

# ID2- EMODNET PHYSICS: TOWARDS AN EUROPEAN IMPULSIVE NOISE REGISTER

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## Abstract

*EMODnet Physics, one of the European Marine Observation and Data network thematic portals, which is currently providing access physical parameters of the oceans, has recently started working on water noise with the aim of making available more operational data (in terms of parameters and format that are close to MSFD I.11 requirements), offer a single European entry point to impulsive noise registries (MSFD I.11.1) and work on (regional) sound maps*

*Keywords – under water noise, data management, climatology*

## I. INTRODUCTION

Underwater noise has been significantly raising in the past decades due to an increment of human-related activities in the oceans such as shipping, industrial activities, seismic explorations, etc. These activities may have adverse effects on fish and mammals, such as communications masking and modifying predator-prey interactions.

In order to assess and limit the impact of these, the European Commission approved the Marine Strategy Framework Directive (MSFD) that aims to achieve a good environmental status in European waters. Within this directive, different environmental challenges are addressed, including the long-term monitoring of underwater noise throughout European waters.

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## II. EUROPEAN MARINE OBSERVATION AND DATA NETWORK

EMODnet[1] is a long-term marine data initiative from the EU Commission Directorate-General for Maritime Affairs and Fisheries (DG MARE) involving more than 150 organisations for assembling marine data, products, and metadata. It has been developed through a step-wise approach and is currently in its third and final development phase.

The organisations involved work together to observe the sea, process the data according to international standards and make that information freely available as interoperable data layers and data products. Unfortunately, marine data collection, storage and access in Europe has been carried out in a fragmented way for many years.

Most data collection has focused on meeting the needs of a single purpose by a wide range of private and public organisations, often in isolation from each

other. EMODnet provides access to European marine data across seven themes: bathymetry[2], geology[3], seabed habitats[4], chemistry[5], biology[6], physics[7], and human activities[8]. For each theme, EMODnet has created a gateway to a range of data archives managed by local, national, regional and international organisations.

Users have free access to standardised observations, data quality indicators and processed data products, such as basinscale maps.

## III. EMODET PHYSICS

EMODnet Physics is a domain specific portal of portals aggregating data and metadata from several data portals. A combined array of services and functionalities are offered to internal and external users, such as facility for viewing and downloading, dashboard reporting and machine-to-machine communication services, to obtain free-of-charge data, metadata and data products on the physical conditions of the ocean from many different distributed data sets.

The acquisition of physical parameters is largely an automated process that allows the dissemination of near real time information. In particular, EMODnet Physics is a stock-share portal strongly federated to the Copernicus Marine Environment Monitoring Service In Situ Thematic Assembly Center. Historical validated datasets are organized in collaboration with SeaDataNet and its network of National Oceanographic Data Centers.

The EMODnet Physics portal is currently providing easy access to metadata, data and products of: wave height and period; temperature and salinity of the water column; wind speed and direction; horizontal velocity of the water column; light attenuation; sea ice coverage and sea level trends (relative and absolute). Lately, EMODnet Physics started working on river runoff data, total suspended matter and underwater noise (acoustic pollution).

EMODnet Physics is continuously increasing the number and type of platforms in the system by unlocking and providing high quality data from a growing network.

EMODnet Physics was able to make available circa 30.000 platforms and more than 400.000 datasets, and to publish more than 350 map layers<sup>1</sup> derived from the data products.

For each connected platform, a dedicated platform page is available. These pages provide the user with metadata, plots, download features, platform products e.g. monthly averages or wind plots, more info and links, as well as statistics on the use of the data from that platform. Data quality information is available in connection to datasets.

EMODnet Physics data policy is open and free and, in agreement with its pillars and the providers network, the user can download in situ data without authentication in case of operational data for past 60 days, operational data from plat-

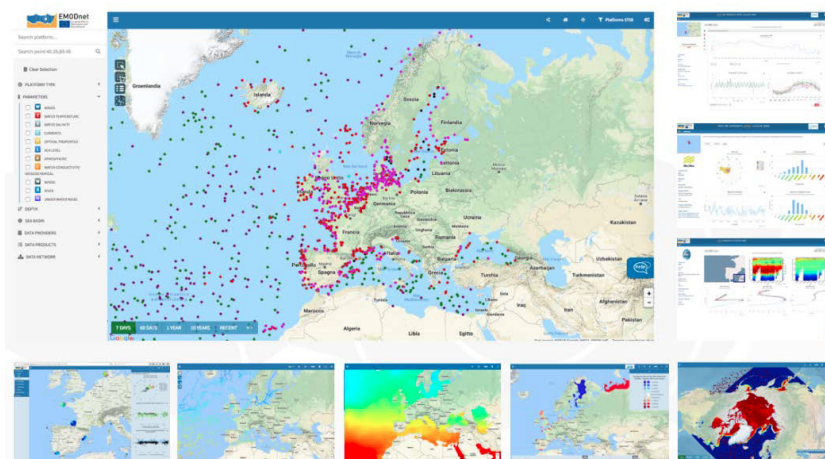


Fig 1. EMODnet Physics overview

<http://geoserver.emodnet-physics.eu/geoserver/web/wicket/bookmarkable/org.geoserver.web.demo.MapPreviewPage?1>

