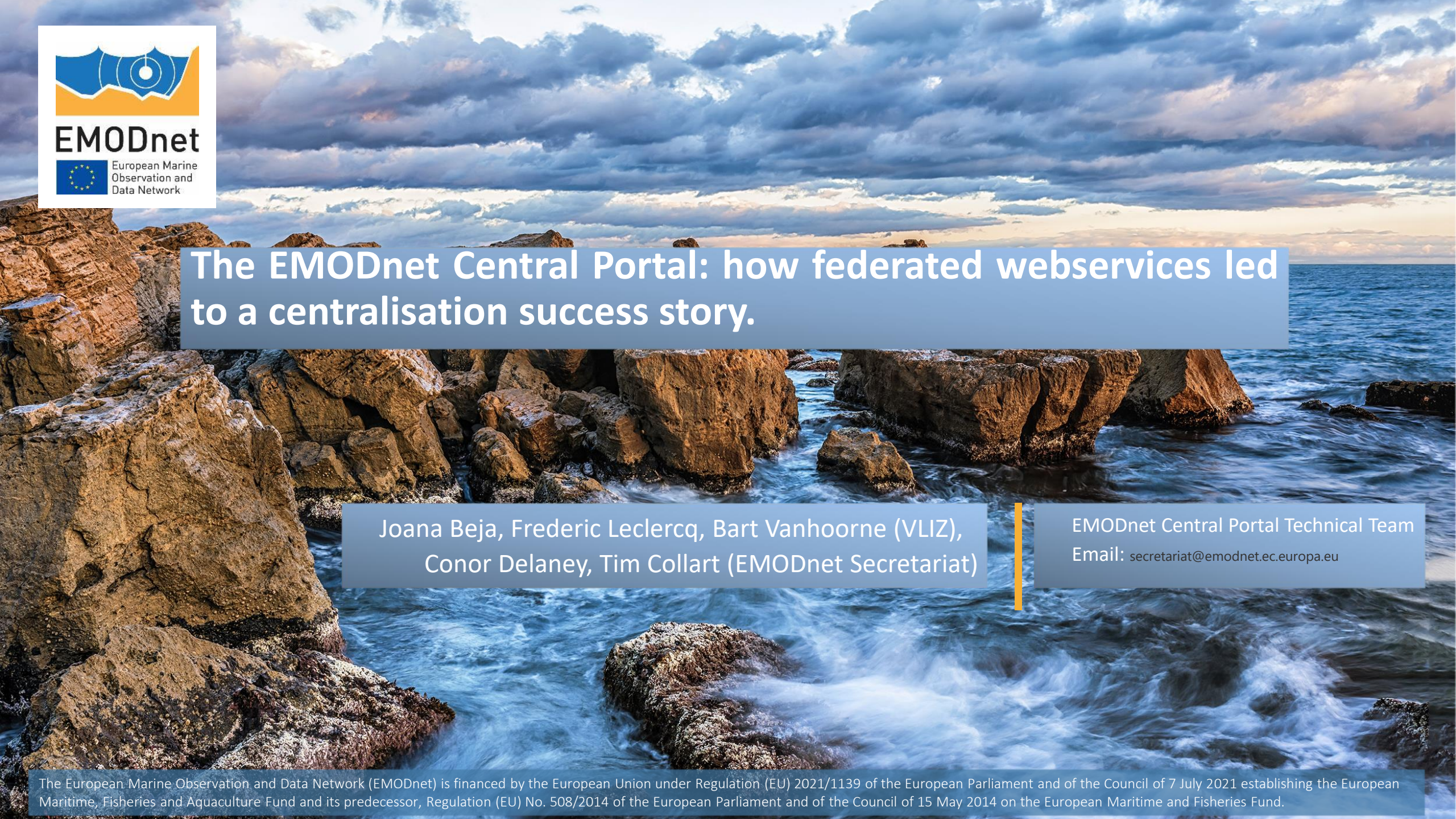


The EMODnet Central Portal: how federated webservices led to a centralisation success story.

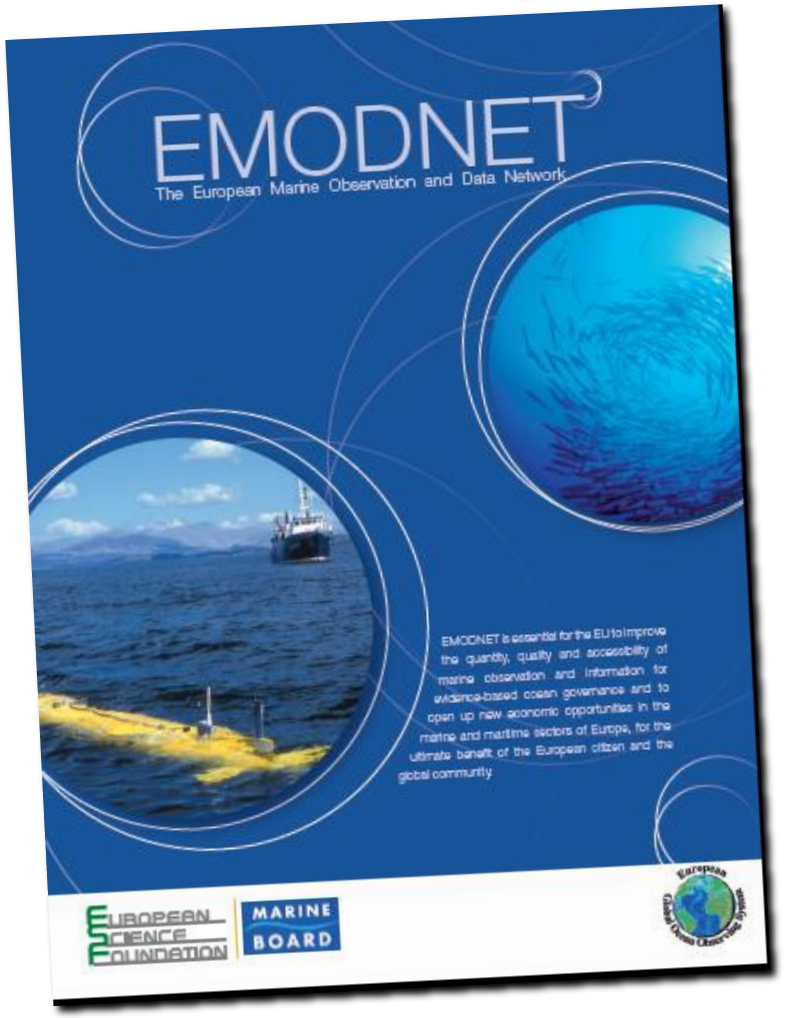
Joana Beja, Frederic Leclercq, Bart Vanhoorne (VLIZ),
Conor Delaney, Tim Collart (EMODnet Secretariat)

EMODnet Central Portal Technical Team
Email: secretariat@emodnet.ec.europa.eu

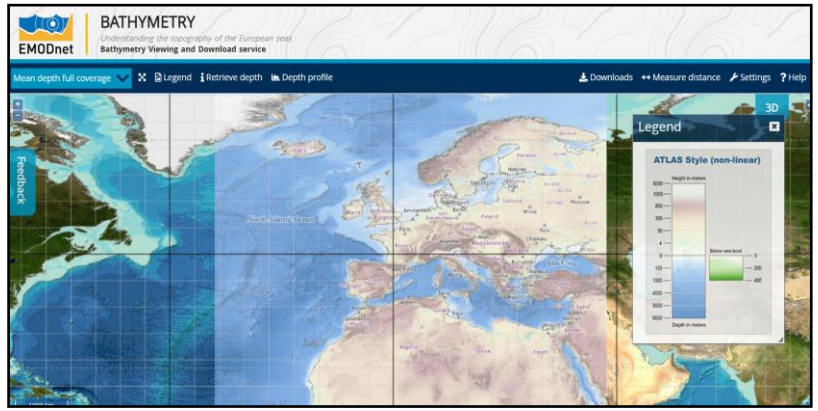
The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and its predecessor, Regulation (EU) No. 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund.

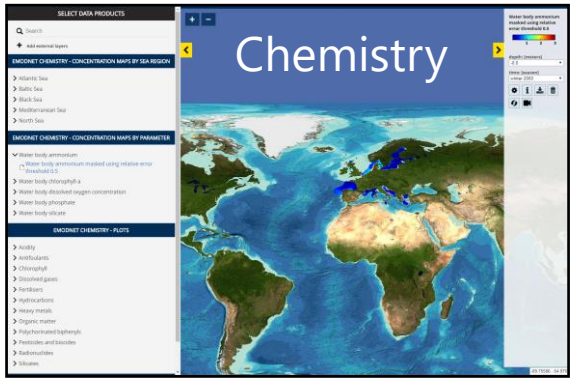
EMODnet | A brief History

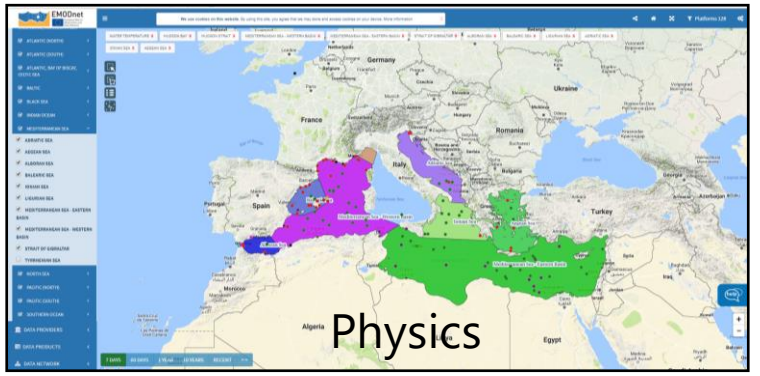
Community Vision (2008): A vision for an end-to-end, integrated, inter-operable and user-oriented network of European marine observation and data systems

