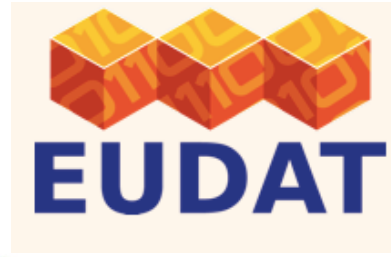




PAN-EUROPEAN INFRASTRUCTURE  
FOR OCEAN & MARINE DATA  
MANAGEMENT



## ***SeaDataCloud – further developing the pan-European SeaDataNet infrastructure for marine and ocean data management***

Dick M.A. Schaap (MARIS – Netherlands)

Technical Coordinator SeaDataCloud Project

Chris Ariyo ( CSC – Finland)

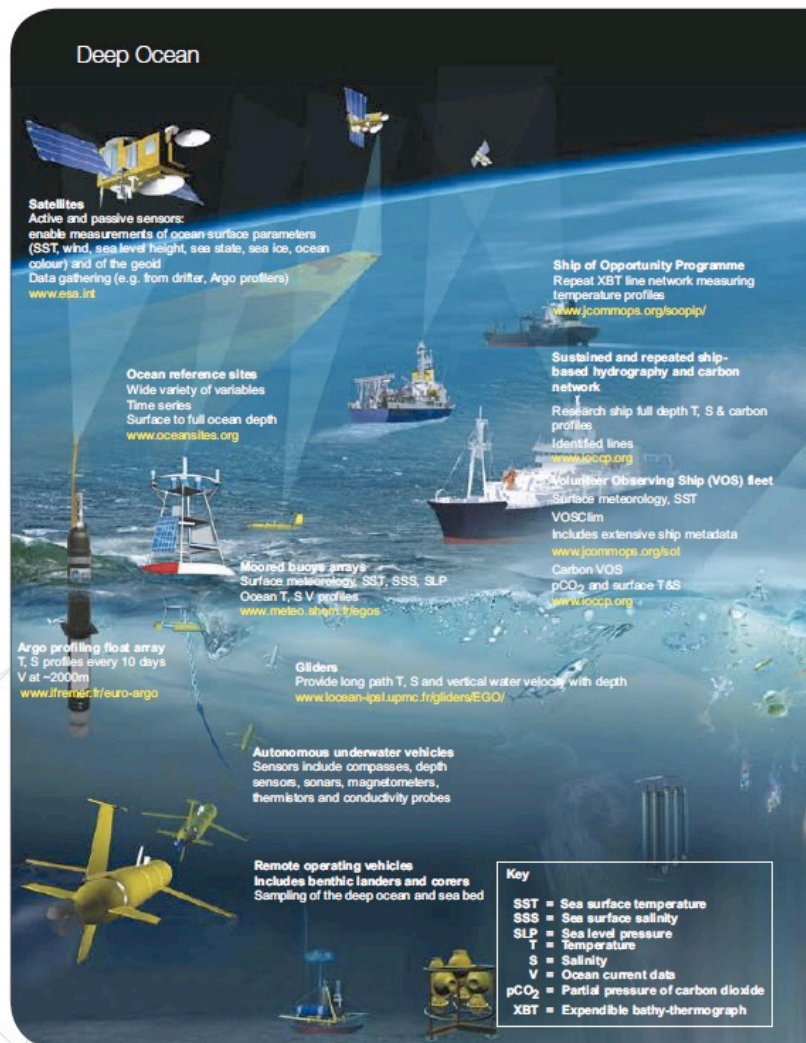
Project Manager SeaDataCloud Project (EUDAT)

**DIGITAL INFRASTRUCTURES for RESEARCH 2017**  
**“Connecting the building blocks for Open Science”**  
**Brussels, Belgium, 30<sup>th</sup> November – 1<sup>st</sup> December 2017**



## PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

### SeaDataNet



Acquisition of ocean and marine data in many ways

## ***Ocean and Marine Data acquisition***

- Data are collected by governments, research institutes, and private industry (in Europe more than 1.000 organisations)
- Data are gathered for physics, geophysics, chemistry, biology, geology, and bathymetry
- Acquisition of oceanographic and marine data is expensive; annual costs in Europe estimated at 1.4 Billion Euro (1.0 = in-situ; 0.4 = satellites)

Professional data management is required with agreements on standardization, quality control protocols, archiving, catalogues, and access.

