



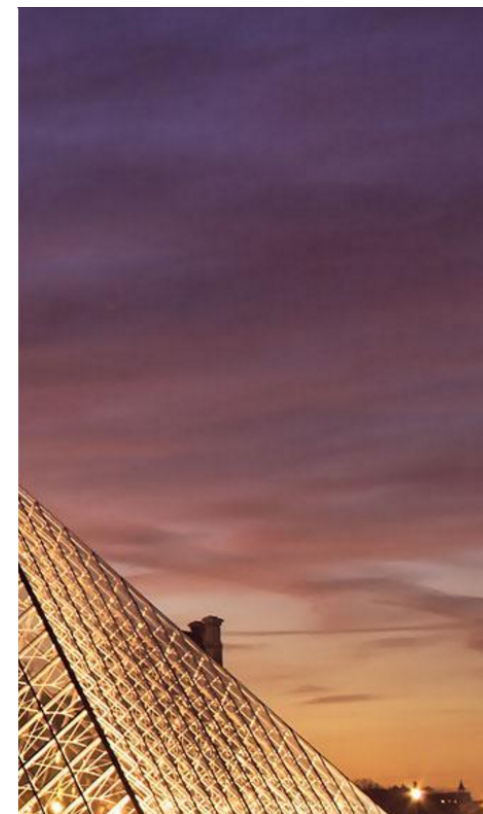
## European forum for geography and statistics 2016 conference

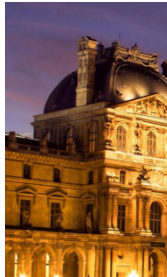


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Paris, France, 15 - 17th November  
2016

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European forum for geography and statistics 2016 conference



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LARS H. BACKER PRIZE VENUE EFGS 2017

Paris, France, 15 - 17th November 2016

<https://www.efgs2016.eu/>

Gestión de la geografía del censo

Difusión de datos. Algunos ejemplos

UN-SDG Y UN-GGIM

Cooperación entre agencias estadísticas y de cartografía

Integración de la geografía en el proceso de producción estadística

Estadísticas medioambientales

Análisis Geoespacial. Algunos ejemplos

Big data y observación terrestre en la estadística oficial

EFGS2016 - European Forum for Geography and Statistics Conference Paris 2016



Time	Programme Activity	Speaker Chair	Organisation Institution
08:30-09:30	Registration		
09:30-10:30	Conference opening	Sylvie Lagarde*	Statistics France
09:30-09:45	Welcome Speech by the Director General of INSEE	Jean-Luc Tavernier	Statistics France
09:45-10:00	Welcome Speech by the Director General of IGN	Daniel Buisson	IGN
10:00-10:15	Welcome Speech by the President of EFGS	Jana Krystovicova	Central Statistical Office
10:15-10:30	Welcome Speech by the representative of Eurostat	Stefhard Petri	European Commission
10:30-11:00	Coffee Break		
11:00-11:30	Keynote: Data integrator for mapping and monitoring the SDGs	Linus Bråttström	Statistics Sweden
11:30-11:45	Introduction by chair	Pier-Giorgio Zachvedu	Federal Agency for Cartography and Geodesy
11:45-11:55	Progress on the Global Statistical Geospatial Framework	Martin Brady	Australian Bureau of Statistics
11:55-12:15	Progress of UN-GGIM: Europe Working Group A on Flow Data	Dominique Laurent	IGN
12:15-12:30	UN-GGIM: Europe Work Group B on Data Integration - Support of the better integration of geospatial information and statistics and the UN SDG monitoring	Pier-Giorgio Zachvedu	Federal Agency for Cartography and Geodesy
12:35-12:55	Monitoring Agenda 2030 through a geospatial lens	Marie Haldrup	Statistics Sweden
12:55-13:05	Summing up by chair	Pier-Giorgio Zachvedu	Federal Agency for Cartography and Geodesy
13:05-14:00	Lunch Break		

EFGS2016 - European Forum for Geography and Statistics Conference Paris 2016



Time	Programme Activity	Speaker Chair	Organisation Institution
08:30-09:45	Session 4: Management of census geography		
08:30-09:45	Introduction by chair	Caroline Escapa	Statistics France
08:35-08:55	Improving quality and adding value of geostatistical units	Ignacio Dupon	Statistics Spain
08:55-09:15	Statistical Canada, Territorial and Spatial Opportunities	Elaine Cartwright	Statistics Canada
09:15-09:45	Egyptian Experience in integrating statistical and geospatial information	Muhammad Ali Alwan	Central Agency for Public Mobilization and Statistics (CAPMAS), Egypt
09:35-09:45	Summing up by chair	Caroline Escapa	Statistics France
09:45-10:40	Session 5: Environment Statistics		
09:45-09:50	Introduction by chair	Patrick Sibard	French Ministry of the Environment, Energy and Marine Affairs
09:50-10:10	Completion of land-use statistics using GIS	Evel Vågnes	Statistics Norway
10:10-10:30	Integrated systems of natural capital and ecosystem services accounting in the EU - an introduction to the project from a geospatial perspective	Elshard Petri	European Commission
10:30-10:40	Summing up by chair	Patrick Sibard	French Ministry of the Environment, Energy and Marine Affairs
10:40-11:00	Coffee Break		
11:00-11:40	Keynote: Why does using individual and geospatial data matter in urban environmental planning?	Floris Philippe Godeaux	Lyon University, Sciences Po Paris
11:40-11:45	Introduction by chair	Jerker Moström	Statistics Sweden
11:45-12:05	Session 6: Big data and Earth observation data in official statistics		
11:45-12:05	Introduction by chair	Jerker Moström	Statistics Sweden
11:45-12:05	Estadísticas ambientales: IA SAR and Sentinel-2A SAR Data for Global Urban Services	Yilang Ben	KTH Royal Institute of Technology
12:05-12:25	Capitalist_2016plus - Analysis of CO2Emissions: remote sensing data for areal statistical purposes	Stephan Arnold, Thomas Wirth	Federal Statistical Office (DESTATIS), Germany
12:25-12:45	Collaboration to produce official statistics from satellite data products from the Australian Bureau of Statistics	Martin Brady, Matt Jellie, Richard Duncanson	Australian Bureau of Statistics
12:45-13:00	Coffee Break		

