



# Developing a global, people-based definition of cities and settlements

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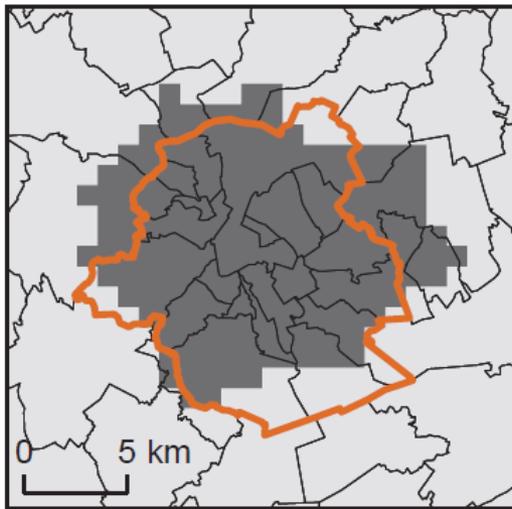
# Overview

- *Why, who, what and by when?*
- *Global results*
- *Experiences with South Africa, Brazil, Morocco*
- *Next steps*

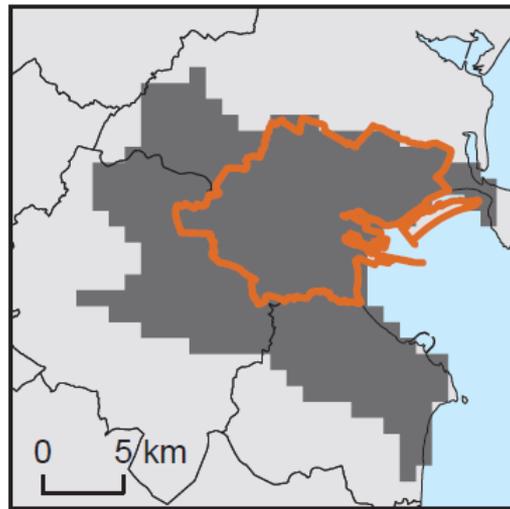
# Why do we need a global definition?

- *To make meaningful comparisons of city indicators possible*
- *To answer questions such as:*
  - **How many cities are there in South Africa**
  - **Is Istanbul bigger than Paris?**
  - **Is my city growing or shrinking**
- *To improve urban investments and development strategies*

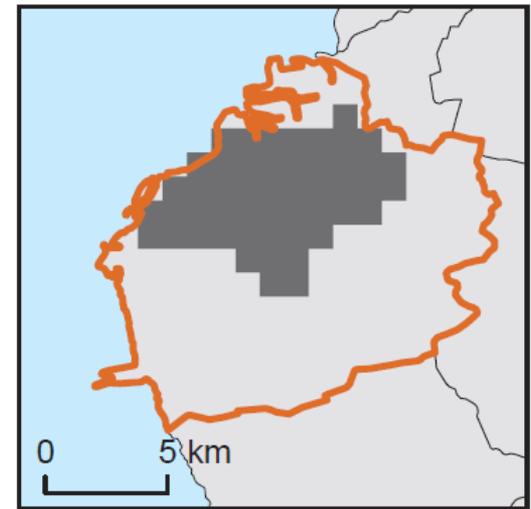
# Where does the city stop?



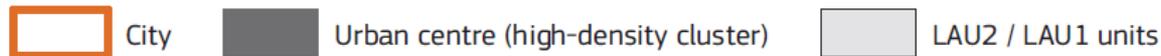
Brussels



Dublin



Malmö



# Urban SDG indicators are very sensitive to the city boundaries

	City centre only	Beyond city centre
11.2.1. Population share with convenient access to public transport	High	Low
11.3.1. Ratio of land consumption rate to population growth rate	Low	High
11.6.2. Fine particulate matter (PM10 and PM 2.5)	High	Low
11.7.1. Open space for public use	Low	High

## Who committed to develop this?

- *The European Union together with the OECD and the World Bank launched this commitment during Habitat III in Quito in 2016*
- *FAO has joined this commitment*
- **Goal:** *present a definition to UN Statistical Commission in 2019*
- *Approach test two definitions:*
  - **Degree of urbanisation**
  - **EU-OECD functional urban area**
- *Interim results at World Urban Forum 2018*

# Degree of urbanisation

- *Is based on the 1 km<sup>2</sup> population grid*
- *Has three grid concepts*
  - **Urban centre**
  - **Urban cluster**
  - **Rural grid cell**
- *Translates these into three types of municipalities*
  - **City**
  - **Towns & suburbs**
  - **Rural areas**

# Three types of grid cells

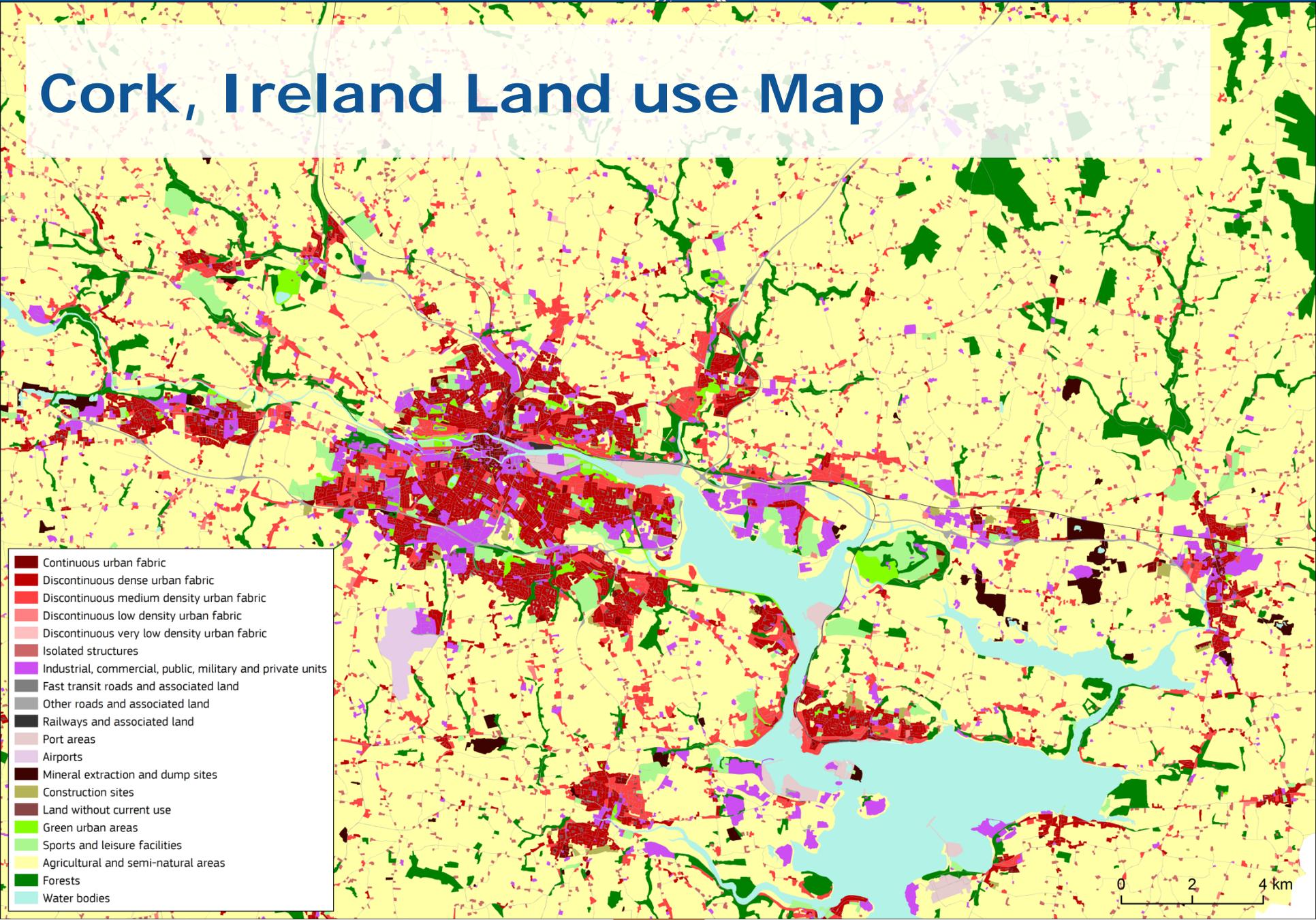
<i>Urban centres</i>	<i>Contiguous cells with at least <b>1,500</b> inhabitants per km<sup>2</sup> and at least <b>50,000</b> inhabitants in the centre</i>
<i>Urban Clusters</i>	<i>Contiguous cells with at least <b>300</b> inhabitants per km<sup>2</sup> and at least <b>5,000</b> inhabitants in the cluster</i>
<i>Rural grid cells</i>	<i>All cells outside urban clusters</i>

# Three types of municipalities

<i>Cities</i>	<i>&gt; 50% pop. in urban centres</i>
<i>Towns and suburbs</i>	<i>&gt; 50% pop. in urban clusters and not classified as city</i>
<i>Rural area</i>	<i>&gt; 50% pop. in rural grid cells</i>

**Urban areas = Cities + Towns and Suburbs**

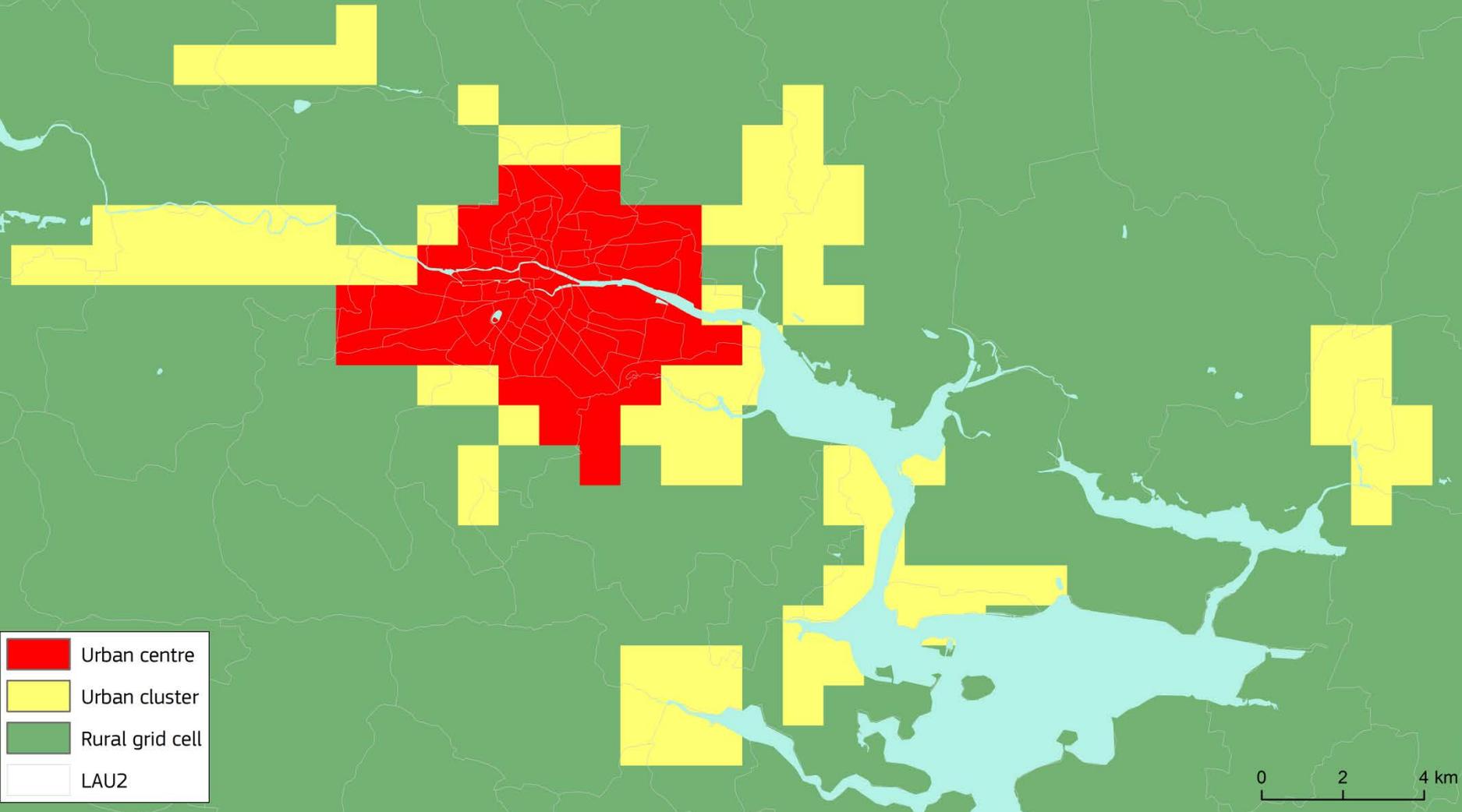
# Cork, Ireland Land use Map



- Continuous urban fabric
- Discontinuous dense urban fabric
- Discontinuous medium density urban fabric
- Discontinuous low density urban fabric
- Discontinuous very low density urban fabric
- Isolated structures
- Industrial, commercial, public, military and private units
- Fast transit roads and associated land
- Other roads and associated land
- Railways and associated land
- Port areas
- Airports
- Mineral extraction and dump sites
- Construction sites
- Land without current use
- Green urban areas
- Sports and leisure facilities
- Agricultural and semi-natural areas
- Forests
- Water bodies

0 2 4 km

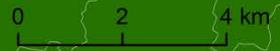
# Cork, Ireland: Urban centre & clusters



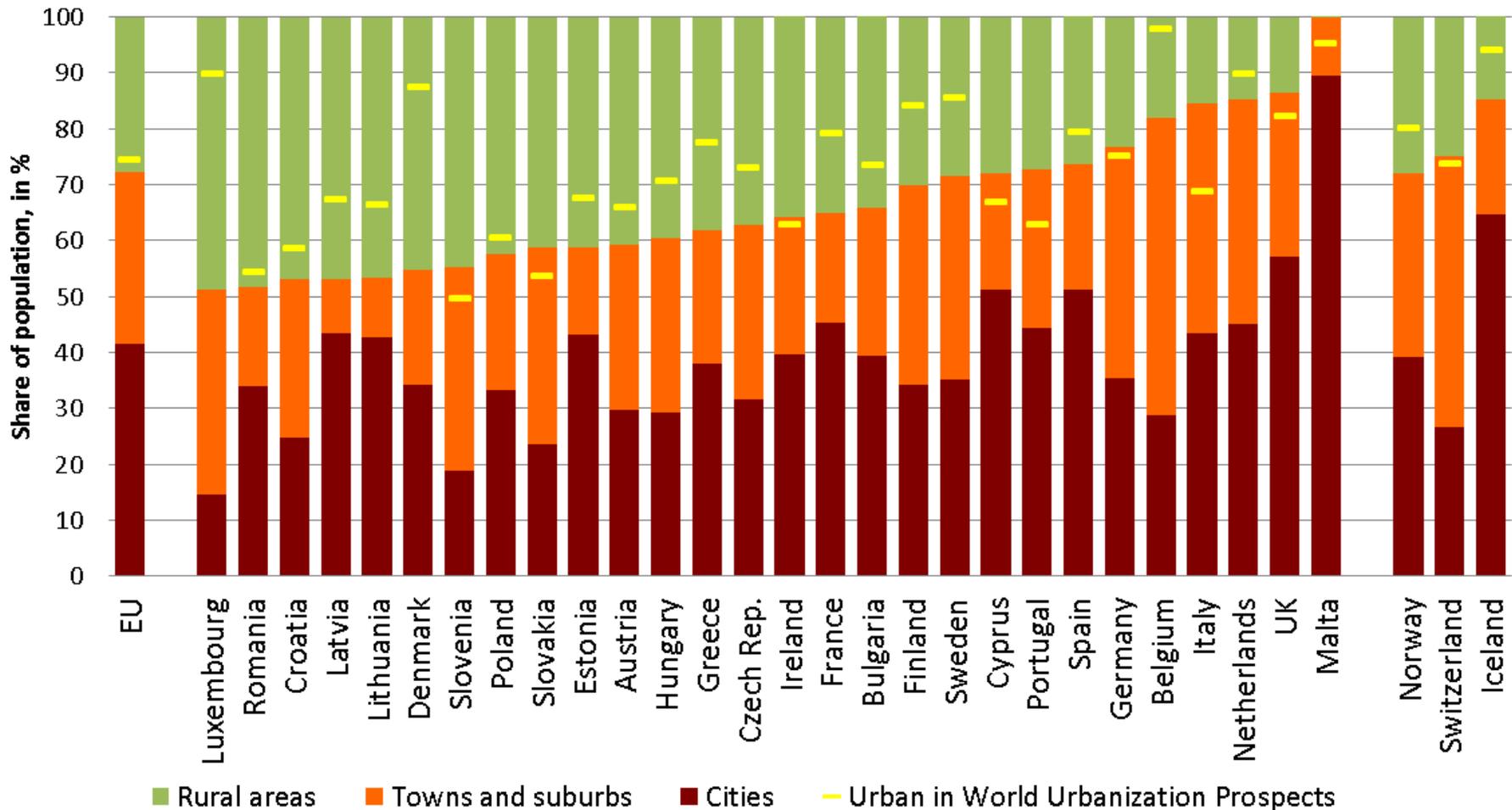
- Urban centre
- Urban cluster
- Rural grid cell
- LAU2