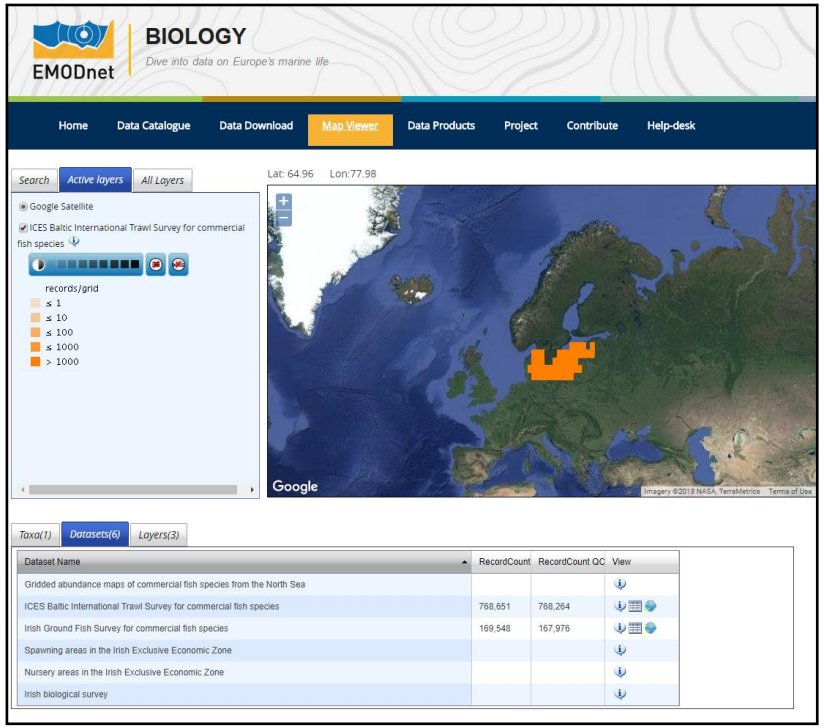


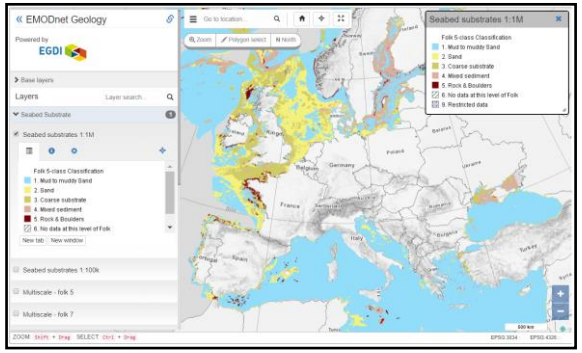
The EMODnet Portals – prior 2023

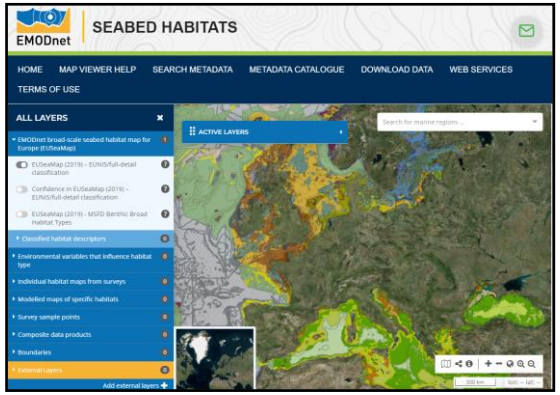


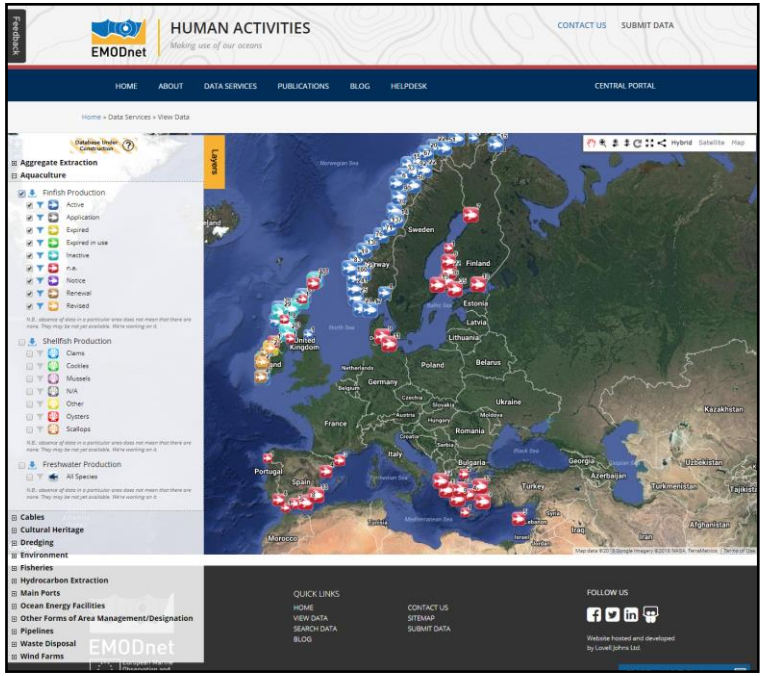












7 separate portals publishing EMODnet products/data/metadata plus a central portal

EMODnet | A trusted in situ marine data service, open and free for all

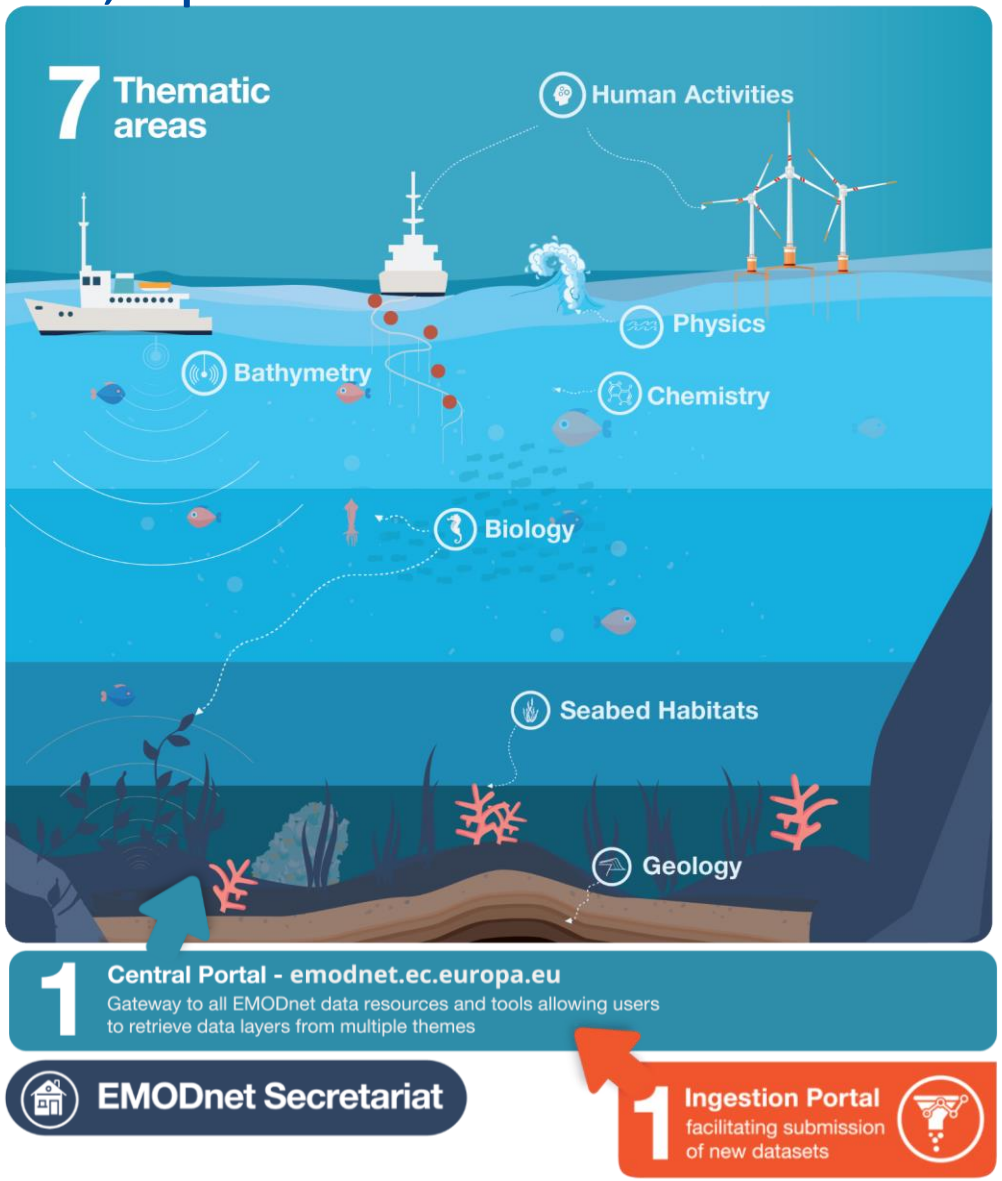
7 EMODnet thematic domains

Datasets

- ✓ *from hundreds of data providers*
- ✓ *harmonized, standardized & integrated*
- ✓ *from seafloor to surface*

Data products & maps

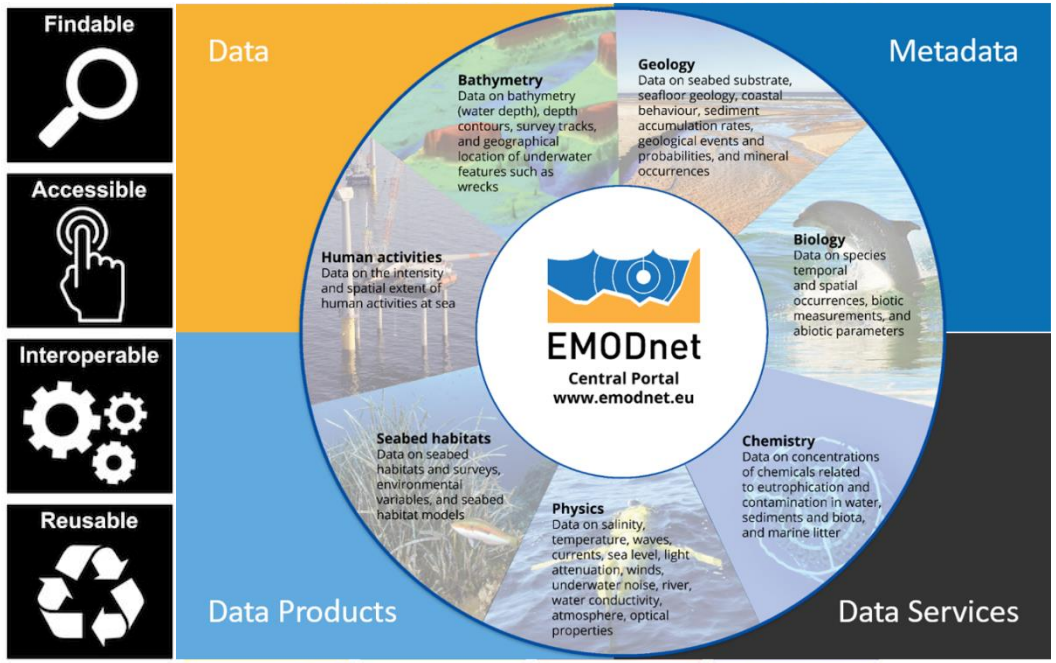
- ✓ *Geospatial*
- ✓ *Opendata*
- ✓ *European scope*

