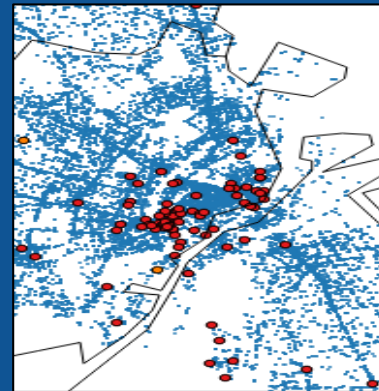
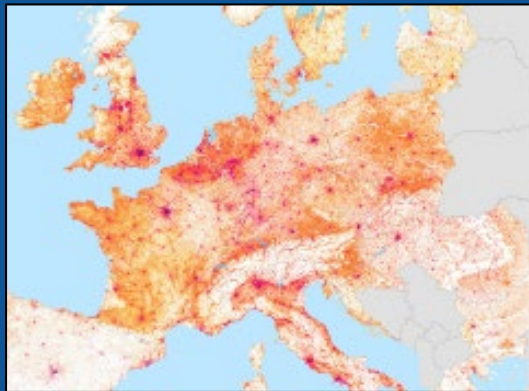
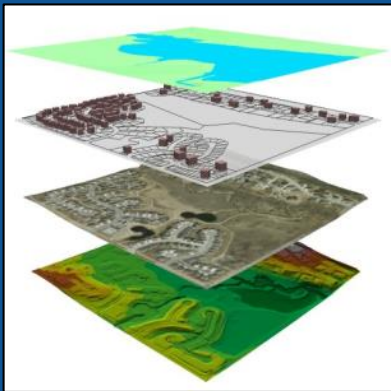


The use of geo-spatial data in official statistics



Eurostat - Regional statistics and geographical information - E4 - GISCO Team - Hannes I. Reuter

Expectation management

- *You will not be a Geospatial data experts but*
 - **You know a bit about geo domain**
 - **You know what is possible**
 - **You know whom to ask for help....**

Overview

- *Introduce Eurostat and GISCO services*
- *Explain that ANY information has a geographic location.*
- *Introduce GIS, data types, data providers – how to find data ?*
- *Know whom to contact for data, analytical tools and communities*
- *Types of geo-analytical tasks and visualizations*
- *Showcase Examples at MS and EU level*

Eurostat – statistical office of the EU

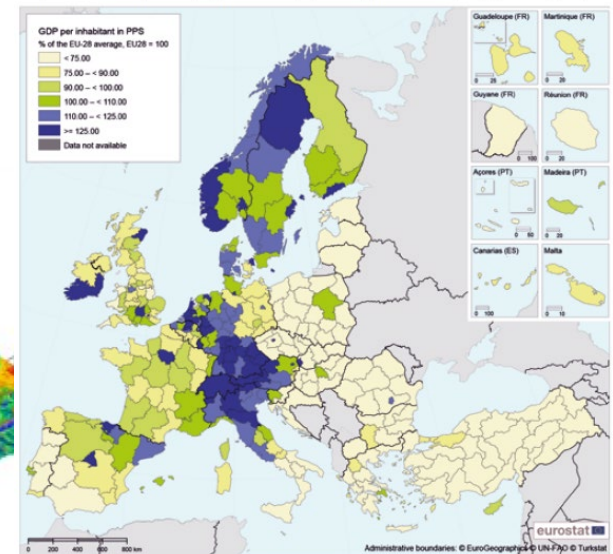
- *Statistical office of the European Union and part of the European Commission*
- *Chairs the European Statistical System (ESS)*
- *Prepares legislation on European statistics*
- *~ 800 staff, located in Luxembourg*



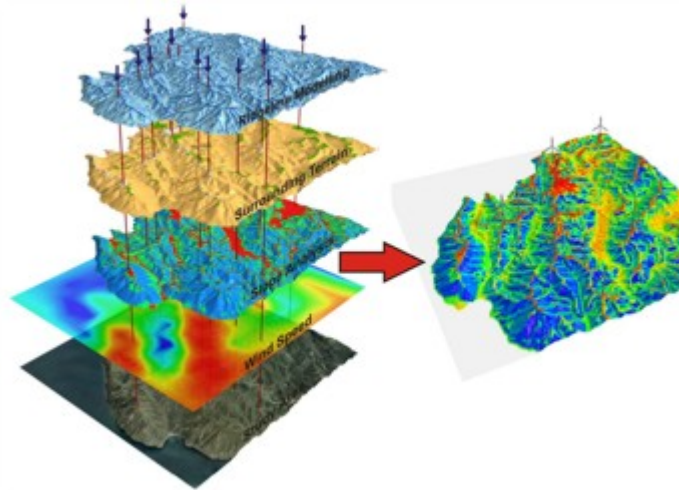
GISCO - the Geographic Information System of the Commission

visualise

Map 1: Gross domestic product (GDP) per inhabitant, in purchasing power standard (PPS), by NUTS 2 regions, 2011

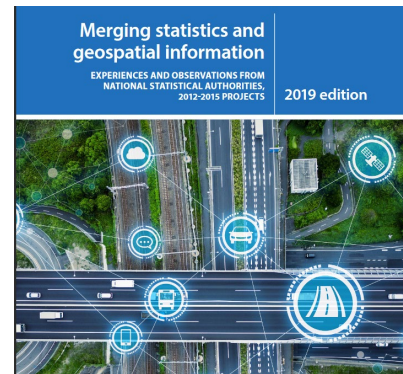


analyse



localise





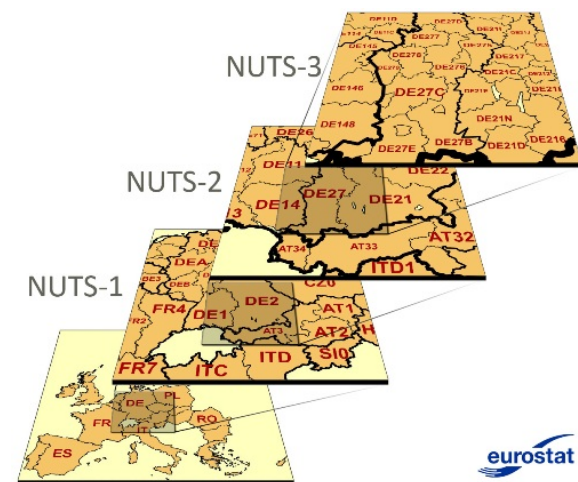
What is GISCO? - triple role

"GISCO is a permanent service of Eurostat that answers the needs of Eurostat and the European Commission for geographical information at the level of the European Union (EU), its Member States and regions."

- *Service provider for Eurostat*
- *Service provider for the European Commission (and the EU)*
- *Coordination and partnership with Member States*

Service provider to Eurostat and the European Commission+

- *Map making*
- *Spatial analysis projects*
- *Support statistical production*
- *Provision of Commission wide geospatial data, software and services*
- *GISCO reference database*
- *GISCO as coordinator of geospatial information use within the European Commission and Agencies*
- *Disputed Areas WIKI*



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- *Showcase Examples at MS and EU level*

Where are the most densely populated places in the EU ?

Figure 8.1: The most densely populated places in the EU, 2011 (*)
(inhabitants/km²)

Barcelona



Figure 8.1: The most densely populated places in the EU, 2011 ⁽¹⁾
(inhabitants/km²)

Barcelona



Paris



⁽¹⁾ The maps show the position of the three most densely populated 1 km² grid cells in the EU. France: 2010.

Source: Eurostat, GEOSTAT Population Grid 2011 (<http://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/population-distribution-demography>)

Every information has a geographic component

(even a legal text)

Geospatial data is essential for ...

Location - just as time - is a key factor in statistics for:

- **collecting,**
- **processing,**
- **storing,**
- **analysing and**
- **aggregating data.**

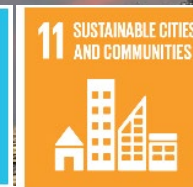
Statistics on a specific area help understanding the relevance of information.







