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the European Union



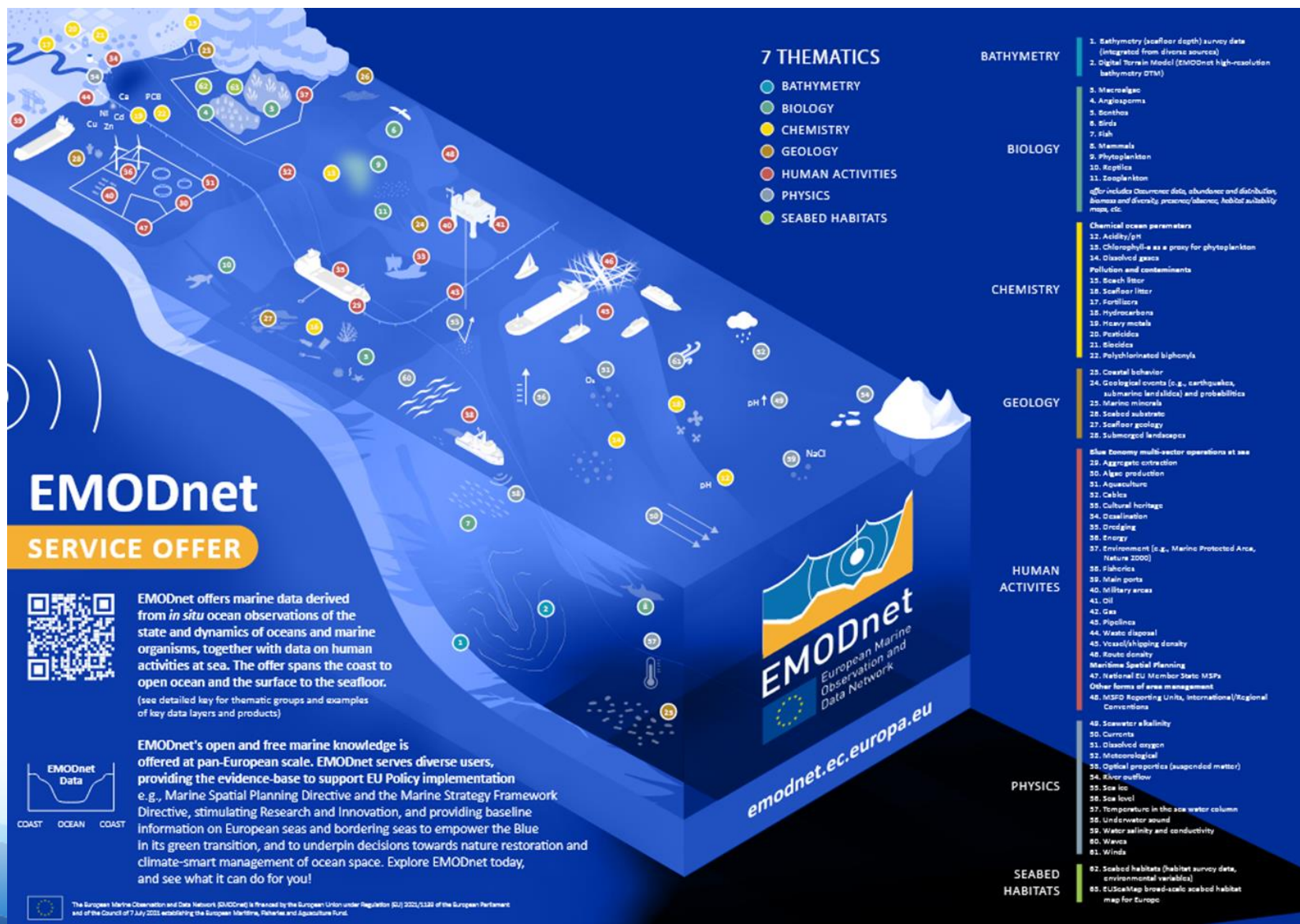
DTO-BioFlow

Integration of biodiversity monitoring
data into the Digital Twin Ocean

DTO-BioFlow data training workshop:

Introduction to EMODnet Biology

What is EMODnet ?



EMODnet
SERVICE OFFER

EMODnet offers marine data derived from *in situ* ocean observations of the state and dynamics of oceans and marine organisms, together with data on human activities at sea. The offer spans the coast to open ocean and the surface to the seafloor. (see detailed key for thematic groups and examples of key data layers and products)

EMODnet's open and free marine knowledge is offered at pan-European scale. EMODnet serves diverse users, providing the evidence-base to support EU Policy implementation e.g., Marine Spatial Planning Directive and the Marine Strategy Framework Directive, stimulating Research and Innovation, and providing baseline information on European seas and bordering seas to empower the Blue in its green transition, and to underpin decisions towards nature restoration and climate-smart management of ocean space. Explore EMODnet today, and see what it can do for you!

7 THEMATICS

- BATHYMETRY
- BIOLOGY
- CHEMISTRY
- GEOLOGY
- HUMAN ACTIVITIES
- PHYSICS
- SEABED HABITATS

BATHYMETRY

- Bathymetry (seafloor depth) survey data (integrated from diverse sources)
- Digital Terrain Model (EMODnet high-resolution bathymetry DTM)

BIOLOGY

- Macroalgae
- Angiosperms
- Benthos
- Birds
- Fish
- Mammals
- Phytoplankton
- Reptiles
- Zooplankton

offer includes Occurrence data, abundance and distribution, biomass and diversity, presence/absence, habitat suitability maps, etc.

CHEMISTRY

Chemical ocean parameters

- Acidity/pH
- Chlorophyll-a as a proxy for phytoplankton
- Dissolved gases
- Pollution and contaminants
- Seafloor litter
- Seafloor litter
- Fertilisers
- Hydrocarbons
- Heavy metals
- Pesticides
- Sludges
- Polyhalogenated biphenyls

GEOLOGY

- Coastal behaviour
- Geological events (e.g., earthquakes, submarine landslides) and probabilities
- Marine minerals
- Seafloor substrate
- Seafloor geology
- Submerged landscapes

Blue Economy multi-sector operations at sea

- Aggregate extraction
- Algae production
- Aquaculture
- Cables
- Cultural heritage
- Coastal erosion
- Crabbing
- Energy
- Enforcement (e.g., Marine Protected Area, Natura 2000)
- Fisheries
- Main ports
- Military areas
- Oil
- Gas
- Pipelines
- Waste disposal
- Vessel/shipping density
- Route density
- Maritime Spatial Planning
- National EU Member State MSPs
- Other forms of area management
- MSP Reporting Units, International/Regional Conventions

HUMAN ACTIVITIES

- Seawater salinity
- Currents
- Dissolved oxygen
- Meteorological
- Optical properties (suspended matter)
- River outflow
- Sea ice
- Sea level
- Temperature in the sea water column
- Underwater sound
- Water salinity and conductivity
- Waves
- Winds

PHYSICS

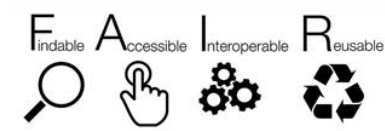
SEABED HABITATS

- Seafloor habitats (habitat survey data, environmental variables)
- EUSeafMap broad-scale seafloor habitat map for Europe

EMODnet
European Marine Observation and Data Network
emodnet.ec.europa.eu



Services		
Standards that implement INSPIRE Procedures that use the INSPIRE Transfer Protocol (ITP)	3D Portrayal Service - Table Joining Service - Web Feature Service - Web Map Tile Service - Web Services Security	- Location Service (OpenLS) - Web Coverage Service - Web Map Service - Web Service Common



