PAN-EUROPEAN INFRASTRUCTURE
FOR OCEAN & MARINE DATA
MANAGEMENT

SeaDataNet

SeaDataCloud

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

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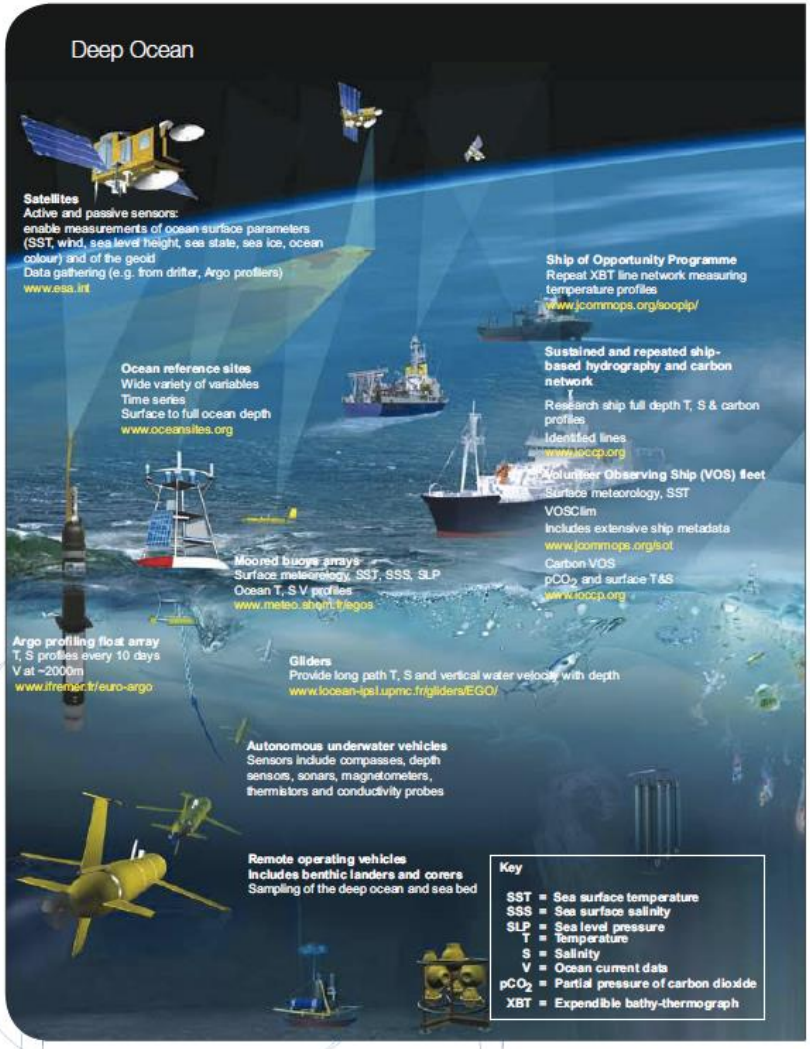

