



**EMODnet**



European Marine  
Observation and  
Data Network

*Your gateway to marine data in Europe*

# EMODnet Physics

## EMODnet Data Ingestion and Safe Keeping

**EASME/EMFF/2016/006 - Operation, development and maintenance of a European Marine Observation and Data Network**

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# EMODnet

EMODnet



Launched in 2009 by DG MARE to unlock hidden and fragmented marine data resources



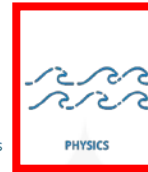
BATHYMETRY



GEOLOGY



SEABED HABITATS



PHYSICS



CHEMISTRY



BIOLOGY



HUMAN ACTIVITIES

## Principles:

*+ Data Ingestion Facility  
+ Central Portal and Secretariat*

- **Collect once and use many times**
- Develop **data standards** across and within disciplines
- **Build on existing efforts** from data communities
- **Accompany data** with statements on data ownership, accuracy and precisions
- Make the data, **free and open**, available to any user
- **Reduce fragmentation** and **facilitate the ingestion/connection** of new data sources and make available more data



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# EMODnet Physics

The screenshot shows the EMODnet Physics portal interface. At the top, there is a navigation bar with the EMODnet logo, the word "PHYSICS", and the tagline "Oceans Physics at your fingertips". Below this is a search bar and links for "CONTACT US" and "SUBMIT DATA". A main navigation menu includes "HOME", "MAP VIEWER", "CATALOGUE", "ABOUT", "HELPDESK", "SUBMIT DATA", and "CENTRAL PORTAL". On the left, a vertical sidebar lists data categories: WAVES, WATER TEMPERATURE, WATER SALINITY, CURRENTS, OPTICAL PROPERTIES, SEA LEVEL, ATMOSPHERIC, WATER CONDUCTIVITY, WINDS, RIVER, and UNDER WATER NOISE. The central area features a map of Europe with numerous colored dots representing data points. At the bottom, a row of icons represents various services: DATA INGESTION, PRODUCTS, THREDDS, ERDDAP, GEOSERVER, API REST SOAP, WMS WFS, DASHBOARD, GITHUB, and VIDEOS.

**One portal, thousands of datasets, many products and services**



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# In a nutshell

## Parameters

**Temperature**

**Salinity**

Waves

Currents

Sea Level

**Optical properties**

Wind

Atmospheric param.

**Biogeochemical  
param.**

Ice data

River inflow

Acoustic pollution  
(water noise)

## Products

Data products

- Sea Level
- Temperature & Salinity
- Currents at sea level
- River runoff & TSM
- Impulsive Noise
- Ocean State
- Ice coverage

## Data age

Real Time (RT) data flow based on SOS SWE

Near real-time (NRT) data at in situ observatories at sea

Reprocessed NRT data

Archived data derived from further elaboration and validation

## Services

Data portal

Monitoring & reporting tools

Catalogues

http & permaURLs

API and widgets

Ingestion and support tools



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# Different sources...



Credit: Dan Costa, SMHI, SOCIB, REDMAR



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# Different (data) routes



**CMEMS INSTAC**  
**Global DAC**  
**Thematic AC<sup>1</sup>**



**EMODnet**  
European Marine  
Observation and  
Data Network



PHYSICS



Parameters
Temperature
Salinity
Waves
Currents
Sea Level
<b>Optical properties</b>
Wind
Atmospheric param.
<b>Biogeochemical param.</b>
Ice data
River inflow
Acoustic pollution (water noise)

Global Networks
ARGO
OceanSITES
DBCP
GOSHIP/GOSUD
Regional Networks
IOOS
IMOS
IAPB
SOOS
Emerging Networks
<i>OceanGliders (including EGO)</i>
<i>(Global) HFR</i>

## xAC functions:

- Acquisition
- Harmonization
  - QC (e.g. EuroGOOS DATA-MEQ WG)
  - Format
  - Vocs (SDN P01, P06, P09)
- Assessment & Validation

<sup>1</sup> when needed data flow were re-designed and «new» one designed e.g. Gliders, HFR, River inflow, Acoustic pollution,



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# One goal

## A linked common infrastructure to serve many user

### Real Time data sets

#### Repositories:

- SOS server

#### Platforms:

- Sensor Web Enabled

#### Time dimension:

- Real time

#### Metadata + Transport format:

- SensorML + O&M

### Reprocessed data/Products

#### Repositories:

- SDN, CMEMS INSTAC, PSMSL, SONEL, GRDC, MEOP, ...

