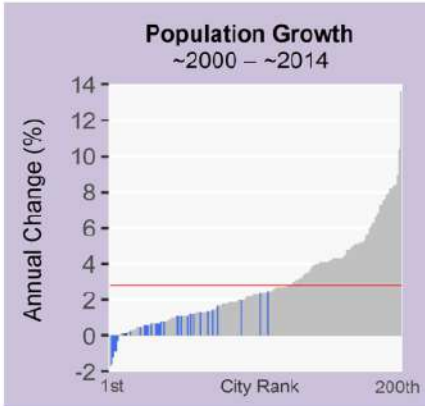
**Yamaguchi, Japan
1990-2014**

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

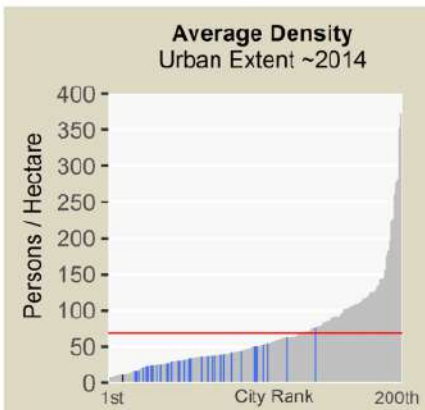
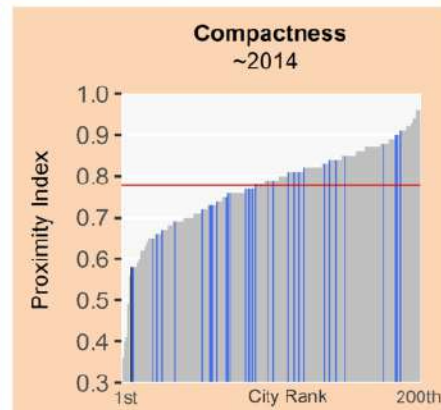
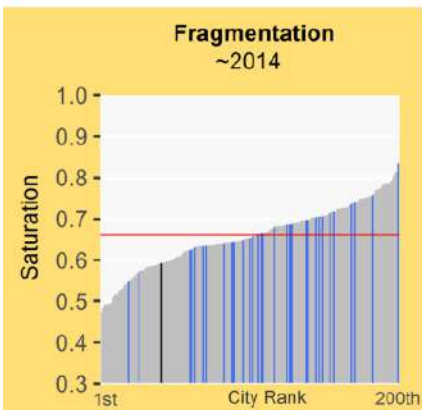
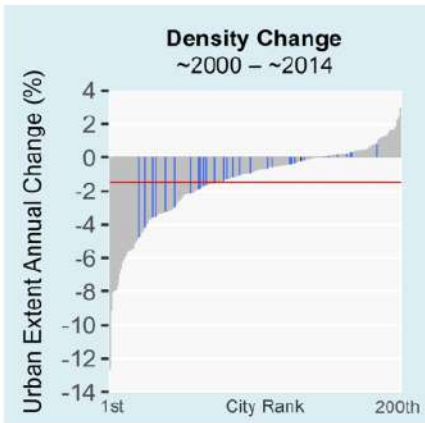
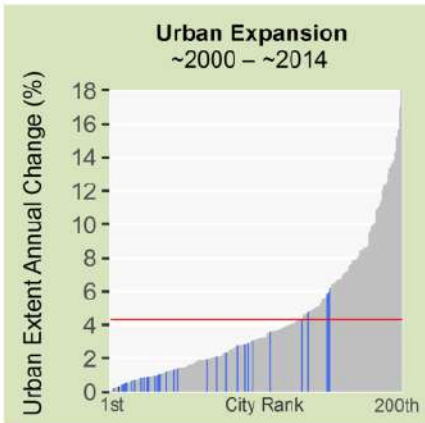
Yamaguchi, Japan (Europe and Japan)

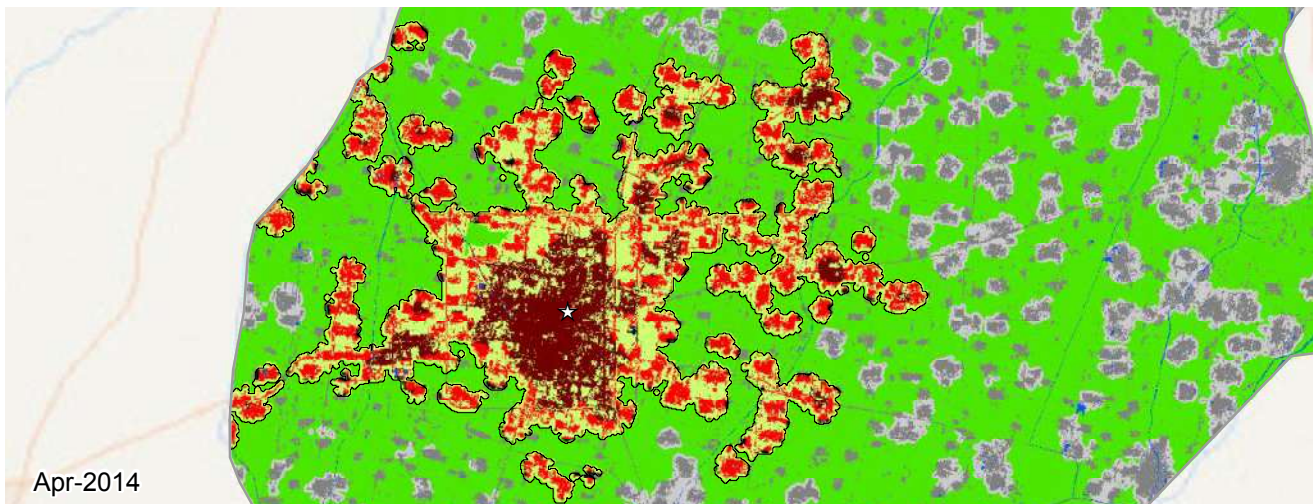
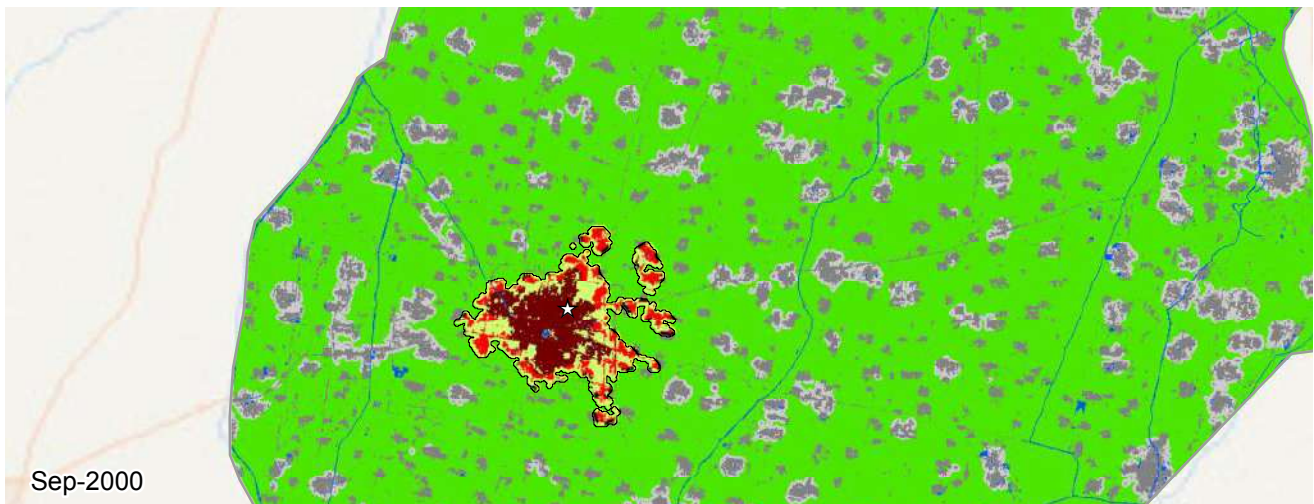
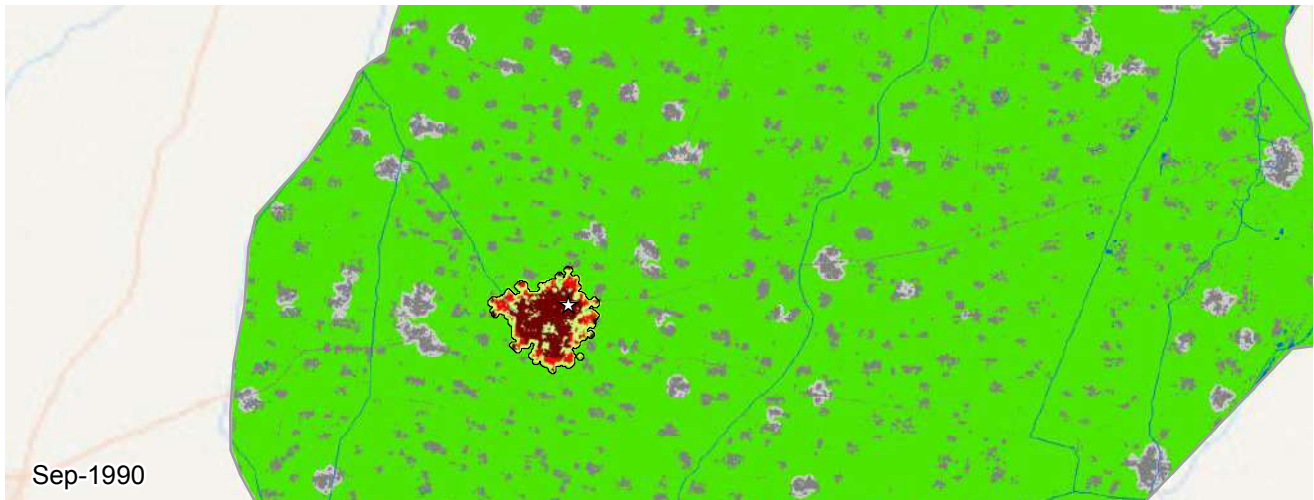


Legend for Charts
 Yamaguchi | Other cities in region | All other cities | Global average



Metrics	Sep 1990	Mar 1999	May 2014	% Annual Change ('99-'14)
Population	115,169	241,087	244,193	0.1
Built-up Area (Hectares)				
Total	5,213	10,865	11,841	0.6
Urban	2,704	6,414	7,376	0.9
Suburban	2,350	4,119	4,158	0.1
Rural	157	331	306	-0.5
Open space (Hectares)				
Urbanized Open Space	4,430	8,190	8,165	-0.0
Urban Extent	9,643	19,055	20,006	0.3
Density (Persons / Hectare)				
Built-up Area Density	22.1	22.2	20.6	-0.5
Urban Extent Density	11.9	12.7	12.2	-0.2
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.54	0.57	0.59	0.2
Openness Index	0.45	0.41	0.38	-0.4
Compactness (Roundness)				
Proximity	0.51	0.57	0.58	0.2
Cohesion	0.53	0.58	0.59	0.2
Added Area (Hectares)	'90-'99	Share	'99-'14	Share
Infill	1,043	47%	620	63%
Extension	564	25%	124	12%
Leapfrog	7	0%	6	0%
Inclusion	559	25%	222	22%





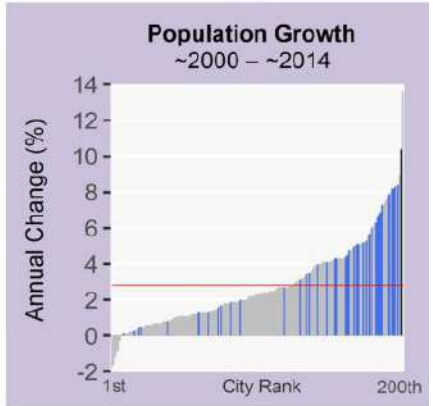
**Yanggu, Shandong, China
1990-2014**

0 3 6 9 12 km

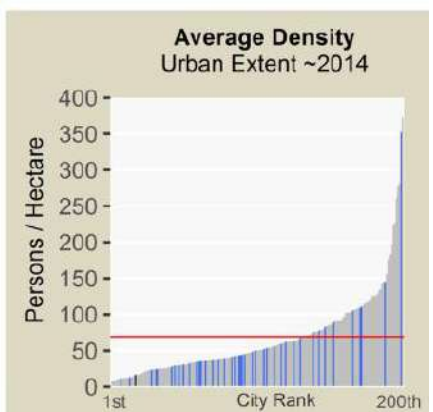
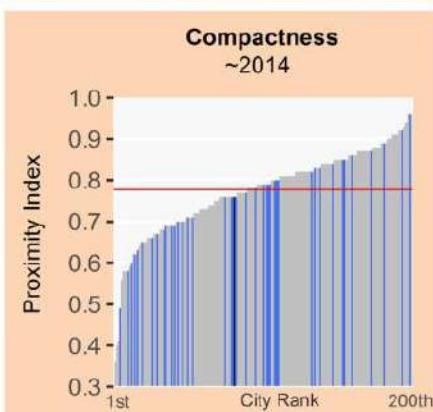
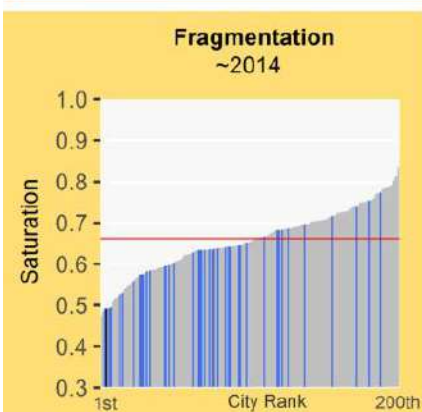
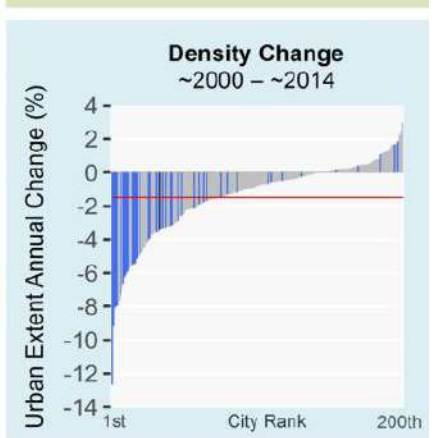
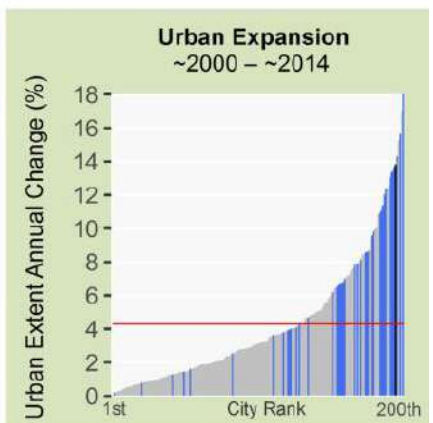
Study area
Urban extent
Urban built-up area
Suburban built-up area
Rural built-up area
Urbanized open space

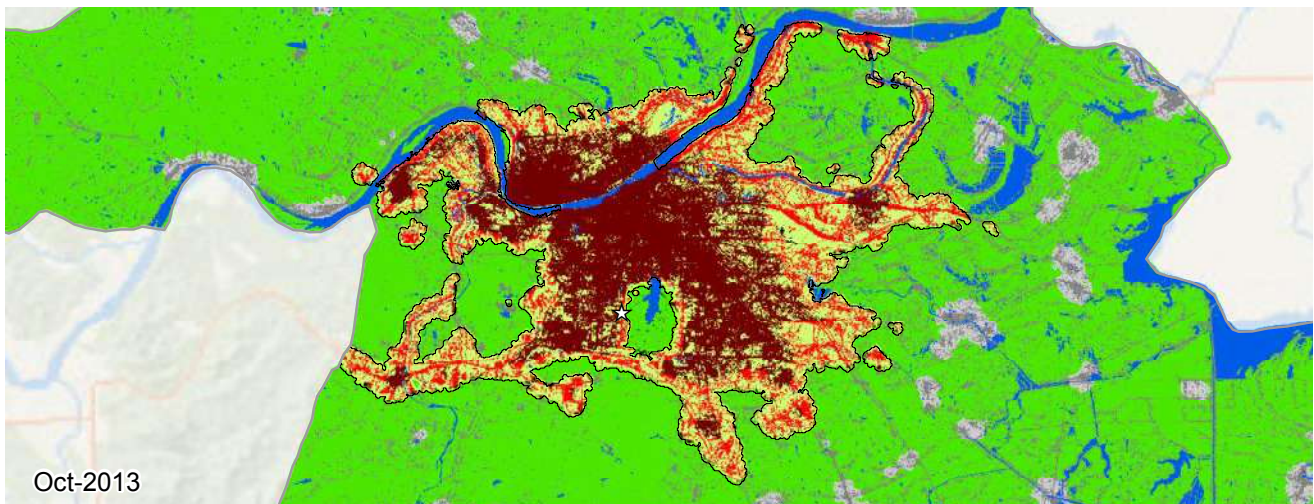
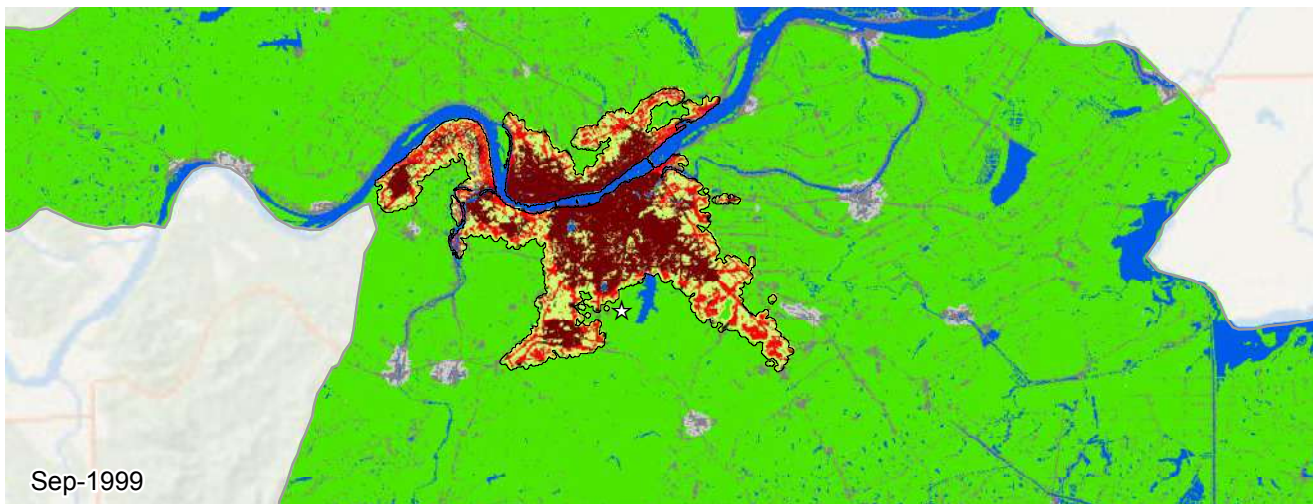
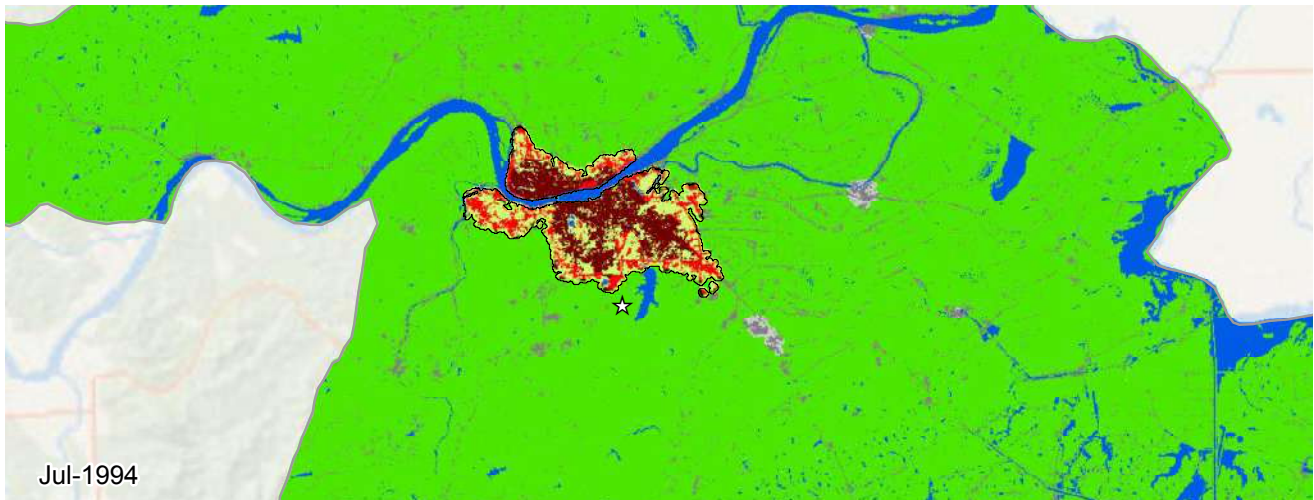
Rural open space
Exurban built-up area
Exurban open space
Water
No data
CBD

Yanggu, Shandong, China (East Asia and the Pacific)



Metrics	Sep 1990	Sep 2000	Apr 2014	% Annual Change ('00-'14)
Population	31,068	53,922	221,306	10.4
Built-up Area (Hectares)				
Total	449	1,150	6,497	12.7
Urban	320	665	2,192	8.8
Suburban	115	414	3,963	16.6
Rural	13	70	341	11.6
Open space (Hectares)				
Urbanized Open Space	279	861	6,709	15.1
Urban Extent	729	2,012	13,207	13.9
Density (Persons / Hectare)				
Built-up Area Density	69.1	46.9	34.1	-2.3
Urban Extent Density	42.6	26.8	16.8	-3.5
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.62	0.57	0.49	-1.1
Openness Index	0.37	0.41	0.52	1.8
Compactness (Roundness)				
Proximity	0.97	0.89	0.76	-1.2
Cohesion	0.96	0.87	0.73	-1.3
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	93	13%	442	8%
Extension	321	45%	1,992	37%
Leapfrog	23	3%	15	0%
Inclusion	262	37%	2,896	54%

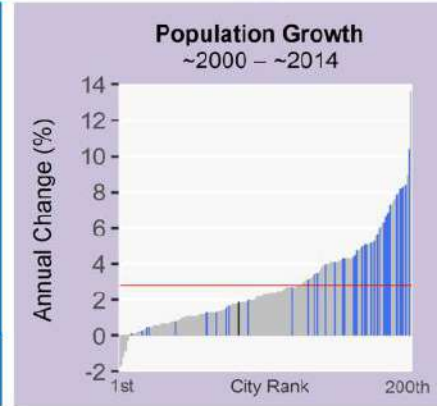




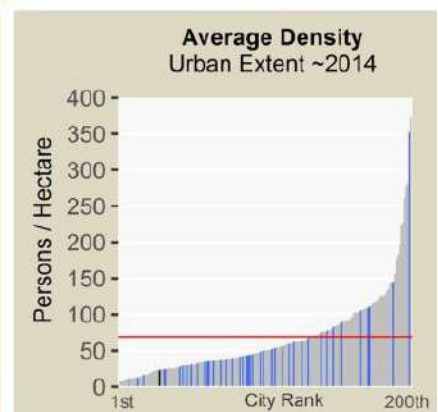
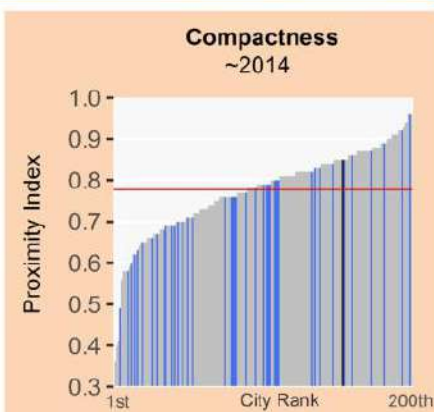
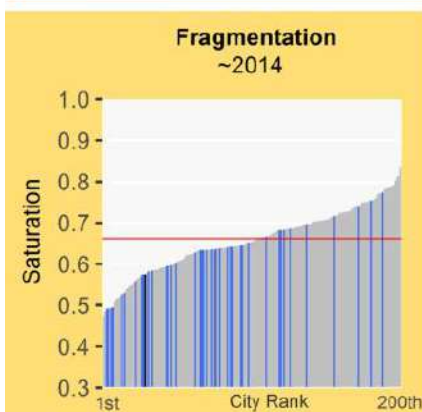
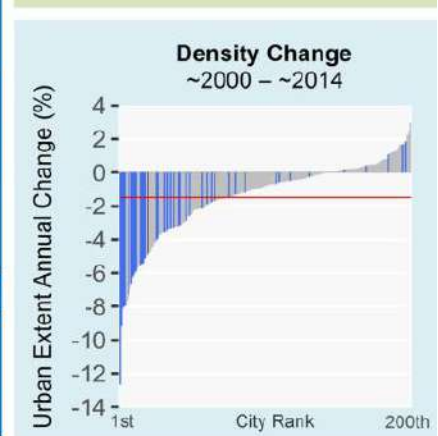
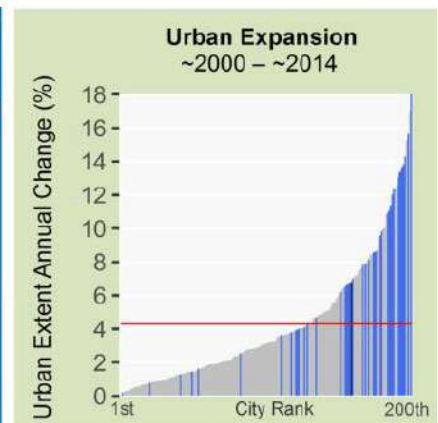
**Yiyang, Hunan, China
1994-2013**

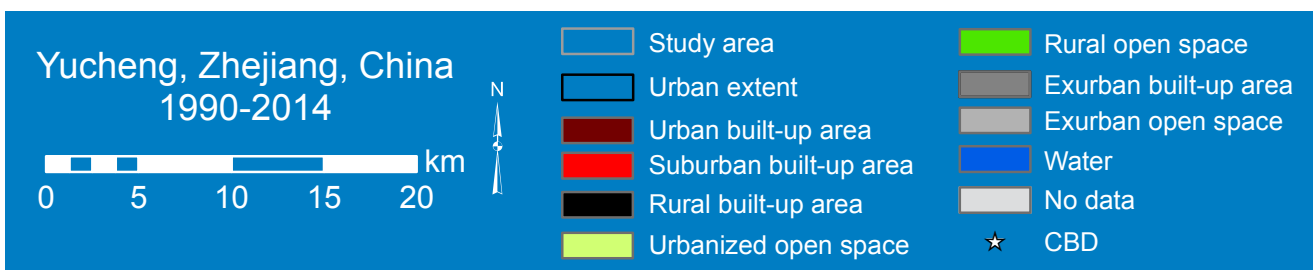
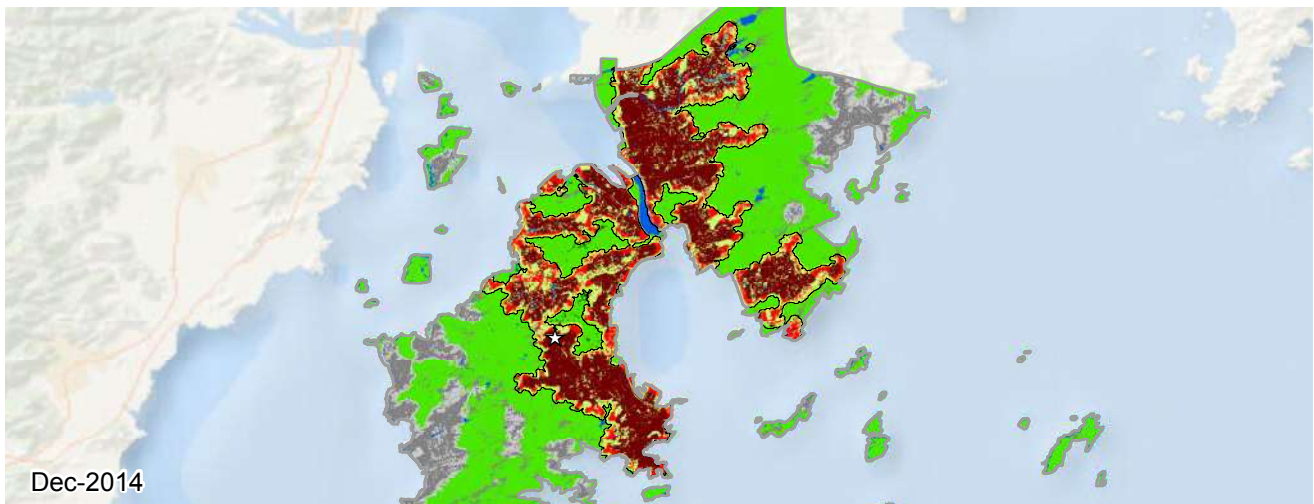
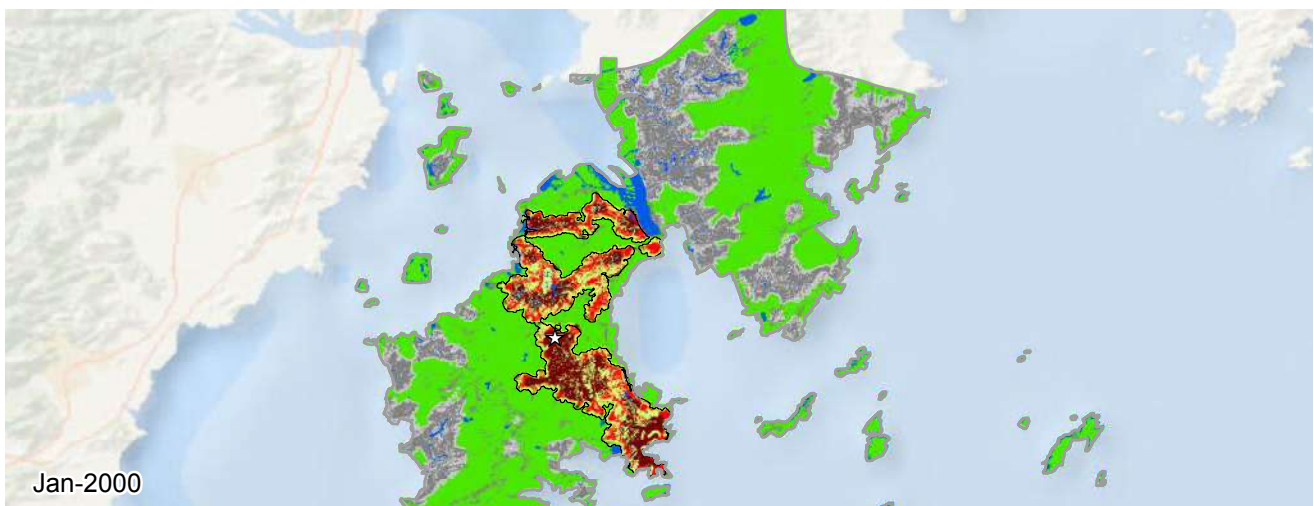
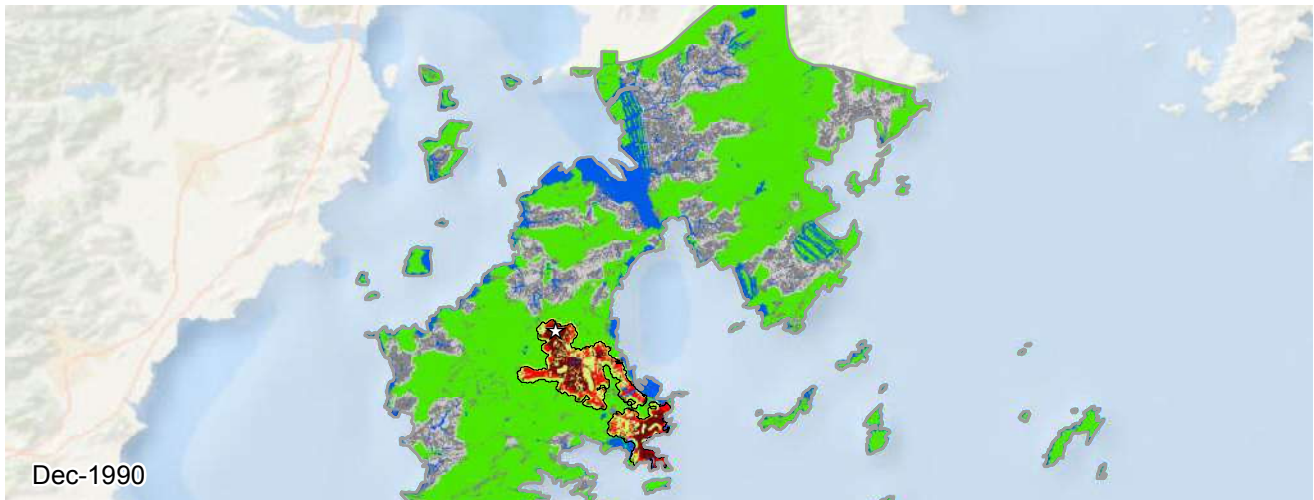
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Yiyang, Hunan, China (East Asia and the Pacific)

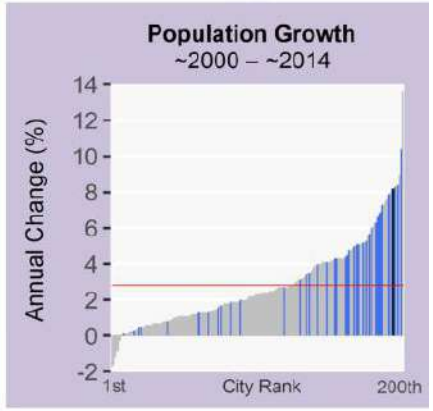


Metrics	Jul 1994	Sep 1999	Oct 2013	% Annual Change ('99-'13)
Population	274,738	315,558	412,684	1.9
Built-up Area (Hectares)				
Total	1,751	3,988	9,951	6.5
Urban	1,089	2,580	6,472	6.5
Suburban	601	1,288	3,196	6.5
Rural	60	119	281	6.1
Open space (Hectares)				
Urbanized Open Space	1,325	2,638	7,353	7.3
Urban Extent	3,077	6,626	17,304	6.8
Density (Persons / Hectare)				
Built-up Area Density	156.9	79.1	41.5	-4.6
Urban Extent Density	89.3	47.6	23.8	-4.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.57	0.60	0.58	-0.3
Openness Index	0.43	0.39	0.37	-0.5
Compactness (Roundness)				
Proximity	0.84	0.80	0.85	0.5
Cohesion	0.84	0.78	0.84	0.5
Added Area (Hectares)	'94-'99	Share	'99-'13	Share
Infill	528	23%	982	16%
Extension	1,328	59%	3,372	56%
Leapfrog	0	0%	0	0%
Inclusion	379	16%	1,607	26%

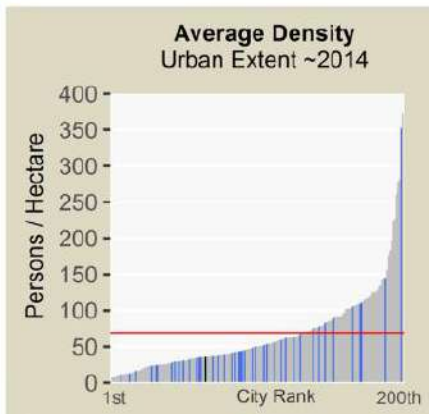
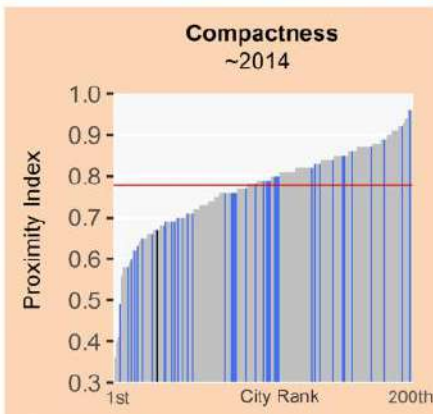
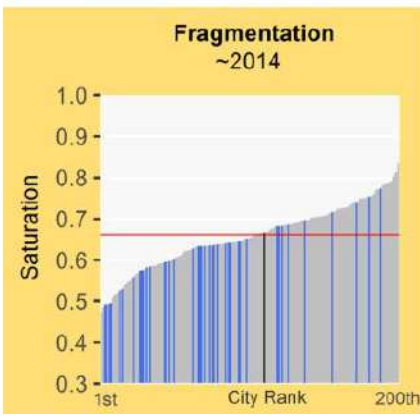
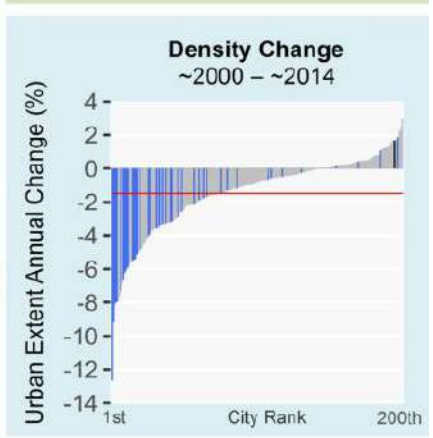
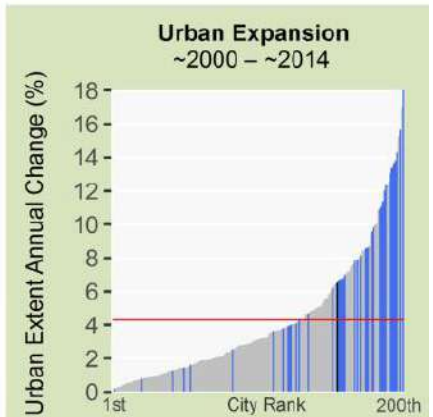


