

# Copernicus and in situ data



**7th Copernicus Czech National User Forum**  
**Dr Hans Bruyninckx, 7 June 2018, Prague**

# The European Environment Agency (EEA)

## The EEA's mission

To provide relevant, reliable, targeted and timely information to policy-makers and the public.

To help achieve significant and measurable improvements in Europe's environment and to support sustainable development.



# EEA - Eionet roles in Copernicus 2014-2020



**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

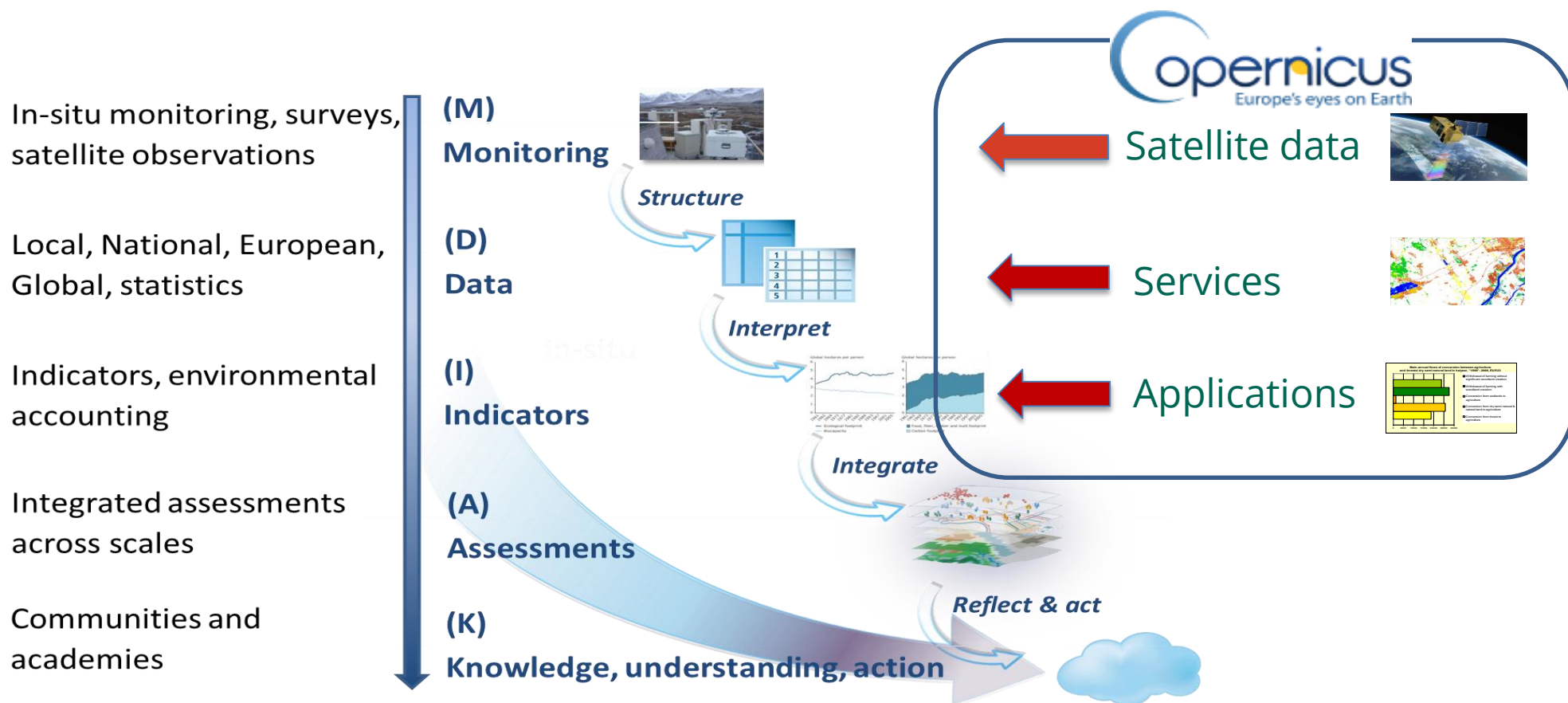


**Key user of Copernicus Data  
and Information Products  
MAWP 2014-2020**

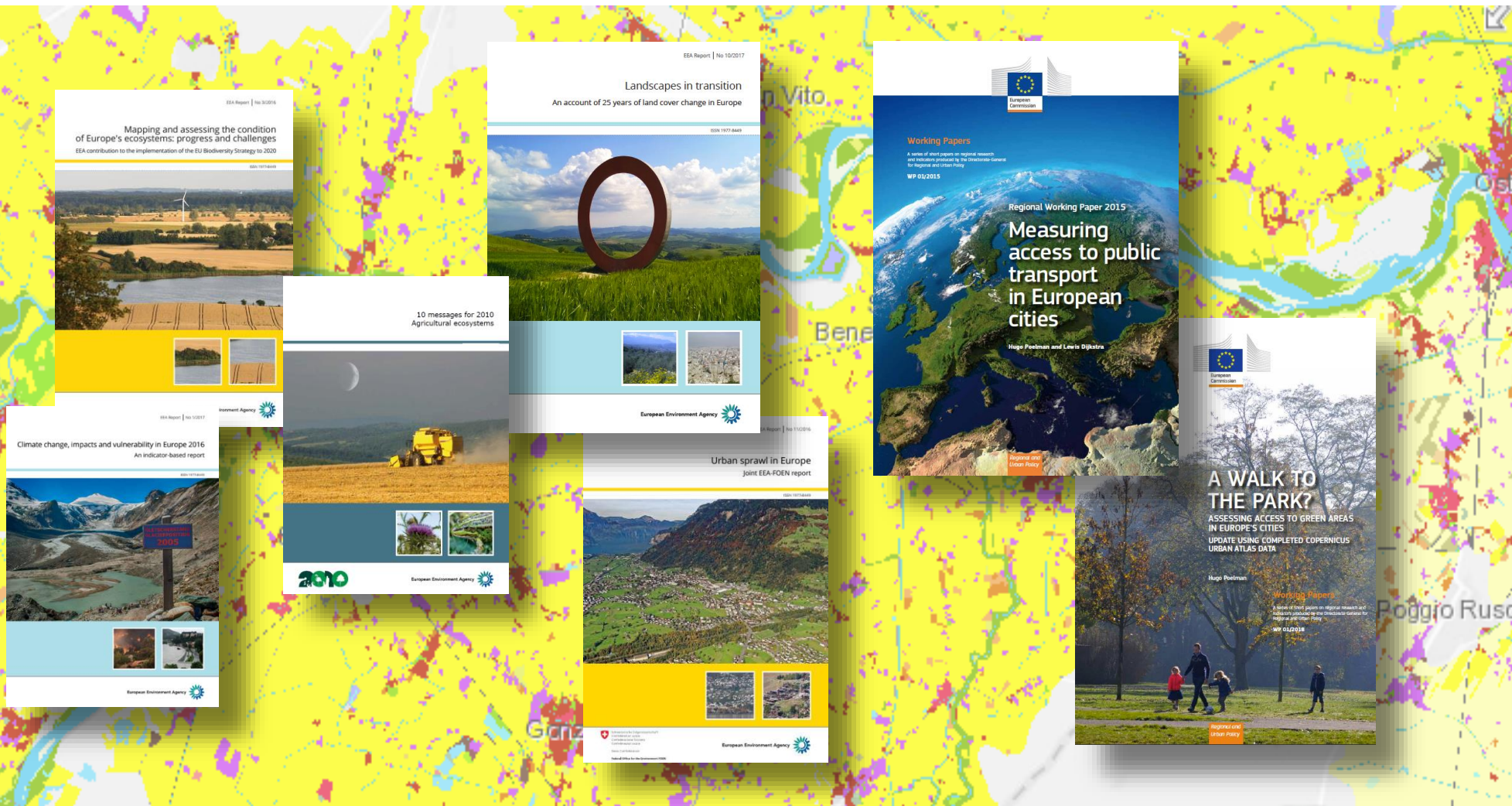
**copernicus**  
Europe's eyes on Earth



# Use of Copernicus in the EEA MDIAK framework



# Copernicus Information Products in EEA's Reports

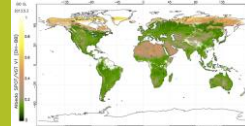




# Copernicus Land Monitoring Core Services



Systematic Biophysical Monitoring



Land Cover & Land Use mapping



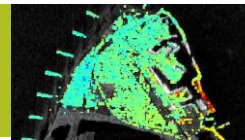
Thematic hotspot mapping



Reference data



Ground Motion service







# Find more information on

The screenshot shows the homepage of the Copernicus Land Monitoring Service. At the top, there is a navigation bar with links for Site Map, About, Contact us, Log in, and Register. Below this is a green header with the Copernicus logo and the text 'Europe's eyes on Earth'. A yellow banner diagonally across the page reads 'land.copernicus.eu'. The main content area features a large aerial photograph of agricultural fields. Below the photo, a white box contains text about Copernicus and four service components: Global, Pan-European, Local, and Reference data, each with an icon and a brief description.

Copernicus is an European system for monitoring the Earth. Data is collected from a variety of Earth observation satellites and in-situ sensors. The data is processed and provides reliable and consistent information about six thematic areas: land, marine, atmosphere, climate change, emergency management and security. The system is divided into four main components:

- Global**  
provides a series of bio-geophysical products on the status and evolution of the land surface at global scale at mid and low spatial resolution
- Pan-European**  
provides information about the land cover and land use (LC/LU), land cover and land use changes and land cover characteristics
- Local**  
focuses on different hotspots, i.e. areas that are prone to specific environmental challenges and problems
- Reference data**  
All of the Copernicus services need access to in-situ data in order to ensure an efficient and effective use of Copernicus space-borne data





# Setting the in situ data scene



- Copernicus is a success and offers excellent data and information products to users.
- In situ data constitute part of the foundation for Copernicus' success; and Copernicus collects and uses an enormous amount of in situ data on a routine basis.
- In situ data is needed for the production and validation of Copernicus Data and Information Products.







# Setting the in situ data scene



- Copernicus relies primarily on existing ‘in situ data’ capacities.
- The Copernicus In Situ Data Component is primarily implemented by the Copernicus Services and the Space Component. Cross-cutting coordination is the responsibility of the EEA.

