British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

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Maximising the benefit of past investment: the subsurface agenda – a case study from Glasgow

Hugh Barron

British Geological Survey, Edinburgh

co-authors:

Ken Lawrie	British Geological Survey
Helen Bonsor	British Geological Survey
Simon Watson	Glasgow City Council
Diarmad Campbell	British Geological Survey
Dave Lawrence	British Geological Survey
Sandy Gillon	Glasgow City Council
Jane Ferguson	Grontmij Ltd
Martin Smith	British Geological Survey

Which INSPIRE theme?

Annex I	Annex II	Annex III
1. Coordinate reference systems	1. Elevation	1. Statistical units
2. Geographical grid systems	2. Land cover	2. Buildings
3. Geographical names	3. Orthoimagery	3. Soil
4. Administrative units	**4. Geology**	4. Land use
5. Addresses		5. Human health and safety
6. Cadastral parcels		6. Utility and Government services
7. Transport networks		7. Environmental monitoring facilities
8. Hydrography		8. Production and industrial facilities
9. Protected sites		9. Agricultural and aquaculture facilities
		10. Population distribution – demography
		11. Area management / restriction / regulation zones & reporting units
		12. Natural risk zones
		13. Atmospheric conditions
		14. Meteorological geographical features
		15. Oceanographic geographical features
		16. Sea regions
		17. Bio-geographical regions
		18. Habitats and biotopes
		19. Species distribution
		20. Energy resources
		21. Mineral resources

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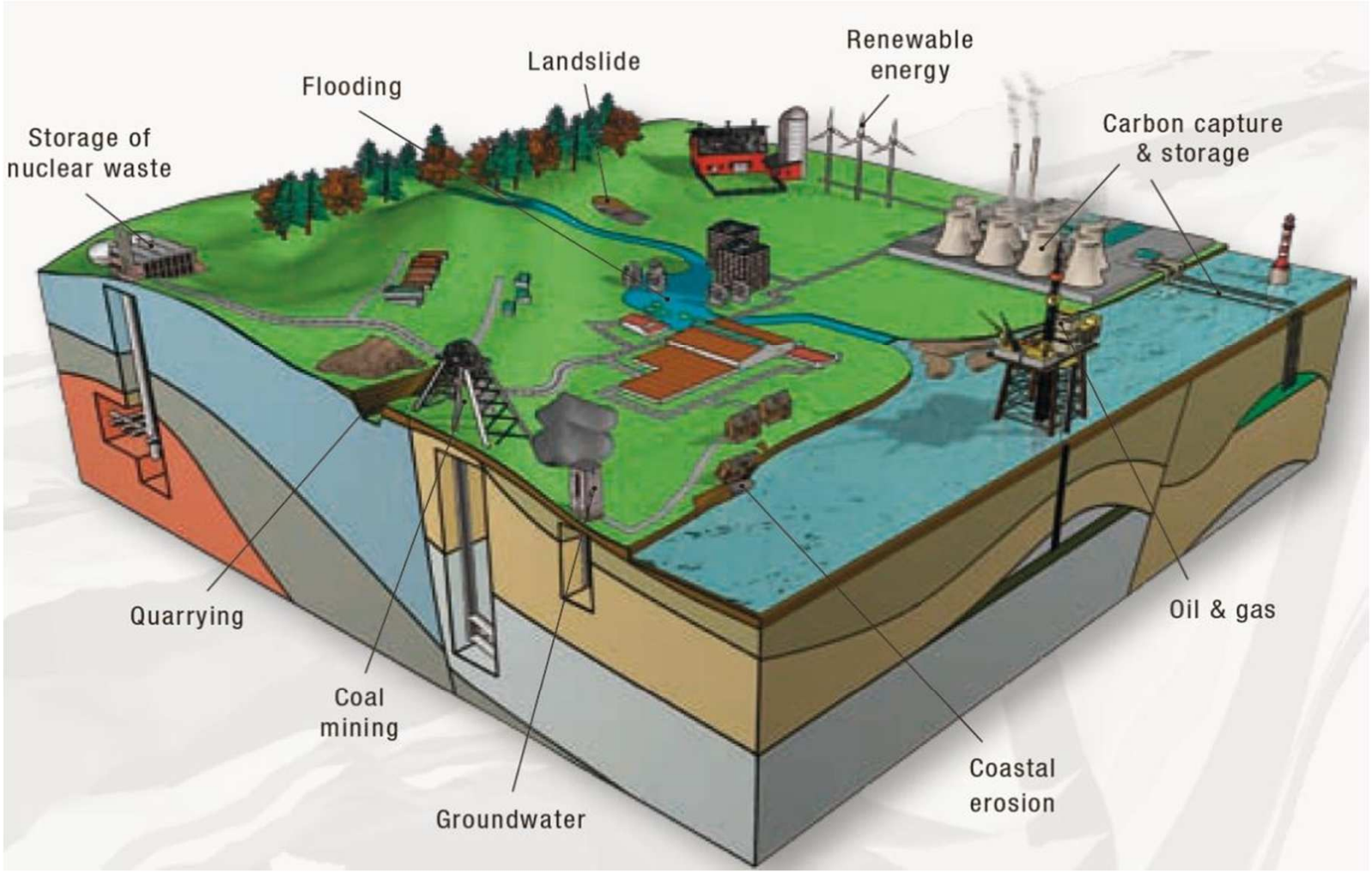
BGS: TWG Editor Geology, Mineral Resources & Coord for Natural Risk Zones