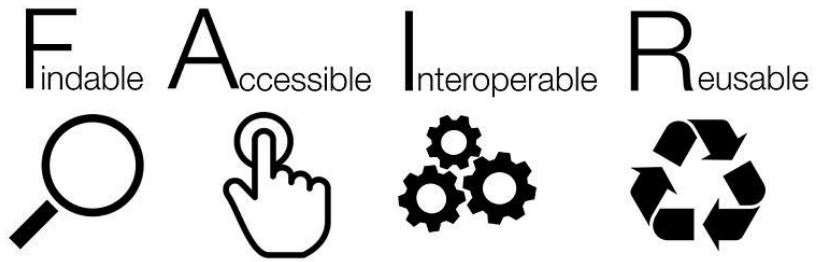


EMODnet | General Tenets

Services to discover, visualise and access open and free data & data products from a trusted source

- **INSPIRE** and **FAIR** data principles
- Aggregated, harmonized multi-parameter **datasets**
- Searchable **metadata**
- Integrated **data products** (e.g., maps)
- **Data services** (visualise, query) & **Web services**, machine-to-machine readability (e.g., OGC WMS, WFS)
- **Multidisciplinary**: environmental and human activity data
- **Long-term service** continuity: providing **trust between data providers, data managers & users**
- Promoting change towards a **culture of open data sharing**





Most **comprehensive** (parameter diversity, resolution and coverage) *in situ* marine environmental and human activities **data and data products service in Europe**;

Added value marine data products produced by domain experts that are not offered by other marine data services in Europe or beyond;

EMODnet | Repatriation and Centralization

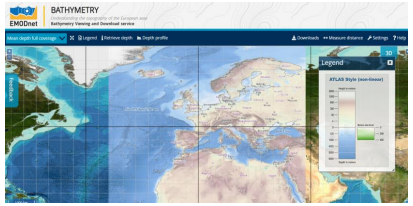
In 2020 DG Mare directed that the EMODnet Central Portal should be Repatriated to the formal domain of the European Commission. –

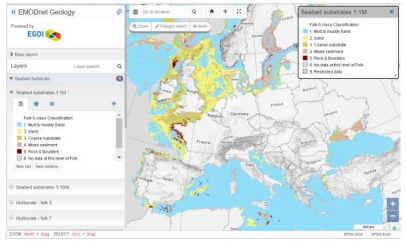
- i.e., https:// www.emodet.eu -→ https://emodnet.ec.europa.eu/en

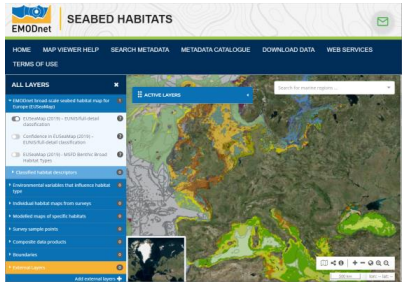
Adopt the official EC corporate look and feel. For the EMODnet central portal

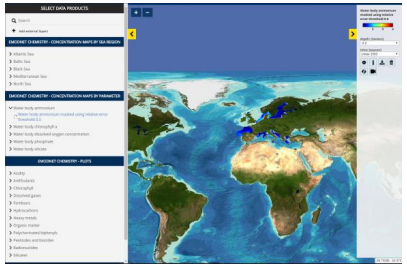
- Colours, fonts and layout.
- Information architecture.
    - Main impact is that repetition is not allowed, e.g., only on map viewer is allowed, only one link to Atlas of the Seas.
- Comply with EC rules and guidelines, e.g. web accessible rules, privacy rules, etc.

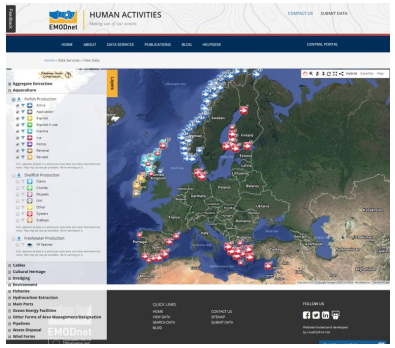
January 2023, we switched to one map viewer

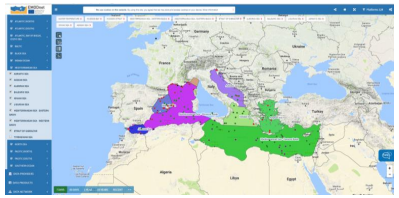


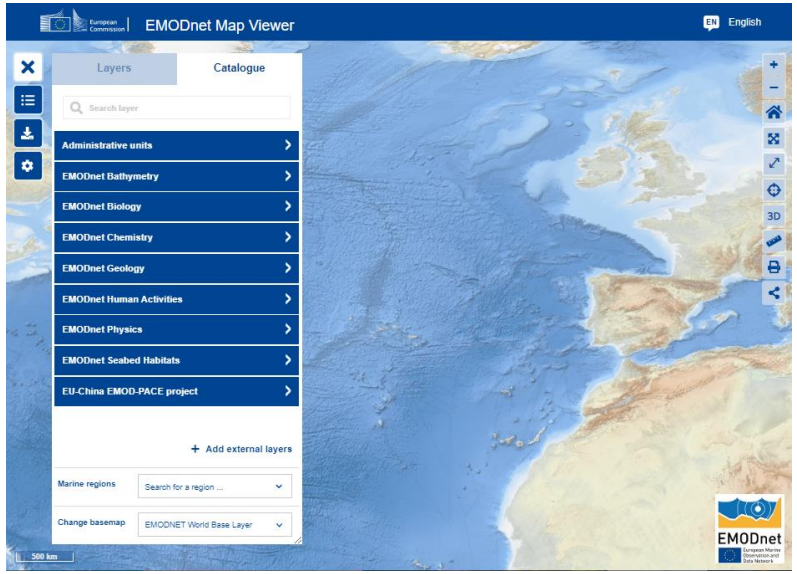








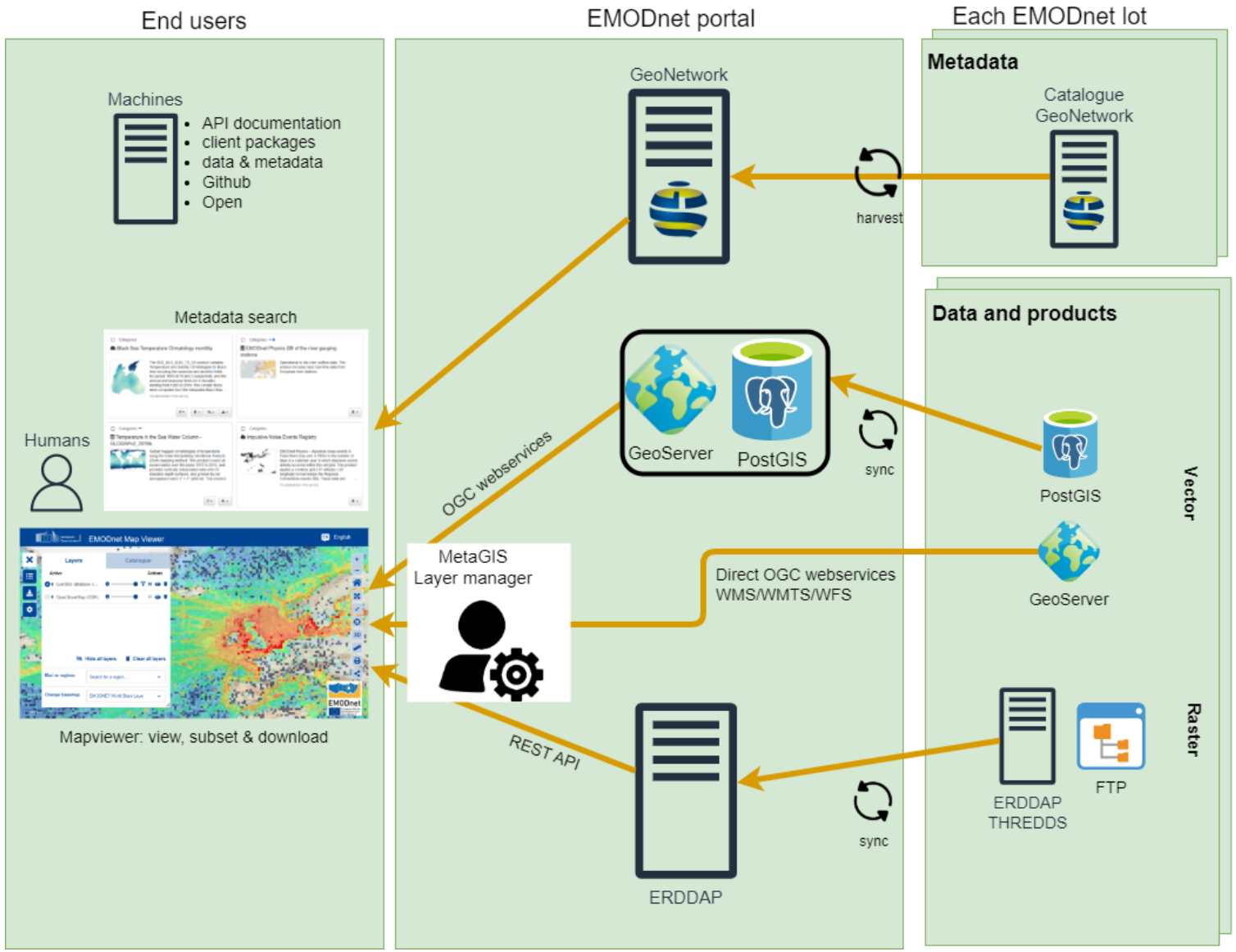




- One EMODnet **website: https://emodnet.ec.europa.eu/en**
- One EMODnet **map viewer: https://emodnet.ec.europa.eu/geoviewer/**
- One EMODnet **catalogue: https://emodnet.ec.europa.eu/geonetwork/**