Context: EMODnet

- European Marine Observation and Data Network

- Mission

- Observe



- Standardise



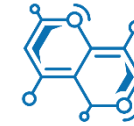
- Disseminate



- *Collect once, use many times*



PHYSICS



CHEMISTRY



GEOLOGY



BATHYMETRY



SEABED HABITATS

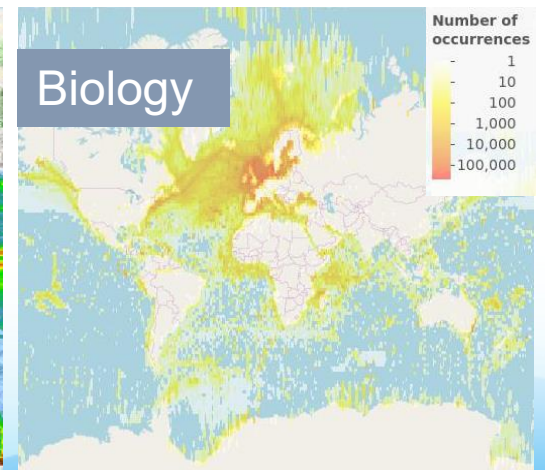
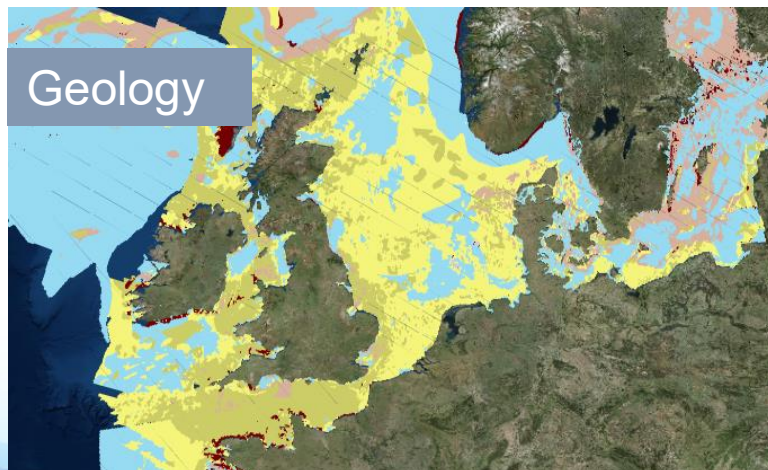
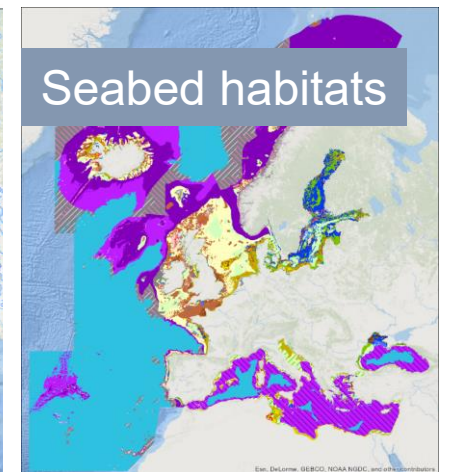
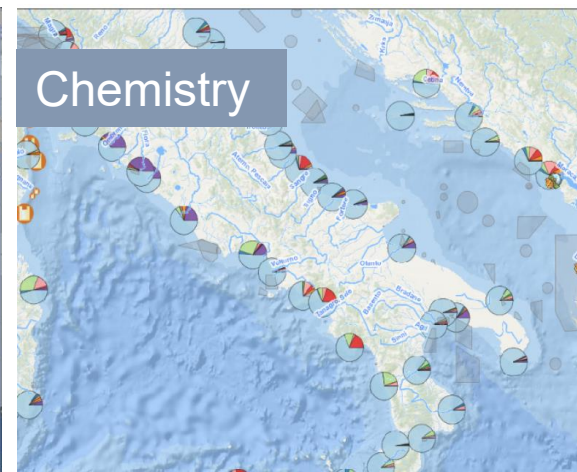
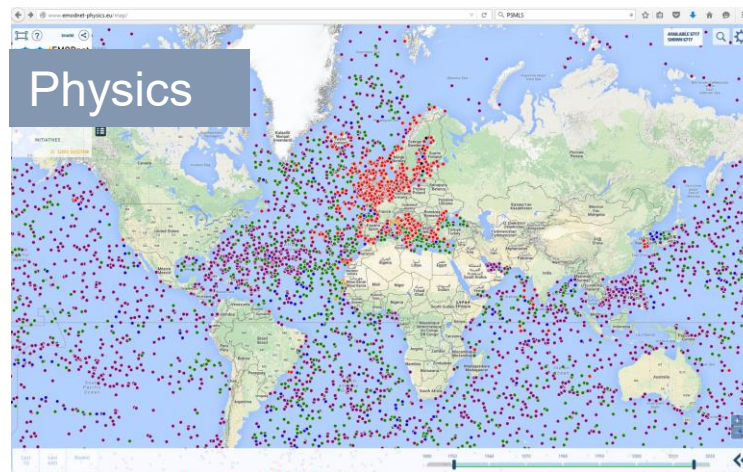
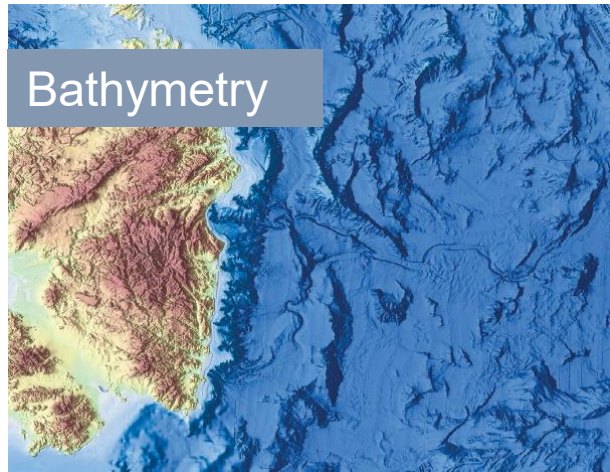


