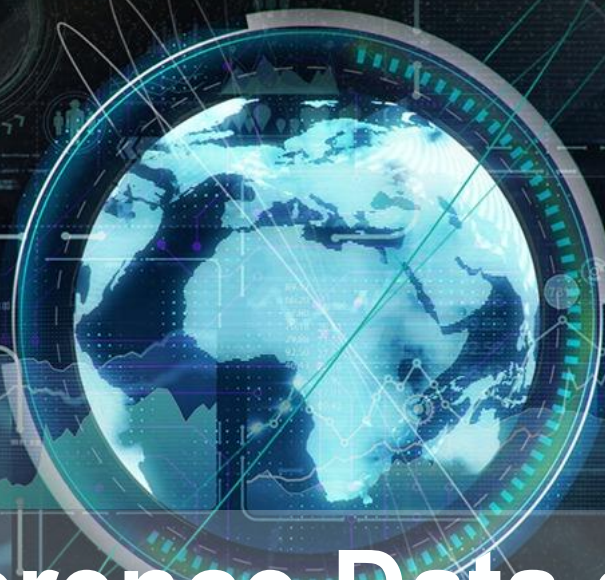


StatEO

5-7 May 2026 | ESA-ESRIN | Frascati (Rome), Italy



Workshop 4 - Reference Data as a Backbone for EO-Based Environmental Statistics and Services



Reference Data as a Backbone for EO-Based Environmental Statistics and Services

- Three back-to-back scene-setting presentations from stage
- Followed by group exercise(s) to name 2 main points per group

Time	Session	Description
5 min	Introduction	Welcome, describing setup
20 min	Presentations	EU Institutions Data providers (ESTAT, EEA, JRC)
5 min	Exercise Framing	Introduction to process (5min write up ideas themselves, post it, discuss, points), 2
30 min	Exercise	Reflect → stick → sort → discuss → vote
10 min	Report	Outline top two ideas for the group(s)
20 min	Harvest & Closing	Share results, wrap-up

Hannes I. Reuter (ESTAT)

Statistical Officer at EUROSTAT



Timo Breure (JRC)

Scientific Officer at the Joint Research Center

Jose Miguel Rubio Iglesias (EEA)

Project Manager at European Environmental Agency

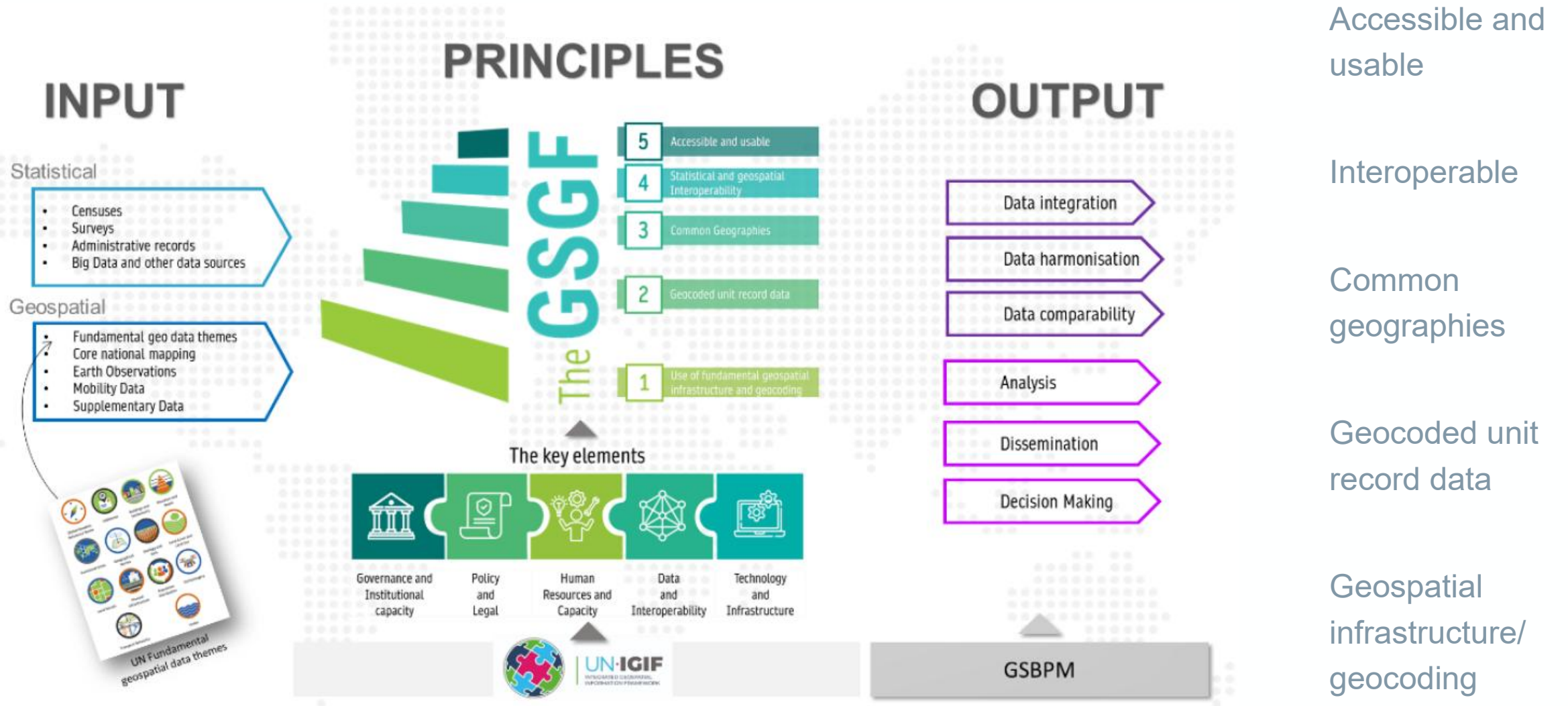


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Eurostat's Geospatial Reference Data



Source: UNGGIM, UNSD (2025)

GISCO – Geographical Information System of the Commission



➤ Main tasks/missions:

✓ Collect, validate and provide **reference geographical information** and related services for use within Eurostat and the EU Commission, and to the European citizens at large

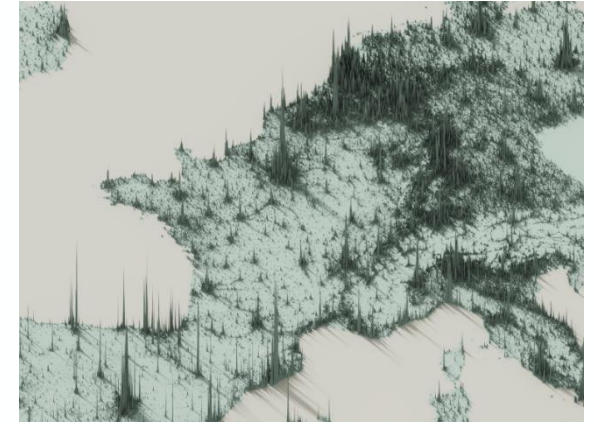
❖ Operation of the spatial data infrastructure of the EC, provision of specialized tools & services, reference geospatial data for use by the EC and other EU Institutions / bodies and within the ESS

reference geospatial data

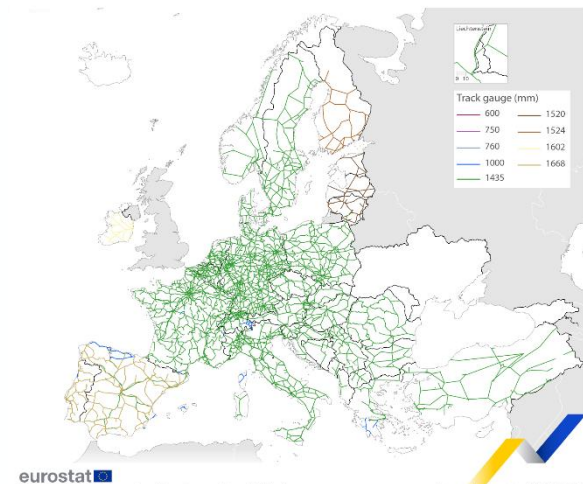
✓ **Answer the needs** of the European Commission, Eurostat and – to some extent – of the Member States **for geographical information** at the level of the European Union, its Member States and regions

❖ Specialized resources, guidance and training, thematic mapping/data and spatial analysis

✓ Contribute to, and coordinate, the work in the ESS on the **integration of statistics and geospatial information** via the **GISCO Working Group**



Railway lines by track gauge, 2020



eurostat
Note: Annex V is mandatory on the rail Trans-European Network (TEN) only.
Source: Annex V of Regulation (EU) 2018/643 on rail transport statistics.
Characteristics of network segments, enriched by the Register of Infrastructure (RINF) managed by the European Union Agency for Railways (ERA).
Cartography: Eurostat – GISCO, 02/2024
Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
This designation is without prejudice to positions on status, and is in line with UNISCT (2004/9) and the EU Opinion on the Kosovo Declaration of Independence.



Geospatial Reference Data at Eurostat - GISCO

➤ [LAU](#)

➤ Typologies

✓ [Urban-rural](#), [DEGURBA](#), [Coastal](#)

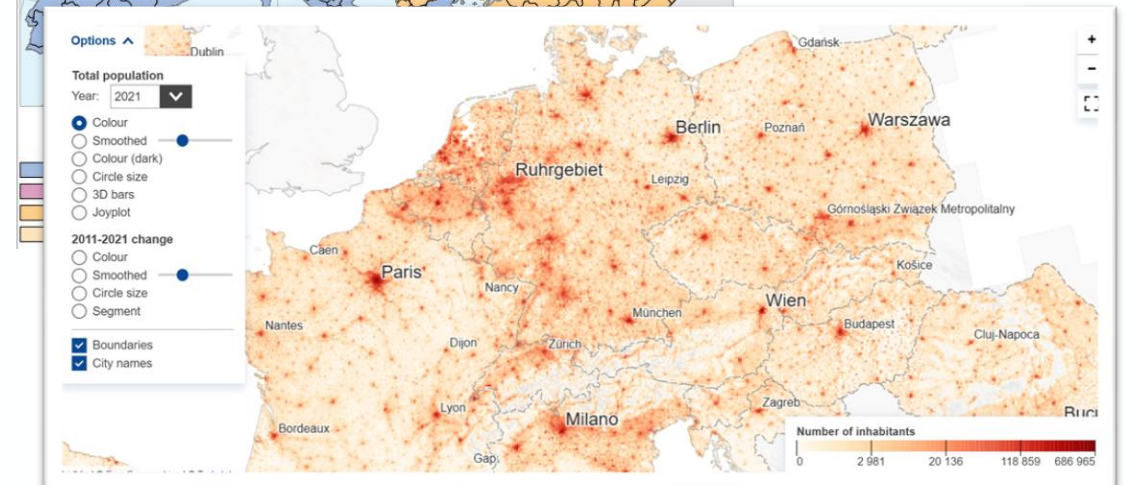
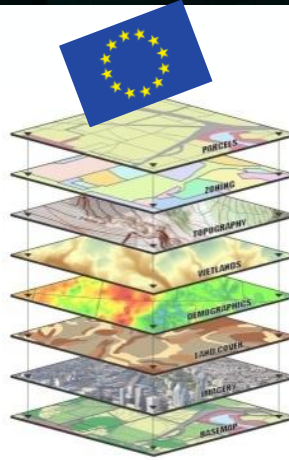
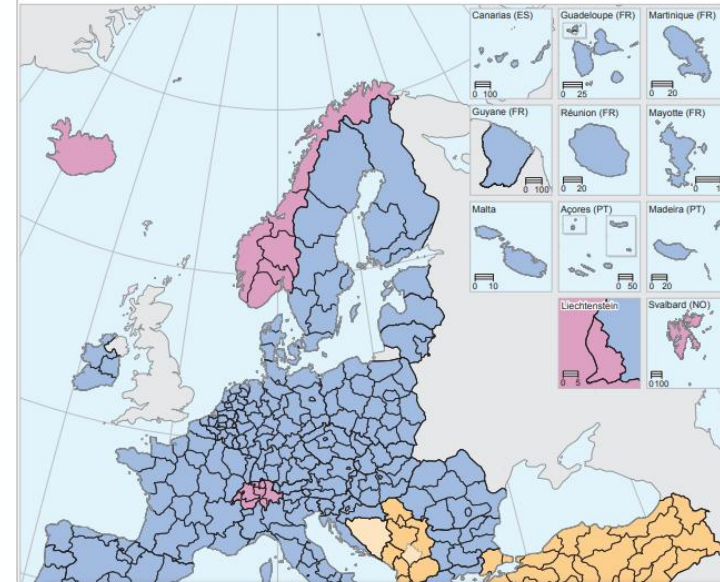
➤ [NUTS](#) (Statistical Units)

