

Why do we need to classify deep marine water habitats found in the UK?

Marine Objective Theme: Science for Integrated Marine Management

What's the problem?

The Marine and Coastal Access Bill provides for the designation of marine protected areas (known as Marine Conservation Zones (MCZs)). These sites should include the range of habitats and species found in our waters. Current habitat classification schemes for the deep sea are considered poor and incomplete, and in many cases it has not been possible to define habitats. The lack of an adequate classification scheme has meant that different groups, e.g. researchers, conservation organisations, consultancies etc., have defined new habitats for their study areas, resulting in duplication and inconsistencies between classifications. This makes it very difficult to compare work done by different organisations. There is a need for a coherent and credible benthic habitat classification scheme for the deep-sea area to be developed and this project is helping to address this need.

What are the aims of the project?

To enable effective marine habitat conservation and protection (as will be required by the Marine and Coastal Access Bill), this project has developed data layers showing the distribution of broad-scale features for the deep-sea. In doing this it will also contribute towards the development of a high-level deep sea habitat classification scheme.

The project goals have been achieved by interpreting and integrating acoustic and other deep water geological and geomorphological datasets from areas off Scotland and the southwest approaches off Cornwall into a series of easily recognised and identified features.

These features portray the landscape of the deep sea (i.e. the hills and valleys) and the distribution of sediments. Both of these are key factors driving the distribution of deep sea habitats.

The results are presented in a form compatible with the planned future refinements of the current European Union-backed EUNIS habitat classification system. A full report detailing the methods used to generate these data layers is also available from the Defra SIS website.

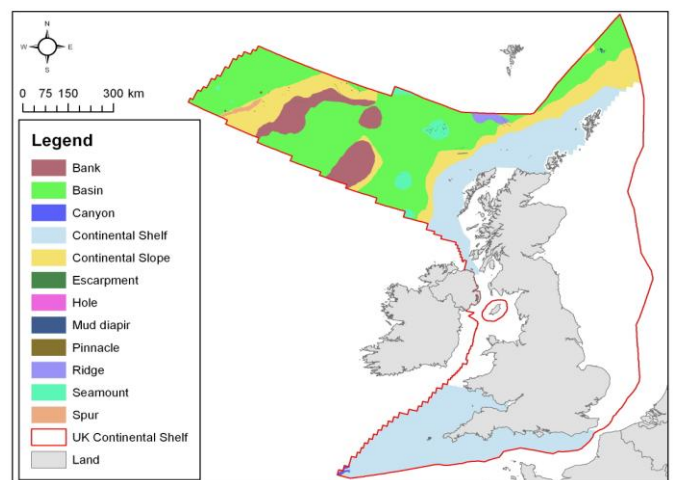


Figure 1. Marine Physiography of the United Kingdom (Image: NOCS)

Which policy areas will the research inform?

This work will support the delivery of MCZs, as provided for in the Marine and Coastal Access Bill. The outputs of this contract will also be of interest to those taking forward marine planning in UK waters.

Development of a classification scheme for the deep sea will aid in implementing the European Marine Strategy Framework Directive (MSFD), by providing a standardised approach to classifying deep sea environments.

Funded by:



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What are the results from the project and how will they be used?

The main purpose of this project has been to help to take forward the classification of deep sea habitats found in UK waters.

The primary output from the project has been a series of digital maps, which can be uploaded into a Geographical Information System (GIS). The most important layer is the “Confidence” layer which gives an indication of the degree of confidence we have in the maps we are producing. Given the size and vast nature of UK offshore waters, survey data is patchy and varied. As such we have interpreted many different types of data to produce the final maps, classifying broad-scale habitats found in our deep seas. It is important for users to know and understand the limitations of the data and thus be able to give policy-makers knowledgeable and authoritative guidance.

The broadest scale classification layer for this area is the “Physiography” layer, which subdivides the UK’s claimed deep water (deeper than 200m) territory into distinct provinces. The results show a wide variety of very large-scale undersea landforms. Basins are the dominant form, followed by the Continental Slope, submarine Banks and finally Seamounts. There are also numerous small-scale features such as Pinnacles, Escarpments and Gullies creating a highly complex deep sea landscape.

The “Substrate” layer shows the broad-scale distribution of surface sediment types utilising a modified form of the standard sediment classification system derived by Folk in 1954, to make it more applicable to benthic ecology at the scale used here. As a result, only exposed bedrock and four types of sediment have been classified.

The “Deposit” layer has been constructed by identifying deposit types that are produced by known geological phenomena such as geostrophic (depth-related) current activity or submarine land-sliding. Each identified deposit is known to be formed by a specific process that has (or had) an ecological significance.

The final classification layer is the “Modifier” layer which shows areas of the seafloor that have been modified by some kind of post-deposition event such as iceberg ploughing or current-scouring in the form of channels, scours or moats.

A full report accompanies the data layers and provides the background for the non-specialist on how these layers were generated and defines the features.

This research will help to ensure that the deep water biological communities present in our seas will be included in the MCZ designation process and in the future will contribute to a robust and useable habitat classification scheme for deep seabed within the UK’s claimed continental shelf, an area around twice the size of the UK mainland!

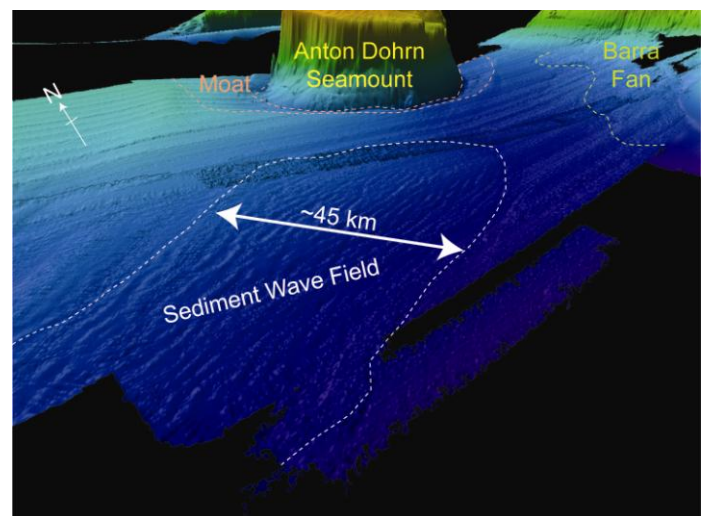


Figure 2. Sediment waves and Anton Dohrn Seamount (Image: NOCS)

Where can I find further information about this and related research?

This research project was carried out by the National Oceanography Centre, Southampton, with technical expertise provided by the University of Plymouth. The full report is on the DEFRA SIS website (below). If you have any queries on this research, please contact the Marine Protected Sites team at JNCC offshore@jncc.gov.uk.

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