

Development, validation and use of the EMODnet Chemistry data sets and climatologies

Trieste, Italy, 13 October 2022

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OGS





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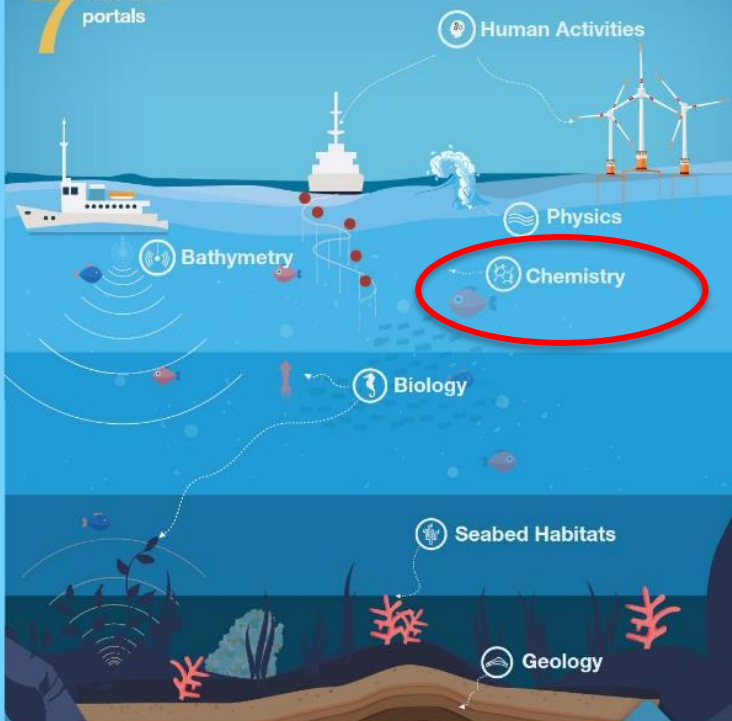
What is EMODnet?

EMODnet
European Marine
Observation and
Data Network

THE EUROPEAN MARINE OBSERVATION AND DATA NETWORK - AT A GLANCE

Over **150 organisations** assembling and making available
marine data, metadata & products

7 Thematic
portals

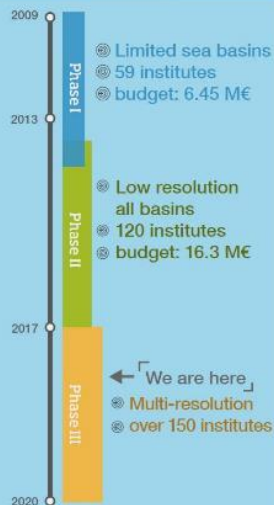


6 Sea-basin Checkpoints

ARCTIC ATLANTIC
BALTIC BLACK SEA
MED SEA NORTH SEA

Checking the fitness for purpose
of marine data in European sea
basins

EMODnet Timeline



1 Central Portal (www.emodnet.eu)

Gateway to all EMODnet data resources and tools allowing users
to retrieve data layers from multiple themes

1 Ingestion Portal

facilitating submission
of new datasets

EMODnet Secretariat



MARITIME AFFAIRS

- ☐ Long-term initiative (2009-...) by **DG MARE**
- ☐ to unlock marine data
- ☐ for different domains
- ☐ 2021-23 Integration and centralization



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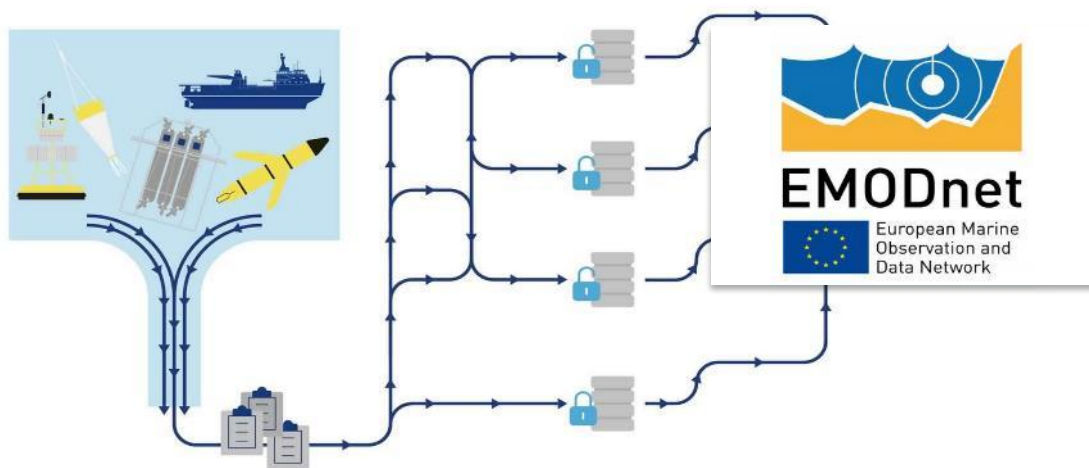
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EMODnet Chemistry: objectives



