



# SeaDataNet, EMODnet, and WEkEO major pillars under the Blue-Cloud



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Copernicus Land, Marine, & Coastal Workshop, 30 March 2021

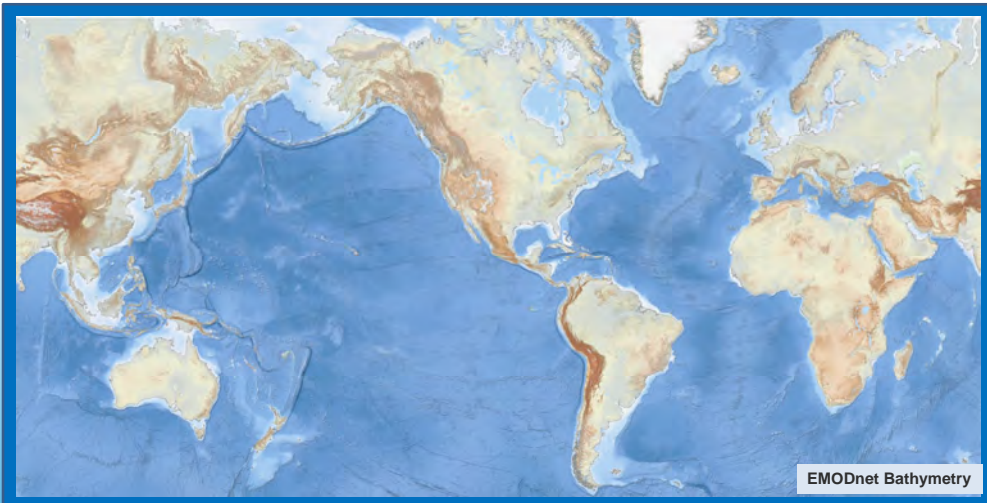


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## Oceans and seas are important



Climate, Energy, Food, Tourism, Trade, Health, ....



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# Acquisition of marine and ocean data

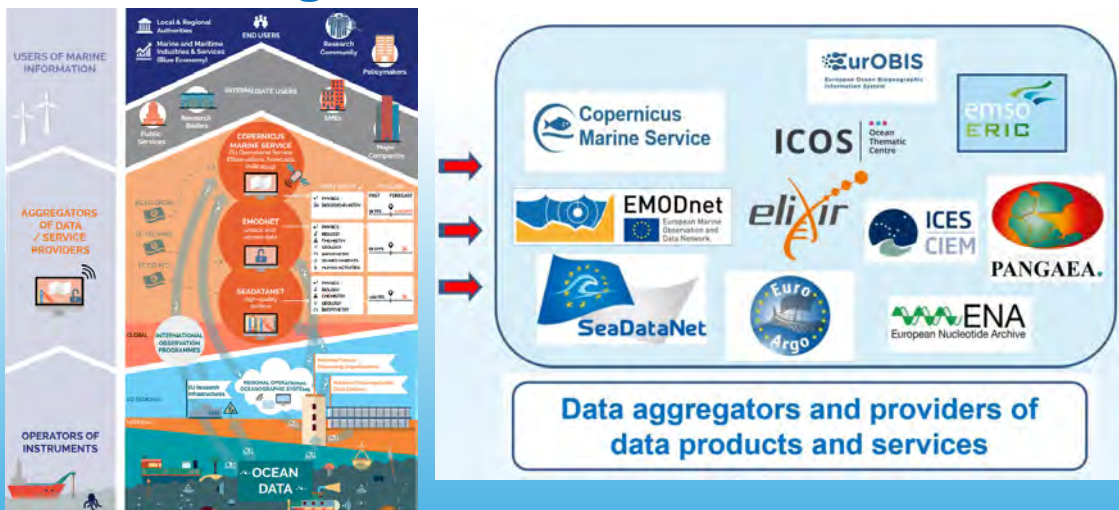


In Europe we spent circa 1.4 Billion Euro a year in marine data acquisition (1.0 BE in-situ; 0.4 BE remote sensing)



