Coast Map News

Managing marine and coastal data and information

Issue 4/Autumn 2003

Welcome to the fourth issue of Coast Map News

It has been some time since the last issue and there has been a lot going on. We have, therefore, decided to make this a bumper issue to bring you up to date with the main initiatives that call for better access to marine and coastal data and information, as well as a number that are starting to deliver it. We are pleased to be able to report significant progress in relation to the priorities for action that were identified at the 1999 workshop - *Integrated mapping of the UK marine and coastal zone – the way forward*[1]. Most significant of these is the creation of a UK Coastal Information Network (see page 28), which at last provides a cross-sectoral pro-active co-ordination mechanism which will act as a focus for bringing key players together. We also have a clearer way forward as a result of the follow-up workshop which was held in September 2002 – *Delivering Integrated Marine Mapping for the UK* (page 3). However, it is not all good news. For the third year running, our bids for funding to deliver a UK data sharing network under Treasury's Invest to Save Budget failed to get past the expression of interest stage. The September workshop also demonstrated that, despite a proliferation of initiatives aimed at improving access to information, the needs of the majority of users are still not being met. It looks like Coast Map News will have a role to play for a while yet!

- The Editor

[1] *the report may be downloaded from the Coast Map News website: www.cefas.co.uk/coastmap*

Coast Map News is produced by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) with funding provided by Defra. If you have comments regarding any of the articles featured in this issue, require further copies of Coast Map News, or wish to submit an article of your own, please contact:

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defra
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Delivering Integrated Marine Mapping for the UK

The first Marine Stewardship Report - Safeguarding our Seas: A Strategy for the Conservation and Sustainable Development of our Marine Environment - included a commitment to deliver a joined-up approach to seabed mapping, starting with a workshop to explore how best to take this forward. This workshop, which took place on 11 September 2002, was funded by Defra and organised by CEFAS as a follow up to the one which took place in 1999[1].

The workshop, and the results of a questionnaire that was sent out beforehand, confirmed that management of marine and coastal data and information in the UK still needs significant improvement. Many of the comments re-iterated those made at the 1999 workshop, with the majority of users still being unable to access information in the form that they need it. Although there have been a number of initiatives[2] aimed at improving access to information, these have not been co-ordinated and have either been technology-led or data-led, or else driven by the needs of a specific user group without taking a wider view. The implications of this include inability of users outside these groups to obtain what they need, lack of clarity over data ownership and quality, and waste of resources through duplication of effort. Some clues as to why this has happened emerged during the presentations from people who had practical experience of setting up information systems. This was encapsulated by the 'iceberg' diagram (Figure 1) produced by Rob Kay, who helped to set up a successful marine information system in Australia over 20 years ago and is now developing a system based on knowledge management technology (see OneCoast – page 4).

This demonstrates the importance of realising that marine and coastal management is largely about human values, expectations and beliefs. Many projects fail because they concentrate on the top of the iceberg so can't see that they are stuck on what is beneath the surface.

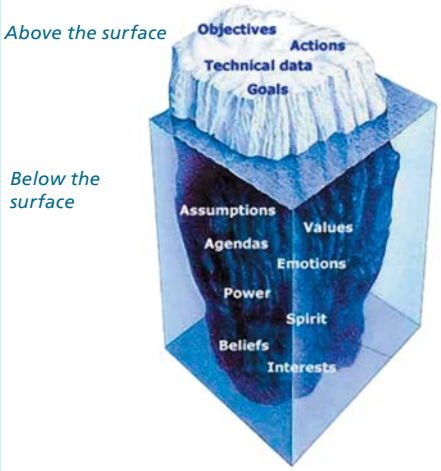

Figure 1.

Rob also pointed out that there are various degrees of integration (Figure 2) Participants at the workshop agreed that a UK-wide marine information system should be based on harmonisation, rather then integration. The primary, authoritative source of each data set will be established (which will generally be the agency responsible for the function, or for collecting the data), and given responsibility for its management within clear agreed standards on quality assurance. Mechanisms and protocols will be set up to provide access to data via metadata (data about data) links that meet the specific needs of different users. There will also need to be a framework for conservation of data once project-specific funding has come to an end and repositories for reports on a specific topic or area.

As in the 1999 workshop, participants confirmed the need for authoritative digital base maps of core data sets, preferably free of charge. These include a definitive version of the UK coastline (including both high and low water marks), plus bathymetric and surface sediment data. This would require an integrated approach driven by a UK government-led initiative building on the ICZMap prototype (for an update on this project see page 12).

The workshop agreed a number of priorities for action, including the need to clarify user requirements, carry out a data audit, establish mechanisms and secure funding. It was agreed that Defra was the most appropriate department to take the lead, working through a cross-sectoral co-ordination mechanism such as the Inter-Agency Committee for Marine Science and Technology (IACMST). Following the workshop, Defra commissioned IACMST to produce a report on the way forward. It is intended that IACMST will be in a position to recommend a course of action in the autumn. This will be considered in conjunction with the review of data and information issues within flood and coastal defence (see page 26), which should be completed at about the same time.

Frances Franklin, CEFAS

[1] Copies of the 1999 and 2002 workshop reports are available for downloading from the Coast Map News website www.cefas.co.uk/coastmap

[2] The list of relevant initiatives included in the workshop report has been turned into a searchable database that can be accessed via www.oceannet.org (see page 28)

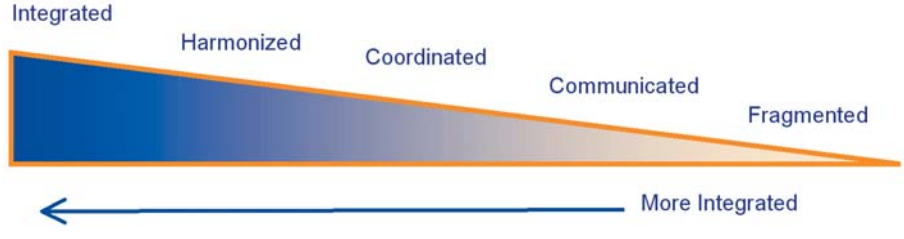

Figure 2. After Cicin Sain (1993)

What's in a name?

Before reporting on the September 2002 workshop, the title Delivering Integrated Marine Mapping for the UK (affectionately known as DIMM UK) seemed reasonable enough. From responses to the pre-workshop questionnaire, it was clear that something needed to be delivered – but what? The workshop concluded that we needed a harmonised, rather than integrated system. 'Marine' and 'coastal' are terms often referred to as if they were separate, but where do you draw the line? The term 'mapping' is also a misnomer, as it is clear that users are likely to need a mixture of data, information and knowledge, not just maps. Also, how can we meet UK needs without taking account of what is happening in Europe and wider afield?

It is often suggested that we need a portal to marine/coastal information/ data, but what exactly is a portal? The dictionary doesn't help much – or does it? "Portal 1. n. *Doorway, gateway, esp. of great building, park, town, &c*" (Pocket Oxford Dictionary, 1962). So - how do you build a great building, park or town? - you,

- Find out what the potential USERs will need.
- Develop PLANS that show what it will look like and how it will happen.
- Provide effective MANAGEMENT to deliver the plan and facilitate communication.
- Agree STANDARDS so that everything fits together.
- Secure adequate FINANCE for materials, tools and labour to complete the task.
- Use MATERIALS of the appropriate quality.
- Use CATALOGUES to help find the materials.
- Use TOOLS that are appropriate for the task.
- Appoint WORKERS to build it.

If all these elements are required to build an effective information system, then maybe it is possible to see why this has proved so difficult. Previous initiatives have tended to concentrate on a single aspect of marine information management, rather than taking the holistic view that is necessary to bring the whole thing together. Much emphasis has been placed on tools such as GIS as these tend to generate the greatest interest. However, these are of little benefit unless they use materials (data) of appropriate quality. Equally, catalogues (metadata) are only of use if the users can obtain the materials (data) and have the appropriate tools to use them. Making it fit together will require agreed standards (metadata, xml, interoperability) and people (e.g. information brokers) to make it happen. Above all, what is needed is an effective plan and a co-ordination mechanism to deliver it.

The good news, as you will see from the other articles in this issue, is that we are beginning to see significant progress in many of these areas.

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The OneCoast Coastal Knowledge Ecosystem

The OneCoast Coastal Knowledge Ecosystem concept was introduced in the UK at the Delivering Integrated Marine Mapping for the UK (DIMM UK) workshop in September 2002. Launched at the World Summit on Sustainable Development in Johannesburg as a Type II Partnership Initiative (under the new flexible mechanism) established by the United Nations Commission on Sustainable Development, OneCoast aims to provide a range of online knowledge sharing services to the global coastal management community. One such service is to provide standards-based connectivity from collaborative communications environments with highly unstructured data, information and personal interactions to more formally structured and rigorous environments such as those found within the spatial information management community.
In the UK, CEFAS, Tiempo (School of Environmental Sciences, University of East Anglia) and the Centre for Coastal Management (University of Newcastle Upon Tyne) are Partners in OneCoast.

OneCoast was borne from the frustration of coastal zone managers wanting a better experience from the Internet, supporting underlying systems and those that use them. The drivers stem from growing requirements for stronger connections between professionals, the information they need to do their work and real time interaction with the changing dynamic of both raw information sets as well as the growing interpretive analysis base surrounding projects and programs globally. The challenge revolves around linking relevant Coastal Zone Management (CZM) information, coastal data and CZM practitioners and community stakeholders when you want to, in a manner that fits with your situation and management objectives, online and in real time. Also, in an area often dominated by local community initiatives and scattered with programs supported by NGOs, why should CZM initiatives have to spend money in continuously developing largely static websites from scratch when in collaboration the ability exists to be able to re-use the best features of what's already been done in a framework that supports continuous technological and disciplinary change for and driven by the CZM community? Hence, OneCoast was initiated as an online knowledge environment, a meeting place that surrounds and supports the complex relationships between people and the data/information they require for managing coastal zones. We think it is best described as a Coastal Knowledge Ecosystem.

A year on from the DIMM UK Workshop OneCoast has developed an initial live testing environment. Sun Microsystems, our first Corporate Partner, has provided the test infrastructure. A combination of commercially available tools and open source collaboration and management software is being used as an initial low cost environment to test the concepts behind OneCoast. A number of projects will interact with this environment over the coming year to assist with the development and refinement of features and functions for an initial production release. One such project is that being run by the Washington based Heinz III Center (for the United States National Oceanographic and Atmospheric Administration Office of Coastal Resource Management) on Sharing Coastal Zone Management Innovations. OneCoast is being used as the online collaboration environment for the development of the study report and will be used as a structured stakeholder consultation environment. Advanced search, structured feedback, discussion forums, personalised web environments, news and event calendars are provided.

In the year since the Summit, we have found that such trial developments are proving to be the most effective way to introduce people to the concepts underpinning OneCoast, particularly in light of the unfamiliarity of many CZM professionals with knowledge sharing concepts and tools. OneCoast is a journey; the directions are only now being explored. We invite the UK coastal mapping community to come with us on this journey both to improve CZM in the UK and to provide leadership in the global CZM agenda.

onecoast
coastal knowledge ecosystem

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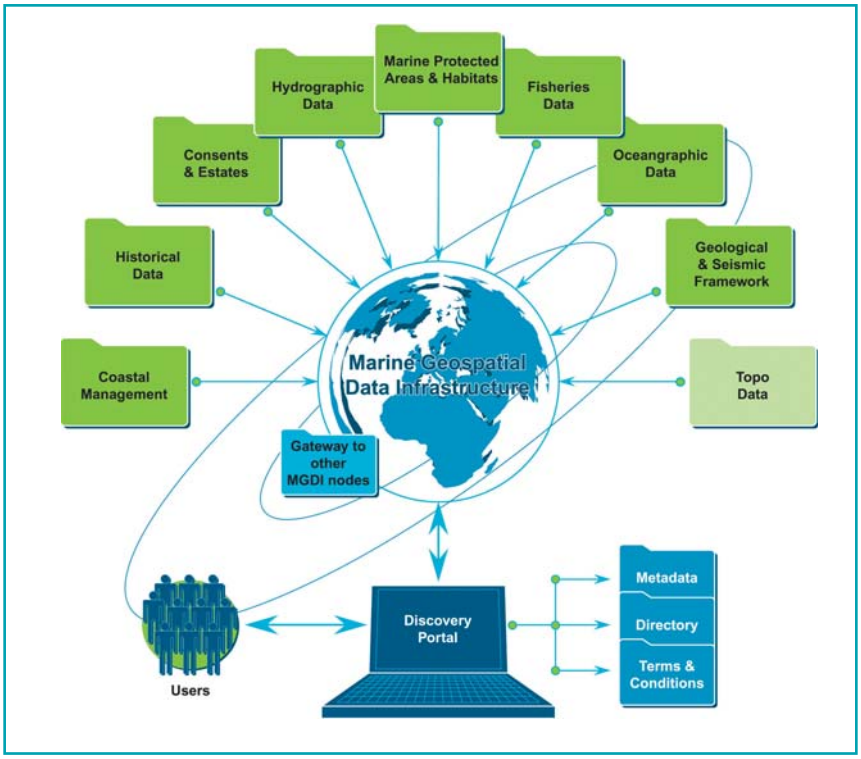
Marine Geospatial Data Industry Seminar - 1-2 July 2003

This highly successful event was hosted by the United Kingdom Hydrographic Office (UKHO). The seminar aimed to stimulate discussion on the potential development of a Marine Geospatial Data Infrastructure (MGDI) for the UK, the role stakeholders will play, and how the initiative might be progressed. In addition, the event provided an opportunity to display the range and potential of data held by the UKHO. Representatives from Government Departments and Agencies, academia and from the commercial sector attended the seminar.