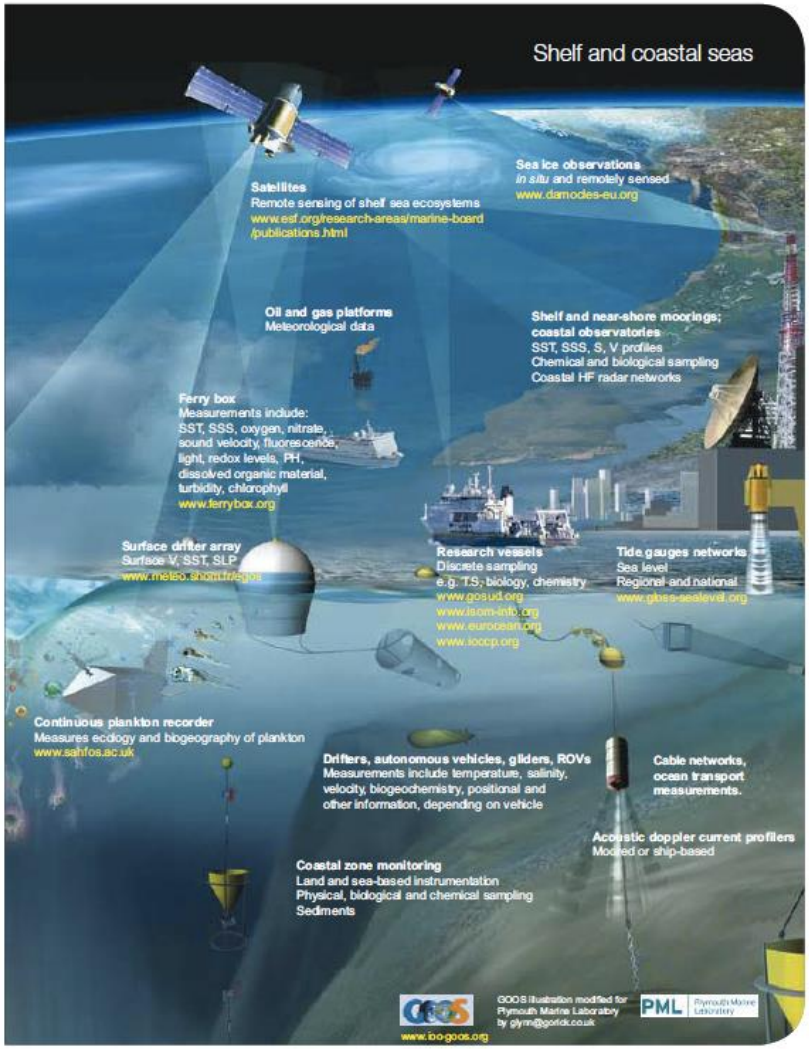

Acquisition of ocean and marine data in many ways

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 standardisation, quality control protocols, archiving, catalogues, and access.

Collect once; use many times!

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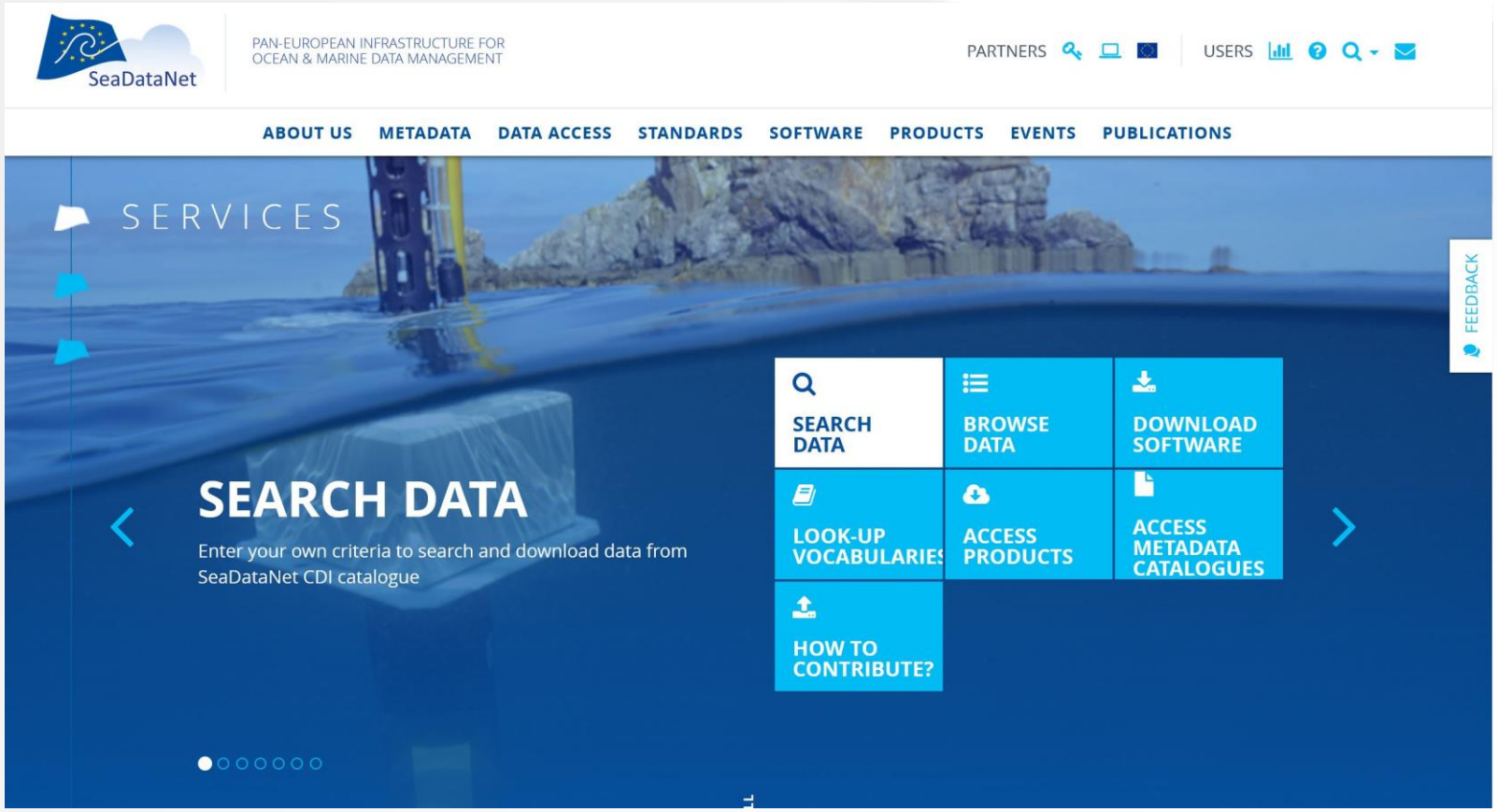
Portal with standards, tools, and services, both for users and data centres