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# European landscape marine data management





## 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 34 countries bordering the European seas

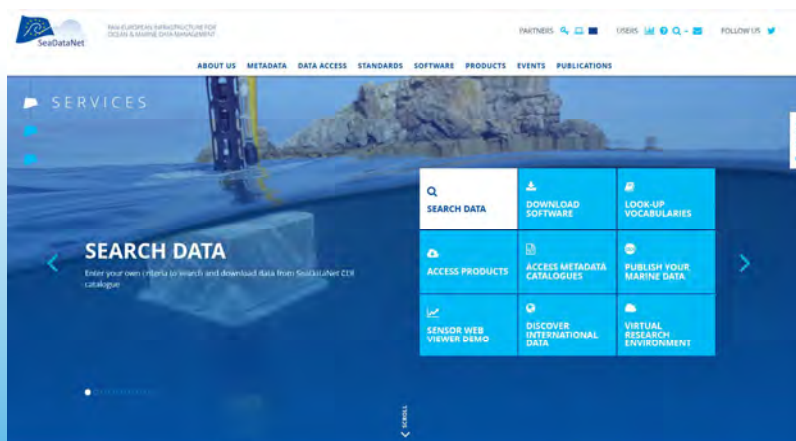
90s	Metadata directories Medar/MedAtlas
2002-2005	Sea-Search (FP5)
2006-2011	SeaDataNet (FP6)
2011-2015	SeaDataNet II (FP7)
2016-2021	SeaDataCloud (H2020)



## SeaDataNet portal and portfolio

Providing:

- Data Management Standards and associated Tools for data centres
- Data and metadata services
- Products services
- Applications for users



<https://www.seadatanet.org>



## SeaDataNet standards

*"Making Data and*

*Services:*

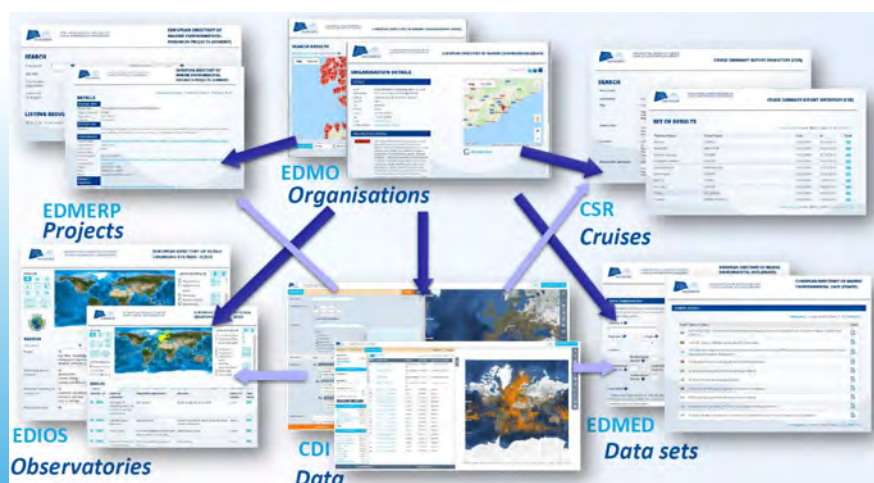
- **Findable**
- **Accessible**
- **Interoperable**
- **Re-usable**

*for machines and  
people."*

- **Common standards for the marine domain**, adapting ISO and OGC standards and achieving INSPIRE compliance:
  - **Metadata formats for data sets, research cruises, monitoring networks, and research projects**
  - **Standard data exchange formats : ODV ASCII and NetCDF (CF)** fully supported by controlled vocabularies
  - **Controlled Vocabularies** for the marine domain (>100.000 terms in 110+ lists), with international governance and web services
- **Maintenance and dissemination of standard QA-QC procedures**, together with IOC/IODE and ICES