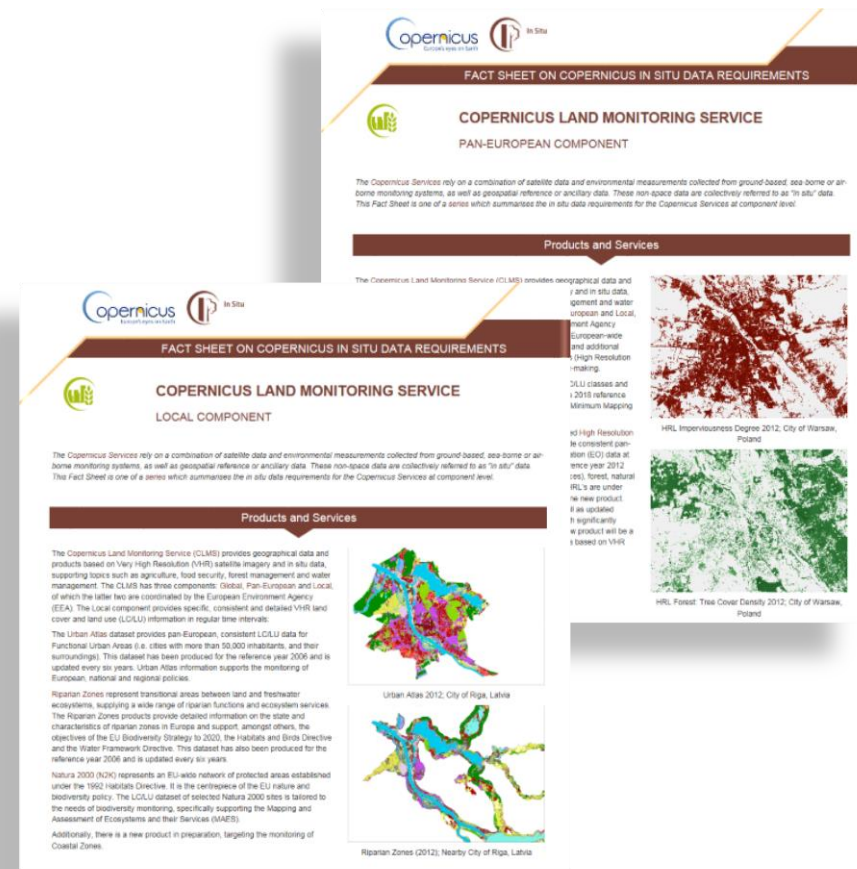




# CLMS - Local & Pan-European Component

Reliable and timely access to essential in situ data is required to:

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





# Known key in situ data 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”*







# The EEA's main cross-cutting activities

**Maintain an  
overview of the  
