THE LONG TERM INITIATIVE TO FACILITATE ACCESS AND RE-USE OF MARINE CHEMICAL DATA, METADATA AND DATA PRODUCTS: EMODNET CHEMISTRY

A. Giorgetti [1]*, M. Lipizer [1], M. Vinci [1], D. Schaap [2] and S. Iona [3]
[1] OGS (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale) - agiorgetti@ogs.trieste.it
[2] Mariene Informatie Service "MARIS" BV
[3] Hellenic Centre for Marine Research, Hellenic National Oceanographic Data Centre

Abstract
EMODnet Chemistry (http://www.emodnet-chemistry.eu/) is the long-term initiative from DG MARE aiming to extend chemical data collection, management, quality control, access and visualization, contributing to the MSFD. Particular effort is dedicated to data quality assurance, facing the issue of enriching the data with all information related to data collection method and analyses, data quality control and parameter homogenization. Aggregated and validated data are produced and dynamically visualized as standards WMS and WPS OGC services. The Mediterranean sea dataset includes 33287 stations of nitrate, nitrite, phosphate and silicate (all data aggregated to umole/l and quality controlled). Based on these data, seasonal basin scale concentration maps are computed using a 10-year moving window spanning from 1960 to 2014.

Keywords: Nutrients, Pollution, Mediterranean Sea

EMODnet Chemistry (http://www.emodnet-chemistry.eu/) aims to assemble fragmented marine chemical data into interoperable and publicly available data streams for complete maritime basins, to assess data quality according to common and standardized protocols and to generate suitable data products in agreement with the requests from the MSFD addressing three of the descriptors of GES: eutrophication, contaminants and contaminants in seafood. The project started in 2009 as a pilot component of the European Marine Observation and Data Network (EMODnet), as proposed in the EU Green Paper on Future Maritime Policy [1] and implemented in the vision document Marine Knowledge 2020 [2]. It was focused on selected chemical groups on limited sea basins (namely North sea, Black sea and five spots in the Mediterranean sea) [3]. In 2012, a new call was opened to extend the parameter coverage as well as the spatial resolution, covering in the current phase all European sea basins. The partnership is built upon 46 institutes from EU and not EU countries. They are acting either as Data Centers, to provide data collections for the requested geographic areas, as Technical partners, to further develop and run the distributed infrastructure, or as Specific experts, to coordinate data analyses and validation and the creation of data products. The technical set-up is based on the principle of adopting and adapting the SeaDataNet pan-European distributed infrastructure for ocean and marine data, duly extended to manage the chemical component. Data quality control is considered as a key element when merging heterogeneous data coming from different sources and a data validation loop has been agreed within EMODnet Chemistry community and is routinely performed.

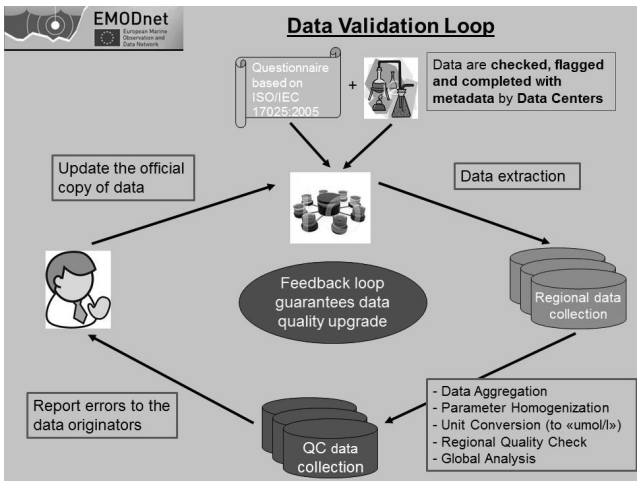

Fig. 1. Data validation loop from the distributed infrastructure to the regional quality controlled data collections with feedback to the data centers giving distributed access to the data

Aggregated and validated regional datasets for nutrients, dissolved oxygen, chlorophyll-a and pollutants (as concentrations of hydrocarbons, metals, pesticides and antifoulants) in the five EU marine basins (Mediterranean Sea, Black Sea, Atlantic Sea, North Sea and Baltic Sea) are released and used to develop data products useful for the requirements of the MSFD. Seasonal concentration maps of nutrients (mostly nitrate, nitrite, phosphate, silicate and ammonium, presenting a good spatial coverage at basin scale) are computed using the variational analysis method [4] to interpolate irregularly-spaced data. A dedicated dynamic service has been developed for the visualization of the datasets as station maps, vertical profiles and time series. All visualization services are developed following OGC standards as WMS and WPS.

Fig. 2. Concentration map of surface nitrate in spring for the decade centered in 2000 (1996-2005) with the distribution of all available data station points.

To guarantee high level performances and long-term availability, the Cloud environment offered by Cineca (the Consortium of Italian Universities and Research Institutes) has been chosen to host the regional aggregated datasets and the visualization services for the dynamic plots and the seasonal analysis.

References
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