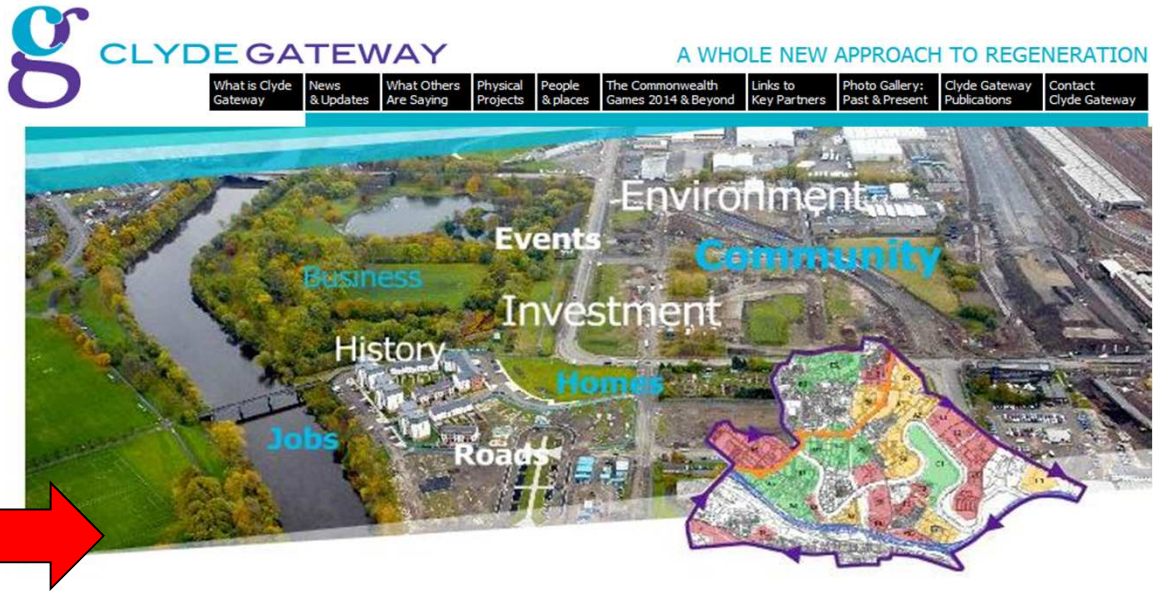
Geology – the 3rd dimension



Zone of Human Interaction

the subsurface – unseen side of construction

Brownfield sites

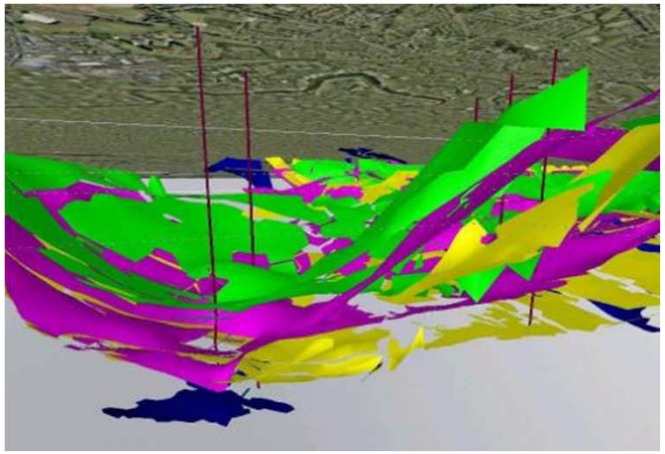


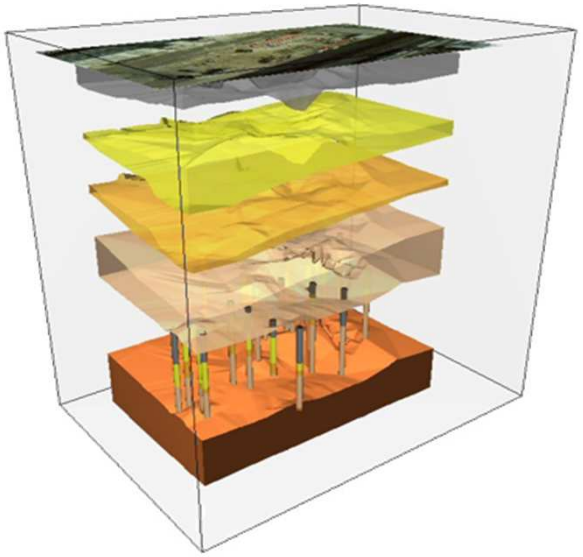
Urban regeneration

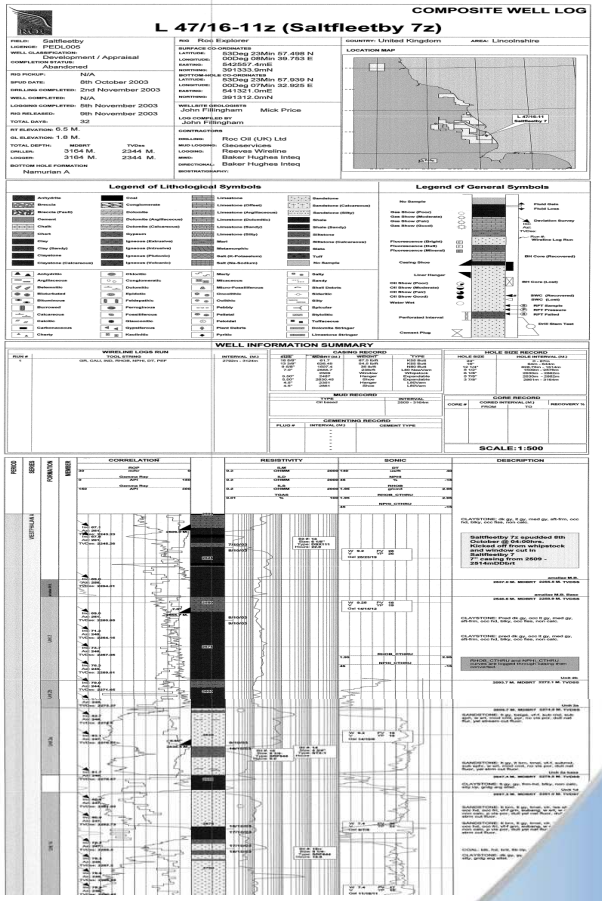
You must know what you are building on

you need subsurface information..