Copernicus in situ  
component**

**Improve access to  
selected in situ  
data**

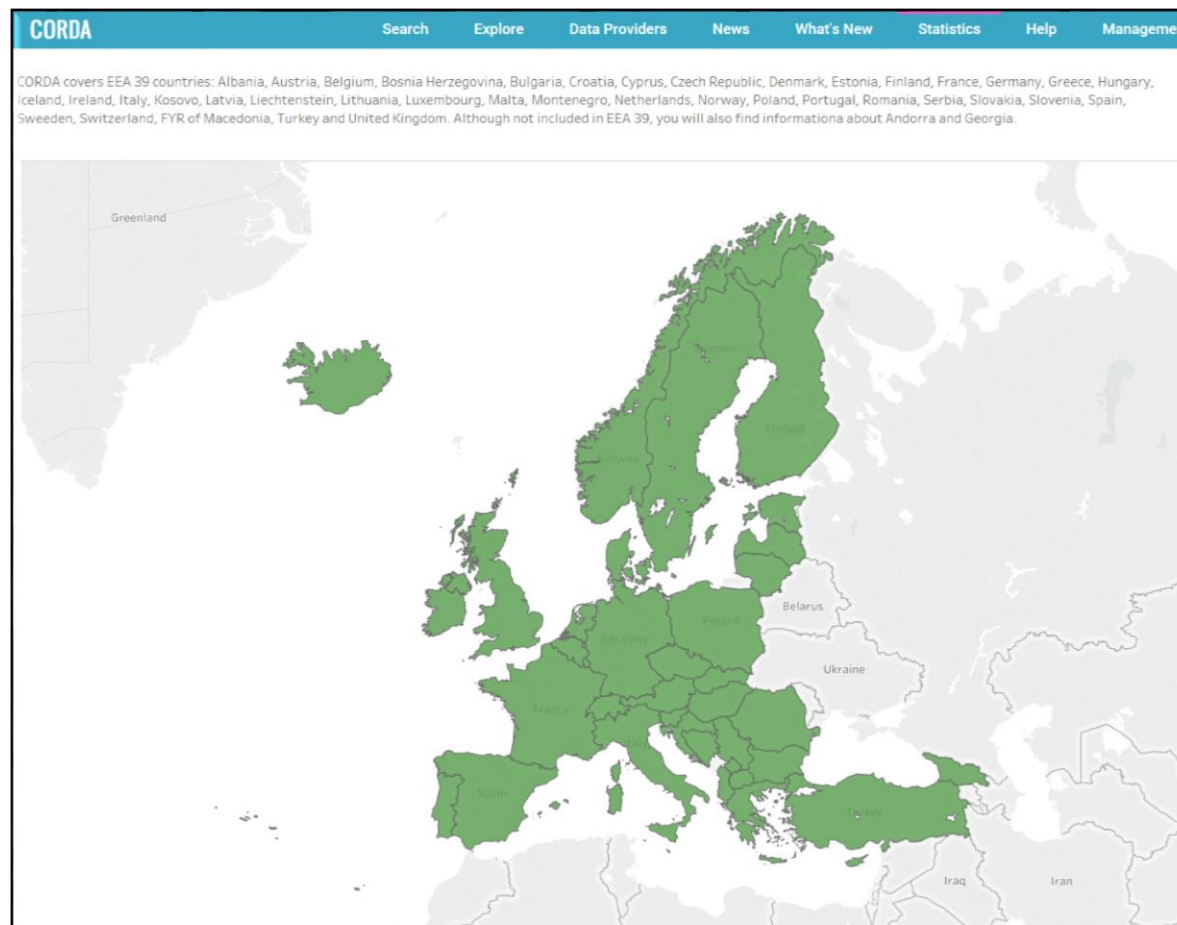
**Raise awareness  
about the  
Copernicus in situ  
component**





# Coordinated data access

The EEA is making national datasets available to the Copernicus Services through a protected and dedicated portal.





