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COAST MAP news

GIS FOR THE MARINE AND COASTAL SECTORS

DELIVERING INTEGRATED MARINE MAPPING FOR THE UK

During the consultation phase of the first Marine Stewardship 'Safeguarding our Seas' Report[1], many stakeholders commented that there was a need to improve the integration of geographical information about the UK marine environment. In response, a DEFRA-funded workshop "Delivering Integrated Marine Mapping for the UK" will be held in London on 11 September 2002. This will review existing initiatives in the UK and overseas, determine what users need in order to fulfil their responsibilities effectively, and then explore how best to provide this in an integrated way. The workshop will be informed by the results of an electronic questionnaire sent to over 1,000 stakeholders. This workshop is a follow up to the 1999 one "Integrated mapping of the UK marine and coastal zone - the way forward" that first highlighted the inadequacies in availability of, and access to, marine and coastal data and information and led to a number of initiatives, including the creation of Coast Map News[2]. We look forward to reporting the outcome of the September workshop in the next issue of Coast Map News.

[1]http://www.defra.gov.uk/environment/marine/stewardship/default.htm

[2]www.cefas.co.uk/coastmap

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FUTURECOAST

In order to help guide the next round of Shoreline Management Plans (SMPs), DEFRA and the National Assembly for Wales commissioned a team led by Halcrow Group Ltd to undertake a coastal process and geomorphological study of the entire open coastline of England and Wales.

The study provides predictions of coastal evolutionary tendencies over the next century, which are to be considered in the updating of SMPs and other Strategic Plans. These are targeted at determining broad scale future coastal defence policy throughout the open coast shorelines of England and Wales. The study, which has become known as Futurecoast, has provided a sound, scientific and nationally-consistent basis for predicting coastal change over the next 100 years, with the aim of providing SMPs with a vision of coastal change in the longer term. This research will help enable coastal defence operating authorities to develop sustainable holistic plans with more confidence. The revised SMPs will, in turn, assist planners in developing policies that discourage inappropriate development in their statutory plans.

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CEFAS
The Centre for Environment, Fisheries & Aquaculture Science

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DEFRA
Department for Environment, Food & Rural Affairs

Habitat mapping: an integrated approach

Mapping a piece of land might not seem like too much of a challenge, but it all changes when that piece of land is covered by 30 metres of water.

Traditional biological surveying techniques have involved a number of spot samples taken with various grabs, but what lies between the sampling points is a matter of conjecture. Another way to picture this is to imagine what an alien race might assume about the earth if they were to send a probe that took 10 random samples over the surface of the globe. They could easily dismiss us as a water-covered planet populated solely by plankton.

CEFAS has recently completed a project that looked at various methods that can be applied to this problem (seabed mapping, not misled aliens).

Areas of the seabed measuring 12 km by 4 km were mapped using a range of techniques. Firstly sidescan was run over the area; this is an acoustic technique that gives information about the physical nature of the seabed. The harder the seabed, the more of the acoustic signal is returned and the darker the resulting image. Seabed features such as sand waves and even aggregate dredge tracks can also be detected.

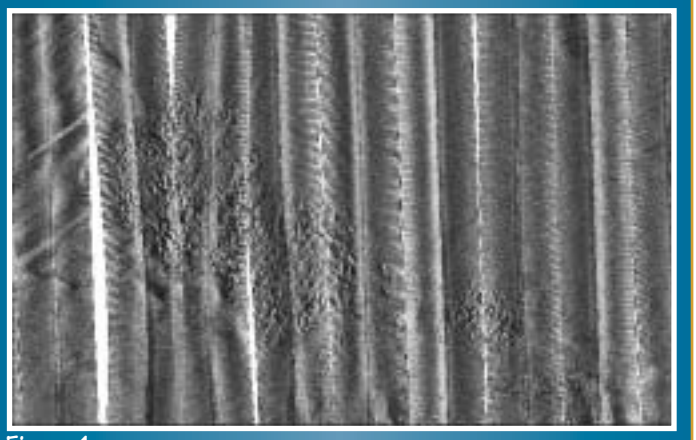

Figure 1

Sidescan produces 400m wide swathes of data that are then mosaiced (Figure 1) into a map of the area surveyed. This map of the area was studied and divided into distinct regions, each with a unique sidescan return.

