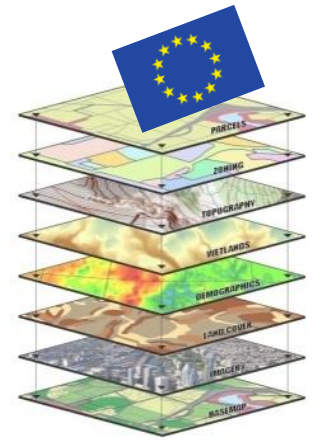# Creation of pan-European geospatial datasets –
Experiences in real life
from INSPIRE and beyond

Eurostat – E.4 – GISCO – H.I. Reuter

GISCO – The Geographical Information System of the Commission

- Permanent service of the European Commission (Eurostat)

- Role: Answers needs of European Commission, Eurostat and the ESS for geographical information at EU/national/regional levels.

  - Provision of GIS (reference) data, services and software,

  - Support cartographic and spatial analysis activities,

  - Coordinates commission-wide GI activities,

  - Stimulate the use of GIS to support commission activities,

  - Support activities on the integration of statistical and geospatial information.

European Commission

Corporate Level Services

- Central Corporate Database   central repository of GIS datasets

- Background Web Map Services   nice background

- (Reverse) Geocoding Services   Find a place on a map and from coordinates to a address/location

- Routing   how to get from one location to another by car or railway

- ID service   Get Codes/Geometries based on coordinates

- IMAGE   make a quick map

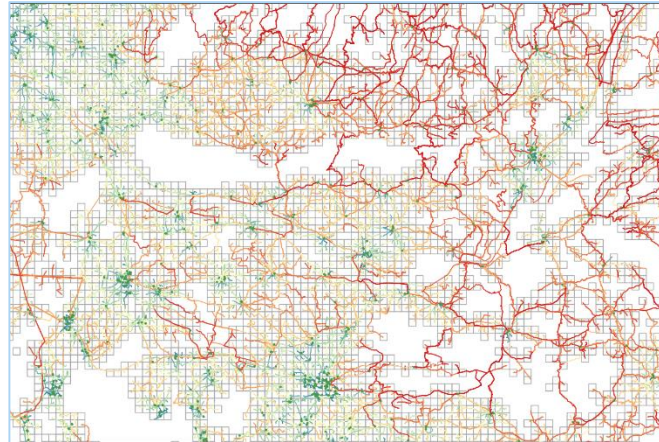- Dissemination   get simple files

- Internal Metadata Portal   search for Data

European Commission
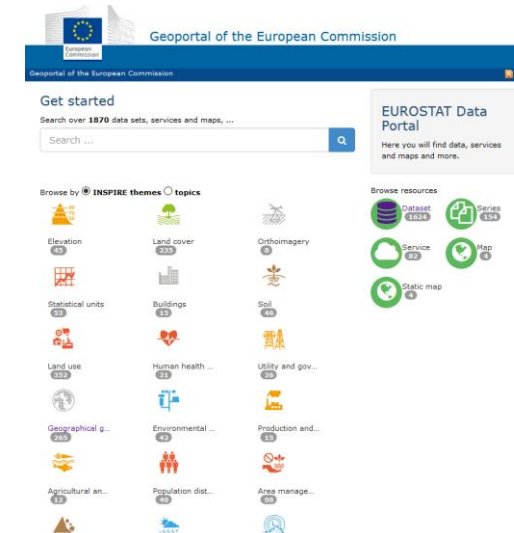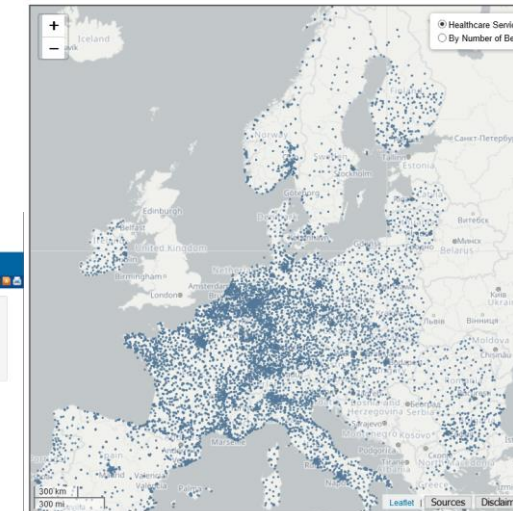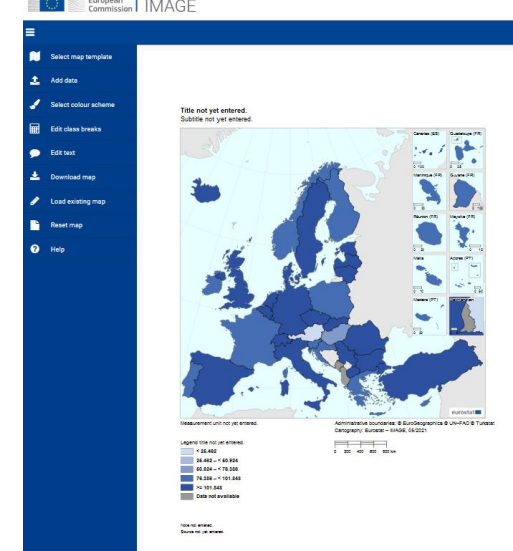
GISCO - the **G**eographic **I**nformation **S**ystem of the **CO**mmission
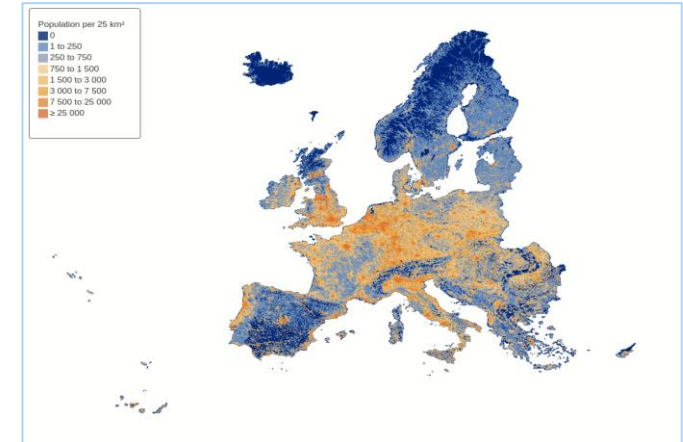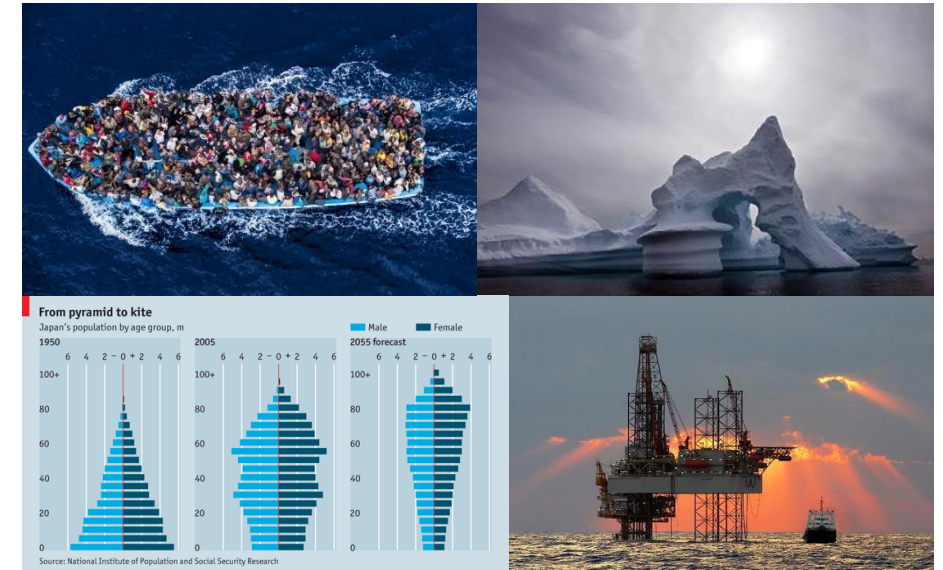
localise