➤ [Countries](#)

➤ Grid for [population census 2021](#)

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

NUTS 2 regions in the Member States of the European Union (EU-) according to NUTS 2021, with corresponding statistical regions in EFTA countries, candidate countries and potential candidates



Geospatial Reference Data at Eurostat - GISCO



➤ Population grids (e.g. 2011, 2021)

➤ [Population clusters](#)

➤ Ports/Airports - [Transport Matrixes](#)

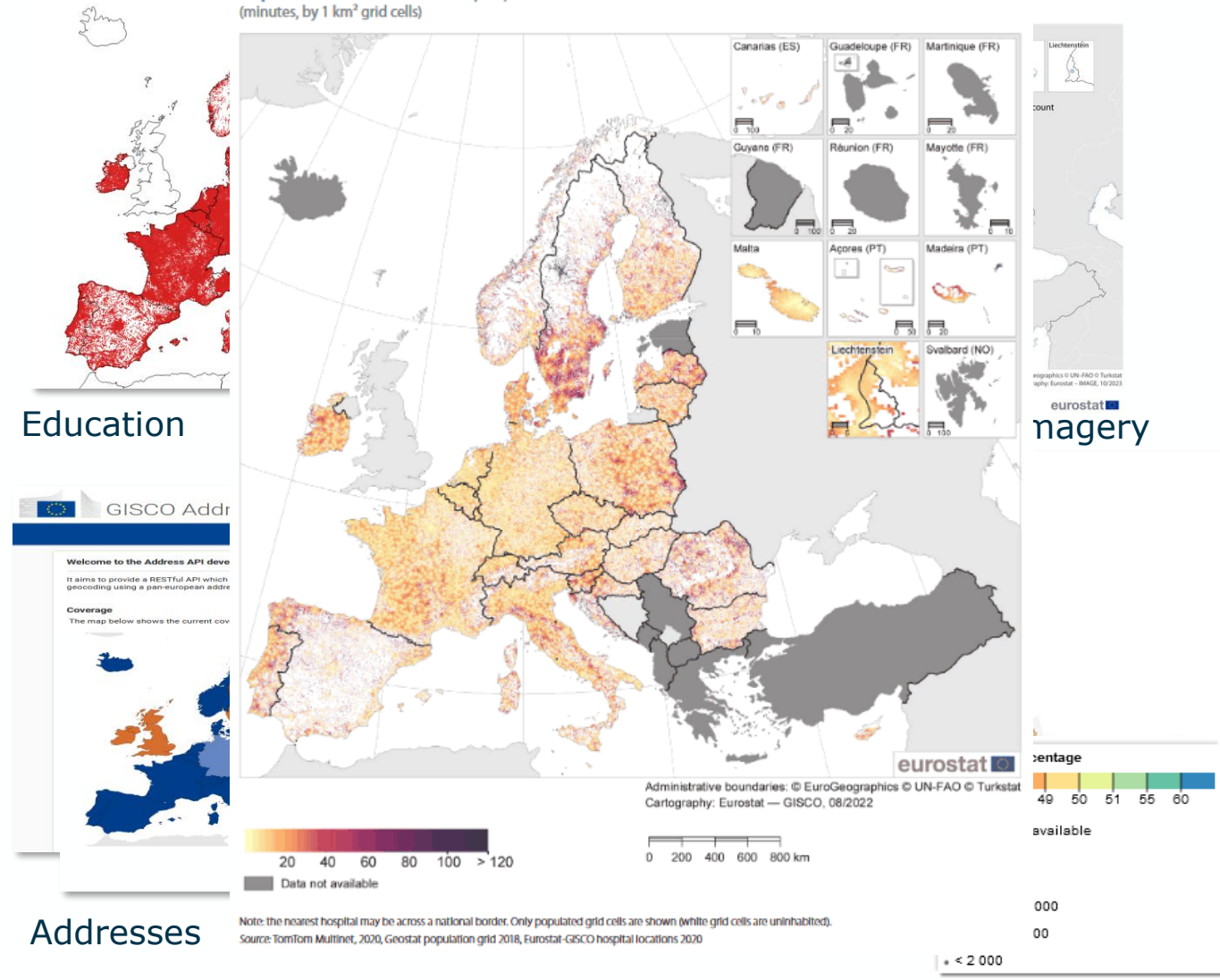
➤ Utility Services (Education / Healthcare)

➤ [Postal Codes](#) / Addresses / Buildings /

➤ Ortho Imagery

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

Map 2.3: Travel time to nearest hospital, 2020 (minutes, by 1 km² grid cells)



Education

GISCO Addr

Welcome to the Address API dev
It aims to provide a RESTful API which geocoding using a pan-European address.

Coverage
The map below shows the current cov

Addresses



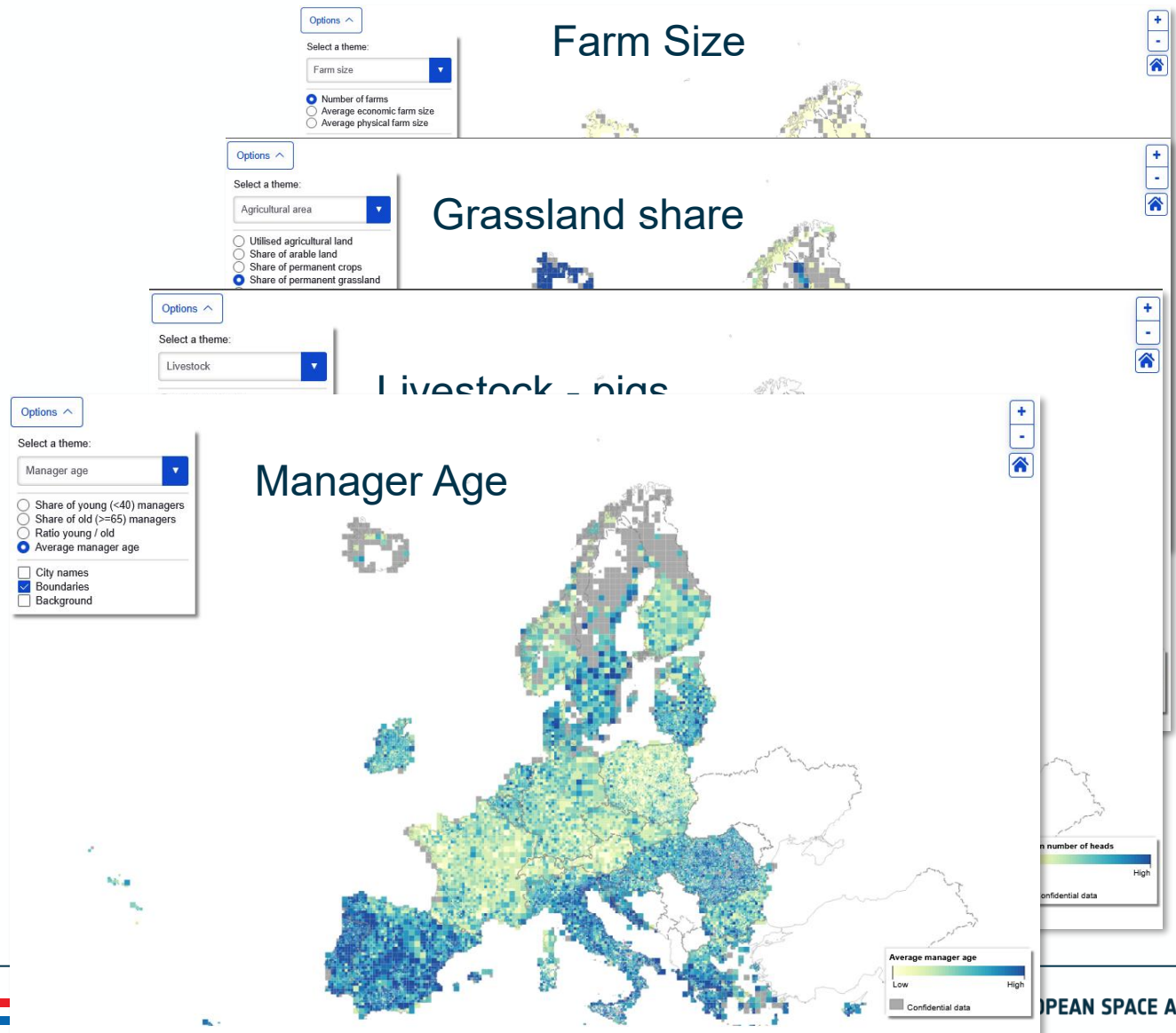
Geospatial data from agricultural census

agricultural census provide information related to the farms (location, main activities, livestock, education, labour force,...)

Collaboration with JRC – [Paper](#)

Statistical disclosure control applied (n=10)

Example of micro data available at NSI / Eurostat level



Land cover, land use area frame survey

Land cover & land use & Environment

Statistical survey

Field points, Office photo-interpretation

European-wide, harmonised

LUCAS Survey — land use and land cover across the European Union:

Monitoring socio-environmental challenges, such as: land take, soil degradation and environmental impact of agriculture.

Land cover
BIOPHYSICAL COVERAGE OF LAND
 74 subclasses



Land use
SOCIO-ECONOMIC USAGE MADE OF LAND
 40 subclasses



1st phase: LUCAS Master Preparation:

2km squared grid

1 000 000 points

- Stratification
- Sample design

2nd phase sample: data collection

Parameters

- Land cover
- Land use
- pictures
- etc.