"Ground-truthing" techniques were then used to establish whether the regions were also distinct in terms of their sediment characteristics and benthic communities. The main sampling tools were a Hamon grab (to sample the macroinfauna and sediments) fitted with a video camera, and a heavy-duty 2 metre beam trawl (to sample the epifauna). The video camera on the grab enabled small scale substrate heterogeneity to be identified.

Multivariate statistical techniques were applied to the data to determine if the regions were distinct in terms of their sediment characteristics and biological communities. In most acoustic regions, particularly where there was a high degree of sediment homogeneity within discrete habitat boundaries, statistically distinct assemblages could be identified. The situation was less clear where the seabed consisted of a complex arrangement of sediment types.

The project concluded that it was important to use a combination of biological, photographic and acoustic survey techniques in order to produce high resolution biotope maps.

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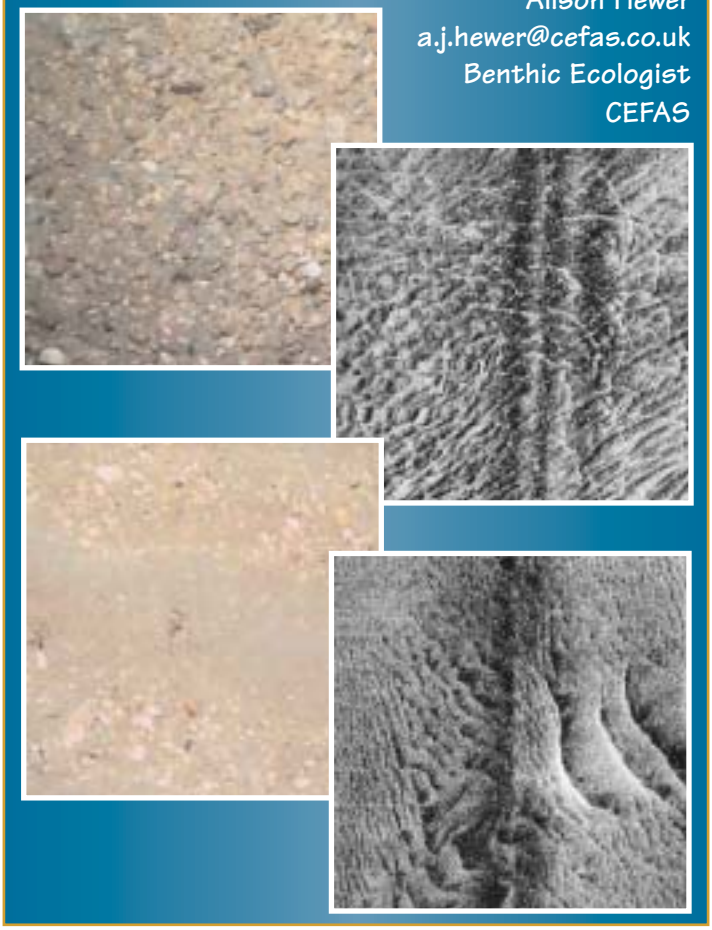
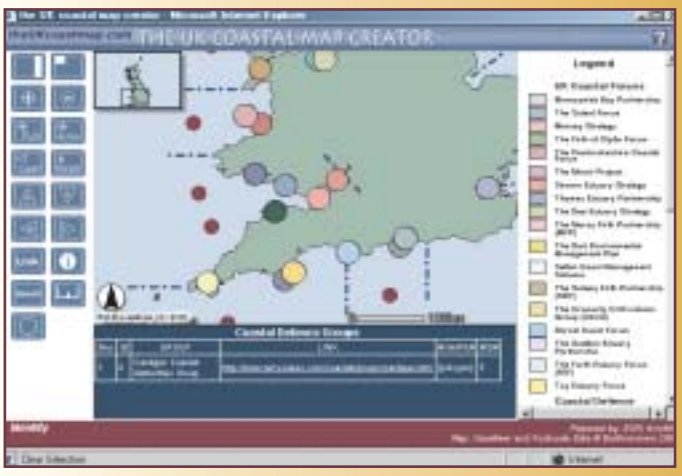


