EMODnet

European Marine Observation and Data Network

Data and Data Product portfolio

March 2020

This document has been produced and designed by the EMODnet Secretariat and the Flanders Marine Institute (VLIZ), with special contribution from Nathalie Tonné (EMODnet Secretariat) and Paula Oset García (VLIZ).

All the maps displayed in this portfolio were obtained through the web services provided by the EMODnet thematic portals. Where data and data products are produced by, or in collaboration with, other organisations and initiatives the logos are shown.

The EMODnet portfolio aims to provide a clear and concise overview of the data and data products offered by the seven EMODnet thematic portals. It is a living document that will be updated regularly.

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Acknowledgement: EMODnet Secretariat and Flanders Marine Institute (2020). EMODnet Data and data product portfolio. Available at http://www.emodnet.eu/data-portfolio

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BATHYMETRY

Understanding the topography of the European seas

Parameters and data formats

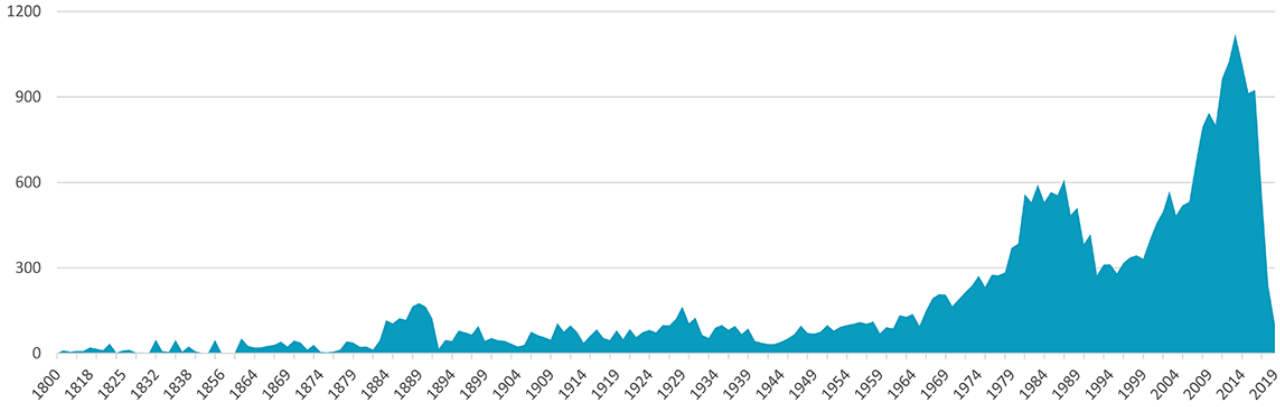
L3

Parameter category
Bathymetry and elevation

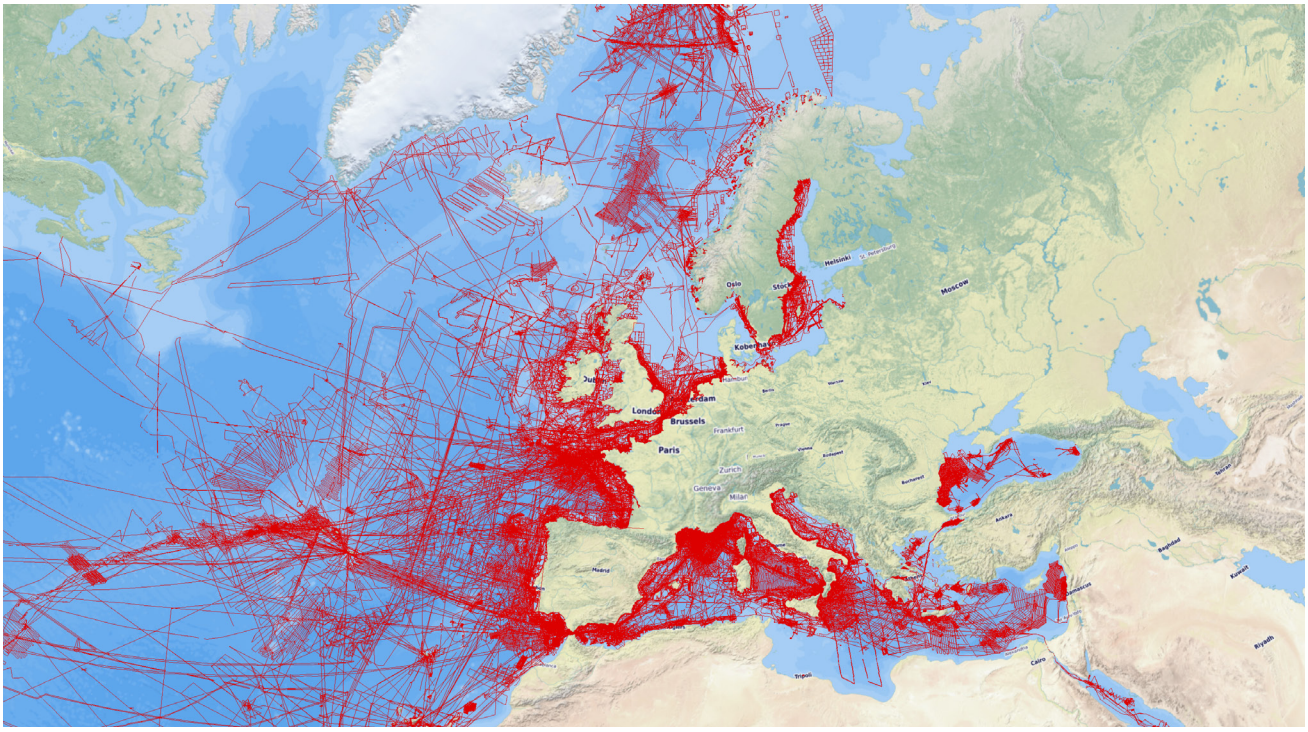
Data formats
BAG, XYZ, SeaDataNet ODV, GeoTiff, NetCDF

Coverage and resolution

Temporal coverage: number of datasets per year (1800-2019).

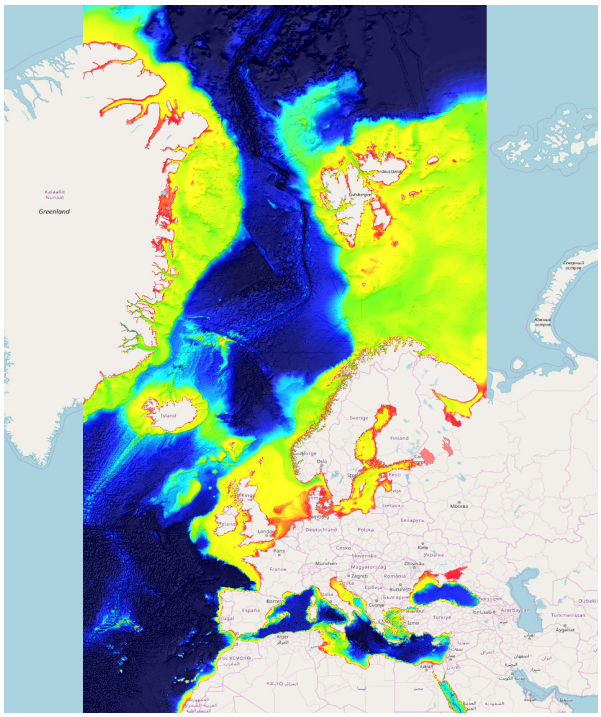


Spatial coverage



Map indicating the tracks of bathymetric surveys from which datasets have been selected and processed as input for building the overall EMODnet Digital Terrain Model (DTM). The metadata and survey data are gathered from European originators: national hydrographic services, research institutes, and companies. Their coverage goes beyond European waters as scientists collect bathymetry on a global scale.

Digital Terrain Model (DTM)

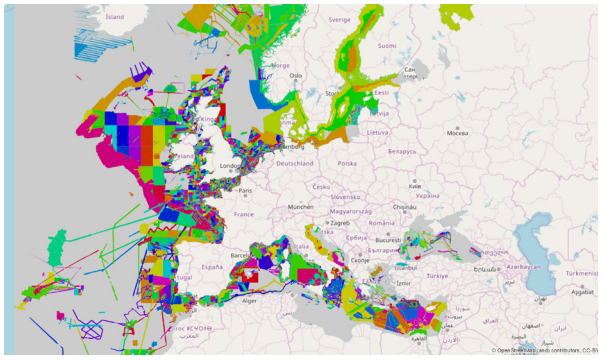


L5

EMODnet Bathymetry Digital Terrain Model (DTM) - version 2018.

- Temporal coverage: 1816 – 2018
- Spatial resolution: DTM grid 1/16 x 1/16 arc minute (circa 115 x 115 m)
- Available to download as: ESRI ASCII, EMODnet CSV, RGB GeoTIFF, NetCDF (CF), SD and XYZ
- Web services: WMS, WMTS, WFS, and WCS
- Based upon circa 9.400 bathymetric surveys, composite DTMs, and Satellite Derived Bathymetry datasets

Source references



L4

Layer containing the data sources used in the construction of the DTM.

Contains direct links to the CDI Data Discovery and Access service for survey datasets and the Sextant Catalogue service for composite DTMs and Satellite Derived Bathymetry data products. These services give metadata, and the CDI Service also facilitates requesting access to survey datasets.

- Web services: WMS, WFS

Depth contours

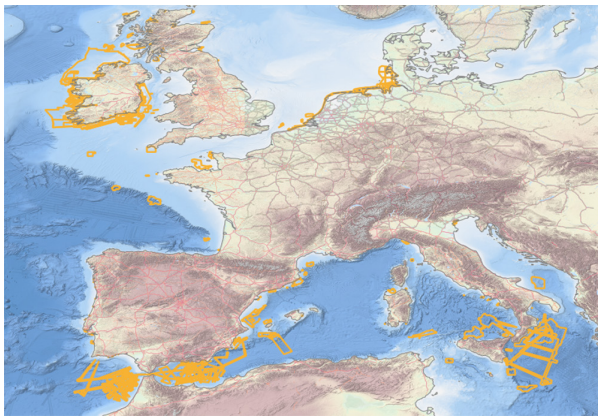
L5

Contours based on the average depth. The contours are shown for the following depths: 50, 100, 200, 500, 1000, 2000, and 5000 meter.

- Web services: WMS, WFS

Data products

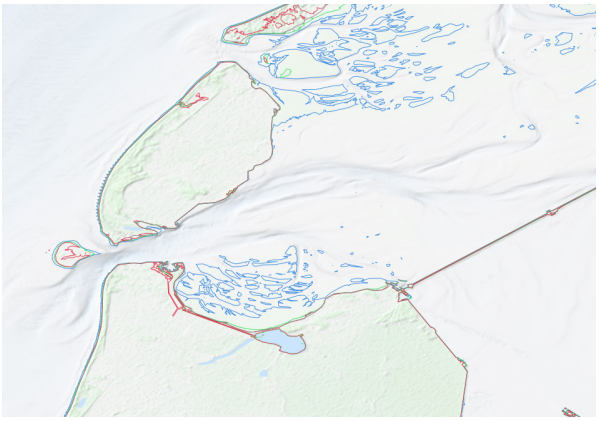
High-resolution DTMs



L5

Layer in the Bathymetry Viewing service containing circa 190 High Resolution DTMs that have been generated by data providers. The resolution of HR-DTMs varies between 1/32 and 1/512 arc minutes, depending on local data policy of data providers. The HR-DTM layer allows to zoom in deeper than the common DTM layer and HR-DTMs can be interrogated for metadata and downloaded as data files.

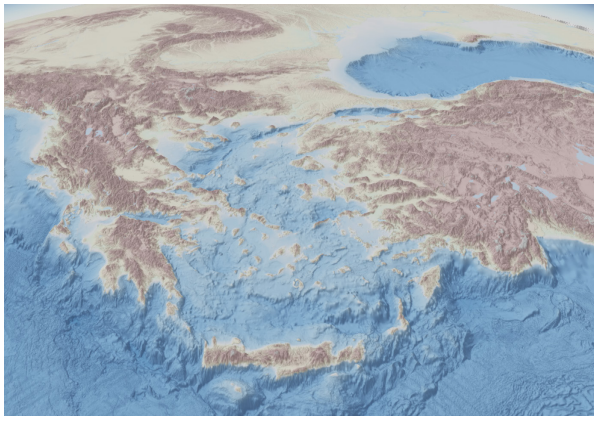
Best-estimate European digital coastlines



L5

Layer in the Bathymetry Viewing service containing best-estimate coastlines for the European seas at LAT (Lowest Astronomical Tide), MSL (Mean-Sea-Level), and MHW (Mean-High-Water). These were determined from satellite data (typically Sentinel-2 and Landsat-8) in combination with the Global Tide Surge Model (GTSM). The level of detail is bound to the resolution of the satellite sensor (e.g. 10m for Sentinel-2). These satellite derived coastlines can also be downloaded with documentation from the EMODnet Bathymetry portal.

3D-viewing of the EMODnet DTM

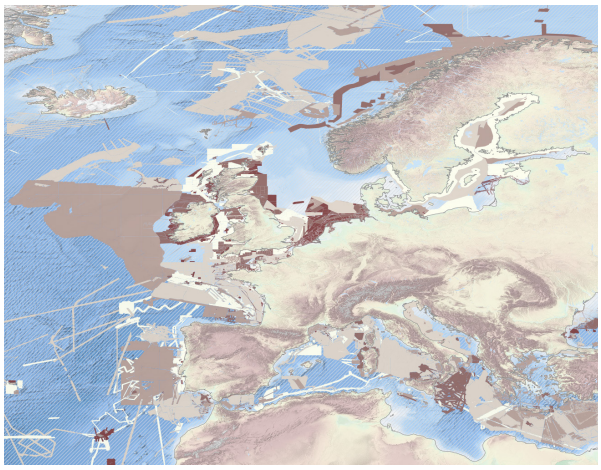


L5

Extra functionality has been added to the Bathymetry Viewing service for 3D visualiation of the latest EMODnet DTM.