BIOLOGY



HUMAN ACTIVITIES

Context: EMODnet



Concept: EMODnet Biology

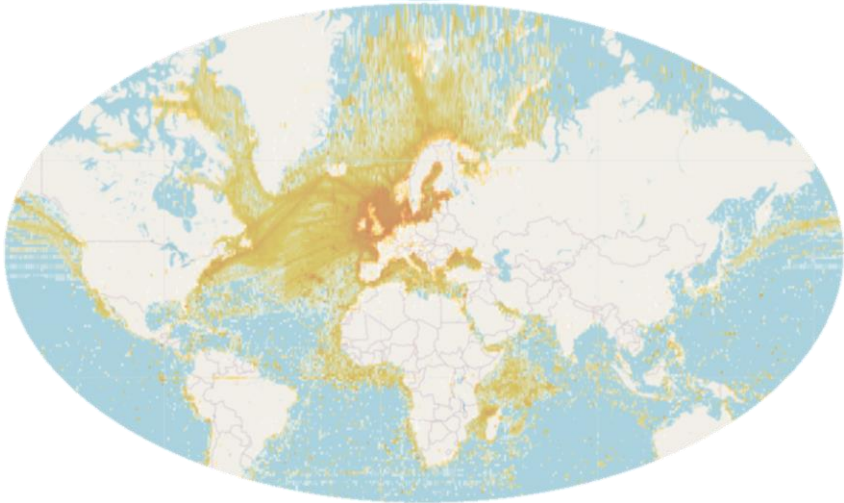
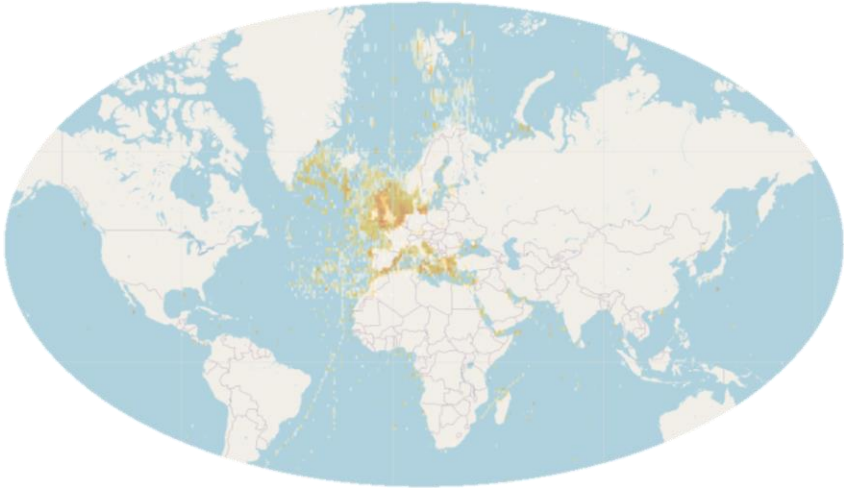
Focus on European Seas but we accept data from anywhere in the world's oceans

