



EMODnet

European Marine
Observation and
Data Network

Your gateway to marine data in Europe

EMODnet Physics

EASME/EMFF/2016/006 - Operation, development and maintenance of a
European Marine Observation and Data Network
EASME/EMFF/2016/1.3.1.2 – Lot 3/SI2.749411

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The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) No 509/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund.



Outline

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- Report on Tasks
- Explain the actions you have undertaken, or planning, to develop a more user oriented approach, in particular to engage with the private sector to stimulate use, to obtain feedback on the provided services, to ask their requirements and actions undertaken to develop a more fit for purpose data, products and services
- Steps undertaken and progress made to engage with Regional Sea Conventions to cater for their needs



Outline



| WP # | WP Title | Corresponding Tasks |
|------|---|--|
| WP 1 | Project management | Task 9. Project management Task 5. Ensure the involvement of regional sea conventions |
| WP 2 | Data Collection, Metadata Compilation, Data Access and Products | Task 1. Develop a common method of access to data held in repositories Task 2. Construct products from one or more data sources that provide users with information about the distribution of parameters in time and space Task 6. Facilitate interoperability with data distributed by non-EU organisations |
| WP 3 | Portal Technical Development and Operation | Task 3. Develop procedures for machine-to-machine connections to data and data products Task 4. Develop a web portal allowing users to find, visualise and download data |
| WP 4 | Analysis, evaluation and feedback | Task 7. Install a process to monitor performance and deal with user feedback Task 8. Operate a help desk offering support to users |



WP4. Analysis, Evaluation and feedback

WP4.1. Monitor performances and deal with user feedback

project statistics will be collected (monitoring web tools/user survey)

Task 7. Install a process to monitor performance and deal with user feedback

Task 8. Operate a help desk offering support to users

WP4.2. Operate a help desk offering support to users.

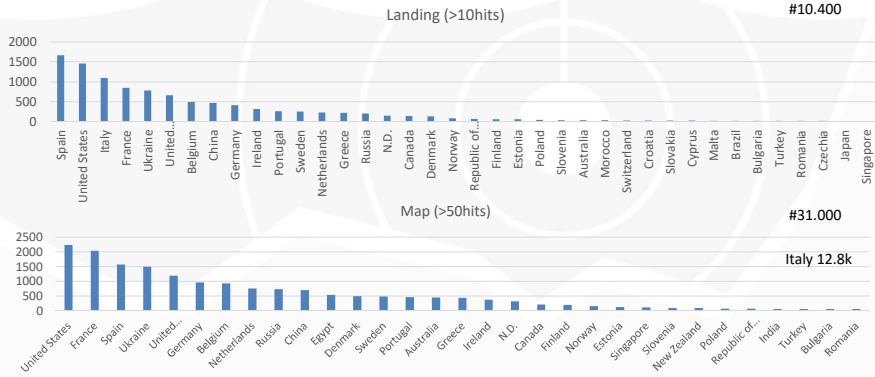
1. help desk will operate during working hours (9.00 – 17.00 Brussels time) from Monday to Friday
2. accessible by: 1) on-line tools 2) email (and call back)
3. Help desk service level 1 -2
4. user feedback management to implement a FAQ



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01/03/2017 – 01/03/2018

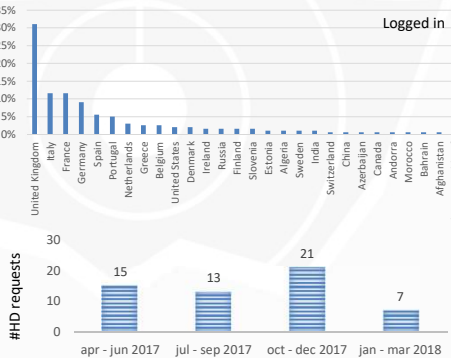
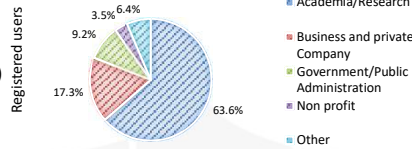
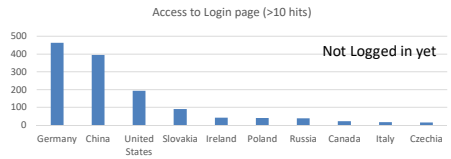
| Country | #data requests (700.000) | Country | #manual download requests (46.000) |
|----------------|--------------------------|----------------|------------------------------------|
| Belgium | 193369 | Portugal | 8043 |
| Germany | 181757 | Netherlands | 6915 |
| United States | 130276 | Germany | 6706 |
| Morocco | 105859 | Greece | 4316 |
| Italy | 22243 | United Kingdom | 3968 |
| Portugal | 18526 | Italy | 3541 |
| France | 18521 | Denmark | 3497 |
| Netherlands | 6941 | Belgium | 2609 |
| United Kingdom | 4408 | France | 1407 |
| Greece | 4319 | Spain | 1074 |
| Denmark | 3497 | Philippines | 1048 |
| China | 2463 | | |
| Slovenia | 2226 | | |
| Spain | 1152 | | |



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01/03/2017 – 01/03/2018

1324 access to the login form
173 user profiles
(obviously the same user access the page many time!)