www.seadatanet.org

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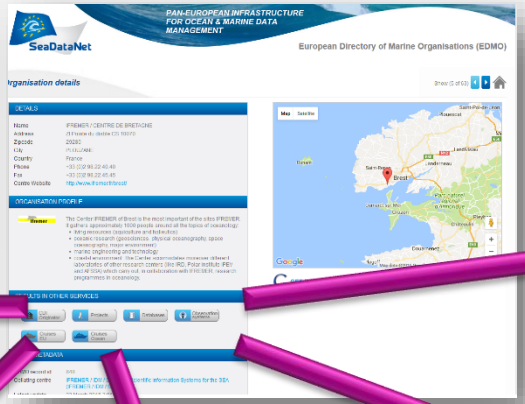
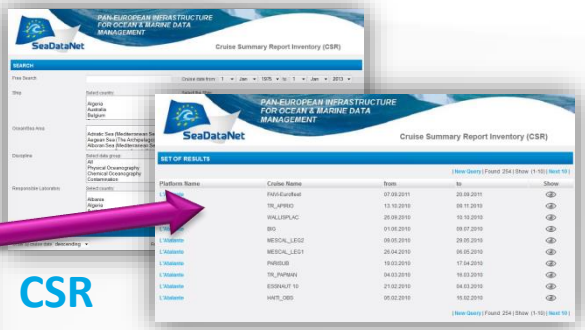
SeaDataNet metadata directories