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Time	Programme Activity	Speaker Chair	Organisation Institution
14:00-15:30	Session 6: Big data and Earth observation data in official statistics (continued)		
14:00-15:30	Integrating Geography and Statistics, but what about Earth Observation?	Ola Nordbeck	Norwegian Space Centre
14:00-14:20	Missing Mobile Phone Data to Recognize Urban Areas	Stéphanie Combes, Marie-Hélène de Bédon, Maarten Vanhoof, Thomas Péroz	Statistics France; Orange Labs - University of Newcastle, United Kingdom
14:20-14:40	Global Population Distribution: a continuum of modeling methods	Ging Yennan, Kyri MacManus	CESIS, Columbia University, USA
14:40-15:00	Merging big data and official statistics for modelling statistical commuting	Ging Yennan, Pasi Piikari	CESIS, Columbia University, Statistics Finland
15:00-15:20	Summing up by chair	Jerker Moström	Statistics Sweden
15:20-15:30	Coffee Break		
15:30-16:00	Session 7: Geospatial Analysis Best practices 1		
15:30-16:00	Introduction by chair	Ng Siaw Yong	Singapore Land Authority
16:00-16:05	Exploring Europe's border areas with the help of geostatistics	Hugo Poolman	European Commission - DG Regional and Urban Policy, Belgium
16:05-16:25	Fly across the boundary: A tracing of actual movements in air transportation network	Dongkun Yim, Suhyung Kang	Department of Geography, Seoul National University, South Korea
16:25-16:45	Income levels and inequality in metropolitan areas: a comparative approach in OECD countries	Justine Bouland, Monica Brezzi and Paolo Venuti	Regional Development Policy Division, OECD, France
16:45-17:05	Summing up by chair	Ng Siaw Yong	Singapore Land Authority
17:05-17:25	Conference Dinner - sponsored by INSEE and IGN		

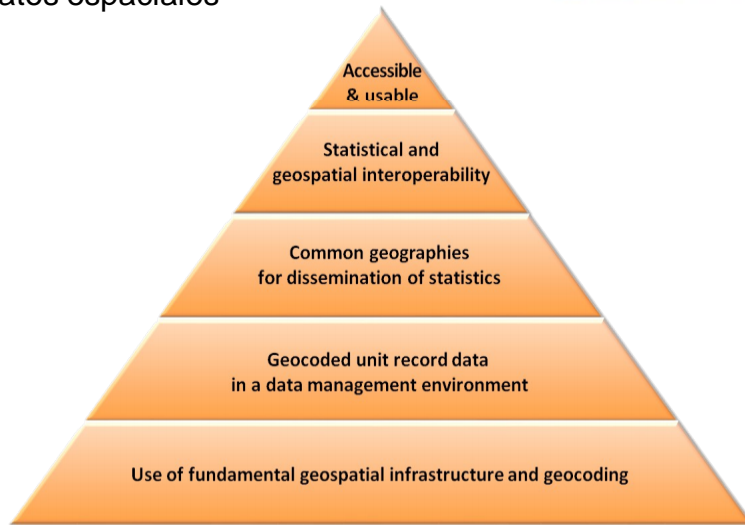
EFGS2016 - European Forum for Geography and Statistics Conference Paris 2016





### UN-GGIM: Europe WG B on Data Integration Support of better integration of geospatial information and statistics and the UN SDG monitoring

Estrategia nacional de datos espaciales/ Estrategia Europea de datos espaciales

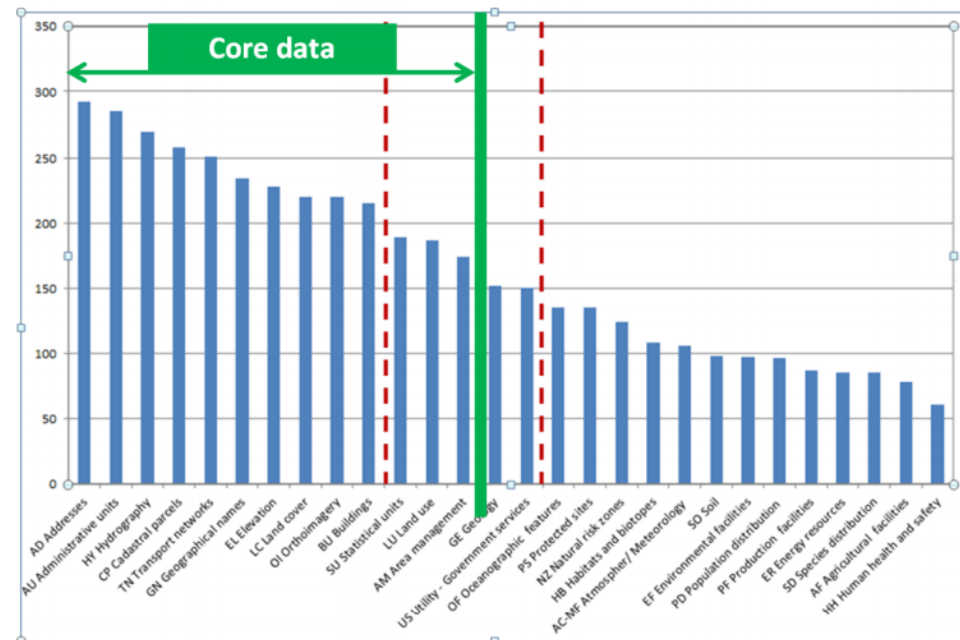
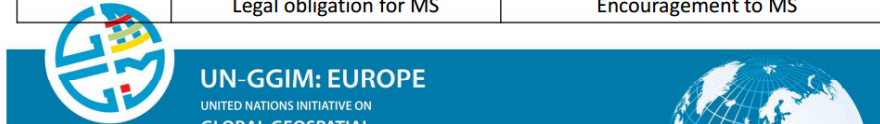


## Progress of UN-GGIM: Europe Working Group A on Core Data

Especificar datos geospaciales nucleares/esenciales que deben ser homogéneos en el ámbito europeo

Marco Institucional  
UN-SDG Y  
UN-GGIM

	INSPIRE	UN-GGIM: Europe WG core data
Driver	European Commission (DG ENV, JRC, Eurostat, EEA)	United Nations (UN-GGIM: Europe Executive Committee)
Geographic scope	European Union Political Europe	Geographic Europe
Objective	Harmonise existing data, ensure common structure	Ensure common similar content
Expected mean	Data transformation	Data upgrade, production of new data.
Status	European Directive Legal obligation for MS	UN Recommendation Encouragement to MS



## NATIONAL ADDRESS DATABASE (BAN)

## LINKING DATA

### Urban units

- Objective: redefine urban units (adapting international recommendations to French context)

Cooperación entre  
agencias estadísticas  
y de cartografía

## A questionnaire for collecting opinions for Statistical Units Data Specifications

Questionnaire  
for statisticians



GGIM WG-A Core Data  
Data Specifications

## Establishing GIS- resources center, 2015



Cooperación entre  
 agencias estadísticas  
 y de cartografía

### User requirements and core statistical data

**A) USERS:**  
 a) Local to National governments and administrations.  
 b) Statistical offices (from local to national and European).  
 c) Private, general users.  
 d) Research, academics.