Dr Wyn Williams, Chief Executive of the UKHO, gave a short history of the organisation, its present focus and strategy for the future. Dr Williams described how the establishment in January 2003 of Admiralty Holdings Ltd will allow the UKHO to further promote the use of its hydrographic data across all market segments. John Roberts, Head of Defra's Marine and Waterways Division, outlined Government policy in relation to marine management, and Mr Chris Roper, Director of Landmark Information Group, brought an industry perspective, with reference to the experience gained by his company in working with the public sector.

John Pepper, Head of Commercial Development, UKHO, laid out his vision for a UK Marine Geospatial Data Infrastructure as a key development for the future prosperity of the marine environment of the UK. At present, marine data exist in diverse forms, and because of lack of co-ordination and co-operation, data are collected in different ways, with much duplication of effort. Information about data is lacking and dissemination methods are ad hoc. A more joined-up approach is essential. The development of an MGDI would bring together all the valuable data collected by both public and commercial organisations and make it widely available.



Central Government Departments and agencies, including the UKHO, local authorities, the oil and gas sector, the fishing industry and other authoritative sources would contribute data and information. The MGDI would provide a thematic hub with information on water depths, currents, tides, channel widths, seabed texture, sediment characteristics, temperature, wrecks, pipelines, cables, seabed obstructions, fish stocks, coastal terrestrial data and more. From the central hub users would be able to extract data from diverse sources, merging the different types of information to produce different perspectives and innovative solutions - see diagram.

Ambitious steps must be taken to move forward. An audit of data holdings is necessary in order to establish who holds what data, and when it was captured. Having identified existing data, the requirement for additional data capture will be clear. The roles of the various data holders must be clearly defined. Once all this has been done a metadata hub with appropriate links can be established. The UK-wide capabilities will then be evident. From the data providers' perspective, it is imperative that these steps are considered as key building blocks for a sustainable future UK marine infrastructure, and a working group is now needed to develop this thinking further. Centres of excellence should be defined; data exchange and trading mechanisms established; dissemination methodologies developed. The commercial sector must be involved as well as Government Departments.

The delegates discussed how to progress towards the development of an MGDI. A key discussion point centred on the ICZMap® project as an example of collaboration (between the UKHO, Ordnance Survey and British Geological Survey), and on how best use can be made of the results of the research to date. ICZMap® could set a pattern for future projects and lay a foundation for moving towards delivery of an integrated data infrastructure for the coastal zone.

The delivery of data to end-users was an important discussion point. Much

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hydrographic and other data are held by disparate sources. Such data must be more widely available. The development of key repositories offering one stop shop access was seen as key to the wider use of available data. Factors such as availability, accessibility, ease of use, together with interoperability of the data would determine the success of the development of the MGDI in the long term, but current lack of interoperability should not be allowed to hold up progress.

The success of the seminar demonstrated the interest that exists in marine geospatial data and in its exploitation, and also demonstrated that the UKHO is a major player in the provision of marine data to the GI market. The UKHO will continue to work with its stakeholders to ensure that the opportunities that exist are maximised.

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Realtime Organisation

The UK Marine Information Council (UKMIC) contains members from industry, academia and government and has a key objective to promote the development of the UK's capability in operational ocean monitoring and forecasting. It was recognised that a number of benefits exist from establishing a network of all instruments active in UK coastal waters including; operational efficiency, improved monitoring and increased understanding of the marine environment. In order to determine the scope of this 'UK metocean network' the UKMIC operational oceanography working group made two recommendations. The first recommendation was to produce a map of existing systems and networks and a second recommendation was to investigate how the existing networks could be linked.

It was recognised that successful development of a UK-wide linked operational oceanography network must take into account many generic issues in information management, related to the interoperability between different organisations. These extend beyond the oceanographic data itself and into areas such as legal issues, business processes, quality control, audit mechanisms, funding and resources.

The outputs from the study brought together, for the first time, all operational oceanography networks operated by the UK Marine Community presented in a common way using standard metadata and a standard parameter dictionary. In this way it becomes much easier to compare like with like. Compiling the catalogue was not straightforward as different organisations in the UK Marine Community catalogue their networks to different standards.

Whilst undertaking the catalogue of metocean networks, it became very apparent how many members of the UK Marine Community are establishing on-line access to their respective oceanography networks; in some cases this includes linking between networks. Many of these initiatives are funded through public funds and so a case may exist for concerted government funding in this area.

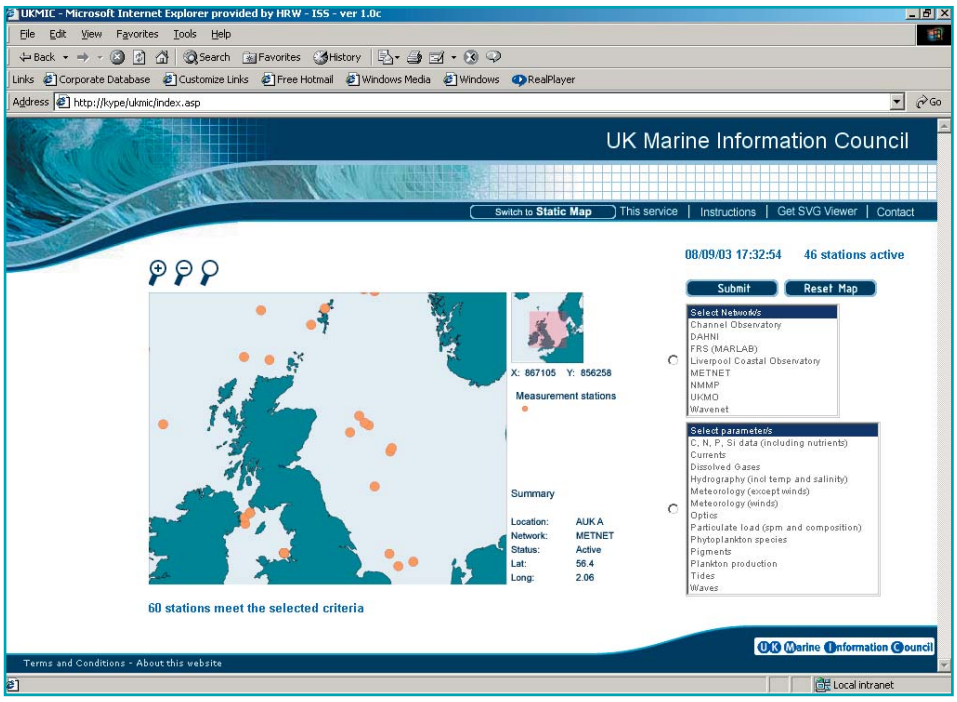

Figure 1. Screen grab from UKMIC's data map website

There is a quantum step from realising the requirements of a single network, to that of the entire UK Marine Community. The study commissioned by UKMIC presented a blue print for the organisation of a UK metocean operational data network. This showed both what the network will do, what activities need to be performed in order to achieve this and what configurations the networks could adopt. Central to achieving this is interoperability between the organisations that operate metocean networks; not just in terms of 'data' but also in terms of the business processes associated with data management and exchange.

The UK Marine Community now needs to establish a consensus how it should practically operate 'as one' to realise goals such as a UK Metocean Network. Crucially this includes mechanisms for sustainable cross community resource allocation for the day to day operation of a metocean network. The follow on from this is the need for cross-community protocols and methods of working in support of a metocean network.

A key step towards establishing the UK metocean network is therefore the establishment of community interoperability through the realisation of a sustainable catalogue of metadata on UK metocean networks. Achieving this would be the necessary stable foundation on which the technology for realtime data access within the metocean network can be established.

The UKMIC initiative is the top-down counter part to the bottom-up development of 'localised' networks within the UK Marine Community. Whilst there are no major risks in leaving these localised networks to continue to evolve linkages, a top down consensus would shorten the time to realising the benefits of a single network and present a robust contribution from the UK to international ocean observing initiatives.

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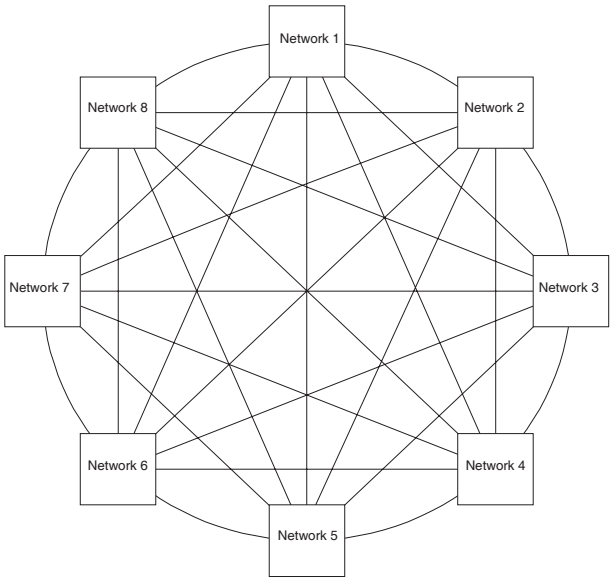
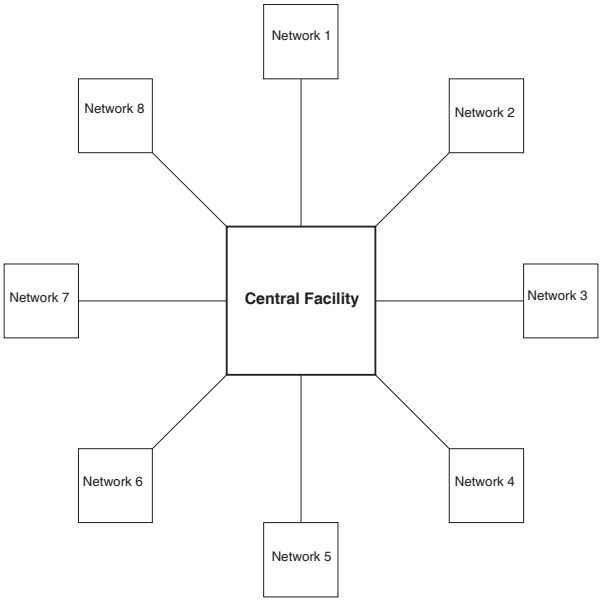
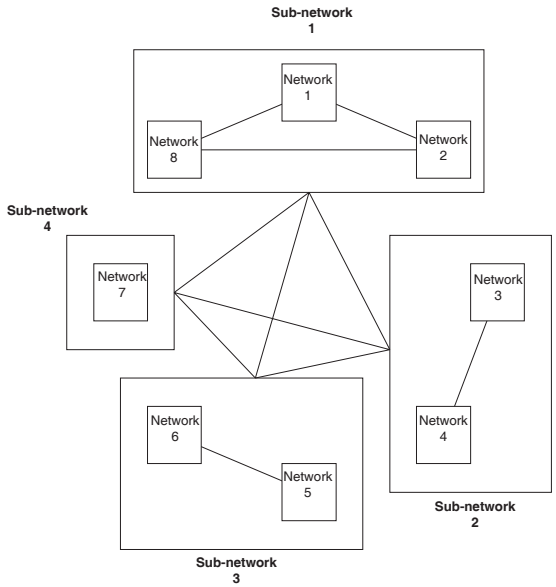
Figures 2-5. Possible scenarios for linking together data networks (continued on following page)



This scenario links all of the existing networks together and treats them as independent entities. This means that they are all operating separately without any overall management structure. Working this way allows each network to control its own business strategy but it creates the possibility of incompatible systems being developed between the networks. A common set of rules is needed and each network must agree to apply, implement and maintain them.



This scenario links all of the existing networks together via a central facility or hub. This will ensure that all network systems will be compatible and only one management organisation will be involved. It is equivalent to all of the networks being outsourced to, and managed by, one organisation to provide a onestop shop facility for data services. However it may prove to be the most difficult scenario to achieve as organisations may not be willing to participate in such a venture because of the loss of control of their businesss trategies.



Scenario 3 is a "half way house" between Scenarios 1 and 2 as it is linking the networks through sub-networks that may be determined by such issues as locations, industries, business interests, funding etc. Each sub-network needs to develop a set of rules and each network, within the sub-network, must agree to apply, implement and maintain them. Similarly the sub-networks that are linked together must develop a set of rules and each network, within the sub-networks, must agree to apply, implement and maintain them.

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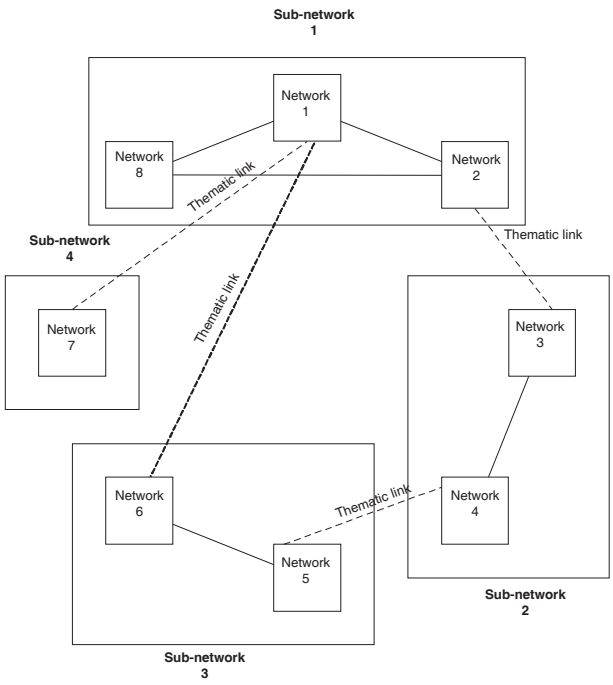

Scenario 4 is an extension to the concepts of Scenario 3 by the addition of services based on thematic themes. It allows for a network to work within a sub-network as well as to independently work with another sub-network, say on a thematic theme basis, providing it agrees to apply, implement and maintain the rules ofthe "external" sub-network. This approach is closest to that adopted by Wavenet where wave data from Wavenet CEFAS buoys is supplemented with wavedata from the Met Office and Shellnetworks.

