



In situ

EEA's In Situ Data Coordination Activities

Italian Copernicus User's Meeting 15 Maj 2018



European
Commission

European Environment Agency





In situ

EEA & Eionet's roles in Copernicus

Coordination of in situ data component across services

Implementation of European and local land monitoring

FULL, FREE AND OPEN ACCESS TO DATA

- ATMOSPHERE MONITORING
- MARINE ENVIRONMENT MONITORING
- LAND MONITORING
- CLIMATE CHANGE
- EMERGENCY MANAGEMENT
- SECURITY

Key user MAWP 2014-2020

copernicus
Europe's eyes on Earth

Source: <http://www.eea.europa.eu/themes/air/air-quality-index/index>



In situ

Setting the scene

- **Copernicus is a great success** and offers excellent Data and Information products to the users;
- **In situ data constitute part of the foundation** for Copernicus' success;
- Copernicus relies primarily on **existing 'in situ data' capacities**;
- Copernicus collects and uses an **enormous amount of in situ data on** a routine basis;
- The **in situ data community benefits** from its cooperation with Copernicus.



In situ

Known key challenges

Copernicus needs to find solutions to key challenges

- Data policy
- Sustainability
- Accessibility
- Data quality
- Coverage
- Timeliness
- Data gaps

“Stable and sustained long-term solutions are needed”

“Use restrictions are often incompatible with Copernicus’ data policy”

“Acknowledgement and attribution of ownership”

“Sustainability of in situ observing systems remains a strong concern”

“Access to locally available observations”



In situ

The benefits of coordination

- Building partnerships
 - European data providers and networks
 - Non-European data providers
 - International cooperation
- Data collection and sharing
- Overview & information gathering
- Knowledge sharing
- Awareness raising and use cases
- Support to internal coordination

The collage features several documents and website screenshots related to the Copernicus In situ component. At the top, a document titled 'STATE OF PLAY REPORT' is visible. Below it, another document is titled 'Framework Service Contract EEA/COM/15/026/LOT 2 for Services supporting the European Environment Agency's (EEA) implementation of cross cutting activities for coordination of the in situ component of the Copernicus Programme Services'. A third document is titled 'Lot 1 in situ - Observations State of Play Report (Final Draft) V1.0 - July 2017'. To the right, a webpage titled 'COPERNICUS LAND MONITORING SERVICE' is shown, featuring a map of Europe and text about 'Products and Services'. At the bottom, a screenshot of the Copernicus In situ website is displayed, showing a navigation menu with 'HOME', 'STATE OF PLAY', 'OBSERVATIONS', 'SPATIAL DATA', 'DATA ACCESS', 'LIBRARY', and 'NEWS'. A 'SPATIAL DATA' section is highlighted, with a text box stating: 'Geospatial reference data, such as aerial imagery, topographic maps and transport and hydrography networks are needed to produce the mapping services in the Copernicus Land, Emergency and Security services.' Below the screenshot, the text 'EXPLORE THE COPERNICUS IN SITU COMPONENT' is visible.





In situ

Examples of what we do ...

Overview

Preparing in situ data
State of Play reports
(covering all six
services)

Creating and populating
the Copernicus In Situ
Component Information
System (CIS²)

Creating Fact Sheets for
all Copernicus Services'
components

Access

Managing partnership
agreements with
EuroGeographics,
EuroGeoSurveys, and
EUMETNET

Managing access
agreements with
international partners

Maintaining and adding
content to the
Copernicus Geospatial
Reference Data Access
Portal

Awareness

Developing and
maintaining the
Copernicus in situ
website

Producing news articles
and newsletters

Representing the
Copernicus in situ
component at
conferences and
workshops



In situ

Find more information on



EXPLORE THE COPERNICUS IN SITU COMPONENT

Copernicus is the European Union's Earth Observation and monitoring programme. Copernicus offers a range of services to support the Commission's policies on environment and sustainable development. Copernicus is a key tool for the Commission to monitor and assess the state of the environment and to provide information for policy-making and emergency management and supporting civil society.