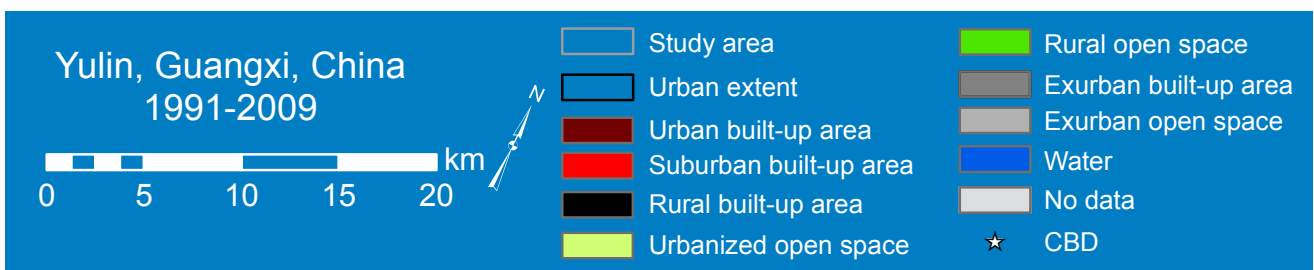
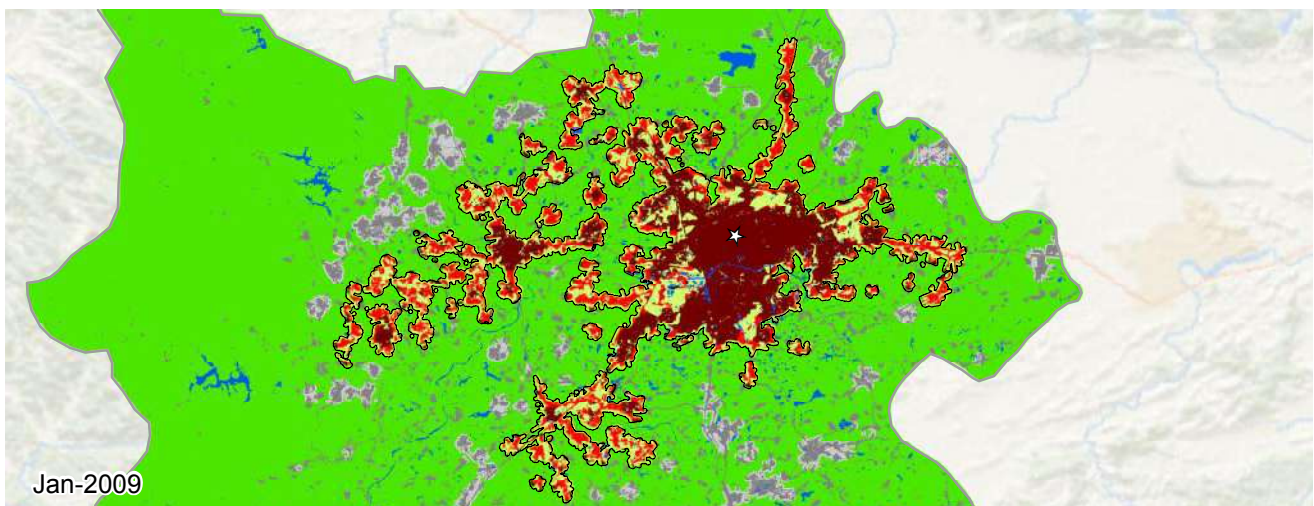
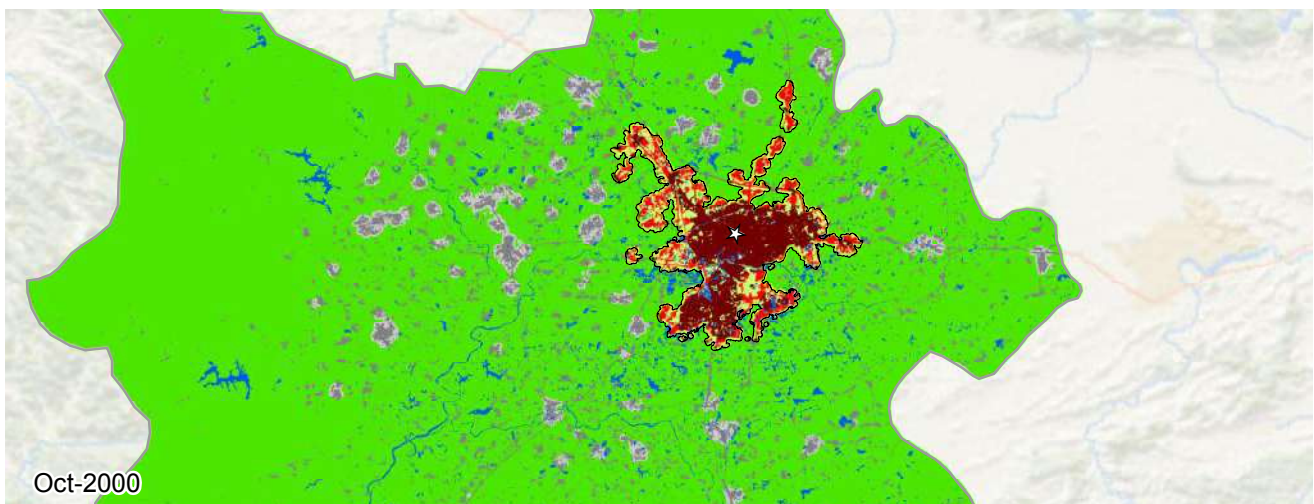
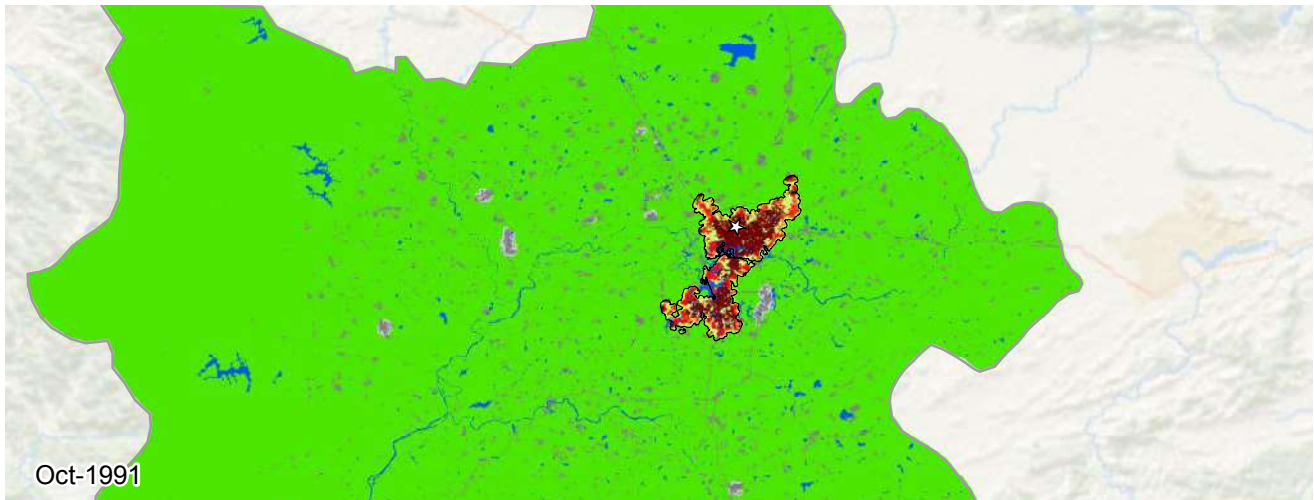


Yucheng, Zhejiang, China (East Asia and the Pacific)

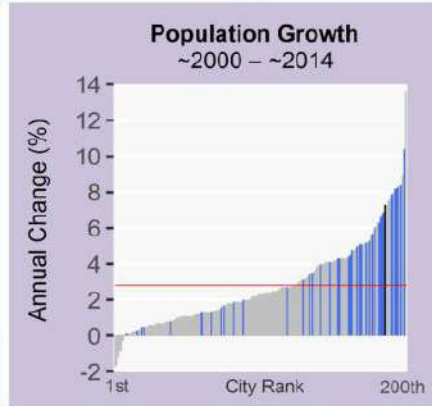


Metrics	Dec 1990	Jan 2000	Dec 2014	% Annual Change ('00-'14)
Population	60,049	142,976	485,305	8.2
Built-up Area (Hectares)				
Total	1,157	2,888	9,111	7.7
Urban	553	1,523	6,861	10.1
Suburban	557	1,282	2,116	3.4
Rural	46	82	134	3.3
Open space (Hectares)				
Urbanized Open Space	875	2,288	4,566	4.6
Urban Extent	2,033	5,176	13,678	6.5
Density (Persons / Hectare)				
Built-up Area Density	51.9	49.5	53.3	0.5
Urban Extent Density	29.5	27.6	35.5	1.7
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.57	0.56	0.67	1.2
Openness Index	0.51	0.48	0.34	-2.2
Compactness (Roundness)				
Proximity	0.69	0.65	0.67	0.2
Cohesion	0.70	0.67	0.68	0.2
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	301	17%	1,270	20%
Extension	321	18%	1,392	22%
Leapfrog	0	0%	80	1%
Inclusion	1,107	64%	3,479	55%

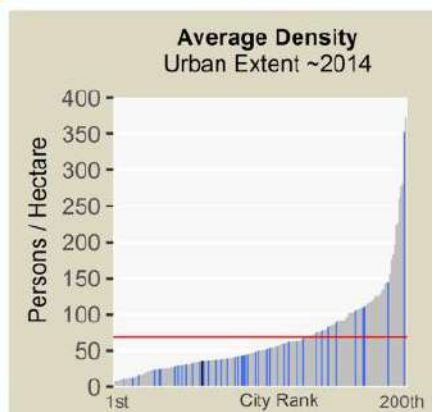
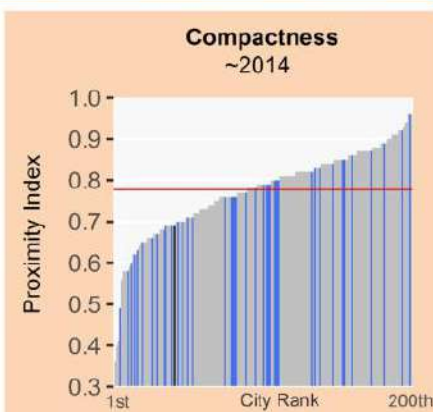
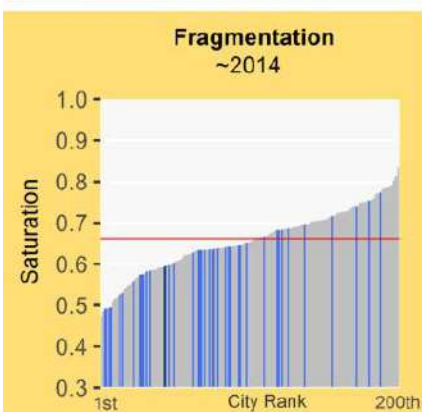
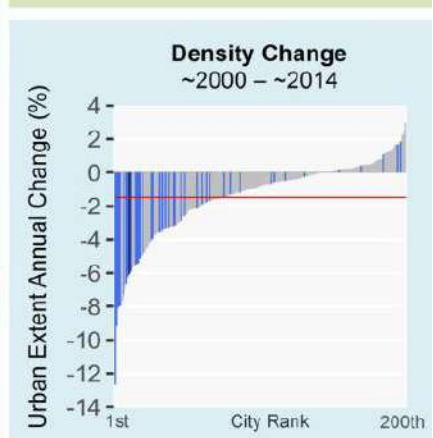
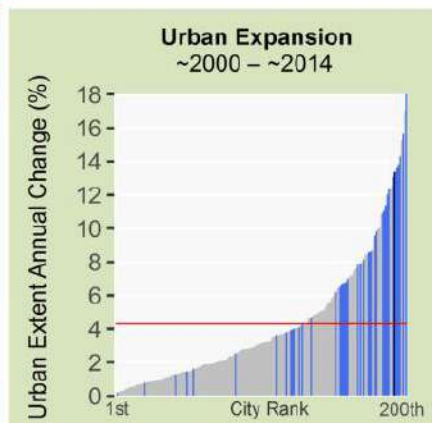


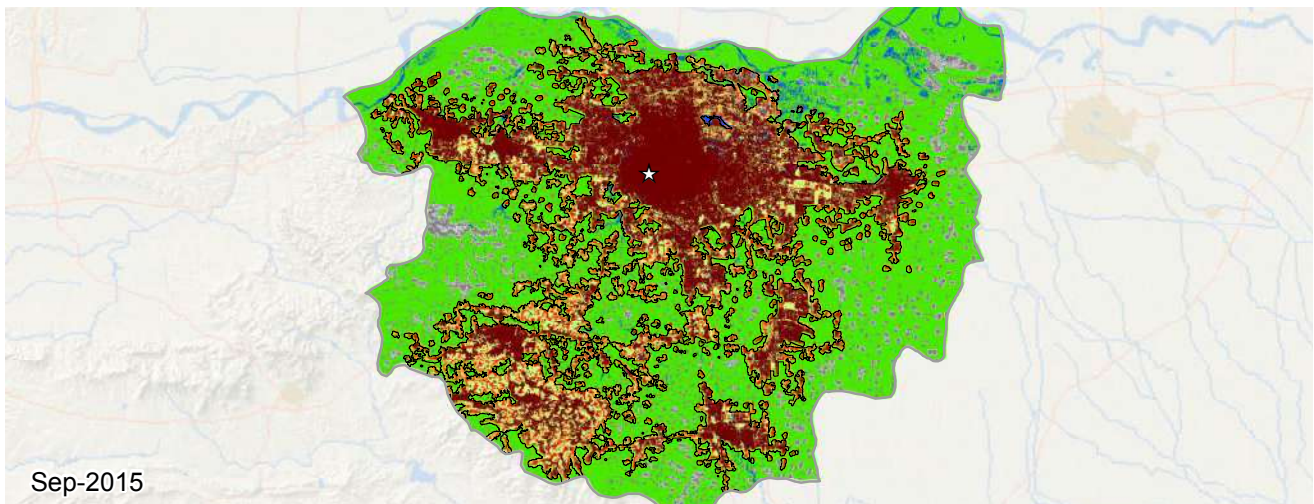
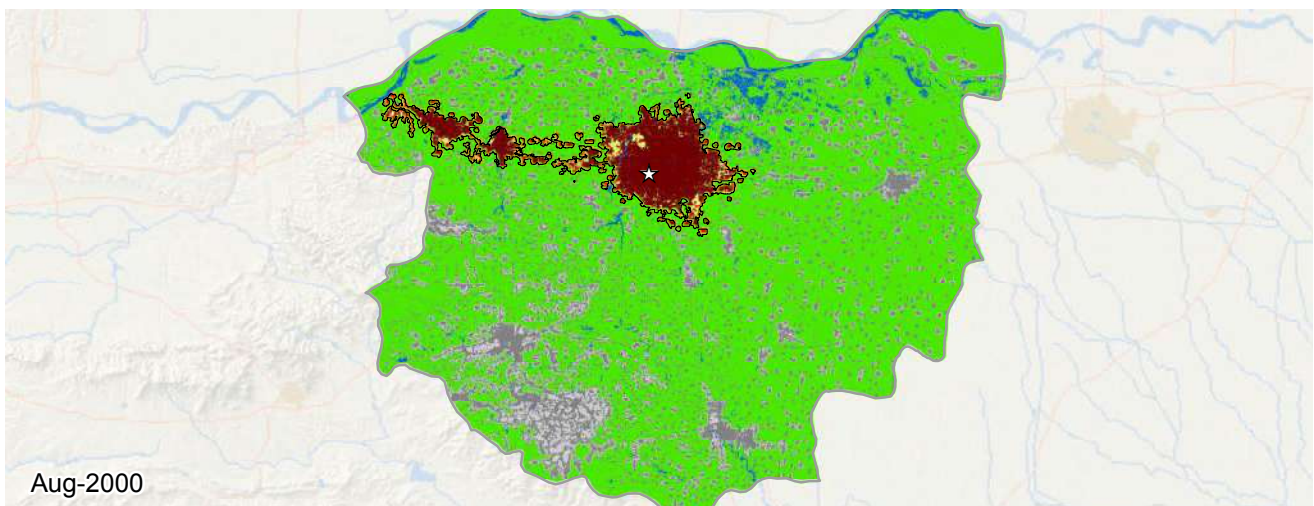
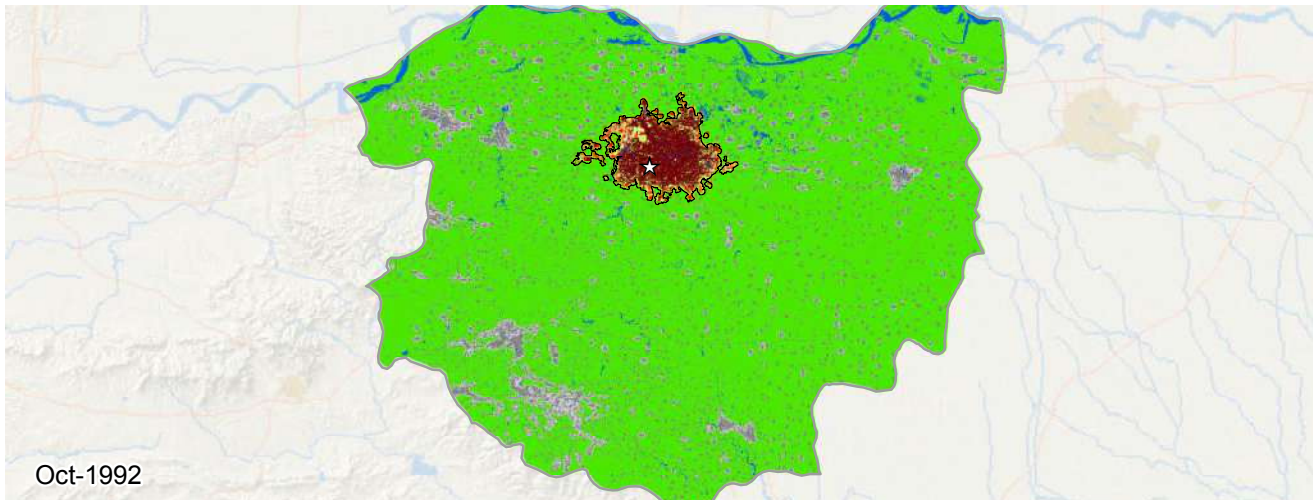


Yulin, Guangxi, China (East Asia and the Pacific)



Metrics	Oct 1991	Oct 2000	Jan 2009	% Annual Change ('00-'09)
Population	250,302	345,815	633,380	7.3
Built-up Area (Hectares)				
Total	1,287	3,871	10,752	12.4
Urban	793	2,504	5,833	10.2
Suburban	448	1,264	4,445	15.2
Rural	44	102	474	18.6
Open space (Hectares)				
Urbanized Open Space	807	2,100	7,340	15.2
Urban Extent	2,095	5,972	18,093	13.4
Density (Persons / Hectare)				
Built-up Area Density	194.5	89.3	58.9	-5.0
Urban Extent Density	119.5	57.9	35.0	-6.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.61	0.65	0.59	-1.1
Openness Index	0.42	0.35	0.41	1.8
Compactness (Roundness)				
Proximity	0.73	0.84	0.69	-2.3
Cohesion	0.72	0.82	0.68	-2.3
Added Area (Hectares)	'91-'00	Share	'00-'09	Share
Infill	341	13%	1,007	14%
Extension	1,652	63%	3,093	44%
Leapfrog	0	0%	95	1%
Inclusion	589	22%	2,684	39%

















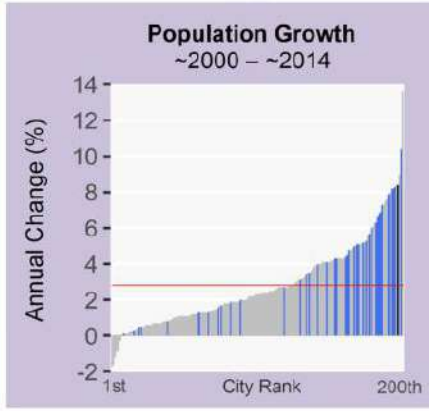
**Zhengzhou, Henan, China
1992-2015**

0 10 20 30 40 km

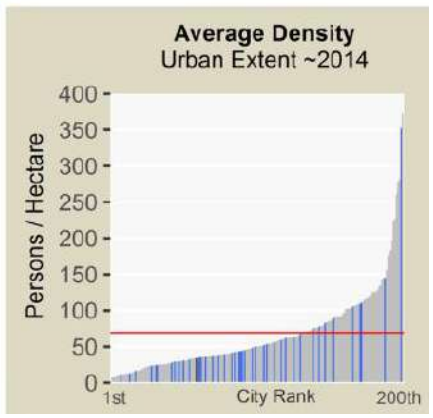
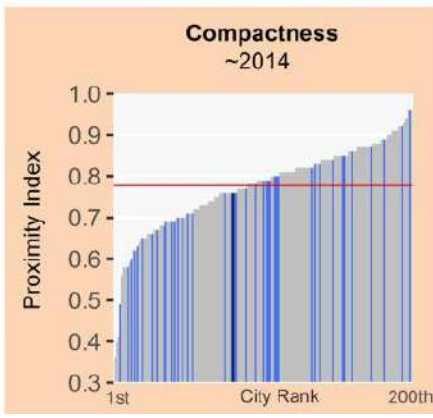
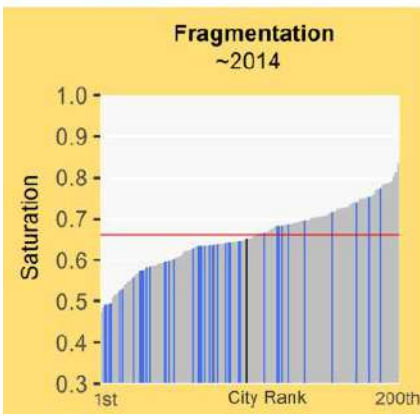
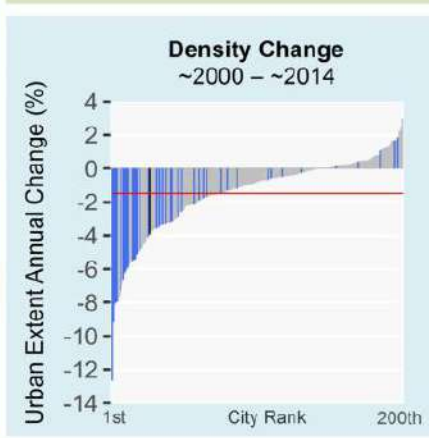
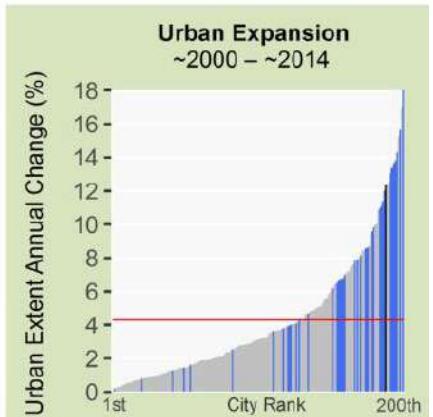
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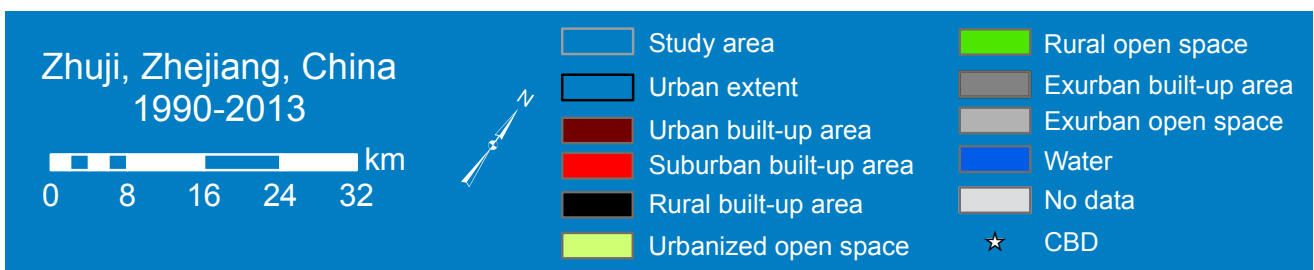
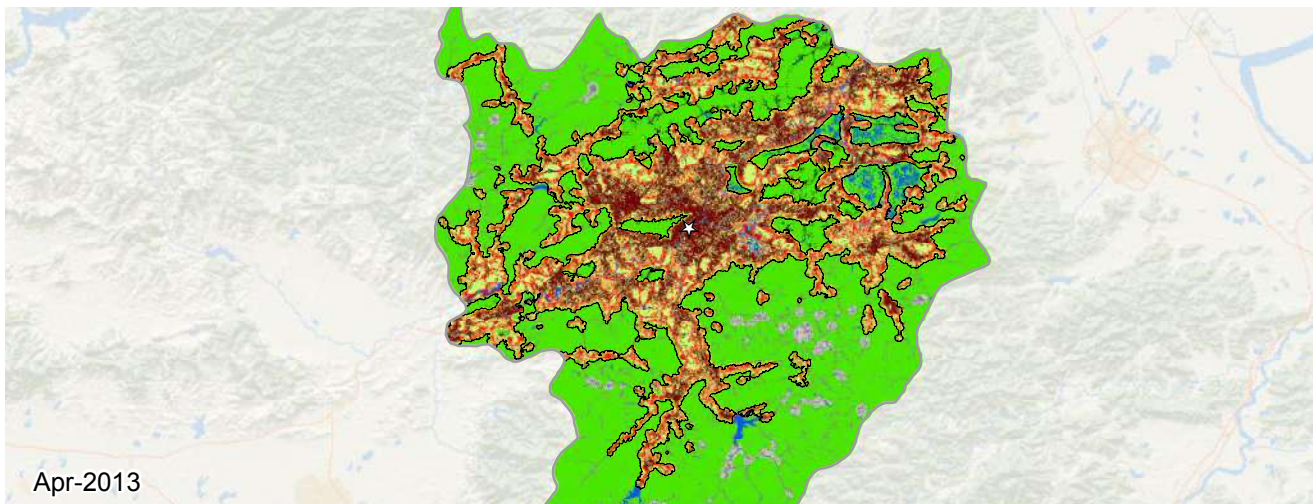
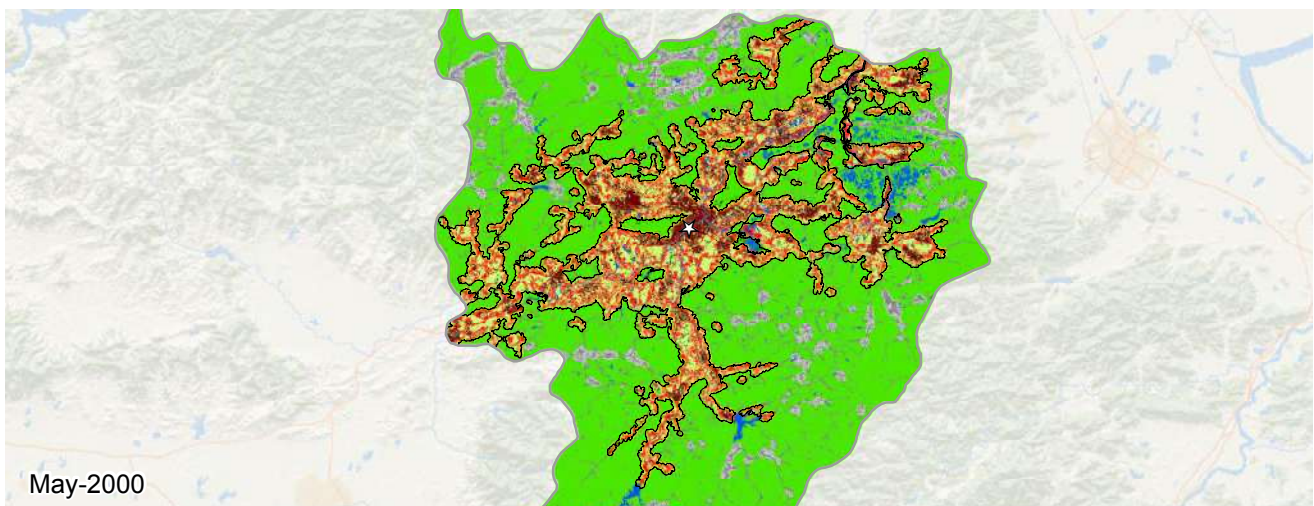
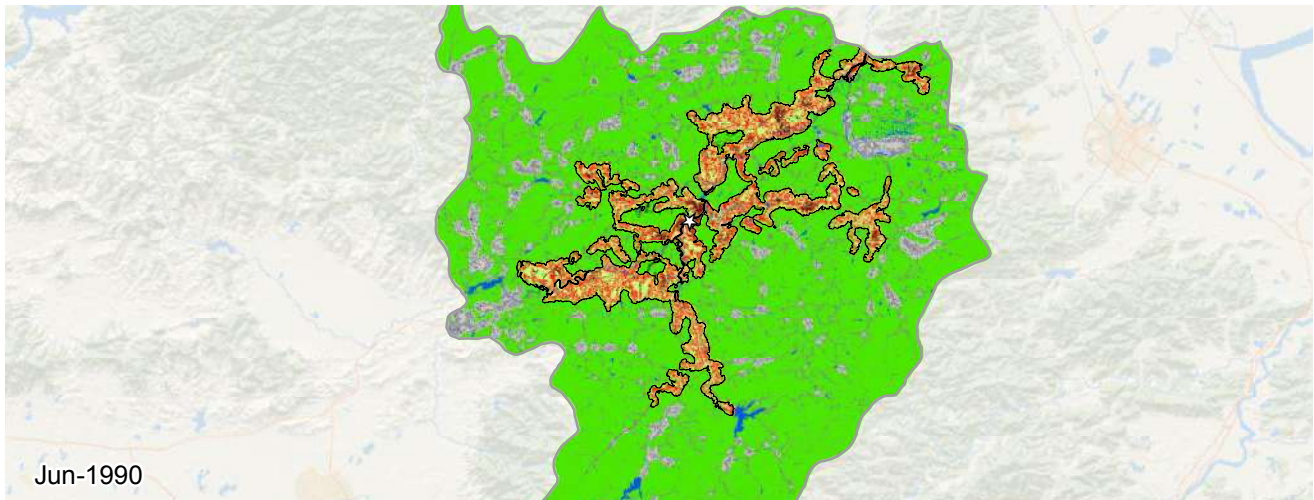
 Study area	 Rural open space
 Urban extent	 Exurban built-up area
 Urban built-up area	 Exurban open space
 Suburban built-up area	 Water
 Rural built-up area	 No data
 Urbanized open space	 CBD

Zhengzhou, Henan, China (East Asia and the Pacific)

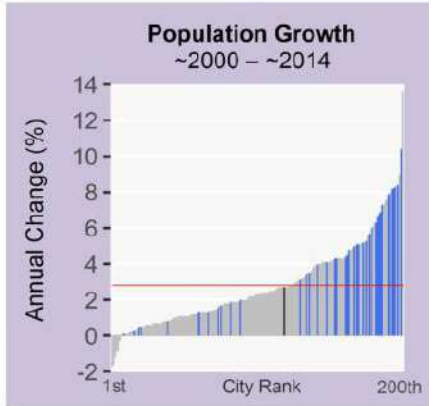


Metrics	Oct 1992	Aug 2000	Sep 2015	% Annual Change ('00-'15)
Population	1,256,955	2,012,209	7,156,618	8.4
Built-up Area (Hectares)				
Total	12,741	25,588	137,260	11.1
Urban	10,334	20,882	96,928	10.2
Suburban	2,205	4,311	37,325	14.3
Rural	201	393	3,005	13.5
Open space (Hectares)				
Urbanized Open Space	5,097	7,096	73,085	15.5
Urban Extent	17,839	32,684	210,345	12.3
Density (Persons / Hectare)				
Built-up Area Density	98.6	78.6	52.1	-2.7
Urban Extent Density	70.5	61.6	34.0	-3.9
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.71	0.78	0.65	-1.2
Openness Index	0.26	0.21	0.33	2.9
Compactness (Roundness)				
Proximity	0.93	0.55	0.76	2.1
Cohesion	0.93	0.56	0.76	2.1
Added Area (Hectares)	'92-'00	Share	'00-'15	Share
Infill	3,615	28%	6,261	5%
Extension	0	0%	56,557	50%
Leapfrog	4,549	35%	1,081	0%
Inclusion	4,680	36%	47,771	42%

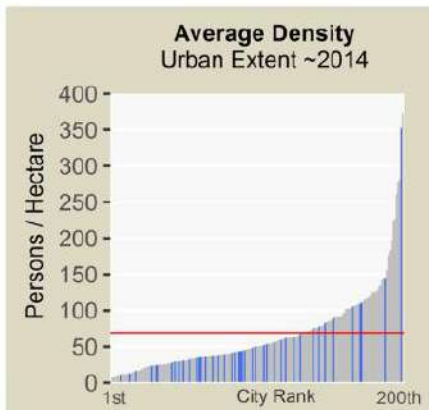
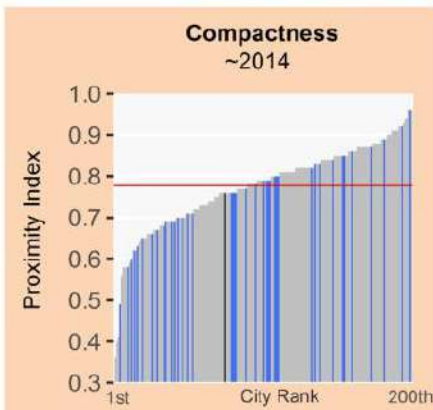
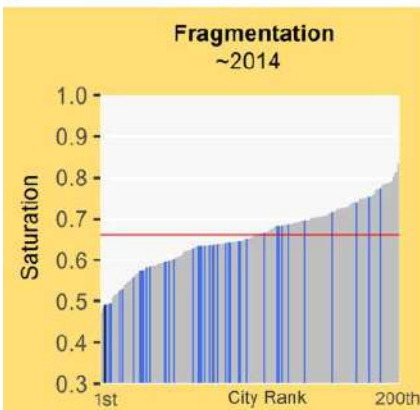
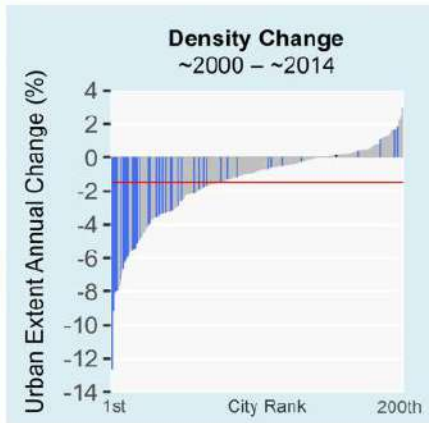
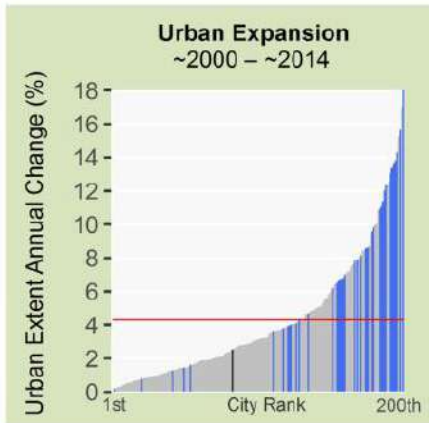