Much of it is already available –the past investment







But more is required

Ground Investigation

Ground Investigation costs*:

c. 2% of substructure costs

c. 0.1% overall building costs

BUT industry reports ground problems cause:

- 30 – 50 % of delays to projects
- 50% over-run > 1 month
- Most common source of project risk & overspend
- Costly resolution, claims and litigation
- Focus on **unforeseen ground conditions**

* Chapman & Marcetteau 2004, The Structural Engineer

“ unforeseen ground conditions”

“DEFRA estimate that £210m per year is spent unnecessarily on remediation due to poor site investigation”

Brownfield Briefing: Cost-Effective Site Investigation, London 15-16 June 2011

Addressing the problem - INSPIRE approach

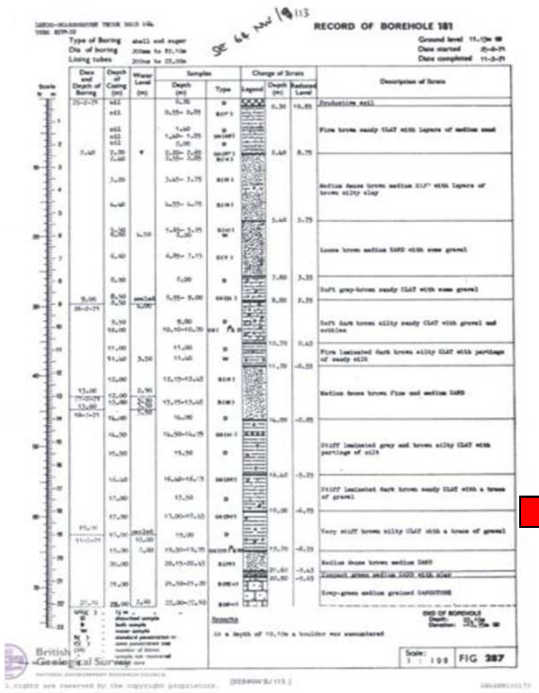
Could increase spend on more boreholes etc.

But, much better to maximise use of existing, and future, data & knowledge, e.g. In 3D models

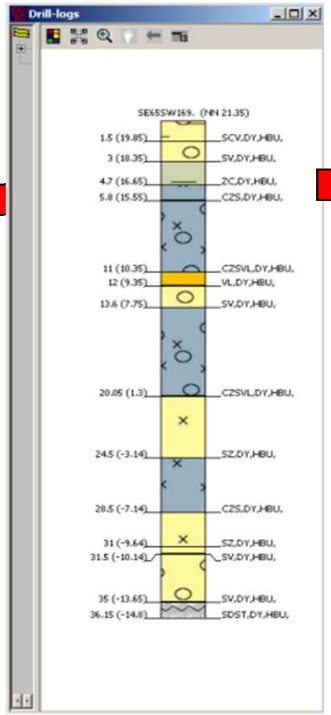
BUT problems in accessing all publicly-held data:

- numerous forms/standards
- very variable quality
- re-use prevented by conflicting acts/regulations/IPR
- confidentiality issues
- Poor accessibility (analogue v digital, multiple locations)

