

Free Data onto the Web

Base data used in the development of marine mapping products are generally not made freely available and are normally at a price that is decided on by their owner. The Irish government has taken the decision to allow free access to all of its digital marine raw data. This poses the problem of how to best achieve this, given the large sizes of these individual units of data. This article lists the objectives of the Irish marine mapping programme and outlines the system devised to meet these objectives via web data distribution.

The Integrated Mapping for the Sustainable Development of Ireland's Marine Resource (INFOMAR) programme is Ireland's national marine mapping programme. It is the successor to the Irish National Seabed Survey (INSS) and is a joint venture of the Geological Survey of Ireland (GSI) and the Marine Institute (MI).

The INSS was undertaken between 1999 and 2005. The initial scope of the INSS, for which EUR27 million (USD42.59 million) was allocated, was to survey and map all of Ireland's territorial waters. At an early stage of implementation, the project scope was revised to the mapping of the entire Zone II (water depths from 50m to 200m) and Zone III (water depths from 200m to 4000m) areas. The final cost of the INSS was EUR32 million (USD50.48 million).

The focus of the INFOMAR programme, therefore, is to create a range of integrated mapping products of the physical, chemical and biological features of the seabed in the near-shore, or Zone 1 (from 0 to 50m) area, thus completing the mapping programme for the entirety of Ireland's territorial waters.

The INFOMAR programme, which commenced in 2006, was initially designed to be completed over a 20-year period, with an associated cost of EUR84 million (USD132.51 million). As part of the INFOMAR strategy, priority has been given to the surveying of 26 bays and three priority areas during the first 10 years of the programme's operations.

Funding of EUR4 million (USD6.31 million) per annum was allocated to the INFOMAR programme for the period 2006–2008. The INFOMAR programme has subsequently been incorporated into the National Development Plan (NDP) 2007–2013, with the same annual budget of EUR4 million (USD6.31 million), i.e. EUR28 million (USD44.27 million) to 2013. It is also listed in the Strategy for Science, Technology and Innovation (SSTI) as a Key Action under the Marine component of Research in the Public Sector.

There are three major programme components of the INFOMAR, and a summary of the overall programme is given in Tables 1–3.

Initiative

The Irish Government announced on 21st February 2007 that open and free access to all of this digital data would be made available over the internet by the end of 2007. A web presence already existed for various aspects of web data management and dissemination:

- data discovery: general GSI webmapping viewers via an INFOMAR-specific webmapping viewer
- frequently asked for pre-zipped shape files of data for direct download
- metadata discovery.

All of these sites have serviced the needs of the public looking to use spatial representations and metadata about the data.

However, none of these sites provided facilities for the public to browse a catalogue of all the available data and then to download onto their own machines their own raw data selections from that catalogue.

The INFOMAR team set about creating just such a web interface that would meet the specified commitment of their parent government department (Communications, Energy and Natural Resources (DCENR)) for free web access to data, as well as the public appetite for the same. An official EU journal tender process called 'ITT 2006/04 IWDDS' was carried out and, following on from it, Intrepid Geophysics of Australia was chosen as the Interactive Web Data Delivery System (IWDDS) developer to carry out the application development part of this new interface. The Higher Education Authority Network (HEAnet) Ltd, with its data centre in Blanchardstown, County Dublin, was chosen as the service provider to house and deliver this hardware and software. HEAnet is a world-class provider of high-quality, broadband internet services to Ireland's universities, institutes of technology, and the research and educational community.

The implementation solution, put forward by Intrepid Geophysics of Australia, is not a very complex one. It is flat file based, with the files themselves being converted into a standardised binary format in order to more easily facilitate storage, data mining and retrieval. It had the added advantage that given the relatively short time-span for implementation, all of the files could be converted in batch mode through automated converters that were provided for the task by Intrepid. The structure of the web interface affords the user a very basic map covering the entirety of the Irish land and sea area. The user can then choose by coordinate map extent, by map number if they already know the area well or by arbitrarily drawing a map-extent box on the map. When the user is happy with their selected area, they then proceed to the thematic choice page. The user then picks the combination of themes to act as search criteria within their chosen area from the initial page. The IWDDS data mines the data store using the user's chosen criteria and area of interest, and returns a listing of all of the data it contains of that type within that area. The user can browse through and preview this listing. After making selections for parts or all of the data listed, the user can commit their data request. The request gets queued for action by the system. When the request has been acted upon and completed by the system, the IWDDS then e-mails the user who made the request, giving them a secure FTP link to

download the data.

The IWDDS went live on 1st June 2007 with this initial basic functionality. Since then, the development team has been working on ironing out the inevitable teething problems that a system such as this generates. The system has stabilised very quickly and this has allowed the developers to enter into the second phase of the development, namely, to enhance the functionality with features such as end-user map creation on the fly and end-user on-the-fly gridding of the XYZ data sets. This added functionality was made available via the system at the start of Q1 2008.

Following on from another E-Tender process, Unitech Systems Ltd was chosen as the hardware provider to provide the required IT infrastructure. The application server element of the system is an IBM x3850 server running MS 64-bit Win 2003 operating system with 32Gb of RAM and 500Gb internal hard drive, giving the system the necessary capacity to host, search and queue substantial numbers of user queries. The disk space element of the system is an IBM DS4700 storage server with 7-Tb disk space capacity helping to underpin this application.

Presently, 2Tb of INFOMAR data covering Ireland both onshore and offshore acquired at a cost of EUR32 million (USD 50.48 million) are available free to download. As more data are acquired in the Irish offshore in waters less than 200m deep, they will also be made available via the same system. There have been over 12,000 individual data downloads from the system in the first 7 months of operation and it now has 229 individual registered users.

The system cost approximately EUR430,000 (USD678,340) in total to implement, inclusive of all software, hardware and consultancy.

To our knowledge, this system is one of a very small group of systems available throughout the world where free web access to a data-store of this extent is allowed.

<https://www.hydro-international.com/content/article/free-data-onto-the-web>
