the Copernicus In Situ Component

7th Copernicus Czech National User Forum

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Space

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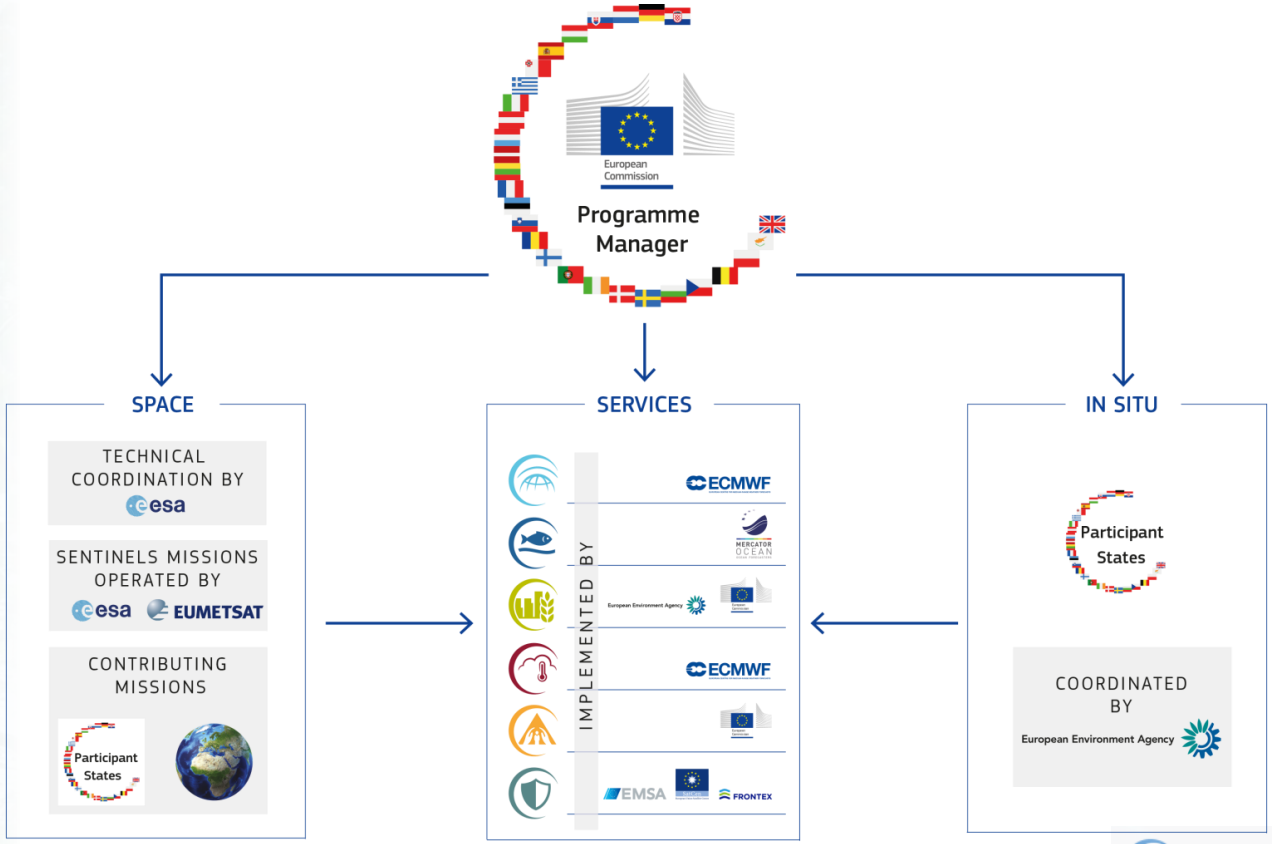
COPERNICUS GOVERNANCE



Copernicus In Situ Component

In situ

- ‘in situ data’ means observation data from ground-, sea-or air-borne sensors as well as reference and ancillary data licensed or provided for use in Copernicus; (Art.3 Copernicus Regulation EU377/2014)

- “The Copernicus in situ component shall provide access to in situ data serving primarily the services…” (Art.7 Copernicus Regulation EU377/2014);

Copernicus in situ component

In situ

Space component & Copernicus Services

Using *in situ* data tailored to specific need

Space component/Individual services focus on:

- Data requirements;
- Access agreements and cooperation with data providers;
- Operational management and processing of in situ data.

