EMODnet Thematic Lot n° 03 - Physics

EMODnet Phase III - Trimonthly Report
Reporting Period: 01/07/2017 – 30/09/2017

Due Date: 15/10/2017

Contents

1. Highlights in this reporting period

Provide a short summary of the key achievements and/or events of interest to a wider audience within this reporting period you wish to highlight – this can be based on the indicators or any other of the reporting sections. [Provide a bullet list - maximum 5 bullets]

1. EMODnet Physics is powering the South Ocean Observing System (SOOS) data portal. The international collaboration between the two will bring and make available more data as recorded in the Antarctic area.

2. EMODnet Physics is offering a customized page for each typology of recording platform. The activity on re-styling these page to better present data was continued and e.g. latest data are now presented together with averages and trends (as processed by e.g. CMEMS INSTAC REP products or PSMSL sea level trend). In parallel the pages to host and show river data and underwater noise were developed and published.

3. The first release of the EMODnet Physics ERDDAP server was published. As planned, EMODnet Physics is developing and empowering its interoperability and machine-to-machine services and it is now able to both ingest and visualize data as exposed on ERDDAP servers as well as present the connected data (latest 60 days) throughout this system. Some technical problems were overcome thanks to the international collaboration and support from the ERDDAP technical development team.

4. The very first operational under water noise data were integrated and are now available on the portal. The OBSEA platform is equipped with a hydrophone that is providing EMODnet Physiscs near real time data on Sound Pressure Level (SPL) by means of OGC - Sensor Observing System features. EMODnet Physics is processing data to create accumulation histograms for past 60, 7 and 1 days.

5. Operational river data (river outflow) from about 130 stations and a preliminary river runoff product (derived from the Global Runoff Data Center database) are available and accessible from the EMODnet Physics portal.

2.Meetings held since last report

List here the meetings held/participated since the last trimonthly report, if relevant add short description.

Date	Location	Topic	Short Description
18/6/2017	call	International Animal Welfare Foundation	After presenting EMODnet Physics and IAWF goals, the discussion was focused on EMODnet Physics plans for the under water noise data management and product developments. They do not host data but are very interested in following up the EMODnet Physics progresses. Contacts and connection with the European UWN Technical working group was established.
20/6/2017	Call	South Oceans Observing System	We discussed technical details on how EMODnet Physics could offer the engine for the SOOS portal.
14/6/2017	Brussels (Belgium)	AtlantOS international Data workshop	EMODnet Physics is one of the AtlantOS integrators and is powering the AtlantOS data portal
5-6/7/2017	Genova (Italy)	EMODnet Technical Working Group	
29-30/8/2017	Web meeting	SOOS	Follow up on of the previous meeting and EMODnet Physics was identified to power the SOOS data portal. In turn the SOOS community will provide the EMODnet Physics infrastructure with new data from south ocean areas
6-7/9/2017	Skiathos (Greece)	Underwater Acoustic Conference Europe 2017	Wide forum on under water acoustics and noise.
5-7/9/2017	Singapore (Singapore)	GOOS Regional Alliance Forum VIII	
13-15/9/2017	Rome (Italy)	EMODnet Steering Committee	
18/9/2017	Toulouse (France)	EMODnet @ MERCATOR	
19-21/9/2017	Luneburg - Germany	Radio Oceanography Workshop (ROW 2017).	International workshop on radio technologies (e.g. HFR) to monitor ocean status.
22/9/2017	Luneburg - Germany	EuroGOOS HF Radar Task Team meeting	
25-28/9/2017	Brussels (Belgium)	Copernicus Marine Week	During the "In situ Infrastructure and CMEMS current state of the system" sprinter session the in situ data management, the key European and international infrastructures and programmes, the cooperation and collaboration between the INSTAC and EMODnet Physics and SeaDataNet were presented and discussed.

27/9/2017	Costanza (Germany)	Bio-logging workshop	Integrating data collected by animals into the Ocean Observing System. The WS is aimed at discussing: Data sharing and standardization of formats, Recent advances and new opportunities, Increasing synergy between biology and physical communities

Table 1. Meetings

3. Work package updates

The project officially started 29thMarch 2017.

WP1 – Project Management

The general objectives of WP1 are the project management and the coordination of all project activities ensuring timely delivery and high quality of documentation, tools, results and products. Project management includes the collaboration with the other EMODnet activities and involvement of regional sea conventions.

Activities:

Representatives of EMODnet Physics participated to the EMODnet SC and it was the opportunity to discuss about joint activities with Biology, Chemistry and Seabed Habitats.

With Biology it was further presented the recently integrated Sea Mammals data (MEOP DataBase) and presented the data that are going to be soon available (add figure…). A brief update about the already available machine-to-machine, services and interoperability layers available on these data was reported.

With Chemistry it was started discussing a common strategy to deal with river data. Both the lots have been requested to work on river data and while Chemistry is focusing on nutrients, Physics will start with the river flow (both near real time data and historical data) and works on the TSM product as second step. The two teams will keep working together, sharing info and contacts in order to avoid and contact the same provider twice.

With Seabed Habitats it was discussed the possibility to let Physics host and/or make available via web service hosted by Seabed Habitats, the Kinetic Energy at the Seabed and Light Availability at the Seabed products produced by Seabed Habitats. Technical details will be further discussed and checked during coming months.

KO.A.1	ETT to draft and hand out the consortium agreement and templates for activating subcontractors.	Completed
KO.A.2	all the partners to provide ETT with the list of meetings/workshops/conferences and relevant events in which EMODNet Physics is presented	Open action for entire duration of the project. Progress reported in Table 1
KO.A.3	to keep updating partners about EMODnet Data Ingestion progresses, needs, and activities.	Open action, progress reported in WP2.4
KO.A.4	EuroGOOS to work on collaboration with Regional Sea Conventions	Established links with HELCOM and Physics was invited to give a first presentation to annual assembly in Sopot 25/10/2017 (agenda[1]) A meeting with OSPAR is planned in November (details to be defined)

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[1] https://portal.helcom.fi/meetings/STATE%20-%20CONSERVATION%207-2017-470/default.aspx

KO.A.5	ETT to contact MERCATOR to be part of the EMODnet Physics "advisory board"	Completed, the officer in charge for the activities is Dominique Obaton

The coordination with MERCATOR on how to reorganize the metadata presentation for the datasets that are validated according the CMEMS QC/QF and how to link to the technical-methodological documentation is undergoing.

The following tables give a summary of the progresses on planned actions.

River Data

R.A.1	List of the rivers to be included	Completed. Figure 1 shows the ideal target (370 river stations). Historical data from the Global Runoff Data Center will cover those stations, while we are going to link as many operational stations as possible.
R.A.2	Inventory of the (operational) fixed platforms on those rivers	In progress – about 100 river stations providing near real time data have already been connected
R.A.3	Definition of the data structure, file transport format, naming convention, data flow (as close as possible to CMEMS INSTAC for easy future uptake), conventions	In progress. Data structure will follow the already adopted for the management of data coming from the other networks: transport file is going to be netcdf v3.6, data is going to be stored in a data server with three folders according the age: latest, monthly and history. CF convention/SeaDataNet P09 will be used for parameters. E.g. Figure 2. IR_LATEST_TS_RS_TagusAlmourol_20170927.nc Is data for 27/9/2017 from the Tagus river.
R.A.4	Mapping of the available parameters for those rivers with a focus on: Level of water, river flow (also as computed by the level), water temperature, nutrients (O2, Nix …)	After the preliminary analysis on the available data sources, data formats etc, we decided to focus on making available the river flow (either as recorded in situ or as computed by the water level). River chemistry will be tackled in cooperation and coordination with EMODnet Chemistry.
R.A.5	Design of a "river" platform page for the portal (WP3)	In progress
R.A.6	Development of a model to compute the outflow of the river on the subsea basin (Hype like) at European level	

R.A.7	Development of river climatology products (with trends)	Data from the Global Runoff Data Center[2] for the European coastal river stations are now integrated in the system. Monthly and annual trends at platform (river station) level are already available.
R.A.8	Development of Total Suspended Matter (gridded) products (with trends)	

Table 2
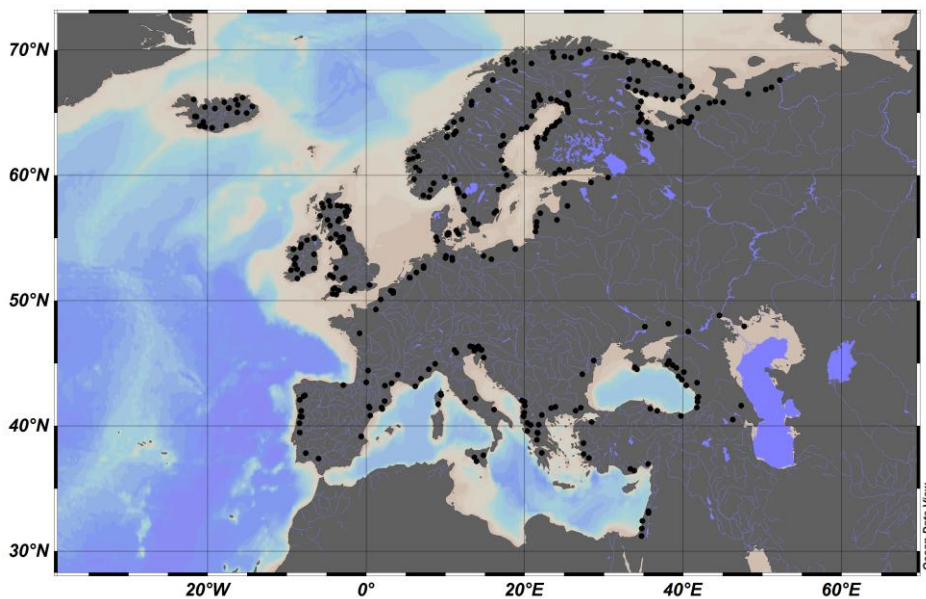
Figure 1. Identified rivers/stations to be connected

Figure 2. Example of the River data repository for latest data

Sea Level

SL.A.1	Inventory of the TG (identification of gaps in time and space). The inventory will be shared with	In progress

	EMODnet DI to closely and proactively work on it and include/make available missing stations	
SL.A.2	Compile an inventory of the TG providing ground movement (GNSS) - (this is fundamental for having the absolute SL trends)	In progress
SL.A.3	Make map product to show both relative and absolute sea level trends. (PSMSL + SONEL)	In progress
SL.A.4	Develop the NRT extreme event identification and visualization tools. It will be based on the percentile to NRT plot (p99 and p1) and display the SL	
SL.A.5	Develop the anomalies plot for historical data (year/period)	

Table 3

Under Water Noise

UWN.A.1	Inventory of existing UWN stations	
UWN.A.2	Inventory of available UWN datasets	
UWN.A.3	Definition of the data structure, file transport format, naming convention, data flow, conventions for both UWN NRT and historical data flow	In progress. The very first UWN sensor from the OBSEA platform is already connected (see WP3). the platform is providing near real time Sound Pressure Level (see annex for details).
UWN.A.4	Design of a "under water noise" platform page for the portal (WP3)	In progress. SPLs are presented for last day, last 7 days and last month. Plots are cumulative. See also WP3.
UWN.A.5	Design and development of the methods and tools for the evaluation of: -Impulsive sounds indicator in 10Hz-10kHz band (11.1.1) -Trends in third octave bands (11.2.1) -Noise Band Monitoring: (63 and 125 Hz) (11.2.1)	

Table 4

After joining the Southern Ocean Observing System (SOOS) Data Management Steering Committee (DMSC), the EMODnet Physics team was invited to participate to the Deep Ocean Observing System (DOOS) Data Management Working group. Discussion about cooperation, mutual data exchange and service interoperability is undergoing.

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

The objectives of WP2 are to identify specific additional data sources that contribute to the EMODnet physical parameters portfolio (Argo, profiling floats, gliders, radar, CTD from ships, river outflow, water noise, etc.), and reduce spatial and temporal gaps in cooperation and collaboration with the underlying EuroGOOS ROOSs, CMEMS INS TAC, and SeaDataNet NODCs infrastructures, as well as EMODnet Data Ingestion. Part of this activity is to develop EMODnet Physics services with user friendly interfaces for data and metadata uploading, data tracking and provide guidance and documents on preferred data, common data and metadata models.