#### Time dimension:

- Depending on products

#### Geo dimension:

- Depending on products

#### Metadata + Transport format:

- Netcdf (CF), OGC

### Near Real Time data/operational data

#### Repositories:

- CMEMS INSTAC - EuroGOOS ROOS  
(5 regional assembly centres + 1)
- Institutes\*
- GDAC/IOOS/IMOS\*\*

#### Platforms:

- fixed mooring, ferrybox, tide gauge, drifting buoy, ARGO, profiling mooring, HF Radar, ships

#### Time dimension:

- Daily files, Monthly aggrg., Rep long term

#### Metadata + Transport format:

- Netcdf (CF convention), csv

### Historical validated data sets

#### Repositories:

- CDI: centralized
- Datasets: NODC and SeaDataNet nodes (100 centres)

#### Platforms:

- fixed stations (mooring, tide gauge)

#### Time dimension:

- Depending on datasets (ranging from month to years)

#### Metadata + Transport format:

- CDI + ODV4/Netcdf (CF)



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# When it is not enough ...



Home

## Welcome to the EMODnet Data Ingestion portal

The European Marine Observation and Data Network (EMODnet) consists of more than 160 organisations that together work on assembling, harmonising and making marine data, products and metadata more available to public and private users. This Data Ingestion portal facilitates additional data managers to ingest their marine datasets for further processing, publishing as open data and contributing to applications for society.

READ MORE

## EMODNET INGESTION

AND HOW DOES IT WORK



### 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



### Ingest operational data

We are also interested in (Near) Real-Time (NRT) data streams from fixed and autonomous ocean observing platforms. This section explains how you



### View submissions

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



## Dataset Identification

\* = Required

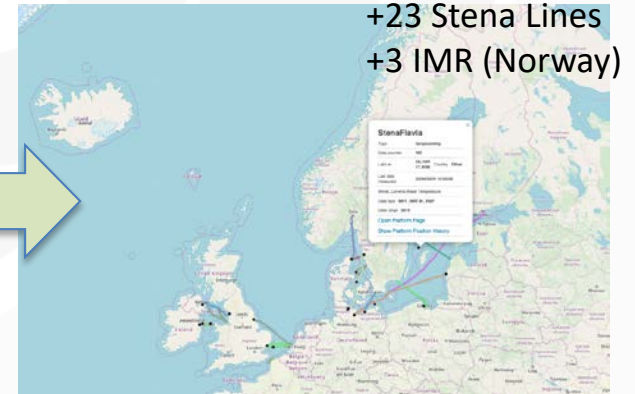
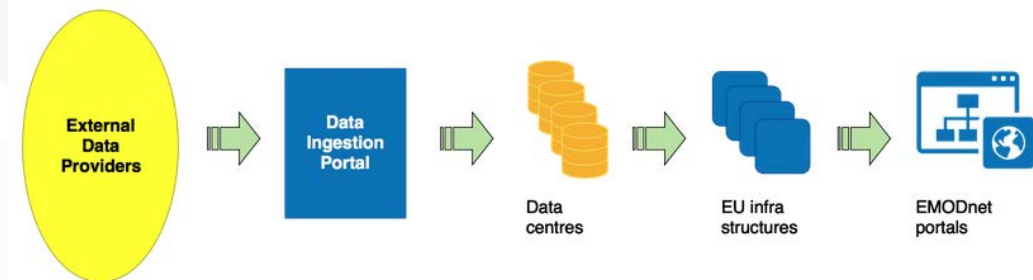
### DATASET GENERAL INFORMATION

Title of dataset \* 2011-GEMS, Zone 8 - Bristol Channel Atlantic Array, Metocean assessment

Narrative summary of dataset \* GEMS Survey Ltd. (GEMS) was awarded a contract by Channel Energy Limited to undertake metocean data collection in the Bristol Channel as part of the Atlantic Array wind farm development project. The scope of work includes the deployment of two acoustic wave and current (AWAC) units and one Directional Waverider Buoy. Ancillary work includes water and sediment sampling, and water profiling. Following non-recovery of AWAC devices, TRIAXIS Directional Wave buoys were utilised for the rest of the survey. This series contains both reports and datasets associated with the Metocean Assessment.