HR Wallingford was commissioned by UKMIC to undertake a study into the organisation of a UK metocean network. The views in this document are those of the author and not necessarily those of UKMIC.

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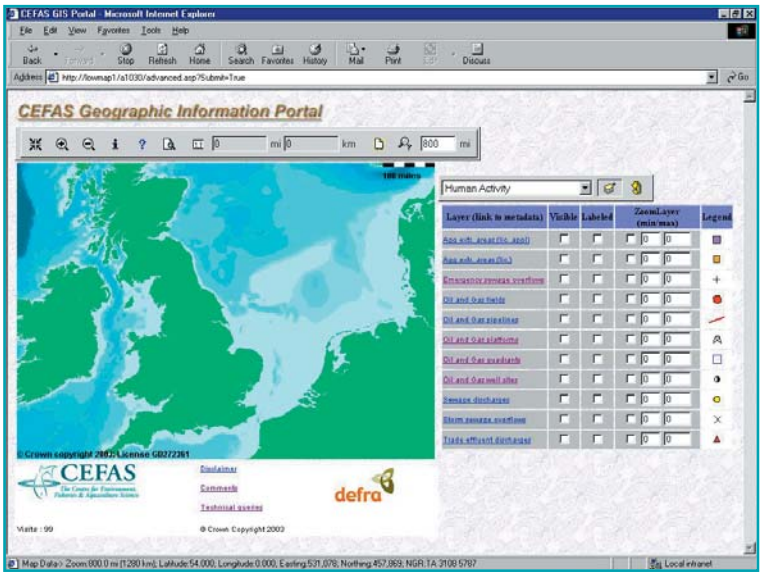
E-enabling spatial marine and coastal data

This newsletter, and the 1999 and 2002 workshops, form part of a series of Defra-funded projects aimed at improving the management of marine data, both within CEFAS and nationally.

Within CEFAS, data availability has recently been facilitated by the development of an intranet based portal to existing geospatial information. This enables staff on each of the three CEFAS sites to use their existing web browsers to access key datasets via an intuitive map-based interface on the intranet. The system is a prototype that includes a relatively limited number of datasets such as spawning and nursery areas for a number of fish species, human activities (e.g. pipeline discharges, licensed dredged material disposal sites and aggregate extraction areas) and useful boundaries such as the 12 mile limit. Additional datasets will be added once this prototype has been fully evaluated, agreed data management techniques have been implemented, and co-ordination mechanisms are fully operational.

Having provided tools to deliver the data, the next stage is to develop mechanisms to allow CEFAS and Defra, as well as other organisations, to focus on realising the benefits of data sharing rather than just the technology needed to achieve it. Work is currently underway to deliver a harmonised CEFAS-wide data and information network that meets the needs of Defra in delivering quality assured data and information about our marine and coastal environment, allowing for improved research capability and more informed science. The project will be further enhanced by bringing together existing projects such as Wavenet (- see article on page 14) and building on



CEFAS GI portal

this technology with the innovative work that CEFAS GIS developers are doing on producing specialist web-enabled spatial analysis tools. The project will also enable the delivery and management of the high quality (and quantity) data currently being generated by CEFAS's new research vessel *RV Endeavour.*

The creation of a fully interoperable CEFAS data portal will follow, thus facilitating interoperability with other coastal and marine data gathering agencies and organisations. Using a range of the latest web mapping technologies (many developed in house) the aim is to deliver data not just metadata.

Consideration has also been given to the sort of national infrastructure that would meet users' needs, whilst making effective use of what has been done already.

The main features required in a national system are:

- The adoption of common information transfer agreements and Memoranda of Understanding (MoU) between data-providers
- Existing partner data portals to be integrated into a network using common communication protocols
- By connecting existing portals with a main UK Coastal and Marine Information Hub, both users and partners increase accessibility - allowing for more informed decision making
- Flow of data and information in all directions to be facilitated by common protocols
- Public access to highly processed and informative data will fulfil many information access requirements
- A Hub that will allow partners to showcase data and information to Value Added Resellers (VARs)

RV Endeavour

- The creation of a UK hub will allow more efficient integration/ harmonisation with European and Global Marine/Coastal Information gateways
- The use of familiar navigation techniques based upon successful commercial information hubs ('shopping trolley model') will further increase user participation

The diagram (below) illustrates one possible way in which this could be achieved.

It is certainly an exciting time in the area of marine and coastal data delivery and CEFAS is committed to E-enabling its spatial coastal and marine data, allowing for a better understanding of these important and dynamic environments.

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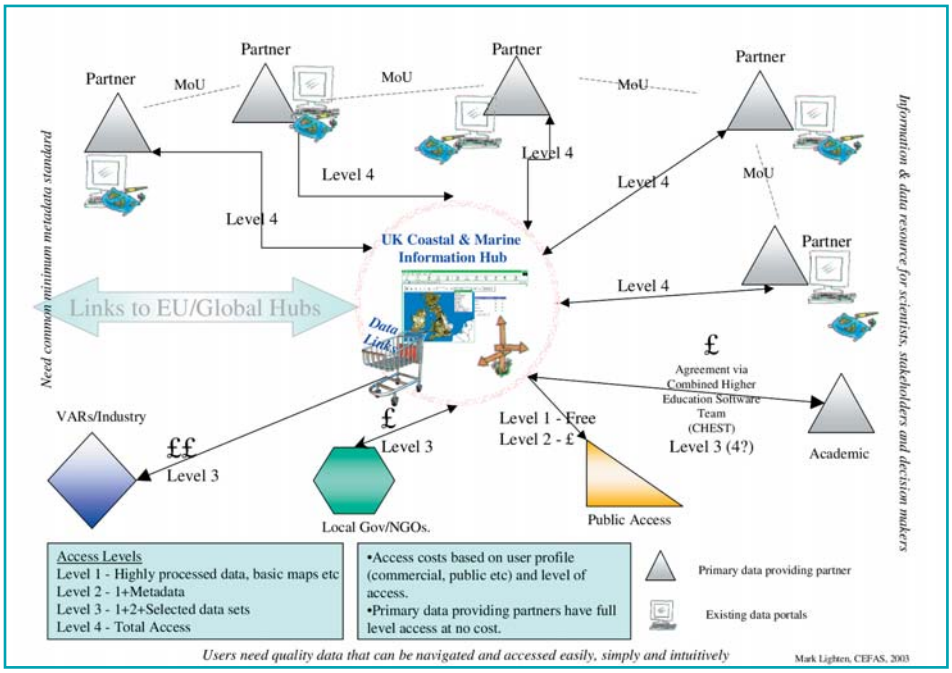

Marine Works Consents Geographical Information System

The Marine Consents and Environment Unit has launched a Marine Consents GIS system which is freely accessible to all through the MCEU's website www.mceu.gov.uk. This facility is designed primarily to provide information about applications to undertake works in the sea and other tidal waters around England & Wales and associated licences and consents issued by the Unit under the Food & Environment Protection Act 1985 and Coast Protection Act 1949.

The system aims to offer:

- ready access to integrated consents data represented in a geographical and temporal context
- information about potential environmental sensitivities & socio-economic inter-actions to underpin the policy of sustainable marine development
- data to assist the assessment of cumulative environmental effects (Habitats/EIA Directives)

The consents data will be updated on a daily basis. At present, however, the system is still under development and whilst every effort is taken to ensure accuracy, many of the older records provide less detail and some include information which may not be correct and is being checked. The information currently presented by the system should not therefore be regarded as definitive.

Data searches may be made by year of each type of consent or application and plotted on a chart with the option of a background Admiralty chart display.

More advanced searches may also be made also be made against a range of criteria, the results of which are shown in a data matrix. This information may be copied to a spreadsheet for further analysis and individual records can be plotted on the display or selected to show more detailed information.

The system is also designed to enable the user optionally to combine the display with overlay information about European conservation areas and other environmental site designations.

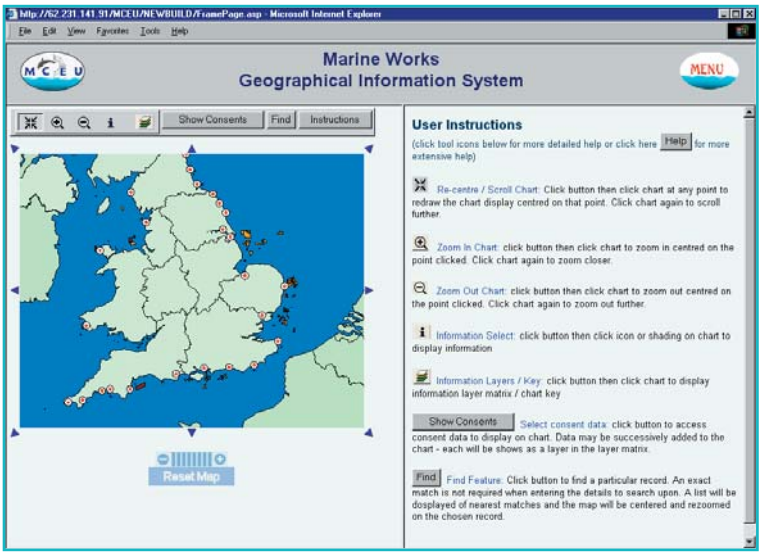

Figure 1. Opening screen display

A range of other information, including fishery areas, disposal sites and aggregate extraction areas, as well as a range of other activities consented under other legislation may also be added.

In considering applications to undertake marine works, the MCEU make a detailed assessment of any risk to the marine environment and potential interference and nuisance to other uses of the sea. Close regard must be paid to other proposed and consented activities.

In particular, the Conservation (Natural Habitats &c) Regulations 1994 impose a mandatory requirement upon regulators to consider the potential impact of any plan or project proposed within or adjacent to the boundaries of a European conservation site on the integrity of that site. Account also must be taken of the potential cumulative or 'in-combination' environmental impact of such activities

It is central to the Government's policy of sustainable development that data about environmental impacts; socio-economic benefits and interactions with existing activities, and the implications for natural resources and assets is available to inform decisions. Similarly, applications for marine consents often require the investment

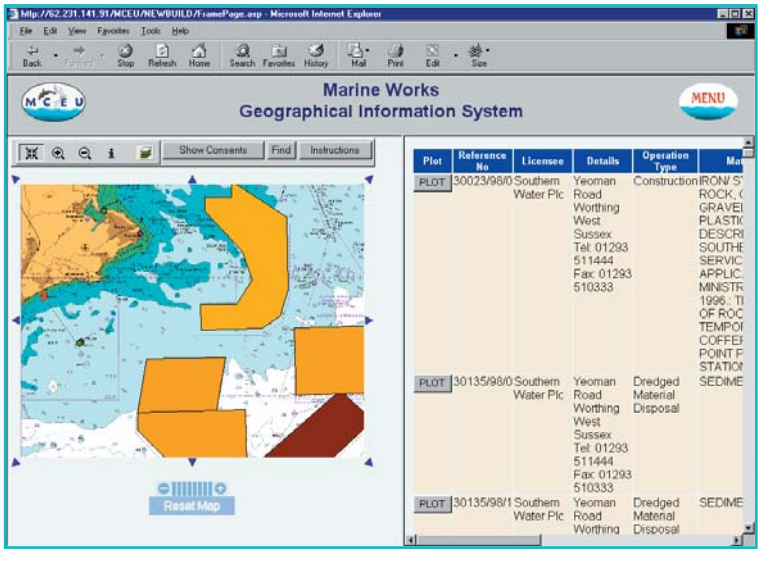

Figure 2. Advanced search data matrix

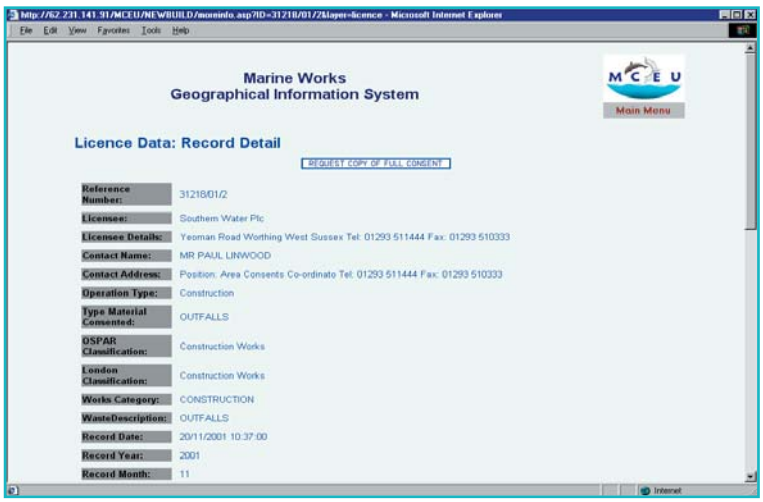

Figure 3. Detailed data screen

of substantial time and resources to site investigations and the preparation of a detailed environmental statement.

