

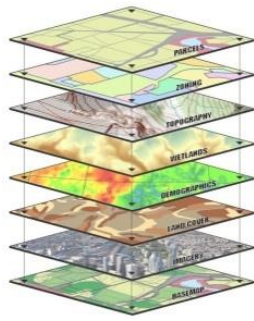


# Addressing the EU need for multi-scale, up-to-date and historical geographical information

TDKEN Webinar - Generalisation – Quality – Life-cycle  
Julien Gaffuri

*27 June 2024*

# GISCO – GIS at the Commission



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

- Provision of GIS (reference) data, services and software,
  - Support cartographic and spatial analysis activities,
  - Stimulate the use of GIS to support commission activities,
  - Support Eurostat activities on the integration of statistical and geospatial information.
- <https://ec.europa.eu/eurostat/web/gisco>

eurostat 

# Requirements

7 main requirements for pan-European datasets



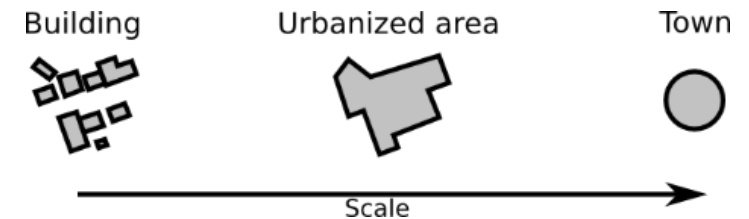
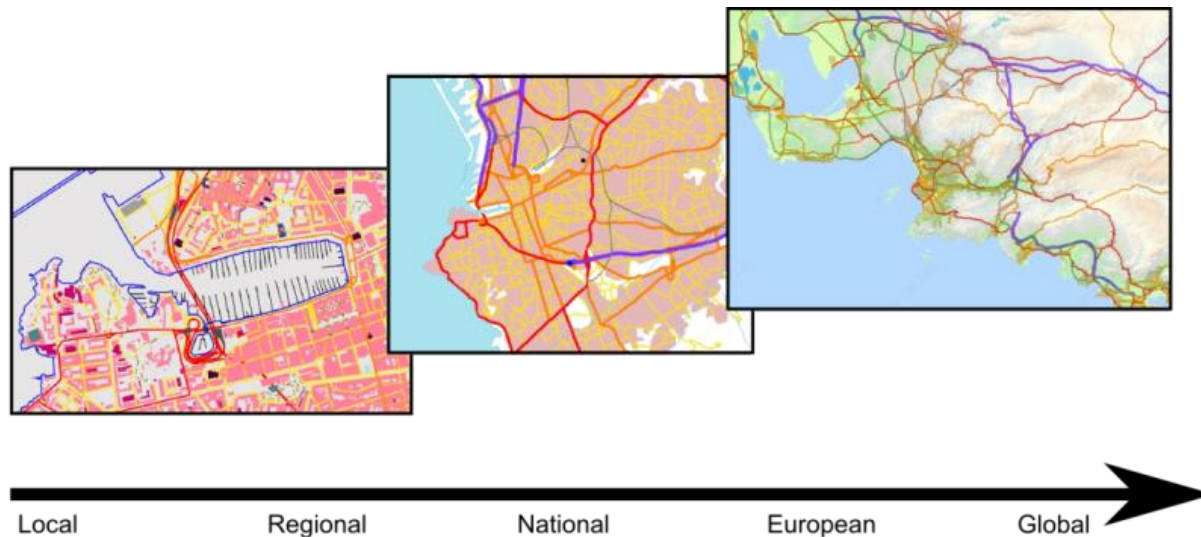
# Quality

- See papers
  - “Some activities on geographical data quality management at Eurostat GISCO”, 4th International Workshop on Spatial Data Quality, 11-12 October 2023.  
[https://eurogeographics.org/app/uploads/2023/05/3.-20231011\\_SDQ2023\\_eurostat\\_gisco\\_gaffuri.pdf](https://eurogeographics.org/app/uploads/2023/05/3.-20231011_SDQ2023_eurostat_gisco_gaffuri.pdf)
  - “Geographical data quality for spatial analysis and geospatial statistics”, European conference on quality in official statistics, 2024.
- ISO 19157-1:2023 – Geographical information – Data quality  
<https://www.iso.org/standard/78900.html>