Geospatial data is essential for statistics and evidence based policy making in the EU

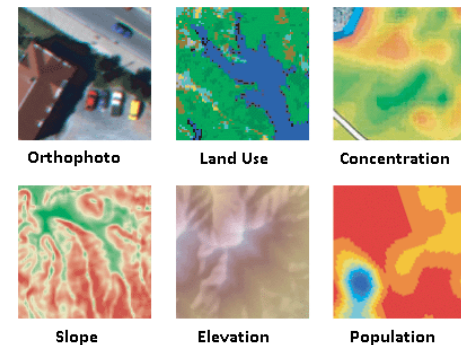
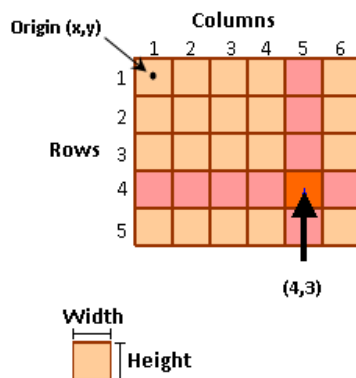
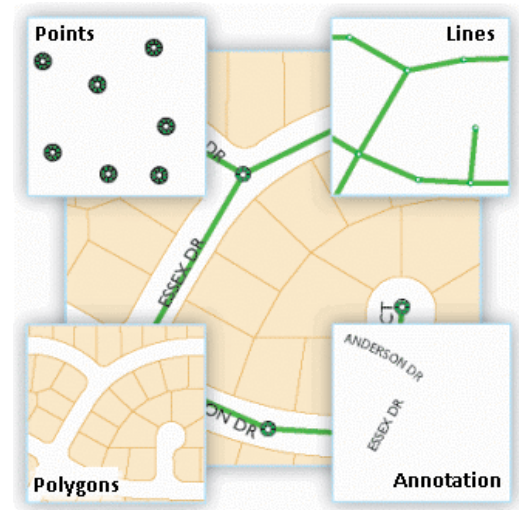


Overview

- *Introduce Eurostat and GISCO services*
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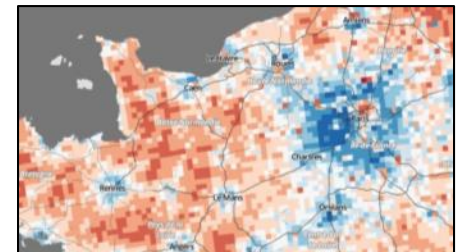
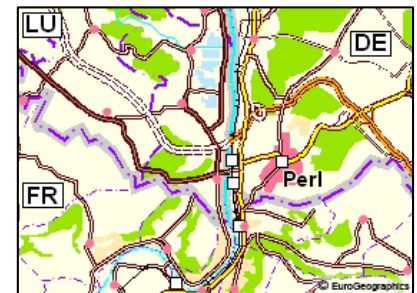
How to represent geographic information?

- *As features*
 - **Vector geometry**
 - **Properties/attributes**
- *As a grid*
 - **Gridded data, like an image**



GIS data sources

- *Topographic and cadastral data*
 - **NMCAs, [GISCO](#) and [EuroGeographics](#)**
- *Statistical data*
 - **NSIs and [Eurostat](#)**
- *Environmental data*
 - **National environmental agencies, [EEA](#)**
- *Geoportals and geocatalogues*
 - **National, European [EC](#)**
- *Open data portals*
 - **Example for [Luxembourg](#), [European Data Portal](#)**
- ...



Spatial data sharing infrastructures

- *INSPIRE - sharing geospatial information*
- *Open Data – sharing EU wide open data including geospatial information*



**EUROPEAN
DATA PORTAL**

INSPIRE Geoportal (MS data)



Welcome to the INSPIRE Geoportal

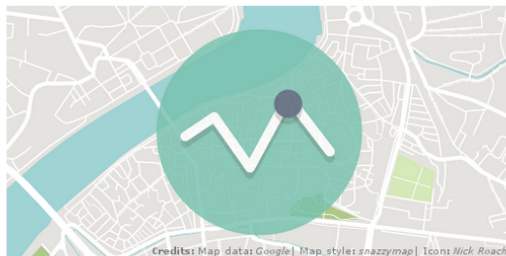
The INSPIRE Geoportal is the central European access point to the data provided by EU Member States and several EFTA countries under the INSPIRE Directive. The Geoportal allows:

- monitoring the availability of INSPIRE data sets;
- discovering suitable data sets based on their descriptions (metadata);
- accessing the selected data sets through their view or download services.

The metadata used in the Geoportal are regularly harvested from the discovery services of EU Member States and EFTA countries. The status of harvesting is available [here](#).

Feedback regarding the functionality as well as data set availability is welcome [here](#).

Priority Data Sets Viewer



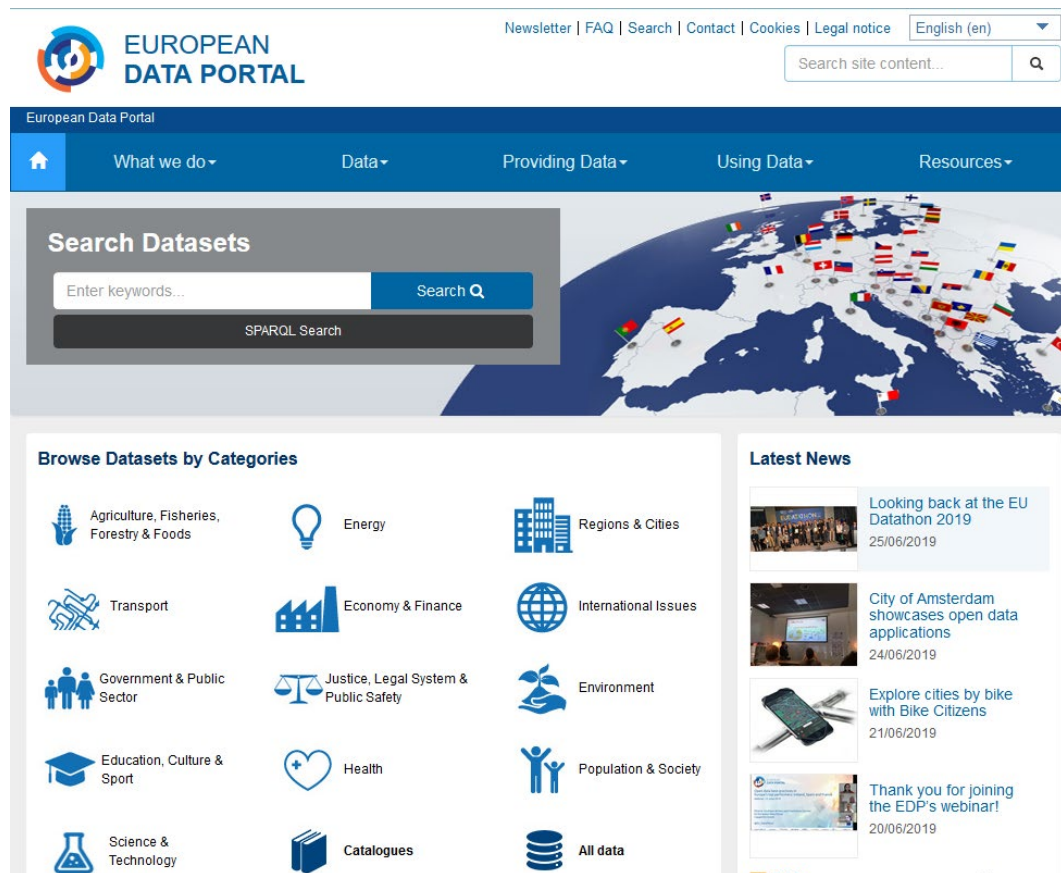
The application displays the availability and provides access to the selected priority data sets used for environmental reporting. It allows filtering by environmental domain, environmental legislation and country.

INSPIRE Thematic Viewer



The application displays the availability and provides access to all EU MS data sets falling under the scope of INSPIRE Directive filtered by data themes and countries (i.e. Annex I, II and III).