## European metadata directories



- **User Interfaces**
- **Machine-to-Machine services:**
  - **SparQL**
  - **SOAP web services**
  - **API's**
  - **Linked Data Principle**

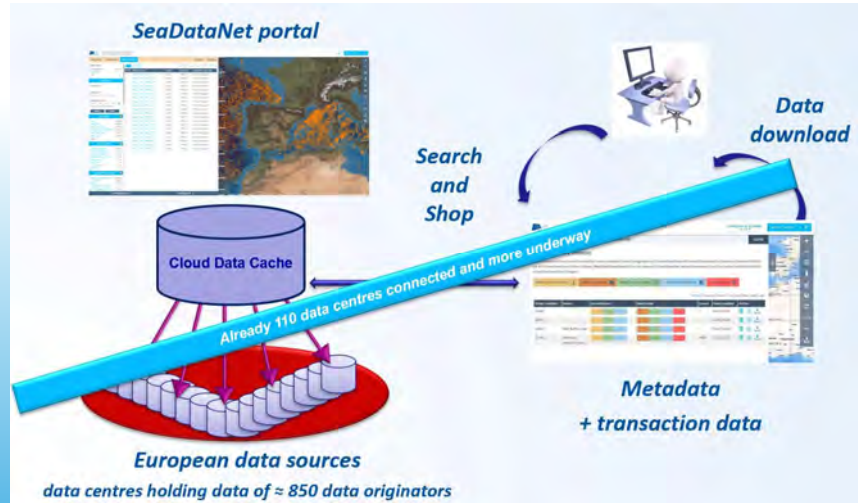


## CDI Data Discovery & Access Service

Cooperation with EUDAT,  
European e-infrastructure  
of academic computing  
centres



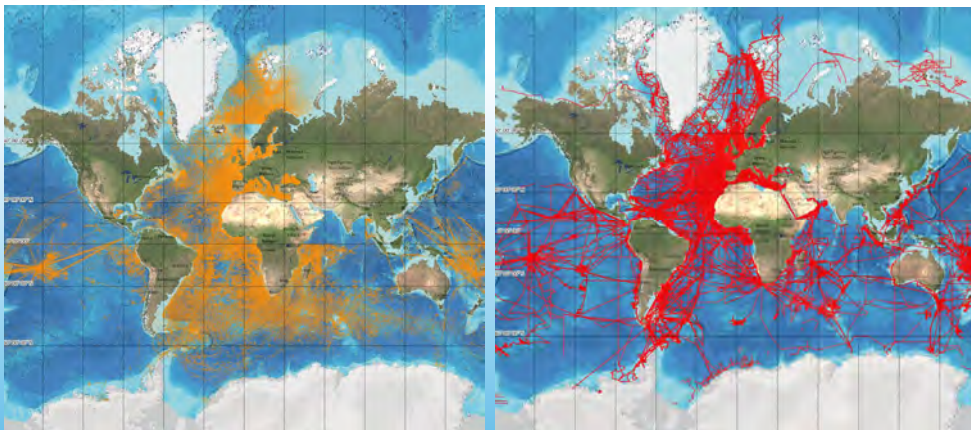
As part of:



<https://cdi.seadatanet.org/search>




## CDI Data Discovery and Access service



> 2.5 Million+  
data sets from >  
110 Data Centres  
for physics,  
chemistry,  
bathymetry,  
geology,  
geophysics, and  
biology and > 850  
Data Originators



<https://cdi.seadatanet.org/search>



## SeaDataNet cooperation

- Providing data management solutions and long term stewardship
- Engaging and educating new thematic communities
- Adopting and adapting SeaDataNet standards