# Generalisation and multi-scale data

- Need for detailed data (1:10k) and generalised data (1:50k, 1:100k, 1:250)
- Generalised data is not lower quality information, but different information.
- Need for **multi-scale** data – derived with AI-based automated generalisation.
- Generalisation is not only for maps – Model VS Graphic generalisation



# Generalisation and multi-scale data

- Generalisation at Eurostat GISCO for administrative and statistical units
- Minimum mapping unit / distance

Scale	Resolution in map mm	Resolution in ground meter
1:1M	0.2mm	200m
1:3M	0.2mm	600m
1:10M	0.2mm	2km
1:20M	0.2mm	4km
1:60M	0.2mm	12km

Generalisieren von Flächenkonturen und Flächen



Abb. 18a Detailliertes Gemeindegrenzbild 1:100 000



Abb. 18b Grenzbild 1:100 000 generalisiert für 1:400 000



Abb. 18c Wichtige Charakteristiken und Reduktion auf den Publikationsmassstab



Abb. 19a Waldflächen 1:50 000



Abb. 19b Waldflächen 1:50 000 generalisiert für 1:200 000

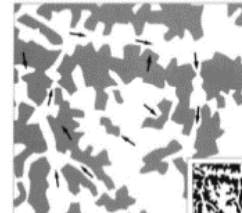


Abb. 19c Hinweise auf wichtige Generalisierungsmaßnahmen und Reduktion auf den Publikationsmassstab