0 2 4 km

# Cork, Ireland Land use Map



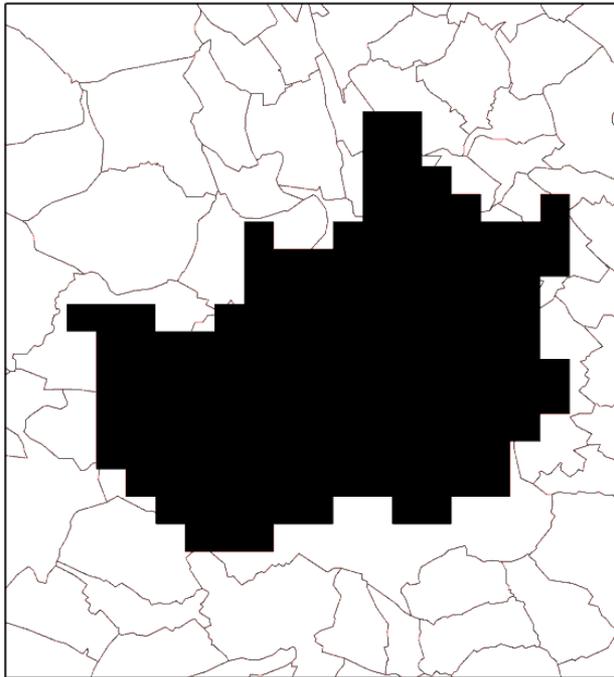
## Population by degree of urbanisation in Europe, 2014



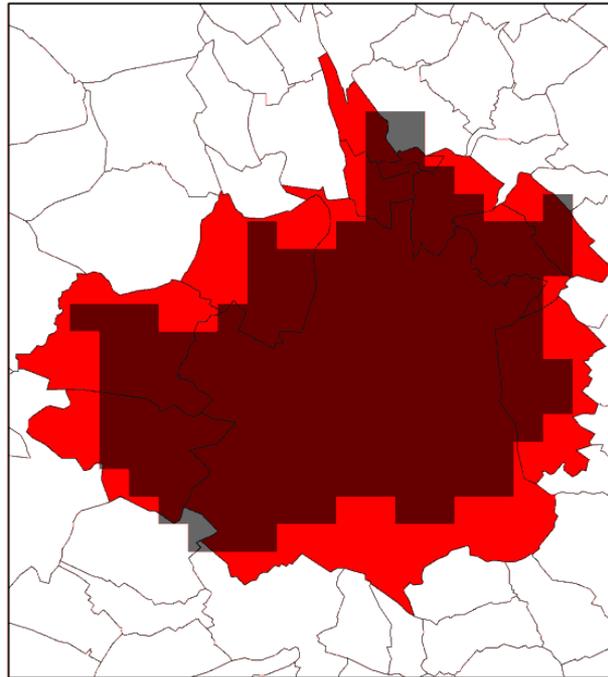
# Joint EU-OECD Definition of a Functional Urban Area

## City and its commuting zone (Toulouse)

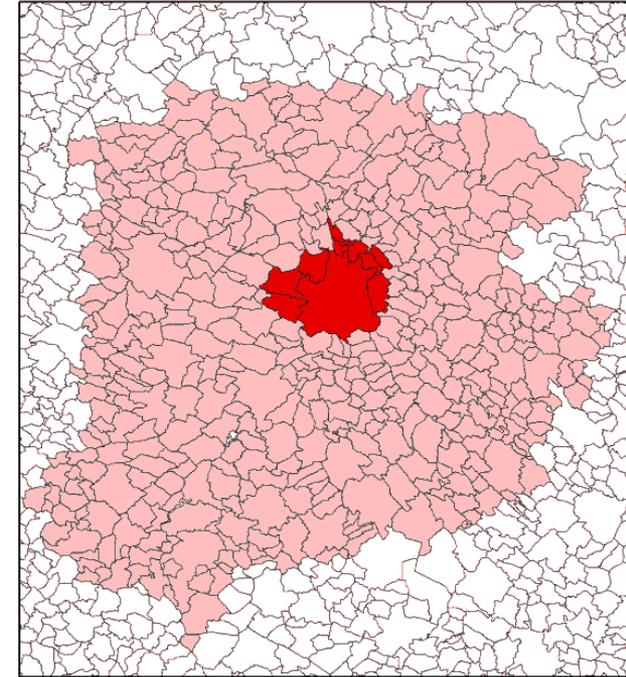
Urban centre



City



Commuting zone



- Urban Centre
- City (local administrative units with at least 50% of their population in an urban centre)
- Commune with > 15 % of its employed population commuting to the city (without exclaves and with enclaves)
- Commune

# Two definitions with a common element: Cities

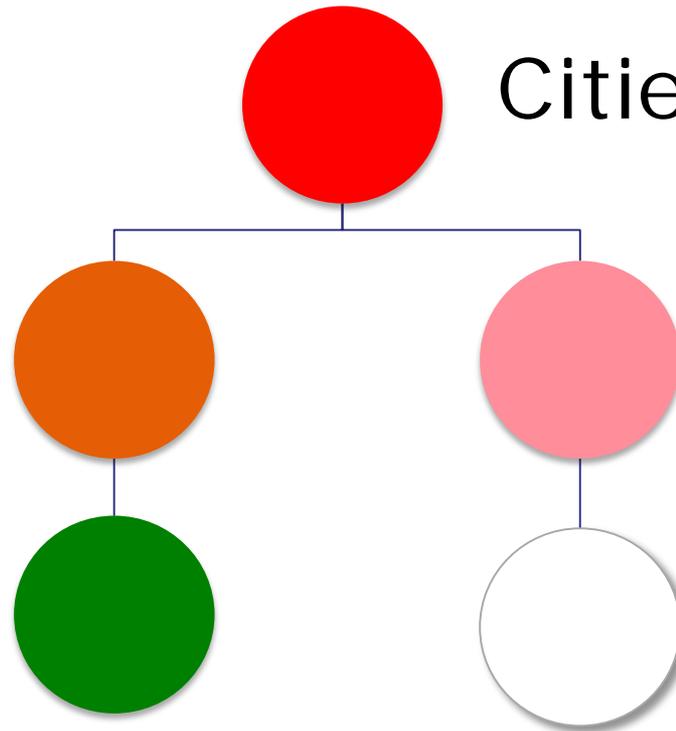
Density based  
(linked to  
morphology)

Functional  
economic  
definition

Cities

Towns &  
suburbs

Rural  
areas



Commuting  
zones

Other  
areas



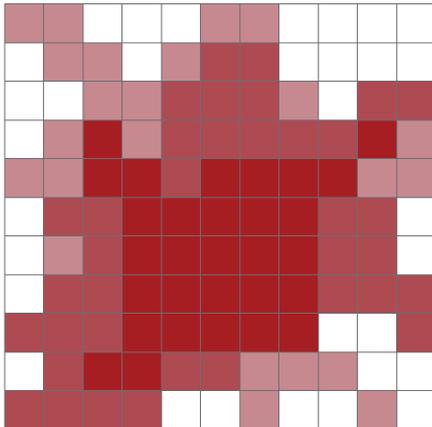
# FIRST GLOBAL RESULTS

# Applying the degree of urbanisation to the globe

- *The degree of urbanisation has been applied to the globe using a new free population grid created by the Joint Research Centre using the Global Human Settlement Layer and CIESIN population data <http://ghsl.jrc.eu.europa.eu>*
- *Results have been presented in the Atlas of the Human Planet and the State of European Cities Report <http://ec.europa.eu/cities-report>*

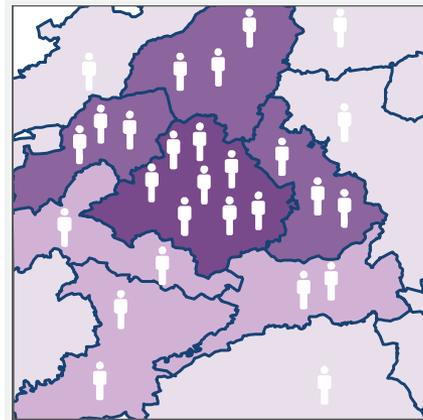
# Creating a global population grid

Share of area covered by buildings based on satellite imagery



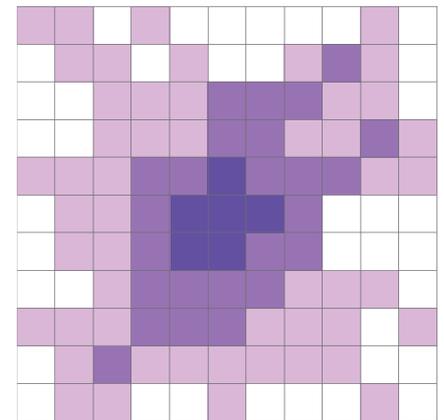
Source: JRC GHSL

Census data on population



Source: CIESIN, Columbia University

Total population by 1km grid cell

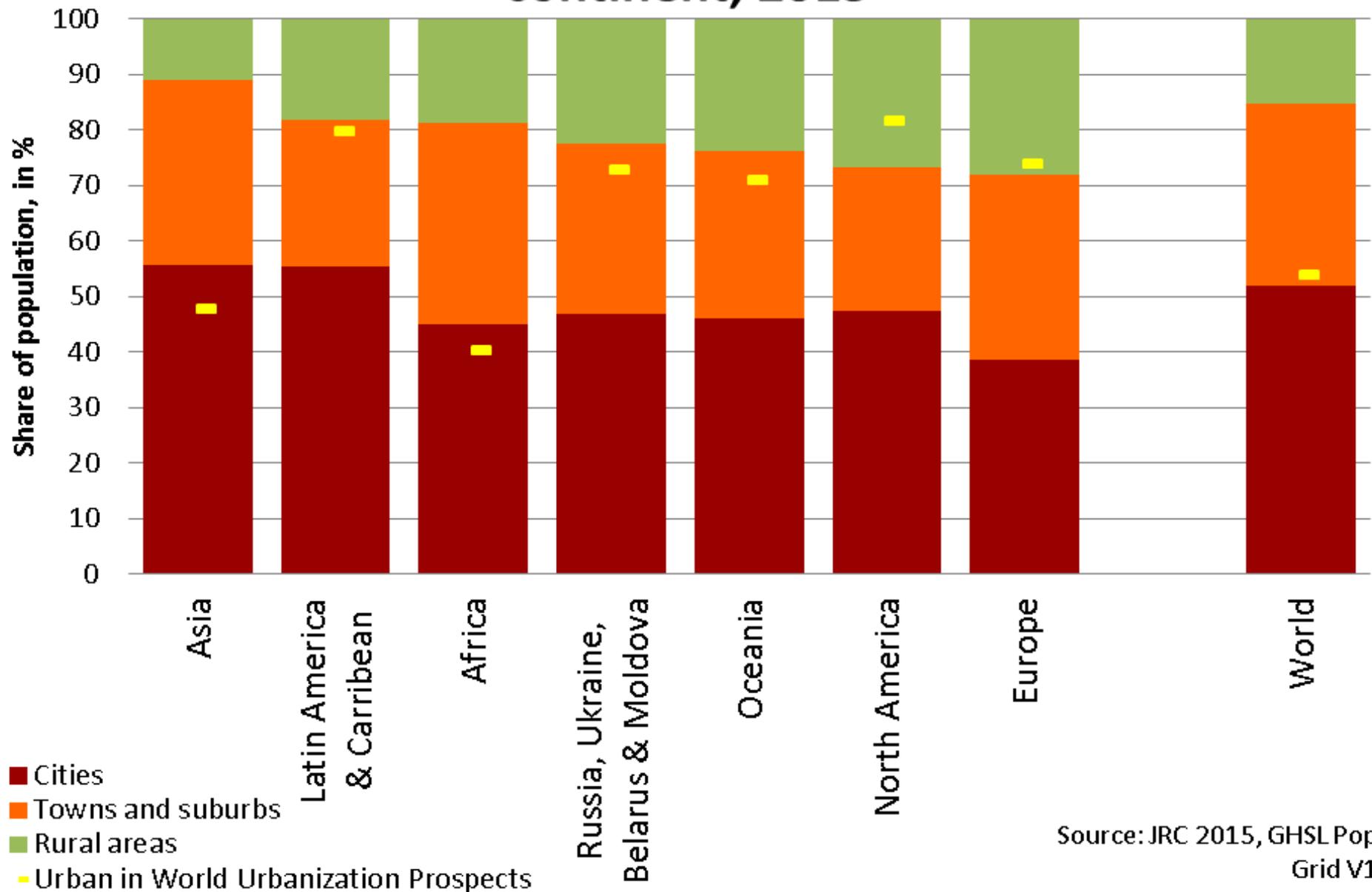


Source: JRC GHS Pop

+

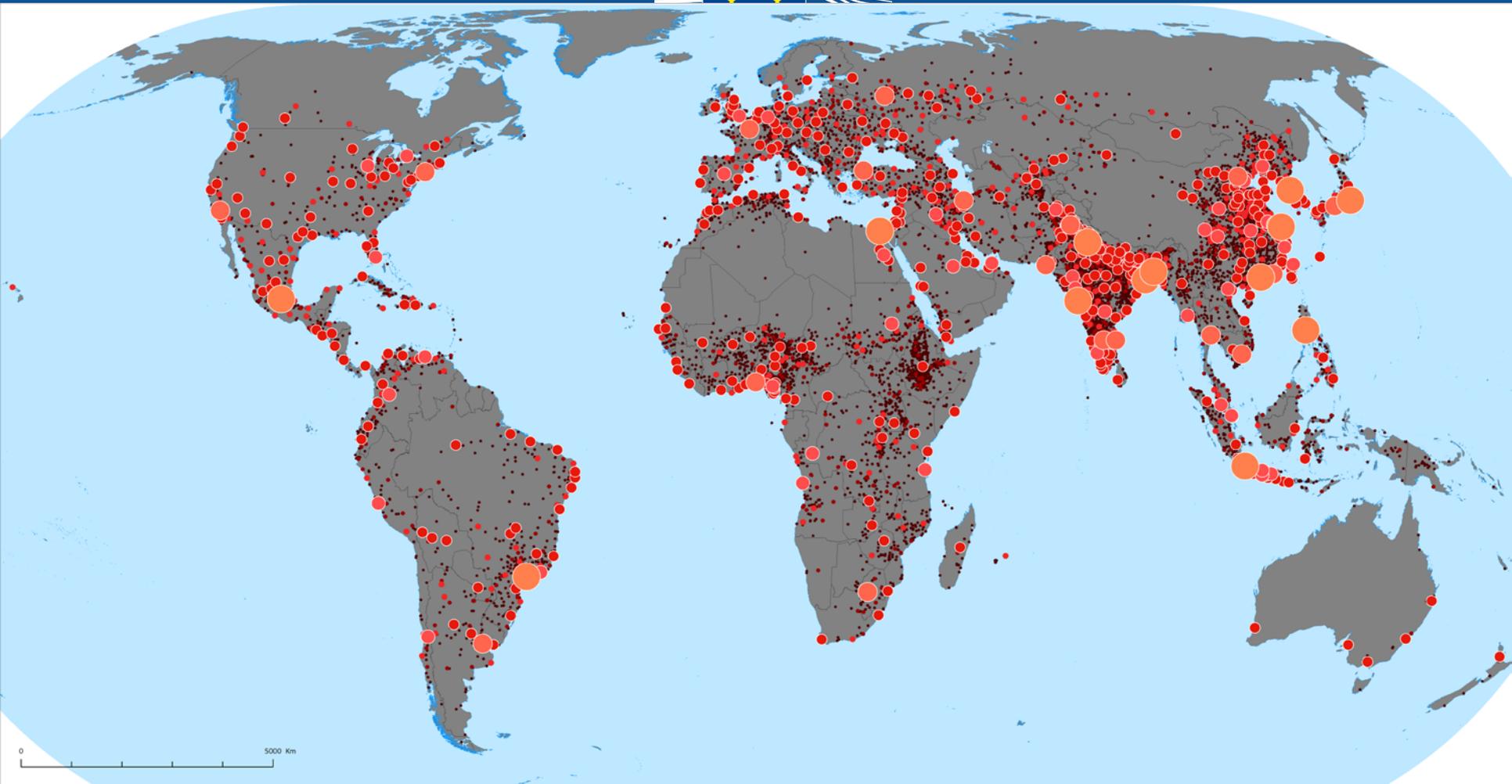
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# Population by degree of urbanisation per continent, 2015