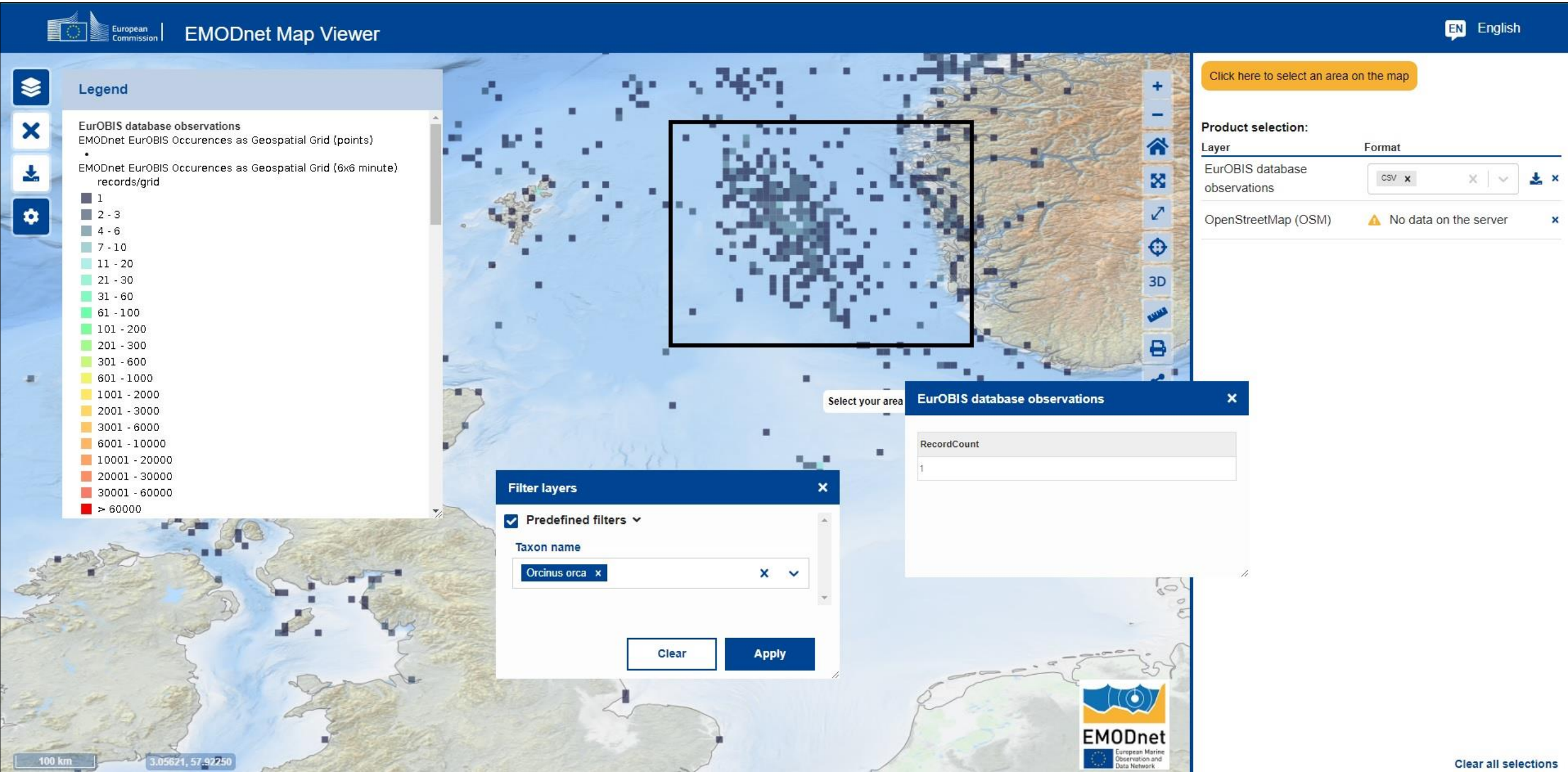
EMODnet
European Marine Observation and Data Network

EMODnet | Technical Architecture of a federated system

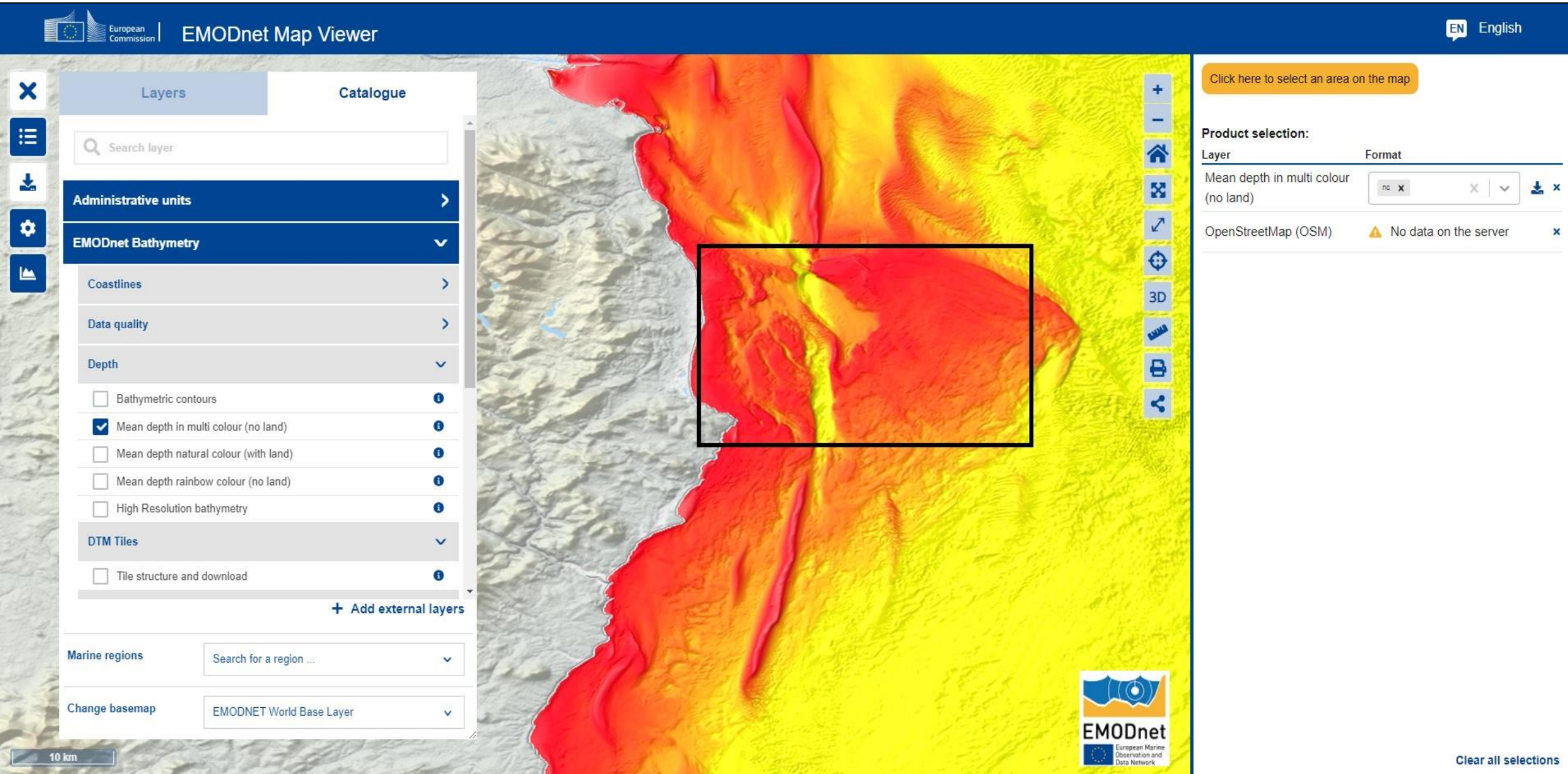


- GeoServers providing OGC services:
  - Web Mapping Services(WMS)
  - Web Feature Services (WFS)
  - Web Coverage Services (WCS)
  - Web Map Tile Services (WMTS)
- GeoNetwork publishing an OGC catalogue:
  - Catalogue Service for the WEB (CSW)
- ERDDAP™ providing gridded data services:
  - Data Access Protocol (DAP) services to Earth Science Data

EMODnet |One map viewer – subset and download – vis WFS (OGC)

