

The following was presented at DMT'09 (May 10-13, 2009).

The contents are provisional and will be superseded by a paper in the DMT'09 Proceedings.

See also earlier Proceedings (1997-2008)

http://ngmdb.usgs.gov/info/dmt/



A Practitioners Guide to Managing Geoscience Information

Jeremy R A Giles Monday 11th May 2009

DMT 09

Environmental Data

- The Natural Environment Research Council has three key resources:
 - its expert work force;
 - its facilities (ships, labs, buildings, etc): and
 - its scientific information holdings.



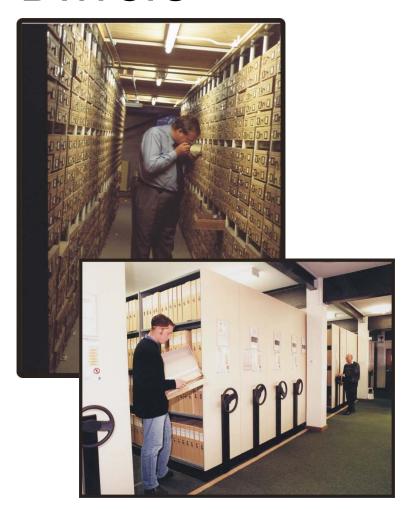


Purpose

- The purpose of Information Management in a Geological Survey is:
 - to maintain the national geoscience database; and
 - underpin efficient and effective delivery by providing geoscientists with ready access to data and information that are timely, fit for purpose, and in which the users have confidence.



Drivers



- to reduce staff effort in finding data;
- to make quality data available to staff and customers;
- to facilitate collaboration across BGS;
- to improve access to the unique BGS information;
- to keep BGS at the forefront of the development of digital geoscience systems;
- to inform management decisions; and
- to allow Corporate implementation of standards and establish best practice

Benefits

- Risk Reduction
 - Reduce legislative compliance risk
 - Reduce litigation risk

Increase Productivity

Better Science



Risk Reduction

- Know the data holdings
- Managing the holdings as an asset
- Improve quality
- Preserve the evidence



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Lofthouse Colliery Disaster



- FREDRICK ARMITAGE AGED 41 YEARS
- COLIN BARNABY AGED 36 YEARS
- FRANK BILLINGHAM AGED 48 YEARS
- SYDNEY BROWN AGED 36 YEARS
- CHARLES COTTON AGED 49 YEARS
- EDWARD FINNEGAN AGED 40 YEARS
- ALAN HAIG AGED 30 YEARS



Legal & Policy Obligations

- GSO are facing anincreasing information related legislative burden
- Whether national or EU legislation the risk of noncompliance is increasing

- The Mining Industry Act 1926
- The Public Records Act 1958
- Science and Technology Act 1965
- The Petroleum (Production Regulations) 1976
- Water Resources Act 1991
- The Freedom of Information Act 2000
- Environmental Information Regulations 2004
- INSPIRE Directive

Negligence ...



Digital Mapping Techniques '03 — Workshop Proceedings U.S. Geological Survey Open-File Report 03-471

Negligence and Professional Malpractice Related to GIS Datasets

By Ian J. Duncan

Texas Bureau of Economic Geology (formerly at Virginia Department of Mines Minerals and Energy), University Station X, Austin, TX 78713 Telephone (512) 471-1534; fax: (512) 471-0140; e-mail ian.duncan@beg.utexas.edu

INTRODUCTION

Chrisman (1991) has suggested that "error (in spatial data) is inescapable, it should be recognized as a fundamental dimension of data." Digital geologic data sets are not an exception to this truism. Typical errors include incorrect data, missing data, incorrect georeferencing, and incorrect documentation of the data. Although these types of errors can always occur, well-established methods are available to characterize them. Informing users of the data's reliability and the nature of errors in the dataset can contribute greatly to effective use of the data. Geologists and GIS professionals should develop and implement a comprehensive approach to addressing these issues.



Myth of Infallibility

- Peritz (1986) has suggested that "...the presumption of trustworthiness (of digital data) simply carries too much weight..."
 - Peritz, R., 1986, Computer Data and Reliability:
 North west University Law Review, v 80, p. 960.



Myth of Infallibility

- Tarter (1992) has noted that "(the) myth of machine infallibility seems to create a demand for higher standards of quality for machine readable data than for traditionally distributed information."
 - Tarter, B., 1992, Information Liability: New Interpretations for the Electronic Age: Computer/Law Journal, v. XI, p. 484.



Increased Productivity

- Reduce costs of finding and manipulating information.
- Prevents re-collection of existing information
- Promotes reuse and repurposing
- Allows scientist to spend more time doing science



Cost Analogues

Peebler (1996) made the following observation:

"Lack of basic data integration costs the average E&P professional a considerable amount of time. According to various estimates geoscientists and engineers spend form 20% to 30% of their total project time searching for, loading and formatting data. Obviously, significant productivity gains are still locked up in organizations that do not have level one integration."

Peebler, R. 1996. Extended Integration The Key To Future Productivity Leap. Oil and Gas Journal May 20, 1996; Vol. 94; No. 21

Cost Analogues

- Shell International, Holland
 - Adam Dobson visit to BGS on 17-12-2002
- An internal audit undertaken in 2002 showed that for New Frontiers Areas Shell Staff spent their time as follows:
 - Finding data 53%
 - Archiving data 9%
 - Documenting the data 15%
 - Interpreting (adding value) 23%
- Shell set goals to raise the time spent interpreting the data (adding value) to 46% by reducing the time to find data to 30%.