Delegation agreements with entrusted entities

Programme level

Article 7 – Copernicus regulation

Cross-cutting coordination across Copernicus services by the EEA

Focus on:

- Overview Copernicus in situ component across services;
- Improving data access;
- Establishing partnership agreements;
- Coordination and exploitation of synergies across all services.

Delegation agreement with the EEA

CMEMS & in situ

https://insitu.copernicus.eu/FactSheets/CMEMS/

Why does CMEMS need access to in situ data:

- Operational use in CMEMS forecasts
  - Merge, complement and correct with satellite data
  - Access in-situ information **in depth** when satellites cover **the surface**
  - Assimilate local values in models
  - Validate satellite satellite observations, forecasts and reanalysis

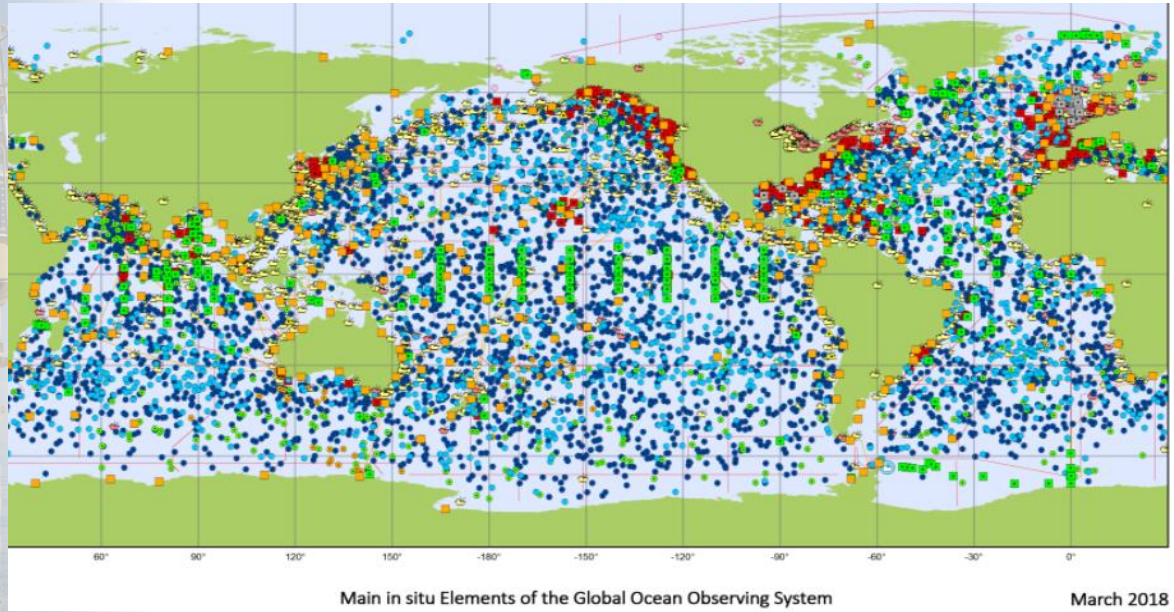
- CMEMS support to Environmental assessment