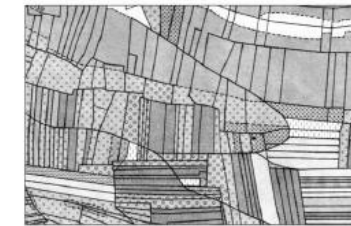


Abb. 14a Landnutzungs mosaik mit insgesamt 47 Kategorien

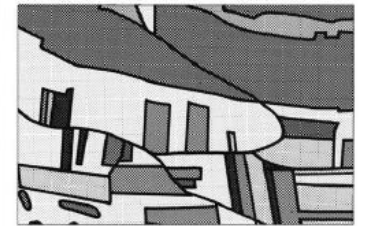


Abb. 14c Fünf Arten von Getreide unter dem Oberbegriff Getreide zusammengefasst



Abb. 14b Legende zu den Abbildungen 14

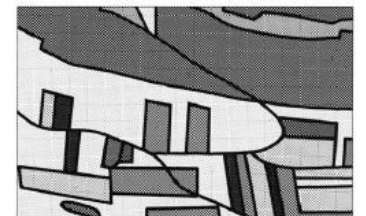


Abb. 14d Zusammengefasstes Getreide geometrisch generalisiert

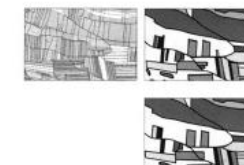
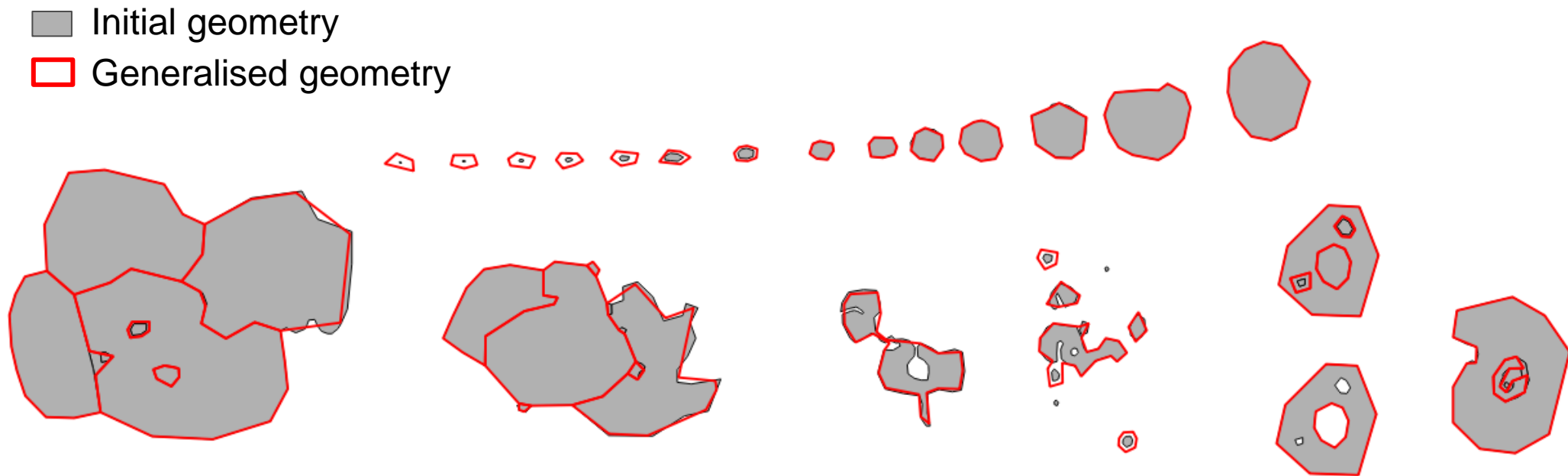


Abb. 15 Reduktion der Abbildungen 14 auf den Publikationsmassstab

# Generalisation and multi-scale data

- **RegionSimplify** tool (<https://github.com/eurostat/RegionSimplify/>)
- Constraint optimisation with multi agent system principles



# Generalisation and multi-scale data

- Key resources:
- ICA commission on generalization and multiple representation  
<https://generalisation.icaci.org/>
- Generalisation in Practice Within National Mapping Agencies, 2014,  
Duchêne et al., DOI: 10.1007/978-3-319-00203-3\_11  
[https://link.springer.com/chapter/10.1007/978-3-319-00203-3\\_11](https://link.springer.com/chapter/10.1007/978-3-319-00203-3_11)



# Temporal aspects

- Overall objective: **Measure evolution**
- Known reference year – a geographical dataset version is a picture taken on a date D. Correction  $\neq$  updates
- Suitable updates frequency
  - The more detailed the data, the more frequent the updates
- Specification stability (comparability accross time)
- Unique identifiers
- Dissemination as differencial datasets