European Data Portal (MS data)



The screenshot shows the homepage of the European Data Portal. At the top left is the logo and name 'EUROPEAN DATA PORTAL'. To the right are links for 'Newsletter | FAQ | Search | Contact | Cookies | Legal notice' and a language selector set to 'English (en)'. Below this is a search bar with the text 'Search site content...' and a magnifying glass icon. A navigation bar contains links for 'Home', 'What we do', 'Data', 'Providing Data', 'Using Data', and 'Resources'. The main content area features a 'Search Datasets' section with a text input field 'Enter keywords...', a 'Search' button, and a 'SPARQL Search' button. To the right is a map of Europe with various national flags. Below the search section is a 'Browse Datasets by Categories' grid with 15 categories: Agriculture, Fisheries, Forestry & Foods; Energy; Regions & Cities; Transport; Economy & Finance; International Issues; Government & Public Sector; Justice, Legal System & Public Safety; Environment; Education, Culture & Sport; Health; Population & Society; Science & Technology; Catalogues; and All data. On the right side, there is a 'Latest News' section with four news items: 'Looking back at the EU Datathon 2019' (25/06/2019), 'City of Amsterdam showcases open data applications' (24/06/2019), 'Explore cities by bike with Bike Citizens' (21/06/2019), and 'Thank you for joining the EDP's webinar!' (20/06/2019).

European Union Data Portal (EU)

The screenshot shows the EU Open Data Portal interface. At the top, there is a navigation bar with links for Sitemap, Legal notice, Contact, and a language dropdown set to English (en). The main header features the EU flag and the text "EU Open Data Portal" with the subtitle "Access to European Union open data". Below this is a breadcrumb trail: "EUROPA > EU Open Data Portal > Data" and a "Share" button. A secondary navigation bar contains links for Home, Data, Applications, Linked data, Visualisation Catalog, Developers' corner, and About. The main content area is divided into several sections: a search bar with the placeholder "Search datasets..." and a magnifying glass icon; a section for "Show results with:" offering options "all of these words", "any of these words", and "the exact phrase"; a notification that "Total datasets available: 13725"; a "Suggest a dataset" box with the text "Is there any data you would like to find on the portal?" and a "Make a suggestion" button; a "Most viewed datasets" list with a "view all" link; and a "Browse datasets by subject or groups" section with a grid of icons for Agriculture, Economy and finance, Education, Energy, Environment, Government and public sector, Health, International issues, and Justice, legal system and public safety. A "more subjects" link is at the bottom of the grid.

EU Open Data Portal
Access to European Union open data

EUROPA > EU Open Data Portal > Data

Home Data Applications Linked data Visualisation Catalog Developers' corner About

Search datasets...

Show results with:
 all of these words | any of these words | the exact phrase

Total datasets available: 13725

Suggest a dataset
Is there any data you would like to find on the portal?
Make a suggestion

Most viewed datasets [view all](#)

- Tenders Electronic Daily (TED) – public procurement notices from the EU and beyond (66481 views)
- Consolidated list of persons, groups and entities subject to EU financial sanctions (60634 views)
- CORDIS – EU research projects under Horizon 2020 (2014–2020) (55966 views)
- DGT – Translation Memory (31122 views)
- EuroVoc, the EU's multilingual thesaurus (24227 views)
- CORDIS – EU research projects under FP7 (2007–2013) (22188 views)
- Transparency Register (21488 views)
- Tenders Electronic Daily (TED) (csv subset) – public procurement notices (18683 views)

Browse datasets by subject or groups

- Agriculture, fisheries, forestry and food
- Economy and finance
- Education, culture and sport
- Energy
- Environment
- Government and public sector
- Health
- International issues
- Justice, legal system and public safety

[more subjects](#)

Communities

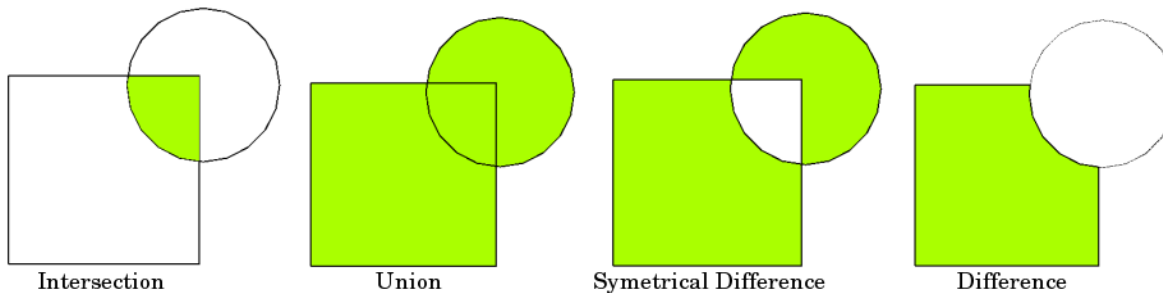
- *National Mapping Agency, [EuroGeographics](#), GISCO – WG, [INSPIRE groups](#), [OpenData groups](#)*
- *European Forum for Geography and Statistics ([EFGS](#)) with EFGS conference – Geostat project*
- *[UNGGIM:Europe](#) – Core Reference Data - [Meeting](#)*
- *UNECE events – NTTS conference*
- *Tools: Commercial (e.g. ESRI, MapInfo) and Open Source Communities (e.g. QGIS, Grass, SAGA, special libraries)*

Overview

- *Introduce Eurostat and GISCO services*
- *Explain that ANY information has a geographic location.*
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Geo-analytical tasks (I)

- *Basic geometrical operations:*
 - Distances, length, area
 - Intersection, union, difference
 - Buffering
 - ...

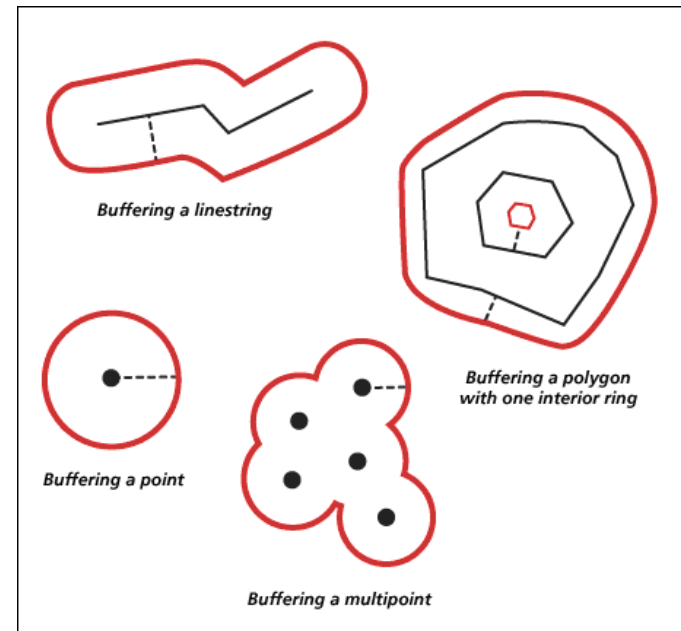


Intersection

Union

Symmetrical Difference

Difference



Buffering a linestring

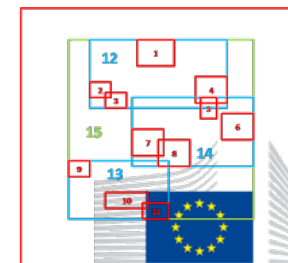
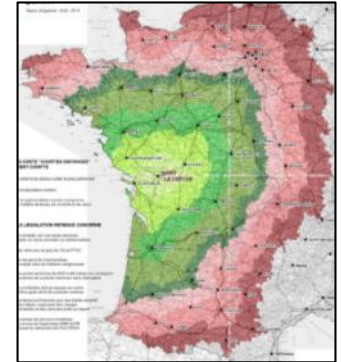
Buffering a polygon with one interior ring

