INFOMAR

Integrated Mapping for the Sustainable Development of Ireland's Marine Resource

The INFOMAR programme, NAG-TEC Project and other Irish marine research

Koen Verbruggen, Janine Guinan, Maria Judge, Xavier Monteys
Geological Survey of Ireland

GSI

NDP
National Development Plan 2007 - 2013

Marine Institute
Foras na Mara

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Integrated Mapping for the Sustainable Development of Ireland's Marine Resource

Overview

- INFOMAR:
  - Aims and objectives of the INFOMAR programme
  - How we map the seabed
  - How we deliver the results
  - Update
- NAG – TEC project
- EMODNET & GEOSEAS EU projects
- TELLUS Border
- Geoscience Ireland

Background– UNCLOS 1996+

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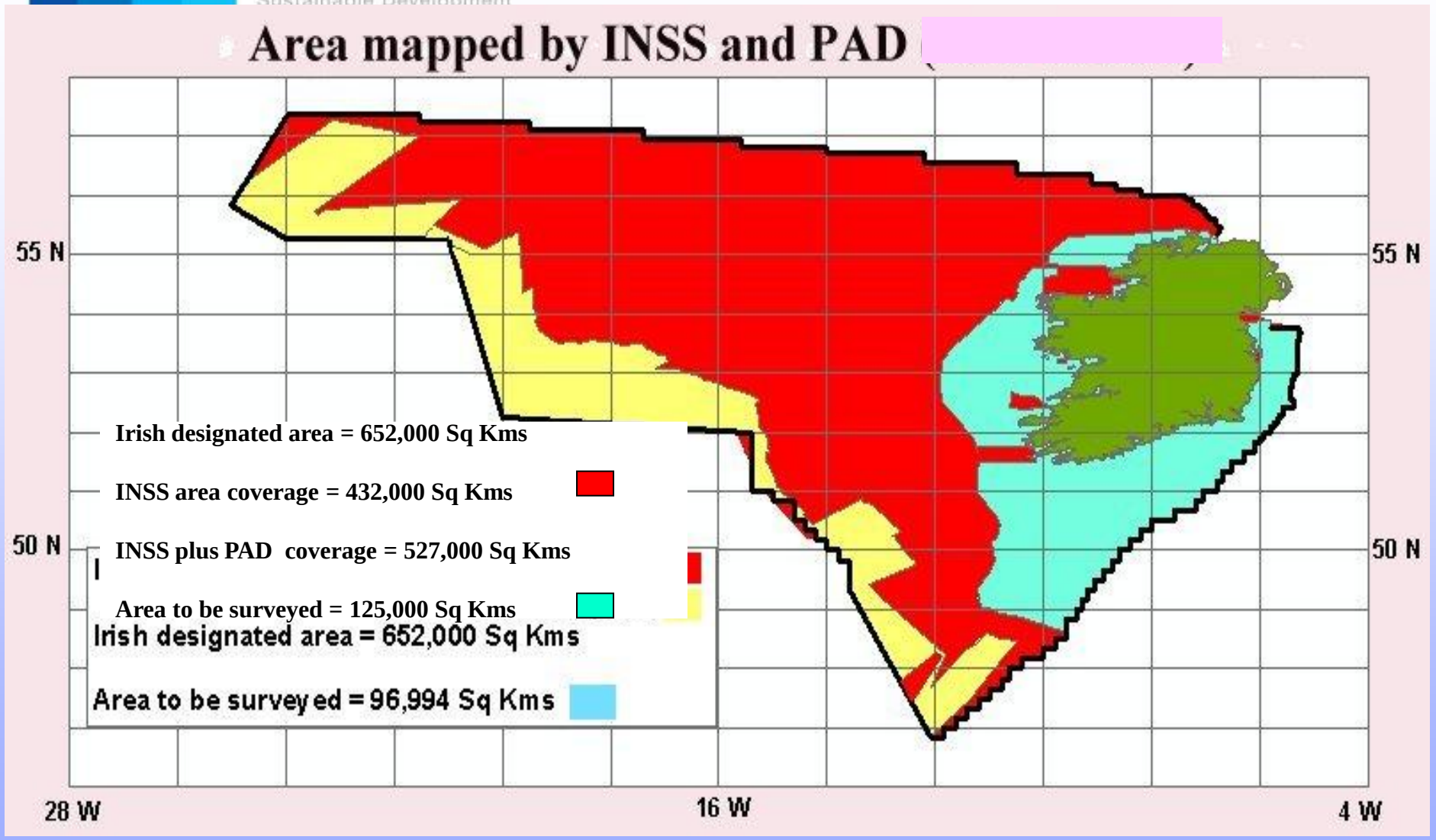
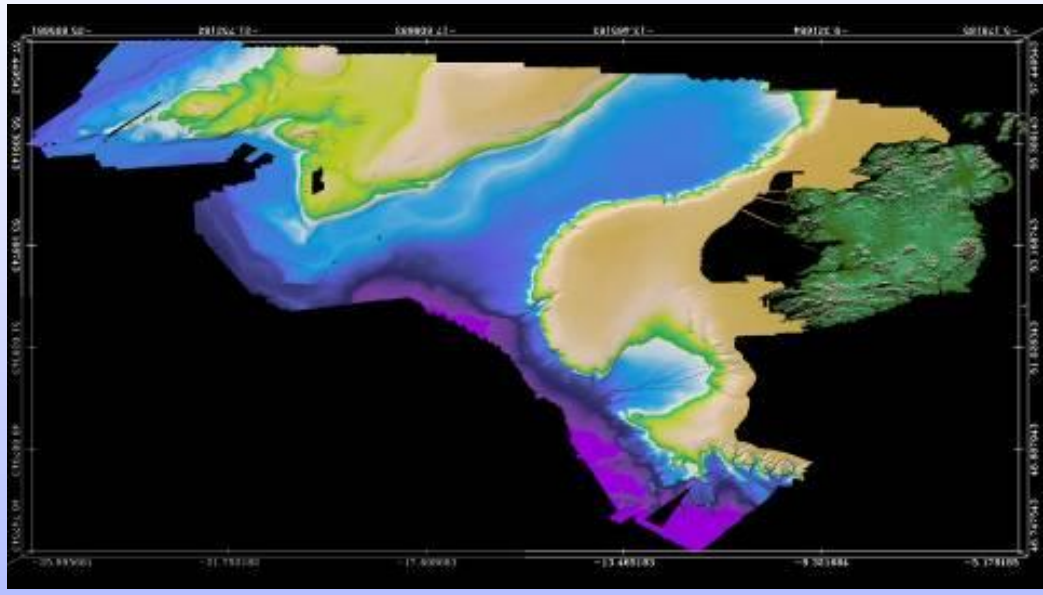


NB All Irish waters > 200m mapped by 2005

EEZ mapping Zones 2 and 3: 1999-2005



The INSS established an essential national asset:

- A marine BASELINE DATA set to underpin present and future Irish economic, environmental, infrastructural and policy decisions
- Upgraded Irish marine surveying infrastructure
- The body of knowledge required to design, procure, build and operate a large Exclusive Economic Zone (EEZ) survey

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INFOMAR '06 – '25

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Partnership between MI & GSI