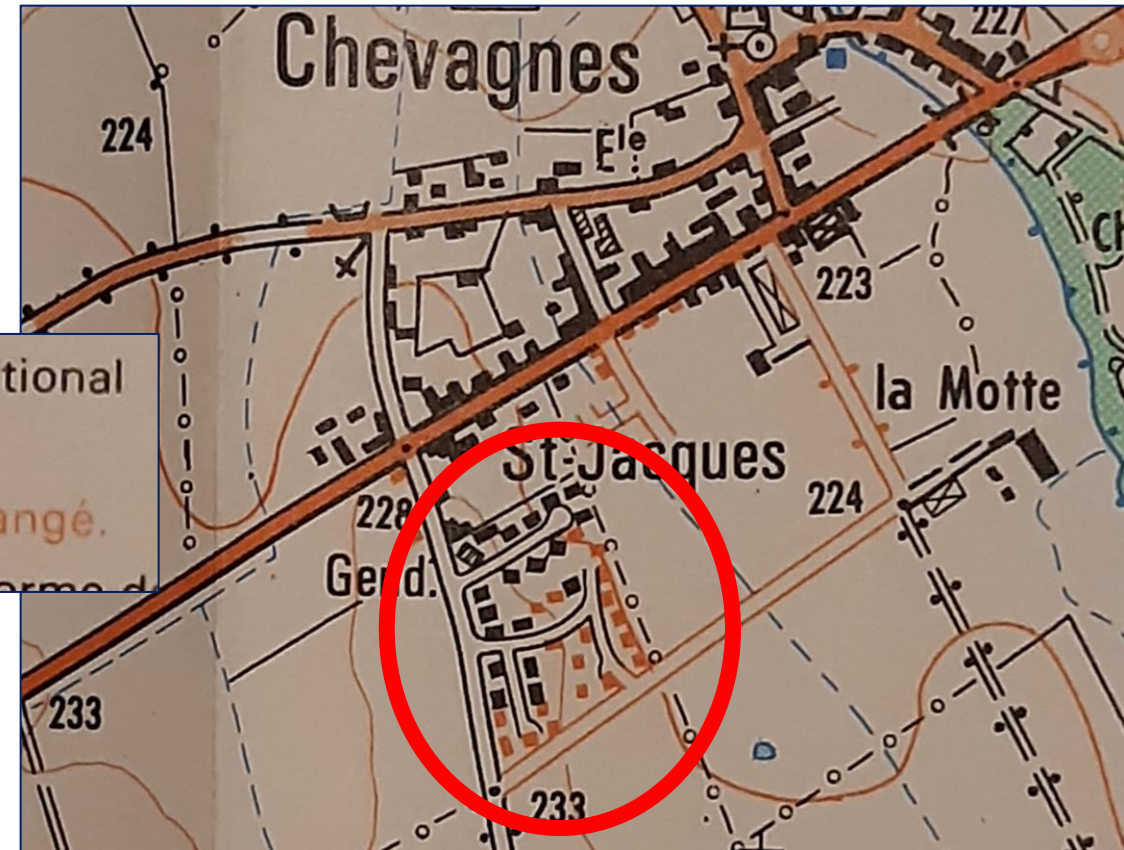
# Temporal aspects

- Differential datasets
- Example on IGN-F map (1992)

Réalisé et édité par l'Institut Géographique National  
complétés sur le terrain en 1970

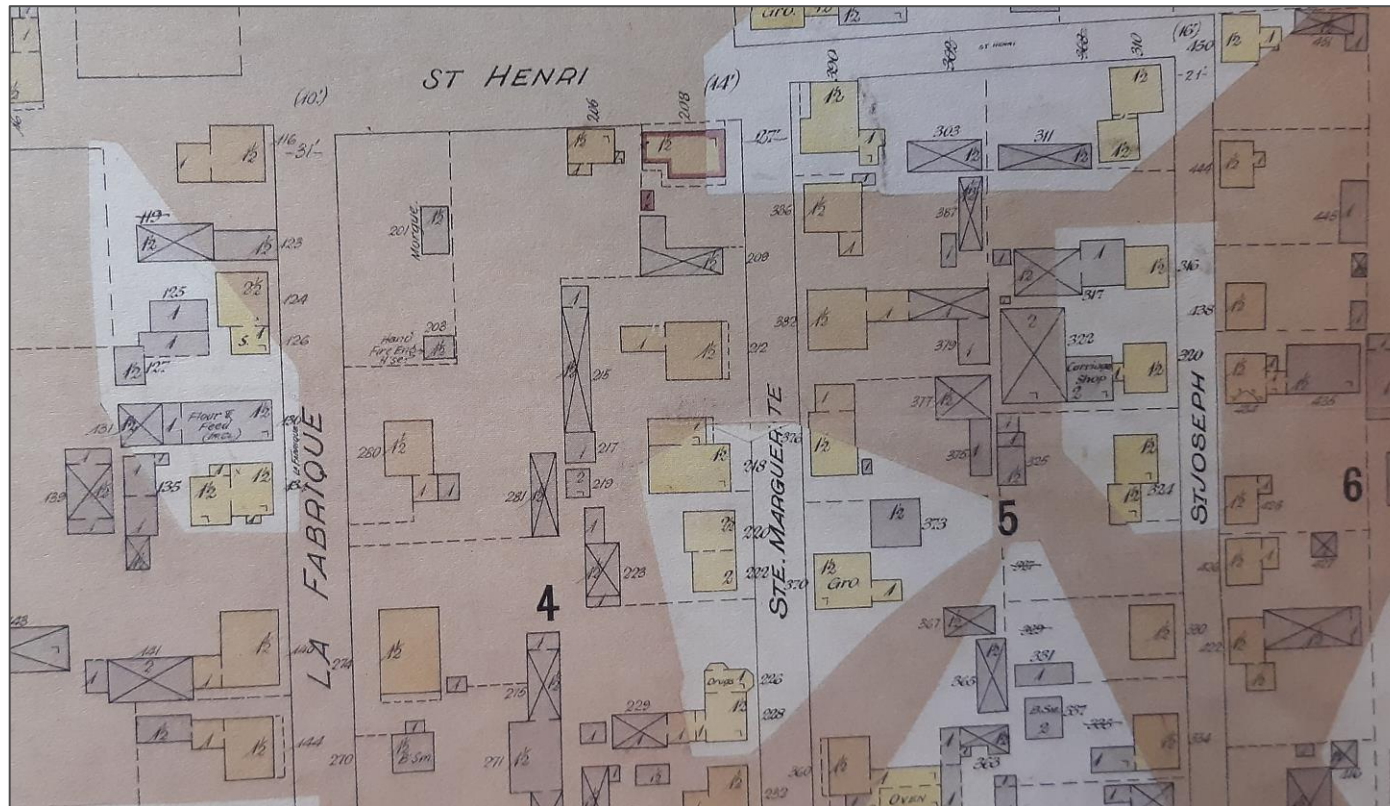
Les éléments de la révision de 1989 figurent en orangé.