### DATASET FORMATS

Dataset format \* Text or PlainText



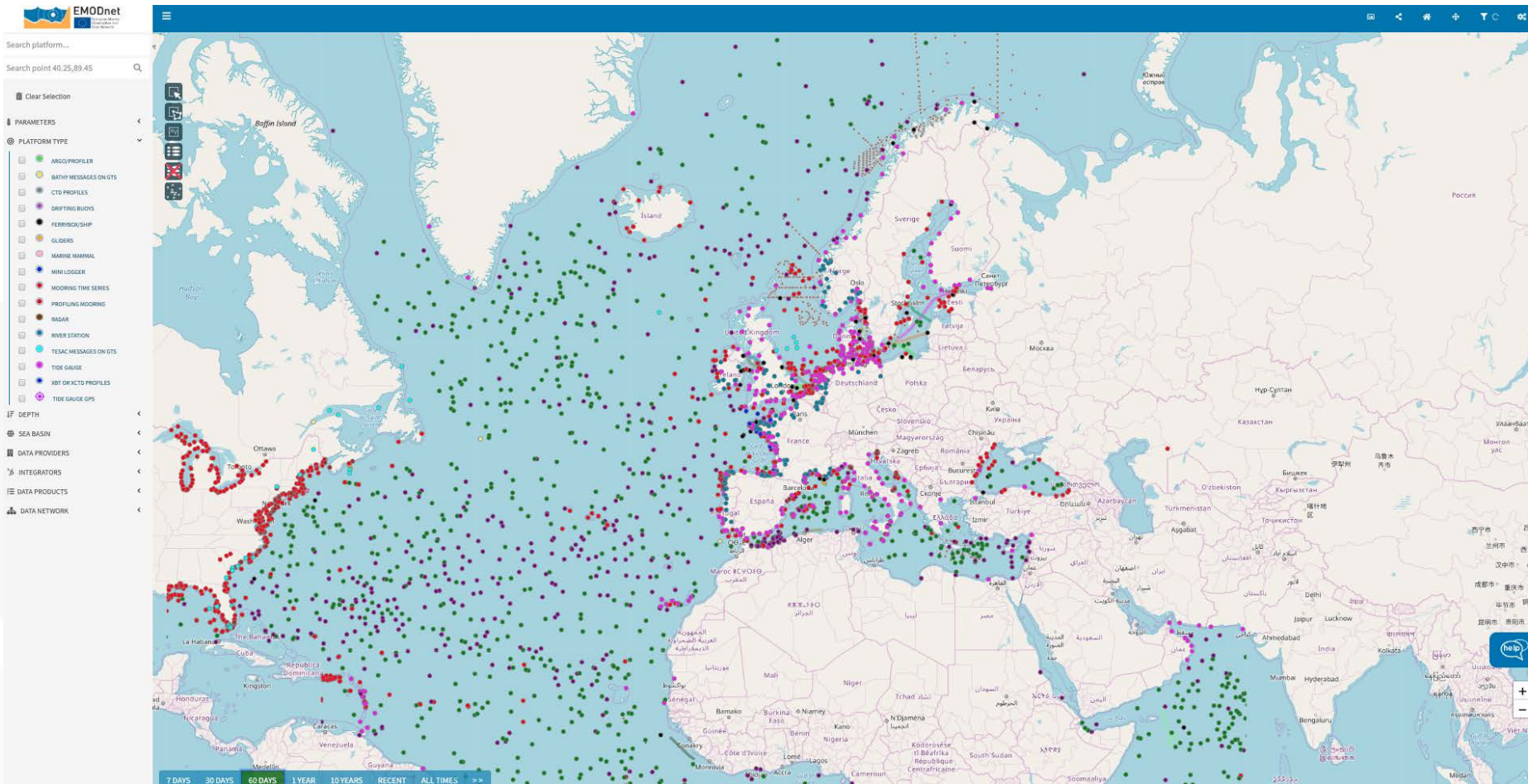




# /map

## EMODnet

European Marine  
Observation and  
Data Network





**ENSTA ParisTech**

**PLATFORM CODE**  
18956

**PLATFORM NAME**  
Bonpland slocum glider

**WMO CODE**  
18956

**INSTITUTION**  
ENSTA - Ecole Nationale Supérieure des  
Techniques Avancées - France

**ASSEMBLY CENTER**  
GLOBAL DAC (Coriolis)

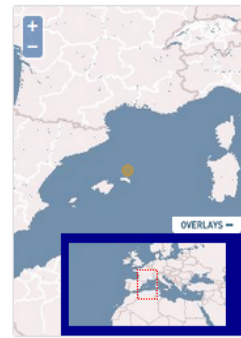
**TYPE**  
gliders

**PRINCIPAL INVESTIGATOR**  
Laurent BEGUERY

**CMEMS - PROD ID**  
INSITU\_GLO\_NRT\_OBSERVATIONS\_013\_030

7 Days 60 Days Older data