The Copernicus Services rely on a range of environmental components collected by ground-based and satellite data, collectively referred to as 'in situ' data.

The Copernicus In situ Component reports the findings of its data on a regular basis and is available to all users.

EVENTS

Upcoming events of the In situ component.

Featured

Hans Bruyninckx, Executive Director of the EEA



Hans Bruyninckx is the Executive Director of the European Environment Agency. In an interview with the Copernicus In situ Newsletter, he discussed the Agency's role as Entrusted Entity for the coordination of the in situ component with the Copernicus services, and the road ahead for in situ coordination.

Masro Facchini, Copernicus Unit, European Commission



Masro Facchini is Head of the Copernicus Unit, within the European Commission's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. The Copernicus In situ Coordination Newsletter asked him about how the Copernicus Services use in situ data, and how the European Commission supports the further development of the in situ component.

Craig Donlon, Sentinel-3 Mission Scientist, European Space Agency



Craig Donlon is Sentinel-3 Mission Scientist at the European Space Agency. In this interview, Dr. Donlon provides an overview of how in situ data are used in the context of the Copernicus space component and outlines the challenges ahead.

Observations Spatial Data Policy [READ MORE...](#)

Observations Spatial Data Policy [READ MORE...](#)

Observations Spatial Data Policy [READ MORE...](#)



Featured

Operational use of in situ data at EUMETSAT: Interview with Bojan Bojkov



In situ data of various kinds is used operationally to verify satellite data products and calibrate satellite instruments. Dr. Bojkov, Head of the Remote Sensing and Products Division in the Department of Technical Support and Science at EUMETSAT, equipped the close links between space and in situ data, and the importance of this relationship for operational satellite data provision.

Observations Spatial Data Policy [READ MORE...](#)

In situ data critical for the Copernicus Marine Service



The Copernicus Marine Environment Monitoring Service benefits from a range of in situ observations, drawn from a wide variety of platforms, including autonomous ocean-based observations and sensors aboard ships, almost 3000 platforms supply the service with data, which is critical for the evolution of the Copernicus Marine Service products.

Observations Spatial Data Policy [READ MORE...](#)

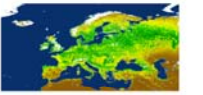
FACT SHEET ON COPERNICUS IN SITU DATA REQUIREMENTS

COPERNICUS LAND MONITORING SERVICE GLOBAL COMPONENT

The Copernicus Services rely on a combination of satellite data and environmental measurements collected from ground-based, sea-borne or air-borne monitoring systems, as well as geospatial reference or ancillary data. These non-space data are collectively referred to as 'in situ' data. This Fact Sheet is one of a series which summarises the in situ data requirements for the Copernicus Services at component level.

Products and Services

The Copernicus Land Monitoring Service (CLMS) provides geographical data and products based on satellite imagery and in situ data, supporting topics such as agriculture, food security, forest management and water management. The CLMS has three components: Global, Pan-European and Local.



European view of Leaf Area Index from May/June 2014 (averaged (using shades of blue) with the water bodies product © Copernicus Global Land Service (2014). Distributed and produced by VITO NV, Belgium.

What in situ data is required for this component?

- The CLMS Global Component requires the following Global and European in situ data:
 - Digital Elevation Models – for modeling surface and subsurface features.
 - Land Cover Maps & Masks – to define the land cover and ecological biomes.
 - Calibration and Validation Measurements – Measurements of phenomena such as vegetation and moisture for calibrating and validating satellite-derived products.
 - Hydrographical & Meteorological Data – to assist in the definition of water bodies and correct for the effects of the atmosphere.



In situ

CLMS - Local & Pan-European Component

Reliable and timely access to essential data is required to

- Support **visual interpretation** and feature delineation of land cover/use objects;
- Improve the **reliability and thematic accuracy** of the thematic products;
- Improve the **calibration of the density products** – imperviousness and tree cover density;
- Support **validation of products** and internal quality control steps.