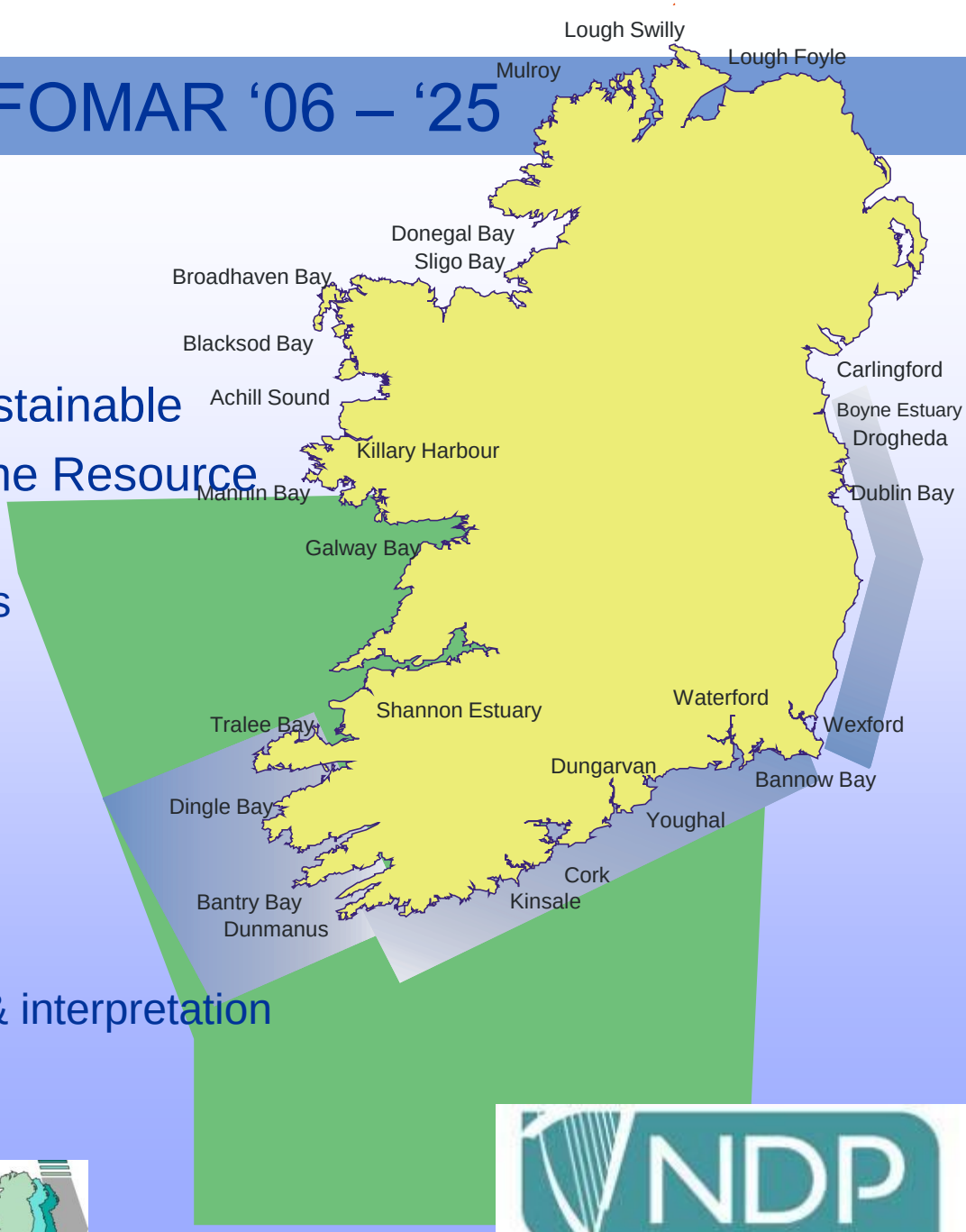
INtegrated Mapping **FO**r the Sustainable Development of Ireland's **MAR**ine Resource

PHASE 1:

•2006 – 2015 26 Bays / 3 P. Areas

PHASE 2:

•2016 – 2025 Remaining Areas



3 Programme Areas

1. Data acquisition, management & interpretation
2. Data exchange & integration
3. Value added exploitation

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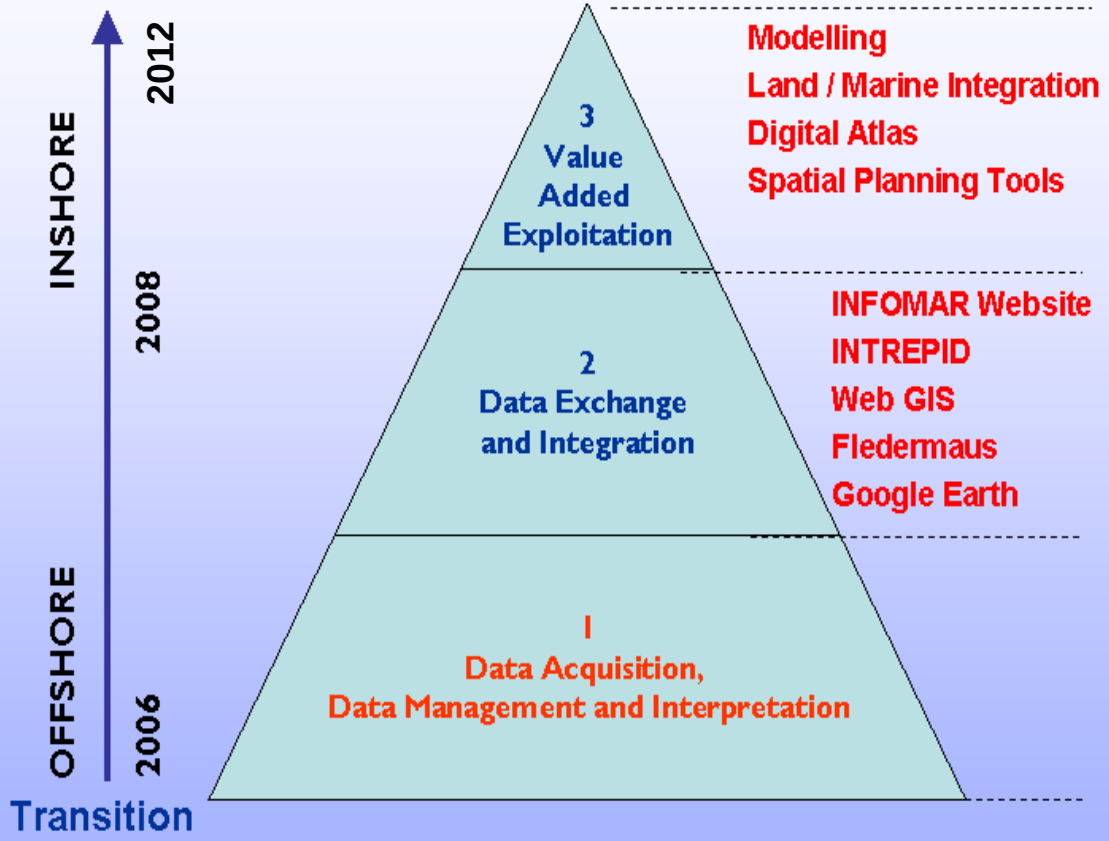
20 Year Programme

- Phase 1: priority bays & coastal areas

(2006 – 2015)



- Phase 2 :remaining Irish marine territories

(2016 – 2025)

- NDP supported
- €84m investment
- CBA c.5:1 return

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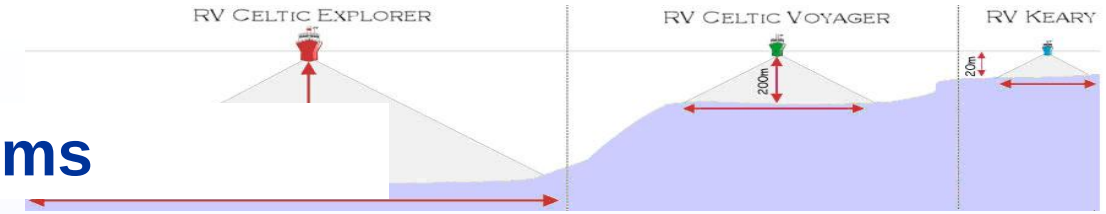
INFOMAR Platforms



RV Celtic Explorer	RV Celtic Voyager
65.5m / 15m / 5.8m	31.4m / 8.5m / 3.8m
16 knots - 45 days endurance	10 knots - 14 days endurance
Mapping from 20 – 500m	Mapping from 20m to 200m

RV Keary	RV Geo
15.5m / 5.6m / 1.5m	7.4m Redbay Rib
22 knots/ 2-3 days endurance	30 knots / 300 NM/1 day endurance
Mapping from 50 to 5m	Mapping from 10m to <0m!