- Collection, Aggregation, Standardization, Quality check of EU marine water quality data relevant to the EU Marine Directives and to global climate change

Group of Parameters

Parameters

Marine Litter

Beach macrolitter, Seafloor macrolitter, Floating microlitter

Composition, Abundance, etc.

Ocean acidification

Acidity

pH, PCO_2 , etc.

Contaminants

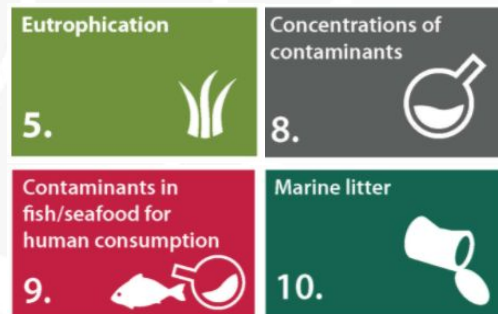
Antifoulants, Hydrocarbons, Heavy metals, Pesticides, Polychlorobiphenyls (PCBs), Radionuclides

Anthracene, Fluoranthene, Me, Cd, Pb, TBT, DDTs, etc.

Eutrophication

Nutrients, dissolved gases, etc.

N, P, Si, Chl-a, O_2 , C, etc.





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EMODnet Chemistry: network



- **66** European centers (environmental monitoring agencies, expert institutes and national oceanographic data centres)
- 5** International organizations
- 500+** data providers
- 32** countries



PAN-EUROPEAN INFRASTRUCTURE FOR
OCEAN & MARINE DATA MANAGEMENT





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EMODnet Chemistry: coverage

- Six major European sea regions are covered: Arctic Ocean (Norwegian Sea including Barents Sea), Baltic Sea, Northeast Atlantic Ocean (Celtic Sea, Iberian coast and Bay of Biscay, Macaronesia), North Sea, Black Sea, Mediterranean Sea.

Challenges

High heterogeneity and complexity of data.

In brief:

- 14 groups of variables (e.g. fertilisers, marine litter) containing multiple parameters, measurement and laboratory methods, instruments etc.;
- 3 matrices - water, sediment and biota;
- different temporal and spatial distributions of data;
- a great variety of EU organisations leading monitoring and research data;
- heterogeneous data access policies.



EMODnet Chemistry geographical coverage



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Overall approach:



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Data and metadata standards:

EMODnet Chemistry ---> SeaDataNet ---> ISO and OGC Standards ---> INSPIRE compliance

Station	daymonthyr	Longitude	Latitude	Depth(m)	TEMPR	CCSALR	C
C1	07/11/2006	13.718	45.701	0.5	17.581	37.555	
C1	07/11/2006	13.718	45.701	0.5	17.581	37.555	
C1	07/11/2006	13.718	45.701	0.5	17.581	37.555	
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C1	07/11/2006	13.718	45.701	0.5	17.581	37.555	



Adoption of ISO 19115 –19139 standard for describing

metadata (data sets, research cruises, monitoring networks, research projects => marine metadata profiles, schemas, schematron rules)



Controlled vocabularies for the marine domain (>65,000 terms in 82 lists), with international governance and web service



Standard data exchange formats : ODV ASCII and NetCDF (CF) fully supported by controlled vocabularies

- Maintenance and dissemination of standard QA-QC procedures, together with IOC/IODE and ICES



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New paradigm: Data as open possible and as closed as necessary