Better Science

Evidence base preserved

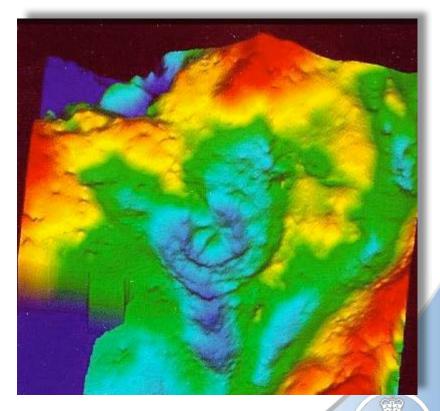
Re-use

Repurposing



Why Manage Data? Evidence

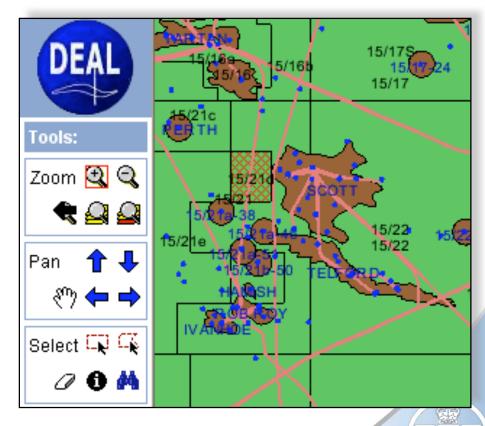
- Data/Records are anything providing permanent evidence of or information about past events.
- In the context of digital research data this is evidence that the data, and associated records, demonstrate that the disseminated conclusions were reasonable given the state of knowledge at the time of dissemination.



3D Bouguer anomaly map over the Chicxulub crater

Why Manage Data? Reuse

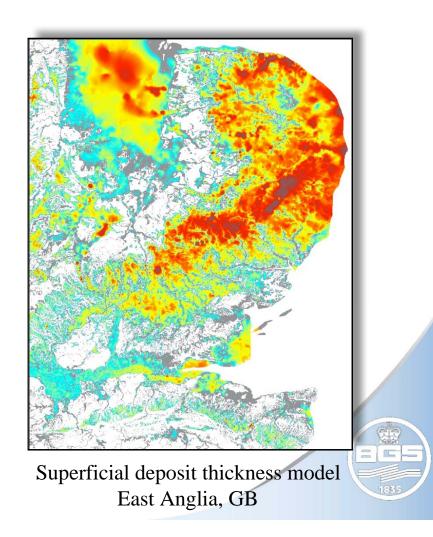
- Preserving existing data so that they can be reused for the same, or similar purpose for which they were acquired.
- New data can be added to existing data which have been reprocessed to provide a richer understanding.