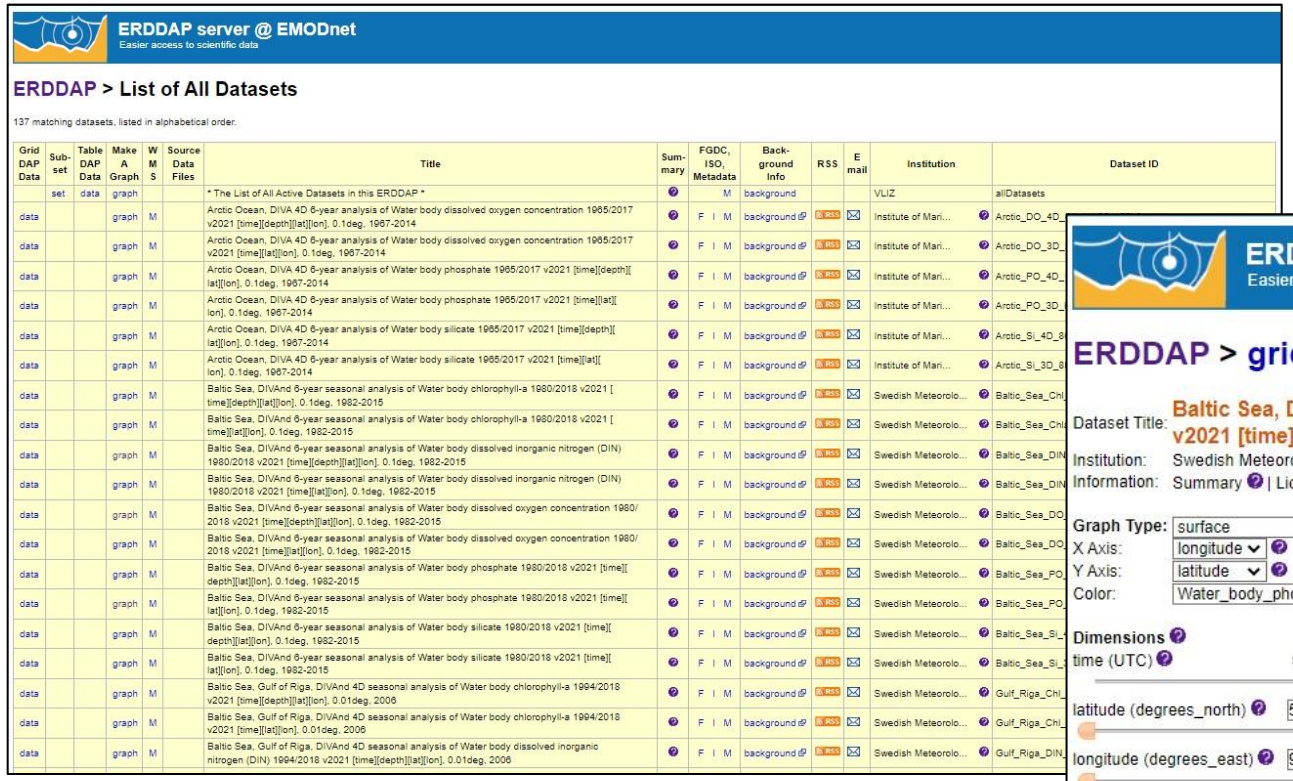


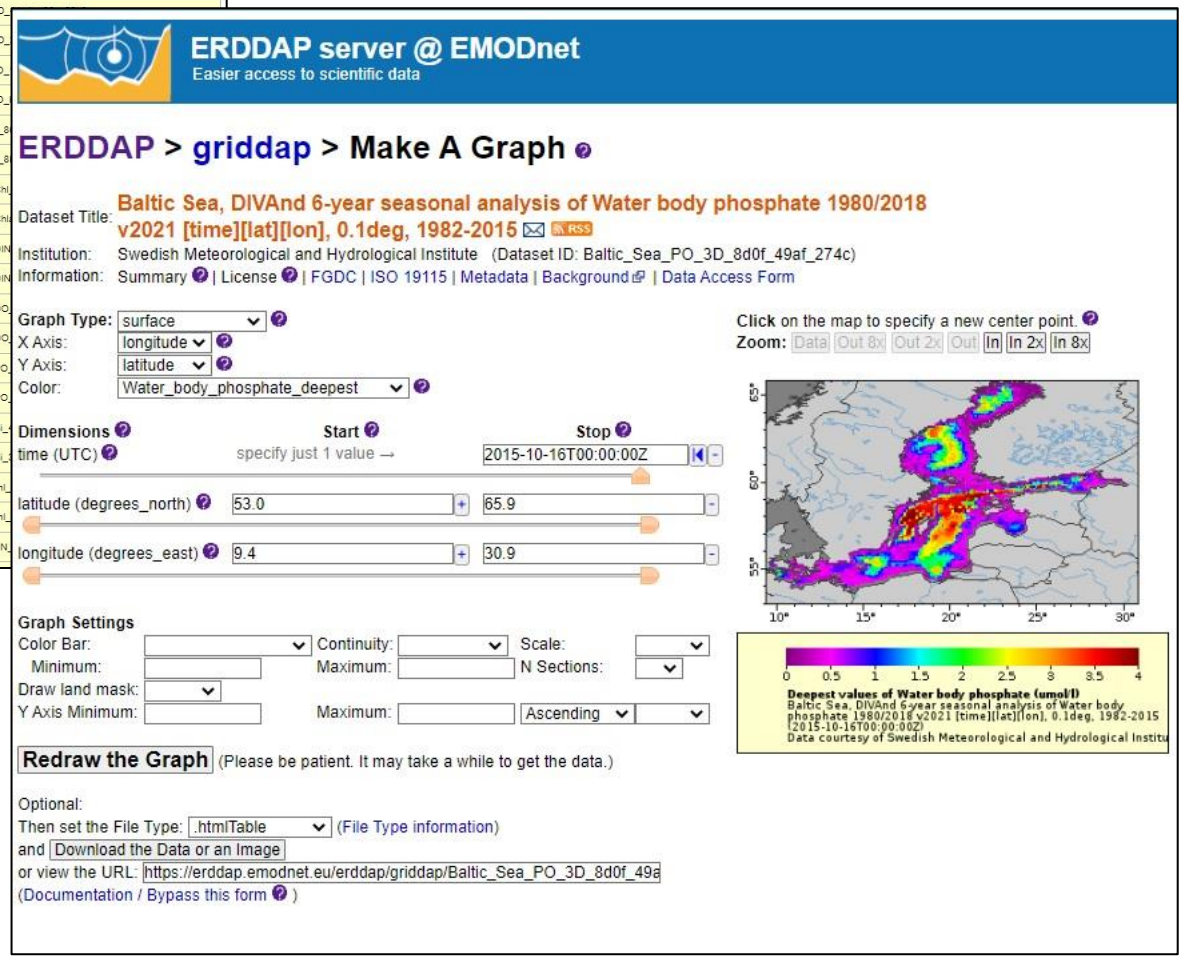
EMODnet |One map viewer – subset and download via DAP (OPEnDAP)



EMODnet | ERDDAP™ – DAP (Data Access Protocol)

- https://erddap.emodnet.eu/erddap/index.html
- An API to Gridded datasets

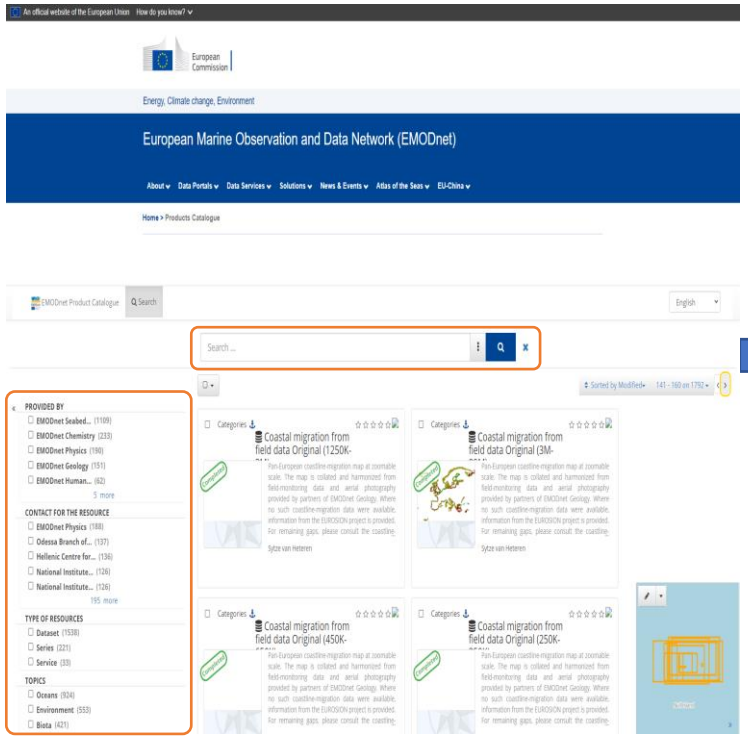


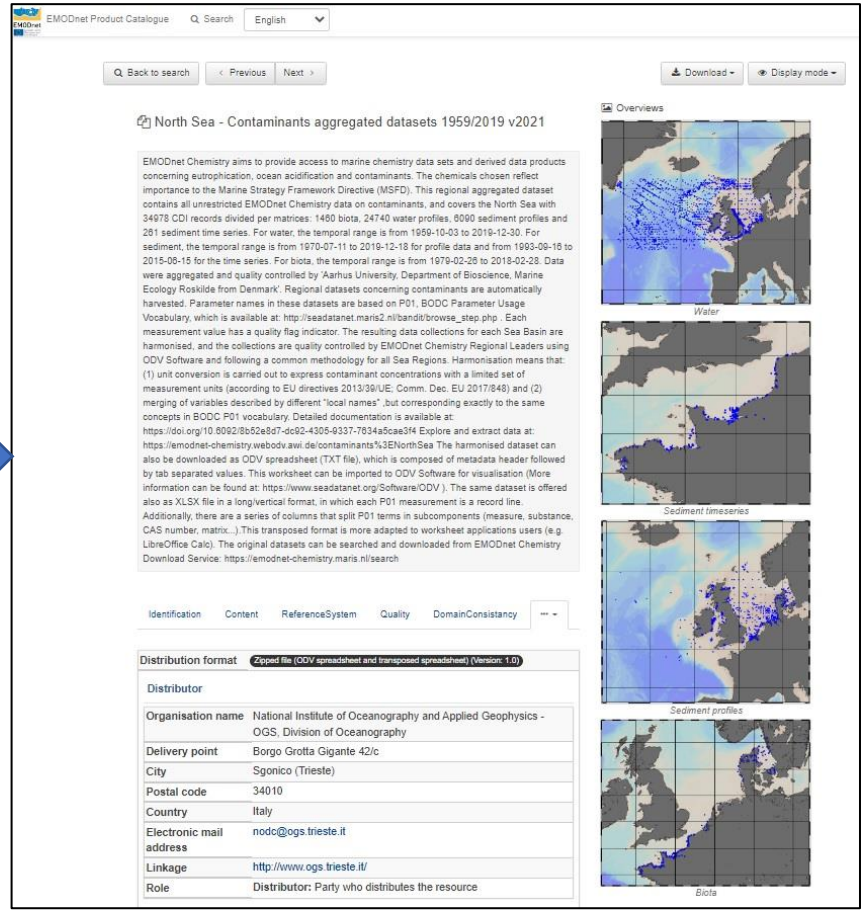


- DODS (Distributed Oceanographic Data System) was the percussor to DAP
- https://www.opendap.org/support/OPeNDAP-servers

EMODnet | GeoNetwork catalogue of catalogues

- Search and filter INSPIRE metadata of all EMODnet products
- **emodnet.ec.europa.eu/geonetwork**