**B) USE CASES:**  
 a) Settlement urban / regional planning.  
 b) Health and education planning and management.  
 c) Environmental and social (labor market, education, poverty/ social exclusion, demography etc.) assessments.  
 d) Economical assessments.  
 e) Spatial analyses of science and technology hubs.  
 f) Exposure to pressure.  
 g) Availability of services.  
 h) Transportation.

**Confirming the INSPIRE statements and level:**

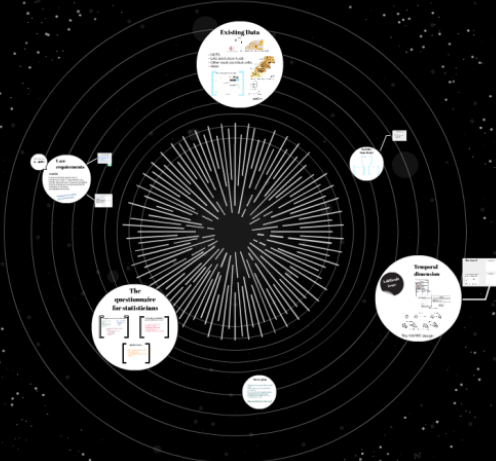
- NUTS-LAU units
- Urban Audit units
- Grid 1km

¿Adding other statistical units to geodata?:

- Enumerations Districts?
- Postal codes?
- Smaller grids?
- Others?

## A questionnaire for collecting opinions for Statistical Units Data Specifications

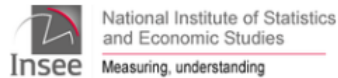
*Questionnaire for statisticians*



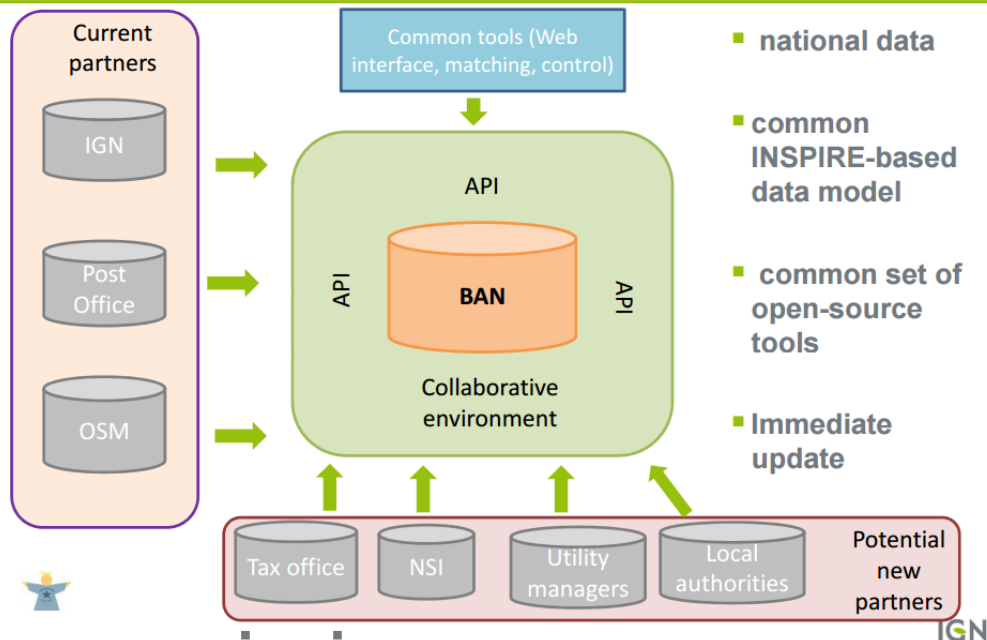
**A Core Data Specifications**

Logos: INE Instituto Nacional de Estadística, UN-GGIM UNITED NATIONS COMMITTEE OF EXPERTS ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT, EUROPEAN FORUM FOR GEOGRAPHY AND STATISTICS, eurostat EUROPEAN COMMISSION

Cooperación entre  
agencias estadísticas  
y de cartografía



### Project : National Address DataBase



### Urban units

- Objective: redefine urban units (adapting international recommendations to French context)
- The principle is to define **continuous areas of residential buildings**.
  - Urban area composed of one or several **municipalities** with continuous built-up area. Each municipality must have more than half of its population in the urban area.
  - distance between 2 **residential buildings** < 200 m
  - each urban unit must have more than **2 000 inhabitants**

### Urban units

- NSI contribution:
  - population data
  - funding
- NMA contribution:
  - topographic data (mainly Building)
  - delineation work

## The history related to GIS ..

### Establishing GIS- resources center, 2015

#### As a result of;

- No one in SN had the overall coordination or responsibility for an overview of the infrastructure, technical needs, GIS-expertise or user needs for GIS and geodata
- Failure to understand the informal – and formal responsibilities between the departments in SN concerning;
  - Obtaining, quality control and storage of spatial data
  - Operation and maintenance of the geodata base
  - Facilitating and improve infrastructure for GIS tools
  - Dissemination of the result as geographic mapping data
- There are in general little knowledge or interest in SN regarding the obligations according to the geodata Act with regulations, and the Inspire directive

Cooperación entre  
agencias estadísticas  
y de cartografía

- From 2007 it has been a growing supply of more and more advanced geographical data
  - New opportunities for more detailed statistics
  - Increase production of statistics and analyses in general
- 2012: Established the Geodatabase to ensure common and quality- assured data
- 2012: Establishment of a web map application - [www.kart.ssb.no](http://www.kart.ssb.no)
  - Users get a simple visual representation of the statistics on map made in SN, both status and changes over time
- 2014: Improved hardware and access to software for everyone in SN
- 2014: Increased demand for GIS products from the head in SN
  - Increased demand for GIS products national
  - Claims and investment in GIS International, EU and by the Geodata act