Description:
EMODnet Physics is developing an **operational service where near real time and historical validated marine data are made interoperable and freely available.**

The operational framework described in the previous report is evolving and EMODnet Physics is now developing a dedicated data infrastructure to manage river station data and underwater noise data.
Near real time river station data will be integrated in regional nodes while historical trends are computed from the Global Runoff Data Base data.
Near real time under water noise will be hosted at the provider infrastructure and EMODnet Physics will process the Sound Pressure Level data to make plots available. ICES under water noise database (which covers OSPAR and HELCOM regions) is under study to consider possible connection into EMODnet Physics.

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

KO.A.6	review data inventory and parameters	In progress
KO.A.7	ETT and EuroGOOS to contact SOCAT community to set up cooperation	
KO.A.8	MARIS to design how to manage the connection between NRT CTD and validated data and CRS	
KO.A.9	XBT can be clustered in an area of about 10miles to be showed as data acquired in the same cruise	In progress
KO.A .10	Ifremer / EuroGOOS will specify what CMEMS needs and Maris will explore with the EMODnet Chemistry consortium what and how EMODnet Chemistry might be able to offer by means of an API and SLA	This action was one of the topic of discussion during the Steering Committee (13-15/9/2017) EMODnet and Copernicus Marine meeting at Mercator (18/9/2017). EMODnet Chemistry is keen to provide services to make available the developed products. EMODnet Chemistry and CMEMS will keep interacting on the topic. EMODnet Physics will made available in situ near real time chemical data when available in the CMEMS products (see Table 11)

Table 5

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

KO.A.11	to work in cooperation with SDC for the identification of a list of candidates	This topic will be one of the discussion point during next SeaDataCloud meeting (16-20/10/2017 Athens, Greece)

KO.A.12	MARIS to update/provide a new service to facilitate the mapping of CDIs on the platforms	
KO.A.13	MARIS and ETT to define/verify CDI for HFR	In progress

Table 6

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

KO.A.14	ETT and IFREMER/EuroGOOS to create links and synergies	In progress. See WP1 section on Rivers and UWN

Table 7

WP2.4. Collaboration with EMODnet Data Ingestion project

EMODnet Physic and Data Ingestion are collaborating on a daily base, results from the joint effort to connect and ingest more data is already showing results. The following datasets/platforms were ingested and are already connected and available in Physics:

- 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

WP2.5: Metadata

KO.A.15	To work on the documentation for tide gauges and sea level trends	
KO.A.16	to update documentation according INSTAC QC procedures	In progress
KO.A.17	IFREMER to provide the updated list of the institute in charge of which providers - CMEMS INSTAC	
KO.A.18	link to the SensorML	In progress. EMODnet Physics is cooperating with EMODnet DI on this action.

Table 8

WP2.6. Data access

KO.A.19	improve data access features according the specificity of the platform	In progress. The results are described in WP3 data portal.

Table 9

WP2.7. Data Products

KO.A.20	ETT to design and propose new plot products.	In progress. See table XX
KO.A.21	ETT to work on a INSITU SST product as recorded by the different platforms	

KO.A.22	ETT to present in the portal the CORA and SDN Climatologies products	In progress
KO.A.23	ETT to present periodic (e.g. monthly) map with amount of available data	
KO.A.24	IFREMER to provide info and details for the REP products	Completed
KO.A.25	ETT to consider PSMSL platforms only for the SL product	Completed
KO.A.26	to think about how to include and make visible (some) SAFHOS data	
KO.A.27	Update PSMSL trends to 2016	
KO.A.28	BODC to approach SONEL to discuss inclusion of the PSMSL+SONEL absolute sea level change product in the EMODnet Physics portal	In progress
KO.A.29	To include/interoperate with delayed mode sea level data DB hosted at BODC	

Table 10

EMODnet Physics integrates and uses CMEMS INS products to populate the map page. EMODnet Physics reorganizes the CMEMS products, provides access to dataset at platform level, provides the users with full metadata on data providers and measuring systems.   The table shows the status of integration:

NEAR REAL TIME data – (past 5 years) – Product name	Status of integration
INSITU_GLO_NRT_OBSERVATION_013_030	Already available (Phase 2)
INSITU_ARC_NRT_OBSERVATIONS_013_031	Already available (Phase 2)
INSITU_BAL_NRT_OBSERVATIONS_013_032	Already available (Phase 2)
INSITU_NWS_NRT_OBSERVATIONS_013_036	Already available (Phase 2)
INSITU_IBI_NRT_OBSERVATIONS_013_033	Already available (Phase 2)
INSITU_MED_NRT_OBSERVATIONS_013_035	Already available (Phase 2)
INSITU_BS_NRT_OBSERVATIONS_013_034	Already available (Phase 2)
REPROCESSED data - Product name	Status of integration
Arctic- In-situ Observations Yearly Delivery in Delayed Mode (1990-2014) - (CMEMS INSITU_ARC_TS_REP_OBSERVATIONS_013_037)	Integrated
Atlantic Iberian Biscay- In-situ Observations Yearly Delivery in Delayed Mode (1990-2014) - (CMEMS INSITU_IBI_TS_REP_OBSERVATIONS_013_040)	Integrated
Atlantic-European North West Shelf- In-situ Observations Yearly Delivery in Delayed Mode (1990-2014), - (CMEMS INSITU_NWS_TS_REP_OBSERVATIONS_013_043)	Integrated
Baltic- In-situ Observations Yearly Delivery in Delayed Mode (1990-2014) - (CMEMS INSITU_BAL_TS_REP_OBSERVATIONS_013_038)	Integrated
Mediterranean- In-situ Observations Yearly Delivery in Delayed Mode (1990-2014) - (CMEMS INSITU_MED_TS_REP_OBSERVATIONS_013_041)	Integrated
Black Sea- In-situ Observations Yearly Delivery in Delayed Mode (1990-2014) – (CMEMS INSITU_BS_TS_REP_OBSERVATIONS_013_042)	Integrated
Global Ocean- Delayed Mode in-situ observations of ocean surface currents – (CMEMS INSITU_GLO_UV_L2_REP_OBSERVATIONS_013_044)	

Global Ocean- CORA- In-situ Observations Yearly Delivery in Delayed Mode (1950-2014) – (CMEMS INSITU_GLO_TS_REP_OBSERVATIONS_013_001_b). These data are collected from main global networks (Argo, GOSUD, OceanSITES, World Ocean Database) completed by European data provided by EUROGOOS regional systems and national system by the regional INS TAC components. It is updated on a yearly basis. The time coverage has been extended in the past by integration of EN4 data for the period 1950-1990.	Under test system

Table 11

EMODnet Physics continued to work on data access to data products. For each of the platform type/network it is possible to load one of the recorded parameters. These products are based on operational data and are managed by a sliding window of 60 days. In general, the user can select two time windows: 7 days and 60 days. The operational products are updated on daily base (automatic procedures).

Historical products are updated (about) once a year (manual procedures). The sea level trends are based on the PSMSL and they are updated once a year (last update 2016). MEOP database is updated as soon a new MEOP DB release is made available. EMODnet Physics is collaborating with MEOP and together are working on a new release of the DB that is going to include data as recorded by sea mammals in North Sea and Manica Channel. SeaDataNet climatologies are updated every 2-3 years.

WP3 – Portal technical Development and operation

The objectives of WP3 are to implement and extend the www.emodnet-physics.eu portal allowing users to find, visualize and download data and data products and their metadata. This includes the development of procedures for machine-to-machine connections to metadata, data and data products and services compatible with INSPIRE, EMODnet and OGS standards and requirements. The portal has also to develop monitoring tools of the website performance and usage.

Activities:

During the period, the team keep working on the portal and the re-organization of the platform pages. The general layout of the new page is presented in the following figure:
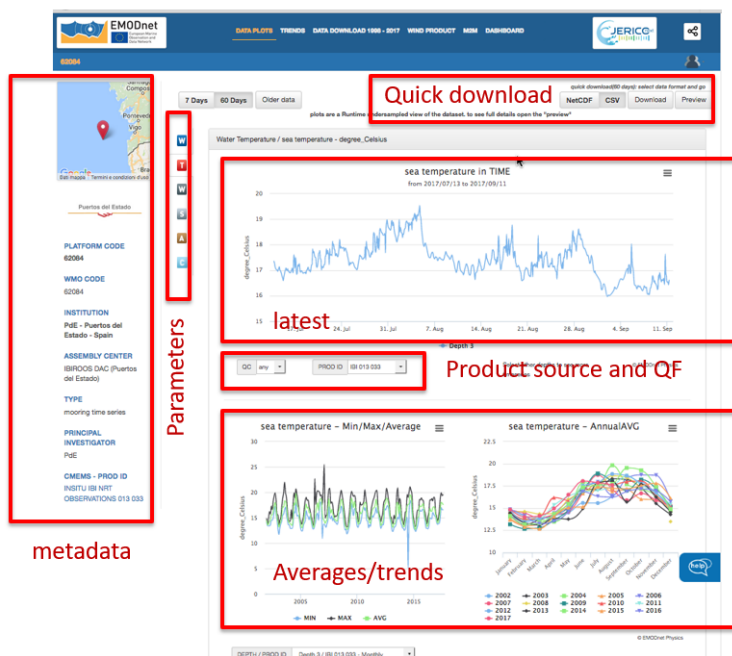
Figure 3. Example of the EMODnet Physics platform page for a mooring

The page is presenting the metadata (data owner, provider, typology of platform etc), plots for the latest 7/60 days (the user to select the variable), quick download features and trends/averages for the given parameter. Two plots for trends/averages are available: the timeseries (one point per month) and annual timeseries (each line is one year of recordings). Links to source products are indicated (and selectable) as well as the QF.

A new section on "Documentation and M2M" is now collecting and presenting relevant information about the platform (e.g. which network it is belonging to) and available machine-to-machine services (e.g. examples of how to call back the plots widgets)

Figure 4. Documents and M2M section

Platform pages for operational river stations and historical river data were developed and published:
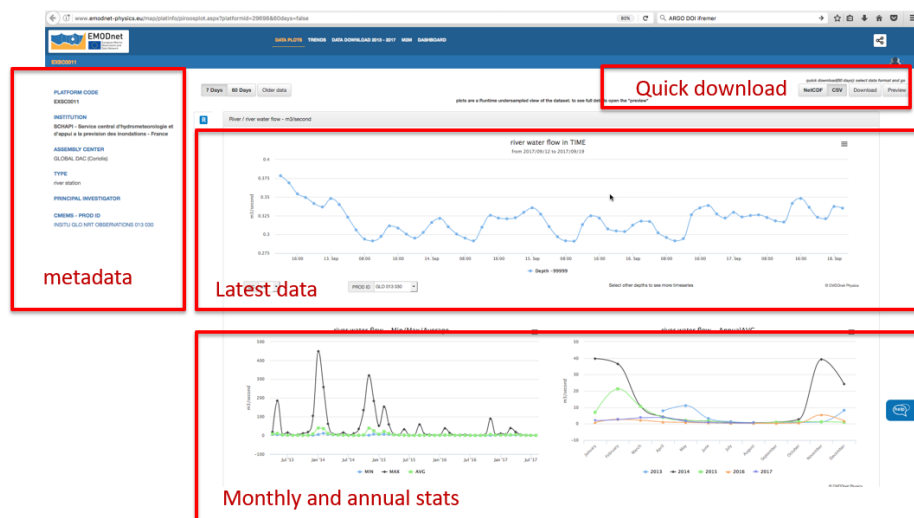
Figure 5. Operational river station
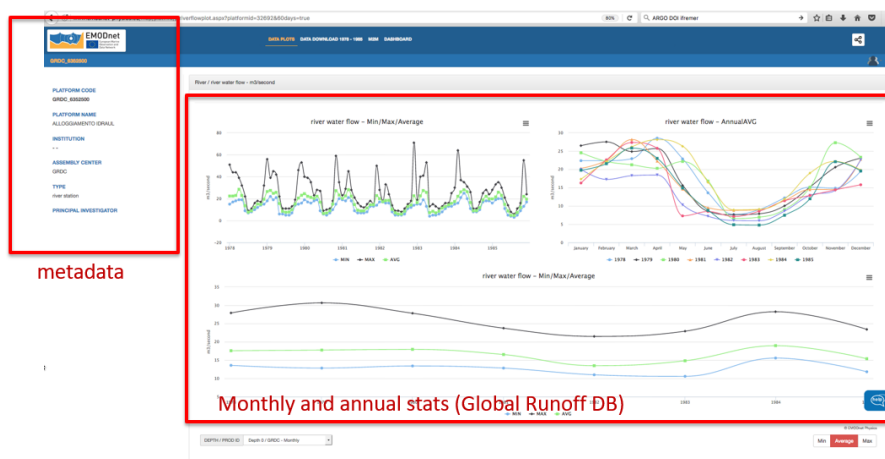
Figure 6. Historical data. EMODnet Physics is integrating the GRDB

The very first operational under water noise sensor was connected and data is now available in the OBSEA (http://www.emodnet-physics.eu/map/platinfo/piroosplot.aspx?platformid=8805&60days=false). The plots are showing the Sound Pressure Levels (in db ref 1uP) in the second, third octave band and the full recorded SPL. Plots are cumulative histograms for the specified time window.