F

Findable



A

Accessible



I

Interoperable



R

Reusable



data

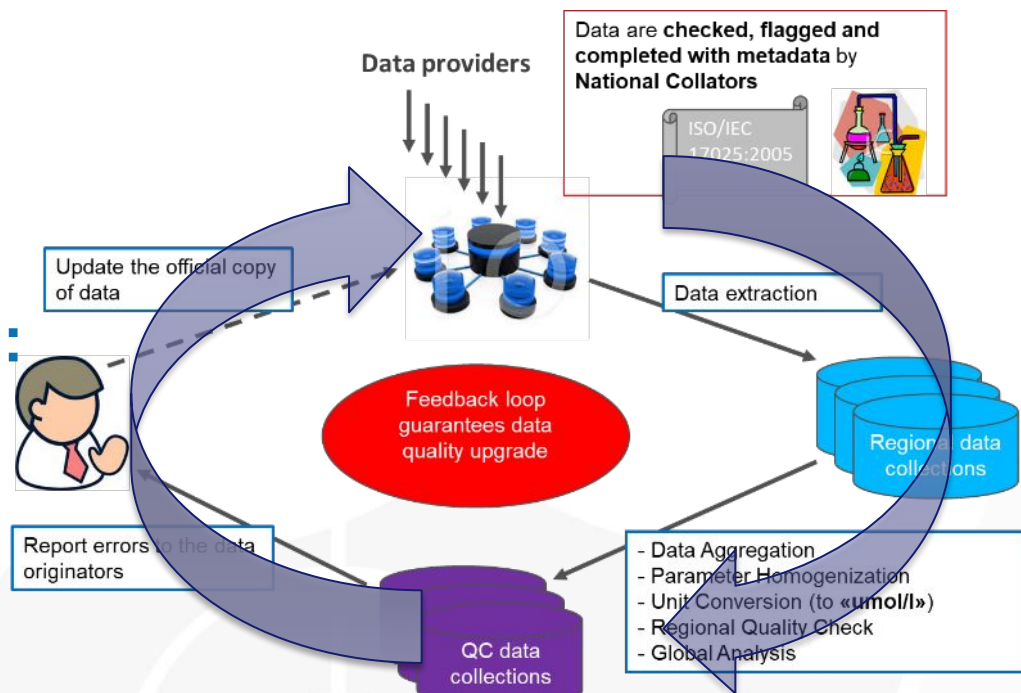


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High quality: From data to product

Quality Control system:



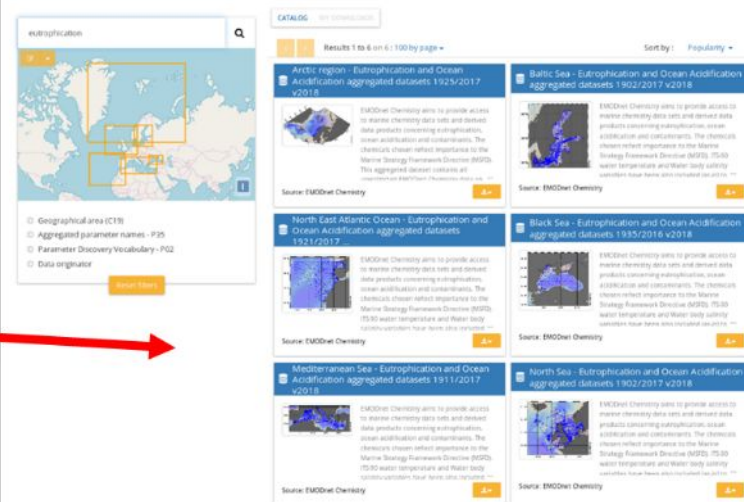
Data products:

Regional aggregated data
(unrestricted)

- **Aggregated data products delivered to EEA** (restricted and not after partners agreement)

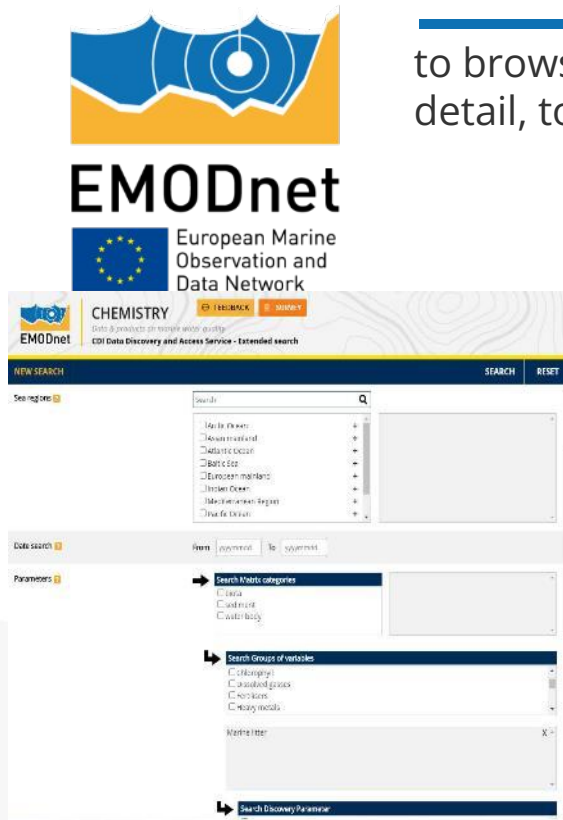
- **Aggregated data products** (unrestricted) available in products catalogue