Collect once; use many times!



## What is SeaDataNet?



A pan-European infrastructure set up and operated for managing marine and ocean data in cooperation with the NODCs and data focal points of 35 countries bordering the European seas

2006-2011	Metadata directories MEDAR/MedAtlas
2002-2005	Sea-Search (FP5)
2006-2011	SeaDataNet (FP6)
2011-2015	SeaDataNet II (FP7)
2016-2020	SeaDataCloud (H2020)





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MANAGEMENT

**SeaDataNet**

*Portal with standards, tools, and  
services, both for users and data centres*

SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

PARTNERS USERS

ABOUT US METADATA DATA ACCESS STANDARDS SOFTWARE PRODUCTS EVENTS PUBLICATIONS

SERVICES

**SEARCH DATA**

Enter your own criteria to search and download data from SeaDataNet CDI catalogue

SEARCH DATA BROWSE DATA DOWNLOAD SOFTWARE

LOOK-UP VOCABULARIES ACCESS PRODUCTS ACCESS METADATA CATALOGUES

HOW TO CONTRIBUTE?

FEEDBACK

[www.seadatanet.org](http://www.seadatanet.org)



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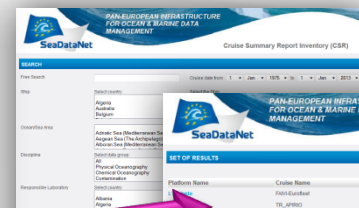
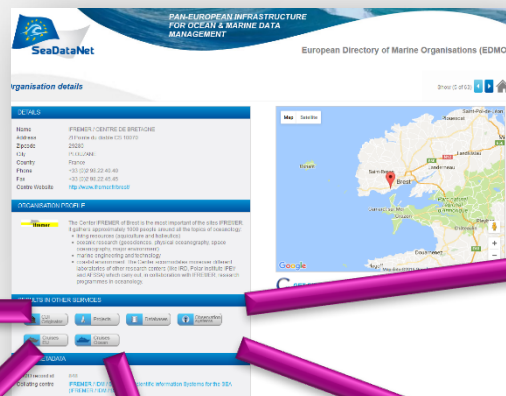


# SeaDataNet metadata directories

EDMO Organisations



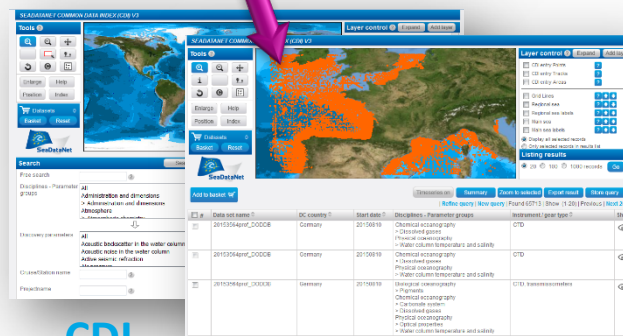
EDMERP  
Projects



CSR  
Research cruises



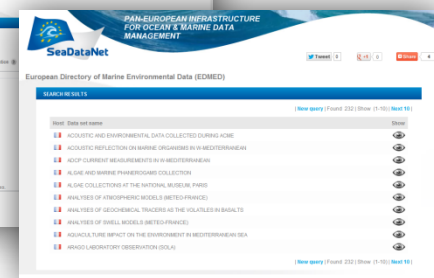
EDIOS  
Observing programmes



CDI  
Data index



EDMED  
Data sets



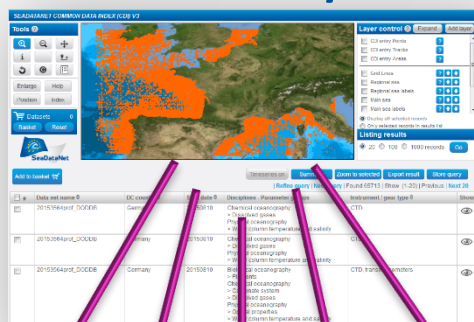


SeaDataNet

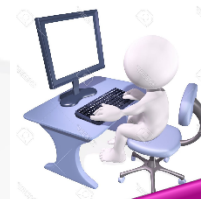
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## CDI service for discovery and unified data access

