

Geological Survey of Ireland

Highlights 2010



Photo by Jonathan Moran

CORE POLICY GOAL

To maximise the benefit to Ireland of providing high quality geoscience information to customers, in a cost effective manner, that is relevant to the sustainable economic development of our natural resources and the wider societal issues concerning environmental protection and quality of life.

Strategic Objectives

- To support the sustainable development of Ireland's earth resources (minerals, hydrocarbons, energy, rocks, soils, water and landscapes).
- To provide reliable geoscience support for environmental protection and effective spatial planning.
- To complete strategic geoscience surveys in priority areas (both onshore and offshore) in response to the needs of specific sectors and customers.
- To support the knowledge economy through the provision of open access to modern geoscience databases and through supporting priority research themes and educational services.

STRATEGIC SURVEYS

Progress in Mapping our seabed

INFOMAR, the nearshore programme of seabed mapping being undertaken jointly with the Marine Institute, had another successful season in 2010. It was designed to create integrated knowledge of the physical, chemical and biological resources of our extensive seabed. Commenced in 2007 as part of the



National Geoscience programme (2007 – 2013), it reached the mid-point of Phase 1 in 2010 with the mapping of 13 priority bays and half of the designated priority areas successfully completed on target. A combination of airborne lidar surveys, RV Celtic Voyager surveys in the Irish Sea and RV Keary surveys in Kinsale harbour, Mannin Bay and the wider Dublin Bay area contributed to this coverage. The RV Keary is proving invaluable as a cost-efficient inshore survey vessel.

The open access to INFOMAR data continues to support an impressive range of spin-off research projects and serves to underpin new business development in the marine area. Much of this work was showcased at the Geoscience 2010 conference in November at Dublin Castle when an entire day was devoted to INFOMAR and marine-related presentations. An Atlas of the Deep Water Seabed: Ireland, authored by scientists at University College Cork and GSI was published by Springer and launched at the conference. At year end tenders were prepared to engage new contractors under INFOMAR and related EU-funded marine projects in which GSI is a partner (EMODNET through DG Mare and GEOSEAS through FP7).

TELLUS Border Funding Achieved

Towards the end of 2010, GSI and GSNI together with researchers at Queen's University and Dundalk IT were awarded €5m funding over a 3-year period under Interreg IVA to undertake the TELLUS Border project which will acquire high resolution airborne geophysical and ground geochemical data for much of the six border counties of the Republic to support environmental objectives and underpin mineral resource assessment in the region. Tenders to procure services for this new flagship project are being prepared and it is hoped



Pictured at the launch are l-r Dr. Valerie McCarthy, Dundalk Institute of Technology, Dr. Pat O'Connor, Geological Survey of Ireland, Conor Lenihan, Minister of State for Natural Resources, Ray Scanlon, Geological Survey of Ireland and Mike Young, Geological Survey of Northern Ireland

that the surveys can commence by mid-2011. The project is 100% funded through the EU Special Programmes Body (SEUPB) and the initiative shows again the capacity of public sector organisations like GSI and GSNI to work together effectively to compete and secure external revenue for the benefit of their respective jurisdictions.



TELLUS Survey plane

ENVIRONMENT AND HEALTH

Securing Clean Water Supplies

The national mapping programme for groundwater protection continued on schedule in 2010 supported partly by funds from the National Development Plan (NDP). Groundwater Protection Schemes for Counties Carlow, Limerick, Offaly, Waterford and Wexford were completed and delivered. Field mapping and drilling was completed for Counties Tipperary and Mayo. Source protection work for Group Water Schemes was initiated through a pilot project, which is being undertaken in conjunction with the National Federation of Group Water Schemes (NFGWS). GSI/Local Authority Source Protection work is on-going in Counties Louth and Cavan. Under the Water Framework Directive, EPA funded contracts for a) the re-delineation of Groundwater Bodies and b) source protection zones were supervised and reviewed respectively. The National Sand and Gravel Aquifer Map was upgraded with additional data.