# Czech Republic Data Providers contribute

CORDA comprises 49 datasets from the Czech Republic provided by 6 data providers

The screenshot displays the CORDA web application interface. On the left, a map of the Czech Republic is shown with a layer titled 'CORDA' and 'INSPIRE - Orthophotos'. The main content area lists datasets with their descriptions and data types. The datasets are categorized by data type: WMS, PSEVER, WMTS, COGIS REST API, MAPSERVER, and ARCGIS REST API. The datasets are listed in a table with columns for 'Capabilities', 'Description', and 'Data types'. The datasets are provided by the Czech Office for Surveying, Mapping and Cadastre (CUZK) (Czech Republic).

Capabilities	Description	Data types
WMS	The cadastral map is a bindin...	
PSEVER	Fundamental Base of Geographi...	
WMTS		
COGIS REST API		
PSEVER	The INSPIRE Elevation data ar...	
WMTS		
COGIS REST API		
PSEVER	The data from the theme Units...	
WMTS		
COGIS REST API	Archive Orthophoto of the Cze...	
PSEVER	Since 2001, the ZM 10 is prod...	
WMTS		
COGIS REST API	Since 2002, the ZM 25 is prod...	
PSEVER	Since 2002, the ZM 50 is prod...	
WMTS		
COGIS REST API		
MAPSERVER		
WMTS		
ARCGIS REST API		
MAPSERVER		
WMTS		
ARCGIS REST API		
MAPSERVER		
WMTS		
ARCGIS REST API		

Area / Data providers

- ☒ Czech Republic (49)
  - ☒ Czech Environmental Information Agency (CENIA) (8)
  - ☒ Czech Office for Surveying, Mapping and Cadastre (CUZK) (28)
  - ☒ Forest Management Institute (FMI) (4)
  - ☒ Gisat (1)
  - ☒ Information Portal of Karlovy Vary Region (7)
  - ☒ Ministry of Agriculture (1)