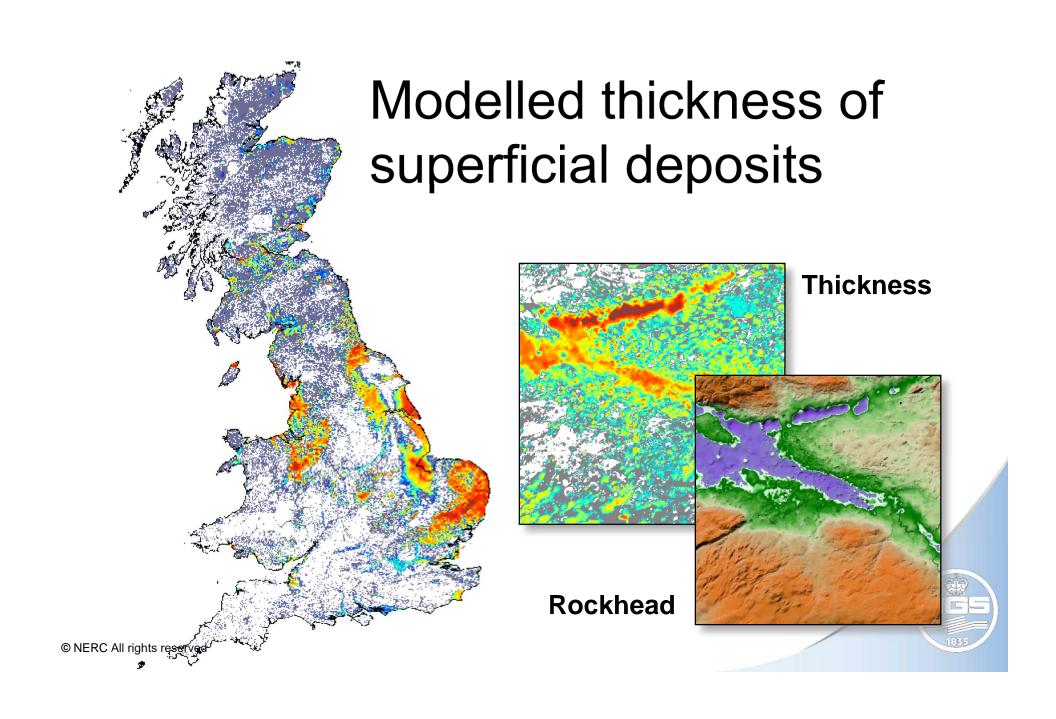


www.ukdeal.co.uk re-use site for offshore oil exploration data

Why Manage Data? Re-purposing

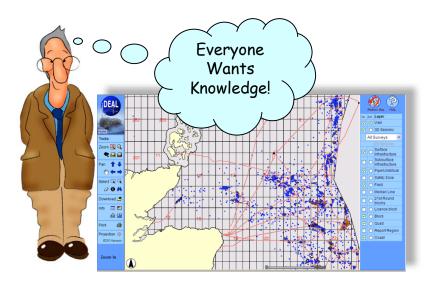
- Using existing data for a purpose for which they were not originally collected.
- Careful long-term preservation of data/records will allow for their reuse in a purpose for which they were not originally collected.





Benefit Realisation

- Discovery
 - Metadata
 - Spatial indexes
- Quality
 - Asset-based management
 - Technical metadata





Discovery Metadata

- Reduces legislative compliance risk
- Informs potential users of what is available
- Provides other key details about availability and quality
- Key tool for asset-based information management
- Originally followed the UK National Geospatial Data Framework (NGDF) but have migrated to ISO 19115





BGS Data Holdings Metadata Application

Home | Search | Contents by Title | Contents by Contact Name | Start New Metadata Creation | Start Duplicate Record |

Help

No record selected Please choose below

Metadata Creation

Metadata Contacts

Dataset Summary

Dataset Contacts

Project Information

Keywords

Geographic Extents

Geographic Bounding Box

Vertical Extents

Geographic Scale

Lineage Statement

Model/Dataset Associations

Distribution Format

Storage Formats

Spatial Representation

Sampling Resolution

Spatial Reference Systems

Access Constraints

Use Constraints

Additional Info on Constraints

Online Access URL

These are your options within the BGS Data Holdings (GeoIDS) Metadata Application

Create a new metadata entry for a BGS Data Holding:

Create new entry from scratch

Create new entry by duplicating an existing record

Select a BGS-GeoIDS metadata entry to edit and/or review:

Select from dataset titles

Select from names of contacts for the metadata

Search in titles/descriptions

Select a BGS-GeoIDS metadata entry for completion and sign-off:

Select from dataset titles

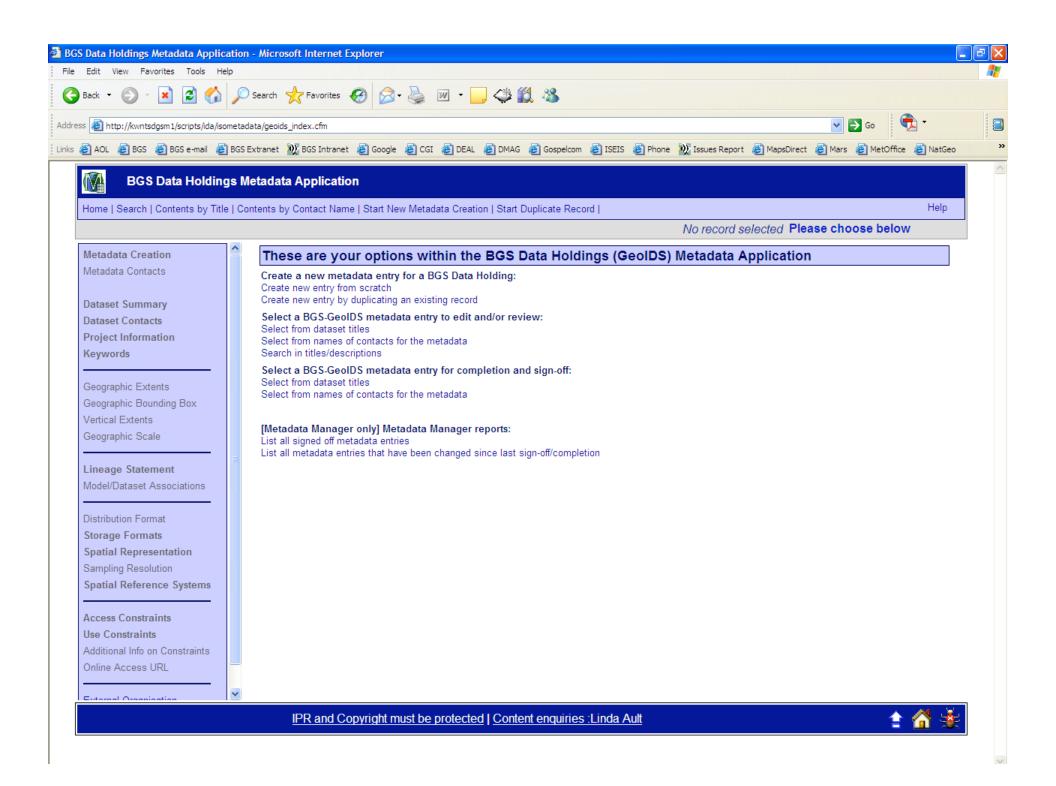
Select from names of contacts for the metadata