Figure 7. under water noise

During the period, the help desk service was released. If a user post a request the system generates an email with a ticket that can be easily followed up.
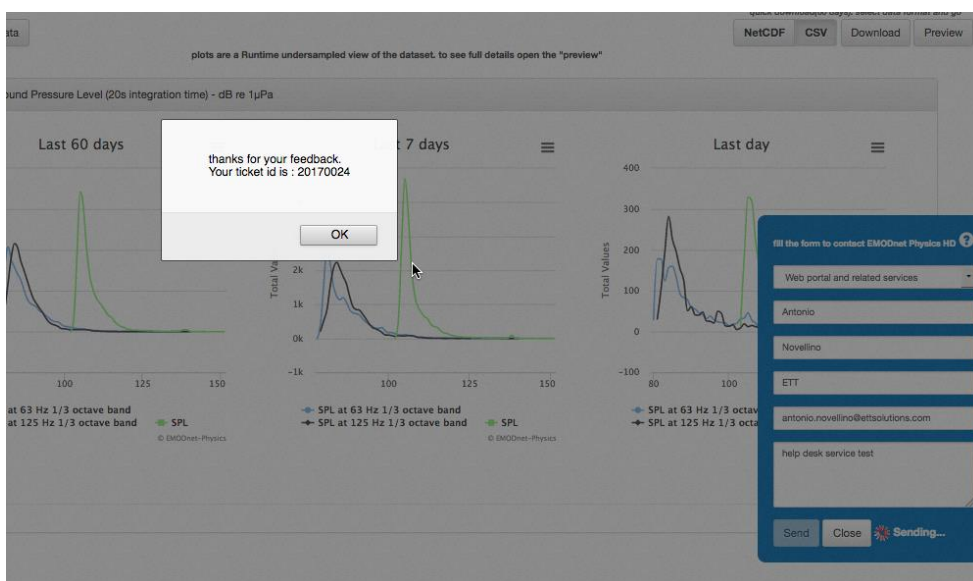
Figure 8. help desk ticket
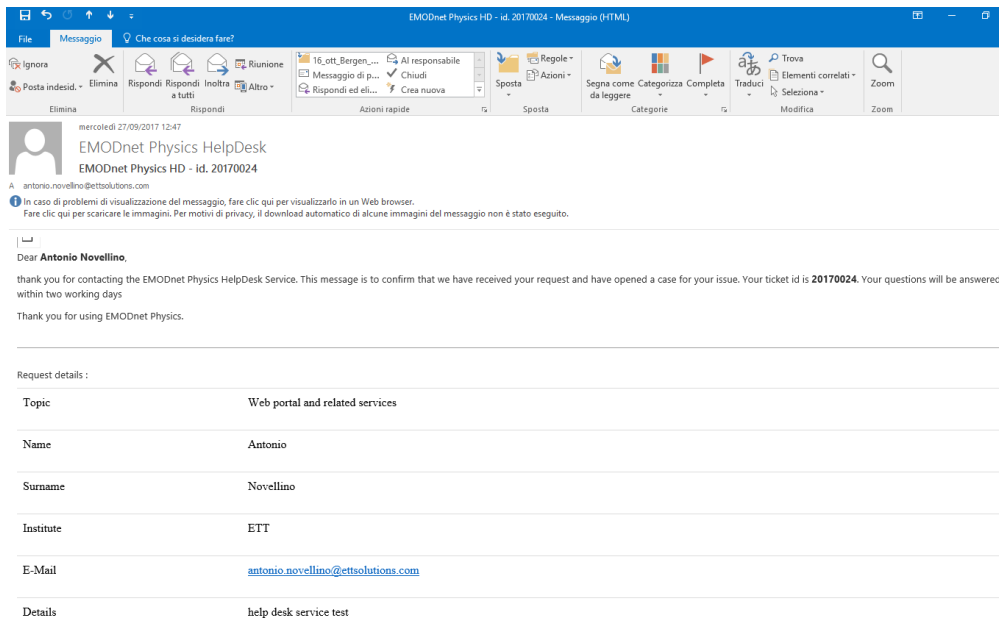
Figure 9. Example of the automatic help desk email with the request ticket.

The following tables summarize the progresses on other planned activities.

KO.A	ETT plot full life data for international program platforms.	
KO.A	Work on the catalogue	
KO.A	Add FAQ page	
KO.A	Set up the help desk email, define the cases for the HD1L and HD2L	Completed
KO.A	Review the EMODnet Dashboard to have a more dynamic interface (to consider EMODnet Arctic SCP e.g. or osmc.noaa.com)	In progress
KO.A	ETT to review Physics against INSPIRE	
KO.A	Add filters by EOVs	

Table 12

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

KO.A	Integrate ERDDAP	Almost finished. The action is taking more than supposed as the netcdf file format as adopted by the INSTAC is not fully compliant to the ERDDAP. EMODnet Physics had to develop adaptors/converters in order to reorganize data and implement the ERDDAP.
KO.A	Extend WMS/WFS/THREDDS/web services features and layers	In progress
KO.A	Extend the tracking system and automatic email to integrators/providers	Delivered the first release

KO.A	Develop widgets - to allow both users and providers to incorporate EMODnet Physics portal parts (e.g. the plots) into their web sites	Completed. Each platform page has a Documentation and M2M section that is also providing full details about how to use and include EMODnet Physics widgets in third systems.
KO.A	Integrate RT data as provided by OGC SWE (in coop with EMODnet DI)	In progress.

Table 13

Thanks to the support of the colleagues in US who developed and are developing the ERDDAP, we made many progresses in implementing the service. The service is now running (we are still fixing some bugs) and the team in in constant connection and coordination with the ERDDAP development team (erddap@googlegroups.com), and are listed among the service provider:

https://coastwatch.pfeg.noaa.gov/erddap/download/setup.html

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

KO.A	interoperate with the OAI-PMH that is a widely used standard by both European entities (e.g. PANGAEA) and non-EU organizations	
KO.A	extend the capacity of EMODnet Physics to integrate historical data hosted in unstructured databases (e.g. GOSHIP).	

Table 14

EMODnet Physics is keep developing interoperability with data distributed by non-EU organizations: during the reporting period we worked on connecting more HFR data and glider data. EMODnet Physics is now integrating

- o HFR data (60), SCRIPPS,
- o HFR data (12), IMOS
- o About 100 gliders from IOOS

EMODnet Physics is also offering/hosting the map viewer and data access to key European Projects:
- AtlantOS (Horizon 2020 research and innovation programme under grant agreement No 633211; https://www.atlantos-h2020.eu/) and
- JERICO-NEXT (Horizon 2020 Research and Innovation programme under grant agreement No 654410; http://www.jerico-ri.eu/).

Since June 2017, EMODnet Physics is also offering/hosting the map viewer for the SOOS Portal (http://www.soos.aq/data/soosmap). This collaboration will bring more data into EMODnet Physics and serve different European organizations working in the southern oceans.
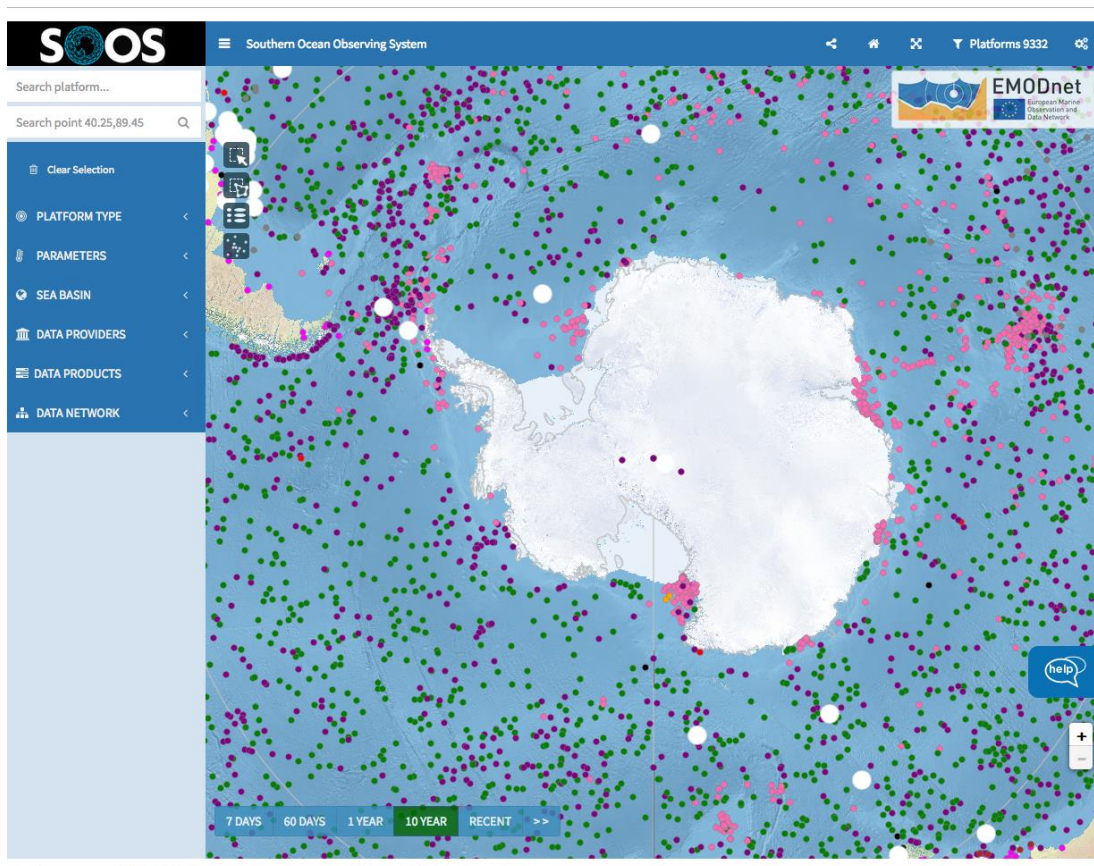
Figure 10

WP4 – Analysis Evaluation and Feedback

WP4 is aimed at reporting effectiveness of the system in meeting the needs of users and other EMODnet portals, assess the robustness of the developed information system and operate help desk to deal with user feedback and need for support

Activities:
Although the development of the help desk service was completed and it is now fully operational, request of support are mainly coming by previous channels (i.e. mails to contactsòemodnet-physics.eu, or direct interaction with the EMODnet Physics team). Since the service was published we have not recorded any request yet.

WP4.1. Monitor performances and deal with user feedback
The plan is to monitor performance in terms of usage and user satisfaction. Typical indicators are:
- monthly page views;
- most popular page in past month and past year;
- number of data, and data products downloaded;
- types of user downloading data (where known);
- databases connected to system;
- number of providers, type and amount of provided data and data products.