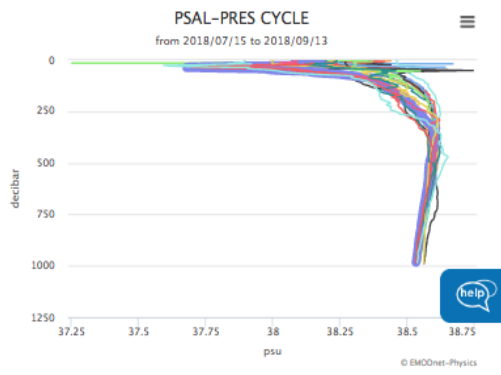
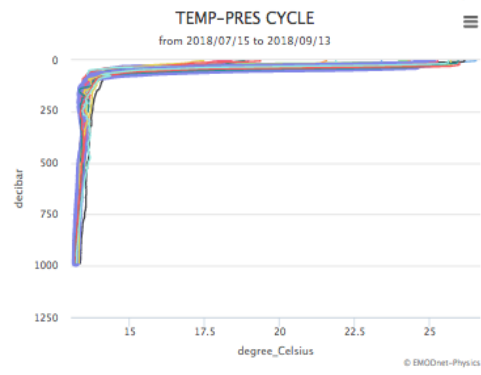
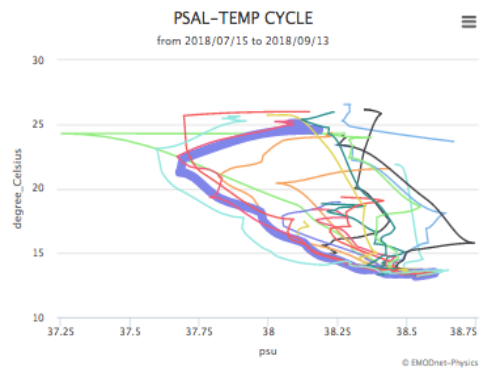
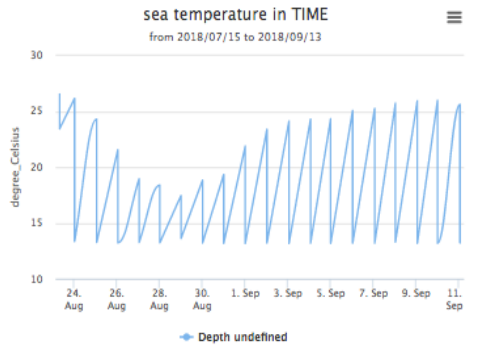
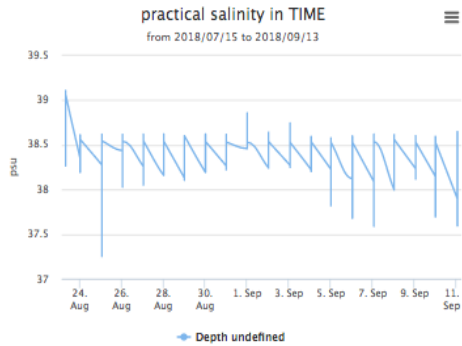
- 2018-08-29 10:07:50.000000
- 2018-08-30T00:16:42.000000
- 2018-08-31T00:01:26.000000
- 2018-09-01T00:10:26.000000
- 2018-09-02T00:31:54.000000
- 2018-09-03T01:19:07.000000
- 2018-09-04T01:30:06.000000
- 2018-09-05T00:05:35.000000
- 2018-09-06T00:45:15.000000



quick download(60 days): select data format and go

NetCDF CSV Download Preview

plots are a Runtime undersampled view of the dataset. to see full details open the "preview"