SeaDataNet portal

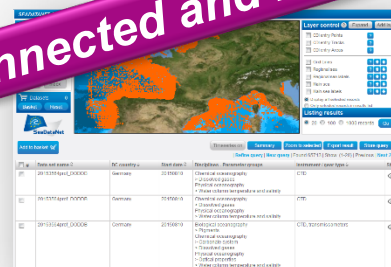


Search  
and  
Shop



Data  
add

Already 102 data centres connected and more underway



European data sources  
data centres > 600 originators

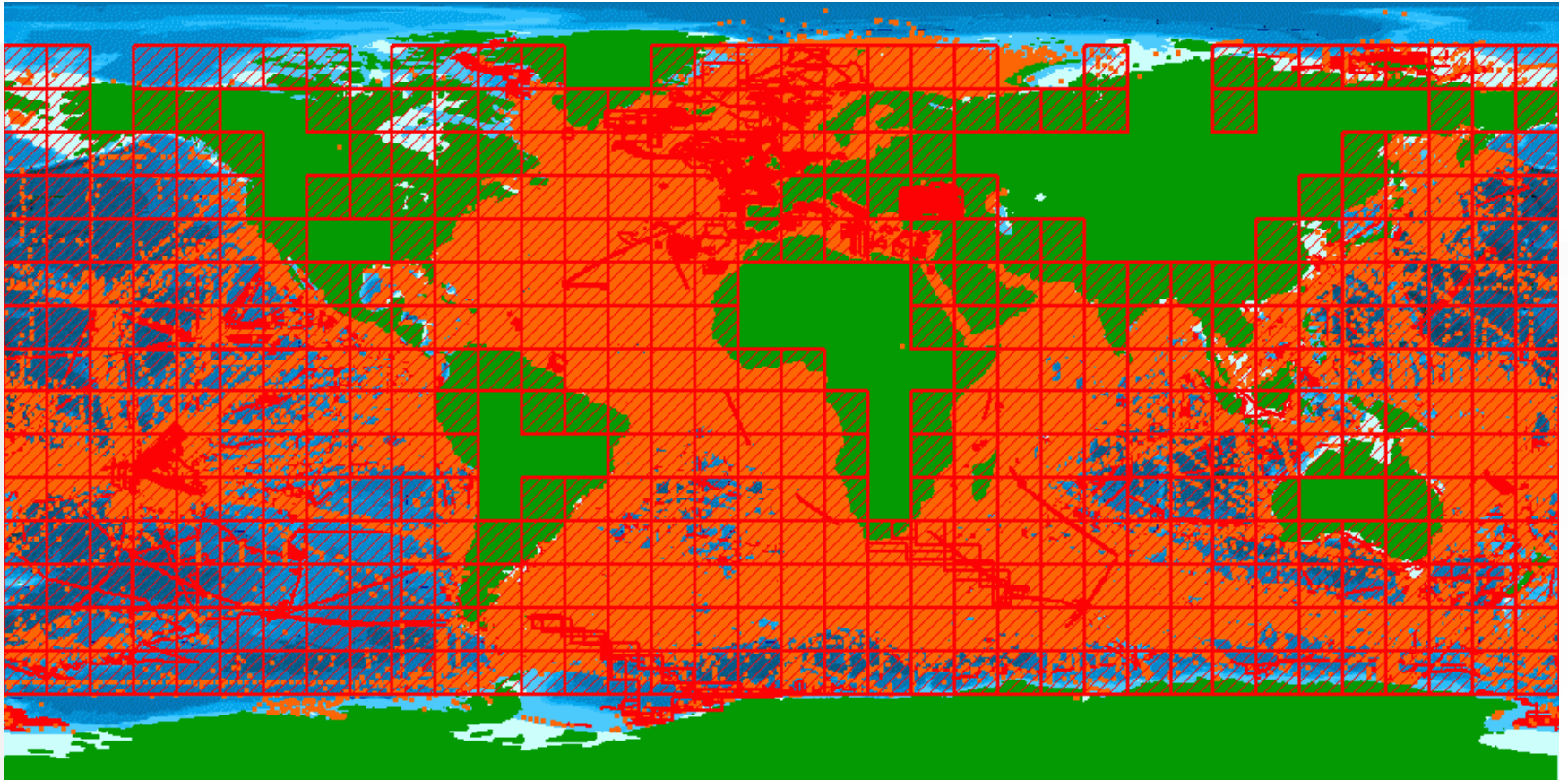
Metadata  
+ transaction data





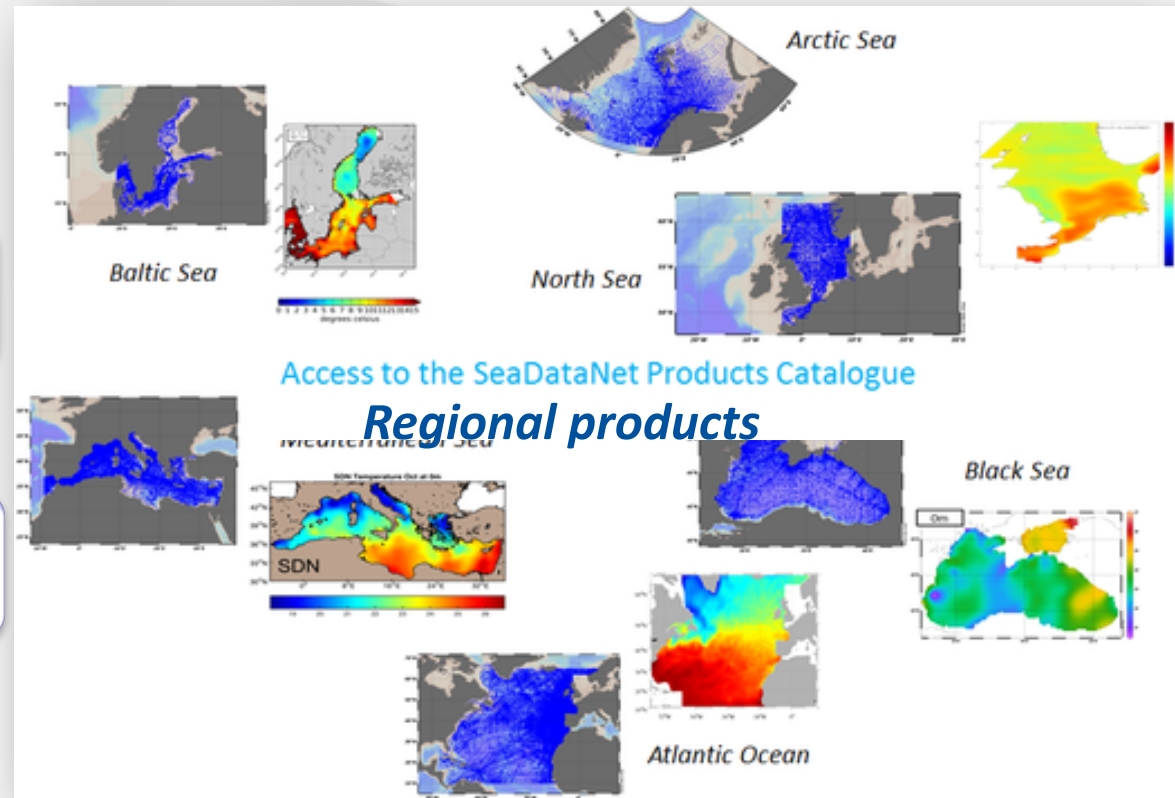
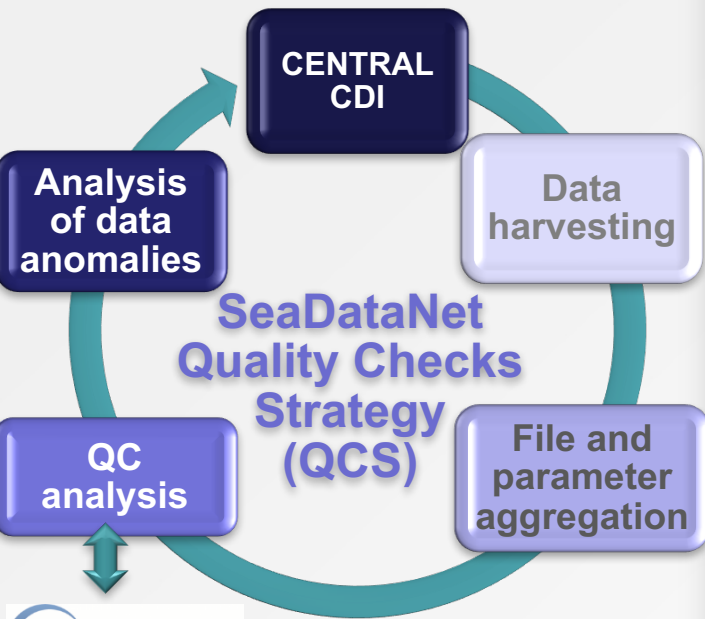
SeaDataNet