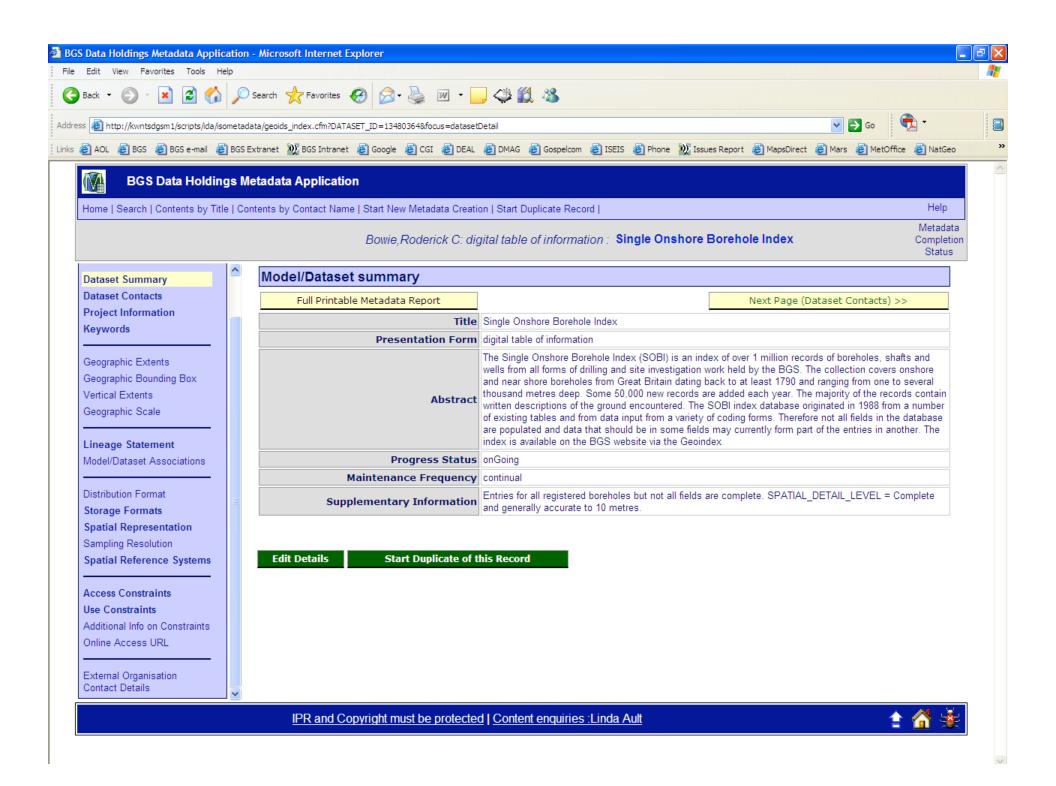
[Metadata Manager only] Metadata Manager reports:

List all signed off metadata entries

List all metadata entries that have been changed since last sign-off/completion









Geoscience for decision making

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Search

Home » Our services » NGDC information & data » Online data » Discovery Metadata

Our services

NGDC information & data

- ▼ Online data
 - Online data index
 - Borehole materials
 - Discovery metadata
 - GeoIndex
 - Geological photographs
 - Lexicon of rock units
 - PalaeoSaurus
 - Rock classification
 - Rock collections
 - Taxonomy Online
 - Vocabularies
 - Water watch
 - Web services

BGS Discovery Metadata



BGS discovery metadata describes the datasets held.

These pages are derived from our discovery metadata database, which complies with ISO standard 19115:2003 for geographic information metadata.

See also

- Library
- NGDC
- Enquiries
- Geoscience information

List of all datasets

<u>This page</u> has a list of all available Discovery Metadata datasets, sorted alphabetically by name with links to the full details for each dataset.

Browse by keywords

<u>This page</u> has an A to Z list of all the keywords used to describe the Discovery Metadata datasets. Each keyword links to a list of matching datasets, or directly to the full details of single dataset matches.

Keyword hierarchy

<u>This page</u> shows a hierarchy of keywords used to describe the Discovery Metadata datasets. Each keyword links to a list of matching datasets, or directly to the full details of single dataset matches.

Browse by location

<u>This page</u> has an A to Z list of all the aereal extents (locations) used to locate the Discovery Metadata datasets. Each location links to a list of matching datasets, or directly to the full details of single dataset matches.

NERC Data Discovery Service

Metadata about data held by other NERC Environmental Data Centres is available from the NERC Data Discovery Service.

Bookmark with: - Delicious MDigg Facebook of reddit StumbleUpon

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BGS Discovery Metadata

A to Z list of all 202 BGS datasets

1" Miscellaneous Sheets Files South West England.

10k Sheet Data Files.

50k Sheet Data Files.

Aa Indices.

Acidity of stream water

Additional Information (AI): Scotland And Northern England.

Airborne Magnetic Survey Records For United Kingdom And Adjacent Areas.

All BGS Raw Biostratigraphy Collections And Data

Archival Card Index Of Quarries In England And Wales.

Arsenic in soil

Arup Review Of Mining Instability In Great Britain

BGS Chemistry Records Pre 2000

BGS Petrological Collection Database.

BGS Photograph Collection

BGS Reports Collection.

Biostratigraphical Interpretative Data Files

Biostratigraphical Masterpacks.

Biostratigraphy Reports - Onshore And Offshore, 1953-2000.

Borehole Notifications.