analyse

visualise

Application domains

- Urban planning

- Resource management

- Geo-marketing

- Transport & mobility

- Logistic

- Civil engineering

- Environmental impact assessment

- Emergency situation management

- Communication/cartography

- Demography
- Social sciences
- Epidemiology
- Agriculture
- Energy
- Defense/intelligence
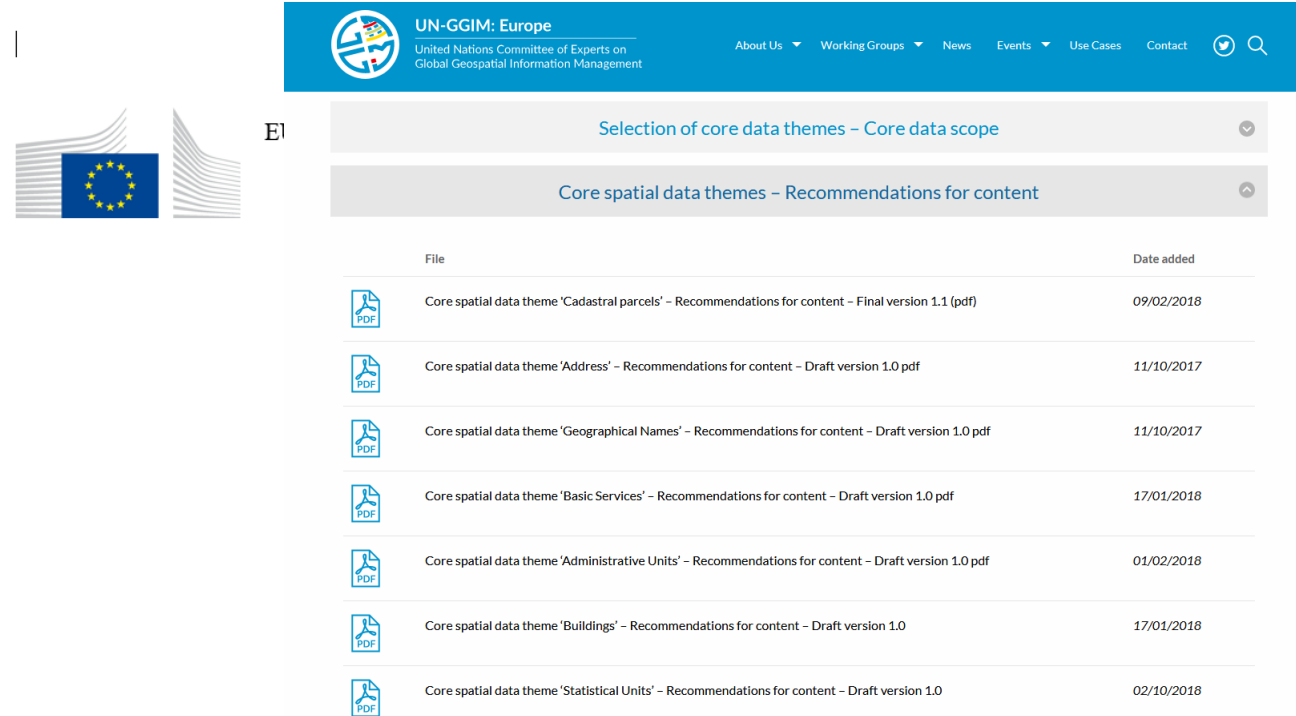- Policy analysis (support to decision making)
- Audit
- Etc.

Global Statistical Geospatial Framework
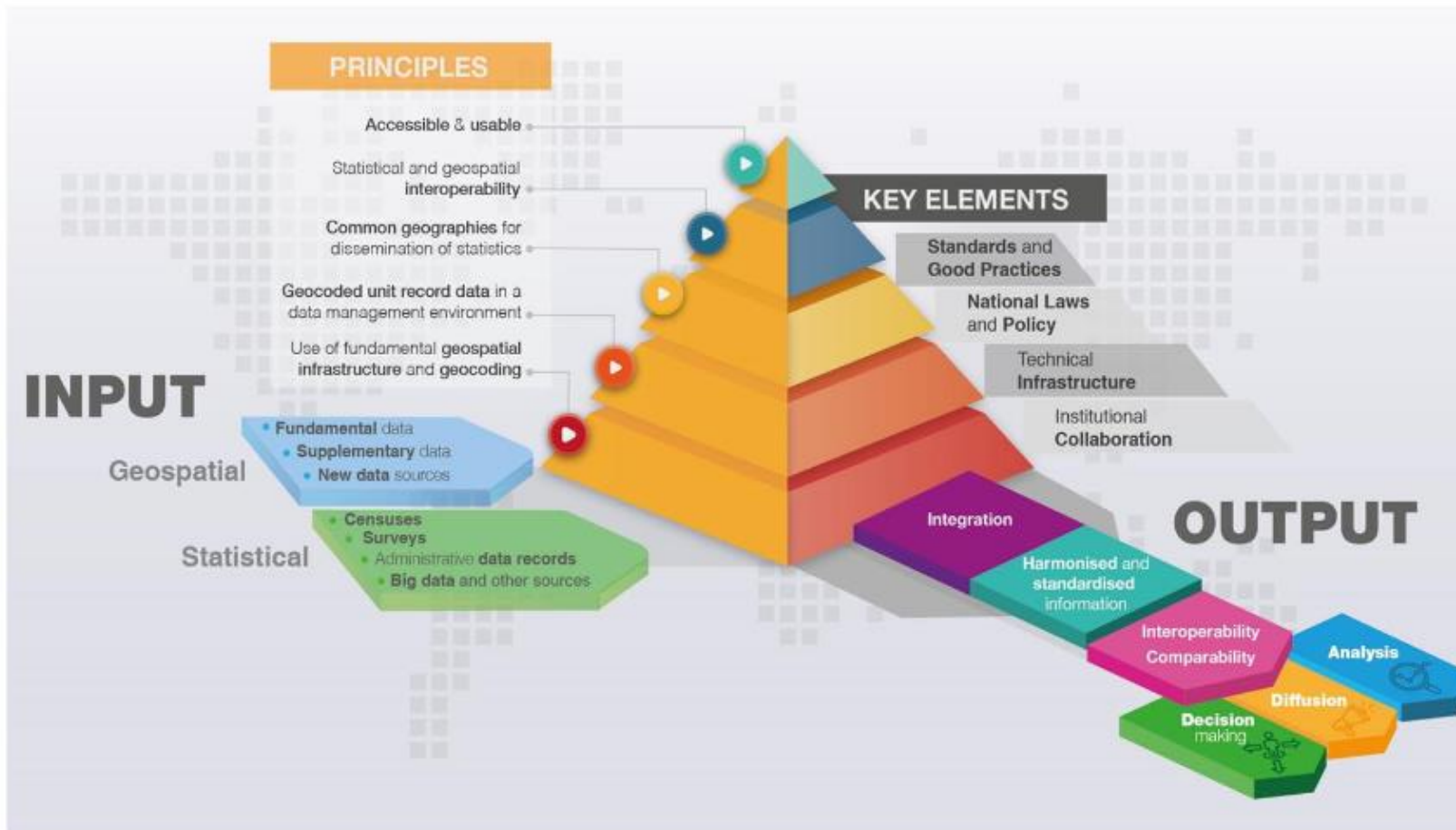
EC Geospatial Data Requirements

Internal EC Consensus document outlining the EC needs for geospatial data

...**to provide a consolidated and consistent overview of the European Commission user needs and set out cross-cutting and domain specific requirements of the European Commission for EU wide geospatial information and data products from Member States in support to Sustainable Development and other EU policies….**


UN-GGIM: Europe
United Nations Committee of Experts on
Global Geospatial Information Management

About Us ▾   Working Groups ▾   News   Events ▾   Use Cases   Contact

Selection of core data themes – Core data scope	⌄
Core spatial data themes – Recommendations for content	⌃

	File	Date added
PDF	Core spatial data theme 'Cadastral parcels' – Recommendations for content – Final version 1.1 (pdf)	09/02/2018
PDF	Core spatial data theme 'Address' – Recommendations for content – Draft version 1.0 pdf	11/10/2017
PDF	Core spatial data theme 'Geographical Names' – Recommendations for content – Draft version 1.0 pdf	11/10/2017
PDF	Core spatial data theme 'Basic Services' – Recommendations for content – Draft version 1.0 pdf	17/01/2018
PDF	Core spatial data theme 'Administrative Units' – Recommendations for content – Draft version 1.0 pdf	01/02/2018
PDF	Core spatial data theme 'Buildings' – Recommendations for content – Draft version 1.0	17/01/2018
PDF	Core spatial data theme 'Statistical Units' – Recommendations for content – Draft version 1.0	02/10/2018