Buffering a point

Buffering a multipoint

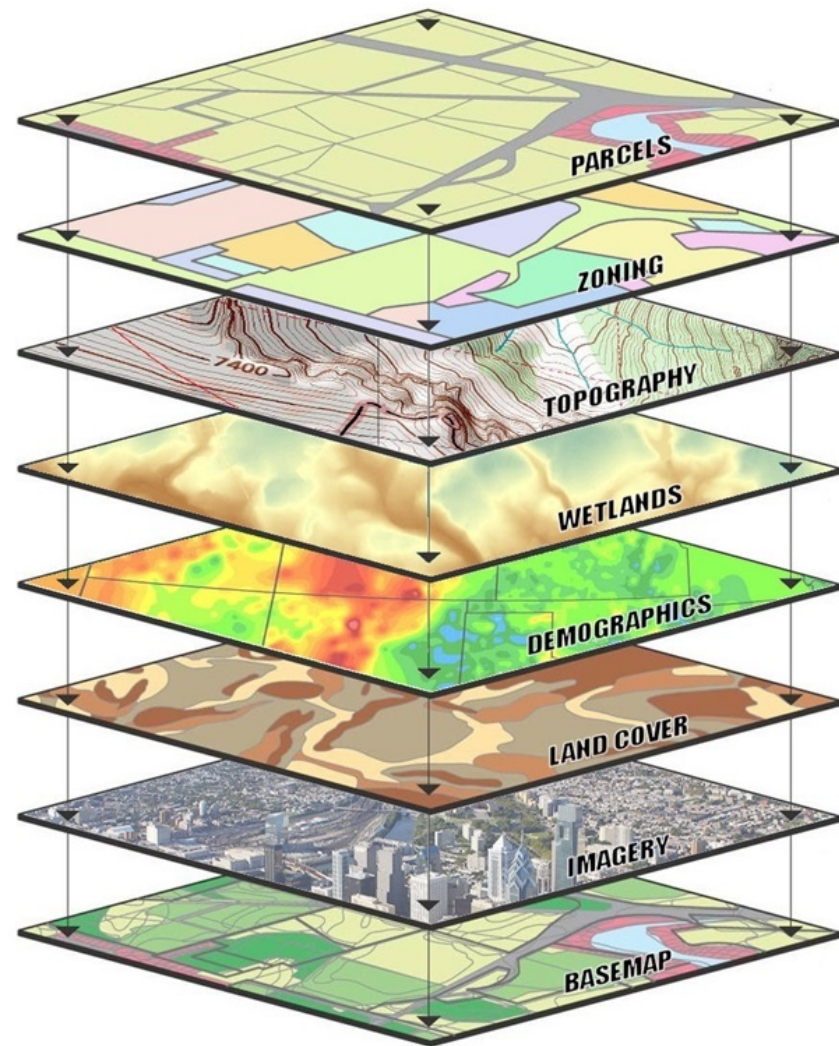
Geo-analytical tasks (II)

- *Network analysis*
 - **Topological queries**
 - **Routing: Shortest path computation, isochrone computation, etc.**
 - **Connectivity analysis**
- *Spatial interpolation*
- *Image processing*
- *Spatio-temporal and 3D analyses*
- *Spatial query optimisations (storage, spatial indexing, etc.)*



Geo-analytical tasks (III)

- *Spatial correlation*
- *Cross-thematic analyses*
- *Information value is not only in each single data layer but rather in their combination*
- *Data "mash-up"*



Geo-analytical tasks (IV)

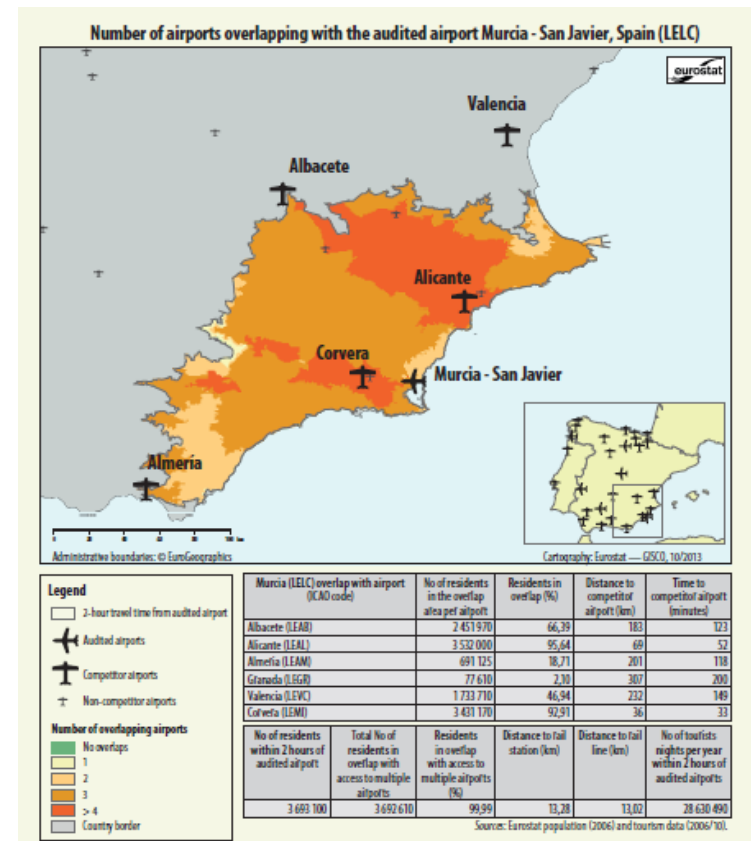
- Road / Railway / Maritime Distance Matrices
- Accessibility analysis
- Generalization of map products

Empty and unused airport infrastructures

The cargo project at Thessaloniki airport in Greece involved building two new cargo terminal buildings, the renovation of two existing cargo buildings and the construction of a parking area. The two newly built cargo buildings remained empty (see Picture 7), and only one of the two renovated cargo buildings was in regular use at the time of the audit visit (EU funds involved: 7 million euro). There was no evidence of any study being carried out to demonstrate a need to extend capacity for air cargo in the region.



Picture 7 — One of the two new cargo buildings at Thessaloniki airport which were empty at the time of the audit visit



https://www.eca.europa.eu/Lists/ECADocuments/SR14_21/QJAB14021ENC.pdf

Visualisation

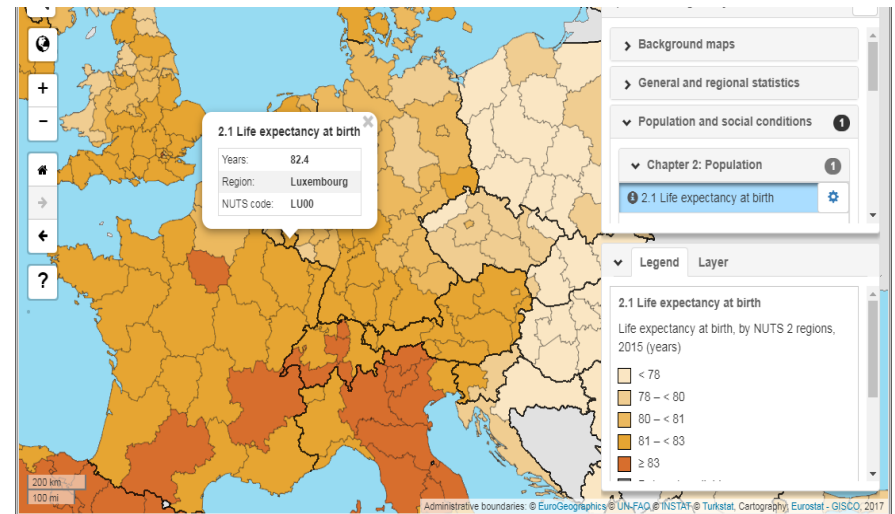
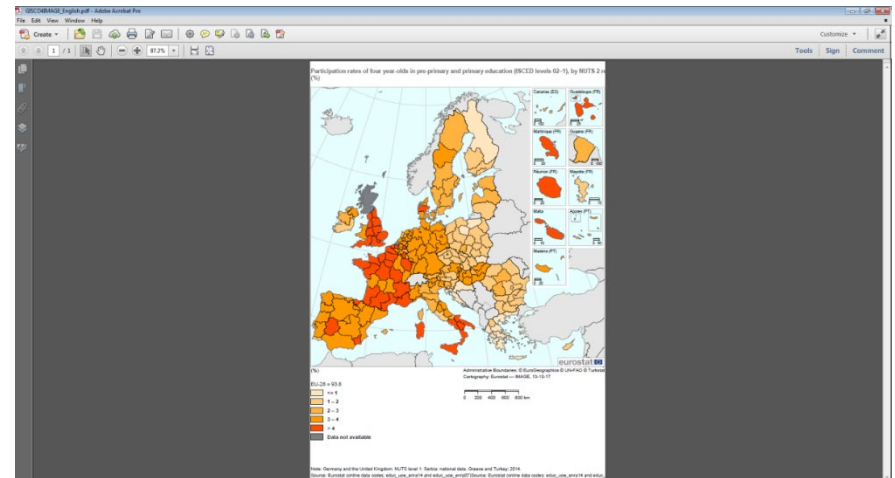
Static / Dynamic

Audience

Target

Message

Tools



Overview

- *Introduce Eurostat and GISCO services*
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The use of geo-spatial data in official statistics

Every statistical officer uses geospatial information on an everyday basis for the production of official statistics !

