

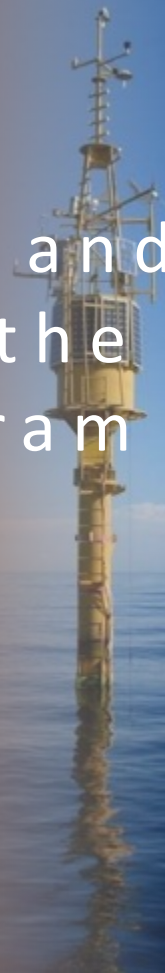


In situ

# Research Infrastructures and their important role in the Copernicus in-situ program

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# Europe's eyes on Earth

Looking at our planet and its environment

For the ultimate benefit of all European citizens

Flood in Bosnia and Herzegovina

 Uruguay River wetlands contains modified Copernicus Sentinel data (2018), processed by ESA, CC BY-SA 3.0 IGO



Atmosphere



Marine



Land



Climate Change



Security



Emergency



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## Setting the scene

- **Copernicus is a great success** and offers excellent Data and Information products to the users;
- **In situ data constitutes an essential part of the foundation** for the success of Copernicus;
- Copernicus relies predominately 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;
- Copernicus **provides important data** (e.g. ERA5 reanalysis) back to data providers





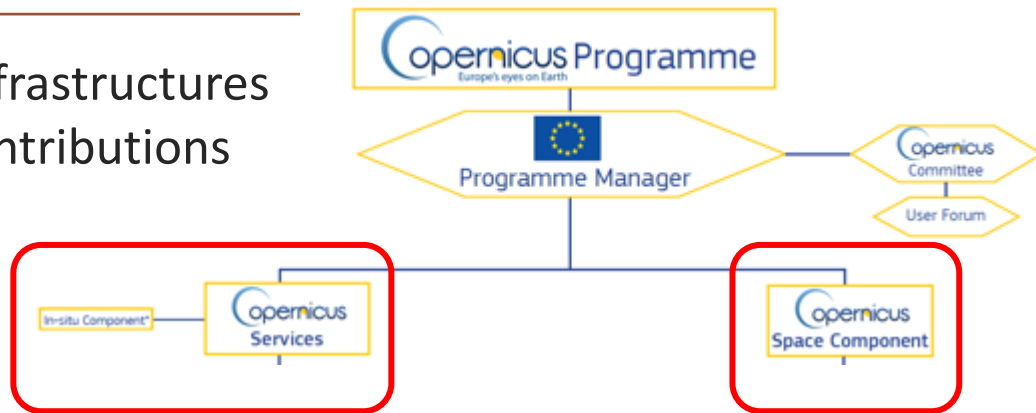
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## The Copernicus in situ component

Provides reliable and sustainable access to in situ data, relying on existing capacities operated at national and European level, and global observing systems;

Is implemented by the Services, and the EEA steps in when cross-cutting coordination is required;

Member states' in situ infrastructures and data are essential contributions to Copernicus.







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## Known key challenges

### Copernicus needs to find solutions to key challenges

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

*“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”*



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## 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**





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# 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 image displays several overlapping documents and a website related to the Copernicus In Situ component. The documents include:

- State of Play Report (Final Draft) V1.0 – July 2017**: A report from the European Environment Agency (EEA) detailing the implementation of in-situ data collection activities for the Copernicus Land Monitoring Service (CLMS).
- CLMS Land Monitoring Service**: A document outlining the requirements for in-situ data collection and the services provided by the CLMS.
- Products and Services**: A document describing the products and services provided by the CLMS, including geographical data and supporting topics such as land management.
- CLMS Land Monitoring Service**: A document outlining the requirements for in-situ data collection and the services provided by the CLMS.
- CLMS Land Monitoring Service**: A document outlining the requirements for in-situ data collection and the services provided by the CLMS.