### GIS- resources center's objective and service profile

#### Contribute to increase the use of GIS;

- Integrate GIS in more statistics/ analyzes
  - Consider the possibilities for establishing new statistics and analysis by the use of GIS
  - Planning and constructing models/program
  - Assist with integrating of GIS in already establish statistics, where GIS is considered to be a central tool
- Increase the expertise in GIS
  - Survey the need for courses in GIS
  - Arrange basic and advanced courses in GIS
  - Individual training in GIS
  - Draw up guidelines "how to start" (Install the software, Access the geodatabase, Connect to the collective citrixs serve, Start up help" – practice use of GIS)
- Provide support to common resources associated to GIS, including;
  - IT data collection and geodatabase
  - IT infrastructure, hardware/software
  - Dissemination of statistics on map, compiled using GIS and spatial data
  - Assist the Internal Agency school to increase competence/courses in GIS
  - International cooperation
  - GIS user forum
  - Assist with preparation of product specification, drawing rules, metadata for dissemination of spatial data



# COMBINING STATISTICAL AND GEOSPATIAL DATA – CHALLENGES AND POSSIBLE SOLUTIONS FROM GERMAN OFFICIAL STATISTICS' PERSPECTIVE

Integración de la geografía en el proceso de producción estadística

## Working towards a Geospatial Strategy in Statistics Denmark

Karen Skjelbo



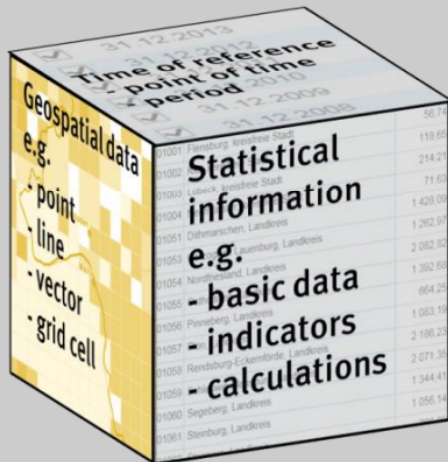
Statistics Finland 

Geostat 2: Some experiences and conclusions – applying the GSBPM to geospatial statistical data production



Integración de la geografía en el proceso de producción estadística

## 2. Regional units



Source: Own illustration

## Identifiers

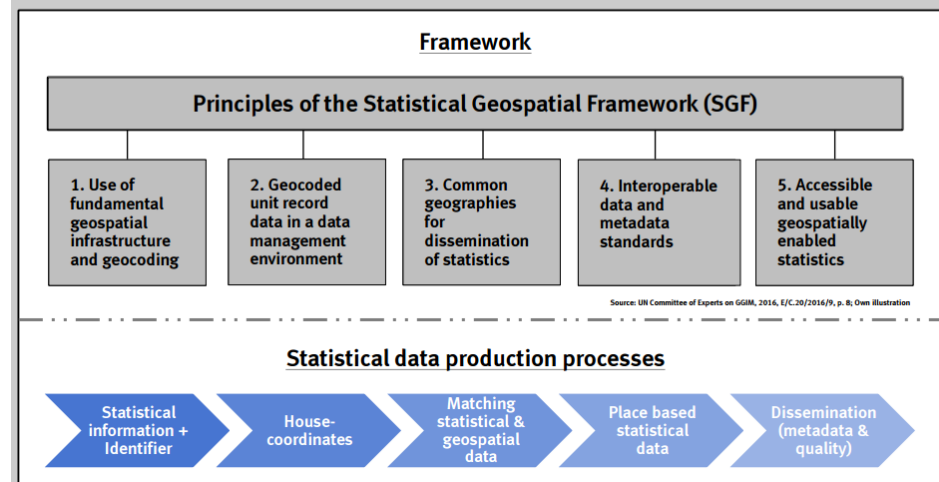
Federal Statistical Office of Germany:

- ✓ NUTS code
- ✓ ZIP code
- ✓ Enumeration areas
- ✓ Full address
- ✓ Geocode/-coordinate

Federal Agency for Cartography and Geodesy:

- ✓ Digital Basic Landscape Model
- ✓ Digital Orthophotos Ground Resolution 20 cm (DOP 20)
- ✓ WMS: DOP20
- ✓ Georeferenced address data
- ✓ Building polygons

## Matching statistical and geospatial data



## Working towards a Geospatial Strategy in Statistics Denmark

### Experience with GIS-strategy in NSI

- Do other countries have experiences with GIS strategy in NSI?

## Principles for professional standards

- Rules and guidelines for working with geography
- Makes choices easier and quicker in the daily work
- Examples:
  - Data are collected by the source
  - Data are only stored one place
  - Data must be documented
  - Geographic visualising must be similar across different statistical products



## Why a strategy?

- Unexploited potential for using GIS and geospatial data in Statistics Denmark due to:
  - Low level of knowledge
  - Dispersed knowledge
  - Lack of harmonised methods and data standards
  - Traditions for no use
- The strategy covers the whole process from collecting to presenting data



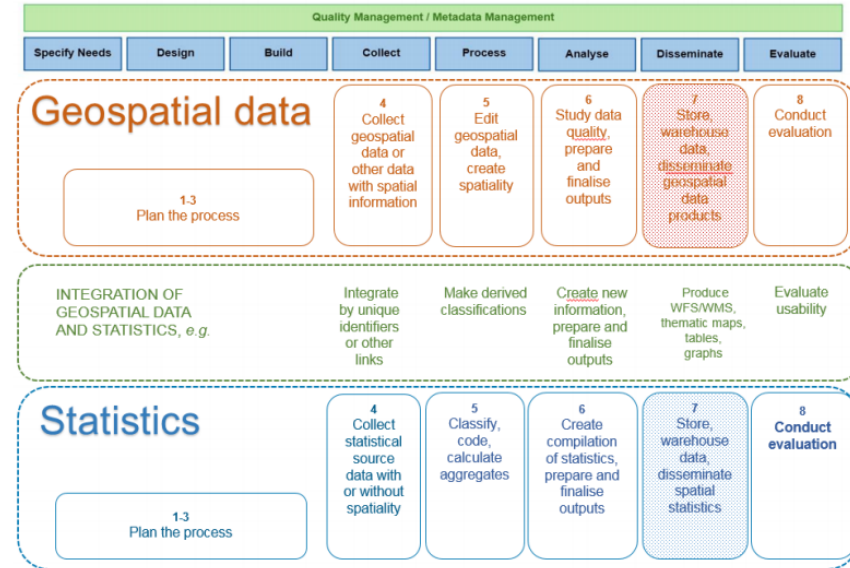
Integración de la geografía en el proceso de producción estadística