Target primarily data from 9 sub-themes



Data types: Observations, acoustic, tracking, imaging, ... and **genomics**

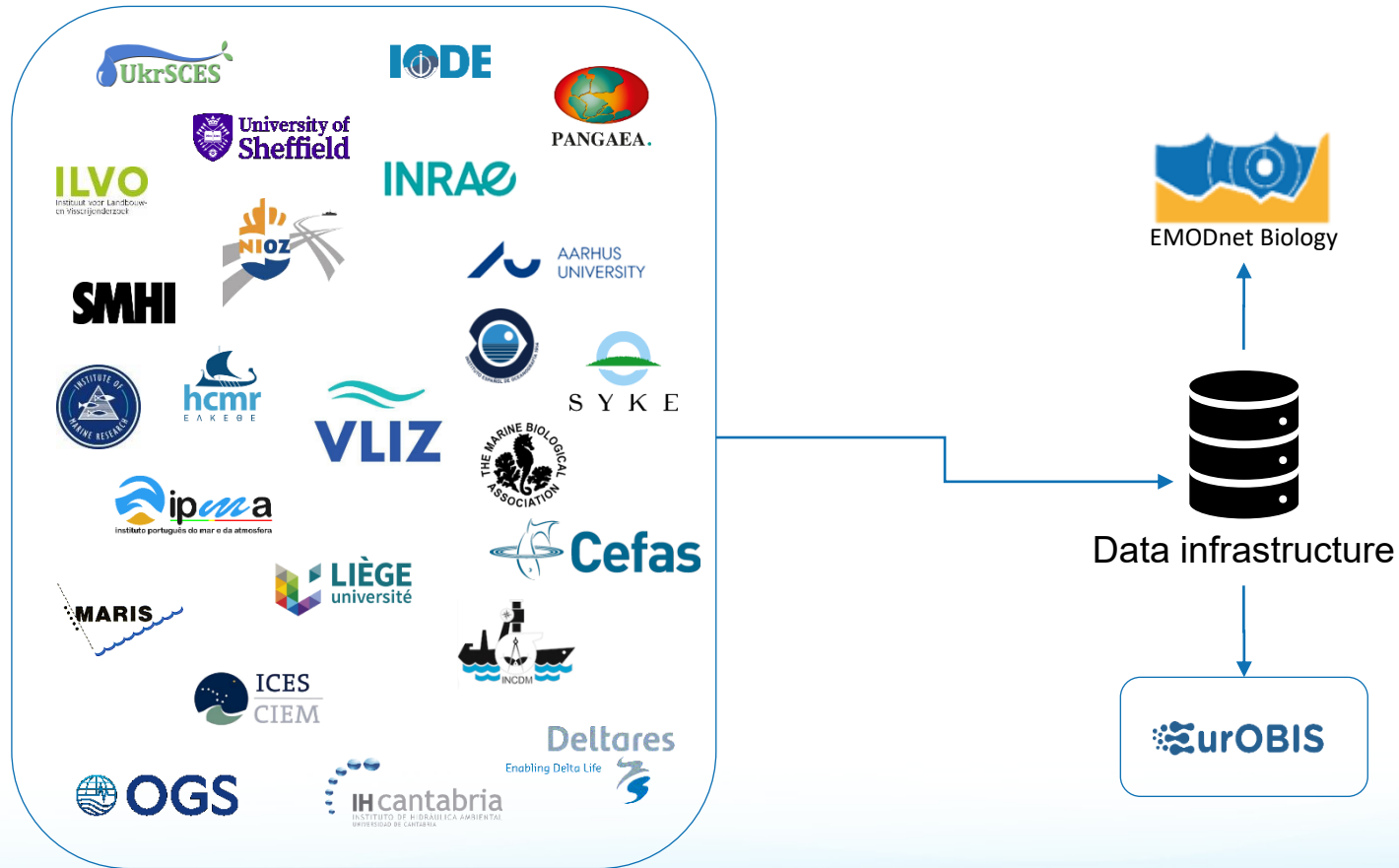
Concept: EMODnet Biology



- 1400+ datasets
- 48M+ occurrence records
- 198M+ measurements or facts

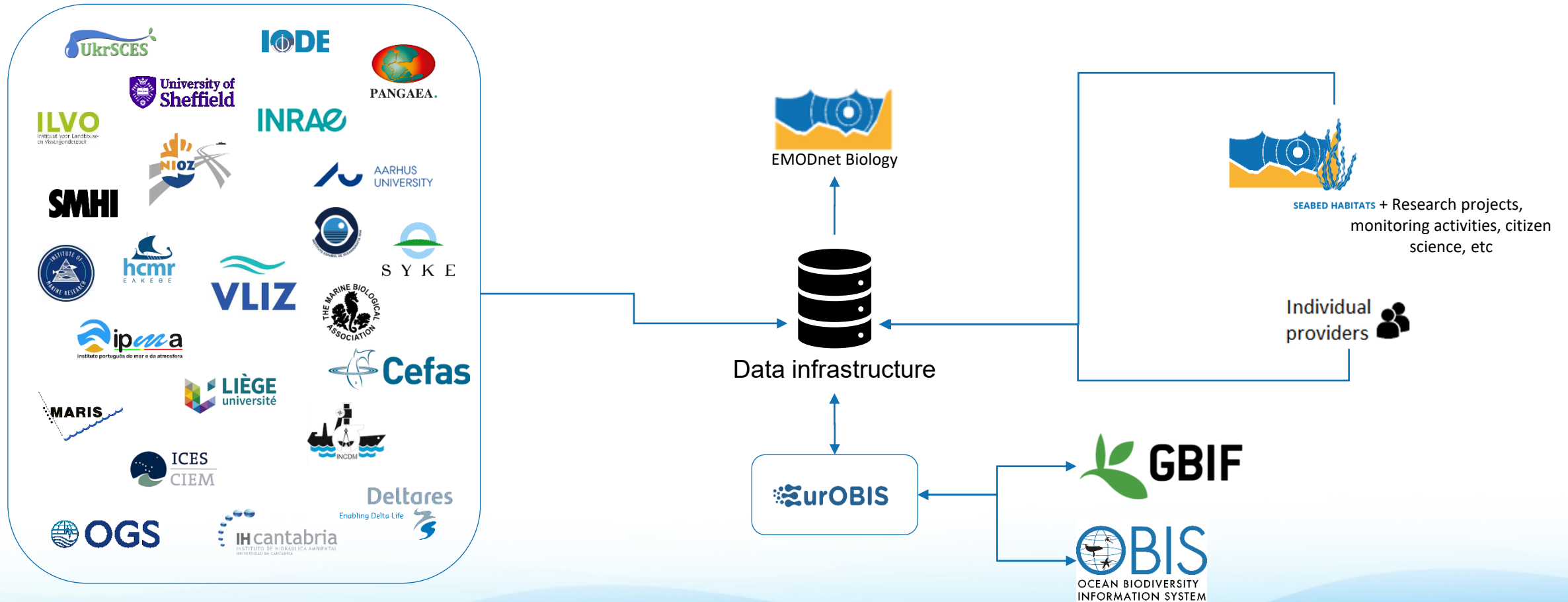
Concept: The data mobilizer

- Data flow powered by EMODnet Biology



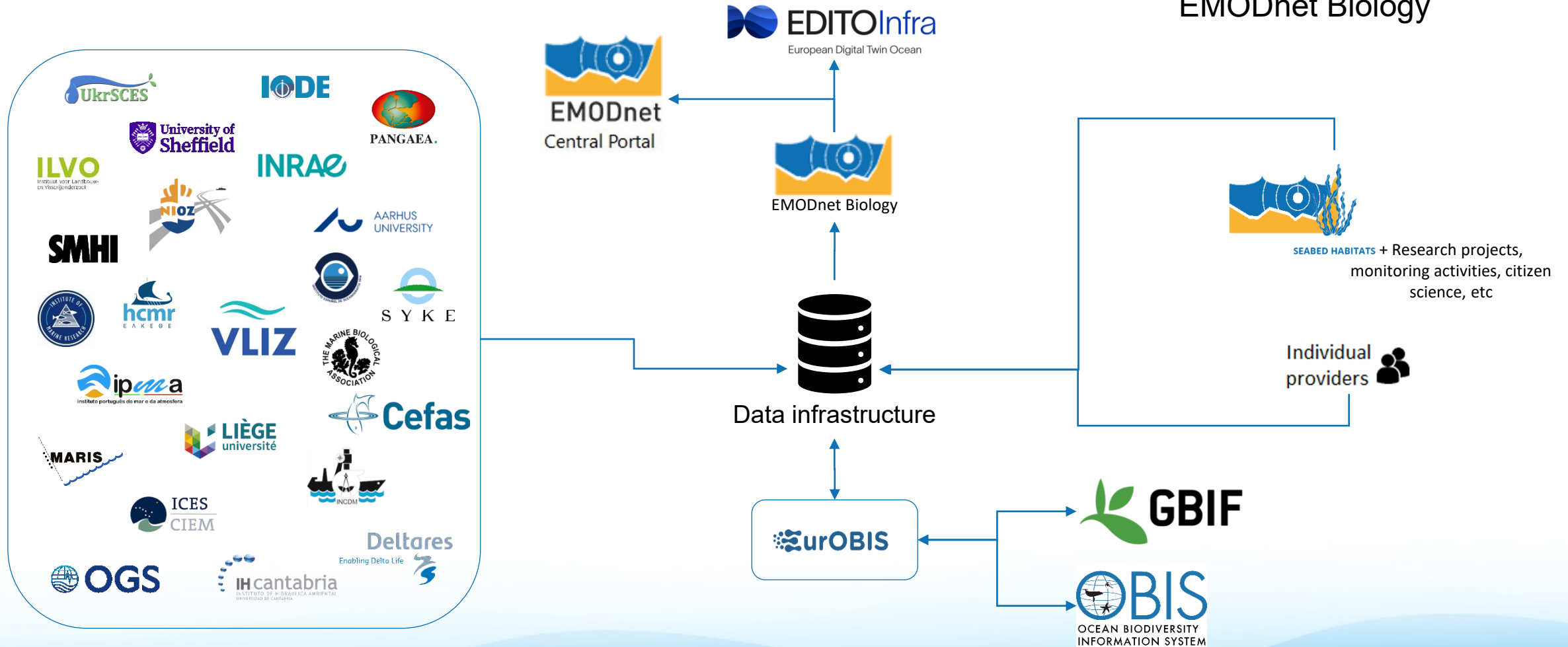
Concept: The data mobilizer

- Data flow powered by EMODnet Biology



Concept: The data mobilizer

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Method: The standards

(Meta)data standards

≡ Ecological Metadata Language



≡ Darwin Core



≡ OBIS ENV- Data



Method: The standards

(Meta)data standards

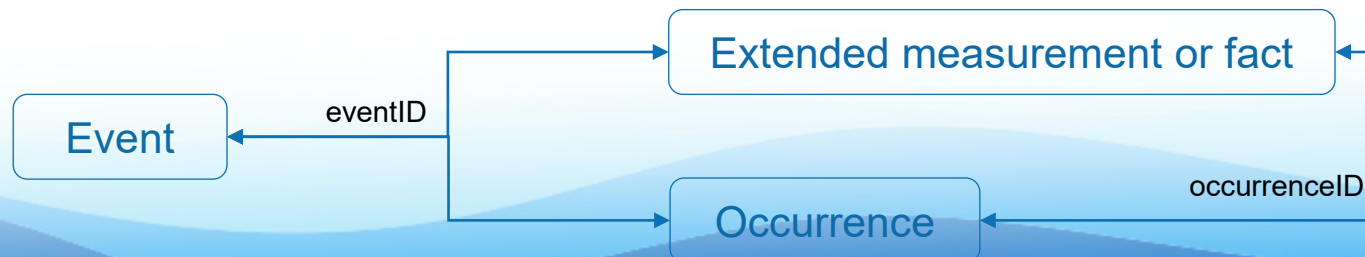
≡ Ecological Metadata Language



≡ Darwin Core



≡ OBIS ENV- Data



- Organisms quantifications, facts and biometrics
- Sampling methodologies
- Environmental data