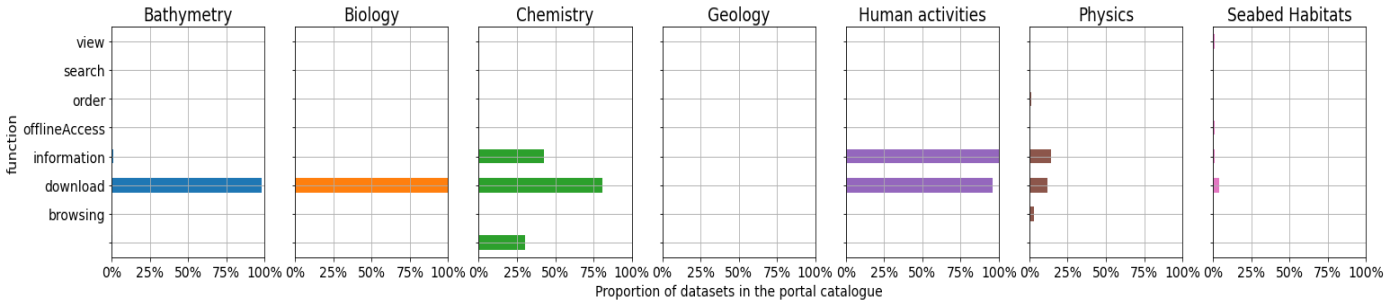


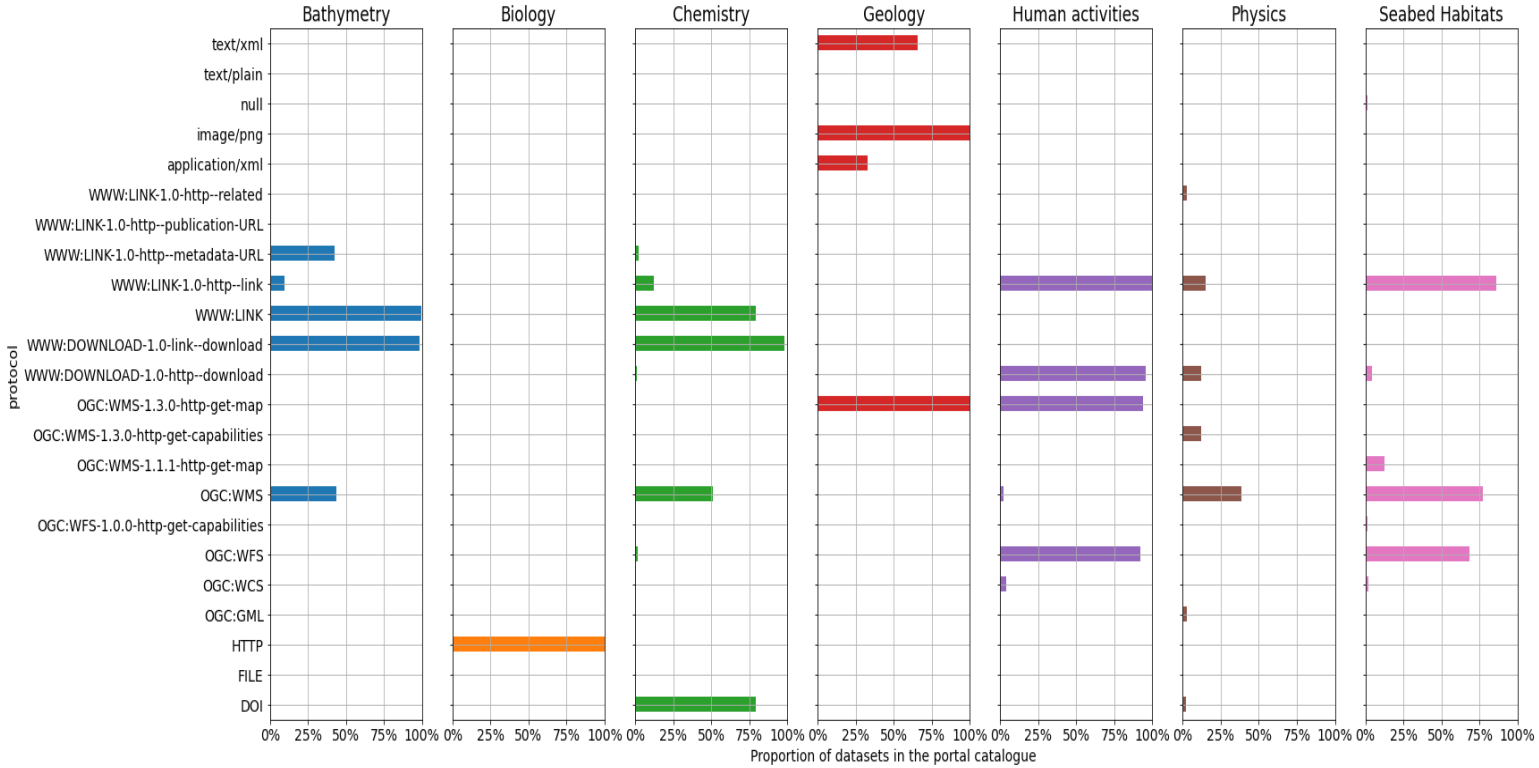


Data products Metadata Catalogue

EMODnet | GeoNetwork catalogue of catalogues

- Challenges integrating metadata from seven catalogues
  - Use of INSPIRE/ISO standards
  - Differences in metadata content





EMODnet | GeoNetwork catalogue of catalogues

- Challenges integrating metadata from seven catalogues
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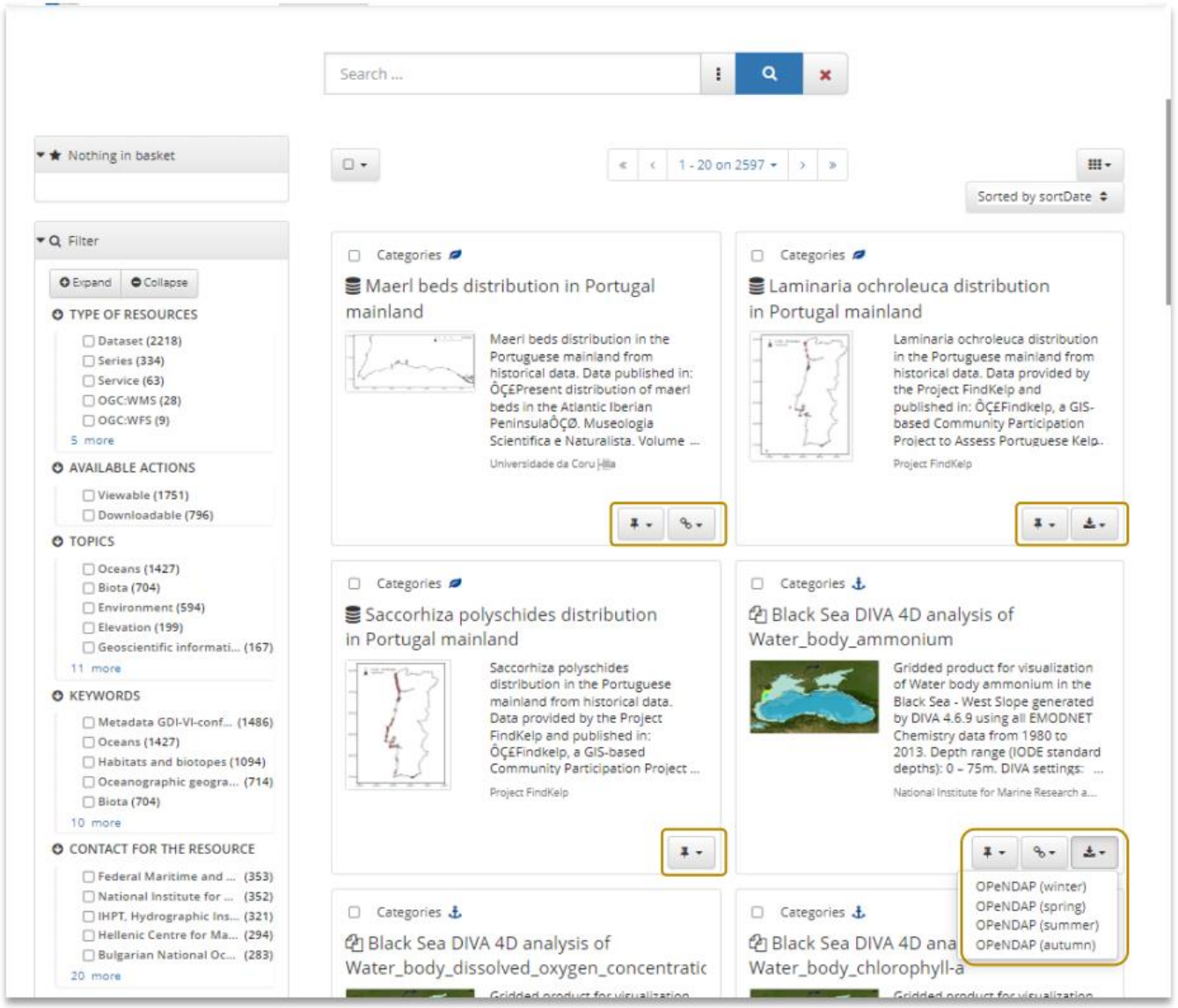
- Users access metadata through one central EMODnet catalogue
  - Metadata and download options need to be displayed to users in a common way
  - Requires metadata from different thematics to be further harmonised



EMODnet | GeoNetwork catalogue of catalogues

- Challenges integrating metadata from seven catalogues
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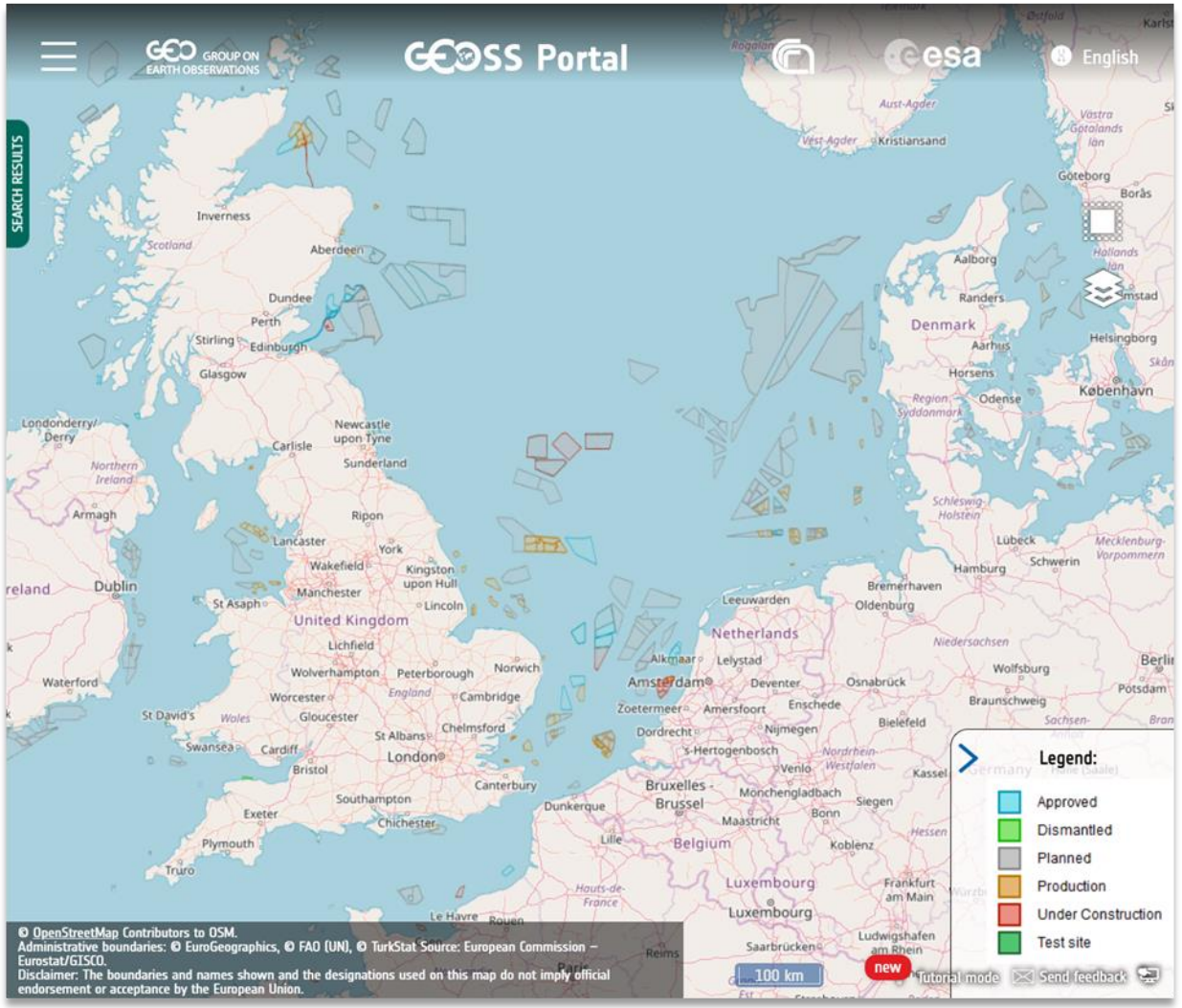
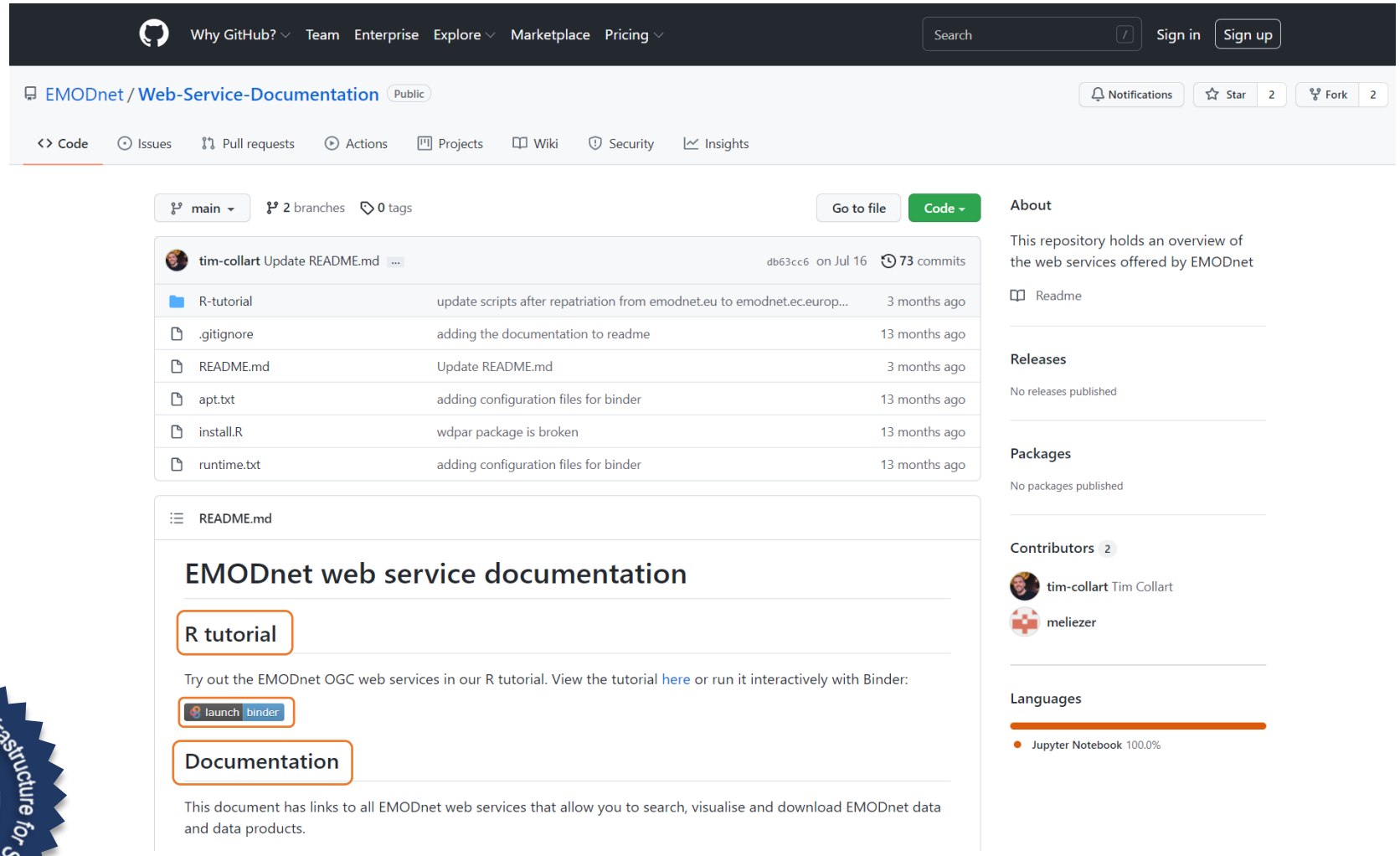
  - Metadata and download options need to be displayed to users in a common way
  - Requires metadata from different thematics to be further harmonised
- EMODnet catalogue is harvested in other portals:
  - Improving interoperability with these platforms requires metadata to be formatted according to ISO/INSPIRE standards