**PLATFORM CODE**  
BalticQueen

**WMO CODE**  
ESJJ

**INSTITUTION**  
MSI - Marine Systems Institute - Estonia

**ASSEMBLY CENTER**  
BOOS DAC (Baltic INS TAC DU)

**TYPE**  
ferrybox/ship

**PRINCIPAL INVESTIGATOR**  
MSI

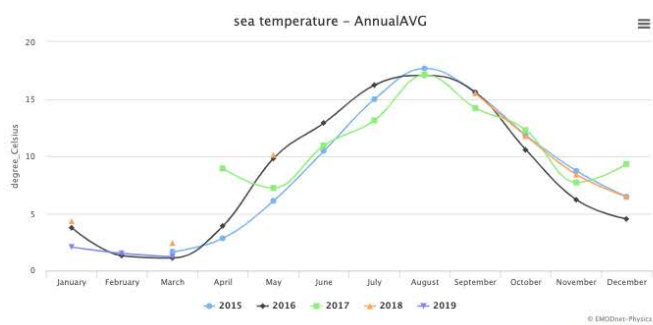
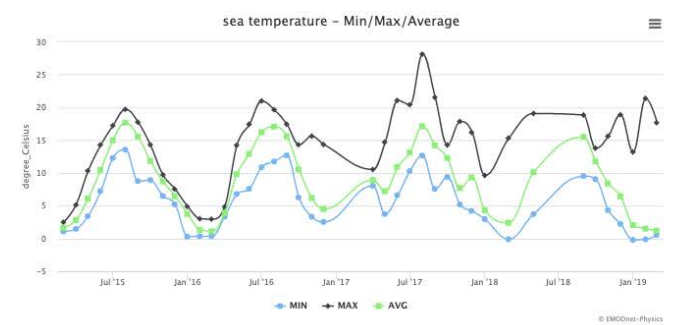
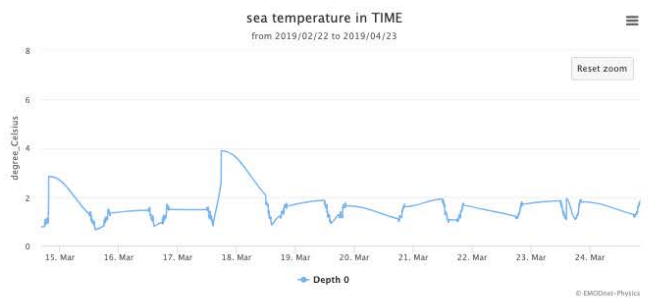
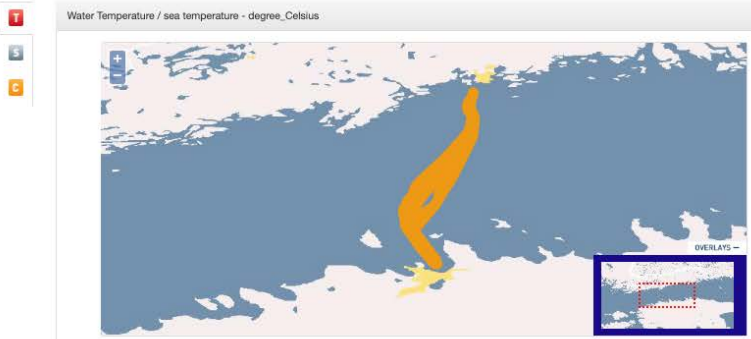
**CMEMS - PROD ID**  
INSITU\_BAL\_NRT\_OBSERVATIONS\_013\_032

7 Days 60 Days Older data

plots are a Runtime undersampled view of the dataset. to see full details open the "preview"