EDMO *Organisations*

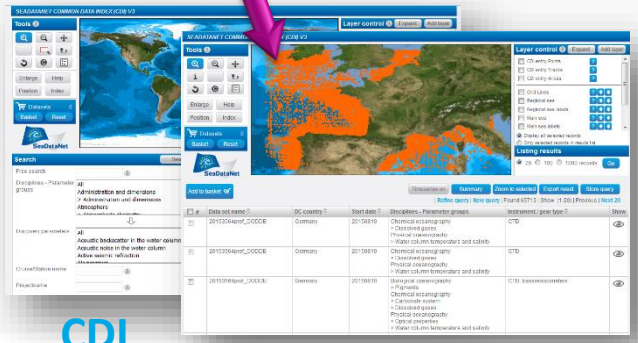


EDMERP
Projects

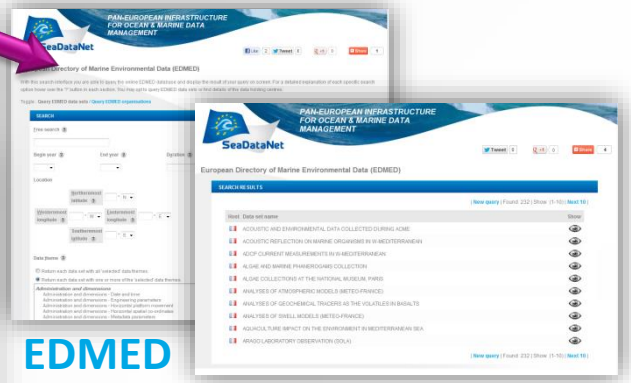


CSR
Research cruises

EDIOS
Observing programmes



CDI
Data index



EDMED
Data sets

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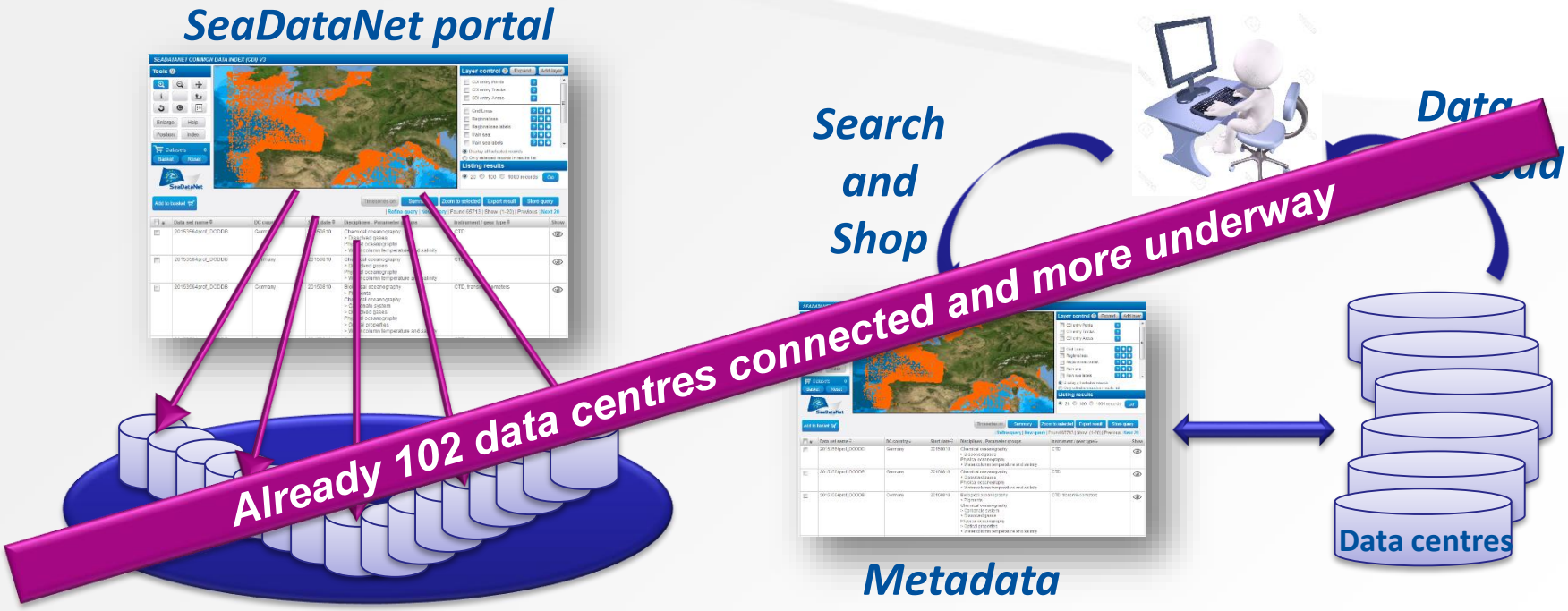
CDI service for discovery and unified data access