Ellipsoïde de Clarke 1880. Projection conique conforme d



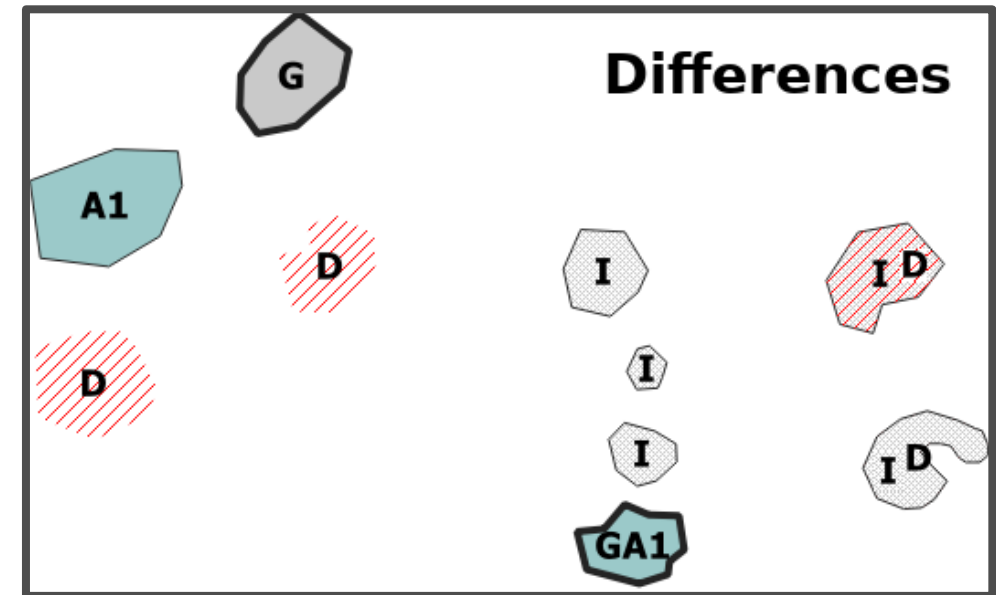
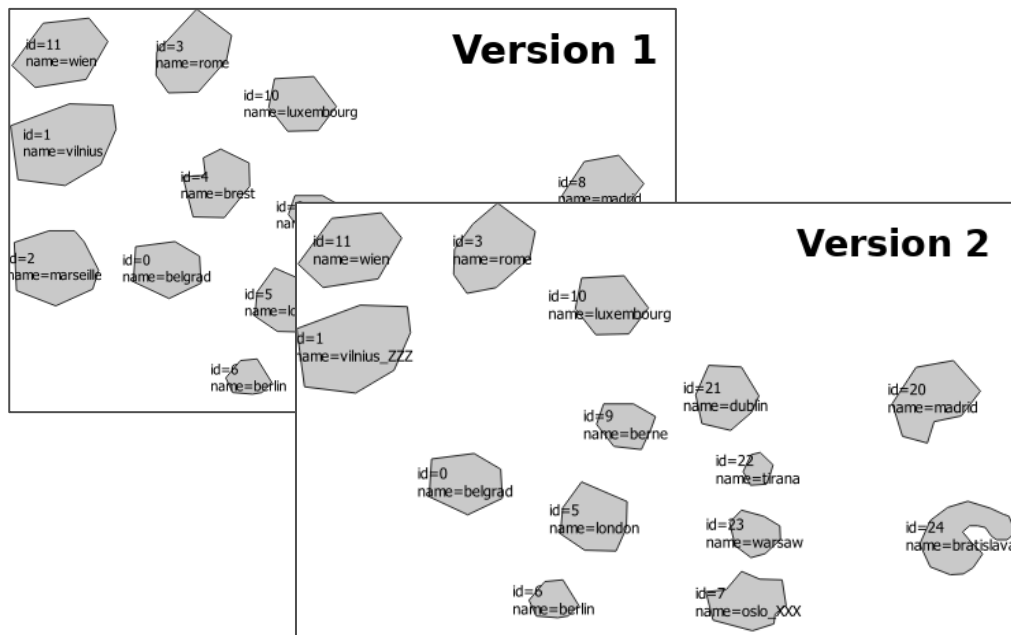
# Temporal aspects