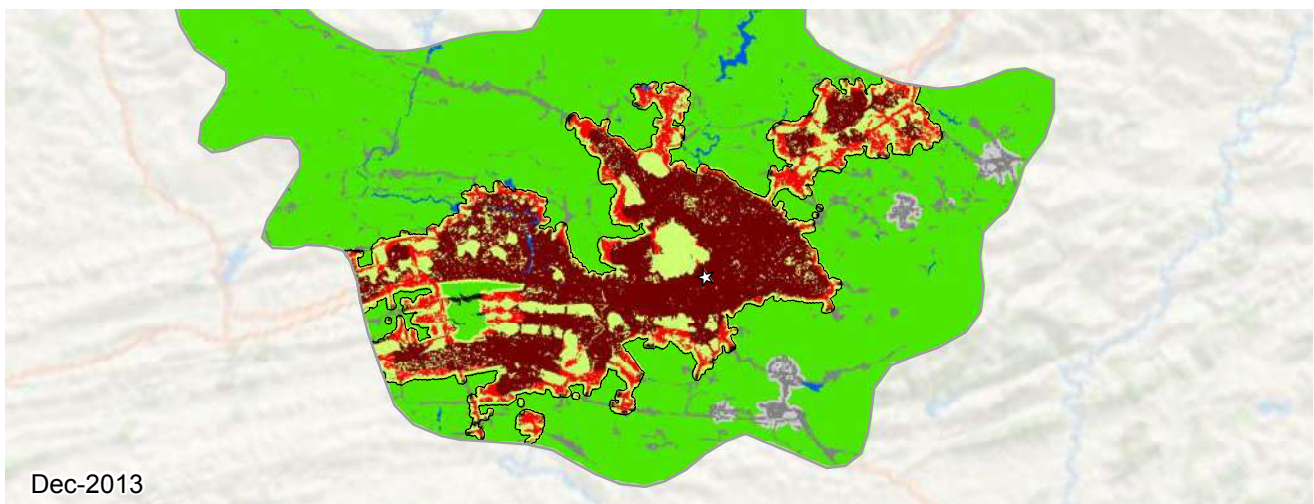
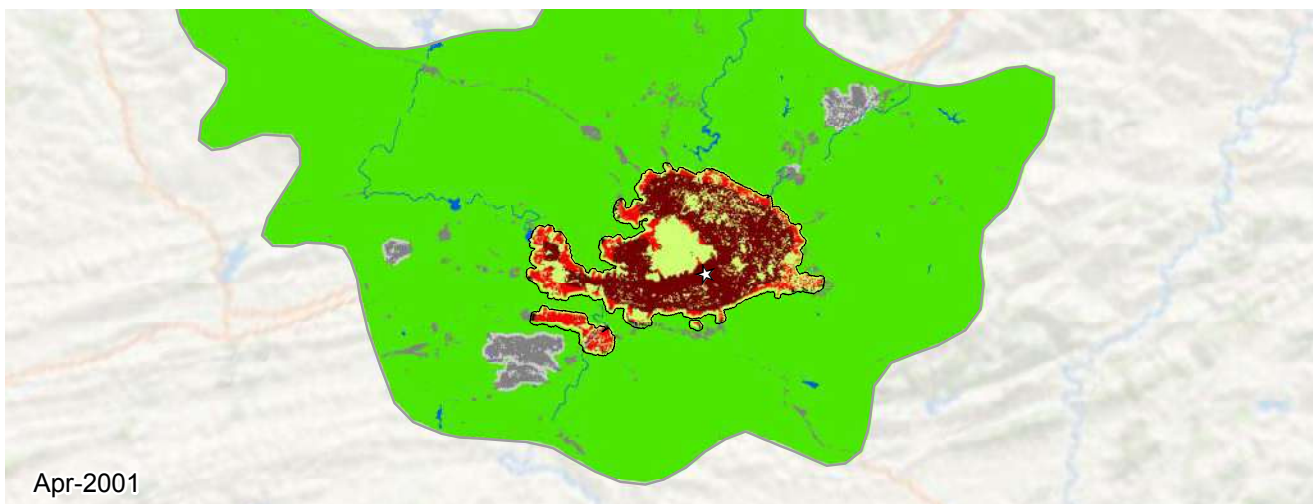
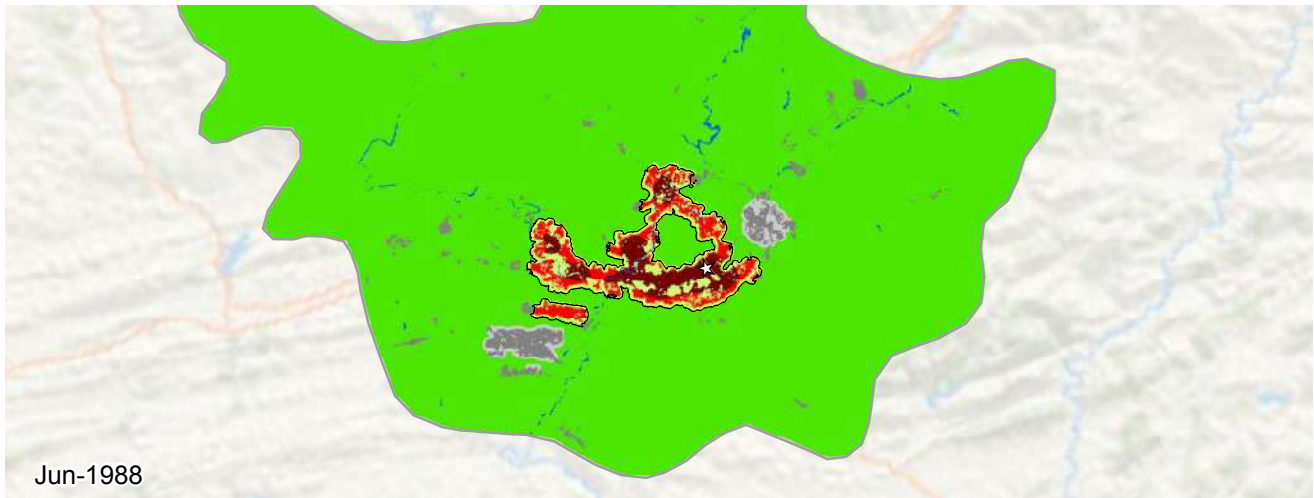


Zhuji, Zhejiang, China (East Asia and the Pacific)



Metrics	Jun 1990	May 2000	Apr 2013	% Annual Change ('00-'13)
Population	367,694	695,580	979,669	2.7
Built-up Area (Hectares)				
Total	11,969	29,129	43,825	3.2
Urban	1,125	7,814	19,666	7.1
Suburban	9,968	19,819	22,591	1.0
Rural	875	1,495	1,566	0.4
Open space (Hectares)				
Urbanized Open Space	17,199	35,216	45,342	2.0
Urban Extent	29,169	64,346	89,168	2.5
Density (Persons / Hectare)				
Built-up Area Density	30.7	23.9	22.4	-0.5
Urban Extent Density	12.6	10.8	11.0	0.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.41	0.45	0.49	0.6
Openness Index	0.63	0.56	0.50	-0.8
Compactness (Roundness)				
Proximity	0.57	0.69	0.76	0.7
Cohesion	0.57	0.68	0.74	0.6
Added Area (Hectares)	'90-'00	Share	'00-'13	Share
Infill	3,465	20%	5,274	35%
Extension	4,353	25%	2,987	20%
Leapfrog	200	1%	43	0%
Inclusion	9,140	53%	6,390	43%



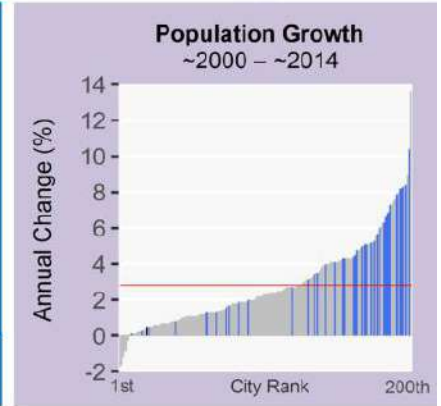


Zunyi, Guizhou, China
1988-2013

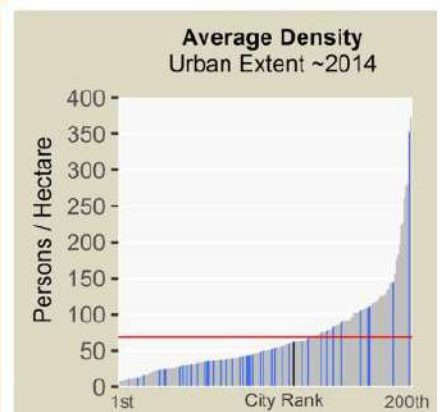
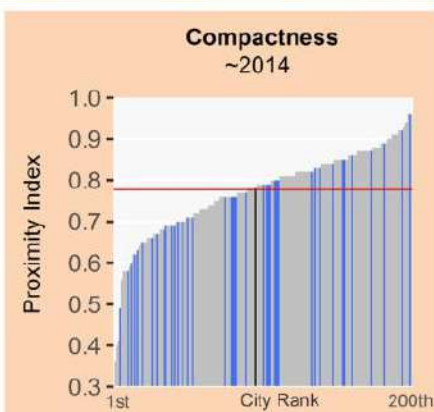
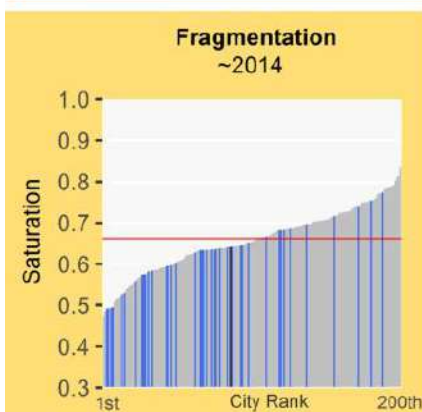
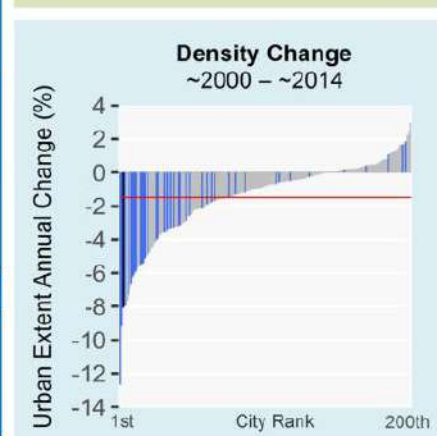
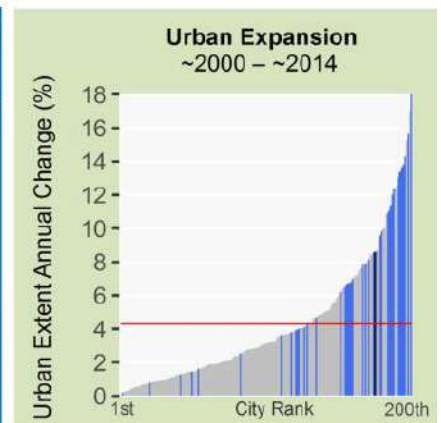
0 2 4 6 8 km

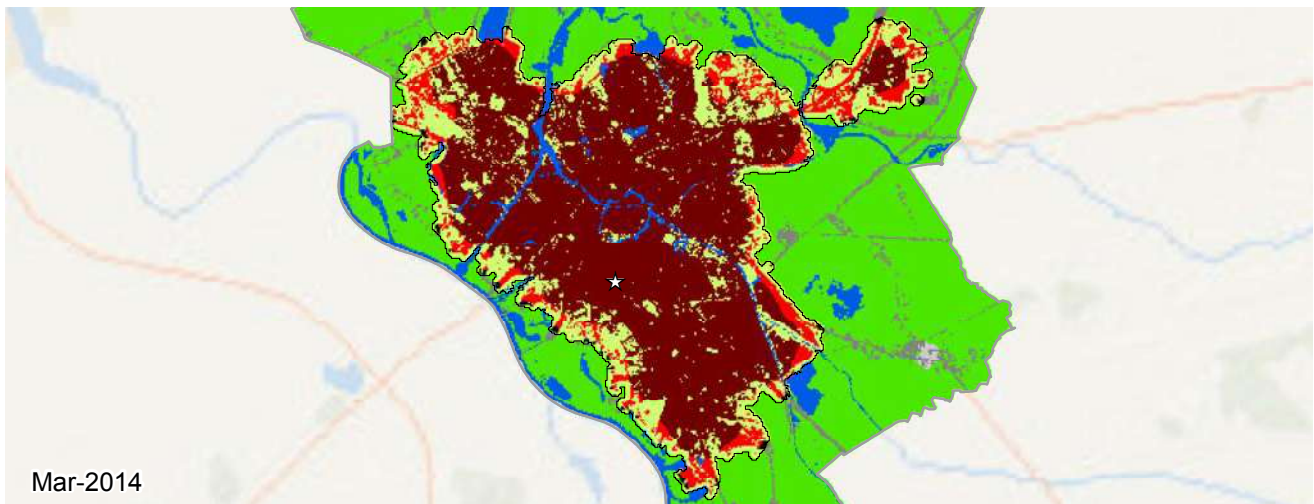
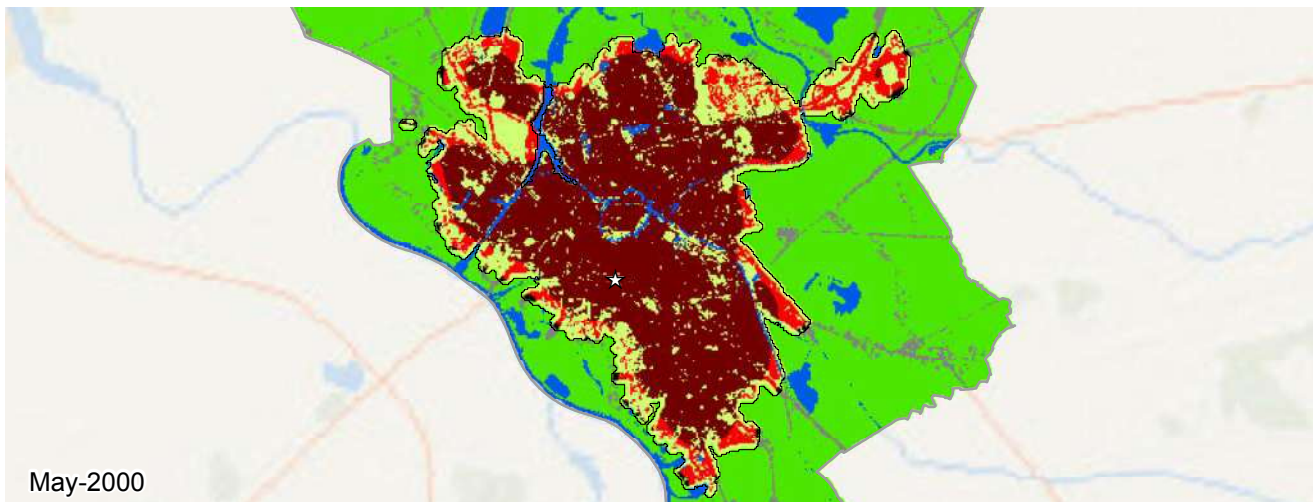
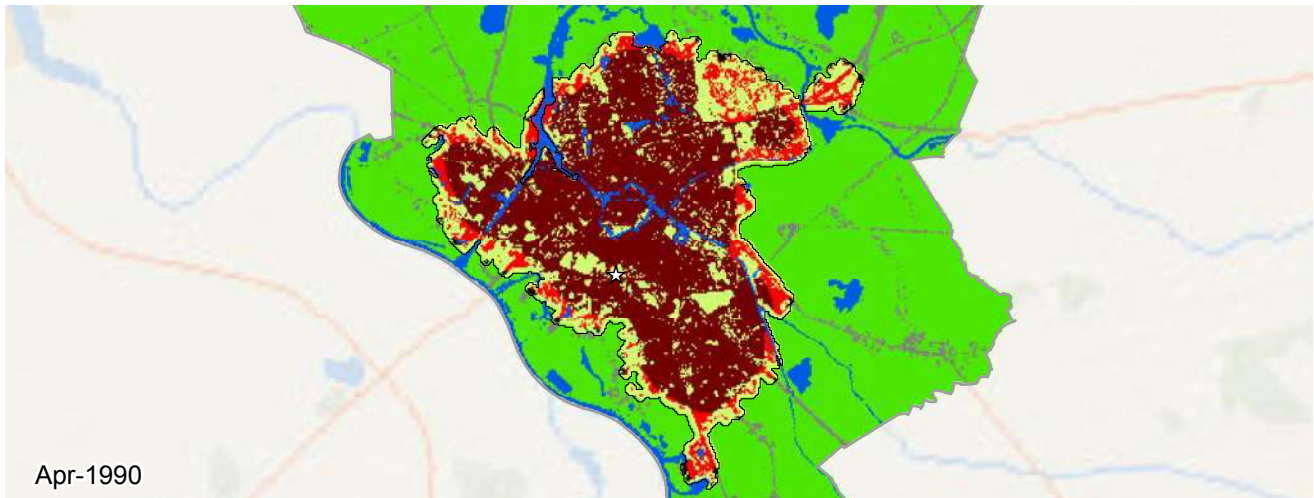
Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Zunyi, Guizhou, China (East Asia and the Pacific)



Metrics	Jun 1988	Apr 2001	Dec 2013	% Annual Change ('01-'13)
Population	24,968	501,483	534,107	0.5
Built-up Area (Hectares)				
Total	89	1,787	5,568	9.0
Urban	21	1,329	4,203	9.1
Suburban	61	434	1,253	8.4
Rural	5	23	111	12.3
Open space (Hectares)				
Urbanized Open Space	97	1,127	3,105	8.0
Urban Extent	187	2,915	8,673	8.6
Density (Persons / Hectare)				
Built-up Area Density	279.7	280.5	95.9	-8.5
Urban Extent Density	133.4	172.0	61.6	-8.1
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.48	0.61	0.64	0.4
Openness Index	0.59	0.37	0.33	-0.8
Compactness (Roundness)				
Proximity	0.99	0.87	0.78	-0.9
Cohesion	0.99	0.86	0.77	-0.9
Added Area (Hectares)	'88-'01	Share	'01-'13	Share
Infill	181	10%	511	13%
Extension	523	30%	2,477	65%
Leapfrog	67	3%	130	3%
Inclusion	926	54%	661	17%





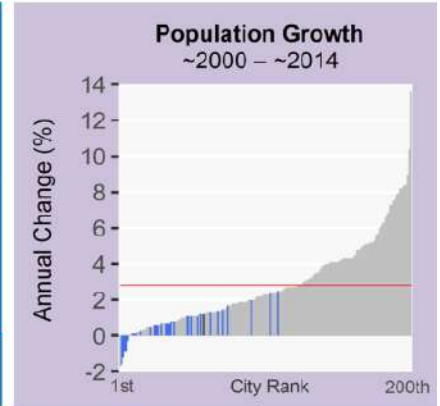
**Zwolle, Netherlands
1990-2014**

0 1 2 3 4 km

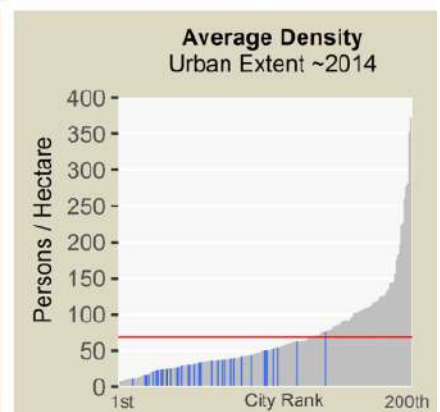
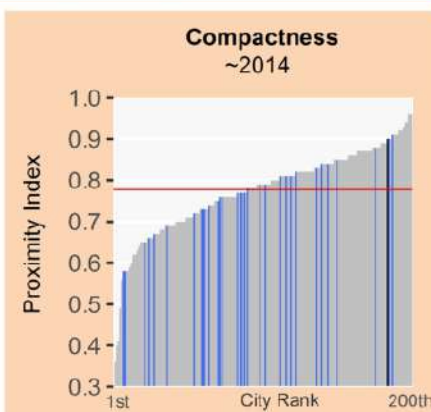
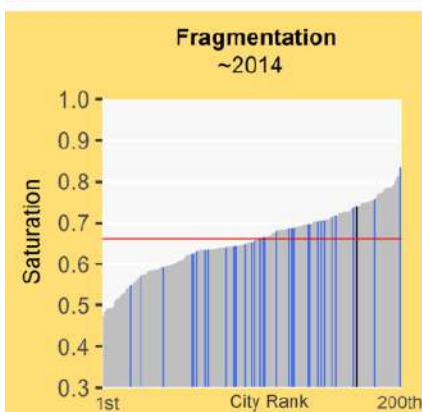
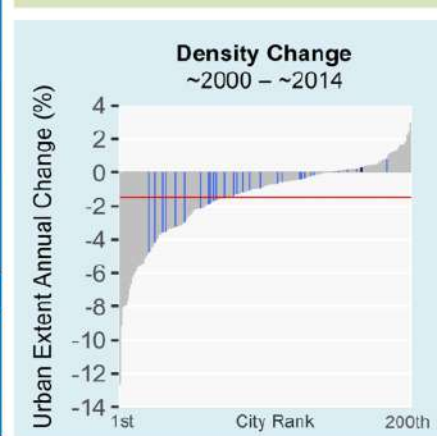
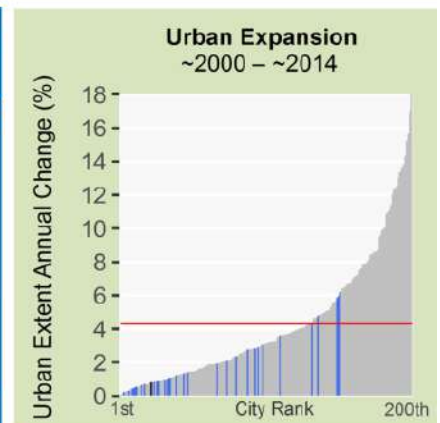
N

Study area	Rural open space
Urban extent	Exurban built-up area
Urban built-up area	Exurban open space
Suburban built-up area	Water
Rural built-up area	No data
Urbanized open space	CBD

Zwolle, Netherlands (Europe and Japan)



Metrics	Apr 1990	May 2000	Mar 2014	% Annual Change ('00-'14)
Population	79,950	92,139	108,237	1.2
Built-up Area (Hectares)				
Total	2,252	2,764	3,197	1.1
Urban	1,873	2,276	2,743	1.3
Suburban	348	446	419	-0.5
Rural	30	41	34	-1.2
Open space (Hectares)				
Urbanized Open Space	971	1,100	1,124	0.2
Urban Extent	3,224	3,864	4,321	0.8
Density (Persons / Hectare)				
Built-up Area Density	35.5	33.3	33.9	0.1
Urban Extent Density	24.8	23.8	25.0	0.4
Fragmentation				
Saturation (Blt-up Area / Urb. Ext.)	0.70	0.72	0.74	0.2
Openness Index	0.31	0.28	0.25	-0.9
Compactness (Roundness)				
Proximity	0.92	0.90	0.90	-0.0
Cohesion	0.91	0.89	0.88	-0.0
Added Area (Hectares)	'90-'00	Share	'00-'14	Share
Infill	181	35%	209	48%
Extension	259	50%	170	39%
Leapfrog	0	0%	0	0%
Inclusion	70	13%	52	12%



Tables

The tables in this section provide a consolidated report of all the metrics listed in the previous pages for individual cities. Cities are listed in alphabetical order in rows and their values for various metrics are listed in columns.

TABLE 1:
Areas and Densities metrics for 200 cities: 1990-2014

City Name	Country	Region	CBD Location		Land Cover Dates		
			Latitude	Longitude	T1	T2	T3
Accra	Ghana	Sub-Saharan Africa	5.615	-0.159	1/1/91	2/1/00	3/1/14
Addis Ababa	Ethiopia	Sub-Saharan Africa	9.001	38.756	1/1/86	12/1/00	12/1/10
Ahmedabad	India	South and Central Asia	23.037	72.589	12/1/89	10/1/00	10/1/13
Ahvaz	Iran	South and Central Asia	31.320	48.665	11/1/91	9/1/00	9/1/13
Alexandria	Egypt	Western Asia and North Africa	31.152	29.884	10/1/87	4/1/99	7/1/13
Algiers	Algeria	Western Asia and North Africa	36.732	3.140	8/1/87	6/1/00	7/1/14
Anqing, Anhui	China	East Asia and the Pacific	30.536	117.050	9/1/90	4/1/00	10/1/13
Antwerp	Belgium	Europe and Japan	51.220	4.403	7/1/90	8/1/00	9/1/13
Arusha	Tanzania	Sub-Saharan Africa	36.695	-3.370	10/1/88	9/1/00	10/1/13
Astrakhan	Russia	Europe and Japan	46.340	48.020	7/1/88	9/1/03	3/1/14
Auckland	New Zealand	Land-Rich Developed Countries	-36.915	174.786	6/1/89	9/1/01	4/1/14
Bacolod	Philippines	Southeast Asia	10.664	122.961	12/1/92	9/1/00	3/1/15
Baghdad	Iraq	Western Asia and North Africa	33.320	44.379	8/1/90	8/1/00	8/1/13
Baku	Azerbaijan	Western Asia and North Africa	40.400	49.881	7/1/89	1/1/00	8/1/14
Bamako	Mali	Sub-Saharan Africa	12.650	-8.000	1/1/90	10/1/00	11/1/13
Bangkok	Thailand	Southeast Asia	13.778	100.538	3/1/88	1/1/02	1/1/15
Beijing, Beijing	China	East Asia and the Pacific	39.920	116.370	12/1/88	7/1/99	10/1/13
Beira	Mozambique	Sub-Saharan Africa	-19.831	34.860	3/1/91	5/1/01	7/1/13
Belgaum	India	South and Central Asia	15.850	74.506	11/1/89	11/1/00	4/1/14
Belgrade	Serbia	Europe and Japan	44.798	20.447	8/1/88	7/1/00	3/1/14
Belo Horizonte	Brazil	Latin America and the Caribbean	-19.904	-44.005	6/1/89	6/1/00	5/1/13
Berezniki	Russia	Europe and Japan	59.415	56.795	7/1/89	5/1/00	7/1/10
Berlin	Germany	Europe and Japan	52.502	13.453	8/1/90	8/1/00	12/1/13
Bicheng, Chongqing	China	East Asia and the Pacific	29.595	106.231	9/1/88	7/1/00	6/1/13
Bogota	Colombia	Latin America and the Caribbean	4.644	-74.129	12/1/89	1/1/01	1/1/10
Budapest	Hungary	Europe and Japan	47.484	19.090	7/1/92	6/1/02	7/1/13
Buenos Aires	Argentina	Latin America and the Caribbean	-34.652	-58.547	5/1/89	12/1/01	3/1/14
Bukhara	Uzbekistan	South and Central Asia	39.763	64.465	4/1/91	7/1/00	8/1/13
Busan	Korea Rep.	East Asia and the Pacific	35.167	129.036	2/1/91	10/1/00	9/1/13
Cabimas	Venezuela	Latin America and the Caribbean	10.284	-71.370	12/1/89	1/1/00	1/1/14
Cairo	Egypt	Western Asia and North Africa	30.034	31.282	8/1/92	4/1/03	5/1/13
Caracas	Venezuela	Latin America and the Caribbean	10.479	-66.897	5/1/91	3/1/01	1/1/14
Cebu City	Philippines	Southeast Asia	10.322	123.907	8/1/93	8/1/00	2/1/14
Changzhi, Hunan	China	East Asia and the Pacific	36.192	113.116	10/1/92	10/1/00	6/1/14
Changzhou, Jingsu	China	East Asia and the Pacific	31.775	119.970	10/1/89	3/1/00	3/1/14
Chengdu, Sichuan	China	East Asia and the Pacific	30.667	104.051	5/1/88	5/1/00	3/1/09
Chengguan, Guizhou	China	East Asia and the Pacific	26.680	105.769	8/1/90	11/1/00	6/1/13
Cheonan	Korea Rep.	East Asia and the Pacific	36.826	127.144	2/1/91	8/1/00	9/1/14
Chicago	United States	Land-Rich Developed Countries	41.860	-87.864	6/1/89	9/1/01	9/1/14
Cirebon	Indonesia	Southeast Asia	-6.702	108.497	10/1/89	10/1/00	6/1/14
Cleveland	United States	Land-Rich Developed Countries	41.470	-81.636	4/1/90	3/1/00	6/1/13
Cochabamba	Bolivia	Latin America and the Caribbean	-17.391	-66.170	7/1/90	6/1/00	7/1/13
Coimbatore	India	South and Central Asia	11.015	76.973	1/1/92	10/1/00	2/1/14
Cordoba	Argentina	Latin America and the Caribbean	-31.381	-64.216	12/1/91	11/1/01	7/1/14
Culiacan	Mexico	Latin America and the Caribbean	24.798	-107.402	1/1/90	1/1/00	3/1/14
Curitiba	Brazil	Latin America and the Caribbean	-25.463	-49.254	9/1/90	7/1/00	1/1/14
Dhaka	Bangladesh	South and Central Asia	23.766	90.418	11/1/89	10/1/99	3/1/14
Dzerzhinsk	Russia	Europe and Japan	56.241	43.455	8/1/89	4/1/00	7/1/10
Florianopolis	Brazil	Latin America and the Caribbean	-27.595	-48.613	5/1/90	5/1/00	1/1/14
Fukuoka	Japan	Europe and Japan	33.598	130.437	5/1/93	5/1/01	4/1/14

Accra - Fukuoka

City Name	Urban Extent Population				Built-up Area Total (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Accra	1,307,784	2,513,026	4,429,649	4.0%	10,022	32,171	61,781	4.6%
Addis Ababa	1,445,701	2,276,356	3,009,130	2.8%	7,531	11,713	21,133	5.9%
Ahmedabad	3,737,723	4,718,391	6,232,952	2.1%	12,174	15,916	21,103	2.2%
Ahvaz	698,310	853,527	1,178,560	2.5%	7,079	9,200	12,873	2.6%
Alexandria	2,558,891	3,132,780	4,345,193	2.3%	7,818	15,514	22,782	2.7%
Algiers	1,535,735	2,184,791	3,085,561	2.5%	7,446	15,639	27,798	4.1%
Anqing, Anhui	402,524	350,035	642,626	4.5%	2,274	2,788	8,779	8.5%
Antwerp	885,820	1,107,990	1,277,376	1.1%	21,677	35,705	43,115	1.4%
Arusha	84,150	181,168	377,169	5.6%	178	694	1,563	6.2%
Astrakhan	475,766	532,541	567,629	0.6%	5,623	13,289	14,857	1.1%
Auckland	838,074	1,031,718	1,300,733	1.8%	27,643	29,918	34,602	1.2%
Bacolod	269,117	378,445	443,456	1.1%	888	2,788	3,297	1.2%
Baghdad	2,837,103	3,985,382	5,279,193	2.2%	34,867	43,502	56,288	2.0%
Baku	1,318,615	1,383,761	1,671,787	1.3%	9,358	13,691	18,670	2.1%
Bamako	352,486	1,113,715	2,358,106	5.7%	2,648	8,975	17,644	5.2%
Bangkok	6,048,386	9,223,566	14,011,131	3.2%	50,746	90,085	172,912	5.0%
Beijing, Beijing	6,037,392	9,869,844	20,669,397	5.2%	66,759	114,226	265,434	5.9%
Beira	131,884	143,908	382,575	8.0%	1,038	1,596	6,208	11.2%
Belgaum	229,412	358,119	636,865	4.3%	335	762	2,779	9.6%
Belgrade	801,013	876,835	963,946	0.7%	8,620	10,198	12,565	1.5%
Belo Horizonte	2,709,529	3,479,598	4,038,047	1.2%	33,855	43,054	48,701	1.0%
Berezniki	137,284	127,504	112,760	-1.2%	2,884	3,912	4,276	0.9%
Berlin	3,248,604	3,510,570	3,860,243	0.7%	24,707	44,413	68,743	3.3%
Bicheng, Chongqing	84,136	119,872	238,159	5.3%	157	510	5,019	17.7%
Bogota	4,438,705	6,362,428	7,801,693	2.3%	24,582	28,501	31,895	1.3%
Budapest	2,041,591	1,885,418	2,272,785	1.7%	27,061	28,413	52,029	5.5%
Buenos Aires	10,568,200	11,494,967	13,879,006	1.5%	99,014	115,643	147,306	2.0%
Bukhara	42,305	138,578	369,044	7.5%	724	4,161	14,153	9.4%
Busan	3,731,022	3,837,305	3,974,065	0.3%	13,690	20,898	32,657	3.5%
Cabimas	238,324	384,017	460,894	1.3%	5,896	7,912	9,488	1.3%
Cairo	9,621,785	11,928,479	15,734,934	2.7%	29,717	45,508	93,093	7.1%
Caracas	2,549,725	2,868,565	3,104,392	0.6%	12,789	14,885	16,352	0.7%
Cebu City	942,998	1,338,323	2,391,839	4.3%	4,649	6,686	12,462	4.6%
Changzhi, Hunan	286,761	346,288	822,355	6.3%	2,921	4,516	11,526	6.9%
Changzhou, Jingsu	1,001,960	1,523,237	3,075,746	5.0%	4,802	17,577	49,226	7.4%
Chengdu, Sichuan	2,019,420	5,117,629	9,339,734	6.8%	10,241	36,391	114,992	13.0%
Chengguan, Guizhou	52,551	95,957	117,083	1.6%	174	283	673	6.9%
Cheonan	111,318	210,488	552,995	6.9%	916	2,900	9,037	8.1%
Chicago	7,325,015	8,509,731	8,913,778	0.4%	340,562	452,051	510,972	0.9%
Cirebon	98,401	328,368	1,044,889	8.5%	285	1,154	6,404	12.5%
Cleveland	1,376,230	1,622,727	1,865,023	1.1%	43,934	72,699	116,854	3.6%
Cochabamba	485,412	723,799	1,034,944	2.7%	5,546	11,323	16,736	3.0%
Coimbatore	528,106	959,042	1,650,080	4.1%	3,630	7,310	12,191	3.8%
Cordoba	1,128,755	1,233,898	1,392,944	1.0%	15,909	19,222	24,542	1.9%
Culiacan	375,046	483,533	625,346	1.8%	5,742	7,896	11,563	2.7%
Curitiba	1,375,084	2,106,460	2,728,388	1.9%	14,909	31,150	44,527	2.6%
Dhaka	4,005,507	6,690,664	13,609,023	4.9%	7,473	12,478	24,676	4.7%
Dzerzhinsk	225,340	201,809	183,841	-0.9%	3,278	4,448	5,047	1.2%
Florianopolis	284,463	375,071	532,951	2.6%	4,394	6,719	10,210	3.1%
Fukuoka	1,953,223	2,110,744	2,306,030	0.7%	23,549	30,518	34,507	1.0%

City Name	Urban Built-up Area (ha)				Surburban Built-up Area (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Accra	9,053	29,166	52,848	4.2%	909	2,822	8,366	7.7%
Addis Ababa	6,243	9,342	18,483	6.8%	1,198	2,188	2,467	1.2%
Ahmedabad	10,356	14,149	18,932	2.2%	1,698	1,642	2,035	1.6%
Ahvaz	5,421	7,520	10,520	2.6%	1,577	1,605	2,203	2.4%
Alexandria	6,757	13,157	18,900	2.5%	998	2,234	3,625	3.4%
Algiers	4,440	11,382	20,537	4.2%	2,810	3,959	6,835	3.9%
Anqing, Anhui	1,593	1,835	6,077	8.9%	631	883	2,532	7.8%
Antwerp	12,290	20,448	27,604	2.3%	8,737	14,152	14,523	0.2%
Arusha	39	381	761	5.3%	125	287	747	7.3%
Astrakhan	3,510	9,965	11,514	1.4%	1,952	3,075	3,107	0.1%
Auckland	22,728	24,972	30,012	1.5%	4,707	4,735	4,361	-0.7%
Bacolod	450	2,249	2,608	1.0%	407	507	625	1.4%
Baghdad	23,812	34,312	48,597	2.7%	10,475	8,618	7,170	-1.4%
Baku	7,705	11,559	16,498	2.4%	1,582	1,993	2,040	0.2%
Bamako	2,118	7,574	14,501	5.0%	490	1,318	2,943	6.1%
Bangkok	28,991	60,619	122,660	5.4%	20,317	27,470	47,004	4.1%
Beijing, Beijing	54,320	86,180	175,362	5.0%	11,580	26,006	83,883	8.2%
Beira	387	1,152	3,225	8.5%	631	421	2,818	15.6%
Belgaum	181	324	1,563	11.7%	137	409	1,146	7.7%
Belgrade	7,078	8,303	9,819	1.2%	1,443	1,786	2,573	2.7%
Belo Horizonte	28,642	37,953	43,236	1.0%	4,802	4,756	5,063	0.5%
Berezniki	1,713	2,990	3,335	1.1%	1,096	865	881	0.2%
Berlin	16,462	32,592	53,160	3.7%	7,632	11,121	14,526	2.0%
Bicheng, Chongqing	85	381	3,512	17.2%	62	115	1,377	19.2%
Bogota	22,111	25,837	29,663	1.5%	2,298	2,501	2,111	-1.9%
Budapest	22,831	23,866	42,061	5.1%	3,942	4,253	9,331	7.1%
Buenos Aires	87,998	103,531	132,652	2.0%	10,275	11,337	13,632	1.5%
Bukhara	248	2,120	9,827	11.7%	441	1,893	4,061	5.8%
Busan	10,630	16,517	25,259	3.3%	2,855	4,113	6,899	4.0%
Cabimas	4,797	6,577	8,194	1.6%	1,022	1,263	1,223	-0.2%
Cairo	24,381	39,689	74,782	6.3%	5,000	5,387	17,100	11.5%
Caracas	9,864	11,946	13,283	0.8%	2,741	2,770	2,894	0.3%
Cebu City	3,525	4,834	9,488	5.0%	1,042	1,698	2,828	3.8%
Changzhi, Hunan	2,010	3,230	7,712	6.4%	843	1,183	3,517	8.0%
Changzhou, Jingsu	3,568	13,386	38,358	7.5%	1,141	3,942	10,187	6.8%
Chengdu, Sichuan	8,740	28,538	93,115	13.4%	1,374	7,286	20,064	11.5%
Chengguan, Guizhou	109	187	454	7.0%	57	87	204	6.8%
Cheonan	707	1,683	4,528	7.0%	193	1,115	4,153	9.3%
Chicago	295,049	387,572	440,661	1.0%	42,131	60,181	65,517	0.7%
Cirebon	24	315	3,719	18.1%	242	766	2,494	8.6%
Cleveland	30,400	51,594	88,282	4.1%	12,737	19,782	26,964	2.3%
Cochabamba	3,606	9,113	12,831	2.6%	1,803	2,024	3,633	4.5%
Coimbatore	2,307	4,468	7,734	4.1%	1,239	2,632	4,081	3.3%
Cordoba	13,556	16,584	20,270	1.6%	2,214	2,432	3,965	3.9%
Culiacan	4,921	6,629	10,008	2.9%	776	1,163	1,451	1.6%
Curitiba	9,646	24,029	37,503	3.3%	4,913	6,707	6,596	-0.1%
Dhaka	4,798	8,287	19,795	6.0%	2,525	3,885	4,521	1.1%
Dzerzhinsk	2,263	3,683	4,354	1.6%	958	728	658	-1.0%
Florianopolis	2,685	4,887	7,748	3.4%	1,600	1,700	2,314	2.3%
Fukuoka	19,829	26,652	30,259	1.0%	3,510	3,617	3,954	0.7%