Quality Index layer

L4



A new layer in the Bathymetry Viewing service, linked to the Source References layer. It gives maps of the used survey datasets by:

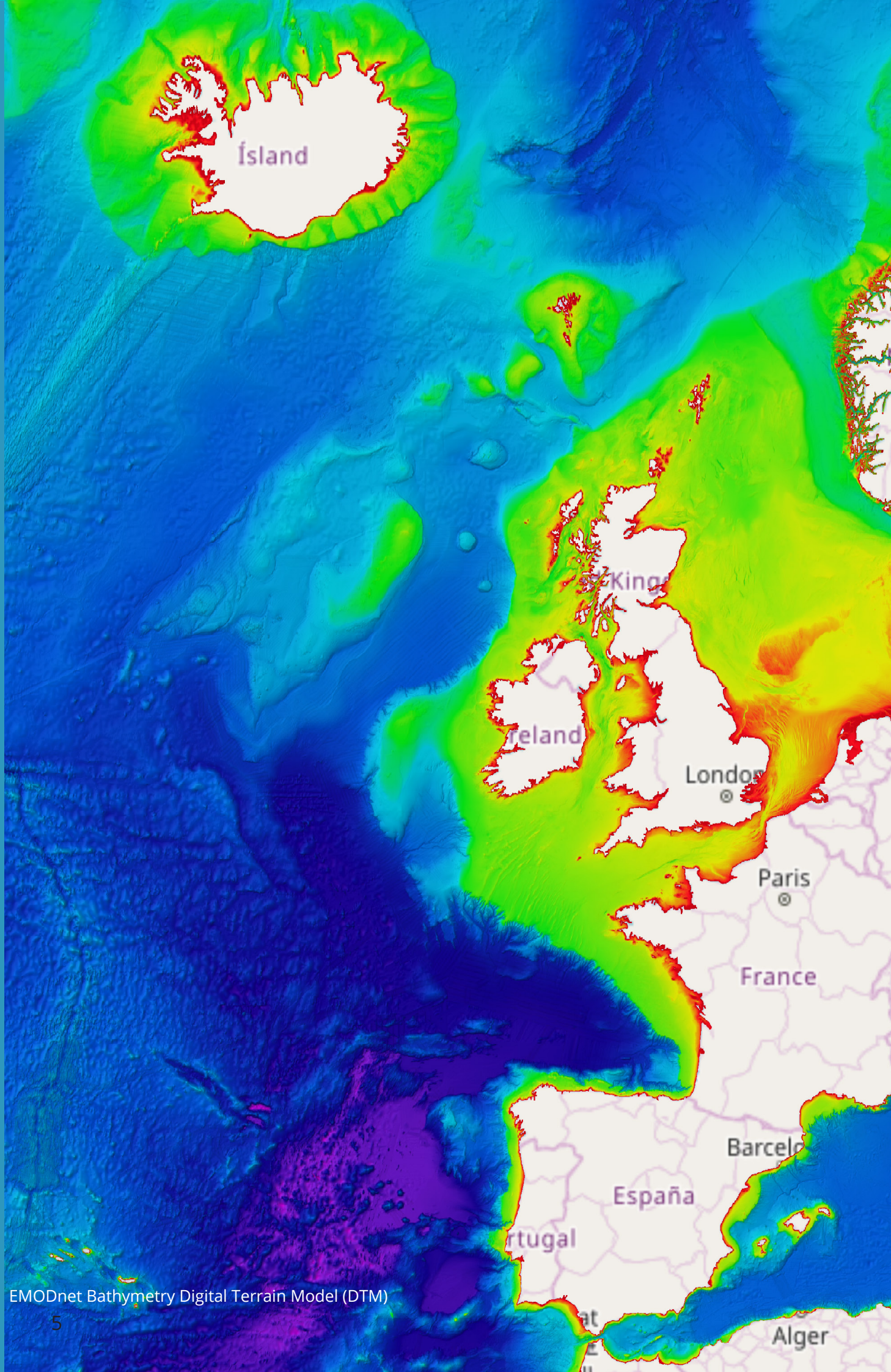
- QI_Age: provides an indication of how old the survey of DTM is (4 options)
- QI_Purpose: provides an indication of the purpose of the survey (4 options)
- QI_Vertical: an indication of the vertical accuracy (5 options)
- QI_Horizontal: an indication of the horizontal accuracy (4 options)
- Combined quality indicator

Inventory of official coastlines and baselines

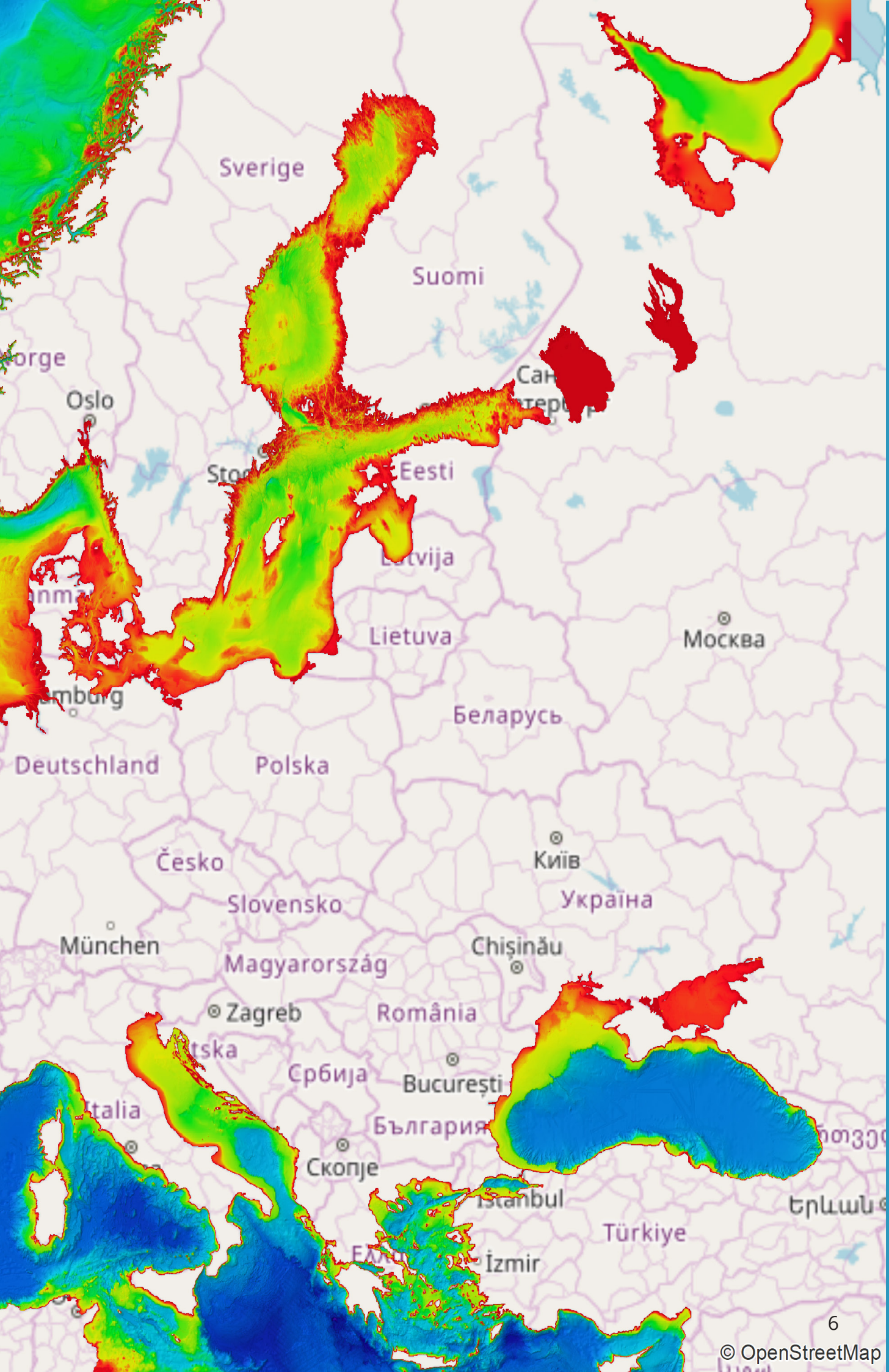
L5

An inventory and report of baseline and coastline data as collected from 21 national authorities in Europe. It describes the information available per country, the resolution, the source of the data and the institute providing/hosting the data. This can be downloaded from the EMODnet Bathymetry portal together with shapefiles of the baselines and coastlines.

More information on the data and data products of EMODnet Bathymetry can be found scanning this QR code, or at www.emodnet-bathymetry.eu.



EMODnet Bathymetry Digital Terrain Model (DTM)



EMODnet | BIOLOGY
Dive into data on Europe's marine life

Parameters and data formats

L3

Parameter groups

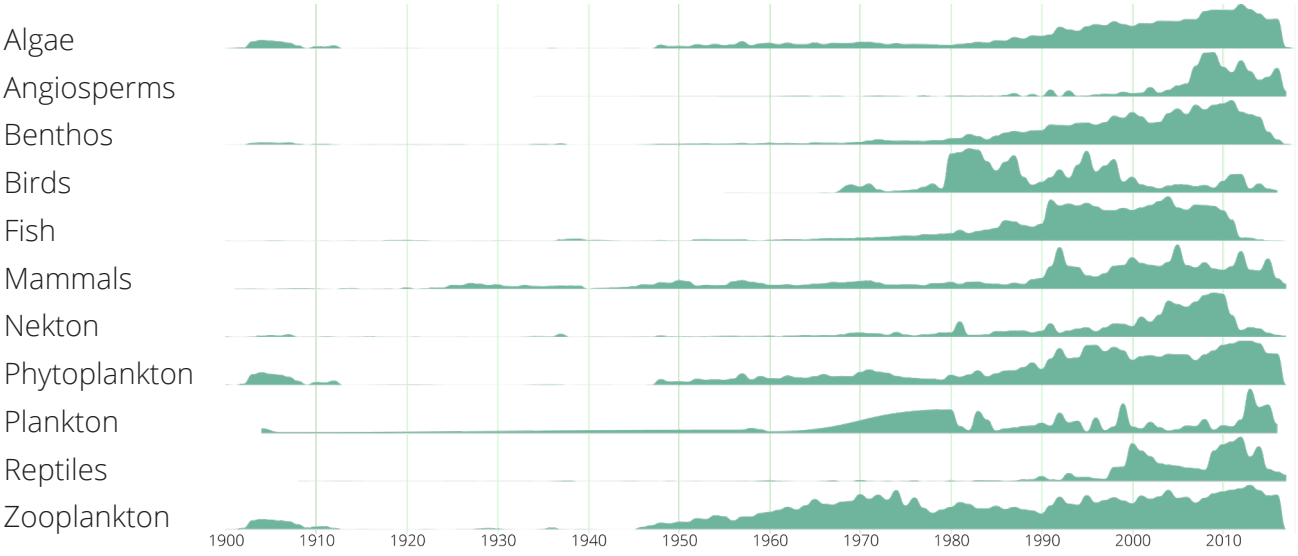
- Species occurrences: location, date, depth
- Biological measurements: e.g. abundance, biomass
- Sampling information and methodology
- Specimen characteristics: e.g. length, lifestage, sex
- Abiotic parameters: e.g. sediment type, temperature, salinity

Data formats

Darwin Core Archive (DwC): occurrence data and measurements can be downloaded as csv, and accessed via WFS web services.

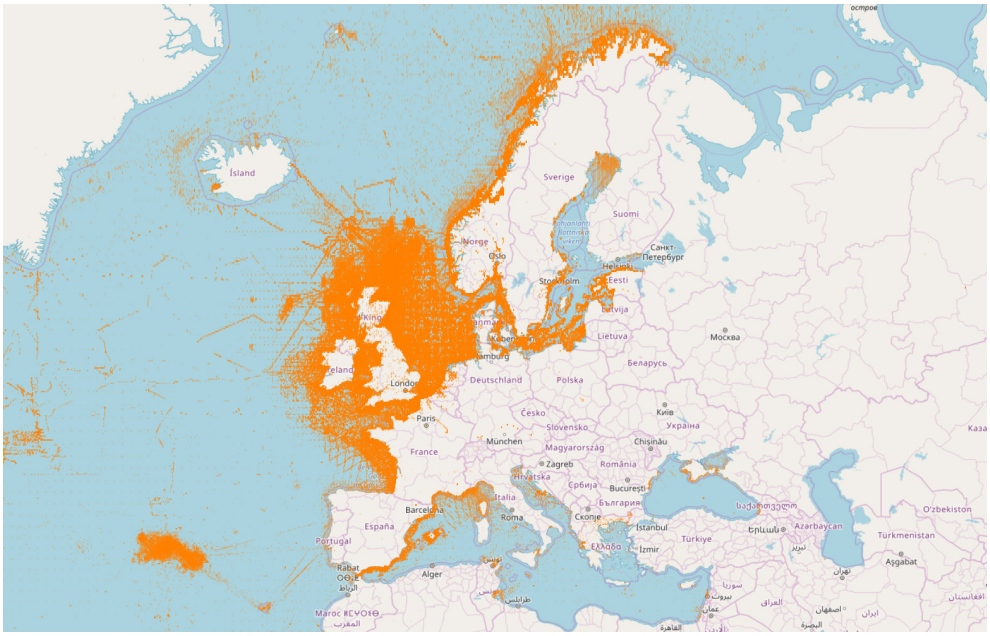
Coverage and resolution

Temporal coverage per functional group: time series of the relative number of records per functional group from 1900 to present. EMODnet Biology/EurOBIS offers species occurrence data that date back to 1526.

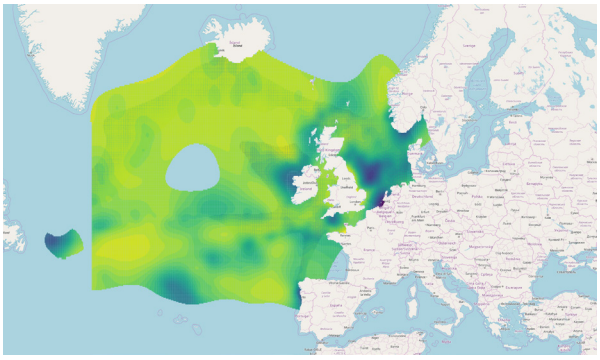


Spatial coverage

Map showing the location of the distribution records available in EMODnet Biology/EurOBIS to date: currently 1407 datasets representing 38.340.665 occurrence records, from 87.807 species names.



Phytoplankton biomass and diversity

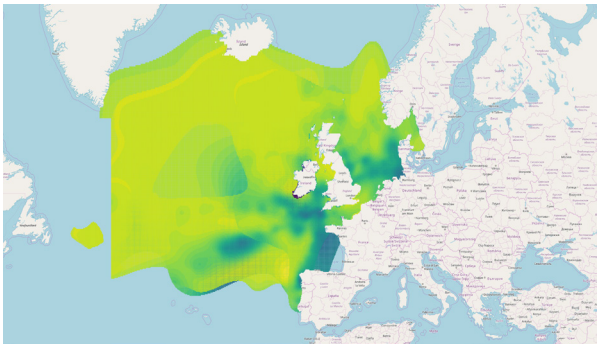


Gridded maps of average abundance of different species or species groups.

- Temporal coverage: 1958 – 2016
- Temporal resolution: seasonal, annual or multi-annual
- Spatial resolution: 0.1 degree
- Taxonomic coverage: phytoplankton species and functional groups
- Web services: WMS, WFS

Example map: diatoms abundance.

Zooplankton biomass and diversity

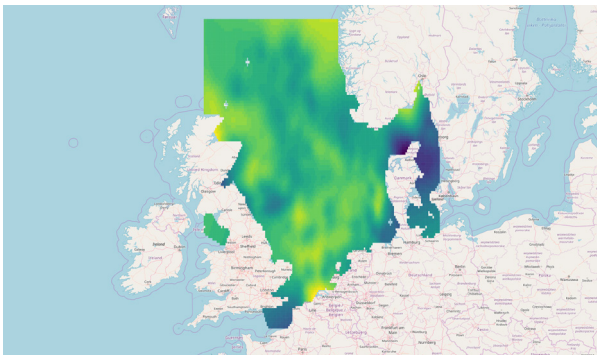


Gridded abundance maps of the six most abundant copepod species collected with the Continuous Plankton Recorder (CPR).