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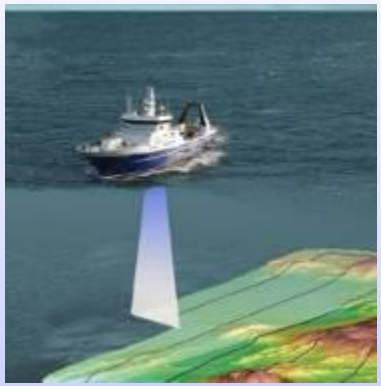
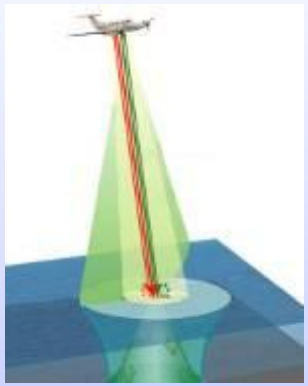
2012, Satellite Bathymetry 0-10m

Data Acquisition Methods



Multi/Singlebeam



Airborne LiDAR

Side Scan sonar

Sparker

Vibrocore

Box Core

ROV

Towed Video

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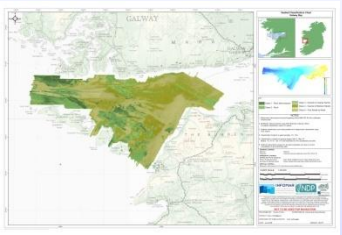
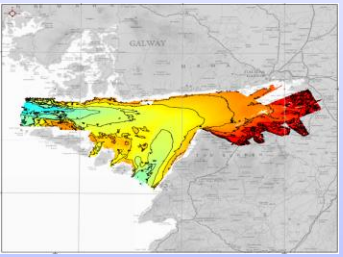
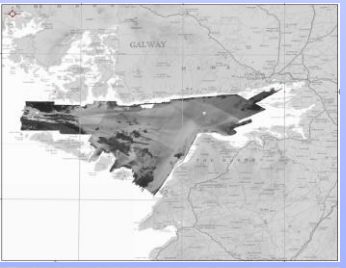
Oil & Gas
SEA Input
Regional Mag, Gravity & Bathymetry
Site investigation data for drill sites
Research/ Leverage

Key Products and Applications

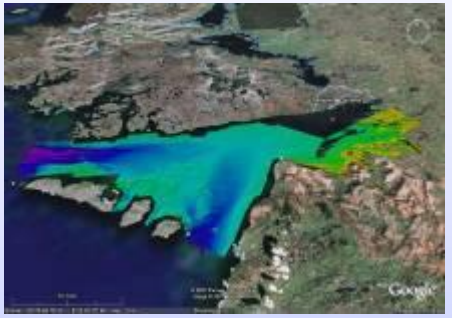
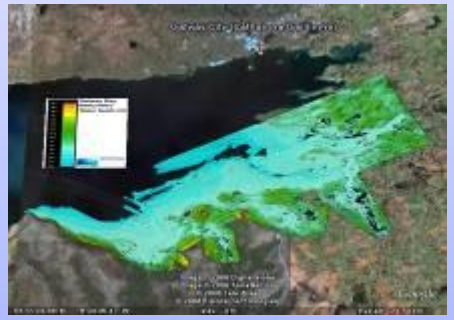
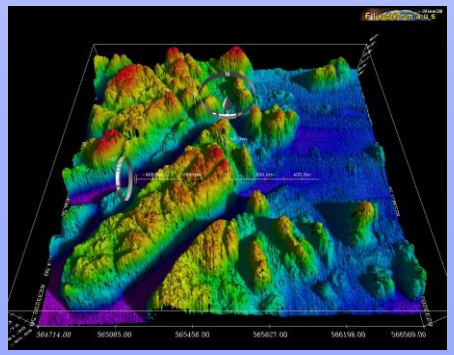





PRODUCTS

- Bathymetry maps:
  - Google Earth
  - Fledermaus DTM's
  - ArcMap Grids
- Backscatter Maps
- Seabed Geology maps
- Shallow Geology
- Sediment analysis
- Wreck Identification
- Cetacean Reports
- Magnetic Mapping

APPLICATIONS

- Transport / Shipping
- Environment
- Coastal Zone Management
- Heritage
- Fisheries
- Resource Management
  - Aggregates
  - Fish Spawning Grounds
  - Wind & wave energy sites
- Marine Leisure
- Spatial planning tool

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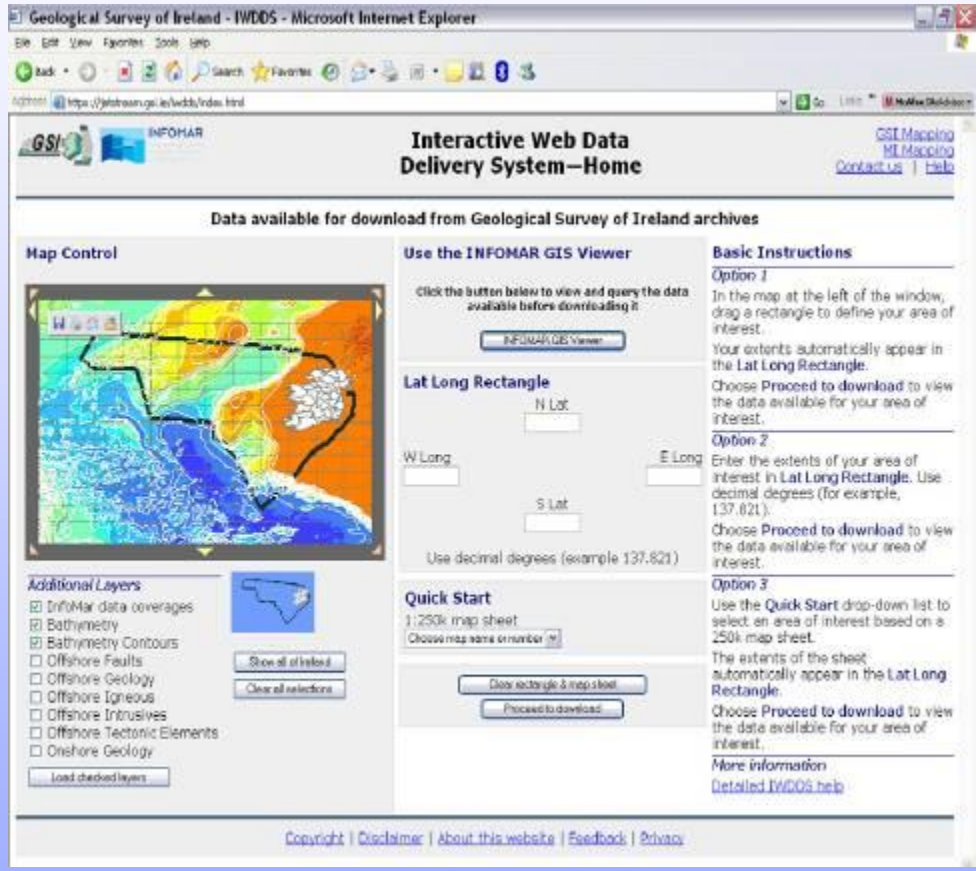
Information - Web Based