Accra - Fukuoka

City Name	Rural Built-up Area (ha)				Urbanized Open Space (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Accra	61	184	567	8.0%	3,301	9,070	25,431	7.3%
Addis Ababa	90	183	183	0.0%	4,019	6,532	8,495	2.6%
Ahmedabad	120	125	137	0.7%	5,018	5,376	6,306	1.2%
Ahvaz	82	74	150	5.4%	2,770	3,497	6,026	4.2%
Alexandria	64	122	257	5.2%	2,175	4,843	7,637	3.2%
Algiers	196	298	426	2.5%	6,458	9,801	17,014	3.9%
Anqing, Anhui	50	69	170	6.7%	1,230	1,851	5,964	8.7%
Antwerp	650	1,105	988	-0.9%	17,705	29,970	32,288	0.6%
Arusha	14	26	55	5.7%	207	695	1,666	6.7%
Astrakhan	161	250	236	-0.6%	3,729	7,808	7,459	-0.4%
Auckland	207	211	229	0.6%	13,892	14,707	14,225	-0.3%
Bacolod	31	33	64	4.6%	895	1,309	1,628	1.5%
Baghdad	580	573	522	-0.7%	27,413	25,284	21,207	-1.4%
Baku	72	138	132	-0.3%	4,889	6,293	6,992	0.7%
Bamako	40	82	200	6.8%	1,432	4,163	7,894	4.9%
Bangkok	1,438	1,995	3,248	3.7%	46,179	66,933	121,550	4.6%
Beijing, Beijing	859	2,041	6,189	7.8%	31,973	61,299	190,250	7.9%
Beira	20	23	165	16.3%	1,169	1,035	5,944	14.4%
Belgaum	18	29	70	6.6%	322	807	2,278	7.7%
Belgrade	99	110	173	3.3%	3,906	4,492	6,522	2.7%
Belo Horizonte	411	345	403	1.2%	15,173	14,798	15,850	0.5%
Berezniki	76	57	60	0.5%	2,459	2,319	2,405	0.4%
Berlin	613	701	1,057	3.1%	20,179	29,724	40,283	2.3%
Bicheng, Chongqing	10	14	130	17.5%	137	257	2,798	18.5%
Bogota	173	163	121	-3.3%	7,541	8,134	7,828	-0.4%
Budapest	288	295	638	7.0%	10,262	11,035	23,686	6.9%
Buenos Aires	742	774	1,022	2.3%	34,000	37,989	46,088	1.6%
Bukhara	36	148	265	4.5%	872	3,822	7,483	5.1%
Busan	204	267	499	4.8%	5,966	8,423	15,228	4.6%
Cabimas	76	71	71	0.0%	2,413	3,142	3,452	0.7%
Cairo	336	432	1,211	10.2%	11,486	12,665	43,303	12.2%
Caracas	183	169	175	0.3%	6,985	7,282	7,851	0.6%
Cebu City	81	153	146	-0.4%	2,680	4,201	6,396	3.1%
Changzhi, Hunan	68	103	297	7.8%	1,902	3,040	8,192	7.3%
Changzhou, Jingsu	92	248	680	7.2%	2,601	8,083	28,475	9.0%
Chengdu, Sichuan	128	567	1,813	13.2%	3,953	16,750	52,688	13.0%
Chengguan, Guizhou	8	9	15	3.8%	132	178	400	6.4%
Cheonan	16	101	356	8.9%	551	2,163	8,014	9.3%
Chicago	3,382	4,298	4,793	0.8%	136,571	177,800	189,867	0.5%
Cirebon	19	74	191	7.0%	444	1,601	4,471	7.5%
Cleveland	797	1,322	1,608	1.5%	35,462	52,108	75,302	2.8%
Cochabamba	136	186	272	2.9%	3,958	5,777	9,559	3.8%
Coimbatore	84	210	376	4.4%	3,172	6,527	10,243	3.4%
Cordoba	140	206	307	3.1%	5,959	7,748	10,945	2.7%
Culiacan	44	104	104	0.0%	1,895	2,871	3,839	2.1%
Curitiba	350	415	428	0.2%	13,208	18,072	19,499	0.6%
Dhaka	150	306	359	1.1%	6,404	10,347	11,865	0.9%
Dzerzhinsk	57	36	35	-0.3%	2,484	1,974	1,813	-0.8%
Florianopolis	108	131	147	0.8%	2,838	3,657	5,640	3.2%
Fukuoka	209	250	295	1.3%	8,829	10,158	10,996	0.6%

City Name	Urban Extent (ha)				Built-up Area Density (persons/ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Accra	13,324	41,241	87,212	5.3%	130	78	72	-0.6%
Addis Ababa	11,550	18,245	29,628	4.8%	192	194	142	-3.1%
Ahmedabad	17,192	21,292	27,409	1.9%	307	296	295	0.0%
Ahvaz	9,849	12,697	18,899	3.1%	99	93	92	-0.1%
Alexandria	9,993	20,356	30,418	2.8%	327	202	191	-0.4%
Algiers	13,903	25,439	44,812	4.0%	206	140	111	-1.6%
Anqing, Anhui	3,504	4,639	14,742	8.6%	177	126	73	-4.0%
Antwerp	39,381	65,676	75,403	1.1%	41	31	30	-0.4%
Arusha	385	1,389	3,229	6.5%	472	261	241	-0.6%
Astrakhan	9,351	21,098	22,316	0.5%	85	40	38	-0.5%
Auckland	41,535	44,625	48,826	0.7%	30	34	38	0.7%
Bacolod	1,783	4,097	4,925	1.3%	303	136	134	-0.1%
Baghdad	62,280	68,786	77,496	0.9%	81	92	94	0.2%
Baku	14,247	19,984	25,662	1.7%	141	101	90	-0.8%
Bamako	4,081	13,138	25,538	5.1%	133	124	134	0.6%
Bangkok	96,925	157,018	294,462	4.8%	119	102	81	-1.8%
Beijing, Beijing	98,733	175,525	455,684	6.7%	90	86	78	-0.7%
Beira	2,207	2,631	12,153	12.6%	127	90	62	-3.1%
Belgaum	657	1,570	5,057	8.7%	685	470	229	-5.4%
Belgrade	12,525	14,691	19,087	1.9%	93	86	77	-0.8%
Belo Horizonte	49,027	57,852	64,552	0.8%	80	81	83	0.2%
Berezniki	5,343	6,231	6,681	0.7%	48	33	26	-2.1%
Berlin	44,886	74,137	109,026	2.9%	131	79	56	-2.6%
Bicheng, Chongqing	295	767	7,816	18.0%	535	235	47	-12.4%
Bogota	32,123	36,635	39,723	0.9%	181	223	245	1.0%
Budapest	37,323	39,449	75,715	5.9%	75	66	44	-3.8%
Buenos Aires	133,014	153,632	193,394	1.9%	107	99	94	-0.4%
Bukhara	1,596	7,983	21,636	7.6%	58	33	26	-1.9%
Busan	19,656	29,321	47,885	3.8%	273	184	122	-3.2%
Cabimas	8,309	11,054	12,940	1.1%	40	49	49	0.0%
Cairo	41,203	58,172	136,396	8.5%	324	262	169	-4.4%
Caracas	19,774	22,167	24,202	0.7%	199	193	190	-0.1%
Cebu City	7,329	10,887	18,858	4.1%	203	200	192	-0.3%
Changzhi, Hunan	4,823	7,556	19,718	7.0%	98	77	71	-0.5%
Changzhou, Jingsu	7,403	25,660	77,700	7.9%	209	87	62	-2.3%
Chengdu, Sichuan	14,194	53,140	167,680	13.0%	197	141	81	-6.2%
Chengguan, Guizhou	305	461	1,072	6.7%	303	339	174	-5.3%
Cheonan	1,467	5,063	17,051	8.6%	122	73	61	-1.2%
Chicago	477,133	629,852	700,838	0.8%	22	19	17	-0.6%
Cirebon	728	2,755	10,875	10.0%	346	285	163	-4.1%
Cleveland	79,395	124,807	192,157	3.3%	31	22	16	-2.5%
Cochabamba	9,504	17,100	26,295	3.3%	88	64	62	-0.3%
Coimbatore	6,802	13,836	22,434	3.6%	145	131	135	0.2%
Cordoba	21,868	26,970	35,487	2.2%	71	64	57	-1.0%
Culiacan	7,636	10,767	15,402	2.5%	65	61	54	-0.9%
Curitiba	28,118	49,222	64,027	1.9%	92	68	61	-0.7%
Dhaka	13,878	22,825	36,541	3.3%	536	536	552	0.2%
Dzerzhinsk	5,762	6,421	6,860	0.6%	69	45	36	-2.1%
Florianopolis	7,231	10,375	15,850	3.1%	65	56	52	-0.5%
Fukuoka	32,377	40,676	45,503	0.9%	83	69	67	-0.3%

Accra - Fukuoka

City Name	Urban Extent Density (persons / ha)				Fragmentation: Saturation (Built-up Area/Urban Extent)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Accra	98	61	51	-1.3%	0.75	0.78	0.71	-0.7%
Addis Ababa	125	125	102	-2.1%	0.65	0.64	0.71	1.1%
Ahmedabad	217	222	227	0.2%	0.71	0.75	0.77	0.2%
Ahvaz	71	67	62	-0.6%	0.72	0.72	0.68	-0.5%
Alexandria	256	154	143	-0.5%	0.78	0.76	0.75	-0.1%
Algiers	110	86	69	-1.6%	0.54	0.61	0.62	0.1%
Anqing, Anhui	115	75	44	-4.1%	0.65	0.60	0.60	-0.1%
Antwerp	22	17	17	0.0%	0.55	0.54	0.57	0.4%
Arusha	218	130	117	-0.8%	0.46	0.50	0.48	-0.2%
Astrakhan	51	25	25	0.1%	0.60	0.63	0.67	0.5%
Auckland	20	23	27	1.1%	0.67	0.67	0.71	0.4%
Bacolod	151	92	90	-0.2%	0.50	0.68	0.67	-0.1%
Baghdad	46	58	68	1.2%	0.56	0.63	0.73	1.1%
Baku	93	69	65	-0.4%	0.66	0.69	0.73	0.4%
Bamako	86	85	92	0.7%	0.65	0.68	0.69	0.1%
Bangkok	62	59	48	-1.6%	0.52	0.57	0.59	0.2%
Beijing, Beijing	61	56	45	-1.5%	0.68	0.65	0.58	-0.8%
Beira	60	55	31	-4.5%	0.47	0.61	0.51	-1.4%
Belgaum	349	228	126	-4.4%	0.51	0.49	0.55	0.9%
Belgrade	64	60	51	-1.2%	0.69	0.69	0.66	-0.4%
Belo Horizonte	55	60	63	0.3%	0.69	0.74	0.75	0.1%
Berezniki	26	20	17	-1.9%	0.54	0.63	0.64	0.2%
Berlin	72	47	35	-2.2%	0.55	0.60	0.63	0.4%
Bicheng, Chongqing	286	156	30	-12.7%	0.53	0.67	0.64	-0.3%
Bogota	138	174	196	1.4%	0.77	0.78	0.80	0.4%
Budapest	55	48	30	-4.2%	0.73	0.72	0.69	-0.4%
Buenos Aires	79	75	72	-0.3%	0.74	0.75	0.76	0.1%
Bukhara	27	17	17	-0.1%	0.45	0.52	0.65	1.7%
Busan	190	131	83	-3.5%	0.70	0.71	0.68	-0.3%
Cabimas	29	35	36	0.2%	0.71	0.72	0.73	0.2%
Cairo	234	205	115	-5.7%	0.72	0.78	0.68	-1.4%
Caracas	129	129	128	-0.1%	0.65	0.67	0.68	0.0%
Cebu City	129	123	127	0.2%	0.63	0.61	0.66	0.5%
Changzhi, Hunan	59	46	42	-0.7%	0.61	0.60	0.58	-0.2%
Changzhou, Jingsu	135	59	40	-2.9%	0.65	0.68	0.63	-0.6%
Chengdu, Sichuan	142	96	56	-6.2%	0.72	0.68	0.69	0.0%
Chengguan, Guizhou	172	208	109	-5.1%	0.57	0.61	0.63	0.2%
Cheonan	76	42	32	-1.8%	0.62	0.57	0.53	-0.6%
Chicago	15	14	13	-0.5%	0.71	0.72	0.73	0.1%
Cirebon	135	119	96	-1.6%	0.39	0.42	0.59	2.5%
Cleveland	17	13	10	-2.2%	0.55	0.58	0.61	0.3%
Cochabamba	51	42	39	-0.6%	0.58	0.66	0.64	-0.3%
Coimbatore	78	69	74	0.4%	0.53	0.53	0.54	0.2%
Cordoba	52	46	39	-1.2%	0.73	0.71	0.69	-0.2%
Culiacan	49	45	41	-0.7%	0.75	0.73	0.75	0.2%
Curitiba	49	43	43	0.0%	0.53	0.63	0.70	0.7%
Dhaka	289	293	372	1.7%	0.54	0.55	0.68	1.5%
Dzerzhinsk	39	31	27	-1.6%	0.57	0.69	0.74	0.6%
Florianopolis	39	36	34	-0.5%	0.61	0.65	0.64	0.0%
Fukuoka	60	52	51	-0.2%	0.73	0.75	0.76	0.1%

City Name	Fragmentation: Openness index				Compactness: Proximity index			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Accra	0.21	0.16	0.22	1.9%	0.81	0.77	0.72	-0.5%
Addis Ababa	0.29	0.29	0.24	-2.1%	0.95	0.85	0.84	-0.1%
Ahmedabad	0.25	0.20	0.19	-0.8%	0.92	0.93	0.94	0.1%
Ahvaz	0.33	0.29	0.28	-0.3%	0.72	0.77	0.81	0.4%
Alexandria	0.22	0.24	0.24	0.0%	0.42	0.43	0.41	-0.3%
Algiers	0.45	0.37	0.33	-0.7%	0.69	0.66	0.72	0.6%
Anqing, Anhui	0.34	0.36	0.35	-0.1%	0.69	0.78	0.77	-0.1%
Antwerp	0.44	0.43	0.40	-0.6%	0.68	0.74	0.76	0.3%
Arusha	0.59	0.47	0.48	0.2%	0.94	0.92	0.83	-0.8%
Astrakhan	0.42	0.33	0.31	-0.7%	0.77	0.78	0.77	0.0%
Auckland	0.33	0.32	0.29	-1.0%	0.73	0.73	0.73	0.1%
Bacolod	0.48	0.31	0.31	0.0%	0.83	0.88	0.83	-0.4%
Baghdad	0.41	0.34	0.24	-2.6%	0.79	0.82	0.84	0.2%
Baku	0.32	0.29	0.24	-1.2%	0.85	0.81	0.82	0.1%
Bamako	0.32	0.26	0.25	-0.2%	0.76	0.83	0.82	-0.1%
Bangkok	0.45	0.39	0.36	-0.6%	0.77	0.77	0.82	0.4%
Beijing, Beijing	0.25	0.28	0.34	1.5%	0.90	0.70	0.80	0.9%
Beira	0.54	0.40	0.48	1.5%	0.88	0.89	0.40	-6.5%
Belgaum	0.47	0.50	0.45	-0.7%	0.80	0.76	0.73	-0.3%
Belgrade	0.29	0.28	0.31	0.8%	0.82	0.81	0.76	-0.5%
Belo Horizonte	0.25	0.20	0.18	-0.7%	0.83	0.85	0.85	0.0%
Berezniki	0.46	0.36	0.34	-0.6%	0.88	0.90	0.91	0.1%
Berlin	0.39	0.35	0.34	-0.3%	0.89	0.86	0.81	-0.4%
Bicheng, Chongqing	0.49	0.33	0.33	0.0%	0.96	0.89	0.49	-4.5%
Bogota	0.19	0.18	0.16	-1.7%	0.84	0.86	0.87	0.2%
Budapest	0.25	0.25	0.27	0.6%	0.82	0.78	0.79	0.0%
Buenos Aires	0.20	0.19	0.17	-0.7%	0.83	0.83	0.82	-0.1%
Bukhara	0.54	0.49	0.36	-2.3%	0.84	0.74	0.76	0.2%
Busan	0.32	0.29	0.31	0.3%	0.70	0.69	0.65	-0.5%
Cabimas	0.27	0.26	0.23	-0.8%	0.32	0.33	0.36	0.6%
Cairo	0.26	0.20	0.26	2.6%	0.67	0.70	0.71	0.1%
Caracas	0.30	0.28	0.26	-0.4%	0.75	0.76	0.77	0.1%
Cebu City	0.33	0.34	0.30	-0.9%	0.68	0.65	0.66	0.0%
Changzhi, Hunan	0.38	0.34	0.36	0.4%	0.90	0.95	0.58	-3.6%
Changzhou, Jingsu	0.34	0.29	0.31	0.4%	0.69	0.86	0.87	0.2%
Chengdu, Sichuan	0.23	0.26	0.25	-0.4%	0.98	0.69	0.79	1.6%
Chengguan, Guizhou	0.44	0.39	0.37	-0.4%	0.96	0.90	0.82	-0.7%
Cheonan	0.32	0.39	0.44	0.8%	0.96	0.82	0.66	-1.6%
Chicago	0.22	0.21	0.21	-0.1%	0.81	0.84	0.85	0.1%
Cirebon	0.63	0.57	0.42	-2.2%	0.85	0.77	0.70	-0.7%
Cleveland	0.39	0.34	0.32	-0.4%	0.80	0.70	0.71	0.1%
Cochabamba	0.39	0.27	0.29	0.5%	0.61	0.66	0.69	0.4%
Coimbatore	0.44	0.43	0.40	-0.6%	0.87	0.78	0.77	-0.1%
Cordoba	0.22	0.21	0.23	0.5%	0.88	0.90	0.87	-0.3%
Culiacan	0.23	0.23	0.21	-0.8%	0.79	0.85	0.90	0.4%
Curitiba	0.42	0.32	0.25	-1.9%	0.91	0.88	0.89	0.0%
Dhaka	0.42	0.39	0.29	-2.2%	0.77	0.67	0.65	-0.2%
Dzerzhinsk	0.42	0.30	0.26	-1.3%	0.55	0.58	0.58	0.0%
Florianopolis	0.41	0.35	0.33	-0.4%	0.57	0.58	0.65	0.8%
Fukuoka	0.26	0.23	0.21	-0.8%	0.67	0.70	0.69	0.0%

Accra - Fukuoka

City Name	Compactness: Cohesion index				Total Added Area (ha)		
	T1	T2	T3	Annual Change T2-T3	T1-T2	T2-T3	(T2-T3)/(T1-T2)
Accra	0.79	0.77	0.71	-0.6%	22,148	29,609	1.3
Addis Ababa	0.95	0.83	0.82	-0.2%	4,181	9,420	2.3
Ahmedabad	0.91	0.92	0.93	0.1%	3,742	5,186	1.4
Ahvaz	0.70	0.75	0.79	0.4%	2,120	3,673	1.7
Alexandria	0.42	0.45	0.41	-0.6%	7,749	7,317	0.9
Algiers	0.69	0.65	0.70	0.6%	8,200	12,168	1.5
Anqing, Anhui	0.68	0.77	0.74	-0.3%	513	5,991	11.7
Antwerp	0.67	0.73	0.75	0.3%	14,029	7,416	0.5
Arusha	0.93	0.92	0.82	-0.9%	515	869	1.7
Astrakhan	0.75	0.76	0.75	-0.1%	7,684	1,567	0.2
Auckland	0.71	0.72	0.72	0.0%	2,275	4,683	2.1
Bacolod	0.82	0.87	0.81	-0.5%	1,900	509	0.3
Baghdad	0.77	0.78	0.81	0.3%	8,635	12,785	1.5
Baku	0.85	0.80	0.82	0.1%	4,332	4,979	1.1
Bamako	0.76	0.84	0.81	-0.2%	3,623	8,683	2.4
Bangkok	0.76	0.75	0.80	0.5%	39,339	82,792	2.1
Beijing, Beijing	0.89	0.69	0.77	0.8%	47,466	151,207	3.2
Beira	0.87	0.88	0.43	-6.0%	558	4,612	8.3
Belgaum	0.81	0.77	0.72	-0.5%	427	2,016	4.7
Belgrade	0.80	0.80	0.74	-0.6%	1,579	3,410	2.2
Belo Horizonte	0.82	0.84	0.84	0.0%	9,199	5,647	0.6
Berezniki	0.87	0.89	0.89	0.1%	1,027	364	0.4
Berlin	0.88	0.83	0.78	-0.5%	19,706	24,329	1.2
Bicheng, Chongqing	0.95	0.88	0.50	-4.3%	352	4,508	12.8
Bogota	0.83	0.85	0.86	0.2%	3,919	3,394	0.9
Budapest	0.79	0.76	0.76	0.0%	1,398	23,655	16.9
Buenos Aires	0.82	0.82	0.81	-0.1%	16,628	31,666	1.9
Bukhara	0.83	0.73	0.76	0.3%	3,436	9,992	2.9
Busan	0.69	0.68	0.64	-0.5%	7,212	11,738	1.6
Cabimas	0.35	0.35	0.38	0.5%	2,016	1,538	0.8
Cairo	0.66	0.68	0.69	0.1%	15,791	47,584	3.0
Caracas	0.73	0.75	0.77	0.1%	2,096	1,466	0.7
Cebu City	0.67	0.65	0.64	-0.1%	2,036	5,677	2.8
Changzhi, Hunan	0.89	0.93	0.61	-3.1%	1,595	7,029	4.4
Changzhou, Jingsu	0.67	0.84	0.85	0.1%	12,775	31,648	2.5
Chengdu, Sichuan	0.98	0.66	0.76	1.6%	26,149	78,501	3.0
Chengguan, Guizhou	0.95	0.89	0.81	-0.8%	109	389	3.6
Cheonan	0.95	0.80	0.64	-1.6%	1,983	6,137	3.1
Chicago	0.80	0.82	0.84	0.1%	111,489	59,804	0.5
Cirebon	0.85	0.76	0.68	-0.9%	869	5,249	6.0
Cleveland	0.80	0.69	0.70	0.1%	28,764	44,156	1.5
Cochabamba	0.57	0.63	0.67	0.5%	5,777	5,412	0.9
Coimbatore	0.86	0.76	0.75	-0.1%	3,679	4,881	1.3
Cordoba	0.87	0.90	0.86	-0.4%	3,312	5,320	1.6
Culiacan	0.77	0.84	0.89	0.4%	2,154	3,666	1.7
Curitiba	0.89	0.86	0.87	0.1%	16,241	13,376	0.8
Dhaka	0.74	0.66	0.64	-0.1%	5,005	12,156	2.4
Dzerzhinsk	0.56	0.59	0.59	0.0%	1,169	599	0.5
Florianopolis	0.55	0.57	0.64	0.9%	2,324	3,491	1.5
Fukuoka	0.64	0.68	0.67	-0.1%	6,975	4,007	0.6

City Name	Added Area: Infill (ha)				Added Area: Extension (ha)			
	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area
Accra	3,091	14%	5,522	19%	13,830	62%	18,718	63%
Addis Ababa	1,077	26%	2,996	32%	2,013	48%	5,520	59%
Ahmedabad	1,777	47%	1,847	36%	1,418	38%	2,747	53%
Ahvaz	517	24%	773	21%	858	40%	1,622	44%
Alexandria	1,307	17%	1,748	24%	4,506	58%	3,586	49%
Algiers	2,533	31%	3,615	30%	2,404	29%	4,990	41%
Anqing, Anhui	116	23%	850	14%	237	46%	4,204	70%
Antwerp	3,454	25%	3,537	48%	2,417	17%	1,147	15%
Arusha	79	15%	116	13%	362	70%	585	67%
Astrakhan	2,153	28%	1,009	64%	3,970	52%	130	8%
Auckland	896	39%	2,696	58%	783	34%	1,307	28%
Bacolod	536	28%	155	30%	1,117	59%	137	27%
Baghdad	5,976	69%	8,335	65%	1,272	15%	2,665	21%
Baku	1,533	35%	2,195	44%	1,265	29%	164	3%
Bamako	1,084	30%	2,344	27%	985	27%	2,497	29%
Bangkok	14,603	37%	23,466	28%	12,534	32%	40,743	49%
Beijing, Beijing	12,868	27%	27,567	18%	9,876	21%	54,735	36%
Beira	372	67%	540	12%	99	18%	545	12%
Belgaum	60	14%	313	16%	273	64%	1,044	52%
Belgrade	703	45%	845	25%	439	28%	1,058	31%
Belo Horizonte	5,274	57%	3,066	54%	2,578	28%	1,063	19%
Berezniki	614	60%	218	60%	263	26%	69	19%
Berlin	6,958	35%	8,613	35%	6,344	32%	5,048	21%
Bicheng, Chongqing	49	14%	131	3%	254	72%	3,603	80%
Bogota	1,654	42%	1,988	59%	1,616	41%	1,148	34%
Budapest	127	9%	5,171	22%	124	9%	7,107	30%
Buenos Aires	8,015	48%	14,456	46%	4,946	30%	11,602	37%
Bukhara	421	12%	2,071	21%	1,959	57%	1,387	14%
Busan	2,116	29%	2,410	21%	2,657	37%	4,459	38%
Cabimas	815	40%	692	45%	713	35%	661	43%
Cairo	5,700	36%	8,543	18%	7,675	49%	23,837	50%
Caracas	1,172	56%	799	54%	493	24%	366	25%
Cebu City	562	28%	2,003	35%	339	17%	1,376	24%
Changzhi, Hunan	543	34%	1,105	16%	595	37%	1,437	20%
Changzhou, Jingsu	1,618	13%	4,018	13%	9,726	76%	20,132	64%
Chengdu, Sichuan	3,715	14%	10,372	13%	16,669	64%	53,833	69%
Chengguan, Guizhou	38	35%	51	13%	44	40%	295	76%
Cheonan	267	13%	984	16%	1,142	58%	1,635	27%
Chicago	47,798	43%	27,834	47%	37,604	34%	15,032	25%
Cirebon	127	15%	1,138	22%	505	58%	2,563	49%
Cleveland	11,427	40%	16,067	36%	11,160	39%	13,225	30%
Cochabamba	2,031	35%	1,548	29%	3,092	54%	2,576	48%
Coimbatore	967	26%	1,798	37%	1,141	31%	1,413	29%
Cordoba	1,498	45%	1,891	36%	1,214	37%	1,789	34%
Culiacan	330	15%	1,083	30%	1,573	73%	2,158	59%
Curitiba	5,864	36%	6,789	51%	7,203	44%	3,752	28%
Dhaka	1,799	36%	4,991	41%	1,508	30%	4,972	41%
Dzerzhinsk	809	69%	359	60%	239	20%	113	19%
Florianopolis	962	41%	1,017	29%	797	34%	1,618	46%
Fukuoka	2,595	37%	1,971	49%	3,658	52%	1,525	38%

Accra - Fukuoka

City Name	Added Area: Leapfrog (ha)				Added Area: Inclusion (ha)			
	T1-T2	Percent T1- T2 Added Area	T2-T3	Percent T2- T3 Added Area	T1-T2	Percent T1- T2 Added Area	T2-T3	Percent T2- T3 Added Area
Accra	2,353	10.6%	0	0.0%	2,874	13%	5,368	18%
Addis Ababa	0	0.0%	1	0.0%	1,091	26%	903	10%
Ahmedabad	0	0.0%	0	0.0%	548	15%	592	11%
Ahvaz	539	25.4%	626	17.0%	206	10%	652	18%
Alexandria	0	0.0%	288	3.9%	1,936	25%	1,695	23%
Algiers	407	5.0%	0	0.0%	2,856	35%	3,563	29%
Anqing, Anhui	0	0.0%	0	0.0%	160	31%	937	16%
Antwerp	226	1.6%	560	7.6%	7,931	57%	2,171	29%
Arusha	0	0.0%	0	0.0%	74	14%	168	19%
Astrakhan	0	0.0%	127	8.1%	1,562	20%	301	19%
Auckland	261	11.5%	3	0.1%	335	15%	677	14%
Bacolod	0	0.0%	0	0.0%	247	13%	217	43%
Baghdad	40	0.5%	100	0.8%	1,347	16%	1,685	13%
Baku	185	4.3%	1,970	39.6%	1,348	31%	650	13%
Bamako	1,399	38.6%	2,816	32.4%	155	4%	1,026	12%
Bangkok	115	0.3%	149	0.2%	12,087	31%	18,434	22%
Beijing, Beijing	1,484	3.1%	362	0.2%	23,239	49%	68,542	45%
Beira	0	0.0%	85	1.8%	87	16%	3,442	75%
Belgaum	0	0.0%	86	4.3%	94	22%	573	28%
Belgrade	4	0.2%	0	0.0%	433	27%	1,507	44%
Belo Horizonte	27	0.3%	133	2.4%	1,320	14%	1,384	25%
Berezniki	0	0.0%	2	0.5%	151	15%	74	20%
Berlin	19	0.1%	836	3.4%	6,385	32%	9,832	40%
Bicheng, Chongqing	0	0.0%	113	2.5%	49	14%	661	15%
Bogota	2	0.0%	6	0.2%	647	17%	252	7%
Budapest	101	7.2%	0	0.0%	1,045	75%	11,377	48%
Buenos Aires	401	2.4%	48	0.2%	3,266	20%	5,559	18%
Bukhara	34	1.0%	268	2.7%	1,021	30%	6,265	63%
Busan	151	2.1%	1	0.0%	2,287	32%	4,869	41%
Cabimas	5	0.3%	0	0.0%	483	24%	185	12%
Cairo	294	1.9%	81	0.2%	2,122	13%	15,123	32%
Caracas	52	2.5%	24	1.7%	379	18%	277	19%
Cebu City	623	30.6%	981	17.3%	513	25%	1,316	23%
Changzhi, Hunan	6	0.4%	0	0.0%	451	28%	4,487	64%
Changzhou, Jingsu	0	0.0%	33	0.1%	1,431	11%	7,464	24%
Chengdu, Sichuan	10	0.0%	107	0.1%	5,755	22%	14,189	18%
Chengguan, Guizhou	0	0.0%	0	0.0%	27	25%	43	11%
Cheonan	0	0.0%	0	0.0%	574	29%	3,518	57%
Chicago	29	0.0%	770	1.3%	26,058	23%	16,169	27%
Cirebon	0	0.0%	12	0.2%	237	27%	1,536	29%
Cleveland	1	0.0%	21	0.0%	6,177	21%	14,843	34%
Cochabamba	0	0.0%	43	0.8%	654	11%	1,245	23%
Coimbatore	0	0.0%	59	1.2%	1,572	43%	1,611	33%
Cordoba	0	0.0%	5	0.1%	600	18%	1,634	31%
Culiacan	30	1.4%	0	0.0%	221	10%	425	12%
Curitiba	163	1.0%	302	2.3%	3,011	19%	2,533	19%
Dhaka	0	0.0%	14	0.1%	1,698	34%	2,179	18%
Dzerzhinsk	1	0.1%	0	0.0%	121	10%	127	21%
Florianopolis	118	5.1%	0	0.0%	447	19%	856	25%
Fukuoka	55	0.8%	3	0.1%	667	10%	508	13%

City Name	Country	Region	CBD Location		Land Cover Dates		
			Latitude	Longitude	T1	T2	T3
Gainesville, FL	United States	Land-Rich Developed Countries	29.661	-82.377	7/1/90	10/1/00	10/1/13
Gaoyou, Jiangsu	China	East Asia and the Pacific	32.792	119.430	10/1/90	1/1/00	4/1/16
Gombe	Nigeria	Sub-Saharan Africa	10.290	11.167	12/1/90	4/1/00	5/1/13
Gomel	Belarus	Europe and Japan	52.432	30.972	5/1/90	9/1/00	5/1/13
Gorgan	Iran	South and Central Asia	36.843	54.436	6/1/91	10/1/00	9/1/14
Guadalajara	Mexico	Latin America and the Caribbean	20.660	-103.357	3/1/90	11/1/99	4/1/14
Guangzhou, Guangdong	China	East Asia and the Pacific	22.936	113.608	2/1/91	9/1/00	10/1/14
Guatemala City	Guatemala	Latin America and the Caribbean	14.605	-90.542	1/1/90	1/1/01	11/1/13
Guixi, Chongqing	China	East Asia and the Pacific	30.332	107.348	6/1/88	7/1/01	6/1/16
Gwangju	Korea Rep.	East Asia and the Pacific	35.146	126.919	10/1/89	3/1/00	5/1/15
Haikou, Hainan	China	East Asia and the Pacific	20.028	110.329	10/1/91	7/1/01	12/1/13
Halle	Germany	Europe and Japan	51.487	11.970	8/1/90	9/1/99	7/1/10
Hangzhou, Zhejiang	China	East Asia and the Pacific	30.305	120.168	10/1/90	5/1/00	4/1/13
Hindupur	India	South and Central Asia	13.838	77.488	2/1/89	3/1/00	3/1/14
Ho Chi Minh City	Vietnam	Southeast Asia	10.830	106.713	1/1/89	12/1/99	1/1/15
Holguin	Cuba	Latin America and the Caribbean	20.883	-76.263	7/1/87	5/1/01	1/1/14
Hong Kong, Hong Kong	China	East Asia and the Pacific	22.346	114.183	11/1/89	1/1/00	10/1/13
Houston	United States	Land-Rich Developed Countries	29.780	-95.386	11/1/90	9/1/00	5/1/14
Hyderabad	India	South and Central Asia	17.422	78.484	3/1/90	7/1/99	5/1/14
Ibadan	Nigeria	Sub-Saharan Africa	7.388	3.896	12/1/84	2/1/00	12/1/13
Ilheus	Brazil	Latin America and the Caribbean	-14.803	-39.045	7/1/93	5/1/01	12/1/13
Ipoh	Malaysia	Southeast Asia	4.590	101.077	12/1/90	3/1/03	2/1/15
Istanbul	Turkey	Western Asia and North Africa	40.981	29.065	11/1/90	6/1/02	7/1/13
Jaipur	India	South and Central Asia	26.911	75.787	10/1/89	10/1/00	9/1/14
Jalna	India	South and Central Asia	19.851	75.878	10/1/89	10/1/00	10/1/14
Jequie	Brazil	Latin America and the Caribbean	-13.862	-40.085	8/1/92	4/1/01	4/1/14
Jinan, Shandong	China	East Asia and the Pacific	36.682	117.020	9/1/91	9/1/00	7/1/13
Jinju	Korea Rep.	East Asia and the Pacific	35.187	128.107	4/1/88	4/1/00	5/1/14
Johannesburg	South Africa	Sub-Saharan Africa	6.842	3.634	3/1/90	7/1/98	6/1/13
Kabul	Afghanistan	South and Central Asia	34.529	69.172	11/1/87	8/1/00	9/1/14
Kaiping, Guangdong	China	East Asia and the Pacific	22.380	112.688	4/1/90	9/1/00	11/1/14
Kairouan	Tunisia	Western Asia and North Africa	35.673	10.096	5/1/92	5/1/00	6/1/10
Kampala	Uganda	Sub-Saharan Africa	0.315	32.585	3/1/88	2/1/03	2/1/15
Kanpur	India	South and Central Asia	26.457	80.310	12/1/91	2/1/99	9/1/14
Karachi	Pakistan	South and Central Asia	24.900	67.075	2/1/91	10/1/00	10/1/13
Kaunas	Lithuania	Europe and Japan	54.903	23.925	8/1/90	9/1/00	3/1/14
Kayseri	Turkey	Western Asia and North Africa	38.724	35.480	10/1/87	6/1/00	8/1/13
Khartoum	Sudan	Western Asia and North Africa	15.552	32.532	12/1/88	4/1/00	3/1/14
Kigali	Rwanda	Sub-Saharan Africa	9.927	8.880	2/1/87	7/1/99	10/1/14
Killeen	United States	Land-Rich Developed Countries	31.112	-97.732	8/1/90	5/1/00	8/1/13
Kinshasa	Congo Dem. Rep.	Sub-Saharan Africa	-4.374	15.320	8/1/94	9/1/00	7/1/13
Kolkata	India	South and Central Asia	22.533	88.356	11/1/90	11/1/03	4/1/14
Kozhikode	India	South and Central Asia	11.254	75.803	2/1/91	3/1/01	2/1/14
Lagos	Nigeria	Sub-Saharan Africa	6.210	7.063	12/1/84	2/1/00	12/1/13
Lahore	Pakistan	South and Central Asia	31.514	74.314	11/1/91	10/1/00	10/1/13
Lausanne	Switzerland	Europe and Japan	46.516	6.633	4/1/87	3/1/01	8/1/15
Le Mans	France	Europe and Japan	47.989	0.199	5/1/92	8/1/99	7/1/13
Leon	Nicaragua	Latin America and the Caribbean	12.438	-86.878	7/1/93	4/1/00	1/1/10
Leshan, Sichuan	China	East Asia and the Pacific	29.591	103.754	7/1/90	7/1/01	8/1/14
London	United Kingdom	Europe and Japan	51.506	-0.139	5/1/89	6/1/00	7/1/13

