

Mapping seabed habitats

Linking geology and biology

The seabed provides a home for a great variety of animals including fish and invertebrates. These benthic fauna which live on or near the seabed are often influenced by the topography and nature of the seabed which is controlled by the underlying geology. Geological information can therefore provide a basis for mapping seabed habitats.

MAREANO, Norway's largest multidisciplinary seabed mapping programme www.mareano.no, sees geologists from NGU and biologists from the Institute of Marine Research working together to analyse data and produce predicted habitat maps. Multibeam mapping surveys are conducted first, providing full coverage baseline information on the morphology and acoustic properties of the seabed. These are followed up by comprehensive, multi-disciplinary sampling cruises. Using a suite of equipment including physical samples and video we gain direct observations of the seabed.

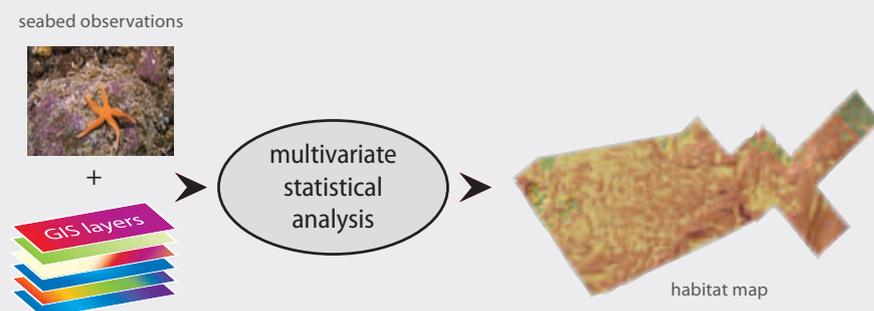


Diverse habitats exist within the MAREANO area. Their distribution is influenced by geology, biology and other seabed processes e.g. currents (all data and images – MAREANO).

Multivariate statistics – definition, classification and modelling of habitats

Once direct observations of seabed fauna have been acquired further multivariate statistical methods can be used to relate bottom environment and faunal distribution and to define habitat classes. At this stage predictive modelling can be used to give an indication of the distribution of these habitats across the entire seabed, not just where we have samples or video observations.

Schematic illustration showing the habitat mapping process. Seabed observations are combined with a stack of full coverage environmental GIS layers (e.g., depth, slope, sediment grain size) which serve as predictor variables in models to indicate distribution of habitats across the seabed. The resulting habitat maps are integrated in GIS and published on www.mareano.no.





This 3D view of bathymetry data highlights the rugged coastal plain near the Lofoten Islands in northern Norway. Photo: Fjellanger Widerøe. Bathymetry data: MAREANO

The goal is to produce maps showing the distribution of seabed habitats, but also to find objective criteria for the definition of Norwegian benthic habitats by connecting physical characteristics of the seabed (e.g., depth, sediment type, slope) to faunal distribution, production etc. This is crucial for the ability to identify and classify relevant habitats, and to model the occurrence of bottom communities based on environmental characteristics.

As part of MAREANO, NGU also produces landscape maps, which are at a broader scale than habitat maps but an important component of mapping offshore nature types. These maps make use of multibeam bathymetry data collected by MAREANO, and use a combination of numerical analysis and expert interpretation to identify offshore features such as canyons, plains and marine valleys.

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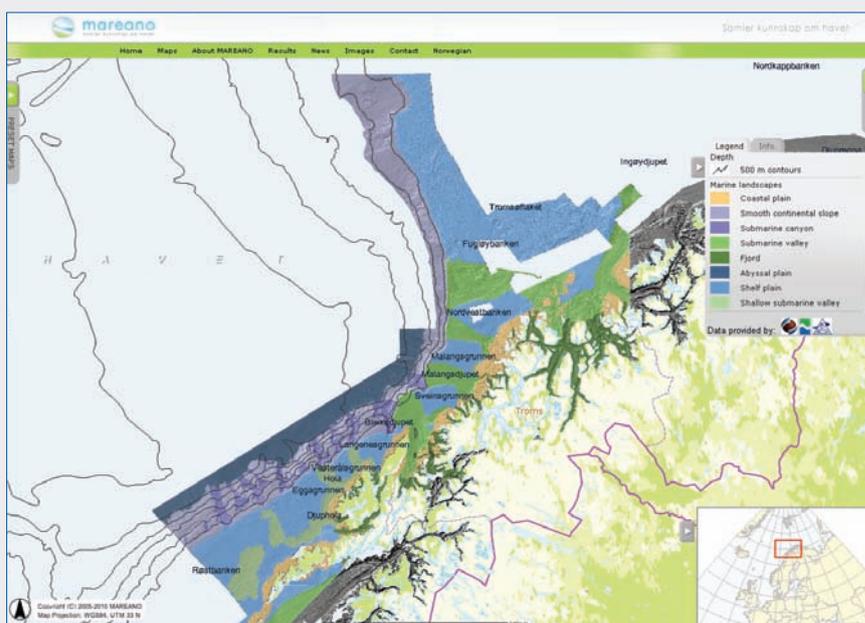
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Marine landscape map produced by MAREANO and published on www.mareano.no.

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