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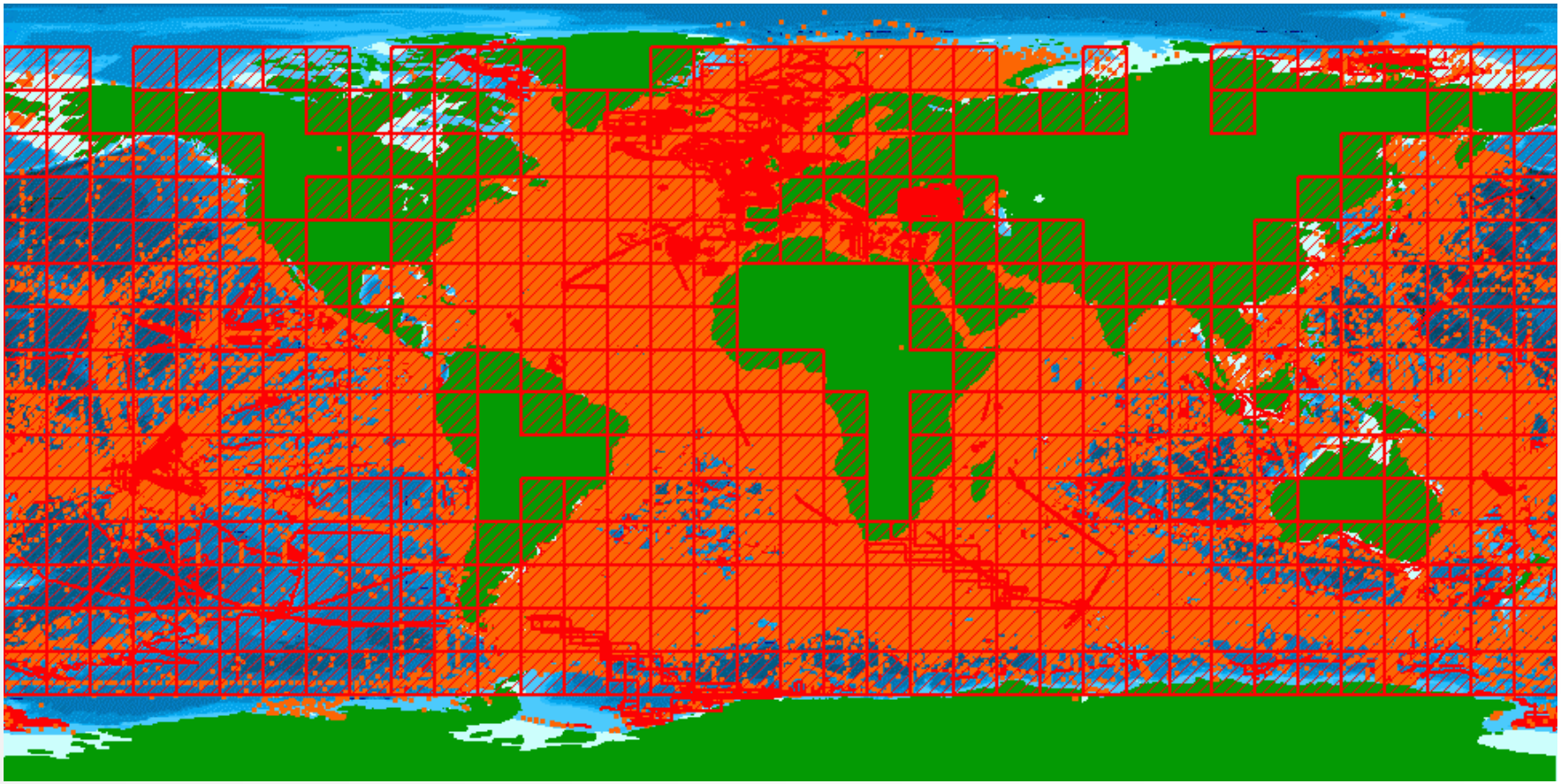