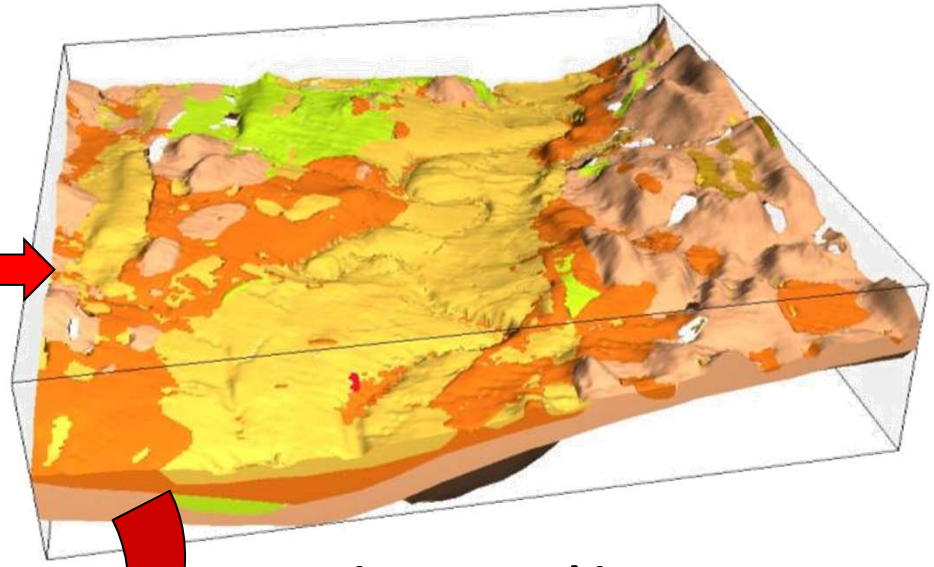
The Glasgow experience



Subsurface
raw data
(>35, 000 Boreholes)



