



In situ

In Situ Component

Copernicus services' requirements for observations from the Arctic region





In situ

Copernicus will benefit from INTAROS

INTAROS' overall objective is to build an efficient integrated Arctic observation System by extending, improving and unifying existing systems in the different regions of the Arctic.

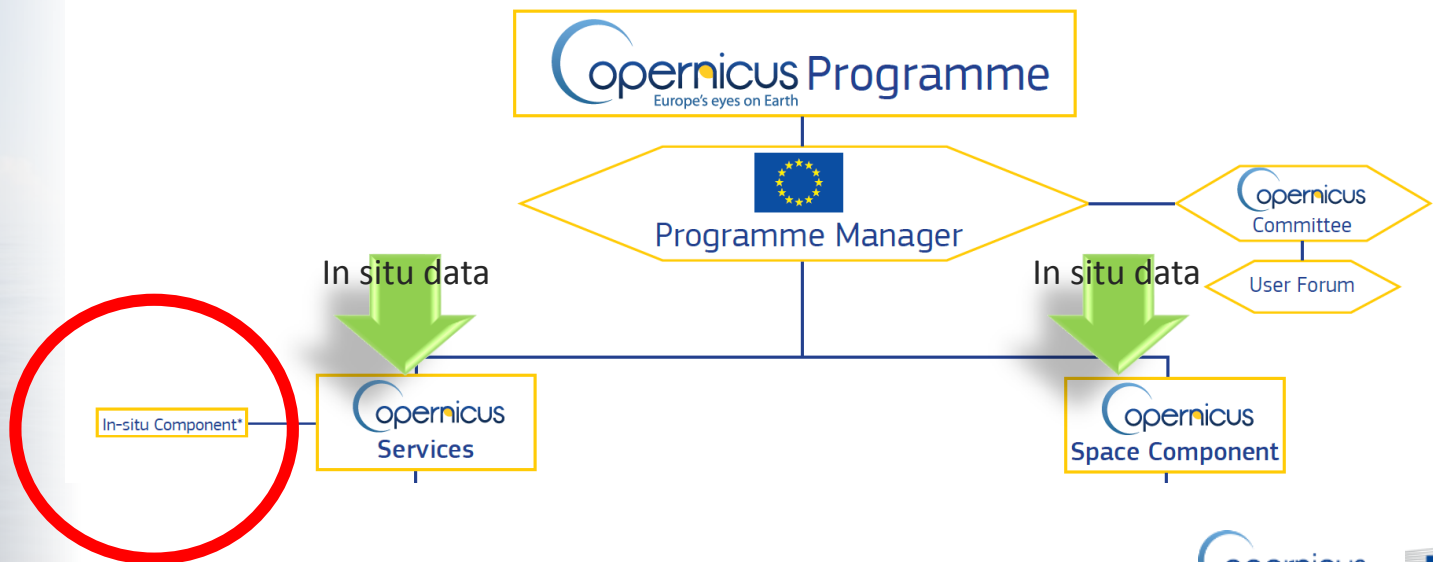




In situ

The Copernicus in situ component

Observation systems constitute an essential part of the Copernicus in situ component





In situ

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 by the EEA when overall coordination is required;

