



The European Commission's science and knowledge service

Joint Research Centre

GEO Human Planet Initiative

GEO GROUP ON EARTH OBSERVATIONS

European Commission

Global Human Settlement datasets for SDG's Focus on Human Settlements

Daniele Ehrlich and GHSL team of the Joint Research Centre

Session Title: Geospatial Information for Urban Sustainable Development
United Nations World Geospatial Information Congress
DEQING, CHINA
19-21 November 2018

GEO Human Planet Initiative

GEO GROUP ON EARTH OBSERVATIONS

European Commission

The Global Human Settlement Layer

open input, open method, open output

Full repeatability

Multi-temporal and spatial **harmonization** of information

Evidence-based output analytics

Real-world (big) data scenario



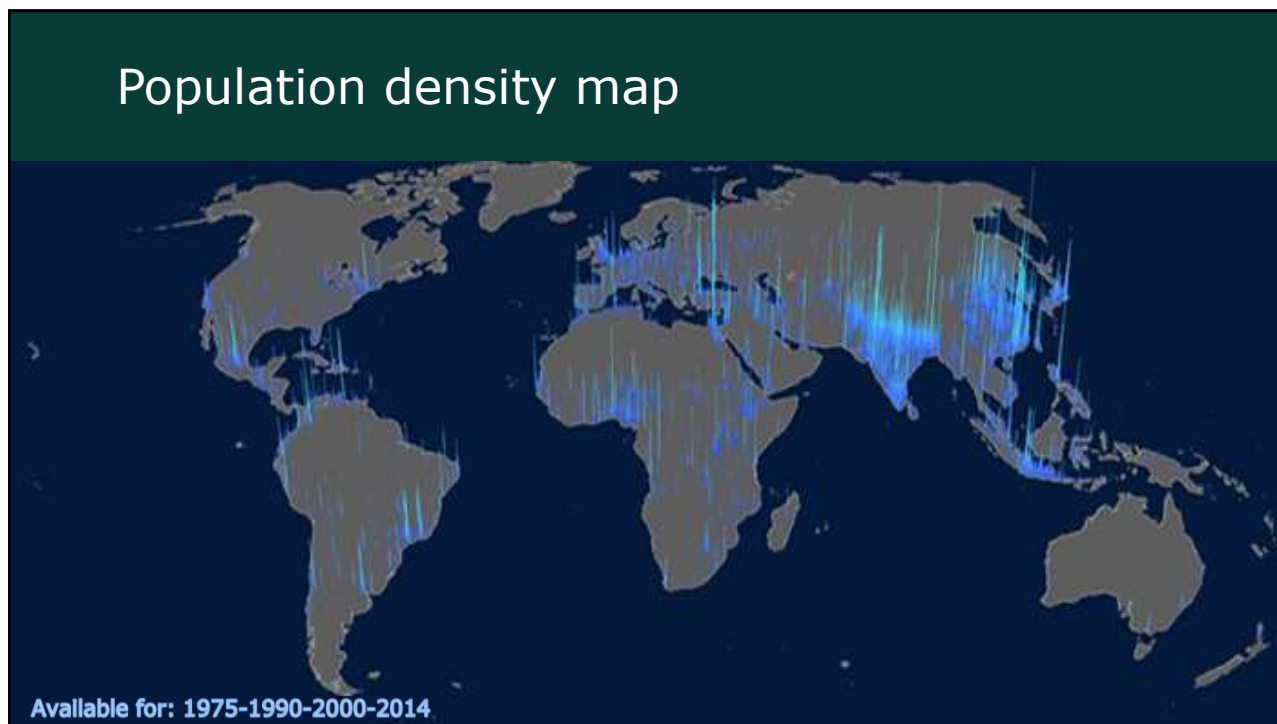
GEO Human Planet Initiative



GHSL Landsat

First available multi-temporal assessment of human settlements

Available 1975-1990-2000-2014



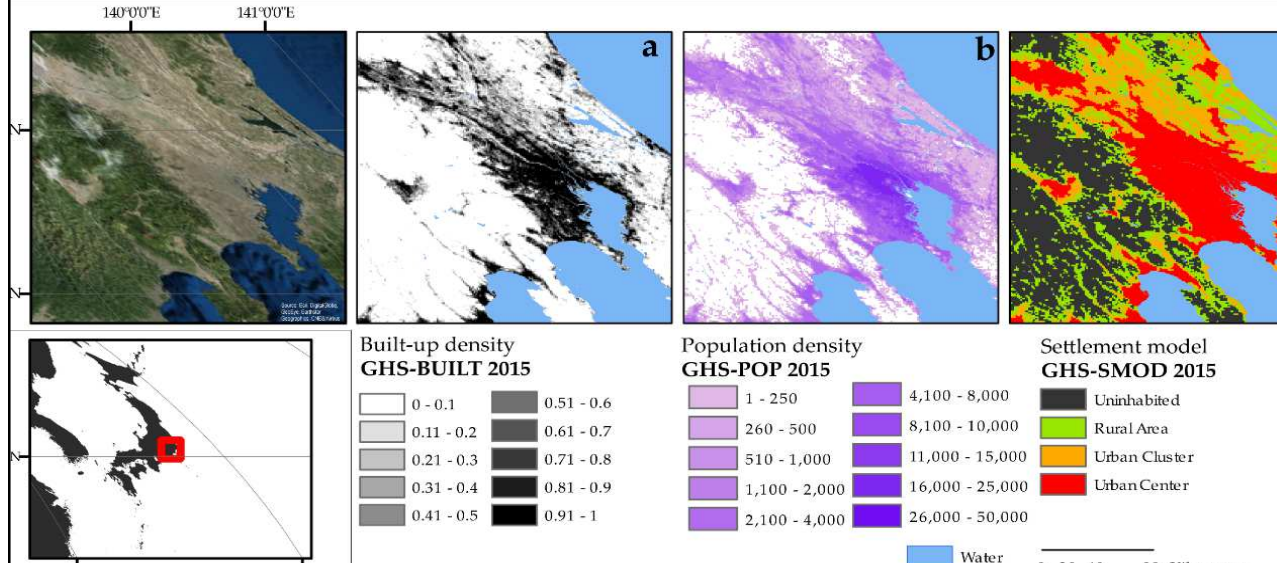
EO4SDGs

These Urban SDG indicators are very sensitive to the city boundaries

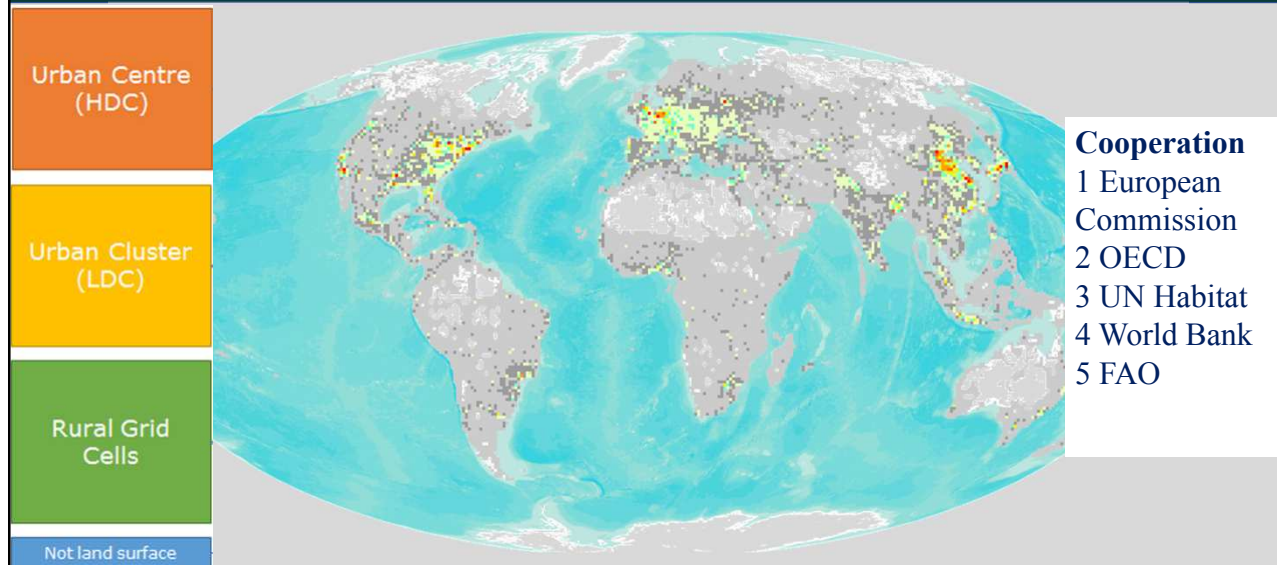
- 11.2.1 Proportion of population that has convenient access to public transport
- 11.3.1 Ratio of land consumption rate to population growth rate
- 11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities
- 11.7.1 Average share of the built-up area of cities that is open space for public use for all