# Integration of Geospatial data and Statistics

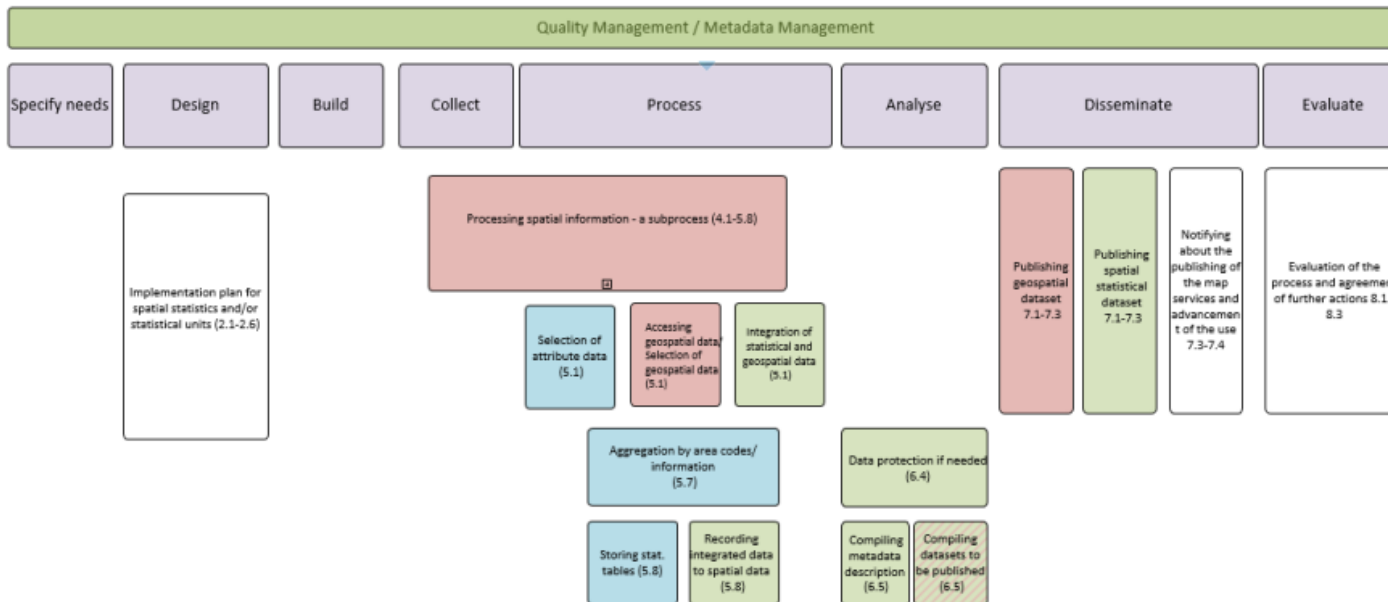
## Stat Fi findings

- The GSBPM seems to be able to cover geospatial related statistical production – however,
- Use of descriptions of the GSBPM requires raising the level of abstraction when interpreting phases - a risk from the coherence point of view

→Our opinion is that the GSBPM model does *not* need new sub-processes for covering geospatiality but the documentation needs to have a broader scope



## The sub-processes of production of geospatial statistics placed in the GSBPM

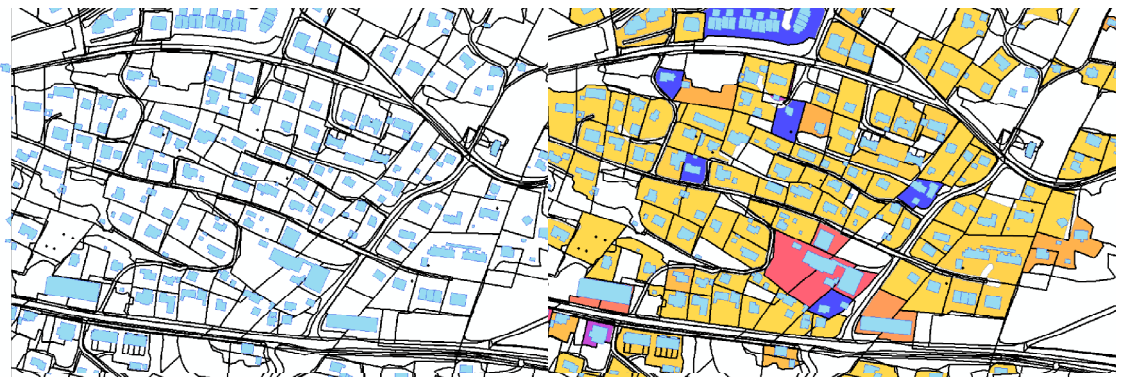
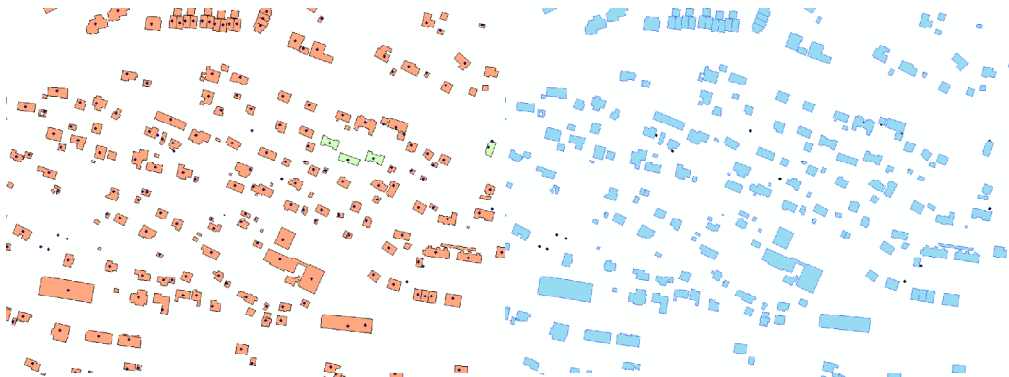
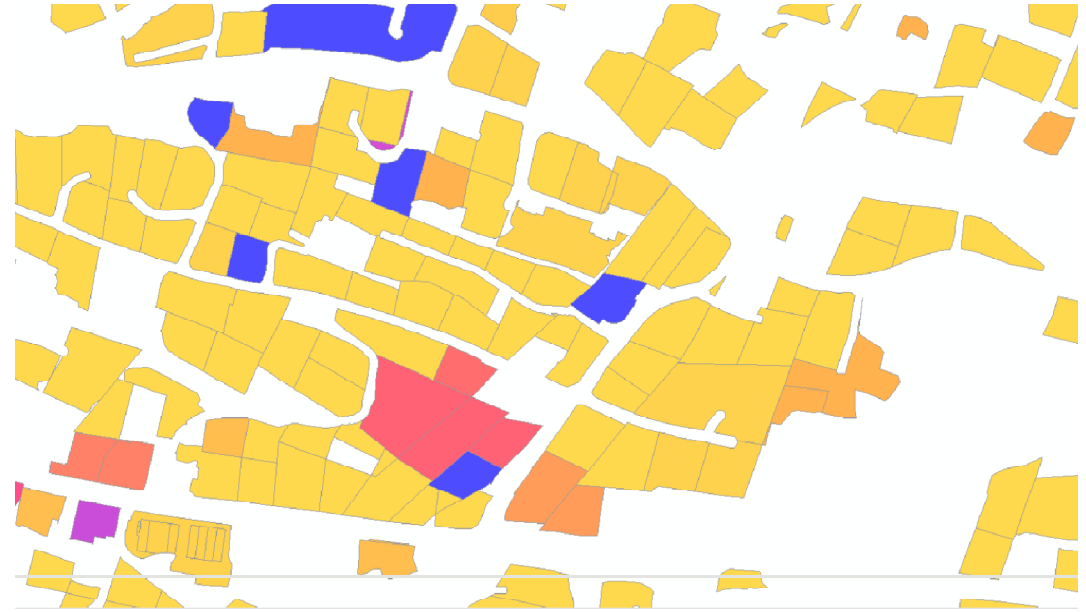