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User, international
collaborations,
interoperability...

Sustainability of
these collaborations

SOOSmap brings circumpolar Southern Ocean data to a computer near you
Pip Bricher, Antonio Novellino, Patrick Gorringe, Marco Albi, Jie Zhang, and Roger Proctor

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, delivery and implementation of cost-effective observing and data delivery systems. As part of this, SOOS has a mission 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 data providers have been putting on SOOSmap.

Figure 3: The SOOSmap interface showing all observation points services and descriptions available on the system, with a search bar and filters.

Figure 4: SOOSmap data download page showing details of a specific dataset.

- 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

The European Marine Observation and Data Network (EMODnet) is a network of organisations supported by the EC's regional innovation policy. These organisations work together to deliver the best products of 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.



Planned actions

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- Set up FAQ page
- Activate the mail service for more providers/networks of interest
- Dissemination (exhibitions)
 - EGU (10-11 April)
 - Liege Colloquium (28-30 May)
 - HyMEX (29-30 May)
 - EMODnet Italy (8 June)
 - SeaFuture (19-23 June)
 - Glider WS (17-19 Sep)
 - IMDIS (Oct)
 - EOOS Conference (Nov)
 - ...
- Workshops (Data Ingestion)
 - Poland (April)
 - Spain + Portugal + Morocco

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Analytics

Provider: IFREMER - Institut Français de Recherche pour l'Exploitation de la Mer - France

Report Period: 01/06/2019 - 30/06/2019

Total views: 244 Total download NRT: latest file 0 Total download NRT: monthly file 4
Total download long term rep. file 2 Total download CDI file 0 Total request web service 48

Top 5 most viewed/downloaded platform

| Platform | Viewed | Download | Web service | Total |
|----------|--------|----------|-------------|-------|
| 01034 | 133 | 4 | 26 | 163 |
| 000642 | 19 | 1 | 0 | 20 |
| 000910 | 17 | 1 | 0 | 18 |
| 0101660 | 10 | 0 | 0 | 10 |
| 0101654 | 9 | 0 | 0 | 9 |

Views per Country

| Country | Tot |
|----------------|-----|
| Germany | 48 |
| China | 38 |
| Belgium | 37 |
| United Kingdom | 36 |
| Italy | 29 |
| France | 11 |

Downloads per Country (data usage)

| Country | NRT Latest | NRT Monthly | Long term rep. | CDI | Web service | Tot |
|----------------|------------|-------------|----------------|-----|-------------|-----|
| Germany | 0 | 0 | 0 | 0 | 48 | 48 |
| China | 0 | 1 | 1 | 0 | 0 | 2 |
| Belgium | 0 | 1 | 1 | 0 | 0 | 2 |
| United Kingdom | 0 | 0 | 0 | 0 | 0 | 2 |
| Italy | 0 | 0 | 0 | 0 | 0 | 0 |
| France | 0 | 0 | 0 | 0 | 0 | 0 |

PROFES

NIB



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Planned actions



| 2016 | 2018 |
|------|------|
| 4 | 4 |
| 26 | 30 |
| 120 | 300 |
| 900 | 1000 |
| 1200 | 2000 |
| 5000 | 6500 |

| |
|---|
| CONFERENCE DAYS |
| FOREIGN NAVIES |
| EXHIBITING ENTERPRISES |
| ADVANCED B2B MEETINGS |
| PROFESSIONNEL VISISTORS |
| SQM OF EHBITING AREA INSIDE LA SPEZIA NAVY BASE |

SEAFUTURE is the HUB able to create connections, synergies among national and international big players, SMEs, universities and research institutes, innovative start ups, technology clusters, marine and maritime ones, Italian Navy, Foreign Navies and institutional stakeholders.