# Why are the results *so different*?

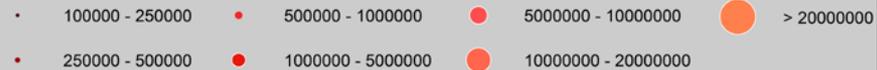
- *National definitions vary substantially: minimum population threshold ranges from 200 to 50,000*
- *Unclear how often definitions are updated*
- *Some countries do not report a definition or use a list of places with city status*
- *The global grid used can contain flaws if:*
  - **Population is not reported accurately**
  - **Building detection over or underestimates presence of buildings**
  - **Combining the data generated distortions**



## Urban Centres in the world by population size, 2015

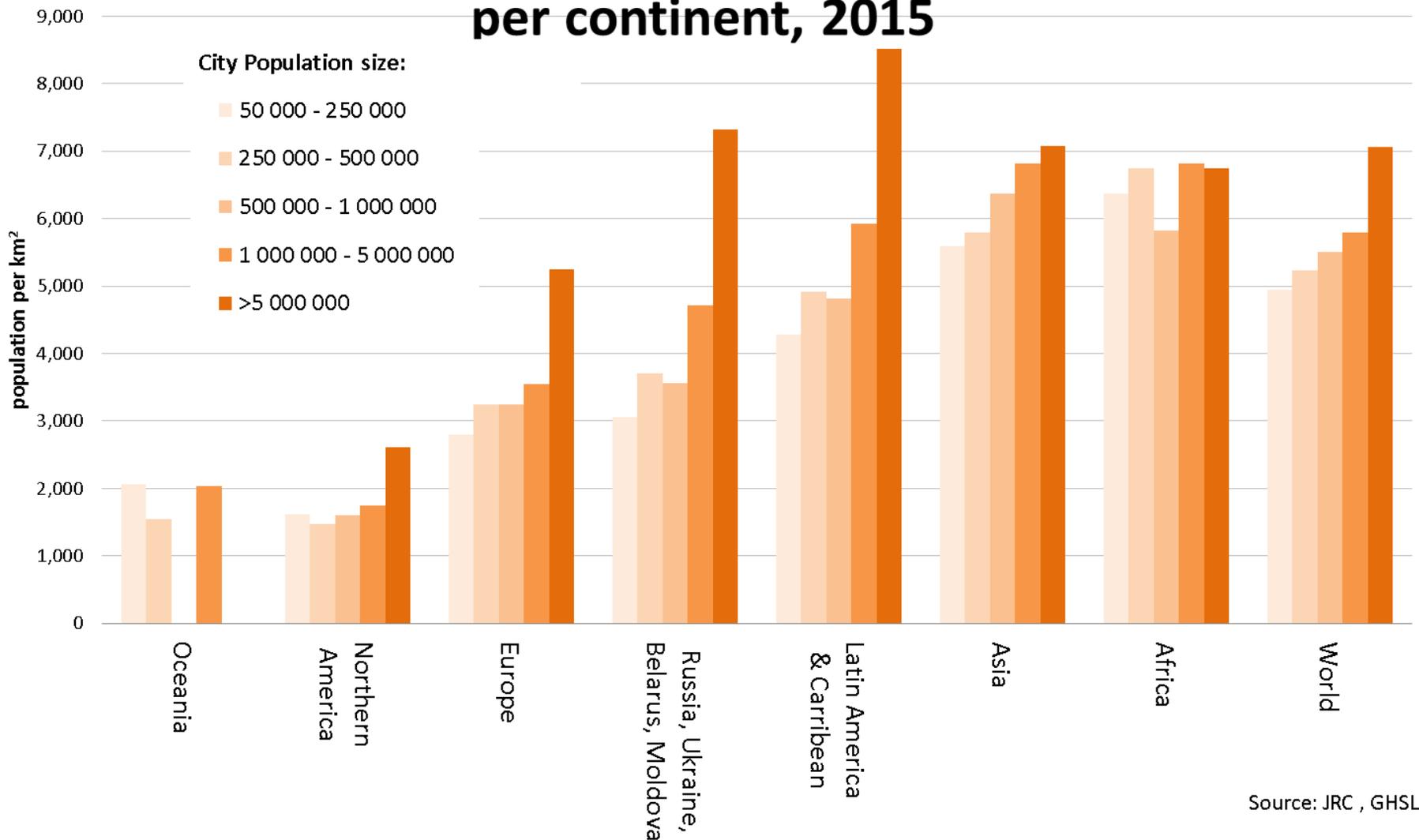
Source : JRC (GHS - POP Global Settlement Model)

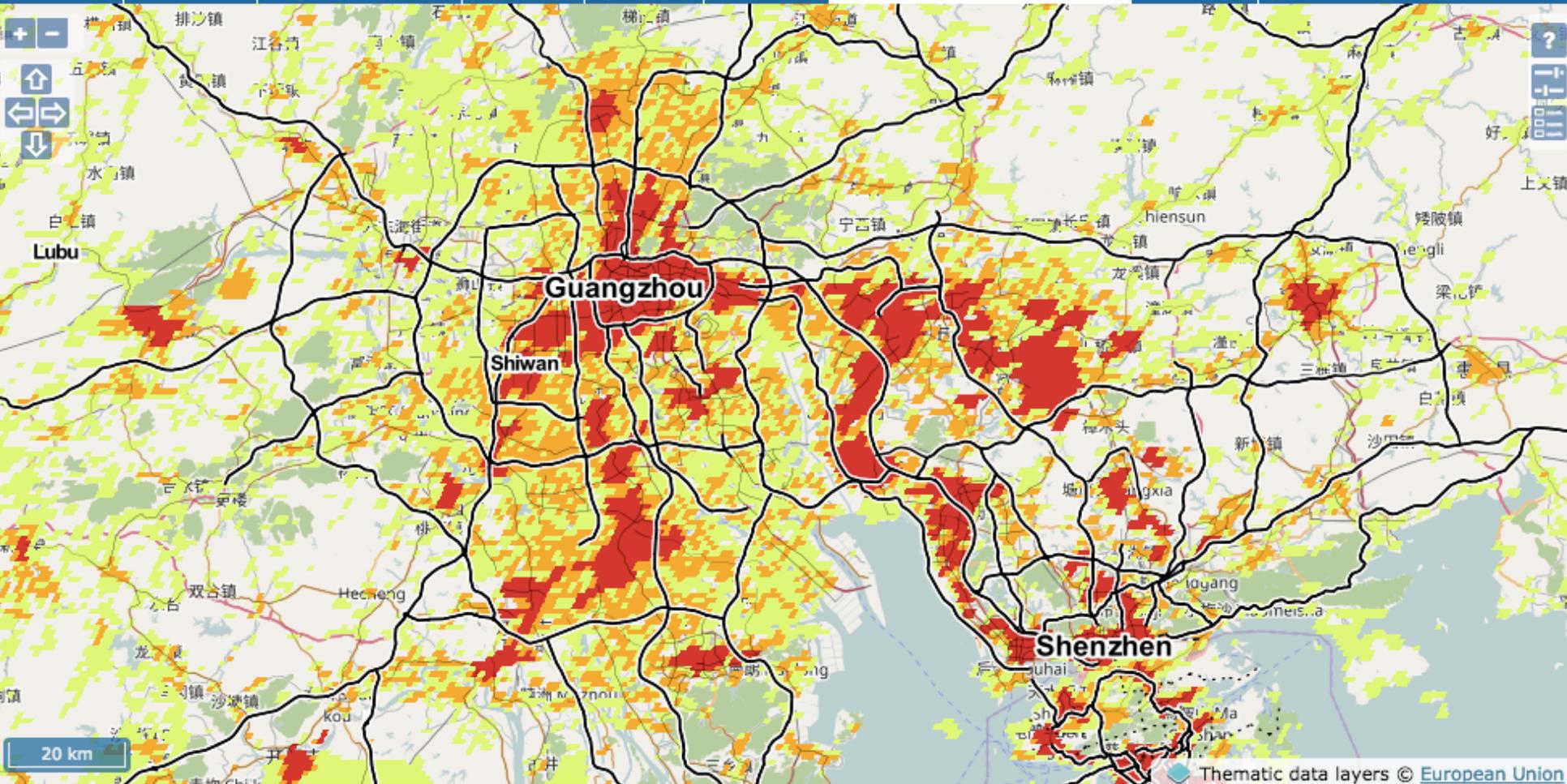
### Inhabitants





# Median population density by city size class per continent, 2015





Create a link to share this map:

[Permalink](#)

Layers selected:

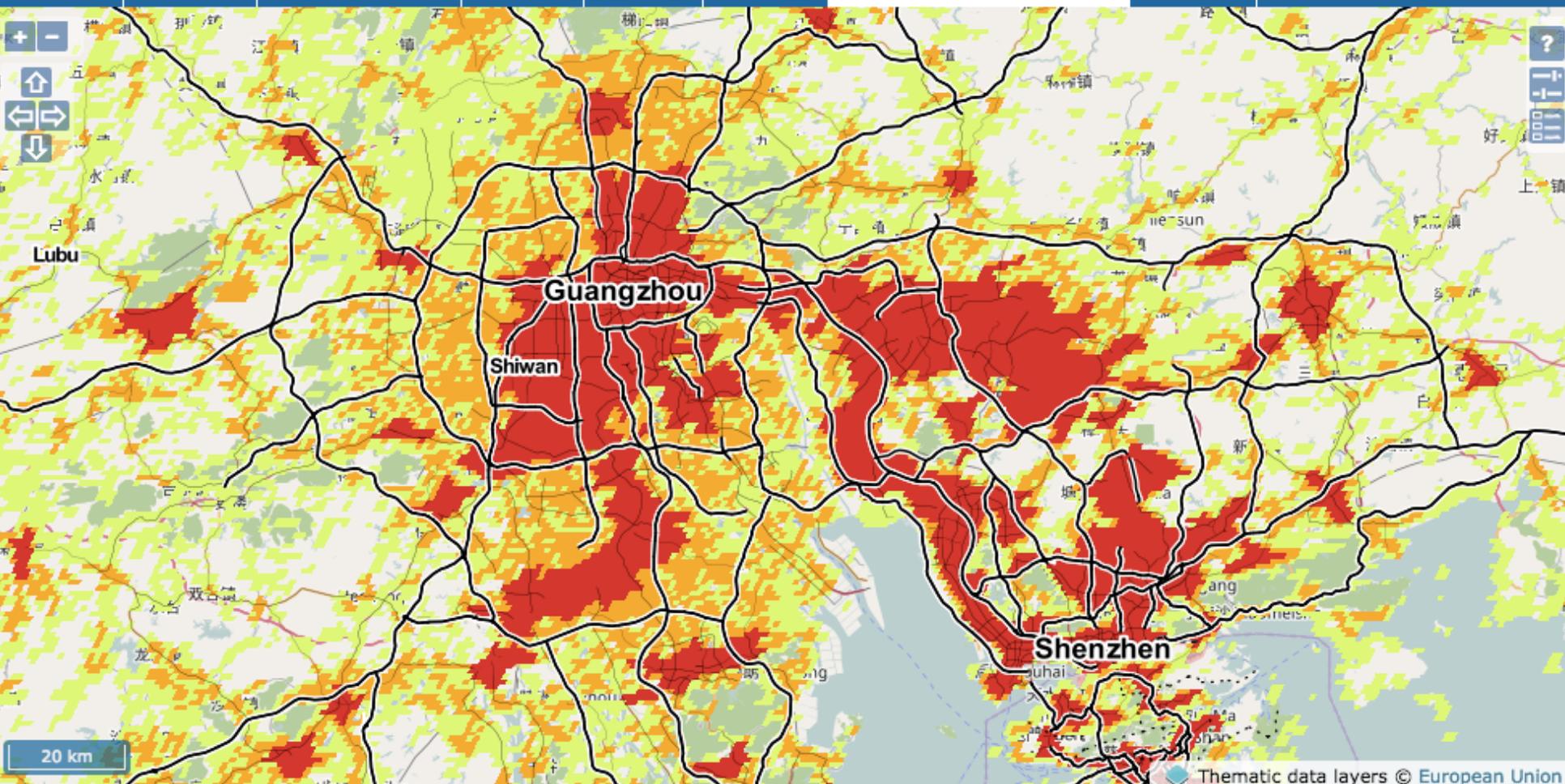
Built-up (resolution: 38m): none

Population (resolution: 250m): none

Settlement Model (resolution: 1km): SMod 1975

Base: OSM, Place names

# 1975



Create a link to share this map:

[Permalink](#)

Layers selected:

