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Discrepancies under Water: Marine Geological Information and Semantic Harmonisation for the EMODnet II Project

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EMODnet, the *European Marine Observation and Data Network*, was established in 2007 by the European Commission (EC) as a long-term marine data initiative from the Directorate General for Maritime Affairs and Fisheries (DG MARE) underpinning its Marine Knowledge 2020 strategy [1].

EMODnet consists of more than 100 organizations assembling marine data, products and metadata in an organized way and standardized as far as possible to facilitate the use of these often fragmented resources for public and private users. The aim is to produce open high-quality harmonized marine data that is interoperable and available free of charge. The EMODnet data infrastructure is being realized in three major phases with the target to be fully deployed by 2020. Currently phase II (2013-2016) is approaching its completion. "Geology" is one of the seven thematic EMODnet projects running in parallel, the so-called "Lots" (Bathymetry, Geology, Seabed, Habitats, Chemistry, Biology, Physics and Human Activities). The Geology Lot (lead BGS, 36 partner organizations by now) started in 2009, comprises of 11 workpackages. BGR leads the workpackage to compile and harmonize the pre-Quaternary and Quaternary European off-shore geology (WP4).

Geological survey and research organizations in Europe and elsewhere have developed their own regional or national way to map, describe and depict their geological information for centuries. For marine data this is even more the case, as most of the marine domain is investigated in much less detail than the land areas and there is often only geophysical data to provide information on the marine geological units and structures. Knowledge is rather heterogeneous here: it can be comparatively detailed in small, well investigated areas while e.g. the surrounding zones are only patchily investigated. In addition, portrayal and classification rules show at least as much discrepancies as those used for geodata and maps of land areas.

Thus, BGR developed for EMODnet (and the IQUAME 2500 project, the Review of the International Quaternary Map of Europe) a pragmatic procedure to collect, classify and deliver the off-shore geology data in a standard format as far as possible conformal to the EC Directive INSPIRE geology data model and term dictionaries. This procedure was described in a technical guidance document (Asch and Gdaniec [2]) in order to facilitate the data input for all partner organizations. The guidelines contain a description of the procedure to transform the data according to OneGeology-Europe/INSPIRE standards [3] but also lists the necessary vocabulary and definitions to describe the data in a semantically uniform way. The use of these procedures and common term dictionaries permitted the WP to produce semantically harmonized off-shore data sets. However, experiences from other projects such as OneGeology-Europe show that full geological harmonisation takes an enormous amount of time and effort.

The presentation will introduce the above harmonization procedure and – as the data still show discrepancies and are not fully semantically or geometrically harmonized yet - discuss the reasons behind that and scrutinize the actual requirements for full data harmonization based on concrete examples resulting from the harmonization process.

References:
[1] DG Fisheries and Maritime Affairs (2013): Study to support Impacts Assessment of Marine Knowledge 2020.
[2] Asch, K. and Gdaniec, P. (2014): "EMODnet 2 – Geology - Workpackage 4: Seafloor Geology. Semantic Transformation and Vocabulary. BGR
[3] INSPIRE Thematic Working Group Geology (2013): D2.8.II.4 Data Specification on Geology – Technical Guidelines. European Commission. 362 P