The new GIS system is intended to offer assistance to potential developers in compiling such statements by facilitating access to data about other activities which have been proposed or consented around our coasts; where these lie in terms of their juxtaposition to sensitive or protected sites; the potential for environmental impact and the mitigation measures that are proposed.

Although this new facility will provide direct access to a substantial amount of data, it also enables users to request more comprehensive information from the Unit.

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It's Good to Talk -

UK collaboration in defining XML standards to help exchange data amongst the marine community

Our understanding of the marine environment and risks associated with marine ventures is restricted as a result of the present lack of data interoperability caused by a lack of standards and frameworks. The huge diversity of data formats, proprietary data management systems, numerical models and visualisation tools complicate the management of marine data. This present complexity of accessing and integrating data makes it a tedious, often labour intensive task to generate knowledge and therefore understanding of how to manage the marine environment.

An international team of marine data experts have come together to demonstrate that eXtensible Mark-Up Language (XML) technology can be used to develop a framework that improves data exchange for the marine community and specifically in support of operational marine observing systems. XML was developed by the World Wide Web Consortium (W3C) to improve data transfer over the Internet. With the advent of XML, the global oceanographic community has the opportunity to create a truly universal marine data standard. Unlike earlier standardisation initiatives, XML can support existing data formats and information systems while providing maximum benefits when included in the development of new systems.

By linking with related projects and initiatives, the MarineXML project will develop a prototype of an XML-based Marine Mark-Up Language (MML) to show the integration between MML and data supported by other established standards. These include the International Hydrographic Organisation S-57 standard, the OpenGIS Geographic Mark-Up Language (GML) standard and proprietary data formats such as those from marine instruments such as ADCP, expendable bathythermographs and ARGO floats etc.

Developing an XML specification (schema) is a relatively straightforward task and indeed several have been devised for marine applications. However these are generally stand alone standards used in 'closed communities'. Widening the community extent of the standard raises issues such as how a domain specific standard (such as a MarineXML) works with (and can rely upon) other data standards, such as GML, and metadata standards such as ISO19115.

A team in the UK is presently determining mechanisms for such co-evolution of schema. This team includes members of the NERC Data Grid project involving BODC and the Rutherford Appleton Laboratory and HR Wallingford as the co-ordinator of the MarineXML initiative. It is anticipated that this will provide useful guidelines to other areas where domain specific XML-schema are required for widespread use in an 'open community'.

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For further information visit the following websites
Marine XML:
www.marinexml.net
NERC Data grid:
http://ndg.nerc.ac.uk/

ICZMap -

Integrating the definitive National Datasets;- Integrated Coastal Zone Map (ICZMap) project, an update on work by the UK Hydrographic Office, Ordnance Survey and British Geological Survey, supported by ISB funds.

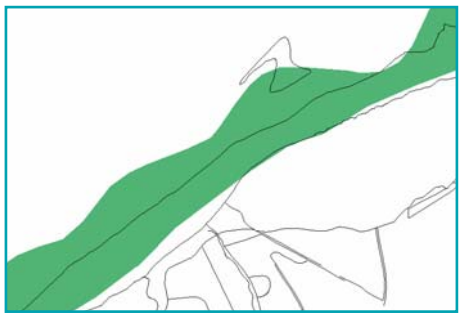
At its close, the ICZMap project has created 3 pilot areas where integrated data has been joined to an agreed coastline. In these areas, gaps and overlaps around the coastline have been reduced, easing the modeller's data preparation and providing a consistent base map for those who wish to log and analyse combined data (Shoreline Management Planning, consistent modelling etc.).

A common coastline was agreed and the data cut or extended to match as shown in the two figures (above right).

That dealt with 2 dimensions, but a key requirement was to deal with height and depth. We engaged key stakeholders to determine the best way to solve this issue. Extensive field and scientific modelling work has now resulted in a triangulated irregular network of height/depth to 20km off shore.

This integrated coastline has been tested and the following reported:

- 85% of the respondents would find the proposed data of use, 70% would find it more useful than existing data.



- The majority of Local Authority respondents would recommend ICZMap to Defra for Shoreline Management Plans.
- Research, planning and meeting legislative drivers represent the greatest likely use.
- Horizontal and Vertical Datums and High Water lines are the most important elements to unify.
- The proposition to make three interoperable datasets available is preferable to a combined product.
- Purchase decisions are largely led by legislation, followed by spending plans and business objectives.
- The largest possible scale was requested by the majority (up to 1: 1250 mapping scale).

Feedback on specification, update cycles and specific usage were also obtained. This will help the decision processes within the 3 organisations beyond the project phase.

Looking to the future, all three organisations are considering adaptations of their data holdings and onward collaboration to meet the demands for greater integration.

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Integrated Coastal Hydrography

The Integrated Coastal Hydrography (ICH) project is a collaboration between the Environment Agency, the Maritime and Coastguard Agency, Ordnance Survey and the UK Hydrographic Office. The project, which has been underway for a year is focused on improving the quality and availability of bathymetric data in the shallow water areas around the UK, and will deliver three main products:

1) *A definitive specification for gathering bathymetric data in shallow water areas.*
2) *A report on emerging technologies for gathering shallow water data.*
3) *A web enabled database of coastal surveys.*

This web-based portal will allow users to search for information (in the form of metadata) on existing and planned coastal surveys, and is near completion. Its purpose is to enable people or organisations looking for data or planning surveys to check on what data are already available in

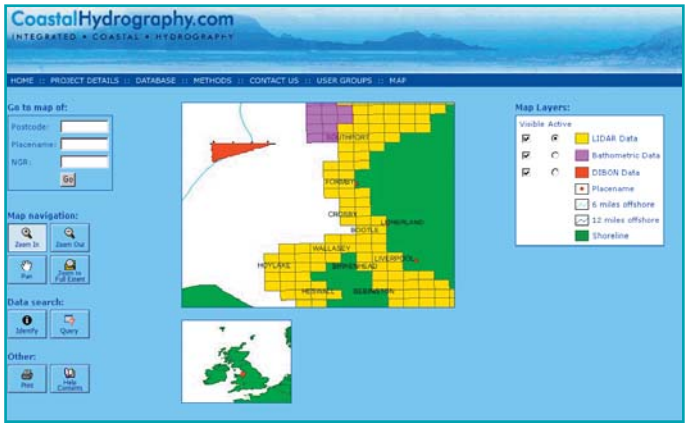

Figure 1. Portal for database of survey metadata

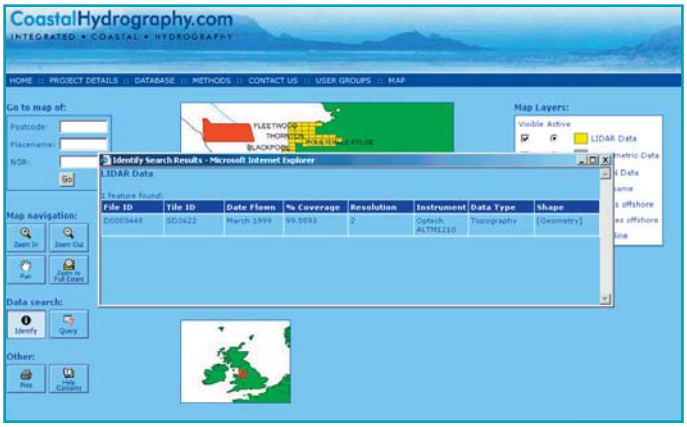

Figure 2. Window showing metadata for selected survey

the area. The web-site will not serve the actual data – the user will need to contact the data owner for that - but it will provide sufficient information to let them gauge the value of the survey data and obtain it if required.

The application will have a multi-level access interface; the lowest level access will allow members of the public to browse the metadata for a number of different data types, e.g. bathymetric and topographic surveys. The user will also be able to undertake text and graphical searches of the metadata. The mapping interface will have standard GIS tools and some defined and bespoke searches of the underlying database.

Once the required metadata of interest has been identified, the results of the search can be added to an e-mail and forwarded directly to the data holder from within the site.

A second level of access will allow additional functionality. Contributing members of the ICH project will be able to upload metadata of recent or forthcoming surveys to the website and view the results in real time. This presents an opportunity for the hydrographic community to explore possibilities for collaboration in forthcoming surveys, and thereby potential reduction in costs.

The web portal is planned to be launched this autumn and will be accessible through the main ICH site - www.coastalhydrography.com
A proposed further development of the ICH web application will be to investigate real-time sharing of metadata layers between other marine GIS portals. Meetings that have taken place with WINDBASE, MCEU and UKDEAL have been very positive. This collaborative approach to delivering integrated marine data and information offers many advantages to the marine community. It will improve awareness of, and access to, marine metadata sets whilst also adding value to the data by allowing other data layers to be overlain within a single web-enabled GIS.

An assessment of the "feasibility and technical options for interoperability" will shortly be published and made available through the main ICH website soon after.

How Can Your Organisation Get Involved in the ICH?

The driving force for the ICH project is to improve the type and availability of information within the shallow water regions of the UK. This will have safety, engineering, environmental and financial benefits for the UK as a whole. If you currently hold survey data within the shallow coastal zone, then the metadata for those surveys can be included within the ICH database. This will allow potential users to see what data is already available for a given area, possibly removing the need for further, expensive surveys. The user will then contact you, the data holders, to agree terms for the acquisition of the data. This may of course provide extra income from your existing data holdings. If you have too many surveys to enter into the web-form, then there is also a facility to take in existing survey database formats (e.g. MS Access). Existing data holdings are already diverse, and include high resolution multibeam bathymetry, single beam echosounder surveys, topographic beach profiles, terrestrial LIDAR, and bathymetric LIDAR. The suppliers of this metadata are equally as diverse, and include engineering companies, government agencies and port authorities.

For further information or to comment about any element of the ICH project, contact:
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WaveNet – A National Wave Monitoring Network for England and Wales

Defra, through CEFAS, is leading a strategic initiative to monitor the wave conditions along long stretches of the England and Wales coastline, thus forming a National wave monitoring network. The wave data will be used by a variety of end users including flood managers in the Environment Agency, consultants, academics, sea users and the general public. Wave data will be available in two formats – real-time and post recovery of wave monitoring buoys.

The data is now available free on www.cefas.co.uk/wavenet
An example of the webpages is shown below in Figure 1.

The webpages have information on the background of the project, the implementation plan and the WaveNet steering group. The database of wave data can be searched using two systems – basic and an advanced menu. The Basic menu allows users to see all the measuring sites/data, and then view time-series of wave parameters in a variety of formats – text or graphs (e.g. Figure 2) – as well as links to other real-time monitoring systems e.g. SmartBuoy measuring water quality parameters. Wave spectral data can also be viewed in either two dimensional or three dimensional plots. The advanced webpages allow the users to select stations, parameters and start/end dates and create their own custom graphs. Wave data can also be downloaded once users have registered.

This project is carried out in conjunction with the Met Office and uses data from Shell UK, Channel Coastal Observatory and the Irish Marine Institute.

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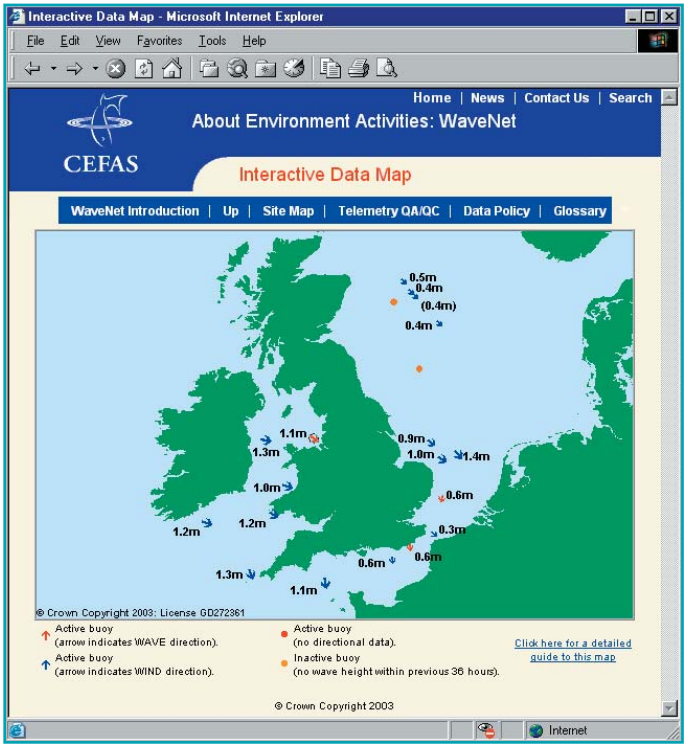

Figure 1. Screen shot of the "Basic" webpage

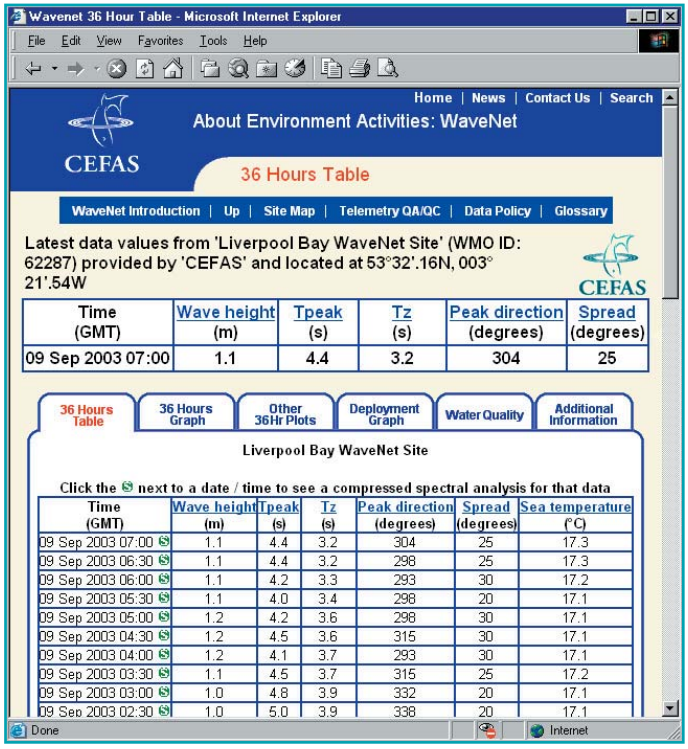

Figure 2. Example of the wave data available from Liverpool Bay site. The data can be displayed in other formats (time-series graphs, spectral plots) by selecting one of the other "tabs"

Windbase and Offshore Windfarm Development Update

Several hundred people have registered and logged on to '*WindBase*' (www.crownestate.co.uk/estates/marine/windfarms.shtml) the Geographic Information System (GIS) pilot project developed by the Crown Estate since it went live on the website over a year ago. Windbase is essentially an inventory integrating numerous accurate and large scale spatial data sources and information. The spatial data has been categorised to present real constraints and opportunities to offshore windfarm development locations and acted as a starting point for discussion and information sharing amongst key stakeholders. The geographic foundation of the database demonstrates how the integration of diverse sources of data can be used to build comprehensive inventories which can be used to conduct conflict checks, establish present levels of resource use and display the spatial relationships between the location of activities. Windbase was used by the DTI as the basis for identifying the Wash, Thames Estuary and the North West as the 3 strategic areas for the second round of UK offshore windfarm development.