Ground Survey

Results: [2018](#)

Land Cover class

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

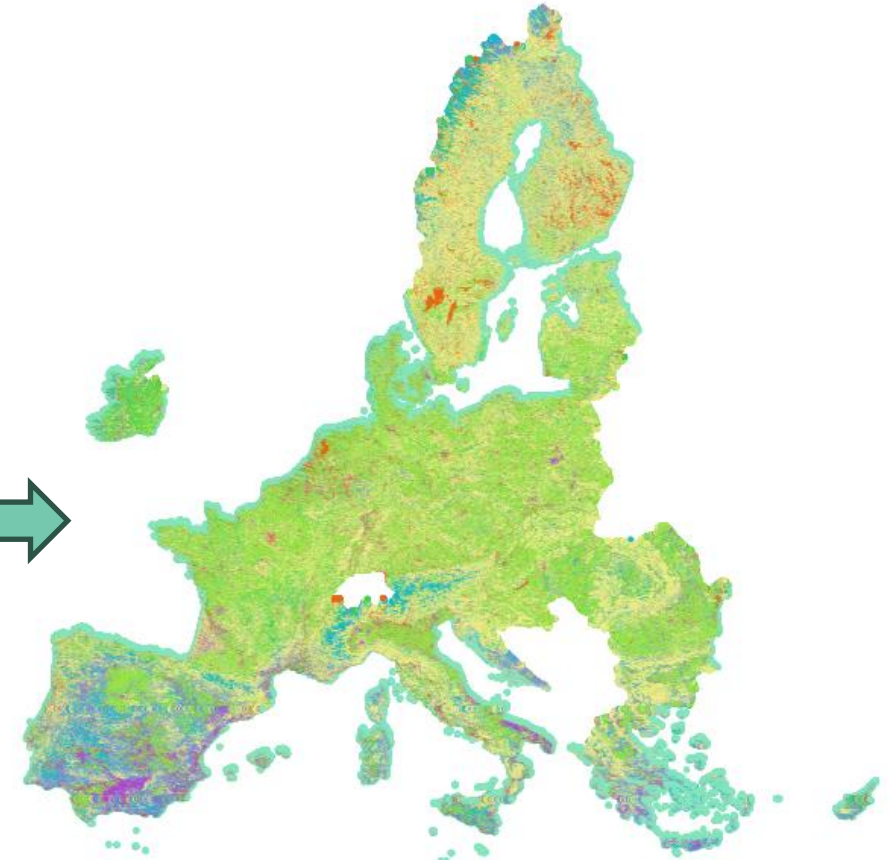
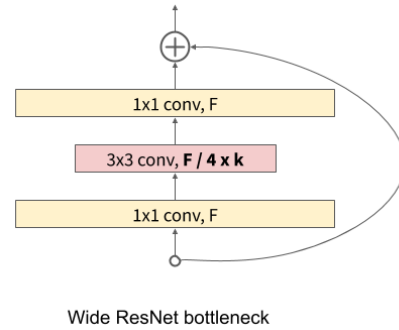
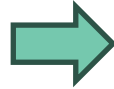
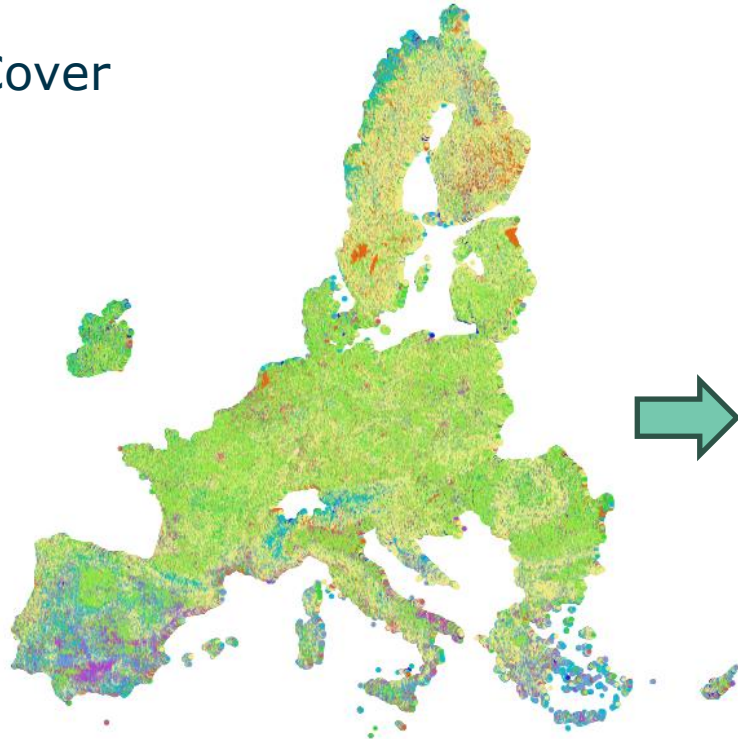


Photo Interpretation (2km grid, ~1m pts)

Predictions (1km grid, ~3m pts)

Providing founding elements of the GSGF in practice - also for EO

Wide variety of Geospatial reference data on which other services rely on directly/ indirectly

Topics: administrative core reference datasets – focusing on the European extent

focus on authoritative datasets with consistent long time series

Plus !! regional statistical data, micro data, census data !!

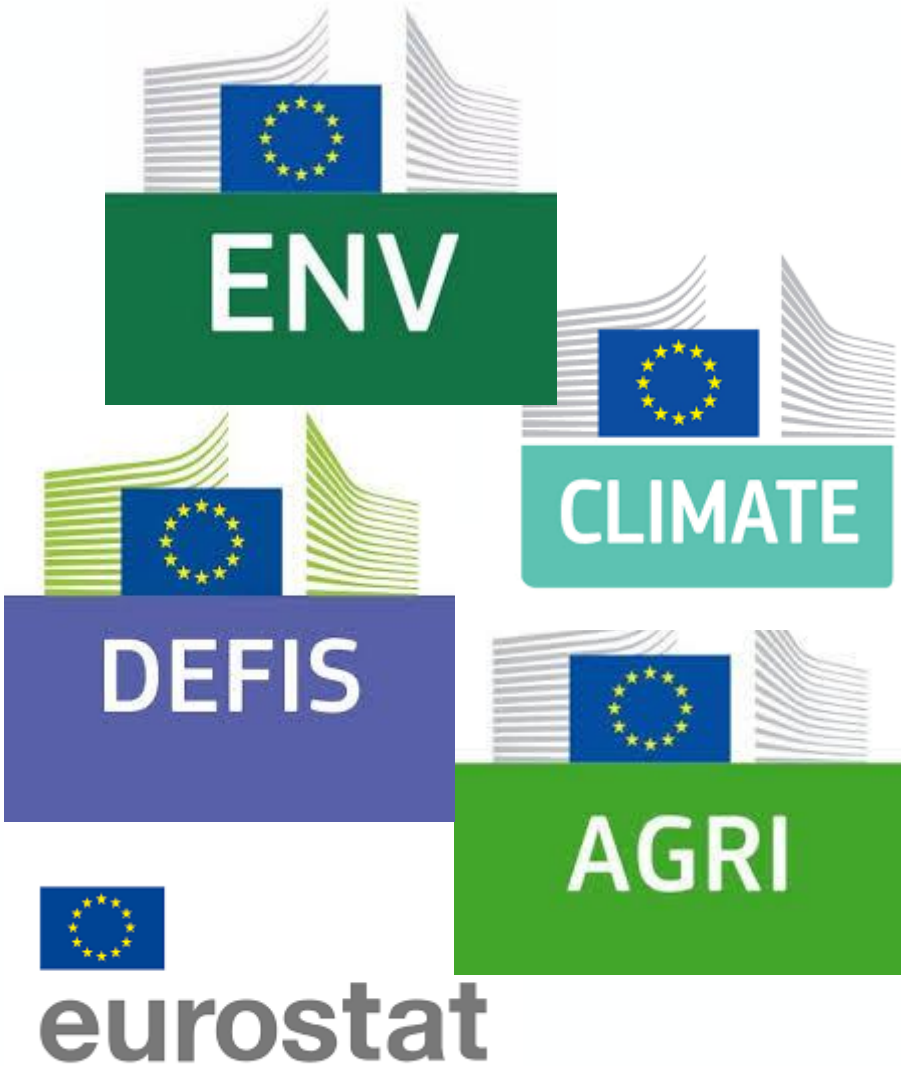
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In-situ datasets that inform JRC products for agriculture and forestry

T.S. Breure (representing work from many colleagues of D1, D5 and E1)
Joint Research Centre – European Commission

In-situ data that support JRC products



JRC is the independent, science and knowledge service of the Commission



D1 Land and Climate
D5 Food security
E1 Disaster Risk Management

Agriculture – LUCAS Soil



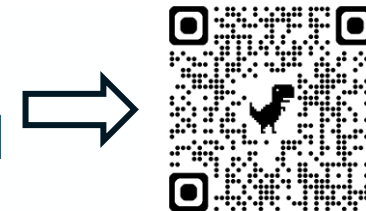
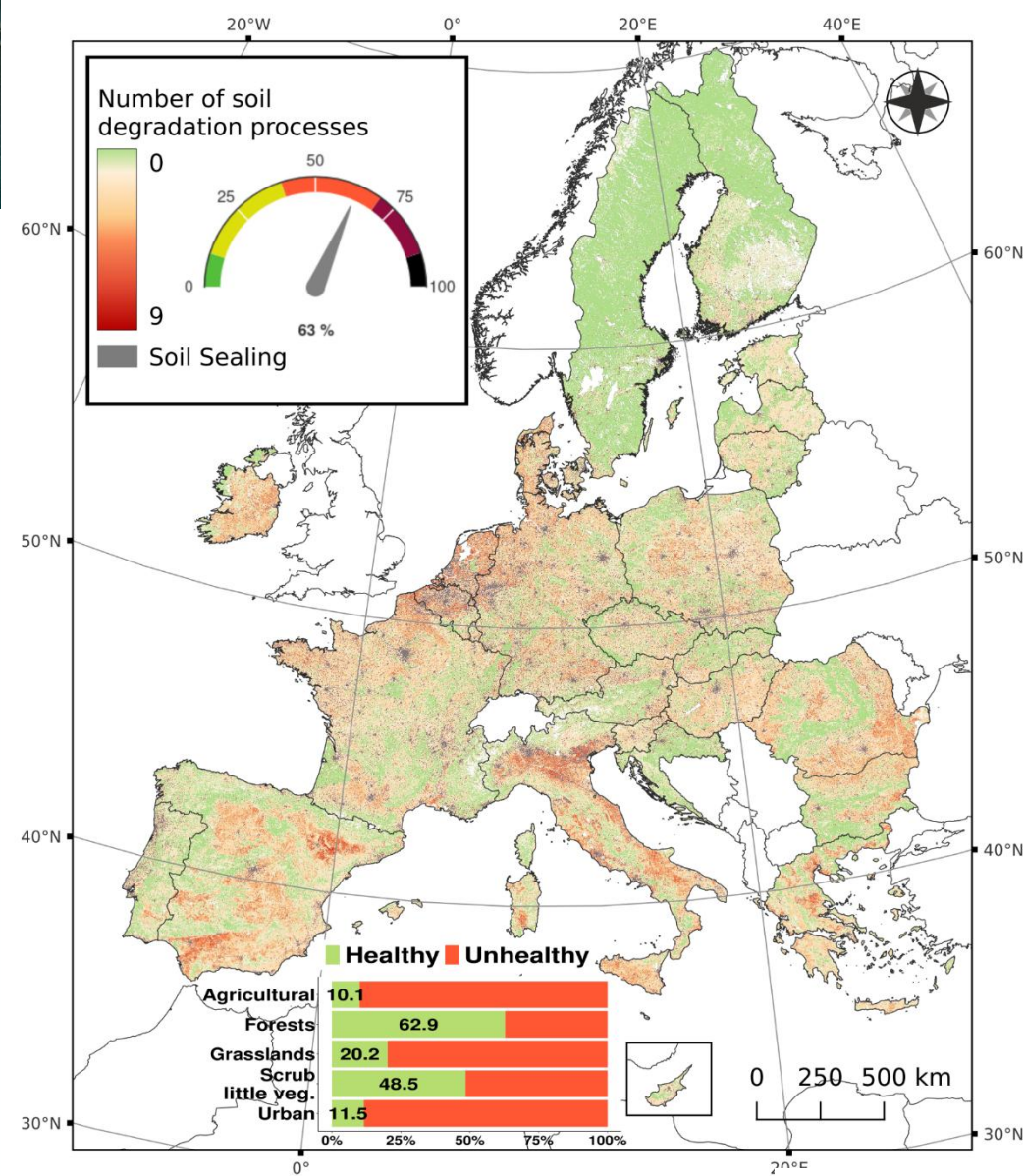
The JRC manages the LUCAS SOIL survey: sample design, EU-wide layers