These data are daily collected and used to fulfil indicators and inform providers about the use of their data: the system is now offering a monthly report (the user has to subscribe to receive it) with stats on its platforms use and downloads. Figure 11 shows an example of the report.
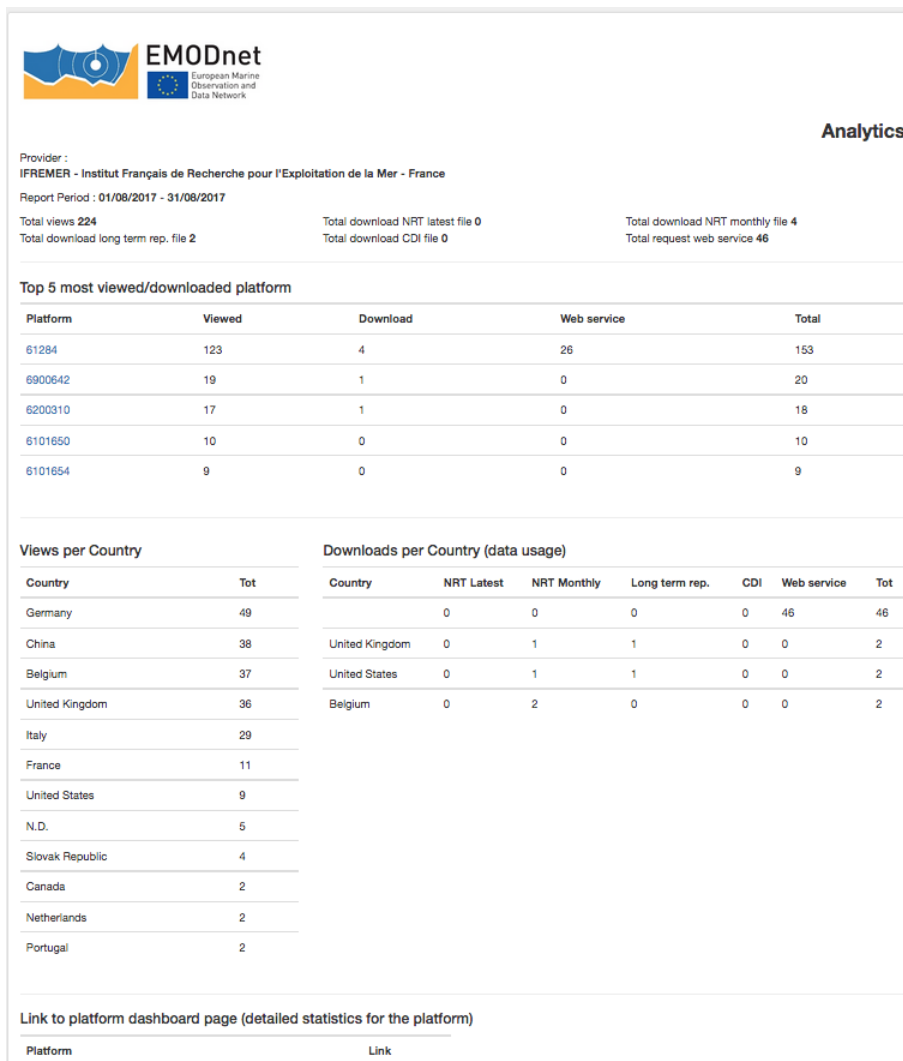
Figure 11

Action	Set up the tracking and monitoring tools	In progress. The monitoring systems was recently updated anyhow new actions and development are planned to be compliant to the specifications agreed during the EMODnet Steering committee

Table 15

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

Action	Set up the on line tools to access/interact with the HD	Completed.
Action	The automatic system will send a mail and the object could be [EMODnet Physics] – id.XXXXXX – topic	Completed. See WP3

Table 16

4. Specific challenges or difficulties encountered during the reporting period

Please list specific problems you have encountered during this period, including related to technical and data provision issues. [Provide a bullet list - maximum 2 pages in total – where more information needs to be provided state 'contact XXX for more information']

The development of the ERDDAP layer on top of the EMODnet Physics data took more than supposed as the dataformat. The way the variable are saved according the CMEMS INSTAC recommendation is not fully compliant with the ERDDAP, in particular the problem is related to the trajectory management method: all the variables have to depend on time (only). The ERDDAP development team (erddap@googlegroups.com) suggested to re-write the netcdf files. EMODnet Physics is now equipped with a service layer that re-organize the variables and re-write data to have them available on the EMODnet Physics ERDDAP server. The procedure is only applied to the latest 60 days near real time data flow.

The connection/integration of PANGEA data is going to be complex and time consuming. The information system PANGAEA is operated as an Open Access library aimed at archiving, publishing and distributing georeferenced data from earth system research. ach dataset can be identified, shared, published and cited by using a Digital Object Identifier, and metadata can be explored by interoperability services.

While the EMODnet Physics is designed with the measuring platform/station at center, the PANGEA database is organized with the parameters at the center and once data is registered in the PANGEA system it is not straight forward to find the connection with the platform that generated the data. It is possible to overcome this limitation for some platforms, e.g. repeated ships cruises, anyhow the number is very little. As planned the EMODnet Physics team will work on the OAI-PMH metadata exchange protocol to identify the list of platforms and data that can be connected.

5.User Feedback

List any useful feedback you received on your portal, your activities or those of other EMODnet projects/activities. Also provide any suggestions you have received for EMODnet case studies and/or future products/activities/events. [Provide information in table - attach the documentation/full user feedback to the report]

Date	Name	Organization	Type of user feedback (*e.g. technical, case study etc*)	Response time to address user request
26/9/2017	'Snaith, Helen M	BODC - UK	Technical – PAP1 station was not visible on the portal	2 days
26/9/2017	Daedelow, Holger	DRL – Germany	Technical – support to harvest wave and wind data	2 days
21/8/2017	Francisco Sousa Diaz	VLIZ - Belgium	Technical – the ERDDAP server was spamming the central portal	1 day
15/8(2017	Mathieu Ouellet	DFO - Canada	Technical – incomplete metadata for Canadian ARGOs	1 day
10/8/2017	Julien Mader	AZTI - Spain	Technical – one HFR system (Germany) was not delivering data	1 day – thanks HZG support: they changes some parameters and EMODnet Physics had to update the harvesting/connection service

Table 17

6.Outreach and communication activities

Please list all the relevant communications activities or products you have developed/executed during this period (including presentations, lectures, trainings, demonstrations and development of communication materials such as brochures, videos, etc.). Relevant scientific and/or popular articles you know have been published using/referring to EMODnet should be reported under indicator in Section 7. [Provide information in table - Maximum 1 page]

When	Location	Topic	Description
27/9/2017	Constance – Germany	Biologging workshop	Oral presentation Collaboration with MEOP, EMODnet Physics sea mammals data management, strategy for integrating more animal-borne instruments data into Ocean Observing Systems were presented and discussed.
25-29/9/2017	Brussles - Belgium	Copernicus Marine Week	Poster presentation Furthermore, during the "In situ Infrastructure and CMEMS current state of the system" sprinter session the in situ data management, the key European and international infrastructures and programmes, the cooperation and collaboration between the INSTAC and EMODnet Physics and SeaDataNet were presented and discussed.
21/9/2017	Ferrara - Italy	RemTech Esonda Expo	Oral presentation EMODnet Physics and the plan and progress on the river data management were presented
21/9/2017	Luneburg - Germany	Radio Oceanography Workshop (ROW 2017).	Oral presentation Progress on HFR data management and EMODnet Physics HFR data products were presented and discussed
6/9/2017	Skiathos-Greece	UACE 2017 – Underwater Acoustic Conference Europe	Oral presentation EMODnet Physics and the plan on the under water noise data management were presented
5-7/9/2017	Singapore - Singapore	GOOS Regional Alliance Forum VIII	Oral presentation EuroGOOS activities, and EMODnet Physics was presented as an example of regional ocean observing systems.
14/6/2017	Brussels (Belgium)	AtlantOS international Data workshop	EMODnet Physics is one of the AtlantOS integrators and is powering the AtlantOS data portal

Table 18

7. Updates on Progress Indicators

Using the indicator as a header list the metrics collated and the time interval. If there was no activity to report leave the section under the indicator header blank.

Indicator 1 - Volume and coverage of available data and products

EMODnet Physics is providing access to both near real time and historical datasets from as recorded by different platform types. Some platforms are delivering data continuously (e.g. fixed stations, radars, ferryboxes), other platforms are delivering data as soon as they can (e.g. ARGO, glider) covering a defined time period, i.e. the mission. Since some platforms have ceased in operation only old data may be available. A platform generally measures one or more parameters and indicator 1.2 summarises the available datasets by parameters.

Data are organised in files according the data age and more specifically the system is making available:

1. Daily files for the past 60 days. It is a sliding window on the latest 60 days of observations for real-time applications, data go towards automatic quality check/flag procedures and no authentication is required to download these data

2. Monthly files. By the end of the first week the month, for each platform, data for the previous month are organised into a single file. The file contains the best copy of the recent dataset according automatic quality check/flag procedures[3]. Some of these datasets download requires user authentication.

3. Long Term time series data files. Annually the monthly files are reprocessed (together with validated data from NODCs) into a single file creating a single best copy history file for each platform. Some of these datasets download requires user authentication.

4. Validated historical datasets. Organized in CDI - dataset files hosted by NODCs (validated data[4], requires user registration).

On top of these data, EMODnet Phyisics is developing and delivering operational products that are presenting a given parameters as recorded by a type of platform.

EMODnet Physics is also integrating some more static products based on the re-elaboration of physical parameters of the sea. Some of these products are developed by initiatives, infrastructures or programs collaborating with EMODnet Physics (e.g. Temperature climatology is developed by SeaDataNet). EMODnet Physics is re-organizing the data and data presentation to make them compatible to EMODnet Physics portal and make them available to more communities.

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[3] http://www.emodnet-physics.eu/map/ARH/QualityCheck/recommendations_for_rtqc_procedures_v1_2.pdf
[4] Validated according the SeaDatanet Quality Check procedure -
http://www.seadatanet.org/content/download/18414/119624/file/SeaDataNet_QC_procedures_V2_%28May_2010%29.pdf

Indicator 1.1 – Volume and coverage of available datasets[5]

@29/09/2017	Temperature	Salinity	Currents	Light Attenuation	SeaLevel	Atmospheric	Waves	Wind	BioChemical	River	Underwater noise	Total
Number of platforms providing operational data for latest 60days	7070	4811	1622	47	442	1569	748	510	465	95	1	17380
Number of platforms providing operational data	19070	9024	3187	49	622	5607	1593	727	664	176	1	40720
Number of platforms providing historical data	19012	9673	1883	47	392	5473	1362	829	742	130	0	39543
Number of platforms providing validated historical data (CDI)	442	65	366	36	398	45	294	173	38	0	0	1857

Table 19

The EMODnet Physics Dashboard is presenting details about the number of platform with a monthly file for the given month (http://www.emodnet-physics.eu/map/dashboard/Section20.aspx)

Indicator 2 - Organisations supplying each type of data

EMODnet Physics is receiving data from all EuroGOOS and ROOSs members (based on a formal data sharing agreement). EMODnet Physics is also receiving data from providers that have sharing agreements with organisations that are cooperating with EMODnet Physics on the data management infrastructures (i.e. CMEMS INSTAC and ROOS RDACs). For instance, through these agreements EMODnet Physics is receiving data from 24 oil platforms (North Sea).

For details on providers, see Annex 1[6]

Indicator 3 - Organisations that have been approached to supply data with no result

Nothing to report

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[6] http://www.emodnet-physics.eu/map/dashboard/Section1.aspx?typeplat=A

Indicator 4 - Volume of each type of data and of each data product downloaded from the portal

EMODnet Physics is tracking the IP address where the request comes from. Internal requests (ETT IPs) and known internet page-indexing/sniffing robots (e.g. Google) are filtered out. If data is requesting authentication (e.g. monthly files) EMODnet forwards the request to the CAS service and if the acknowledgment is positive the user can download data, if it is not the user is requested to fill up the registration form to receive a login and password.