The development of Windbase along with similar GIS based decision support tools has also fed into the increasing dialogue about the need for marine spatial planning.

As this issue goes to print we are only a few weeks away from the deadline for the submission of tenders from developers bidding for sites in the second round of offshore windfarm development. The second round was launched in mid July with massive press coverage. Since then developers have been working on Business Development Plans as the basis of their tender submissions.

Recognising that significant amounts of environmental data and information were gathered as part of Round One but have remained relatively inaccessible to other users, we are requiring developers who are successful in the tender process to deposit data with the Crown Estate as part of the leasing arrangements for Round 2. The intention is to improve the availability and dissemination of marine data and information collected during all stages of windfarm development and operation. The data must be submitted in a format that can be entered into a GIS for data management purposes as well as being made available to relevant national databases and repositories. We feel that this is an important step forward in improving accessibility of information for the benefit of a wide range of marine users.

Meanwhile good progress is being made on the research projects funded by the trust fund set up by the Crown Estate under Round One procedures. Four generic environmental research projects are underway and further information can be accessed on Windfarms and Collaborative Offshore Wind Research Into Environment (COWRIE) within the Marine Estates section of our website (www.crownestate.co.uk). For Round Two a similar research and data management initiative will be established using the option fees to be paid by developers awarded agreements for lease for site development.

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www.crownestate.co.uk

Construction of North Hoyle windfarm, off Rhyl, north Wales

Digital Energy Atlas and Library

DEAL (Digital Energy Atlas and Library)is a free-to-user web-based service designed to promote and facilitate access to data and information relevant to exploration and production of hydrocarbons on the United Kingdom Continental Shelf (UKCS). It provides the definitive quality-assured database of key positional data for the UK offshore petroleum industry. It can be difficult, time consuming, expensive, and sometimes impossible to find out what data have been collected or where they reside in the UK. DEAL addresses these issues by providing an accurate register of UK data for the first time. Easy and cheap access to data encourages further exploration and will extend production from the UKCS

The project is one of the success stories of PILOT, the Government-Industry body charged with improving the opportunities for the UK offshore oil and gas industry. The service is championed by UK Offshore Operators Association (UKOOA), via Common Data Access Limited and the website is developed and maintained by the British Geological Survey. In September 2003, the Minister for Energy, Stephen Timms, announced the launch of the DEAL Data Registry as an even more comprehensive service. In future DTI will require operators to provide a register of a range of data associated with exploration and production licences. This will help both preserve data, and make it more readily available for other users to gain access to the data, thus making it easier for new entrants to rework prospects and work on new exploration ideas. DTI is now providing financial support for DEAL development.

The success of the recent "promote" round of offshore licensing for oil and gas exploration was aided by DEAL, which provided a fantastic opportunity for new explorers to find data very easily.

www.ukdeal.co.uk is based on ArcIMS GIS software, linked to an Oracle database. Products associated with spatial data are linked dynamically to vendor repositories on the Internet. Access to DEAL is operating system and browser independent, and is therefore available on everyone's desktop via the Internet.

Since launch, continuous development is guided by working groups of users drawn from operators, service companies, consultants, academics and government.

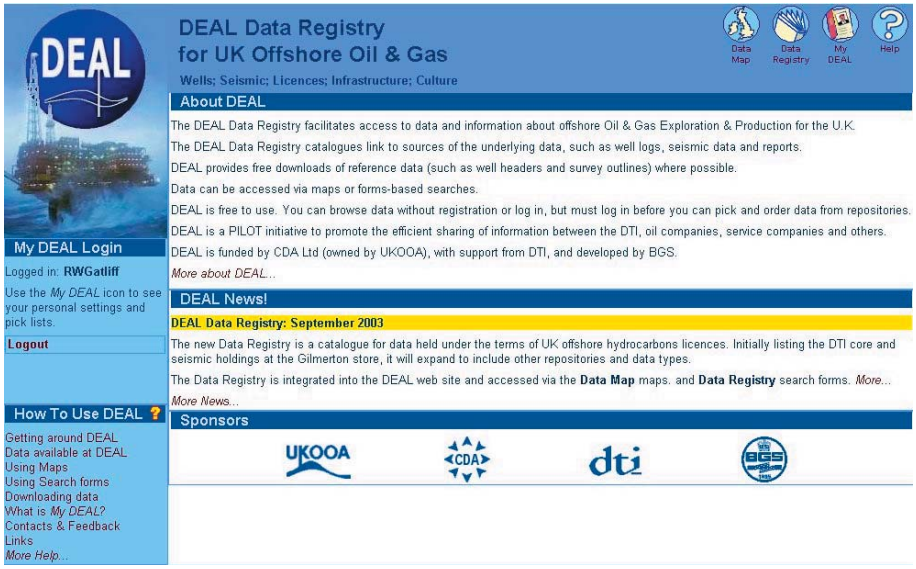

Figure 1. The Deal Data Registry Front Page. Users may enter the site without logging on for ease of use. Users who log on (no charge) as registered users receive updates and news items by e-mail and can use the full functionality

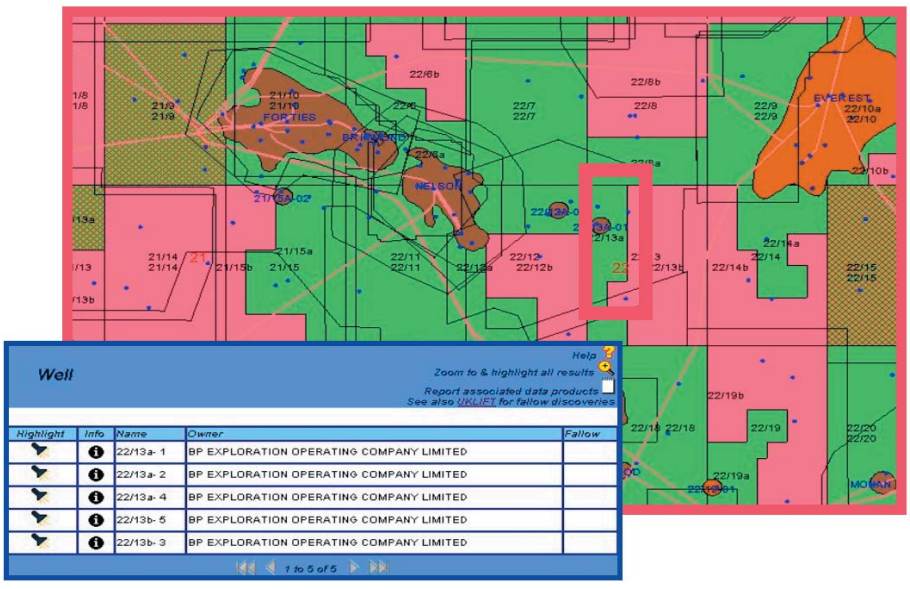

Figure 2. Data, such as wells, seismic, licence information, infrastructure may be selected. Detailed product information is attached and contact to data providers is available via direct e-mail, web or telephone contact

DEAL provides quick access to a single, complete and reliable dataset of basic spatial and attribute data over the UKCS. Licence data and well, 3D seismic and pipeline locations are downloadable. Other, commercial data are linked via e-mail or URL directly to the relevant data vendor. DEAL also provides opportunities for data and services suppliers to post product information associated with spatial features for on-line access.

DEAL is the first comprehensive, accurate metadatabase of positional data for the UK offshore. As a joint industry-government initiative, DEAL receives widespread support from across the sector. The project saves the industry money by providing a unique and comprehensive service, and provides a window for new explorers and developers to realise the opportunities in the UK.

The success of the project is leading to new applications, and DEAL now provides and maintains the vital SeaFish database that is used by the fishing industry to reduce the chances of accidental collision with surface and sub-surface installations. The pipeline data will shortly be used to provide more information about future spare capacity and help encourage the effective use and extend the efficient life of UKCS infrastructure.

The system is very flexible and can be extended to other spatially related data, including a range of environmental, ecological and oceanographic data. It can be developed to provide direct downloads of public domain data or provide access to sources of proprietary information.

Benefits of the DEAL Data Registry

- Improves overall catalogue quality
- Consolidates the underlying data between licence partners
- Reduces duplication of data
- Avoids the loss of data through poor indexing
- Provides definitive "trusted" data sets
- Extendable to other areas and new data types
- Ensures that companies comply with licence obligations
- Makes data more readily available
- Encourages new exploration

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Review of development in coastal and marine waters

In May 2002, the UK Government initiated a cross-cutting review to investigate ways of reducing the complexity of the regime governing development in coastal and marine waters[1]. One of its objectives was to examine the scope for improving the availability of data on both existing and proposed consents and the potential to provide this from a single source.

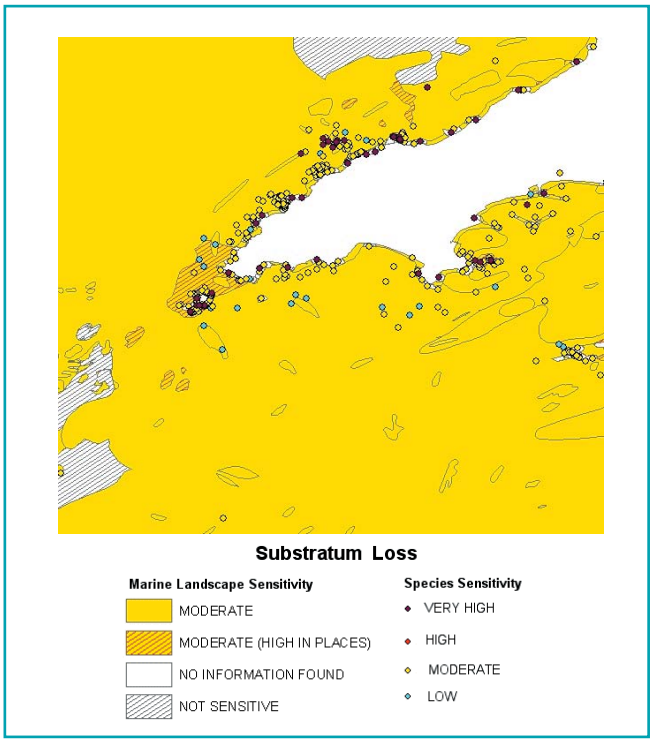
The Minister in charge of the Review was Lord Rooker, Minister for Housing, Planning and Regeneration in the Office of the Deputy Prime Minister (ODPM). The Review undertaken by a special unit in the Department for Transport, worked closely with the Welsh Assembly Government, Defra, DTI and ODPM, and consulted as necessary with other Devolved Administrations, businesses, environmental bodies and regulators. The various recommendations are currently being considered and consultations will take place in the near future.

Frances Franklin
CEFAS

[1] *www.dft.gov.uk/stellent/groups/dft_shipping/documents/page/dft_shipping_505276.hcsp*

Mapping sensitivity

Oil spill sensitivity maps have done it for years. Indeed, the oil spill approach used for mapping sensitivity is now more than 25 years old. It relies greatly on identifying 'important' features (such as location of protected sites, seal colonies, bird roosts, bathing beaches) some of which may not be adversely affected by an oil spill – for instance, a geological SSSI. Changing that approach – or at least changing what is meant by 'sensitivity' – might seem a drastic step. But sensitivity should reflect the intolerance of a habitat, biotope or species to perturbation and its likelihood of recovery – a more prevalent perception of what sensitivity is. Over the past five years, the *MarLIN* programme at the Marine Biological Association has been building its database of Biology and Sensitivity Key Information (BASKI). Now that we have reached a critical mass of species and biotopes (key functional and structural species, biotopes in SACs etc. researched and on the Web site) we have started to match sensitivity assessment to survey data so that sensitivity can be mapped on GIS. In doing so, we have engaged a wide range of users in the development of approaches and, so that there is one index of sensitivity, have used intolerance (which we had called sensitivity) and recoverability through a matrix to identify sensitivity.