Integración de la geografía en el proceso de producción estadística

# Compilation of land use statistics using GIS



Estadísticas medioambientales







## Project KIP INCA

### Knowledge Innovation Project on an Integrated System of Natural Capital and Ecosystem Services Accounting in the EU

Design and Implement an integrated accounting system for ecosystems and services at EU level

- Address EU policy needs linked to ecosystems and natural capital and strengthen the knowledge base for the implementation of the 7th EAP;
- Test international environmental accounting guidelines (SEEA);
- Integrate existing EU data sources and MS reporting exercises; identify gaps and needs for adjustment;
- Further harmonise ecosystem-accounting activities between EU and MS
  - Develop EU level accounts and support MS in developing accounts;
  - Provide a shared ecosystem accounting platform for MS to build on
  - Some MS already advancing (NL, UK especially, also DE, FR, FI....)



## Main characteristics of INCA

- **Data quality and architecture:**
  - Integrated geo-spatial data platform. Include CORINE/Copernicus data at a Minimum Mapping Unit of 1ha, and possibility higher resolutions.
  - Works with existing EU level data (Copernicus, LUCAS, agriculture and other statistics, administrative, environment monitoring data)
  - Optional MS data (national regional) to link-in to EU layer
- **Ecosystem Services:**
  - Minimum set of ecosystem services: **provisioning, regulatory and cultural services:** crops, timber, fish, pollination, water purification, air filtration, carbon sequestration, flood and erosion control, recreation/tourism.
- **Types of accounts:**
  - **ecosystem extent; ecosystem condition; ecosystem service supply and use,** experimental asset accounts in monetary terms.



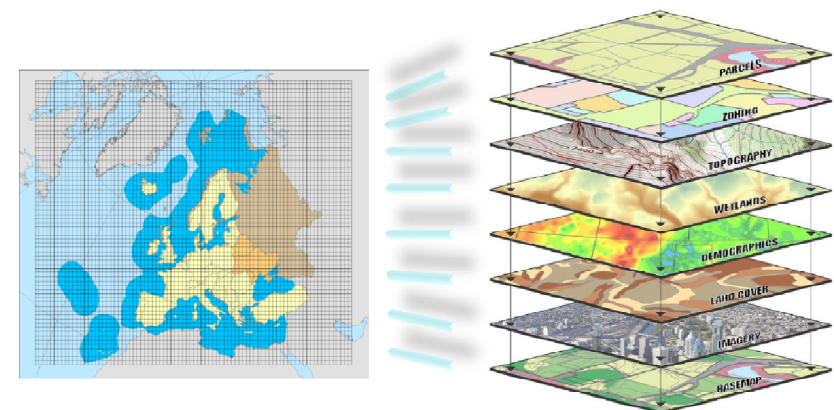
Estadísticas medioambientales

## INCA outlook

- Start building the EU data integration platform in 2017;
- Create first draft of ecosystem extent accounts and condition accounts in 2017 and 2018;
- Review of data and models for ecosystem services accounts in 2017,
- Ecosystem services accounts and monetary accounts will start in 2017;
- Implementation of operable system until 2020 (+ beyond..)



## Geospatial data platform – Basic spatial units to integrate different datasets



## EO4Urban: Multitemporal Sentinel-1A SAR and Sentinel-2A MSI Data for Global Urban Services

Yifang Ban, Professor & Director

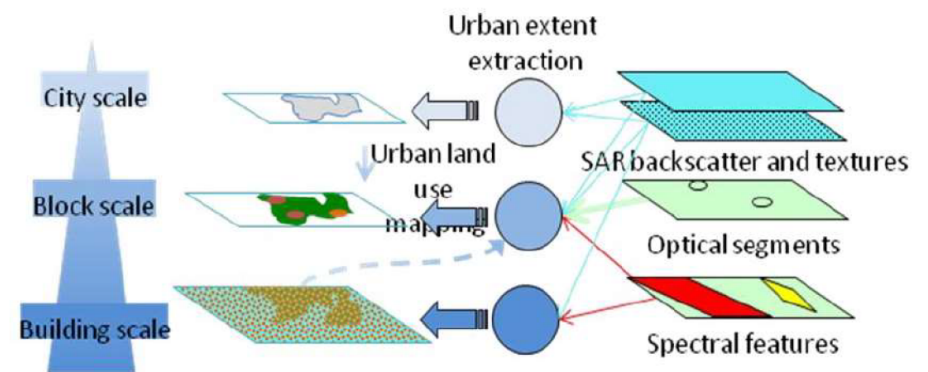
Division of Geoinformatics  
KTH Royal Institute of Technology  
Stockholm, Sweden

Big data y  
observación terrestre  
en la estadística oficial

- Multitemporal Sentinel-1A SAR data is very promising for urban extent mapping at global scale
  - High-density builtup areas are very well extracted
  - Under-estimation in low-density builtup areas
  - Fusion of S-1A SAR and S-2A MSI data reduced commission errors
- For urban land cover classification at semi-global scale
  - Sentinel-2A MSI data produced very good results with confusions
  - Fusion of S-1A SAR and S-2A MSI data reduced the confusions
- For new builtup area mapping
  - S-1A SAR and historical SAR data produced very good results