- **Many research projects:** EUMARSIN, EU-SeaSed, Geo-Seas, Upgrade Black Sea scene, CaspInfo, EDIOS, ODIP1, ODIP2, ENVRI-FAIR, MARINET2, PHIDIAS, E-Shape, EOSC-HUB, EOSC-EGI-ACE, EOSC-Future, ....., adopting and adapting SeaDataNet standards and services, and use cases
- **Large ocean monitoring systems:** EuroGOOS, AtlantOS, Euro-ARGO, JERICO-S3, EuroFleets+, ...: providing standards and validation + long-term archiving services
- **GEOSS - EuroGEOSS:** populating the GEOSS portal with SeaDataNet in-situ data collections from large community of European data holders (> 110 data centres; >850 data originators)
- **UNESCO IOC – IODE network and Ocean Data Portal:** global data exchange and interoperability solutions
- **Copernicus Marine Environmental Monitoring Services (CMEMS):** providing standards, and aggregated data collections
- **European Marine Observation and Data Network (EMODNet) driven by Marine Knowledge 2020 and Blue Growth**

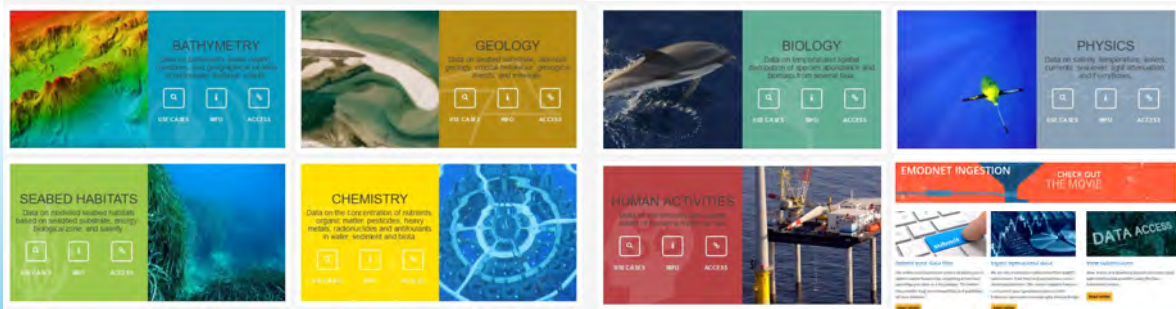



## SeaDataNet and EMODnet

- **EU DG MARE initiative**, started in 2008, for an overarching **European Marine Observation and Data Network (EMODnet)**
- SeaDataNet qualified as a leading infrastructure for the EMODnet data management component and is driving several thematic portals from the start
- 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
- EMODnet has a focus on **European data products and services** in support of Blue Economy, Blue Environment and Marine Knowledge 2020 agendas

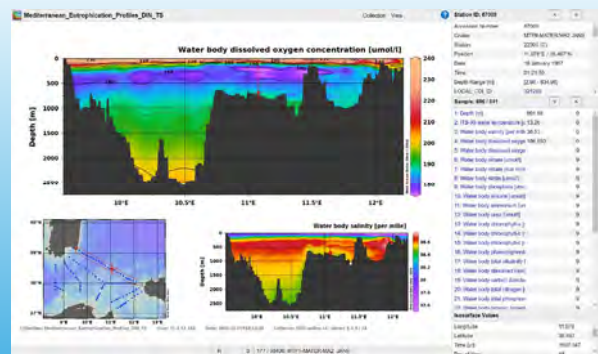
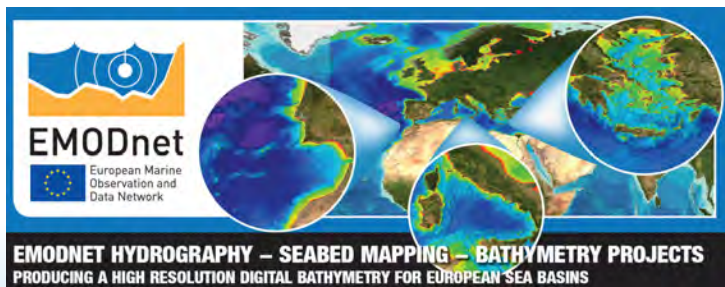



# EMODnet thematic portals



EMODnet consists of more than 160 organisations, assembling, harmonising and making marine data, and data products available by public services and machine-to-machine services.