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***1.95 million*** CDI entries from ***34*** countries, ***102*** data centres and ***612*** originators for physics, chemistry, geology, geophysics, bathymetry and biology; from ***1805 to 2017***; ***87.6%*** unrestricted or under SDN License

# SeaDataNet products



**Aggregated datasets and climatologies**  
*Improvement of the data quality*

## ***SeaDataNet cooperation and involvement***

- **Copernicus Marine Environmental Monitoring Services (CMEMS):** providing long-term archives and standards
- **Marine Strategy Framework Directive (MSFD):** providing infrastructure, standards and data collections for several indicators
- **Large ocean monitoring systems (EuroGOOS, AtlantOS, Euro-ARGO, JERICO-Next, ..):** providing standards and validation + long-term archiving services
- **Ocean Data Interoperability Platform (ODIP):** exploring and demonstrating common standards and interoperability with leading data management infrastructures in USA and Australia
- **GEOSS - EuroGEOSS:** Maintaining the GEOSS portal with SeaDataNet in-situ data collections from large community of European data holders (> 100 data centres; >600 data originators)
- **European Open Science Cloud (EOSC):** shaping the pilot Blue Cloud



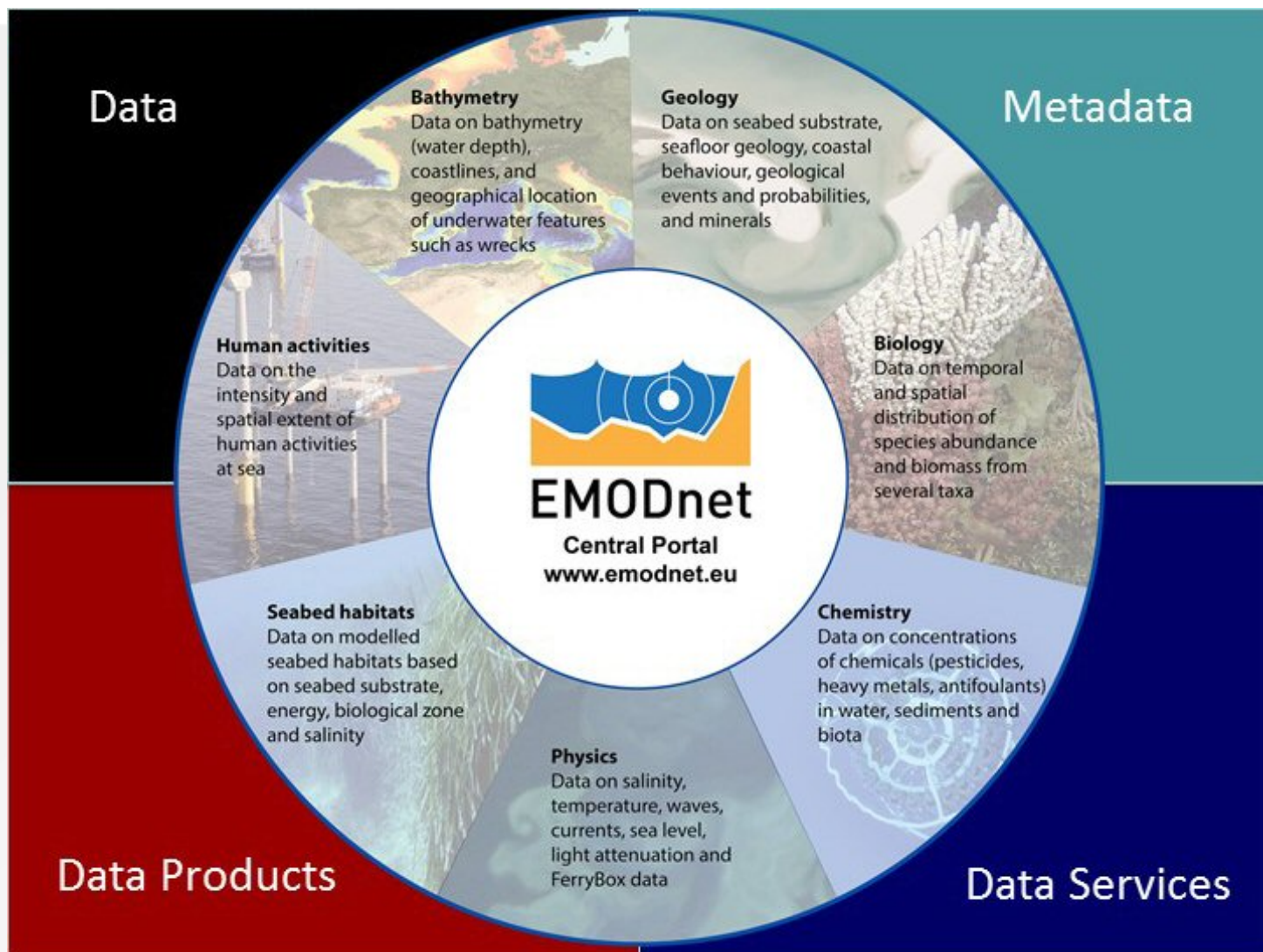