Gainsville - London

City Name	Urban Extent Population				Built-up Area Total (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Gainesville, FL	112,979	137,912	175,756	1.9%	4,516	6,091	7,663	1.8%
Gaoyou, Jiangsu	86,595	70,291	186,351	6.0%	695	1,128	5,336	9.6%
Gombe	158,339	222,582	416,874	4.8%	950	1,327	3,699	7.8%
Gomel	434,467	501,664	508,557	0.1%	5,152	8,738	9,573	0.7%
Gorgan	142,123	227,778	375,741	3.6%	1,777	2,523	3,235	1.8%
Guadalajara	2,802,064	3,360,859	4,375,721	1.8%	26,758	35,080	51,625	2.7%
Guangzhou, Guangdong	2,405,072	12,039,122	24,657,221	5.1%	8,183	120,182	323,148	7.0%
Guatemala City	1,128,878	1,946,428	2,654,085	2.4%	13,307	19,229	26,506	2.5%
Guixi, Chongqing	17,185	104,711	198,120	4.3%	140	381	1,862	10.6%
Gwangju	723,576	1,054,149	1,368,716	1.7%	3,639	8,151	16,033	4.5%
Haikou, Hainan	501,814	756,043	1,247,662	4.0%	2,379	3,868	8,867	6.7%
Halle	283,271	258,612	235,706	-0.9%	3,587	5,894	6,721	1.2%
Hangzhou, Zhejiang	68,585	3,603,845	10,446,329	8.2%	4,627	43,702	196,261	11.6%
Hindupur	56,003	70,224	106,830	3.0%	57	125	445	9.1%
Ho Chi Minh City	2,563,621	3,950,264	10,187,671	6.3%	5,453	15,057	63,478	9.5%
Holguin	200,231	238,531	263,345	0.8%	1,652	2,070	2,157	0.3%
Hong Kong, Hong Kong	3,661,992	4,017,763	4,322,119	0.5%	5,934	8,037	9,254	1.0%
Houston	2,739,736	3,758,618	5,399,338	2.7%	116,357	182,480	272,394	2.9%
Hyderabad	3,906,590	5,067,000	7,609,285	2.7%	12,669	26,666	46,168	3.7%
Ibadan	1,397,391	2,041,756	2,954,967	2.7%	17,966	26,274	36,811	2.4%
Ilheus	88,775	121,000	97,888	-1.7%	532	1,250	1,513	1.5%
Ipoh	409,006	605,174	793,675	2.3%	10,153	18,566	25,310	2.6%
Istanbul	8,662,185	12,202,504	13,974,428	1.2%	28,372	57,759	102,589	5.2%
Jaipur	1,555,856	2,508,689	2,938,602	1.1%	4,023	12,788	19,218	2.9%
Jalna	186,307	244,109	278,314	0.9%	519	1,153	1,509	1.9%
Jequie	123,038	131,027	128,045	-0.2%	1,271	2,249	2,511	0.8%
Jinan, Shandong	1,716,692	2,239,910	3,316,828	3.1%	19,266	26,315	45,089	4.2%
Jinju	200,588	154,175	317,194	5.1%	1,860	2,158	13,432	13.0%
Johannesburg	3,148,133	4,726,764	8,000,159	3.5%	76,333	92,826	181,191	4.5%
Kabul	1,176,972	2,347,810	3,536,646	2.9%	10,712	13,559	22,872	3.7%
Kaiping, Guangdong	35,194	188,290	191,749	0.1%	137	1,537	2,045	2.0%
Kairouan	85,809	105,892	127,570	1.8%	905	1,367	1,661	1.9%
Kampala	723,017	1,646,980	3,017,000	5.0%	8,804	17,954	30,040	4.3%
Kanpur	2,101,131	2,521,488	2,795,714	0.7%	7,970	11,071	14,405	1.7%
Karachi	5,736,359	9,973,619	12,787,536	1.9%	18,058	27,536	35,018	1.8%
Kaunas	402,490	369,085	298,743	-1.6%	6,126	6,908	8,090	1.2%
Kayseri	131,605	444,740	673,805	3.2%	608	5,155	10,054	5.1%
Khartoum	1,253,183	1,844,695	5,061,792	7.3%	12,889	16,955	58,271	8.9%
Kigali	211,150	422,776	821,881	4.4%	960	3,937	8,272	4.9%
Killeen	93,137	119,748	225,248	4.8%	8,141	10,038	17,686	4.3%
Kinshasa	4,226,053	6,379,816	10,226,183	3.7%	7,878	20,142	33,763	4.0%
Kolkata	9,934,562	13,706,424	15,123,555	0.9%	18,048	33,576	60,278	5.6%
Kozhikode	202,612	440,244	1,171,852	7.6%	217	1,663	11,232	14.8%
Lagos	3,860,488	7,254,827	11,008,357	3.0%	19,403	38,082	52,788	2.4%
Lahore	3,474,381	5,716,948	9,682,207	4.1%	11,518	14,955	24,775	3.9%
Lausanne	193,460	260,181	306,229	1.1%	2,501	5,289	6,495	1.4%
Le Mans	173,669	175,640	179,135	0.1%	4,954	5,353	5,974	0.8%
Leon	135,097	141,815	160,355	1.3%	680	1,199	1,544	2.6%
Leshan, Sichuan	158,519	278,811	524,838	4.8%	1,061	2,963	8,391	8.0%
London	8,520,935	9,735,667	11,197,941	1.1%	131,495	167,368	177,273	0.4%

City Name	Urban Built-up Area (ha)				Suburban Built-up Area (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Gainesville, FL	2,147	3,227	3,927	1.5%	2,235	2,705	3,540	2.1%
Gaoyou, Jiangsu	576	856	4,252	9.9%	106	255	1,003	8.4%
Gombe	691	1,117	3,064	7.7%	236	191	587	8.6%
Gomel	4,345	7,047	7,764	0.8%	763	1,561	1,693	0.6%
Gorgan	1,280	2,002	2,571	1.8%	467	473	606	1.8%
Guadalajara	22,900	31,367	44,886	2.5%	3,620	3,453	6,279	4.1%
Guangzhou, Guangdong	4,881	77,412	237,094	7.9%	3,038	39,584	80,406	5.0%
Guatemala City	9,831	15,213	22,402	3.0%	3,252	3,750	3,808	0.1%
Guixi, Chongqing	56	219	1,374	12.3%	76	149	449	7.4%
Gwangju	2,989	5,960	13,831	5.6%	598	2,014	2,057	0.1%
Haikou, Hainan	1,628	2,774	6,817	7.2%	691	1,019	1,943	5.2%
Halle	2,505	4,409	5,131	1.4%	999	1,357	1,484	0.8%
Hangzhou, Zhejiang	1,904	21,314	108,115	12.6%	2,559	20,611	82,497	10.7%
Hindupur	0	35	190	12.0%	50	79	236	7.8%
Ho Chi Minh City	4,285	11,717	47,604	9.3%	1,093	3,097	14,964	10.4%
Holguin	1,107	1,427	1,523	0.5%	509	600	589	-0.1%
Hong Kong, Hong Kong	4,643	6,330	7,487	1.2%	1,231	1,646	1,669	0.1%
Houston	77,754	142,751	217,995	3.1%	36,472	37,334	51,264	2.3%
Hyderabad	8,918	20,683	36,294	3.8%	3,487	5,595	9,099	3.3%
Ibadan	15,774	23,972	32,352	2.2%	2,034	2,129	4,170	4.9%
Ilheus	233	746	1,023	2.5%	256	461	468	0.1%
Ipoh	5,605	13,074	20,444	3.7%	4,218	5,189	4,534	-1.1%
Istanbul	20,855	47,000	92,509	6.1%	7,105	10,172	9,396	-0.7%
Jaipur	3,134	11,309	14,570	1.8%	809	1,395	4,245	8.0%
Jalna	245	761	1,144	2.9%	248	369	341	-0.6%
Jequie	975	1,890	2,075	0.7%	281	331	402	1.5%
Jinan, Shandong	15,810	20,150	34,839	4.3%	3,224	5,683	9,455	4.0%
Jinju	1,366	1,705	7,806	10.8%	454	419	5,218	17.9%
Johannesburg	52,246	66,200	157,588	5.8%	22,565	24,950	22,225	-0.8%
Kabul	8,141	10,912	18,514	3.8%	2,389	2,501	4,071	3.5%
Kaiping, Guangdong	4	803	1,196	2.8%	126	682	797	1.1%
Kairouan	703	1,137	1,555	3.1%	188	218	102	-7.6%
Kampala	5,668	12,541	21,223	4.4%	2,925	5,071	8,208	4.0%
Kanpur	6,294	9,265	11,826	1.6%	1,553	1,660	2,374	2.3%
Karachi	16,675	25,475	31,400	1.6%	1,295	1,940	3,360	4.2%
Kaunas	4,630	5,693	6,479	1.0%	1,421	1,124	1,479	2.0%
Kayseri	206	3,220	6,611	5.5%	371	1,818	3,185	4.3%
Khartoum	7,992	12,290	52,682	10.5%	4,712	4,493	5,283	1.2%
Kigali	256	3,105	5,987	4.3%	644	768	2,092	6.6%
Killeen	5,187	6,767	12,421	4.6%	2,715	3,018	4,865	3.6%
Kinshasa	4,550	17,041	30,057	4.4%	3,168	2,935	3,526	1.4%
Kolkata	11,795	21,902	44,343	6.8%	5,885	10,997	14,788	2.8%
Kozhikode	31	769	5,078	14.6%	166	825	5,710	15.0%
Lagos	15,209	31,291	42,213	2.2%	3,924	6,358	9,972	3.3%
Lahore	9,136	11,998	20,240	4.0%	2,225	2,721	4,159	3.3%
Lausanne	1,222	4,017	5,302	1.9%	1,204	1,191	1,107	-0.5%
Le Mans	4,046	4,393	4,788	0.6%	855	889	1,098	1.5%
Leon	438	955	1,220	2.5%	221	225	290	2.6%
Leshan, Sichuan	646	1,732	4,909	8.0%	380	1,160	3,285	8.0%
London	108,695	141,363	151,304	0.5%	21,421	24,311	24,261	0.0%

Gainsville - London

City Name	Rural Built-up Area (ha)				Urbanized Open Space (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Gainesville, FL	134	159	196	1.6%	4,316	5,536	7,182	2.0%
Gaoyou, Jiangsu	14	18	81	9.2%	164	444	2,111	9.6%
Gombe	22	19	48	7.2%	521	544	1,563	8.1%
Gomel	44	129	117	-0.8%	2,250	3,986	4,013	0.1%
Gorgan	31	49	58	1.3%	883	956	1,288	2.1%
Guadalajara	238	259	460	4.0%	11,157	11,564	17,191	2.8%
Guangzhou, Guangdong	264	3,186	5,647	4.1%	6,837	75,290	185,112	6.4%
Guatemala City	224	267	297	0.8%	8,281	10,243	11,059	0.6%
Guixi, Chongqing	8	13	39	7.5%	146	296	1,070	8.6%
Gwangju	52	177	144	-1.4%	1,637	4,343	5,632	1.7%
Haikou, Hainan	60	75	108	3.0%	1,293	2,614	5,129	5.4%
Halle	83	127	106	-1.6%	2,497	3,047	3,073	0.1%
Hangzhou, Zhejiang	164	1,776	5,649	9.0%	5,298	41,851	175,928	11.1%
Hindupur	6	10	19	4.3%	79	153	404	7.0%
Ho Chi Minh City	75	243	910	8.7%	2,978	6,958	35,913	10.9%
Holguin	36	43	45	0.3%	899	1,192	1,219	0.2%
Hong Kong, Hong Kong	60	61	98	3.5%	2,316	2,985	3,024	0.1%
Houston	2,131	2,396	3,135	2.0%	91,608	107,148	150,754	2.5%
Hyderabad	265	388	776	4.7%	8,999	15,292	26,829	3.8%
Ibadan	158	173	289	3.7%	6,297	7,155	12,310	3.9%
Ilheus	43	42	22	-5.2%	340	595	570	-0.3%
Ipoh	330	303	332	0.8%	9,373	12,451	13,065	0.4%
Istanbul	411	588	684	1.4%	18,556	29,367	29,017	-0.1%
Jaipur	80	83	403	11.3%	2,604	5,782	11,172	4.7%
Jalna	26	23	24	0.2%	487	740	869	1.1%
Jequie	15	29	35	1.6%	657	680	959	2.6%
Jinan, Shandong	232	482	794	3.9%	7,238	11,943	20,999	4.4%
Jinju	40	34	408	17.6%	887	957	9,958	16.6%
Johannesburg	1,522	1,676	1,378	-1.3%	64,462	71,273	81,377	0.9%
Kabul	183	146	287	4.8%	6,499	6,909	11,537	3.6%
Kaiping, Guangdong	7	52	51	-0.2%	117	1,090	1,183	0.6%
Kairouan	14	12	5	-9.9%	460	569	384	-3.9%
Kampala	211	342	610	4.8%	7,688	12,744	21,280	4.3%
Kanpur	123	145	205	2.2%	4,515	4,901	6,263	1.6%
Karachi	88	120	257	5.9%	4,277	6,591	10,309	3.4%
Kaunas	76	92	132	2.7%	3,398	3,148	4,064	1.9%
Kayseri	32	118	257	5.9%	849	3,941	7,774	5.2%
Khartoum	185	172	307	4.2%	10,141	10,254	16,026	3.2%
Kigali	60	64	193	7.2%	1,243	2,625	5,607	5.0%
Killeen	239	252	400	3.5%	6,574	7,523	12,880	4.1%
Kinshasa	160	166	180	0.6%	6,764	9,064	11,918	2.1%
Kolkata	368	677	1,147	5.1%	13,271	26,024	36,590	3.3%
Kozhikode	19	69	445	14.4%	318	1,653	12,409	15.6%
Lagos	270	432	603	2.4%	10,335	19,978	29,896	2.9%
Lahore	158	236	376	3.6%	6,233	8,201	12,367	3.2%
Lausanne	75	81	86	0.4%	2,418	2,719	2,701	0.0%
Le Mans	53	71	88	1.5%	2,000	1,988	2,571	1.8%
Leon	21	19	33	5.7%	556	598	711	1.8%
Leshan, Sichuan	35	71	196	7.8%	577	1,872	5,680	8.5%
London	1,379	1,694	1,708	0.1%	65,860	75,586	73,498	-0.2%

City Name	Urban Extent (ha)				Built-up Area Density (persons/ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Gainesville, FL	8,832	11,627	14,845	1.9%	25	23	23	0.1%
Gaoyou, Jiangsu	860	1,572	7,446	9.6%	125	62	35	-3.6%
Gombe	1,471	1,871	5,262	7.9%	167	168	113	-3.0%
Gomel	7,402	12,724	13,587	0.5%	84	57	53	-0.6%
Gorgan	2,660	3,480	4,523	1.9%	80	90	116	1.8%
Guadalajara	37,915	46,644	68,816	2.7%	105	96	85	-0.8%
Guangzhou, Guangdong	15,020	195,472	508,259	6.8%	294	100	76	-1.9%
Guatemala City	21,588	29,472	37,566	1.9%	85	101	100	-0.1%
Guixi, Chongqing	285	677	2,931	9.8%	123	275	106	-6.4%
Gwangju	5,277	12,494	21,664	3.6%	199	129	85	-2.7%
Haikou, Hainan	3,672	6,482	13,996	6.2%	211	195	141	-2.6%
Halle	6,084	8,941	9,793	0.8%	79	44	35	-2.1%
Hangzhou, Zhejiang	9,925	85,552	372,189	11.4%	15	82	53	-3.4%
Hindupur	136	277	849	8.0%	986	563	240	-6.1%
Ho Chi Minh City	8,430	22,015	99,391	10.0%	470	262	160	-3.3%
Holguin	2,551	3,262	3,376	0.3%	121	115	122	0.5%
Hong Kong, Hong Kong	8,250	11,022	12,278	0.8%	617	500	467	-0.5%
Houston	207,965	289,629	423,148	2.8%	24	21	20	-0.3%
Hyderabad	21,668	41,958	72,998	3.7%	308	190	165	-1.0%
Ibadan	24,264	33,429	49,121	2.8%	78	78	80	0.2%
Ilheus	872	1,845	2,083	1.0%	167	97	65	-3.2%
Ipoh	19,526	31,017	38,374	1.8%	40	33	31	-0.3%
Istanbul	46,928	87,126	131,606	3.7%	305	211	136	-4.0%
Jaipur	6,628	18,570	30,390	3.5%	387	196	153	-1.8%
Jalna	1,007	1,893	2,377	1.6%	359	212	184	-1.0%
Jequie	1,928	2,930	3,470	1.3%	97	58	51	-1.0%
Jinan, Shandong	26,504	38,258	66,087	4.3%	89	85	74	-1.1%
Jinju	2,746	3,115	23,390	14.3%	108	71	24	-7.9%
Johannesburg	140,795	164,099	262,568	3.2%	41	51	44	-1.0%
Kabul	17,212	20,468	34,409	3.7%	110	173	155	-0.8%
Kaiping, Guangdong	254	2,627	3,227	1.5%	257	122	94	-1.9%
Kairouan	1,365	1,936	2,044	0.5%	95	77	77	-0.1%
Kampala	16,492	30,698	51,321	4.3%	82	92	100	0.8%
Kanpur	12,485	15,971	20,667	1.7%	264	228	194	-1.0%
Karachi	22,335	34,127	45,327	2.2%	318	362	365	0.1%
Kaunas	9,524	10,056	12,154	1.4%	66	53	37	-2.7%
Kayseri	1,458	9,097	17,828	5.1%	216	86	67	-1.9%
Khartoum	23,031	27,208	74,297	7.2%	97	109	87	-1.6%
Kigali	2,203	6,562	13,880	4.9%	220	107	99	-0.5%
Killeen	14,716	17,561	30,566	4.2%	11	12	13	0.5%
Kinshasa	14,642	29,206	45,681	3.5%	536	317	303	-0.3%
Kolkata	31,319	59,600	96,868	4.7%	550	408	251	-4.7%
Kozhikode	535	3,316	23,642	15.2%	936	265	104	-7.2%
Lagos	29,738	58,060	82,684	2.6%	199	191	209	0.7%
Lahore	17,751	23,156	37,142	3.6%	302	382	391	0.2%
Lausanne	4,919	8,008	9,196	1.0%	77	49	47	-0.3%
Le Mans	6,954	7,341	8,545	1.1%	35	33	30	-0.6%
Leon	1,236	1,797	2,255	2.3%	199	118	104	-1.3%
Leshan, Sichuan	1,638	4,836	14,070	8.2%	149	94	63	-3.1%
London	197,355	242,954	250,771	0.2%	65	58	63	0.6%

Gainsville - London

City Name	Urban Extent Density (persons / ha)				Frgmentation: Saturation (Built-up Area/Urban Extent)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Gainesville, FL	13	12	12	0.0%	0.51	0.52	0.52	-0.1%
Gaoyou, Jiangsu	101	45	25	-3.6%	0.81	0.72	0.72	0.0%
Gombe	108	119	79	-3.1%	0.65	0.71	0.70	-0.1%
Gomel	59	39	37	-0.4%	0.70	0.69	0.70	0.2%
Gorgan	53	65	83	1.7%	0.67	0.73	0.72	-0.1%
Guadalajara	74	72	64	-0.9%	0.71	0.75	0.75	0.0%
Guangzhou, Guangdong	160	62	49	-1.7%	0.54	0.61	0.64	0.2%
Guatemala City	52	66	71	0.5%	0.62	0.65	0.71	0.6%
Guixi, Chongqing	60	155	68	-5.5%	0.49	0.56	0.64	0.8%
Gwangju	137	84	63	-1.9%	0.69	0.65	0.74	0.8%
Haikou, Hainan	137	117	89	-2.2%	0.65	0.60	0.63	0.5%
Halle	47	29	24	-1.7%	0.59	0.66	0.69	0.4%
Hangzhou, Zhejiang	7	42	28	-3.1%	0.47	0.51	0.53	0.2%
Hindupur	413	253	126	-5.0%	0.42	0.45	0.52	1.1%
Ho Chi Minh City	304	179	103	-3.7%	0.65	0.68	0.64	-0.5%
Holguin	78	73	78	0.5%	0.65	0.63	0.64	0.1%
Hong Kong, Hong Kong	444	365	352	-0.3%	0.72	0.73	0.75	0.2%
Houston	13	13	13	-0.1%	0.56	0.63	0.64	0.2%
Hyderabad	180	121	104	-1.0%	0.58	0.64	0.63	0.0%
Ibadan	58	61	60	-0.1%	0.74	0.79	0.75	-0.3%
Ilheus	102	66	47	-2.7%	0.61	0.68	0.73	0.6%
Ipoh	21	20	21	0.5%	0.52	0.60	0.66	0.8%
Istanbul	185	140	106	-2.5%	0.60	0.66	0.78	1.5%
Jaipur	235	135	97	-2.4%	0.61	0.69	0.63	-0.6%
Jalna	185	129	117	-0.7%	0.52	0.61	0.63	0.3%
Jequie	64	45	37	-1.5%	0.66	0.77	0.72	-0.5%
Jinan, Shandong	65	59	50	-1.2%	0.73	0.69	0.68	-0.1%
Jinju	73	49	14	-9.2%	0.68	0.69	0.57	-1.3%
Johannesburg	22	29	30	0.4%	0.54	0.57	0.69	1.3%
Kabul	68	115	103	-0.8%	0.62	0.66	0.66	0.0%
Kaiping, Guangdong	139	72	59	-1.3%	0.54	0.59	0.63	0.6%
Kairouan	63	55	62	1.3%	0.66	0.71	0.81	1.4%
Kampala	44	54	59	0.8%	0.53	0.58	0.59	0.0%
Kanpur	168	158	135	-1.0%	0.64	0.69	0.70	0.0%
Karachi	257	292	282	-0.3%	0.81	0.81	0.77	-0.3%
Kaunas	42	37	25	-3.0%	0.64	0.69	0.67	-0.2%
Kayseri	90	49	38	-2.0%	0.42	0.57	0.56	0.0%
Khartoum	54	68	68	0.0%	0.56	0.62	0.78	1.7%
Kigali	96	64	59	-0.6%	0.44	0.60	0.60	0.0%
Killeen	6	7	7	0.6%	0.55	0.57	0.58	0.1%
Kinshasa	289	218	224	0.2%	0.54	0.69	0.74	0.5%
Kolkata	317	230	156	-3.7%	0.58	0.56	0.62	1.0%
Kozhikode	379	133	50	-7.6%	0.40	0.50	0.48	-0.4%
Lagos	130	125	133	0.5%	0.65	0.66	0.64	-0.2%
Lahore	196	247	261	0.4%	0.65	0.65	0.67	0.2%
Lausanne	39	32	33	0.2%	0.51	0.66	0.71	0.5%
Le Mans	25	24	21	-0.9%	0.71	0.73	0.70	-0.3%
Leon	109	79	71	-1.1%	0.55	0.67	0.68	0.3%
Leshan, Sichuan	97	58	37	-3.3%	0.65	0.61	0.60	-0.2%
London	43	40	45	0.8%	0.67	0.69	0.71	0.2%

City Name	Openness index				Compactness (Roundness): Proximity index			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Gainesville, FL	0.48	0.46	0.47	0.1%	0.86	0.86	0.84	-0.2%
Gaoyou, Jiangsu	0.26	0.30	0.27	-0.7%	0.96	0.94	0.83	-0.8%
Gombe	0.33	0.26	0.25	-0.2%	0.86	0.90	0.81	-0.8%
Gomel	0.28	0.29	0.28	-0.2%	0.93	0.78	0.78	0.0%
Gorgan	0.33	0.27	0.26	-0.5%	0.86	0.86	0.86	0.0%
Guadalajara	0.22	0.18	0.20	0.5%	0.95	0.94	0.88	-0.4%
Guangzhou, Guangdong	0.45	0.39	0.34	-0.9%	0.82	0.71	0.79	0.8%
Guatemala City	0.33	0.29	0.23	-1.8%	0.84	0.83	0.87	0.3%
Guixi, Chongqing	0.53	0.44	0.32	-2.0%	0.93	0.87	0.79	-0.6%
Gwangju	0.27	0.30	0.23	-2.0%	0.93	0.75	0.89	1.1%
Haikou, Hainan	0.38	0.36	0.35	-0.2%	0.78	0.93	0.85	-0.7%
Halle	0.38	0.31	0.29	-0.6%	0.88	0.88	0.88	0.0%
Hangzhou, Zhejiang	0.54	0.44	0.44	0.0%	0.86	0.67	0.84	1.8%
Hindupur	0.66	0.58	0.51	-0.9%	0.96	0.90	0.85	-0.4%
Ho Chi Minh City	0.30	0.26	0.32	1.5%	0.94	0.88	0.74	-1.2%
Holguin	0.36	0.35	0.34	-0.2%	0.81	0.87	0.88	0.0%
Hong Kong, Hong Kong	0.32	0.30	0.27	-0.6%	0.66	0.69	0.69	0.0%
Houston	0.40	0.32	0.30	-0.3%	0.84	0.86	0.87	0.1%
Hyderabad	0.37	0.30	0.29	-0.2%	0.88	0.87	0.91	0.3%
Ibadan	0.19	0.15	0.17	1.0%	0.92	0.94	0.94	0.0%
Ilheus	0.51	0.43	0.38	-1.0%	0.57	0.55	0.56	0.1%
Ipoh	0.47	0.38	0.31	-1.7%	0.74	0.72	0.76	0.4%
Istanbul	0.37	0.30	0.17	-5.2%	0.50	0.54	0.58	0.6%
Jaipur	0.33	0.26	0.29	0.9%	0.92	0.91	0.87	-0.3%
Jalna	0.50	0.40	0.35	-1.0%	0.88	0.82	0.82	0.0%
Jequie	0.37	0.26	0.26	-0.1%	0.82	0.80	0.82	0.2%
Jinan, Shandong	0.25	0.27	0.27	0.0%	0.81	0.81	0.79	-0.1%
Jinju	0.33	0.31	0.43	2.4%	0.75	0.77	0.60	-1.8%
Johannesburg	0.41	0.39	0.25	-3.0%	0.79	0.80	0.89	0.7%
Kabul	0.34	0.30	0.28	-0.5%	0.81	0.83	0.80	-0.2%
Kaiping, Guangdong	0.62	0.47	0.43	-0.6%	0.72	0.87	0.86	-0.1%
Kairouan	0.32	0.27	0.18	-3.8%	0.95	0.93	0.93	0.0%
Kampala	0.42	0.37	0.35	-0.3%	0.89	0.66	0.75	1.1%
Kanpur	0.31	0.25	0.25	0.0%	0.86	0.84	0.82	-0.2%
Karachi	0.17	0.16	0.18	0.7%	0.93	0.83	0.87	0.3%
Kaunas	0.35	0.30	0.31	0.2%	0.84	0.83	0.81	-0.2%
Kayseri	0.57	0.43	0.39	-0.8%	0.76	0.69	0.73	0.5%
Khartoum	0.39	0.26	0.18	-2.6%	0.75	0.78	0.76	-0.2%
Kigali	0.57	0.34	0.33	-0.2%	0.82	0.82	0.87	0.4%
Killeen	0.40	0.39	0.38	-0.2%	0.81	0.86	0.82	-0.4%
Kinshasa	0.42	0.25	0.22	-0.9%	0.83	0.85	0.79	-0.6%
Kolkata	0.40	0.39	0.32	-1.9%	0.62	0.64	0.70	0.9%
Kozhikode	0.62	0.48	0.49	0.2%	0.92	0.68	0.64	-0.4%
Lagos	0.30	0.30	0.30	0.2%	0.76	0.80	0.79	-0.2%
Lahore	0.31	0.30	0.28	-0.6%	0.87	0.87	0.86	-0.1%
Lausanne	0.47	0.33	0.29	-0.9%	0.68	0.74	0.73	-0.1%
Le Mans	0.24	0.24	0.25	0.5%	0.83	0.83	0.83	0.0%
Leon	0.44	0.29	0.29	-0.2%	0.94	0.93	0.89	-0.4%
Leshan, Sichuan	0.40	0.42	0.41	-0.1%	0.74	0.64	0.71	0.7%
London	0.30	0.27	0.25	-0.5%	0.83	0.82	0.82	0.0%

Gainsville - London

City Name	Compactness (Roundness): Cohesion index				Total Added Area (ha)		
	T1	T2	T3	Annual Change T2-T3	T1-T2	T2-T3	(T2-T3)/(T1-T2)
Gainesville, FL	0.86	0.85	0.83	-0.2%	1,574	1,572	1.0
Gaoyou, Jiangsu	0.95	0.93	0.81	-0.8%	432	4,207	9.7
Gombe	0.85	0.89	0.78	-0.9%	377	2,372	6.3
Gomel	0.92	0.75	0.75	0.0%	3,585	835	0.2
Gorgan	0.84	0.84	0.84	0.0%	745	711	1.0
Guadalajara	0.94	0.93	0.87	-0.4%	8,345	16,544	2.0
Guangzhou, Guangdong	0.80	0.69	0.77	0.7%	112,029	202,961	1.8
Guatemala City	0.83	0.81	0.85	0.5%	5,922	7,277	1.2
Guixi, Chongqing	0.92	0.86	0.78	-0.6%	240	1,481	6.2
Gwangju	0.91	0.75	0.88	1.0%	4,511	7,881	1.7
Haikou, Hainan	0.76	0.91	0.83	-0.7%	1,488	4,999	3.4
Halle	0.87	0.87	0.86	-0.1%	2,306	827	0.4
Hangzhou, Zhejiang	0.85	0.66	0.83	1.8%	39,068	145,330	3.7
Hindupur	0.95	0.89	0.84	-0.4%	67	320	4.8
Ho Chi Minh City	0.92	0.87	0.73	-1.1%	9,604	48,418	5.0
Holguin	0.80	0.85	0.86	0.0%	418	86	0.2
Hong Kong, Hong Kong	0.65	0.68	0.68	-0.1%	2,110	1,222	0.6
Houston	0.82	0.84	0.85	0.1%	66,340	90,138	1.4
Hyderabad	0.88	0.84	0.89	0.4%	13,996	19,501	1.4
Ibadan	0.91	0.93	0.93	0.0%	8,307	10,537	1.3
Ilheus	0.58	0.53	0.54	0.1%	730	263	0.4
Ipoh	0.73	0.71	0.74	0.4%	8,442	6,743	0.8
Istanbul	0.50	0.54	0.58	0.6%	29,409	44,855	1.5
Jaipur	0.91	0.91	0.86	-0.4%	8,764	6,471	0.7
Jalna	0.88	0.81	0.81	0.0%	632	355	0.6
Jeque	0.82	0.79	0.81	0.2%	978	262	0.3
Jinan, Shandong	0.80	0.80	0.79	-0.1%	7,048	18,774	2.7
Jinju	0.75	0.77	0.59	-1.8%	302	11,274	37.3
Johannesburg	0.77	0.79	0.87	0.6%	16,694	88,587	5.3
Kabul	0.80	0.82	0.79	-0.3%	2,846	9,313	3.3
Kaiping, Guangdong	0.71	0.86	0.84	-0.1%	1,400	507	0.4
Kairouan	0.94	0.92	0.92	0.0%	461	293	0.6
Kampala	0.87	0.63	0.72	1.1%	9,150	12,090	1.3
Kanpur	0.85	0.82	0.80	-0.2%	3,101	3,333	1.1
Karachi	0.91	0.83	0.86	0.2%	9,478	7,482	0.8
Kaunas	0.81	0.82	0.79	-0.2%	828	1,181	1.4
Kayseri	0.75	0.67	0.72	0.6%	4,546	4,898	1.1
Khartoum	0.75	0.78	0.74	-0.4%	9,458	27,459	2.9
Kigali	0.81	0.81	0.86	0.3%	2,976	4,335	1.5
Killeen	0.79	0.84	0.80	-0.4%	1,896	7,648	4.0
Kinshasa	0.83	0.84	0.78	-0.6%	12,263	13,621	1.1
Kolkata	0.61	0.63	0.70	0.9%	14,809	24,179	1.6
Kozhikode	0.91	0.66	0.64	-0.3%	1,446	9,569	6.6
Lagos	0.75	0.79	0.76	-0.3%	18,679	14,706	0.8
Lahore	0.85	0.86	0.84	-0.1%	3,436	9,820	2.9
Lausanne	0.66	0.72	0.72	0.0%	2,787	1,206	0.4
Le Mans	0.82	0.81	0.82	0.0%	399	621	1.6
Leon	0.93	0.92	0.88	-0.5%	519	344	0.7
Leshan, Sichuan	0.74	0.63	0.70	0.8%	1,902	5,427	2.9
London	0.80	0.79	0.79	0.0%	35,875	9,911	0.3

City Name	Added Area: Infill (ha)				Added Area: Extension (ha)			
	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area
Gainesville, FL	424	27%	341	22%	559	36%	217	14%
Gaoyou, Jiangsu	47	11%	360	9%	306	71%	2,771	66%
Gombe	182	48%	205	9%	170	45%	1,913	81%
Gomel	897	25%	407	49%	720	20%	137	16%
Gorgan	290	39%	229	32%	311	42%	308	43%
Guadalajara	4,522	54%	5,236	32%	2,708	32%	7,906	48%
Guangzhou, Guangdong	11,302	10%	36,502	18%	70,580	63%	106,604	53%
Guatemala City	2,051	35%	3,811	52%	2,038	34%	2,479	34%
Guixi, Chongqing	54	22%	122	8%	146	61%	1,095	74%
Gwangju	1,058	23%	2,380	30%	1,858	41%	3,596	46%
Haikou, Hainan	331	22%	1,093	22%	942	63%	3,149	63%
Halle	1,055	46%	442	53%	693	30%	201	24%
Hangzhou, Zhejiang	4,899	13%	23,912	16%	21,667	55%	73,968	51%
Hindupur	18	27%	41	13%	25	37%	206	64%
Ho Chi Minh City	1,918	20%	8,757	18%	6,713	70%	19,751	41%
Holguin	109	26%	45	52%	169	40%	22	26%
Hong Kong, Hong Kong	500	24%	619	51%	1,101	52%	197	16%
Houston	30,461	46%	25,543	28%	19,525	29%	40,799	45%
Hyderabad	4,545	32%	5,591	29%	6,346	45%	10,332	53%
Ibadan	3,186	38%	3,156	30%	4,667	56%	5,961	57%
Ilheus	156	21%	144	55%	91	12%	48	18%
Ipoh	2,920	35%	3,470	51%	2,841	34%	1,471	22%
Istanbul	7,727	26%	20,577	46%	17,913	61%	7,441	17%
Jaipur	1,247	14%	1,588	25%	6,517	74%	4,446	69%
Jalna	204	32%	156	44%	291	46%	182	51%
Jequie	310	32%	75	29%	652	67%	142	54%
Jinan, Shandong	1,048	15%	4,305	23%	3,770	53%	9,267	49%
Jinju	165	55%	1,397	12%	86	28%	5,132	46%
Johannesburg	6,041	36%	38,191	43%	5,679	34%	37,553	42%
Kabul	1,514	53%	2,148	23%	863	30%	5,747	62%
Kaiping, Guangdong	88	6%	210	41%	942	67%	0	0%
Kairouan	143	31%	246	84%	275	60%	38	13%
Kampala	3,329	36%	3,641	30%	2,584	28%	4,999	41%
Kanpur	1,443	47%	1,026	31%	1,085	35%	1,328	40%
Karachi	1,400	15%	1,992	27%	1,216	13%	5,030	67%
Kaunas	609	74%	227	19%	107	13%	201	17%
Kayseri	570	13%	1,012	21%	2,967	65%	3,012	62%
Khartoum	4,149	44%	5,995	22%	4,692	50%	16,251	59%
Kigali	685	23%	1,024	24%	1,881	63%	2,848	66%
Killeen	698	37%	1,351	18%	684	36%	3,610	47%
Kinshasa	4,208	34%	3,648	27%	7,363	60%	8,618	63%
Kolkata	4,315	29%	11,220	46%	6,491	44%	6,658	28%
Kozhikode	211	15%	1,174	12%	950	66%	5,177	54%
Lagos	3,985	21%	4,379	30%	10,363	55%	5,898	40%
Lahore	919	27%	2,756	28%	2,027	59%	5,779	59%
Lausanne	1,217	44%	719	60%	1,003	36%	159	13%
Le Mans	165	41%	144	23%	155	39%	140	23%
Leon	258	50%	124	36%	211	41%	150	44%
Leshan, Sichuan	240	13%	992	18%	822	43%	2,504	46%
London	14,294	40%	6,537	66%	5,558	15%	619	6%