Indicator 4.1 - Data downloads[7] (period 01/07/2017 – 30/09/2017)

Country	NRT LATEST	NRT MONTHLY	REP.TIMESERIES	CDI	ALL	WEBSERVICE	TOT
Australia	0	0	2	0	0	3	5
Belarus	0	0	0	0	0	1	1
Belgium	4	39	1	0	0	522	566
Brazil	0	0	0	0	0	2	2
Bulgaria	3	1	2	0	0	0	6
Canada	1	2	0	0	0	1	4
China	0	0	0	0	0	479	479
Colombia	0	0	0	0	0	1	1
Croatia	0	1	1	0	0	0	2
Denmark	3	8	1	0	0	0	12
Ecuador	0	0	0	0	0	2	2
Egypt	0	0	0	0	0	1	1
Estonia	0	3	0	0	0	0	3
Finland	0	4	2	0	0	0	6
France	85	51	30	1	0	124	291
Germany	534	215	772	0	0	875	2396
Greece	2	18	13	11	0	0	44
Hong Kong	0	0	0	0	0	26	26
India	0	0	0	0	0	2	2
Indonesia	0	0	0	0	0	1	1
Iran	0	0	0	0	0	2	2
Ireland	16	16	0	0	0	0	32
Italy	1169	42	33	0	0	4727	5971
Jamaica	0	0	0	0	0	1	1
Kenya	0	0	0	0	0	1	1
N.D.	1	46	4	381	0	4	436
Netherlands	0	5	7	0	0	1	13
New Zealand	0	0	0	0	0	1	1
Peru	0	0	0	0	0	1	1
Philippines	0	1048	0	0	0	0	1048
Poland	3	5	4	0	0	192	204
Portugal	4	28	6	4	0	2452	2494
Puerto Rico	5	1	0	0	0	0	6
Republic of Korea	1	1	0	0	0	0	2
Republic of Lithuania	0	0	0	0	0	1	1
Republic of Moldova	0	0	0	0	0	3	3
Romania	3	7	0	0	0	3	13
Russia	4	4	2	1	0	94	105
Rwanda	2	0	0	0	0	0	2
Serbia	0	0	0	0	0	1	1

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[7] http://www.emodnet-physics.eu/map/dashboard/ReservedAreaSection13.aspx

Singapore	0	0	0	0	0	2	2
Slovak Republic	0	0	0	0	0	193	193
Slovenia	154	0	0	36	0	1960	2150
South Africa	0	12	0	0	0	0	12
Spain	16	64	193	6	0	1	280
Sweden	12	12	3	0	0	5	32
Taiwan	0	0	0	0	0	2	2
Turkey	0	0	0	0	0	1	1
Ukraine	0	0	0	0	0	5	5
United Kingdom	7	31	4	10	0	292	344
United States	1	45	10	3	0	81124	81183
Venezuela	0	0	0	0	0	2	2
Vietnam	0	0	0	0	0	4	4
totals	2030	1709	1090	453	0	93115	98397

Table 20

Note: web requests from US are likely to be too many, new bots and indexing services may have had doped the figure. We're going to investigate and in case block them.

Indicator 4.2 - Most downloaded platforms – (period 01/07/2016 – 30/09/2017)[8]

The following tables report on the most downloaded data-platform (top 15), for the full report see the attachment.

Platform	Download	Web service	SeaDataNet	Total
61499	6	2401	0	2407
13130	9	2391	0	2400
13131	4	2395	0	2399
Algeciras-coast-buoy	4	2389	0	2393
Melilla-coast-buoy	2	2387	0	2389
Langosteira-coast-buoy	6	2380	0	2386
Bilbao-coast-buoy	4	2381	0	2385
Barcelona-coast-buoy	4	2380	0	2384
Ceuta-coast-buoy	4	2380	0	2384
Tarragona-coast-buoy	3	2381	0	2384
Bilbao-station	4	2379	0	2383
Gijon-coast-buoy	3	2380	0	2383
OBSEA	5	2378	0	2383
Pasaia-station	4	2379	0	2383
USNDBC_mlww3	0	3649	0	3649
61499	6	2401	0	2407

Table 21. List is ordered by "total"

Platform	Download	Web service	SeaDataNet	Total
Europlatform	40	0	9	49
Helgoland	37	0	0	37
62170	35	0	0	35
Elbe	34	0	0	34
62001	33	8	0	41
K13a	32	0	3	35

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[8] http://www.emodnet-physics.eu/map/dashboard/ReservedAreaSection6.aspx

Table 22. Top 5, Manual Download

Platform	Download	Web service	SeaDataNet	Total
TRIESTE	28	0	15	43
Europlatform	40	0	9	49
RMN-BARI	4	1	9	14
RMN-ANCONA	8	1	6	15
RMN-NAPOLI	8	1	6	15

Table 23. Top 5 CDI requests.

Full report in the annex.

Indicator 5 - Organisations that have downloaded each data type

Indicator 5 shows the Country (rows) where a request came from versus the sea basin (columns) where the dataset - platform is belonging to.

Indicator 5 - Downloads by country[9] (period 01/07/2017 – 30/09/2017)

Country	Arctic, Barents,	Atlantic, Bay of Biscay, Celtic Sea	Baltic Sea	Black Sea	Global	Mediterrane an Sea	North Sea	Inland	all	total
Australia	0	0	0	0	4	0	0	1	0	5
Azerbaijan	0	0	0	0	0	0	0	1	0	1
Belarus	0	0	0	0	0	0	0	1	0	1
Belgium	1	70	125	14	3	214	17	107	0	551
Brazil	0	0	0	0	0	0	0	2	0	2
Bulgaria	0	0	0	5	0	2	0	0	0	7
Canada	3	5	0	0	0	0	0	17	0	25
China	0	0	37	4	196	10	0	346	0	593
Colombia	0	0	0	0	0	0	0	1	0	1
Croatia	0	0	0	0	0	11	0	0	0	11
Czech Republic	0	0	0	0	2	0	0	2	0	4
Denmark	30	429	159	0	39	0	444	52	0	1153
Ecuador	0	0	0	0	0	0	0	2	0	2
Egypt	0	0	0	0	0	0	0	1	0	1
Estonia	0	0	3	0	0	0	0	0	0	3
Finland	0	0	10	0	0	0	0	0	0	10
France	2	76	6	6	64	75	23	17	0	269
Georgia	0	0	0	2	0	0	0	0	0	2
Germany	2	76	196	9	690	43	460	582	0	2058
Greece	6	124	71	0	0	45	208	47	0	501
Hong Kong	0	2	0	1	15	0	0	10	0	28
India	0	0	1	0	0	0	0	3	0	4
Indonesia	0	0	0	0	0	0	0	1	0	1
Iran	0	0	0	0	0	0	0	2	0	2
Ireland	0	18	0	0	0	0	0	0	0	18
Italy	21	381	158	66	758	7311	201	299	0	9195
Jamaica	0	0	0	0	0	0	0	1	0	1
Japan	0	0	0	0	2	0	0	0	0	2
Kenya	0	0	0	0	0	0	0	1	0	1
Luxembourg	0	0	1	0	0	0	0	0	0	1
N.D.	0	44	16	2	2	46	42	227	0	379
Netherlands	0	2	0	0	1	44	12	1	0	60
New Zealand	0	0	0	0	0	0	0	1	0	1
Peru	0	0	0	0	0	0	0	1	0	1
Philippines	0	2	798	0	0	0	0	244	0	1044
Poland	0	0	23	0	72	0	1	108	0	204
Portugal	0	1674	0	0	1	8	1	1	0	1685
Puerto Rico	0	0	0	0	6	0	0	0	0	6

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[9] http://www.emodnet-physics.eu/map/dashboard/ReservedAreaSection5.aspx

Republic of Korea	0	0	1	2	0	0	0	1	0	4
Republic of Lithuania	0	0	0	0	0	0	0	1	0	1
Republic of Moldova	0	0	0	0	0	0	0	3	0	3
Romania	0	1	0	9	87	0	0	2	0	99
Russia	0	0	9	3	85	0	0	55	0	152
Rwanda	0	2	0	0	0	0	0	0	0	2
Serbia	0	0	0	0	0	0	0	1	0	1
Singapore	0	0	0	0	0	0	0	2	0	2
Slovak Republic	0	0	12	0	72	0	0	109	0	193
Slovenia	1	129	0	7	49	435	0	1430	0	2051
South Africa	0	12	0	0	0	0	0	0	0	12
Spain	0	126	0	0	1	19	1	2	0	149
Sweden	0	2	26	0	1	1	0	4	0	34
Taiwan	0	0	0	0	0	0	0	2	0	2
Turkey	0	0	0	0	0	0	0	1	0	1
Ukraine	0	0	0	0	13	0	0	15	0	28
United Arab Emirates	0	0	0	0	0	0	0	2	0	2
United Kingdom	0	118	9	3	247	14	340	99	0	830
United States	3	19531	160	18	3837	42740	21	1488	0	67798
Venezuela	0	0	0	0	0	0	0	2	0	2
Vietnam	0	0	0	0	0	0	0	4	0	4
	69	22824	1821	151	6247	51018	1771	5302	0	89203

Table 24

Indicator 6 - Using user statistics to determine the main pages utilised and to identify preferred user navigations routes

This report is indicating how many times the pages/services have been viewed/used. Indicator 6.1 reports on the access and use of EMODnet Physics dynamic map, products, and services. Indicator 6.2 provides users statistics about navigation on the landing portal.

AVGS is indicating how many times the "averages" tab in the platform page have been viewed. This page is available in each of the platforms that provide time series data (e.g. mooring buoys), e.g. platform 6200192[10]. To note that these plots have been reorganized in the portal pages and are now presented together with the near real time data (we are waiting for a decrease in the AVGS figure).
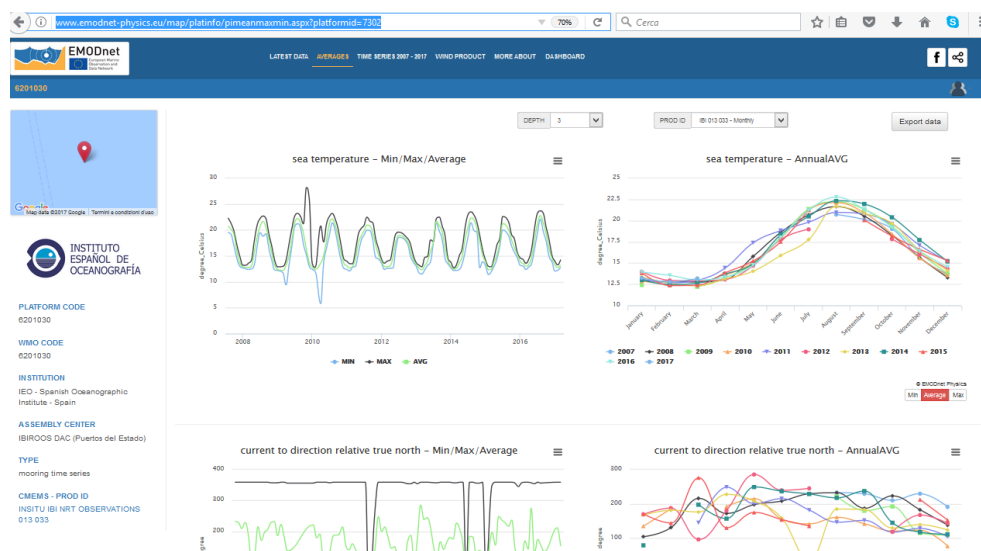
WIND is indicating how many times the "wind plot rose" tab in the platform page have been view. This page is only available for platforms[11] recoding wind data, e.g. platform 62085[12]

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[10] http://www.emodnet-physics.eu/map/platinfo/pimeanmaxmin.aspx?platformid=7302

[11] http://www.emodnet-physics.eu/map/DefaultMap.aspx?sessionid=636277650091147219

[12] http://www.emodnet-physics.eu/map/platinfo/piwindproduct.aspx?platformid=7341
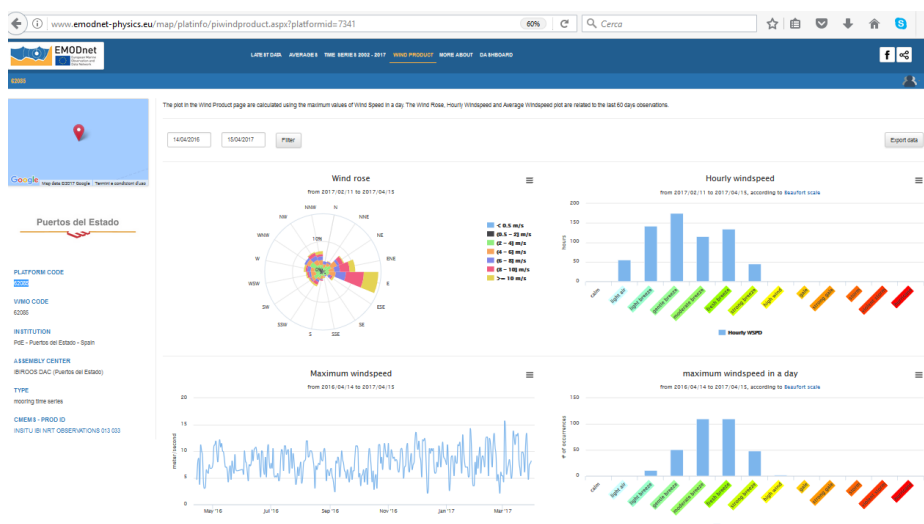
PR.XX are the product pages e.g. PR.AR[13] is the product page for the ARGO