### User Requirement Baseline

- Global Urban Mapping
  - Urban Extent Maps
- Semi-Global Urban Mapping
  - Urban Land Cover Maps
- City-Level Urban Mapping
  - New Builtup Area Maps
  - Urban Green Structure Maps
  - Urban Green Structure Change Maps





European Forum for Geography and Statistics - EFGS  
15.-17.11.2016, Paris

# Copernicus for Statistics

European Forum for Geography and Statistics - EFGS  
15.-17.11.2016, Paris

## COP4STAT\_2015plus

- **Image data analysis**
  - **Multi-temporal** approach, several time slides
  - Pixel based supervised **classification**
  - Object-oriented **segmentation** of imagery
    - Subdivision of image by clustering similar pixels
  - **Rule-based** analysis (Random forest classification), combination of
    - Pixel based indices (e.g. NDVI, LAI)
    - Principle Component Analysis (PCA)
    - Support vector machine (SVM)
    - Integration with input from vector data

St. Arnold, Destatis: Copernicus for Statistics – Cop4Stat\_2015plus

Folie 18

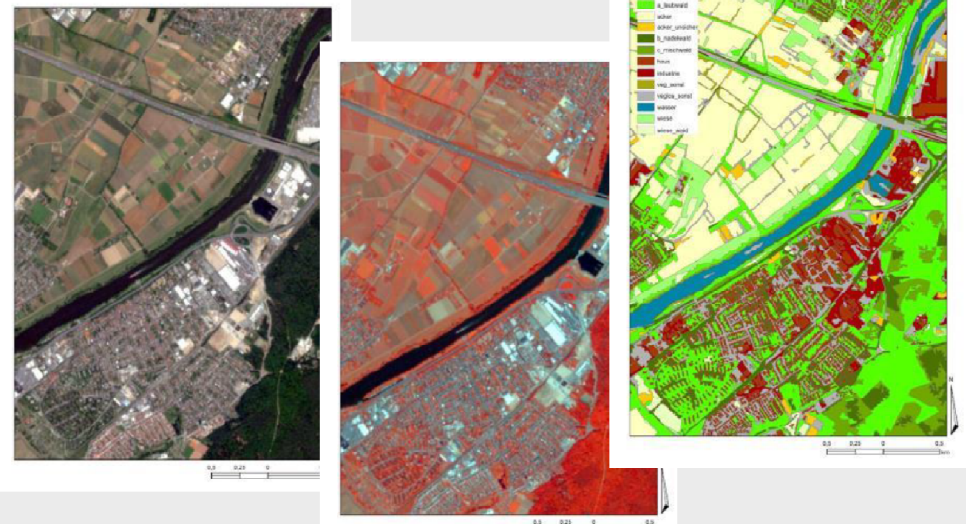
Big data y  
observación terrestre  
en la estadística oficial

## COP4STAT\_2015plus

- **Project goals:**
  - **Usability assessment** of Copernicus products for data needs of **Statistics** on LC and LU
  - **Fulfill requirements** on European level
    - (Eurostat: LUCAS): separation of LC & LU,
    - grassland / arable land; soil sealing, (semi-)natural areas
    - Use intensity, seasonal patterns, status, condition of land
  - **Integrate results of LUCAS Pilot study 2014:** Which existing national

European Forum for Geography and Statistics - EFGS  
15.-17.11.2016, Paris

## Segmentation of imagery



St. Arnold, Destatis: Copernicus for Statistics – Cop4Stat\_2015plus

Folie 22

# Mining mobile phone data to recognize urban areas

Stéphanie Combes, Marie-Pierre de Bellefon  
Maarten Vanhoof (Orange Labs)

Big data y  
observación terrestre  
en la estadística oficial

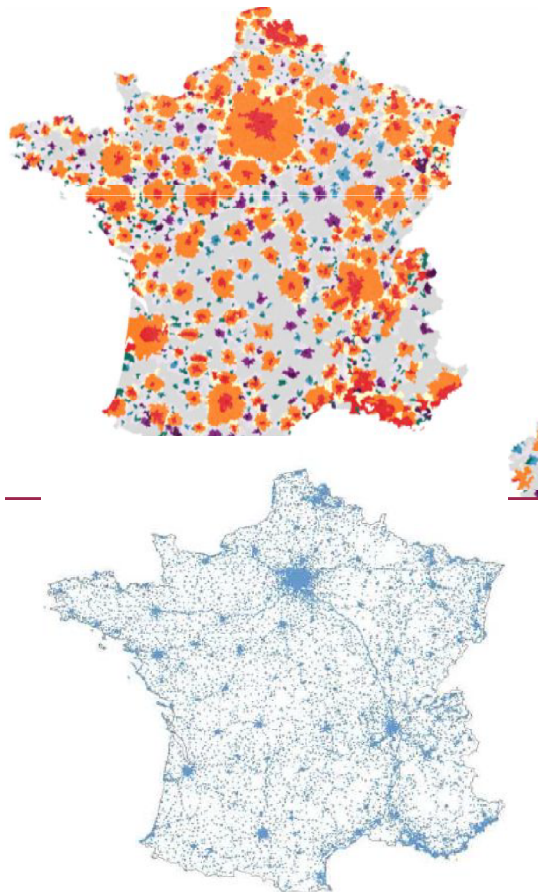
## Mining mobile phone data to recognize urban areas?

**Understanding territory organization**, for example in terms of employment, home location and mobility, is crucial for the implementation of policy measures.

In France, the National Statistics Office (INSEE) produces a zoning (**ZAU: Urban Area Zoning**) to identify the geographical extent of cities' influence at the national level: **each French municipality is assigned a type** from Major urban pole to rural municipality (9 classes)

This typology is **complex/long to produce** (several data sources to process, complex algorithm): first published in 2002, it was updated in 2010 (based on 2006-2008 data)

In this study, we aim at evaluating the **potential of mobile phone data** as a complementary source for generating this indicator between two official releases: **a collaboration between INSEE and Orange**



## Conclusion

Consequently the lack of accuracy of the Orange scenario **is not exclusively due to the potential limits of mobile phone data** but limits their potential for this application.

Still, the study allowed to **compare a new source with a reliable reference. Mobile phone data as inputs allow an excellent detection of major urban poles (comparable to official data).**

These data **may be interesting to explore further**, probably for some **more local analysis in urban areas** where the mobile phone operator network is dense.