Gainsville - London

City Name	Added Area: Leapfrog (ha)				Added Area: Inclusion (ha)			
	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area
Gainesville, FL	14	0.9%	189	12.0%	577	37%	825	52%
Gaoyou, Jiangsu	0	0.0%	4	0.1%	79	18%	1,072	25%
Gombe	0	0.0%	0	0.0%	25	7%	253	11%
Gomel	27	0.7%	119	14.2%	1,941	54%	172	21%
Gorgan	0	0.0%	6	0.9%	144	19%	168	24%
Guadalajara	24	0.3%	381	2.3%	1,091	13%	3,022	18%
Guangzhou, Guangdong	296	0.3%	3,602	1.8%	29,851	27%	56,252	28%
Guatemala City	230	3.9%	25	0.3%	1,603	27%	963	13%
Guixi, Chongqing	0	0.0%	0	0.0%	41	17%	263	18%
Gwangju	0	0.0%	27	0.3%	1,595	35%	1,877	24%
Haikou, Hainan	0	0.0%	0	0.0%	215	14%	756	15%
Halle	15	0.6%	24	2.9%	543	24%	160	19%
Hangzhou, Zhejiang	256	0.7%	32	0.0%	12,245	31%	47,418	33%
Hindupur	0	0.0%	0	0.0%	24	36%	73	23%
Ho Chi Minh City	0	0.0%	2	0.0%	973	10%	19,909	41%
Holguin	0	0.0%	2	2.4%	140	34%	17	20%
Hong Kong, Hong Kong	113	5.3%	87	7.1%	395	19%	318	26%
Houston	351	0.5%	2,178	2.4%	16,003	24%	21,618	24%
Hyderabad	0	0.0%	13	0.1%	3,106	22%	3,566	18%
Ibadan	0	0.0%	0	0.0%	454	5%	1,420	13%
Ilheus	115	15.8%	34	12.8%	367	50%	37	14%
Ipoh	50	0.6%	7	0.1%	2,632	31%	1,795	27%
Istanbul	0	0.0%	12,719	28.4%	3,768	13%	4,119	9%
Jaipur	40	0.5%	0	0.0%	960	11%	436	7%
Jalna	0	0.0%	0	0.0%	137	22%	17	5%
Jequie	0	0.0%	0	0.0%	17	2%	45	17%
Jinan, Shandong	174	2.5%	191	1.0%	2,056	29%	5,012	27%
Jinju	0	0.0%	0	0.0%	51	17%	4,744	42%
Johannesburg	1,013	6.1%	121	0.1%	3,961	24%	12,723	14%
Kabul	0	0.0%	53	0.6%	468	16%	1,365	15%
Kaiping, Guangdong	0	0.0%	144	28.3%	370	26%	153	30%
Kairouan	0	0.0%	0	0.0%	43	9%	9	3%
Kampala	14	0.1%	38	0.3%	3,223	35%	3,413	28%
Kanpur	23	0.8%	122	3.7%	549	18%	857	26%
Karachi	503	5.3%	0	0.0%	6,359	67%	459	6%
Kaunas	10	1.2%	0	0.0%	101	12%	753	64%
Kayseri	0	0.0%	4	0.1%	1,009	22%	870	18%
Khartoum	260	2.8%	2,398	8.7%	357	4%	2,814	10%
Kigali	0	0.0%	0	0.0%	410	14%	464	11%
Killeen	27	1.4%	19	0.2%	487	26%	2,668	35%
Kinshasa	0	0.0%	97	0.7%	692	6%	1,258	9%
Kolkata	0	0.0%	43	0.2%	4,003	27%	6,258	26%
Kozhikode	0	0.0%	0	0.0%	285	20%	3,218	34%
Lagos	1,298	7.0%	2,095	14.2%	3,033	16%	2,333	16%
Lahore	130	3.8%	0	0.0%	360	10%	1,285	13%
Lausanne	0	0.0%	7	0.6%	567	20%	321	27%
Le Mans	4	1.0%	15	2.5%	75	19%	321	52%
Leon	0	0.0%	0	0.0%	50	10%	69	20%
Leshan, Sichuan	0	0.0%	0	0.0%	840	44%	1,931	36%
London	177	0.5%	451	4.6%	15,846	44%	2,304	23%

City Name	Country	Region	CBD Location		Land Cover Dates		
			Latitude	Longitude	T1	T2	T3
Los Angeles	United States	Land-Rich Developed Countries	33.971	-117.969	5/1/90	5/1/00	10/1/14
Luanda	Angola	Sub-Saharan Africa	-8.825	13.260	6/1/91	6/1/00	5/1/14
Lubumbashi	Congo Dem. Rep.	Sub-Saharan Africa	-11.677	27.480	7/1/90	9/1/98	8/1/13
Madrid	Spain	Europe and Japan	40.413	-3.707	5/1/91	6/1/02	5/1/10
Malatya	Turkey	Western Asia and North Africa	38.350	38.270	8/1/90	7/1/00	3/1/14
Malegaon	India	South and Central Asia	20.562	74.520	2/1/91	3/1/00	10/1/14
Manchester	United Kingdom	Europe and Japan	53.470	-2.474	5/1/89	9/1/02	10/1/10
Manila	Philippines	Southeast Asia	14.579	121.028	12/1/90	4/1/00	2/1/14
Marrakesh	Morocco	Western Asia and North Africa	31.636	-8.021	3/1/88	6/1/02	8/1/14
Medan	Indonesia	Southeast Asia	3.596	98.651	6/1/89	6/1/01	6/1/13
Mexico City	Mexico	Latin America and the Caribbean	19.446	-99.123	3/1/90	2/1/00	4/1/14
Milan	Italy	Europe and Japan	45.608	9.222	9/1/88	8/1/03	8/1/13
Minneapolis	United States	Land-Rich Developed Countries	44.959	-93.256	5/1/90	4/1/00	10/1/14
Modesto	United States	Land-Rich Developed Countries	37.649	-120.993	7/1/92	7/1/00	8/1/14
Montreal	Canada	Land-Rich Developed Countries	45.534	-73.658	8/1/90	9/1/00	8/1/13
Moscow	Russia	Europe and Japan	55.743	37.645	5/1/91	5/1/01	9/1/14
Mumbai	India	South and Central Asia	19.115	72.913	12/1/91	12/1/01	10/1/14
Myeik	Myanmar	Southeast Asia	12.448	98.618	2/1/91	12/1/03	1/1/14
Nakuru	Kenya	Sub-Saharan Africa	-0.294	36.058	3/1/89	2/1/00	2/1/14
Ndola	Zambia	Sub-Saharan Africa	-12.981	28.634	6/1/89	5/1/02	6/1/14
New York	United States	Land-Rich Developed Countries	40.842	-73.798	5/1/91	10/1/00	5/1/11
Nikolaev	Ukraine	Europe and Japan	46.974	32.029	5/1/89	9/1/00	8/1/13
Okayama	Japan	Europe and Japan	34.657	133.949	5/1/90	5/1/00	5/1/14
Oldenburg	Germany	Europe and Japan	53.148	8.207	8/1/90	8/1/99	10/1/13
Osaka	Japan	Europe and Japan	34.718	135.389	5/1/89	10/1/01	3/1/14
Oyo	Nigeria	Sub-Saharan Africa	6.818	3.916	12/1/90	2/1/00	2/1/14
Palembang	Indonesia	Southeast Asia	-2.958	104.736	4/1/90	7/1/01	6/1/13
Palermo	Italy	Europe and Japan	38.135	13.330	7/1/87	5/1/00	7/1/13
Palmas	Brazil	Latin America and the Caribbean	-10.189	-48.330	4/1/90	6/1/00	8/1/13
Parbhani	India	South and Central Asia	19.280	76.765	3/1/91	10/1/02	12/1/14
Parepare	Indonesia	Southeast Asia	119.633	-4.023	8/1/94	8/1/00	7/1/14
Paris	France	Europe and Japan	48.863	2.315	5/1/87	8/1/00	5/1/14
Pematangiantar	Indonesia	Southeast Asia	2.962	99.074	7/1/94	7/1/01	2/1/14
Philadelphia	United States	Land-Rich Developed Countries	40.015	-75.168	6/1/90	5/1/00	4/1/14
Pingxiang, Jiangxi	China	East Asia and the Pacific	27.643	113.851	2/1/89	12/1/99	9/1/13
Pokhara	Nepal	South and Central Asia	28.220	83.980	4/1/89	1/1/00	5/1/13
Port Elizabeth	South Africa	Sub-Saharan Africa	13.052	5.230	6/1/90	7/1/01	7/1/13
Portland, OR	United States	Land-Rich Developed Countries	45.520	-122.666	9/1/90	9/1/00	8/1/14
Pune	India	South and Central Asia	18.524	73.864	2/1/91	4/1/01	1/1/11
Pyongyang	Korea Dem. Rep.	East Asia and the Pacific	39.045	125.767	3/1/90	5/1/00	3/1/14
Qingdao, Shandong	China	East Asia and the Pacific	36.220	120.403	5/1/90	1/1/00	8/1/13
Qom	Iran	South and Central Asia	34.640	50.876	1/1/90	7/1/01	5/1/10
Quito	Ecuador	Latin America and the Caribbean	-0.135	-78.443	6/1/88	12/1/00	6/1/13
Rajshahi	Bangladesh	South and Central Asia	24.367	88.600	5/1/90	11/1/00	1/1/10
Raleigh	United States	Land-Rich Developed Countries	35.807	-78.675	10/1/90	11/1/00	5/1/13
Rawang	Malaysia	Southeast Asia	3.330	101.577	6/1/89	9/1/01	3/1/14
Reynosa	Mexico	Latin America and the Caribbean	26.063	-98.302	7/1/91	6/1/00	7/1/13
Ribeirao Preto	Brazil	Latin America and the Caribbean	-21.172	-47.798	12/1/90	3/1/01	3/1/14
Riyadh	Saudi Arabia	Western Asia and North Africa	24.686	46.742	8/1/90	8/1/00	8/1/13
Rovno	Ukraine	Europe and Japan	50.624	26.248	5/1/90	5/1/00	5/1/14

Los Angeles - Rovno

City Name	Urban Extent Population				Built-up Area Total (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Los Angeles	12,355,295	14,091,412	15,138,973	0.5%	353,941	417,726	459,047	0.7%
Luanda	1,572,722	2,690,396	5,555,024	5.2%	10,411	17,175	36,891	5.5%
Lubumbashi	660,736	942,352	1,746,415	4.1%	5,509	8,435	15,865	4.2%
Madrid	3,641,938	4,337,697	5,256,249	2.4%	20,632	32,971	56,019	6.7%
Malatya	184,773	299,754	394,722	2.0%	1,922	3,296	5,147	3.3%
Malegaon	253,609	311,046	461,737	2.7%	406	634	1,432	5.6%
Manchester	2,452,873	2,448,232	2,585,614	0.7%	43,129	49,554	51,040	0.4%
Manila	9,031,508	13,252,150	19,485,398	2.8%	35,669	56,296	70,334	1.6%
Marrakesh	371,585	514,030	770,422	3.3%	3,824	5,447	9,999	5.0%
Medan	1,214,040	2,863,706	3,771,804	2.3%	8,062	21,439	39,096	5.0%
Mexico City	9,781,971	12,514,239	17,765,121	2.5%	70,948	99,113	161,821	3.5%
Milan	3,506,838	4,971,193	6,402,051	2.5%	51,115	102,617	178,364	5.5%
Minneapolis	1,899,162	2,281,581	2,626,920	1.0%	83,673	117,302	142,874	1.4%
Modesto	232,879	334,840	458,146	2.2%	8,770	14,853	22,728	3.0%
Montreal	2,719,909	2,870,230	3,317,850	1.1%	68,677	74,831	89,185	1.4%
Moscow	10,377,113	12,726,303	15,220,986	1.3%	108,909	160,019	223,436	2.5%
Mumbai	11,786,684	14,344,154	19,601,845	2.4%	27,806	33,417	53,135	3.6%
Myeik	109,650	116,528	216,734	6.2%	321	430	1,079	9.1%
Nakuru	122,762	189,557	326,160	3.9%	1,031	1,494	4,729	8.2%
Ndola	275,484	338,145	443,327	2.2%	2,355	3,481	4,738	2.6%
New York	16,235,289	17,955,548	18,412,093	0.2%	509,235	720,862	747,852	0.3%
Nikolaev	351,234	347,486	334,691	-0.3%	5,166	6,512	6,566	0.1%
Okayama	1,156,304	1,196,567	1,277,186	0.5%	36,681	40,169	45,925	1.0%
Oldenburg	129,512	145,877	158,329	0.6%	2,026	2,732	3,781	2.3%
Osaka	8,505,622	8,674,622	8,709,527	0.0%	72,025	87,895	95,077	0.6%
Oyo	145,717	250,282	452,477	4.2%	1,231	2,123	3,704	4.0%
Palembang	1,195,955	1,454,196	1,721,220	1.4%	4,735	15,089	20,960	2.8%
Palermo	696,750	702,462	822,940	1.2%	5,762	6,918	13,249	4.9%
Palmas	6,441	88,195	154,873	4.3%	726	3,215	4,228	2.1%
Parbhani	267,978	324,330	382,635	1.4%	1,135	1,694	1,868	0.8%
Parepare	70,610	77,220	104,563	2.2%	302	426	662	3.2%
Paris	9,265,734	10,009,893	11,114,026	0.8%	127,790	158,629	198,626	1.6%
Pematangiantar	233,506	214,274	219,790	0.2%	1,090	1,369	1,650	1.5%
Philadelphia	4,760,536	5,329,830	5,852,880	0.7%	163,084	223,016	298,214	2.1%
Pingxiang, Jiangxi	192,628	475,926	757,573	3.4%	2,746	8,944	15,265	3.9%
Pokhara	80,223	138,941	272,830	5.1%	935	1,160	1,630	2.6%
Port Elizabeth	608,113	645,910	952,747	3.2%	10,349	12,137	18,141	3.3%
Portland, OR	1,131,570	1,512,404	1,904,409	1.7%	48,909	67,673	88,455	1.9%
Pune	1,752,854	3,676,767	5,509,160	4.1%	2,623	13,480	32,338	9.0%
Pyongyang	1,524,988	1,674,292	1,996,172	1.3%	8,695	11,242	11,463	0.1%
Qingdao, Shandong	853,484	1,540,789	4,501,931	7.9%	4,813	11,752	71,528	13.3%
Qom	597,132	847,703	1,071,783	2.7%	3,104	5,124	8,404	5.6%
Quito	854,477	1,358,278	2,173,697	3.8%	5,585	9,792	22,665	6.7%
Rajshahi	26,943	320,085	517,053	5.2%	36	1,401	3,234	9.1%
Raleigh	262,552	702,158	1,188,416	4.2%	12,143	40,683	78,270	5.2%
Rawang	13,532	43,521	236,967	13.6%	243	968	4,876	12.9%
Reynosa	197,217	286,782	479,078	3.9%	7,489	8,640	12,028	2.5%
Ribeirao Preto	372,764	468,285	607,350	2.0%	7,365	8,937	10,917	1.5%
Riyadh	2,210,740	3,311,356	5,552,240	4.0%	30,305	45,496	95,861	5.7%
Rovno	207,139	235,250	286,691	1.4%	1,954	2,838	6,201	5.6%

City Name	Urban Built-up Area (ha)				Suburban Built-up Area (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Los Angeles	314,393	378,971	424,453	0.8%	37,396	36,573	32,733	-0.8%
Luanda	8,942	15,187	31,702	5.3%	1,346	1,877	4,826	6.8%
Lubumbashi	4,326	7,426	14,179	4.3%	1,121	955	1,560	3.3%
Madrid	16,073	24,629	44,305	7.4%	4,242	7,849	10,928	4.2%
Malatya	1,105	2,386	3,653	3.1%	756	857	1,394	3.6%
Malegaon	98	240	995	9.8%	281	369	412	0.8%
Manchester	32,897	39,970	41,675	0.5%	9,667	9,087	8,841	-0.3%
Manila	27,210	45,972	53,883	1.1%	7,844	9,615	15,298	3.4%
Marrakesh	3,125	4,735	8,252	4.6%	666	676	1,622	7.2%
Medan	6,012	12,658	28,464	6.8%	1,877	8,132	9,933	1.7%
Mexico City	60,525	87,726	144,222	3.5%	9,765	10,612	16,363	3.1%
Milan	34,810	67,959	136,814	7.0%	15,125	32,225	38,761	1.8%
Minneapolis	52,233	81,360	98,968	1.4%	29,610	33,676	40,846	1.3%
Modesto	7,053	12,526	18,630	2.8%	1,640	2,118	3,773	4.1%
Montreal	61,308	67,097	81,093	1.5%	6,970	7,257	7,606	0.4%
Moscow	79,370	120,685	160,937	2.2%	27,560	36,430	57,829	3.5%
Mumbai	24,417	29,883	45,590	3.3%	3,193	3,318	6,957	5.8%
Myeik	218	297	553	6.2%	96	126	495	13.6%
Nakuru	703	1,132	2,762	6.4%	296	329	1,833	12.3%
Ndola	1,138	2,175	3,702	4.4%	1,148	1,241	988	-1.9%
New York	445,870	638,565	666,185	0.4%	59,541	76,815	76,475	0.0%
Nikolaev	4,324	5,319	5,375	0.1%	804	1,117	1,115	0.0%
Okayama	24,940	28,959	33,465	1.0%	11,052	10,550	11,756	0.8%
Oldenburg	557	1,201	2,546	5.3%	1,383	1,424	1,167	-1.4%
Osaka	62,911	81,539	89,230	0.7%	8,675	5,978	5,547	-0.6%
Oyo	835	1,704	2,776	3.5%	368	402	865	5.5%
Palembang	2,813	10,980	16,507	3.4%	1,815	3,866	4,168	0.6%
Palermo	4,217	5,020	9,888	5.1%	1,460	1,785	3,127	4.3%
Palmas	309	2,553	3,510	2.4%	396	619	674	0.6%
Parbhani	737	1,370	1,550	1.0%	366	299	297	0.0%
Parepare	170	224	349	3.2%	115	190	291	3.0%
Paris	101,932	131,083	166,725	1.7%	24,058	25,609	29,219	1.0%
Pematangiantar	799	1,025	1,296	1.9%	262	319	322	0.1%
Philadelphia	111,804	155,082	222,643	2.6%	48,219	63,623	70,673	0.8%
Pingxiang, Jiangxi	1,017	4,295	7,894	4.4%	1,582	4,202	6,755	3.5%
Pokhara	494	787	1,213	3.2%	404	351	378	0.5%
Port Elizabeth	7,387	9,534	14,668	3.6%	2,806	2,482	3,443	2.7%
Portland, OR	34,370	54,167	75,185	2.4%	13,719	12,786	12,204	-0.3%
Pune	1,029	9,406	27,021	10.8%	1,485	3,812	4,945	2.7%
Pyongyang	6,567	8,498	8,642	0.1%	1,942	2,538	2,601	0.2%
Qingdao, Shandong	1,326	6,829	58,008	15.8%	3,231	4,553	12,591	7.5%
Qom	2,455	3,888	6,777	6.3%	599	1,142	1,504	3.1%
Quito	4,220	7,412	16,057	6.2%	1,267	2,182	6,178	8.3%
Rajshahi	0	619	1,668	10.8%	31	727	1,437	7.4%
Raleigh	5,210	19,741	41,155	5.9%	6,543	19,577	34,480	4.5%
Rawang	0	403	2,610	14.9%	221	538	2,130	11.0%
Reynosa	5,858	7,177	10,006	2.5%	1,537	1,367	1,907	2.5%
Ribeirao Preto	6,713	7,925	9,385	1.3%	609	944	1,418	3.1%
Riyadh	24,251	37,741	84,857	6.2%	5,631	7,255	10,778	3.0%
Rovno	1,463	2,271	4,127	4.3%	460	540	1,917	9.0%

Los Angeles - Rovno

City Name	Rural Built-up Area (ha)				Urbanized Open Space (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Los Angeles	2,151	2,182	1,860	-1.1%	134,324	133,976	126,855	-0.4%
Luanda	123	111	363	8.5%	3,628	6,006	14,076	6.1%
Lubumbashi	62	55	126	5.6%	3,137	3,691	6,234	3.5%
Madrid	318	493	786	5.9%	11,244	19,580	28,387	4.7%
Malatya	61	54	100	4.5%	1,724	2,232	3,397	3.1%
Malegaon	27	26	25	-0.2%	581	711	1,094	3.0%
Manchester	565	497	525	0.7%	25,656	27,125	27,656	0.2%
Manila	615	708	1,154	3.5%	22,318	27,125	40,077	2.8%
Marrakesh	33	37	125	10.1%	1,340	1,813	4,303	7.1%
Medan	174	649	698	0.6%	5,122	17,449	22,461	2.1%
Mexico City	658	775	1,236	3.3%	32,514	37,363	48,198	1.8%
Milan	1,180	2,434	2,790	1.4%	37,302	76,384	98,813	2.6%
Minneapolis	1,830	2,265	3,060	2.1%	71,915	89,218	108,383	1.3%
Modesto	77	209	326	3.2%	5,167	6,997	10,247	2.7%
Montreal	399	477	486	0.2%	21,908	22,730	23,814	0.4%
Moscow	1,979	2,904	4,669	3.6%	67,361	87,548	134,160	3.2%
Mumbai	196	216	588	7.8%	8,875	9,583	17,398	4.6%
Myeik	7	8	31	13.1%	164	217	861	13.7%
Nakuru	32	32	133	10.1%	798	934	4,395	11.1%
Ndola	68	65	48	-2.5%	2,283	3,067	3,048	-0.1%
New York	3,824	5,483	5,193	-0.5%	179,640	201,855	203,251	0.1%
Nikolaev	38	77	76	-0.2%	2,025	2,564	2,583	0.1%
Okayama	689	660	705	0.5%	24,311	24,133	26,516	0.7%
Oldenburg	86	107	68	-3.2%	2,652	3,064	3,120	0.1%
Osaka	439	378	300	-1.9%	23,403	19,868	18,681	-0.5%
Oyo	27	18	62	8.9%	755	966	2,229	6.0%
Palembang	106	243	284	1.3%	3,875	9,581	10,788	1.0%
Palermo	84	113	234	5.5%	3,499	4,184	7,639	4.6%
Palmas	21	43	45	0.3%	691	1,595	1,944	1.5%
Parbhani	33	25	22	-1.1%	832	742	785	0.5%
Parepare	17	12	23	4.7%	186	250	467	4.5%
Paris	1,801	1,937	2,682	2.4%	69,420	72,727	79,222	0.6%
Pematangiantar	29	25	32	1.9%	651	779	920	1.3%
Philadelphia	3,061	4,311	4,897	0.9%	123,316	166,522	193,646	1.1%
Pingxiang, Jiangxi	147	446	616	2.4%	3,090	8,915	15,550	4.0%
Pokhara	37	22	40	4.4%	807	862	1,036	1.4%
Port Elizabeth	156	121	30	-11.6%	6,378	6,436	8,910	2.7%
Portland, OR	820	720	1,066	2.8%	35,195	38,166	40,068	0.3%
Pune	109	262	372	3.6%	2,804	8,585	13,606	4.7%
Pyongyang	186	205	220	0.5%	5,029	6,292	6,522	0.3%
Qingdao, Shandong	257	370	928	6.8%	5,941	10,987	30,971	7.6%
Qom	50	94	123	3.0%	1,626	2,407	3,216	3.3%
Quito	98	198	430	6.2%	3,745	5,897	15,643	7.8%
Rajshahi	5	55	129	9.3%	67	1,358	2,775	7.8%
Raleigh	390	1,366	2,634	5.3%	14,012	43,161	80,658	5.0%
Rawang	21	26	136	13.1%	338	1,003	4,344	11.7%
Reynosa	93	96	116	1.4%	3,317	3,321	4,356	2.1%
Ribeirao Preto	43	69	114	3.8%	2,208	2,994	4,127	2.5%
Riyadh	424	500	226	-6.1%	15,582	21,315	31,945	3.1%
Rovno	30	27	157	12.7%	1,160	1,145	3,277	7.5%

City Name	Urban Extent (ha)				Built-up Area Density (persons/ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Los Angeles	488,265	551,702	585,902	0.4%	35	34	33	-0.2%
Luanda	14,038	23,181	50,967	5.7%	151	157	151	-0.3%
Lubumbashi	8,645	12,126	22,098	4.0%	120	112	110	-0.1%
Madrid	31,876	52,551	84,407	6.0%	177	132	94	-4.3%
Malatya	3,647	5,528	8,544	3.2%	96	91	77	-1.2%
Malegaon	987	1,345	2,526	4.3%	625	491	322	-2.9%
Manchester	68,785	76,679	78,696	0.3%	57	49	51	0.3%
Manila	57,987	83,421	110,411	2.0%	253	235	277	1.2%
Marrakesh	5,164	7,260	14,302	5.6%	97	94	77	-1.7%
Medan	13,184	38,888	61,557	3.8%	151	134	96	-2.7%
Mexico City	103,462	136,477	210,020	3.0%	138	126	110	-1.0%
Milan	88,417	179,001	277,177	4.4%	69	48	36	-3.0%
Minneapolis	155,588	206,520	251,256	1.4%	23	19	18	-0.4%
Modesto	13,937	21,850	32,976	2.9%	27	23	20	-0.8%
Montreal	90,585	97,561	113,000	1.1%	40	38	37	-0.2%
Moscow	176,270	247,567	357,596	2.8%	95	80	68	-1.2%
Mumbai	36,681	43,000	70,533	3.9%	424	429	369	-1.2%
Myeik	485	647	1,940	10.9%	342	271	201	-3.0%
Nakuru	1,829	2,427	9,124	9.5%	119	127	69	-4.4%
Ndola	4,638	6,547	7,786	1.4%	117	97	94	-0.3%
New York	688,875	922,717	951,103	0.3%	32	25	25	-0.1%
Nikolaev	7,191	9,077	9,149	0.1%	68	53	51	-0.4%
Okayama	60,992	64,302	72,442	0.9%	32	30	28	-0.5%
Oldenburg	4,678	5,796	6,900	1.2%	64	53	42	-1.7%
Osaka	95,428	107,763	113,758	0.4%	118	99	92	-0.6%
Oyo	1,986	3,089	5,933	4.7%	118	118	122	0.3%
Palembang	8,609	24,670	31,748	2.1%	253	96	82	-1.3%
Palermo	9,261	11,102	20,888	4.8%	121	102	62	-3.7%
Palmas	1,417	4,810	6,172	1.9%	9	27	37	2.2%
Parbhani	1,967	2,436	2,653	0.7%	236	191	205	0.6%
Parepare	488	676	1,130	3.7%	234	181	158	-1.0%
Paris	197,210	231,356	277,848	1.3%	73	63	56	-0.9%
Pematangiantar	1,741	2,148	2,571	1.4%	214	156	133	-1.3%
Philadelphia	286,400	389,538	491,860	1.7%	29	24	20	-1.4%
Pingxiang, Jiangxi	5,837	17,859	30,815	4.0%	70	53	50	-0.5%
Pokhara	1,741	2,022	2,667	2.1%	86	120	167	2.5%
Port Elizabeth	16,727	18,573	27,051	3.1%	59	53	53	-0.1%
Portland, OR	84,104	105,838	128,523	1.4%	23	22	22	-0.3%
Pune	5,427	22,065	45,944	7.5%	668	273	170	-4.8%
Pyongyang	13,724	17,534	17,985	0.2%	175	149	174	1.1%
Qingdao, Shandong	10,754	22,739	102,499	11.1%	177	131	63	-5.4%
Qom	4,730	7,531	11,620	4.9%	192	165	128	-2.9%
Quito	9,331	15,689	38,308	7.1%	153	139	96	-3.0%
Rajshahi	103	2,759	6,009	8.5%	745	228	160	-3.9%
Raleigh	26,155	83,845	158,928	5.1%	22	17	15	-1.0%
Rawang	581	1,971	9,220	12.3%	56	45	49	0.6%
Reynosa	10,806	11,961	16,384	2.4%	26	33	40	1.4%
Ribeirao Preto	9,573	11,931	15,044	1.8%	51	52	56	0.5%
Riyadh	45,887	66,811	127,805	5.0%	73	73	58	-1.8%
Rovno	3,114	3,983	9,477	6.2%	106	83	46	-4.2%

Los Angeles - Rovno

City Name	Urban Extent Density (persons / ha)				Frgmentation: Saturation (Built-up Area/Urban Extent)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Los Angeles	25	26	26	0.1%	0.72	0.76	0.78	0.2%
Luanda	112	116	109	-0.5%	0.74	0.74	0.72	-0.2%
Lubumbashi	76	78	79	0.1%	0.64	0.70	0.72	0.2%
Madrid	114	83	62	-3.6%	0.65	0.63	0.66	0.7%
Malatya	51	54	46	-1.2%	0.53	0.60	0.60	0.1%
Malegaon	257	231	183	-1.6%	0.41	0.47	0.57	1.3%
Manchester	36	32	33	0.4%	0.63	0.65	0.65	0.0%
Manila	156	159	176	0.8%	0.62	0.67	0.64	-0.4%
Marrakesh	72	71	54	-2.2%	0.74	0.75	0.70	-0.6%
Medan	92	74	61	-1.5%	0.61	0.55	0.64	1.2%
Mexico City	95	92	85	-0.6%	0.69	0.73	0.77	0.4%
Milan	40	28	23	-1.8%	0.58	0.57	0.64	1.2%
Minneapolis	12	11	10	-0.4%	0.54	0.57	0.57	0.0%
Modesto	17	15	14	-0.7%	0.63	0.68	0.69	0.1%
Montreal	30	29	29	0.0%	0.76	0.77	0.79	0.2%
Moscow	59	51	43	-1.4%	0.62	0.65	0.62	-0.3%
Mumbai	321	334	278	-1.4%	0.76	0.78	0.75	-0.2%
Myeik	226	180	112	-4.7%	0.66	0.67	0.56	-1.8%
Nakuru	67	78	36	-5.6%	0.56	0.62	0.52	-1.2%
Ndola	59	52	57	0.8%	0.51	0.53	0.61	1.1%
New York	24	19	19	0.0%	0.74	0.78	0.79	0.1%
Nikolaev	49	38	37	-0.4%	0.72	0.72	0.72	0.0%
Okayama	19	19	18	-0.4%	0.60	0.62	0.63	0.1%
Oldenburg	28	25	23	-0.7%	0.43	0.47	0.55	1.1%
Osaka	89	80	77	-0.4%	0.75	0.82	0.84	0.2%
Oyo	73	81	76	-0.4%	0.62	0.69	0.62	-0.7%
Palembang	139	59	54	-0.7%	0.55	0.61	0.66	0.6%
Palermo	75	63	39	-3.6%	0.62	0.62	0.63	0.1%
Palmas	5	18	25	2.4%	0.51	0.67	0.69	0.2%
Parbhani	136	133	144	0.7%	0.58	0.70	0.70	0.1%
Parepare	145	114	93	-1.5%	0.62	0.63	0.59	-0.5%
Paris	47	43	40	-0.6%	0.65	0.69	0.71	0.3%
Pematangiantar	134	100	86	-1.2%	0.63	0.64	0.64	0.1%
Philadelphia	17	14	12	-1.0%	0.57	0.57	0.61	0.4%
Pingxiang, Jiangxi	33	27	25	-0.6%	0.47	0.50	0.50	-0.1%
Pokhara	46	69	102	3.0%	0.54	0.57	0.61	0.5%
Port Elizabeth	36	35	35	0.1%	0.62	0.65	0.67	0.2%
Portland, OR	13	14	15	0.3%	0.58	0.64	0.69	0.5%
Pune	323	167	120	-3.4%	0.48	0.61	0.70	1.5%
Pyongyang	111	95	111	1.1%	0.63	0.64	0.64	0.0%
Qingdao, Shandong	79	68	44	-3.2%	0.45	0.52	0.70	2.2%
Qom	126	113	92	-2.3%	0.66	0.68	0.72	0.7%
Quito	92	87	57	-3.4%	0.60	0.62	0.59	-0.4%
Rajshahi	261	116	86	-3.3%	0.35	0.51	0.54	0.6%
Raleigh	10	8	7	-0.9%	0.46	0.49	0.49	0.1%
Rawang	23	22	26	1.2%	0.42	0.49	0.53	0.6%
Reynosa	18	24	29	1.5%	0.69	0.72	0.73	0.1%
Ribeirao Preto	39	39	40	0.2%	0.77	0.75	0.73	-0.2%
Riyadh	48	50	43	-1.0%	0.66	0.68	0.75	0.7%
Rovno	67	59	30	-4.8%	0.63	0.71	0.65	-0.6%

City Name	Openness index				Compactness (Roundness): Proximity index			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Los Angeles	0.22	0.19	0.17	-0.9%	0.75	0.75	0.74	0.0%
Luanda	0.21	0.21	0.20	-0.3%	0.77	0.82	0.87	0.4%
Lubumbashi	0.31	0.25	0.22	-0.9%	0.93	0.96	0.96	0.0%
Madrid	0.31	0.32	0.28	-1.5%	0.72	0.72	0.75	0.5%
Malatya	0.45	0.38	0.37	-0.2%	0.72	0.69	0.59	-1.2%
Malegaon	0.59	0.53	0.41	-1.8%	0.83	0.88	0.91	0.2%
Manchester	0.35	0.32	0.31	-0.4%	0.82	0.84	0.84	0.1%
Manila	0.35	0.27	0.30	0.6%	0.74	0.71	0.68	-0.4%
Marrakesh	0.28	0.22	0.26	1.3%	0.82	0.91	0.71	-2.0%
Medan	0.31	0.39	0.31	-1.8%	0.88	0.66	0.75	1.1%
Mexico City	0.25	0.20	0.16	-1.5%	0.87	0.87	0.84	-0.3%
Milan	0.37	0.39	0.31	-2.1%	0.81	0.69	0.77	1.1%
Minneapolis	0.41	0.38	0.38	0.0%	0.90	0.90	0.88	-0.1%
Modesto	0.34	0.27	0.25	-0.6%	0.87	0.63	0.67	0.4%
Montreal	0.22	0.21	0.19	-0.7%	0.82	0.82	0.79	-0.2%
Moscow	0.36	0.33	0.34	0.3%	0.74	0.72	0.73	0.1%
Mumbai	0.22	0.19	0.21	0.7%	0.69	0.71	0.66	-0.5%
Myeik	0.42	0.38	0.44	1.6%	0.87	0.85	0.82	-0.4%
Nakuru	0.42	0.34	0.43	1.7%	0.95	0.94	0.67	-2.4%
Ndola	0.50	0.45	0.36	-1.9%	0.71	0.79	0.81	0.2%
New York	0.23	0.18	0.18	-0.2%	0.69	0.70	0.70	0.1%
Nikolaev	0.29	0.28	0.28	-0.1%	0.78	0.74	0.74	0.0%
Okayama	0.37	0.35	0.34	-0.1%	0.77	0.77	0.77	0.0%
Oldenburg	0.57	0.52	0.43	-1.3%	0.87	0.88	0.90	0.2%
Osaka	0.20	0.16	0.14	-1.1%	0.78	0.77	0.77	0.0%
Oyo	0.38	0.27	0.31	1.0%	0.66	0.79	0.87	0.7%
Palembang	0.43	0.35	0.29	-1.4%	0.85	0.83	0.86	0.3%
Palermo	0.34	0.33	0.32	-0.2%	0.75	0.70	0.58	-1.4%
Palmas	0.52	0.30	0.27	-0.7%	0.80	0.77	0.82	0.5%
Parbhani	0.43	0.29	0.27	-0.4%	0.84	0.87	0.88	0.1%
Parepare	0.47	0.46	0.45	-0.2%	0.64	0.66	0.69	0.3%
Paris	0.30	0.25	0.23	-0.6%	0.86	0.85	0.85	0.1%
Pematangiantar	0.37	0.34	0.32	-0.5%	0.91	0.91	0.92	0.0%
Philadelphia	0.38	0.37	0.34	-0.6%	0.77	0.79	0.81	0.2%
Pingxiang, Jiangxi	0.53	0.47	0.45	-0.2%	0.53	0.69	0.69	0.0%
Pokhara	0.49	0.43	0.37	-1.1%	0.90	0.94	0.86	-0.7%
Port Elizabeth	0.35	0.32	0.31	-0.2%	0.82	0.83	0.68	-1.6%
Portland, OR	0.37	0.31	0.26	-1.2%	0.79	0.83	0.84	0.1%
Pune	0.51	0.37	0.26	-3.6%	0.80	0.72	0.85	1.7%
Pyongyang	0.34	0.33	0.33	0.1%	0.82	0.82	0.83	0.0%
Qingdao, Shandong	0.57	0.46	0.26	-4.1%	0.48	0.66	0.80	1.4%
Qom	0.30	0.27	0.25	-0.8%	0.91	0.80	0.78	-0.2%
Quito	0.34	0.30	0.34	1.0%	0.60	0.61	0.69	1.0%
Rajshahi	0.70	0.51	0.47	-1.1%	0.99	0.64	0.62	-0.4%
Raleigh	0.51	0.48	0.47	-0.2%	0.81	0.68	0.78	1.1%
Rawang	0.64	0.51	0.48	-0.5%	0.83	0.90	0.65	-2.5%
Reynosa	0.27	0.24	0.23	-0.4%	0.76	0.78	0.80	0.2%
Ribeirao Preto	0.19	0.21	0.22	0.4%	0.91	0.90	0.91	0.0%
Riyadh	0.29	0.26	0.19	-2.4%	0.83	0.88	0.91	0.3%
Rovno	0.38	0.28	0.34	1.4%	0.93	0.87	0.65	-2.1%