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



In situ

EEA's main cross-cutting activities

Maintain an overview of the Copernicus in situ component

Improve access to selected in situ data

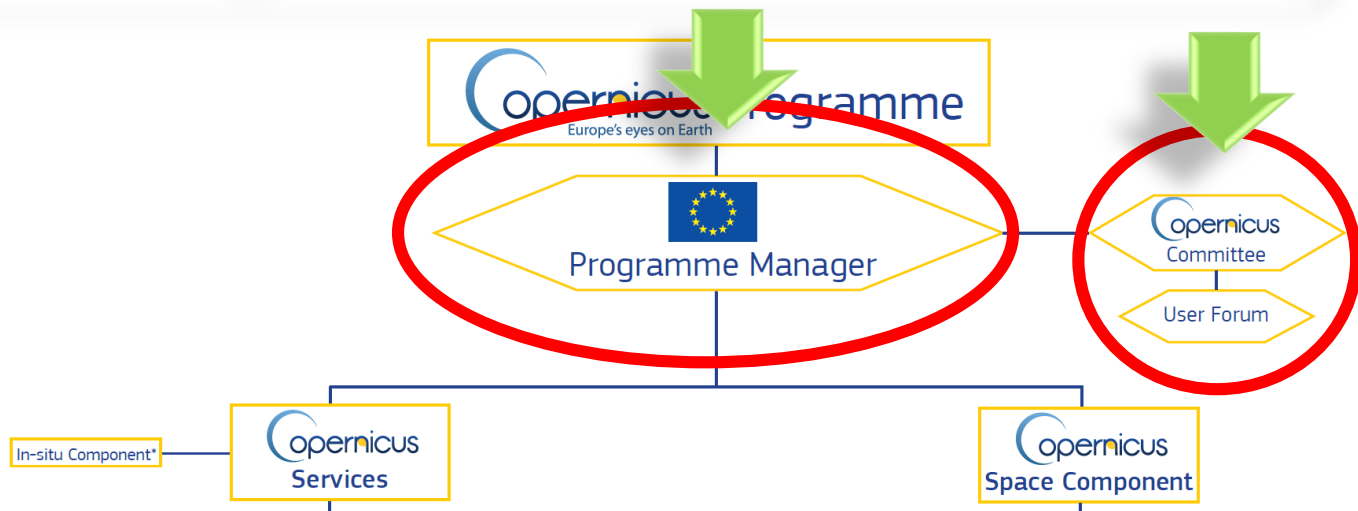
Raise awareness about the Copernicus in situ component



In situ

The Copernicus in situ component

The EEA is delivering information to Copernicus' governance bodies.





