

Management of coastal change

A new national coastal geoscience programme

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Coasts are extremely dynamic and complex environments. Issues of coastal change associated with erosion, flooding, storms and rising sea-level and their impacts have been more noticeable in recent years. Consequently, society has become increasingly aware of the threat to coastal areas from these changes and also of the sensitivity of nearshore resources such as aggregates and fisheries to human influence.

Geoscience has an important part to play in managing coastal change. It is a key element in understanding the environment, assessing geological hazards, calibrating rates of global change, and determining the value of coastal resources. In conjunction with other environmental sciences, such as oceanography and biology, geoscience has a key role to play in determining the sustainability of ecosystems and habitats. In recognition of this, the BGS, after extensive consultation with coastal planners, engineers, academics and representatives of local and national government, has developed a national coastal

geoscience programme. This is designed to provide geoscience information on the coastal zone and its processes in order to address coastal management questions posed by the user community.

Building on the marine and coastal expertise and data sets built up over many decades by the BGS, the programme will collect new data that will be essential in underpinning future coastal management. The themes of the four component projects are within both estuarine and marine realms of the UK with an increasing emphasis on coastal lowland geology. The projects are complementary and together form an integrated package:

The Coastal and Estuarine Evolution project will examine the evolution of the coastal zone since the last glaciation and enhance our understanding of the long-term processes that drive coastal change. It will enable delivery of geoscientific knowledge and data to enhance the prediction of the future response of the coast to various scenarios of environmental change such as sea-level rise.

The **Strategic Nearshore Zone Survey** project will increase our understanding of the geology of the nearshore zone by collating existing data and making them available to address enquiries and specific scientific topics. Data will be put into a framework based around Geographical Information Systems, from which environmental and planning models may be derived. The project will facilitate future research into subjects such as nearshore sediment supply and transport.

The **Geochemistry of Estuarine Sediments** project will compile an inventory of the geochemistry of major estuaries and map the distribution of sediment-hosted contaminants within them. Geochemical data will be incorporated with geological, physical oceanographic, biological and socio-economic data to provide an integrated framework for management of contaminants in estuaries.

The **Stability of Cluffed Coasts** will establish a cliffed coast stability zonation based on factors of safety obtained from modelling of geotechnical and oceanographic factors. The methodologies will be exportable and will be developed following consultation with end-users and other researchers.

The coastal and global change sciences cover a broad range of issues and, whilst an appreciation of geoscience is essential in managing change, an understanding of other scientific disciplines is, in most cases, also essential. The BGS identifies the importance of providing users with integrated scientific solutions, developed across many disciplines. It recognises the necessity of maintaining and enhancing the links between the BGS scientists and other NERC specialists, particularly from the Centre for Coastal and Marine Sciences, as well as scientists researching coastal, near-coastal or global changes in the academic and commercial worlds.

In creating the National Coastal Geoscience Programme, the BGS is confident that it will continue to provide data and services to coastal zone users in the format that they require for the foreseeable future. The programme should play an integral part in the management of the major changes in the form and utilisation of our coasts that are likely over the next century.

Sampling sediments in rivers entering the Irish Sea for metals.

