

Building a transnationally harmonised marine geological database

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Abstract

Within the framework of marine resource management, a common knowledge base is being developed on the distribution, composition and dynamics of various geological resources. Focus is on data from the Belgian part of the North Sea, being representative of a typical sandbank sedimentary system. To ensure harmonised seabed mapping over large, supraregional areas and to facilitate the exchange of information, special attention was paid to compatibility with marine geodatabases from the adjacent Netherlands territory.

With reference to the seabed and its subsurface, two main databases are being compiled: one comprising all available lithological descriptions and one with all numerical grain-size information. To enable standardisation of the data and make them easily query-able, non-numerical descriptions are being coded to an international standard (EU FP7 Geo-Seas; www.geoseas.eu), of which the Udden-Wentworth scale is the main classifier. Several other parameters were derived, such as percentages mud, sand, gravel, shells and organic material. For the sediment database, cumulative grain-size-distribution curves were compiled, enabling calculations of any desired granulometry parameter, such as percentages of the grain-size fractions (fine, medium, coarse sand) and percentiles that are relevant in seabed-habitat mapping or sediment-transport modelling (D35, D50, D84). For both databases, the completeness and accuracy of the metadata were considered highly important. Information about sampling and coring techniques, analytical methods, horizontal and vertical positioning accuracy, and the exact timing of data acquisition is pivotal in uncertainty analyses, which are an increasingly important element of seabed mapping. The time of seabed mapping is critical to convert measured water depths to a common datum such as TAW in Belgium, facilitating integration of sample data in bathymetry data and thus their incorporation in 4D-modelling studies on morphodynamic change.

For Belgium, the geological databases will be imbedded in the data infrastructure of the Belgian Marine Data Centre (www.bmdc.be), ensuring compatibility with international standards and providing easy access to a wide user community. Following processing to generate data products such as resource-related subsurface models, visualisation is foreseen through Subsurface Viewer (GmbH INSIGHT). Applied maps and models thus disseminated are crucial in decision making, and invaluable for outreach and educational purposes. The newly developed database and its associated data products will contribute to the objectives of the projects TILES (Belspo Brain-be), EMODnet-Geology (EU DG MARE), and ZAGRI (private revenues from the marine-aggregate industry).