→ EMODnet Stand + oral presentation 22 June «Our Ocean, One Future» session



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Planned actions

File Strumenti Visualizza EUROGOOS_EMODNet_dataworkshop_Feb2018_meeting_details.docx - Word

EuroGOOS and EMODNet Physics Data Workshop

Location: Marine Institute, Rinville, Dranmore, Co. Galway, Ireland.
Date: Tuesday 13th February 2018 09:30 – 17:00

Agenda

09:30 Arrival and registration in the Brendan the Navigator Room
09:45 Welcome, overview and introductions – Adam Leadbetter

Session 1: The European Perspective
10:00 European Data Landscape – Patrick Gorringer
10:20 EMODNet Physics – Antonio Novellino
10:40 EMODNet Ingestion
10:50 Discussion
11:00 Tea and coffee

Session 2: National data management infrastructure
11:20 Introduction to Erdap – Rob Fuller
11:30 Ireland's Digital Ocean – Adam Leadbetter
12:00 COMPASS Project – Adam Mellor
12:20 MEDIN – Lesley Richards – Charlotte Misikin
Hymns
12:30 Lunch in the MI canteen - meal options starting from around €5.

Session 3: National ocean physical data generators
13:30 Commissioners of Irish Lights (CIL) – Barbara Fogarty
• Navigation buoys and lighthouses – Ray Donohoe

13:45 Centre for Marine and Renewable Energy (MaREI) & UCC – Mark Jessopp
• Seal tag data

14:00 NIUG, Earth & Ocean Sciences – Sheena Fennell
• Galway Bay Time-series

14:15 Office of Public Works (OPW) – Peter Newport
• Tide gauges

14:30 Marine Institute (MI) – Diarmuid O'Connor
• ARGO floats
• Glider data

14:45 SMART Bay – Alan Berry
• Galway Bay Observatory
• Wave buoys

15:00 Tea and coffee

Session 4: COMPASS project data generators
15:20 Marine Scotland Science (MSS) – Jens Rasmusen
15:30 Scottish Association for Marine Science (SAMS) – Paola Arce (tbc)
15:40 Agro Fisheries and Biosciences Institute (AFBI) – Adam Mellor
15:50 Marine Institute (MI) – Andrew Conway

Discussion
16:00 Summary discussion and wrap up.
17:00 Workshop close

Schemate 1-2 di 7



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Task 3. Develop procedures for machine-to-machine connections to data and data products

Task 4. Develop a web portal allowing users to find, visualise and download data

WP3. Portal technical development and operation

WP3.1 EMODnet Physics Portal

WP3.2 EMODnet Physics machine-to-machine (M2M) and interoperability features

1. From EMODnet Physics to end-users
JSON and REST services, (OGC) compliant WMS (v.1.0) and WFS (v.1.0) services, SWE, THREDDS Data Server, ERDDAP, web widgets
2. User to EMODnet Physics
faster synchronization with the near-real-time data flow and historical data
FTP, THREDDS, SWE
coordination and support to EMODnet Data Ingestion

WP3.3 interoperability with data distributed by non-EU organizations

1. data access to- and preview for- coastal data in non-European areas
2. interoperate with the OAI-PMH that is a widely used standard by both European entities (e.g. PANGAEA) and non-EU organizations
3. providing support to non-EU organizations that want to be connected