Urban Soils and Public Health

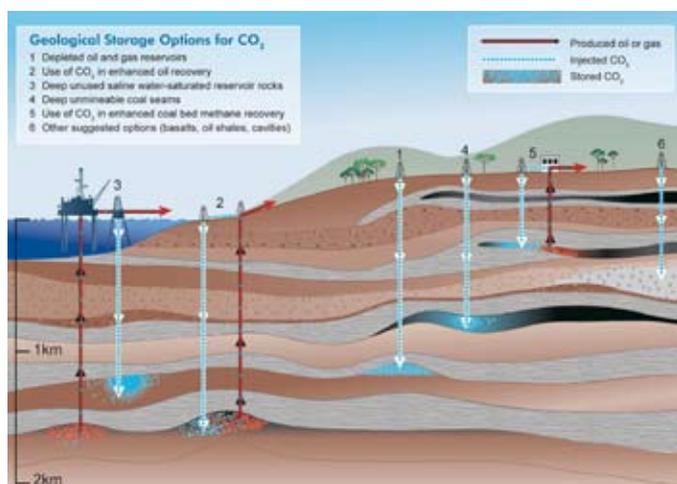
The Dublin SURGE (Soil Urban Geochemistry) Project aims to create a first-ever baseline dataset of persistent organic pollutants and heavy metals in Dublin topsoil. The project is NDP-funded and is being carried out in conjunction with all of the Dublin local authorities, the EPA and HSE. It will provide information on soil geochemistry in the Irish urban environment relevant to the protection of human health, compliance with environmental legislation, land-use planning and urban regeneration. Over 1,000 samples of Dublin topsoil (0 – 10cm depth range) were collected from public lands in late 2009 and analysed at laboratories in Norway and Sweden. Dublin has a long history of habitation stretching back over 1,000 years and a rich industrial history concentrated in the inner city and

docklands area. The distribution of persistent organic contaminants (PAHs and PCBs) and anthropogenic heavy metals (arsenic, lead, copper, mercury, nickel and zinc) measured in topsoil reflect this history. Concentrations are highest in inner city and docklands areas and are most likely to be associated with historical fossil fuel burning in homes and industry, historical industrial activity, the re-use and recycling of contaminated soil over time and more recently traffic. The project will conclude in 2011 with the public release of data to stakeholders and the public.

Infrastructural Support

Several strategic GSI-led projects, mostly NDP-funded, currently assist infrastructure development by providing geoscience information on ground conditions, aggregates supply and soil quality. The Dublin GeoUrban project is creating a 3D model of the capital city's subsurface which will contribute to future major tunnelling, transport and construction projects in helping to minimise costs and reduce delays. Ground motion (subsidence and heave) is being investigated under the ESA-funded project 'TerraFirma' in which GSI is an associated partner. Soil quality is being investigated under the Dublin SURGE project (see above). Sourcing convenient and suitable aggregates is an essential requirement for infrastructure projects and is the basis of the ongoing Aggregates Potential Mapping project. Landslides susceptibility mapping inventory neared completion in east Leinster and the greater Cork area and 397 previously unrecorded events were identified. GSI handled 120 statutory notifications under EIS and the Planning Acts and contributed to 3 County development plans in the context of geoheritage. The EU-funded Atlanterra project on mine heritage got underway with GSI as a partner.

ENERGY AND CLIMATE



Storing Carbon Dioxide Underground

In the present context of climate change fuelled by greenhouse gas emissions, it is important that Ireland should assess its potential for carbon-capture-and-storage (CCS) both onshore and offshore. To that end, a conference focussed on specifically on CCS and the issues surrounding. It was organised by RIA, GSI and GSNI at Dublin Castle in March 2010 and attended by 130 delegates; 80 people attended an associated public debate organised by the Irish Times. An EPA-GSI study of the Moneypoint area found no significant storage potential in the geological formations underlying the district. GSI, BGS and GSNI engaged in a collaborative initiative to assess CO₂ storage potential under the Irish Sea. GSI joined CGS Europe, a European CCS network funded by the Commission to facilitate exchange of knowledge on CCS.

RESEARCH AND EDUCATION

Enhancing Geoscience Research Capacity

Under the National Geoscience Programme some €9.2m of funding was committed over 7 years to strategic geoscience research initiatives among the Irish universities (north and south) – the Griffith Geoscience Research Awards scheme. The programme reached its mid-term in late 2010 and an independent external review of the scheme was concluded by Indecon international economic consultants who have considerable experience in research evaluation. Their review found that the scheme has had considerable success to date both in terms of programme outputs and also in terms of leveraging non-Exchequer funding. When fully implemented, the Griffith programme is likely to achieve significant outputs which will be of lasting benefit. Research groups funded under the Griffith programme also made a series of presentations at the Geoscience 2010 conference.