In situ

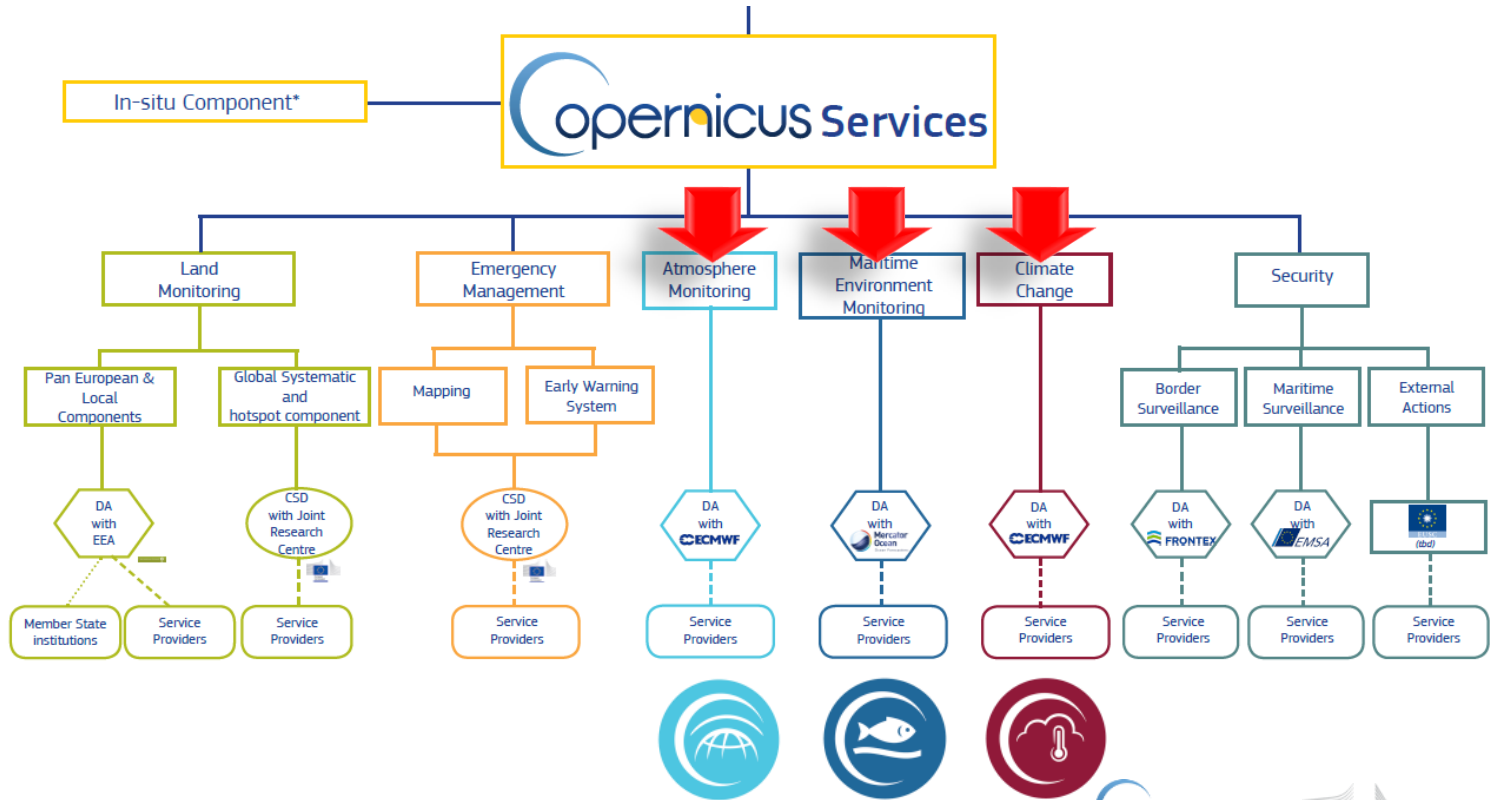
Contractors supporting the EEA

- Two consortia are supporting the EEA's cross-service in situ data coordination activities:
 - In Situ Observations: EUMETNET (lead), EuroGOOS, and the University of Lund;
 - Spatial Reference Data: e-geos (lead), ISPRA, ITHACA, and Evenflow;



In situ

Services with an interest in the Arctic





In situ



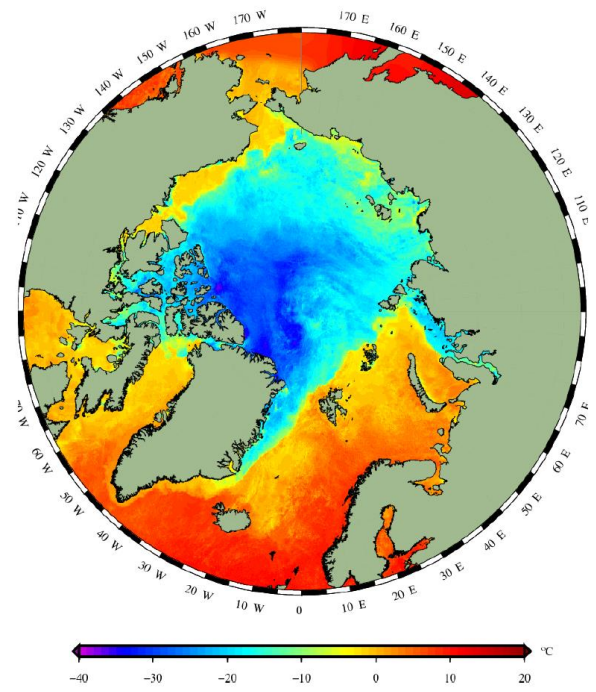
By monitoring the evolution of sea ice in the Arctic, the service provides a major indicator for studying global warming