Web Data delivery key to project

- Allows customised downloads of area specific data
- Over 1,200 Registered Users to date
- More than 37,000 files downloaded
- > all other DCENR web Sites combined
- > 2,000 Gb of data downloaded
- Across a range of sectors
- Site referenced by EU Marine Directorate in EMODNET Proposal
- Recent similar initiative by British Geological Survey



https://jetstream.gsi.ie/iwdds/index.html

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INFOMAR Update

- New/converted inshore vessel
- Bids for
  - EMODNET Geology (many NAG Members)
  - EMODNET Hydrography (IFREMER etc)
  - Mineral Outreach (FP7), including marine
- EC Green Paper Seabed Mapping (Dec 15)
- EC Atlantic Strategy – 2013 (MI)
- Marine Mining now on EC Agenda

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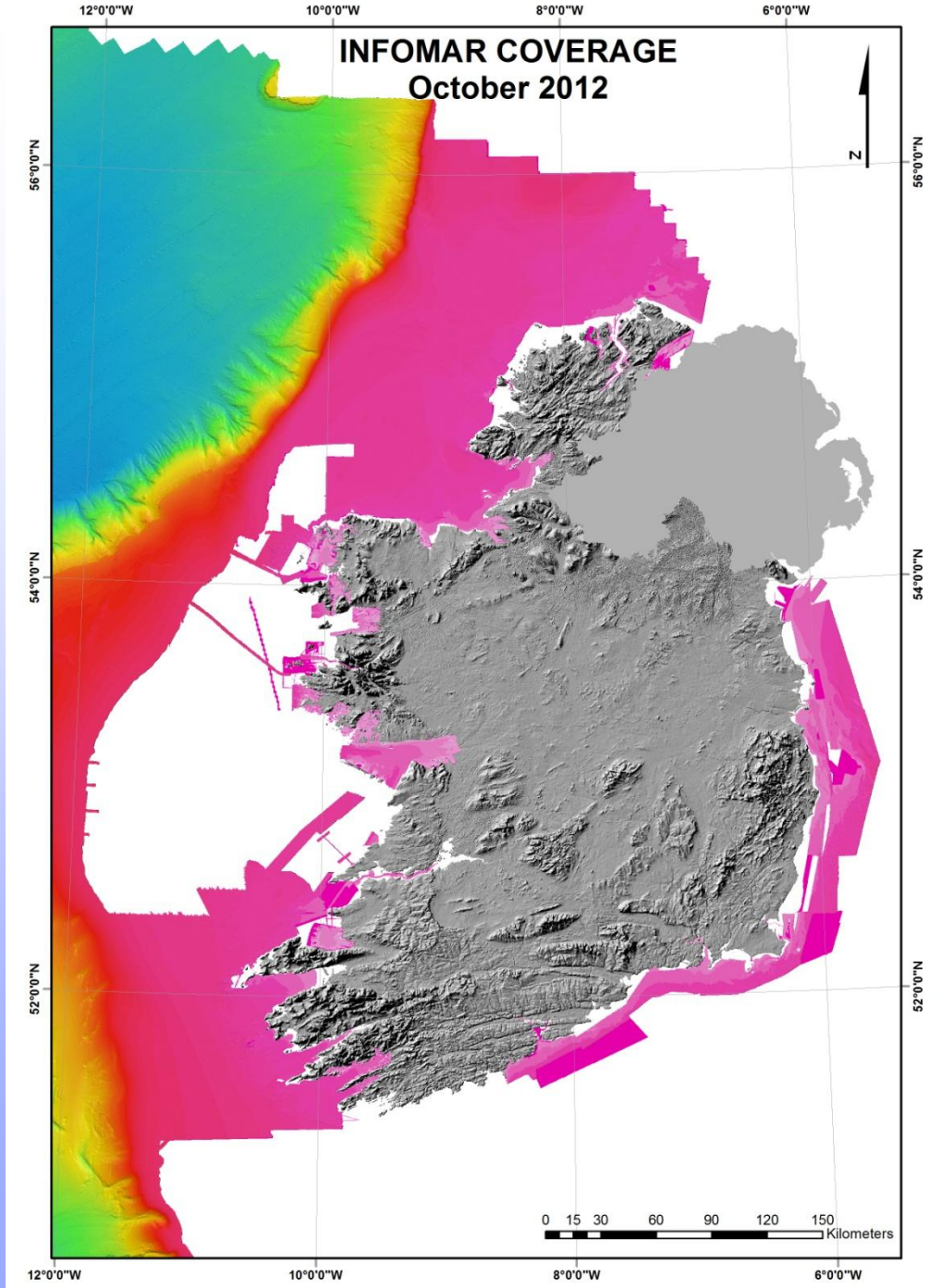

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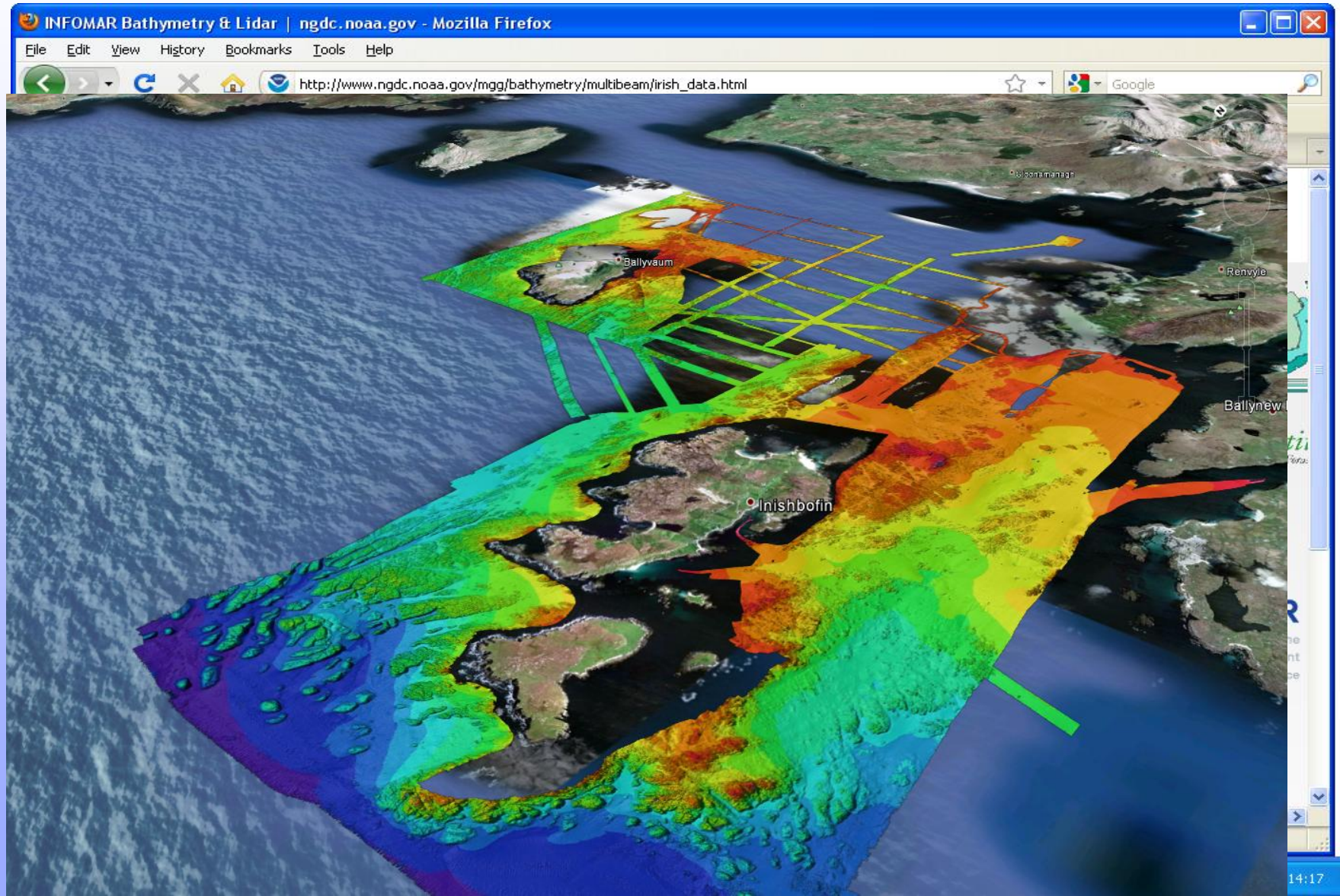
GSI Data on NGDC