Home Dataset A to Z Keyword A to Z Keyword heirarchy Location A to Z



BGS Discovery Metadata Dataset

Opencast Coal Data

Dataset description

Primary Geological Data resulting from Open Cast Coal exploration. Collection of data includes reports, interpretations and records of research in British coalfield areas deposited by British Coal. Data for past and current collieries and for future prospects. The majority of the collection was deposited with the National Geological Records Centre by the Coal Authority in July 2001. The collection includes borehole site plans, borehole logs, analyses and geophysical data etc. BGS holdings of opencast data are to be integrated with these collections. New data from coal companies will be added as it is recieved.

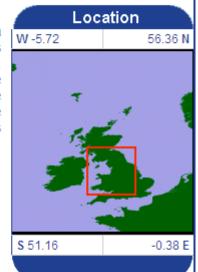
Constraints

Copyright and commercial restrictions may apply.

For more information please contact:

Enquiries British Geological Survey Keyworth Nottingham NG12 5GG

Tel: +44 (0)115 936 3143 Fax: +44 (0)115 936 3276 Email:enquiries@bgs.ac.uk



Reviewed

17th November 2006











BGS Discovery Metadata Dataset

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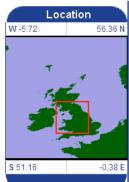
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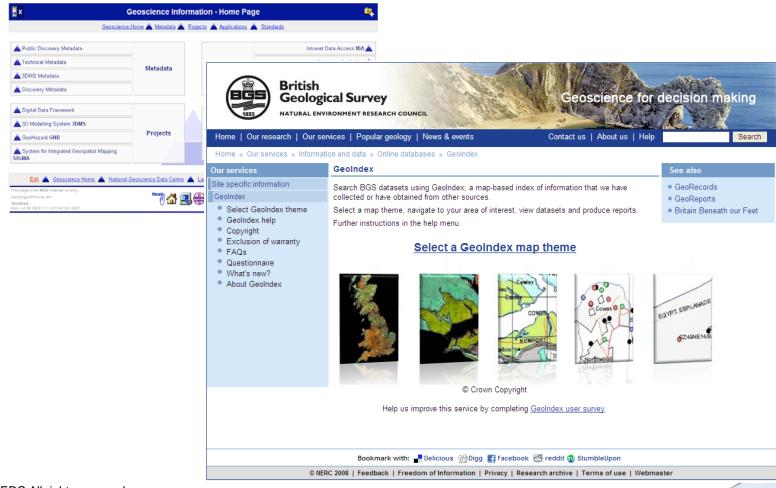


Further details [close]

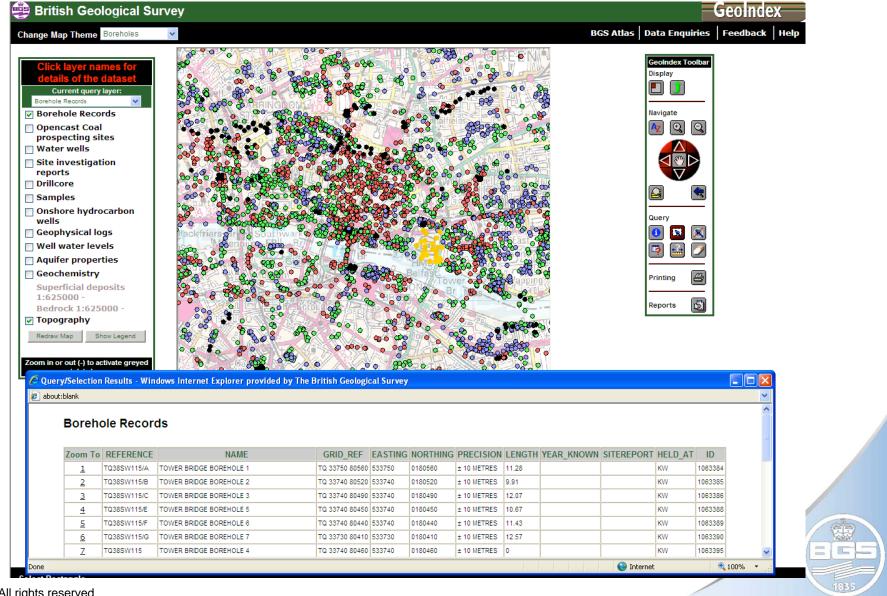
Dataset details	
Language	English
Curator	British Geological Survey
Supply media/format	PAPER
Storage format	Hardcopy:Paper copy
Frequency of update	irregular
Start of capture	Not known
End of capture	Not known
Contact details	
Department	Enquiries
Organisation	British Geological Survey
Address	Kingsley Dunham Centre, Nicker Hill, Keyworth
City	Nottingham
County	Nottinghamshire
Country	United Kingdom
Postcode	NG12 5GG
E-mail	enquiries@bgs.ac.uk
Telephone	+44 (0)115 936 3143