Census

FSS

LFS

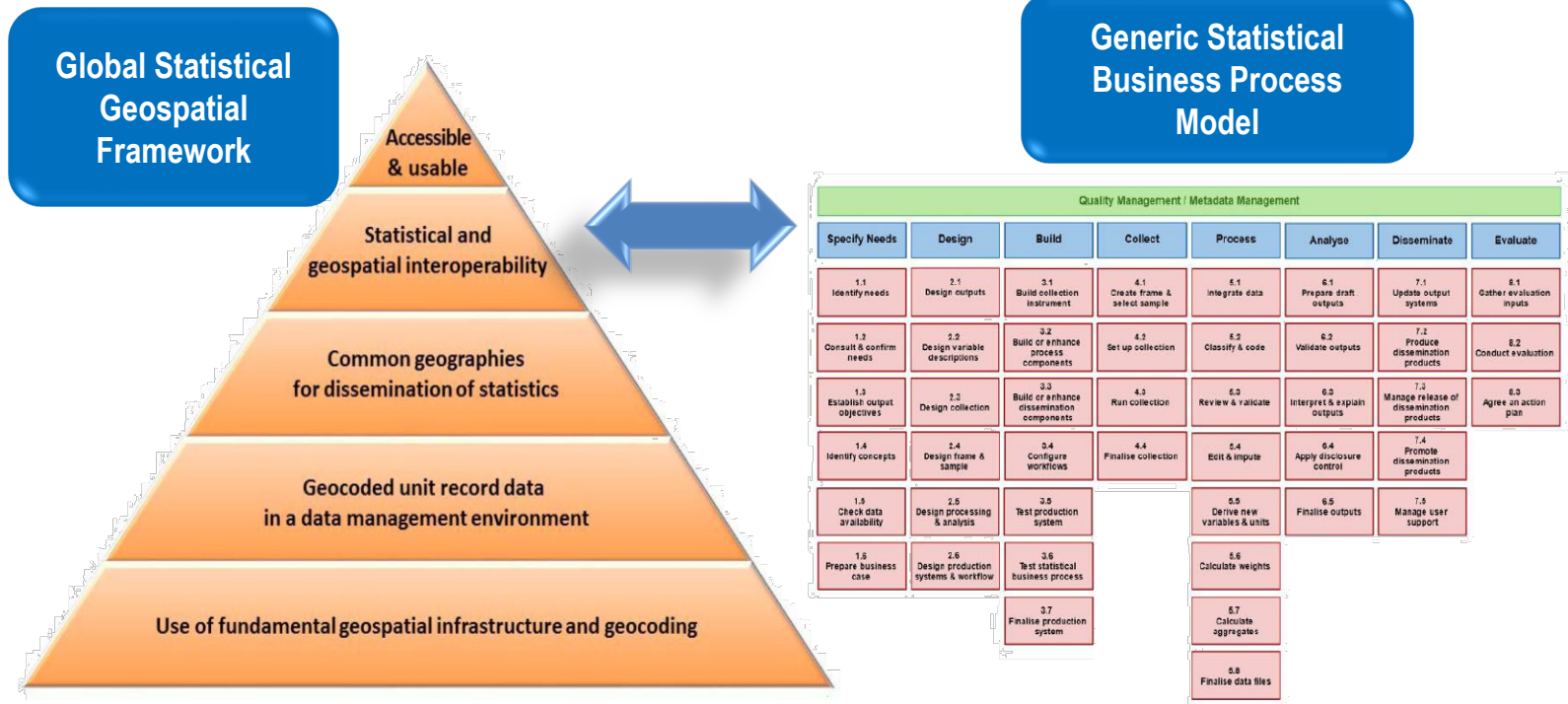
Business Register

**Every information
has a geographic
component**

(even a legal text)

Enhancing the generic business process model to integrate GSGF into the GSBPM

GEOSTAT-3: Implementation guide for the GSGF Europe



Supporting the Integration of Statistics and Geospatial data

Figure 2: Service areas within 30 minutes driving time of an emergency medical care centre

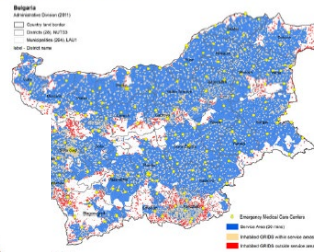


Figure 2: Commuting distance and median time

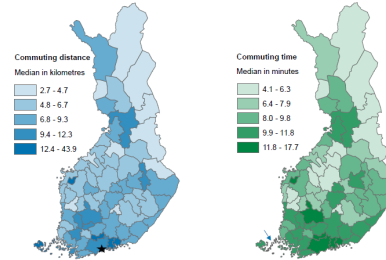
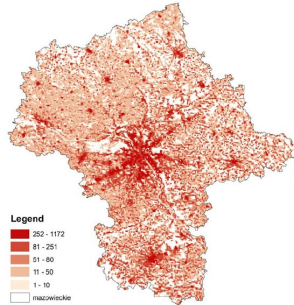


Figure 6: Number of single-family houses/ km²



2012 - 2019
Over 40 national projects on merging statistics and geospatial information supported by Eurostat

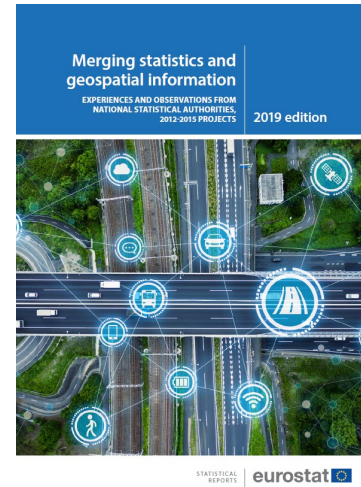
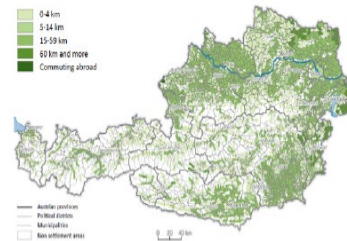


Figure 1: Most frequent distance travelled by economically active commuters, 2013



Note: Vienna is presented as one municipality.
 Source: Labour market register, Statistik Austria

Figure 1: Example of spatial visualisation of demographic data, Poland

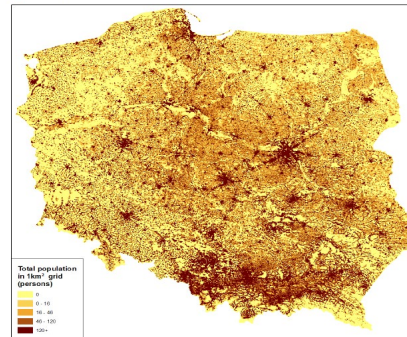
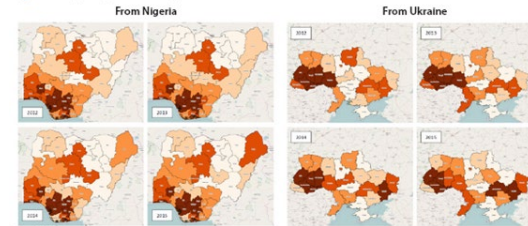


Figure 1: Migratory flows to Italy, 2012-2015



Source: ISTAT

Examples from Memberstates (HU)

Figure 1: Example of the geostatistical system created within the Hungarian Central Statistical Office