The website shown is the Copernicus In Situ portal, featuring a search bar, navigation menu, and a map of Europe. The portal provides information on the CLMS Land Monitoring Service and the requirements for in-situ data collection.





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# Creating an overview

## Requirement details

Name O3  
Note Mole fraction of ozone. (WMO OSCAR, id: 306)  
Dissemination NRT Service

Edit requirement Delete requirement  
Close requirement

## Data provider network

Name ACTRIS esitu  
Description ACTRIS is the European Research Infrastructure for the observation of Aerosol, Clouds, and Trace gases. ACTRIS is composed of observing stations, exploratory platforms, instrument calibration centres, and a data centre. ACTRIS serves a vast community of users working on atmospheric research, climate and Earth system and air quality infrastructure.

Edit data provider Edit network members Delete data provider

## Data details

Name IAGOS Air  
Note  
Update Frequency <5 min  
Area Global  
Temporal -

## Product details

Name  
Acronym  
Description O3  
Note (P)  
Status Operational  
Group AMC European Air Quality NRT Analysis and Forecast  
Area Europe  
Component Atmosphere Monitoring Component  
Service Copernicus Atmosphere Monitoring Service  
Entrusted Entity European Centre for Medium-Range Weather Forecasts

Delete product



## The Copernicus In Situ Component Information System

## Fact Sheets

### FACT SHEET ON COPERNICUS IN SITU DATA REQUIREMENTS



### COPERNICUS ATMOSPHERE MONITORING SERVICE

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.



RESEARCH INFRASTRUCTURES AND COPERNICUS  
Issue 1.0  
Date: 10/10/2017

Framework Service Contract EEA/WM/15/006/001 for services supporting the European Environment Agency's 2017 Implementation of cross-cutting activities for coordination of the in-situ component of the Copernicus Programme Services

#### Thematic Report

#### Research Infrastructures and Copernicus

Issue 1.0  
Date: 10/10/2017



## Reports

European Environment Agency



European Commission







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# Raising the awareness

## Geoscience Australia provides atmospheric spectrometers to support Sentinel validation

Geoscience Australia, the Australian public geoscience organisation, has installed and deployed a pair of spectrometers capable of measuring concentrations of trace gases in the Earth's atmosphere. These instruments support validation of the Sentinel-5P satellite, one of the Copernicus Sentinels. The spectrometers measure sulphur dioxide, ozone and nitrogen dioxide.

Atmosphere Observations

## How in situ data brings air quality and greenhouse gas emissions into focus

The Copernicus Atmosphere Monitoring Service (CAMS) relies on a range of in situ observations. Member State monitoring networks, European Research Infrastructures and international partnerships all contribute towards bringing air quality and greenhouse gas (GHG) emission into focus for the operational service.



This map shows the twenty-sixth highest Ozone (O<sub>3</sub>) value in Europe based on daily max 8-hour averages with at least 75% of valid measurements, in µg/m<sup>3</sup> (source: EEA, AirBase v.8 & AQ e-Reporting)

Air pollution is a threat to both the environment and human health, and is an increasing

## The 3rd ICOS Science Conference 2018

The Conference will be organised in Prague, Czech Republic from Tuesday 10th to Thursday 12th September 2018. The programme is currently under planning, Monday 10th and Tuesday 11th September will be used for registration and events, so be sure to reserve the whole day.

Observations

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

Jun 15, 2018



Policy Spatial data Observations

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 [...]

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## Recent results of Copernicus in situ

- Licensing agreement between EEA and EUMETNET giving access to hydrological, meteorological and climatological data held by EUMETNET members
- Improving the availability of non-European weather and oceanography data through engagement with WMO, IOC, and the Commission for Hydrology (CHy)
  - Cooperation Arrangements with countries outside Europe: Australia, Brazil, Chile, Colombia, India, Serbia, Ukraine
- Connecting with European Research Infrastructures, through forums such as the European Environmental Research Infrastructures (ENVRI), alongside engagement on specific themes, such as the sustainability of Total Carbon Column Observing Network (TCCON)
- Mapping Arctic data availability
- Engaging with relevant Horizon 2020 projects such as AtlantOS, INTAROS, JERICO-NEXT, and MONOCLE, KEPLER



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# Key observing systems' sustainability

The EEA is striving to document key observing network's level of sustainability.

