**OBJECTIVES**

EMODnet focuses in finding, collecting, harmonizing and standardizing the existing data on the marine environment, as well as to provide interoperability into the existing data and metadata. These data are accessible through Thematic Portals of EMODnet. EMODnet focuses in finding, collecting, harmonizing and standardizing the existing data on the coastal area. Moreover, a quality index is provided at the grid node level in order to inform the IEO in consortium are developing a DTM of ¼ of an arc minute, about 100 meters of extended coverage including European zones. In the current development phase (2021-2022) Regarding EMODnet Bathymetry, the main objective is to create a multi-resolution DTM with conservation of biodiversity and marine researches. Emphasizing, these models covering the entire surface of the marine bottom is equally necessary for the analysis of indicators such as the loss of the seabed and the physical alteration of the bottom surface.

**To ensure sustainable growth and the conservation of biodiversity and marine resources**

Regarding EMODNet Bathymetry, the main objective is to create a multi-resolution DTM with extended coverage including European zones. In the current development phase (2021-2022) the IEO in consortium are developing a DTM of ¼ 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.

**EU INITIATIVES**

- Integrated Maritime Policy
- Marine Strategy Framework
- Blue Growth
- INSPIRE
- Marine Spatial Planning

In Spain, the Ministry of Ecological Transition and Demographic Challenge (MITERD) coordinates the MSFD, but the Spanish Institute of Oceanography (IEO) performs the research/study of the different indicators and therefore the tasks of collecting oceanographic data. This process is cyclical, thus the first cycle took place during the years 2012-2018 and, now, having started the second cycle (2018-2024).

**BATHYMETRY BIOLOGY CHEMISTRY GEOLOGY**

**Conclusions**

The benefits obtained of using these DMTs in the investigations carry out in MSFD are many. Emphasizing, these models covering the entire surface of the marine demarcations. The resolution of 100 meters is enough to simulate process at demarcation scale. Beside, EMODNet bathymetry provide bathymetry of higher resolution (50, 25, 5 meters) in so-called "hot spot", very useful in detail studies.

**EMODnet and MSFD. Case of Use of IEO**

All the data collected in EMODnet are essential for the researches of IEO to be able to have a spatial database of marine environment, to achieve the objectives of MSFD. The EMODnet DMTs are essential in many investigations developed by the IEO. A good case of use is the application of EMODnet DTMs in the studies of MSFD. The IEO is responsible of carrying out several monitoring programs of MSFD and the EMODnet Bathymetric models are also of vital importance in these monitoring programs, established for the different descriptors for continuous evaluation and periodic updating of the MSFD objectives.

For example, for the Biodiversity Descriptor (D1), it is essential to know the depth of seabed, from the coastal zone to the depths of the sea. The distribution of marine habitats responds to bathymetric criteria, since it determines the existence of certain species and communities associated with different depth ranges. The assessment of D1 state is required at three main ecological levels: species, habitats and ecosystems.

In addition, taking bathymetric data as a source and supporting on existing spatial analysis tools in common GIS software, it is possible to obtain more practical information for the description of seabed. These tools use an analysis between the cells surrounding each one of them, obtaining patterns that offer us variables for the characterization of the seabed. Thus we get new information such as Hillshade, Slope, Aspect, Ruggedness or exposure to the main current (see Fig. 7).

All these new parameters are fundamental for their introduction in the analysis for the generation of Species Distribution Models, Habitat Suitability Models and many other types of models for the study of marine biological diversity and its status environmental.

**Fig. 2. MSFD Schema. Good Environment Status. Source: MITERD.**

**Fig. 3. MSFD Schema. descriptors. Source: MITERD.**

**Fig. 4. MSFD Marine subregions. Source: MITERD.**

**Fig. 7. Gazul Mud Volcano (Gulf of Cádiz, NE Atlantic). Example of thematic mapping sequence aimed at cataloging habitats based on variables derived from bathymetric data.**

1) DTM 3D; 2) Reflectivity; 3) Slope; 4) Aspect; 5) Type of sea-floor; 6) Geomorphological Features

Source: IEO/GEMAR & Proyecto INDEMARES