EU-wide soil monitoring



- Surveys (and the resulting data) span multiple years
2009, 2015, 2018, 2022

32,000 observations in 2022 <https://esdac.jrc.ec.europa.eu/>



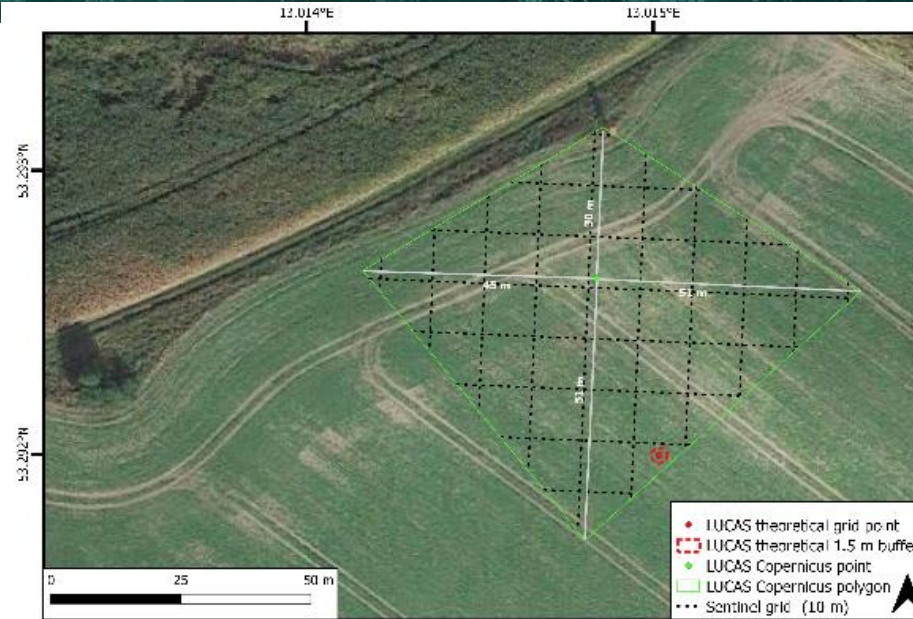
Copernicus Programme

Need for in-situ reference data

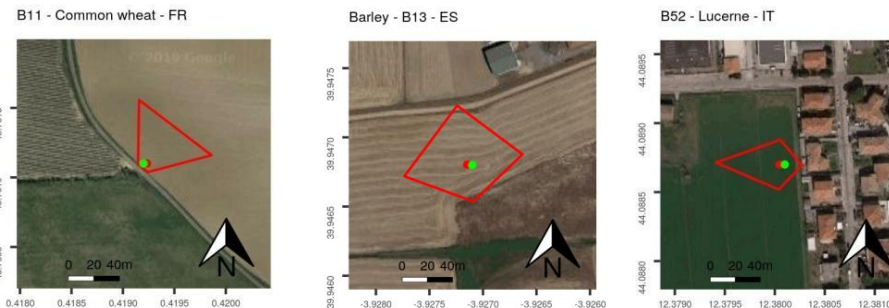
EO LUCAS module introduced in 2018 to collect surface relevant for EO instead of points

1.5-m points not suited for EO

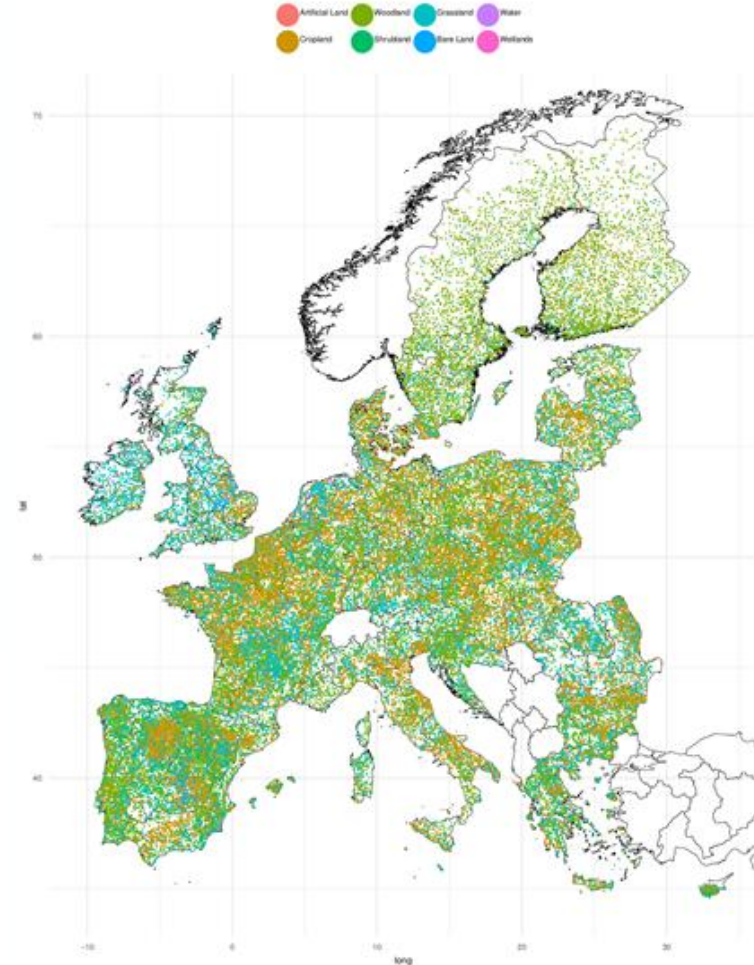
- 60 K “pure” polygons collected
- Average area of 0.3 Ha
- Open Data set in ESSD*



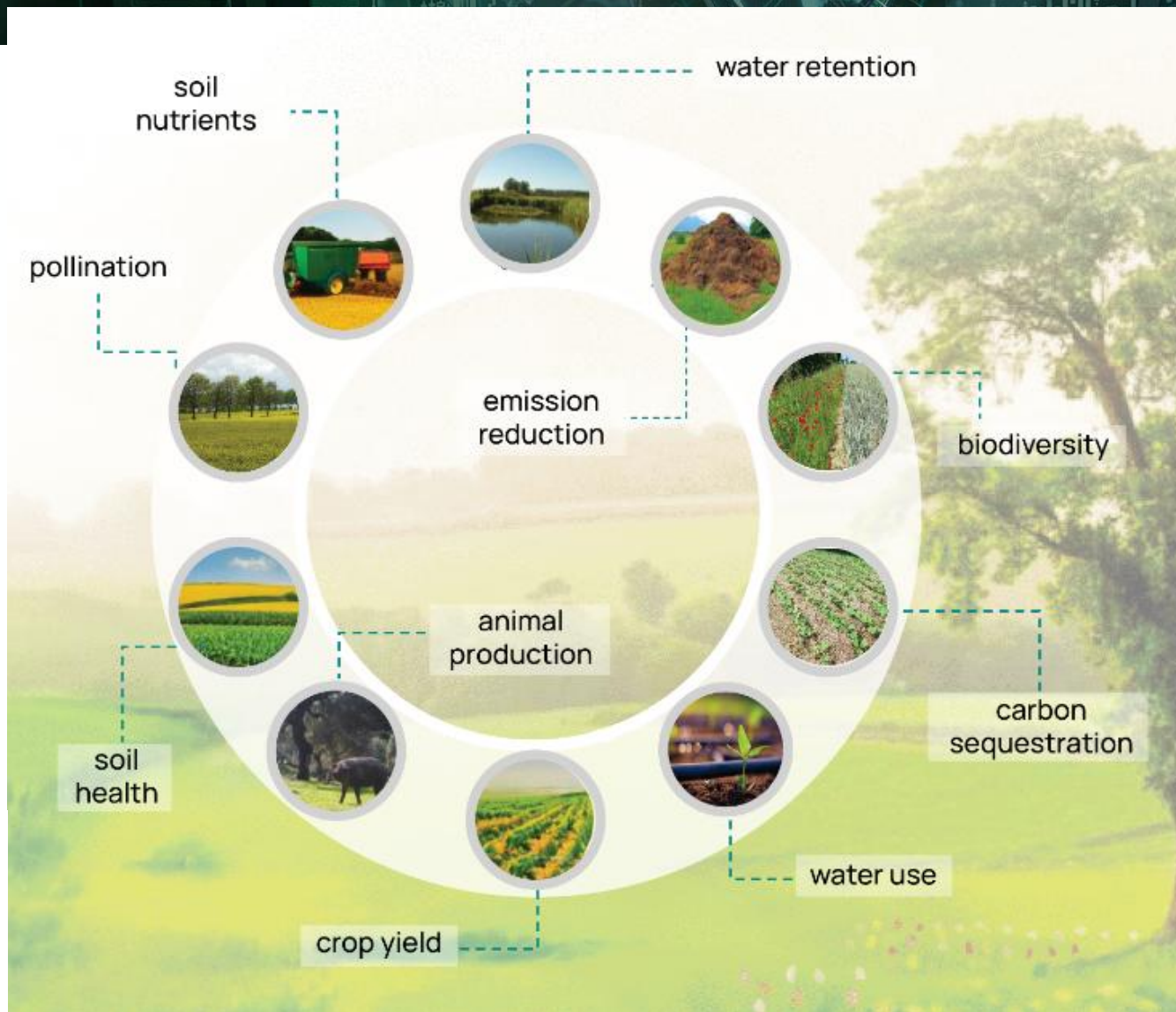
Example of a LUCAS Copernicus polygon and Sentinel 10-m grid VS LUCAS point