- Temporal coverage: 1958 – 2016
- Temporal resolution: 10-year and 1-year averages
- Taxonomic coverage: *Calanus h.*, *Calanus f.*, *Acartia* spp., *Oithona s.*, *Temora l.* , *Metridia l.*
- Temporal resolution: seasonal
- Spatial resolution: 0.1 degree
- Web services: WMS, WFS

Example map: *Calanus helgolandicus.*

Fish abundance and distribution

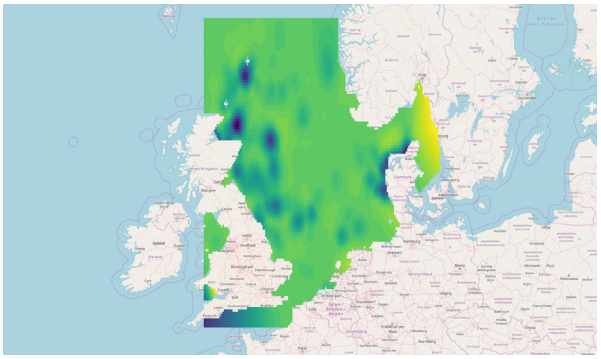


Gridded maps of average abundance of different species or species groups.

- Temporal coverage: 1980 – 2013
- Temporal resolution: annual or multi-annual
- Spatial resolution: 0.1 degree
- Taxonomic coverage: *Gadus morhua, Clupea harengus, Engraulis encrasicolus, Scomber scombrus, Sprattus sprattus*
- Web services: WMS, WFS

Example map: *Gadus morhua.*

Marine turtles, birds, mammals abundance and distribution



Gridded maps of average abundance of different species or species groups.

- Temporal coverage: 1998 – 1999, 1995 – 1997, and 1980 – 1989
- Temporal resolution: annual or multi-annual
- Spatial resolution: 0.1 degree
- Taxonomic coverage: seabirds, reptiles, marine mammals
- Web services: WMS, WFS

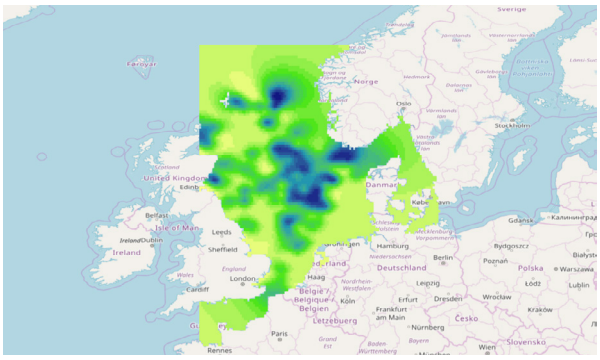
Example map: *Phocoena phocoena.*

EMODnet | BIOLOGY

Dive into data on Europe's marine life

Benthic invertebrate abundance and distribution

L5



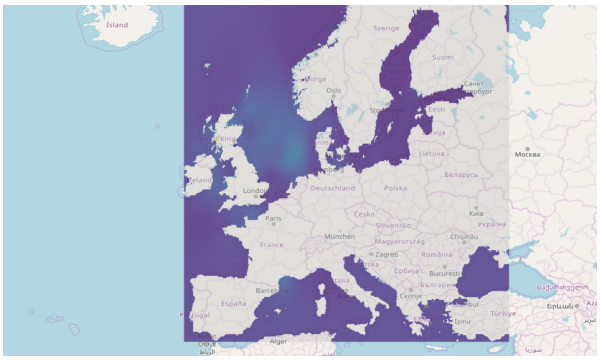
Gridded maps of average abundance of different species or species groups.

- Temporal coverage: 1986 – 2013
- Temporal resolution: annual or multi-annual
- Spatial resolution: 0.1 degree
- Taxonomic coverage: *Abra prismatica, Amphiura filiformis, Bathyporeia elegans, Chaetozo ne setosa*, etc.
- Web services: WMS, WFS

Example: map *Abra prismatica.*

Macrobenthos functional trait based analysis

L6

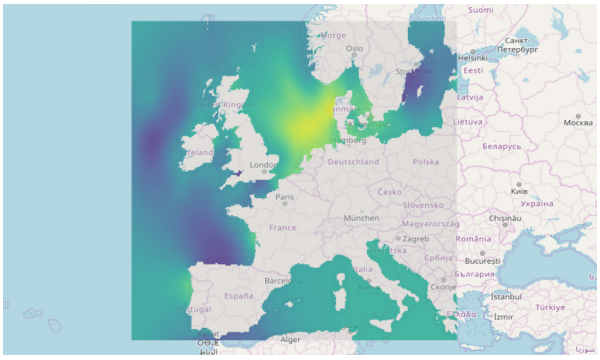


This series of products displays the main functional types of seafloor macroinvertebrates derived from a multivariate analysis of 13 life history traits defined on 617 taxa (illustrative map: vulnerability to physical damage). Other maps display scores for each of the 60 trait modalities aggregated over absolute and relative organism densities averaged per spatial location.

- Temporal resolution: 1 year – several decades
- Spatial resolution: 0.1 degree
- Taxonomic coverage: macrozoobenthos

Fish functional trait based analysis

L6



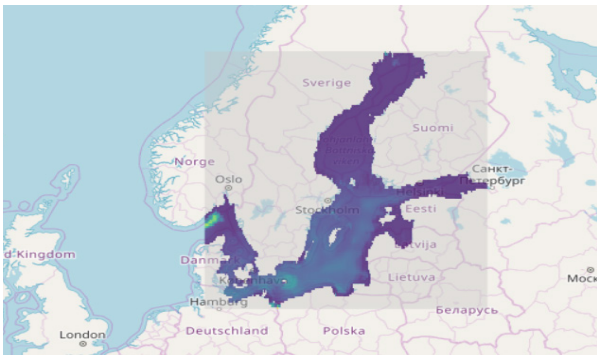
This series of products displays the main functional types and four main living modes of benthic and bentho-pelagic fish species derived from a multivariate analysis of eight life history traits defined on 161 taxa (illustrative map: relative abundance of small pelagic fish). Other maps display scores for each of the trait modalities aggregated over absolute and relative densities averaged per spatial location.

- Temporal resolution: decadal (2000 -)
- Spatial resolution: 0.1 degree
- Taxonomic coverage: benthic and bentho-pelagic fish

More information on the data and data products of EMODnet Biology can be found scanning this QR code, or at www.emodnet-biology.eu.

Neural network modelling of Baltic zooplankton abundances

L6



These Baltic Sea products are gridded data products for 40 zooplankton species using a neural network modelling approach. The neural network uses dissolved oxygen, salinity, temperature, chlorophyll concentration, bathymetry and the distance from coast as input. (illustrative map: *Acartia longiremis* in 2007).

- Temporal resolution: 2007, 2008, 2010, 2011, 2012 and 2013
- Spatial resolution: 0.1 degree
- Taxonomic coverage: zooplankton

Other products

- Thermal niche maps: Summaries of the environmental temperatures at which European marine species have been observed to occur, aggregated and gridded to give average thermal affinities of assemblages of major functional groups (benthos, zooplankton, macroalgae, etc.) at a 0.5 degree resolution. These are compared against current and future temperature projections under different 'IPCC scenarios'.
- Time series analysis: Workflows using phyto- and zooplankton timeseries data to show the evolution over time of depth-averaged abundance of major groups of species, as well as the most frequent species. An interactive dynamic multivariate representation of the communities shows the long-term trend as a shift in yearly and seasonal fluctuation.
- Invasive marine species: Maps showing the occurrences of marine invasive species in European marine harbours based on EurOBIS data, in order to identify *same risk areas*.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CHEMISTRY

Data and products on marine water quality

Parameters and data formats

L3

Parameter groups

- Acidity
- Antifoulants
- Chlorophyll
- Dissolved gasses
- Fertilisers
- Heavy metals
- Hydrocarbons
- Marine litter
- Organic matter
- Pesticides and biocides
- Polychlorinated biphenyls
- Radionuclides
- Silicates

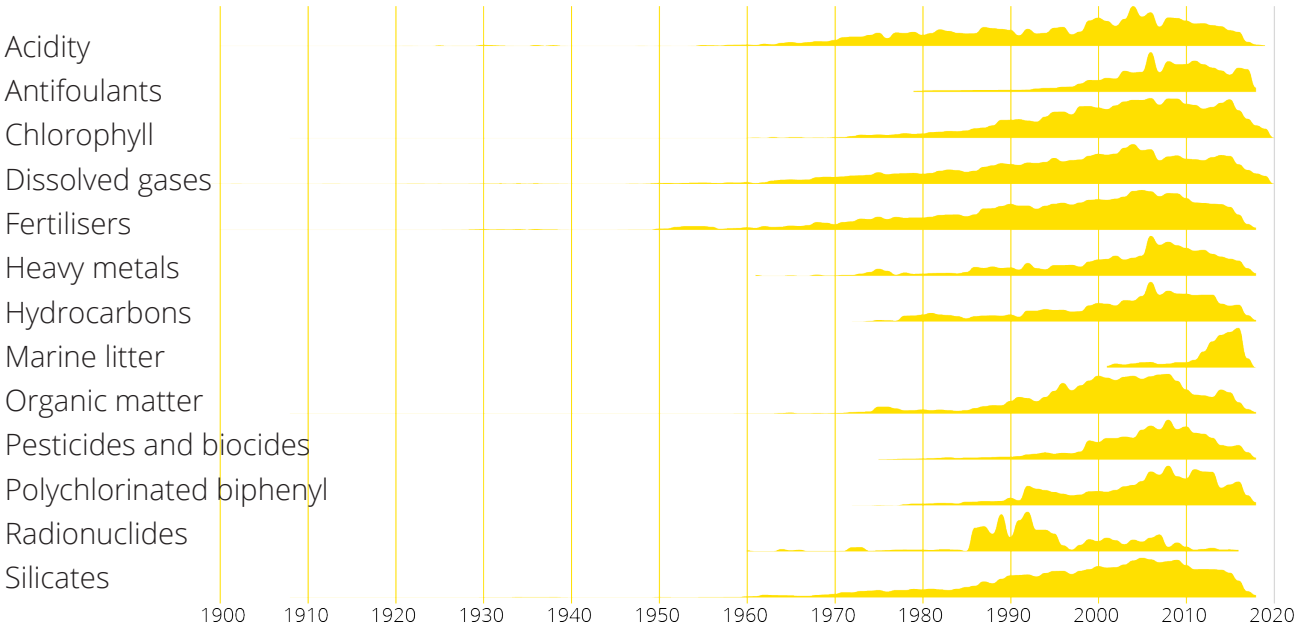
The parameters might have a depth and time component.

Data formats

ODV4 ASCII, MedAtlas ASCII, NetCDF (CF)

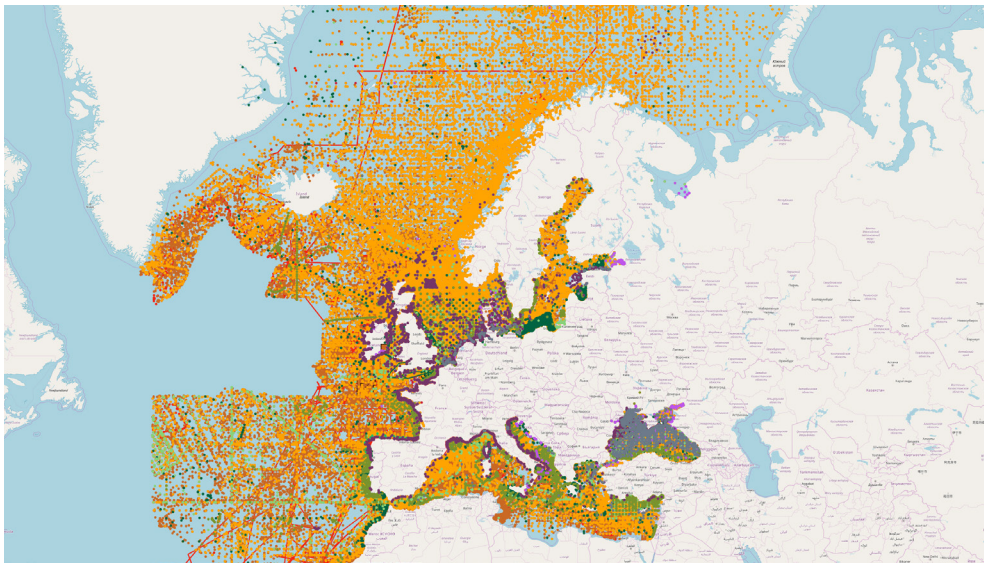
Coverage and resolution

Temporal coverage: time series of the relative number of datasets per parameter group.



Spatial coverage

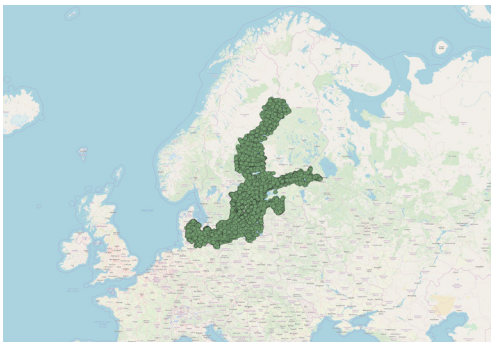
Distribution of the available datasets (CDIs) in EMODnet Chemistry per parameter group.



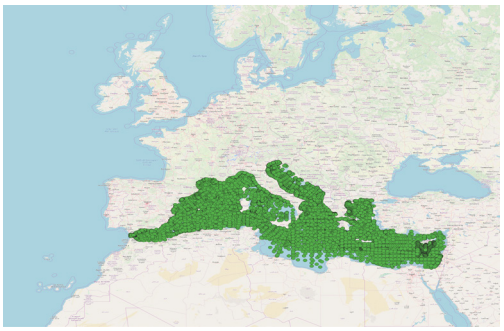
Eutrophication, Ocean acidification aggregated datasets v2018

L4

Standardised, harmonised and validated data collections concerning eutrophication (nutrients, chlorophyll and oxygen) and ocean acidification (Alkalinity and pH) available per sea region (Mediterranean Sea, Black Sea, Arctic Region, Baltic Sea, North Sea and North East Atlantic Ocean). Available to download as ODV spreadsheet format that can be easily visualised with ODV Software (more information can be found at: https://www.seadatanet.org/Software/ODV).