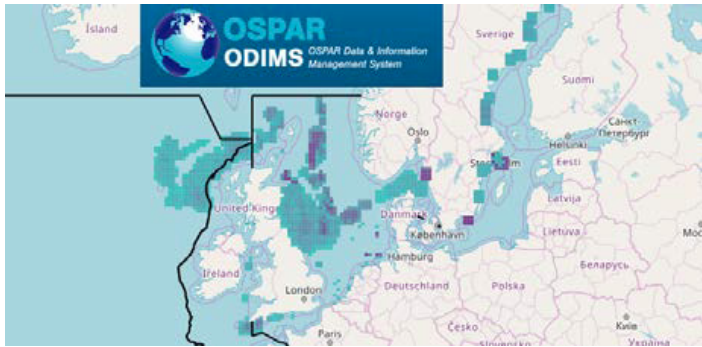


Fig 2. OSPAR registry <https://odims.ospar.org/maps/524/view>



Fig 3. ACCOBAMS registry <https://accobams.noiseregister.org/>



Fig 4 HELCOM registry <http://underwaternoise.ices.dk/map.aspx>

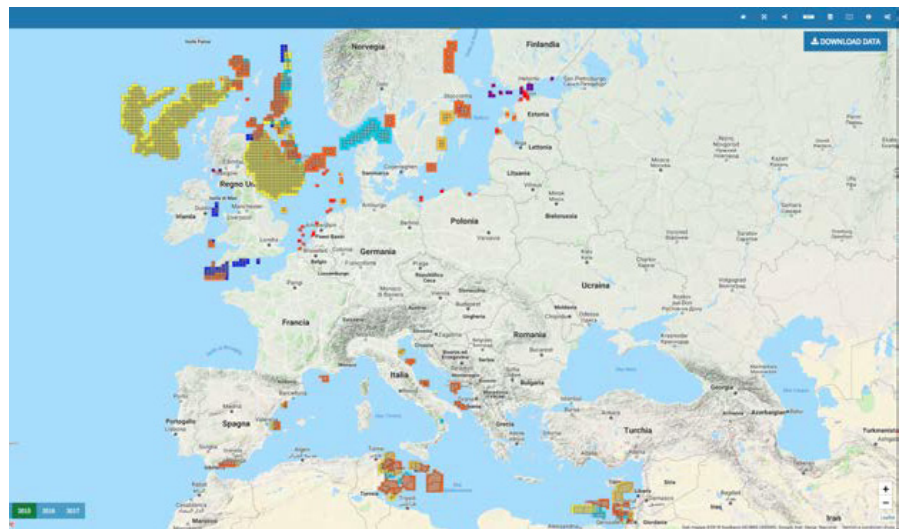


Fig 5 EMODnet Physics Impulsive Noise Registry

forms participating to international programs (e.g. ARGO) and data from providers that specifically requested it. User is asked to authenticate (CMEMS Service Level Agreement) for data older than 60 days and reprocessed/delay mode in situ data, and (SDN Service Level Agreement) for requesting CDI - historical data hosted by National Oceanographic.

#### IV. IMPULSIVE NOISE REGISTRY

The data are collated nationally from registers of licenced events such as pile driving, controlled explosions from naval operations and other activities that release energy. The registry is specifically purposed with supporting Regional Sea Conventions (Fig. 2, Fig.3, Fig.4) in providing information that will feed their regional assessments, and in reporting by its contracting parties to MSFD descriptor 11.1.1 (Low and mid frequency impulsive noise).

Data supplied by contracting parties to OSPAR (North East Atlantic), HELCOM (Baltic Sea), and Barcelona and ACCOBAMS (Mediterranean Sea, Black Sea). Starting from the already implemented regional registries of impulsive noise, EMODnet Physics harmonized and integrated the registry into one single discoverable interface (Fig. 5).

More specifically the ICES statistical subrectangles (10' lat\*20' lon) was extended to cover the Mediterranean Sea, the noise event shape files were download-

ed from the HELCOM, OSPAR and ACCOBAMS hosting repositories, finally the events falling into the block were counted to have the pulse event days per block.

#### V. CONCLUSIONS

EMODnet Physics is providing a harmonized interface to discover and download impulsive noise event covering the European Regional Sea conventions. The same data is also exposed OGC compliant services<sup>1</sup> for easy integration and use.

#### REFERENCES

- [1] EMODnet Homepage, <http://www.emodnet.eu>.
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1 [http://geoserver.emodnet-physics.eu/geoserver/emodnet/wms?service=WMS&version=1.1.0&request=GetMap&layers=emodnet:EP\\_UWN\\_INER&styles=&bb](http://geoserver.emodnet-physics.eu/geoserver/emodnet/wms?service=WMS&version=1.1.0&request=GetMap&layers=emodnet:EP_UWN_INER&styles=&bb)