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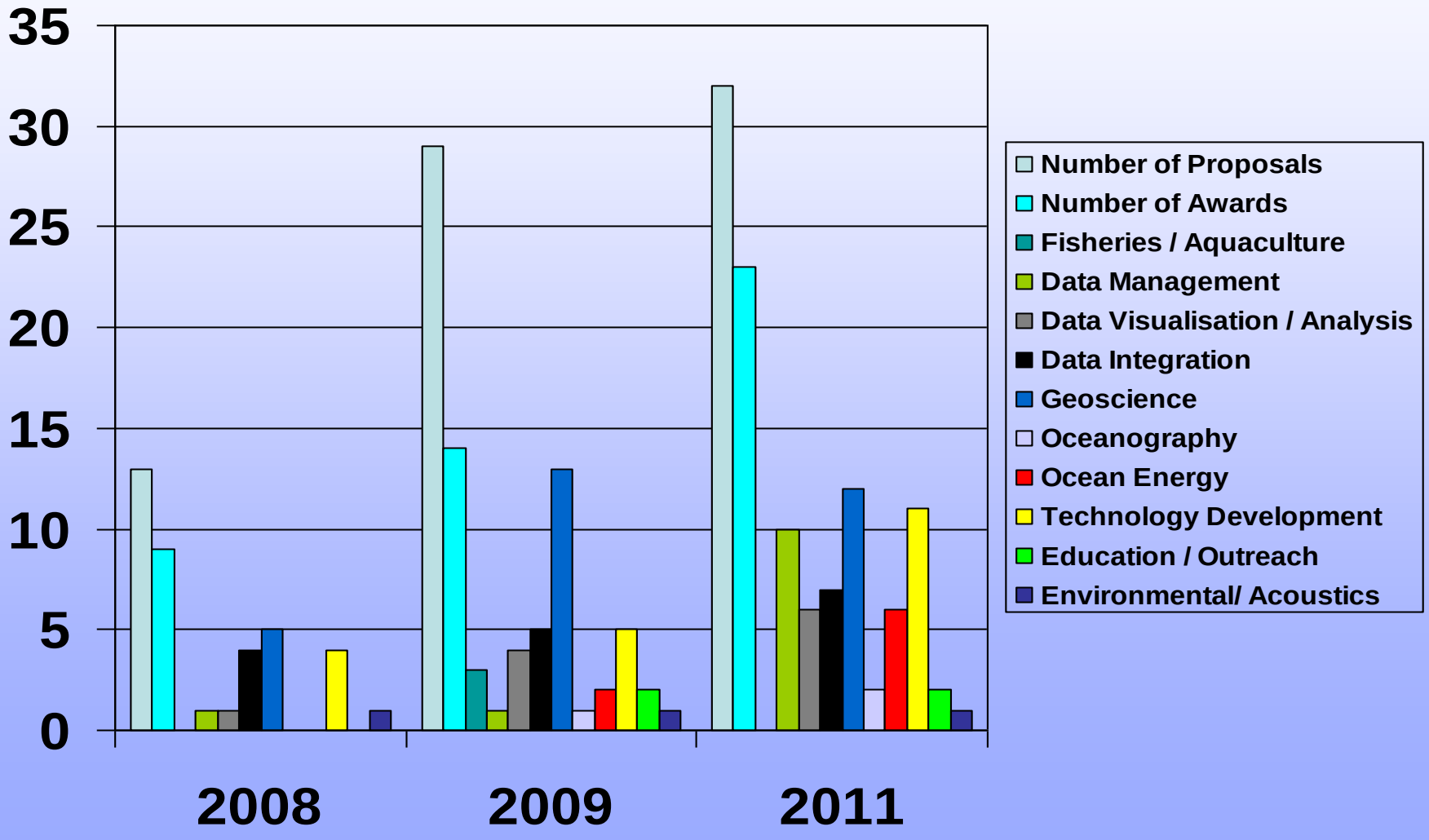
2008 - 2011 RESEARCH CALLS



Sponsored Research

Currently c. 25 Projects

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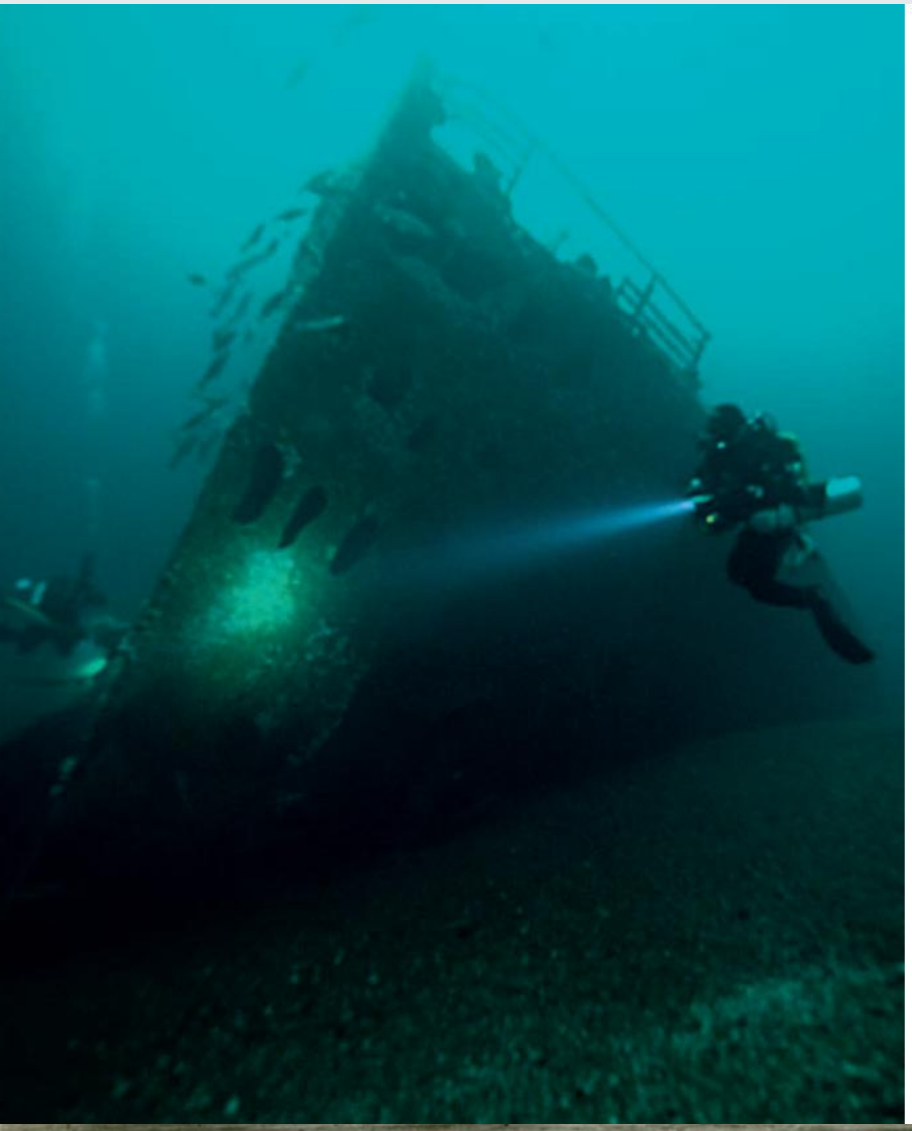
Title	Project Leader	Organisation	Topic
Integration of multiple offshore and onshore datasets from NE Ireland and the Irish Sea: an integrated **3-D model of geological structure.**	John Walsh	UCD	Geology
Foundation Risk & Geotechnical Uncertainty Mapping for future Offshore Wind Farm Developments	Paul Doherty	Gavin & Doherty Geosolutions	Energy
Celtic Sea **Sedimentary Proceses**, Quaternary Stratigraphy and Offshore Renewable Energy Development (CeSQuORE)	Andy Wheeler	UCC	Energy
COLDSTORE: Enhanced facilities for the extension of **sediment core** shelf life	Stephen McCarron	NUI Maynooth	Technology/Geology
Geochemical constraints on the age, affinity and history of the Porcupine High	Shane Tyrell	UCD	Geology/Energy
Coastal **Seabed Observatory** Platform (COSOP)	Phillip Trickett	Techworks	Technology
The **Bedrock Geology of Dublin Bay,** from recent WWT Drilling	David Chew	Trinity College Dublin	Geology/Infrastructure
A Study of the Effect on **Seabed Sediments at Ocean Energy Sites** of Storm Waves and Currents using a Coupled Wave and Hydrodynamic Numerical Model	Marcel Cure	Numerics Warehouse	Energy/Oceanography
Geological and geophysical description of the Arc Mounds, southwest Porcupine Bank	John Murray	NUI Galway	Geology/Biology
Smart Event Triggered **Ocean Monitoring Platform,** (lander/mooring/databuoy)	Dan Toal	UL	Technology
Development of an integrated environmental **on-line mapping system** for the marine environment, to support the **Marine Strategy Framework Directive** and to Highlight the Value of Infomar Data	Liam Lysaght	National Biodiversity Data Centre, Ireland	Biology/Technology /Education