Los Angeles - Rovno

City Name	Compactness (Roundness): Cohesion index				Total Added Area (ha)		
	T1	T2	T3	Annual Change T2-T3	T1-T2	T2-T3	(T2-T3)/(T1-T2)
Los Angeles	0.73	0.73	0.73	0.0%	63,789	41,484	0.7
Luanda	0.75	0.80	0.86	0.5%	6,764	19,715	2.9
Lubumbashi	0.93	0.96	0.96	0.0%	2,926	7,429	2.5
Madrid	0.69	0.69	0.73	0.7%	12,338	23,048	1.9
Malatya	0.71	0.68	0.58	-1.2%	1,374	1,850	1.3
Malegaon	0.83	0.88	0.91	0.2%	228	797	3.5
Manchester	0.81	0.83	0.83	0.1%	6,430	1,485	0.2
Manila	0.72	0.70	0.68	-0.2%	20,807	14,059	0.7
Marrakesh	0.81	0.90	0.70	-2.1%	1,622	4,551	2.8
Medan	0.86	0.64	0.73	1.1%	13,377	17,657	1.3
Mexico City	0.85	0.86	0.82	-0.3%	28,164	62,707	2.2
Milan	0.80	0.67	0.76	1.2%	51,502	75,751	1.5
Minneapolis	0.89	0.88	0.87	-0.1%	33,629	25,571	0.8
Modesto	0.86	0.61	0.64	0.3%	6,083	7,881	1.3
Montreal	0.80	0.80	0.77	-0.4%	6,153	14,354	2.3
Moscow	0.72	0.69	0.71	0.2%	51,110	63,416	1.2
Mumbai	0.68	0.70	0.66	-0.4%	5,612	19,762	3.5
Myeik	0.86	0.85	0.81	-0.5%	109	649	5.9
Nakuru	0.94	0.94	0.68	-2.3%	463	3,150	6.8
Ndola	0.71	0.80	0.80	0.0%	1,125	1,257	1.1
New York	0.67	0.69	0.69	0.0%	211,658	27,020	0.1
Nikolaev	0.77	0.72	0.72	0.0%	1,371	55	0.0
Okayama	0.76	0.75	0.75	0.0%	3,509	5,755	1.6
Oldenburg	0.86	0.87	0.89	0.1%	705	1,049	1.5
Osaka	0.77	0.76	0.76	0.1%	15,869	7,182	0.5
Oyo	0.66	0.79	0.87	0.7%	892	1,580	1.8
Palembang	0.83	0.83	0.84	0.2%	10,354	5,870	0.6
Palermo	0.73	0.67	0.57	-1.3%	1,156	6,318	5.5
Palmas	0.80	0.77	0.82	0.5%	2,489	1,013	0.4
Parbhani	0.83	0.87	0.88	0.1%	558	174	0.3
Parepare	0.64	0.66	0.69	0.4%	124	236	1.9
Paris	0.84	0.82	0.83	0.1%	31,045	40,476	1.3
Pematangiantar	0.90	0.91	0.91	0.0%	279	280	1.0
Philadelphia	0.74	0.77	0.79	0.2%	59,931	75,263	1.3
Pingxiang, Jiangxi	0.55	0.70	0.70	0.0%	6,197	6,321	1.0
Pokhara	0.88	0.93	0.84	-0.7%	225	469	2.1
Port Elizabeth	0.81	0.82	0.67	-1.7%	1,788	8,588	4.8
Portland, OR	0.78	0.82	0.83	0.1%	18,764	20,700	1.1
Pune	0.78	0.72	0.85	1.6%	10,856	18,858	1.7
Pyongyang	0.80	0.82	0.82	0.0%	2,547	221	0.1
Qingdao, Shandong	0.49	0.68	0.79	1.1%	6,939	59,776	8.6
Qom	0.89	0.77	0.76	-0.1%	2,019	3,280	1.6
Quito	0.61	0.61	0.69	0.9%	4,206	12,349	2.9
Rajshahi	0.98	0.65	0.61	-0.7%	1,365	1,832	1.3
Raleigh	0.80	0.69	0.77	0.9%	28,539	37,586	1.3
Rawang	0.82	0.89	0.65	-2.5%	724	3,908	5.4
Reynosa	0.75	0.77	0.79	0.3%	1,151	3,387	2.9
Ribeirao Preto	0.91	0.90	0.90	0.0%	1,571	1,979	1.3
Riyadh	0.82	0.87	0.90	0.3%	15,190	50,422	3.3
Rovno	0.93	0.85	0.64	-2.0%	883	3,363	3.8

City Name	Added Area: Infill (ha)				Added Area: Extension (ha)			
	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area
Los Angeles	34,870	55%	25,570	62%	15,842	25%	10,171	25%
Luanda	1,492	22%	3,739	19%	4,350	64%	14,717	75%
Lubumbashi	1,061	36%	1,152	16%	1,634	56%	5,954	80%
Madrid	2,884	23%	8,283	36%	4,773	39%	7,934	34%
Malatya	464	34%	468	25%	634	46%	401	22%
Malegaon	71	31%	214	27%	114	50%	492	62%
Manchester	3,730	58%	1,025	69%	1,569	24%	272	18%
Manila	9,309	45%	3,631	26%	7,427	36%	5,442	39%
Marrakesh	404	25%	527	12%	1,051	65%	3,312	73%
Medan	2,564	19%	7,256	41%	6,707	50%	6,363	36%
Mexico City	12,360	44%	23,298	37%	11,733	42%	30,938	49%
Milan	11,293	22%	31,516	42%	11,686	23%	18,091	24%
Minneapolis	12,915	38%	9,349	37%	11,571	34%	3,375	13%
Modesto	2,138	35%	2,481	31%	1,175	19%	2,141	27%
Montreal	3,006	49%	5,903	41%	1,529	25%	3,671	26%
Moscow	18,611	36%	13,724	22%	10,796	21%	16,964	27%
Mumbai	2,723	49%	3,869	20%	2,183	39%	3,525	18%
Myeik	35	32%	96	15%	52	48%	271	42%
Nakuru	239	52%	356	11%	149	32%	1,850	59%
Ndola	317	28%	824	66%	555	49%	253	20%
New York	90,528	43%	13,799	51%	82,437	39%	6,195	23%
Nikolaev	504	37%	38	69%	292	21%	8	15%
Okayama	2,073	59%	2,703	47%	488	14%	775	13%
Oldenburg	339	48%	677	65%	0	0%	204	19%
Osaka	10,047	63%	4,719	66%	4,006	25%	1,615	22%
Oyo	326	37%	177	11%	494	55%	1,362	86%
Palembang	2,189	21%	3,103	53%	6,595	64%	1,290	22%
Palermo	489	42%	1,913	30%	302	26%	1,242	20%
Palmas	328	13%	392	39%	1,873	75%	520	51%
Parbhani	312	56%	75	43%	205	37%	82	47%
Parepare	37	30%	65	28%	42	34%	98	41%
Paris	16,010	52%	20,201	50%	4,748	15%	9,282	23%
Pematangiantar	125	45%	131	47%	0	0%	99	35%
Philadelphia	20,384	34%	36,704	49%	18,653	31%	18,250	24%
Pingxiang, Jiangxi	954	15%	1,377	22%	2,203	36%	2,085	33%
Pokhara	128	57%	219	47%	66	29%	146	31%
Port Elizabeth	855	48%	1,071	12%	729	41%	1,079	13%
Portland, OR	9,319	50%	11,641	56%	6,015	32%	2,752	13%
Pune	2,432	22%	4,357	23%	5,671	52%	11,539	61%
Pyongyang	1,013	40%	81	37%	850	33%	34	15%
Qingdao, Shandong	1,611	23%	11,196	19%	3,341	48%	32,849	55%
Qom	763	38%	802	24%	689	34%	1,967	60%
Quito	1,628	39%	2,628	21%	1,582	38%	6,017	49%
Rajshahi	32	2%	555	30%	927	68%	452	25%
Raleigh	4,324	15%	7,889	21%	7,286	26%	18,126	48%
Rawang	80	11%	549	14%	489	68%	653	17%
Reynosa	587	51%	840	25%	481	42%	2,207	65%
Ribeirao Preto	280	18%	625	32%	779	50%	851	43%
Riyadh	5,492	36%	12,767	25%	6,542	43%	33,179	66%
Rovno	489	55%	513	15%	178	20%	627	19%

Los Angeles - Rovno

City Name	Added Area: Leapfrog (ha)				Added Area: Inclusion (ha)			
	T1-T2	Percent T1- T2 Added Area	T2-T3	Percent T2- T3 Added Area	T1-T2	Percent T1- T2 Added Area	T2-T3	Percent T2- T3 Added Area
Los Angeles	61	0.1%	2,094	5.0%	13,015	20%	3,650	9%
Luanda	0	0.0%	0	0.0%	921	14%	1,259	6%
Lubumbashi	0	0.0%	0	0.0%	231	8%	323	4%
Madrid	113	0.9%	18	0.1%	4,568	37%	6,812	30%
Malatya	0	0.0%	40	2.2%	276	20%	941	51%
Malegaon	0	0.0%	0	0.0%	43	19%	91	11%
Manchester	11	0.2%	10	0.7%	1,120	17%	178	12%
Manila	183	0.9%	18	0.1%	3,888	19%	4,969	35%
Marrakesh	0	0.0%	1	0.0%	167	10%	711	16%
Medan	15	0.1%	18	0.1%	4,091	31%	4,019	23%
Mexico City	217	0.8%	502	0.8%	3,854	14%	7,969	13%
Milan	542	1.1%	516	0.7%	27,981	54%	25,628	34%
Minneapolis	46	0.1%	2,200	8.6%	9,096	27%	10,646	42%
Modesto	0	0.0%	0	0.0%	2,769	46%	3,259	41%
Montreal	241	3.9%	734	5.1%	1,377	22%	4,046	28%
Moscow	1,690	3.3%	2,940	4.6%	20,014	39%	29,788	47%
Mumbai	73	1.3%	3,073	15.6%	634	11%	9,295	47%
Myeik	0	0.0%	0	0.0%	22	20%	281	43%
Nakuru	0	0.0%	0	0.0%	75	16%	945	30%
Ndola	49	4.4%	2	0.2%	204	18%	177	14%
New York	152	0.1%	2,573	9.5%	38,540	18%	4,454	16%
Nikolaev	9	0.7%	1	1.5%	566	41%	8	15%
Okayama	31	0.9%	30	0.5%	917	26%	2,247	39%
Oldenburg	155	22.0%	0	0.0%	211	30%	168	16%
Osaka	205	1.3%	121	1.7%	1,611	10%	728	10%
Oyo	0	0.0%	0	0.0%	71	8%	41	3%
Palembang	0	0.0%	4	0.1%	1,570	15%	1,473	25%
Palermo	0	0.0%	25	0.4%	366	32%	3,138	50%
Palmas	0	0.0%	0	0.0%	288	12%	101	10%
Parbhani	0	0.0%	0	0.0%	42	8%	17	10%
Parepare	0	0.0%	0	0.0%	45	36%	73	31%
Paris	649	2.1%	698	1.7%	9,638	31%	10,296	25%
Pematangiantar	97	34.8%	0	0.0%	57	20%	50	18%
Philadelphia	710	1.2%	1,175	1.6%	20,184	34%	19,135	25%
Pingxiang, Jiangxi	15	0.2%	4	0.1%	3,025	49%	2,855	45%
Pokhara	0	0.0%	0	0.0%	31	14%	104	22%
Port Elizabeth	6	0.4%	769	9.0%	198	11%	5,669	66%
Portland, OR	154	0.8%	978	4.7%	3,275	17%	5,329	26%
Pune	0	0.0%	150	0.8%	2,753	25%	2,812	15%
Pyongyang	26	1.0%	7	3.2%	658	26%	99	45%
Qingdao, Shandong	7	0.1%	294	0.5%	1,979	29%	15,437	26%
Qom	26	1.3%	49	1.5%	541	27%	462	14%
Quito	0	0.0%	20	0.2%	996	24%	3,684	30%
Rajshahi	4	0.3%	10	0.6%	403	30%	815	44%
Raleigh	803	2.8%	99	0.3%	16,127	57%	11,472	31%
Rawang	0	0.1%	20	0.5%	154	21%	2,686	69%
Reynosa	0	0.0%	103	3.0%	83	7%	237	7%
Ribeirao Preto	0	0.0%	0	0.0%	513	33%	503	25%
Riyadh	2	0.0%	3	0.0%	3,154	21%	4,472	9%
Rovno	14	1.6%	36	1.1%	202	23%	2,187	65%

City Name	Country	Region	CBD Location		Land Cover Dates		
			Latitude	Longitude	T1	T2	T3
Saidpur	Bangladesh	South and Central Asia	25.802	88.881	11/1/90	11/1/01	4/1/14
Saint Petersburg	Russia	Europe and Japan	59.911	30.348	7/1/90	5/1/00	5/1/14
San Salvador	El Salvador	Latin America and the Caribbean	13.700	-89.201	3/1/91	10/1/99	1/1/14
Sana	Yemen	Western Asia and North Africa	15.363	44.208	9/1/89	5/1/00	11/1/14
Santiago	Chile	Latin America and the Caribbean	-33.491	-70.670	1/1/90	1/1/00	4/1/14
Sao Paulo	Brazil	Latin America and the Caribbean	-23.534	-46.615	9/1/88	4/1/00	7/1/14
Seoul	Korea Rep.	East Asia and the Pacific	37.495	126.939	8/1/91	5/1/00	5/1/14
Shanghai, Shanghai	China	East Asia and the Pacific	31.250	121.440	1/1/91	8/1/00	8/1/15
Sheffield	United Kingdom	Europe and Japan	53.454	-1.356	5/1/92	9/1/02	11/1/13
Shenzhen, Guangdong	China	East Asia and the Pacific	24.316	116.112	10/1/87	1/1/00	10/1/13
Shymkent	Kazakhstan	South and Central Asia	42.315	69.630	8/1/93	9/1/00	10/1/13
Sialkot	Pakistan	South and Central Asia	32.508	74.524	11/1/92	10/1/00	10/1/14
Singapore	Singapore	Southeast Asia	1.290	103.850	4/1/90	10/1/02	4/1/13
Singrauli	India	South and Central Asia	82.671	24.200	1/1/90	2/1/00	2/1/10
Sitapur	India	South and Central Asia	27.568	80.692	2/1/89	4/1/00	3/1/14
Springfield, MA	United States	Land-Rich Developed Countries	37.190	-93.293	9/1/91	9/1/00	10/1/14
Suining, Sichuan	China	East Asia and the Pacific	30.524	105.564	9/1/88	7/1/00	8/1/13
Suva	Fiji	East Asia and the Pacific	-18.142	178.441	8/1/91	10/1/99	5/1/14
Sydney	Australia	Land-Rich Developed Countries	151.071	-33.798	4/1/91	2/1/00	8/1/14
Taipei, Taiwan	China	East Asia and the Pacific	25.047	121.546	7/1/90	3/1/01	1/1/14
Tangshan, Hebei	China	East Asia and the Pacific	39.648	118.190	9/1/90	7/1/00	7/1/13
Tashkent	Uzbekistan	South and Central Asia	41.297	69.233	8/1/90	10/1/99	9/1/13
Tebessa	Algeria	Western Asia and North Africa	35.416	8.108	5/1/88	6/1/01	8/1/14
Tehran	Iran	South and Central Asia	35.705	51.384	6/1/91	7/1/00	6/1/10
Tel Aviv	Israel	Western Asia and North Africa	32.077	34.839	8/1/87	5/1/00	8/1/14
Thessaloniki	Greece	Europe and Japan	40.650	22.916	8/1/90	3/1/00	9/1/11
Tianjin, Tianjin	China	East Asia and the Pacific	39.142	117.189	10/1/90	6/1/00	9/1/13
Tijuana	Mexico	Latin America and the Caribbean	32.499	-116.970	4/1/89	4/1/00	5/1/14
Tokyo	Japan	Europe and Japan	35.682	139.649	12/1/90	9/1/00	5/1/14
Toledo	United States	Land-Rich Developed Countries	41.655	-83.602	8/1/90	9/1/00	6/1/14
Tyumen	Russia	Europe and Japan	57.160	65.551	4/1/90	8/1/99	9/1/11
Ulaanbaatar	Mongolia	East Asia and the Pacific	47.930	106.889	9/1/90	8/1/01	6/1/14
Valledupar	Colombia	Latin America and the Caribbean	10.464	-73.261	12/1/89	10/1/01	2/1/11
Victoria	Canada	Land-Rich Developed Countries	48.456	-123.401	8/1/90	7/1/00	9/1/13
Vienna	Austria	Europe and Japan	48.124	16.346	6/1/91	9/1/00	8/1/13
Vijayawada	India	South and Central Asia	16.515	80.641	11/1/91	10/1/00	6/1/14
Vinh Long	Vietnam	Southeast Asia	10.250	105.967	4/1/89	11/1/00	1/1/14
Warsaw	Poland	Europe and Japan	52.234	21.024	5/1/92	8/1/00	9/1/13
Wuhan, Hubei	China	East Asia and the Pacific	30.576	114.295	9/1/90	9/1/00	9/1/13
Xingping, Shaanxi	China	East Asia and the Pacific	34.308	108.463	7/1/92	6/1/00	6/1/13
Xucheng, Jiangsu	China	East Asia and the Pacific	33.004	118.507	10/1/90	9/1/00	8/1/13
Yamaguchi	Japan	Europe and Japan	34.155	131.458	9/1/90	3/1/99	5/1/14
Yanggu, Shandong	China	East Asia and the Pacific	36.116	115.786	9/1/90	9/1/00	4/1/14
Yiyang, Hunan	China	East Asia and the Pacific	28.587	112.356	7/1/94	9/1/99	10/1/13
Yucheng, Zhejiang	China	East Asia and the Pacific	28.125	121.247	12/1/90	1/1/00	12/1/14
Yulin, Guangxi	China	East Asia and the Pacific	22.611	110.139	10/1/91	10/1/00	1/1/09
Zhengzhou, Henan	China	East Asia and the Pacific	34.756	113.637	10/1/92	8/1/00	9/1/15
Zhuji, Zhejiang	China	East Asia and the Pacific	29.725	120.237	6/1/90	5/1/00	4/1/13
Zunyi, Guizhou	China	East Asia and the Pacific	27.696	106.925	6/1/88	4/1/01	12/1/13
Zwolle	Netherlands	Europe and Japan	52.513	6.090	4/1/90	5/1/00	3/1/14

Saidpur - Zwolle

City Name	Urban Extent Population				Built-up Area Total (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Saidpur	104,935	102,621	111,029	0.6%	267	323	871	8.0%
Saint Petersburg	3,871,640	3,855,458	5,070,516	2.0%	36,039	46,787	68,500	2.7%
San Salvador	1,242,224	1,293,520	1,693,748	1.9%	8,216	10,501	16,889	3.3%
Sana	929,646	1,513,993	2,258,322	2.8%	9,051	13,468	22,113	3.4%
Santiago	4,499,499	5,396,623	6,486,535	1.3%	37,861	47,274	60,381	1.7%
Sao Paulo	13,654,119	16,866,432	19,609,222	1.1%	113,867	156,401	172,428	0.7%
Seoul	17,106,932	19,696,142	23,711,624	1.3%	67,574	116,423	199,578	3.9%
Shanghai, Shanghai	10,044,522	14,460,678	24,387,272	3.5%	95,071	200,978	320,046	3.1%
Sheffield	1,048,927	1,077,868	1,166,836	0.7%	21,758	25,687	27,394	0.6%
Shenzhen, Guangdong	455,782	5,955,495	10,945,126	4.4%	10,017	41,942	78,521	4.6%
Shymkent	334,602	376,601	651,614	4.2%	7,969	9,239	19,457	5.7%
Sialkot	413,632	736,095	1,023,264	2.4%	1,195	4,582	5,699	1.6%
Singapore	2,700,539	4,006,613	5,085,789	2.3%	15,760	23,618	27,392	1.4%
Singrauli	8,273	90,805	136,936	4.1%	82	749	1,739	8.4%
Sitapur	107,700	132,115	139,273	0.4%	614	984	1,271	1.8%
Springfield, MA	303,222	470,384	530,272	0.9%	9,184	26,790	36,637	2.2%
Suining, Sichuan	57,707	340,355	439,801	2.0%	319	757	1,940	7.2%
Suva	25,574	162,385	182,140	0.8%	127	2,258	2,846	1.6%
Sydney	2,871,961	3,318,263	4,114,435	1.5%	69,123	86,548	110,033	1.7%
Taipei, Taiwan	5,541,394	7,266,320	8,591,170	1.3%	21,852	38,042	70,235	4.8%
Tangshan, Hebei	819,328	1,139,998	2,699,870	6.6%	7,767	12,568	58,221	11.8%
Tashkent	2,314,220	2,886,114	3,428,914	1.2%	26,207	52,030	63,449	1.4%
Tebessa	100,969	156,741	203,543	2.0%	919	1,796	2,579	2.7%
Tehran	6,254,309	8,025,064	9,675,929	1.9%	32,148	47,429	61,367	2.6%
Tel Aviv	967,661	1,953,109	2,774,395	2.5%	7,304	22,666	33,397	2.7%
Thessaloniki	744,994	828,396	859,431	0.3%	4,543	6,888	10,568	3.7%
Tianjin, Tianjin	4,335,420	4,723,410	10,056,078	5.7%	20,124	27,331	152,442	13.0%
Tijuana	605,336	1,156,319	1,706,084	2.8%	10,753	18,798	28,626	3.0%
Tokyo	29,181,161	31,349,978	34,765,638	0.8%	278,695	324,835	448,929	2.4%
Toledo	402,895	458,978	489,974	0.5%	12,964	21,486	33,057	3.1%
Tyumen	419,522	464,410	557,794	1.5%	6,670	9,979	13,171	2.3%
Ulaanbaatar	426,960	633,616	1,070,573	4.1%	7,269	9,283	15,493	4.0%
Valledupar	171,357	263,543	392,935	4.3%	1,516	2,236	2,688	2.0%
Victoria	224,424	275,203	318,267	1.1%	7,219	11,613	13,351	1.1%
Vienna	1,551,706	1,760,685	2,025,195	1.1%	17,226	30,978	36,563	1.3%
Vijayawada	824,159	926,989	1,210,498	2.0%	2,724	3,874	4,664	1.4%
Vinh Long	22,433	67,416	222,220	9.1%	54	373	3,794	17.6%
Warsaw	1,833,480	2,128,104	2,298,450	0.6%	21,130	33,864	47,779	2.6%
Wuhan, Hubei	2,112,069	4,674,398	8,174,063	4.3%	17,460	28,916	102,833	9.8%
Xingping, Shaanxi	39,458	68,813	193,390	7.9%	271	503	2,728	13.0%
Xucheng, Jiangsu	11,599	60,225	176,753	8.3%	31	383	3,480	17.1%
Yamaguchi	115,170	241,088	244,194	0.1%	5,214	10,865	11,841	0.6%
Yanggu, Shandong	31,068	53,923	221,306	10.4%	450	1,151	6,498	12.7%
Yiyang, Hunan	274,739	315,559	412,685	1.9%	1,751	3,988	9,951	6.5%
Yucheng, Zhejiang	60,050	142,977	485,305	8.2%	1,158	2,888	9,112	7.7%
Yulin, Guangxi	250,302	345,816	633,381	7.3%	1,287	3,871	10,753	12.4%
Zhengzhou, Henan	1,256,956	2,012,209	7,156,619	8.4%	12,742	25,588	137,261	11.1%
Zhuji, Zhejiang	367,695	695,581	979,670	2.7%	11,970	29,130	43,826	3.2%
Zunyi, Guizhou	24,968	501,484	534,107	0.5%	89	1,788	5,569	9.0%
Zwolle	79,950	92,139	108,237	1.2%	2,253	2,764	3,197	1.1%

City Name	Urban Built-up Area (ha)				Suburban Built-up Area (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Saidpur	144	200	572	8.5%	112	112	278	7.3%
Saint Petersburg	31,360	39,026	54,051	2.3%	4,437	7,262	13,530	4.4%
San Salvador	6,677	8,876	14,155	3.3%	1,429	1,510	2,535	3.6%
Sana	7,124	12,120	15,395	1.6%	1,819	1,257	6,302	11.1%
Santiago	35,303	43,639	53,985	1.5%	2,412	3,408	5,890	3.8%
Sao Paulo	100,055	142,463	158,290	0.7%	12,896	12,946	13,170	0.1%
Seoul	56,047	88,312	151,051	3.8%	10,683	25,947	45,113	4.0%
Shanghai, Shanghai	45,678	126,666	269,340	5.0%	45,621	69,465	49,025	-2.3%
Sheffield	15,245	19,140	20,908	0.8%	6,189	6,221	6,161	-0.1%
Shenzhen, Guangdong	7,984	33,088	70,152	5.5%	1,901	8,201	7,862	-0.3%
Shymkent	6,695	7,932	15,179	5.0%	1,187	1,206	4,005	9.2%
Sialkot	744	2,836	4,018	2.5%	415	1,672	1,589	-0.4%
Singapore	9,379	17,596	22,311	2.3%	6,007	5,711	4,787	-1.7%
Singrauli	0	249	968	13.6%	71	455	705	4.4%
Sitapur	367	587	823	2.4%	224	356	390	0.7%
Springfield, MA	5,412	15,529	22,210	2.5%	3,427	10,553	13,524	1.8%
Suining, Sichuan	207	591	1,336	6.2%	105	150	553	10.0%
Suva	22	1,420	1,962	2.2%	98	792	846	0.4%
Sydney	51,774	70,447	90,790	1.7%	16,371	15,132	18,000	1.2%
Taipei, Taiwan	17,829	27,929	52,099	4.9%	3,760	9,329	16,734	4.6%
Tangshan, Hebei	5,677	9,132	39,211	11.2%	1,934	3,197	17,904	13.3%
Tashkent	16,332	37,572	47,173	1.6%	9,259	13,500	15,217	0.9%
Tebessa	643	1,414	2,022	2.7%	259	348	517	3.0%
Tehran	26,722	41,825	54,161	2.6%	5,041	5,157	6,648	2.6%
Tel Aviv	5,858	16,766	24,419	2.6%	1,363	5,438	8,282	3.0%
Thessaloniki	3,429	5,195	8,009	3.8%	1,046	1,592	2,402	3.6%
Tianjin, Tianjin	16,724	22,038	111,533	12.2%	3,146	4,873	38,192	15.5%
Tijuana	9,368	17,032	25,718	2.9%	1,296	1,639	2,732	3.6%
Tokyo	233,260	281,859	380,755	2.2%	43,068	40,277	63,408	3.3%
Toledo	6,219	13,602	23,668	4.0%	6,355	7,383	8,744	1.2%
Tyumen	5,087	8,382	10,296	1.7%	1,493	1,481	2,656	4.8%
Ulaanbaatar	6,350	8,401	13,567	3.7%	864	830	1,790	6.0%
Valledupar	1,287	1,924	2,336	2.1%	203	288	333	1.6%
Victoria	4,916	8,680	10,150	1.2%	2,149	2,767	3,009	0.6%
Vienna	11,277	24,165	28,833	1.4%	5,599	6,350	7,225	1.0%
Vijayawada	2,040	3,250	3,662	0.9%	647	581	927	3.4%
Vinh Long	0	119	2,324	22.6%	49	231	1,372	13.5%
Warsaw	14,189	24,409	37,142	3.2%	6,460	8,834	9,904	0.9%
Wuhan, Hubei	11,360	21,782	63,008	8.2%	5,711	6,653	36,491	13.1%
Xingping, Shaanxi	29	266	1,289	12.2%	217	201	1,328	14.5%
Xucheng, Jiangsu	0	102	2,420	24.5%	25	265	988	10.2%
Yamaguchi	2,705	6,415	7,377	0.9%	2,351	4,120	4,158	0.1%
Yanggu, Shandong	321	666	2,193	8.8%	115	414	3,964	16.6%
Yiyang, Hunan	1,089	2,580	6,473	6.5%	602	1,289	3,197	6.5%
Yucheng, Zhejiang	554	1,523	6,861	10.1%	557	1,282	2,116	3.4%
Yulin, Guangxi	794	2,505	5,833	10.2%	448	1,265	4,445	15.2%
Zhengzhou, Henan	10,334	20,883	96,929	10.2%	2,206	4,311	37,326	14.3%
Zhuji, Zhejiang	1,126	7,815	19,667	7.1%	9,969	19,820	22,592	1.0%
Zunyi, Guizhou	22	1,329	4,204	9.1%	62	435	1,253	8.4%
Zwolle	1,874	2,276	2,743	1.3%	349	446	419	-0.5%

Saidpur - Zwolle

City Name	Rural Built-up Area (ha)				Urbanized Open Space (ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Saidpur	11	10	21	5.7%	225	246	586	7.0%
Saint Petersburg	243	500	920	4.4%	13,243	18,885	32,235	3.8%
San Salvador	110	115	199	3.8%	4,312	4,592	6,970	2.9%
Sana	109	90	416	10.5%	4,049	2,769	14,277	11.3%
Santiago	146	227	506	5.6%	7,852	9,856	15,727	3.3%
Sao Paulo	916	992	968	-0.2%	41,666	38,589	39,480	0.2%
Seoul	844	2,164	3,413	3.3%	28,229	65,328	115,171	4.1%
Shanghai, Shanghai	3,772	4,847	1,681	-7.1%	100,510	166,582	148,826	-0.8%
Sheffield	324	326	325	0.0%	14,152	15,896	16,391	0.3%
Shenzhen, Guangdong	133	653	507	-1.8%	3,783	18,151	25,598	2.5%
Shymkent	87	102	273	7.5%	3,024	3,643	10,279	7.9%
Sialkot	36	75	92	1.5%	843	3,587	3,922	0.6%
Singapore	373	311	294	-0.5%	14,221	15,614	14,646	-0.6%
Singrauli	11	45	66	3.8%	133	898	1,617	5.9%
Sitapur	23	41	58	2.5%	481	788	907	1.0%
Springfield, MA	345	708	902	1.7%	8,824	25,272	31,017	1.5%
Suining, Sichuan	6	16	51	8.8%	174	321	1,087	9.3%
Suva	7	46	39	-1.1%	118	1,651	1,876	0.9%
Sydney	978	969	1,243	1.7%	43,913	43,765	52,493	1.3%
Taipei, Taiwan	263	785	1,402	4.5%	8,271	22,736	40,291	4.5%
Tangshan, Hebei	155	240	1,107	11.8%	3,749	6,313	32,014	12.5%
Tashkent	616	958	1,059	0.7%	24,413	33,589	38,551	1.0%
Tebessa	17	34	40	1.2%	601	748	1,088	2.8%
Tehran	385	447	558	2.2%	14,955	14,575	17,030	1.6%
Tel Aviv	83	462	697	2.9%	3,660	14,359	20,922	2.6%
Thessaloniki	68	101	157	3.9%	2,465	4,001	5,879	3.3%
Tianjin, Tianjin	255	421	2,717	14.1%	7,120	11,034	83,849	15.3%
Tijuana	88	127	176	2.3%	4,791	5,622	7,916	2.4%
Tokyo	2,367	2,699	4,766	4.2%	139,209	139,054	194,311	2.4%
Toledo	389	501	645	1.8%	13,777	17,951	22,984	1.8%
Tyumen	90	116	219	5.2%	3,708	3,647	6,029	4.2%
Ulaanbaatar	55	51	137	7.7%	2,595	2,611	4,558	4.3%
Valledupar	27	25	19	-2.5%	632	757	937	2.3%
Victoria	154	166	193	1.1%	4,989	6,607	7,295	0.8%
Vienna	351	462	505	0.7%	13,294	15,720	16,785	0.5%
Vijayawada	37	42	75	4.3%	1,563	1,532	1,935	1.7%
Vinh Long	5	23	97	10.8%	63	313	2,689	16.3%
Warsaw	481	621	734	1.3%	15,497	22,409	26,500	1.3%
Wuhan, Hubei	388	481	3,334	14.9%	12,887	15,357	80,891	12.8%
Xingping, Shaanxi	25	36	111	8.7%	386	465	2,794	13.8%
Xucheng, Jiangsu	6	16	72	11.6%	45	422	2,572	14.0%
Yamaguchi	158	331	306	-0.5%	4,430	8,190	8,165	0.0%
Yanggu, Shandong	14	71	341	11.6%	279	862	6,710	15.1%
Yiyang, Hunan	61	119	282	6.1%	1,326	2,639	7,353	7.3%
Yucheng, Zhejiang	47	83	134	3.3%	876	2,289	4,567	4.6%
Yulin, Guangxi	45	102	474	18.6%	808	2,101	7,340	15.2%
Zhengzhou, Henan	202	394	3,006	13.5%	5,098	7,096	73,085	15.5%
Zhuji, Zhejiang	875	1,495	1,567	0.4%	17,200	35,217	45,343	2.0%
Zunyi, Guizhou	6	24	112	12.3%	98	1,128	3,105	8.0%
Zwolle	30	41	35	-1.2%	972	1,100	1,125	0.2%

City Name	Urban Extent (ha)				Built-up Area Density (persons/ha)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Saidpur	492	569	1,457	7.6%	393	318	127	-7.4%
Saint Petersburg	49,282	65,672	100,735	3.1%	107	82	74	-0.8%
San Salvador	12,529	15,093	23,859	3.2%	151	123	100	-1.4%
Sana	13,100	16,236	36,390	5.6%	103	112	102	-0.7%
Santiago	45,713	57,130	76,108	2.0%	119	114	107	-0.4%
Sao Paulo	155,533	194,990	211,908	0.6%	120	108	114	0.4%
Seoul	95,803	181,751	314,748	3.9%	253	169	119	-2.5%
Shanghai, Shanghai	195,581	367,559	468,872	1.6%	106	72	76	0.4%
Sheffield	35,909	41,583	43,785	0.5%	48	42	43	0.1%
Shenzhen, Guangdong	13,800	60,093	104,119	4.0%	45	142	139	-0.1%
Shymkent	10,993	12,882	29,736	6.4%	42	41	33	-1.5%
Sialkot	2,038	8,169	9,620	1.2%	346	161	180	0.8%
Singapore	29,981	39,232	42,039	0.7%	171	170	186	0.9%
Singrauli	215	1,647	3,356	7.1%	101	121	79	-4.3%
Sitapur	1,095	1,772	2,178	1.5%	175	134	110	-1.5%
Springfield, MA	18,008	52,062	67,653	1.9%	33	18	14	-1.4%
Suining, Sichuan	493	1,078	3,027	7.9%	181	450	227	-5.2%
Suva	245	3,909	4,722	1.3%	202	72	64	-0.8%
Sydney	113,035	130,313	162,527	1.5%	42	38	37	-0.2%
Taipei, Taiwan	30,123	60,778	110,526	4.7%	254	191	122	-3.5%
Tangshan, Hebei	11,516	18,882	90,235	12.0%	105	91	46	-5.2%
Tashkent	50,621	85,620	102,000	1.3%	88	55	54	-0.2%
Tebessa	1,520	2,544	3,667	2.8%	110	87	79	-0.8%
Tehran	47,103	62,005	78,398	2.4%	195	169	158	-0.7%
Tel Aviv	10,963	37,025	54,319	2.7%	132	86	83	-0.3%
Thessaloniki	7,008	10,889	16,447	3.6%	164	120	81	-3.4%
Tianjin, Tianjin	27,245	38,365	236,292	13.7%	215	173	66	-7.3%
Tijuana	15,544	24,421	36,543	2.9%	56	62	60	-0.2%
Tokyo	417,904	463,890	643,240	2.4%	105	97	77	-1.6%
Toledo	26,740	39,436	56,042	2.6%	31	21	15	-2.7%
Tyumen	10,378	13,627	19,200	2.8%	63	47	42	-0.8%
Ulaanbaatar	9,863	11,894	20,051	4.1%	59	68	69	0.1%
Valledupar	2,149	2,994	3,625	2.0%	113	118	146	2.3%
Victoria	12,208	18,220	20,646	0.9%	31	24	24	0.0%
Vienna	30,521	46,697	53,347	1.0%	90	57	55	-0.2%
Vijayawada	4,287	5,405	6,599	1.5%	303	239	260	0.6%
Vinh Long	117	687	6,483	17.1%	413	181	59	-8.6%
Warsaw	36,627	56,274	74,279	2.1%	87	63	48	-2.0%
Wuhan, Hubei	30,347	44,273	183,723	10.9%	121	162	79	-5.5%
Xingping, Shaanxi	657	968	5,522	13.4%	146	137	71	-5.1%
Xucheng, Jiangsu	76	805	6,052	15.6%	369	157	51	-8.8%
Yamaguchi	9,644	19,056	20,007	0.3%	22	22	21	-0.5%
Yanggu, Shandong	729	2,013	13,207	13.9%	69	47	34	-2.3%
Yiyang, Hunan	3,077	6,627	17,304	6.8%	157	79	41	-4.6%
Yucheng, Zhejiang	2,034	5,177	13,679	6.5%	52	50	53	0.5%
Yulin, Guangxi	2,095	5,972	18,093	13.4%	194	89	59	-5.0%
Zhengzhou, Henan	17,840	32,684	210,346	12.3%	99	79	52	-2.7%
Zhuji, Zhejiang	29,170	64,347	89,168	2.5%	31	24	22	-0.5%
Zunyi, Guizhou	187	2,916	8,674	8.6%	280	281	96	-8.5%
Zwolle	3,224	3,864	4,322	0.8%	35	33	34	0.1%