- Differential datasets
- Example on Canadian map (1905) – "Butterfly service"



# Temporal aspects

- **GeoDiff** format and tool for differential datasets (<https://github.com/eurostat/GeoDiff>)



# Summary

- Quality
- Généralisation and multi-scale data
- Temporal aspects

# Thank you



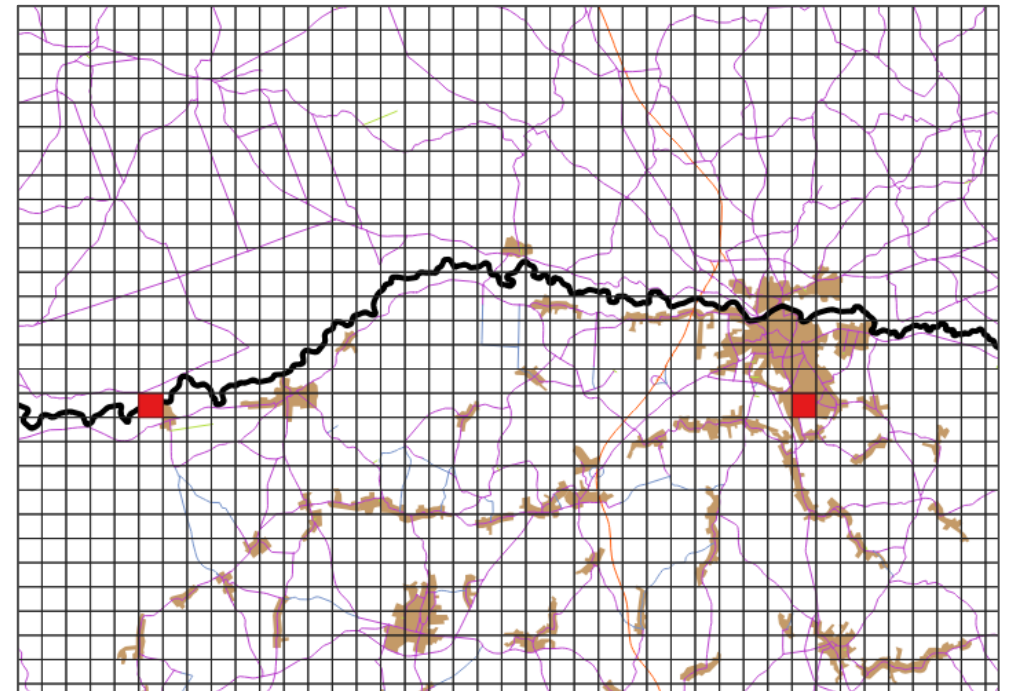
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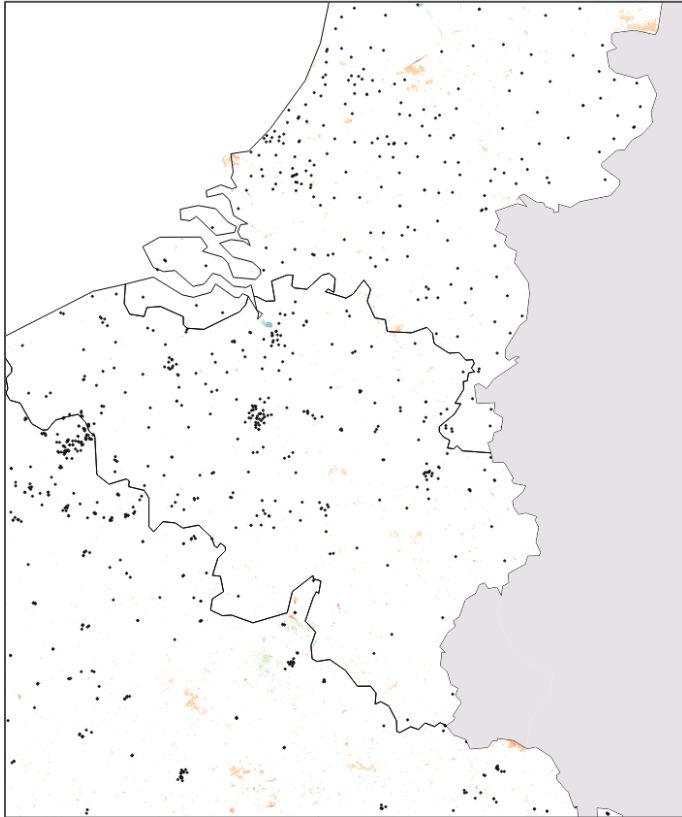
# Quality control – Completeness