•New shipwreck publication www.gsi.ie



Justicia

GSI ref. code	58
NMS wreck no.	W 07410
Location	38km NW of Malin Head, Co. Donegal
Co-ordinates	55 39 46.98N, 007 43 13.12W
Depth of water	67m
Vessel type	Passenger Liner
Vessel dimensions	226m (l), 26m (b), 13m (d)
Date of building	1914
Date of loss	20 July 1918

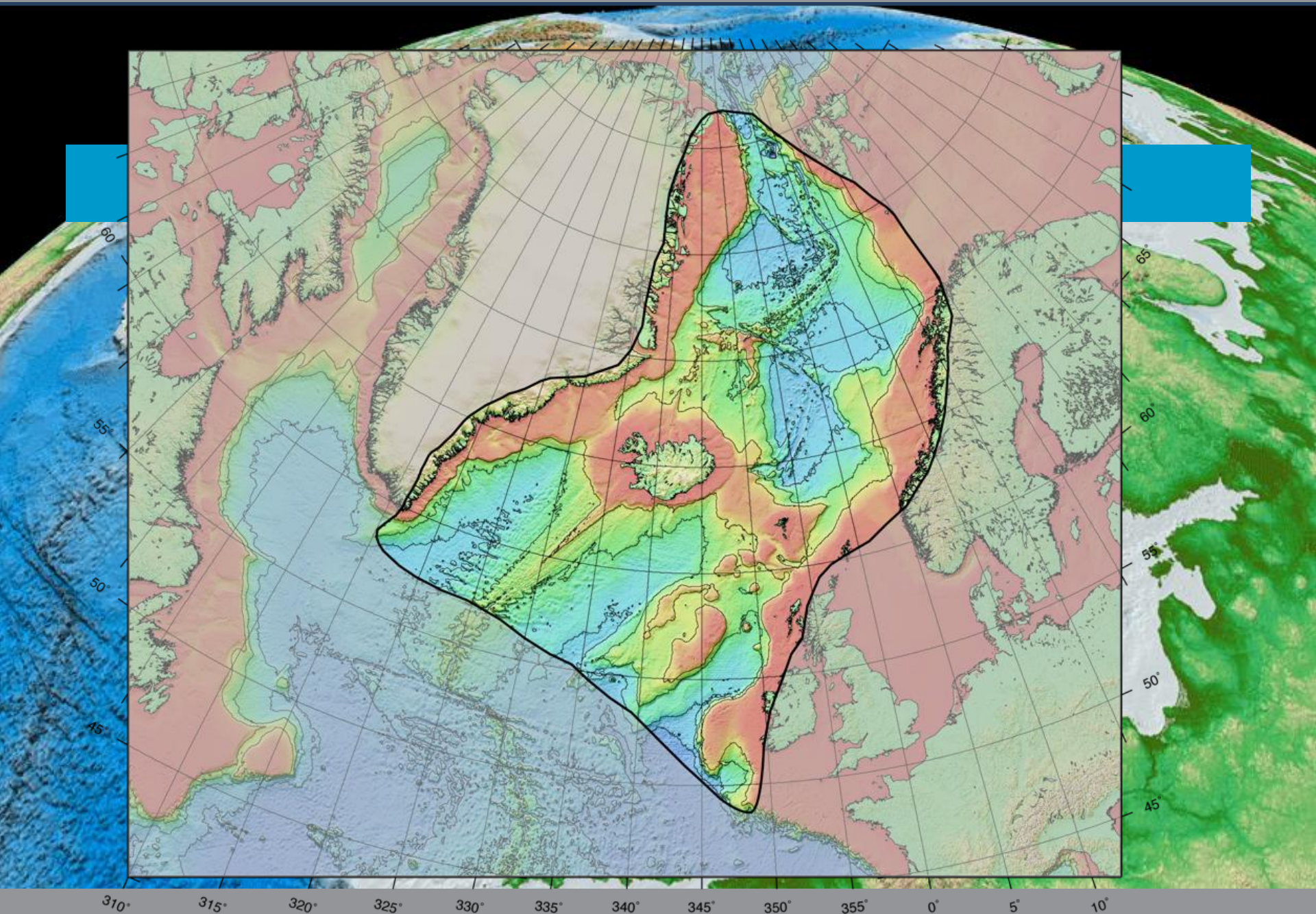
Above: A postcard depicting how the 32,234-ton *Justicia* may have looked had she been completed as the SS *Statendam*, as originally planned, for the Holland-Amerika Line. Due to the outbreak of war, the liner was requisitioned by the British Government and converted to a troopship in 1917. (Ian Lawler Collection)

Opposite: Divers investigate the still largely intact bow of the *Justicia*, which lies in 67m of water. (Photo Barry McGill)

