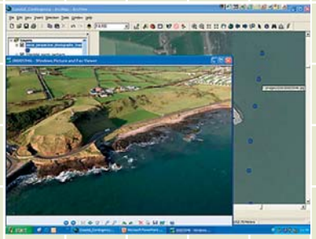
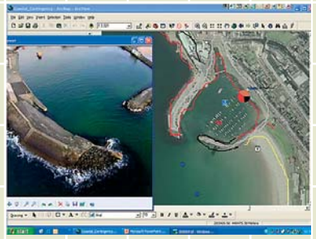
ESRI Ireland
VISIONARY THINKING



Aerial photography taken from oblique angles



Coastal Contingency Planning – Ortho Map and Aerial Photographs

Although pollution incidents can not be readily predicted, contingency planning is undertaken by the Agency. This is where the analytical capability of ArcGIS has been particularly valuable. The system has been used to create charts and graphs showing the characteristics of the Northern Ireland coastline section by section. Users are able to view shoreline soil substrate types and as a result determine the type of clean up response required for that particular substrate type. This allows the Agency pre-determine likely appropriate responses to various incident types thereby feeding into the rapid response at the time of an incident.

Benefits

The Enterprise GIS environment delivered on time and within budget by ESRI Ireland has enabled the Coastal Survey Team at EHS to represent more than 40 layers of data spatially, to see spatial patterns emerge and in effect, to make informed decisions in planning their response to minor and major shipping incidents such as ship spillages, ship accident 'black spots' and ship traffic density of the Northern Ireland Coastline.

Following on from the success of the Enterprise environment ESRI Ireland have now been requested to examine the potential of using ArcGIS Desktop's inbuilt GeoProcessing Framework and Model Builder environment to construct a computer model that would allow EHS to evaluate risk more objectively. The ability with ArcGIS Server to publish such models on the Internet brings additional by enhancing the Agency's effective consultation with major external stakeholders such as councils, port authorities, clean-up contractors and waste management companies who will be able to collaborate interactively over the internet using the model.

'The outcome has been extremely useful – the user-friendly desktop data management and planning tool has been as good as, if not better than, we had originally hoped for prior to the project completion', remarked Conor.

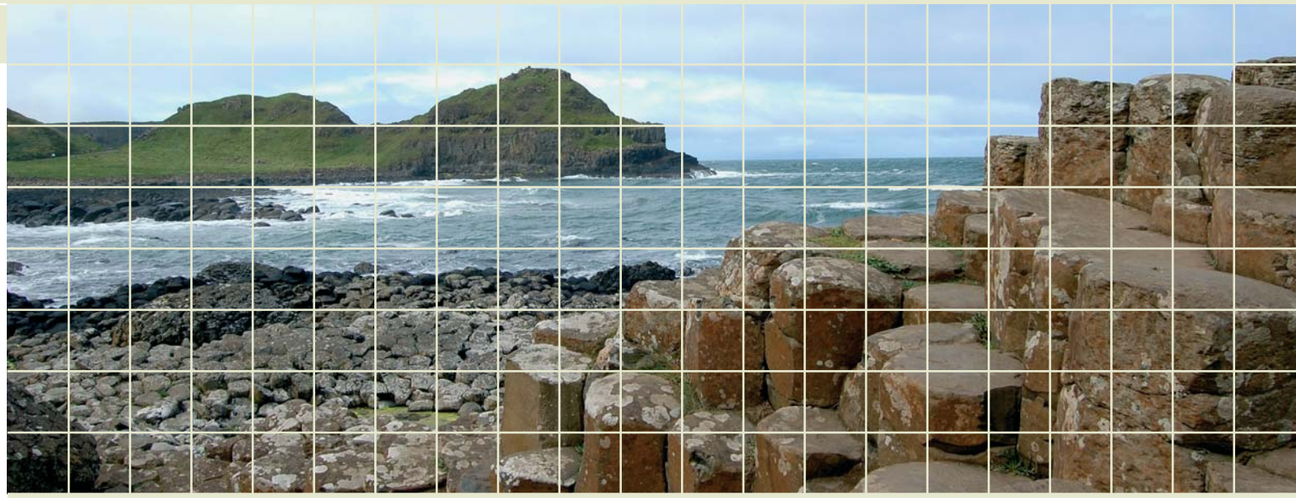
'One of the most pleasing aspects of the finished article is that it has an in-built versatility because not only is it loaded onto the SDE server within EHS and therefore can be shared across the agency, but also it has offline capabilities meaning that the datasets and tools can be utilised in the field using a notebook PC and an external HDD, without being connected to the EHS network. I believe we have led the way within EHS in this respect as other teams within the Agency have expressed an interest in following the model of data management enshrined in the Coastal Contingency Planning GIS.'

Dublin Block B Ashtown Gate Navan Road Dublin 15 Ireland T +353 (0)1 8693900 F +353 (0)1 8693901
Belfast The Mount 2 Wood Stock Link Belfast BT6 8DD Northern Ireland T +44 (0)2890 730165 F +44 (0)2890 730167 **www.esri-ireland.ie**

ESRI Ireland
VISIONARY THINKING

Delivering solutions to the

Environment & Heritage Service

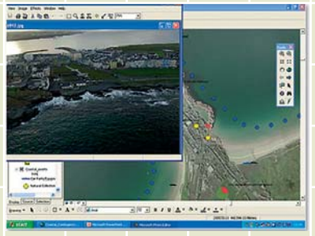


Case study

Visionary thinking delivered

Enabling effective Coastal Contingency Planning for Northern Ireland

EHS were faced with the challenge of migrating all of their spatial information to a GIS platform – Why? so they could communicate this information to local authorities, port authorities, other government bodies, clean up contractors and waste management companies who all play a part in the response to a major coastal pollution incident



Coastal Survey Images accessed through a hyperlink

Spill Tonne Results and ship ran aground – Strangford Lough

> "The outcome has been extremely useful – the user friendly desktop data management tool has been as good as if not better than, we had orginally hoped for prior to project completion."
>
> Conor Symington, EROCIPS and Coastal Contingency Planning Officer, EHS.