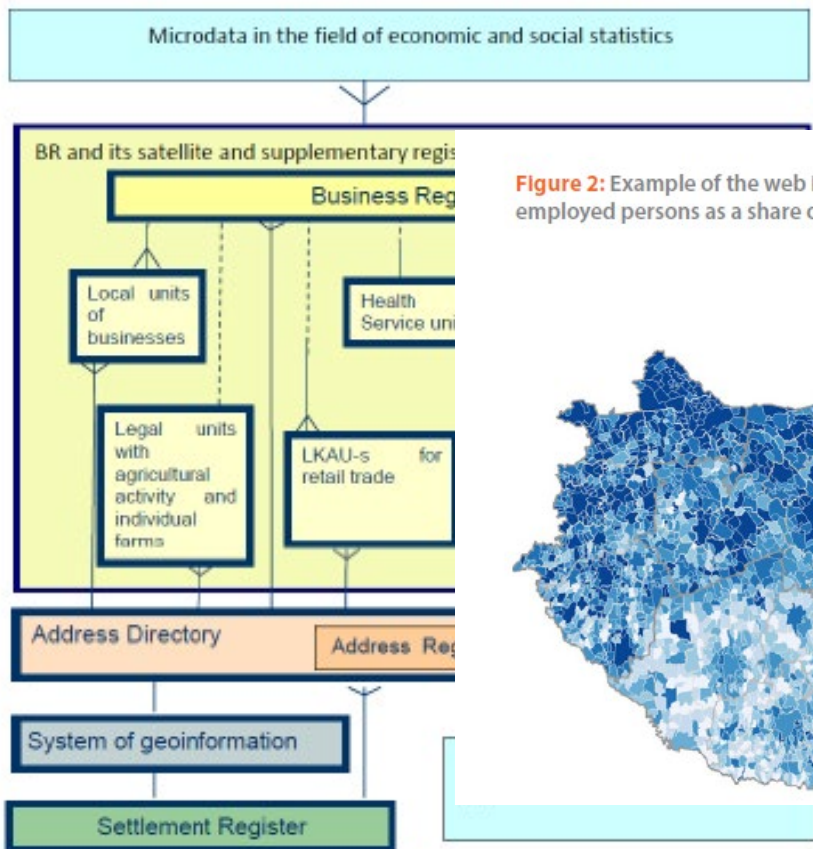
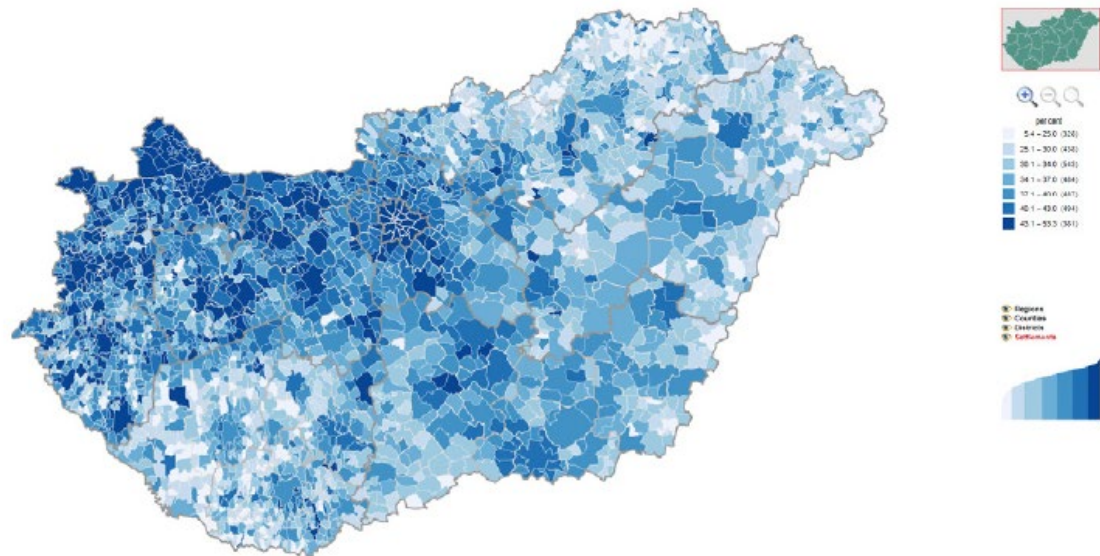


Figure 2: Example of the web interface developed by the HCSO showing results of the 2011 census detailing employed persons as a share of the resident population, by settlement



Examples from Memberstates (RO)

Figure 1: Organisation of the project

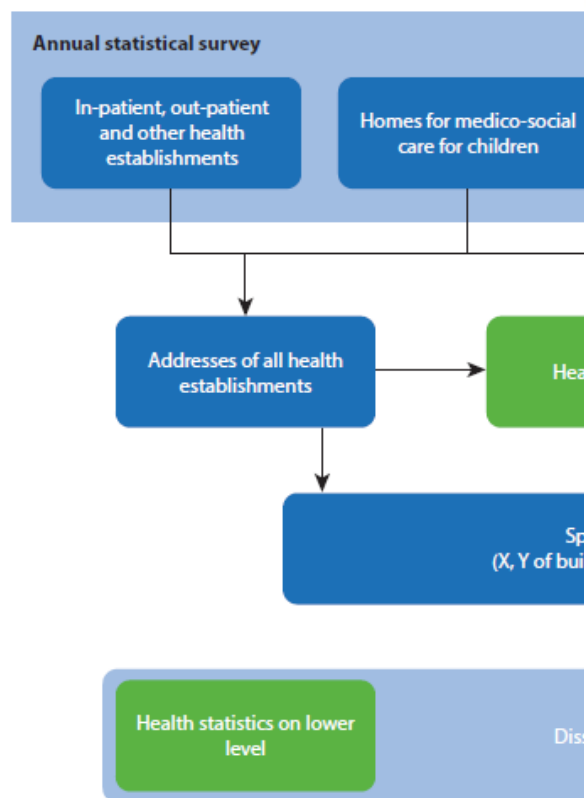
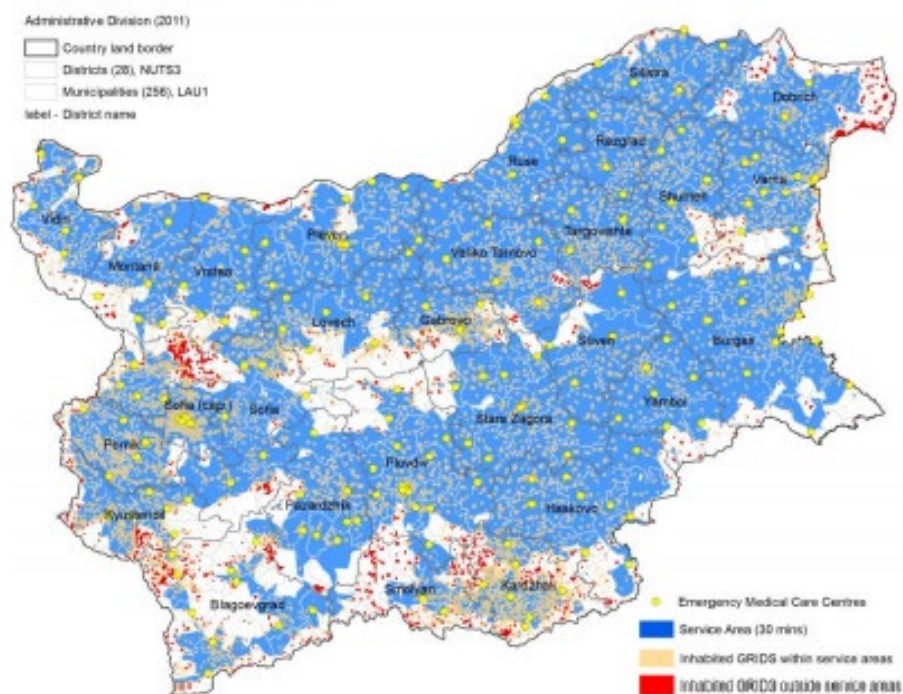


Figure 2: Service areas within 30 minutes driving time of an emergency medical care centre