- 1 Global
- 2 Arctic
- 3 Baltic
- 4 NWS
- 5 IBI
- 6 Med Sea
- 7 Black Sea



Marine
(CMEMS)





In situ

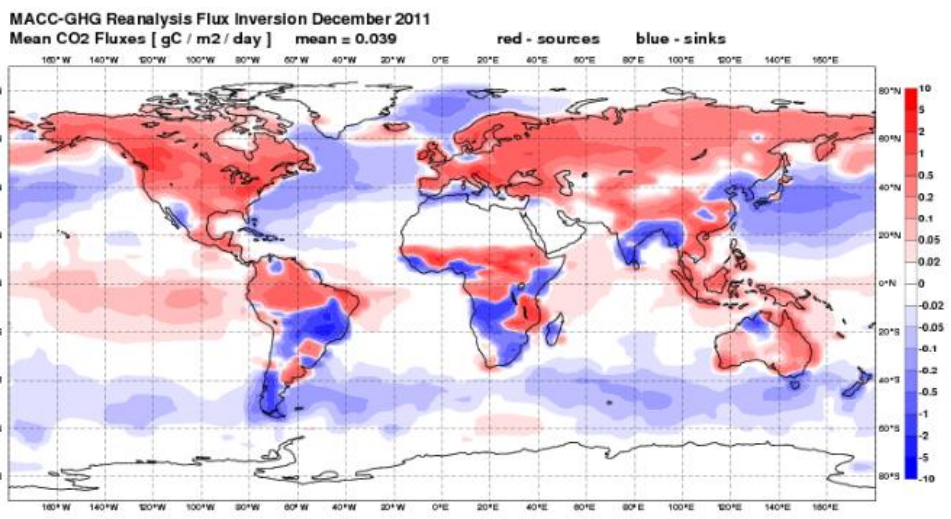
C M E M S - Selected needs and challenges

- In-situ data to validate all variables produced by the models, for assimilation into ocean forecasts and for use in multi-year gridded products;
- There is a general lack of real time/near real time data in the Arctic, in particular wave data. In situ data from this region is becoming more significant as human activities expand there;
- About 10% of measurements in the ocean observing networks are biogeochemical observations. A steady increase in the number of biogeochemical measurements in European seas and globally is required;
- Maintenance of Argo core mission (physical variables) at the present level and increased proportion of biologically equipped Argo profiling floats (Bio-Argo);
- Provision of tidal data, more accurate bathymetric maps, river outflow data (volume, nutrients and sediments);
- The interface between the ocean and atmosphere is also a critical area where additional in situ data need to be collected to enhance models and understanding of air-sea interaction processes;
- Extension of relevant in situ time series data to periods exceeding 20 years.



Copernicus Atmosphere Monitoring Service

In situ



Atmosphere
(CAMS)



In situ

CAMS - Selected needs and challenges

- For model evaluation and improvement In situ data needs to be available from locations that are representative for the air quality at the exposure level and that can be represented well in the global and the regional air pollution models;
- More information on aerosol size distribution is needed and is lacking from standard air quality networks;
- More information on (size resolved) aerosol composition is needed and is lacking from standard air quality networks;
- More vertical profile information on all components would help to improve the model evaluation and assimilation;
- In situ greenhouse gas concentration levels are even more ideal for model evaluation due to the high precision and accuracy of the measurements and the more representative location of the observing sites;
- Issues with (NRT) data availability from scientific networks and data licensing and attribution to providers need improvement.