## ***SeaDataNet and EMODNet***

- EU initiative for an overarching **European Marine Observation and Data Network (EMODNet)** driven by Marine Knowledge 2020 and Blue Growth
- SeaDataNet qualified as a leading infrastructure for the EMODnet data management component and is driving several thematic portals from the start in 2008
- This synergy has resulted in many more data centres adopting SeaDataNet standards and connecting to the CDI Data Discovery and Access service while it gave a flying start to EMODnet



SeaDataNet

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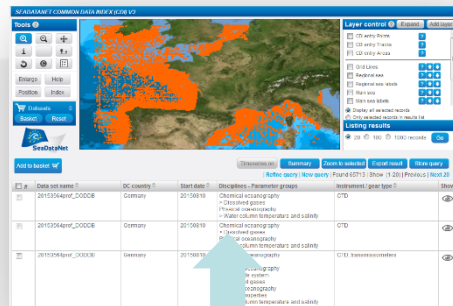
Example of **EMODnet Bathymetry** – using > 7000 survey data sets to generate and provide a harmonized and higher resolution digital terrain model for all European seas – comparison with GEBCO





SeaDataNet

# PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT



Data discovery  
and access



> 100 data centres



NODCs; HO; GEOs; BIOS; ICES; PANGAEA

≈ 600 European  
data originators

CDI Data Discovery and  
Access service



GEOSS portal



IODE ODP portal

Aggregated collection



Black Sea portal



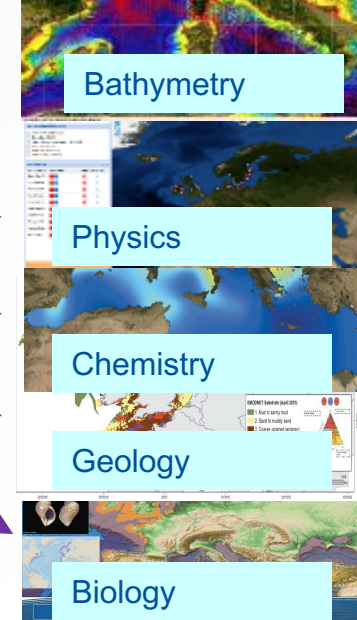
Caspian portal

Regional subsets



Geo-Seas portal

Thematic portals



Bathymetry

Physics

Chemistry

Geology

Biology



SeaDataNet

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## SeaDataCloud – cooperation with EUDAT