FACT SHEET ON COPERNICUS IN SITU DATA REQUIREMENTS

COPERNICUS LAND MONITORING SERVICE
PAN-EUROPEAN COMPONENT

The Copernicus services rely on a combination of satellite data and environmental measurements collected from ground-based, air-borne or airborne monitoring systems, as well as geospatial reference or ancillary data. These non-space data are collectively referred to as 'in situ' data. This Fact Sheet is one of a series which summarises the in situ data requirements for the Copernicus Services at component level.

Products and Services

The Copernicus Land Monitoring Service (CLMS) provides geographical data and VHR (in situ) data for land cover, urban, agriculture and water management. The CLMS has three components: Global, Pan-European and Local, of which the latter two are coordinated by the European Environment Agency (EEA). The Local component provides specific, consistent and detailed VHR (in situ) data for Functional Urban Areas (FUAs) in cities with more than 50,000 inhabitants, and their surroundings. This dataset has been produced for the reference year 2006 and is updated every six years. Urban Atlas information supports the monitoring of European, national and regional policies.

Urban Atlas 2012, City of Riga, Latvia

Riparian Zones (2012), Neahly City of Riga, Latvia

FACT SHEET ON COPERNICUS IN SITU DATA REQUIREMENTS

COPERNICUS LAND MONITORING SERVICE
LOCAL COMPONENT

The Copernicus services rely on a combination of satellite data and environmental measurements collected from ground-based, air-borne or airborne monitoring systems, as well as geospatial reference or ancillary data. These non-space data are collectively referred to as 'in situ' data. This Fact Sheet is one of a series which summarises the in situ data requirements for the Copernicus Services at component level.

Products and Services

The Copernicus Land Monitoring Service (CLMS) provides geographical data and VHR (in situ) data for land cover, urban, agriculture and water management. The CLMS has three components: Global, Pan-European and Local, of which the latter two are coordinated by the European Environment Agency (EEA). The Local component provides specific, consistent and detailed VHR (in situ) data for Functional Urban Areas (FUAs) in cities with more than 50,000 inhabitants, and their surroundings. This dataset has been produced for the reference year 2006 and is updated every six years. Urban Atlas information supports the monitoring of European, national and regional policies.

Urban Atlas 2012, City of Riga, Latvia

Riparian Zones (2012), Neahly City of Riga, Latvia

Forest Cover Density 2012, City of Warsaw, Poland





In situ

CLMS - Local & Pan-European Component

Main challenges

- **Access:** Various geospatial in situ data exist at national and regional level, but are currently not accessible on a full, free and open basis;
- **Consistency:** Existing national datasets often differ significantly in their technical specifications and standards;
- **Timeliness:** The in situ data should meet the temporal requirements of the Pan-European CLMS component with its specific reference years.

FACT SHEET ON COPERNICUS IN SITU DATA REQUIREMENTS

COPERNICUS LAND MONITORING SERVICE
PAN-EUROPEAN COMPONENT

The Copernicus services rely on a combination of satellite data and environmental measurements collected from ground-based, sea-borne or air-borne monitoring systems, as well as geospatial reference or auxiliary data. These non-space data are collectively referred to as "in situ" data. This Fact Sheet is one of a series which summarises the in situ data requirements for the Copernicus Services at component level.

Products and Services

The Copernicus Land Monitoring Service (CLMS) provides geographical data and products based on Very High Resolution (VHR) satellite imagery and in situ data, supporting areas such as agriculture, food security, forest management and water management. The CLMS has three components: Global, Pan-European and local, of which the latter two are coordinated by the European Environment Agency (EEA). The Local component provides specific, consistent and relevant "in situ" data and services to support the monitoring of European, national and regional policies.

FACT SHEET ON COPERNICUS IN SITU DATA REQUIREMENTS

COPERNICUS LAND MONITORING SERVICE
LOCAL COMPONENT

The Copernicus services rely on a combination of satellite data and environmental measurements collected from ground-based, sea-borne or air-borne monitoring systems, as well as geospatial reference or auxiliary data. These non-space data are collectively referred to as "in situ" data. This Fact Sheet is one of a series which summarises the in situ data requirements for the Copernicus Services at component level.