quick download@0 days: select data format and go

NetCDF CSV Download Preview



DEPTH / PROD ID Depth 0 / BAL\_013\_032 - Monthly

Min Average Max



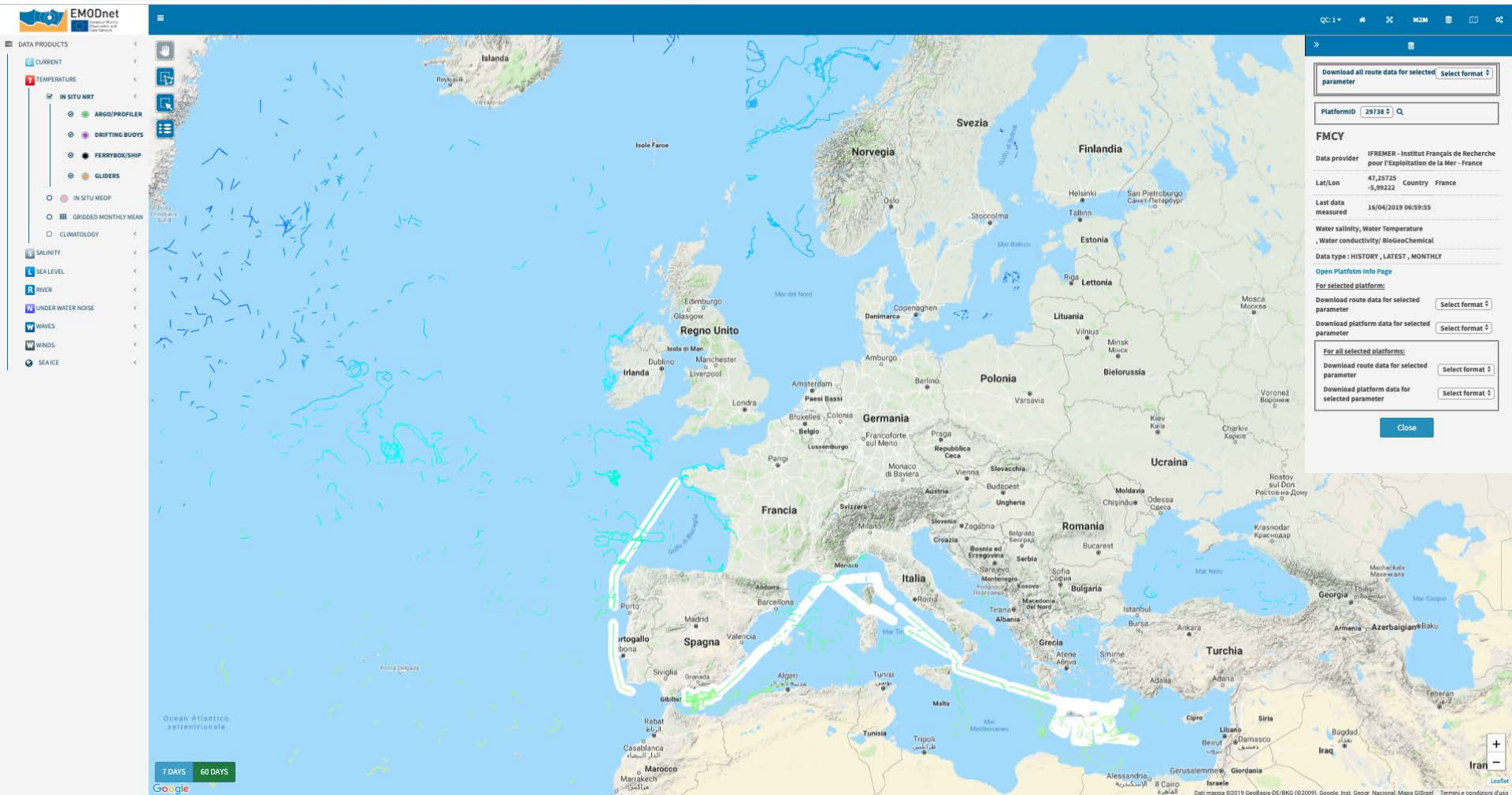


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# /products

Non sicuro | www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PROTOTYPE=PR&type=&param=TEMP





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# User: DHI and HyMOLAB

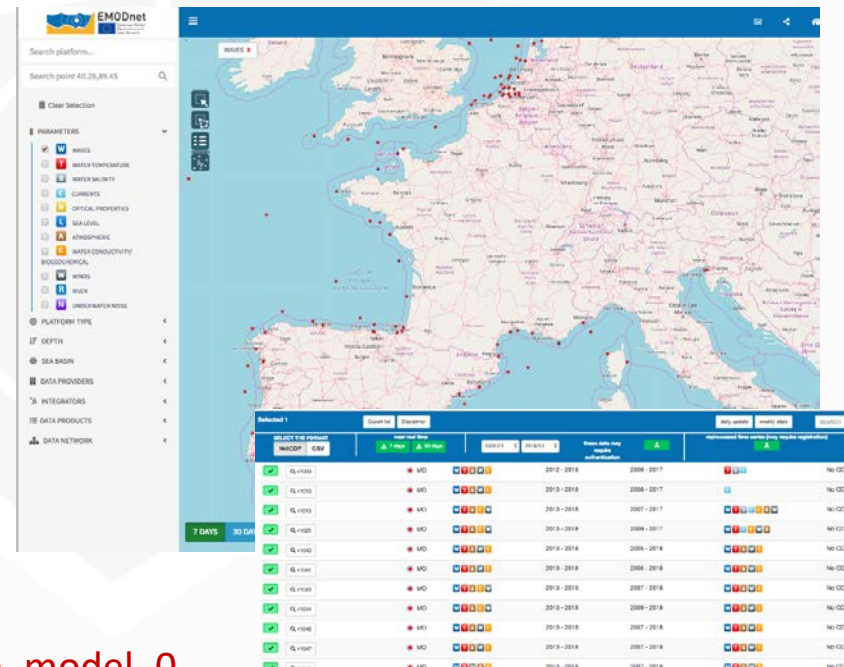


**Mediterranean Wind Wave Model** is a **met-ocean database** aimed at providing nearly 40 years of hourly time series of wind and wave conditions for the entire Mediterranean Sea.

**EMODnet Physics data were and are used for calibration and continuous validation purposes**

DHI is an international firm with its headquarters in Denmark, which specializes in delivering solutions to various water challenges.