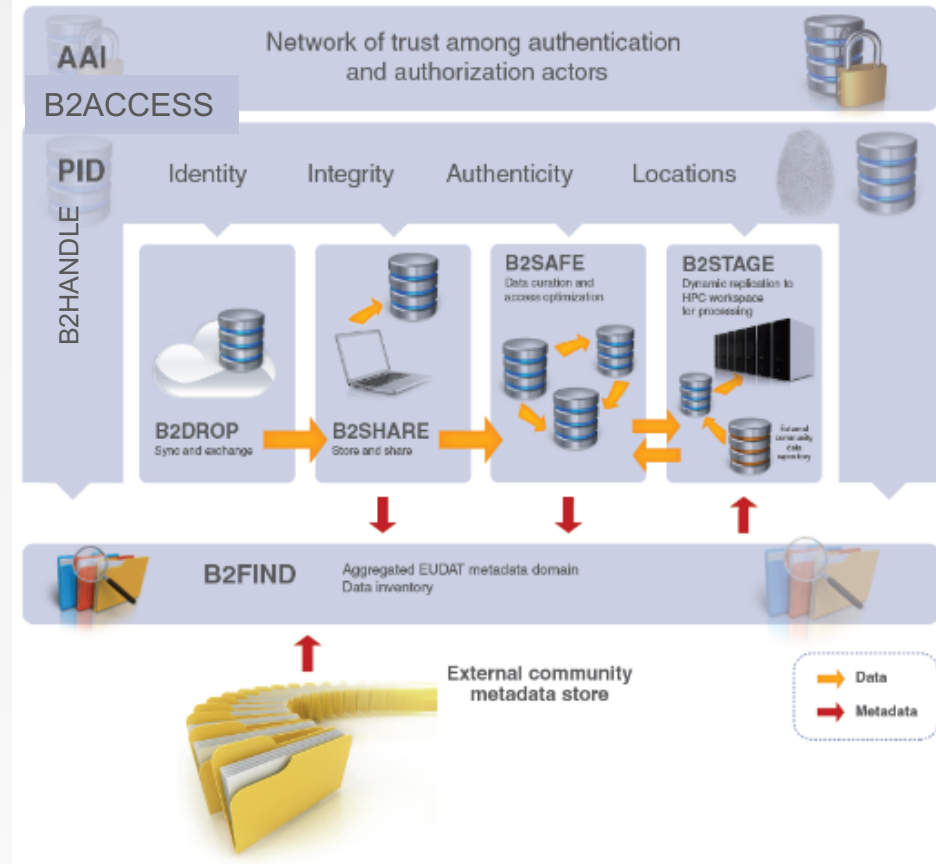
### European Collaborative Data Infrastructure



A consortium of high performance computing (HPC) / data centres, libraries, scientific communities, data scientists



# EUDAT Service Suite



NEW  
SERVICE

Generic Execution Framework



B2NOTE

WORKSPACE

DATA SUBSCRIPTION



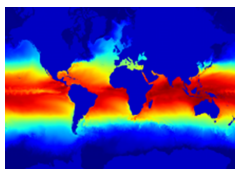


ICOS

INTEGRATED  
CARBON  
OBSERVATION  
SYSTEM



## EUDAT ENV Data Pilots



Support to scientific research  
on seasonal-to-decadal climate  
and air quality modelling



## Institutions and partners



**GFZ**  
Helmholtz Centre  
POTSDAM



**Ifremer**



ENVIRONMENT  
AGENCY AUSTRIA **umweltbundesamt**



# ***EUDAT Organisational Roadmap***



- Council Transition
- Board Transition
- Appointment of Executive Roles
- Appointment of Secretariat

- Establishment of Legal Entity
- Transition of Executive Roles
- Transition of Secretariat

- Relationship with other e-Infrastructures (single e-Infrastructure ERIC?)
- Establish ERIC
- Transition of Council

- Current emphasis on moving towards a **Partnership Agreement** between service providers (establishment in September 2016)
- Movement **beyond Partnership** (e.g. ERIC) will depend on circumstances and will be decided in close discussion with the other e-Infrastructures (e.g. PRACE, EGI, GEANT), in the context of the **European Open Science Cloud**

## ***SeaDataCloud – general challenges***

- It is about updating and further developing standards
- It is about improving and innovating services & products
- It is about adopting and elaborating new technologies
- It is about giving more attention to users and putting the user experience in a central position
- Moreover, it is about implementing a strategic and operational cooperation between the SeaDataNet consortium of marine and ocean data centres and the EUDAT consortium of e-infrastructure service providers