EMODnet web services

- Access EMODnet data, products and metadata through INSPIRE-compliant OGC web services and other API's
- Web service documentation and R code examples available on GitHub: **github.com/EMODnet/Web-Service-Documentation**
- Find additional code examples on the EMODnet Github



OGC® Making location count.

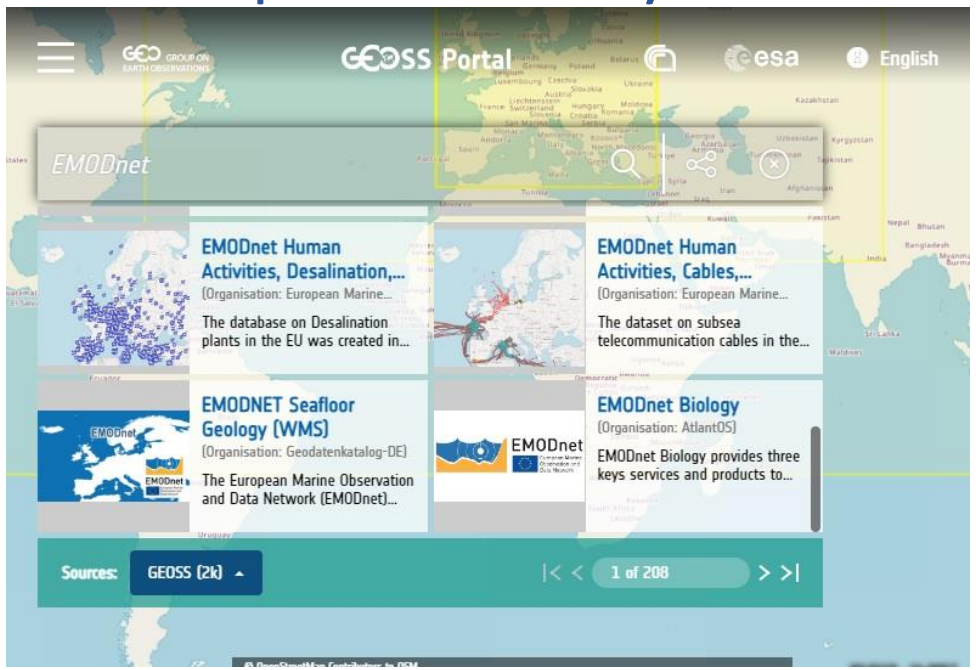
INSPIRE · Infrastructure for Spatial Information in Europe

EMODnet European Marine Observation and Data Network

EMODnet | Interoperable data/metadata, harvested by global ocean data catalogues

GEOSS Portal

International portal, implemented by ESA



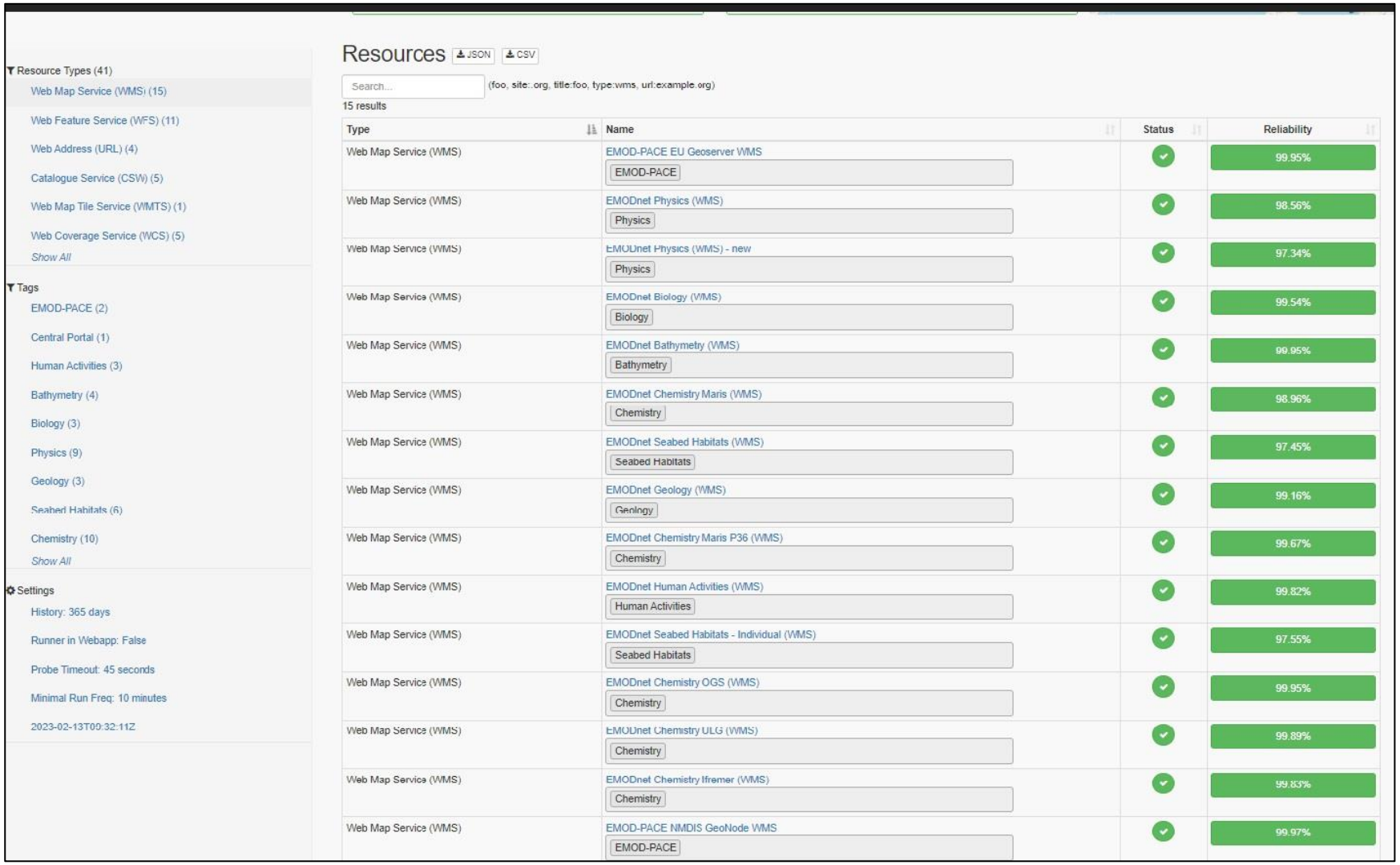
Ocean InfoHub

Implemented by IODE of IOC/UNESCO

EMODnet's FAIR common metadata catalogue is the backbone for EMODnet's contribution to the the **global ocean data digital ecosystem**, the UN Decade of Ocean Science for Sustainable Development, Sustainable Development Goals (SDG) agenda and OceanData 2030, via **machine-machine data harvesting.**