Sextant Catalogue service

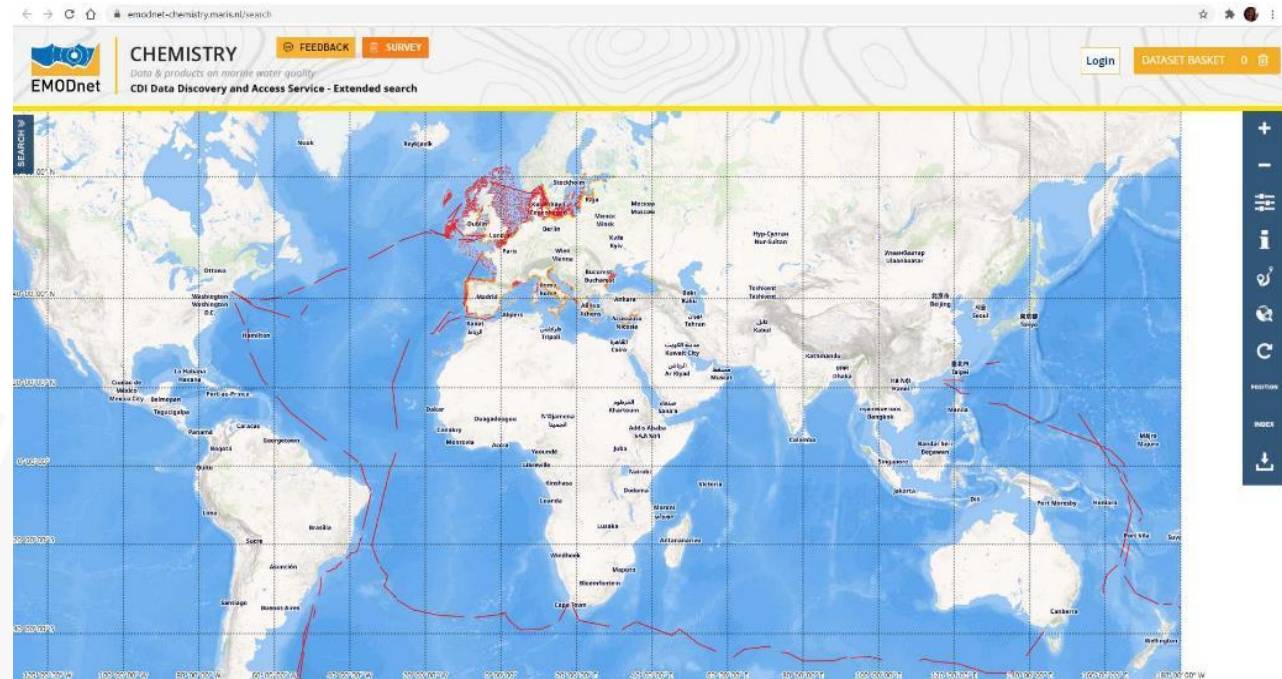


Data Discovery and access service

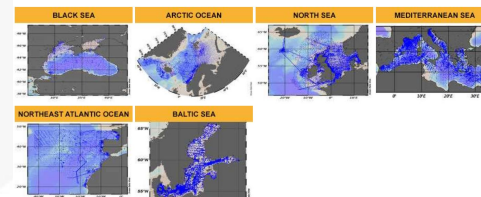
to browse measurement data sets, as delivered by the originators, in more detail, to narrow down queries and to download a selection of data sets.



Free and open access to **over 1 million data sets** in all EU sea basins

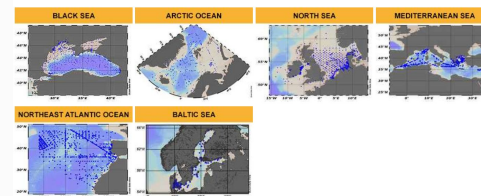


Eutrophication (nutrients, chlorophyll and oxygen) and Ocean Acidification (alkalinity and pH) in seawater



Available to download as ODV spreadsheet.