Priority Geospatial Datasets for the European Commission

European Commission

EC Geospatial Data Requirements

- Buildings (BU),

- Cadastral Parcels (CP),

- Addresses (AD),

- Administrative units (AU),

- Statistical Units (SU),

- Transport Networks (TN),

- Land Parcel Information System (LPIS)

- Postal Codes (PC)

- Utility and governmental services (US)

PC

European Commission
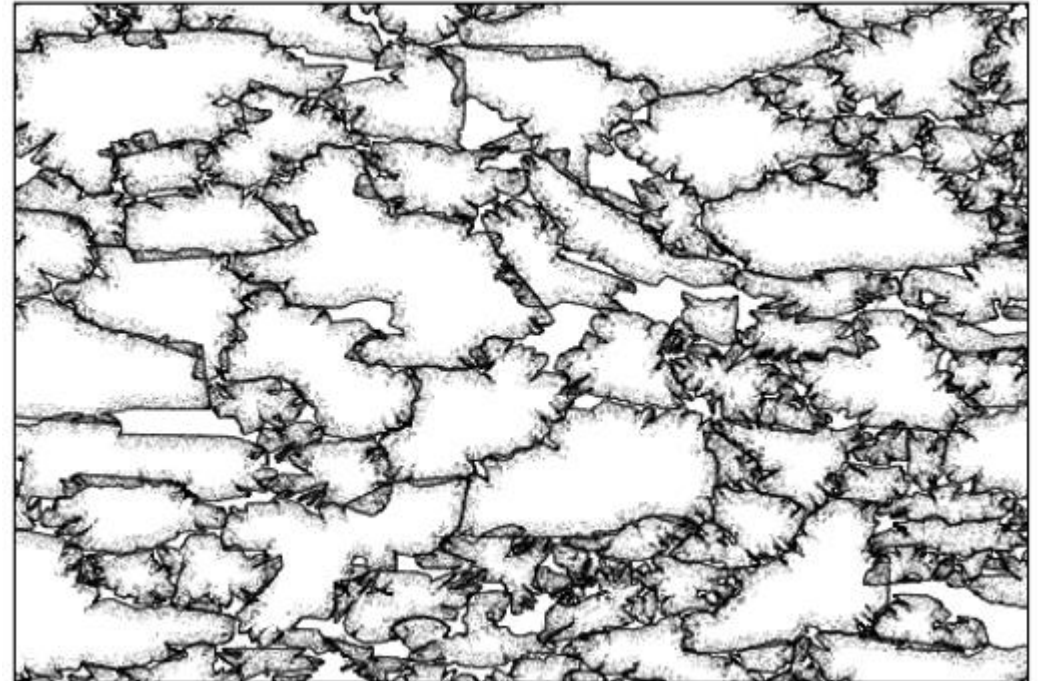
General Requirements for data themes

- Unique and persistent identifier

- full geographic extent of the territory

- at the scale ~1: 5000-10.000 (or better)

- update frequency (incremental) should be once a year or better

- INSPIRE mechanism of life-cycle attributes and versioning.

IN, AG , QA, DI

Eurostats Workprogramm 2022

To bring Europe closer to citizens and regions, Eurostat will continue to make use of georeferenced data by systematically integrating and mainstreaming geospatial information into statistical production and **collecting more geospatial data, with a special focus on the core geospatial datasets** ([3]). This will allow for more detailed regional and local level statistics in areas such as demography, economy, environment, energy, transport and agriculture.

Management plan 20

EUROSTAT

([3]) These are as defined by the Commission inter-service group on Geographic Information (COGI): administrative units, statistical units, buildings, cadastral parcels, addresses, transport networks, land parcel information system, postal codes, utility and governmental services.

https://ec.europa.eu/info/publications/management-plan-2022-eurostat_en

European Commission

Workflow for pan European GI Datasets

Computer Systems

INSPIRE Geoportal

data.europa.eu

Kohesio: discover EU projects

Human Intelligence

Local Contacts   Reports

EUROPEAN STATISTICAL SYSTEM   eurogeographics

NSI/NMCAs
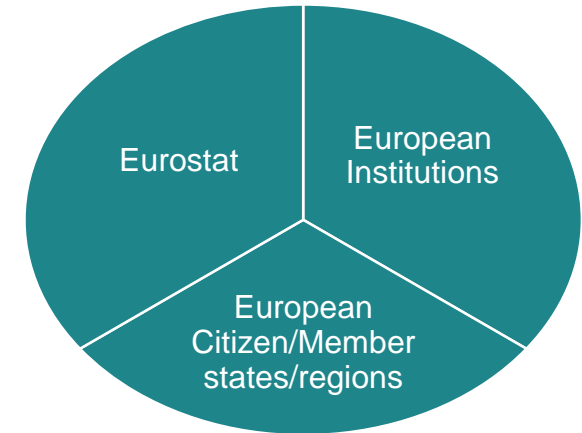
Social media   Research projects

ETL

Analysis in Incoming WIKI
Import into Database
 QAQC Cycles,
 Integration, Generalisation,
 Topological Checks,
 Feedback   with MS
………..

Majority of work

Analysis / Dissemination

Eurostat   European Institutions

European Citizen/Member states/regions

GISCO ReferenceDB
Website   *Tercet*
Services: *Download*,
AddressAPI, *ID*, *VectorT*,
OGC-API