EMODnet Physics Portal

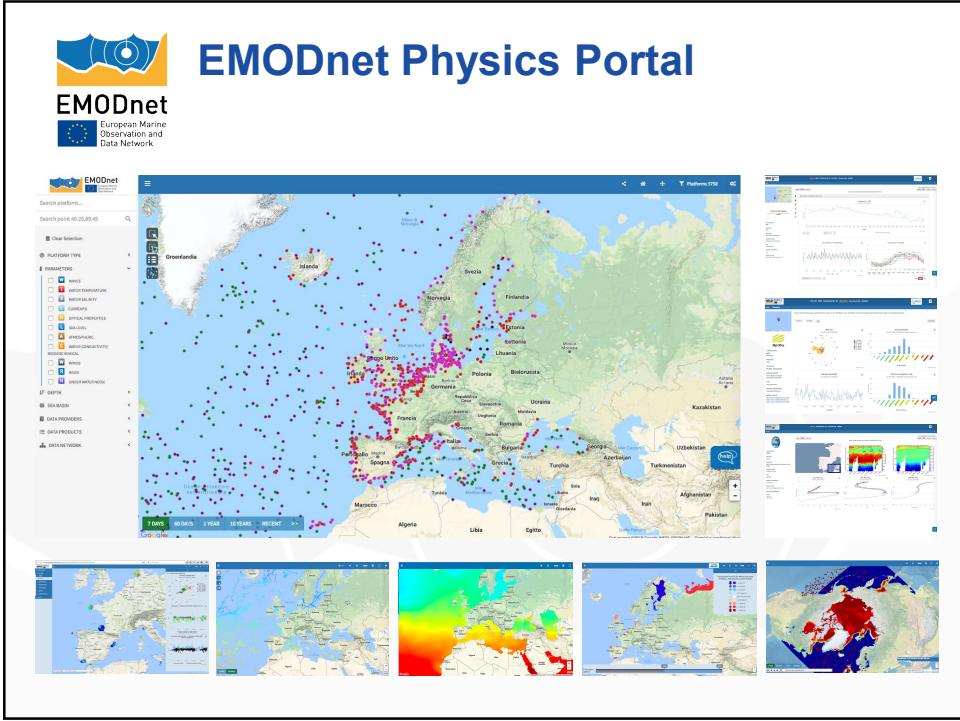
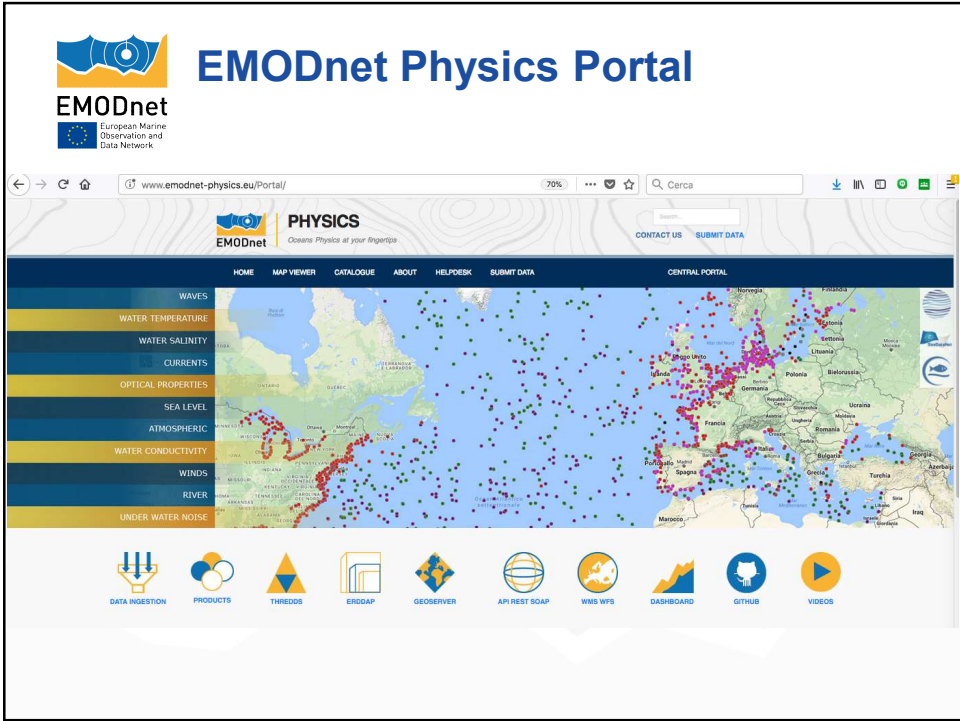
EMODnet

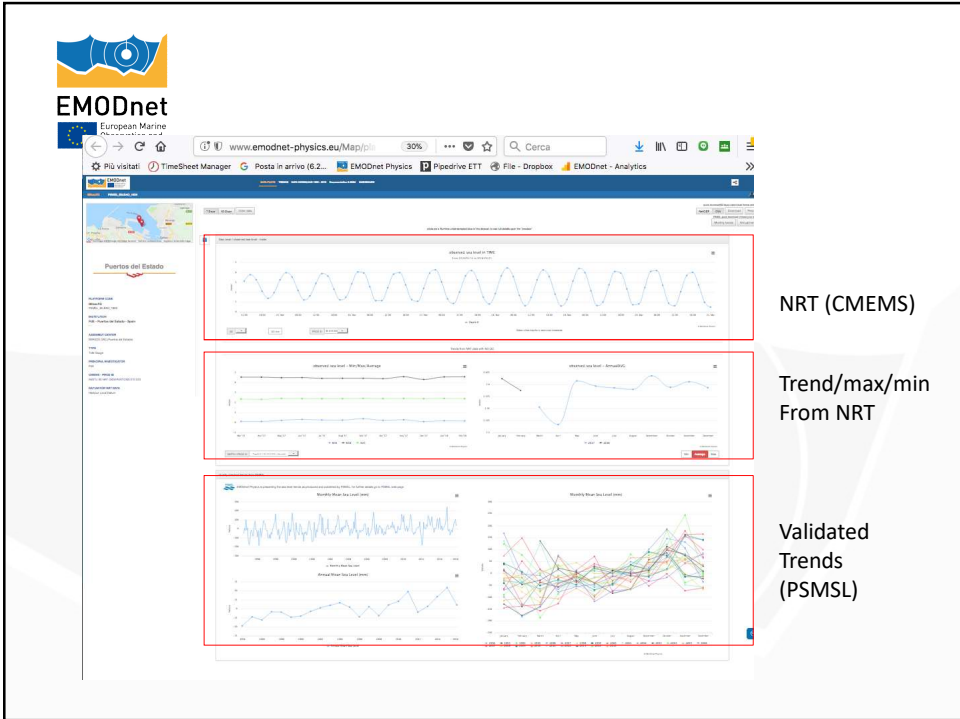
| Data |
|---|
| Near real-time (NRT) data at in situ observatories at sea |
| Reprocessed NRT data |
| Archived data derived from further elaboration and validation |