The Irish Sea Pilot (ISP) project has now given us the opportunity to see how sensitivity assessments can be applied to the Ecological Units identified for the Irish Sea. Those units are broad and sensitivity assessment has to be non-specific. The maps produced are indicative, taking the sensitivity of most widespread biotopes rather than of localized or minority features which may be more or less sensitive. The map shown (see figure above) illustrates both broadscale sensitivity and point-specific sensitivity assessed for biotopes in a portion of the Irish Sea. The approach developed is currently (early August 2003) included in the consultation papers for ISP work.

The routines now established by the *MarLIN* programme enable sensitivity to different factors to be mapped wherever there is biological survey data. And therein lies much frustration. We are often aware that an area has been surveyed but the data are not available. Although, with funding and support from several organisations, we have entered a significant number of datasets to our *MarLIN* holdings (and then on to the UK National Biodiversity Network - NBN), there are major gaps where we know data exists. Access to, and where necessary, interpretation of those data is of central importance if we are to provide the most comprehensive possible sensitivity mapping resource.

The *MarLIN* programme has embarked upon a 'campaign' to access and interprete as wide a range of datasets as possible. We are working in collaboration with BODC and with the IACMST Coastal Data Co-ordinator and data will be transferred to the National Biodiversity Network where it will become available on www.searchnbn.net. If you have access to seabed biology datasets that have not already been provided to the Marine Nature Conservation Review or to *MarLIN*, and you would be happy to see those datasets accessed, please contact us at marlin@mba.ac.uk.

The BASKI sub-programme of *MarLIN* has been funded by Defra, English Nature and Scottish Natural Heritage. Access to data has been funded by the Environment Agency, Joint Nature Conservation Committee, The Crown Estate (Marine Estates), Defra (including through the NBN) and others.

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SeaZone – a new data service for the marine environment

On the 18 June 2003, Metoc and the UK Hydrographic Office (UKHO) launched a new service that brings Admiralty and other marine data to the coastal and offshore scientific and engineering community. The data are easy to access and come in a form that is ready for immediate use within GIS (e.g. ESRI Shape and MapInfo TAB formats) and other software. Digital data are acquired from authoritative sources, such as UKHO, the Environment Agency and many other UK data providers, and are provided as fully symbolised themed layers on CD-ROM, either for pre-defined areas, or as specified by the SeaZone customer. Value added services are provided through the availability of ready-made GIS projects, elevation models and data transformations. The latter means that marine data can be integrated with that from land mapping agencies to provide a near seamless combined data set to a common horizontal and vertical datum.

SeaZone data layers already include topography and bathymetry, charted features, seabed obstructions, military practice and exercise areas, development areas, water quality information and oceanographic measurement locations. It is hoped to widen the range of information included by adding new data layers from existing collaborators, and by bringing on-board other organisations such as British Geological Survey, the UK Met Office, CEFAS and many more. Metoc's experience of capturing, collating and using coastal and offshore data in GIS, to support its work as a marine engineering and environmental specialist, was a key driver in the development of the new service.

SeaZone is being made available with a variety of licensing options: from a single-user, multi-user or corporate licence, including the facility produce maps in paper or .pdf formats or to display extracts of the data on the Internet. Each licence runs for a period of one year, with the option to renew the data on an annual or quarterly basis. Tools are being developed to exploit the new data and Metoc is looking for both data and technical collaborators to improve and widen the scope of the service.

Figure 1. Liz Paulson (UKHO) and Mike Osborne (Metoc) launching SeaZone at Metoc's recent conference on Marine and Coastal GIS

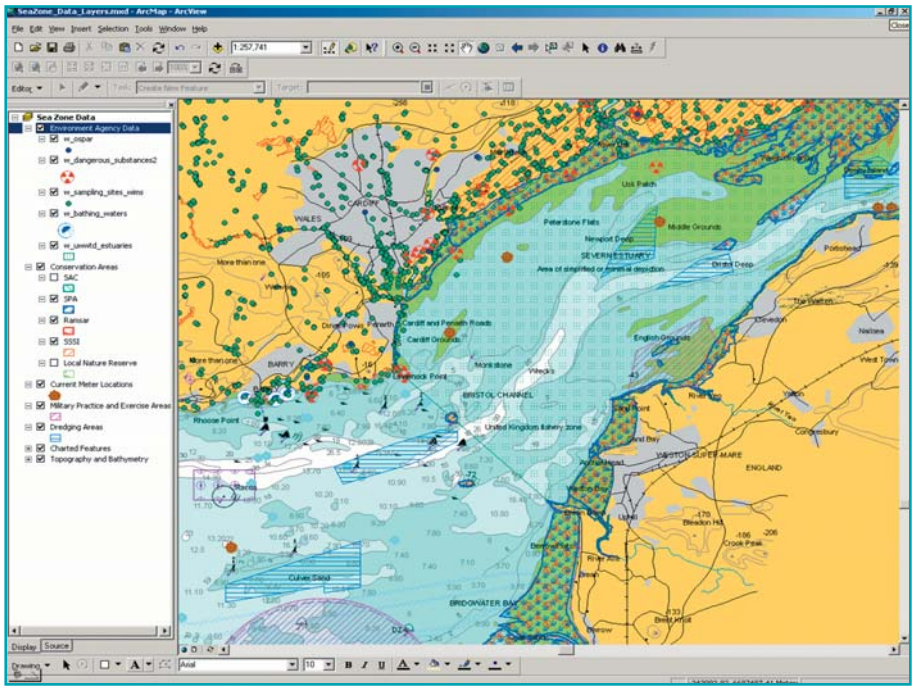

Figure 2. Screen shot of example SeaZone data layers in ESRI ArcGIS 8.3

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Estuaries Research Programme

Phase 1 Uptake Project

The Estuaries Research Programme (ERP) began in 1997 with the EMPHASYS project and was designed to improve understanding about processes operating in estuaries and in particular, broad scale modelling techniques which can be applied to estuarine processes. The project Consortium included the following members: Environment Agency/Defra (as the clients funding the project), Posford Haskoning, HR Wallingford, ABPmer (then ABP Research) and Royal Holloway.

One of the deliverables from the EMPHASYS project was a database CD (Figure 1), which was supplied to members of the Consortium only, as a source of data for modelling in estuaries. The project Consortium supplied some of their own data to the database, but other data suppliers were also approached. The CD aimed to include datasets covering the main physical and environmental characteristics in estuaries, such as bathymetry, flows, chemical and nutrient concentrations, ecology etc. The database was supplied under the proviso that it was to be used for the EMPHASYS project only or any new research projects arising from the Estuaries Research Programme. During this initial phase of the project many datasets were identified but not all could be included onto the CD, due to time and technical constraints of the project. However, following the EMPHASYS project, further funding was sought to carry on the work that EMPHASYS had started and to disseminate the knowledge and data to a wider audience and encourage uptake of the ideas and methods.

In April 2002, the ERP Phase 1 Uptake project began, and was again an Environment Agency/Defra funded project. The Consortium of members assigned to deliver the project, had mostly been involved in the first phase. Members of the Consortium were Posford Haskoning (Project Managers), ABPmer (database and best practice), HR Wallingford (best practice), and CIRIA (best practice and workshops). In addition, data suppliers were identified for each of the estuaries and for national datasets.

The aim of the project was to encourage wider uptake of the ERP project ideas and experience through a series of workshops and the establishment of a set of best practice guidelines for carrying out this type of project. Secondly, the database was updated with data which could not be included during EMPHASYS and any additional data which had arisen out of this phase. The new version of the database was intended for wider distribution and has been released into the public domain as the Estuaries Database 2003. The target end users were people working on research projects or for EA, Defra, local authority work or similar 'not for profit' work. Copies of the CD are available from ABPmer at a cost of £44.50 ex VAT.

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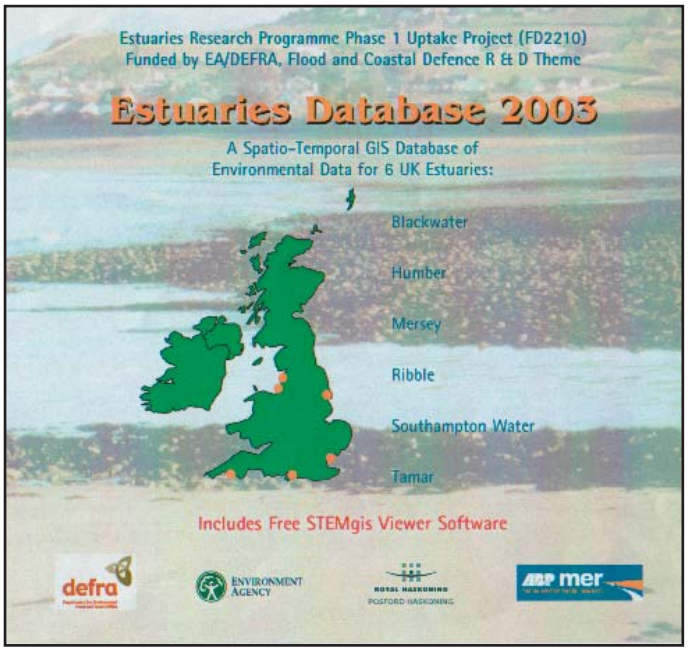

Figure 1. Database CD

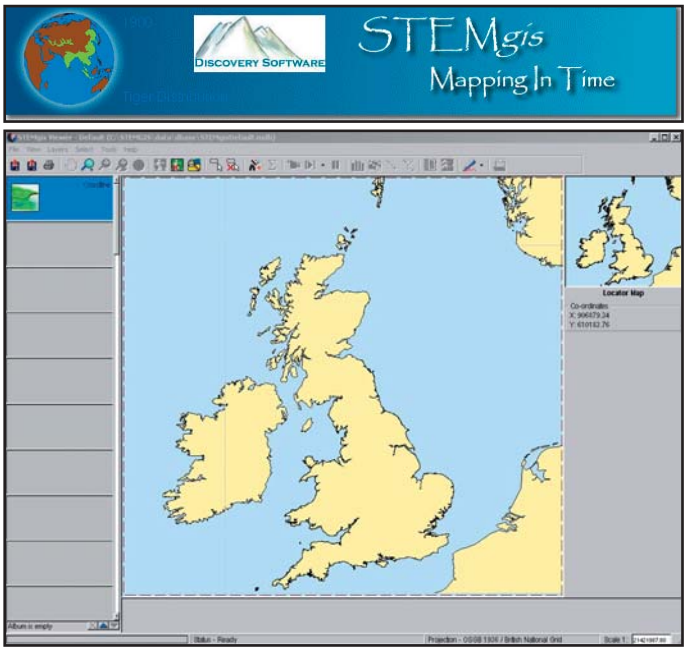

Figure 2. Screen grab from database CD

The Channel Coastal Observatory

The Channel Coastal Observatory is the data management and regional coordination centre for the Southeast Regional Coastal Monitoring Programme. A consistent regional approach to coastal process monitoring has been adopted, providing information for development of strategic shoreline management plans, coastal defence strategies and operational management of coastal protection and flood defence. The programme is managed on behalf of the Coastal Groups of the Southeast of England and is funded by Defra, in partnership with local Authorities of the southeast of England and the Environment Agency.

The Channel Coastal Observatory is hosted by New Forest District Council, in partnership with the University of Southampton and the Southampton Oceanography Centre. Data collection is managed at three regional centres (Channel Coastal Observatory, Worthing Borough Council and Canterbury City Council).

Recent additions to the programme include deployment of 7 new nearshore (<12m) wave recorders. Data are freely available in near real time at www.channelcoast.org. More instruments will be added in the next few months, including tide gauges and met stations.

Important recent programme developments include completion of a GPS control survey and production of high-resolution digital ortho-photos from an aerial survey; these extend from Portland to North Kent. Extensive baseline topographic (beach) and nearshore bathymetric surveys are underway. Development of an online meta-database is nearing completion; this will allow all programme data to be made freely available via the website.

Ongoing developments include an online GIS – which will include aerial photos and survey mapping.

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The Essex Estuaries Local Information System

On the Essex Coast, the Essex Estuaries Initiative, with the support of the EUROSION project, CEFAS and Cardiff University are responding to a long-held demand from coastal stakeholders: '*to improve the opportunities for co-ordinating and sharing information for coastal management.*' The Essex Estuaries Initiative is providing this support through the development of a Local Information System (LIS). The system has two defining characteristics:

- Focusing on providing support information at the Local and Regional Level for implementing Coastal Management.
- Moving from an 'Online Repository of Data' towards a 'Working Information System.'

Coastal Stakeholder Involvement

During April and May 2003 approximately 24 coastal stakeholders participated in 2 half day workshops, the purpose of which, was to bring coastal practitioners together, to identify new ways of sharing information and working together towards the development of a Local Information System for the Essex Coast.

At the workshops participants were introduced to the concept of soft systems modelling. This process involved participants working together to identify the various stages involved in processing a coastal planning application and FEPA (Food and Environmental Protection Act) licence. By breaking the planning and FEPA licensing processes down into different stages participants were then able to identify the various sources of data required at each stage to enable the planning application/FEPA licence to be processed. Over 150 information resources were identified. The results from the group modelling work form useful material for the design of the LIS by helping the developers base the design on user needs and terminology.

(continued overleaf)

(continued from page 23)

As of September 2003 the LIS is in prototype phase, and it is envisaged that it will be tested by users through a series of lunchtime workshops, before the prototype is put online in early 2004.