European Commission

GISCO - the **G**eographic **I**nformation **S**ystem of the **CO**mmission
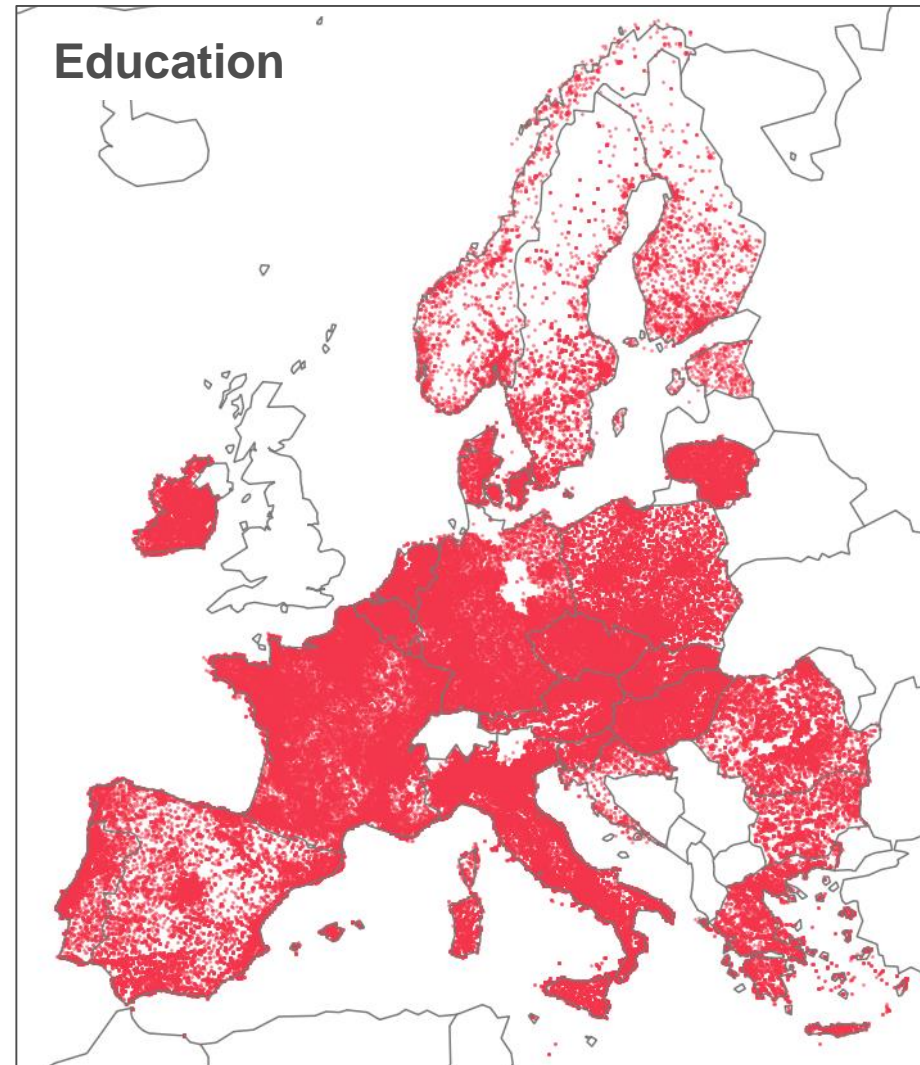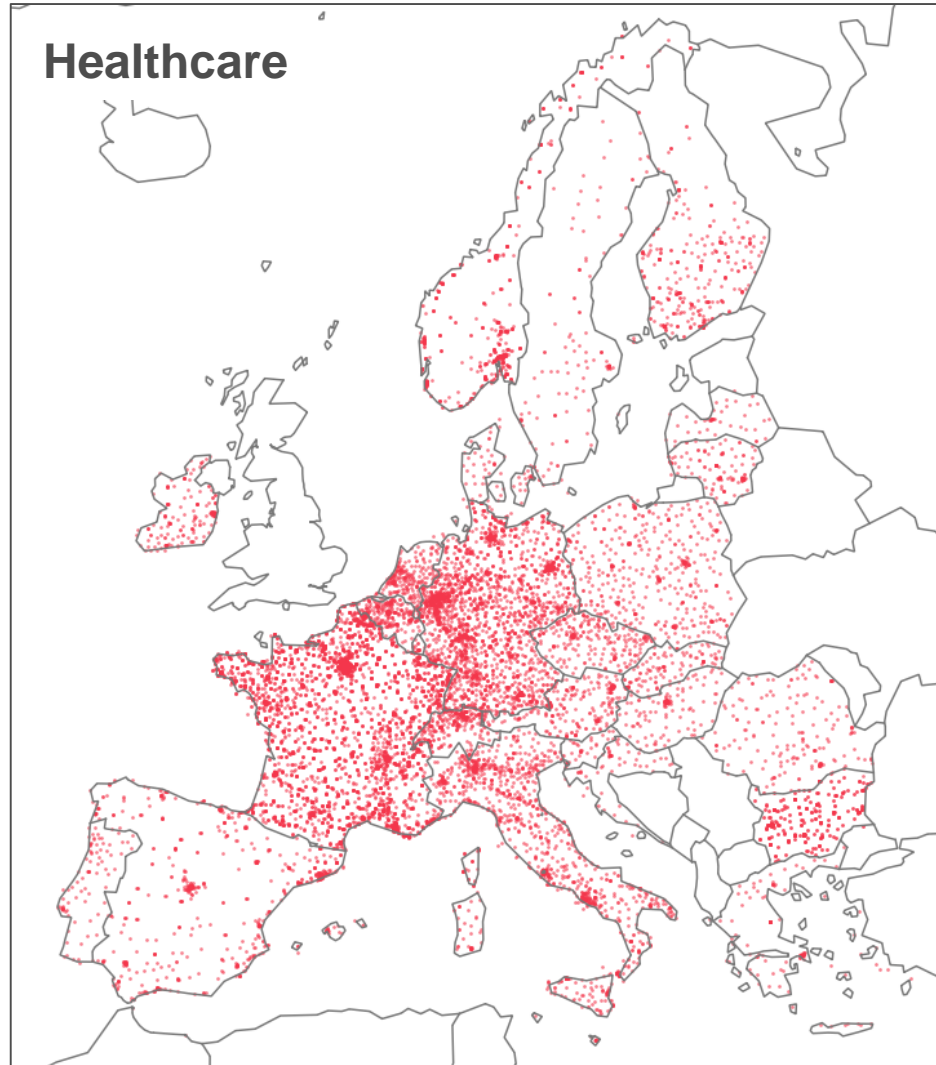
localise

analyse

visualise
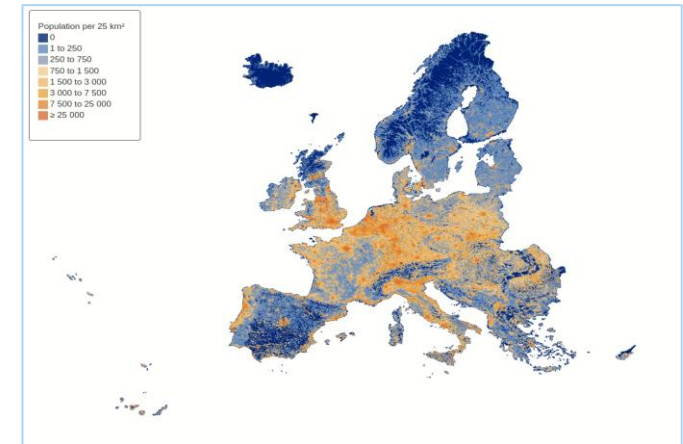
Data & systems: Utility services, examples

Healthcare

Education

https://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/healthcare-services

Geospatial analysis, aggregating into statistics (1/3)