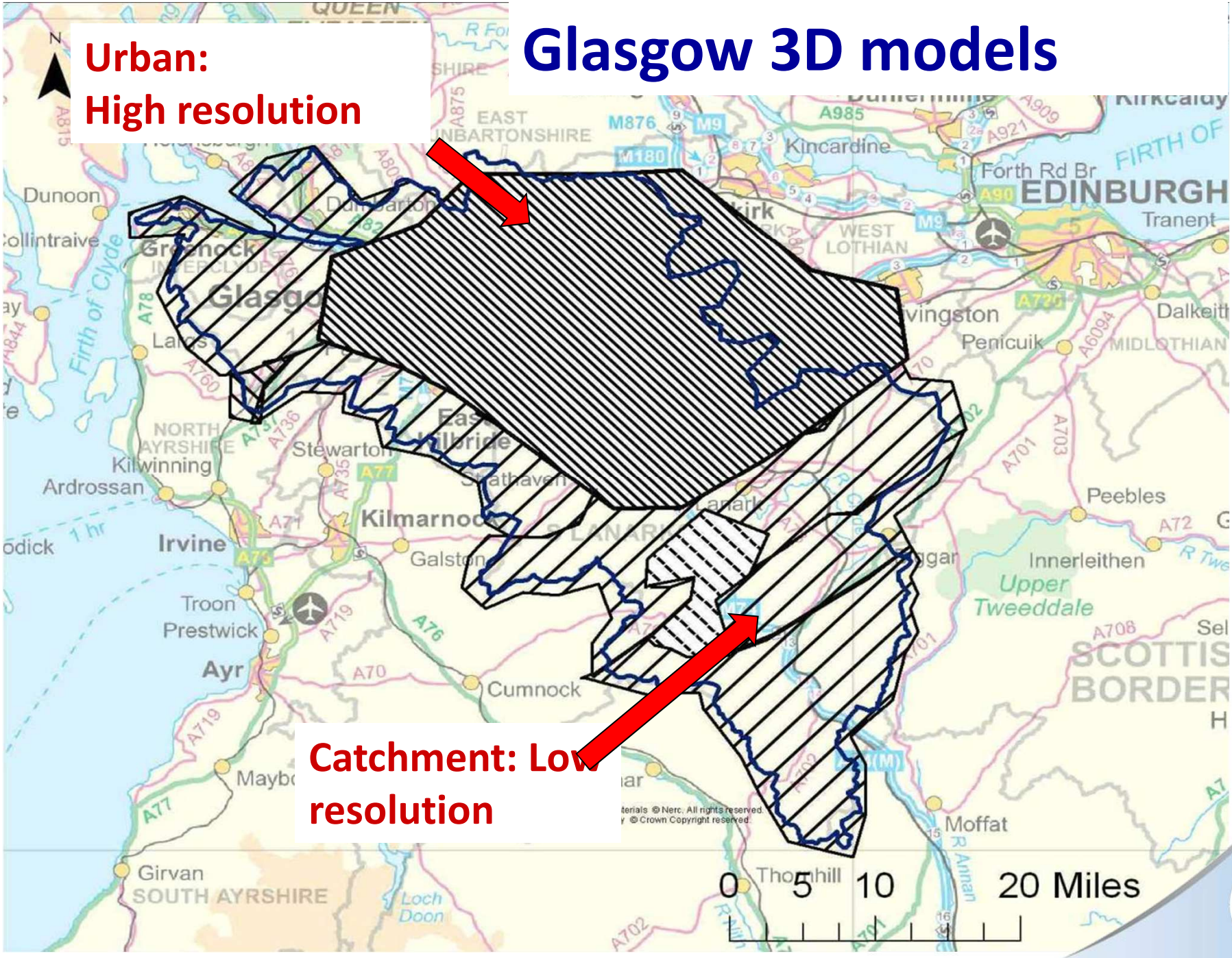
BGS digital data



Data integrated in BGS 3D models for GCC & others – **maximises benefit of past investment**

Glasgow City Council

Glasgow 3D models



following some INSPIRE principles..

- *Data should be collected only once and kept where it can be maintained most effectively*
- *Easy to find what geographic information is available, how it can be used to meet a particular need, and under which conditions it can be acquired and used*

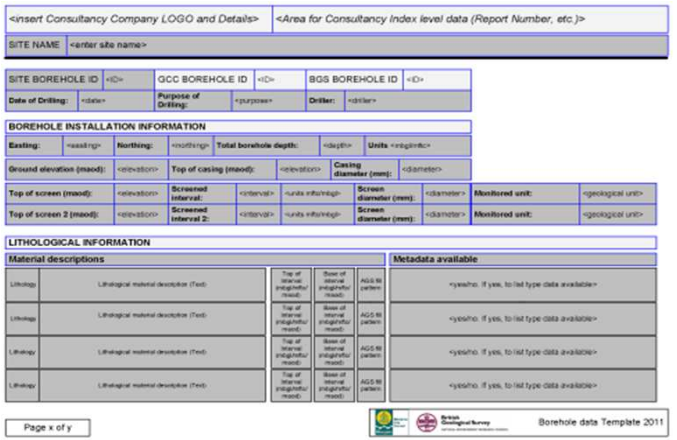
For Glasgow 3D models:

- Over 35,000 boreholes in BGS archive
- But many more held by GCC
- Access and constraints impede their reuse (by BGS)
- **So improved data flow & partnership key to efficiency gains**

The Glasgow partnership solution....

GCCs consultants and contractors (e.g. Grontmij)

- use simple data acquisition templates (INSPIRE-compliant) for ground investigation data
- provide georeferenced site plans



Glasgow City Council (Client):

- Receive and use data
- Transfer key data to BGS

BGS (National Custodian):

- Archive & reinterpret data to update 3D models/GIS
- GCC upload BGS updates to support decision making

All using web services to reduce costs for all parties

The wider perspective

Partnership approach towards culture of improved data accessibility and exchange:

- between LAs & BGS
- and between public & private sectors

Hence

- national subsurface 3D models for decision makers
- reduction in costly unforeseen ground conditions
- improved/ timely delivery of public construction
- potential culture change in private sector
- direct savings to government and Industry

And the scale of the impact?

the construction industry….

10% of GDP
26 million jobs

8% of GDP
€126 bn (2009)

10% of GDP
€10.8 bn (2009)

Any questions?

hfb@bgs.ac.uk

www.bgs.ac.uk