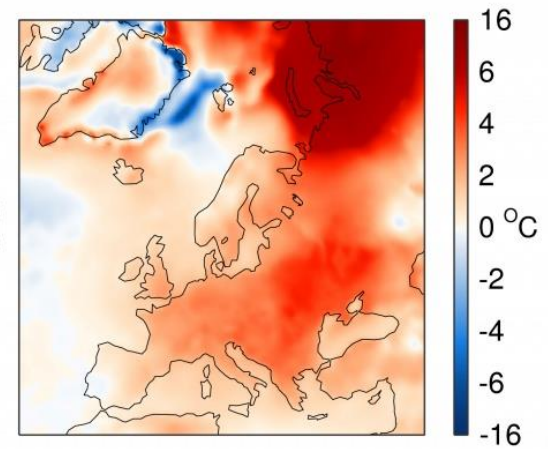
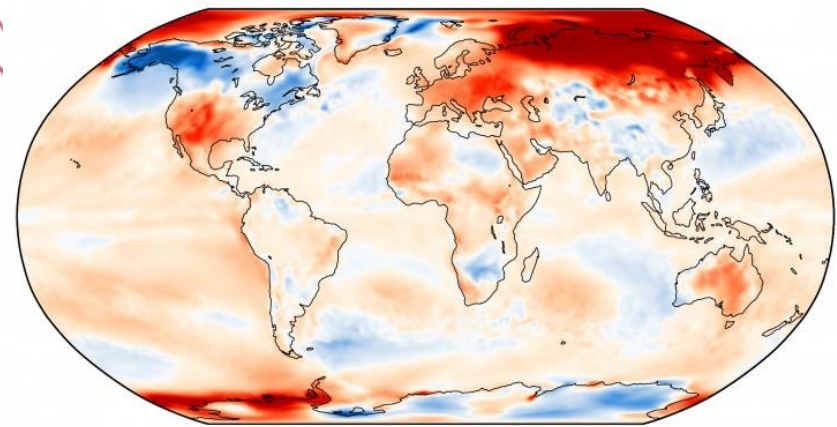
In situ



Copernicus Climate Change Service



Climate
(C3S)





In situ

C3S - Selected needs and challenges

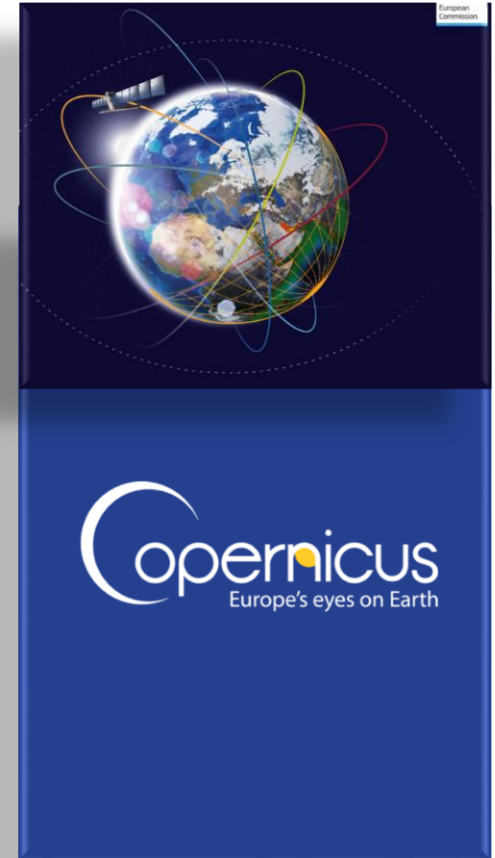
- The service requires high-quality observational records of variables that critically contribute to the characterisation of Earth's climate: the so-called Essential Climate Variables (ECVs);
- There are three main applications of in situ data in the climate service:
 - **Calibration and validation** of long satellite records;
 - **Evaluation** of climate models by comparing model output with observations of the current and past climate, using historical forcings;
 - **Assessments** of climate variability and change in recent decades by analysing long historical climate records. Before the 1970s, these assessments relied fully on in situ data. Reanalysis systems assimilate these observations enabling comprehensive reconstructions of past climate.
- Long, consistent data series are needed to detect climatic trends of, for example, the frequency of extreme climatic events that may have a severe impact on society;
- Problems for climate can be encountered over a long-period record through changes in measurement environment and observing practices, including instrumentation;
- Homogenisation and harmonised QA/QC and gridding procedures applied to historical time series of observations are needed to avoid spurious trends and incorrect statistics of extremes;
- Historical in situ observations are not always documented according to modern standards which makes quality assessment difficult;



In situ

Copernicus – some boundary conditions

- Copernicus services are operational;
- Continuity of service is important for end users;
- Copernicus services will evolve based on end user requirements;
- The Copernicus programme offers currently very limited budget specifically for in situ data;
- New Copernicus regulation and budget 2021-2027 will be prepared during the coming months (target date: spring 2018).