Source: Statistics Bulgaria

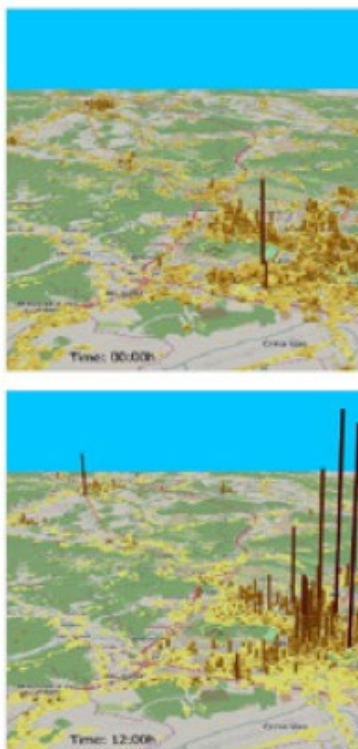
Examples from Memberstates (EE)

January

July

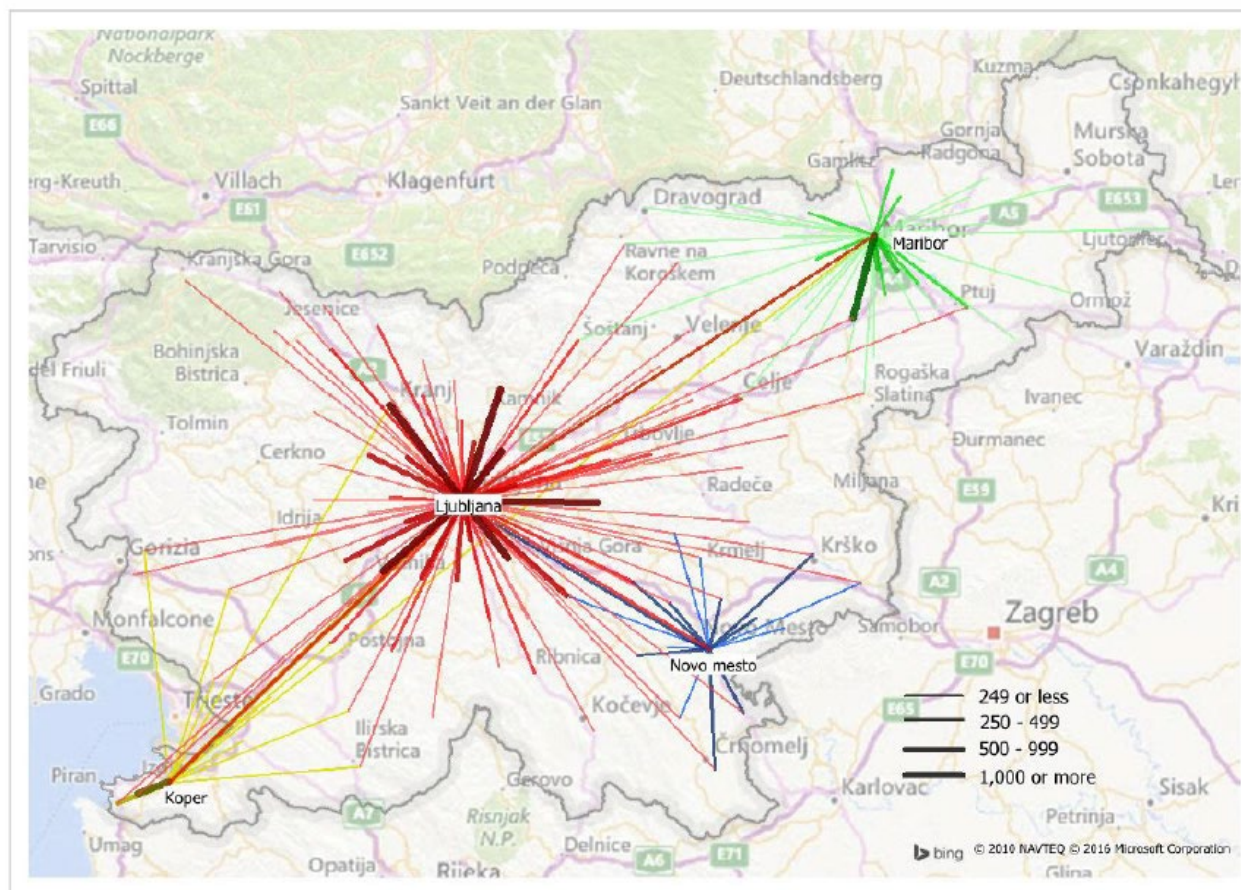
Examples from Memberstates (SI)

Figure 2: Estimated population, Ljubljai



Source: SURS

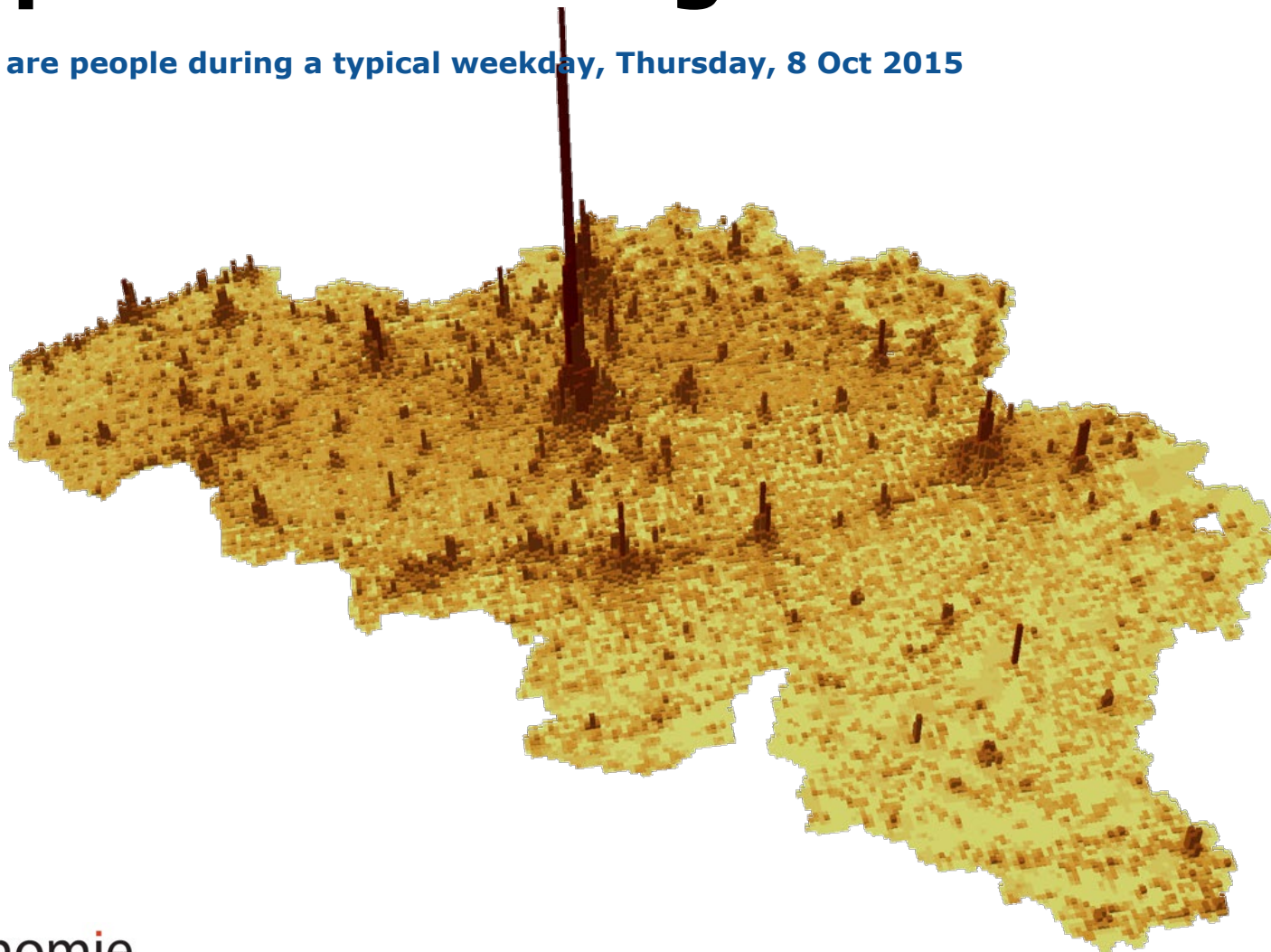
Figure 3: Attractiveness in terms of daily commuter inflows, 2015