Method: The standards

(Meta)data standards

≡ Ecological Metadata Language



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≡ OBIS ENV- Data



Controlled vocabularies

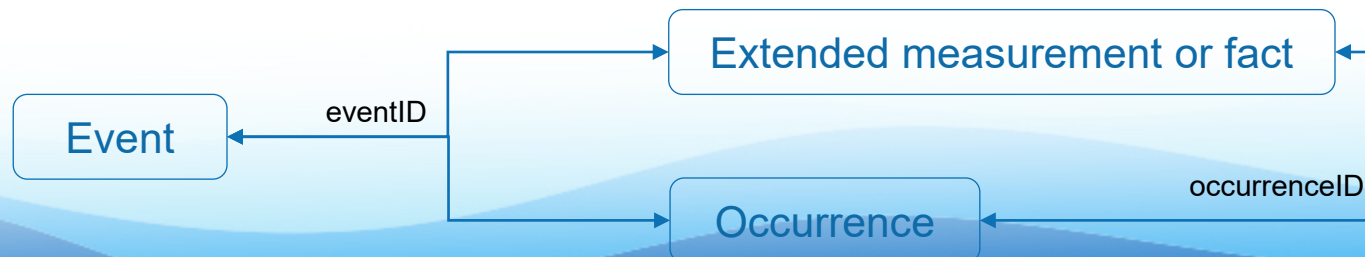
• WoRMS – taxonomy



• Marine Regions – geography

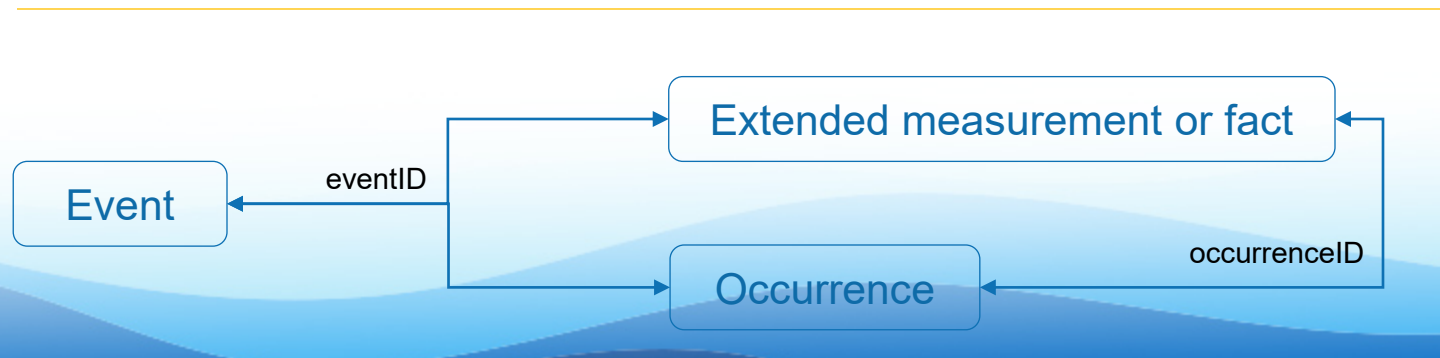
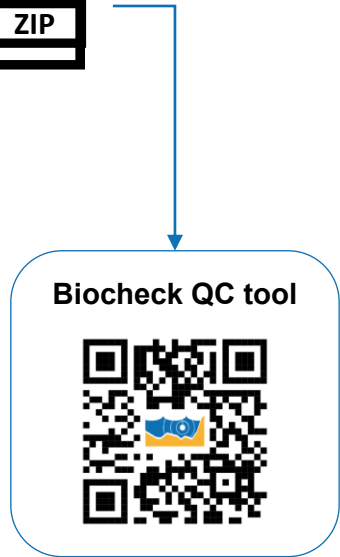


• BODC - parameters



- Organisms quantifications, facts and biometrics
- Sampling methodologies
- Environmental data

Services: The QC



measurement types: Abundance, Abundance per something, Observed

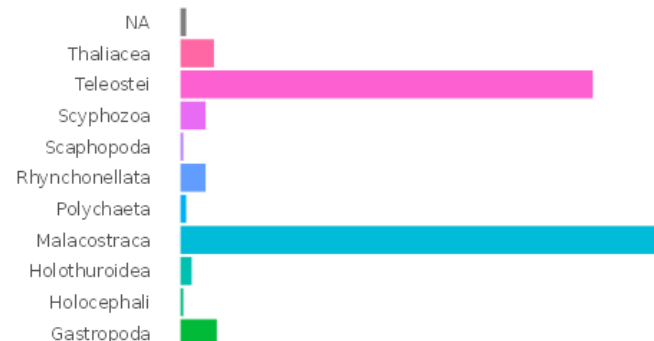
Geographical cover of the dataset



Taxonomic cover of the dataset

Select kingdom

Animalia



Biocheck QC tool



Overview

Extended measurement or fact

Event

eventID

Occurrence

occurrenceID

Services: The QC

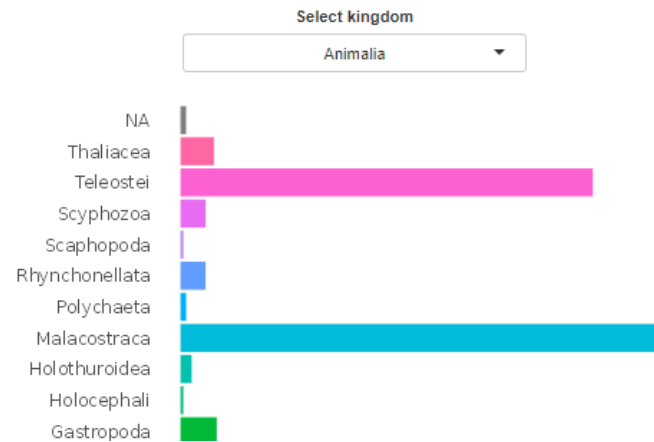


Biocheck QC tool



Overview

Taxonomic cover of the dataset



Geographical cover of the dataset



Issues

- Format and integrity
- Taxonomy
- Biogeography
- Parameters



Event

eventID

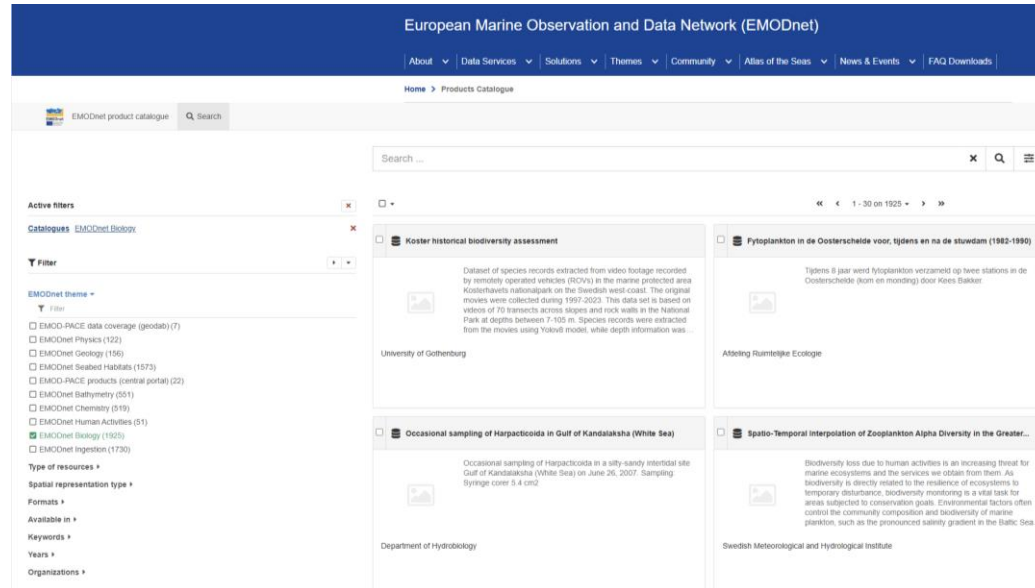
Extended measurement or fact

Occurrence

occurrenceID

Services: Data search and access

Data catalogue



European Marine Observation and Data Network (EMODnet)

Home > Products Catalogue

EMODnet product catalogue

Search ...

Active filters

Catalogues EMOdet Biology

Filter

EMODnet theme

Filter

- ☐ EMOdet-FAO data coverage (geodab) (7)
- ☐ EMOdet Physics (122)
- ☐ EMOdet Geology (156)
- ☐ EMOdet Seabed Habitats (1573)
- ☐ EMOdet-FAO products (central portal) (22)
- ☐ EMOdet Bathymetry (551)
- ☐ EMOdet Chemistry (519)
- ☐ EMOdet Human Activities (51)
- ☒ EMOdet Biology (1925)
- ☐ EMOdet Ingestion (1730)

Type of resources

Spatial representation type

Formats

Available in

Keywords

Years

Organizations

1 - 30 on 1925

Koster historical biodiversity assessment

Dataset of species records extracted from video footage recorded by remotely operated vehicles (ROVs) in the marine protected area Kosterhavets nationalpark on the Swedish west-coast. The original movies were collected during 1997-2023. This data set is based on videos of 79 transects across seagrass and rock walls in the National Park at depths between 7-105 m. Species records were extracted from the movies using Yoklav model, while depth information was...