Products and Services

The Copernicus Land Monitoring Service (CLMS) provides geographical data and products based on Very High Resolution (VHR) satellite imagery and in situ data, supporting areas such as agriculture, food security, forest management and water management. The CLMS has three components: Global, Pan-European and local, of which the latter two are coordinated by the European Environment Agency (EEA). The Local component provides specific, consistent and relevant "in situ" data and services to support the monitoring of European, national and regional policies.

The Urban Atlas dataset provides pan-European, consistent LULU data for Functional Urban Areas (i.e. cities with more than 50,000 inhabitants, and their surroundings). This dataset has been produced for the reference year 2016 and is updated every six years. Urban Atlas information supports the monitoring of European, national and regional policies.

Riparian Zones represent transitional areas between land and freshwater ecosystems, enjoying a wide range of riparian functions and ecosystem services. The Riparian Zones products provide detailed information on the state and characteristics of riparian zones in Europe and support, amongst others, the objectives of the EU Biodiversity Strategy to 2030, the Habitat and Birds Directive and the Water Framework Directive. This dataset has also been produced for the reference year 2016 and is updated every six years.

Natura 2000 (N2000) represents an EU-wide network of protected areas established under the 1992 Habitats Directive. It is the cornerstone of the EU nature and biodiversity policy. The LULU dataset of selected Natura 2000 sites is tailored to the needs of biodiversity monitoring, specifically supporting the Mapping and Assessment of Ecosystems and their Services (MAES).

Additionally, there is a new product in preparation, targeting the monitoring of Coastal Zones.





In situ

CEMS – Mapping Component

Reliable and timely access to essential data is required to

- Reduce **delivery time** of the final products;
- Increase the **thematic and geometric accuracy** of the products;
- Provide **input** to flood area estimation and risk models;
- Support **quality assurance and validation** activities.

FACT SHEET ON COPERNICUS IN SITU DATA REQUIREMENTS

**COPERNICUS EMERGENCY MANAGEMENT SERVICE
MAPPING COMPONENT**

The Copernicus Services rely on a combination of satellite data and environmental measurements collected from ground-based, sea-borne or air-borne monitoring systems, as well as geospatial reference or ancillary data. These non-space data are collectively referred to as "in situ" data. This Fact Sheet is one of a series which summarises the in situ data requirements for the Copernicus Services at component level.

Products and Services

The Copernicus Emergency Management Service (EMS) provides maps and analyses based on satellite imagery (before, during or after a crisis) in response to a wide variety of disaster types, as well as early warning services for flood and fire risks. It thereby supports crisis managers, Civil Protection authorities and humanitarian aid actors dealing with natural disasters, man-made emergency situations, and humanitarian crises, as well as those involved in recovery, disaster risk reduction and preparedness activities. The EMS comprises two components: EMS Mapping and EMS Early Warning.

The EMS Mapping Component provides two service modules: (1) Rapid Mapping (RM): high-speed service delivery in the midst of, or immediately after, catastrophic events or humanitarian crises (available 24/7/365), and (2) Risk & Recovery Mapping (RRM): for pre- or post-crisis situations in support of recovery, reconstruction, disaster risk reduction, prevention, and preparedness activities.

"The Copernicus EMS needs reliable mapping of transport networks, for example so that relief efforts can be targeted on the most important places."

Forest fire Grading Map of the Nurri municipality in Sardinia. Copernicus Emergency Management Service (© 2018 European Union). [EMSR171] Nurri: Grading Map

Landslide Risk Assessment Map showing population and assets at risk in Funchal, Madeira Island, Portugal. Copernicus Emergency Management Service (© 2018 European Union). [EMSR031] Funchal: Population and Assets at Risk. Map - Landslide Risk Assessment (Details, Tile 2000)





In situ

CEMS – Mapping Component

Main challenges

- The main challenge is accessing and exploiting in situ data within emergency management **timeframe**;
- For reference topographic datasets and pre-event aerial orthoimagery, **global datasets** are often insufficient;
- The quality of products would be significantly improved by **access to higher-resolution and up-to-date datasets** for e.g. assets, elevation and population;
- Whilst local in situ data may exist, they are either inaccessible, **not accessible in the correct timeframe**, or are made available in an inappropriate format.