EMODnet Ingestion facilitates additional data managers to ingest marine datasets for further processing, publishing as open data, and contributing to data products.






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## Blue-Cloud initiative





2021  
2030 United Nations Decade  
of Ocean Science  
for Sustainable Development

- 🔗 To explore and demonstrate the potential of **cloud based open science** supporting research for ocean sustainability, and UN Decade of the Oceans and G7 Future of the Oceans
- 🔗 To deploy a **cyber platform with smart federation** of multidisciplinary data repositories, analytical tools, and computing facilities
- 🔗 To develop a **marine thematic European Open Science Cloud (EOSC)** serving the blue economy, marine environment & marine knowledge agendas










15



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## Blue-Cloud overarching concept

Developing and deploying Virtual Research Environment (VRE) with an array of services for configuring Virtual Labs for specific analytical workflows, use cases and demonstrators.

Applying common standards and interoperability solutions for providing harmonized data and metadata.

Developing and deploying harmonised discovery and access to the established European marine data management and processing infrastructures,

Added-value services and applications  
VRE – Cloud Platform

Downstream Services


Standards  
OGC, ISO, W3C & Vocabularies

Upstream Services

Discovery and access to datasets from many sources


16



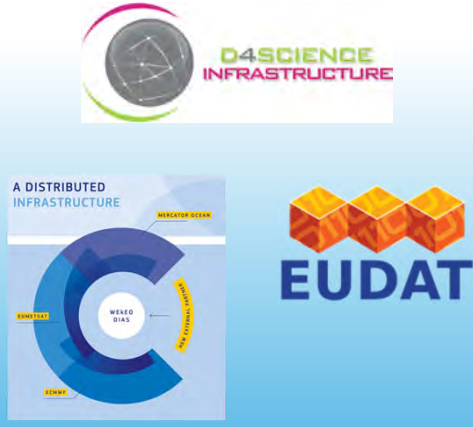
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## Blue-Cloud federation of major infrastructures


**Blue Data infrastructures**




**E-infrastructures**





17

 **Blue-Cloud**






## Key products and services


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• **Blue-Cloud Data Discovery & Access service**, federating key European data management infrastructures, to facilitate users in finding and retrieving multi-disciplinary datasets from multiple repositories
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• **Blue-Cloud Virtual Research Environment infrastructure** to provide a range of services and to facilitate orchestration of computing and analytical services for constructing, hosting and operating Virtual Labs for specific applications
- 

• **Blue-Cloud Virtual Labs**, configured with specific analytical workflows to serve as **Demonstrators**, which can be adopted and adapted for other inputs and analyses

-  Fish a matter of scales
-  Aquaculture Monitor
-  Zoo & Phytoplankton EOY products
-  Plankton Genomics
-  Marine Environmental Indicators



18



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## Developing a Roadmap 2030 via stakeholder consultation



The Blue-Cloud Roadmap will be a **policy document for the future strategic development of the Blue-Cloud** well embedded as a leading system in the wider marine community and as a component of the **European Open Science Cloud (EOSC)**.

**JOIN THE ROADMAP CONSULTATION:**  
[INFO@BLUE-CLOUD.ORG](mailto:INFO@BLUE-CLOUD.ORG)

[www.blue-cloud.org](http://www.blue-cloud.org)

**All-Atlantic 2021** Connecting, Acting, Cooperating  
 3-4 June  
 Porto, Algarve, Azores, Portugal

**All-Atlantic R&I for a Sustainable Ocean**  
 Ministerial High-Level & Stakeholders Conference  
 Under the Portuguese Presidency of the Council of the European Union

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THANK YOU

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20