Source: SURS

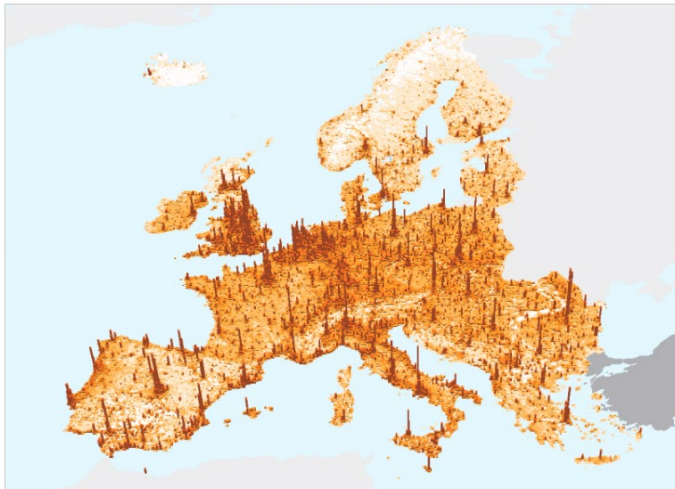
Population: at Night - at Noon

Where are people during a typical weekday, Thursday, 8 Oct 2015



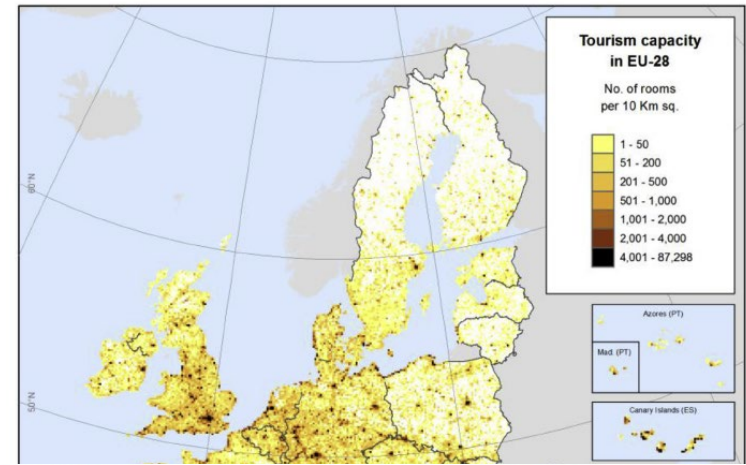
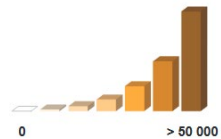
Gridded Statistics

Population density based on the GEOSTAT population grid, 2011
(number of inhabitants/10 km²)

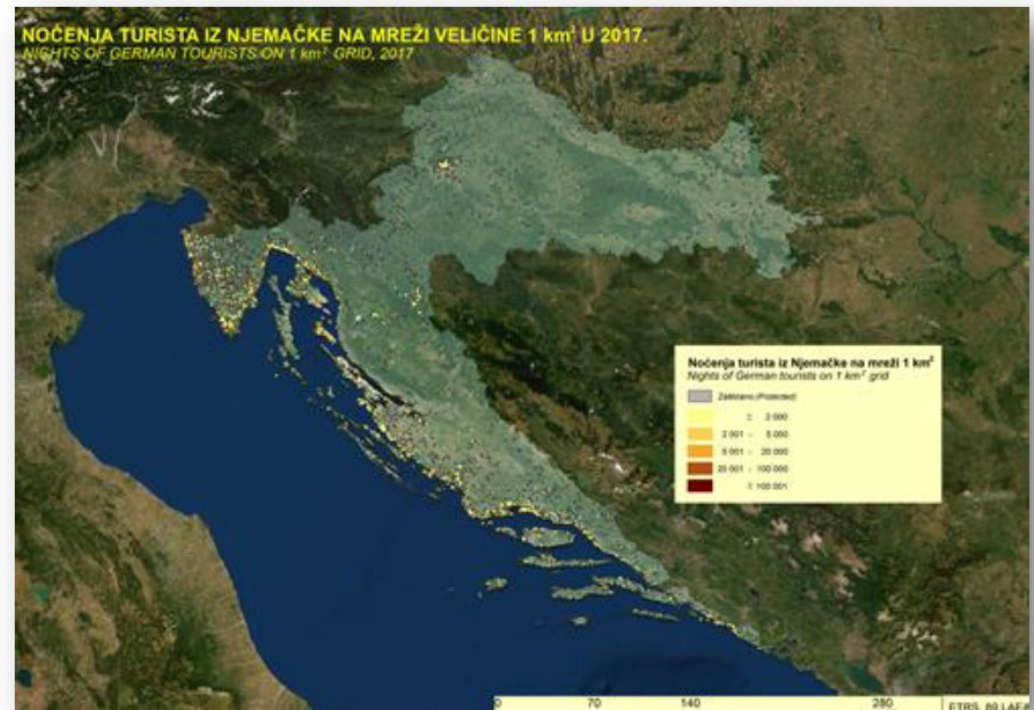


(number of inhabitants/10 km²)

Administrative boundaries: © EuroGeographics
Cartography: Eurostat — GISCO, 06/2011



Picture 3 NIGHTS OF GERMAN TOURISTS ON 1 km² GRID, 2017

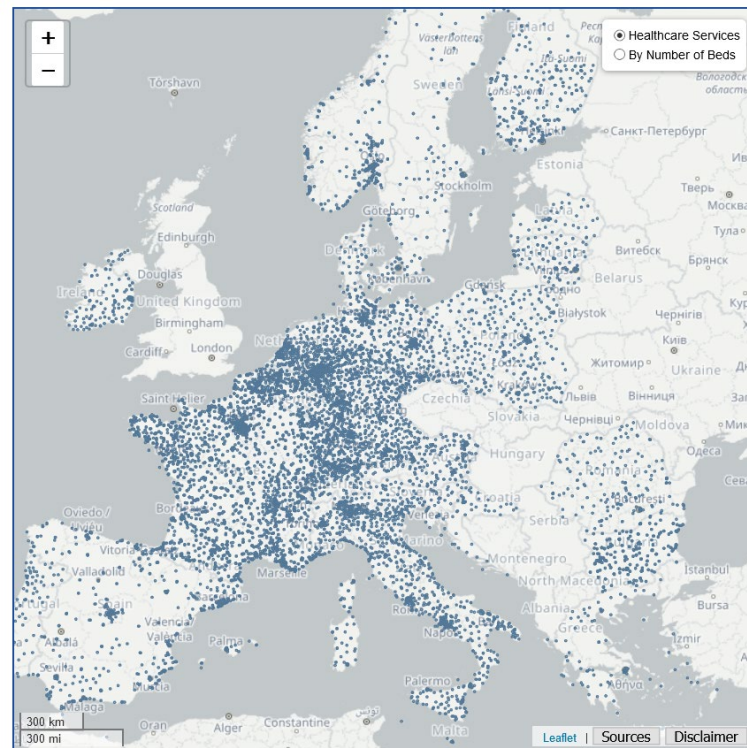


Locations of Healthcare facilities in EU

geolocalised healthcare information to facilitate spatial analyses at European level for European Commission services and other GIS users.

The data is extracted from official national registers and may contain inconsistencies or inaccuracies.

Not all European countries are currently included, however the coverage is being improved progressively.



What did you learn ?

- *Every information has a location*
- *Knowledge about the type and use of geospatial data, analytical task and visualizations*
- *Know whom to contact – Where to look for data*

- *Examples from the use of geospatial information at Member State and the European Union for official statistics*

Thanks !

Email: ESTAT-GISCO@ec.europa.eu

Data: <https://ec.europa.eu/eurostat/web/gisco>