| Products |
|--|
| Data products |
| <ul style="list-style-type: none"> • Sea Level • Temperature & Salinity • Currents • Ice coverage • River runoff & TSM • Impulsive Noise |

| Parameters | |
|-------------------|-----------------------|
| Temperature | Wind |
| Salinity | Atmospheric param. |
| Waves | Biogeochemical param. |
| Currents | Optical properties |
| Sea Level | Ice data |
| Under water noise | River Runoff |

| Services | |
|-------------------|---------------------|
| Data portal | Catalogue |
| Products portal | Newsletter & digest |
| Monitoring tools | Reports (mail) |
| http & permaURLs | API REST/SOAP |
| OGC WMS, WFS, WCS | THREDDS |
| ERDDAP | widgets |





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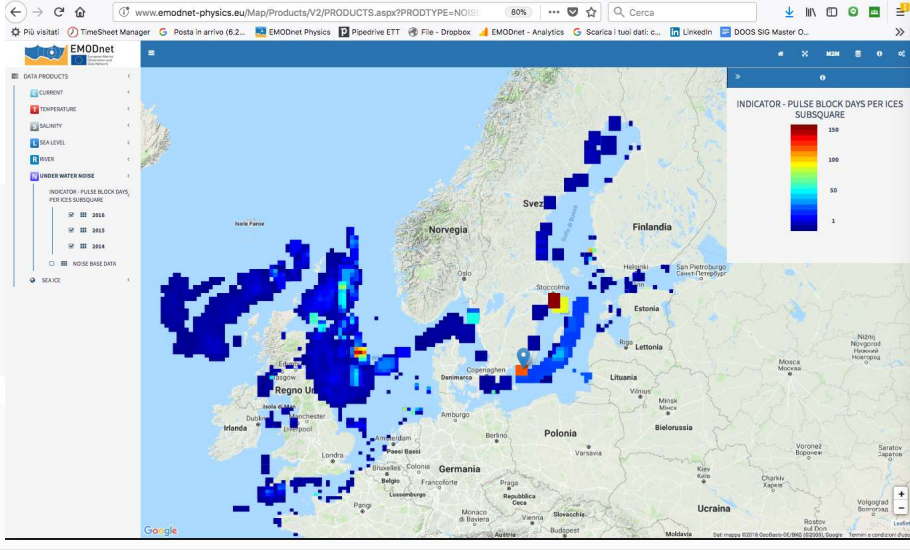
EMODnet Physics Portal

- Mooring
- ARGO profiler
- tide gauge
- river station
- repeated CTD
- Wind station
- HFR
- sea mammal
- ferrybox
- Data download
- M2M
- Dashboard



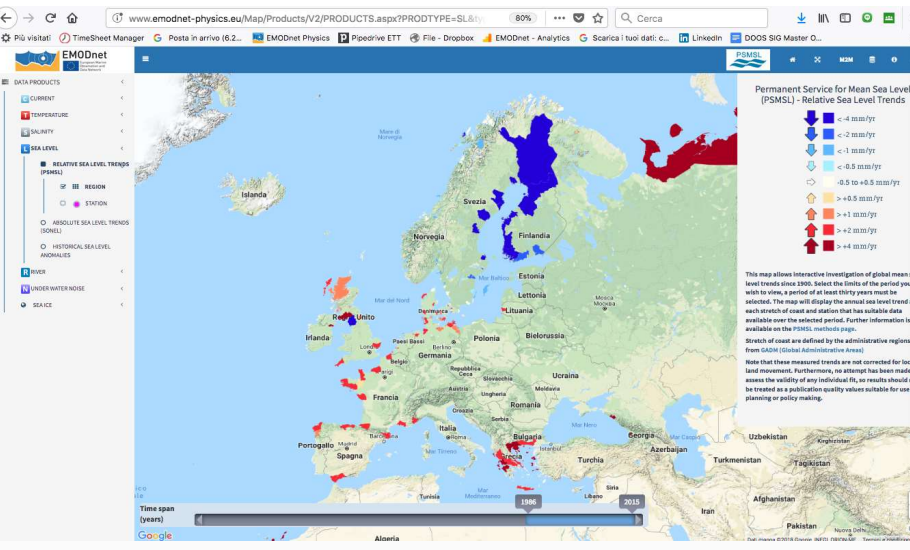
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Impulsive Noise Registry