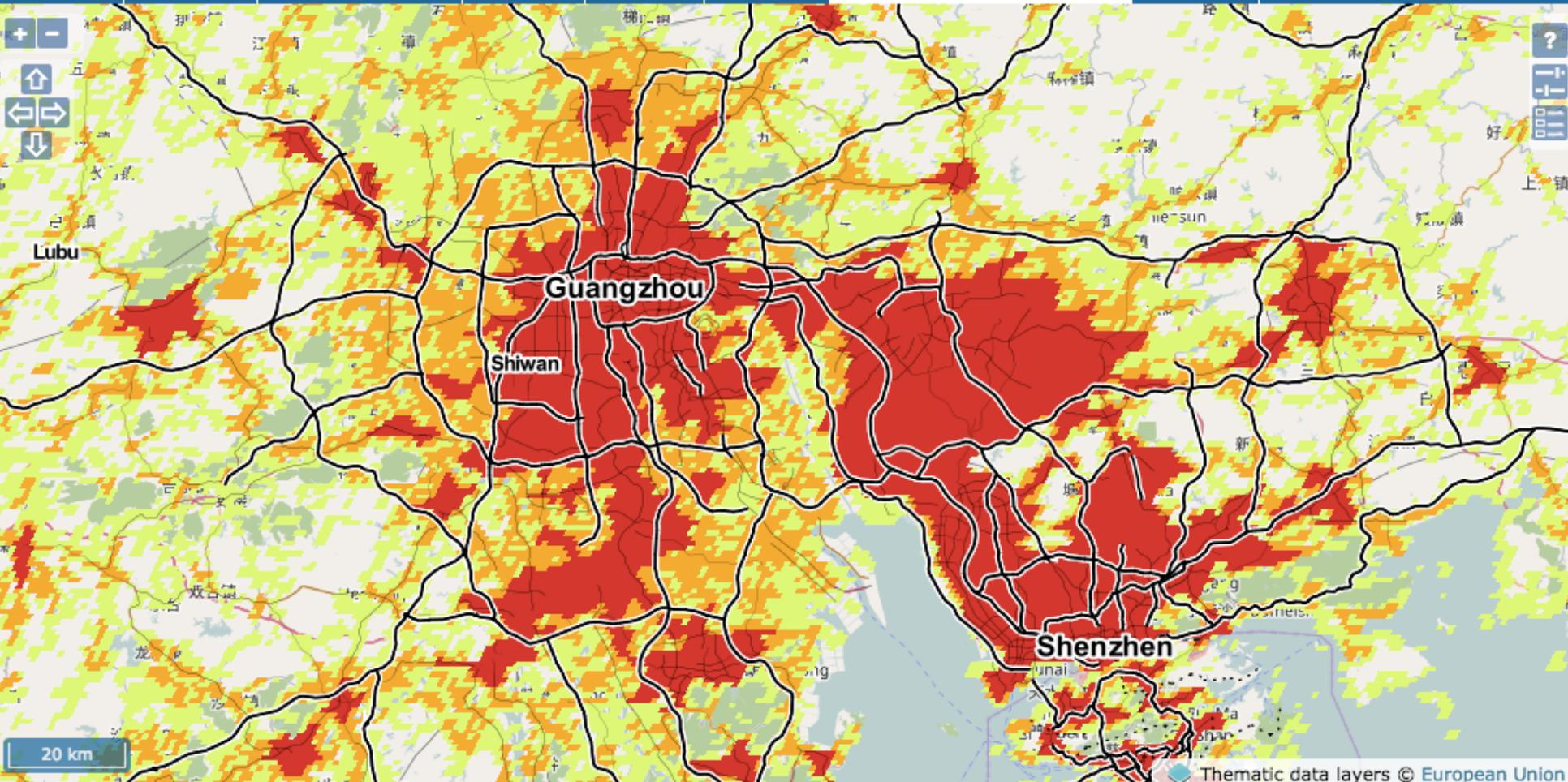
Built-up (resolution: 38m): none

Population (resolution: 250m): none

Settlement Model (resolution: 1km): SMod 1990

Base: OSM, Place names

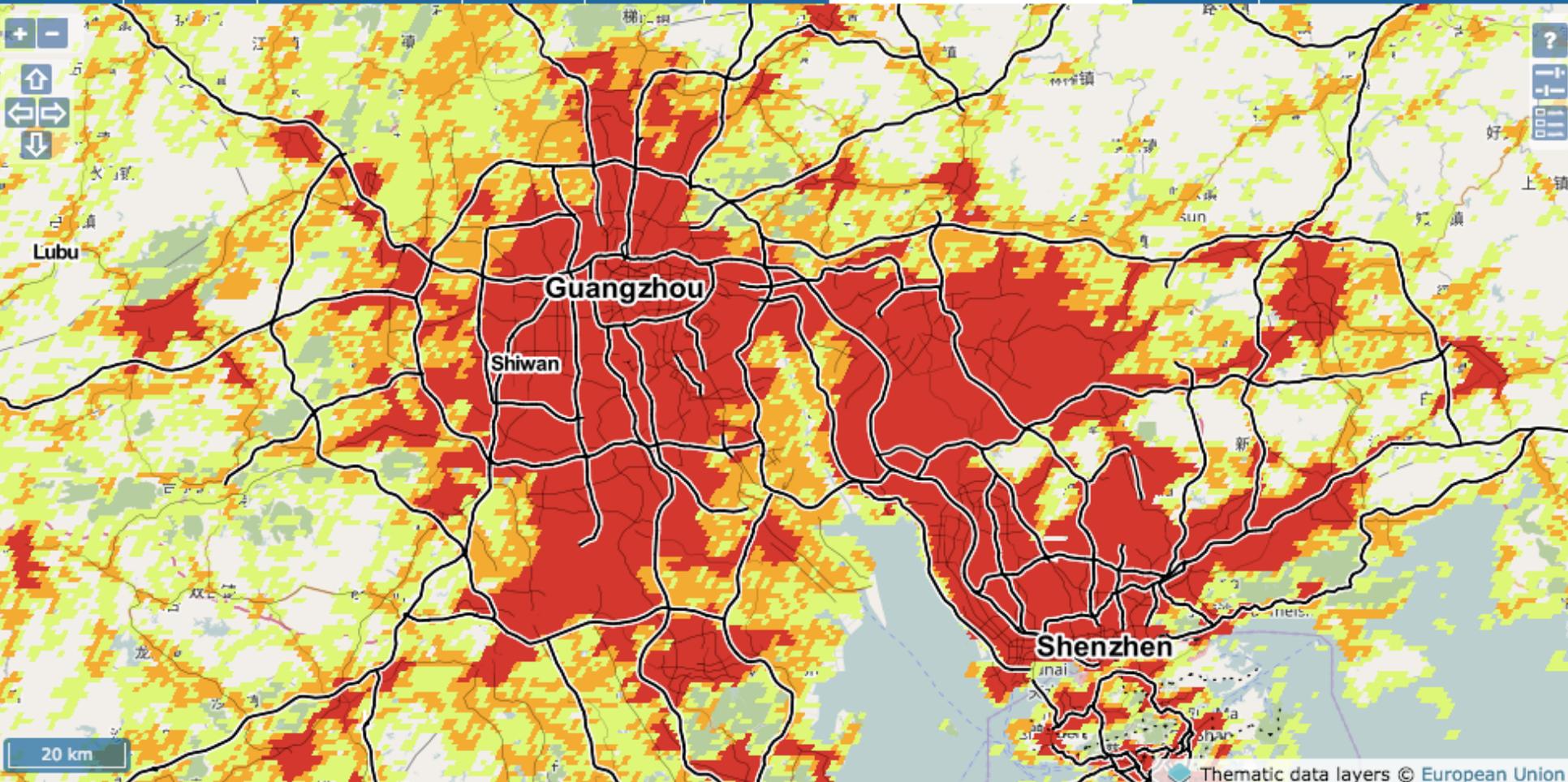
1990



Create a link to share this map: [Permalink](#)

Layers selected:  
Built-up (resolution: 38m): none  
Population (resolution: 250m): none  
Settlement Model (resolution: 1km): SMod 2000  
Base: OSM Place names

# 2000



Create a link to share this map: [Permalink](#)

Layers selected:  
Built-up (resolution: 38m): none  
Population (resolution: 250m): none  
Settlement Model (resolution: 1km): SMod 2015  
Base: OSM Place names

# 2015



# RESULTS OF THE PILOT PROJECTS

# South Africa

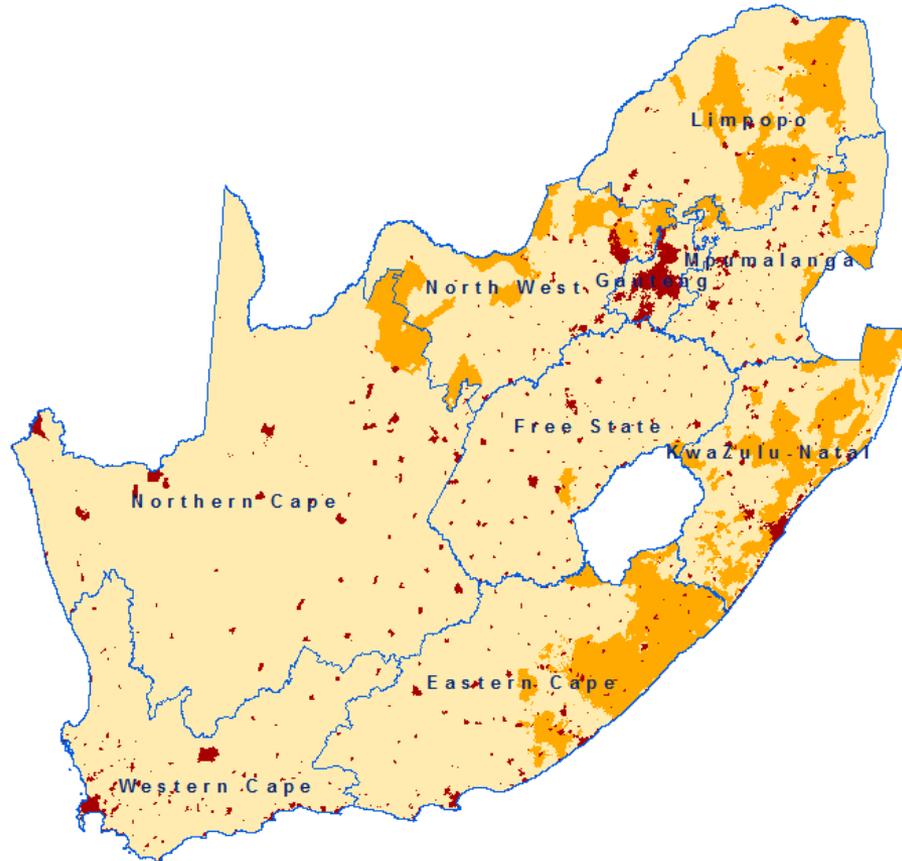
- *40% of population lives in eight metropolitan municipalities*
- *Population by enumeration area*
  - **64% in urban enumeration areas**
  - **31% in traditional areas**
  - **5% in farm areas**

# The degree of urbanisation

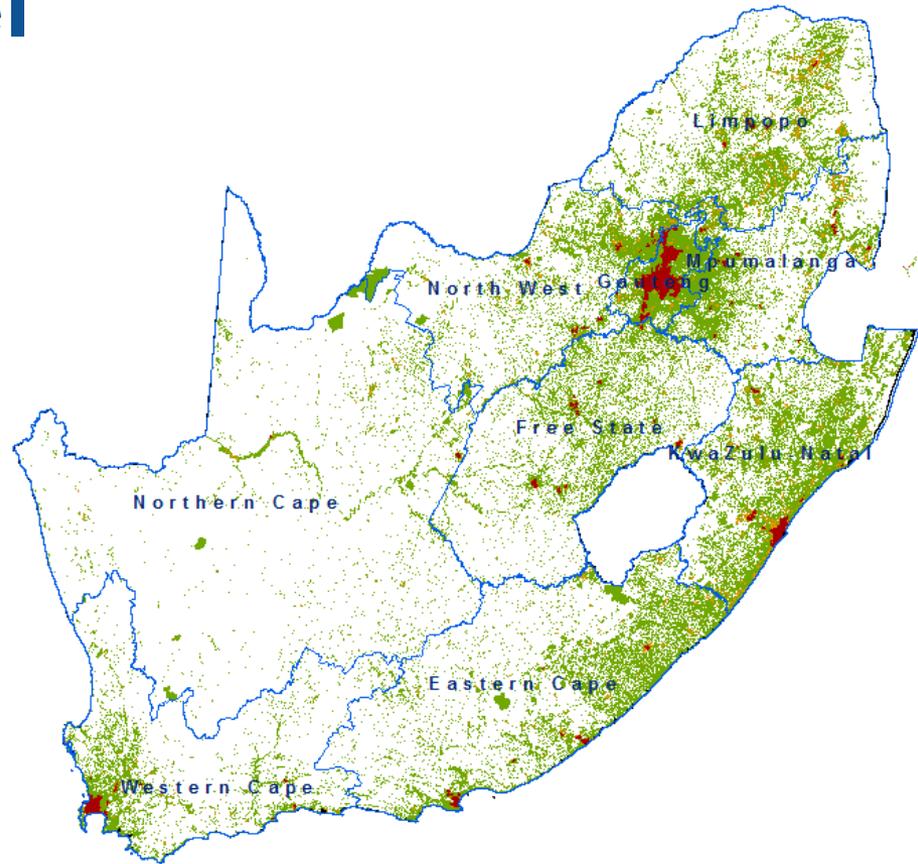
- *Identifies all eight metropolitan municipalities as cities*
- *Classifies 97% of the population in urban enumeration areas as in a city, town or suburb*
- *Classifies 93% of the population in farm areas as in rural areas*
- *Classifies 45% of the population in traditional areas as rural areas, 44% as town or suburb and 11% as city.*