**Service: webmap and platforms list download**



[http://www.emodnet.eu/mediterranean\\_wind\\_wave\\_model\\_0](http://www.emodnet.eu/mediterranean_wind_wave_model_0)



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# User: LAMBDA

**EMODnet Physics River data service supports the LAMBDA project to demonstrate the quality of modelling results produced by the watershed models.**

The EMODnet Physics - River data service provides a unique one stop shop for operational near real time river data in a standardised format for several countries facilitating the access, download and validation of this kind of data

## Service: API and web services

<https://github.com/EMODnet-Physics/EMODnet-Physics-Documentation/blob/master/WebService.md>



### THE PROJECT

The LAMBDA project aims to improve the CMEMS MFC's thermohaline circulation in coastal areas by a better characterisation of the land-marine boundary conditions, with special regard to the salinity fields, through exploring the capacities of watershed numerical modelling and its coupling to mesoscale regional ocean models. New Earth Observation sea surface salinity products and experts groups will evaluate the project products impact on ocean salinity fields.

Currently hydrological models are not generally coupled to coastal and regional ocean models because, even if regarded as a powerful and useful tool, they do not fully accomplish to estimate accurately the right volume of water reaching the coastal zone for many reasons including water management activities such as human consumption, irrigation, etc. For this reason, many coastal and ocean models continue to use river climatologies as boundary conditions for representing such an active boundary. Furthermore, continuous salinity observations in the coastal area are scarce and sensors are highly unreliable while current Earth Observation (EO) products for salinity poorly represents the coastal gradients.



GitHub, Inc. [US] | <https://github.com/EMODnet-Physics/EMODnet-Physics-Documentation/blob/master/WebService.md>

1 contributor  
558 Lines (429 sloc) 16.4 KB

### EMODnet Physics Web Service

Method (click method name for description of return variables)	Description	Parameters (description)	Example
<a href="#">GetAllDataOwner</a>	it gives the list and details of the data owners/contributors		XML TXT
<a href="#">GetAllLatestData60Days</a>	it gives the latest data (60 days) for the specified platform	PlatformID	XML TXT
<a href="#">GetAllLatestDataCode</a>	it gives the latest data (60 days) for the specified platform and parameter	PlatformID ParamCode	XML TXT

<http://www.emodnet.eu/emodnet-cmems-together-build-framework-improving-land-boundary-conditions-cmems-regional-products>



# User: PM\_TEN

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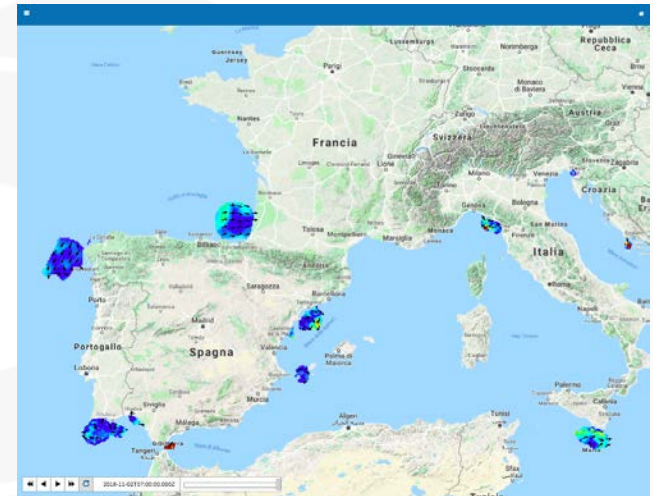
**Water-pollutants-dispersion studies** are usually performed with numerical codes, which require both meteorological and marine **surface current inputs**. The inputs are usually provided by circulation models and/or by radar data analysis, **such as those available in the EMODnet Physics database**.



PM\_TEN (Physical Methods and Technologies for Environmental Needs) is an Italian supporting assessment on the analysis of air pollution, atmospheric impact and the effects of harbours and ships on urban air quality.

## Service: THREDDS SERVER

- <http://thredds.emodnet-physics.eu/thredds/catalog.html>
- <http://thredds.emodnet-physics.eu/thredds/HFRADARCatalog.html>





# User: SOOS

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**SOOSmap builds on** the data aggregation and sharing **infrastructure of EMODnet** to bring circumpolar datasets into a single web-based discovery portal.

Through SOOSmap, users can discover, plot, explore, and download datasets of relevance to biologists, ecologists, ice scientists, and physical oceanographers.

