

The Shallow Geological Model: Mapping and Monitoring the Marine Landscape

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Managing our seas without a sound knowledge of the sea-bed environment and the processes that shape the sea-bed characteristics makes it difficult to conserve key areas, maintain biodiversity and economically develop our marine resources in an efficient and sustainable way. Recent developments in marine landscape mapping, visualisation techniques and instant data access provide timely, proven technologies that are now in widespread use.

The British Geological Survey is responsible for the geological mapping of the UK land area and the continental shelf and margins. A wide range of marine geological data has been acquired, which provide information about the rocks and sediments both on and below the seabed. During the 1980's and 1990's these data were interpreted and published in a series of thematic maps and regional reports. More recently digital data derived from bathymetry, seabed sediment, Quaternary geology and solid geology, have been used to develop the BGS Offshore Geographical Information System.

These data have been used to produce a shallow geological model that provides tailored information for an integrated approach to the understanding of a study area. The model examines both static and dynamic geological processes, and modern and historical conditions to provide information on the geological processes that form geohazards and habitats both on and up to 1000m below the seabed. The wider geological setting such as the climate zone, oceanography, and the nearshore, shelf, or deep-water environment, are also incorporated into the shallow geological model.

This approach has been successfully applied in several geohazard and/or habitat studies worldwide. Areas studied include the passive continental margins of the glaciated UK and mid-Norwegian regions, offshore West Africa, the active Alpine–Himalayan collision zone and offshore south-east Brazil. These areas represent a number of climatic and tectonic settings. The shallow geological model therefore provides a method by which habitats and potential geohazards can be characterised, resulting in improved understanding of the historical and modern processes that formed them. The model can also be used to predict areas where geohazards could occur and potential changes in habitat.