## Conclusions

Administrative criteria for the definition and classification of urban/rural areas, like those used in Kosovo, seems not adequate for a reliable and up-to-date classification of the urban and rural population;

The high differences between the two classifications in the share of urban population at national level (about 16% in Kosovo).

The EU grid-based approach proposed in this analysis may be one option to be considered by countries to develop reliable definitions and classifications on what is urban and what is rural, ensuring international comparability as well.

Moreover, urban and rural definitions are not only relevant for the dissemination and analysis of statistical data. They have also particular value in the phase of production of data through sample surveys.

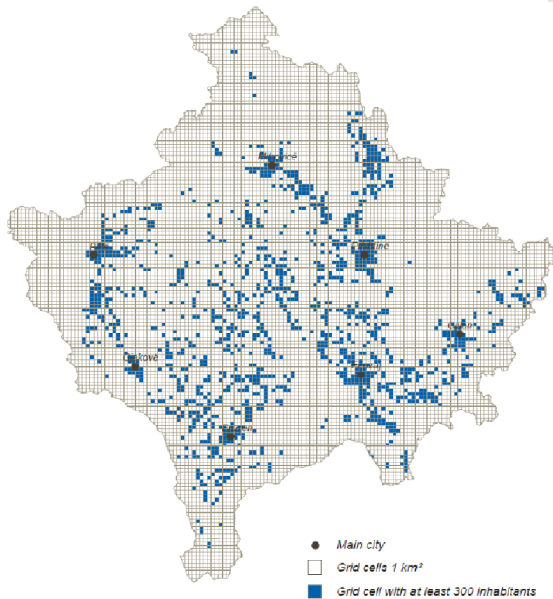
## Population distribution in the Republic of Kosovo: a comparative analysis on urban population and its classification based on administrative and non-administrative criteria

### Objectives of the study

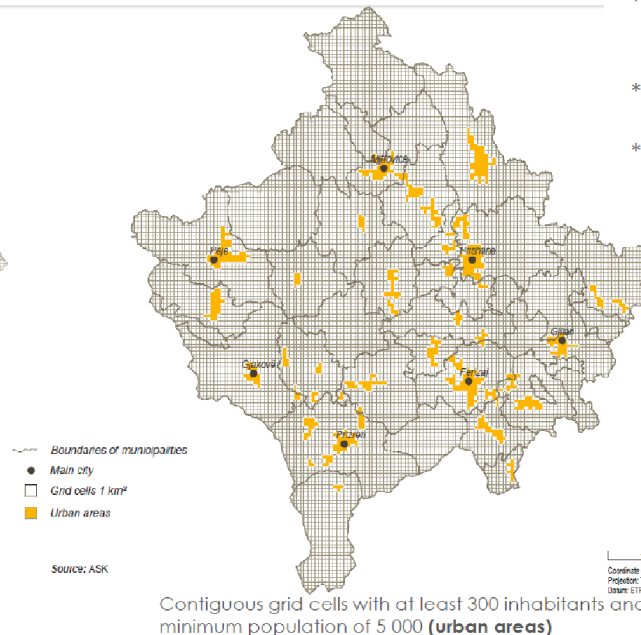
- To identify the urban and rural population in Kosovo (2011 censuses), according to **non-administrative criteria**, using grid-based typology
- To compare the results with the urban and rural population derived from **administrative criteria**

## Results

Grid cells with at least 300 inhabitants per 1 km<sup>2</sup>



41 urban clusters in Kosovo – 2011



### Results

- According to the grid approach, the urban population of Kosovo in 2011 was **54.7%**.
- According to administrative criteria was **38.2%** (**16.5% difference**).
- Urban areas of Kosovo: **41** grid approach, **39** administrative approach

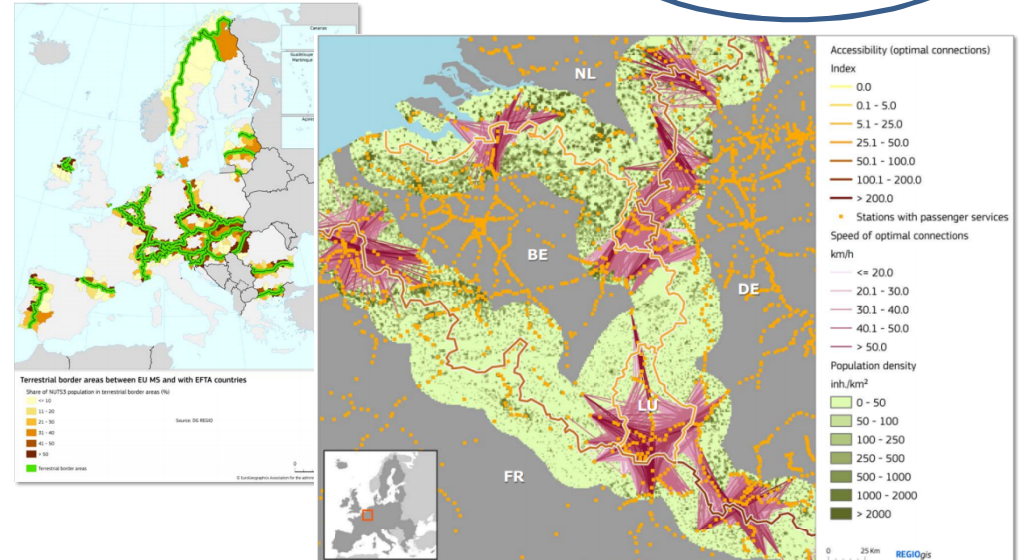
Análisis geoespacial.  
Algunos ejemplos

## Spatial statistics in support of analysing border areas in the European Union

Hugo Poelman  
European Commission  
DG Regional and Urban Policy  
Analysis Unit

### Defining border areas

- NUTS-neutral definition of border areas (25 km width at each side of the border)
- Typology of NUTS regions according to their population share in border areas
- Based on GEOSTAT 2011 grid



### Outlook on the future of cross-border analysis

- Publication of results on various ongoing studies (2017)
- Studies show the need for further analysis
  - Enhanced exploitation of spatial data
  - Pilot projects by NSIs to improve cross-border statistics
- Analysis is preparing the future of the EU territorial cooperation policy (period post-2020)

### Road accessibility in border areas

- Analysis ongoing by JRC (IPTS Sevilla)
- Assessing the quality and efficiency of the road network in border areas (2x25 km width along borders)
  - Comparing border areas with their surroundings
  - Accessibility taking all relevant settlements (grid-based concepts of cities and smaller towns) as destinations
  - Accessibility is assessed starting from GEOSTAT 2011 grid population distribution