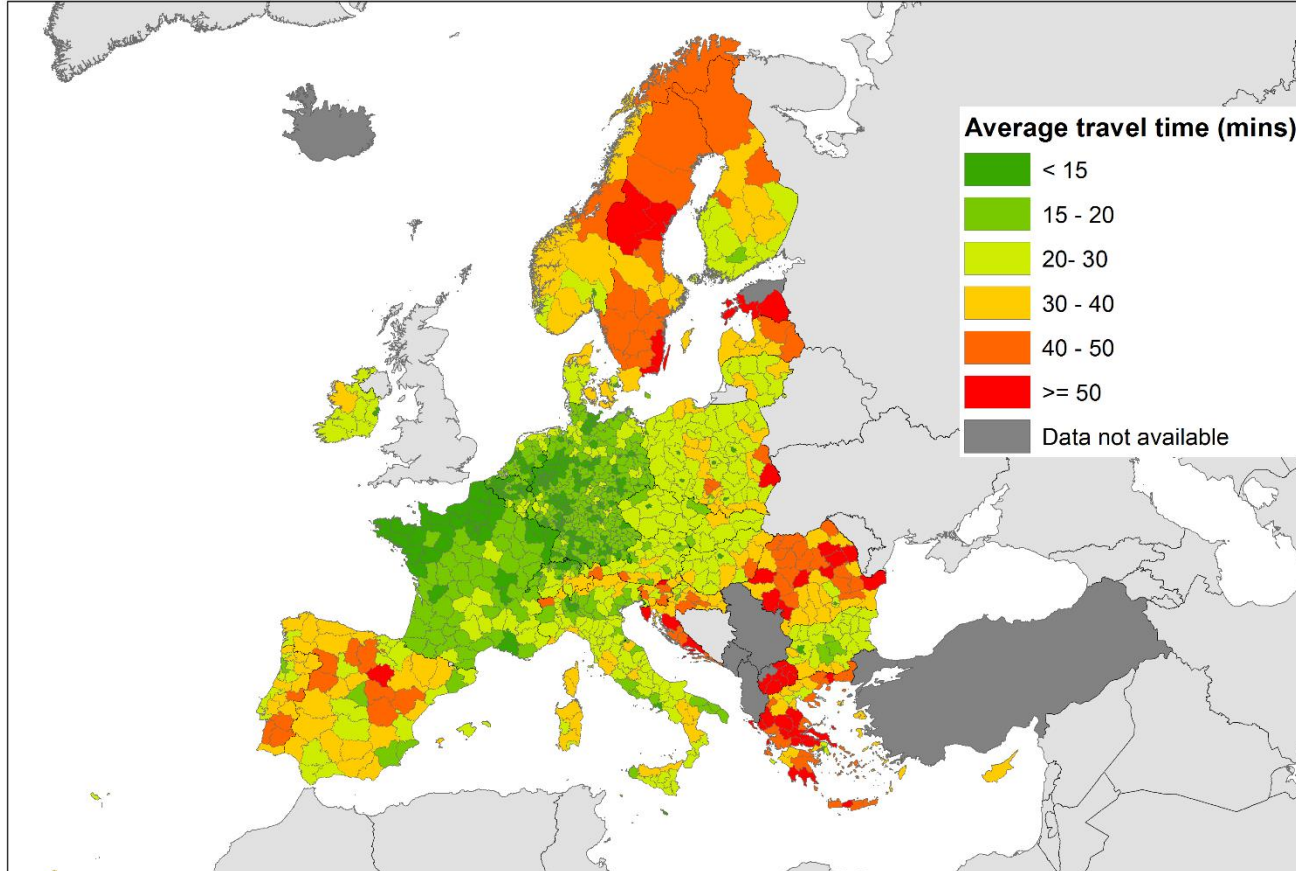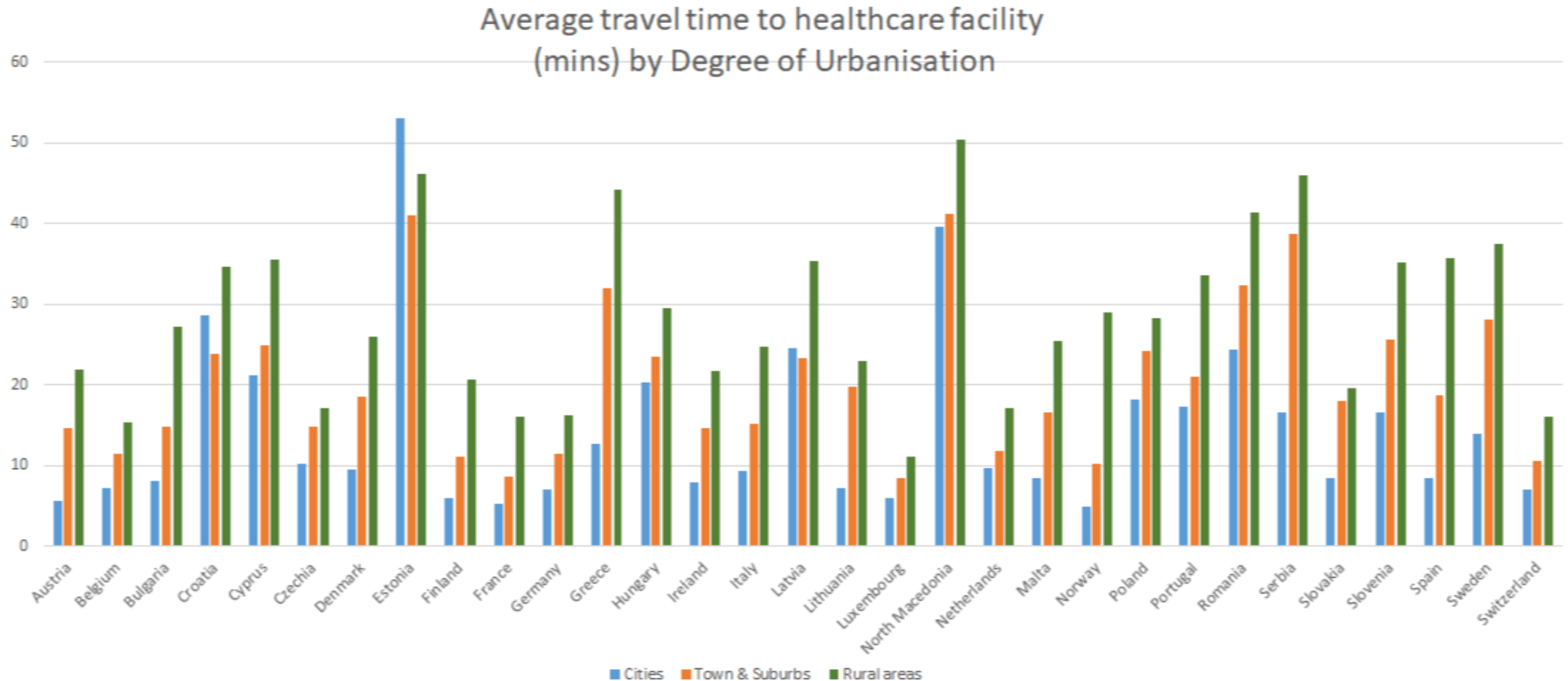Access to Healthcare - Travel time (minutes) by 1km grid

Geospatial analysis, aggregating into statistics (2/3)

Average Travel time to Hospital (NUTS3)

Average travel time (mins)

- < 15
- 15 - 20
- 20- 30
- 30 - 40
- 40 - 50
- >= 50
- Data not available

Geospatial analysis, aggregating into statistics (3/3)

Average travel time to healthcare facility
(mins) by Degree of Urbanisation

Cities ■ Town & Suburbs ■ Rural areas

Data & systems:
GIS reference data – AD - BU – CP - AU – TN
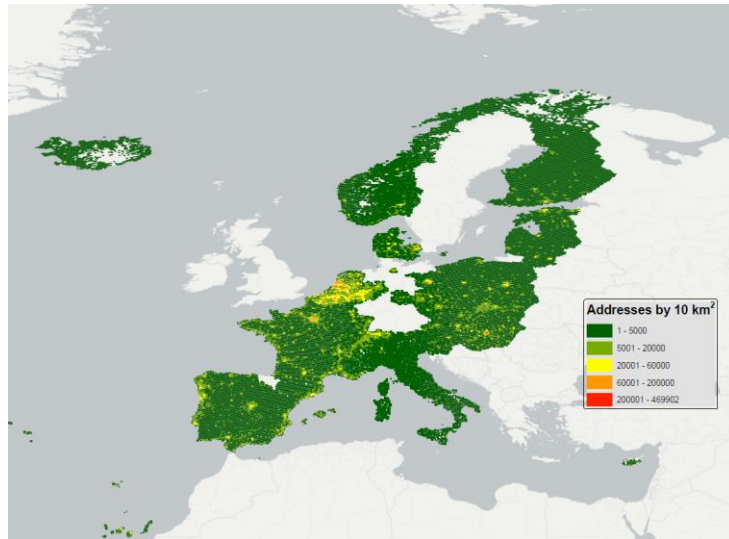
Addresses

tackles the issue of non-validated data Address data entry (1 – 10 - 100 rule)

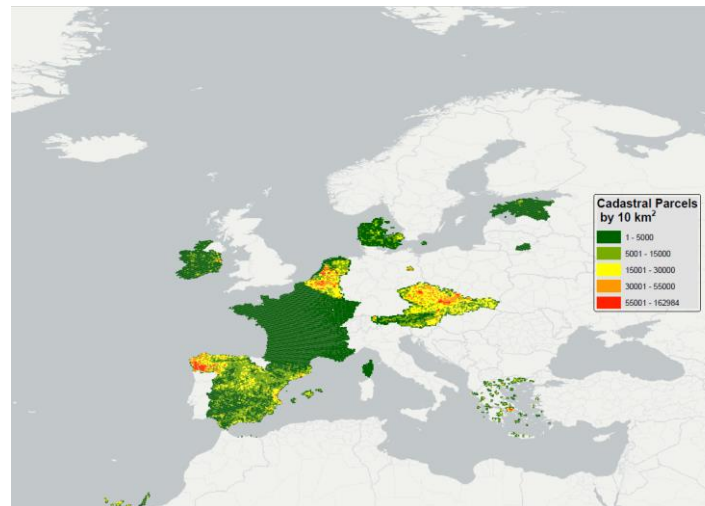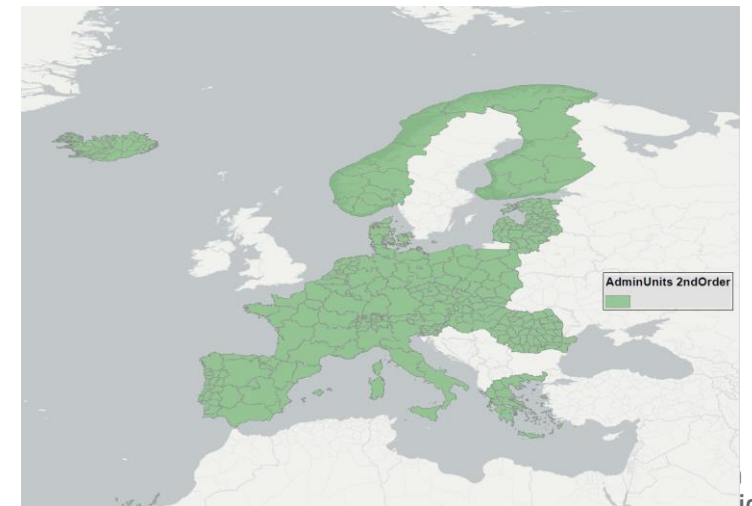https://gisco-services.ec.europa.eu/addressapi