- CMEMS contribution to Climate science and policy

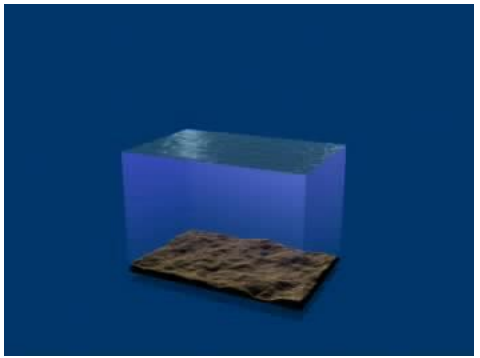
Example: Ocean modelling in CMEMS

In situ

CMEMS insitu Thematic Centers



Main in situ Elements of the Global Ocean Observing System March 2018

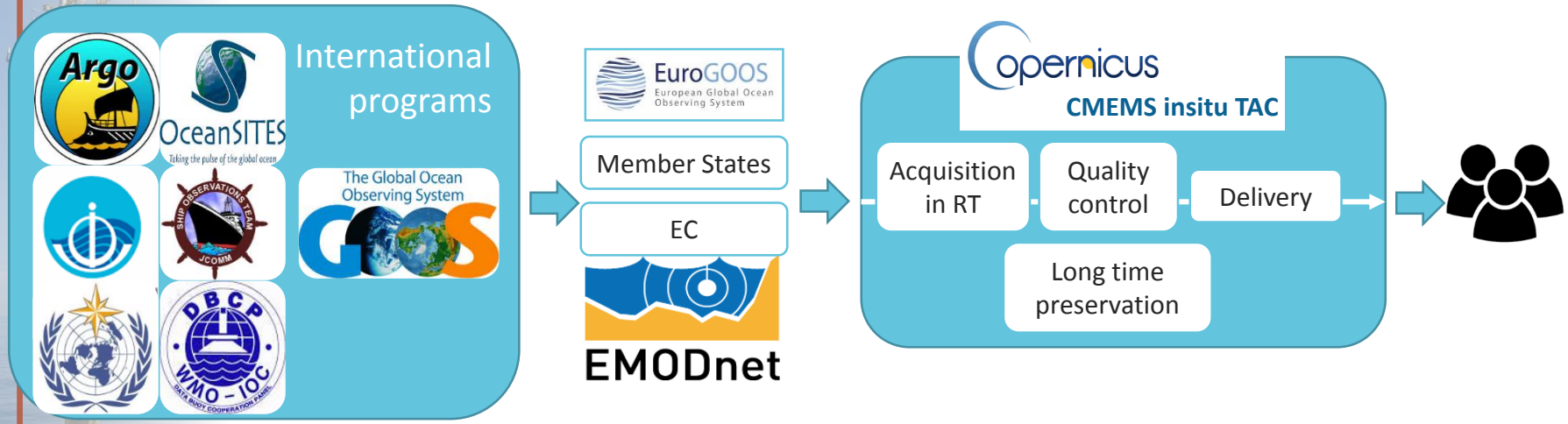


Which types of in situ data:

80 parameters, 31 000 platforms, 5 billions observations collected since 2015

In-situ for the Copernicus marine service

- Success of in-situ in CMEMS : **A complex but efficient and operational organisation in place**



https://insitu.copernicus.eu/library/fact-sheets

Why does CLMS need access to in situ data:

- Supporting the visual interpretation and feature delineation
- Improving the reliability and thematic accuracy
- validation of products and internal quality control steps
- Improving the calibration quality

Example: LPIS/IACS & Copernicus

LPIS : Land Parcel Identification System
IACS : Integrated Administration and Control System

Fruitful interchanges are possible in both directions between LPIS, IACS and CAP & Copernicus

LPIS, IACS and CAP		Copernicus & its products
Targeting and evaluation	←	Information about non-declared land Information about environmental conditions
Grassland management	→	HRL Grassland, Natura 2000, Riparian zones
Types of crops	→	Natura 2000
Types of crops – Crop conditions (also relevant for product development)	← →	Biophysical products
Greenhouses	→	HRL Imperviousness
Permanent grassland monitoring	→ ←	HRL grassland (ploughing indicator)
Ecological Focus Areas	→	Small woody features

C3S & in situ

https://insitu.copernicus.eu/FactSheets/C3S/

Why does C3S need access to in situ data:

- Climate reanalysis
- Calibration and validation
- Evaluation and improvement

In situ data requirements for Essential Climate Variables (ECVs) to systematically monitor the Earths' climate

- Atmospheric: over land, sea and Ice
- Oceanic
- Terrestrial

CAMS & in situ

https://insitu.copernicus.eu/FactSheets/CAMS

- Accurate, stable and well-calibrated observations to constrain the air quality models at the near-surface level of exposure
- To validate the global and regional forecasts and reanalyses

Only the combination of all the data sources including in situ data will provide users with reliable and up-to-date information.

Atmosphere Monitoring

CAMS SPECIFIC IN SITU DATA CONTRACTS

European Environment Agency

A range of dedicated directly negotiated contracts with the main networks that monitor atmospheric composition in Europe and worldwide. Contracts (until 2020) negotiations are in progress.

