The Need for Regional Geological Datasets

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Regional Data

- Why
- What
- Who
- Future

Why?

- Place developments in context
- Promote exploration and sustainable development of resources
- Land use decision making
- Assist policy formulation
- Support and benefit the economy
- Research, the Knowledge Economy and developing Irish Expertise
- Other benefits – health and safety, heritage, tourism, public good

What scale?

• National	>1:500,000
• Regional	1:50,000 - 1:500,000
• Local	<1:50,000

What?

Onshore

- Geological mapping
- Airborne Geophysics
- Geochemical mapping - multielement

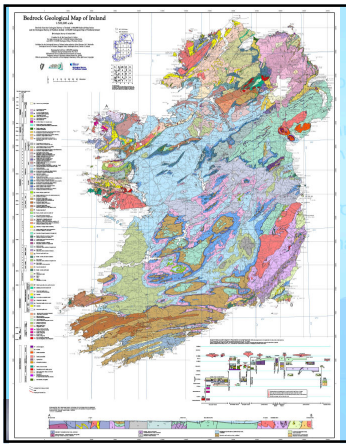
Offshore

- Geology
- Multibeam, single beam, side scan, Gravity, magnetics, groundtruthing

Global Data Ranking

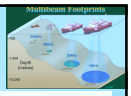
- 1: 50,000 Bedrock geology
- Regional aeromagnetics (<1 km line spacing)
- Stream sediment geochemistry (1st order drainage)
- Airborne EM/Radiometrics
- 1:50,000 Surfical geology
- Lake/till geochemistry (Every basin)
- Regional gravity or seismic
- Mineral deposit studies
- Geochemical modeling

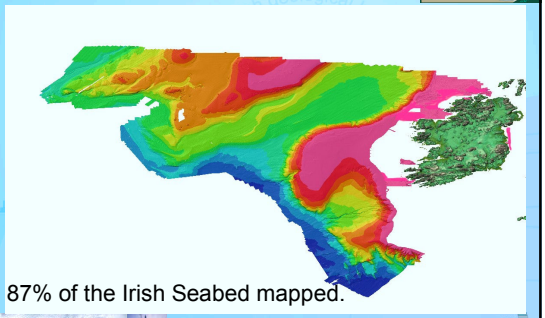
(After Thompson, 2000)



Geological Map of Ireland

INSS data





87% of the Irish Seabed mapped.

Who?

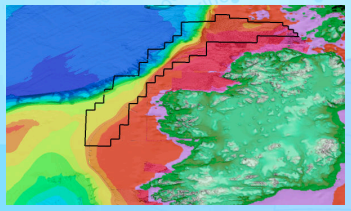
- Geological Surveys are best placed to carry out these surveys
- Integrate with databanks which they already hold
- Provide objective, impartial advice and interpretation of the data

Context

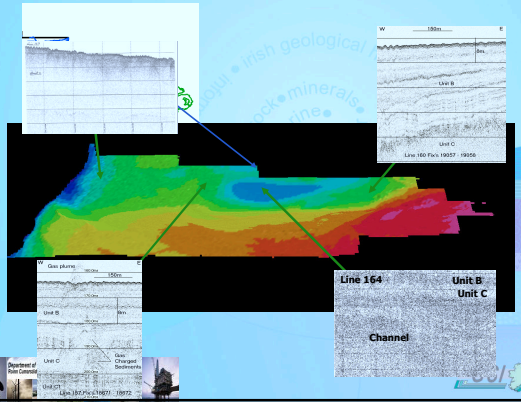
- The need to place a development or a number of developments in context is important for assessing its effect on the region or their cumulative effect
- Strategic Environmental Assessments are now required for certain policy initatives under EU directive

Regional Datasets

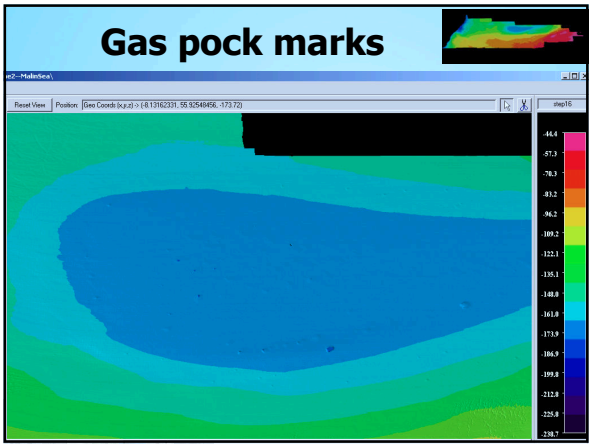
Policy decision tool, e.g. SEA



Gas charged sediments



Gas pock marks



Promote exploration and sustainable development of resources

- Good quality data
- Good licencing system

Promote exploration and sustainable development of resources

e.g. Investment in the Yukon

Geological Survey of Canada geochemical survey costing C$212,000 led to the discovery of the Kudz Ze Kayah massive sulphide deposit.