## Enumeration Area 2011

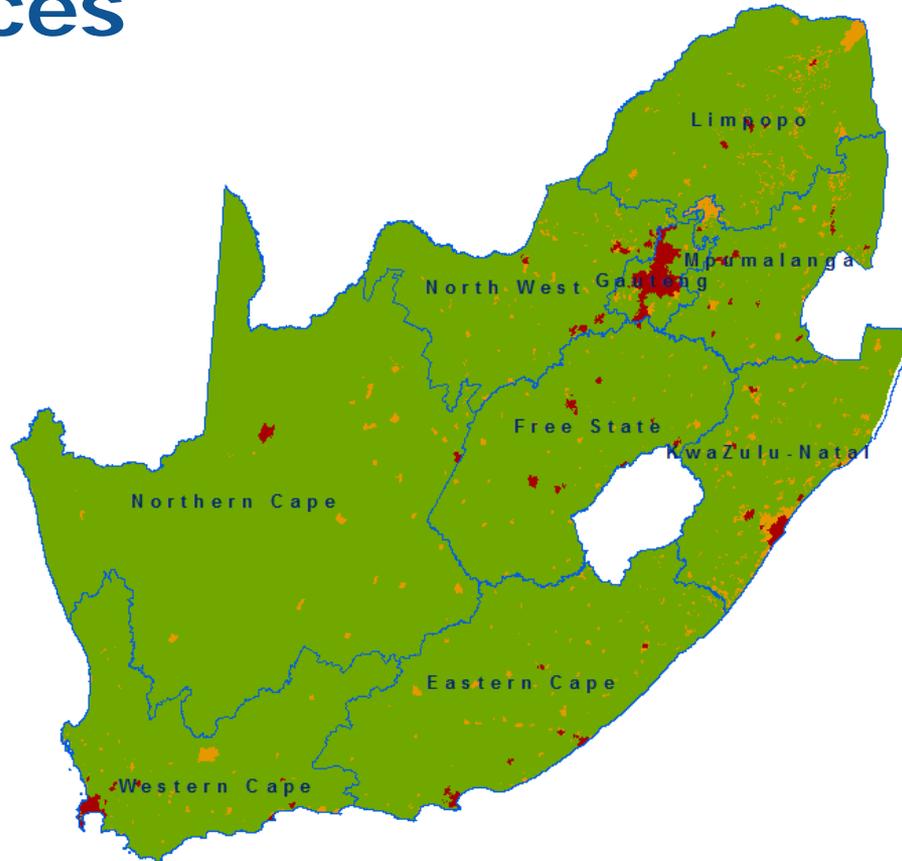
-  Urban
-  Traditional
-  Farms



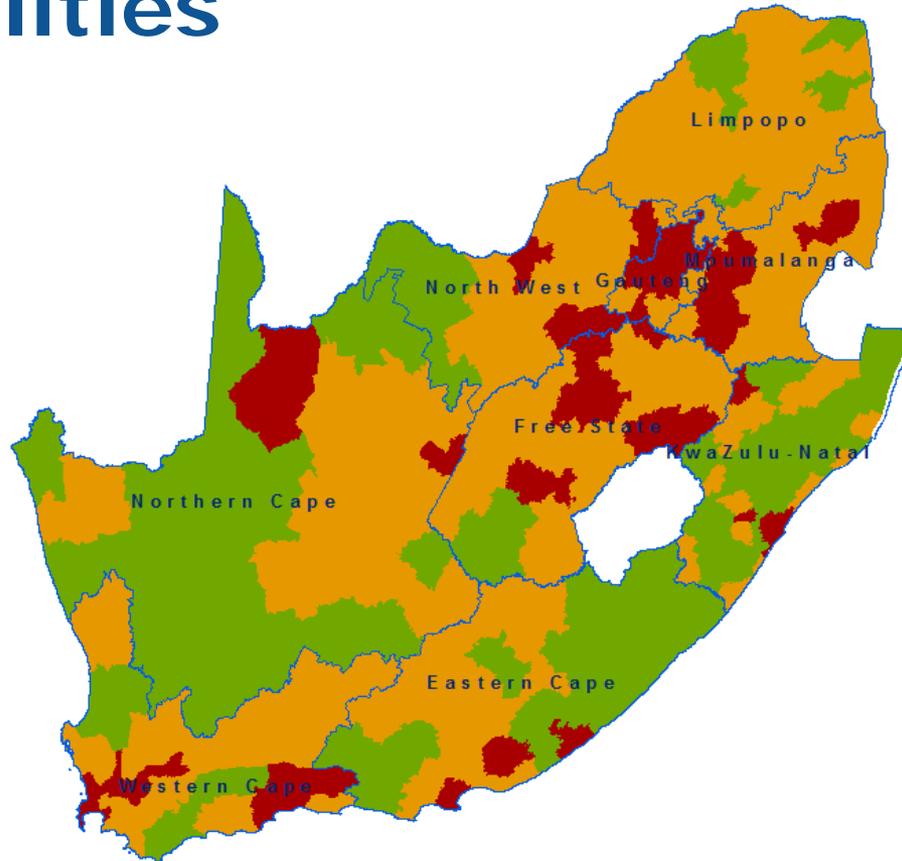
# Grid level



# Main places



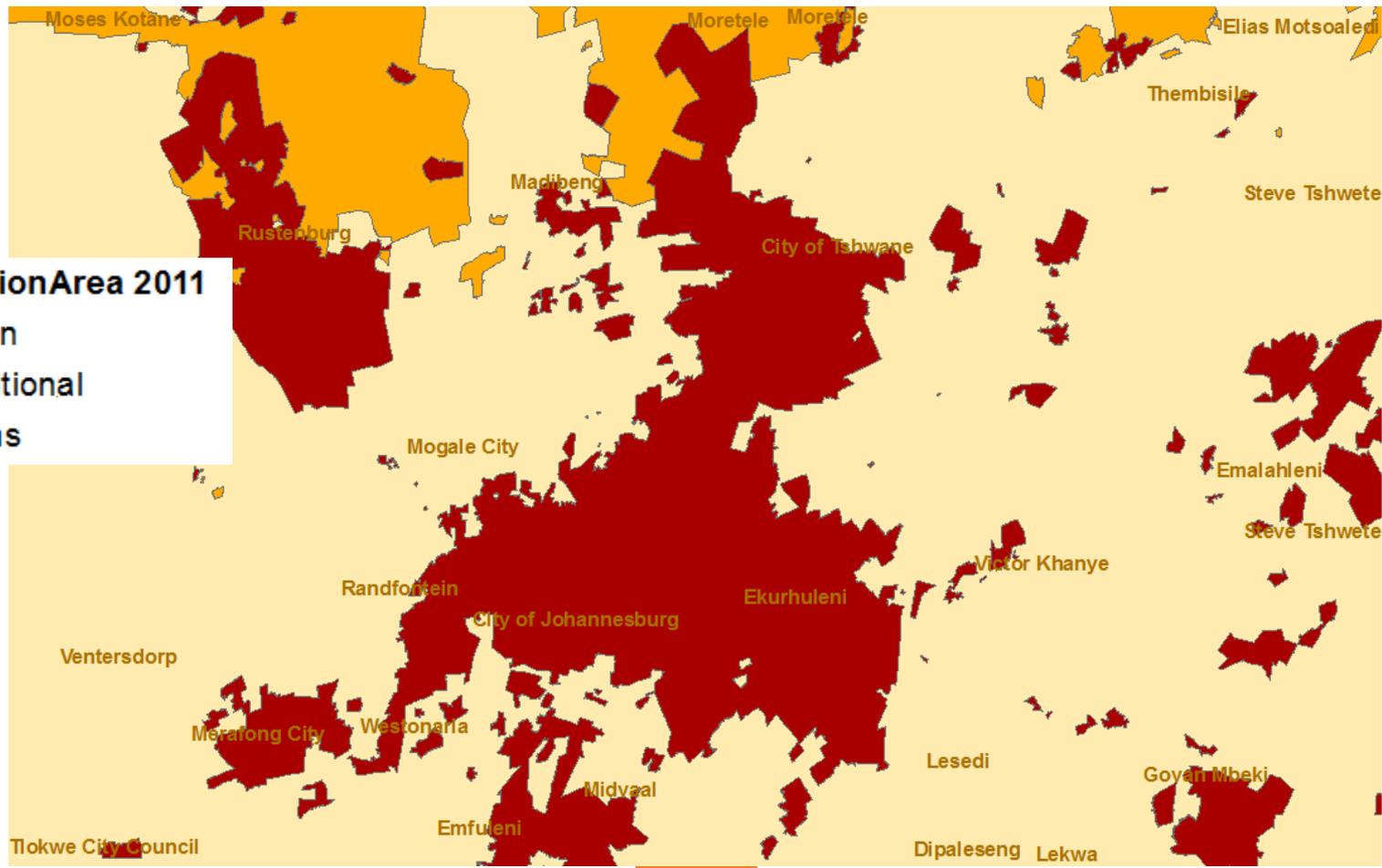
# Municipalities



# Population share by degree of urbanisation in South Africa

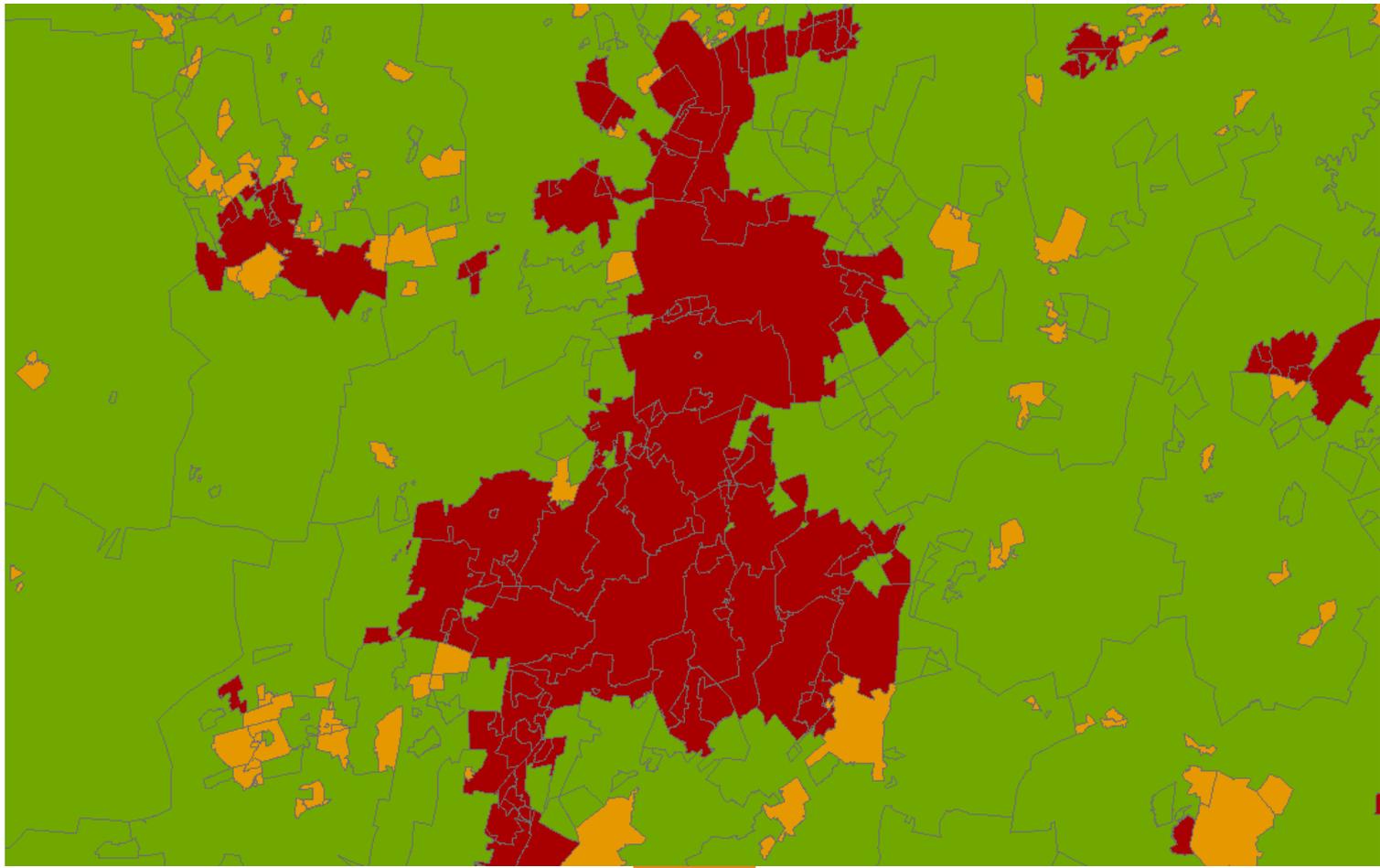
Geographic level	Grid	Main Places	Municipality
City	50.9	53.0	55.3
Towns and suburbs	26.6	26.2	28.4
Rural area	22.6	20.8	16.3
Total	100.0	100.0	100.0
Number of units	1.2 million	14,039	234.0