Interim Lessons for Managing Coastal Information

1. Focus on Coastal Activities not individual datasets.

With so much information overload, users of an information system want more than just a 'keyword search' for individual datasets. The LIS will provide a more intelligent method for a user to gain an overview of relevant information outside their organisation. The key to this is sorting information by coastal management activities. The system is being designed so that when users arrive at the LIS they are greeted with a page, "What coastal management activity are you working on today?" Through a sequence of menus, they are then guided to an appropriate overview of relevant data and information, including: Textual documents, Non-georeferenced images, pictures and video, Tables and statistics, Web links, Organisations and contacts, and Geo-referenced information.

2. Take an Incremental Approach

With the support of the EUROSION project, the LIS will focus on two statutory consent processes: Coastal Planning Permissions, Food and Environment Protection Act Licences. These are important statutory drivers for sharing information on the coast. The project has started with these activities because of the priority for coastal defence schemes along the Essex coast, such as managed realignments, which often have to gain both consents. Other coastal activities will be added to the system as it develops.

3. Provide Guidance for Metadata Entry

The basic contents of the LIS are sets of 'summary info,' called 'Metadata,'

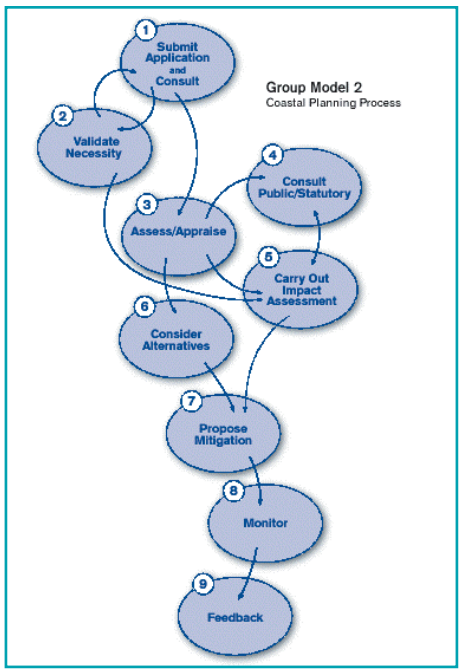

Figure 1. Workshop Output: Stages for Generating and Collecting Information in a Coastal Planning Application

about different information resources. The EUROSION project has provided a metadata entry tool for participants, http://herakles.fzi.de/CatalogServer/index.jsp

However, many coastal stakeholders are not IT specialists, and inputting metadata has been more problematic than expected. The project has had to adjust its expectations and take a hands on 'hand holding' approach to explain why metadata is important and help stakeholders complete the different fields. No one really enjoys creating metadata but it is needed for good housekeeping of information resources. The EUROSION project has developed a coastal standard based on existing metadata standards for European-wide use, which the Essex LIS uses.

4. Build a Human Network with the Technological Network

Too often on the UK coast, information systems have failed because the developers have sought to establish a 'virtual community' before the different coastal stakeholders are actually communicating with one another. The Essex approach, using workshops, has focused on the importance of developing personal contacts. The development of the system has occurred in the context of 4 years of existing work on the topic of coastal information. In 1999 a Research Workshop was held on the Essex Estuaries that sought to identify the research priorities for the European marine site. The research workshop concluded that there is much information already in existence but that it could be better used. In 2000 an Information Workshop was held, which prioritised improved collaboration between organisations and led to the establishment of the Essex Estuaries Information Network in 2001. This Information Network will be key to maintaining working relationships which are the basis for exchanging information, and providing quality assurance for the LIS to avoid the "rubbish-in, rubbish-out" syndrome.

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Thames Estuary Information Exchange System

The Port of London Authority (PLA) is the licensing authority for maintenance dredging operations in the River Thames and Estuary, some 150km in length. In recognition of the growing environmental awareness amongst river stakeholders and also the desire to work towards a transparent decision-making process, the PLA, together with the Thames Estuary Partnership (TEP), initiated the development of an Information Exchange System (IES). The concepts behind the IES are to bring together stakeholders as partners in the decision-making process, to share information and to produce an excellent baseline of relevant environmental data for the Thames. The partners include, amongst others, the Environment Agency, English Nature, RSPB, Kent and Essex Sea Fisheries Committee and two dredging companies, with the TEP providing administrative support and a neutral forum for discussion.

The PLA carries out a scientific and environmental assessment of each application for maintenance dredging within the limits of the Port of London. The assessment includes the potential effects on legislative requirements, coastal processes, sediment quality, water quality, ecology, fisheries, archaeology, local community and recreation with a summary being recorded in the PLA's Environmental Checklist.

The assessment is informed by the IES which provides details of environmental sensitivities in the vicinity of dredge sites. The PLA's Environmental Scientist uses the IES, together with information about the proposed dredge, to inform decision-making on consultation requirements for an individual project.

The IES is being developed as part of a number of initiatives in the PLA's Maintenance Dredging Framework including a beneficial use register, environmental monitoring and research and guidance notes for berth operators. It has been created using Cadcorp ASC (Active Server Component) Software and is deployed over the Internet.

The data have been supplied by members of the DLG to include dredged sites within the Thames (dredging companies), water and sediment quality data (Environment Agency), information about fish and shellfish (Kent and Essex Sea Fisheries Committee), and environmental designations e.g. SSSIs and SACs (English Nature). Each partner has agreed to provide updates to their data every quarter; they remain the owners of the data and are responsible for keeping the system current.

Facilities within the system allow the user to search for a specific dredge site, either by name or by using the map, and then display the environmental information that is applicable to that site. This allows the user to find the necessary information to inform decision making regarding the effects of maintenance dredging on the surrounding area. The interface also uses the standard GIS tools for zoom, pan and measurement and allows the environmental data to be queried.

As the IES is used further developments and enhancements are completed based on feedback and additional data becoming available. Data to be added in the future includes bird count data from the RSPB and fisheries data for the upriver sections from the Environment Agency.

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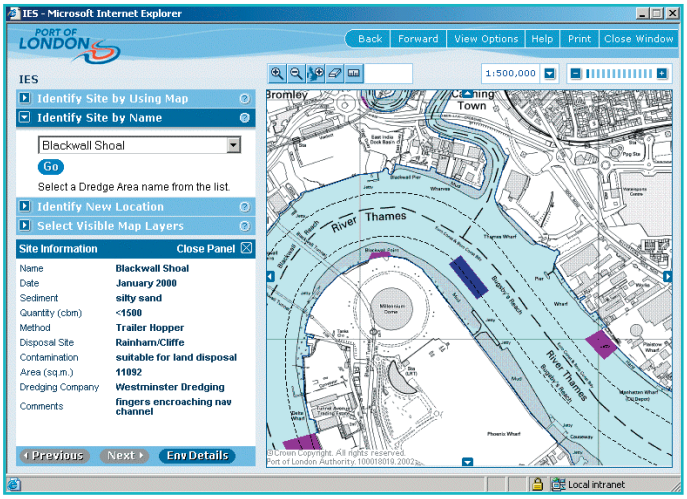
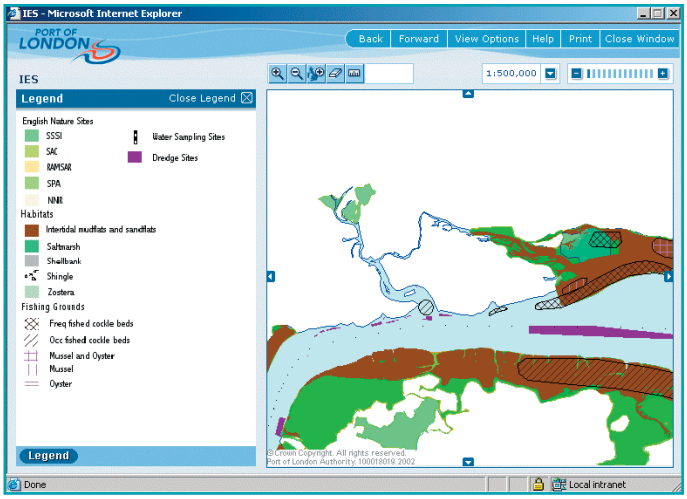


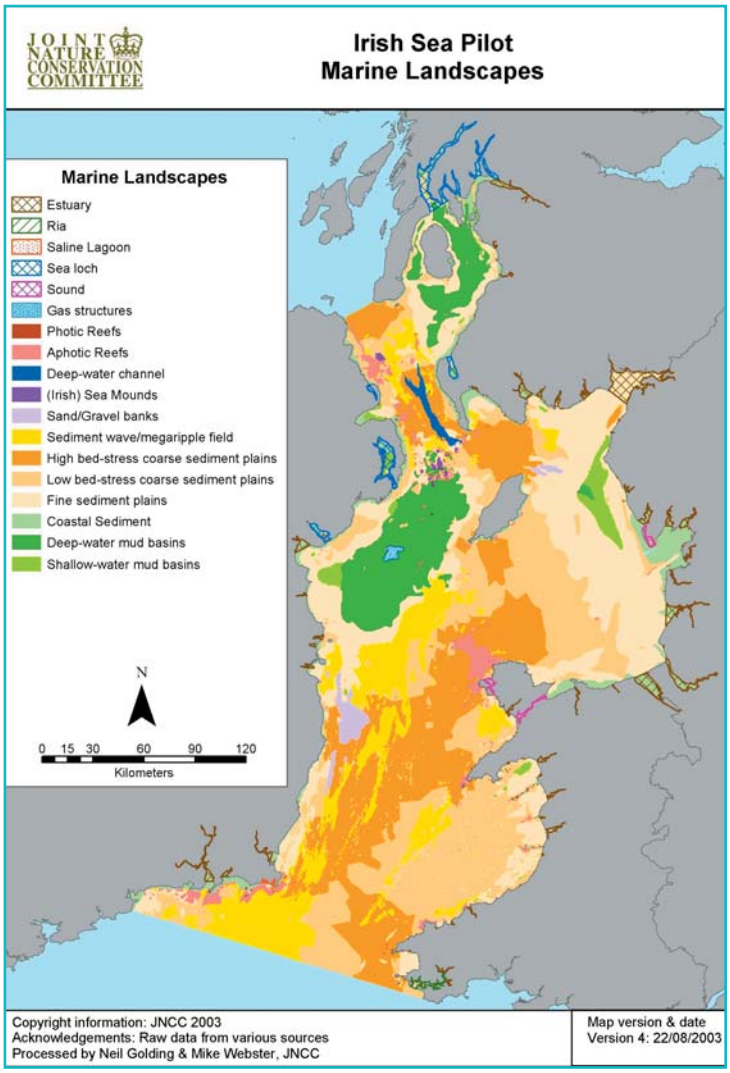


Figures 1 and 2. Screen grabs from the Thames Estuary IES

Irish Sea Pilot: GIS and mapping

The Irish Sea Pilot was set up to investigate ways of managing the marine environment at a regional sea scale using an ecosystem based approach. It is testing a marine nature conservation framework, which proposes the use of a series of nested geographical scales for management of the marine environment. These are the whole (regional) sea, marine landscapes, special or high biodiversity areas, habitats and species.

The pilot has collated and mapped a large number of datasets covering physical, hydrographical, ecological, conservation and human activity data. A report on the data collation task with conclusions and recommendations for data management in the UK is now published on the web site. The project team welcomes feedback on this report.



A key output from the mapping work is the classification of the Irish Sea into a set of marine landscapes (also called ecological units seabed types or physiographic units) distributed as shown in the map (above right). This map is also available for download on the web site in a paper describing the classification method and purpose of marine landscapes. The analysis has been undertaken using physical data such as sediment types and bathymetry and further refined using water column parameters including currents, salinity, temperature and frontal systems.

The map of the ecological units allows us to view the marine environment at a scale, which on land would be a 'countryside map' of the seabed. It shows the seabed equivalent of, for example, mountains, moorland, forests and grasslands on land. The map shows 18 ecological units or seabed types so far identified in the Irish Sea, including sediment types, physiographic features and landscapes with high or low current forces. Achieving this classification marks an important milestone for the pilot because it shows that there is sufficient information (for one regional sea at least) to undertake an effective analysis at this scale.
Marine landscapes provide a scale between whole regional seas and local special areas or designated sites, with a variety of potential uses for (spatial) planning and management. The next stage is to try and identify the habitats and species associated with each ecological unit. We want to investigate how well they can be used to predict the natural biodiversity resources of a regional sea with a view to extending the approach to other UK seas. This test of the classification will indicate the extent to which marine landscapes can form a basis for identifying and managing nature conservation resources or as a backdrop to future marine spatial planning programmes.

The pilot is now moving into its final phase when reports with conclusions and recommendations will be prepared. A number of interim and consultants reports, including those mentioned above, have been placed on the web site for comment to give stakeholders the opportunity to influence the final reports:

- The identification and mapping of nationally important habitats and species of the Irish Sea
- Draft conservation objectives covering all the important nature conservation features of the Irish sea – ecological units, habitats, species, and special areas.
- A review of marine legislation, enforcement and governance. A draft report summarising UK marine legislation is now available. Comments on this report would be welcome so we can ensure it is as accurate as possible; please contact the project team to receive a copy by email.

- A study of conservation mechanisms, which might be suitable for use in the Irish Sea to protect valuable nature conservation features.

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GMES: The European Space Agency and the UK Coast

In April this year, representatives from 10 industry consortia met to plan the next phase of the European Space Agency's (ESA) contribution to the Global Monitoring for Environment and Security (GMES) programme.