The UK Coastal Map Creator

Coastal management is about understanding coastal systems and processes, how the coastal zone changes across space and through time, and how human use of the coastal resource can be managed in a sustainable fashion with least detriment to the natural environment. Coastal management is also about decision-making, weighing up the pros and cons and costs and benefits to arrive at a solution with an acceptable outcome. However, effective decisions can only be made if they are based upon up-to-date and accurate data and information. GIS provides the ideal medium for retrieval, display and analysis of this type of spatial data.

The UK Coastal Map Creator[3] is an initiative developed with ESRI (UK) to use ESRI's ArcIMS (Internet Map Server) software to deliver an interactive coastal map of the UK coast via the Internet, as well as help point to digital data sets that are available in the UK for coastal management purposes. The current version of 'theUKcoastmap.com' website has two main services, (1) Create a Map and (2) the Data Shop. To create a map, the user simply has to navigate to the 'Create a Map' web page and click on the 'Free Maps' button. This will launch the ArcIMS GIS interface which offers facilities such as zoom in and out, pan and roam. Other useful features of the interface include the ability to directly launch other websites from 'hotspots' on the map, call up information tables about the active data layer (theme), search the active theme by keyword and measure distances on the map. At the present time, data available on 'The UK Coastal Map Creator' includes a Bartholomew raster base map, English Nature vector data depicting the boundaries of Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Sites, National Nature Reserves (NNRs), Sites of Special Scientific Interest



(SSSIs), Character Areas and Natural Areas (all freely available for download from the English Nature website[4]). Other datasets specially created for the site include the location of coastal forums and partnerships throughout the UK, as well as sediment cell boundaries and coastal defence groups in England.

To find out more about the The UK Coastal Map Creator and many other coastal geospatial services, visit http://www.theukcoastalzone.com

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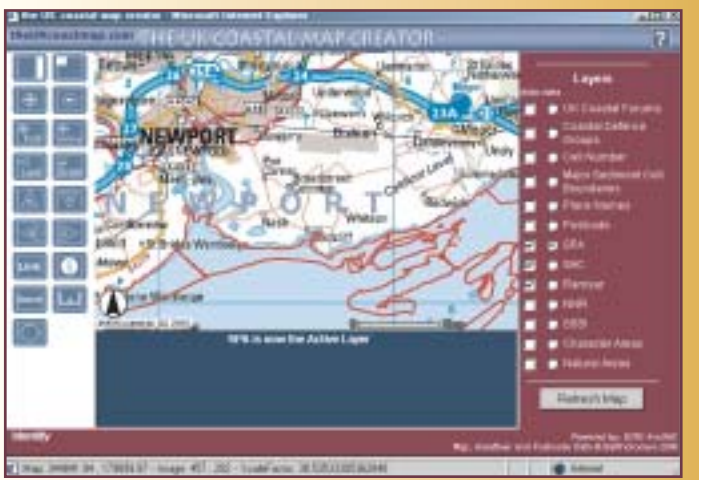
[3]http://www.theukcoastmap.com
[4]www.english-nature.org.uk