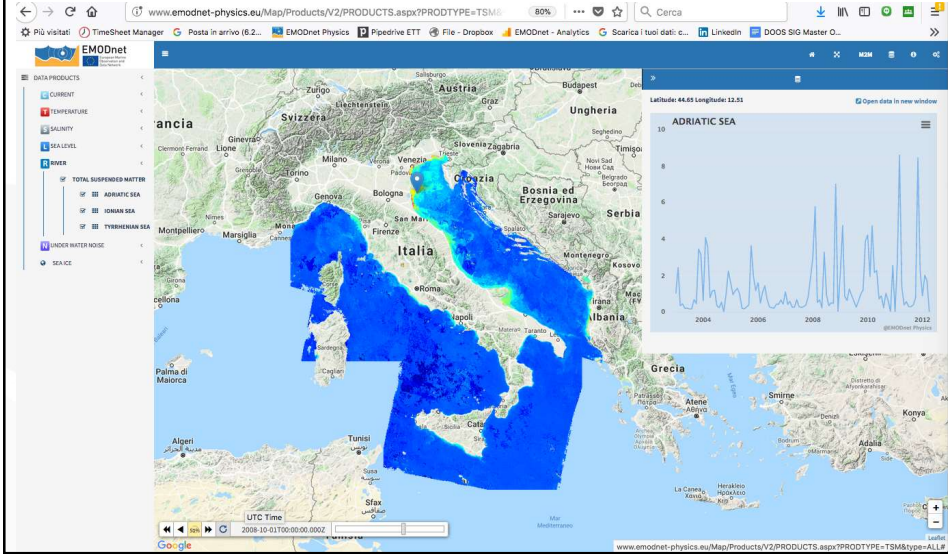
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Relative Sea Level trend

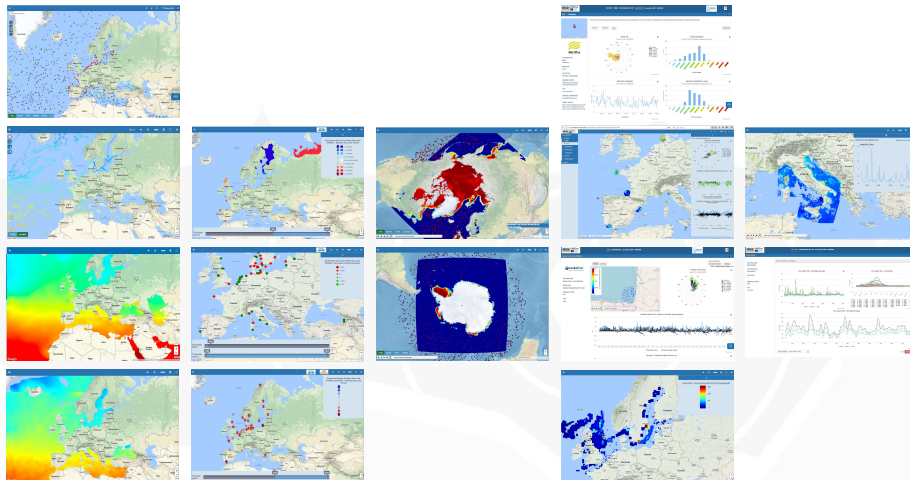




Total Suspended Matter



EMODnet Physics Portal



Temperature, Salinity, Sea Level and Anomalies, Sea Ice, Winds, Currents, River Runoff, Suspended Matter; Water Noise



M2M

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| Service | Description | Examples |
|-----------------------------|---------------------------------|---|
| permaURL | All platforms | http://www.emodnet-physics.eu/map/platinfo/piradar.aspx?platformid=10273 http://www.emodnet-physics.eu/map/platinfo/pidashboard.aspx?platformid=10273 Service description @ http://www.emodnet-physics.eu/map/spi.aspx |
| API REST/SOAP | Latest 60 days of data | www.emodnet-physics.eu/map/Service/WSEmodnet2.aspx www.emodnet-physics.eu/map/service/WSEmodnet2.asmx |
| OGS WMS, WFS, | Postgresql + Geoserver | geoserver.emodnet-physics.eu/geoserver/web examples and service description @ www.emodnet-physics.eu/map/service/GeoServerDefaultWMS www.emodnet-physics.eu/map/service/GeoServerDefaultWFS |
| THREDDS (OpenDAP, WMS, WCS) | Latest 60 days + HFR data + Ice | thredds.emodnet-physics.eu/thredds/catalog.html |
| ERDDAP | Latest 60 days | erddap.emodnet-physics.eu |
| widgets | All plots | www.emodnet-physics.eu/Map/Charts/PlotDataTimeSeries.aspx?paramcode=1010&platin=1010&timerange=1 |