	Population distr	Cities and infrastructure m	Elevation and to	Land cover and	Oceanographic	Hydrological an observations	Atmospheric an monitoring	Biodiversity and observations	Agricultural mo	Hazards, disaste environmental i
1 No poverty										
2 Zero hunger										
3 Good health and well-being										
4 Quality education										
5 Gender equality										
6 Clean water and sanitation										
7 Affordable and clean energy										
8 Decent work and economic growth										
9 Industry, innovation and infrastructure										
10 Reduced inequalities										
11 Sustainable cities and communities										
12 Responsible consumption and production										
13 Climate action										
14 Life below water										
15 Life on land										

Built-up and Population density, city outline



New degree of urbanization map





GHSL – City Centre Database

Geography

- Elevation
- Travel time to capital
- River basin
- Income class
- Name of the center
- etc.

Environment

- Climate
- Biome
- Temperature
- Precipitation
- Greenness
- CO₂ concentration
- PM2.5 emission

DRR – exposure to

- Flood
- Earthquake
- Storm surge
- Heatwave

Socio-economic

- Population
- Built-up areas
- GDP
- HDI
- Nighttime lights
- area

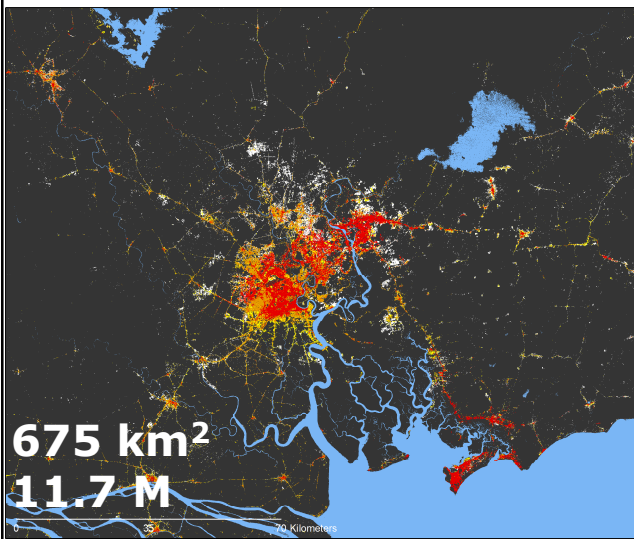
Estimate **3 SDG** indicators

Multi-temporal information
1975-1990-2000-2015

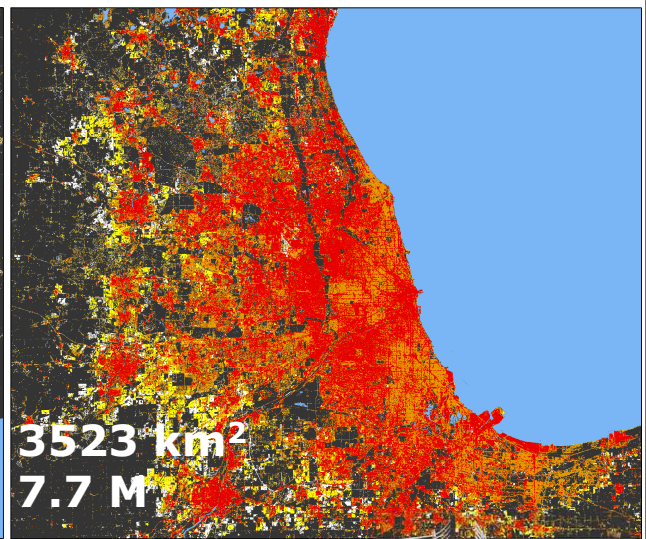
<http://ghsl.jrc.ec.europa.eu/ccdb2016Overview.php>

