

# Assembling data on seabed substrates of the European Seas

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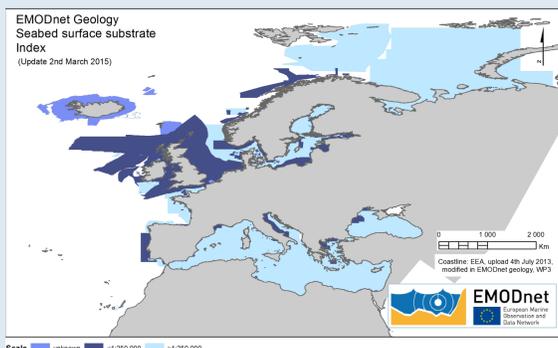
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## Background

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.

The second phase of the EMODnet -Geology project started in 2013 and it 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), aim to assemble geological information on seabed substrate, seafloor geology, coastal behavior, geological events and event probabilities and mineral resources at a scale of 1:250000 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 will be more detailed and aim to cover much larger area.



The index map (Fig. 2) identifies the data sources and initial map layers that are used to create the EMODnet seabed substrate map. It provides information on metadata: the scale and the grain size classification systems used. The EMODnet-Geology project does not only deliver digital information on distribution of seabed substrates, but also highlights data gaps and deficiencies.

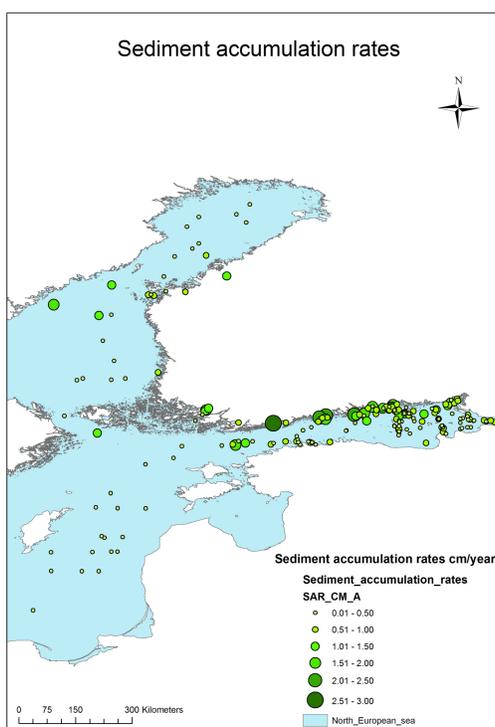


Figure 4. Sediment accumulation rates (cm/year) in the Baltic Sea.

## Seabed substrate map

The project includes collecting and harmonizing the first seabed substrate map for the European Seas, as well as data/map showing sedimentation rates at the seabed. The data will be essential not only for geologists but also for others interested in marine sediments like marine managers and habitat mappers. A 1:250000 GIS layer on seabed substrates will be delivered in the portal, in addition to the existing 1:1 million map layer from the previous phase that will be updated with data from the new sea areas. A confidence assessment will be 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).

### EMODnet sea-bed substrate hierarchy: 16, 7 or 5 classes. Draft 1.4.14.

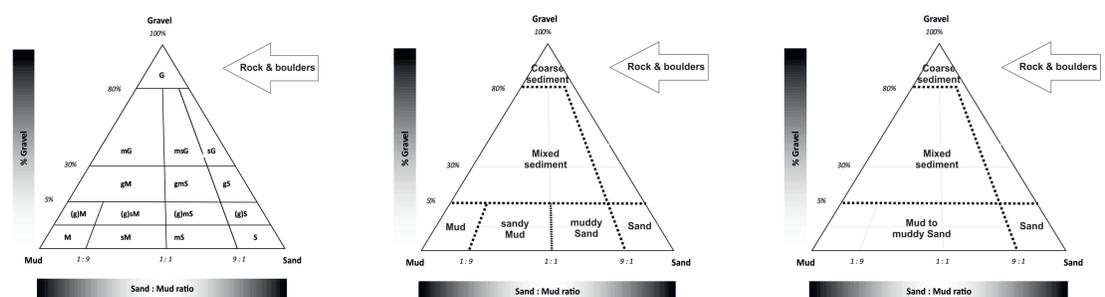


Figure 1. The Folk sediment triangle and the hierarchy of combined Folk classification developed for EMODnet geology.