Contaminants in seawater, biota and sediment



Available to download as ODV spreadsheet.

Data collections

Data are harmonized, standardized, validated and made available as regional and global data collections.

Marine Litter



Available to download as EMODnet Beach litter spreadsheet and as EMODnet Sea-floor litter csv file.



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Data products: maps on eutrophication

Eutrophication Gridded climatologies

Spatially interpolated (DIVA) maps that display the depth variability over time of 5 variables:

Dissolved **i**norganic **n**itrogen (DIN),

Phosphate, **S**ilicate,

Chlorophyll - a,

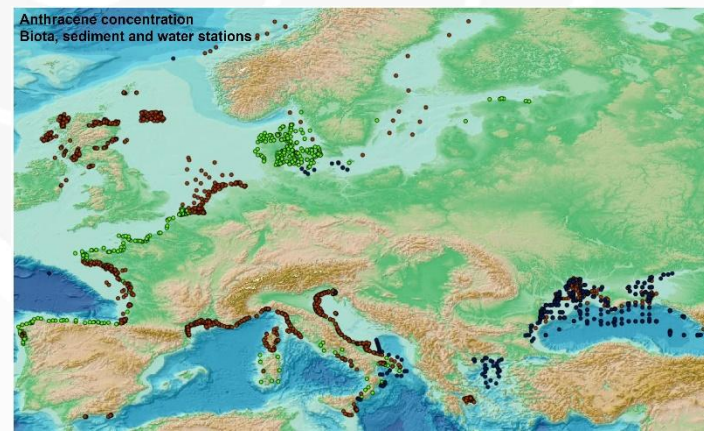
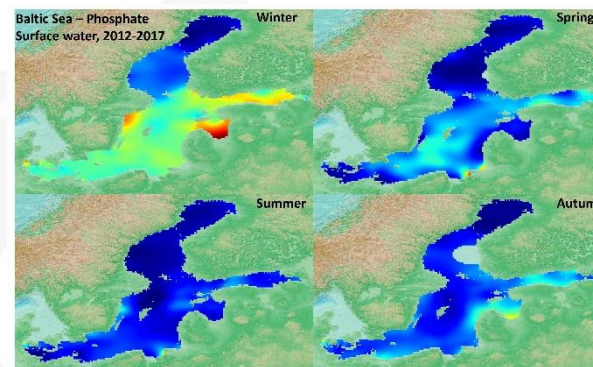
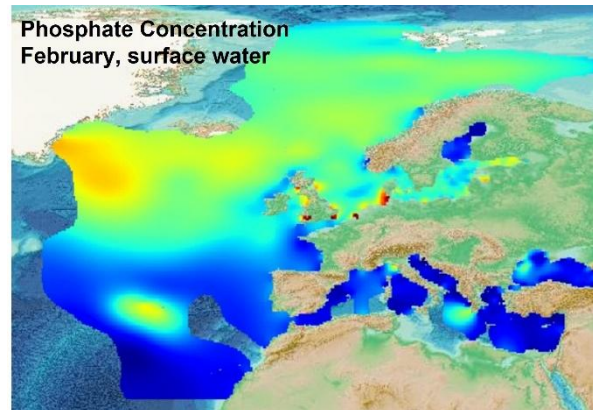
Dissolved **o**xxygen concentration.

Three resolutions:

All European seas, monthly

By sea **r**egion, seasonal, as 6-years running averages

Coastal areas, seasonal



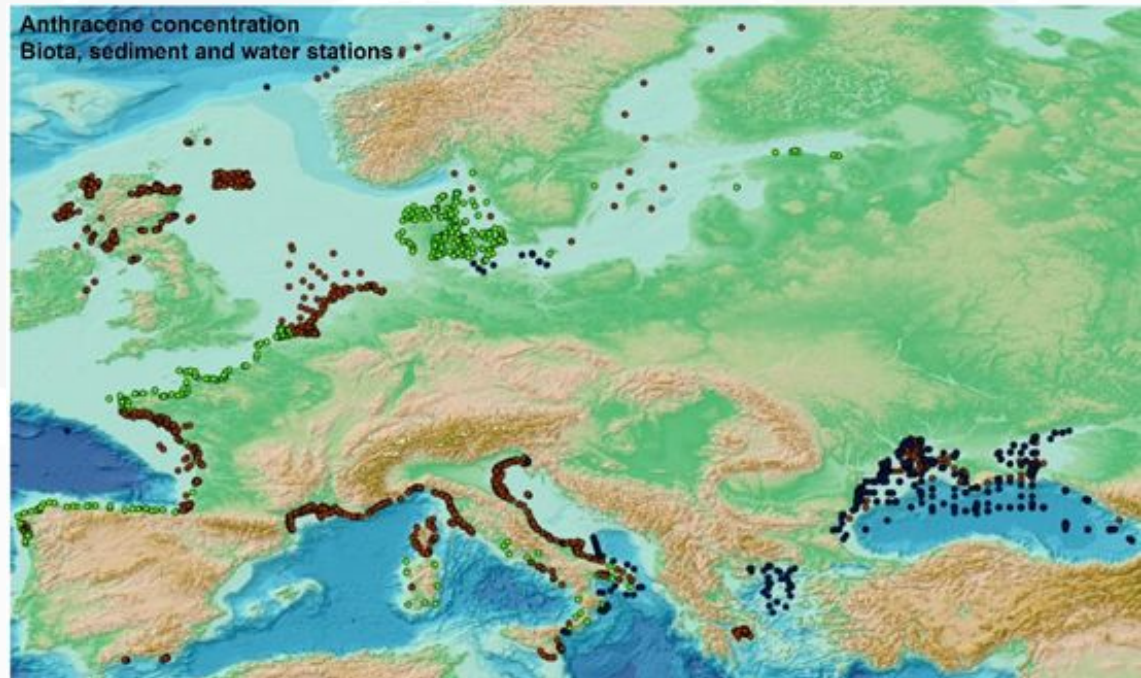
Maps on contaminants



- ❑ **Purpose:** useful for EU directives (eg. WFD, MSFD) and Regional Sea Conventions
- ❑ **But:** large heterogeneity of data (different matrices) for comparable visualization at EU scale
- ❑ **Focus** on set of specific contaminants (for Quality Control and mapping)

Types of maps:

- ❖ Below and above Limit of Quantification (LOQ)
- ❖ LOQ above or below 30% of EQSD thresholds
- ❖ Below or above EQSD thresholds
- ❖ Matrix distinction