European Commission

Comparisons



Ho Chi Minh City, Viet Nam

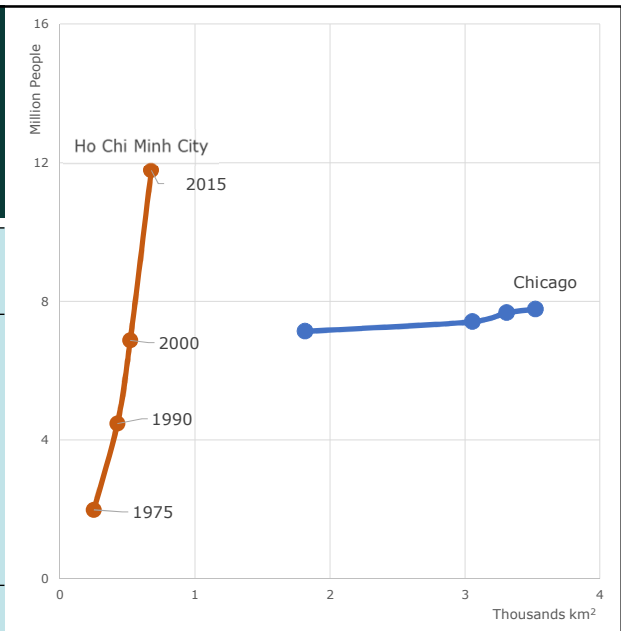


Chicago, USA




Sociospatial patterns of change 1975-2015

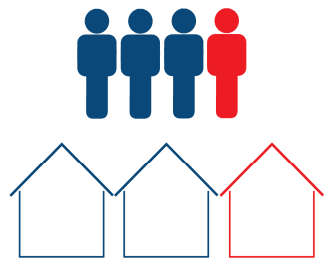
	Population	Built-up Areas
Ho Chi Minh City	6x	3x
Chicago	1x	2x



SDG 11.3.1



Year 1




Year 2


$$\frac{\text{Ln} \left(\frac{\text{Houses}_{\text{Year 2}}}{\text{Houses}_{\text{Year 1}}} \right)}{\text{Ln} \left(\frac{\text{Population}_{\text{Year 2}}}{\text{Population}_{\text{Year 1}}} \right)} = \text{LUE}$$


11 SUSTAINABLE CITIES AND COMMUNITIES

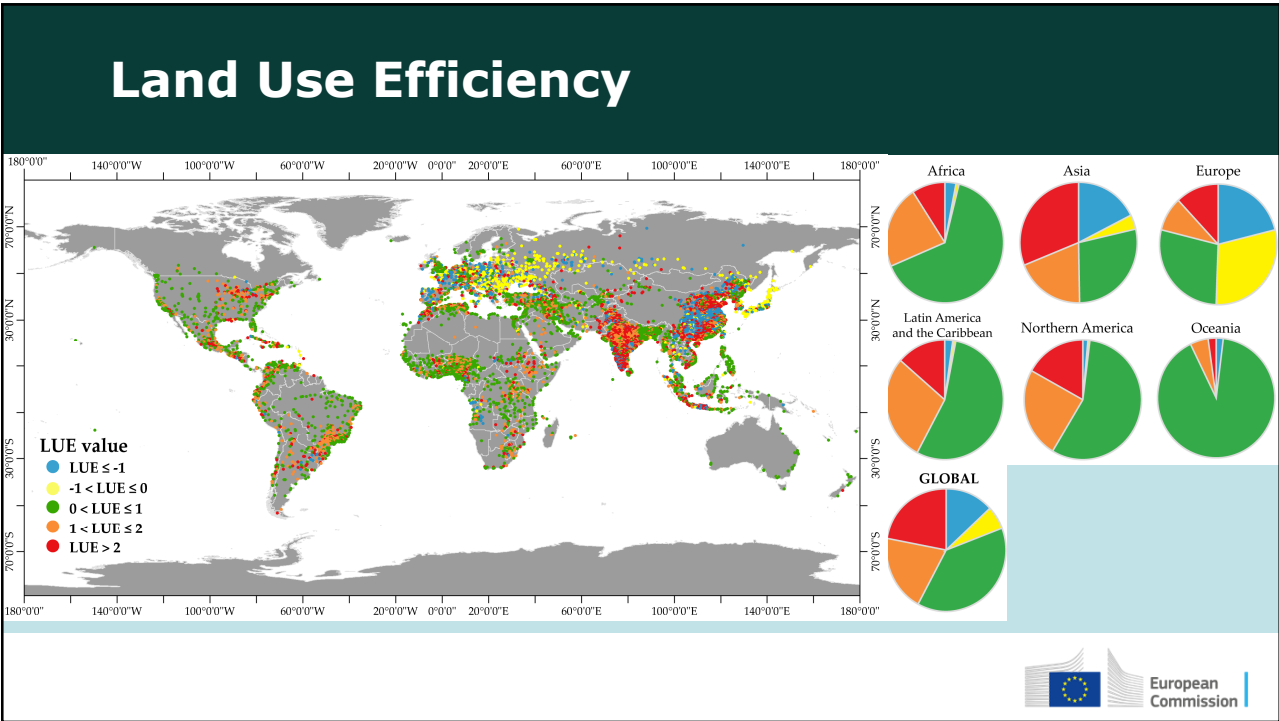
Ratio of land consumption rate to population growth rate