University of Gothenburg

Pytoplankton in de Oosterschelde voor, tijdens en na de stuwdam (1982-1990)

Tijdens 8 jaar werd fytoplankton verzameld op twee stations in de Oosterschelde (van en meeding) door Kees Bakker

Attiling Rumlthje Ecology

Occasional sampling of Harpacticoida in Gulf of Kandalaksha (White Sea)

Occasional sampling of Harpacticoida in a silty-sandy intertidal site Gulf of Kandalaksha (White Sea) on June 26, 2007. Sampling by using core 8.4 cm

Department of Hydrobiology

Spatio-Temporal Interpolation of Zooplankton Alpha Diversity in the Greater...

Biodiversity loss due to human activities is an increasing threat for marine ecosystems and the services we obtain from them. As biodiversity is directly related to the resilience of ecosystems to temporary disturbance, biodiversity monitoring is a vital task for areas subjected to conservation goals. Environmental factors often control the community composition and biodiversity of marine plankton, such as the pronounced salinity gradient in the Baltic Sea

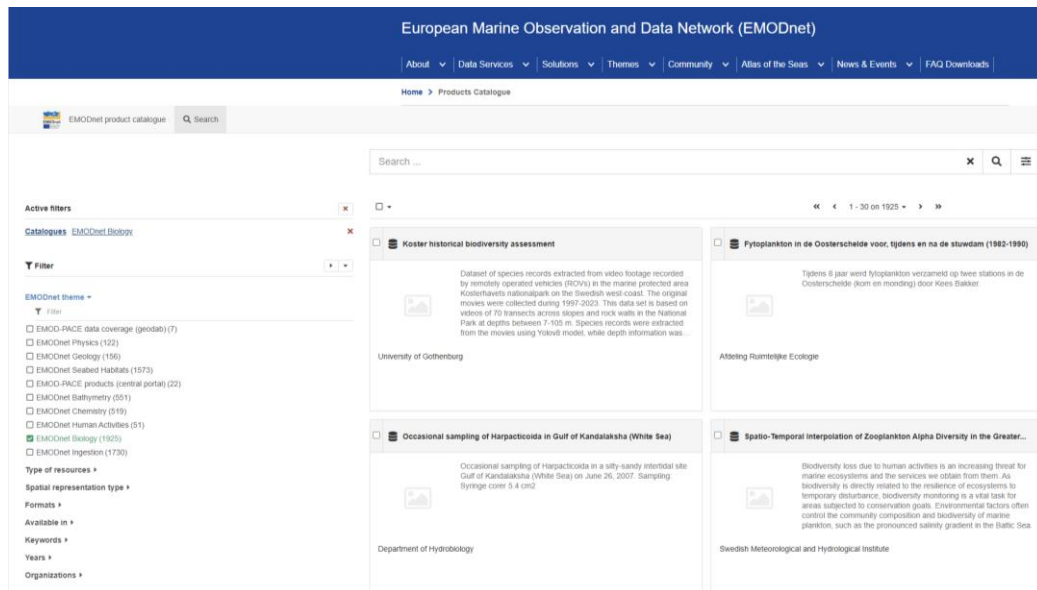
Swedish Meteorological and Hydrological Institute