Copernicus Europe's eyes on Earth

European Commission

CEMS & in situ

https://insitu.copernicus.eu/library/fact-sheets

Why does CEMS need access to in situ data:

- To reduce the delivery time final products
- To increase the thematic and geometric accuracy
- To facilitate the integration of the data and information
- To provide input to models
- To validate post-events
- To improve the accuracy of the (forecasted and monitored) risks
- To reduce potential losses
- To increase awareness

Copernicus Security service & in situ

Security

- https://insitu.copernicus.eu/library/fact-sheets

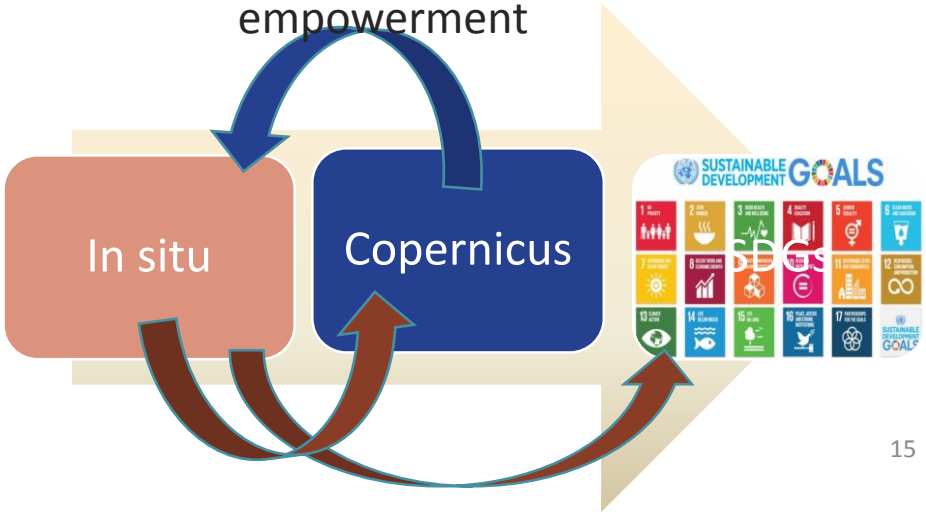
- Why does CSS need access to in situ data:

- To increase situational awareness
- To improve reaction capability
- To improve thematic and geometric accuracy
- To increase area coverage and observation time
- To increase the speed of response to user requests
- To improve the quality of products
- To improve the tasking and acquisition of satellite imagery (by relying on accurate metereological data)

In situ & Copernicus & SDGs

- UN sustainable development knowledge platform

"The-Future-We-Want" in paragraph 274 recognizes "the importance of space-technology-based data, in situ monitoring, and reliable geospatial information for sustainable development policy-making, programming and project operations."



In situ & Copernicus & SDGs

CEOS publication:

Satellite Earth Observations in support of the sustainable development goals – Special 2018 Edition

http://eohandbook.com/sdg/files/CEOS_EOHB_2018_SDG.pdf

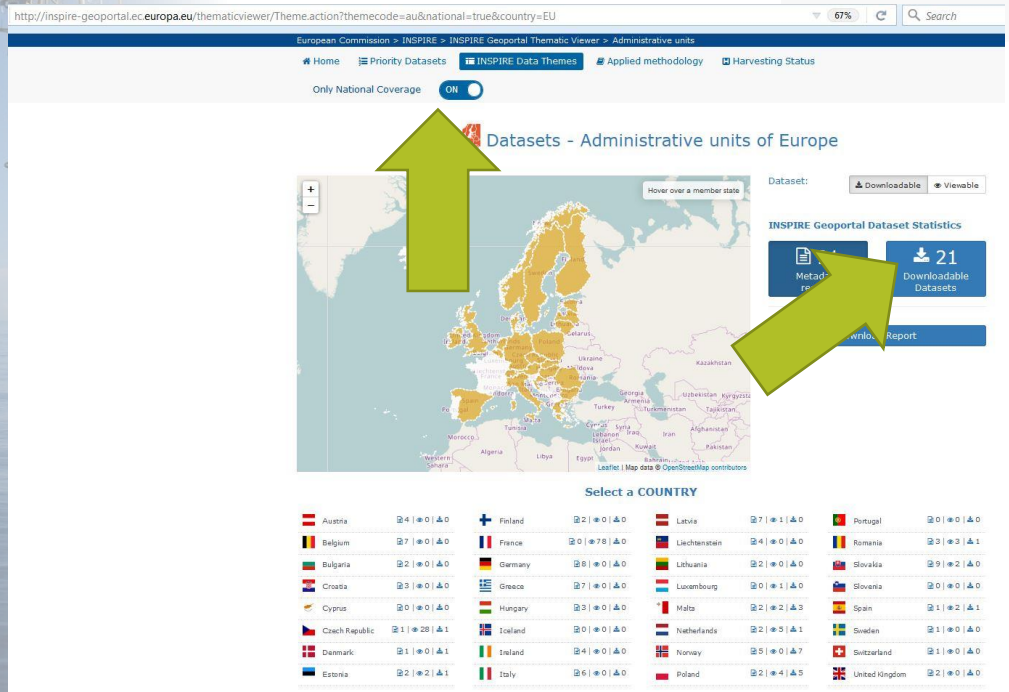
- *"**EO data is** no doubt going to play a significant and **central role in the global reporting processes** for the next 15 years. Its use will not be in isolation and **must be** guided by issues around definition and scope and **supported by complementary in-situ information.** "*