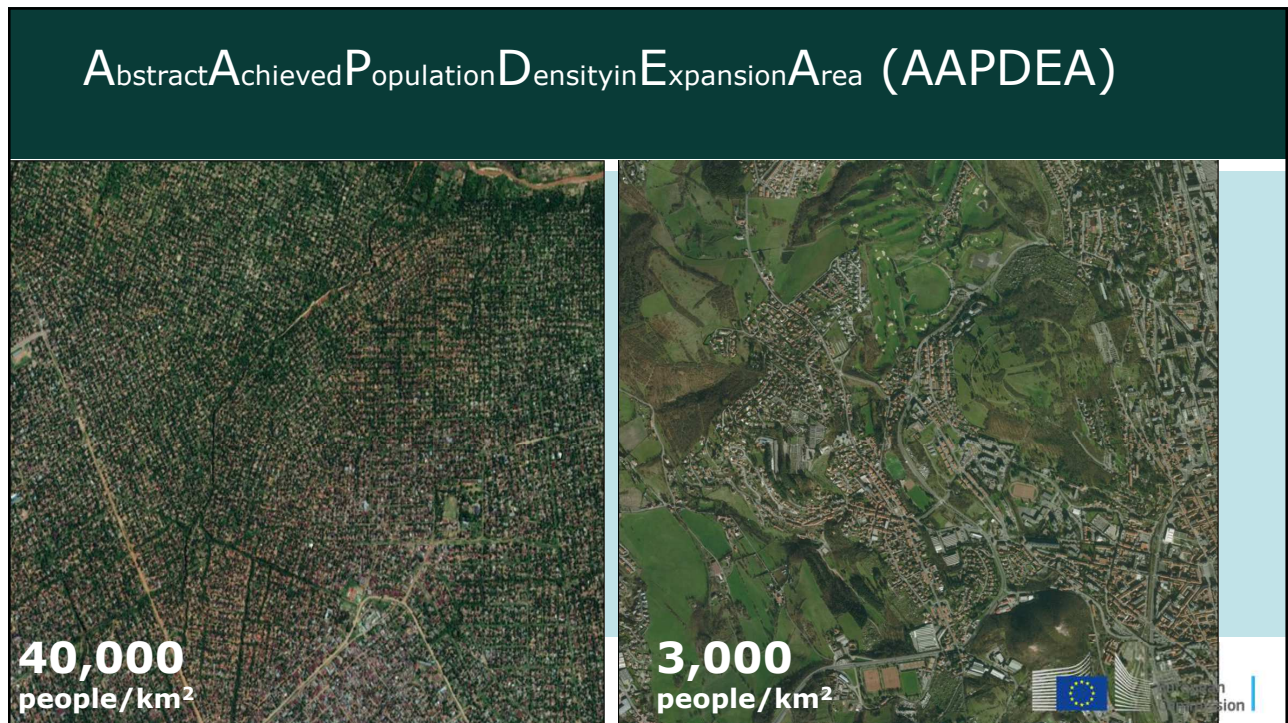
Tier II indicator