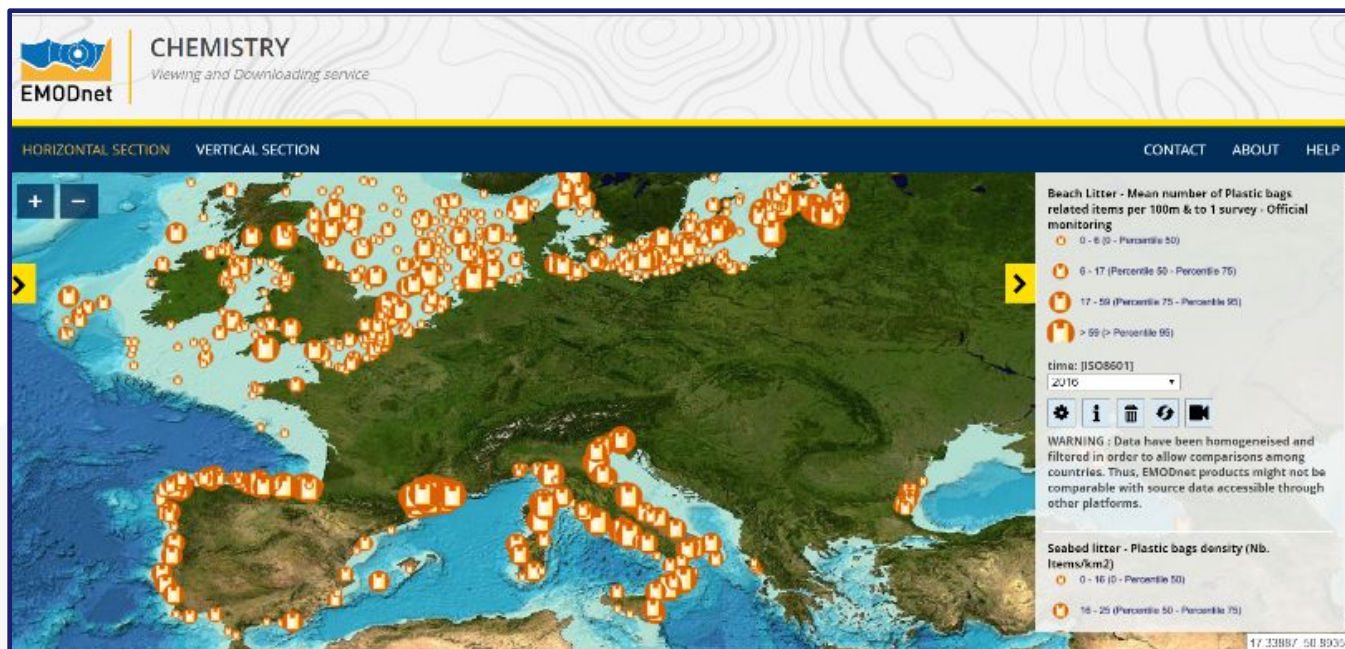


Marine Litter

Spatial distribution, composition and abundance



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Seafloor surveys by trawling distribution and used gears



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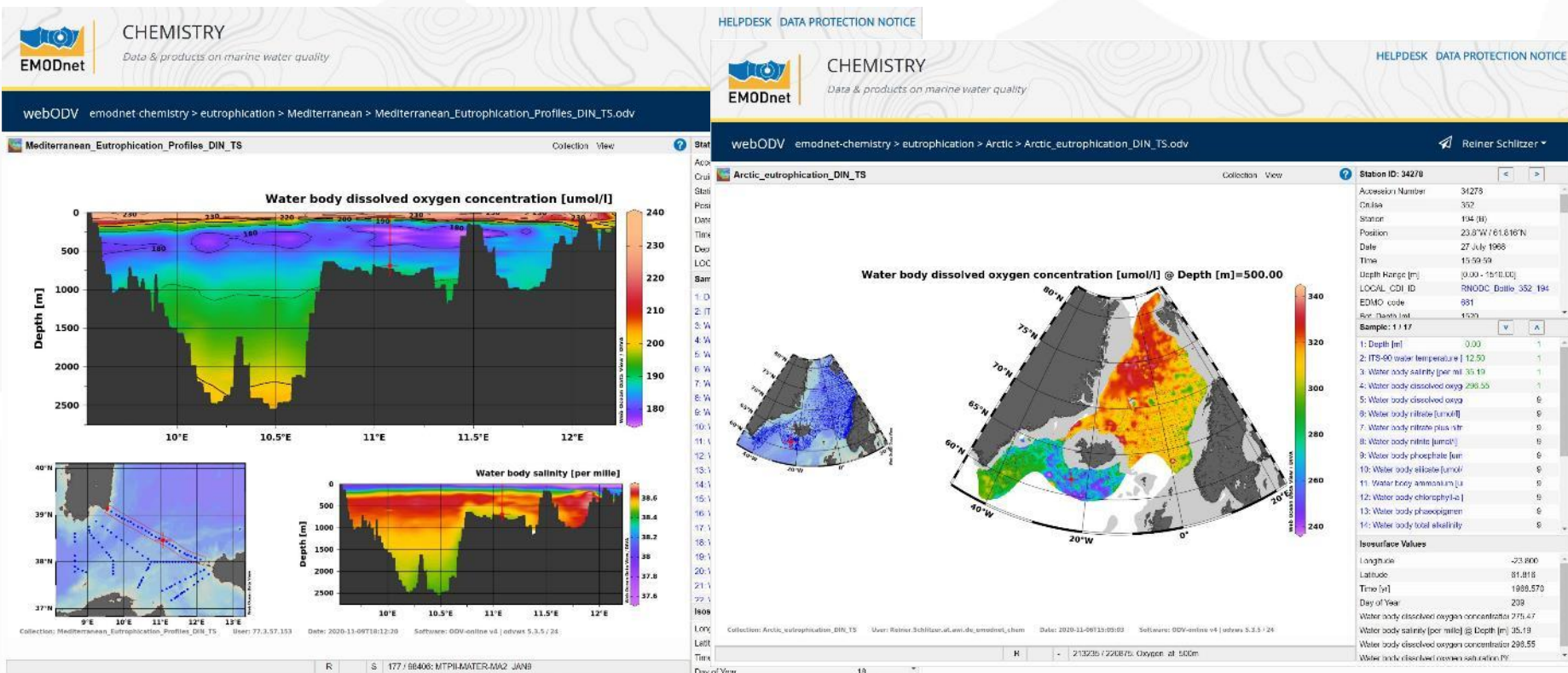
webODV data Explorer and Extractor

browse, sub-set, and export data sets into several formats.

perform in-depth scientific analyses,

prepare extracts and all kinds of visualisations

for scientific papers and analytical documents and presentations.