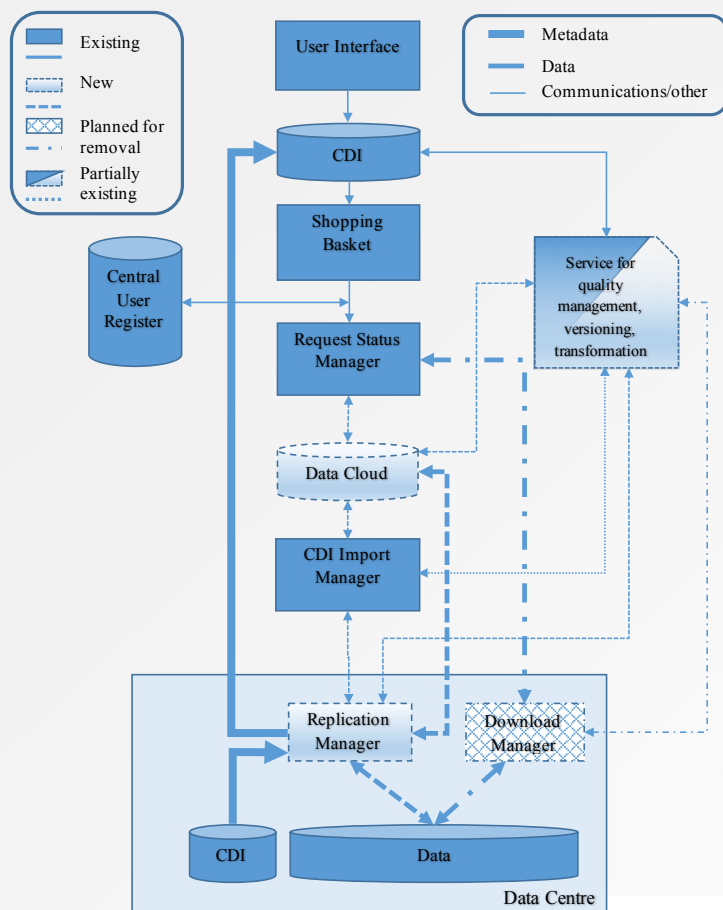
## *SeaDataCloud topics*

- Standards:
  - Vocabularies
  - Data Formats
  - INSPIRE compliance
  - Sensor Web Enablement (SWE)
  - Data Management for new data types
- Services:
  - Implementing Linked Data for SeaDataNet directories for M-to-M services
  - Upgrading the CDI Data Discovery and Access service making use of the cloud
  - Integrating data offering from international programmes and organisations
  - Integrating INSPIRE Transformation services
  - Data publishing



SeaDataNet

# Upgrading of CDI Data Discovery and Access service

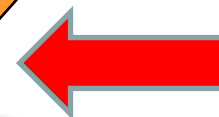


- Introducing central data cache
  - Extra QA-QC
  - More efficient delivery
  - Higher performance
  - Transformations
- Replication for synchronisation

Added-value services  
and applications

WP10  
Downstream  
Services

**NEW FOCUS:  
ACHIEVING  
MORE USER  
ENGAGEMENT**



WP8  
Standards &  
Vocabularies

***make it work!***

WP9  
Upstream  
Services

Discovery and access  
to more datasets and  
information



## *SeaDataCloud topics*

- Developing and deploying a **Virtual Research Environment (VRE)**:
  - Collaborative environment
  - Cloud computing
  - Big data
  - Advanced e-services to facilitate research for handling, curating, quality controlling, transforming and processing marine and ocean data into value-added analyses, harmonised data collections, and data products which can be integrated, visualised and published using OGC and high level visualisation services.
- **Products**:
  - Improved T&S Climatology – cooperation with Copernicus Marine Environmental Monitoring Service

## ***Contacts information***

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Chris Ariyo ( CSC – Finland)  
Manager SeaDataCloud Project (EUDAT)

SeaDataNet: <https://www.seadatanet.org/>  
EUDAT: [https://b2\(service\).eudat.eu/](https://b2(service).eudat.eu/)  
EUDAT: <http://www.eudat.eu/>

EUDAT Partners in SeaDataCloud:  
CINECA (Italy), CSC (Finland), DKRZ (Germany),  
GRNET (Greece), and STFC (United Kingdom)