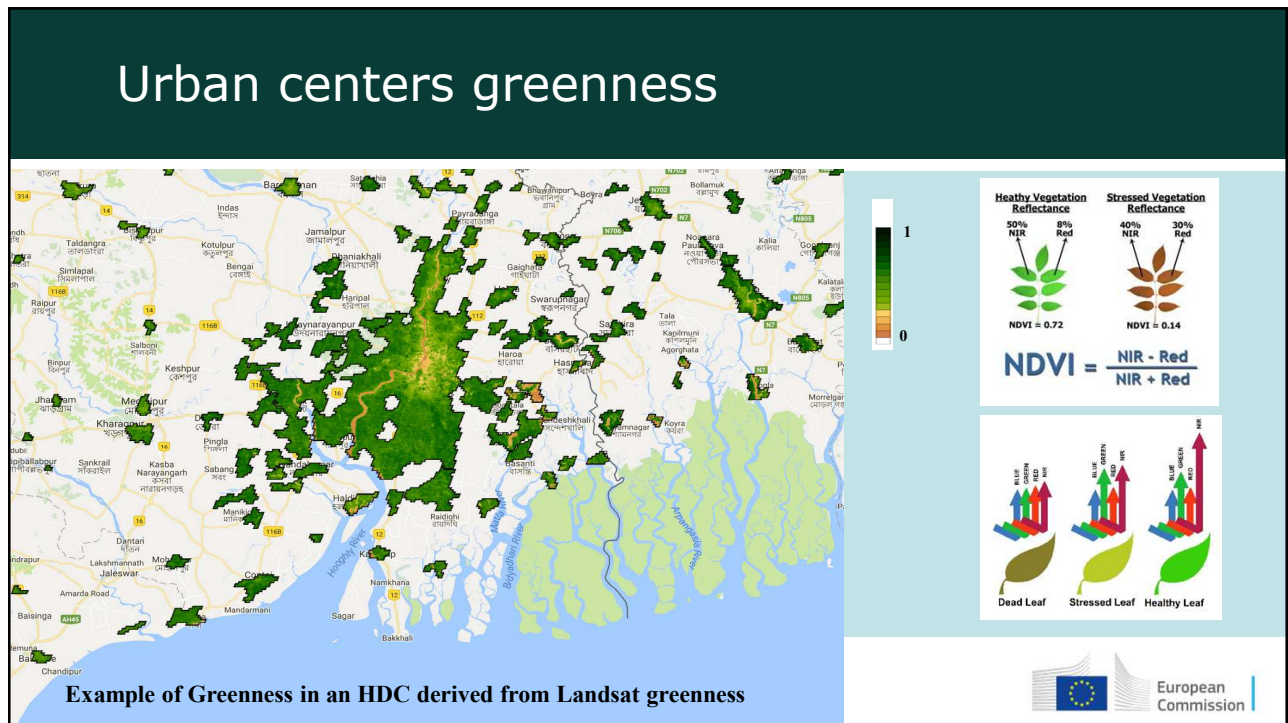




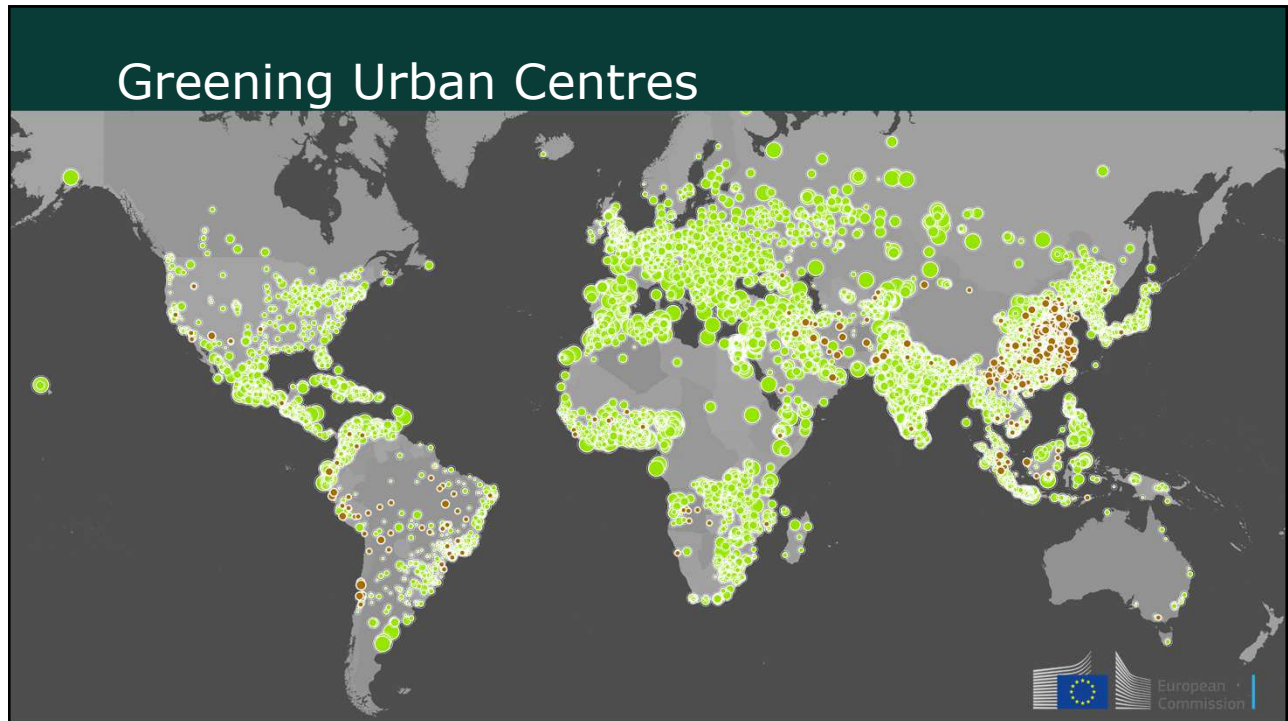