The Client

Environment and Heritage Service (EHS) is the largest Agency within the Department of the Environment in Northern Ireland, with approximately 700 staff. EHS takes the lead in advising on and in implementing, the Government`s environmental policy and strategy in Northern Ireland. The Agency carries out a range of activities, which promote the Government's key themes of sustainable development, biodiversity and climate change. Their overall aims are to protect and conserve Northern Ireland`s natural heritage and built environment, to control pollution and to promote the wider appreciation of the environment and best environmental practices.

EHS is the body responsible for co-ordinating the response to any pollution incident which may affect the coastline of Northern Ireland and is a partner in the EROCIPS Project (Emergency Response to Coastal Oil, Chemical and Inert Pollution from Shipping) jointly funded by EHS, Interreg IIIb of the European Union and the Department of Communities and Local Government.The EROCIPS project aims to develop 'a transferable methodology that communicates relevant information to responders and decision-makers involved in shoreline counter pollution operations following a shipping incident.'

In the context of EROCIPS, a shipping incident is considered to be the large-scale accidental discharge of hydrocarbons, chemicals, or inert material (timber, plastics, etc) carried as cargo, into the coastal marine environment. The incident may result in contamination of coastal habitats and/or pollution damage to the natural, human and built resources they support.

The Challenge

The EHS is the repository for a diverse range of coastline information concerning for example, vehicle access points, pedestrian access points, equipment laydown areas, waste water treatment discharge points, coastal assets, booming sites and National Trust areas - in total over 40 distinct types of data. This information is held in both hard and soft copy formats, sitting in disparate locations throughout the Agency. On examination it was found that all this information had a spatial component and as a result it was decided that a geographical information system (GIS) was the ideal platform on which to integrate and communicate this data.

The challenge was to migrate all this information to a GIS platform that would enable the EHS Coastal Survey Team integrate all the information they held on coastal assets and communicate this information to external stakeholders such as local councils, port authorities, other government bodies, clean-up contractors and waste management companies who also play their part in the response to a large incident.

Conor Symington EROCIPS and Coastal Contingency Planning Officer at the EHS commented 'In 2002 I was tasked with compiling the data required to populate the data directory component of a Coastal Contingency Plan for Northern Ireland. I spent the next 18 months or so out on the coastline carrying out surveys of all aspects of the physical coastal environment and liaising with a large variety of external and departmental agencies in order to draw together all the requisite datasets. My thinking at all times was towards producing a GIS-enabled set of layers and maps of all the data so that responders during a major coastal pollution incident (e.g. from a shipping casualty) would have at their fingertips all the necessary data and tools to mount a timely, effective and appropriate response to the incident facing them. So when ESRI Ireland came on board we were able to begin work together to construct the GIS as was specified in the initial plans'.

The Technology

ESRI Ireland was engaged to advise and assist EHS in building a GIS platform to meet their needs under the EROCIPS Project. In order to meet the objectives of the Agency a requirements analysis was carried out by ESRI Ireland. The analysis considered:

- the nature of existing datasets and their readiness for inclusion in GIS
- how to collect new information and collate this information for ultimate use within GIS
- how to synchronise and share information of common interest to multiple business units within the Agency
- the technical specification of a GIS hardware and software platform that could store, integrate, analyse and communicate these data

As well as facilitating this process ESRI Ireland contributed their experience from similar projects to assist in the requirements validation process and made appropriate recommendations to the Coastal Survey Team & EHS on best practice in spatial data management.

Following the Requirements Analysis a decision was made to build upon the Enterprise GIS environment already implemented within EHS, by ESRI Ireland.

This solution is based on the ArcGIS 9 technology suite and utilised ArcGIS Server for the management, visualisation and dissemination of spatial data. ArcGIS Desktop (ArcEditor) clients are used for desktop visualisation, analysis and data capture.

ArcGIS Server is a server software product used to store and serve massively large multi user geographic databases stored in relational database management systems (RDBMSs). It is an integrated part of ArcGIS 9 and a core element of any enterprise GIS solution.

ArcEditor is a professional GIS desktop system as well as one of the core products of the ArcGIS 9 technology suite. Using ArcEditor the Coastal Survey Team and other users at EHS could understand the geographic context of their data. Thus allowing them to see relationships and identify spatial patterns in order to make more informed decisions regarding the environmental management of the Northern Ireland coastline.

Solution & Capability Delivered

The solution was delivered through the development of an online spatial data catalogue served from ArcGIS Server. Using ArcGIS Desktop any user can now access and visualise all base mapping from Ordnance Survey Northern Ireland – including all large scale mapping and aerial photography, in conjunction with Coastal Survey Team's very own business layers that include hyperlinks to additional non-spatial data.

Rapid response is key to the effective management of any pollution incident. With the simple click of a mouse on a digital map, the Agency's incident managers can now access all relevant information such as the harbour booming plans for Belfast Lough, where booms would be erected in the event of a disaster, ground level photographs, additional aerial perspective photography (taken at oblique angles by coastal marine helicopters) and various vector datasets. Access to hyperlinked photographs of harbour piers, beach entrances, slipways and other coastal assets will allow the Coastal Survey Team to ascertain the likely specifics of deploying beach cleaning equipment at the best possible vantage points.