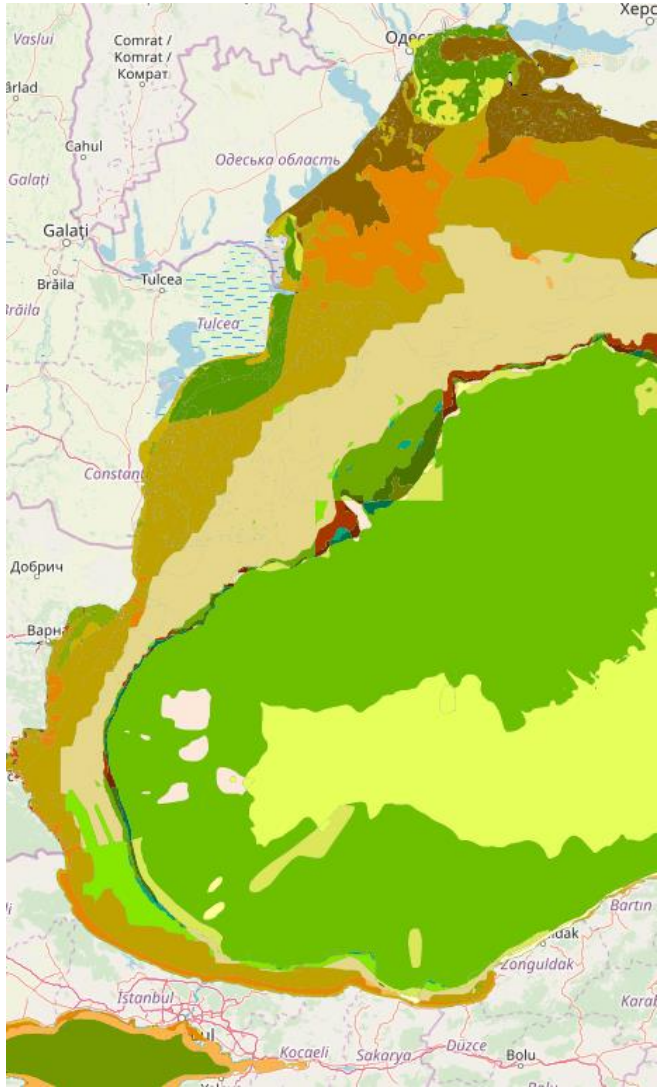
EMODnet
European Marine Observation and Data Network

EMODnet | Webservices – monitoring dashboard



https://monitor.emodnet.eu/

EMODnet | The results of working together: EMODnet EUSeamap



GEOLOGY

Substrate

E.g. Sand, Mud, Rock

PHYSICS

Hydrodynamic Energy

Wave and currents climate at the seabed

BATHYMETRY BIOLOGY

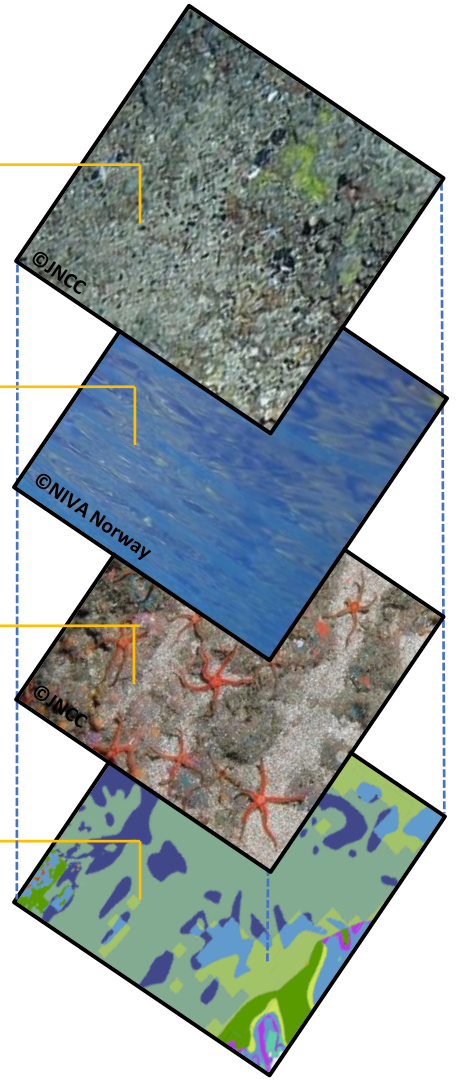
Biological Zone

Infralittoral, circalittoral etc

SEABED HABITATS

Predictive habitat maps

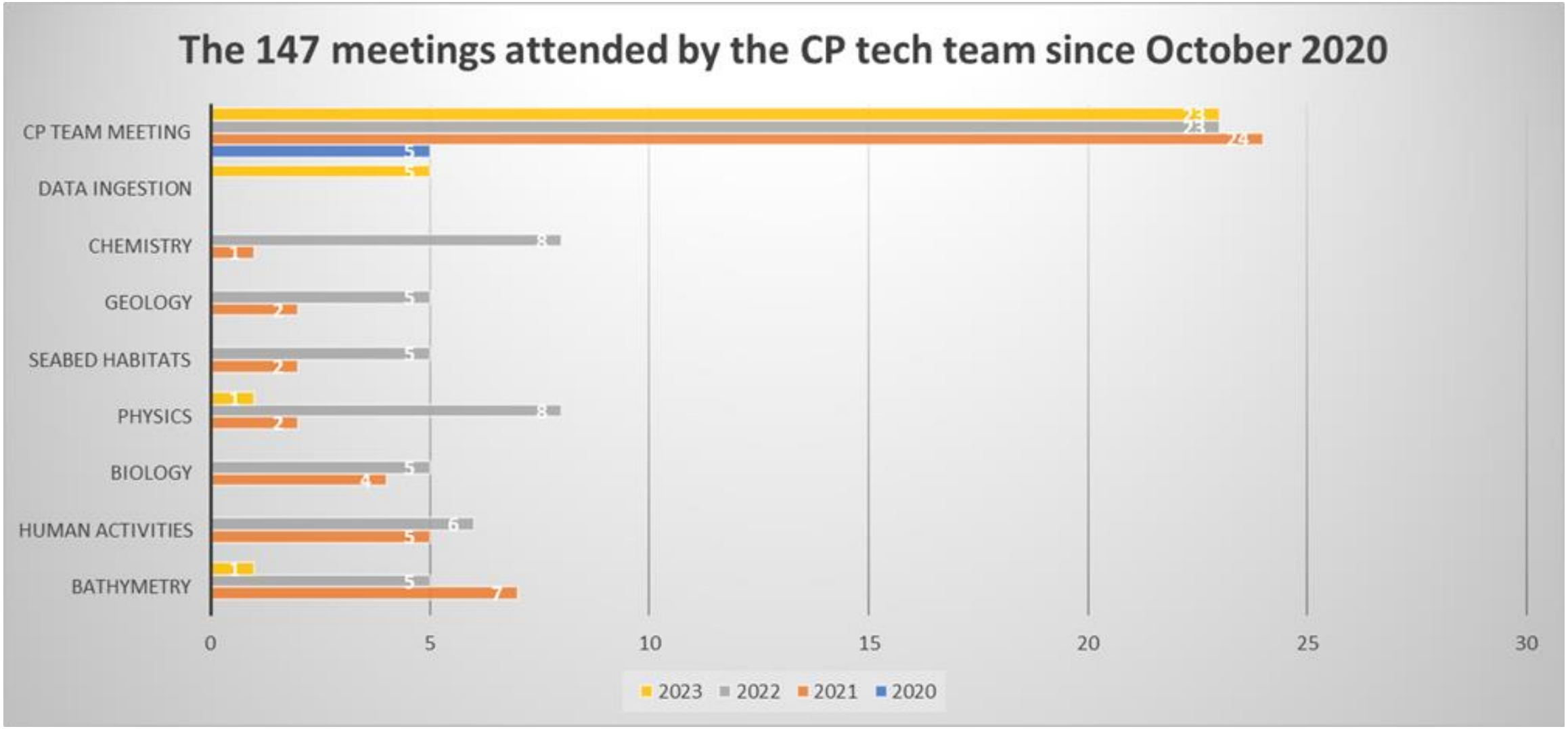
EUNIS A3.1: Atlantic and Mediterranean High Energy Infralittoral Rock



With harmonized, trusted datasets, integrated products are made possible for ocean applications and evidence-based decision-making.

EMODnet
European Marine Observation and Data Network

EMODnet | Centralization – Resource Impact



EMODnet | Centralization – Resource Impact

List of webservices by distinct internet domain (EMODnet central servers are excluded)

	WFS	WMTS	WCS	NON OGC
BATHYMETRY	1	1	1	1
BIOLOGY	1	2	1	
HUMAN ACTIVITIES	1	1	1	
SEABED HABITATS	1	1	1	
GEOLOGY	1	1		
CHEMISTRY	3	1		1
PHYSICS	1	1		1

Operational Challenges:

- At least 10 distinct servers, with no central maintenance
- Performance varies across the network
- Huge repetition of tasks for distributed technical staff
- Network is dependent on willingness of technical teams to carry out operational maintenance (GeoNetwork updates etc).

One central map viewer

to visualise all EMODnet data

1 OCEAN 1 EMODnet

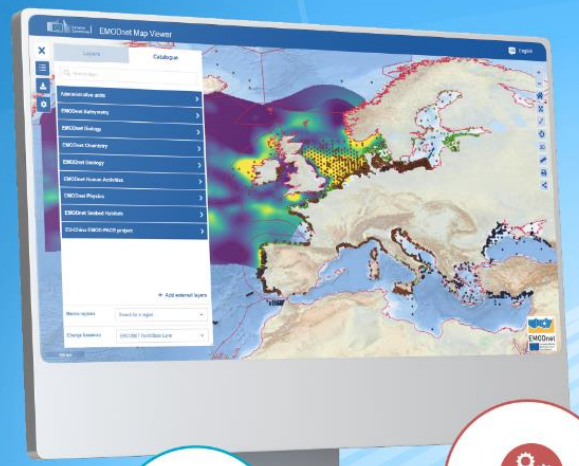
One single portal

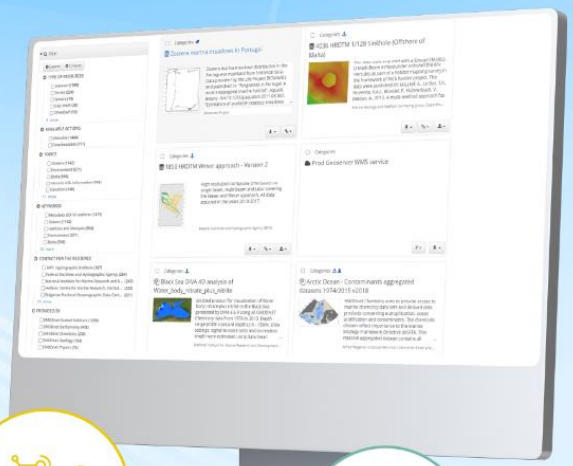
One central metadata catalogue

to enhance data search and discovery

140 partners

+100 use cases





Discover, visualise and download marine data and products across 7 thematics and hundreds of parameters

BATHYMETRY

HUMAN ACTIVITIES

PHYSICS

GEOLOGY

SEABED HABITATS

CHEMISTRY

BIOLOGY

EMODNET.EC.EUROPA.EU

The European Marine Observation and Data Network (EMODnet) is financed by the European Union under regulation (EU) No 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund

YOUR GATEWAY TO *IN SITU* MARINE DATA IN EUROPE AND BEYOND

EMODnet
European Marine Observation and Data Network

Spare Slides