In a separate development, Irish researchers received FP-7 funding for 4 years to participate in the European Plate Observing System (EPOS) research infrastructure. GSI will act as the Irish lead partner along with UCD and DIAS.

GSI was invited to participate in working groups under Forfás engaged in the process of research prioritisation for the period 2010-2020.

GeoEducation and Public Awareness of Geoscience

It is vitally important that the community understands the value of our geological resources and the contribution that they make to our economic development and quality of life. This helps to ensure that investment in the Geoscience sector is maintained and that we continue to educate and train high-quality geoscience graduates

to underpin that contribution to our economic recovery in the decade ahead. With this as a goal, GSI undertakes ongoing outreach and educational activities.

The EU-funded NEED project (www.geoneed.org) concluded with the successful delivery of teaching modules for primary school pupils. GSI organised the Cunningham Awards (for best field mapping projects at undergraduate level) and the du Noyer Photo Competition aimed at the general public.

GSI published two newsletters on its website in 2010 – **Geology Matters** (the GSI newsletter) and the **Groundwater Newsletter** (targeted at water supply stakeholders and consultants). GSI activities continued to generate public interest with the level of print media coverage maintaining that of previous years particularly for seabed mapping activities, heritage, geotourism and outreach. The Minister of State, Conor Lenihan TD, launched a podcast on Dublin on the Rocks as a self-guided walk/tourism resource in the inner city exploring the building materials and architecture of Dublin. On a more technical level the Geoscience 2010 Conference in Dublin Castle, also opened by the Minister of State, showcased recent geoscience developments and a wide range of geoscience research projects. A webinar on the outcome of the National Geoscience Programme, arranged by the American Geological Institute, achieved significant media publicity including in Ireland.

In partnership with GSNI, GSI continued to manage the Geoparks Ireland Forum as an important venue for those involved, or aspiring to become involved, in Geoparks as an educational and tourism resource. GSI provided support to the Copper Coast European Geopark, the Marble Arch Fermanagh-Cavan European Geopark and the aspiring Burren & Cliffs of Moher Geopark. A draft brochure on the geology of Slieve League was prepared as a basis for establishing the first overseas leg of the International Appalachian Trail in Ireland.

North-South Geoscience Cooperation

Significant achievements have resulted under the Framework for Scientific Cooperation (November 2007) signed jointly by GSNI, BGS and GSI. Some key examples in 2010 were:

- **Tellus Border Project:** (see note above).
- **Minerals Map of Ireland:** a draft all-island Minerals Map of Ireland was prepared by GSI-GSNI and distributed to over 200 delegates at the IAEG Zinc 2010 Conference in September. A final DVD version will be published in time for the Prospectors & Developers Association of Canada (PDAC) Convention in March 2011 in Toronto to help promote Ireland as an inward exploration investment destination.

- **The Classic Geology of the North of Ireland:** a new book on the classic geology of Northern Ireland and the border counties was published jointly by GSNI and GSI.

International Cooperation

A delegation from the US Geological Survey visited GSI in September to discuss future cooperation under the existing MoU between the two surveys. Cooperation will initially focus on geophysical interpretation of forthcoming Tellus Border project, on which USGS will have an advisory role.



Dr Ingrid Verstraeten from the United States Geological Survey with Minister of State for Natural Resources Conor Lenihan

Northeast Atlantic Geoscience, a consortium of national geological surveys, has decided to prepare a regional inventory of potential carbon dioxide storage sites in order to support national and trans-national decision making on CCS. GSI will participate in cooperation with PAD.

GSI participated in EuroGeoSurveys meetings designed to re-align its future strategy through the European Scientific Framework Research Infrastructure (ESFRI) funded through FP-7, in which GSI is already participating in cooperation with Irish geophysical partners (EPOS initiative). GSI was also active in some of the EuroGeoSurveys Expert Groups (Marine, Geochemistry, Minerals, Earth Observation & Geohazards, Groundwater, Carbon Capture).