Transport Networks
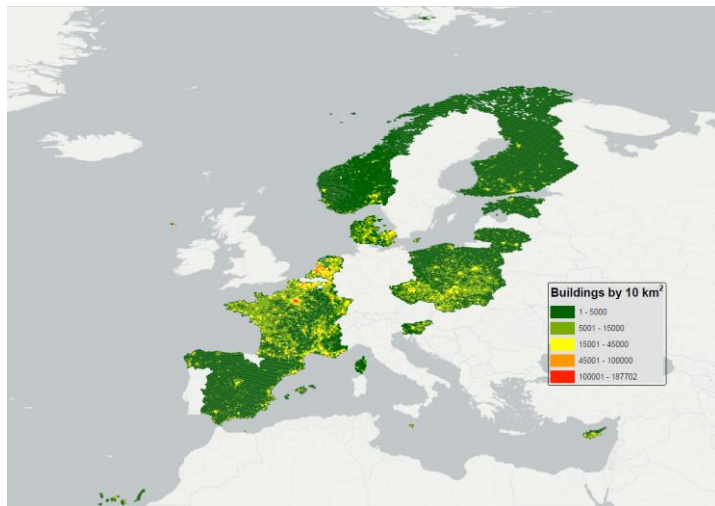
Building Units

Cadastral Parcels
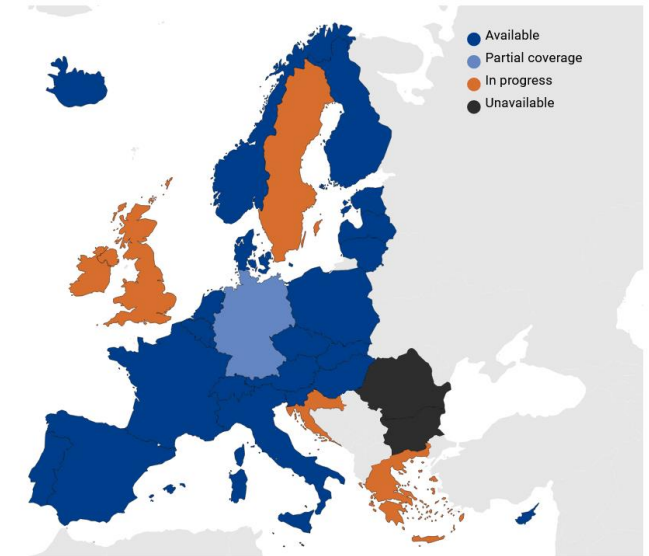

Administrative Units

Address API

- Authoritative Address Datasets (AD) from MS responsible organisation

- Ingested in INSPIRE AD schema -> simplified for performance

- Tackles the issue of non-validated data entry (1 – 10 - 100 rule)

- Vision: any address entered in an EC/ESS system {c,w,sh}ould be validated by AddressAPI

- Based on eUI – API agnostic - OpenAPI

Buildings Example (I)

Buildings by 10 km²

- 1 - 5000
- 5001 - 15000
- 15001 - 45000
- 45001 - 100000
- 100001 - 187702

Buildings Example (II)

Buildings by 10 km²

Year of Construction

- < 1880
- 1881 - 1930
- 1931 - 1968
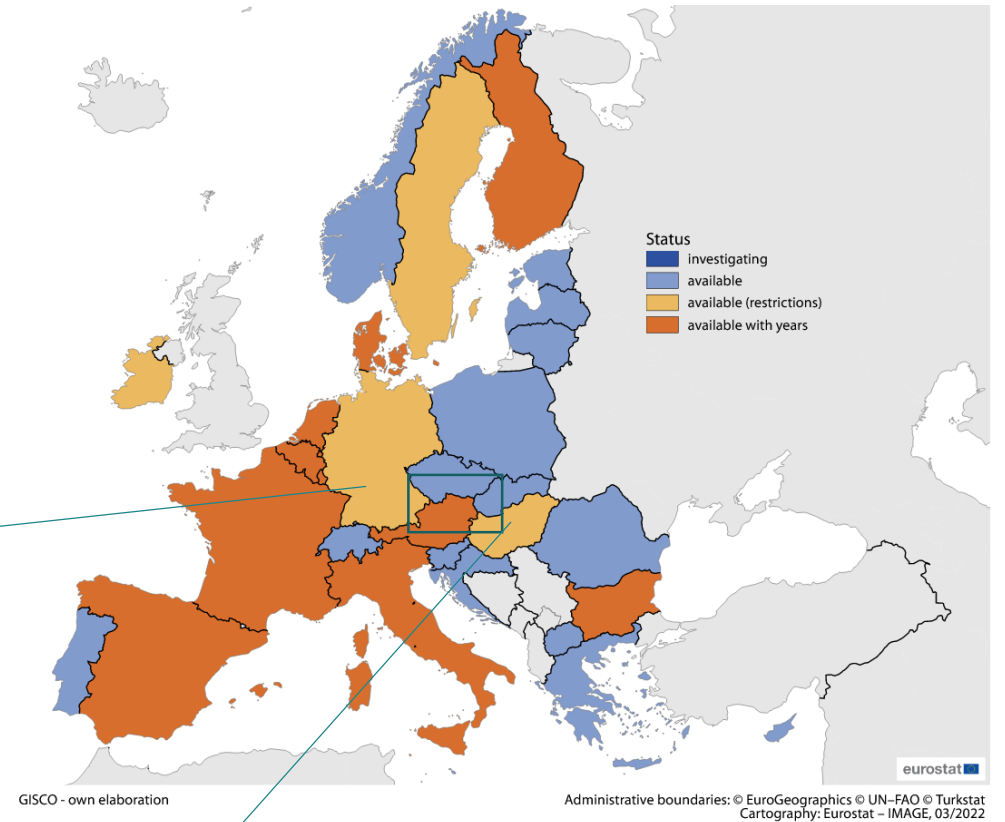- 1969 - 1979
- 1980 - 1991
- 1992 - 2021
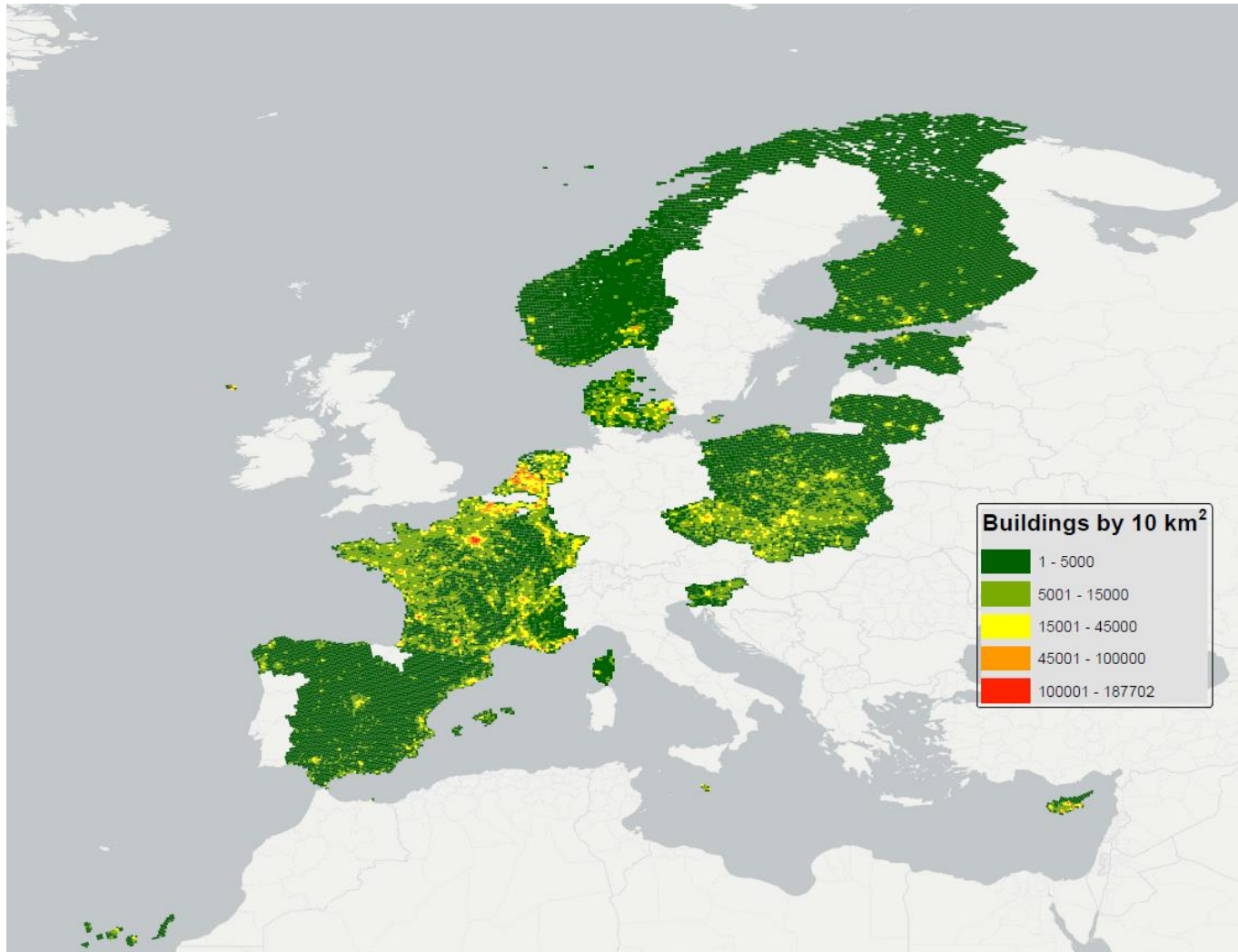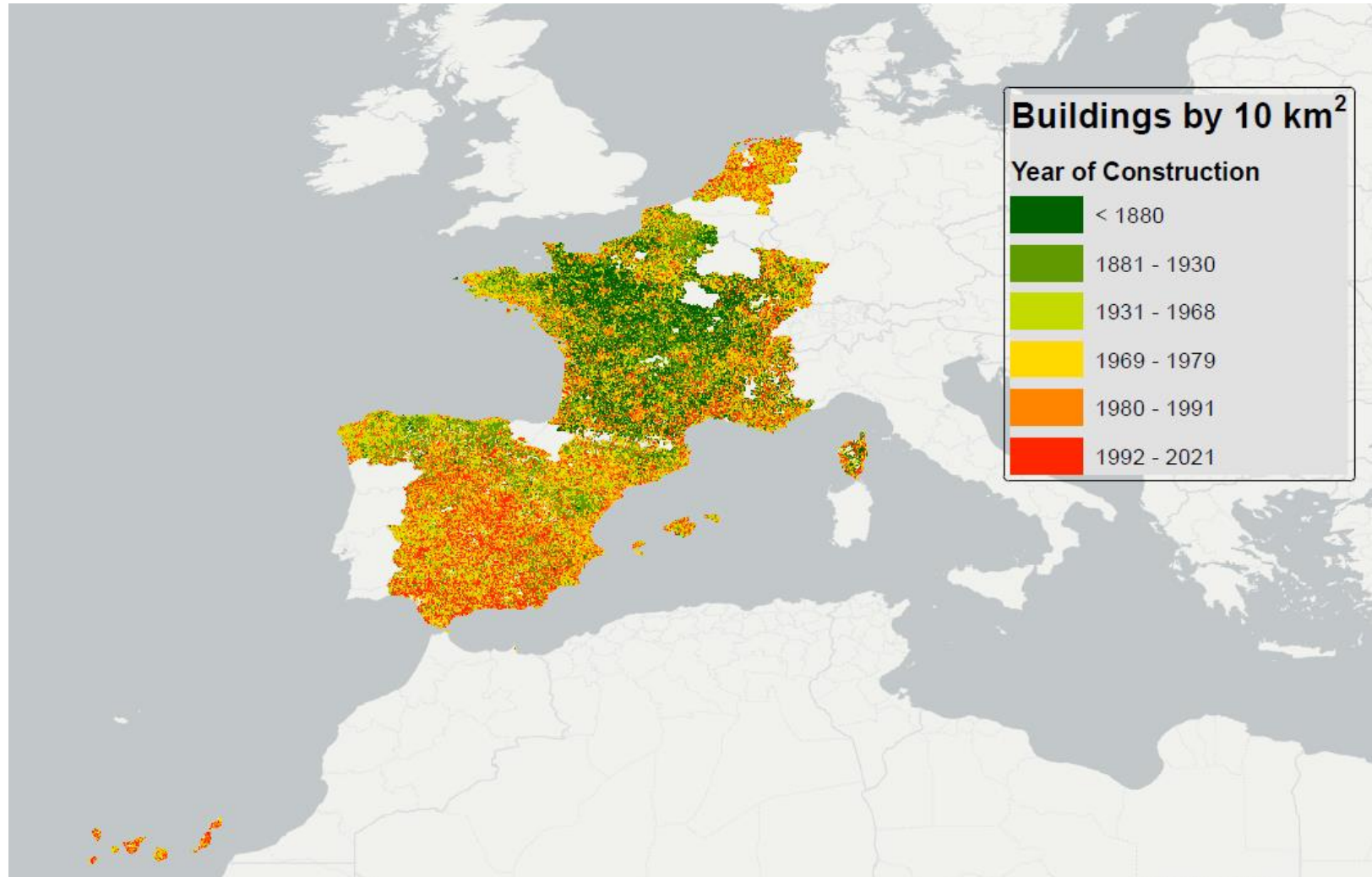
OrthoImagery (I)