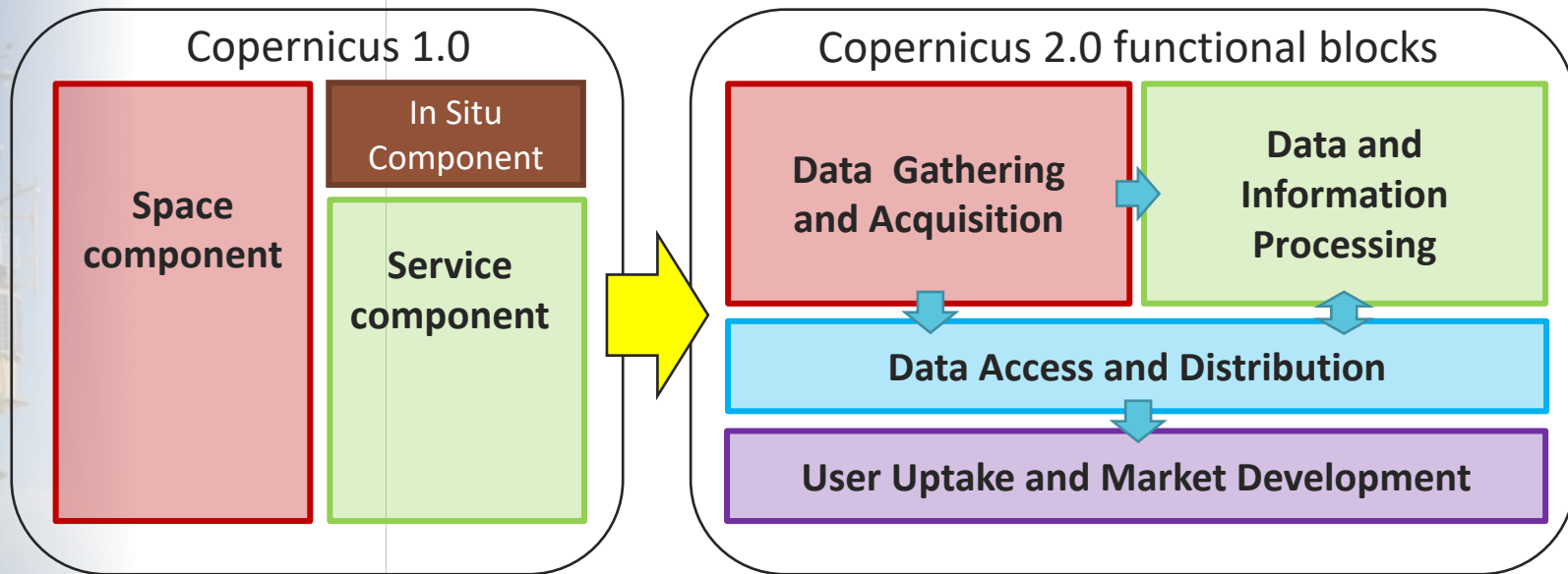
With a view to influencing decision makers at national and European level.





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# Moving towards Copernicus 2.0



Copernicus shall comprise four elements, namely:

(a) **data acquisition** which shall include:

- the development and operations of the Copernicus Sentinels;
- access to third party space-borne Earth Observation data;
- access to **in situ and other ancillary data**;





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## The New Space Regulation (TBC)

10b. Research infrastructures, in particular **in situ observing networks will constitute essential elements** of the in situ observation infrastructure enabling the Copernicus Services.