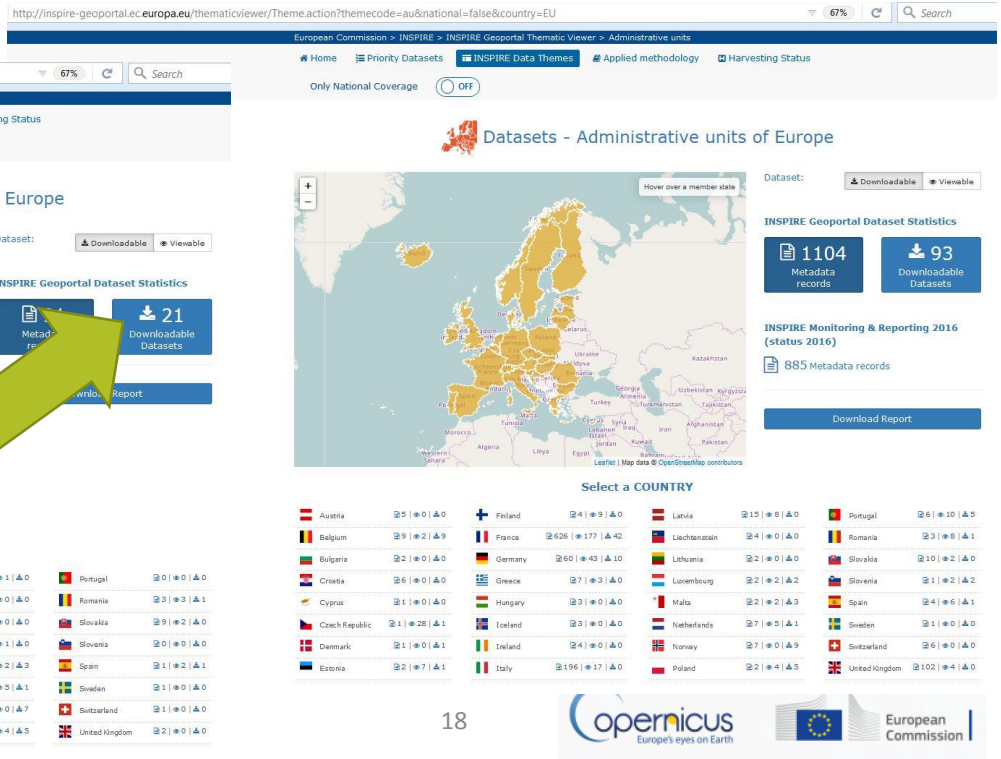
Coordinating in situ

- Provision of in situ data to the operational services based on existing capacities of others (CORDA)
- **Improving the access** and (harmonized) license conditions
  - Best practices and Quality control
  - Can be beset by technical challenges of
    - lack of data,
    - missing contributions by communes,
    - missing attributes,
    - errors in presentation/formats
    - …

Coordinating in situ

Example of technical challenge: Working with downloadable harmonized datasets: Administrative Units (INSPIRE Annex I theme) – status April 2018