- latest snapshot of OI from MS organisation

- If time series available – will be supported

- Depends on MS service performance + data requirements

- Up to 0.2m

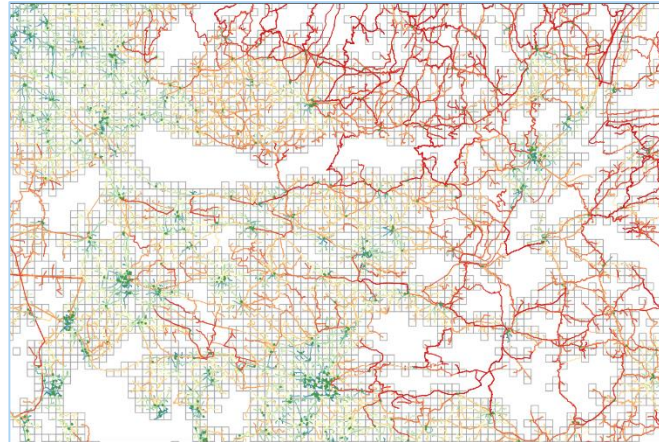**OrthoImagery Status March 2022**
Available in Development Instance

Status
- investigating
- available
- available (restrictions)
- available with years

GISCO - own elaboration

Administrative boundaries: © EuroGeographics © UN–FAO © Turkstat
Cartography: Eurostat – IMAGE, 03/2022

eurostat

European Commission

GISCO - the **G**eographic **I**nformation **S**ystem of the **CO**mmission
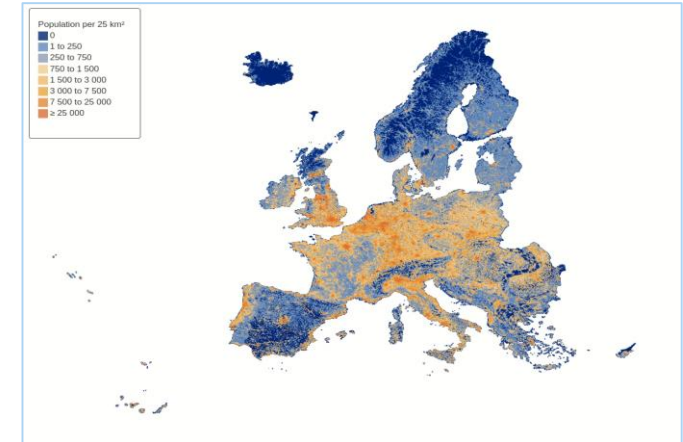
localise

analyse

visualise

Observations

Data exists but are not documented in Metadata systems (neither European or MS ones) or directly *hidden*.

Several datasets with various specifications exits for the same theme maintained by different organisations? Who is the master?

Dispersed datasets per country without a central authority

Depending on organisations - Administrative hurdles / Lock down mentality – not user centric

Officially data do not exists, but commercial datasets exists for the same area.

Outdated (temporally), semantically or resolution reduced data (e.g. content, scale)

- Requirement: Data are documented in INSPIRE/ EuropeanDataPortal/National Portals

- Requirement: Coordination inside the MS

- Requirement: Central Access/Distribution Point

- Requirement: Data Access for EC

- Requirement: Public Administration data MUST exists and be accessible

- Requirement: update data at least once a year, full content

Observations

- Eurostat works on a range of topics for the creation of pan-European data

- Depending on the datasets a) European Databases are created or b) datahub pointing back to MS resources to provide services internally/externally

- Code of conduct for Geospatial Data is required (e.g. PIDs, topology across domain, time-series) and enforced….