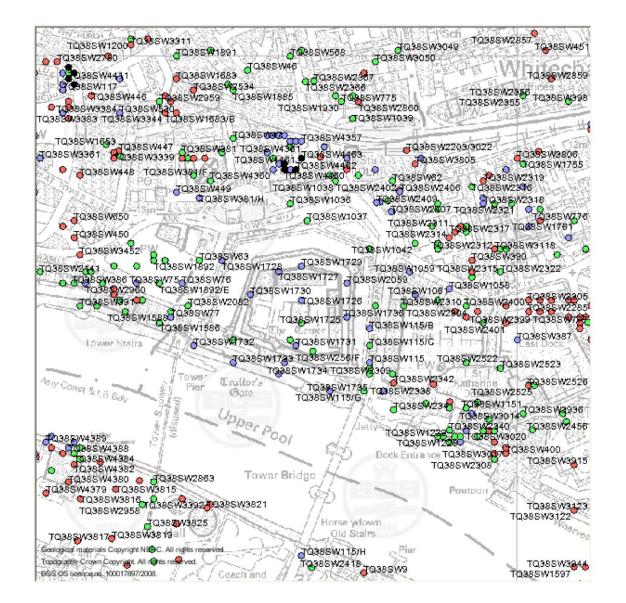


Geospatial Indexes - External



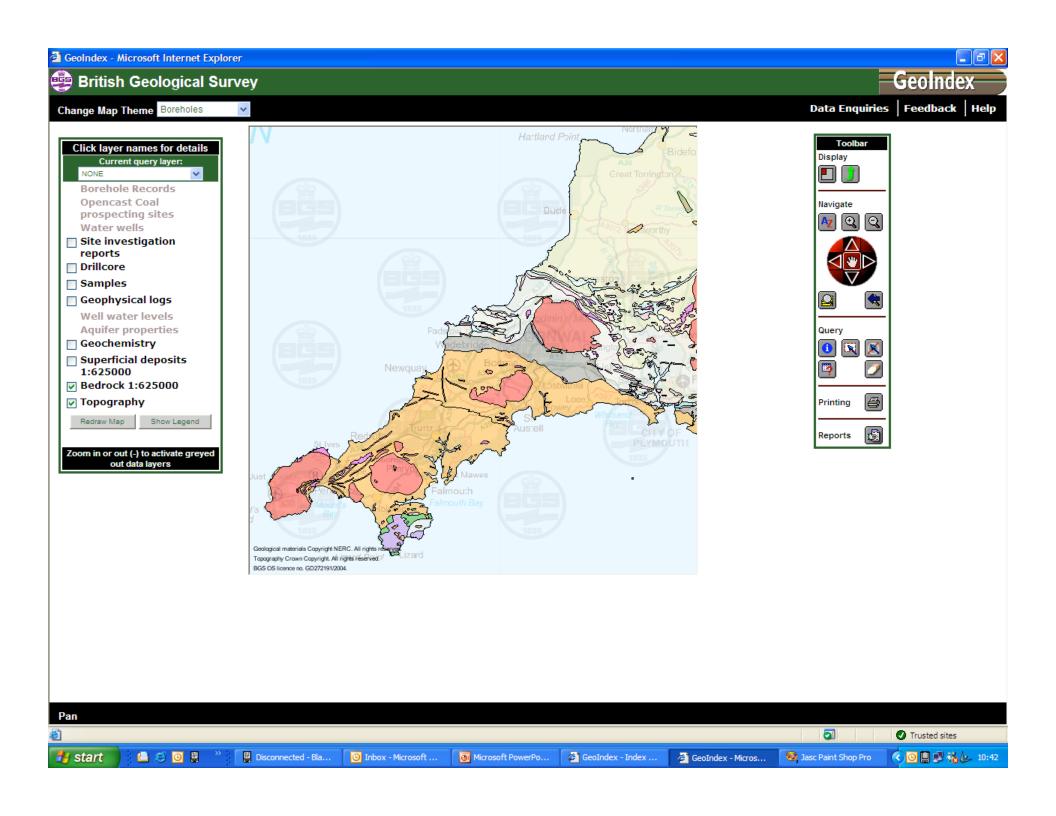