WMS, WFS, WS SOAP, WS, SOS are the pages to access and use the EMODnet Physics M2M services

Indicator 6.1 - Pages and Services accesses[14] (period 01/07/2017 – 30/09/2017)

Country	AVGS	WIND	DASHB	PR.RD	PR.AR/PR	PR.DB	PR.FB	PR.GL	PR.MM	PR.ARCTIC	PR.ANTARCTIC	PSMSL	WMS	WFS	WSSOAP	WS	SOS	TOTAL
Australia	0	0	4	2	0	0	0	0	0	0	5	2	0	0	0	3	1	17
Belarus	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Belgium	47	3	4	5	0	3	0	1	4	2	1	0	12	9	10	10	5	116
Brazil	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	4	0	6
Bulgaria	2	5	4	0	0	1	0	0	0	0	0	0	1	1	1	2	0	17
Canada	0	0	2	2	1	0	0	0	3	0	0	0	1	1	20	39	1	70
China	0	1	0	7	3	1	0	2	0	1	0	1	25	26	197	539	16	819
Colombia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Croatia	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Denmark	10	3	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	19
Ecuador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Estonia	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Finland	2	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	4
France	28	19	49	10	3	7	1	2	6	5	1	5	23	16	6	58	1	240
Germany	12	9	4	8	0	0	0	0	0	0	0	6	20	16	65	467	15	622
Hong Kong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
India	0	0	0	2	0	0	0	0	0	0	0	0	3	0	1	3	0	9
Indonesia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Iran	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
Ireland	1	0	4	1	0	0	0	0	0	0	0	0	2	1	0	1	0	10
Italy	8	15	25	16	3	6	0	0	16	3	2	6	4	13	17	26	0	160
Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Kenya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Malta	0	0	2	1	2	0	0	2	6	0	0	1	0	0	0	0	0	14

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[13] http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=AR
[14] http://www.emodnet-physics.eu/map/dashboard/Section25.aspx

Morocco	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
N.D.	11	0	7	0	0	1	3	0	0	0	0	1	2	1	2	7	0	35
Netherlands	0	0	0	1	0	0	0	0	0	0	1	1	6	3	6	3	1	22
New Zealand	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	2
Norway	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	4
Peru	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Poland	5	1	4	4	8	16	12	20	8	13	12	3	6	6	120	199	0	437
Portugal	10	8	12	9	0	3	6	0	0	0	0	0	1	2	2450	3	0	2504
Puerto Rico	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Republic of Korea	0	0	0	4	0	0	0	1	0	0	0	0	1	2	0	1	0	9
Republic of Lithuania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Republic of Moldova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
Romania	0	0	1	0	0	0	0	0	2	0	0	4	1	1	0	1	0	10
Russia	0	0	0	4	0	0	0	0	0	0	0	0	12	12	4	15	0	47
Serbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Singapore	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Slovak Republic	0	0	0	6	0	0	0	0	0	0	0	0	6	6	0	213	0	231
Slovenia	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1969	75	0	2045
South Africa	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Spain	1	5	8	5	0	3	0	1	1	0	0	3	0	1	1	4	0	33
Sri Lanka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Sweden	4	0	10	0	0	0	0	0	2	0	0	0	0	0	0	6	0	22
Taiwan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
Turkey	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5
Ukraine	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	4
United Kingdom	36	35	8	1	0	2	3	0	0	0	0	3	5	3	9	24	4	133
United States	8	11	7	59	0	0	7	2	6	1	8	2	68	25	76542	264	19	77029
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Vietnam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
TOTAL	188	115	169	153	20	43	32	33	55	26	31	42	200	146	81420	2000	63	84736

Indicator 6.2 - Landing portal accesses[15] (period 01/07/2017 – 30/09/2017)

Country	Associ.	Backgr.	Catalo.	Cookie.	Docume.	Home	How to.	Login	Meetin.	Near R.	News	News -.	QA/QC.	Terms .	User's.	Videos.	TOTAL
Australia	0	0	0	0	0	7	0	0	0	0	1	0	0	0	0	5	13
Belgium	0	0	2	0	11	48	2	0	0	0	0	0	0	0	1	0	64
Bulgaria	0	0	0	0	0	7	0	0	0	2	0	0	0	0	1	1	11
Canada	6	7	3	1	6	12	1	16	0	1	4	0	6	1	6	1	71
China	8	8	16	14	8	87	10	102	0	8	0	0	8	12	8	8	297
Colombia	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Croatia	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	5
Cyprus	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Czech Republic	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Denmark	0	0	0	0	0	10	0	0	0	0	0	0	0	1	1	0	12
Estonia	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	9
Finland	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
France	1	0	5	0	5	158	1	0	0	4	0	0	1	2	0	1	178
Georgia	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Germany	7	9	9	10	10	173	8	361	4	7	5	1	8	10	8	6	636
Greece	0	0	1	0	1	23	0	0	0	0	0	0	0	0	0	0	25
Iceland	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
India	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	4
Iran	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Ireland	0	0	1	0	5	16	0	0	0	0	1	0	1	1	0	0	25
Israel	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Italy	2	2	6	0	6	240	2	0	0	0	2	1	3	1	4	4	273
Japan	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	3
Kenya	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Latvia	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Malta	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Mexico	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Morocco	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
Mozambique	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
N.D.	0	1	1	4	0	54	1	1	0	1	0	0	0	1	0	0	64
Netherlands	1	2	0	0	5	22	0	0	0	0	0	0	0	0	0	0	30
Norway	0	1	1	0	1	13	0	0	0	0	0	0	0	0	1	0	17
Pakistan	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3
Philippines	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Poland	3	5	2	4	2	15	2	36	0	2	0	0	2	2	2	2	79
Portugal	0	1	1	0	0	32	0	0	0	0	0	0	0	0	0	0	34
Puerto Rico	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Republic of Korea	2	2	2	2	2	33	0	0	2	0	3	0	6	4	5	0	63
Romania	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Russia	2	2	2	9	2	22	2	5	0	2	3	3	2	2	5	0	63
Singapore	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Slovak Republic	6	6	12	12	6	21	6	90	0	6	0	0	6	6	6	6	189
Slovenia	0	0	0	0	2	10	0	0	0	0	0	0	0	0	2	0	14
Spain	1	1	7	0	2	346	1	0	0	1	0	0	0	0	0	0	359
Sweden	1	1	2	1	2	57	1	1	0	2	1	0	1	1	1	1	73
Taiwan	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Thailand	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Turkey	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Ukraine	1	0	0	2	0	13	0	2	0	0	0	0	2	0	1	0	21

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[15] http://www.emodnet-physics.eu/map/dashboard/Section30.aspx

United Arab Emirates	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
United Kingdom	0	4	9	1	5	131	3	0	0	2	0	0	1	5	5	2	168
United States	32	30	54	37	37	498	45	76	0	44	7	2	30	29	25	17	963
Vietnam	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTAL	75	82	138	98	119	2102	85	690	7	82	29	7	78	78	81	54	3805

Table 25

Indicator 7 - List of what the downloaded data has been used for (divided into categories e.g. Government planning, pollution assessment and (commercial) environmental assessment, etc.)

The team is working on a system to get this information. For the time being is not available yet.

Indicator 8 - List of web-services made available and user organisations connected through these web-services

EMODnet Physics is offering different web-services and machine-to-machine data distribution services. By means of a GeoServer based infrastructure, EMODnet Physics is offering OGC compliant catalogues and services (WMS, WFS, etc.). The following links redirect to the landing page of each of the available service and presents the available features and services in details.

- *UniqueURL*

www.emodnet-physics.eu/map/spi.aspx

  - *e.g.*

    www.emodnet-physics.eu/map/platinfo/pidashboard.aspx?platformcode=arkona
    www.emodnet-physics.eu/map/platinfo/pidashboard.aspx?platformid=8427

- *API (REST, SOAP) → web services [latest 60 days of data]*

www.emodnet-physics.eu/map/Service/WSEmodnet2.aspx
www.emodnet-physics.eu/map/service/WSEmodnet2.asmx

- *OGC (WMS, WFS, …) → postgresql + geoserver*

www.emodnet-physics.eu/map/service/GeoServerDefaultWMS
www.emodnet-physics.eu/map/service/GeoServerDefaultWFS
geoserver.emodnet-physics.eu/geoserver/web

- *Opendap/THREDDS [HFR data, Ice, climatologies]*

thredds.emodnet-physics.eu/thredds/catalog.html

- *Widgets*

www.emodnet-physics.eu/Map/Charts/PlotDataTimeSeries.aspx?paramcode=TEMP&platid=8427&timerange=7

- *Sextant*

www.emodnet-physics.eu/portal/Catalogue

- *GeoServer*

geoserver.emodnet-physics.eu/geoserver/web/wicket/bookmarkable/org.geoserver.web.demo.MapPreviewPage?1

- *ERDDAP (new) → latest 60 days*

erddap.emodnet-physics.eu

Indicator 9 – List of identified publication citing EMODnet Physics

Year	Type	EMODnet Authors	Authors	Title	Publication	other info
2013	Conference	No	Sissy Iona, Stavroula Balopoulou, Pelopidas Karagevrekis, Angelo Lykiardopoulos	The HNODC Data & Information Management Services: Description & Recent Upgrades	Bollettino di Geofisica teorica ed applicata, Vol. 54 Supplement, 2013	IMDIS 2013, International Conference on Marine Data and Information Systems, 23-25 September, 2013 - Lucca (Italy)
2013	Conference	No	Wilhelm Petersen	FerryBox Systems: State-of-the-art and Incorporation in European Observation Networks	Book of Abstract: The Future of Operational Oceanography 2013	
2013	Conference	Yes	A. Novellino, G. Manzella, D. Schaap, P. Gorringe, L. Rickards, S. Pouliquen	EMODNet Physical Parameters	Bollettino di Geofisica teorica ed applicata, Vol. 54 Supplement, 2013	IMDIS 2013, International Conference on Marine Data and Information Systems, 23-25 September, 2013 - Lucca (Italy)
2013	Conference	Yes	Dahlin, Hans; Gies, Tobias; Giordano, Marco; Gorringe, Patrick; Manzella, Giuseppe; Maudire, Gilbert; Novellino, Antonio; Pagnani, Maureen; Petersson, Sian; Pouliquen, Sylvie; Rickards, Lesley; Schaap, Dick; Tijsse, Peter; van der Horste, Serge	European Marine Observation and DataNetwork (EMODNET)- physical parameters: A support to marine science and operational oceanography	EGU General Assembly 2013, held 7-12 April, 2013 in Vienna, Austria, id. EGU2013-3126	EGU 2013
2013	Conference	Yes	Patrick Gorringe, Antonio Novellino, Giuseppe Manzella, Dick Schaap, Lelsy Richards, Sylvie Pouliquen	EMODNet – Physical Parameters	Book of Abstract: The Future of Operational Oceanography 2013	IMDIS 2013, International Conference on Marine Data and Information Systems, 23-25 September, 2013 - Lucca (Italy)
2013	Report	Yes	Ribotti, Alberto and Ciuffardi, Tiziana and Pes, Aandrea and Manzella, Giuseppe M.R. and Sparnocchia, Stefania	Rapporto tecnico-scientifico sullo stato dell'arte dei sistemi oceanografici operativi in Mare Mediterraneo e nei mari italiani con particolare riguardo ai sistemi osservativi	RITMARE project Report, 2013	
2014	Conference	No	W.R. Turrell, B. Berx, A. Gallego, S. Hughes, R. O'Hara-Murray, J. Sanchez	HF Radar Supporting Blue Growth in NW Europe: The Brahan Project	HF Radar Supporting Blue Growth in NW Europe: The Brahan	