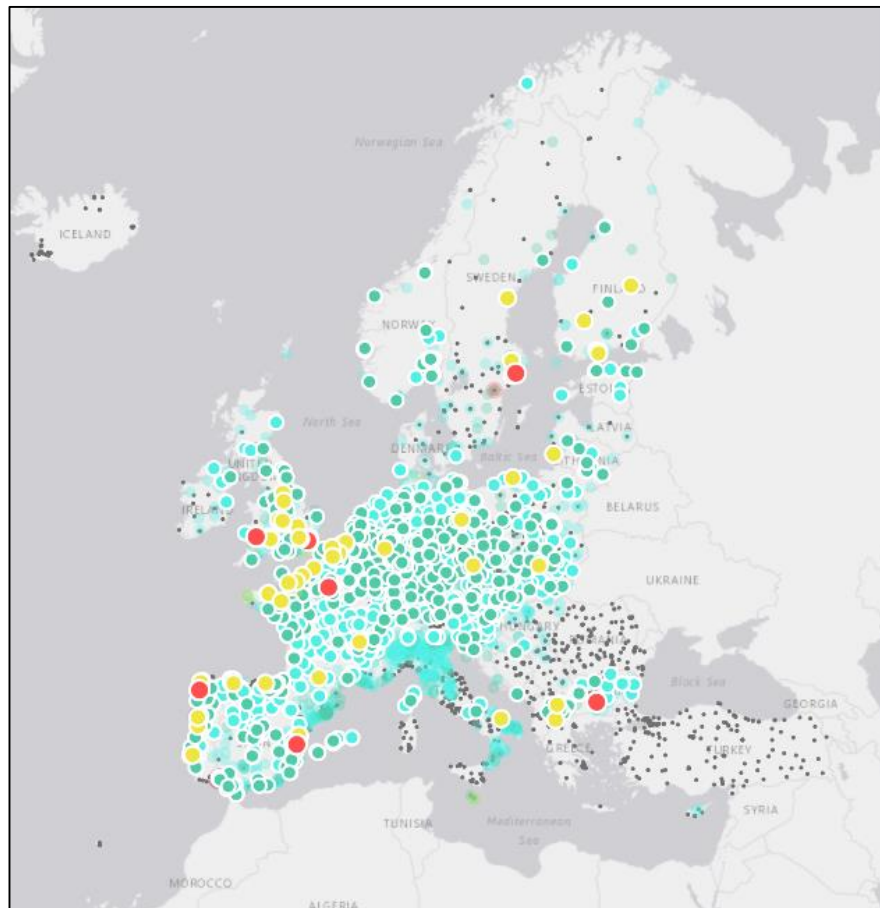




# EEA/EIONET is delivering data to Copernicus

## EIONET

European Environment Information and Observation Network



### Air quality

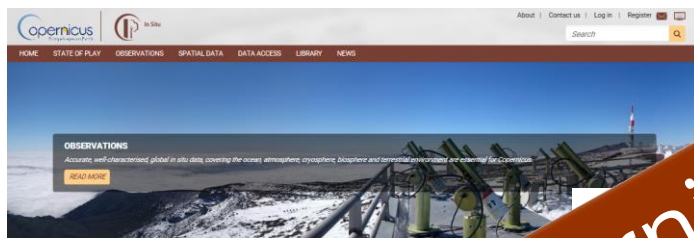
- Good
- Fair
- Moderate
- Poor
- Very poor
- No data

The EEA delivers Up-to-Date Air Quality Observations to Copernicus via the EIONET Core Data Flow.





# Find more information on



## EXPLORE THE COPERNICUS IN SITU COMPONENT

Copernicus is the European Union's evolutionary Earth Observation and monitoring programme. Copernicus offers a world of insight for entrepreneurs and businesses. Copernicus is openly and freely available to everyone at no cost. Copernicus transforms information from multiple sources, including satellites, into operational services for keeping you safe, supporting your business, and safeguarding our planet. The Copernicus Services rely on many environmental measurements collected by data providers external to Copernicus, collectively referred to as "in situ" data. The Copernicus In Situ Component maps the landscape of in situ data availability, identifies data sources, and sets out the conditions for access and use conditions.

insitu.copernicus.eu

### Featured

#### Copernicus In Situ Newsletter #1

#### EVENTS

No upcoming events at this time.

### 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, the relationship of the in situ component with the Copernicus services, and the road ahead for in situ coordination.

Observations Spatial Data Policy

READ MORE...

#### Mauro Facchini, Copernicus Unit, European Commission



Mauro 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.

Observations Spatial Data Policy

READ MORE...

#### 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 Marine

READ MORE...

#### 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, explained 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 observatories and sensors aboard ships. Almost 9000 platforms supply the service with data, which is critical for the production of the Copernicus Marine Service products.

Observations Policy Marine

READ MORE...

## FACT SHEET ON COPERNICUS IN SITU DATA REQUIREMENTS



### COPERNICUS LAND MONITORING SERVICE

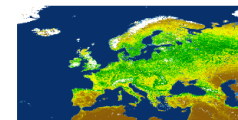
#### GLOBAL COMPONENT

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.

The CLMS Global Component offers a series of bio-geophysical products to monitor the status and evolution of land surfaces at a global scale. Production and delivery of the parameters take place in a timely manner and are complemented by the generation of long-term time series. The products are used to monitor vegetation, the water cycle and the energy budget.



European view of Leaf Area Index from May/June 2014 overlaid (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 modelling 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 irradiance 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.





# 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.
- A long-term strategy and operational solutions are needed to mitigate key challenges in particular sustainability and data policy.
- The EEA and its Environment Information and Observation Network is committed continuing cross-cutting coordination to reach effective and cost-efficient in situ data solutions.



# Thank you

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