At a global level, GMES will provide new verification tools to contribute to the precise monitoring of compliance with international agreements, such as the Kyoto protocol on climate change, as well as security and international aid agreements. At the EU regional level, GMES will provide objective data to support a broad range of public policies, including regional development, transportation, agriculture and foreign policy. GMES also will help local authorities pinpoint environmental problems and minimise the risks and consequences of environmental changes on local populations.

GMES is a cornerstone of the unified European space strategy developed by EC and ESA. Along with the Galileo global satellite navigation system, GMES is key to the realisation of a unified space policy emerging from the ever-closer partnership between the two organisations.

Each of the 10 consortia will start delivering services immediately, and will back this up with a blueprint for delivering long-term monitoring. Two of the GSE thematic services target marine and coastal users. 'ROSES' is focused on the open ocean and 'COASTWATCH' is focused on the coastal zone. The first two phases of COASTWATCH are dedicated to the provision of information in support of two policies driving management of coastal resources: the EC ICZM Recommendation and the EC Water Framework Directive.

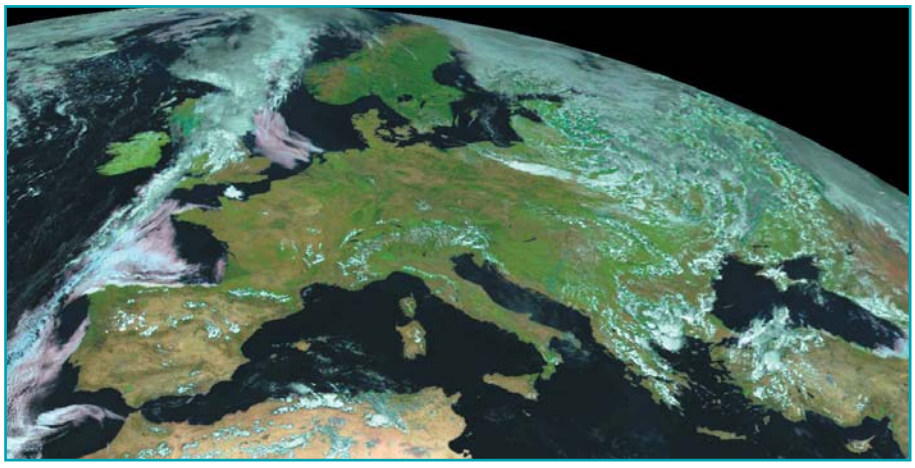

Photo courtesy of EUMETSAT

The use of satellite data to help manage the coastal zone is not new, and indeed it is fair so say there has been a mixed response to its usefulness in the past. A reason for this has been the 'take it or leave it' approach to information supply. Accordingly, COASTWATCH is strongly focused on *service*, giving the customer the data they want, in the form they want, when they want it.

As such, COASTWATCH is not a project in the traditional sense, nor is it a cartel of information suppliers. Its funding is used to establish a sustainable entity to deliver satellite-based data to the policy driven information sector. Accordingly, a key component of the project is to foster the dialogue between 'users' and 'providers'. This means that users can make requests for the information that COASTWATCH supplies and any organisations that deliver services can become a certified deliverer of COASWATCH data products. In essence COASTWATCH is brokering a 'win-win' for all organisations in the coastal zone information supply chain.

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ICZM in the UK: A Stocktake

Defra are currently embarking on a stocktake of ICZM issues and initiatives in the UK. This is due for completion in March 2004. Details of the project structure, team and communications framework are set out in the project Scoping Report and Communications Report (www.defra.gov.uk/environment/marine/iczm) along with the latest progress newsletter and questionnaires which are being used to disseminate and receive views from a range of stakeholders. Continued support and participation is encouraged on the project.

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Position Review of Data and Information Issues within Flood and Coastal Defence (FCD)

All aspects of the flood and coastal defence process require effective data and information to undertake inspection, design, monitoring, forecasting and appraisal. The purpose of this research project is to understand the efficiency of current data and information practices and what opportunities exist to improve the flood and coastal defence processes by identifying:

- The right information
  Do we measure the right things?
- The management of information
  Who does what and how well is it done?
- Information policies and procedures
  What policies and procedures help/hinder efficient use of data and information?
- Information technology
  Do we use appropriate technology for data capture, processing and dissemination?

The output of the project is to determine where these limitations can be matched with, where possible, quick fixes and improved uptake of ongoing research and initiatives.

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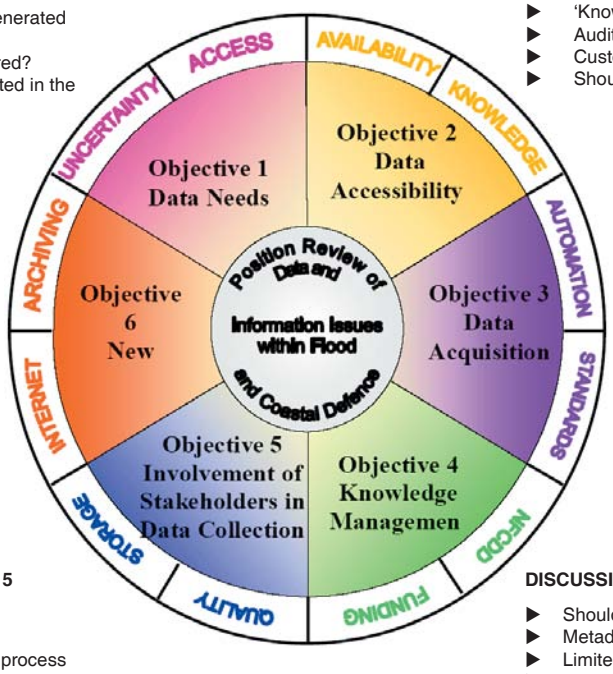
DISCUSSION POINTS ON OBJECTIVE 1

- Data needs relate to information generated
- It is an iterative process
- What is the value of the data required?
- What needs to be captured/generated in the FCD industry

DISCUSSION POINTS ON OBJECTIVE 2

- 'Knowledge of Data' – who articulates this?
- Audit/traceability
- Customers responsibility
- Should data format be a key issue?



DISCUSSION POINTS ON OBJECTIVE 6

- INTERNET
- Archiving
- GIS harmonising & Integration
- Remote sensing – terrestrial & marine
- Technology both now and in the future.

DISCUSSION POINTS ON OBJECTIVE 3

- Regional Centres of Experts – would this help?
- A phased approach looking forward in time
- Introduce 'Uncertainty' in data acquisition
- Route Map for where to acquire data

DISCUSSION POINTS ON OBJECTIVE 5

- Role of Industry (communication)
- "Cost" of involving stakeholders
- How to manage stakeholders in this process
- Provision of practical examples/advice

DISCUSSION POINTS ON OBJECTIVE 4

- Should centralised databases be used?
- Metadata – psp discovery
- Limited resources – how do we deliver?
- Skill shortages within the industry

Summary of the questionnaire and workshops responses received from the 24 April 2003 event

Foresight Activities in Flood and Coastal Defence

In the 3rd phase of the UK Office of Science and Technology (OST) Foresight programme, the previous sectoral and thematic panels have been replaced by a rolling programme of projects. These projects have certain characteristics: they tackle issues that look ahead at least 10 years; are driven by science and technology; have outcomes that can be influenced; are not covered by work carried on elsewhere; require an inter-disciplinary approach and command support.

The rolling programme has 3-4 projects at any time. Each project: lasts 9-18 months; has 3-4 dedicated OST staff; has a budget of £200-500k; has a senior project Director. All projects have a top-level stakeholder group chaired by a Minister. Two pilot projects were launched in March 2002. These were (i) Cognitive systems and (ii) Flooding and Coastal Defence. New projects launched in March 2003 were (a) Cyber trust and crime prevention and (b) Exploiting the electromagnetic system. The fifth project, Brain science and drugs, will be launched later this year (see www.foresight.gov.uk).

The aim of the Flooding and Coastal Defence (FCD) project is to produce a long term vision for the future of flood and coastal defence and is a Foresight project because: £214 billion of assets (including 2 million households) at risk; £400 million spent on flood defences each year; defences have a long lifespan so need to look ahead to invest well; future planning is difficult because of future uncertainties including climate change, changes in land use, changes in distribution of property and people.

The FCD project uses scenarios as tools to achieve its objectives. These scenarios involve both societal and climate change issues. The project is in its third and final phase which involves consideration of five categories of response to specific critical risks. The work packages include one involving science and technology which aims to identify knowledge and technologies that might be transferred from other sectors and inform long-term needs for future research.

In addition to the OST Foresight FCD project described above, the Foresight Marine Panel (yes, the previous sectoral panel does still exist and is active) has been involved in a flood and coastal defence activity for some time. A specific current project is examining the feasibility of major wave attenuation devices as a contribution to coastal defence, whilst at the same time generating electrical power from renewable energy devices. The prime case study involves Bridgewater Bay and the project has been encouraged and part-funded by the South-West Regional Development Agency (SWRDA). Other funds have come from Somerset County Council, North Devon and Somerset Shoreline Management Group, Halcrow Group Ltd and the Foresight Marine Panel itself (which is jointly funded by a number of industrial and commercial concerns who added to the previous OST financial support). The feasibility study is currently underway.

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Virtual Partnership Forum

The Virtual Partnership Forum has been developed by the Data and Information Exploitation Unit (DIEU) at the Environment Agency to build upon the success of the Data Partnership Forum held in Solihull in February 2003.

The Agency has been forging links with other Government bodies and organisations in the not for profit sector to disseminate its information more widely.

The aim of the forums is to develop a multi agency approach to issues by bringing together representatives of those organisations in an arena where topics can be discussed and understood by a wide range of participants at a technical level.

Initially the focus is on developing a better understanding of the different pressures placed upon these organisations by their constitution, to share and develop best practice when dealing with the wider dissemination of information. Consideration of the issues relating to interoperability in the future of information exchange will be a key topic.

In the longer term there is potential for much closer working relationships between the participants who are all important data providers. This will lead to the development of partnerships to create joint products and services to benefit UK plc.

The interest generated by the initial meeting in Solihull proved that there is a great deal of interest in this area of work and it should provide a valuable resource to all the organisations involved, providing a mechanism for the sharing of ideas and knowledge.

The Agency is hosting the 'Virtual Partnership Forum' for an initial pilot period to prove the concept and assess the viability of continuing hosting and further development of the facility in the future.

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The Coastal Information Network

Following the 1999 Defra workshop[1] (see page 1), the Inter-Agency Committee on Marine Science and Technology's (IACMST) Marine Environmental Data Action Group (MEDAG) held a special 'coastal' meeting to explore ways of addressing the issues raised at the workshop. One of the ideas proposed was the creation of a new coastal co-ordinator role to help achieve this as well as broadening the scope of the existing IACMST Marine Environment Data activity to include the coastal zone. Further discussions led to Defra agreeing to support the position financially and I took up post in November 2002.

The Coastal Information Network, and associated Coastal Information Team, were created in December 2002 under the auspices of the IACMST and MEDAG. The team, chaired by Professor Mike Cowling (IACMST and University of Glasgow), meets on a regular basis and currently comprises Frances Franklin and myself from CEFAS, Lesley Rickards from the British Oceanographic Data Centre, Tim Sawyer and Mike Rose from the Environment Agency and, periodically, representatives from the IACMST and Defra.

Since its inception, the Team's activity has focussed primarily on raising awareness amongst stakeholders of existing and future marine and coastal data and information projects, and improving access to coastal datasets. To this end, the Oceannet website (www.oceannet.org) hosted by the British Oceanographic Centre has been modified to include an up-to-date, searchable database of UK and international initiatives relating to coastal data collection and management. The current coastal metadata catalogue is being expanded to include additional datasets from CEFAS and the Environment Agency, and is to be further developed to provide a definitive, user-friendly source of information on who is undertaking what, where and why in the UK coastal and near-coastal area. It is envisaged that this resource will be available within a few months.

The Team is also seeking to address one of the major issues in this arena by developing a mechanism by which access to those baseline datasets most commonly required by a number of organisations would be improved. In the current climate, coastal and near-coastal data and information are scattered across a variety of government departments and agencies, other public bodies, NGO's and commercial organisations. Often new initiatives and projects involve extensive and costly data and information collation and synthesis, with consequential repetition of effort. Organisations frequently require essentially the same data, but collate them separately, sometimes with uncertainty regarding data quality. This would be unnecessary if there was a single approved source of these baseline geospatially-referenced data.

Over the past few years, changes in government attitudes to information, and new legislation regarding the availability of environmental data, means that it should now be possible to provide a uniform access route to many readily available data products. Therefore, in addition to the current ongoing activity, the Coastal Team's longer-term objective is to develop a web-based resource to provide 'static' spatial information relating to coastal and near-coastal areas. This will include, for example, designated conservation areas, bathing waters, heritage sites, dredging and disposal sites, and oil and gas structures. These data and information are required for Shoreline Management Plans and can be added to in the future. In choosing these two applications the Team will ensure that the widest spectrum of users possible benefit from the resource and will be more likely to subscribe to it in the longer term.

To create the proposed resource it will be necessary to secure a commitment to the activity from a variety of major data holders, including assurances to provide access to quality assured, updated data. In order to achieve this the Coastal Team will be facilitating dialogue in the coming months between key government departments and other data holders, and actively encouraging expansion of the coastal team membership and the development of a business plan for these projects.

[1] *Copies of the 1999 and 2002 workshop reports are available for downloading from the Coast Map News website www.cefas.co.uk/coastmap*

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