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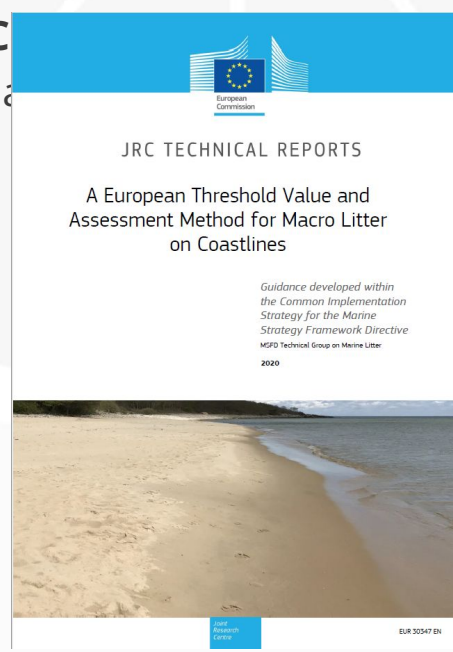


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Collaborations at EU level

MSFD Technical Groups

- EMODnet Chemistry is the **European data management hub** for many kinds of marine litter data, accepted by the MSFD community, Regional Sea Conventions, and Member States
- Regular delivery of the **pan-European beach litter database**, including all EU Member States monitoring data
- Launch of **floating micro-litter data collection** from all Member States in synergy with MSFD Technical Group of Marine Litter



Collaborations at EU level



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Copernicus
Marine Service



EuroGOOS

European Global Ocean
Observing System



- After the Memorandum of Understanding with EMODnet Physics and SeaDataNet, also **EMODnet Chemistry signed its MoU** to cooperate on in-situ biogeochemical marine data with CMEMS
- Cooperation areas covers **metadata and data exchange**, enhancement of **quality control** procedures, **development and distribution of joint products** for the benefit of respective users, teaming up in relevant projects and joined activities
- In July 2022, EMODnet and Euro-Argo ERIC signed a MoU to formalise ongoing dialogues and relationships.



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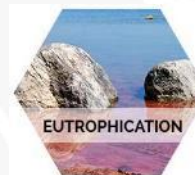


Interactions at global scale

Engagement in the implementation of the
UN 2030 Agenda for Sustainable Development



- Support to the **UNEP/MAP 2023 Mediterranean Quality Status Report**
- Participation in the implementation of the Global Ocean Oxygen Database and ATlas (**GO2DAT**)
- Contribution to the **Global Ocean Acidification** data portal (SDG14.3.1), and to the Metada and Vocabulary WGs
- Member of the **G20 TWG** for standardizing methods on marine plastics
- Member of the **UN Global Partnership on Marine Litter**





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EMODnet Chemistry portal

emodnet-chemistry.eu

CHEMISTRY
Data & products on marine water quality

CONTACT US SUBMIT DATA

ABOUT DATA ACCESS DATA PRODUCTS PROMOTION HELPDESK

EUTROPHICATION

OCEAN ACIDIFICATION

CONTAMINANTS

MARINE LITTER

The EMODnet Chemistry portal provides easy access to marine chemical data, standardised harmonized validated data collections and reliable data products, highly relevant to assess ecosystem status according to the Marine Strategy Framework Directive.

Explore and extract data

Map viewer

Latest news and events

Date	Event
12 October 2022	Data Harmonization Community of Practice, GPML: 10 October 2022
7 October 2022	GPML webinar "Advancing science-policy linkages to tackle plastic pollution": 6 October 2022
3 October 2022	European Researchers' Night 2022: 30 September 2022

MORE NEWS AND EVENTS

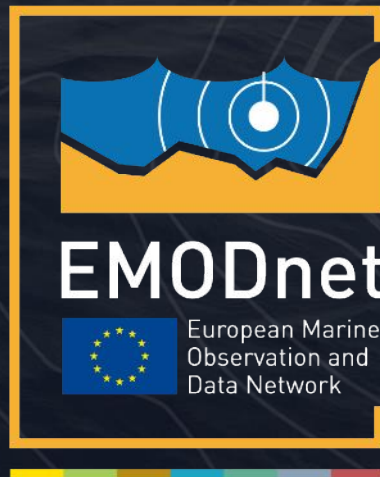
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FOLLOW US
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OGS and MARIS

info@emodnet-chemistry.eu

10/12/2022



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