- Assess the number of omissions and commissions for some feature classes.
- Pseudo-random sampling – of 1km grid cells:
  - 30 grid cells (one per country)
  - 17 cross-country grid cells
- For each grid cell:
  - Cross-source comparison

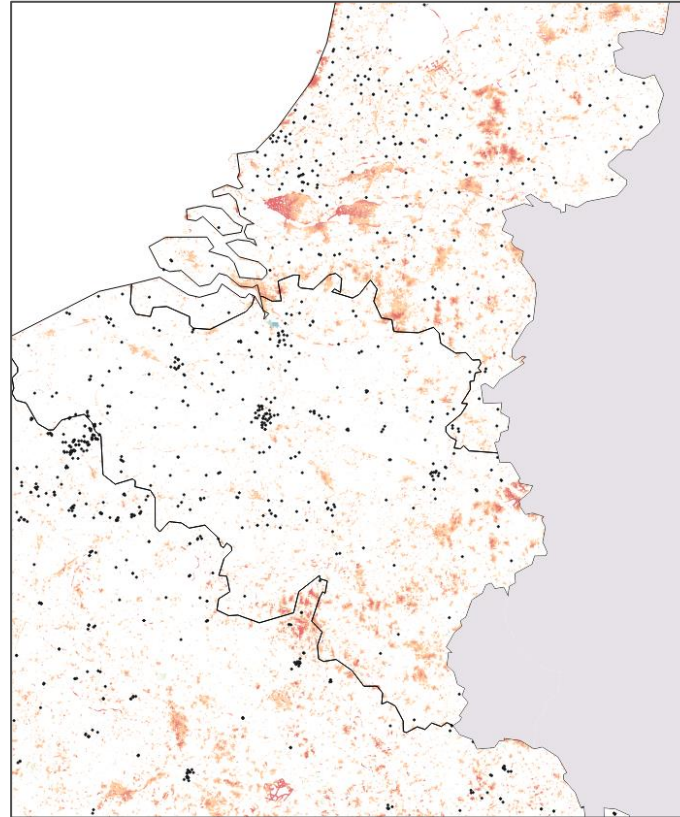


# Healthcare services accessibility analysis

**OME2 - Tomtom**



**OME2 - OpenStreetMap**



**Tomtom - OpenStreetMap**