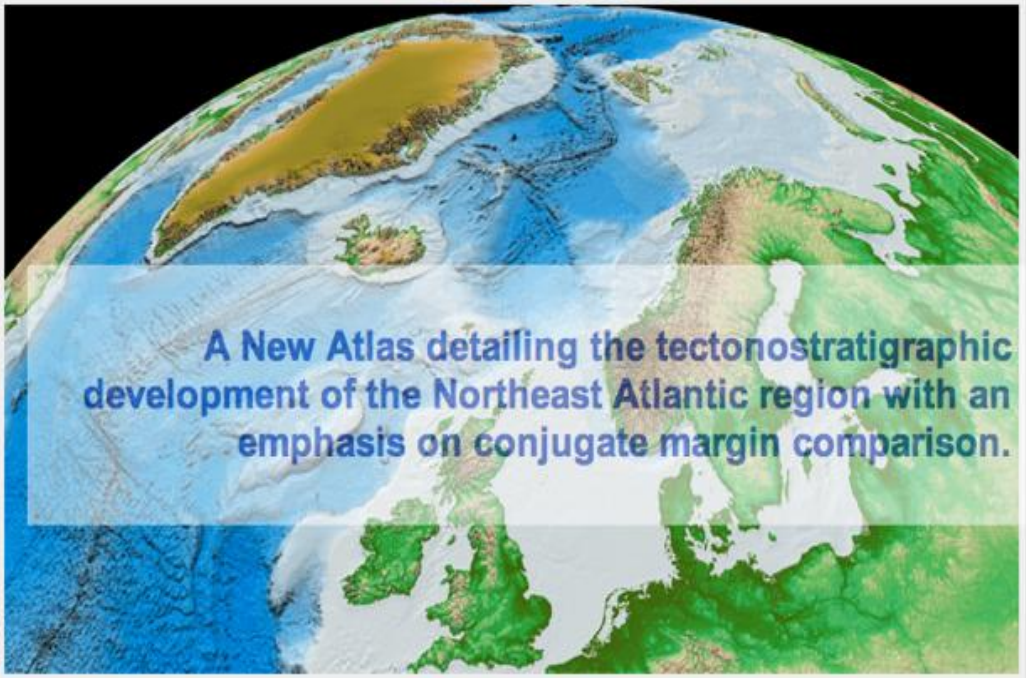
Circumstances of loss

This 32,234-ton steel steamship was originally built by Harland & Wolff for the Holland-Amerika Line as the *Statendam*, a liner capable of carrying 3,430 passengers. It was powered by triple-expansion engines, allowing for speeds up to 18 knots. The *Statendam* was launched on 9 July 1914 and was due to serve on transatlantic passenger service routes, but the British Government requisitioned the vessel and changed its name to *Justicia*, earmarking it for service as a troopship in 1917.

Under the management of the White Star Line, the *Justicia* entered service on 7 April 1917 and made several successful transatlantic trips, carrying American troops for service in Europe. The *Justicia* had a close call when it survived a U-boat attack in January 1918, when it had 600–700 crew on board, but no passengers. Later that year, on 19 July, the liner was en route from Liverpool to New York in convoy when it was attacked by *UB-64*, under the command of *Kapitänleutnant* Otto von Schrader. At 2.30pm a torpedo struck the engine room, and at 4.30pm two more torpedoes were fired: one missed its target; the other was diverted by gunfire. At 8.00pm a fourth torpedo was discharged, but gunfire again proved successful in


60°
55°
50°
45°
65°
60°
55°
50°
45°
310°
315°
320°
325°
330°
335°
340°
345°
350°
355°
0°
5°
10°

NAG-TEC: Northeast Atlantic Geoscience Tectonostratigraphic Atlas



Why another atlas?

1. Currently no existing compilation of key geological and geophysical information over the whole region
2. Local nomenclature differences result in difficulties establishing regional correlations to identify commonalities and differences between areas
3. Large areas with sparse data make it difficult to prioritise which data gaps are most important in terms of regional understanding.

NAGTEC

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Project Structure

Work Package	Lead Survey(s)
WP1: Tectonostratigraphy	British Geological Survey, Natural Environment Research Council
WP2: Spreading history	NGU Norges geologiske undersøkelse
WP3: Crustal Structure	GEUS
WP4: History of igneous provinces	ÍSOR Íslenskar orkurannsóknir; JARÐFEINGI
WP5: Data management	GEUS
WP6: Final atlas & conjugate margin evolution	

2011 → 2012 → 2013 → 2014

•Kick off

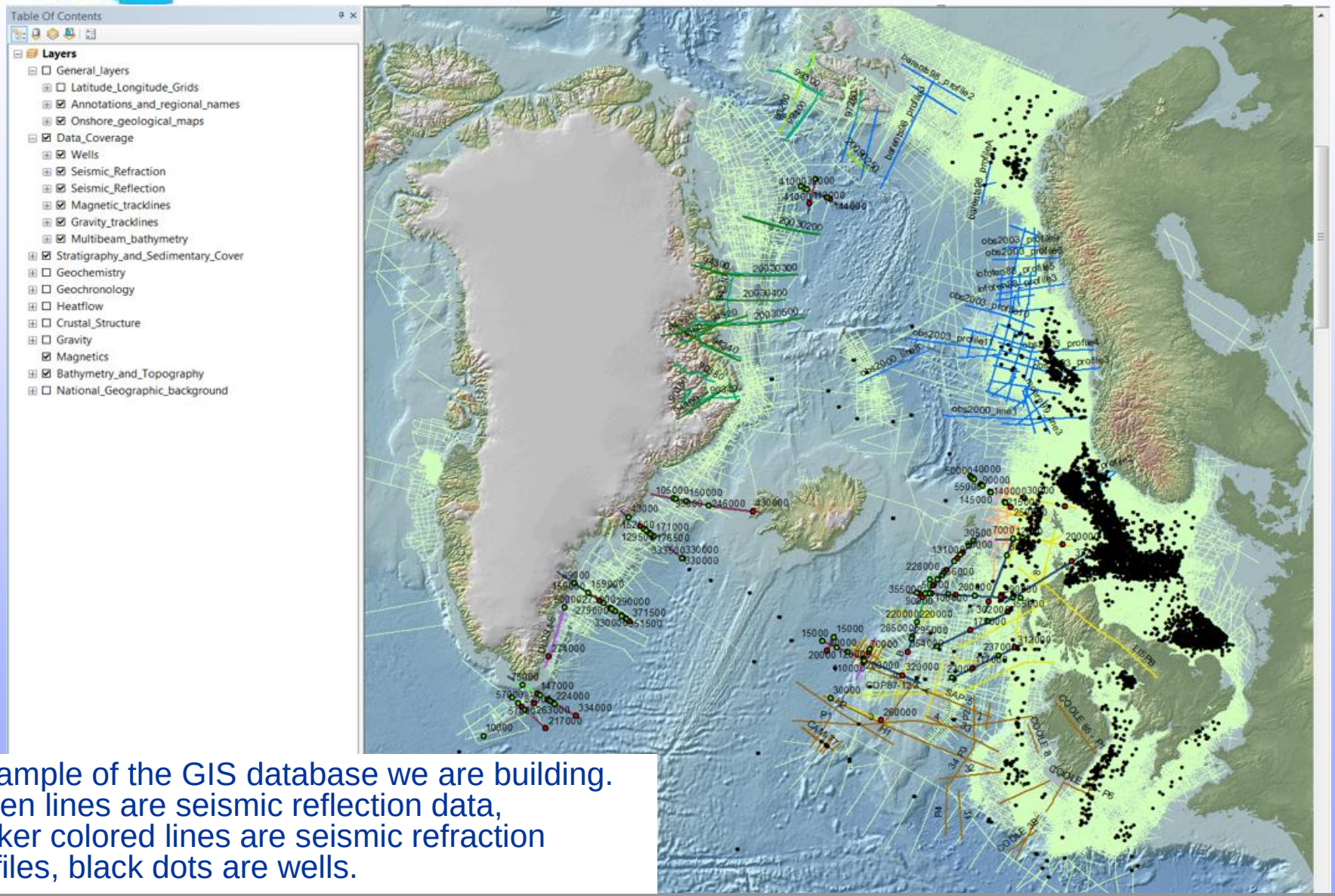
•WP1-4

•Product Delivery

•For a full project description

John R. Hopper - jrh@geus.dk

Master ArcMap Project



•Example of the GIS database we are building. Green lines are seismic reflection data, thicker colored lines are seismic refraction profiles, black dots are wells.