Saidpur - Zwolle

City Name	Urban Extent Density (persons / ha)				Frgmentation: Saturation (Built-up Area/Urban Extent)			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Saidpur	213	180	76	-6.9%	0.54	0.57	0.60	0.4%
Saint Petersburg	79	59	50	-1.1%	0.73	0.71	0.68	-0.3%
San Salvador	99	86	71	-1.3%	0.66	0.70	0.71	0.1%
Sana	71	93	62	-2.8%	0.69	0.83	0.61	-2.1%
Santiago	98	94	85	-0.7%	0.83	0.83	0.79	-0.3%
Sao Paulo	88	86	93	0.5%	0.73	0.80	0.81	0.1%
Seoul	179	108	75	-2.6%	0.71	0.64	0.63	-0.1%
Shanghai, Shanghai	51	39	52	1.9%	0.49	0.55	0.68	1.5%
Sheffield	29	26	27	0.2%	0.61	0.62	0.63	0.1%
Shenzhen, Guangdong	33	99	105	0.4%	0.73	0.70	0.75	0.6%
Shymkent	30	29	22	-2.2%	0.72	0.72	0.65	-0.7%
Sialkot	203	90	106	1.2%	0.59	0.56	0.59	0.4%
Singapore	90	102	121	1.6%	0.53	0.60	0.65	0.8%
Singrauli	39	55	41	-3.0%	0.38	0.45	0.52	1.3%
Sitapur	98	75	64	-1.1%	0.56	0.56	0.58	0.4%
Springfield, MA	17	9	8	-1.0%	0.51	0.51	0.54	0.4%
Suining, Sichuan	117	316	145	-5.9%	0.65	0.70	0.64	-0.7%
Suva	104	42	39	-0.5%	0.52	0.58	0.60	0.3%
Sydney	25	25	25	0.0%	0.61	0.66	0.68	0.1%
Taipei, Taiwan	184	120	78	-3.4%	0.73	0.63	0.64	0.1%
Tangshan, Hebei	71	60	30	-5.4%	0.67	0.67	0.65	-0.2%
Tashkent	46	34	34	0.0%	0.52	0.61	0.62	0.2%
Tebessa	66	62	56	-0.8%	0.60	0.71	0.70	0.0%
Tehran	133	129	123	-0.5%	0.68	0.76	0.78	0.2%
Tel Aviv	88	53	51	-0.2%	0.67	0.61	0.61	0.0%
Thessaloniki	106	76	52	-3.3%	0.65	0.63	0.64	0.1%
Tianjin, Tianjin	159	123	43	-8.0%	0.74	0.71	0.65	-0.7%
Tijuana	39	47	47	-0.1%	0.69	0.77	0.78	0.1%
Tokyo	70	68	54	-1.6%	0.67	0.70	0.70	0.0%
Toledo	15	12	9	-2.1%	0.48	0.54	0.59	0.6%
Tyumen	40	34	29	-1.3%	0.64	0.73	0.69	-0.5%
Ulaanbaatar	43	53	53	0.0%	0.74	0.78	0.77	-0.1%
Valledupar	80	88	108	2.2%	0.71	0.75	0.74	-0.1%
Victoria	18	15	15	0.2%	0.59	0.64	0.65	0.1%
Vienna	51	38	38	0.1%	0.56	0.66	0.69	0.3%
Vijayawada	192	171	183	0.5%	0.64	0.72	0.71	-0.1%
Vinh Long	191	98	34	-8.0%	0.46	0.54	0.59	0.6%
Warsaw	50	38	31	-1.5%	0.58	0.60	0.64	0.5%
Wuhan, Hubei	70	106	44	-6.6%	0.58	0.65	0.56	-1.2%
Xingping, Shaanxi	60	71	35	-5.4%	0.41	0.52	0.49	-0.4%
Xucheng, Jiangsu	152	75	29	-7.3%	0.41	0.48	0.57	1.5%
Yamaguchi	12	13	12	-0.2%	0.54	0.57	0.59	0.2%
Yanggu, Shandong	43	27	17	-3.5%	0.62	0.57	0.49	-1.1%
Yiyang, Hunan	89	48	24	-4.9%	0.57	0.60	0.58	-0.3%
Yucheng, Zhejiang	30	28	35	1.7%	0.57	0.56	0.67	1.2%
Yulin, Guangxi	119	58	35	-6.1%	0.61	0.65	0.59	-1.1%
Zhengzhou, Henan	70	62	34	-3.9%	0.71	0.78	0.65	-1.2%
Zhuji, Zhejiang	13	11	11	0.1%	0.41	0.45	0.49	0.6%
Zunyi, Guizhou	133	172	62	-8.1%	0.48	0.61	0.64	0.4%
Zwolle	25	24	25	0.4%	0.70	0.72	0.74	0.2%

City Name	Openness index				Compactness (Roundness): Proximity index			
	T1	T2	T3	Annual Change T2-T3	T1	T2	T3	Annual Change T2-T3
Saidpur	0.48	0.44	0.38	-1.3%	0.86	0.86	0.81	-0.4%
Saint Petersburg	0.27	0.28	0.30	0.4%	0.81	0.73	0.73	-0.1%
San Salvador	0.30	0.25	0.23	-0.8%	0.75	0.76	0.78	0.1%
Sana	0.30	0.18	0.31	3.8%	0.67	0.71	0.70	-0.1%
Santiago	0.14	0.14	0.15	0.9%	0.92	0.91	0.85	-0.4%
Sao Paulo	0.21	0.16	0.14	-0.7%	0.86	0.86	0.86	0.0%
Seoul	0.25	0.30	0.30	0.2%	0.70	0.75	0.80	0.5%
Shanghai, Shanghai	0.47	0.37	0.25	-2.7%	0.80	0.90	0.96	0.4%
Sheffield	0.39	0.36	0.35	-0.3%	0.65	0.67	0.67	0.1%
Shenzhen, Guangdong	0.31	0.30	0.21	-2.5%	0.49	0.57	0.68	1.3%
Shymkent	0.25	0.23	0.28	1.5%	0.71	0.74	0.72	-0.2%
Sialkot	0.38	0.40	0.37	-0.6%	0.87	0.90	0.88	-0.1%
Singapore	0.44	0.37	0.33	-1.2%	0.68	0.72	0.74	0.3%
Singrauli	0.68	0.56	0.47	-1.7%	0.97	0.80	0.76	-0.5%
Sitapur	0.45	0.44	0.41	-0.5%	0.83	0.83	0.82	-0.1%
Springfield, MA	0.42	0.43	0.41	-0.3%	0.82	0.79	0.81	0.1%
Suining, Sichuan	0.43	0.34	0.36	0.2%	0.73	0.64	0.62	-0.1%
Suva	0.60	0.44	0.40	-0.7%	0.86	0.70	0.70	0.1%
Sydney	0.35	0.30	0.28	-0.5%	0.80	0.81	0.81	0.0%
Taipei, Taiwan	0.27	0.32	0.30	-0.4%	0.69	0.57	0.71	1.6%
Tangshan, Hebei	0.33	0.32	0.36	0.8%	0.81	0.77	0.70	-0.7%
Tashkent	0.43	0.32	0.31	0.0%	0.93	0.74	0.68	-0.7%
Tebessa	0.40	0.28	0.27	-0.2%	0.93	0.86	0.85	0.0%
Tehran	0.26	0.20	0.19	-0.4%	0.87	0.81	0.79	-0.3%
Tel Aviv	0.28	0.34	0.32	-0.3%	0.79	0.72	0.78	0.6%
Thessaloniki	0.32	0.31	0.30	-0.2%	0.73	0.68	0.66	-0.2%
Tianjin, Tianjin	0.27	0.28	0.33	1.4%	0.89	0.80	0.76	-0.4%
Tijuana	0.26	0.19	0.17	-0.7%	0.88	0.86	0.85	-0.1%
Tokyo	0.28	0.25	0.23	-0.4%	0.84	0.83	0.84	0.1%
Toledo	0.50	0.42	0.37	-0.9%	0.88	0.89	0.92	0.2%
Tyumen	0.36	0.26	0.28	0.6%	0.76	0.78	0.81	0.3%
Ulaanbaatar	0.25	0.18	0.19	0.1%	0.73	0.77	0.80	0.2%
Valledupar	0.27	0.22	0.22	-0.3%	0.95	0.95	0.96	0.1%
Victoria	0.38	0.33	0.32	-0.4%	0.79	0.60	0.62	0.2%
Vienna	0.38	0.31	0.29	-0.6%	0.83	0.73	0.72	-0.1%
Vijayawada	0.36	0.29	0.29	0.2%	0.82	0.79	0.76	-0.4%
Vinh Long	0.66	0.56	0.43	-1.9%	0.94	0.69	0.70	0.1%
Warsaw	0.40	0.36	0.31	-1.1%	0.75	0.76	0.79	0.3%
Wuhan, Hubei	0.41	0.32	0.38	1.3%	0.71	0.75	0.76	0.0%
Xingping, Shaanxi	0.62	0.49	0.47	-0.3%	0.92	0.87	0.63	-2.5%
Xucheng, Jiangsu	0.70	0.57	0.40	-2.7%	0.97	0.74	0.92	1.7%
Yamaguchi	0.45	0.41	0.38	-0.4%	0.51	0.57	0.58	0.2%
Yanggu, Shandong	0.37	0.41	0.52	1.8%	0.97	0.89	0.76	-1.2%
Yiyang, Hunan	0.43	0.39	0.37	-0.5%	0.84	0.80	0.85	0.5%
Yucheng, Zhejiang	0.51	0.48	0.34	-2.2%	0.69	0.65	0.67	0.2%
Yulin, Guangxi	0.42	0.35	0.41	1.8%	0.73	0.84	0.69	-2.3%
Zhengzhou, Henan	0.26	0.21	0.33	2.9%	0.93	0.55	0.76	2.1%
Zhuji, Zhejiang	0.63	0.56	0.50	-0.8%	0.57	0.69	0.76	0.7%
Zunyi, Guizhou	0.59	0.37	0.33	-0.8%	0.99	0.87	0.78	-0.9%
Zwolle	0.31	0.28	0.25	-0.9%	0.92	0.90	0.90	0.0%

Saidpur - Zwolle

City Name	Compactness (Roundness): Cohesion index				Total Added Area (ha)		
	T1	T2	T3	Annual Change T2-T3	T1-T2	T2-T3	(T2-T3)/(T1-T2)
Saidpur	0.86	0.86	0.80	-0.5%	55	548	10.0
Saint Petersburg	0.79	0.71	0.70	-0.1%	10,748	21,712	2.0
San Salvador	0.73	0.75	0.75	0.0%	2,284	6,387	2.8
Sana	0.65	0.70	0.69	-0.1%	4,416	8,645	2.0
Santiago	0.90	0.90	0.83	-0.5%	9,412	13,107	1.4
Sao Paulo	0.85	0.84	0.85	0.1%	42,637	16,094	0.4
Seoul	0.69	0.73	0.79	0.6%	48,849	76,396	1.6
Shanghai, Shanghai	0.79	0.90	0.95	0.4%	105,906	119,040	1.1
Sheffield	0.64	0.67	0.67	0.1%	3,929	1,706	0.4
Shenzhen, Guangdong	0.50	0.57	0.67	1.2%	31,944	36,584	1.1
Shymkent	0.70	0.73	0.70	-0.3%	1,269	10,217	8.0
Sialkot	0.86	0.89	0.87	-0.2%	3,387	1,117	0.3
Singapore	0.69	0.72	0.75	0.3%	7,857	3,774	0.5
Singrauli	0.96	0.80	0.76	-0.5%	666	989	1.5
Sitapur	0.82	0.82	0.81	-0.1%	370	286	0.8
Springfield, MA	0.82	0.77	0.79	0.1%	17,606	9,846	0.6
Suining, Sichuan	0.74	0.65	0.64	-0.1%	437	1,182	2.7
Suva	0.85	0.70	0.70	0.0%	2,131	589	0.3
Sydney	0.78	0.79	0.79	0.0%	17,463	23,548	1.3
Taipei, Taiwan	0.67	0.57	0.70	1.7%	16,190	32,192	2.0
Tangshan, Hebei	0.80	0.75	0.69	-0.7%	4,801	45,652	9.5
Tashkent	0.92	0.71	0.64	-0.7%	25,823	11,418	0.4
Tebessa	0.92	0.83	0.83	0.0%	876	783	0.9
Tehran	0.85	0.79	0.77	-0.2%	15,280	13,938	0.9
Tel Aviv	0.78	0.71	0.77	0.6%	15,362	10,731	0.7
Thessaloniki	0.71	0.67	0.66	-0.1%	2,363	3,684	1.6
Tianjin, Tianjin	0.88	0.78	0.74	-0.4%	7,207	125,110	17.4
Tijuana	0.87	0.85	0.83	-0.2%	8,053	9,752	1.2
Tokyo	0.83	0.81	0.82	0.1%	46,220	124,201	2.7
Toledo	0.87	0.88	0.91	0.3%	8,521	11,571	1.4
Tyumen	0.75	0.77	0.79	0.3%	3,308	3,191	1.0
Ulaanbaatar	0.72	0.76	0.78	0.2%	2,019	6,210	3.1
Valledupar	0.95	0.95	0.96	0.1%	719	451	0.6
Victoria	0.76	0.60	0.61	0.2%	4,401	1,759	0.4
Vienna	0.82	0.70	0.70	0.0%	13,751	5,584	0.4
Vijayawada	0.81	0.79	0.74	-0.4%	1,149	790	0.7
Vinh Long	0.93	0.69	0.68	-0.1%	318	3,420	10.7
Warsaw	0.73	0.73	0.76	0.3%	12,734	13,914	1.1
Wuhan, Hubei	0.70	0.74	0.75	0.0%	11,455	73,913	6.5
Xingping, Shaanxi	0.91	0.86	0.61	-2.6%	231	2,225	9.6
Xucheng, Jiangsu	0.95	0.74	0.92	1.6%	351	3,097	8.8
Yamaguchi	0.53	0.58	0.59	0.2%	2,174	974	0.4
Yanggu, Shandong	0.96	0.87	0.73	-1.3%	701	5,346	7.6
Yiyang, Hunan	0.84	0.78	0.84	0.5%	2,236	5,963	2.7
Yucheng, Zhejiang	0.70	0.67	0.68	0.2%	1,730	6,223	3.6
Yulin, Guangxi	0.72	0.82	0.68	-2.3%	2,583	6,881	2.7
Zhengzhou, Henan	0.93	0.56	0.76	2.1%	12,845	111,672	8.7
Zhuji, Zhejiang	0.57	0.68	0.74	0.6%	17,159	14,695	0.9
Zunyi, Guizhou	0.99	0.86	0.77	-0.9%	1,698	3,781	2.2
Zwolle	0.91	0.89	0.88	0.0%	511	433	0.8

City Name	Added Area: Infill (ha)				Added Area: Extension (ha)			
	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area
Saidpur	30	55%	121	22%	13	24%	331	60%
Saint Petersburg	2,735	25%	3,326	15%	2,120	20%	6,246	29%
San Salvador	1,072	47%	2,290	36%	901	39%	1,864	29%
Sana	2,061	47%	180	2%	1,877	42%	7,028	81%
Santiago	2,311	25%	2,984	23%	5,829	62%	7,313	56%
Sao Paulo	22,628	53%	9,532	59%	11,919	28%	3,580	22%
Seoul	9,028	18%	21,712	28%	24,254	50%	32,453	42%
Shanghai, Shanghai	38,013	36%	66,455	56%	33,213	31%	37,586	32%
Sheffield	1,690	43%	725	43%	543	14%	114	7%
Shenzhen, Guangdong	2,939	9%	8,110	22%	21,316	67%	23,639	65%
Shymkent	511	40%	1,898	19%	635	50%	4,946	48%
Sialkot	348	10%	524	47%	2,751	81%	253	23%
Singapore	3,097	39%	2,618	69%	2,684	34%	541	14%
Singrauli	57	9%	228	23%	368	55%	503	51%
Sitapur	99	27%	133	47%	146	40%	62	22%
Springfield, MA	3,815	22%	4,288	44%	7,677	44%	1,284	13%
Suining, Sichuan	91	21%	148	12%	299	68%	871	74%
Suva	153	7%	267	45%	1,330	62%	202	34%
Sydney	10,107	58%	10,100	43%	3,755	22%	6,449	27%
Taipei, Taiwan	1,989	12%	10,983	34%	3,551	22%	12,473	39%
Tangshan, Hebei	936	19%	2,846	6%	1,742	36%	20,706	45%
Tashkent	11,714	45%	5,129	45%	4,649	18%	920	8%
Tebessa	319	36%	176	23%	391	45%	459	59%
Tehran	7,385	48%	4,488	32%	4,548	30%	4,229	30%
Tel Aviv	3,018	20%	3,680	34%	6,148	40%	3,564	33%
Thessaloniki	845	36%	1,283	35%	870	37%	1,347	37%
Tianjin, Tianjin	862	12%	11,092	9%	2,463	34%	75,377	60%
Tijuana	2,560	32%	3,143	32%	4,588	57%	3,791	39%
Tokyo	28,173	61%	52,177	42%	8,917	19%	44,314	36%
Toledo	3,618	42%	5,126	44%	2,872	34%	3,127	27%
Tyumen	1,694	51%	797	25%	1,160	35%	1,395	44%
Ulaanbaatar	916	45%	1,400	23%	1,018	50%	3,584	58%
Valledupar	235	33%	113	25%	439	61%	294	65%
Victoria	1,792	41%	909	52%	865	20%	441	25%
Vienna	6,458	47%	2,804	50%	2,461	18%	805	14%
Vijayawada	561	49%	273	35%	449	39%	61	8%
Vinh Long	39	12%	179	5%	195	61%	2,749	80%
Warsaw	4,497	35%	6,593	47%	2,968	23%	4,128	30%
Wuhan, Hubei	4,919	43%	12,088	16%	4,292	37%	31,050	42%
Xingping, Shaanxi	93	40%	383	17%	67	29%	874	39%
Xucheng, Jiangsu	12	3%	198	6%	0	0%	2,357	76%
Yamaguchi	1,044	48%	620	64%	565	26%	125	13%
Yanggu, Shandong	94	13%	442	8%	321	46%	1,992	37%
Yiyang, Hunan	529	24%	982	16%	1,328	59%	3,373	57%
Yucheng, Zhejiang	302	17%	1,271	20%	321	19%	1,392	22%
Yulin, Guangxi	342	13%	1,007	15%	1,653	64%	3,094	45%
Zhengzhou, Henan	3,615	28%	6,262	6%	0	0%	56,558	51%
Zhuji, Zhejiang	3,466	20%	5,274	36%	4,354	25%	2,988	20%
Zunyi, Guizhou	182	11%	512	14%	523	31%	2,478	66%
Zwolle	182	36%	209	48%	259	51%	171	39%

Saidpur - Zwolle

City Name	Added Area: Leapfrog (ha)				Added Area: Inclusion (ha)			
	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area	T1-T2	Percent T1-T2 Added Area	T2-T3	Percent T2-T3 Added Area
Saidpur	0	0.0%	0	0.0%	11	20%	96	18%
Saint Petersburg	461	4.3%	529	2.4%	5,431	51%	11,610	53%
San Salvador	0	0.0%	0	0.0%	311	14%	2,233	35%
Sana	117	2.6%	0	0.0%	361	8%	1,437	17%
Santiago	80	0.8%	169	1.3%	1,192	13%	2,641	20%
Sao Paulo	1,141	2.7%	357	2.2%	6,949	16%	2,625	16%
Seoul	43	0.1%	1,002	1.3%	15,524	32%	21,229	28%
Shanghai, Shanghai	220	0.2%	111	0.1%	34,459	33%	14,889	13%
Sheffield	449	11.4%	222	13.0%	1,247	32%	644	38%
Shenzhen, Guangdong	26	0.1%	455	1.2%	7,662	24%	4,381	12%
Shymkent	0	0.0%	0	0.0%	123	10%	3,374	33%
Sialkot	0	0.0%	8	0.7%	287	8%	331	30%
Singapore	505	6.4%	152	4.0%	1,571	20%	464	12%
Singrauli	1	0.1%	0	0.0%	240	36%	258	26%
Sitapur	0	0.0%	0	0.0%	124	34%	90	31%
Springfield, MA	0	0.0%	26	0.3%	6,114	35%	4,248	43%
Suining, Sichuan	0	0.0%	0	0.0%	47	11%	164	14%
Suva	0	0.0%	1	0.1%	648	30%	119	20%
Sydney	1,003	5.7%	343	1.5%	2,598	15%	6,657	28%
Taipei, Taiwan	19	0.1%	10	0.0%	10,631	66%	8,727	27%
Tangshan, Hebei	50	1.0%	803	1.8%	2,074	43%	21,297	47%
Tashkent	105	0.4%	243	2.1%	9,355	36%	5,127	45%
Tebessa	0	0.0%	0	0.0%	167	19%	147	19%
Tehran	233	1.5%	2,265	16.3%	3,115	20%	2,956	21%
Tel Aviv	0	0.0%	62	0.6%	6,196	40%	3,426	32%
Thessaloniki	0	0.0%	0	0.0%	649	27%	1,054	29%
Tianjin, Tianjin	613	8.5%	175	0.1%	3,268	45%	38,467	31%
Tijuana	4	0.0%	465	4.8%	901	11%	2,352	24%
Tokyo	1,088	2.4%	68	0.1%	8,042	17%	27,643	22%
Toledo	0	0.0%	16	0.1%	2,032	24%	3,302	29%
Tyumen	0	0.0%	46	1.4%	454	14%	954	30%
Ulaanbaatar	0	0.0%	12	0.2%	85	4%	1,214	20%
Valledupar	0	0.0%	0	0.0%	45	6%	44	10%
Victoria	0	0.0%	4	0.2%	1,744	40%	405	23%
Vienna	262	1.9%	94	1.7%	4,571	33%	1,880	34%
Vijayawada	0	0.0%	27	3.4%	139	12%	429	54%
Vinh Long	0	0.0%	0	0.0%	85	27%	492	14%
Warsaw	118	0.9%	58	0.4%	5,151	40%	3,135	23%
Wuhan, Hubei	9	0.1%	98	0.1%	2,235	20%	30,676	42%
Xingping, Shaanxi	2	0.9%	49	2.2%	69	30%	919	41%
Xucheng, Jiangsu	244	69.5%	0	0.0%	95	27%	541	17%
Yamaguchi	7	0.3%	7	0.7%	559	26%	222	23%
Yanggu, Shandong	23	3.3%	15	0.3%	262	37%	2,896	54%
Yiyang, Hunan	0	0.0%	0	0.0%	379	17%	1,607	27%
Yucheng, Zhejiang	0	0.0%	81	1.3%	1,107	64%	3,479	56%
Yulin, Guangxi	0	0.0%	96	1.4%	589	23%	2,684	39%
Zhengzhou, Henan	4,550	35.4%	1,082	1.0%	4,680	36%	47,771	43%
Zhuji, Zhejiang	200	1.2%	43	0.3%	9,140	53%	6,390	43%
Zunyi, Guizhou	67	4.0%	130	3.4%	926	55%	661	17%
Zwolle	0	0.0%	1	0.1%	70	14%	52	12%

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This earlier study of the sample of 120 cities continued with a second set of studies in 2009–2012 involving the creation of a set of metrics for measuring urban spatial structure and a python script for calculating these metrics with ArcGIS software. These studies included the collection, geo-referencing, and digitizing of maps at 20–25 year intervals for the 1800–2000 period for a representative sample of 30 cities; the statistical modeling of the results of all the phases; the preparation of several working papers as well as papers in peer-reviewed journals; the drafting of the Lincoln Institute’s Policy Focus Report titled *Making Room for a Planet of Cities* (Angel, S. et al., 2011); and the preparation and publication of two companion volumes: the *Atlas of Urban Expansion* (Angel, S. et al., 2012) and *Planet of Cities* (Angel, S. 2012). Work on these studies was undertaken by Shlomo Angel, Jason Parent, Daniel Civco, and Alejandro Blei. All work on these studies benefited from the generous support of the Lincoln Institute of Land Policy and the direct assistance of Gregory K. Ingram, its president, and Ann LeRoyer, its director of publications at the time.

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IMAGE CREDITS

Figure 1.2

www.skyscrapercity.com and Brian Gratwicke:

<https://www.flickr.com/photos/briangratwicke/4083981667/>

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INDEX OF CITIES BY COUNTRY AND REGION

- Afghanistan: Kabul, 192
 Algeria: Algiers, 44; Tebessa, 378
 Angola: Luanda, 236
 Argentina: Buenos Aires, 86; Cordoba, 120
 Australia: Sydney, 370
 Austria: Vienna, 402
 Azerbaijan: Baku, 60
 Bangladesh: Dhaka, 126; Rajshahi, 320;
 Saidpur, 334
 Belarus: Gomel, 140
 Belgium: Antwerp, 48
 Bolivia: Cochabamba, 116
 Brazil: Belo Horizonte, 74; Curitiba, 124;
 Florianopolis, 130; Ilheus, 174; Jequie, 184;
 Palmas, 290; Ribeirao Preto, 328;
 Sao Paulo, 344
 Canada: Montreal, 262; Victoria, 400
 Chile: Santiago, 342
 China: Anqing, Anhui, 46; Beijing, Beijing, 66;
 Bicheng, Chongqing, 80;
 Changzhi, Hunan, 100;
 Changzhou, Jingsu, 102;
 Chengdu, Sichuan, 104;
 Chengguan, Guizhou, 106;
 Gaoyou, Jiangsu, 136;
 Guangzhou, Guangdong, 146;
 Guixi, Chongqing, 150;
 Haikou, Hainan, 154;
 Hangzhou, Zhejiang, 158;
 Hong Kong, Hong Kong, 166;
 Jinan, Shandong, 186;
 Kaiping, Guangdong, 194;
 Leshan, Sichuan, 230;
 Pingxiang, Jiangxi, 302;
 Qingdao, Shandong, 314;
 Shanghai, Shanghai, 348;
 Shenzhen, Guangdong, 352;
 Suining, Sichuan, 366;
 Taipei, Taiwan, 372;
 Tangshan, Hebei, 374;
 Tianjin, Tianjin, 386;
 Wuhan, Hubei, 410;
 Xingping, Shaanxi, 412;
 Xucheng, Jiangsu, 414;
 Yanggu, Shandong, 418;
 Yiyang, Hunan, 420;
 Yucheng, Zhejiang, 422;
 Yulin, Guangxi, 424;
 Zhengzhou, Henan, 426;
 Zhuji, Zhejiang, 428;
 Zunyi, Guizhou, 430
 Colombia: Bogota, 82; Valledupar, 398
 Congo Dem. Rep.: Kinshasa, 214;
 Lubumbashi, 238
 Cuba: Holguin, 164
 East Asia and the Pacific:
 China: Anqing, Anhui, 46;
 Beijing, Beijing, 66;
 Bicheng, Chongqing, 80;
 Changzhi, Hunan, 100;
 Changzhou, Jingsu, 102;
 Chengdu, Sichuan, 104;
 Chengguan, Guizhou, 106;
 Gaoyou, Jiangsu, 136;
 Guangzhou, Guangdong, 146;
 Guixi, Chongqing, 150;
 Haikou, Hainan, 154;
 Hangzhou, Zhejiang, 158;
 Hong Kong, Hong Kong, 166;
 Jinan, Shandong, 186;
 Kaiping, Guangdong, 194;
 Leshan, Sichuan, 230;
 Pingxiang, Jiangxi, 302;
 Qingdao, Shandong, 314;
 Shanghai, Shanghai, 348;
 Shenzhen, Guangdong, 352;
 Suining, Sichuan, 366;
 Taipei, Taiwan, 372;
 Tangshan, Hebei, 374;
 Tianjin, Tianjin, 386;
 Wuhan, Hubei, 410;
 Xingping, Shaanxi, 412;
 Xucheng, Jiangsu, 414;
 Yanggu, Shandong, 418;
 Yiyang, Hunan, 420;
 Yucheng, Zhejiang, 422;
 Yulin, Guangxi, 424;
 Zhengzhou, Henan, 426;
 Zhuji, Zhejiang, 428;
 Zunyi, Guizhou, 430
 Fiji: Suva, 368
 Korea Dem. Rep.: Pyongyang, 312

- Korea Rep.: Busan, 90; Cheonan, 108;
 Gwangju, 152; Jinju, 188; Seoul, 346
 Mongolia: Ulaanbaatar, 396
 Ecuador: Quito, 318
 Egypt: Alexandria, 42; Cairo, 94
 El Salvador: San Salvador, 338
 Ethiopia: Addis Ababa, 36
 Europe and Japan:
 Austria: Vienna, 402;
 Belarus: Gomel, 140;
 Belgium: Antwerp, 48;
 France: Le Mans, 226; Paris, 296;
 Germany: Berlin, 78; Halle, 156;
 Oldenburg, 280;
 Greece: Thessaloniki, 384;
 Hungary: Budapest, 84;
 Italy: Milan, 256; Palermo, 288;
 Japan: Fukuoka, 132; Okayama, 278;
 Osaka, 282; Tokyo, 390;
 Yamaguchi, 416;
 Lithuania: Kaunas, 204;
 Netherlands: Zwolle, 432;
 Poland: Warsaw, 408;
 Russia: Astrakhan, 52; Berezniki, 76;
 Dzerzhinsk, 128; Moscow, 264;
 Saint Petersburg, 336; Tyumen, 394
 Serbia: Belgrade, 72;
 Spain: Madrid, 240;
 Switzerland: Lausanne, 224;
 Ukraine: Nikolaev, 276;
 Rovno, 332;
 United Kingdom: London, 232;
 Manchester, 246; Sheffield, 350
 Fiji: Suva, 368
 France: Le Mans, 226; Paris, 296
 Germany: Berlin, 78; Halle, 156;
 Oldenburg, 280
 Ghana: Accra, 34
 Greece: Thessaloniki, 384
 Guatemala: Guatemala City, 148
 Hungary: Budapest, 84
 India: Ahmedabad, 38; Belgaum, 70;
 Coimbatore, 118; Hindupur, 160;
 Hyderabad, 170; Jaipur, 180;
 Jalna, 182; Kanpur, 200;
 Kolkata, 216; Kozhikode, 218;
 Malegaon, 244; Mumbai, 266;
 Parbhani, 292; Pune, 310;
 Singrauli, 360; Sitapur, 362;
 Vijayawada, 404
 Indonesia: Cirebon, 112; Medan, 252;
 Palembang, 286; Parepare, 294;
 Pematangiantar, 298
 Iran: Ahvaz, 40; Gorgan, 142;
 Qom, 316; Tehran, 380
 Iraq: Baghdad, 58
 Israel: Tel Aviv, 382
 Italy: Milan, 256; Palermo, 288
 Japan: Fukuoka, 132; Okayama, 278;
 Osaka, 282; Tokyo, 390;
 Yamaguchi, 416
 Kazakhstan: Shymkent, 354
 Kenya: Nakuru, 270
 Korea Dem. Rep.: Pyongyang, 312
 Korea Rep.: Busan, 90; Cheonan, 108;
 Gwangju, 152; Jinju, 188; Seoul, 346
 Land-Rich Developed Countries:
 Australia: Sydney, 370;
 Canada: Montreal, 262; Victoria, 400;
 New Zealand: Auckland, 54;
 United States: Chicago, 110;
 Cleveland, 114; Gainesville, FL, 134;
 Houston, 168; Killeen, 212;
 Los Angeles, 234; Minneapolis, 258;
 Modesto, 260; New York, 274;
 Philadelphia, 300; Portland, OR, 308;
 Raleigh, 322; Springfield, MA, 364;
 Toledo, 392
 Latin America and the Caribbean:
 Argentina: Buenos Aires, 86;
 Cordoba, 120;
 Bolivia: Cochabamba, 116;
 Brazil: Belo Horizonte, 74; Curitiba, 124;
 Florianopolis, 130; Ilheus, 174;
 Jequie, 184; Palmas, 290;
 Ribeirao Preto, 328; Sao Paulo, 344;
 Chile: Santiago, 342;
 Colombia: Bogota, 82; Valledupar, 398;
 Cuba: Holguin, 164;
 Ecuador: Quito, 318;
 El Salvador: San Salvador, 338;
 Guatemala: Guatemala City, 148;
 Mexico: Culiacan, 122; Guadalajara, 144;
 Mexico City, 254; Reynosa, 326;
 Tijuana, 388;
 Nicaragua: Leon, 228;

- Venezuela: Cabimas, 92; Caracas, 96
Lithuania: Kaunas, 204
Malaysia: Ipoh, 176; Rawang, 324
Mali: Bamako, 62
Mexico: Culiacan, 122; Guadalajara, 144;
Mexico City, 254; Reynosa, 326;
Tijuana, 388
Mongolia: Ulaanbaatar, 396
Morocco: Marrakesh, 250
Mozambique: Beira, 68
Myanmar: Myeik, 268
Nepal: Pokhara, 304
Netherlands: Zwolle, 432
New Zealand: Auckland, 54
Nicaragua: Leon, 228
Nigeria: Gombe, 138; Ibadan, 172;
Lagos, 220; Oyo, 284
Pakistan: Karachi, 202; Lahore, 222;
Sialkot, 356
Philippines: Bacolod, 56; Cebu City, 98;
Manila, 248
Poland: Warsaw, 408
Russia: Astrakhan, 52; Berezniiki, 76;
Dzerzhinsk, 128; Moscow, 264;
Saint Petersburg, 336; Tyumen, 394
Rwanda: Kigali, 210
Saudi Arabia: Riyadh, 330
Serbia: Belgrade, 72
Singapore: Singapore, 358
South Africa: Johannesburg, 190;
Port Elizabeth, 306
South and Central Asia:
Afghanistan: Kabul, 192,
Bangladesh: Dhaka, 126, Rajshahi, 320,
Saidpur, 334,
India: Ahmedabad, 38; Belgaum, 70;
Coimbatore, 118; Hindupur, 160;
Hyderabad, 170; Jaipur, 180;
Jalna, 182; Kanpur, 200; Kolkata, 216;
Kozhikode, 218; Malegaon, 244;
Mumbai, 266; Parbhani, 292;
Pune, 310; Singrauli, 360;
Sitapur, 362; Vijayawada, 404;
Iran: Ahvaz, 40; Gorgan, 142; Qom, 316;
Tehran, 380,
Kazakhstan: Shymkent, 354;
Nepal: Pokhara, 304;
Pakistan: Karachi, 202; Lahore, 222;
Sialkot, 356;
Uzbekistan: Bukhara, 88; Tashkent, 376
Southeast Asia:
Indonesia: Cirebon, 112; Medan, 252;
Palembang, 286; Parepare, 294;
Pematangiantar, 298;
Malaysia: Ipoh, 176; Rawang, 324;
Myanmar: Myeik, 268;
Philippines: Bacolod, 56; Cebu City, 98;
Manila, 248;
Singapore: Singapore, 358;
Thailand: Bangkok, 64;
Vietnam: Ho Chi Minh City, 162;
Vinh Long, 406
Spain: Madrid, 240
Sub-Saharan Africa:
Angola: Luanda, 236;
Congo Dem. Rep.: Kinshasa, 214;
Lubumbashi, 238;
Ethiopia: Addis Ababa, 36;
Ghana: Accra, 34;
Kenya: Nakuru, 270;
Mali: Bamako, 62;
Mozambique: Beira, 68;
Nigeria: Gombe, 138; Ibadan, 172;
Lagos, 220; Oyo, 284;
Rwanda: Kigali, 210;
South Africa: Johannesburg, 190;
Port Elizabeth, 306;
Tanzania: Arusha, 50;
Uganda: Kampala, 198;
Zambia: Ndola, 272
Sudan: Khartoum, 208
Switzerland: Lausanne, 224
Tanzania: Arusha, 50
Thailand: Bangkok, 64
Tunisia: Kairouan, 196
Turkey: Istanbul, 178; Kayseri, 206;
Malatya, 242
Uganda: Kampala, 198
Ukraine: Nikolaev, 276, Rovno, 332
United Kingdom: London, 232;
Manchester, 246; Sheffield, 350
United States: Chicago, 110; Cleveland, 114;
Gainesville, FL, 134; Houston, 168;
Killeen, 212; Los Angeles, 234;
Minneapolis, 258; Modesto, 260;

New York, 274; Philadelphia, 300;
Portland, OR, 308; Raleigh, 322;
Springfield, MA, 364; Toledo, 392
Uzbekistan: Bukhara, 88; Tashkent, 376
Venezuela: Cabimas, 92; Caracas, 96
Vietnam: Ho Chi Minh City, 162;
Vinh Long, 406
Western Asia and North Africa:
Algeria: Algiers, 44; Tebessa, 378;
Azerbaijan: Baku, 60;
Egypt: Alexandria, 42; Cairo, 94;
Iraq: Baghdad, 58;
Israel: Tel Aviv, 382;
Morocco: Marrakesh, 250;
Saudi Arabia: Riyadh, 330;
Sudan: Khartoum, 208;
Tunisia: Kairouan, 196;
Turkey: Istanbul, 178;
Kayseri, 206; Malatya, 242;
Yemen: Sana, 340
Yemen, Sana, 340
Zambia: Ndola, 272

ABOUT THE RESEARCH PARTNERSHIP

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The NYU Urban Expansion Program is a research and action program based at the Marron Institute of Urban Management and the Stern School of Business at New York University. The program was initiated in 2012 with the primary mission of lending direct assistance to municipalities of rapidly growing cities so that they can make room, using four practical steps, for their expansion. Direct assistance is provided in partnership with municipalities, focused on capacity building, empowerment, training, and regular review, rather than on providing consultancy services. The program has active urban expansion initiatives in Ethiopia and Colombia, begun as pilot projects, and now extends to a national scale. The secondary mission of the program is to monitor the quantity and quality of global urban expansion on a regular basis, focused on a stratified global sample of 200 cities. A primer describing it may be found at <http://urbanizationproject.org/uploads/blog/UEPrimer2014.pdf>.

UN-Habitat, the United Nations Human Settlements Programme, is working toward a better urban future. Its mission is to promote socially and environmentally sustainable human settlements development and achievement of adequate shelter for all. Mandated by the UN General Assembly in 1978 to address the issues of urban growth, it is a knowledgeable institution on urban development processes and understands the aspirations of cities and their residents. For close to forty years, UN Habitat has been working in human settlements throughout the world, focusing on building a brighter future for villages, towns, and cities of all sizes. Because of these four decades of extensive experience, from the highest levels of policy to a range of specific technical issues, UN-Habitat has gained a unique and a universally acknowledged expertise in all things urban. This has placed UN-Habitat in the best position to provide answers and achievable solutions to the current challenges faced by our cities. UN-Habitat is capitalizing on its experience and position to work with partners in order to formulate the urban vision of tomorrow. It works to ensure that cities become inclusive and affordable drivers of economic growth and social

development. UN-Habitat and its projects and programs is described in detail at www.unhabitat.org.

The Lincoln Institute of Land Policy is an independent, nonpartisan organization whose mission is to help solve global economic, social, and environmental challenges to improve the quality of life through creative approaches to the use, taxation, and stewardship of land. As a private operating foundation whose origins date to 1946, the Lincoln Institute seeks to inform public dialogue and decisions about land policy through research, training, and effective communication. By bringing together scholars, practitioners, public officials, policy makers, journalists, and involved citizens, the Lincoln Institute integrates theory and practice and provides a forum for multidisciplinary perspectives on public policy concerning land, both in the United States and internationally. The Institute, its education and research projects, databases and publications are described in detail at <http://www.lincolninst.edu>.

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