			, B. Pereira , A. Alonso-Martirena		Project, Lisbon, 28-30 October 2014	
2014	Conference	Yes	Novellino, Antonio; Gorringe, Patrick; Schaap, Dick; Pouliquen, Sylvie; Rickards, Lesley; Manzella, Giuseppe	Knowledge base for growth and innovation in ocean economy: assembly and dissemination of marine data for seabed mapping - European Marine Observation Data Network - EMODnet Physics	EGU General Assembly 2014, held 27 April - 2 May, 2014 in Vienna, Austria, id.5765	EGU 2014
2014	Conference	Yes	Patrick Gorringe	Introducing the EuroGOOS HFR Task Team and EMODnet	European HFR meeting Monday 27th October 2014, Lisbon	EuroGOOS meeting
2015	Conference	Yes	Antonio Novellino; Paolo D'Angelo; Giacomo Benedetti; Giuseppe Manzella; Patrick Gorringe; Dick Schaap; Sylvie Pouliquen; Lesley Rickards	European marine observation data network — EMODnet physics	IEEE Conference Publications, 2015	OCEANS 2015 - Genova
2015	Conference	Yes	Manzella, Giuseppe M. R.; Novellino, Antonio; D'Angelo, Paolo; Gorringe, Patrick; Schaap, Dick; Pouliquen, Sylvie; Loubrieu, Thomas; Rickards, Lesley	European Marine Observation Data Network - EMODnet Physics	EGU General Assembly 2015, held 12-17 April, 2015 in Vienna, Austria. id.8417	EGU 2015
2015	Conference	Yes	Mader, Julien; Novellino, Antonio; Gorringe, Patrick; Griffa, Annalisa; Schulz-Stellenfleth, Johannes; Montero, Pedro; Montovani, Carlo; Ayensa, Garbi; Vila, Begoña; Rubio, Anna; Sagarminaga, Yolanda	European coordination for coastal HF radar data in EMODnet Physics	EGU General Assembly 2015, held 12-17 April, 2015 in Vienna, Austria. id.14714	EGU 2015
2015	Journal	No	A Aparicio-González, J L López-Jurado, R Balbín, J C Alonso, B Amengual, J Jansá, M C García, F Moyá, R Santiago, M Serra, M Vargas-Yáñez	IBAMAR DATABASE: FOUR DECADES OF SAMPLING ON THE WESTERN MEDITERRANEAN SEA	Data Science Journal, Volume 13, 27 January 2015	
2015	Journal	No	U Gräwe, M Naumann, V Mohrholz, H. Burchard	Anatomizing one of the largest saltwater inflows into the Baltic Sea in December 2014	Journal Geophysical Research, Volume 120, Issue 11 November 2015 Pages 7676–7697	
2016	Conference	No	Stefania Sparnocchia, Michela Martinelli, Srdjan Dobricic, Rajesh Nair, Alessandro Crise, Patrick Farcy, Glenn Nolan, Joaquin Tintorè	An interlinked coastal observatory network for Europe	Journal of Operational Oceanography . Volume 9, 2016 - Issue sup1: Operational Oceanography, Innovative Technologies and Applications. Pages s193-s201	Third Meeting of the Italian National Group for Operational Oceanography

2016	Conference	No	Bahamon, N., Ahumada-Sempoal, M.A., Bernardello, R., Aguzzi, J., Gordoa, A., Carreras, G., Velasquez, Z., Cruzado, A.	SEVEN YEARS OF MARINE ENVIRONMENTAL CHANGES MONITORING AT COASTAL OOCS STATIONS (CATALAN SEA, NW MEDITERRANEAN)	instrumentation viewpOint- 19 - MARTECH 16	MARTECH 2016
2016	Conference	No	A. Oliveira, J. Rogeiro, J.L. Gomes, P. Pinto, A. B. Fortunato, P. Freire, R. T., Costa, L. Sá, R. Pablo, A. Mendes	Plataforma integrada WebSIG para apoio à gestão da emergência em eventos de inundação em estuários	4as Jornadas de Engenharia Hidrográfica, Lisboa, 21 a 23 de junho de 2016	
2016	Conference	Yes	Novellino, Antonio; Benedetti, Giacomo; D'Angelo, Paolo; Gorringe, Patrick; Thjisse, Peter; Schaap, Dick; Pouliquen, Sylvie; Manzella, Giuseppe	EMODnet Physics: One-stop Portal to access Multiplatform Observing Systems	EGU General Assembly 2016, held 17-22 April, 2016 in Vienna Austria, p.3831	EGU 2016
2016	Conference	Yes	S. Goggi, G. Pardelli, R. Bartolini, F. Frontini, M. Monachini, G. Manzella, M. De Mattei and F. Bustaffa:	A semantic engine for grey literature retrieval in the oceanography domain.	Ed. D. Farace and J. Frantzen, 104 – 111, 2016;	Seventeenth International Conference on Grey Literature - A New Wave of Textual and Non-Textual Grey Literature. December 1st - 2nd 2015 at the Royal Netherlands Academy of Arts and Sciences in Amsterdam.
2016	Journal	No	Gisbert Breitbach, Hajo Krasemann, Daniel Behr, Steffen Beringer, Uwe Lange, Nhan Vo, and Friedhelm Schroeder	Accessing diverse data comprehensively – CODM, the COSYNA data portal	Ocean Sci., 12, 909–923, 2016	
2016	Journal	No	Manuel Ruiz-Villarreal, Luz M. García-García, Marcos Cobas, Patricio A. Díaz, Beatriz Reguera	Modelling the hydrodynamic conditions associated with *Dinophysis* blooms in Galicia (NW Spain)	Harmful Algae, Volume 53, March 2016, Pages 40–52	
2016	Journal	Yes	Jan-Bart Calewaert, Phil Weaver, Vikki Gunn, Patrick Gorringe, , Antonio Novellino	The European Marine Data and Observation Network (EMODnet): Your Gateway to European Marine and Coastal Data	Ocean Engineering & Oceanography, Vol. 6, pp 31-46, 2016	

Year	Type		Authors	Title	Source	Notes
2016	Newsletter	Yes	S. POULIQUEN, T. CARVAL, D GUILLOTIN , C. COATANOAN, T. LOUBRIEU, C. GUYOT, K. BALEM, T. SZEKELY, J. GOURRION, A. GROUAZEL, K. VON SCHUCKMANN, H. WEDHE, L.S. RINGHEIM, T. HAMMARKLINT, A. HARTMAN, K. SOETJE, T. GIES, S. JANDT, L. MULLER, M. DE ALFONSO, F. MANZANO MUÑOZ, L. PERIVOLIOTIS, D. KASSIS, A. CHALKIOPOULOS, V. MARINOVA, P. JACCARD, A. LEDANG, K. SORENSEN, G. NOTARSTEFANO, J. TINTORE , S. KAITALA, P. ROIHA, L. A. LEDANG, K. SORENSEN, G. NOTARSTEFANO, J. TINTORE , S. KAITALA, P. ROIHA, L. RICKARDS, G. MANZELLA, F. RESEGHETTI	MAIN ACHIEVEMENTS FOR MYOCEAN IN SITU THEMATIC ASSEMBLY CENTER	MERCATOR OCEAN JOURNAL 54, 2016	
2016	Report	No	Carval Thierry, Chalkiopoulos Antonis, Perivoliotis Leonidas, De Alfonso Alonso-Muñoyerro Marta, Manzano Munoz Fernando, Jandt Simon, Ringheim Lid Sjur, Hammarklint Thomas, Marinova Veselka	System Requirements Document	CMEMS-INS-SRD	
2016	Report	Yes	Ifremer	Catalogue of data and platforms at Network GDAC level, including the example of Copernicus In Situ TAC	IFREMER IMN/IDM/ISI/TC/16-031, 30th May 2016	
2016	Report	Yes	V. Harscoat, S. Pouliquen	Data Management Handbook	AtlantOS – 633211, D7.4, 2016	EU Atlantos project
2016	Report	Yes	Pepijn de Vries, Jacqueline Tamis, Martine van den Heuvel-Greve, Peter Thijsse & Belinda Kater	Collecting literature for identifying data sets and data sources	IMARES Report C072/16	IMARES Wageningen UR, Den Helder, 14 July 2016
2017	Book chapter	Yes	G. Manzella, R. Bartolini, F.Bustaffa, P. D'Angelo, M. De Mattei, F. Frontini, M. Maltese, D. Medone, M. Monachini, A. Novellino and A. Spada:	Semantic Search Engine for Data Management and Sustainable Development: Marine Planning Service Platform.	Oceanographic and Marine Cross-Domain Data Management for Sustainable edited by P. Diviacco, A. Leadbetter, H. Glaves, IGI Global,	
2017	Journal	No	Christina Kalogeri, George Galanis, Christos Spyrou, Dimitris Diamantis, Foteini Baladima, Marika Koukoula, George Kallos	Assessing the European offshore wind and wave energy resource for combined exploitation	Renewable Energy, Volume 101, February 2017, Pages 244–264	

2017	Journal	Yes	Anna Rubio, Julien Mader, Lorenzo Corgnati, Carlo Mantovani, Annalisa Griffa, Antonio Novellino, Céline Quentin, Lucy Wyatt, Johannes Schulz-Stellenfleth, Jochen Horstmann, Pablo Lorente, Enrico Zambianchi, Michael Hartnett, Carlos Fernandes, Vassilis Zervakis, Patrick Gorringe, Angélique Melet and Ingrid Puillat	HF Radar Activity in European Coastal Seas: Next Steps toward a Pan-European HF Radar Network	Marine Sciemce, 20 January 2017	
2017	Conference	Yes	Novellino, Antonio; Gorringe, Patrick; Schaap, Dick; Pouliquen, Sylvie; Rickards, Lesley; Thijsse, Peter; Manzella, Giuseppe	EMODnet Physics in the EMODnet program phase 3	EGU General Assembly 2017, held 23-28 April, 2017 in Vienna, Austria. id.7113	
2017	Book chapter	No	Keiran Westley	Chapter 6: The Northwest Shelf.	Submerged Landscapes of the European Continental Shelf. Edited by Nicholas C. Flemming,Jan Harff,Delminda Moura,Anthony Burgess,Geoffrey N. Bailey	
2017	Conference	Yes	Schaap, Dick M. A.; Schmitt, Thierry	EMODnet High Resolution Seabed Mapping - further developing a high resolution digital bathymetry for European seas	EGU General Assembly 2017, held 23-28 April, 2017 in Vienna, Austria. id.194371S	
2017	Journal	no	Kumar et al	Ocean wave height prediction using ensemble of Extreme Learning Machine	neurocomputing	http://dx.doi.org/10.1016/j.neucom.2017.03.092

8. Annex

Description of the EMODnet Physics_TrimonthlyReport_XX (Excel File)

The EMODnet Physics portal makes available the following data type:

- **Latest data** → freely available up to 60 days   (automatic quality check/flag procedures)
- **Recent data** → organized in monthly data files (post 60 days, automatic quality check/flag procedures[16], requires user registration)
- **Long Term time series data** → organized one data file for platform (automatic quality check/flag procedures, requires user registration)
- **Historical validated data** → organized in CDI - dataset files hosted by NODCs (validated data[17], requires user registration).

The following table lists the full data availability, in particular it lists the typology of platform (MO= mooring buoy/fixed platform; FB=ferrybox; GL= glider, DB = drifting buoy, AR = Argo), whether it is providing data (NRT true/false), recent data time coverage (from to) and number of files (if the first number is lower than the second there are temporal gaps in the monthly data files; if the first number is higher than the second the platform hosts different data acquisition sets – e.g. Arkona), long term time series files (from to), if there are historical validated data for that platform (CDI) in SeaDataNet-NODCs network (from to, and the number of available CDIs covering the specified time range).