The use of EMODnet allows SOOS to develop the data-sharing tools it needs **without duplicating existing infrastructure** and without placing undue burden on its member organisations

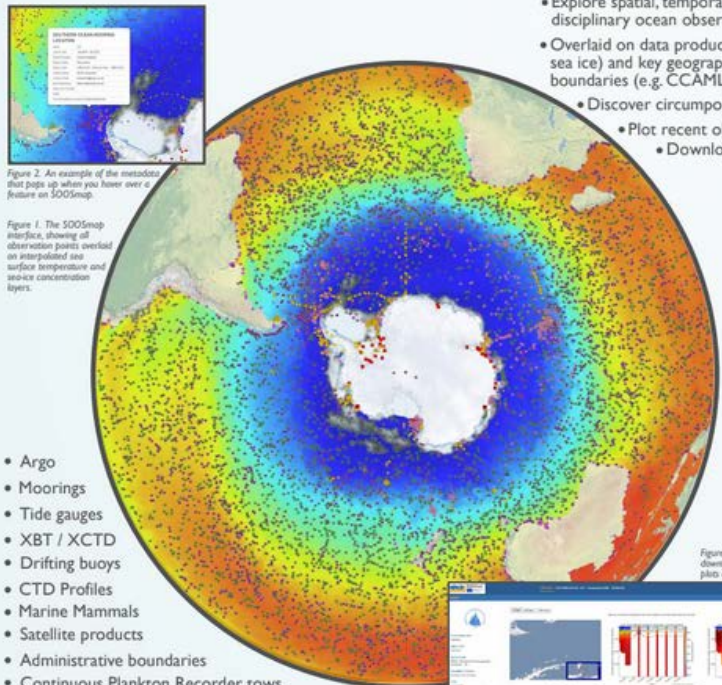
**Service: child portal**

<http://www.soos.aq>

**SOOSmap brings circumpolar Southern Ocean data to a computer near you**  
 Pip Bricher<sup>1</sup>, Antonio Novellino<sup>2</sup>, Patrick Gorringer<sup>3</sup>, Marco Alba<sup>4</sup>, Jie Zhang<sup>5</sup>, and Roger Proctor

<sup>1</sup>Southern Ocean Observing System, University of Tasmania, Private Bag 118, Sandy Bay Tasmania, 7001 Australia, email: [daa@soos.aq](mailto:daa@soos.aq); <sup>2</sup>EMODnet Physics, Genova, Italy; <sup>3</sup>EuroGOOS, Sweden; <sup>4</sup>Polar Research Institute of China, China; <sup>5</sup>HOSSADON, Australia

The Southern Ocean Observing System (SOOS) is an international initiative with the mission to facilitate the collection and delivery of essential observations on dynamics and change of Southern Ocean systems to all international stakeholders (researchers, governments, industries), through design, advocacy and implementation of cost-effective observing and data delivery systems. As part of this, SOOS has a mandate to provide tools to make it easier to share and discover existing data from the Southern Ocean.



- Explore spatial, temporal and multi-disciplinary ocean observation data
- Overlaid on data products (e.g. SST, sea ice) and key geographic boundaries (e.g. CCAMLR)
- Discover circumpolar datasets
- Plot recent observations
- Download datasets

Figure 2. An example of the metadata that pops up when you hover over a feature on SOOSmap.

Figure 1. The SOOSmap interface, showing all observation points overlaid on interpolated sea surface temperature and sea-ice concentration layers.

- Argo
- Moorings
- Tide gauges
- XBT / XCTD
- Drifting buoys
- CTD Profiles
- Marine Mammals
- Satellite products
- Administrative boundaries
- Continuous Plankton Recorder tows
- NECKLACE Ice Shelf Melt Observations
- **More layers coming all the time**

Figure 3. SOOSmap data download page showing plot of key variables.

The European Marine Observation and Data Network (EMODnet) is a network of organisations supported by the EU's integrated maritime policy. These organisations work together to observe the sea, process the data according to international standards and make that information freely available as interoperable data layers and data products.

• SOOSmap is a collaboration between SOOS and the European Marine Observation and Data Network (EMODnet) Physics group

[www.soos.aq/data/soosmap](http://www.soos.aq/data/soosmap)

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# Back to the point

Different user, different interests, different products, ...

- Data format (netcdf, odv, ...), data organization (daily, transects, cruises, ...)
- Data quality and Data quality flags (common integrated method, enable synch with other platforms)
- Parameters and data flow/ different users, different needs:
  - **Real Time, Near Real Time** (within 24 hours)
  - **Recovered** (full resolution),
  - **Delayed mode** after calibration and/or validation
- Findability, Accessibility, Interoperability and Reusability (**FAIR**) both for machines and for people
- **Open and free** data flow (we do not need one single DB, we need the data to be accessible!)

Node/TAC  
approach

- If the **data provider can set up the data flow**, the node/TAC has to link and include
- If the **data provider cannot setup the data flow**, the node/TAC applies functions and disseminate

**Ocean physics at your fingertips**

**contacts@emodnet-physics.eu**



[www.emodnet.eu](http://www.emodnet.eu)

*Your gateway to marine data in Europe*