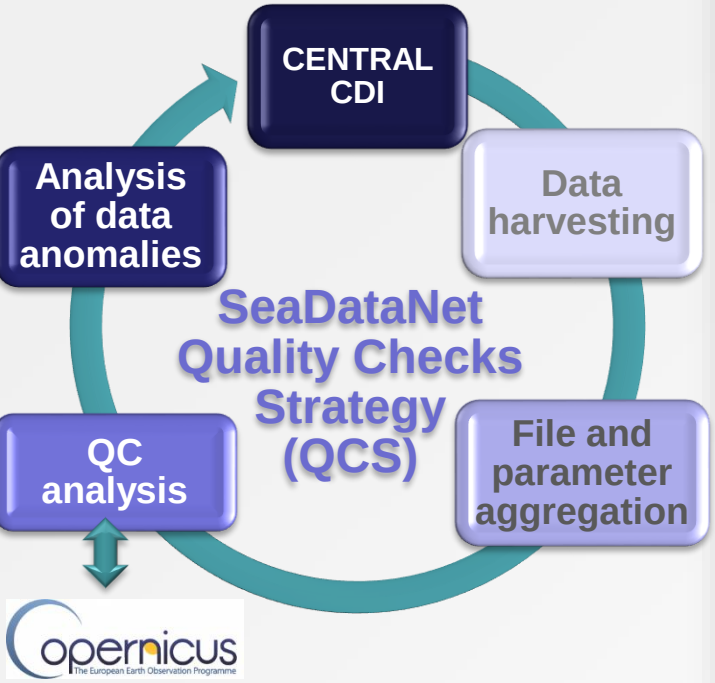
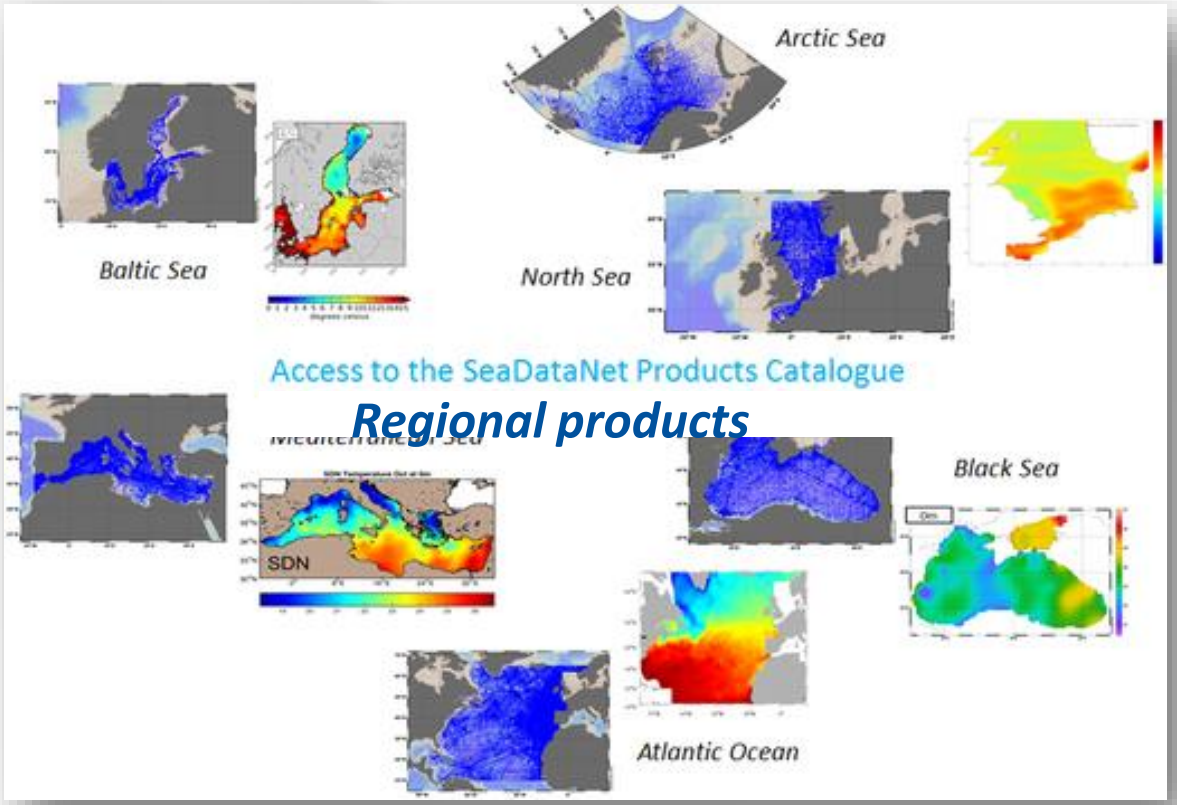