The screenshot displays the EMODnet web interface. At the top, there is a navigation bar with the EMODnet logo and the text "European Marine Observation and Data Network". Below this, there is a "GeoServer" section with a "Layer Preview" window. The "Layer Preview" window shows a list of layers with columns for "Type", "Title", "Name", "Common Formats", and "All Formats". Below the "Layer Preview" window, there is a section for "ERDDAP" (Easy Access to Scientific Data) with a "Start Using ERDDAP" button and a search bar. The "ERDDAP" section includes a list of datasets and a "Dataset" list on the right side of the page.



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Planned actions

- Landing
 - First time on line guide/wizard/FAQ
 - Reorganize/redesign the catalog
- Map:
 - First time on line guide/wizard
 - Shortcuts to data packages
 - Quick download features
- Platform pages:
 - Undersampled plot full time series/data package
 - More instruction/help less buttons/options
 - Better/easier links between plots and M2M
- Products:
 - Products catalogue linked to products viewer
 - Quick download/shortcuts



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Task 1. Develop a common method of access to data held in repositories

Task 2. Construct products from one or more data sources that provide users with information about the distribution of parameters in time and space

Task 6. Facilitate interoperability with data distributed by non-EU organisations

WP2. Data Collection, Metadata Compilation, Data Access and Products

WP2.1. Expand the existing measurements from fixed and moving platforms

Argo, profiling floats, gliders, radar, CTD from ships, river outflow, water noise, etc.

WP2.2. closing the gap in data flow between operational repository and validated archives

More synergies and cooperation between operational operators (ROOSs) and national data centres (NODC)

WP2.3. Include the new parameters: inflow from rivers and sound

WP2.4. Collaboration with EMODnet Data Ingestion project

WP2.5: Metadata

EuroGOOS ROOSs and SeaDataNet NODCs for EU, JCOMMOPS for international programmes

WP2.6. Data access

WP2.7. Data Products

several types of maps, in situ linear trends and aggregated data sets



EMODnet Physics

A common infrastructure to serve many users

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 agggr., Rep long term
- **Metadata + Transport format:**
Netcdf (CF convention), csv

Direct download

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)

RSM mediated download

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

Download/M2M



Data

@20/03/2018

| | EMODnet | CMEMS | IOOS | SDN | IMOS | NDBC | IAPB | GOSUD | PSMSL | GRDC | MEOP | OS - FIX03 | Redundancy |
|---------------|---------|--------|------|-----|------|------|------|-------|-------|------|------|------------|------------|
| Mooring | 2908 | 1592 | | 838 | 16 | 950 | | | | | | 72 | X |
| Tide Gauge | 1690 | 390 | | 155 | | | | | 1391 | | | | X |
| FB/Ship | 259 | 140 | | 4 | | | | 114 | | | | | X |
| Glider | 190 | 54 | 137 | | | | | | | | | | |
| ARGO/profiler | 9244 | 9240 | | | | | | | | | | | |
| Sea Mammal | 1743 | 579 | | | | | | | | | 1145 | | X |
| River Station | 177 | 177 | | | | | | | | 370 | | | X |
| HF Radar | 142 | 30 | 96 | | 16 | | | | | | | | |
| CTD | >54000 | >54000 | | | | | | | | | | | X |
| Drifting Buoy | >10100 | >10100 | | | | | 1225 | | | | | | X |

more than 25.000 connected platforms, more than 600.000 datasets



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Planned actions

Under water noise

- Inventory of the operational systems
- Data management and real time (SPLs) data flow
- Integration HELCOM, OSPAR, ACCOBAMS registries

River runoff

- ingestion of the operational systems
- Integration of Global Runoff Database
- total suspended matter product
- Annual Runoff product

Gliders

- Data management and facilitate interoperability
- Glider Workshop Genoa (Italy) Sept 2018

Ferrybox

- facilitate interoperability and data flow
- FB Workshop Genoa (Italy) Spring 2019

HFR

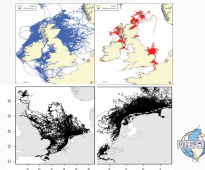
- Coastal current product (gap filling)
- Interoperability with international data /programs
- Historical data

Sea Level

- Absolute trends (SONEL)
- Add links to GNSS stations
- Sea level anomalies (from PSMSL and SONEL)