- Pan European progress is hampered by e.g. a) available datasets, b) stability of services, c) performance of services or d) at point of use restrictions due to financial demands.

- API and Bulk Downloads are needed and support various user communities –

- We (the GIS community) need to move from spatial/special into the main stream usage…

Recap

- GISCO – who we are and what we do

- Pan-European Dataset creation – Requirements – the WHY

- Pan-European Dataset creation – Requirements – the HOW

- Pan-European Dataset creation – Status update

- Pan-European Dataset creation – Observations…

Thank you

Contact: estat-gisco@ec.europa.eu

European Commission

Systems: address API

Solves one ISSUE:

Reference data set for address verification/ validation stored in XX+ systems of the EC

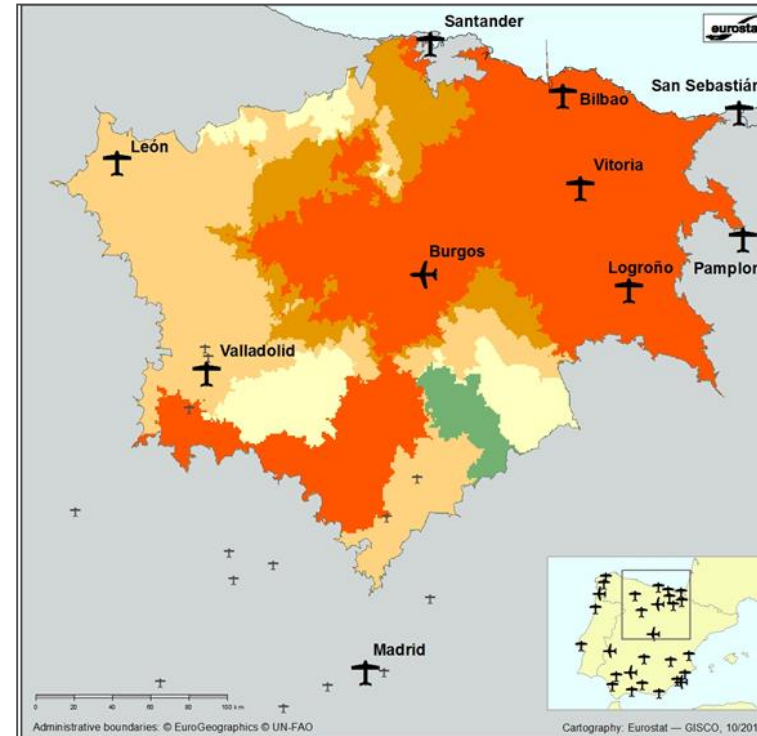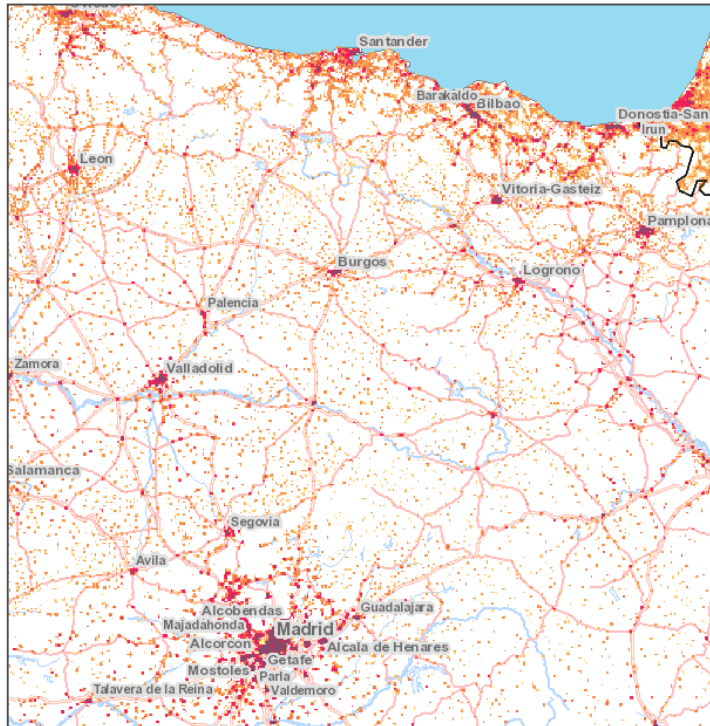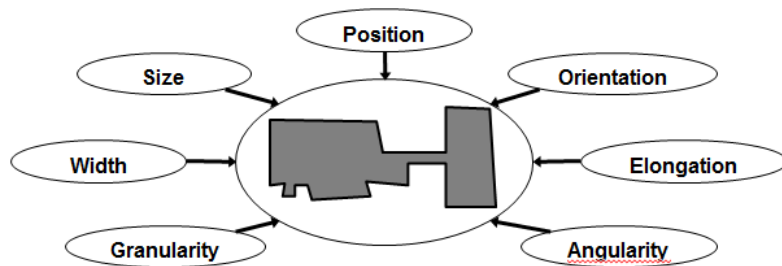Tackles the issue of non-validated data entry (1 – 10 - 100 rule)

URL: https://gisco-services.ec.europa.eu/addressapi

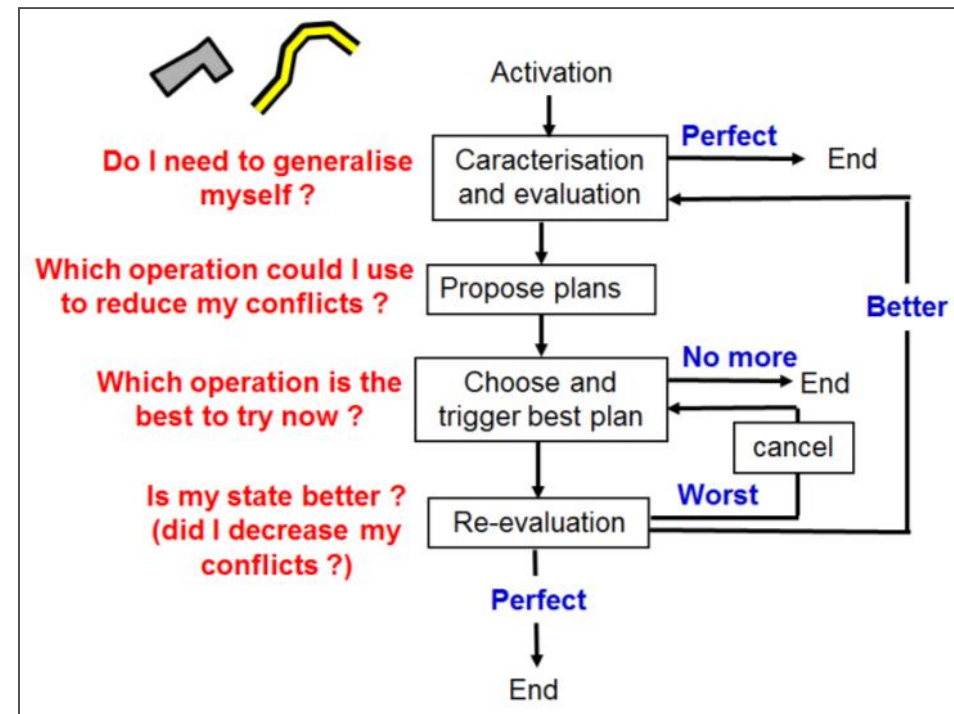# Example of spatial analysis (1)

- Airport catchment analysis

Agent-based generalisation

Target state formalised as constraints at object level…

…constraints satisfied iterativelly at object level

Analytics Codes

- https://github.com/eurostat/JGiscoTools

- https://github.com/eurostat/RegionSimplify

- https://github.com/eurostat/GridMaker

- https://github.com/eurostat/GeoDiff

- https://github.com/eurostat/happyGISCO

Java library for the manipulation of geospatial and statistical data

simplify vector geographical datasets representing tesselations

Produce grid geometries for statistics. As GIS vector datasets.

Analyse differences between two versions of a vector geospatial dataset

Simple pythonClient on top of GISCO services

European Commission