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EU Marine Context

•Aims –to bring together marine data from different sources – to help industry, public authorities and researchers to find data -for the benefit of the '**blue economy**' -improving **knowledge for jobs & growth of economy.**

•*'data should be interoperable, accessible and free of restrictions on use'.*

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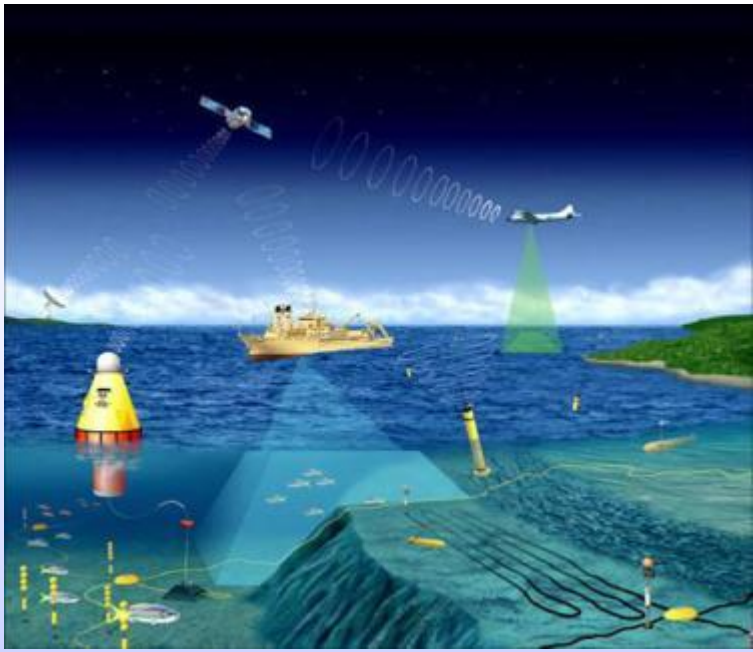
Challenges

- >600 European marine scientific data centres

- Various Sensors, Platforms, Acquisition Procedures,
- Data formats, Data access restrictions



Objectives

- Integrated and harmonised data for European Seas

- Collate fragmented data to disseminate
- via data download services (WFS) & web mapping services (WMS)

- Collaborate with marine data centres & geological surveys

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EMODnet
European Marine Observation and Data Network

•EU Marine Observation & Data Network

•DG Mare/ Marine Directorate

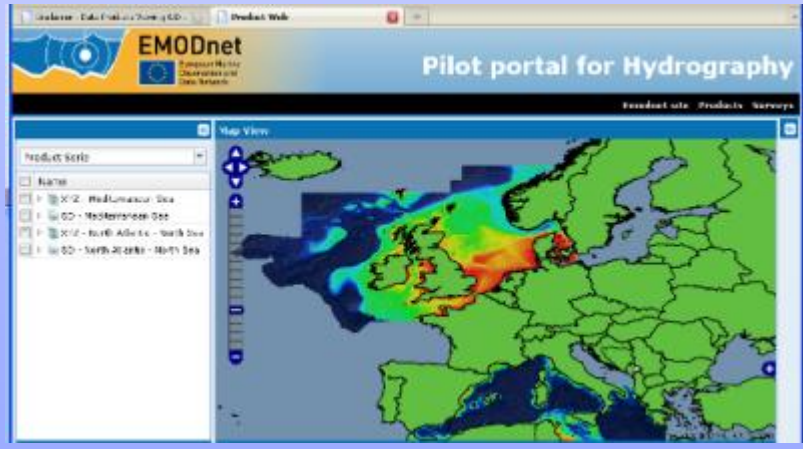
• Preparatory Phase 2009-12

•Ireland, UK, France, Belgium, The Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania and Poland

•5 Modules: **Geology, Hydrography, Biology, Chemistry, Habitat Mapping**

•Continuous large scale data sets via web portals-**OneGeologyEurope**

•EMODnet-Geology Data Portal



•EMODnet-Hydrography Data Portal

GSI EU MARINE VIEWER

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- **WP4: Sea Floor Geology Compilation-Age**

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Geo-Seas

•Geo-Seas – Marine Geological & Geophysical data

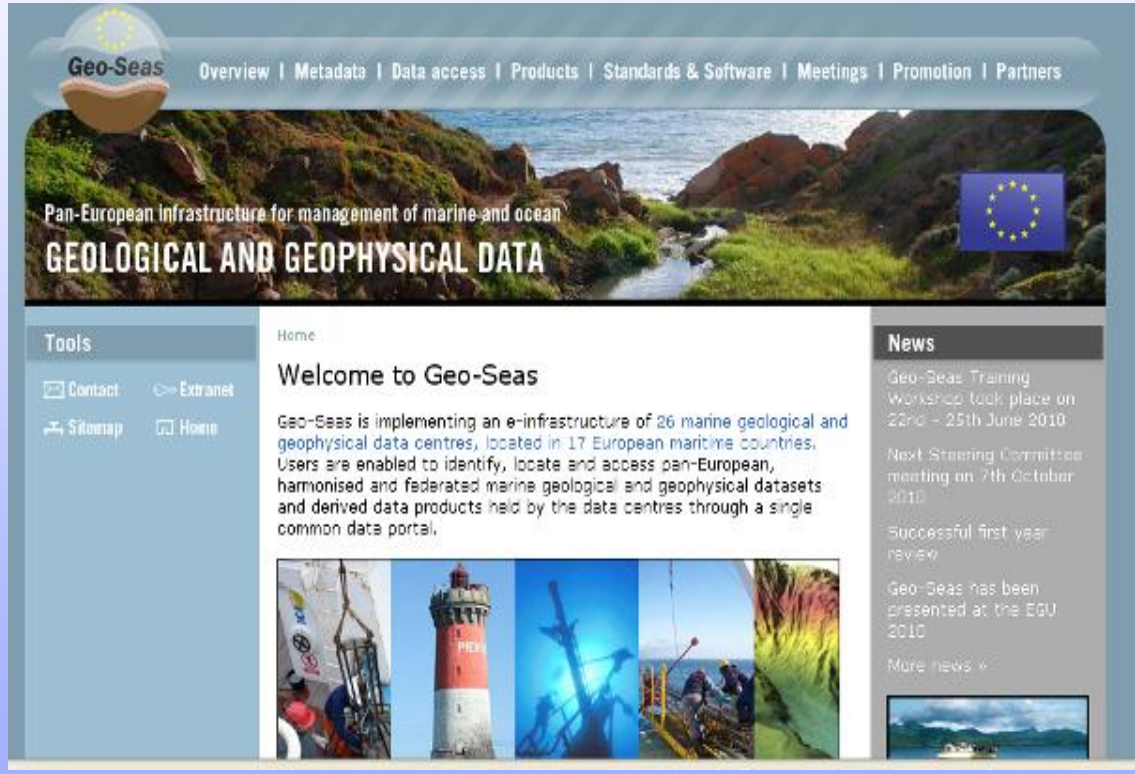
•Linking 26 marine geological and
•geophysical data centres

•17 European maritime countries

•Timeline 2009-2013

•Marine data exchange and product development

•Single portal pan-EU access to
•harmonised marine Geo-datasets
•and products



•http: www.geo-seas/eu

TELLUS BORDER

Understanding Underground

European Union
European Regional Development Fund
Investing in your future

A project supported by the INTERREG IVA Programme managed by the Special EU Programmes Body

- Airborne Mag, Resistivity, EM
- Soil & Stream sed & water Geochem
- 6 Border Counties - Award winning outreach
- Current EU (ERDF/InterReg Funded) GSNI/GSI
- Results Q1 2013
- Free to all

GEOSCIENCE IRELAND

Exploring
Developing
Sustaining

- Enterprise Ireland/GSI & Industry - 2010
- Job creation/protection project
- Irish Geoscience firms together to win work overseas
- Linking back to excellence in applied research
- Common Marketing/Branding/website - 2011
- Overlapping but complimentary firms
  - Groundwater, Geotech, GeoEngineering, MinEx, Capacity Building, Drilling
- Business Development Manager Q3 – 2012
- Overall success linked to ability to win work
- Conact Sean.Finlay@geoscience.ie

www.geoscience.ie

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Summary – see websites

- INFOMAR www.infomar.ie
- NAG – TEC project www.nagtec.org
- EMODNET & GEOSEAS EU projects
- www.emodnet-hydrography.eu/
  www.emodnet-geology.eu/
- www.geo-seas.eu/
- www.tellusborder.eu
- www.geoscience.ie

Thank you for your attention,
please see stands for more information.