Summary table of all the data (latest, recent, long term and validated historical) by Country, Organization, Platform type and Data availability

Column name	Description
Platform ID	EMODnet Physics internal code to identify the platform
Latitude	Latitude
Longitude	Longitude
Country	Country of the data provider
Data provider	Name of the data provider
EdmoCode	EDMO code of the data provider
EdmoDescr	EDMO full description
Platform	Platform name
Type	Typology of the plaform (AR, DB, MO, GL, RD, FB, …)
Data assembly center	Name of the DAC
NODC	National Oceanographic Data Center or SeaDataNet node in charge for the CDIs

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[16] http://www.emodnet-physics.eu/map/ARH/QualityCheck/recommendations_for_rtqc_procedures_v1_2.pdf

[17] Validated according the SeaDatanet Quality Check procedure -

http://www.seadatanet.org/content/download/18414/119624/file/SeaDataNet_QC_procedures_V2_%28May_2010%29.pdf

Recent data From - To	Time coverage of the Near Real Time data as aggregated in monthly files
Recent data #files	Number of NRT.Monthly files
Long term TS From - To	Time coverage of the REPROCESSED NRT data as aggregated in REP files
CDI dataset ID - validated historical data From - To	Time coverage of the CDIs for the specified platform
CDI dataset ID #files	Number of CDIs for the specified platform
State	EMODnet Physics Internal flag
Operational	Platform is delivering operational data? YES/NO
Water Temperature	X in the cell, if the platform is delivering the parameter
Water salinity	X in the cell, if the platform is delivering the parameter
Currents	X in the cell, if the platform is delivering the parameter
Light Attenuation/ Absorption / Fluorescence/ Back Scattering	X in the cell, if the platform is delivering the parameter
Sea Level	X in the cell, if the platform is delivering the parameter
Atmospheric	X in the cell, if the platform is delivering the parameter
Other Parameters	X in the cell, if the platform is delivering the parameter
Water conductivity/ BioGeoChemical	X in the cell, if the platform is delivering the parameter
Waves	X in the cell, if the platform is delivering the parameter
Winds	X in the cell, if the platform is delivering the parameter
River	X in the cell, if the platform is delivering the parameter

Where N.D. means that metadata or data is not available yet or it is under check procedure.

M: YY/XX → if YY = XX there are no temporal gaps in monthly time series

EMODnet Physics Products

Operational products:

ARGO	
Water column Temperature	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=AR&param=TEMP
Water column salinity	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=AR&param=PSAL
Drifting Buoys	
Sea Surface Temperature	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=DB&param=TEMP
Sea Surface Salinity	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=DB&param=PSAL
Pressure at Sea Surface	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=DB&param=ATMS
Temperature in the bulb	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=DB&param=DRYT
Ferrybox and Ships	
Sea Surface Temperature	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=FB&param=TEMP
Sea Surface Salinity	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=FB&param=PSAL
Sea Surface Chlorophylls	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=FB&param=CHLT
HF Radar	
Sea Surface Currents (direction and intensity)	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RD

Table 26

Sea Ice products: Sea Ice products are both for operational (daily information on the ice is also made available on the WMS/WFS service) and (re)analysis use (e.g. long term time-series and trends).

Arctic Sea Ice	
Ice concentration	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=ICE&Antarctic=0&param=Concentration
Ice edge	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=ICE&Antarctic=0&param=Edge
Ice type	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=ICE&Antarctic=0&param=Type
Antarctic Sea Ice	
Ice concentration	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=ICE&Antarctic=1&param=Concentration
Ice edge	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=ICE&Antarctic=1&param=Edge

Ice type	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=ICE&Antarctic=1&param=Type

Table 27

EMODnet Physics is using the CMEMS - SEAICE_GLO_SEAICE_L4_NRT_OBSERVATIONS_011_001 product to generate the dynamic maps and parameters time series.

Other Products

Marine Mammals[18]	
Water column temperature	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=MM&param=TEMP
Water column salinity	http://www.emodnet-physics.eu/map/Products/V2/PRODUCTS.aspx?PRODTYPE=RT&type=MM&param=PSAL
Sea Level Trends	
PSMSL	http://www.emodnet-physics.eu/map/Products/PRPSMSL.aspx

Table 28

EMODnet Physics is using the Permanent Service for Mean Sea Level database to make available the sea level trends product

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[18] The MEOP product let the user to see animation of the parameter along the animal route for the past 10 years. This product was ingested in cooperation with EMODnet Data Ingestion

Under Water Noise data management

Important concepts

A digital hydrophone send a packet of values (array), typically 512 values signed integers. The sampling frequency is necessary to determinate the time interval of each array and the number of arrays in the average time, following the next equation:

$$N = \frac{T}{n/Fs} \quad [1]$$

where

Fs is the sampling frequency

n is the numbers of values of an array

T is the average time

N is the number of arrays in the average time

Instantaneous Pressure

Usually the data from the hydrophone is an array of counts with n elements, thus first is necessary convert counts in pressure and remember that in the water the reference pressure in water is 1 µPa.

$$P_i(\mu Pa) = \frac{Counts \cdot C2V}{10^{S/20} \cdot 10^{G/20}} \quad [2]$$

where:

C2V is the conversion factor of counts to voltage. Usually maximum voltage per maximum counts

S is the Sensitivity of the hydrophone. Its unit is dB rel V/µPa

G is the Gain of the hydrophone. Its unit is dB rel V/µPa

P$_i$ is the Instantaneous Pressure. Its unit is µPa

The value of Pi is referred at 0 to peak, as shows the figure 1, thus the counts always are referered to 0. In case, that the center works peak to peak in $P_i(\mu Pa) = Counts \cdot C2V ⏑ 10^{S/20} \cdot 10 G20$ [2 the counts must to be divided by 2.
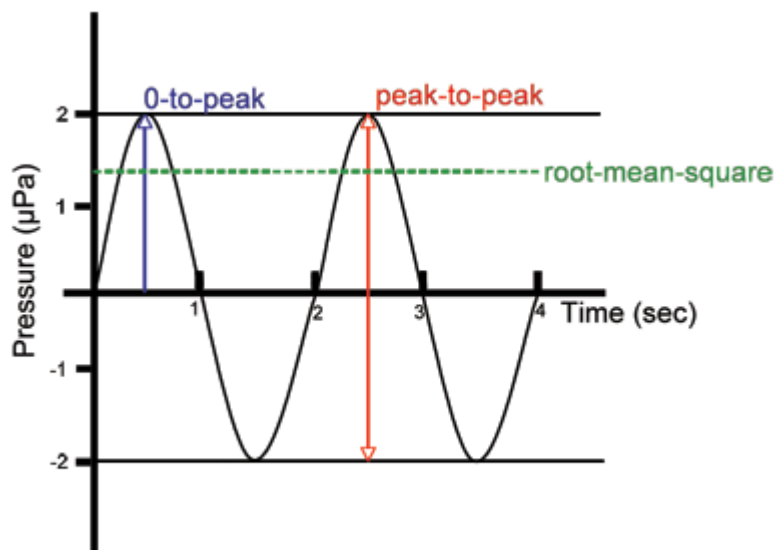

Figure 12 - Description of different type of signals

Time definition for P$_{RMS}$

The definition of time for P$_{RMS}$ is the main parameter that its length can change the value of P$_{RMS}$ such Figure 13 detailed:

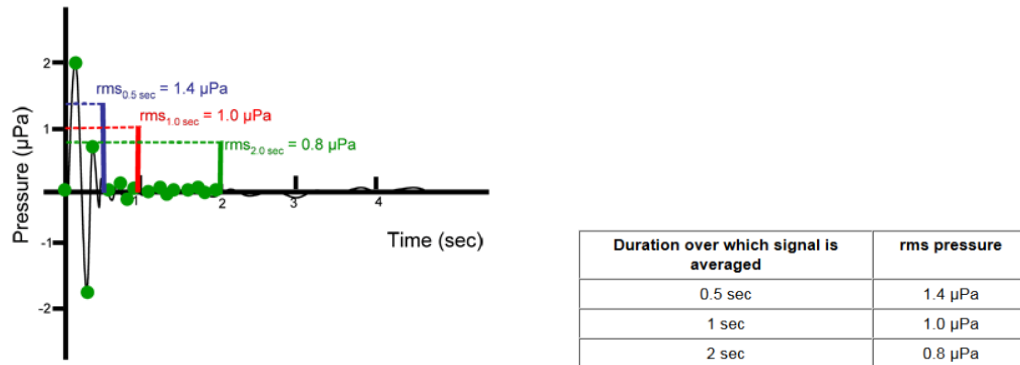| Duration over which signal is averaged	rms pressure
0.5 sec	1.4 µPa
1 sec	1.0 µPa
2 sec	0.8 µPa

Figure 13 - The acquisition hydrophone in pressure and time (left) and the table of the pressure in RMS in function of time integration (right)

An integration time could be 20 seconds.

The P$_{RMS}$ is the quadratic sum of all elements per the number elements

$$P_{RMS} = \sqrt{\frac{\sum P_i^2}{N \cdot n}} = \sqrt{\frac{\int_{t_1}^{t_2} P_i^2 \, dt}{t_2 - t_1}} \quad [3]$$

where :
- Fs is the sampling frequency (Hz)
- N is the number of arrays in the average time
- n is the numbers of values of an array
- t2-t1 is the elapse time of measurement (s)

At least the Sound Pressure Level is:

$$SPL = 20 \cdot \log(P_{RMS}) = 10 \cdot \log\left(\frac{\sum P_i^2}{N \cdot n}\right) \quad [4]$$

Its units is dB$_{RMS}$ re 1µPa at X seconds (in the case the integration time is 20 seconds)

Other interesting values

Following the [EUR 26557 EN](#) will be interesting to calculate an archive other parameters like:
- SPL$_{63}$ corresponding at the value of SPL in dB re 1 µPa during 20 seconds centered at 63 Hz, where the band frequency is from 56,3 Hz until 70,8 Hz
- SPL$_{125}$ corresponding at the value of SPL in dB re 1 µPa at during seconds centered at 125 Hz, where the band frequency is from 112 Hz until 141 Hz

To calculate the value at determinate frequency the Fourier analysis is applied each array and determinate the value Pi at determinate frequency.

Conclusions:

Each provider will provide at least the following:
- SPL in dB$_{RMS}$ re 1 µPa with 20 seconds of integration time
- SPL$_{63}$ in dB re 1 µPa at 63 Hz with 20 seconds of time integration

- SPL$_{125}$ in dB re 1 µPa at 125 Hz with 20 seconds of time integration
- Hydrophone metadata
    - Sampling frequency
    - Antialiasing filters applied
    - Gain
    - Sensitivity
    - Offset, in counts if it's possible
    - Etc…

References:
http://www.npl.co.uk/upload/pdf/gpg133-underwater-noise-measurement.pdf
http://dosits.org/science/advanced-topics/introduction-to-signal-levels/

Processing levels

Oceanographic data and data product production workflow is composed of different processing steps that range from the acquisition of unprocessed data at full resolution from the platform payload up to integrated products as processed by models with qualified assimilated data.

The following table aims at representing generic processing levels applicable to most of the platforms and data sources. The table follows the same conceptual scheme as applied to remote sensing processing levels (see Wikipedia "Remote Sensing").

Processing Level	Processing sub-Level	Definition	Description
Level 0	LEVEL 0	Reconstructed, unprocessed instrument/payload data at full resolution; any and all communications artifacts, e.g. synchronization frames, communications headers, duplicate data removed.	raw data: Unprocessed instrument/payload data at full resolution including synchronisation methods (e.g. elimination of CTD up-down duplicates) and excluding communication artifacts
	LEVEL 1A	Reconstructed, unprocessed instrument data at full resolution, time-referenced and annotated with ancillary information, including radiometric and geometric calibration coefficients and georeferencing.	Full resolution data reconstructed with calibration coefficients, geo and time referenced
	LEVEL 1B	Level 1A data that have been processed to sensor units for next processing steps. Not all instruments will have data equivalent to Level 1B.	
	LEVEL 2A	Derived geophysical variables at the same resolution and locations as the Level 1 source data.	Derived geophysical data processed with a minimum QC (e.g. gross range test)
	LEVEL 2B	Level 2A data that have been processed with a minimum set of QC.	
	LEVEL 3A	Variables mapped on uniform space-time grid scales, usually with some completeness and consistency	Data resampled regularly and with delayed mode QC applied (including climatology comparison).
	LEVEL 3B	Level 3A data that have been processed with a minimum set of QC.	
Level 4	LEVEL 4	Model output or results from analyses of lower level data, e.g. variables derived from multiple measurements	Data quality assured from multiple campaign, measurements or model outputs.

Table 29