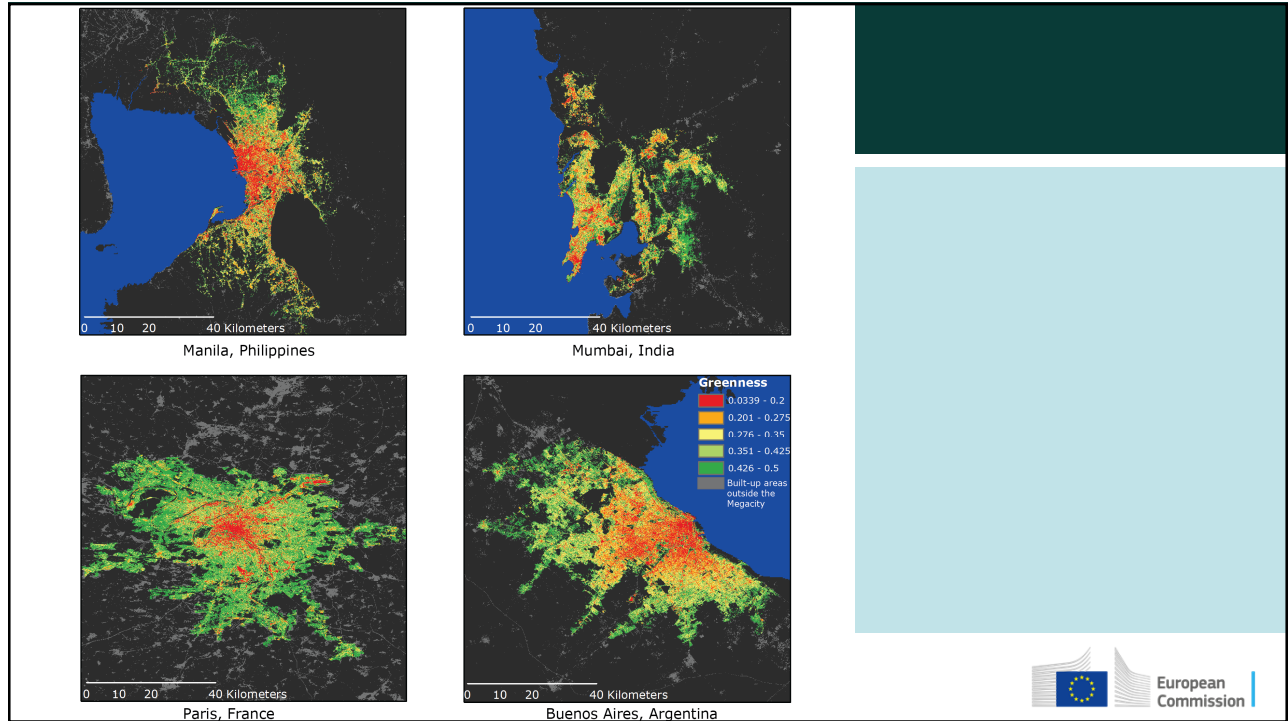