1.95 million *CDI entries from* ***34*** *countries,* ***102*** *data centres and* ***612*** *originators for physics, chemistry, geology, geophysics, bathymetry and biology; from* ***1805 to 2017****;* ***87.6%*** *unrestricted or under SDN License*

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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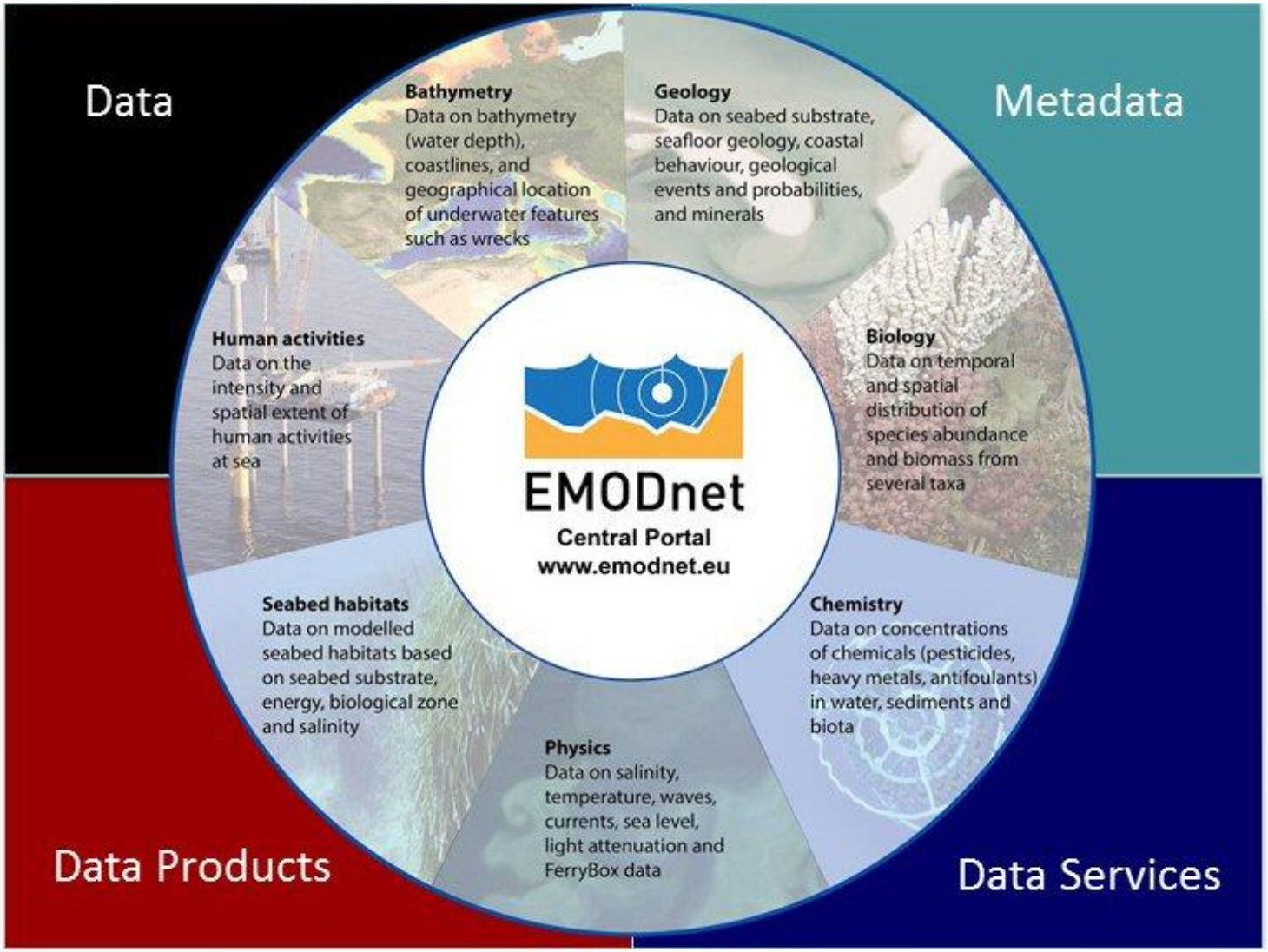

Example of **EMODnet Bathymetry** – using > 7000 survey data sets to generate and provide a harmonized and higher resolution digital terrain model for all European seas – comparison with GEBCO

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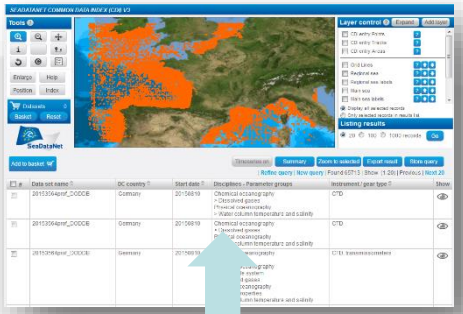


Data discovery and access

GEOSS portal

IODE ODP portal

Aggregated collection

Black Sea portal

Caspian portal

Geo-Seas portal

Regional subsets

SeaDataNet

> 100 data centres

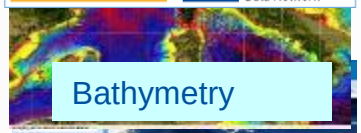
NODCs; HOs; GEOs; BIOs; ICES; PANGAEA

≈ 600 European data originators

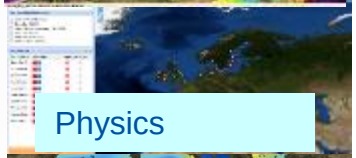
CDI Data Discovery and Access service

Thematic portals

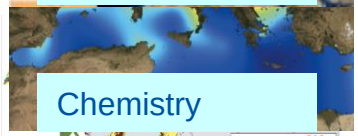
EMODnet European Marine Observation and Data Network