# Johannesburg enumeration areas





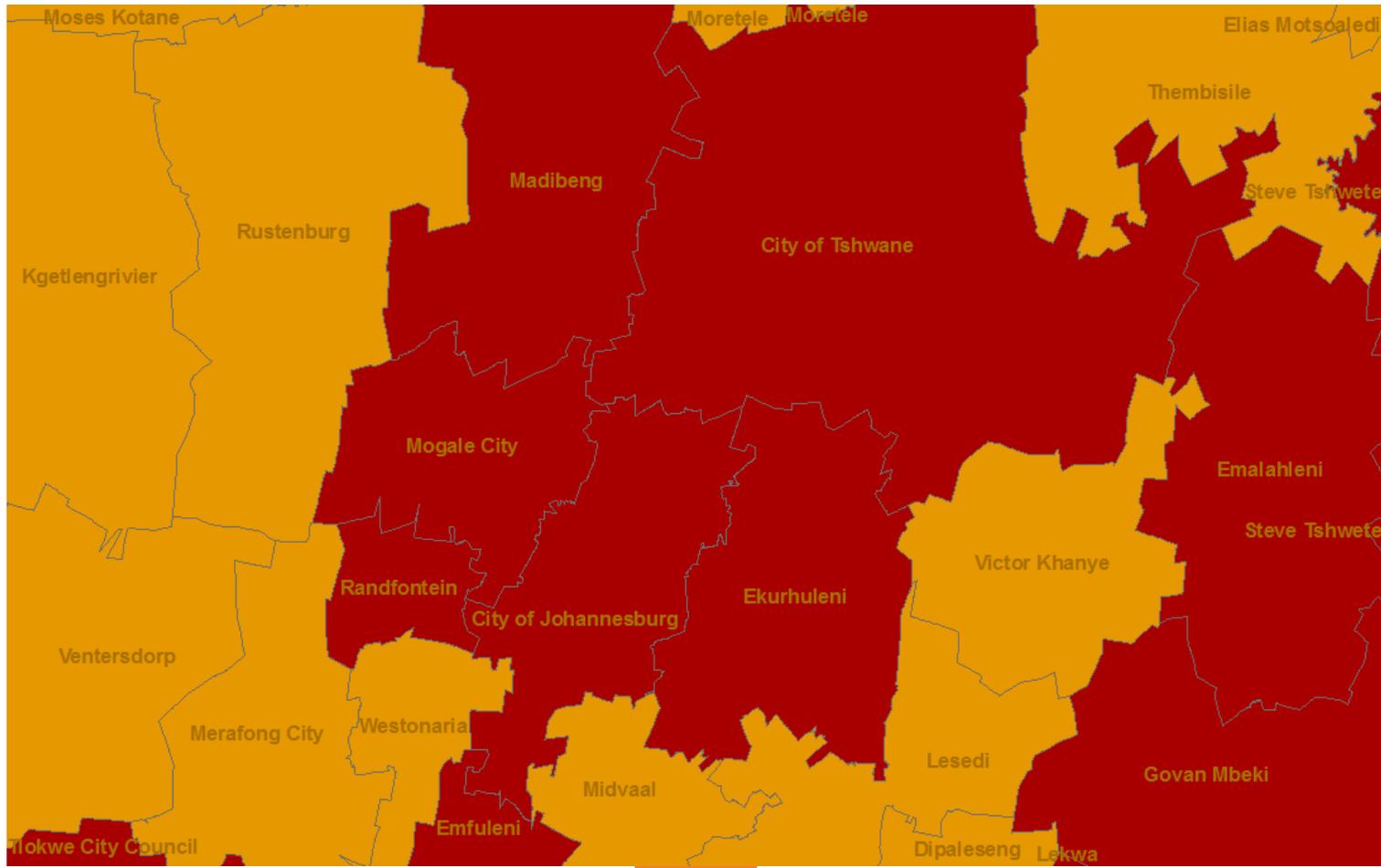
# Johannesburg, main places





-  City
-  Towns and surburbs
-  Rural area

# Johannesburg, municipalities



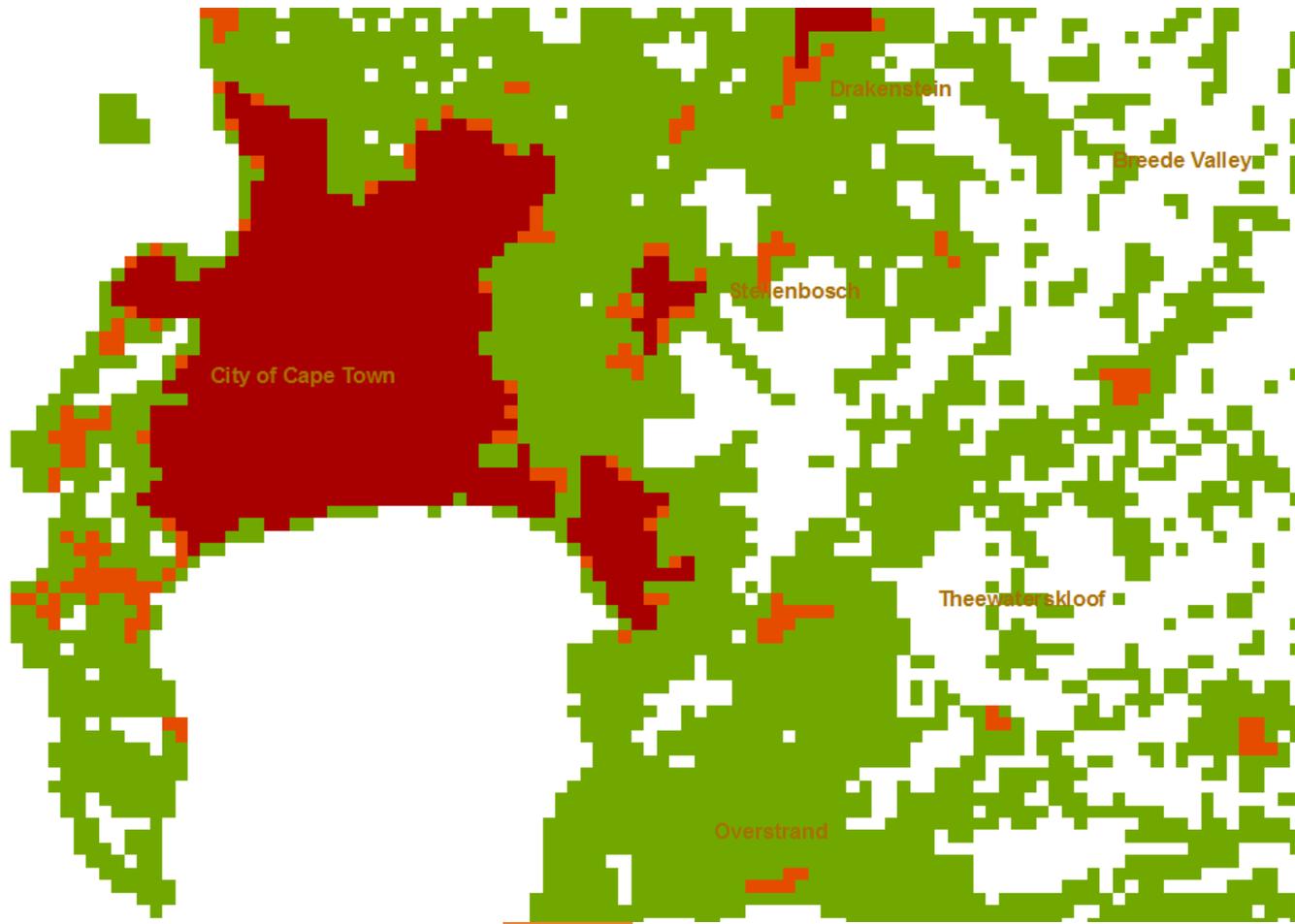
# Cape Town, enumeration areas

EnumerationArea 2011

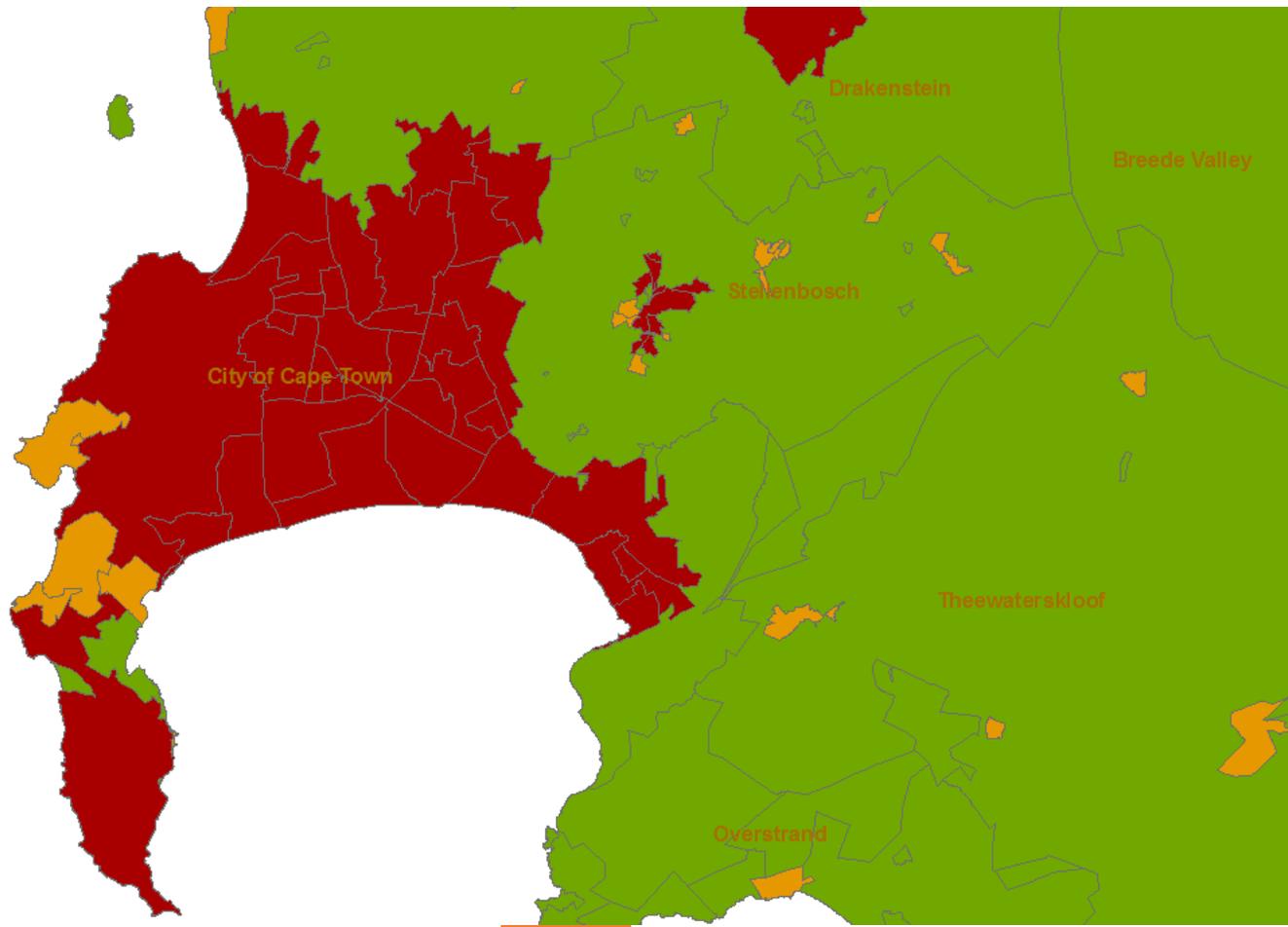
- Urban
- Traditional
- Farms



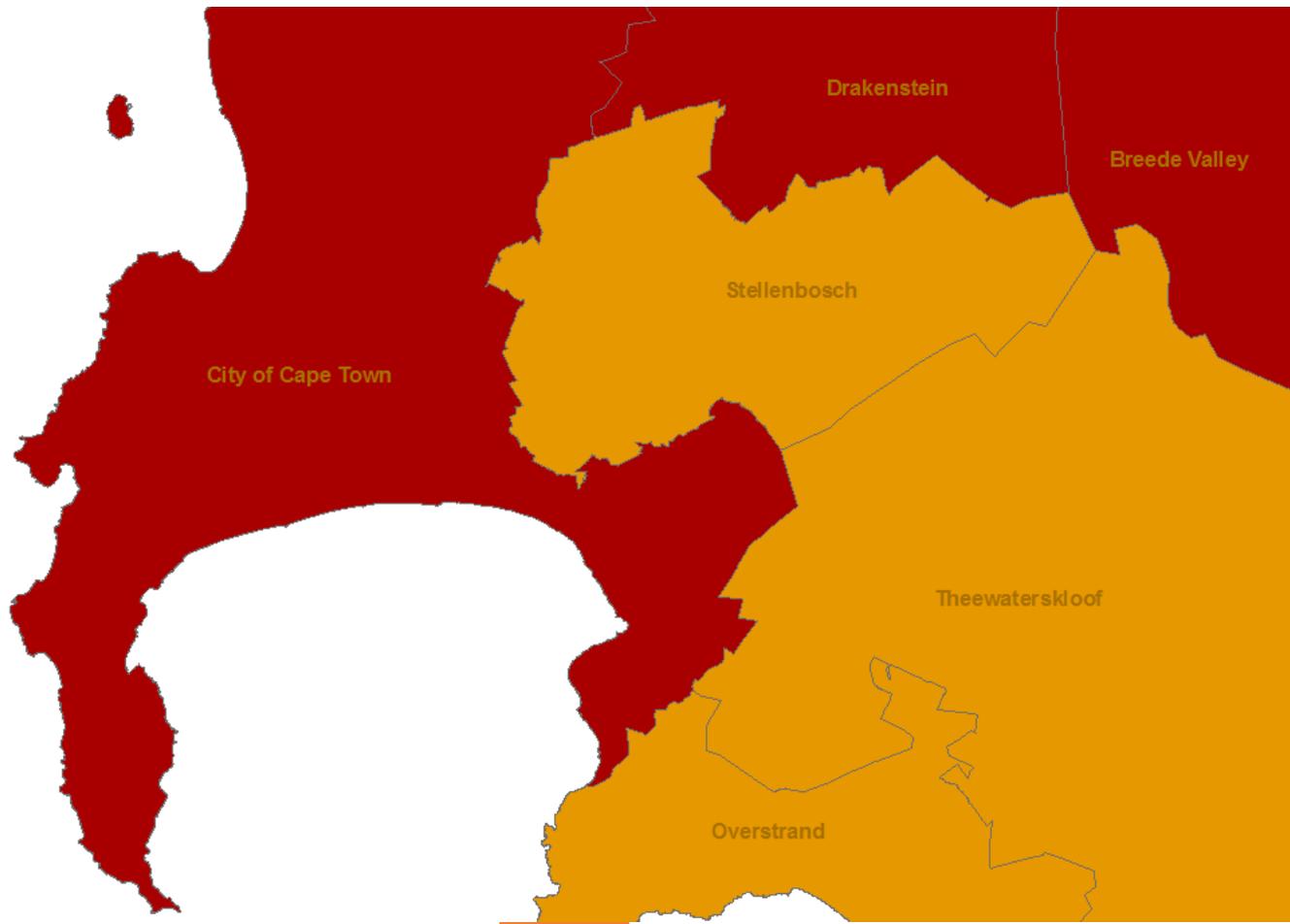
# Cape Town at grid level



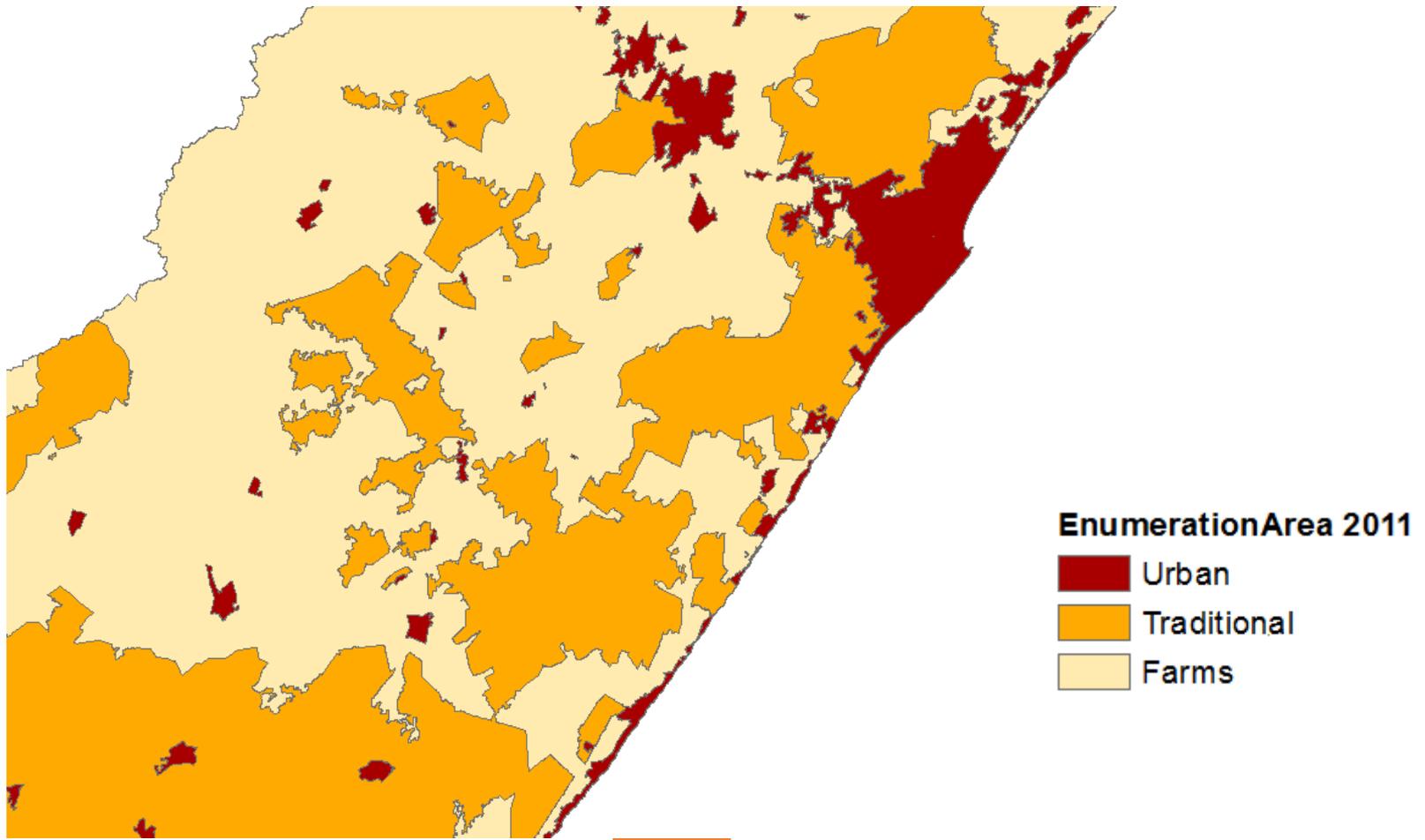
# Cape Town, main places



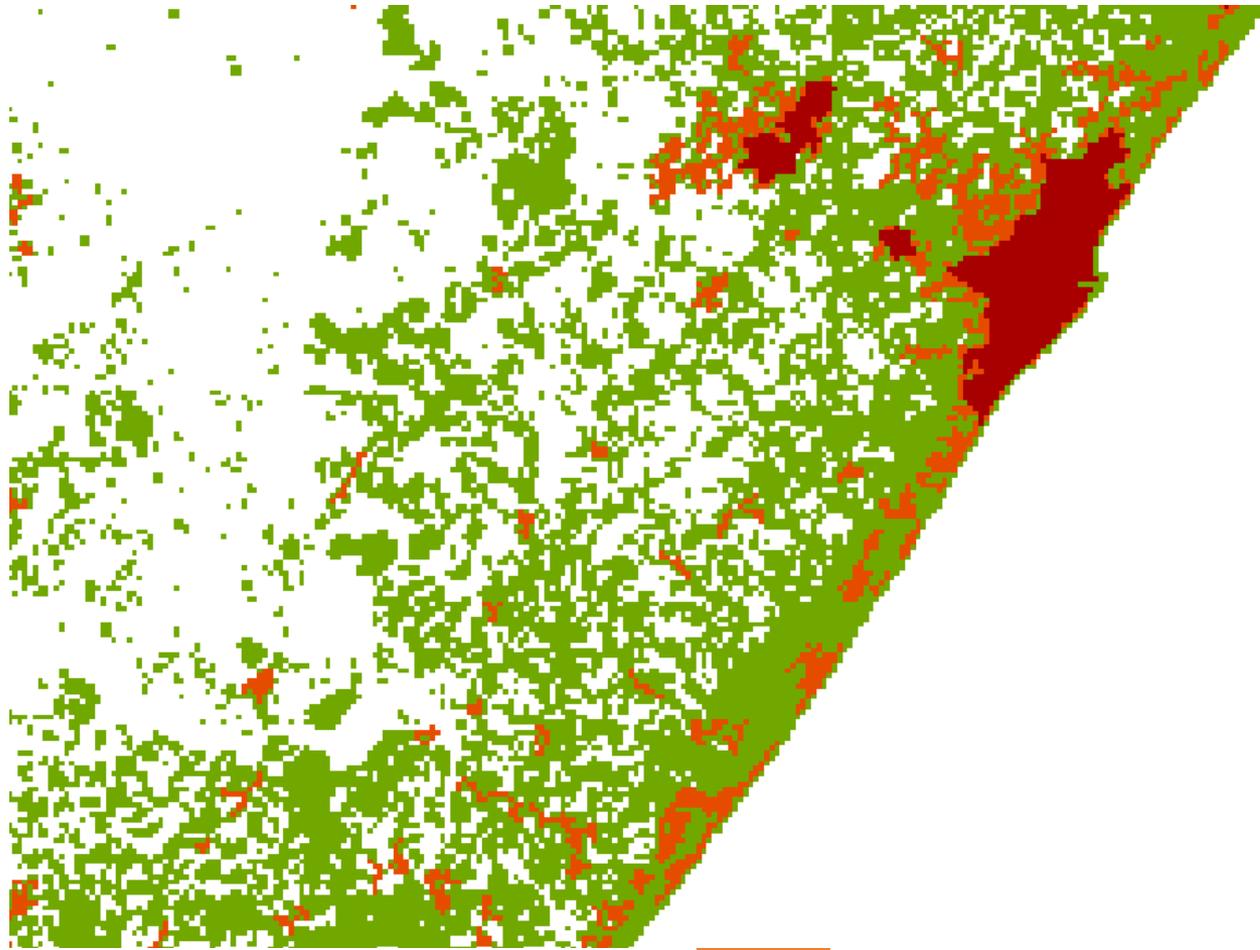
# Cape Town, municipalities



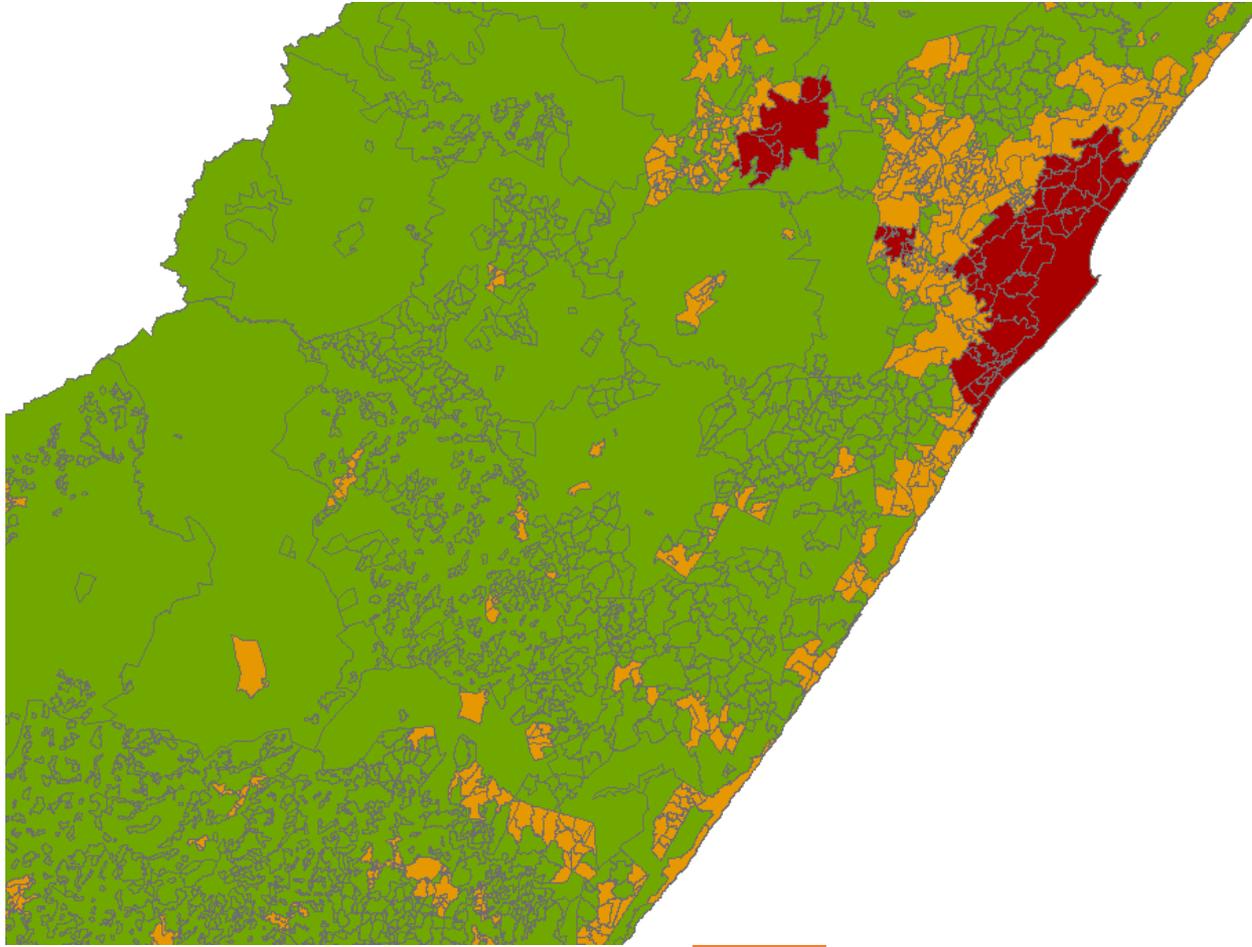
# Durban, enumeration areas



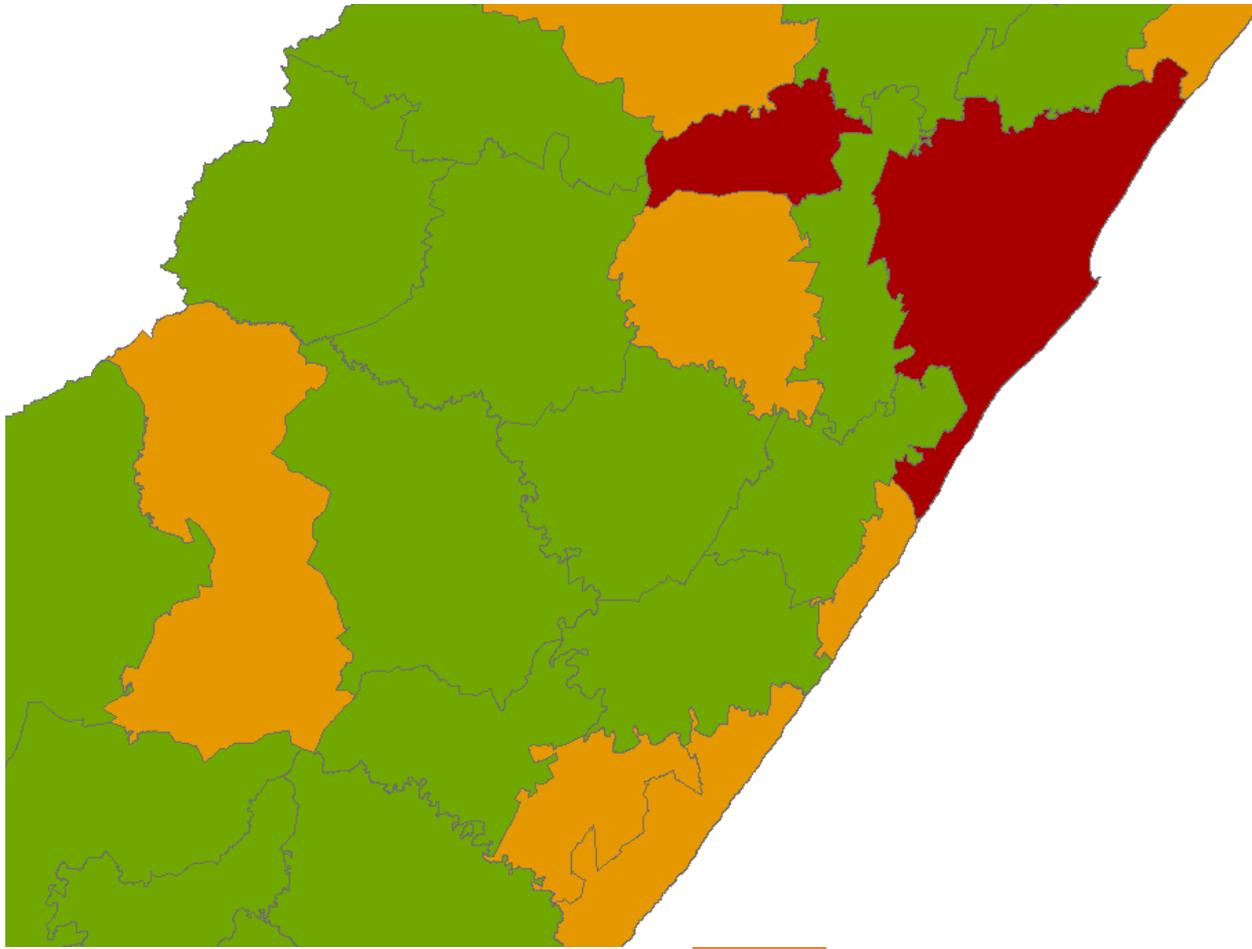
# Durban at grid level



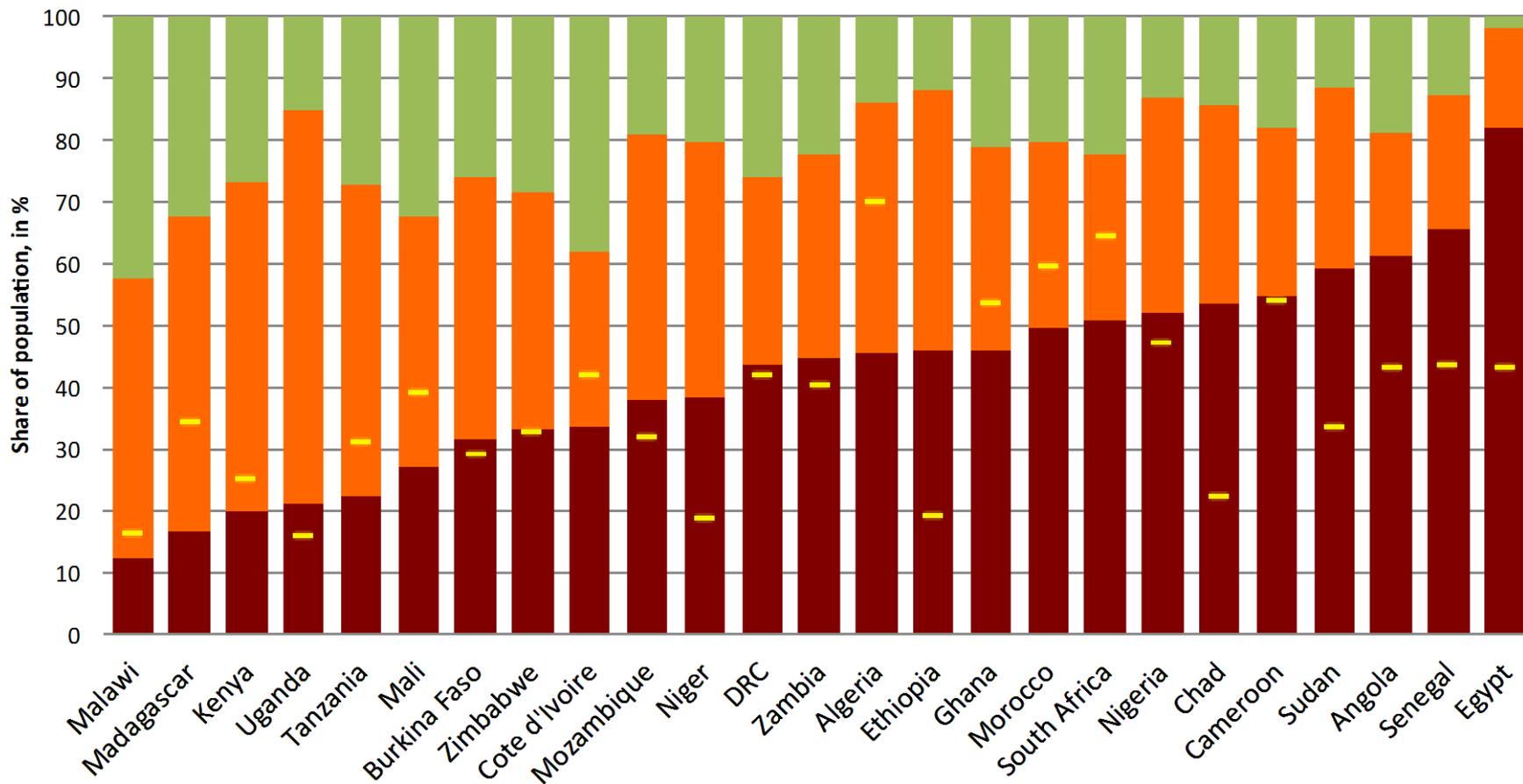
# Durban, main places



# Durban, municipalities



## Population by degree of urbanisation per country, 2014



Source: JRC and World Urbanization Propsects, 2014

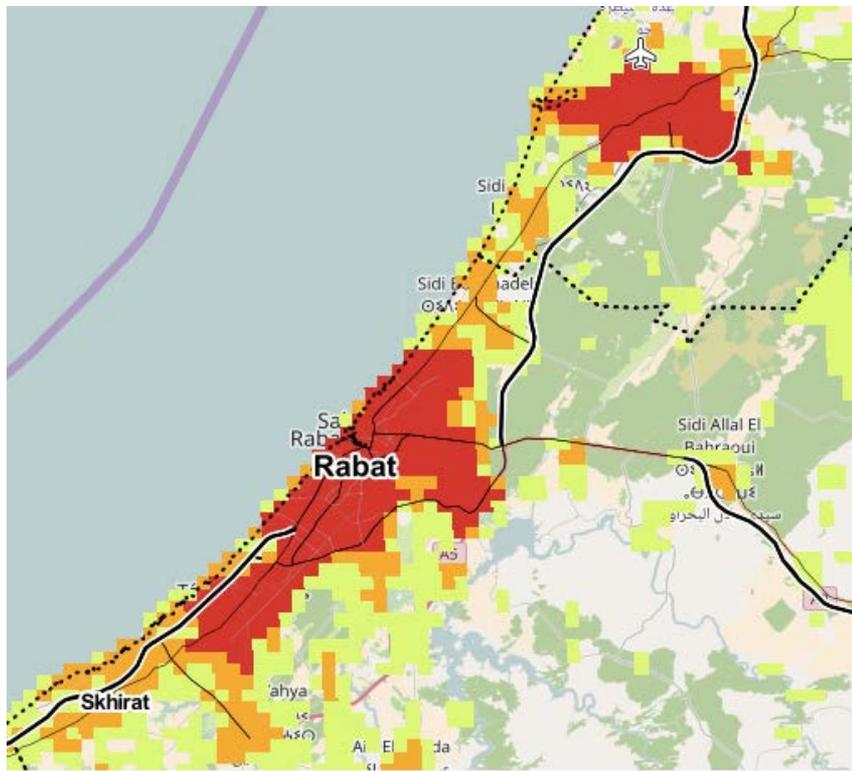
Rural areas

Towns and suburbs

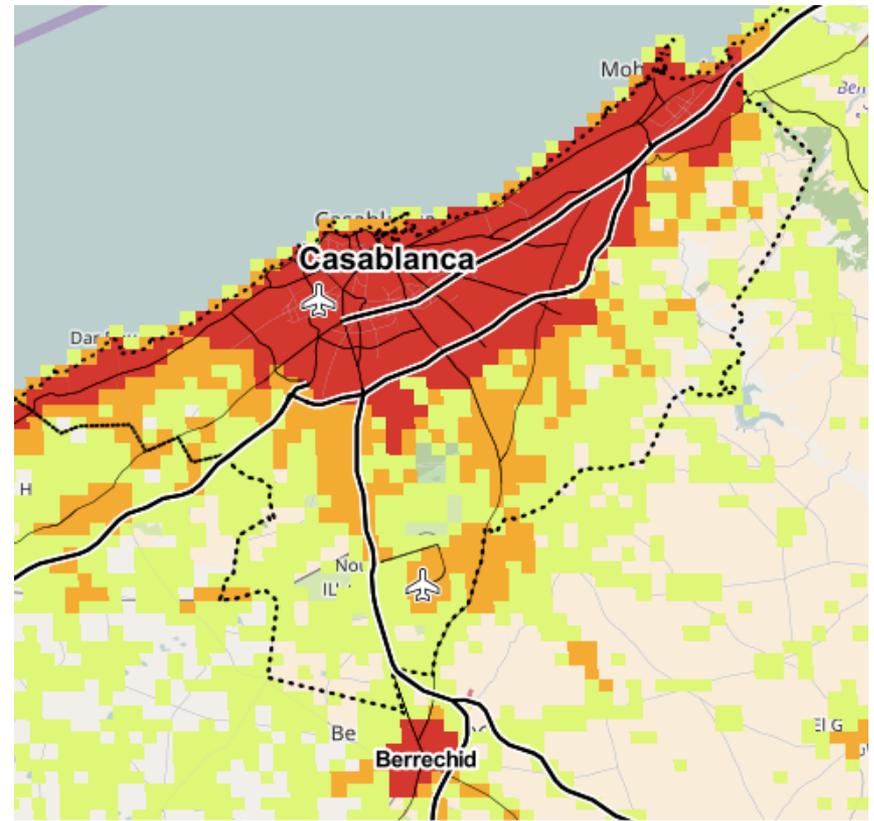
Cities

UN Value

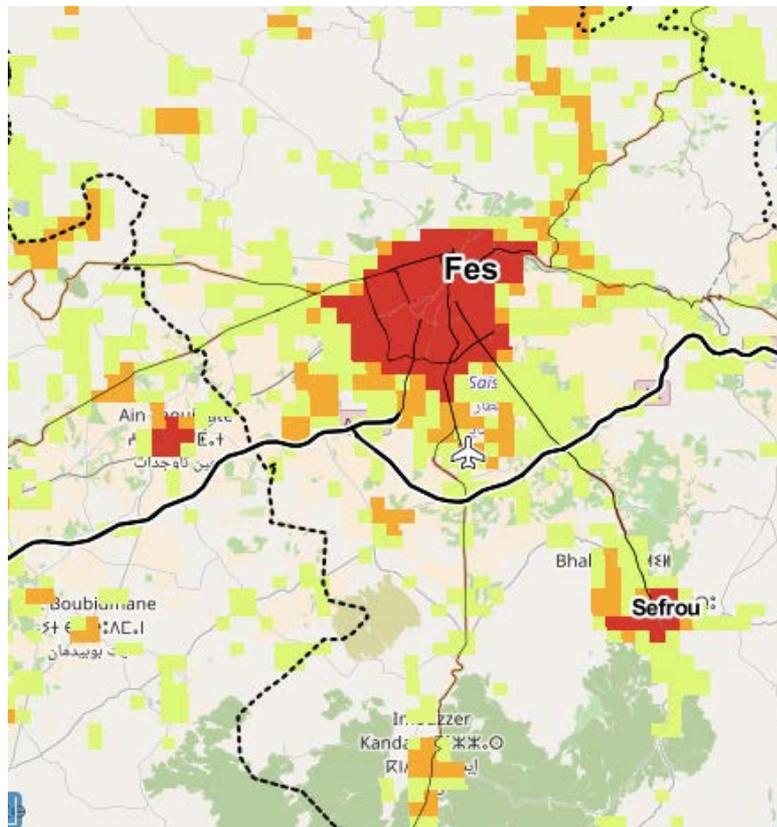
## *Rabat 1,9 M*



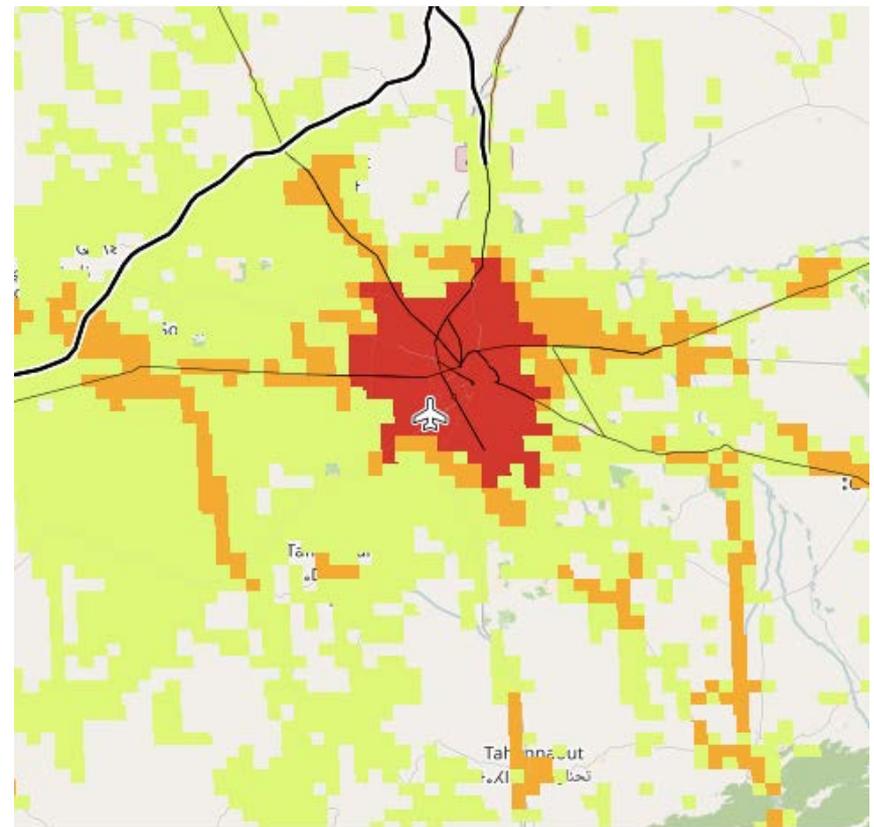
## *Casablanca 4 M*



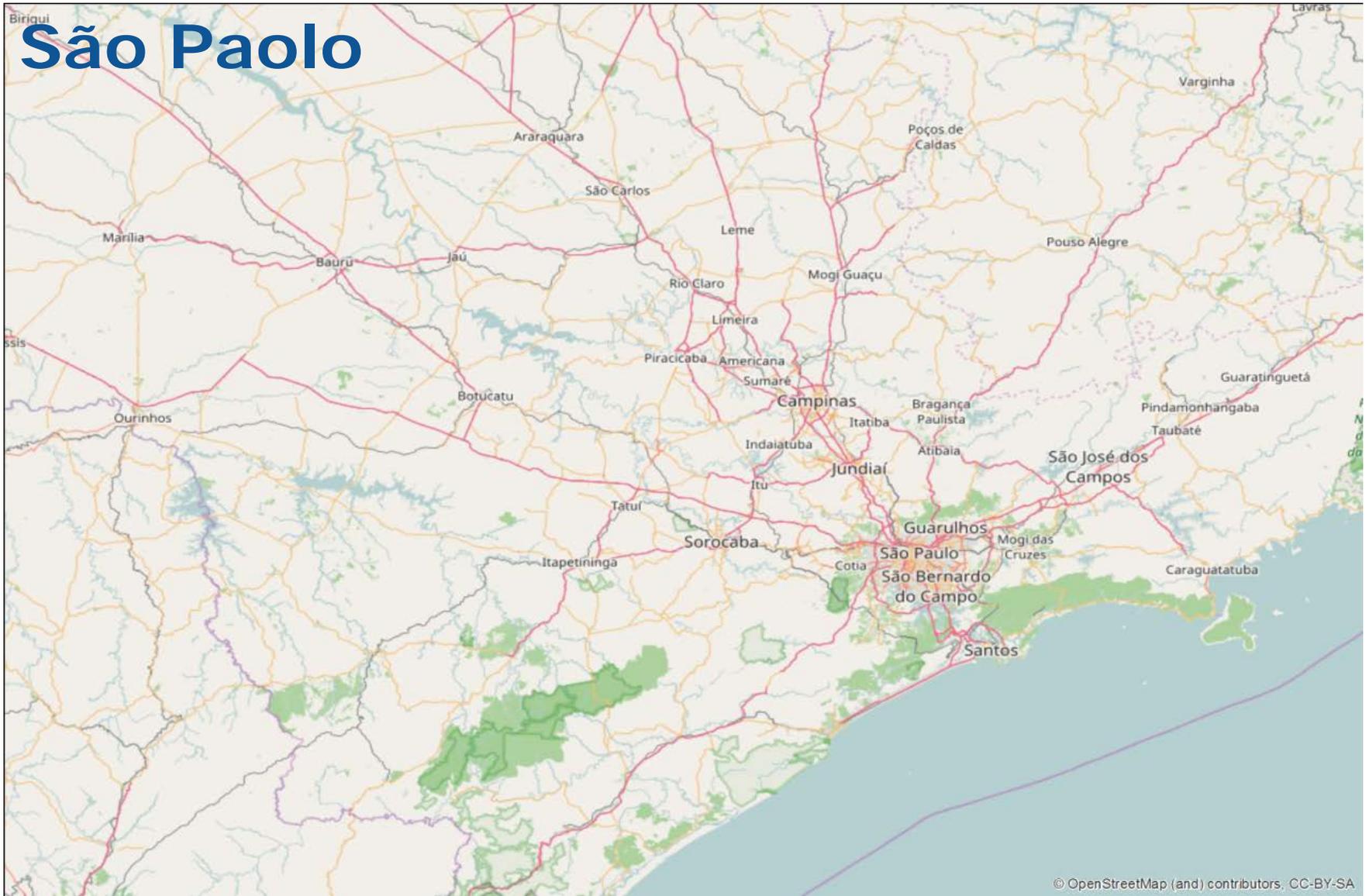
