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Integrated coastal zone mapping: ICZMap pilot project

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Introduction

News about our coastline continually hits the media headlines, portraying this as a dynamic environment of increasing social, economic and environmental significance. For the UK the coastline has, historically, formed the mapping boundary of both Ordnance Survey & Ordnance Survey Northern Ireland information (down to mean low water) and United Kingdom Hydrographic Office chart data (up to mean high water). As a result the coastal zone, although being fully mapped, is covered by a variety of data products from different sources.

Joining up land and sea

In the past it has fallen to the user of the disparate datasets to resolve any integration problems resulting from differing projections, scale of capture and other specification issues. This process can be time consuming, result in inconsistent data and can cause a hindrance to the management of a particularly sensitive environmental zone.

There are many different types of users of coastal zone information, from the casual user who may only want to browse, to the sophisticated user who make frequent use of mapping and demand continuous improvement. These user communities are diverse in the topics they address, covering such areas as Local and Central Government, environmental and economic analysis, and also increasingly leisure use.

A common mapping framework for the coastal zone would allow users to build applications and decision-making tools necessary to promote the shared use of such data throughout all levels of Government, the private and non-profit sectors and academia. A consistent framework could also serve to stimulate growth, potentially resulting in significant savings in data collection, enhanced use of data and assist better decision making.

The customers and their needs

The aim of the ICZMap (Integrated Coastal Zone Mapping) project is to enable the integration of terrestrial and marine topographic data for the pilot area, referencing and recording information in a consistent framework which will support a wide range of users. A user group is being established to provide independent advice on data specification, potential data products/services and the suitability of these to satisfy their applications. It is intended that this group will include a wide range of potential users from organizations such as:

- Environment Agency,
- Department for Transport, Local authorities and the Regions (DTLR),
- English Nature,
- Department for Environment , Farming and Rural Affairs (DEFRA),

- Centre for Environment Fisheries and Aquaculture Science (CEFAS),
- Met. Office,
- National Environmental Research Centre (NERC),
- Scottish Environment Protection Agency (SEPA)
- Scottish Natural Heritage (SNH),
- The National Assembly for Wales,
- Countryside Commission for Wales (CCW),
- Local Authorities and Coastal Groups, and
- Universities.

A collaborative effort

UK Hydrographic Office, British Geological Survey and Ordnance Survey are contributing different elements to the ICZMap from their roles as National dataset:

- **UK Hydrographic Office:** The mission of the UK Hydrographic Office is to meet national, defence and civil customer's needs for charts and other hydrographic information in support of safe navigation, and is now providing this information increasingly in digital form. This data, although primarily of use for navigation purposes, also provides important contextual information for other coastal zone applications and uses.
- **British Geological Survey:** The effect of the geology on coastal processes is significant, and current & accurate information about surface and sub-surface features is important in understanding the processes involved and forecasting changes. BGS knowledge and data forms an important part in the development of an integrated coastal zone dataset, which is able to support diverse applications.
- **Ordnance Survey:** Ordnance Survey maintains large-scale topographic mapping down to the mean low water mark. This data is currently being restructured to provide a framework of land parcels, which can be used, for coastal zone management applications. Accompanying this height information is maintained which allows 3-dimensional processes to be modelled.

The objective of the ICZMap project is to support the provision of a definitive integrated “land and sea” database (and subsequent products) by:

- co-ordinating the creation of necessary contributory terrestrial, hydrographic and geological databases;
- ensuring all such data is made readily accessible;
- pioneering electronic supply and delivery mechanisms for the data;
- expanding and delivering “joined-up coastal geography“ on a national basis as directed by users; and
- supporting the European Integrated Coastal Zone Management (ICZM) strategy.

The Plan

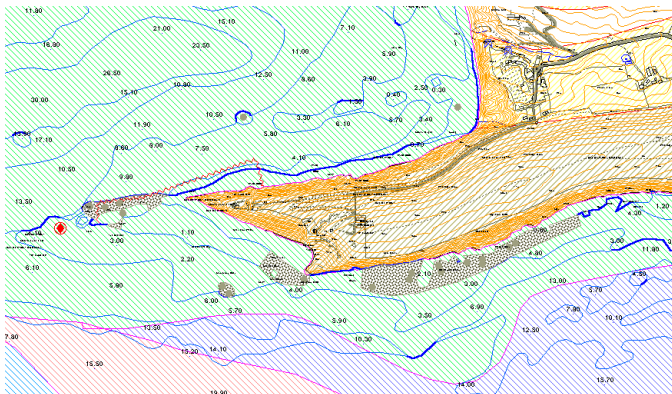
The key stages of the project are to:

- establish user needs, priorities and service provision;
- draw up a Specification of Requirements for data integration;

- evaluate options for resolving technical differences;
- develop a Technical Specification for integrated coastal zone mapping;
- capture and integrate ICZMap data for the pilot area;
- derive options for electronic delivery of data & services;
- use the pilot data to support innovative coastal management projects; and
- present findings to the user community.

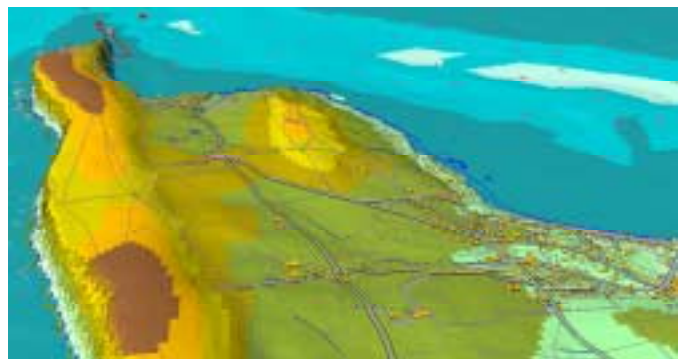
UK Government funding from the ‘Invest to Save’ budget has been secured to aid project work for the pilot area. An initial specification has been established and is being refined in consultation with a wide range of potential users. In parallel with this, options for an integrated data model are being developed and technical issues identified.

Specific integration issues include problems relating to the different datum, projection, capture scale and currency of the data. However, work already done has shown that integrated data can be produced utilizing existing core datasets from Ordnance Survey, UK Hydrographic Office and British Geological Survey.



Example output of integrated data for The Needles - Isle of Wight

Example visualisation of integrated bathymetry and terrain model for The Needles – Isle of Wight.



Throughout the course of the project it is intended that potential users will perform a key role in directing how the pilot progresses, both from the point of view of data specification, but also in the possible forms in which the data is made available. Ultimately it is hoped that as well as the potential savings for users in data preparation, the existence of ICZMap could improve the results achieved by users, enable new applications to be considered which were not previously feasible, and hence, enable better management and use of the coastal zone.

Acknowledgements

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