Baltic Sea

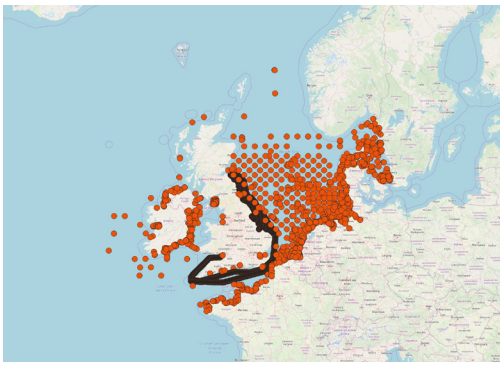


Mediterranean Sea

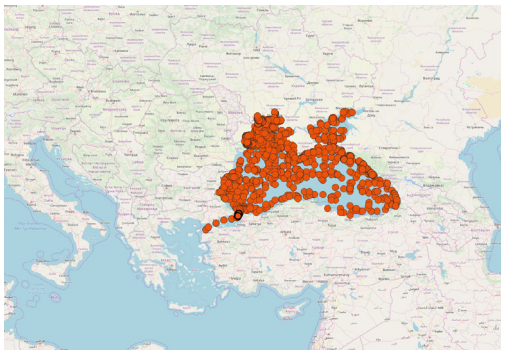
Contaminants aggregated datasets v2018

L4

Standardised, harmonised and validated data collections concerning contaminants (in seawater, biota and sediment) available per sea region (Mediterranean Sea, Black Sea, Arctic Region, Baltic Sea, North Sea and North East Atlantic Ocean). Available to download as ODV spreadsheet format that can be easily visualised with ODV Software (more information can be found at: http://www.seadatanet.org/Standards-Software/Software/ODV).



North Sea

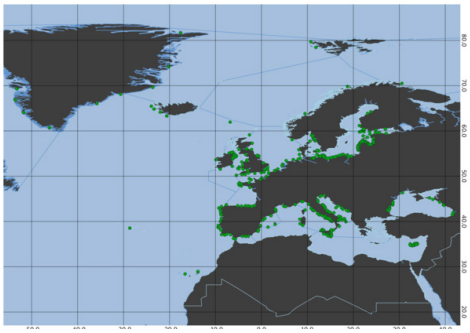


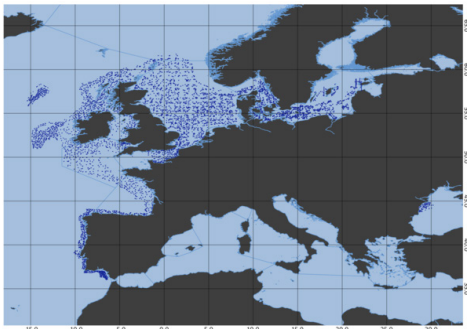
Black Sea

Marine litter aggregated datasets v2019

L4

Standardised and harmonised data collections concerning beach and seafloor litter. The harmonised datasets for beach litter can be downloaded as EMODnet Beach litter data format Version 1.0, which is a spreadsheet file composed of 4 sheets: beach metadata, survey metadata, animals and litter. Regarding seafloor litter, the collection can be downloaded as EMODnet Sea-floor litter data format Version 1.0, which is a csv file (tab separated values).

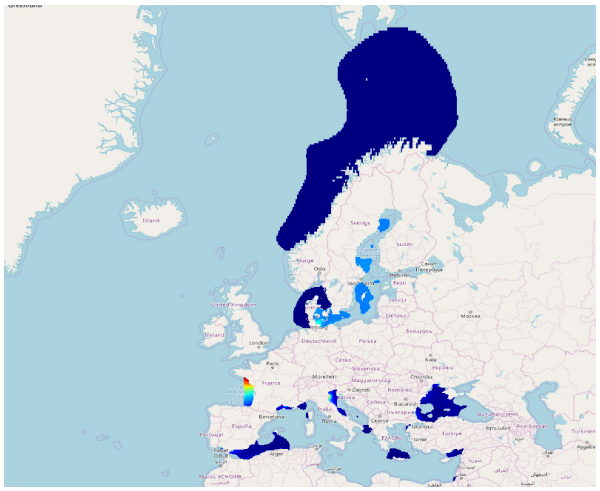




CHEMISTRY

Data and products on marine water quality

Chlorophyll-a

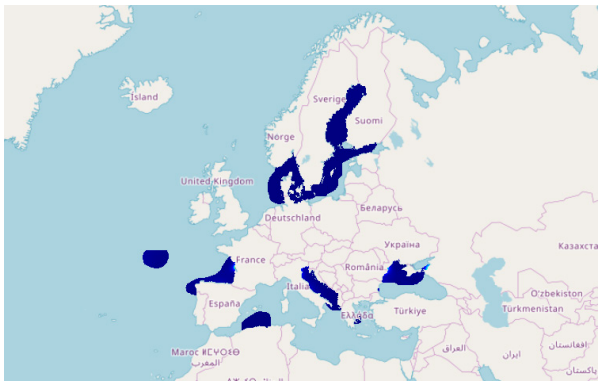


L5

Regional gridded maps of water body chlorophyll-a available as 6-year analysis and combined for all EU basins.

- Temporal coverage: 1960 – 2017*
- Temporal resolution: seasonal
- Spatial resolution: 0.1 degree
- Depth coverage: -1000 – 0 m
- Unit: mg/m³
- Available to download as: NetCDF
- Web services: WMS, OPenDAP

Dissolved inorganic nitrogen (DIN)

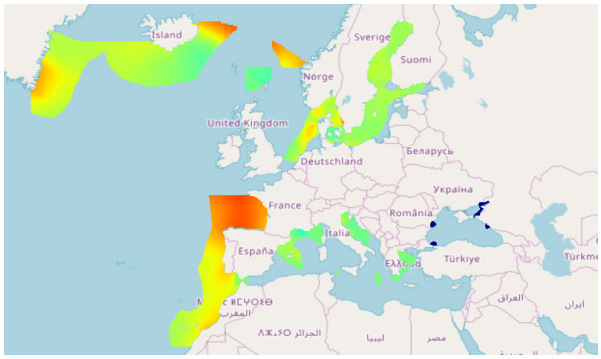


L5

Regional gridded maps of water body dissolved inorganic nitrogen (DIN) available as 6-year analysis and combined for all EU basins.

- Temporal coverage: 1960 – 2017*
- Temporal resolution: seasonal
- Spatial resolution: 0.1 degree
- Depth coverage: -1000 – 0 m
- Unit: µmol/l
- Available to download as: NetCDF
- Web services: WMS, OPenDAP

Dissolved oxygen



L5

Regional gridded maps of water body dissolved oxygen available as 6-year anaysis and combined for all EU basins.

- Temporal coverage: 1960 – 2017*
- Temporal resolution: seasonal
- Spatial resolution: 0.1 degree
- Depth coverage: -1000 – 0 m
- Unit: µmol/l
- Available to download as: NetCDF
- Web services: WMS, OPenDAP

Regional gridded maps of 6-year analysis of nutrients, dissolved oxygen and chlorophyll concentration

L5

Moving 6-year analysis, at seasonal scale, of water body chlorophyll-a, dissolved oxygen, dissolved inorganic nitrogen (DIN), phosphate and silicate concentration, available at distinct depth layers, for the Arctic Region, North East Atlantic Ocean, Baltic Sea, North Sea, Mediterranean Sea and Black Sea, implemented following MSFD board guidelines.

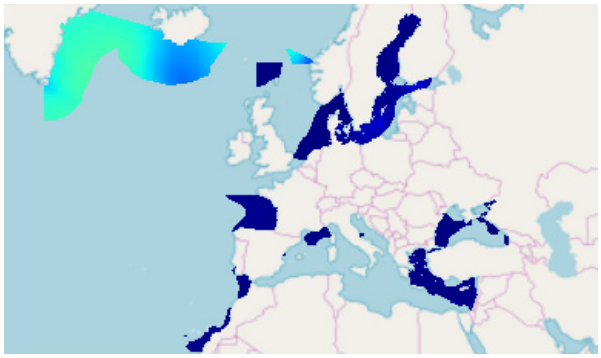
Silicate

L5

Regional gridded maps of water body silicate available as 6-year analysis and combined for all EU basins.

- Temporal coverage: 1960 – 2017*
- Temporal resolution: seasonal
- Spatial resolution: 0.1 degree
- Depth coverage: -1000 – 0 m
- Unit: µmol/l
- Available to download as: NetCDF
- Web services: WMS, OPenDAP

Phosphate



L5

Regional gridded maps of water body phosphate available as 6-year analysis and combined for all EU basins.

- Temporal coverage: 1960 – 2017*
- Temporal resolution: seasonal
- Spatial resolution: 0.1 degree
- Depth coverage: -1000 – 0 m
- Unit: µmol/l
- Available to download as: NetCDF
- Web services: WMS, OPenDAP

Maps of 10 selected contaminants

L5

Harmonised, validated and, subsequently, analysed and aggregated datasets are represented in the new maps for contaminants. These maps show data spatial distribution and contribute to the evaluation of data quality and adequacy for environmental quality assessment. Products, focused on ten different substances, display data below and above Limit of Quantification (LOQ), data with LOQ above or below 30 percent of EQSD threshold values, as well as the information on the sampled matrix.

- Temporal coverage: 1970 – 2017
- Temporal resolution: annual
- Available to download as: compressed Shapefile and PNG
- Web services: WMS, WFS

Example map: Anthracene stations above/below LOQ/LOD

*Note that actual values are are sea-basin and parameter dependent.

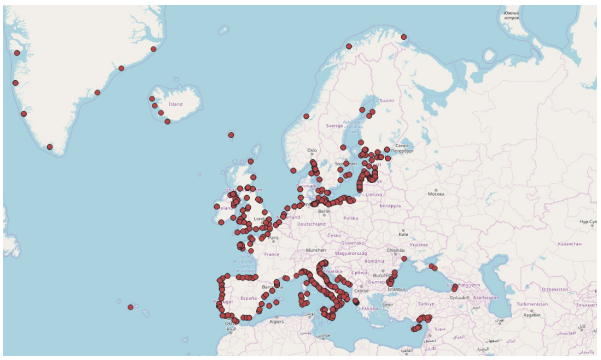
Marine litter maps for beach and seabed litter

L4

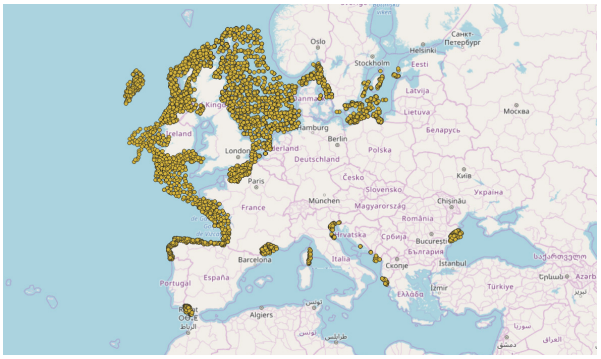
- Web services (for all): WFS

Beach litter (2001 – 2018)

- Official monitoring
  - Beaches locations and litter list used
  - Number surveys & temporal coverage
  - Mean total number of litter items per 100m & to 1 survey
  - Composition of litter according to material categories in percent
  - Mean number of Cigarette related items per 100m & to 1 survey - without UNEP_MARLIN
  - Mean number of Cigarette related items per 100m & to 1 survey - UNEP_MARLIN
  - Mean number of Fishing related items per 100m & to 1 survey
    (example map)
  - Mean number of Plastic bags related items per 100m & to 1 survey



- Other sources
  - Beaches locations and litter list used
  - Number surveys & temporal coverage
  - Mean total number of litter items per 100m & to 1 survey
  - Composition of litter according to material categories in percent
  - Mean number of Cigarette related items per 100m & to 1 survey - without UNEP_MARLIN
  - Mean number of Fishing related items per 100m & to 1 survey
  - Mean number of Plastic bags related items per 100m & to 1 survey
    (example map)



Seafloor litter (2006 – 2018)

- Trawls locations
- Density (Nb. Items/km²)
  (example map)
- Material categories percentage per year
- Fishing related items density (Nb. Items/km²)
- Plastic bags density (Nb. Items/km²)

More information on the data and data products of EMODnet Chemistry can be found scanning this QR code, or at www.emodnet-chemistry.eu.

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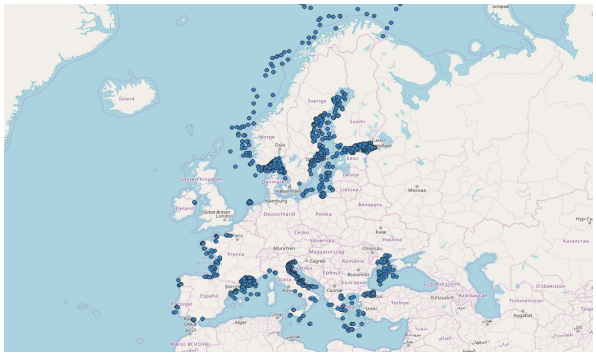
EMODnet | GEOLOGY
Discover Europe´s seabed geology

Sedimentation rates

L4

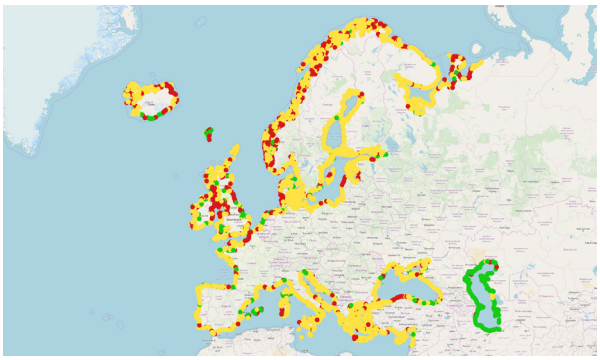


Sedimentation rate map of the European Seas. The attribute table contains sediment accumulation rates expressed in cm/year, together with sampling information.

- Available to download as: ESRI file geodatabase
- Web services: WMS, WFS

Coastal behaviour via satellite data

L5

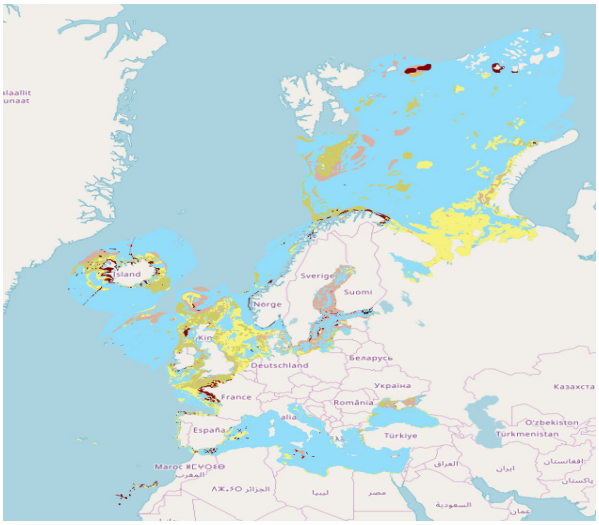


Shoreline-migration map allows users to visualise pan-European coastal behaviour for 2007-2017 at different spatial scales. Three coastal migration classes are defined – erosion, stable, and accretion – which are accompanied by the level of accuracy (e.g. estimated, confirmed, no information).

- Available to download as: GeoJSON
- Web services: WMS, WFS

Seabed substrates

L6

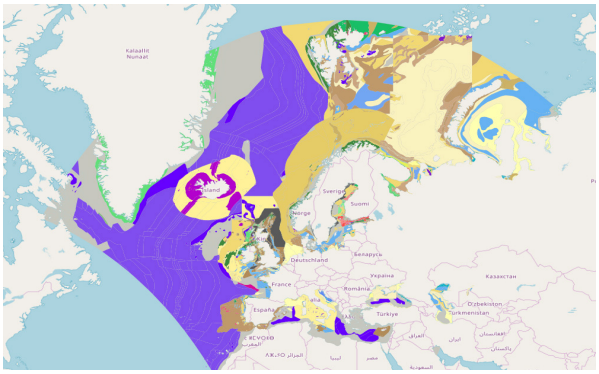


Multiscale maps of seabed substrates at scales 1:1M, 1:250k, 1:100k and 1:50k. The substrate classes are defined on basis of the modified Folk sediment triangle. At minimum level the data includes following 5 classes: mud to muddy sand, sand, coarse substrate, mixed sediment, rock and boulders.