<https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/search>



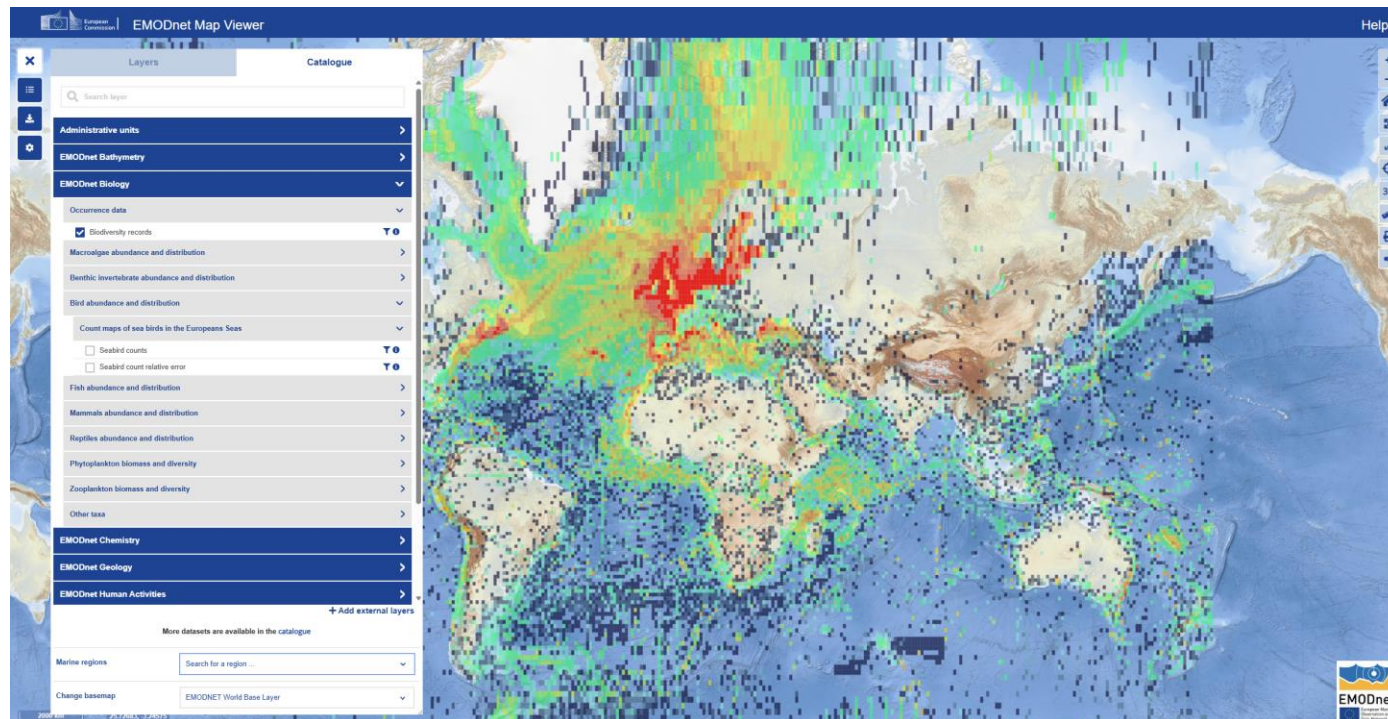
Services: Data search and access

Data catalogue



<https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/search>

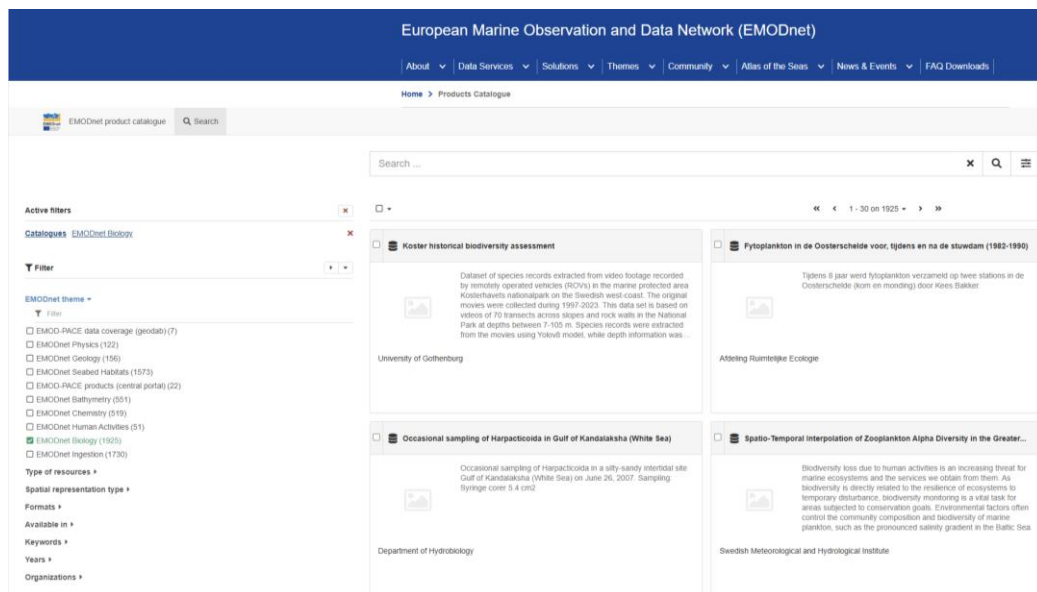
Data portal



<https://emodnet.ec.europa.eu/geoviewer/>

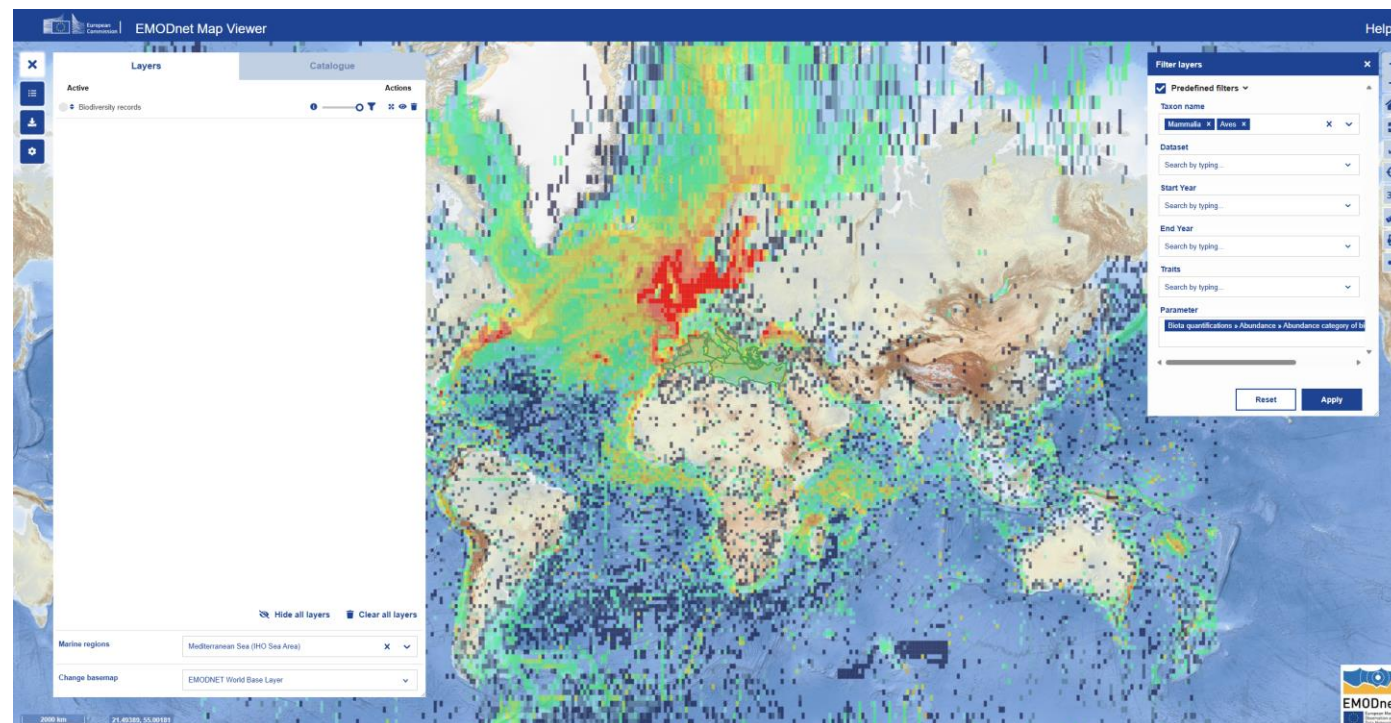
Services: Data search and access

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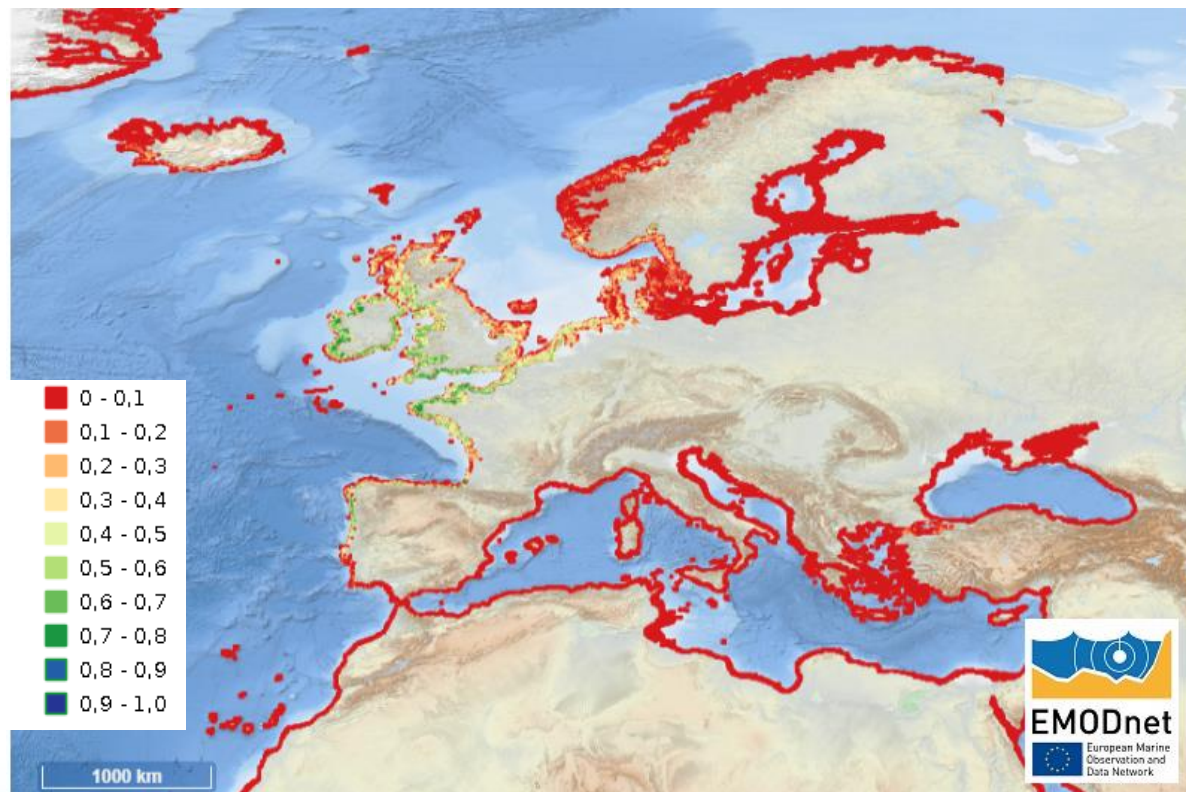
Data portal