•This led to the largest staking rush in Yukon history
•Subsequently additional discoveries, including Wolverine and Kona deposits
•Expenditures in the area were more than C$40 million

Promote exploration and sustainable development of resources

For Canada, it is estimated that

• For every $1m in government geoscience
• Results in $5m in exploration expenditures
• And discovery worth $125m
• About 50% of the exploration expenditure goes directly to employment

THE CARLIN DISCOVERY

(after Coope, 1991, Livermore, 1996)

1936-39 W.O. Vanderburg (U.S. Bureau of Mines) recognizes and describes a class of sediment hosted micron gold occurrences in north-central Nevada (e.g., Gold Acres); predicts more deposits of this type remain to be found

1955-60 Roberts et al. publish syntheses of USGS mapping; document relation of known mining districts to NW alignments of windows through the Roberts Mountains thrust

March 1961 Newmont launches exploration program for bulk-mineable gold deposits in Nevada; John Livermore and Alan Coope assigned to program

September 1962 Discovery hole drilled into Carlin deposit (30 m @ 35 g/t Au)

Promote exploration and sustainable development of resources

	m tonnes	Au grade g/t	Tonnes Au
Production	586	1.68	984
Reserves	434	4.18	1,663
Mineral Inventory	185	3.73	694
Total	**1,205**	**2.78**	**3,341**

Relatively small investment in mapping led to the discovery of the Carlin Trend

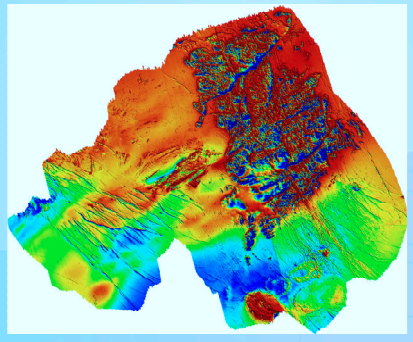
Value approximately $50bn

Promote exploration and sustainable development of resources

- Data used in imaginative ways may lead to further discoveries
- New models in the future may lead to further discoveries
- The data itself is a national asset

Open file

Magnetics



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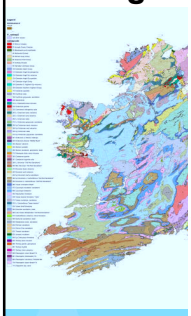
Land Use

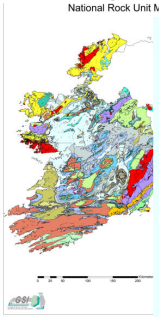
Customising datasets

- Groundwater Maps
- Aggregate Potential Maps
- Geohazard Maps

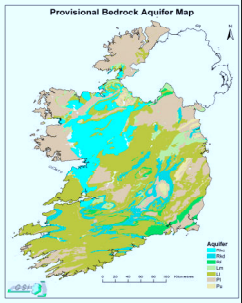
Creating Knowledge: Layer by layer



Bedrock Geology

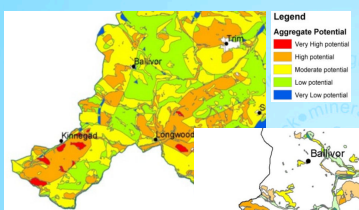


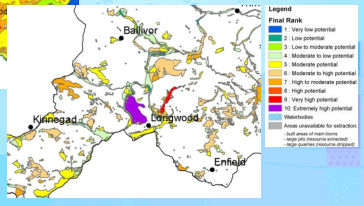
Rock Units



Aquifers

Aggregate Potential Mapping





- Meath
- Wicklow
- Donegal

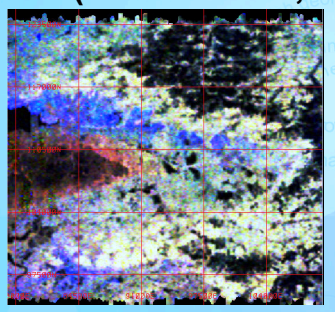
Important planning tool for linear infrastructure

- To ensure aggregates supply
- To avoid sterilising resources

Geohazards

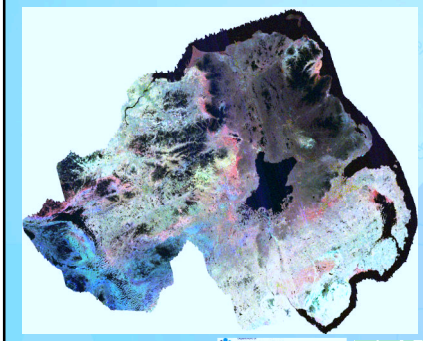
- Mine Site Pollution
- Landslides
- Tsunami
- Subsidence
- Radon

Ternary diagram: Radon risk (Castleisland, Co. Kerry)



K=red,
U=blue,
Th=green

Gamma Ray



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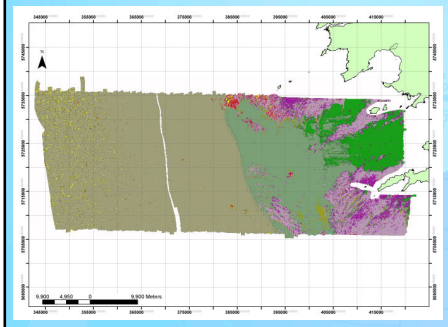
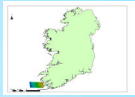
Research: Seabed Classification





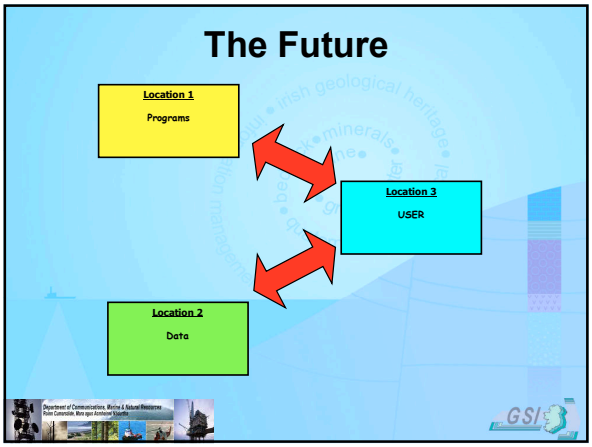
Knowledge Economy and the development of Irish Expertise

Geological Heritiage

Access to Data

- Data available digitally
- Old data often as scanned images
- Newly collected data digital

- GSI moving towards Web delivery


The Future
Location 1
Programs
Location 3
USER
Location 2
Data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