Examples of a LUCAS Copernicus polygon



d’Andrimont et al. (2021)

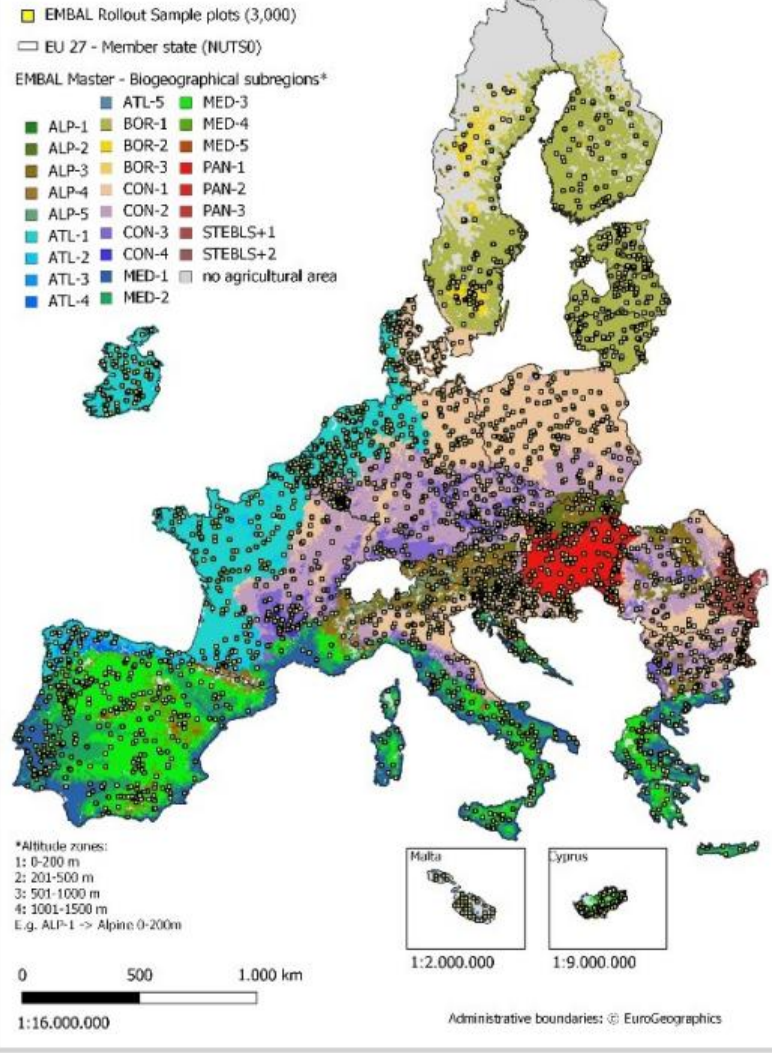


The JRC synthesized scientific evidence to assess the effect of practices on sustainability outcomes

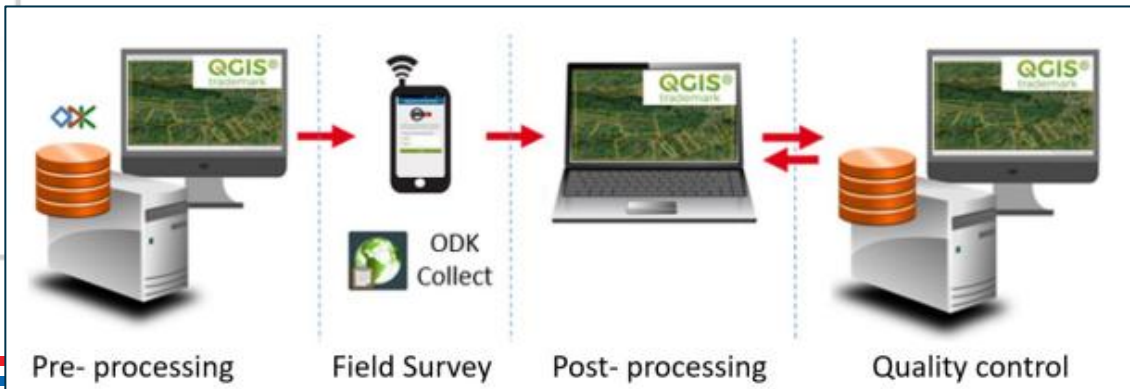
Schievano et al. (2023)



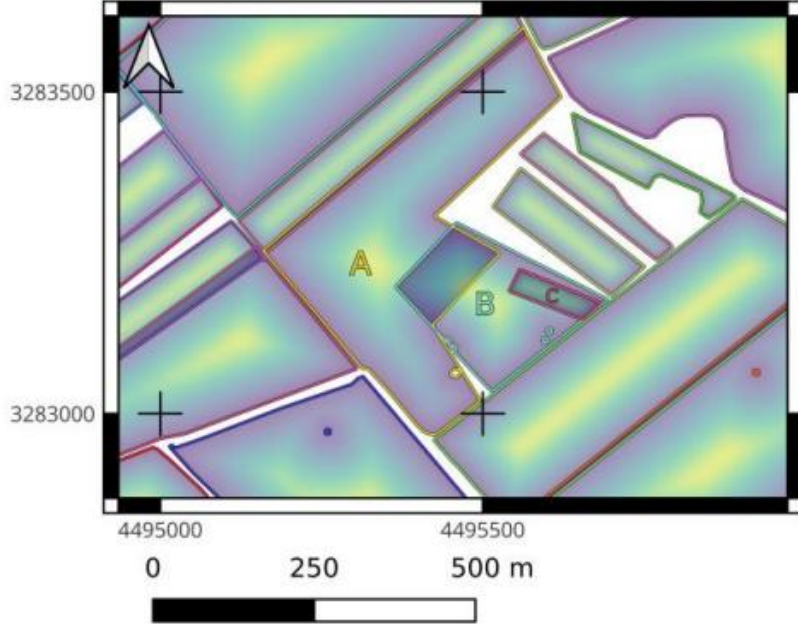
EMBAL Rollout 2022 & 2023



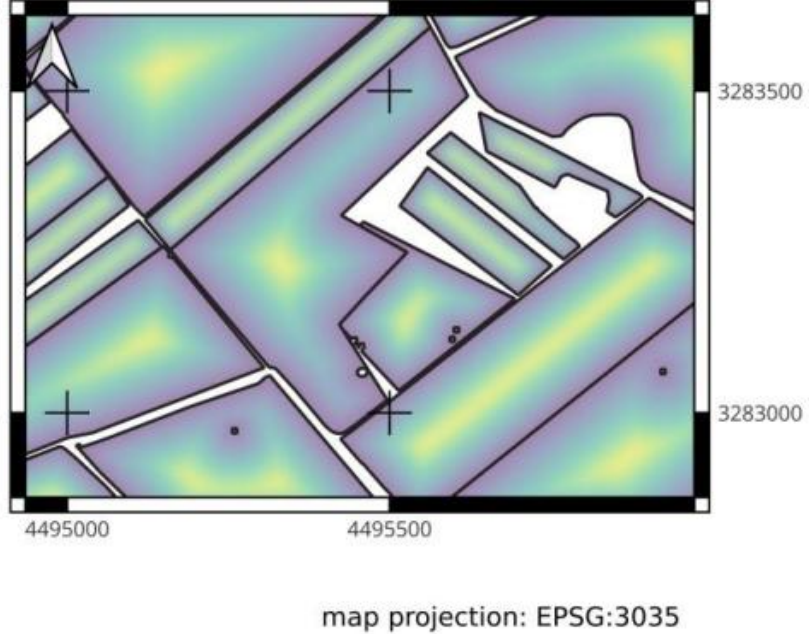
European Monitoring of Biodiversity in Agricultural Landscapes (EMBAL)



2015 DE4 GSA - Original data set



2015 DE4 GSA - EurocropsV2 data set



**JRC harmonizes
multiannual collection of
parcel-level declarations
(GSA) from 12 MS**



European Commission (2026)



EuroCropsV2 Public Watch 0

main 1 Branch 0 Tags

xchan011	added automatic string matching code and files	78633df · last month	82 Commits
code	Revert "add file on misspelling"		last month
data	added automatic string matching code and files		last month
.gitignore	includede stack tables code and mapping tables		5 months ago
README.md	add doi link to readme		5 months ago



License

GPL-3 + file [LICENSE](#)

Citation

Citing [defid2R](#)

Developers

[Loïc Dutrieux](#)

Author, maintainer 



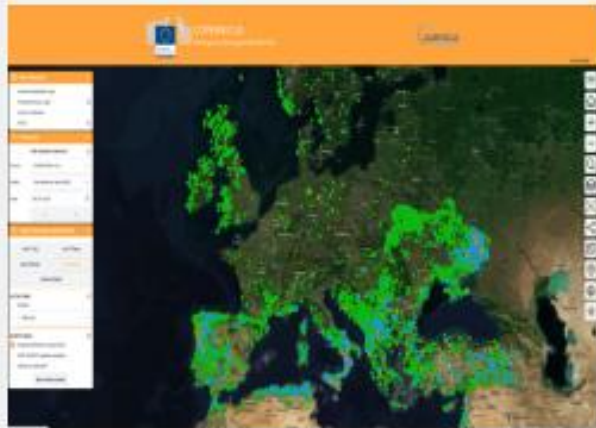
The JRC curates georeferenced records and maps these as polygons/points across the EU



A spatio-temporal database of disturbances in European forests caused by insects and diseases.

Forzieri et al. (2023)

EFFIS applications



Current Situation Viewer 2.0

The new version of the Current Situation Viewer, faster and mobile friendly.

[Read more >](#)



Current Statistics Portal

Statistics are provided at national level and also for 3 groups of countries, EU, European non-EU countries, and Middle East and North Africa countries.

[Read more >](#)

The JRC curates information on forest fires based on the collection of a minimum set of data



Common issues:

- Measurement footprint matched with EO-based footprint
- Spatial representativeness (e.g. climate x soils x management x ..)
- Variety in the basic unit of analysis (variables measured, protocols)
- Well-developed metadata (e.g. activity reporting)

All the issues above are use-case specific!