- Scale: 1/1.000.000, 1/250.000, 1/100.000, 1/50.000
- Available to download as: ESRI file geodatabase
- Web services: WMS, WFS

Seafloor (bedrock)

L6

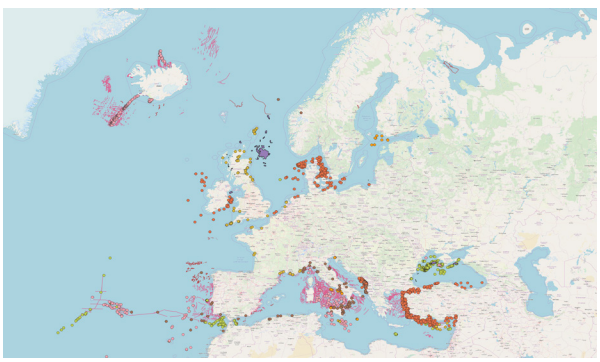


Seafloor stratigraphy, lithology and fault maps representing the marine pre-Quaternary geological units, their age, structure and physical characteristics.

- Multiresolution scale: 1/100.000 – 1/5.000.000
- Available to download as: ESRI file geodata-base
- Web services: WMS, WFS

Geological event distribution

L6



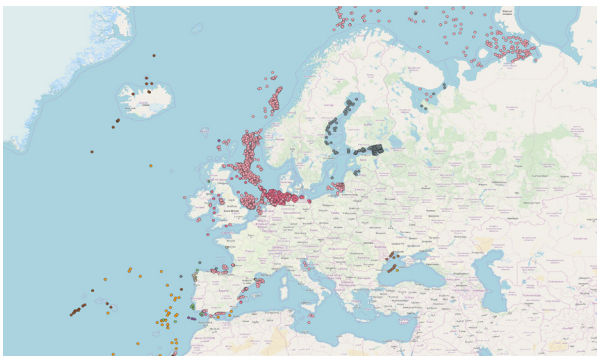
Geographical distribution of all significant geological events such as submarine landslides, fluid emissions, tectonics, earthquakes, tsunamis and volcanoes identified by their characteristics which are detailed in the attribute tables of the GIS layers.

- Multiresolution scale: 1/250.000, 1/100.000
- Available to download as: ESRI shapefile
- Web services: WMS, WFS

EMODnet | GEOLOGY

Discover Europe´s seabed geology

Mineral occurrences

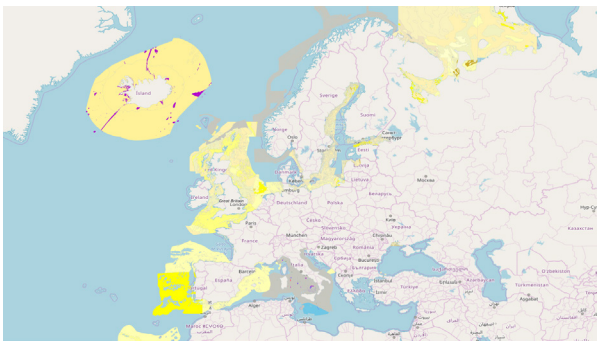


L6

Information on known marine mineral occurrences in European seas. Comprising marine aggregates, hydrocarbons, gas hydrates, placers, phosphorites, evaporites, polymetallic sulphides, polymetallic nodules, cobalt rich ferromanganese crust, metal rich sediment, and vein hosted mineralisation.

- Available to download as: ESRI shapefile
- Web services: WMS, WFS

Quaternary geological units

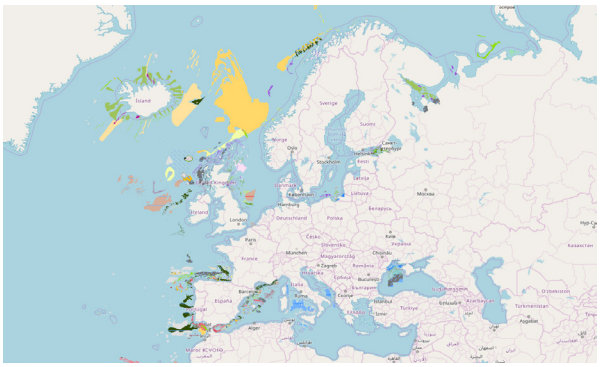


L6

Upper seafloor stratigraphy, lithology, and genesis maps representing the youngest marine Quaternary geological units, their age, genesis and physical characteristics.

- Multiresolution scale: 1/20.000 – 1/3.000.000
- Available to download as: ESRI file geodatabase
- Web services: WMS, WFS

Geomorphology

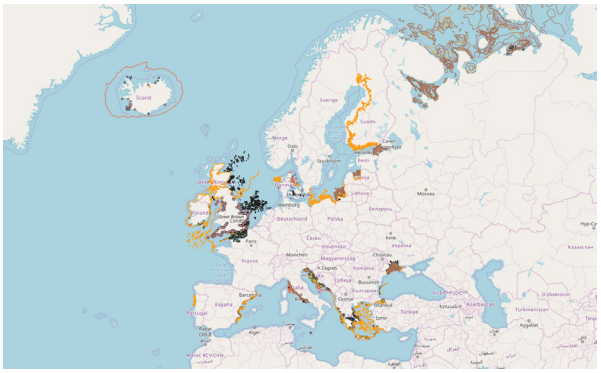


L6

Maps showing the geomorphology of the seafloor representing the "marine landscape" *i.e.* physiographic features (e.g. ridges, troughs, sea mounts, marine landforms) and their genesis.

- Multiresolution scale: 1/10.000 – 1/16.000.000
- Available to download as: ESRI file geodatabase
- Web services: WMS, WFS

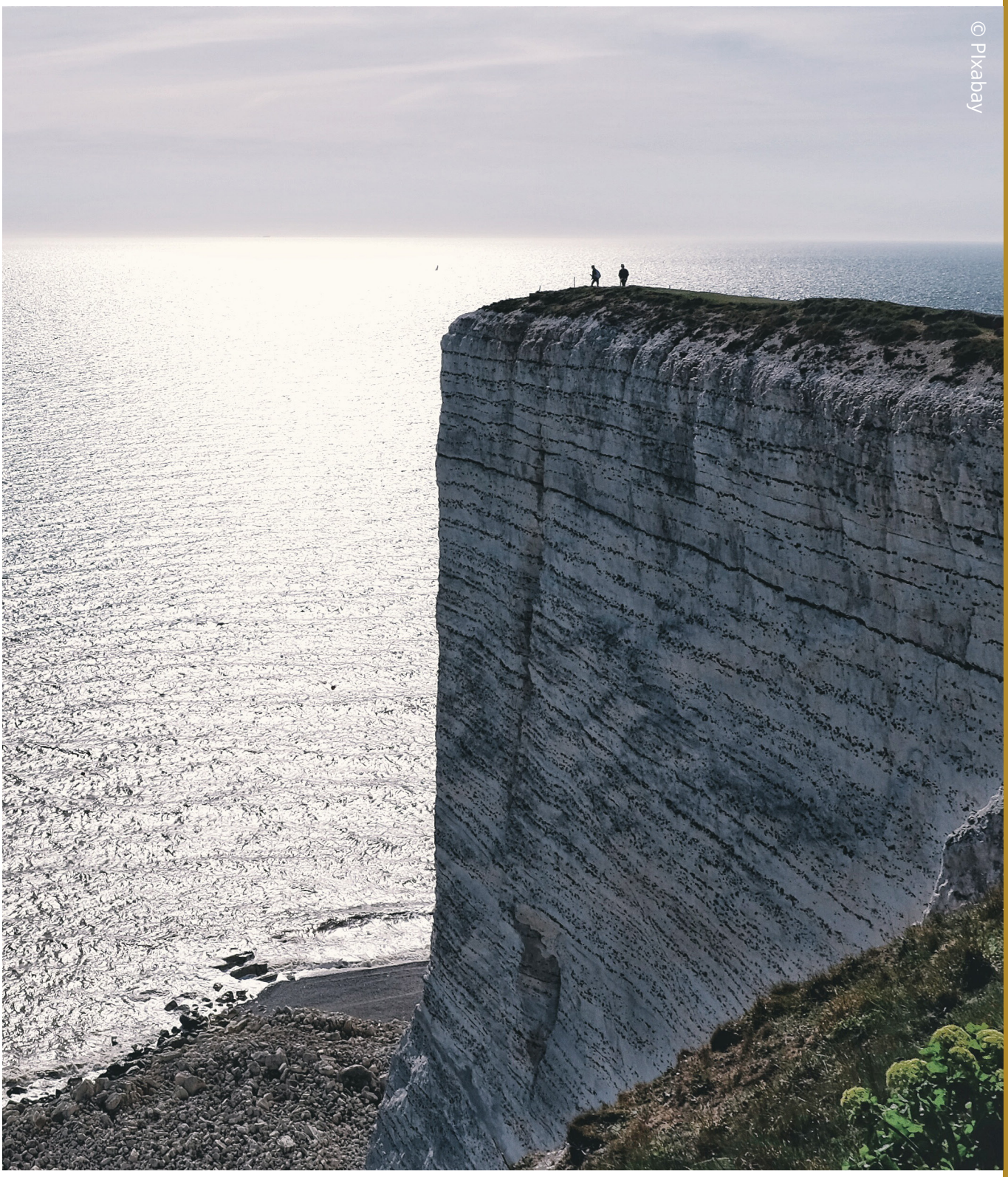
Submerged landscapes



L6

This new data product released in April 2019, represents the geological known hidden landscapes in Europe. It includes more than 10.000 features representing 26 classes of submerged landscape and palaeoenvironmental indicators ranging from mapped and modelled palaeocoastlines, evidence for submerged forests and peats, thickness of post-Last Glacial Maximum sediments and submerged freshwater springs.

- Available to download as: ESRI file geodatabase
- Web services: WMS, WFS



More information on the data and data products of EMODnet Geology can be found scanning this QR code, or at www.emodnet-geology.eu.

EMODnet

HUMAN ACTIVITIES

Making use of our oceans

Parameters and data formats

L4

Themes and subthemes

- Aggregate extraction
- Algae production: macroalgae, microalgae, Spirulina
- Aquaculture: finfish, shellfish and freshwater production
- Cables: telecommunications cables, landing stations
- Cultural heritage: ship wrecks, lighthouses, submerged prehistoric archaeology and landscape
- Dredging sites
- Environment: Natura 2000 areas, nationally designated areas, state of bathing water
- Fisheries: ICES statistical areas, FAO fishery statistical area, fish catches by FAO fishery statistical areas, fish sales, fishing effort, fishing intensity
- Oil and Gas: active licences, boreholes, offshore installations
- Nuclear power plants
- Ocean energy facilities: project locations and test sites
- Other forms of area management / designation: advisory councils, international conventions, maritime boundaries, MSFD reporting units, Exclusive Economic Zones
- Pipelines
- Traffic in main ports
- Waste disposal: dredge spoil dumping, dumped munitions, port reception facilities, urban wastewater discharge points and treatment plants
- Wind farms

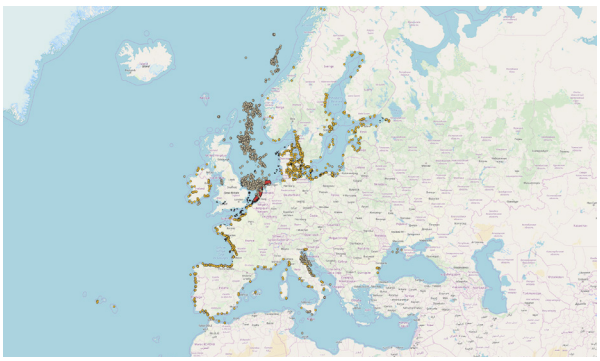
Data formats

ESRI shapefile, ESRI File Geodatabase, WMS and WFS web services

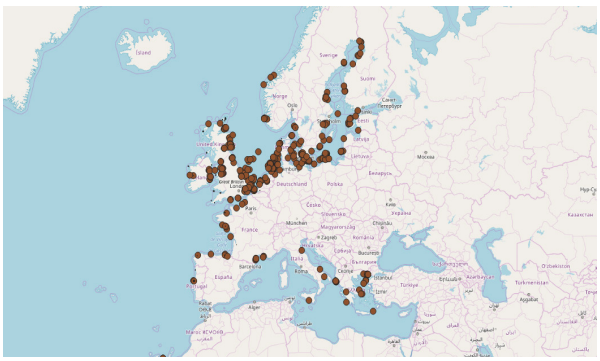
Coverage and resolution

Spatial coverage: the following example maps illustrate the distribution of the respective human activities.

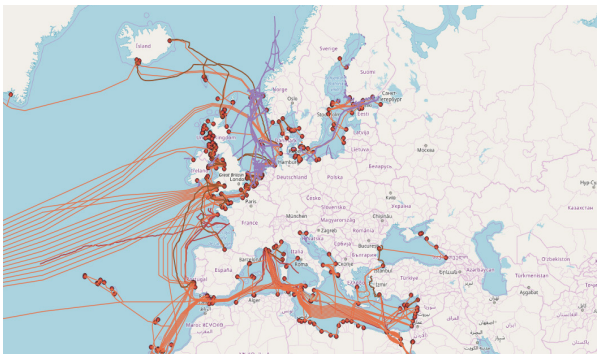
Dredging, aggregate extraction and offshore platform locations



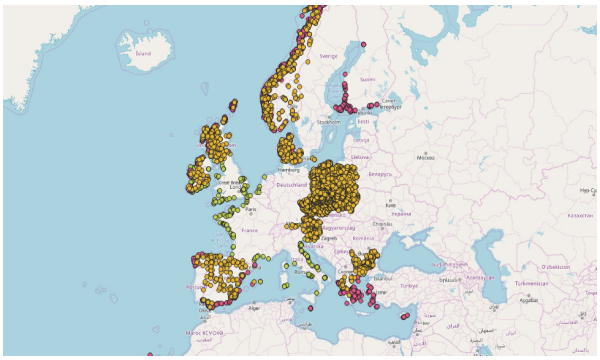
Energy facilities and wind farms



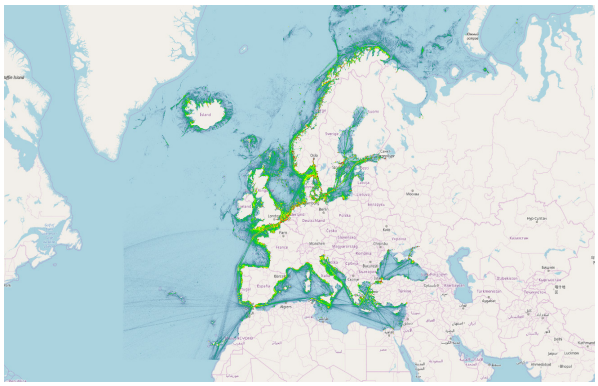
Submarine cables and pipelines



Finfish, freshwater and shellfish production sites

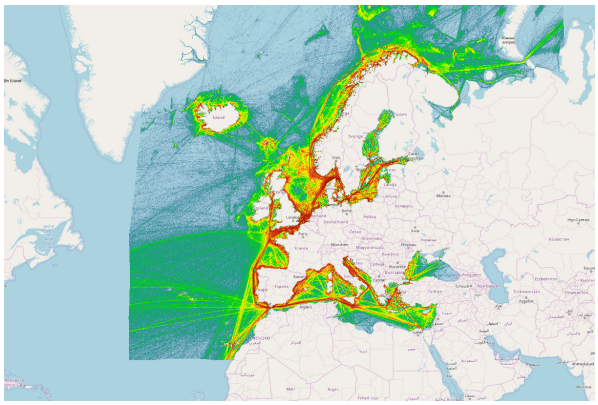


Shipping Density



Vessel Density Maps
Number of hours spent in a grid cell by ship type.