The Copernicus Services rely on a combination of satellite data and environmental measurements collected from ground-based, sea-borne or air-borne monitoring systems, as well as geospatial reference or ancillary data. These non-space data are collectively referred to as 'in situ' data. This Fact Sheet is one of a series which summarises the in situ data requirements for the Copernicus Services at component level.

Products and Services

The Copernicus Emergency Management Service (EMS) provides maps and analyses based on satellite imagery (before, during or after a crisis) in response to a wide variety of disaster types, as well as early warning services for flood and fire risks. It thereby supports crisis managers, Civil Protection authorities and humanitarian aid actors dealing with natural disasters, man-made emergency situations, and humanitarian crises, as well as those involved in recovery, disaster risk reduction and preparedness activities. The EMS comprises two components: EMS Mapping and EMS Early Warning.

The EMS Mapping Component provides two service modules: (1) Rapid Mapping (RM): high-speed service delivery in the midst of, or immediately after, catastrophic events or humanitarian crises (available 24/7/365), and (2) Risk & Recovery Mapping (RRM): for pre- or post-crisis situations in support of recovery, reconstruction, disaster risk reduction, prevention, and preparedness activities.

"The Copernicus EMS needs reliable mapping of transport networks, for example so that relief efforts can be targeted on the most important places."

Forest fire Grading Map of the Nurri municipality in Sardinia. Copernicus Emergency Management Service (© 2016 European Union), [EMSR171] Nurri - Grading Map

Landslide Risk Assessment Map showing population and assets at risk in Funchal, Madeira Island, Portugal. Copernicus Emergency Management Service (© 2016 European Union), [EMSR031] Funchal - Population and Assets at Risk Map - Landslide Risk Assessment (Details, Tile 2000)