Bathymetry

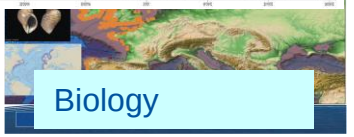


Physics



Chemistry

Geology



Biology

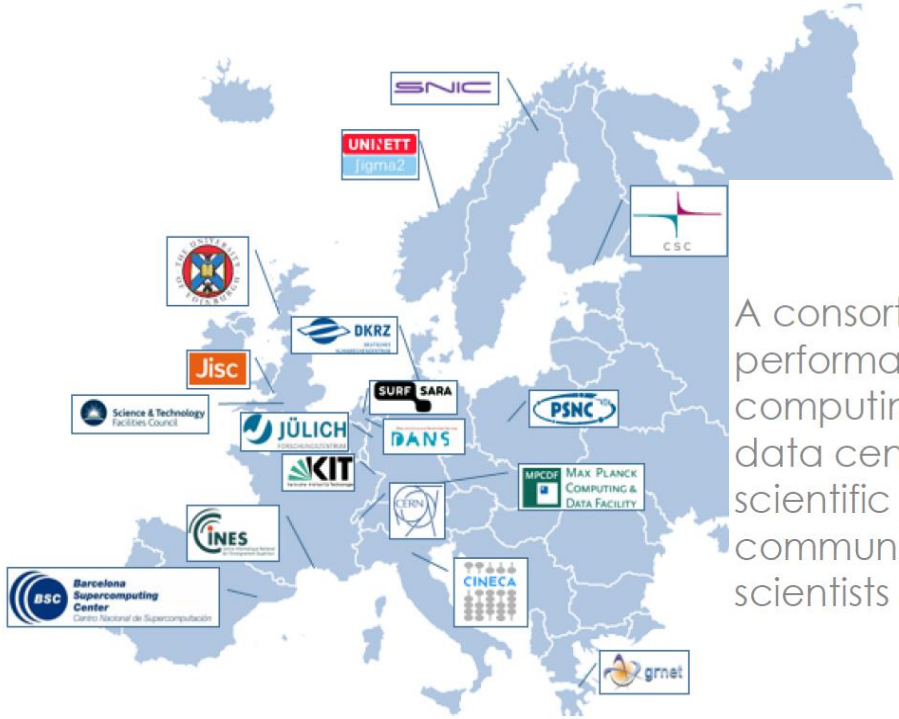
SeaDataCloud – general challenges

- 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 – cooperation with EUDAT

EUDAT

European Computing Infrastructure

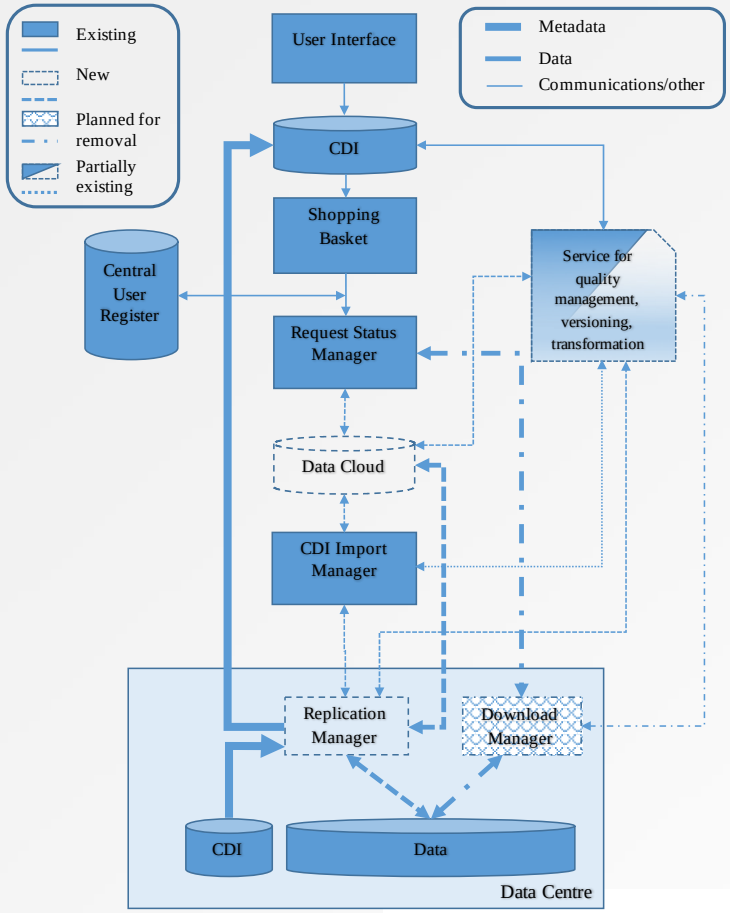


A consortium of high performance computing (HPC) / data centres, libraries, scientific communities, data scientists

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

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