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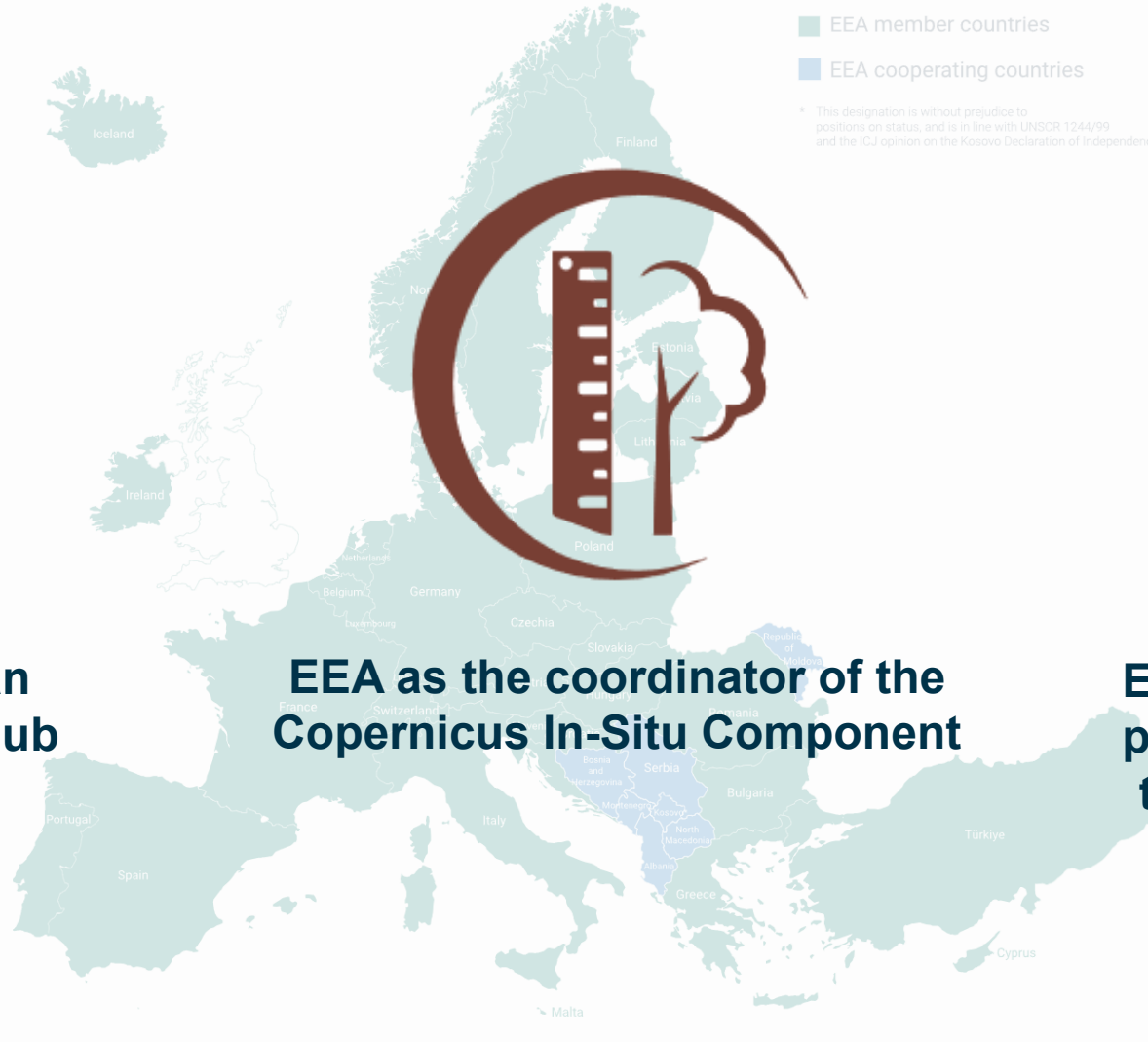


Reference Data as a Backbone for EO-Based Environmental Statistics and Services

The role of the EEA – Jose Miguel Rubio Iglesias



EEA as the European environmental data hub



EEA as the coordinator of the Copernicus In-Situ Component



EEA as the responsible for the pan-European products within the Copernicus Land Service

EEA as the European environmental data hub

- EEA is an EU agency providing valuable insights on the **state of Europe's environment**.
- Thanks to **reliable data** collected from our EEA/Eionet network, we actively support Europe's environment and climate policies.
- This is facilitated with **Reportnet**, the e-Reporting platform supporting countries' reporting of environmental and climate data.
- Based on reported data, EEA prepares and curates **pan-European datasets** covering different environmental and climate domains



Reportnet

The next generation for e-Reporting environmental and climate data

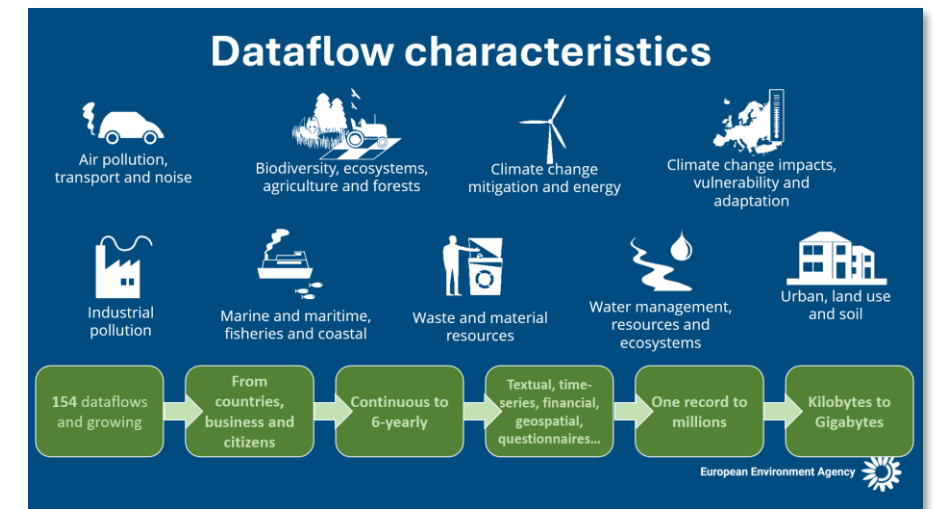
Reportnet 3 is the new e-Reporting platform for reporting environmental and climate data to the European Environment Agency (EEA). The platform embraces the strategic goals of the European Commission's Green Deal and Digital Strategy and hosts reporting tasks on behalf of EEA and the Commission.

The transition of reporting obligations from Reportnet 2 to Reportnet 3 will take a number of years. Therefore, Reportnet 2 will remain operational until all data flows are migrated and will then become an archive.

Reportnet 2 can be accessed here: <http://cdr.eionet.europa.eu/>

Reportnet 3

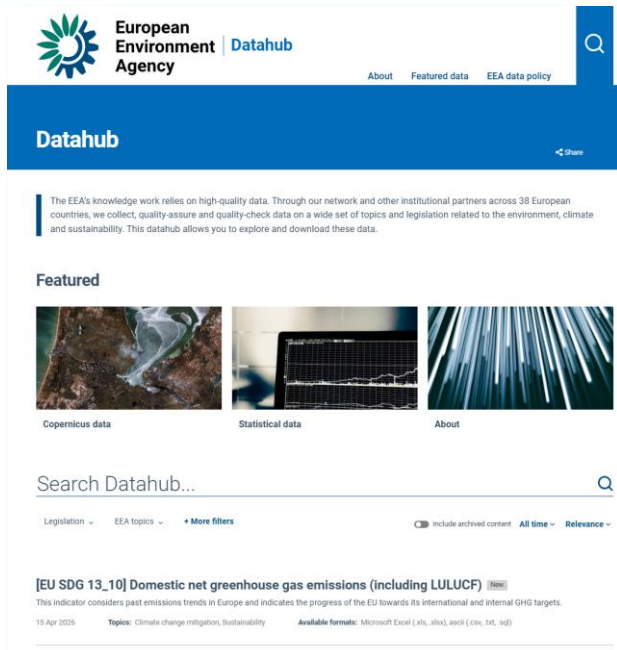
<p>[2023] Energy Community: National climate change adaptation planning... Pursuant to article 19(1) of the adopted implementing Regulation 2020/1208, Annex I</p> <p>Obligation: Integrated reporting on national adaptation action</p> <p>Instrument: Adapted Governance Regulation for the Energy Community</p> <p>Status: Open Delivery date: 2023-03-15</p>	<p>[2023] Annex III Decarbonisation - Adaptation dataflow Annex III</p> <p>Obligation: Progress towards objectives, targets and contributions (Decarbonisation: adaptation)</p> <p>Instrument: Regulation on the Governance of the Energy Union and Climate Action</p> <p>Status: Closed Delivery date: 2023-03-15</p>	<p>[2025] Energy Community: Additional reporting obligations (EE) - Annex XVII Annex XVII</p> <p>Obligation: Additional reporting obligations in the area of energy efficiency</p> <p>Instrument: Adapted Governance Regulation for the Energy Community</p> <p>Status: Open Delivery date: 2023-03-15</p>
<p>[2025] Energy Community: Annex III Decarbonisation - Adaptation dataflow Progress towards objectives, targets and contributions (Decarbonisation: adaptation)</p> <p>Obligation: Progress towards objectives, targets and contributions (Decarbonisation: adaptation)</p> <p>Instrument: Adapted Governance Regulation for the Energy Community</p> <p>Status: Open Delivery date: 2023-03-15</p>	<p>[2025] Energy Community: National climate change adaptation planning... Contracting Parties shall report on their national climate change adaptation planning and strategies, outlining their implemented and planned actions to facilitate adaptation to climate change</p> <p>Obligation: Integrated reporting on national adaptation action</p> <p>Instrument: Adapted Governance Regulation for the Energy Community</p> <p>Status: Open Delivery date: 2023-03-15</p>	<p>[2025] Energy Community: National projections of anthropogenic greenhouse gas emissions National projections of anthropogenic greenhouse gas emissions</p> <p>Obligation: National projections of anthropogenic greenhouse gas emissions</p> <p>Instrument: Adapted Governance Regulation for the Energy Community</p> <p>Status: Open Delivery date: 2023-03-15</p>
<p>[2025] Energy Community: National systems for policies and measures 9... Pursuant to Governance Regulation Art. 30 / implementing Regulation Art. 36 of the adapted Governance Regulation.</p> <p>Obligation: National systems for policies and measures and projections</p> <p>Instrument: Adapted Governance Regulation for the Energy Community</p>	<p>[2025] Energy Community: Progress to targets (EE) - Annex IV Pursuant to Governance Regulation Art. 30 / implementing Regulation Art. 36 of the adapted Governance Regulation.</p> <p>Obligation: Progress towards objectives, targets and contributions (Energy efficiency)</p> <p>Instrument: Adapted Governance Regulation for the Energy Community</p>	<p>[2025] Energy Community: Progress to targets (GHG) - Annex I Reporting obligations for Progress towards objectives, targets and contributions (Decarbonisation: greenhouse gas emissions and removals)</p> <p>Obligation: Progress towards objectives, targets and contributions (Decarbonisation: greenhouse gas emissions and removals)</p> <p>Instrument: Adapted Governance Regulation for the Energy Community</p>



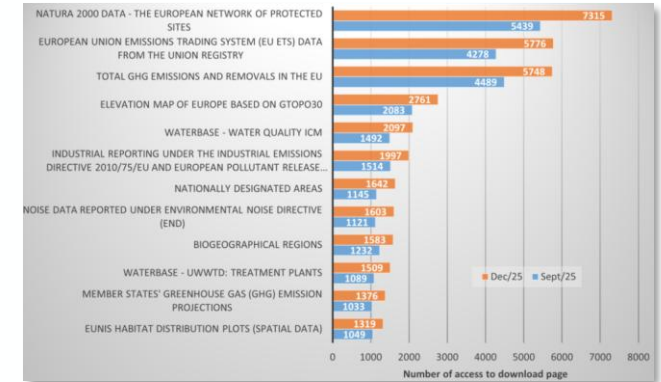
EEA as the European environmental data hub



The **EEA Datahub** provides access to the data collected, quality-assured and quality-checked (and metadata) over a wide set of topics and legislation related to the environment, climate and sustainability throughout our 39 members and cooperating countries.