In situ

CORDA - Serving the Copernicus Services

CORDA

Search

Explore

Data Providers

News

What's New

Statistics

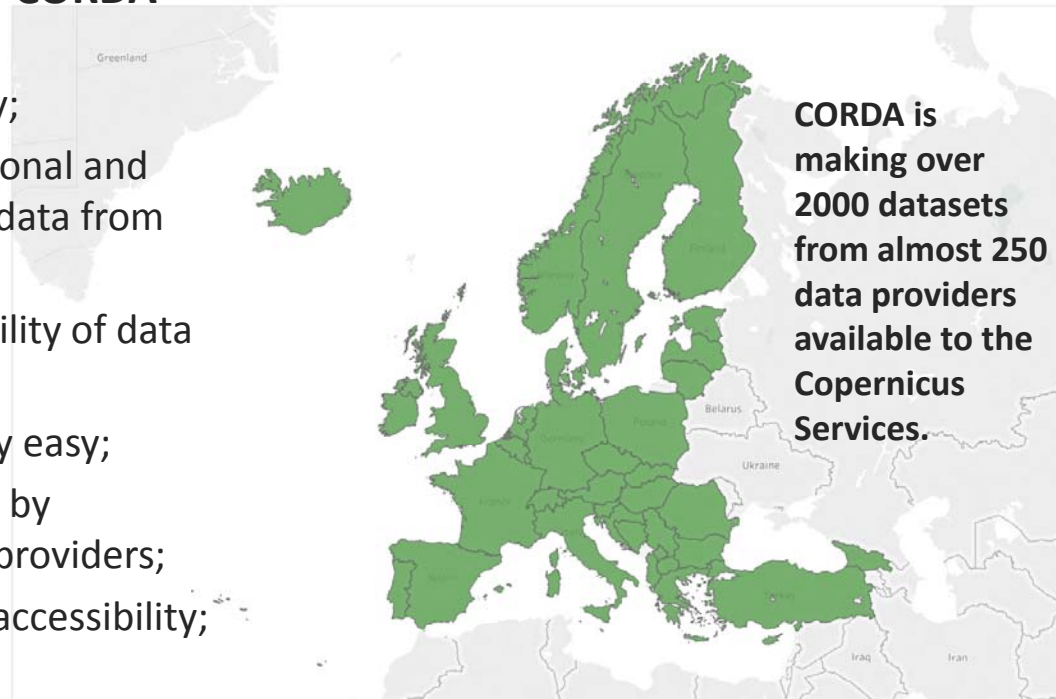
Help

Management

CORDA covers EEA 39 countries: Albania, Austria, Belgium, Bosnia Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Kosovo, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, FYR of Macedonia, Turkey and United Kingdom. Although not included in EEA 39, you will also find information about Andorra and Georgia.

Main benefits of CORDA

- Single point of entry;
- Provide links to national and regional geospatial data from across Europe;
- Monitor the availability of data services;
- Make data discovery easy;
- Restricted to access by Copernicus service providers;
- High reliability and accessibility;
- Simple to use.



CORDA is making over 2000 datasets from almost 250 data providers available to the Copernicus Services.

European Environment Agency



European Commission





In situ

Italian data provides contribute to CORDA

CORDA Search Explore Data Providers News What's New Statistics Help Management

/ Datasets

113 datasets from 7 data providers

Display: Cards Table

Dataset title	Provider	Capabilities	Description
"Coate" project - Assets at risk of erosion: residential areas, national, provincial and municipal roads and railways	Ministry of the Environment (MATTM) (Italy)	WFS WMS	Identification of assets (inf...
"Coate" project - Physiographic units of the coast	Ministry of the Environment (MATTM) (Italy)	WFS WMS	Major coastal areas in which ...
Administrative boundaries 2015 - Municipalities	Italian National Institute of Statistics (ISTAT) (Italy)	VECTOR FILE	Administrative boundaries con...
Administrative boundaries 2015 - Provinces	Italian National Institute of Statistics (ISTAT) (Italy)	VECTOR FILE	Administrative boundaries con...
Administrative boundaries 2015 - Regions	Italian National Institute of Statistics (ISTAT) (Italy)	VECTOR FILE	Administrative boundaries con...
Administrative units ISTAT 2011	Ministry of the Environment (MATTM) (Italy)	WFS WMS	The Istat has released, as la...
AIB - Fires 2001-2005 (satellite test)	Ministry of the Environment (MATTM) (Italy)	WFS	Perimeters of forest fires de...
AIB - Fires detected with GPS in the National Parks	Ministry of the Environment (MATTM) (Italy)	WMS	Perimeters fires recorded ann...
AIB - General Fire Risk	Ministry of the Environment (MATTM) (Italy)	WFS	Descriptive map of predisposi...
AIB - Summer fire risk	Ministry of the Environment (MATTM) (Italy)	WFS	Descriptive map of predisposi...
AIB - Winter fire risk	Ministry of the Environment (MATTM) (Italy)	WFS	Descriptive map of predisposi...
Lakes and other water bodies	Ministry of the Environment (MATTM) (Italy)	WFS WMS	Polygonal elements belonging ...
Landslides - linear Frane	Ministry of the Environment (MATTM) (Italy)	WFS WMS	As part of the Extraordinary ...

Refine by

Data types

Area / Data providers

- Italy (113)
 - Basilicata Region - Cartographic Center Sidepartmental of Environment and Territory (33)
 - Campania Region (20)
 - Italian National Institute of Statistics (ISTAT) (9)
 - Lombardia Region (7)
 - Ministry of the Environment (MATTM) (29)
 - Piedmont Region (12)
 - Regional Agency for Environment protection - Piemonte Region (ARPA) (3)





In situ

Bilateral agreements with NMCA s

- Bilateral agreement with IMGI Italian Military Geographic Institute re data to CEMS.
- Data under the Scope of Agreements for Copernicus Emergency Management Services (CEMS) are:
 - Orthophoto, approx. accuracy 0,5m
 - Raster topographical maps 1:50 000 or larger
 - Georeferenced datasets in vector format with an accuracy equivalent to a scale of 1:50 000 or larger (georeferenced datasets are: administrative boundaries, transportation infrastructure, settlement boundaries and toponyms, hydrographic network, ...)
 - Digital Elevation Models (DEM) with a resolution of 1m-25m (accuracy horizontal CE90:1m-25m; vertical LE90:1-10m)