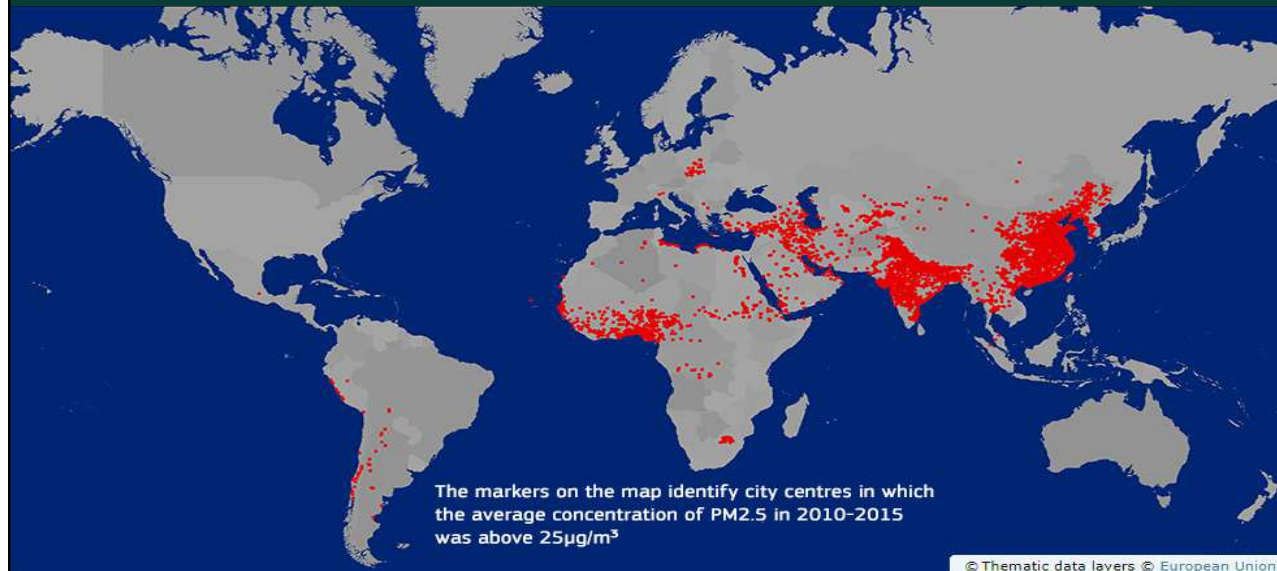




Example of Greenness in an HDC derived from Landsat greenness



PM2.5 concentration



Global Human Settlement Layer (GHSL)

The most complete, consistent, global, free and open data set on human settlements, from the village to the megacity, for the epochs 1975 – 1990 – 2000 – 2015

EUROPEAN COMMISSION
Global Human Settlement

Home | About | Copernicus | Documents | Atlases | Global Definition | Data | Tools | Visualisation | News

GHSL - Global Human Settlement Layer
A new open and free tool for assessing the human presence on the planet

- Produces new global spatial information, evidence-based analytics and knowledge describing the human presence on the planet
- Operates in an open and free data and methods access policy (open input, open method, open output)
- Supported by the Joint Research Centre (JRC) and the DG for Regional Development (DG REGIO) of the European Commission, together with the international partnership [GEO Human Planet Initiative](#) 

Geospatial World Excellence Award

News 11/09/2017 Degree of Urbanisation - New page of our website, contains country fact sheets used to inform the discussion on the "global harmonized definition of cities and settlements"

2014

Click here to find out about the technology behind this image

Full open free data and tools at <http://ghsl.jrc.ec.europa.eu>
<http://www.geoportal.org/>

GEO Human Planet Initiative

 GROUP ON
EARTH OBSERVATIONS

 European
Commission