Marine Mammals

- with MEOP to ingest recent (European) data
- Near real time data flow



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WP1. Project Management

Task 9. Project management

Task 5. Ensure the involvement of regional sea conventions

WP1.1. Project Management

WP1.2. Project Reports

WP1.3. Project handover

WP1.4. Harmonization/Coordination with the other EMODnet Portals

WP1.5. Coordination with the EMODnet ingestion project

WP1.6. Regional Sea Conventions involvement



EMODnet Physics & Data Ingestion

Near Real Time

- 30 tide gauge stations, Italian TG network, ISPRA via GLOSS
- 4 fixed stations, 2 gliders, 2 turtles, 2 FB, SOCIB
- HFR data (Brest bay: Pointe de Brézellec- Pointe de Garchine), SHOM
- 23 Ferrybox (StenaLines), SMHI

Historical data

- >1100 sea mammals data, 2004 – 2015, MEOP DB
- 3 fixed buoys (Civitavecchia, Gaeta), 2012 -2017, Uni. Tuscia
- HFR data (Naples, Manfredonia, Trieste), CNR ISMAR, RITMARE prj.
- HFR data (MESA, VADE), 2014-2015, SMHI
- MEOP update 2016

In progress

- 10 wind stations, 2014-2018, IMR
- 1 HFR, 2016-2018, IMR
- Some Repeated profiles, MI
- Ca 20 stations, Ireland
- 8 mooring, Croatia



EMODnet Physics & Data Ingestion

The screenshot shows the EMODnet web interface. At the top, there is a navigation bar with tabs for 'Timeseries', 'Profiles', 'Trajectories', 'Favorites', and 'Settings'. Below this is a sub-navigation bar with 'Diagram', 'Map', 'Listselection', and 'Provider'. A search bar is located on the left side of the map area. The map itself shows Europe with various locations marked. A red box with the text 'BETA ver.' is overlaid on the map. On the right side, there is a list of phenomena under the heading 'All Phenomena'. The list includes: Average crest period, Average height waves H 1/10, Average height waves H 1/3, Average zero crossing period, Average zero crossing period Tz 1/3, Average zero up crossing period Tz 1/10, Concentration of oxygen (O2) the water body, Directional spreading spectral peak, Downwelling vector irradiance as energy (longwave), Downwelling vector irradiance as energy (solar wavelengths), Electrical conductivity of the water body, Latitude, Longitude, Maximum zero crossing height, Maximum zero crossing period, Mean direction spectral, and Orientation (horizontal relative to magnetic north) of measurement platform.

www.emodnet-physics.eu/realtime



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RSCs involvement

- Participated to Helcom State and Conservation meeting and Ospar Working Groups on Monitoring and on Trends and Effects of Substances in the Marine Environment (MIME) meeting
- Participated to TG NOISE

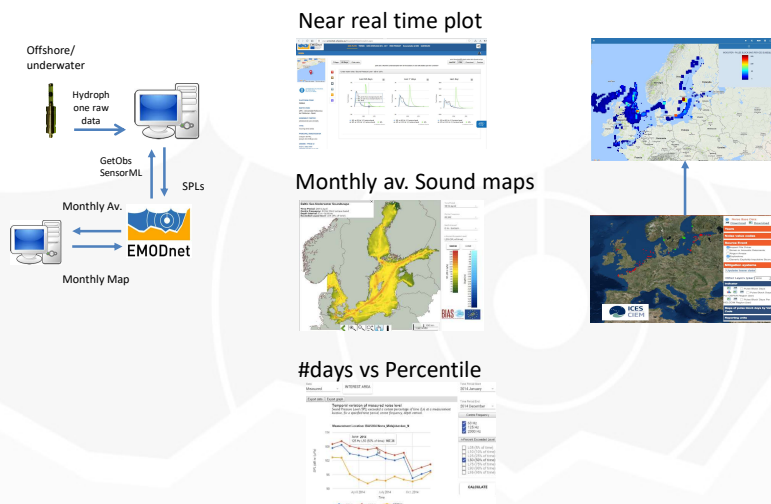
Planned actions:

- Integrate and show the impulsive registries (ICES) and keep working with TG Noise
- Follow up on BIAS project
- Follow up on JOMOPANS project



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Planned actions



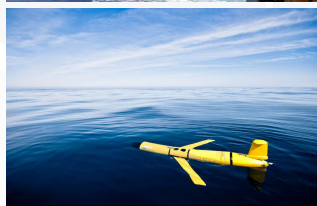
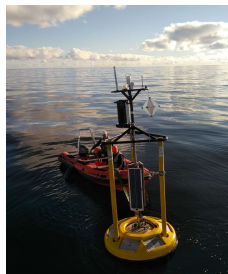
Ocean physics at your fingertips

contacts@emodnet-physics.eu



www.emodnet.eu

Your gateway to marine data in Europe



Credit: Dan Costa, SMHI, SOCIB, REDMAR