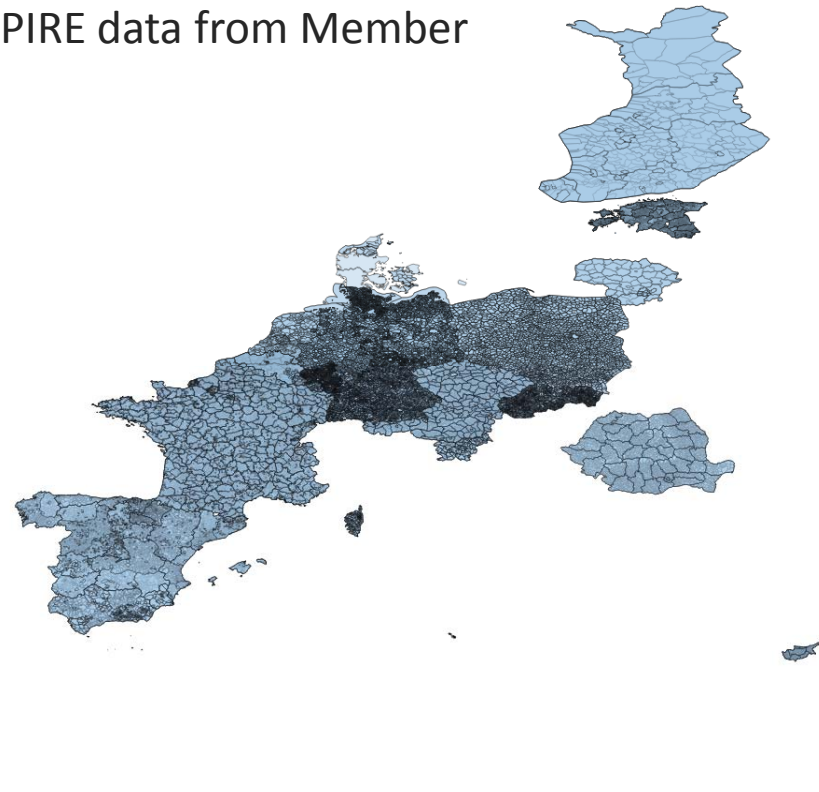


In situ

Harmonised datasets – INSPIRE Annex 1

The EEA is collecting and combining INSPIRE data from Member States

Example: Administrative Units





In situ

Partnership agreement with EUMETNET

- EEA and EUMETNET signed agreement on the provision of hydrological, meteorological and climatological data for the Copernicus Services;
- Eric Petermann, Executive Director of EUMETNET, emphasised the broad scope of the new arrangement, explaining that *“Copernicus Services can reuse all the data produced by EUMETNET members for their own purposes free of charge. The only limitations are attribution of ownership and proper licensing with data owners in case of redistribution of such data”*.



In situ

A few concluding remarks

- In situ data is an integrated and essential part of Copernicus;
- Data from Member States are critical to ensure the quality of Copernicus Data and Information products;
- Cross-cutting coordination is required to reach effective and cost-efficient solutions;
- A long-term strategy and operational solutions are needed to mitigate key challenges sustainability and data policy.



In situ

And a few questions

- Will Copernicus benefit from a more **holistic and long-term approach** to in situ data requirements, challenges, and solutions?
- Will a **deeper and more targeted involvement** of Copernicus Relays, Academy, and the Copernicus community in general incentivise data sharing and buy-in from in situ data providers?
- Could Copernicus' **in situ data capacities play a stronger cross-cutting role** e.g. vis-à-vis efficient data collection, quality control, and data sharing for the benefit of Copernicus users and data providers?



In situ

Thank you for your
attention



European
Commission

European Environment Agency