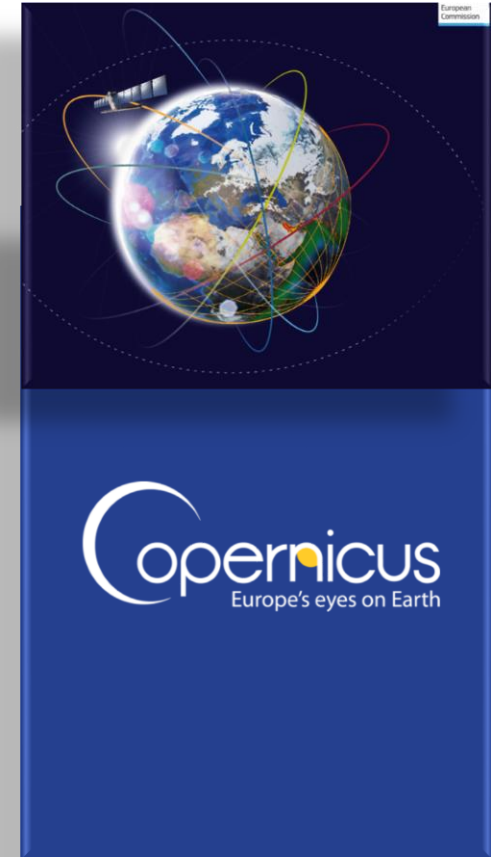




In situ

High level cross-cutting needs

- Access protocols;
- Data formats;
- Metadata standards;
- Use conditions, data policies;
- Service level agreements.





In situ

More information available at

The screenshot shows the Copernicus In Situ website. At the top, there are navigation links for 'About', 'Contact us', 'Log in', and 'Register'. A search bar is located on the right. Below the navigation is a main menu with categories: 'HOME', 'STATE OF PLAY', 'OBSERVATIONS', 'SPATIAL DATA', 'DATA ACCESS', 'LIBRARY', and 'NEWS'. The main content area features a large banner image of a snowy mountain landscape with scientific equipment. A dark overlay on the banner contains the text: 'OBSERVATIONS Accurate, well-characterised, global in situ data, covering the ocean, atmosphere, cryosphere, biosphere and terrestrial environment are essential for Copernicus.' Below this text is a yellow 'READ MORE' button.

EXPLORE THE COPERNICUS IN SITU COMPONENT

Copernicus is the European Union's revolutionary Earth Observation and monitoring programme. Copernicus offers a world of insight about our planet to European and global citizens, public authorities, policymakers, scientists, 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 watch over the planet Earth's land, ocean and atmosphere, monitoring climate change, supporting European emergency management and safeguarding civil security.

The Copernicus Services rely on many environmental measurements collected by data providers external to Copernicus, from **ground-based, sea-borne or air-borne monitoring systems**, as well as **geospatial reference or 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 cross-cutting data and manages partnerships with data providers to improve access and use conditions.

Discover the Copernicus Services
Europe's eyes on Earth



Marine



Atmosphere



Land



Security



Emergency



Climate

<http://insitu.copernicus.eu/>

EVENTS

9 MAY 2017
GIS for a Sustainable World Conference

NEWS

27 APR 2017
New Copernicus In Situ Website and

REPORTS

20 APR 2017
GISC - Update of D2-1 Note on In-situ





In situ

Working together ...

Thank you for your attention

