

EMODnet Chemistry: progresses and challenges along the path to the European marine litter data management

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EMODnet Chemistry project is facing the challenge of European marine litter data management to support the reporting of the descriptor 10 of the Marine Strategy Framework Directive (MSFD), since its third phase (2016-2018). The data management activities are focused on the following topics: beach, seafloor (trawlings), and floating microlitter. These data are managed in a PostgreSQL relational database that provides PostGIS spatial capabilities for beach and seafloor litter. For floating microlitter the SeaDataNet infrastructure has been adapted.

The development of data submission tools has facilitated the tasks related to data formatting, validation and database population.

Data product (Fig.1) and aggregated and validated datasets are provided with free access.

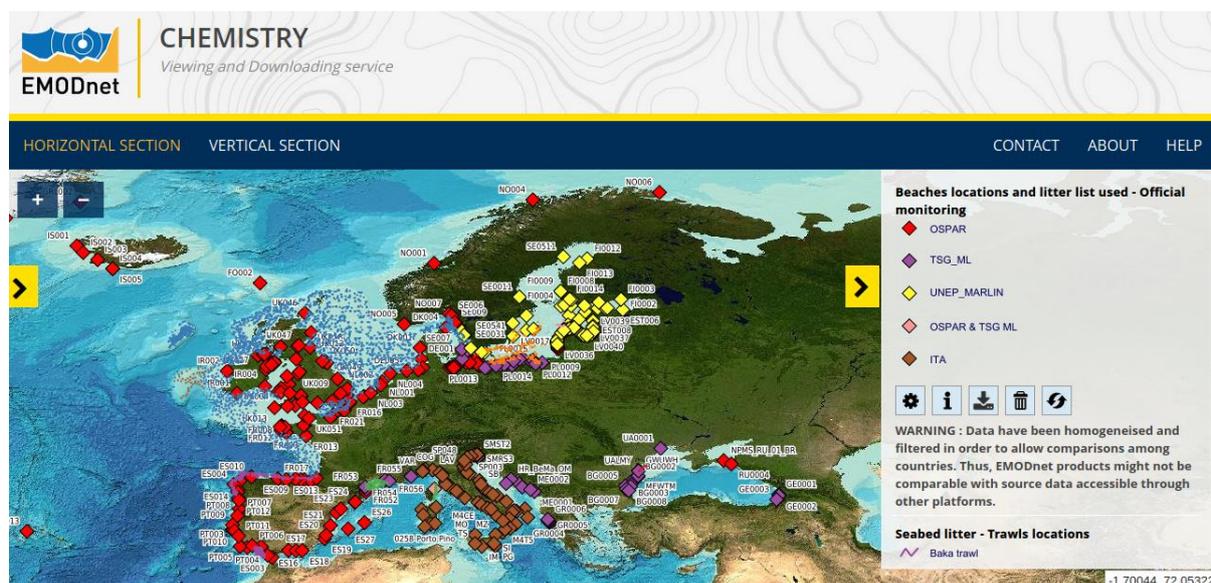


Figure 1: An example of free available products through the online mapviewer service showing the distribution of beach and seafloor litter surveys

Data quality and reliability has always been a key point of the data management challenge. Presently, the quality control (QC) for marine litter data is performed before and after database ingestion. The first phase of the QC process checks that the input files are provided in the correct format and that contents are consistent (syntactic and semantic) with the guidelines and common vocabularies used to describe data. The online validation tools handle these kind of controls and additionally, the database population web service monitors the existence of potential duplicates. In case of suspects, further manual checks are accomplished with the support of GIS tools.

After database ingestion further quality checks take place during metadata, data publication and products generation. At this stage of the QC the use of GIS tools is very relevant to support database queries. Data analysis during products generation are a further step of data handling that can highlight errors or anomalies previously missed.

Differently from what happens with eutrophication and contaminants data types, in the marine litter topic there is not structured QC loop that aggregates, homogenizes and controls the received data at regional level.

The correction of errors recognized after database ingestion or even after data, metadata, and products publication is very expensive in terms of time and resources. In view of the previous considerations, to optimize the use of resources in the workflow that goes from data collation to data publication, there is a focus on continuous update and upgrade of warnings during the online validation phase, before data ingestion. This can be done taking advantage of the previous experience in litter data handling, the support of the National Oceanographic Data Centres and the positive interactions with other relevant stakeholders like: JRC and TG-ML (EU Marine Beach Litter Baselines, Hanke et al., 2019), ICES (Datras database), EEA (Marine Litter Watch) and Regional Sea Conventions acting at regional and EU level.

New litter data types are under evaluation for its inclusion in EMODnet Chemistry data management. Seafloor litter images are already available from several initiatives and floating macrolitter data is accessible thanks to a Mediterranean area project. The addition of these new litter types would be a good complement for the available information at European scale. Thanks to the participation to OceanObs'19 conference, EMODnet Chemistry had the chance to be in contact with the most relevant initiatives on marine litter data at global level. This is bringing already some important results like the active interaction with the Japanese environmental agency JAMSTEC that is providing knowledge and lessons learned from the JAMSTEC deep sea debris online database experience.

In conclusion the EMODnet Chemistry experience in European marine litter data management led to improve the data quality procedures. Great efforts have been made to improve the data management tools provided for users. These efforts are finalized to streamline the data flow from submission to publication and to save resources to be invested in the new marine litter datatypes management.