- Temporal coverage: 2017 – 2020
- Temporal resolution: monthly and annual
- Spatial resolution: 1 km²
- Available to download as: GeoTIFF
- Web services: WMS, WCS



Route Density Maps (EMSA)
Number of ship routes in a grid cell by ship type.

- Temporal coverage: 2019 – 2020
- Temporal resolution: monthly, seasonal and annual
- Spatial resolution: 1 km²
- Available to download as: GeoTIFF
- Web services: WMS, WCS

More information on the data and data products of EMODnet Human Activities can be found scanning this QR code, or at www.emodnet-humanactivities.eu.

Parameters and data formats

L2 L3

Parameter groups and variables

- Water temperature (°C)
- Water salinity (psu)
- Water conductivity (biogeochemical): dissolved oxygen (kg/m³), fluorescence (S/m), turbidity (ml/l), total chlorophyll-a (mg/m³), etc.
- Currents and winds (m/s): direction
- River flow (m³/s)
- Optical properties: light irradiance surface PAR (micromole photon/m².s), turbidity (milliF.T.U Formza Turb Unit)
- Sea level (m)
- Atmospheric: air temperature (°C), relative humidity (%), atmospheric pressure (decibar, pascal)
- Underwater noise (dB)

Platform types: mooring buoys, ARGO profilers, drifting buoys, HF radars, tide stations, river gauging stations, ferrybox and CTD profiles from ships, gliders, marine mammal.

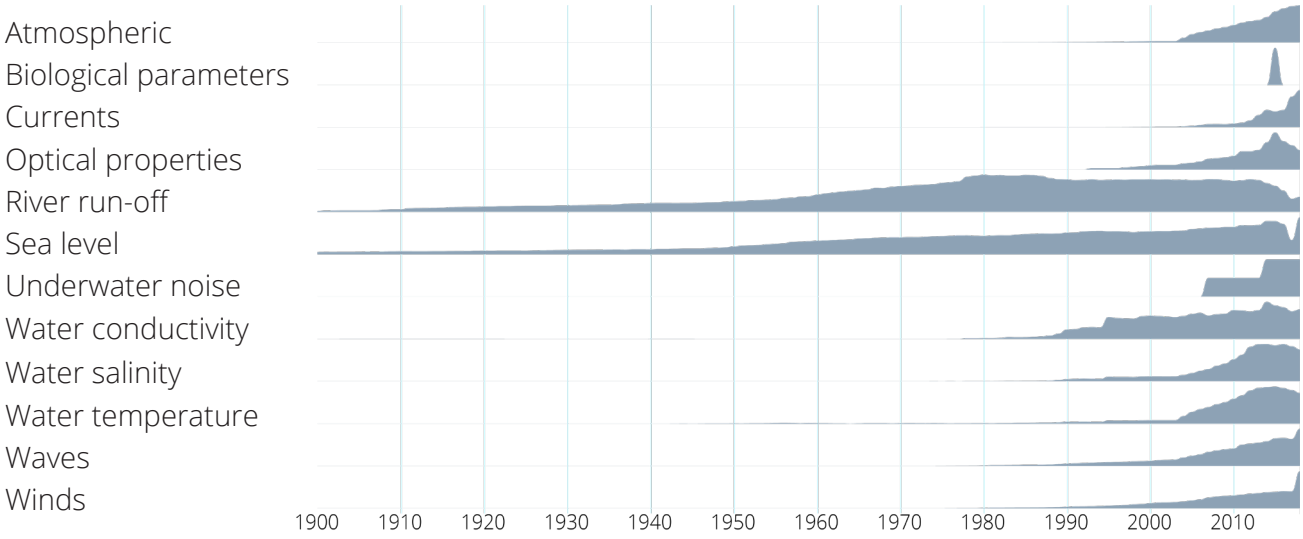
Data formats

html table, ESRI asc & csv, Google Earth kml, OPeNDAP binary, mat, NetCDF, ODV txt, csv, tsv, json, and xhtml

Coverage and resolution

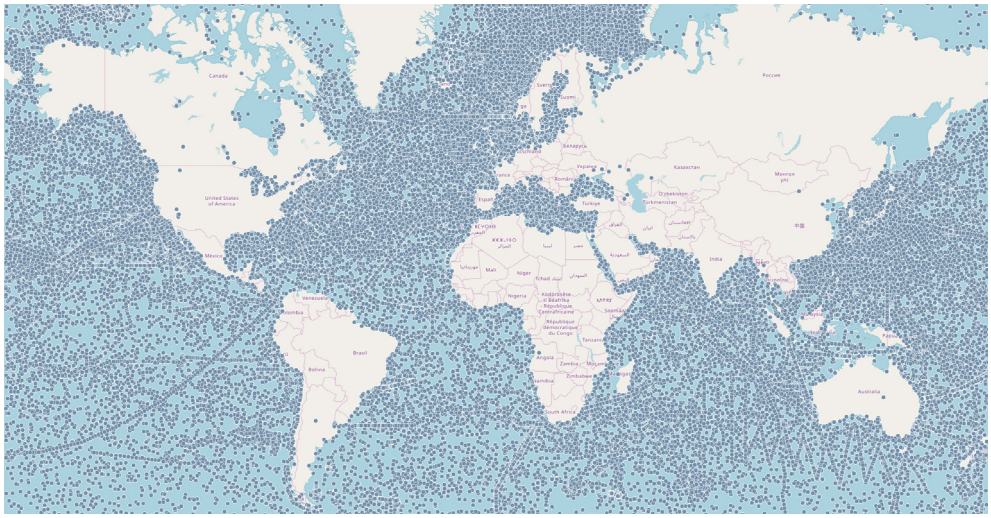
Temporal resolution: minutes to seasons

Temporal coverage: time series of the relative number of datasets per year from 1900 to present. EMODnet Physics also offers historical datasets that date back to 1807.

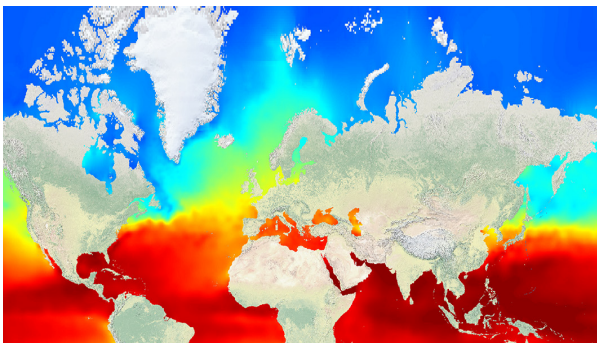


Spatial coverage

Overview of all the platforms (linked in Physics) that measure or have measured one or more physical variables.



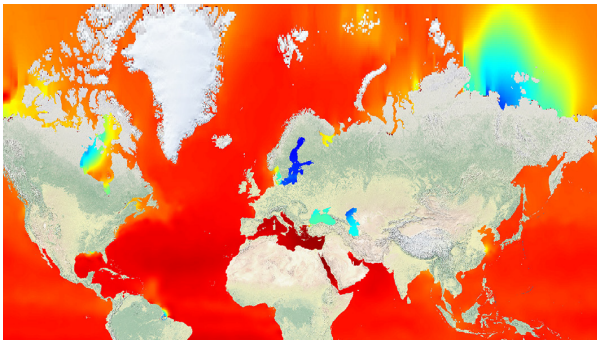
Temperature



Multi point time series observations, Aggregated data interpolation, Maps.

- Temporal coverage: 1900 – now
- Temporal resolution: hourly to monthly
- Spatial resolution: in situ / 8 – 22 km
- Depth coverage = -3000 – 0 m
- Web services: WMS, WCF, WFS, WAF, REST, OpenDAP

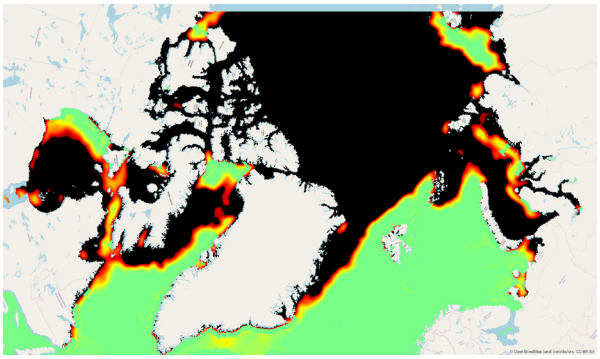
Salinity



Multi point time series observations, Aggregated data interpolation, Maps.

- Temporal coverage: 1900 – now
- Temporal resolution: hourly to monthly
- Spatial resolution: in situ / 8 – 22 km
- Depth coverage = -3000 – 0 m
- Web services: WMS, WCF, WFS, WAF, REST, OpenDAP

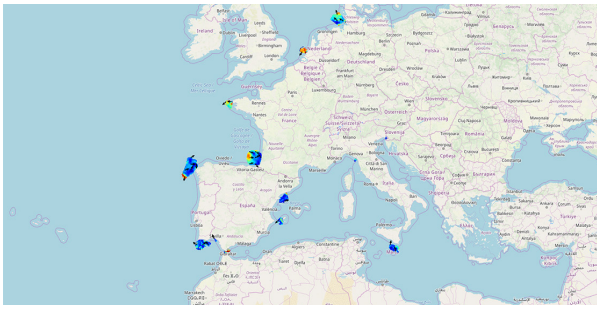
Sea Ice Coverage (Arctic and Antarctic Oceans)



Sea ice coverage for the Arctic and Antarctic Oceans.

- Temporal coverage: 2005 – ongoing
- Spatial resolution: 10 km
- Web services: WMS

Sea Surface Currents

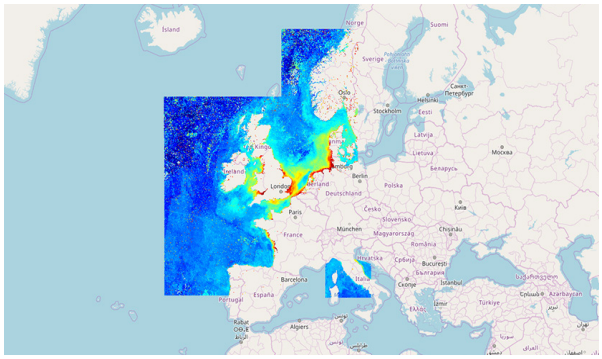


In situ gridded sea surface currents as monitored by High Frequency Radars.

- Temporal coverage: near real time
  Sliding window of 60 days
- Temporal resolution: 1 hour
- Spatial resolution*: 5 – 150 km
- Available to download as: NetCDF
- Web services: WMS

*Note that resolutions are sea-basin dependent.

Total Suspended Matter

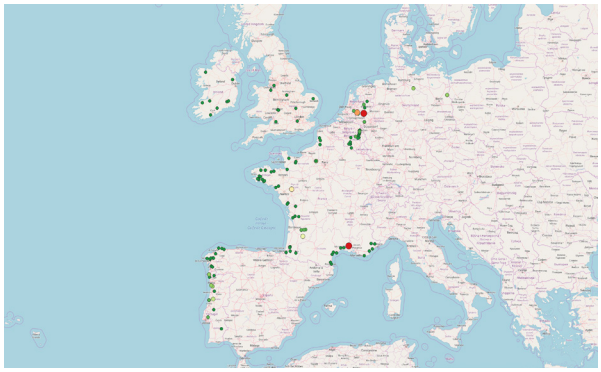


L5

Monthly time series of total suspended matter.

- Temporal coverage: 2012 – 2013
- Temporal resolution*: 1 month
- Unit: % (suspended particles, that are not dissolved)
- Available to download as: NetCDF
- Web services: WMS, WFS

River run-off

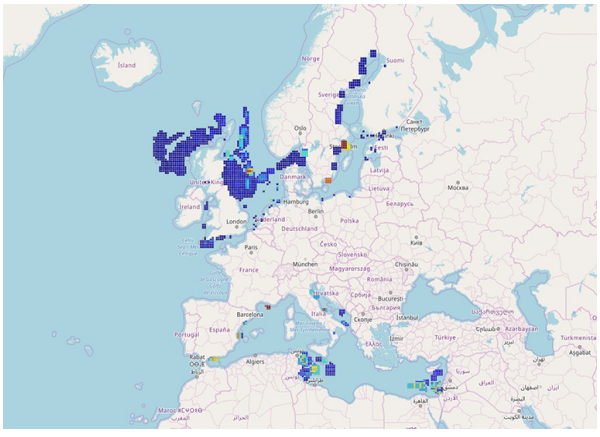


L5

Multi point time series observation, Aggregated data interpolation, Maps.

- Temporal coverage: 1900 – now
- Temporal resolution: hourly to monthly, monthly to annual averages
- Spatial resolution: in situ / sea basin
- Depth coverage = -3000 – 0 m
- Web services: WMS, WCF, WFS, WAF, REST, OpenDAP

European Impulsive Noise Registry



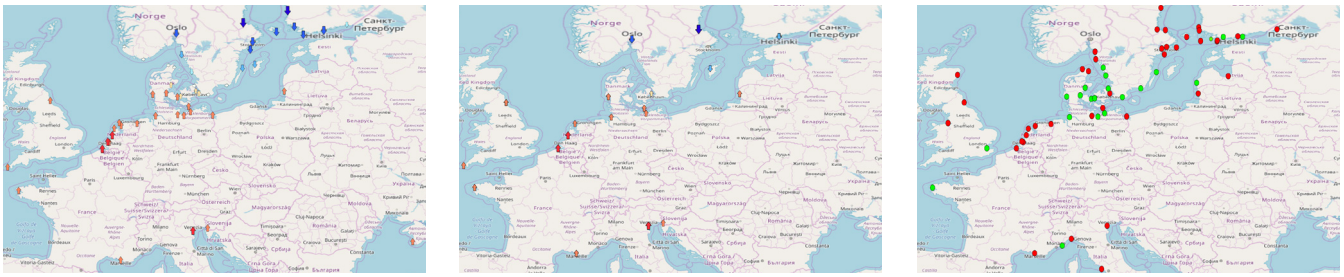
L5

This registry shows licenced events such as pile driving, controlled explosions from naval operations, and other activities that release energy (MSFD descriptor 11.1.1).