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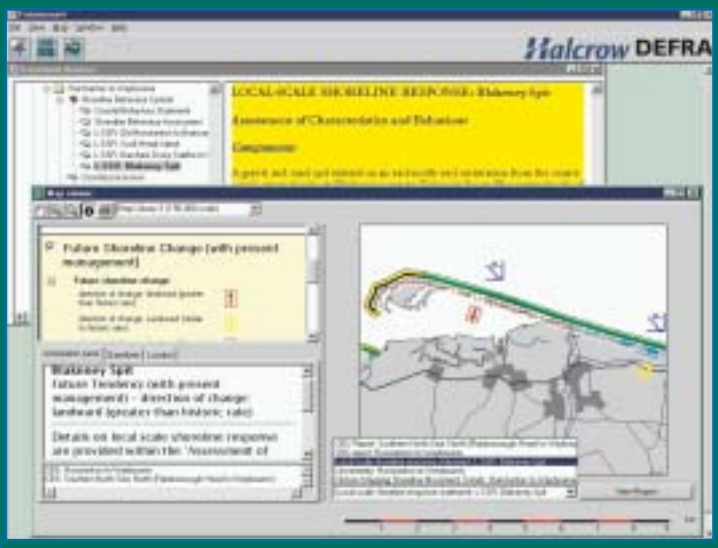
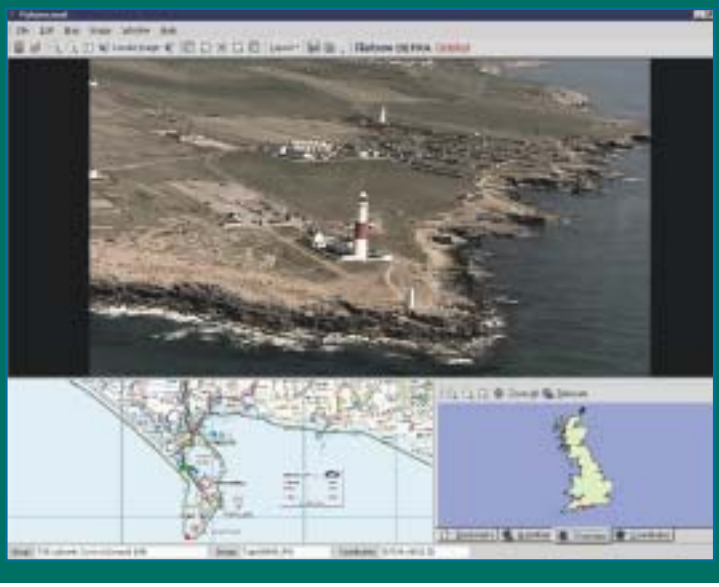
The output from the study includes reports, guidance, data and mapping at various scales. This is presented on a single interactive CD within an application that includes links between map views and report browsers, enabling easy and rapid access to specific information on any subject relating to the area of interest, together with an ability to compile maps and reports. This is supplemented by two further CDs, explained below:

The CD-ROM

The interactive CD-ROM has many advantages in terms of the way data can be accessed and displayed, particularly for a project of this scale. Although this is a national project, many of the end-users will be interested in specific areas and the CD-ROM is designed for easy access to the relevant data. The user can navigate through both the text and mapped data and there are links from the maps to the relevant sections of text. The user is also able to 'design' reports. Therefore no hard copies of reports have been produced, but users can print from the CD-ROM and produce reports to their own specification.





The Aerial Photograph CDs

A key step was the capture of the entire coastline of England and Wales as an oblique aerial digital video, shot from a helicopter in early 2001 to familiarise users with the area of coast that is being analysed. Images have been extracted from the video and are provided to the end-users on two supplementary CDs. The aerial images are accessed via a digital interactive map-based viewing system, which enables easy location of coastal sections.

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EVENTS

DEFRA-sponsored workshop: Delivering Integrated Marine Mapping for the UK, London, 11 September 2002 (attendance at this event is by invitation only)

Marine Data Pavillion at GIS 2002, London, UK, 17-19 September 2002
www.geosolutions-expo.com

Association for Geographic Information Marine and Coastal Zone Management Special Interest Group Session and Workshop: Using the Internet to Manage the Coast - Networking the Coastal Practitioner, at Littoral 2002, Porto, Portugal, 24 September 2002
www.futurecoast.co.uk

CoastNET conference: Information Management for Strategic Environmental Assessment and Regulation in the Marine Environment, London, 16 October 2002
www.coastms.co.uk

DEFRA-sponsored conference: Marine Stewardship and Integrated Coastal Zone Management (ICZM), London, 14 November 2002
www.coastms.co.uk

The Colour of Ocean Data: A Symposium on Oceanographic Data and Information Management with Special Attention to Biological Data, Brussels, 25-27 November 2002
www.vliz.be/En/Activ/Cod/cod.htm