## Fes 1,2 M



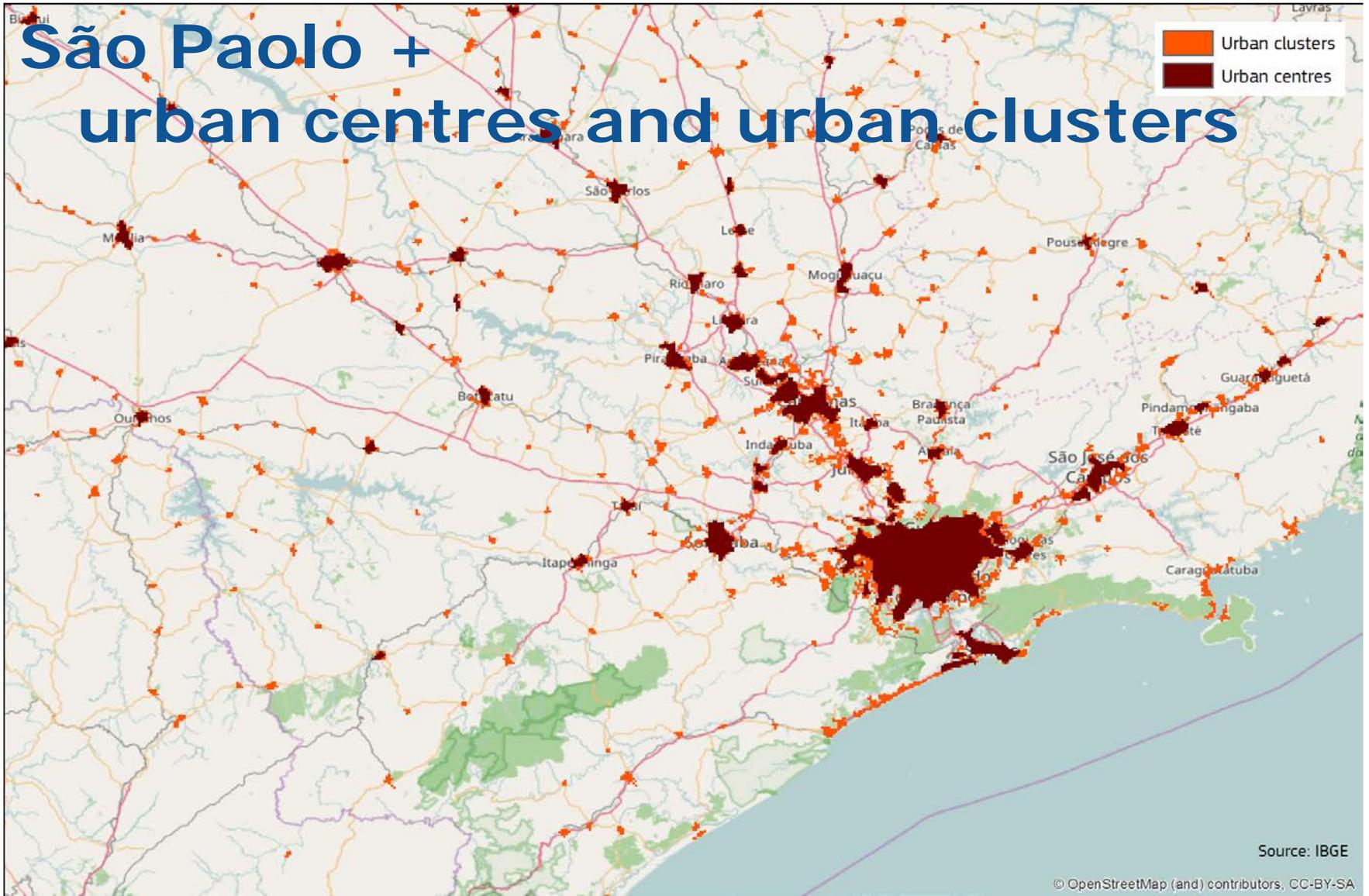
## Marrakech 1,1 M

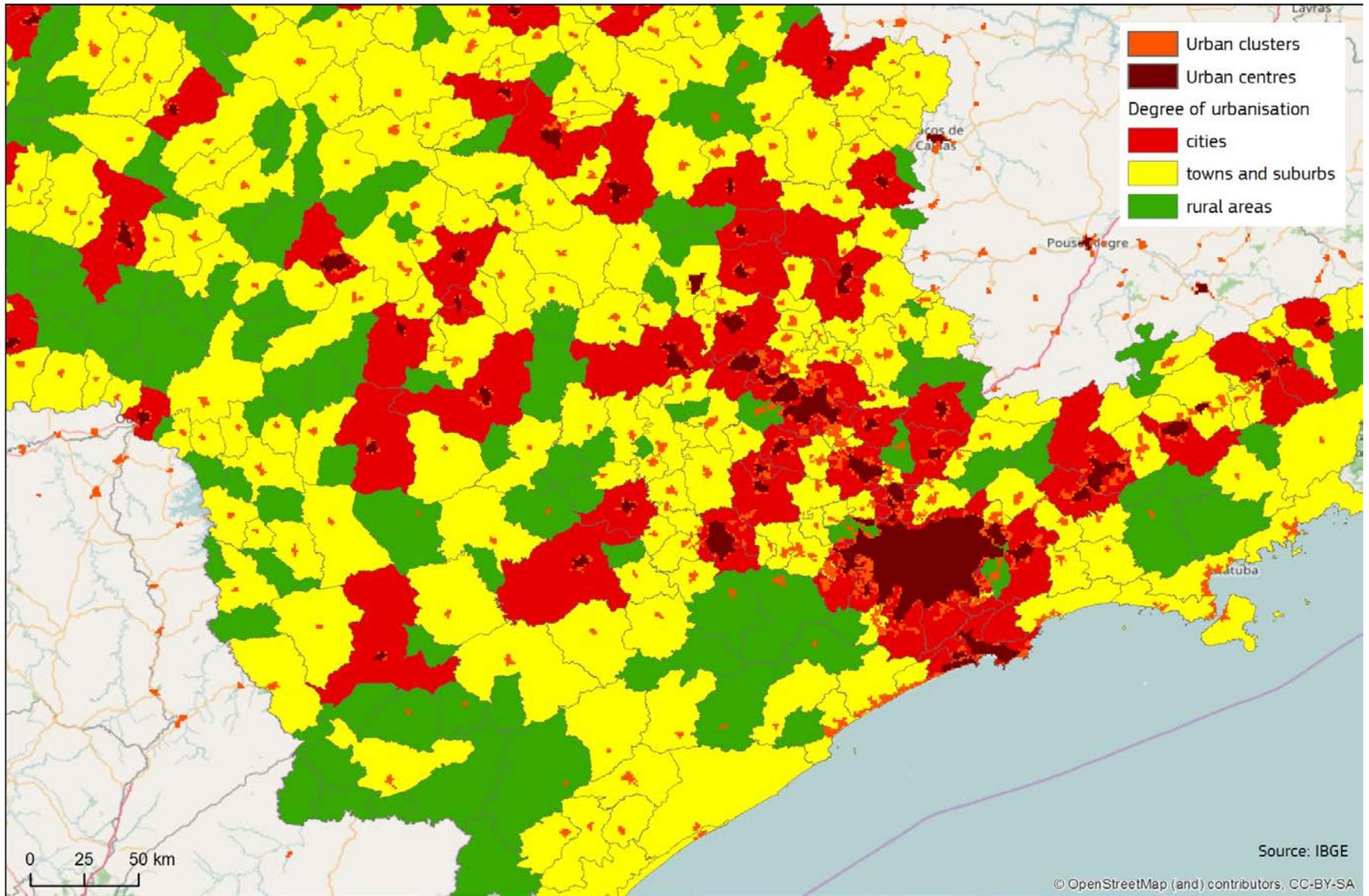


# São Paulo



# São Paulo + urban centres and urban clusters





Source: IBGE

# Key questions

- *Validity: Does the degree of urbanisation correctly distinguish the three types of areas?*
- *Utility: Would this be useful for international comparison?*
- *Feasibility: Can data be produced for these areas?*
- *Should this be used to ensure global comparability of the urban SDG indicators?*

# NEXT STEPS

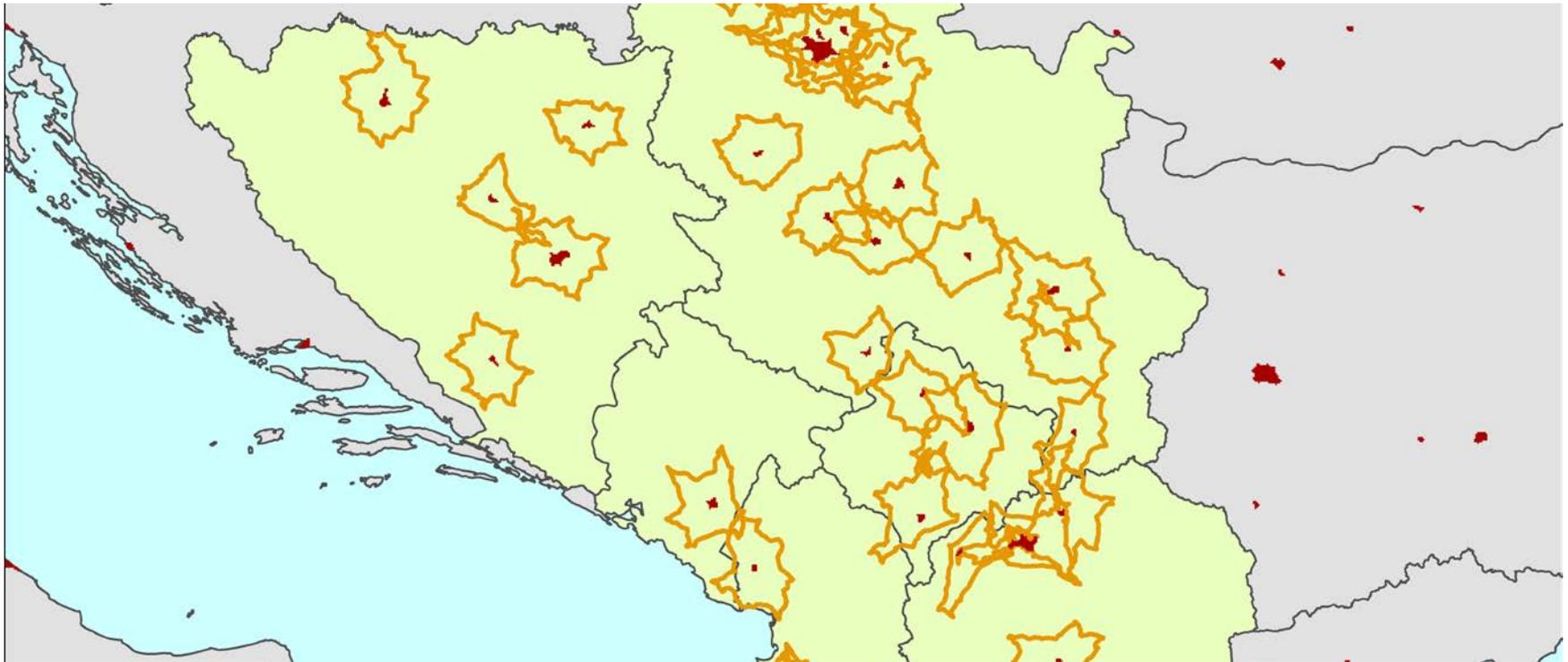
# What is planned during 2017?

- *A global consultation by Eurostat and UN asking about the validity, utility and feasibility of using the degree of urbanisation*
- *Complete the on-going pilot projects*
- *Find more volunteers for the pilot projects*
- *More outreach activities: World Statistical Congress in Marrakech, July 2017*

# Technical work

- *Testing of methods to create a commuting zone in absence of commuting data?*
- *How to identify settlements? Maybe by distinguishing towns from suburbs*
- *Improvements to the global population grid by using higher resolution EU satellites (Sentinel 1 and 2). Results will be published in 2018*

# 30 minute driving time buffers



# Other methods to identify commuting zones

- *Estimate adult population flows based on mobile phone data*
- *Estimate relation between city size and driving time*

# Conclusions

- *The results from the global application of the degree of urbanisation and the first pilots are promising*
- *We are still looking for more national statistical institutes to join a pilot project, especially from the Middle East, Central Africa and Asia.*
- *Need advice and suggestions on how to organise this process*

## More information

*Global Human Settlement Layer:*

<http://ghsl.jrc.ec.europa.eu>

*Degree of urbanisation*

[http://ec.europa.eu/regional\\_policy/sources/docgener/work/2014\\_01\\_new\\_urban.pdf](http://ec.europa.eu/regional_policy/sources/docgener/work/2014_01_new_urban.pdf) and

<http://ec.europa.eu/eurostat/web/degree-of-urbanisation/overview>

*EU-OECD City definition*

[http://ec.europa.eu/regional\\_policy/sources/docgener/focus/2012\\_01\\_city.pdf](http://ec.europa.eu/regional_policy/sources/docgener/focus/2012_01_city.pdf) and

<http://ec.europa.eu/eurostat/web/cities/overview>