- Temporal coverage: 2014 – 2016
- Spatial resolution: grid 10 x 20 arc minute
- Unit: pulse block days
- Web services: WMS, WFS

HELCOM OSPAR COMMISSION ICES CIEM ACCOBAMS

Sea Level Trends and Anomalies



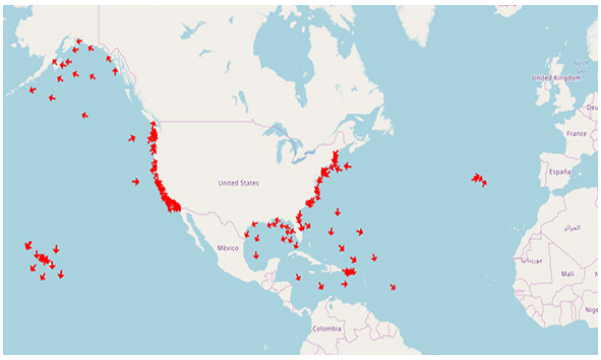
Relative (left) and absolute (middle) sea level trends, plus anomalies (right), by the Permanent Service for Mean Sea Level (PSMSL) and Système d'Observation du Niveau des Eaux Littorales (SONEL), expressed in mm/year. The trend is available for stations with at least 30 years of measurements.

- Temporal coverage: 1900 – now
- Temporal resolution: hourly to monthly, monthly to annual averages
- Spatial resolution: in situ / sea basin
- Depth coverage = -3000 – 0 m
- Web services: WMS, WCF, WFS, WAF, REST, OpenDAP

SONEL

PSMSL Permanent Service for Mean Sea Level

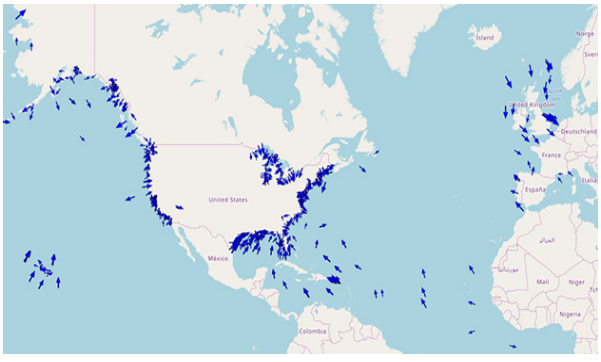
Wave



Multi point time series observation.

- Temporal coverage: 1900 – now
- Temporal resolution: hourly, daily
- Spatial resolution: in situ
- Depth coverage = -3000 – 0 m
- Web services: WMS, WCF, WFS, WAF, REST, OpenDAP

Wind



Multi point time series observation.

- Temporal coverage: 1900 – now
- Temporal resolution: hourly, daily
- Spatial resolution: in situ
- Depth coverage = -3000 – 0 m
- Web services: WMS, WCF, WFS, WAF, REST, OpenDAP

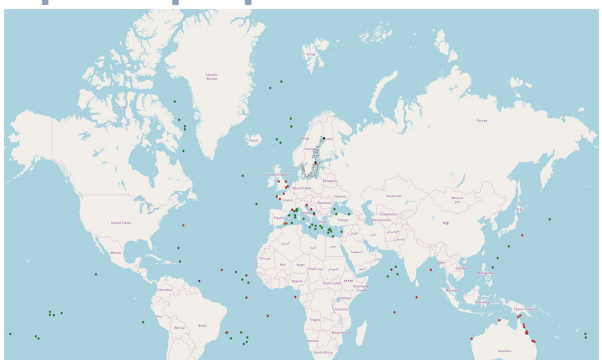
EMODnet

PHYSICS

Oceans physics at your fingertips

Optical properties

L5

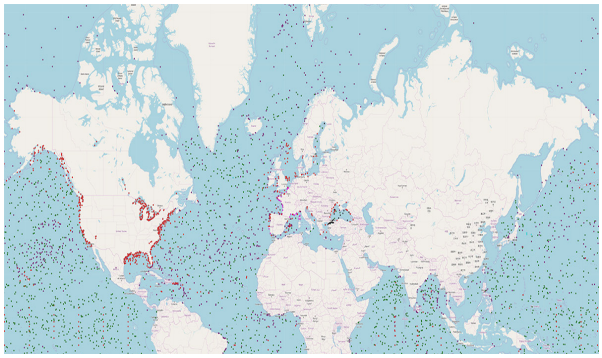


Multi point time series observation.

- Temporal coverage: 1900 – now
- Temporal resolution: hourly, daily
- Spatial resolution: in situ
- Depth coverage = -3000 – 0 m
- Web services: WMS, WCF, WFS, WAF, REST, OpenDAP

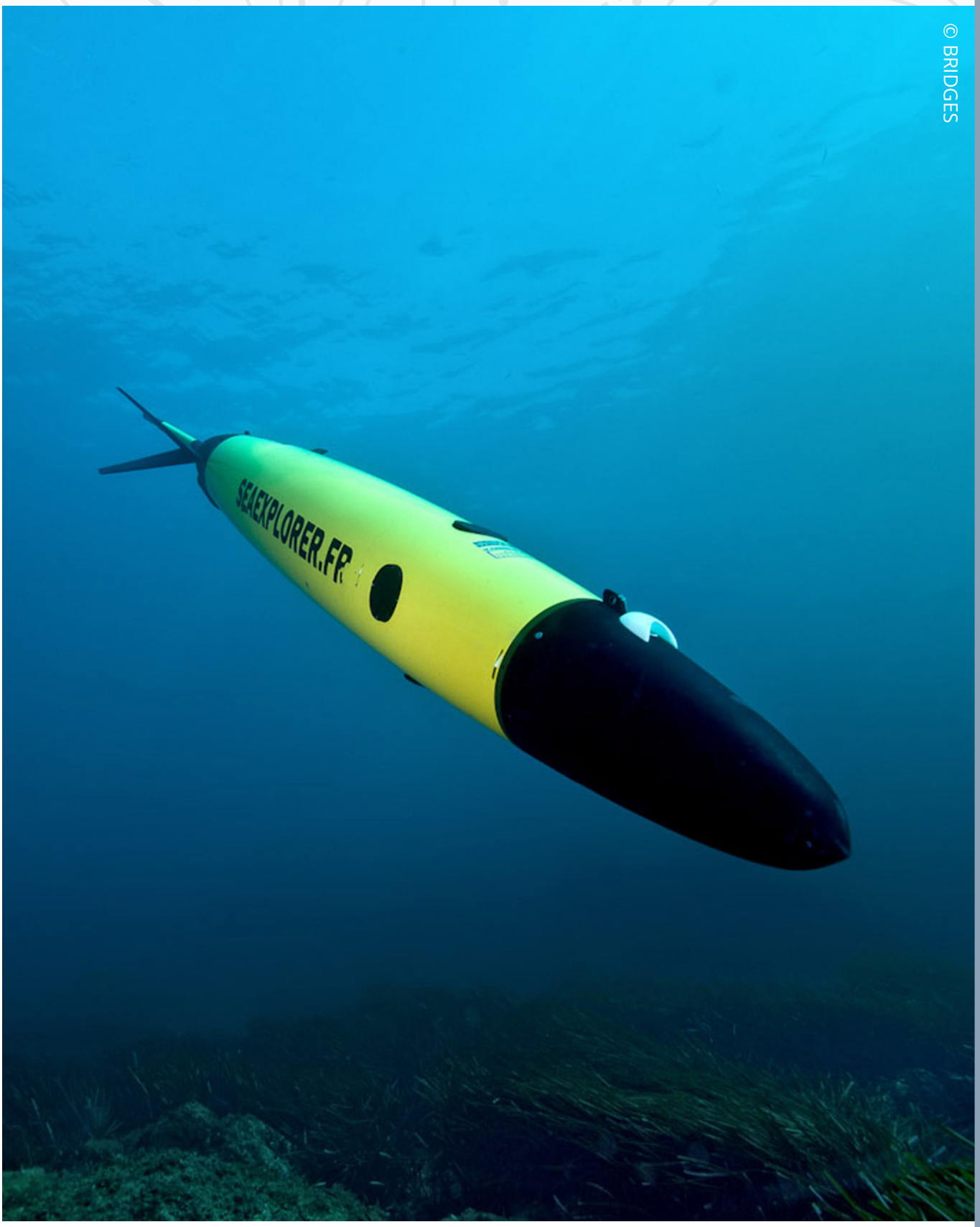
Atmospheric parameters

L5



Multi point time series observation.

- Temporal coverage: 1900 – now
- Temporal resolution: hourly, daily
- Spatial resolution: in situ
- Depth coverage = -3000 – 0 m
- Web services: WMS, WCF, WFS, WAF, REST, OpenDAP



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More information on the data and data products of EMODnet Physics can be found scanning this QR code, or at www.emodnet-physics.eu.

Parameters and data formats

L4

Parameter category

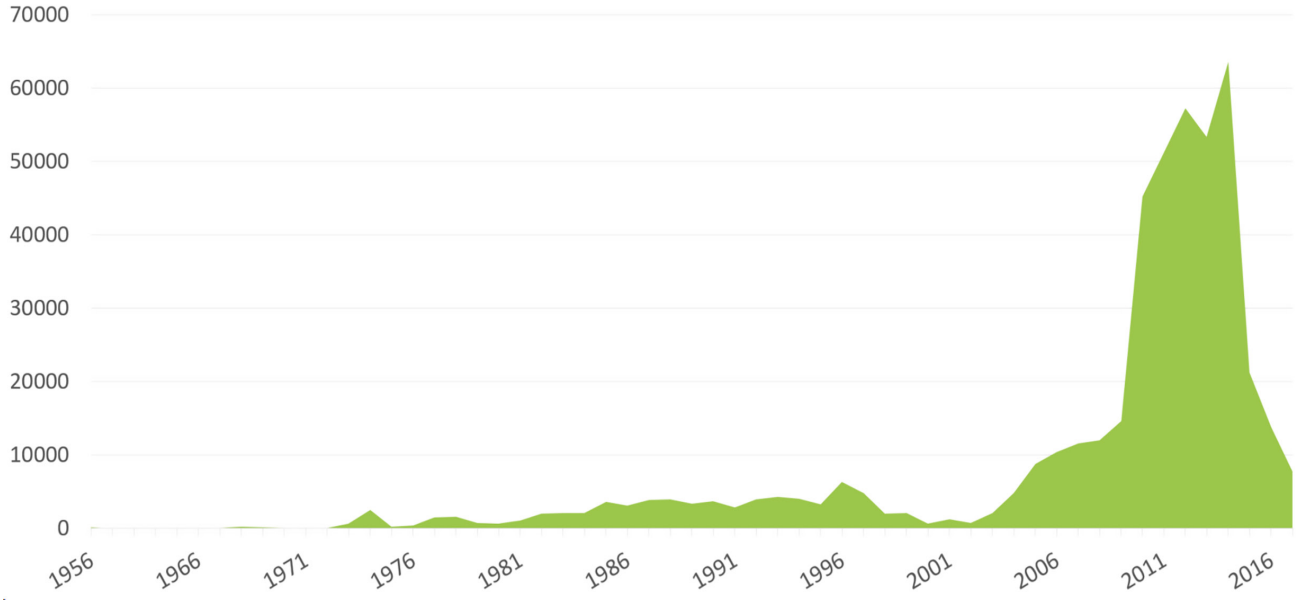
Habitats and biotopes, classified according to the European Nature Information System (EUNIS) habitat classification, where possible, and other regional, national and local classification systems.

Data formats

Data can be downloaded as an ESRI Shapefile, and accessed via WMS and WFS web services.

Coverage and resolution

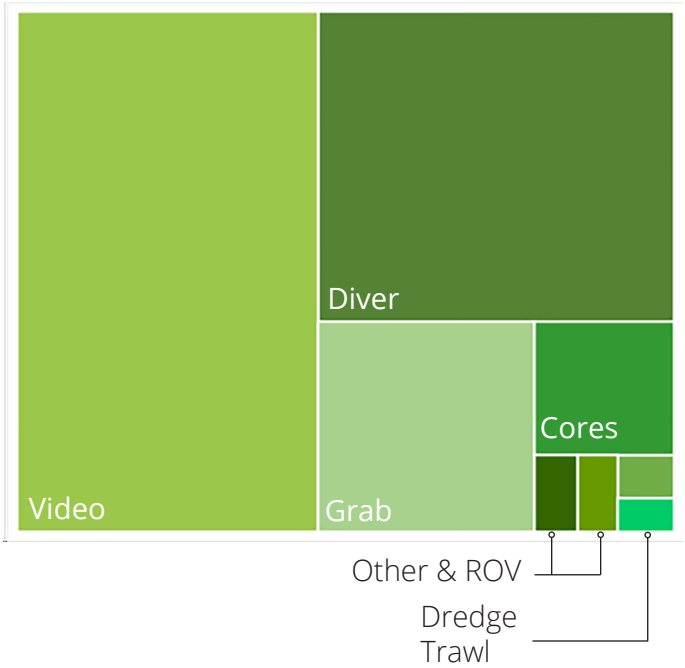
Temporal coverage: number of records per year.



Spatial coverage

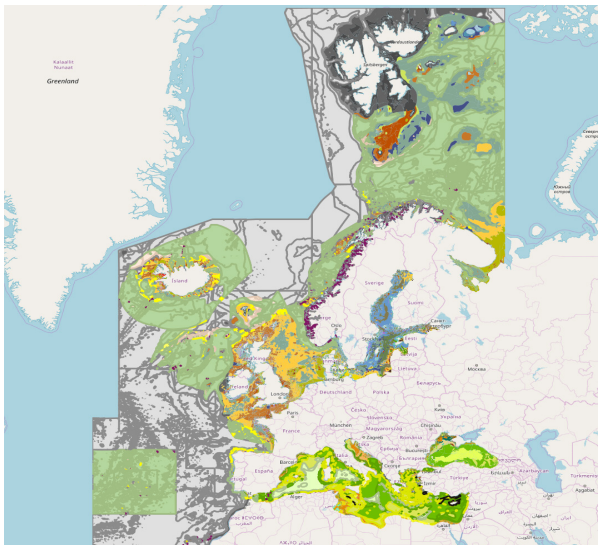
Note: spatial coverage is currently expanding to a pan-European scale.

Proportional availability of data per survey type



EMODnet broad-scale seabed habitat map for Europe (EUSeaMap): EUNIS / full-detailed habitat classification

L6

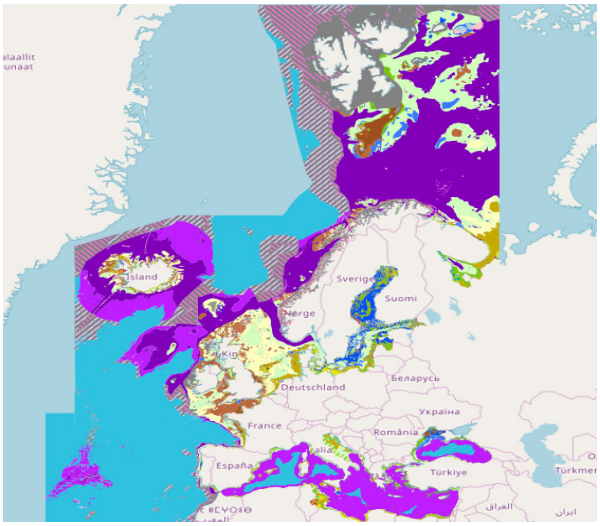


Updated in 2019 with improved resolution and extension to the Barents Sea.

