

Contribution of EMODNET Bathymetry Project to Marine Strategy Framework Directive (MSFD). Case of use: The IEO experience.

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The Spanish Institute of Oceanography is involved in the EMODNET Bathymetry project from its beginning. The results of this project are very useful in several projects carried out by researchers of this institution, emphasizing the usefulness in developing the work in the framework of MSFD.

EMODnet: The European Marine Observation and Data Network

The European Union, in line with its policy and commitment to ensure sustainable growth and the conservation of biodiversity and marine resources, has carried out several initiatives in this respect, such as the Integrated Maritime Policy in 2007, the Directive for Marine Strategies (2008/56/EC), the “Blue Growth” to support sustainable growth in the marine environment, the “Marine Knowledge 2020” to increase knowledge of the marine environment and stresses the importance of knowing what data exists and providing access to it, the INSPIRE Directive 2007/2 / CE, to provide interoperability to information and promotes the sharing of information through Spatial Data Infrastructures, the Marine Spatial Planning Directive /2014/89/EU), etc.

With the purpose of encouraging these policies, Marine Knowledge 2020 promotes the open access to marine data through the EMODnet. <https://emodnet.eu/>

The general objectives of EMODnet are to find, collect, harmonize and standardize the existing data on the marine environment, scattered throughout different European institutions, as well as to provide interoperability into the existing data and metadata. Another objective includes the creation of a Spatial Infrastructure that allows access to the data and metadata. EMODnet provides access to European marine data set in seven fields: Bathymetry, Geology, Seabed Habitats, Chemistry, Biology, Physics and Human Activities.

In order to achieve these aims, the DGMARE launches a “call” under its guidelines searching a consortium of institutions. Since the beginning of this initiative, several calls have been launched, in which the IEO has been participating and working in a consortium.

In the case of bathymetry call, the main objective is to create a multi-resolution DTM with extended coverage which would include European zones. In the current development phase (2017-2020) the IEO in consortium are developing a DTM of $\frac{1}{4}$ of an arc minute, about 100 meters of resolution. Additionally, the satellite-derived bathymetry data contributes to cover the gaps in the coastal area. Moreover, a quality index is provided at the grid node level in order to inform the user about the quality of the DTMs.

MSFD: Marine Strategy Framework Directive (2008/56/EC)

The MSFD aims to achieve Good Environmental Status (GES) of the EU’s marine waters and to protect the resource base upon which marine-related economic and social activities depend.

The Directive enshrines in a legislative framework the ecosystem approach to the management of human activities having an impact on the marine environment, integrating the concepts of environmental protection and sustainable use. <https://ec.europa.eu/>

MSFD establishes a monitoring program of different descriptors for continuous evaluation and periodic updating of the objectives. In Spain, the Ministry of Ecological Transition (MITERD) is responsible and coordinator of carrying out the MSFD, but the Spanish Institute of Oceanography (IEO) performs the research and study of the different indicators and therefore the tasks of collecting oceanographic data.

The process is cyclical, a review of the different elements of the strategy is produced every six years. The first cycle started in 2012 and the second cycle started in 2018. IEO is working in all monitoring programmes of this cycle.

EMODnet and MSFD. Case of Use: The IEO experience.

With this work we want to highlight that all data collected in EMODnet is essential information in order to have a database with georeference information about the marine environment to achieve the objectives of MSFD.

Focusing on EMODnet bathymetry, the researchers of IEO are participating as partner on the development of the EMODnet bathymetry data (continuous DTMs for all european seas). IEO is contributing with new bathymetric surveys, following the common standards of the project, to integrate the regional GRID into the global result. The spanish contribution to EMODnet Bathymetry is also increasing the quality of the DTMs provided. The high resolution of the datasets represent a remarkable improvement to see in more detail the seafloor characteristics and to increase the efficiency of seabed mapping.

On the other hand, the IEO researchers are involved in the development of research in the framework of MSFD in Spain and they are using the EMODnet bathymetry as important element of reference. The bathymetric data is a fundamental contribution to the study of marine habitats, it is also one of the physical factors on which most of the ecosystems are structured. For the MSFD works is essential to have a continuous DTM bathymetry in order to the stablishment of indicators for each descriptor. For instance, in the MSFD "Biodiversity descriptor", it is essential to know the seabed relief in order to know the habitat situation from the coastal zone to the deep sea. The distribution of marine habitats normally responds to bathymetric criteria, thus determines the existence of certain species and associated communities at different ranges of depth. It is very important to define bathymetrical thresholds to identify the benthic habitats domain as infralitoral, circalitoral, etc.

Moreover, the bathymetry it is especially valuable in the indicators as spatial extent of loss of seabed, spatial extent of physical disturbance to seabed, distribution of habitat adversely altered by physical disturbance. Other utilities of bathymetry are to know the marine currents and therefore in order to know species distribution. In line with the EU MSFD, the marine spatial databases are an essential tool to analysis and to understand the ocean dynamics.

The Bathymetic Model from EMODnet has also presence on other descriptors such as seafloor integrity, where the seafloor plays an essential role to evaluate and to monitor the Good Enviromental Status of the european waters. Hence, It represents an special key in the assesment and management of the marine resources.