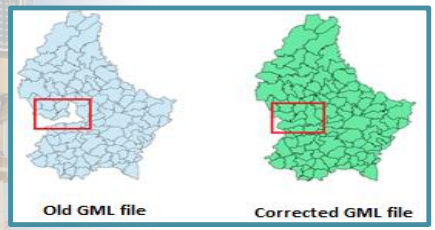


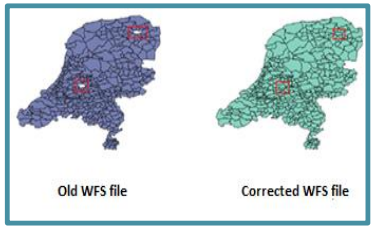


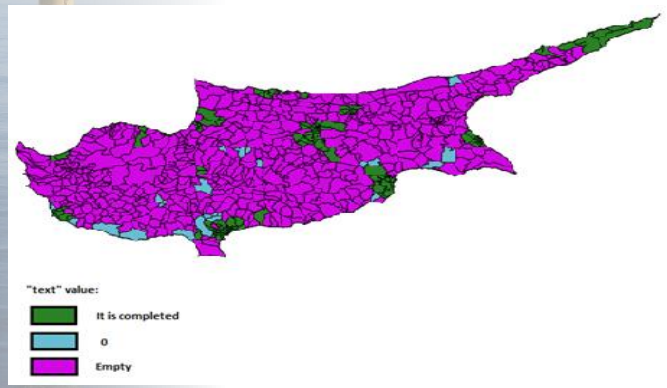
Coordinating in situ

Working with downloadable harmonized datasets: Administrative Units (INSPIRE Annex I theme) - status April 2018

Missing communes

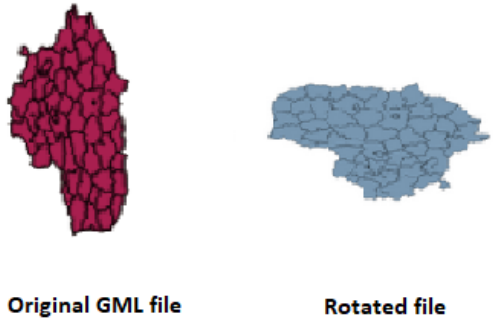


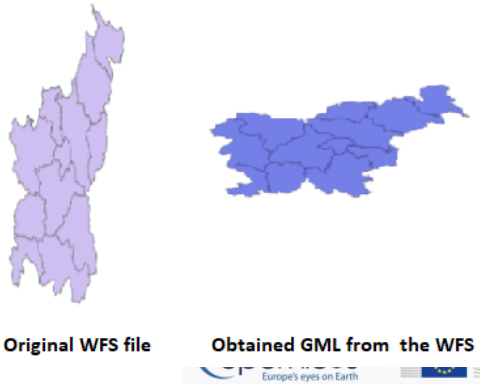




Lack of attributes

Rotation





Coordinating in situ

- **Partnership agreements:** engagement and exploring synergies with in situ data networks, international organisations, global networks
  - Best practice of efficiency : agreement with EUMETNET : one single interface providing access to several partners;

    - exploring the possibility to negotiate data exchange agreements e.g. with China, India, USA on air quality;
- **Copernicus international administrative arrangements:**
  - Technical Operating Arrangements (TOA) for access to in situ data e.g. Geoscience Australia, Brazil, Chile, Colombia and India;
  - Coordinating to include the provision of the in-situ data into the core DIAS infrastructure in the TOA's managed by ESA and EUMETSAT.
  - Testing access and quality control

Copernicus In Situ Component v2.0

- Exploring **synergies with research infrastructure**

E.g. explore the possibility to coordinate data exchanges with European Research Infrastructure for the observation of Aerosol, Clouds, and Trace gases (ACTRIS)

https://insitu.copernicus.eu/library/reports/ResearchInfrastructuresandCopernicusFinalversionNov2017.pdf

- Examples of RIs that have established a link to GEOSS at national level :

- the European Marine Biological Research Centre (EMBRC)
- European Multidisciplinary Seafloor and water column Observatory (EMSO)
- SeaDataNet: a distributed Marine Data Infrastructure for the management of large and diverse marine in situ datasets.
- JERICO: *in-situ* coastal and shelf-sea observations

Copernicus In Situ Component v2.0

- Exploring **synergies with the space component** (e.g. CO2)
- Identifying **coverage gaps**, **sustainability issues**

Challenge:

- Locating the right partners to have a dialogue with, since in situ data is held by communities outside Copernicus: very heterogenous landscape (complexity);

- Locating communities own coordination bodies
  - At supplier level – commercial, public provision, research driven
  - At user level – users groups formed to improve access

All data and information is available full, free and open from:

http://www.copernicus.eu/

https://twitter.com/CopernicusEU

https://www.facebook.com/Copernicus

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