48. Where feasible and appropriate, it should also **make use of the available in situ and ancillary data provided mainly by the Member States** in accordance with Directive 2007/2/EC<sup>20</sup>. The Commission should work together with the Member States and the European Environment Agency to ensure an efficient access and use of the in-situ data sets for Copernicus.

55. The Commission and Member States should **work together to develop the in-situ component of Copernicus** and to facilitate the integration of in-situ datasets with space datasets for upgraded Copernicus services.

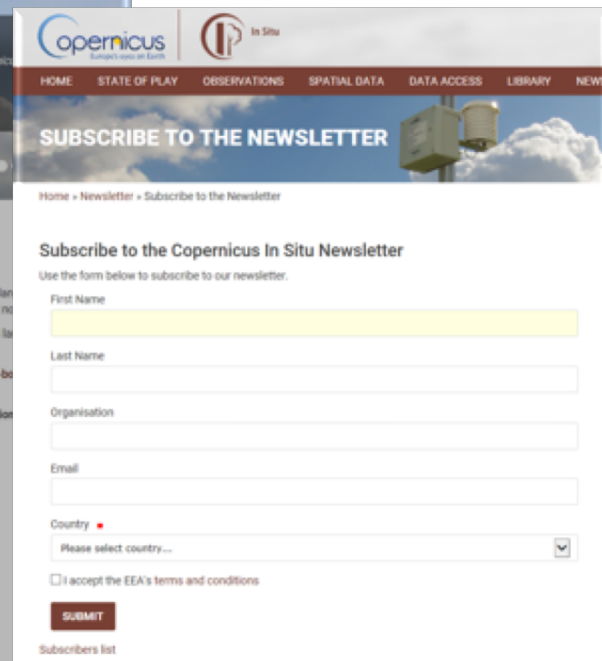


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# For more information



The screenshot shows the 'Copernicus In Situ' component page. The header includes the Copernicus logo, 'In Situ' text, and navigation links: About, Contact us, Log in, and a search bar. The main navigation menu lists: HOME, STATE OF PLAY, OBSERVATIONS, SPATIAL DATA, DATA ACCESS, LIBRARY, and NEWS. The main content area features a banner for the 'COPERNICUS IN SITU COMPONENT' with a 'READ MORE' button. Below this is a section titled 'EXPLORE THE COPERNICUS IN SITU COMPONENT' with text explaining that Copernicus is the European Union's revolutionary Earth observation programme, offering a world of insight about our planet. It mentions that Copernicus transforms information from various sensors into operational services for keeping watch over the planet Earth's land, atmosphere, monitoring climate change, and managing and safeguarding civil security. It also states that Copernicus Services rely on many environmental measurements collected by data providers external to Copernicus, from ground-based, sea-based, and space-based monitoring systems, as well as geospatial information and ancillary data, collectively referred to as "in situ" data. The Copernicus In Situ Component maps the landscape of in situ data availability, identifies data access gaps or bottlenecks, supports the provision of data, and manages partnerships with data providers to improve access and use conditions. At the bottom, there is a section titled 'Discover the Copernicus Services' with icons for Marine, Atmosphere, Land, Security, Emergency, and Climate.



The screenshot shows the 'Subscribe to the Newsletter' form on the Copernicus In Situ website. The header includes the Copernicus logo, 'In Situ' text, and navigation links: HOME, STATE OF PLAY, OBSERVATIONS, SPATIAL DATA, DATA ACCESS, LIBRARY, and NEWS. The main content area features a banner for 'SUBSCRIBE TO THE NEWSLETTER'. Below this is a section titled 'Subscribe to the Copernicus In Situ Newsletter' with the text 'Use the form below to subscribe to our newsletter.' The form includes fields for First Name, Last Name, Organisation, Email, and Country (a dropdown menu with a 'Please select country...' prompt). There is a checkbox for 'I accept the EEA's terms and conditions' and a 'SUBMIT' button. At the bottom, it says 'Subscribers list'.

European Environment Agency



European Commission





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Thank you for your  
attention

