EMODnet Geology - seabed substrate and sedimentation rate data from Europe’s Seas

Background

Seas and oceans are important for us. However, increased human activities in marine and coastal areas have altered marine ecosystems worldwide. To ensure sustainable use of marine resources and health of the seas, improved management is needed.

The European Union’s (EU) Marine Strategy Framework Directive targets to achieve Good Environmental Status (GES) of the EU’s marine waters by 2020. However, it has been acknowledged that the poor access to data on the marine environment was a handicap to government decision-making, a barrier to scientific understanding and a break on the economy. The effective management of the broad marine areas requires spatial datasets covering all European marine areas. As a consequence the European Commission adopted the European Marine Observation and Data Network (EMODnet) in 2009 to combine dispersed marine data into publicly available datasets covering broad areas.

Currently EMODnet is in the second phase of development. The 2nd phase of the EMODnet Geology project started in 2013 and will run for 3 years. The partnership includes 36 marine organizations from 30 countries, and it is led by the British Geological Survey. The partners, mainly from the marine departments of the geological surveys of Europe (through the Association of European Geological Surveys – EuroGeoSurveys), assembled geological information on seabed substrate, seafloor geology, coastal behavior, geological events and event probabilities and mineral resources at a scale of 1:250 000 from all European sea areas (e.g. the White Sea, Baltic Sea, Barents Sea, the Iberian Coast, and the Mediterranean Sea within EU waters). In comparison to the urEMODnet project (2009-2012) the data is more detailed and cover much larger area.

Seabed substrate - Aims

The EMODnet Geology project includes collecting and harmonizing the first seabed substrate map for the European Seas, as well as data showing sedimentation rates at the seabed. The data is essential not only for geologists but also for others interested in marine sediments like marine managers and habitat mappers. A 1:250 000 GIS layer on seabed substrates has been delivered in the EMODnet Geology data portal, in addition to an updated 1:1 million map layer from the previous phase (2009-2012) that is updated with data from the new sea areas. A confidence assessment has been applied to all areas to identify the information that underpins the geological interpretations.

Traditionally, European countries have conducted their marine geological surveys according to their own national standards and classified substrates on the grounds of their national classification schemes. These national classifications are now harmonized into a shared EMODnet schema using Folk’s sediment triangle. We have used a hierarchy of Folk classification with 16, 7 and 5 classes (Fig. 1).

Seabed substrate – Data & Process

At the moment more than 400 individual seabed substrate dataset have been identified from the study area. The datasets represent different scales and only those that are on a target scale or more detailed have been included in the 1:250 000 dataset. As far as we know this is the first seabed substrate map for the European Seas on this scale (Fig. 2). This kind of data is mainly available from the coastal areas and the Atlantic Ocean. Thus a dataset including data on a scale of 1:1 000 000 was produced to extend the coverage (Fig. 3).

The EMODnet Geology partners have harmonized their seabed substrate data according to an agreed scheme and the individual maps have been combined into a seabed substrate map of the seafloor. The final versions of the datasets will be available for download in October 2016.

The project partners have collected data on the sedimentation rates as well. Estimations of modern sediment accumulation rates (cm/year) are based mainly on the 137Cs or 210Pb datings. The aim was to update the urEMODnet data that is a point-source map collated from more than 1000 seabed sediment sampling sites (Fig. 4).

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