- With associated confidence layer
- Spatial resolution: ~100 m, 1/16 * 1/16 arc minute
- Available to download as: ESRI shapefile
- Web services: WMS

EMODnet broad-scale seabed habitat map for Europe (EUSeaMap): MSFD Benthic broad habitat types

L6

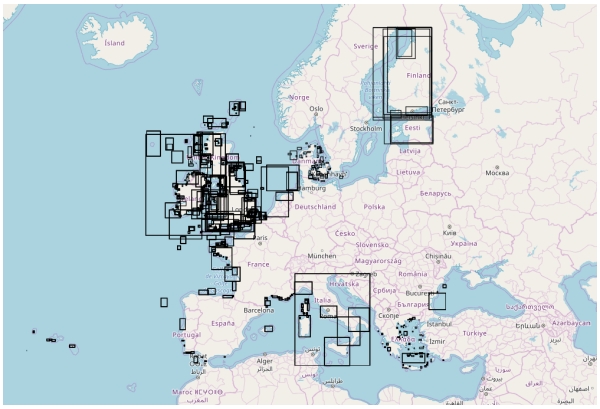


Updated in 2019 with improved resolution and extension to the Barents Sea.

- With associated confidence layer
- Spatial resolution: ~100 m, /16 * 1/16 arc minute
- Available to download as: ESRI shapefile
- Web services: WMS

Collection of individual habitat maps from surveys

L6

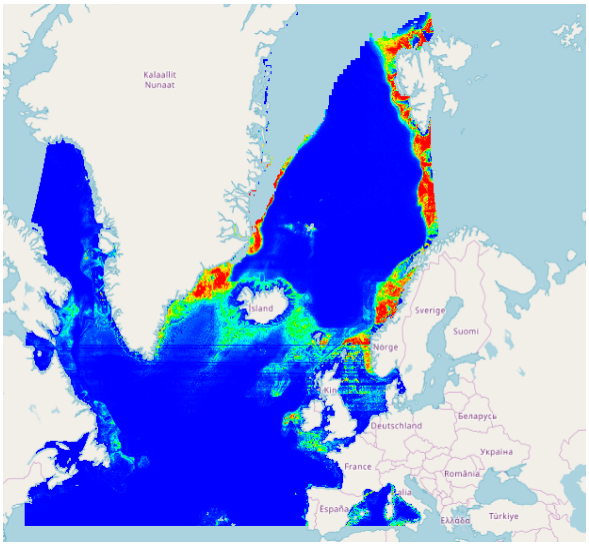


Over 800 habitat maps collated from various sources, grouped according to habitat classification: EUNIS, Habitats Directive Annex I and Other.

- Web services: WMS, WFS

Collection of modelled maps of specific habitats

L6



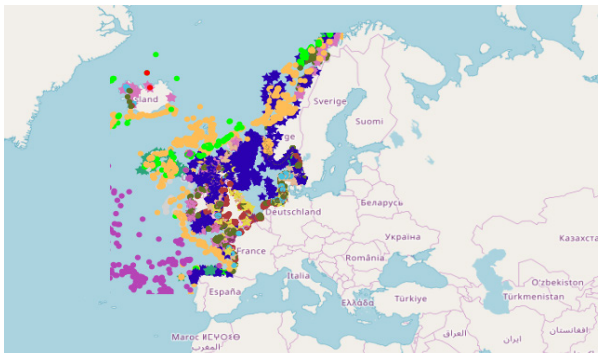
Over 70 predictive habitat models of various habitats, collated from various sources, grouped according to sea region.

- Web services: WMS, WCS

Example map: Predictive habitat model of ostur distribution in the North Atlantic.

Composite data products

L6



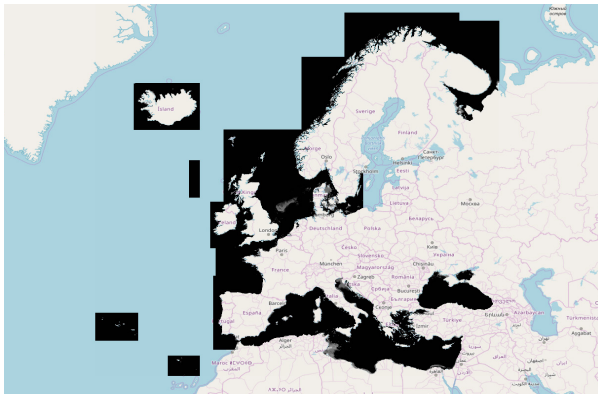
Compilations of data from multiple sources into new products that show the presence and extent of priority habitats, including OSPAR threatened and/or declining habitats and Essential Ocean Variables (live coral, seagrass and macroalgae). The official reported gridded distribution of habitat types listed in the Habitats Directive Annex 1 from the European Environment Agency are also available.

- Available to download as: ESRI shapefile
- Web services: WMS, WFS

Example map: OSPAR threatened and/or declining habitats in the NE Atlantic.

Environmental variables that influence habitat type: optical properties

L5

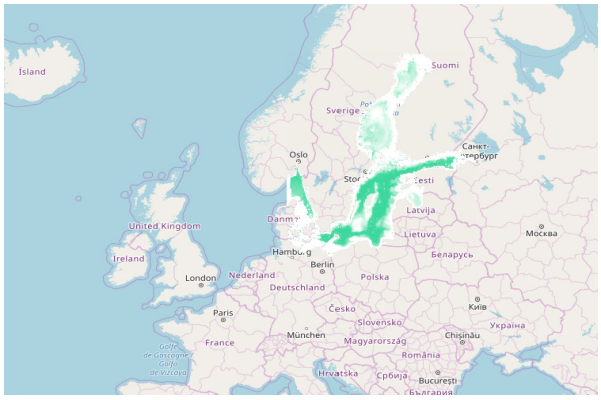


Created for EMODnet Seabed Habitats. Includes Light attenuation coefficient (KDPAR), Light (PAR) at the sea surface, Light (PAR) at the seabed, and associated confidence assessments.

- Temporal coverage: 2005 – 2019
- Spatial resolution: 250 m
- Web services: WMS

Environmental variables that influence habitat type: probability of the seabed being below the halocline

L5

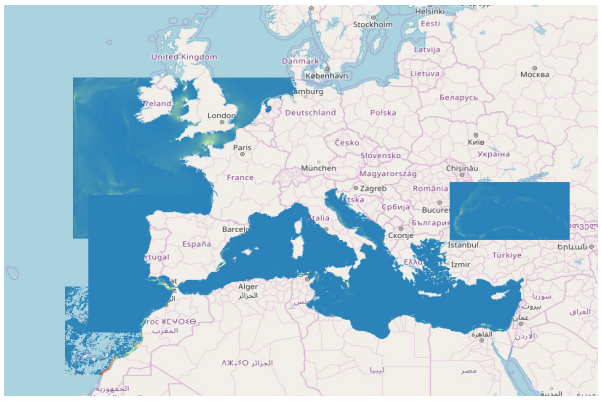


Created for EMODnet Seabed Habitats for the Baltic Sea only, includes confidence assessment.

- Spatial resolution: 5.5 km
- Web services: WMS

Environmental variables that influence habitat type: kinetic energy at the seabed due to currents

L5

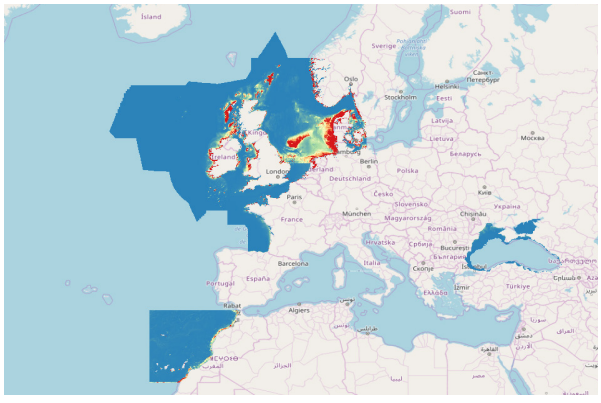


Created for EMODnet Seabed Habitats. Includes separate models for Mediterranean, Macaronesia, Celtic Seas, North Sea, Channel, Biscay, Black Sea and Adriatic. Includes confidence assessments.

- Temporal coverage: variable
- Temporal resolution: variable
- Spatial resolution: variable
- Web services: WMS

Environmental variables that influence habitat type: kinetic energy at the seabed due to waves

L5



Created for EMODnet Seabed Habitats. Includes separate models for Macaronesia, Celtic Seas, North Sea and Biscay. Includes confidence assessments.

- Temporal coverage: variable
- Temporal resolution: variable
- Spatial resolution: variable
- Web services: WMS

Environmental variables that influence habitat type: exposure index at the sea surface

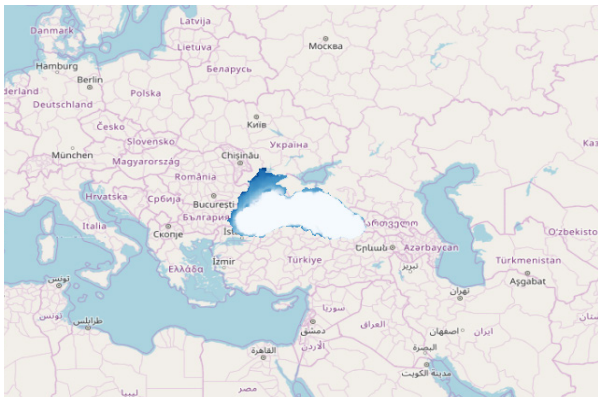
L5

Created for EMODnet Seabed Habitats for the Baltic Sea only.

- Temporal coverage: 2002 – 2007
- Spatial resolution: 25 m
- Web services: WMS

Environmental variables that influence habitat type: density of dissolved oxygen at the seabed

L5



Created for EMODnet Seabed Habitats for the Black Sea only.

- Temporal coverage: 1992 – 2018
- Temporal resolution: monthly
- Spatial resolution: 1/36 x 1/27 degree (~3 km)
- Web services: WMS

Environmental variables that influence habitat type: from external providers

L5

Other environmental variables from external providers, including kinetic energy due to waves and currents for various regions.

- Temporal coverage: variable
- Temporal resolution: variable
- Spatial resolution: variable
- Web services: WMS

Example map: kinetic energy at the seabed surface due to currents – Norway (source: Institute of Marine Research).

More information on the data and data products of EMODnet Seabed Habitats can be found scanning this QR code, or at www.emodnet-seabedhabitats.eu.

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WAKE UP YOUR DATA – MAKE USE OF EMODnet INGESTION

The EMODnet Data Ingestion portal activities are undertaken by a large European network that is geographically anchored in the countries bordering all European marine basins, and covers all EMODnet data themes. The EMODnet Data Ingestion members are national and regional marine and oceanographic data repositories and data management experts. The coordinators of the EMODnet thematic portals are also engaged.

The EMODnet Data Ingestion portal facilitates submission of sleeping marine datasets for further processing, Open Data publishing and contributing to applications for society. It provides an easy data submission process for data holders from public and private sectors that are not yet connected to the existing marine data management infrastructures to easily release their data for safekeeping and subsequent distribution through EMODnet. The EMODnet Data Ingestion portal helps to wake up your data so it can serve Blue Society, based on the principle of 'collect once and use many times'. This idea – a guiding principle of the Marine Knowledge 2020 strategy – benefits all marine data users, including policy makers, scientists, private industries and the public, and opens up new opportunities for innovation and growth.

The involved data centres have been actively engaged in data management for many decades. They have the essential capacities and facilities for data quality control, long-term stewardship, retrieval and distribution of ingested data sets. They are involved in national research and monitoring activities and have established arrangements for managing the resulting data on a national and thematic basis. Moreover, the data centres work together on pan-European and international scales in organisations such as IODE, ICES, EuroGeoSurveys, EuroGOOS, and IHO, and for pan-European marine data management infrastructures such as SeaDataCloud and EurOBIS. So, your ingested data will be reviewed and elaborated by these experts for wider distribution, and where possible, for inclusion in EMODnet portals and their widely-used data products.

SHARE YOUR DATA WITH EMODnet – GO TO WWW.EMODNET-INGESTION.EU

Submit your data files

The online Data Submission service facilitates you to submit marine datasets by completing a form and uploading your data as a file package. The service also provides long term stewardship and publishing for your datasets.

Ingest operational data

We are also interested in (Near) Real-Time ((N)RT) data streams from fixed and autonomous ocean observing platforms. This section explains how you can connect your operational stations to the European operational oceanography data exchange.

View submissions

View, search and download datasets that have been submitted by data providers using the Data Submission service.

Check guidelines for formatting data

The wider use and processing of your submitted datasets by public users and by receiving data centres is made much easier if you apply standard formats and quality control to your datasets before submission. This option gives an overview of relevant guidelines for various marine data themes.

Data wanted

Are you seeking specific datasets and can not find them in any of the EMODnet portals? Specify and post your needs.

Help

The Help desk can provide you assistance and instructions when required.

Key | Data and data product processing levels

L0 Raw data. Unprocessed instrument data at full resolution, including synchronisation methods (e.g. elimination of CTD up-down duplicates) and excluding communication artifacts.

L1 Full resolution data reconstructed with calibration coefficients, geo- and time-referenced.

L2 Geo- and time-referenced processed (derived) data with a minimum QC. Near-real time (NRT) with full spatial and/or temporal resolution.

L3 Delayed mode data with further QC, usually with some completeness, consistency and space/time uniformity. Data QC checks may include comparison with historical data and/or Level 5 products such as climatologies or gridded data.

L4 Collated data from different measurements, samples and/or sources that have been integrated in a data system by means of standardisation and/or categorisation, and subset or otherwise selected or derived to fulfil a specific requirement. Data can represent numerical values and presence/absence of a category or entity. Integration of datasets at this level enables further QC based on parameter to parameter relationships (e.g. TS diagrams).

Data

L5 Model or analysis output that uses data of Level 2 and/or 3 as input. Data products of this level represent the spatial distribution of a single parameter derived from multiple measurements. Data are aggregated and undergo some level of geo-processing and spatial or temporal interpolation to cover data gaps and/or solve data discrepancies.

L5A. One-dimensional distribution of a specific parameter, without variations on the temporal or depth dimensions.

L5B. Two-dimensional distribution of a specific parameter, with variations on the temporal and/or depth dimensions.

L5C. Three-dimensional distribution of a specific parameter.

L6 Derived information from multi-variable model or analysis that has Level 5 data products and/or Level 2-3 data as input. These input data and data products might have been gathered or developed by the thematic lot itself, by other thematic lots or third parties.

Data products

EMODnet

European Marine Observation and Data Network

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.