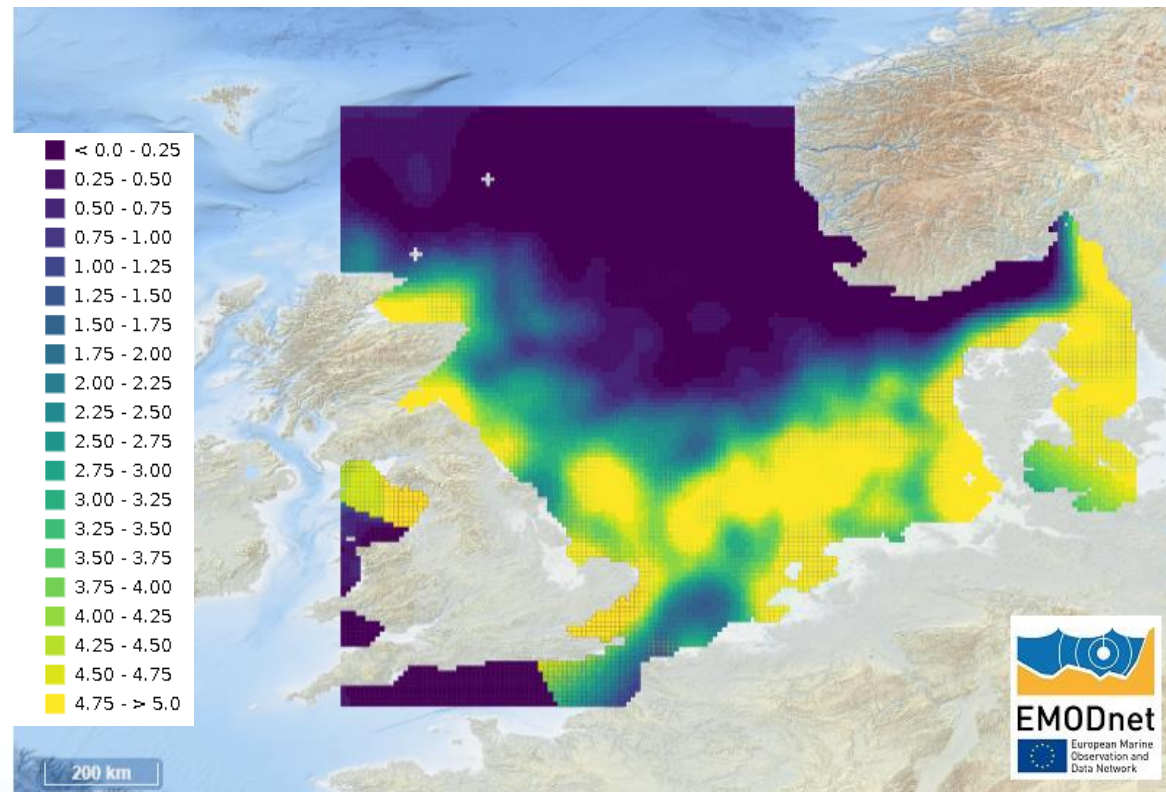
<https://emodnet.ec.europa.eu/geoviewer/>

Services: Data products

Habitat Suitability Maps for *Asparagopsis armata*, *Caulerpa Taxifolia*, *Sargassum muticum* and *Undaria pinnatifida*



Relative abundance by taxon - *Sprattus sprattus* (European sprat)

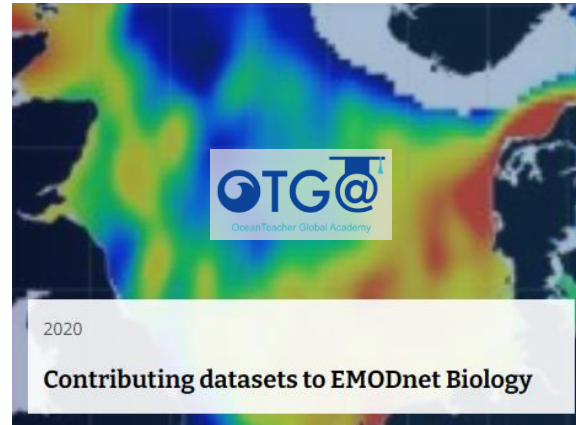


EMODnet Biology Data products catalogue



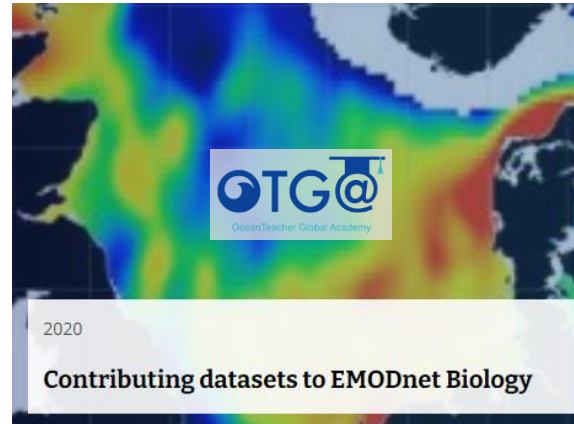
Initiatives

≡ Training, Networking and Outreach

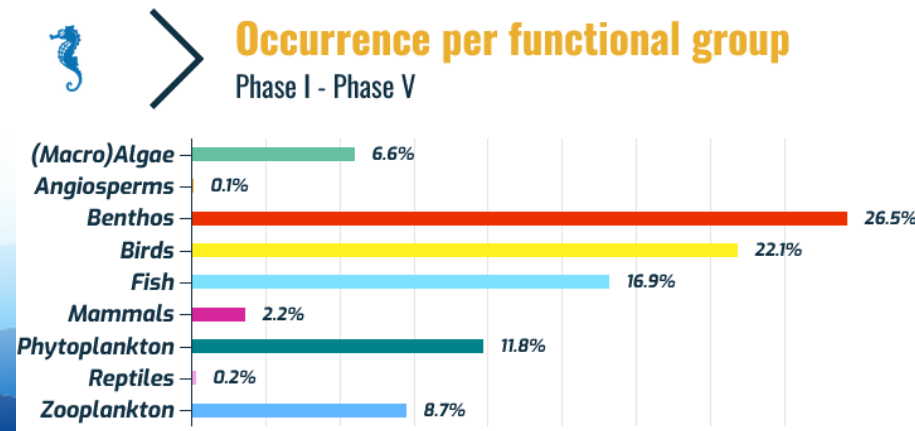


Initiatives

≡ Training, Networking and Outreach



• Data search and Gap analysis



EMODnet Biology (VLIZ team)

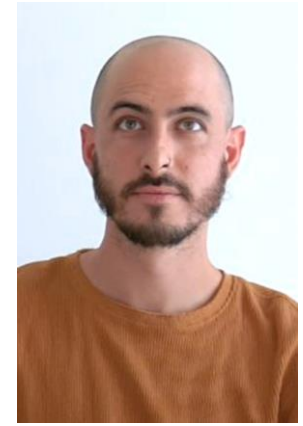
Joana Beja
(Coordinator)



Leen Vandepitte
(WP2 data
management
lead)



Ruben Perez
(WP2 co lead)



Lynn Delgat
(data manager)



Cyril Radermecker
(data manager)





DTO-BioFlow

Integration of biodiversity monitoring
data into the Digital Twin Ocean

THANKS!