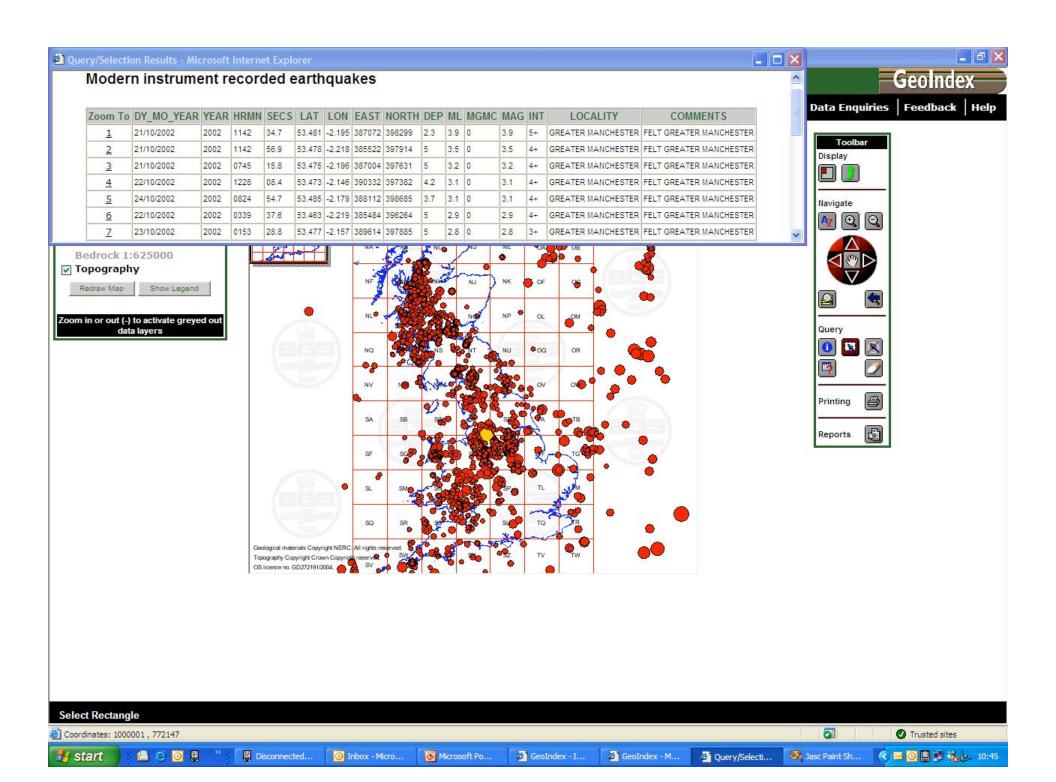


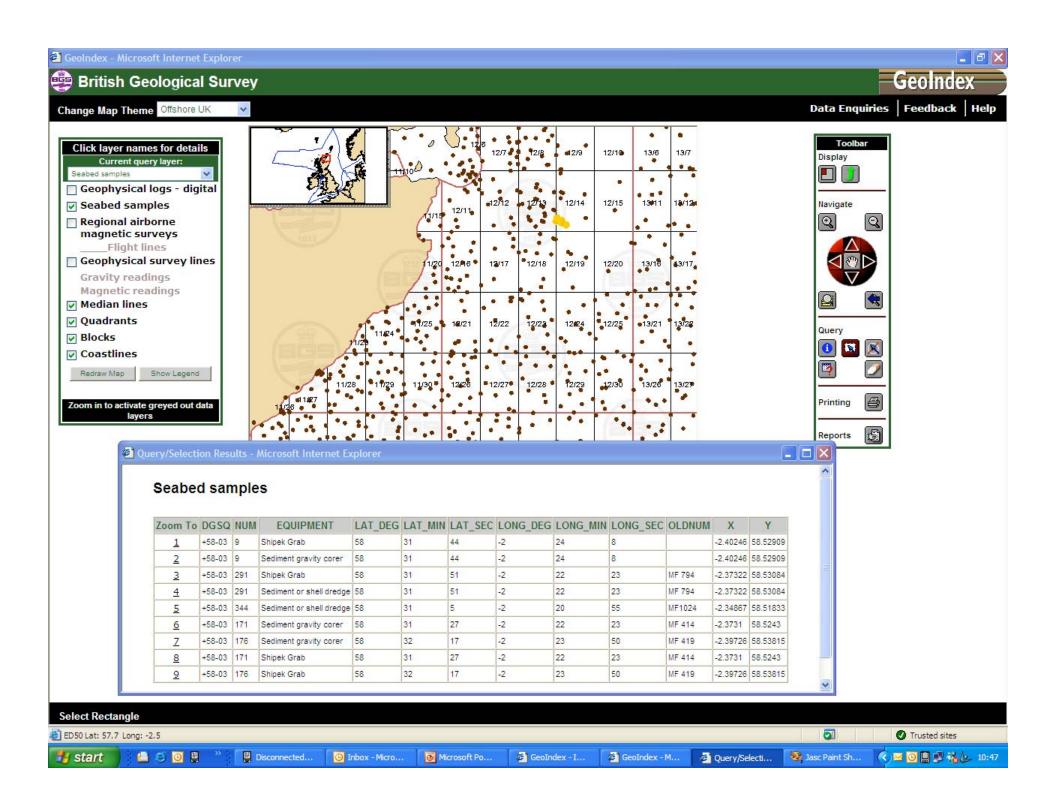