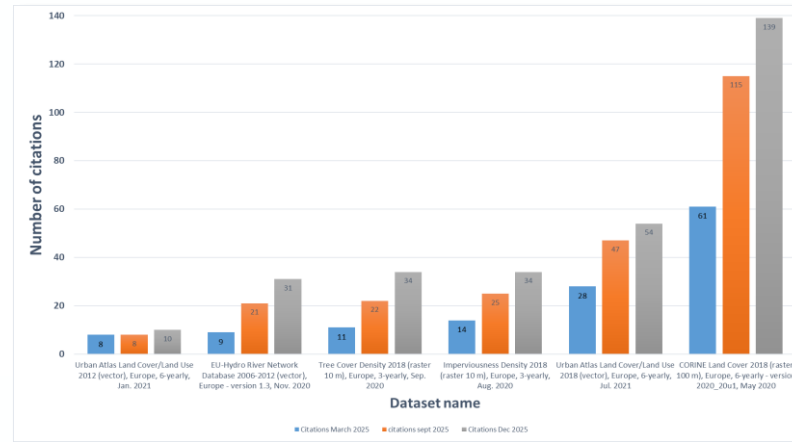


Top 12 EEA datasets downloaded by the data hub in 2025



38 Member and cooperating countries
 200+ Datasets
 400+ National partner institutions

<https://www.eea.europa.eu/en/datahub>



Top 6 EEA datasets cited in scientific literature in 2025





Copernicus in-situ data: observations, **geospatial reference** and ancillary data licensed or provided for use in Copernicus

Essential for production and validation in Copernicus services and for calibration and validation of satellite sensors

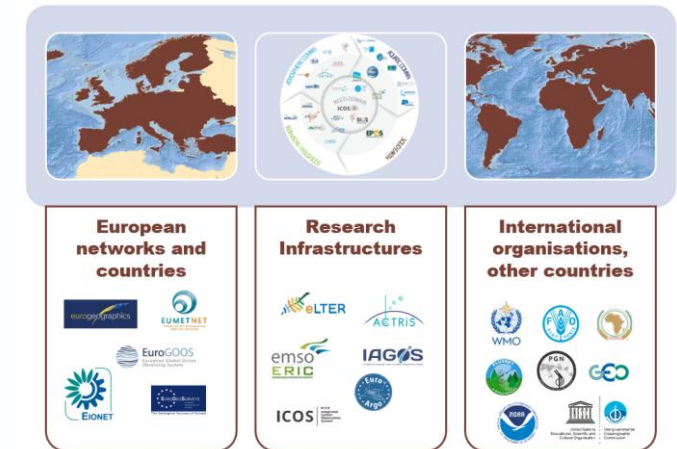


Without in-situ data, Copernicus simply cannot deliver its data, products and services

Copernicus relies on a myriad of in-situ data providers and networks at national, regional and global level: national authorities, pan-European organisations, international organisations, research initiatives....



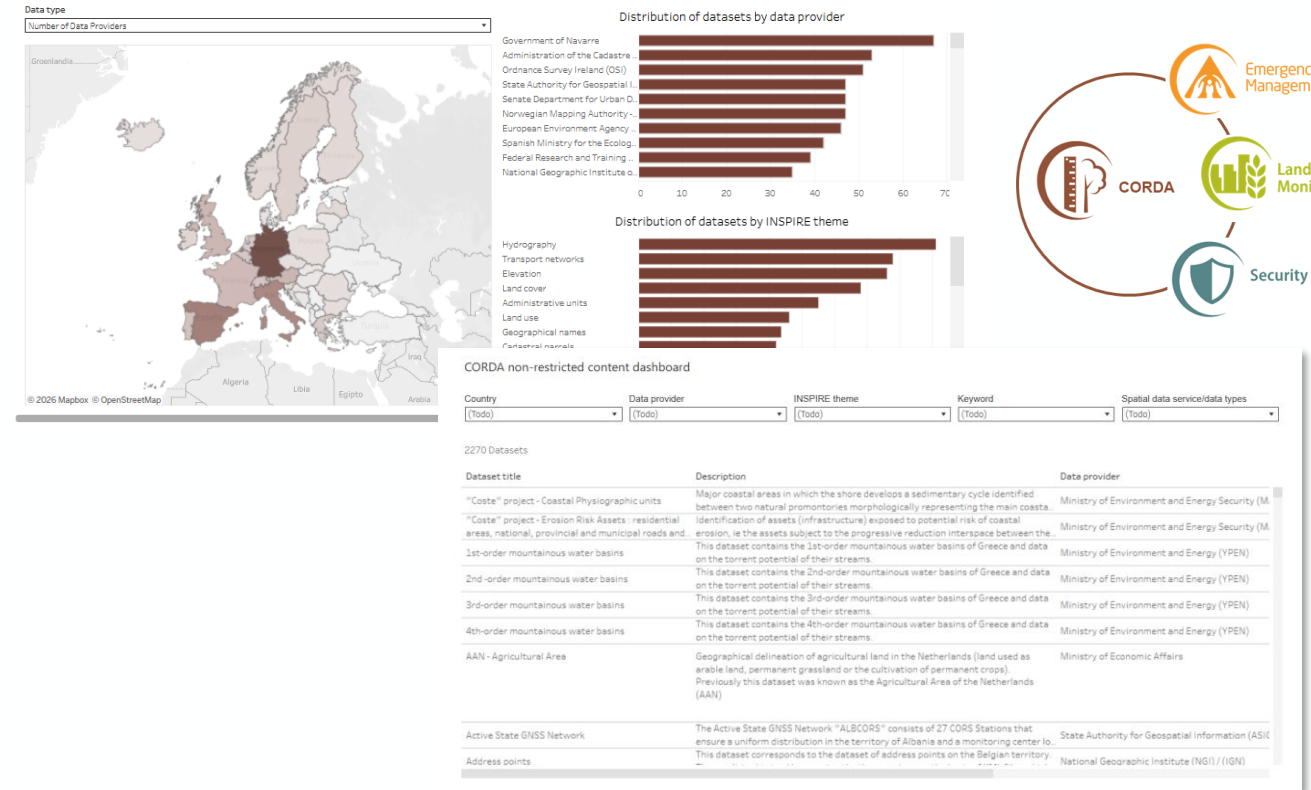
Collaboration with in-situ providers is essential for the success of the programme!



Copernicus Reference Data Access Portal (CORDA)



- Single entry point node to **national and regional authoritative geospatial data**
- Main target users: mapping services
- Data hosted in origin by default
- Continuous monitoring and update
- Semantically harmonised multi-country databases for key reference data
- Restricted for Copernicus service providers and data providers
- Evolution project ongoing, towards a new architecture in 2027
 - Improved data hosting capacities, new front-end...



<https://corda.eea.europa.eu/>



43
countries

334
data providers

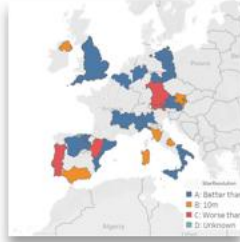
2308
datasets



CORDA national and subnational datasets



LIDAR



Digital Elevation Models



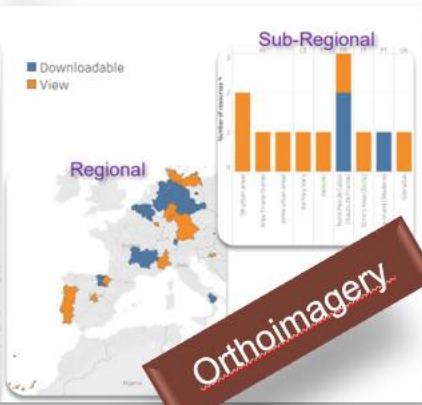
Buildings



Wetlands



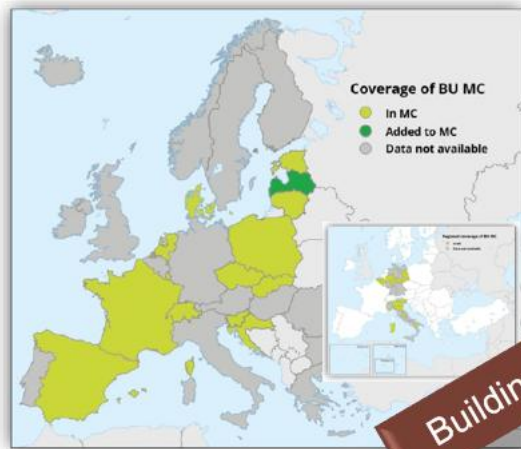
Land Parcel Information System



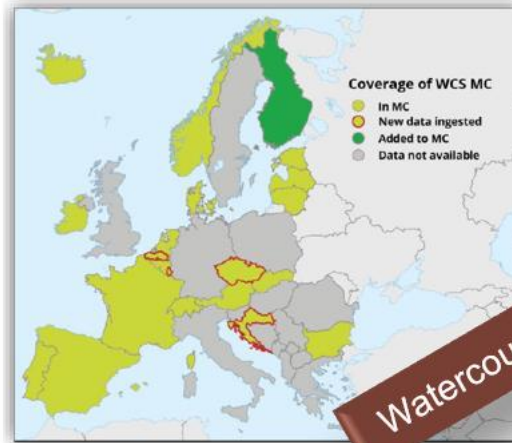
Orthoimagery



CORDA semantically harmonised datasets



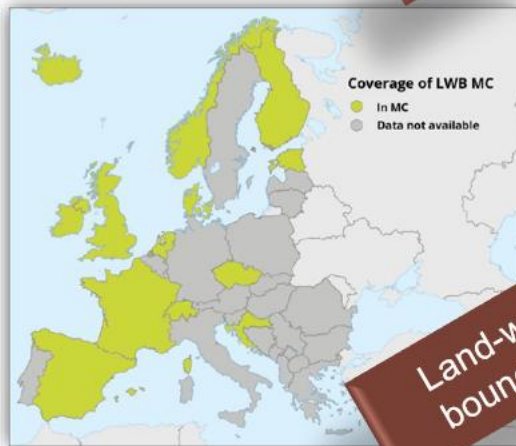
Buildings



Watercourses



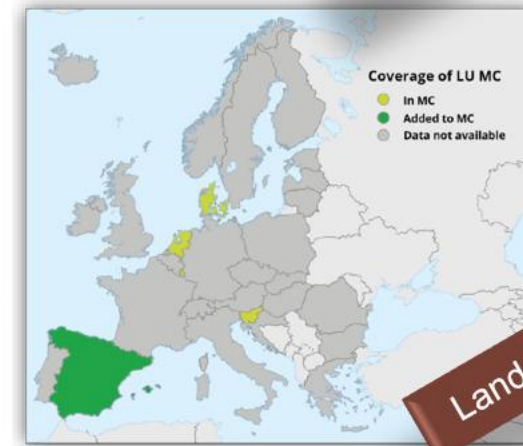
Standing waters



Land-water boundaries



Wetlands



Land Use

 **Land cover and land use mapping**




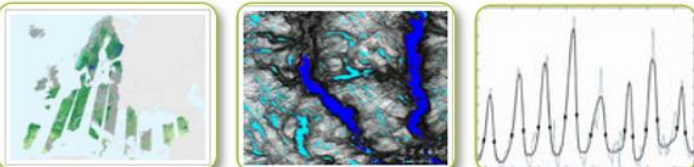
 **Priority area monitoring**




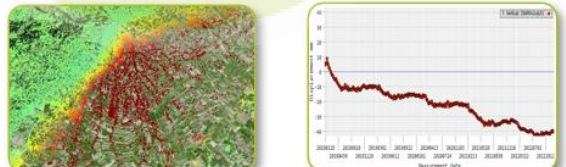
 **Satellite data**





 **Bio-geophysical parameters**



 **Ground motion monitoring**



 **Reference and validation data**



CLMS requires diverse, **high-quality reference data**, including:

- Land Cover and Land Use
- Agricultural datasets such as LPIS/GSAA
- LUCAS
- National and regional geospatial reference datasets
- Thematic datasets (e.g. forests, wetlands, and other land cover types)

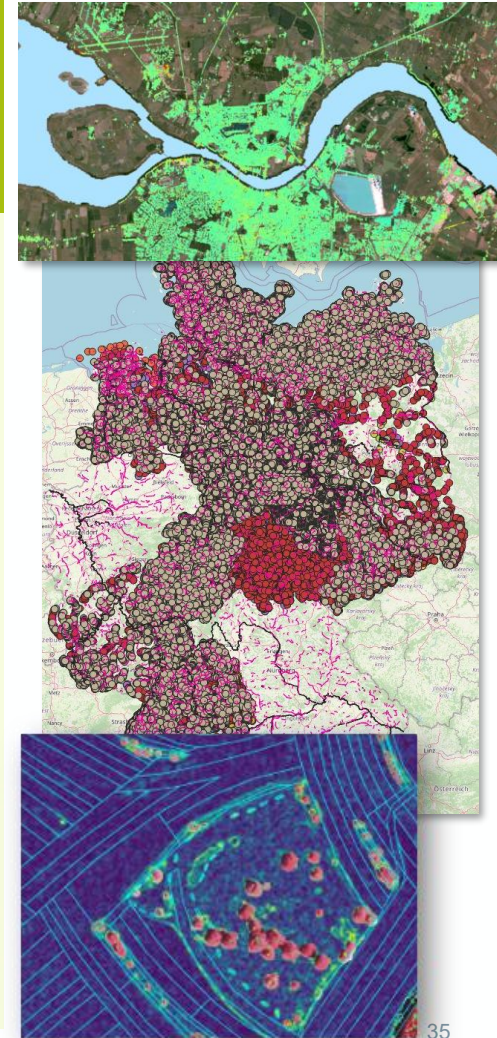


Several **issues currently limit** the effective use of data across Europe:

- Fragmented access to national and regional geospatial data (especially land use)
- Insufficient documentation and metadata
- Limited harmonisation across countries and data sources
- Inconsistent availability and update cycles
- Variability in format, quality, and accessibility, reducing cross-country usability

Developing new CLMS products would benefit from **better access** to:

- National forest inventories, especially for very high-resolution land cover mapping
- Cadastral and parcel-level datasets, to support next-generation land use products
- Consistent pan-European datasets delivered regularly and predictably (e.g. LUCAS, IACS/GSAA), aligned with CLMS requirements



- 1) What datasets are missing from Reference Data / In-Situ at EU level - at national level (NSI) – Artus/Luca
- 2) Which agreements / governance needs to be in place to get required datasets? - J.
- 3) Do we need a 'single/federated' data repository for reference data at national/EU level ? - Sam
- 4) In-situ Requirements for Statistical Processing – (temporal, spatial, semantic, governance) - Timo
 - Soil Agriculture
 - Land use
 - Any other theme
- 5) The out of the box (requirements, theme) - Hannes

Which agreements / governance framework at European level need to be in place to make reference datasets available and usable?

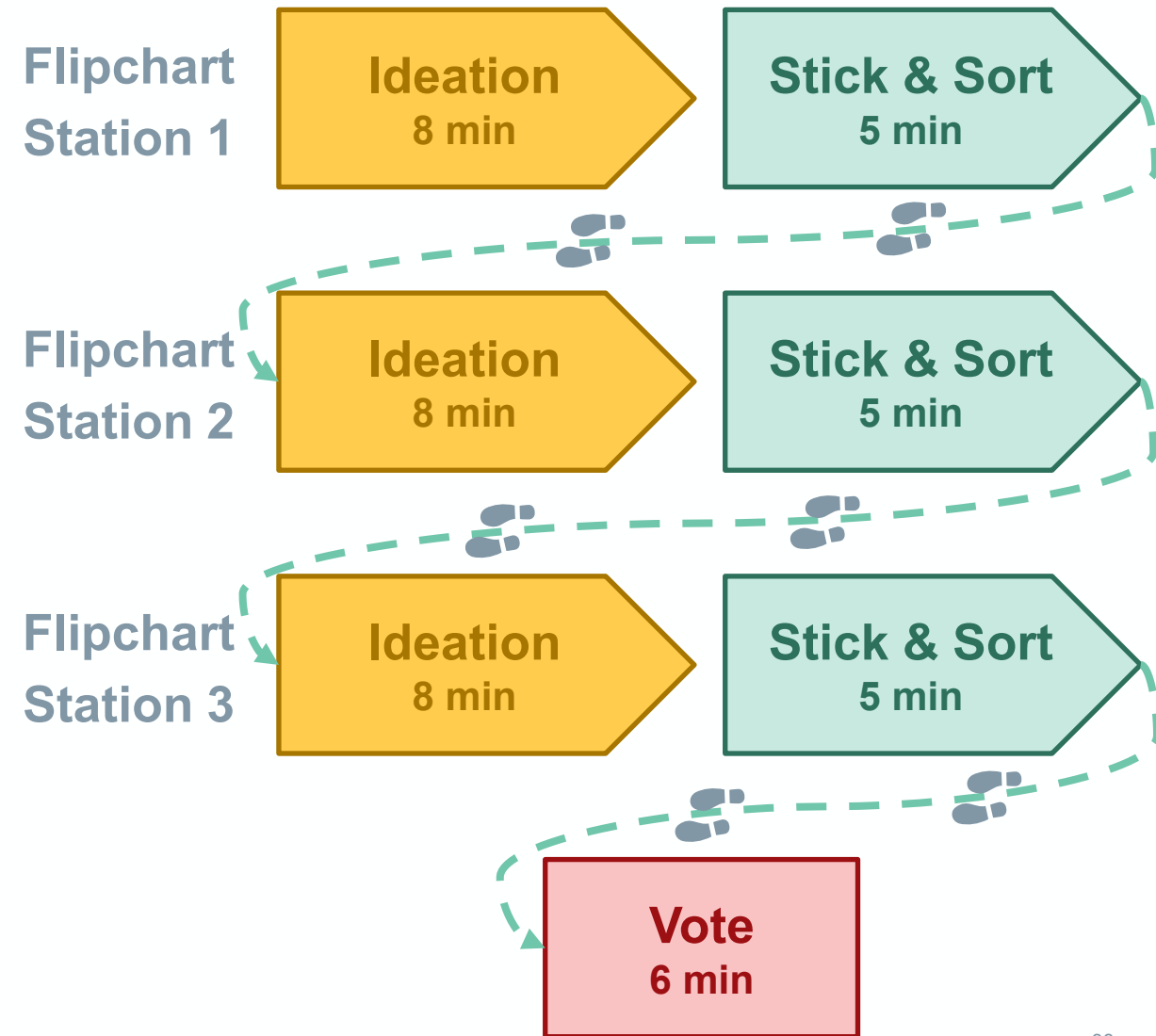
- Roles and responsibilities (*Who does what?*)
 - Who should be responsible for coordinating reference data governance at EU level? Which institutions should play operational roles (EEA, Eurostat, JRC, Copernicus, national authorities)?
- Access and data sharing frameworks (*What blocks access today?*)
 - What are the real blockers today: legal, organisational, licensing, resource-related? Do we need new agreements or can existing mechanisms be used?
- Are existing EU Frameworks Enough? (*Are Open Data/HVD/INSPIRE enough?*)
 - Are the Open Data Directive and HVD regulation sufficient for reference datasets? What could be the impact of INSPIRE simplification on the availability and interoperability of reference datasets?
- Incentives for Member States to share (*How to make it happen?*)
 - Why would countries prioritise sharing and maintaining reference datasets for EU use? What incentives could work?
- Governance model for the future (*What framework should we aim by 2030?*)
 - Light coordination network? EU Service model? Thematic intermediaries? ...

- **9 Flipchart Stations**

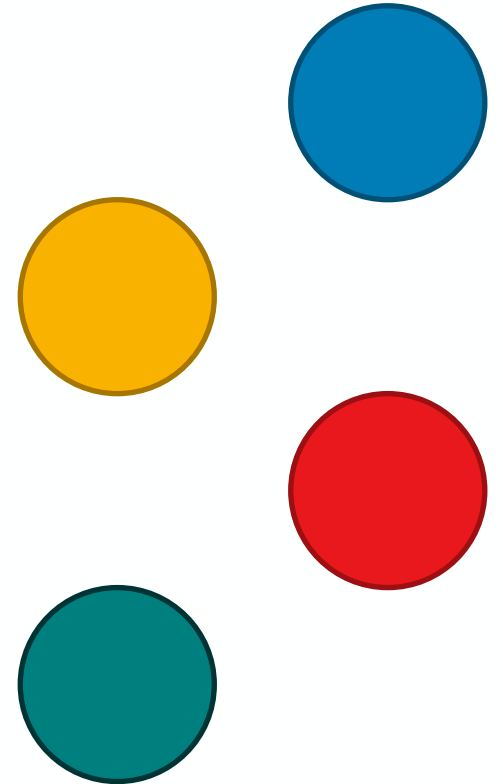
- One flipchart per pre-defined theme,
- Each board is labelled with its Question and has blank space for idea post-its.

- Each participants **visits two stations**

- Ideation + Stick & Sort for each station
- Volunteer at each station helping with organisation



1. Read ideas
2. Distribute your 5 dot-stickers on the most promising ideas
3. Volunteers count and mark the top-voted ideas per board and report back to the audience



- One participant per board briefly presents 1–2 of their board’s top-voted ideas to the room.
- Volunteers photograph all boards and transcribe top ideas in parallel.
- Results forwarded for the workshop summary plenary this afternoon.

StatE0

5-7 May 2026 | ESA-ESRIN | Frascati (Rome), Italy



Thank you for participating!