## Seabed substrate map, scale of 1:250 000

At the moment more than 400 individual seabed substrate dataset have been identified from the study area (Fig. 2). The maps represent different scales and only those that are on a scale of 1:250 000 or more detailed have been analyzed during the first phase. The data on this scale is mainly available from the coastal areas and the Atlantic Ocean.

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. As far as we know this is the first seabed substrate map

for the European Seas on a scale of 1:250 000 (Fig. 3). The current version will be updated during the project and should be regarded as a draft, not as a final output.

At the moment the project partners are collecting their data on the sedimentation rates. Estimations of modern sediment accumulation rates (cm/year) are based mainly on the <sup>137</sup>Cs or <sup>210</sup>Pb dating, and some accumulation rates have been estimated from acoustic-seismic and sediment core data. The aim is to update the urEMODnet data that is a point-source map collated from more than 600 seabed sediment sampling sites (Fig. 4).

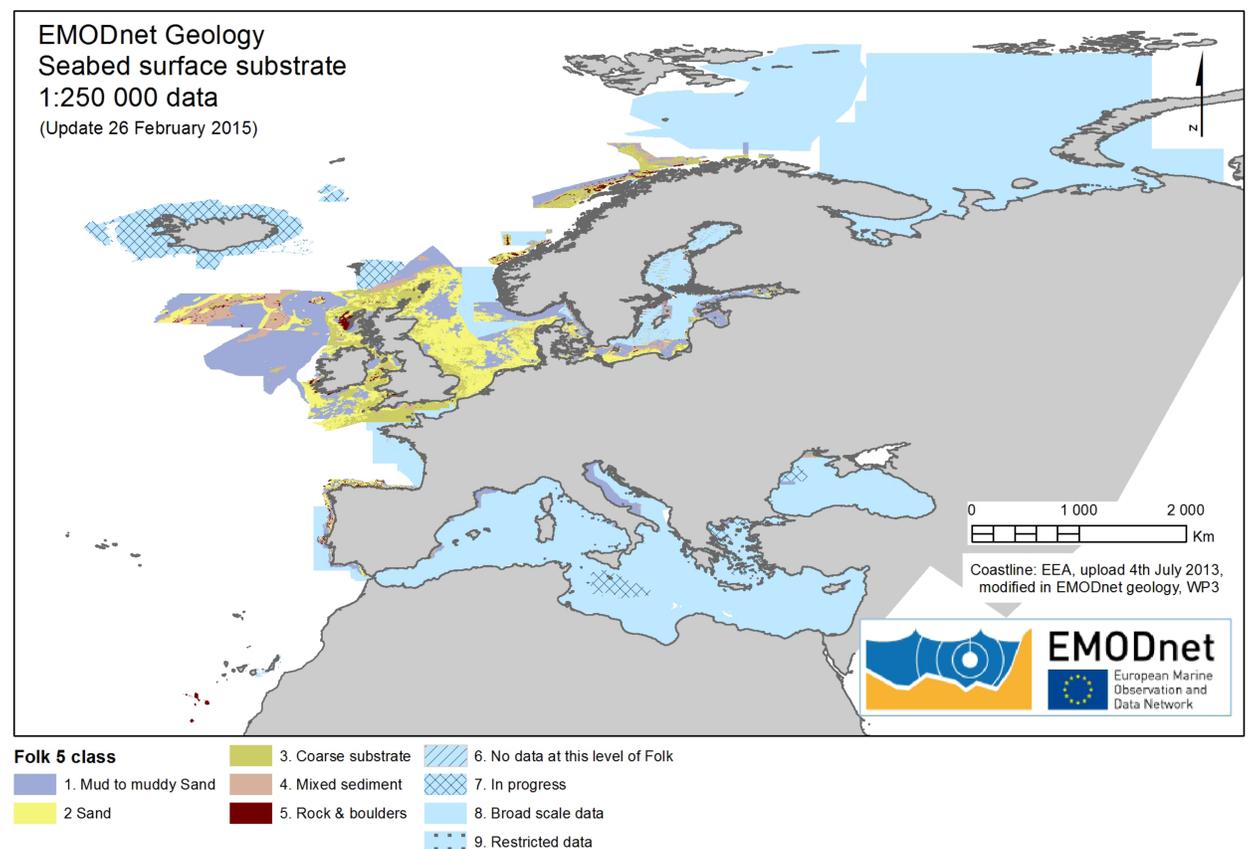


Figure 3. The EMODnet seabed substrate map, 1:250 000.