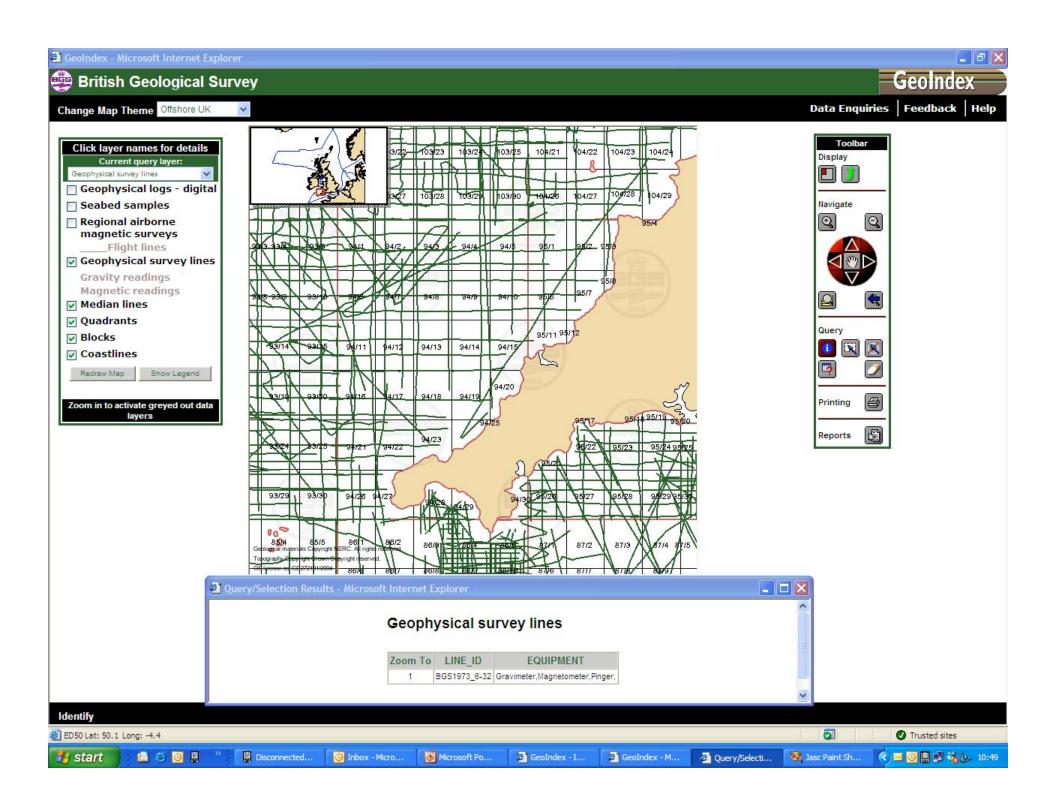




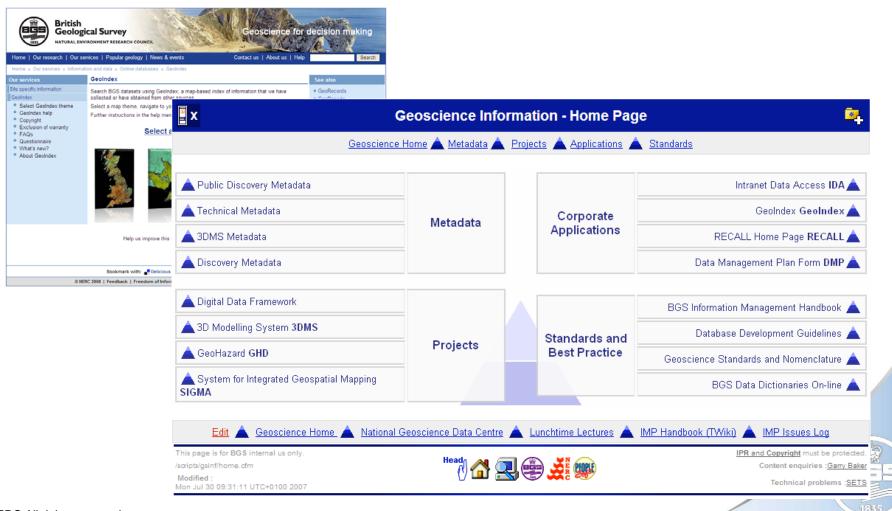


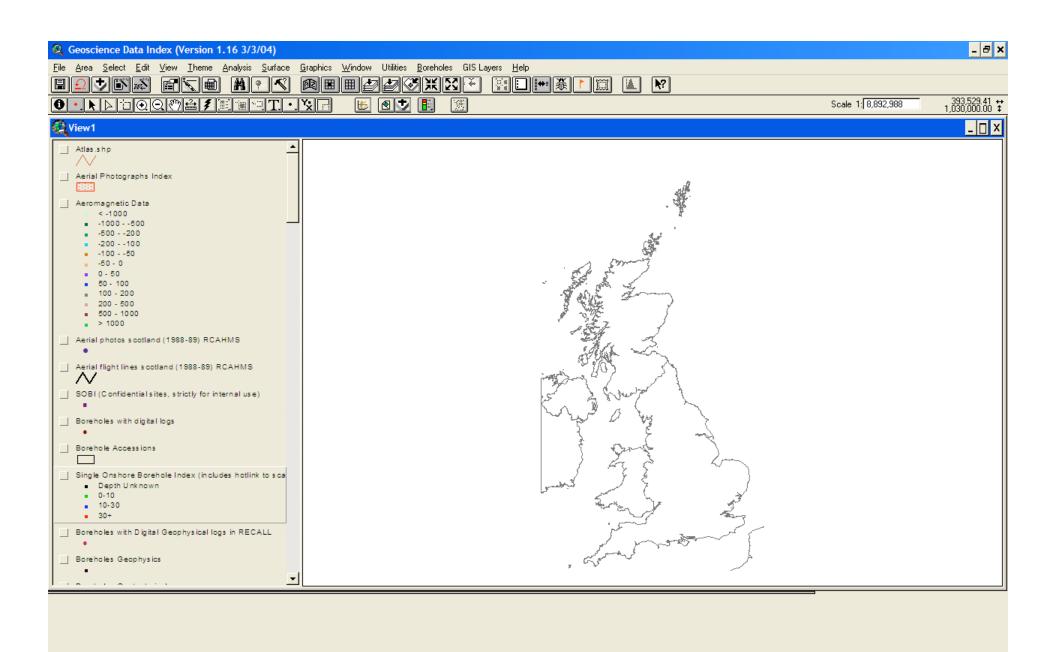


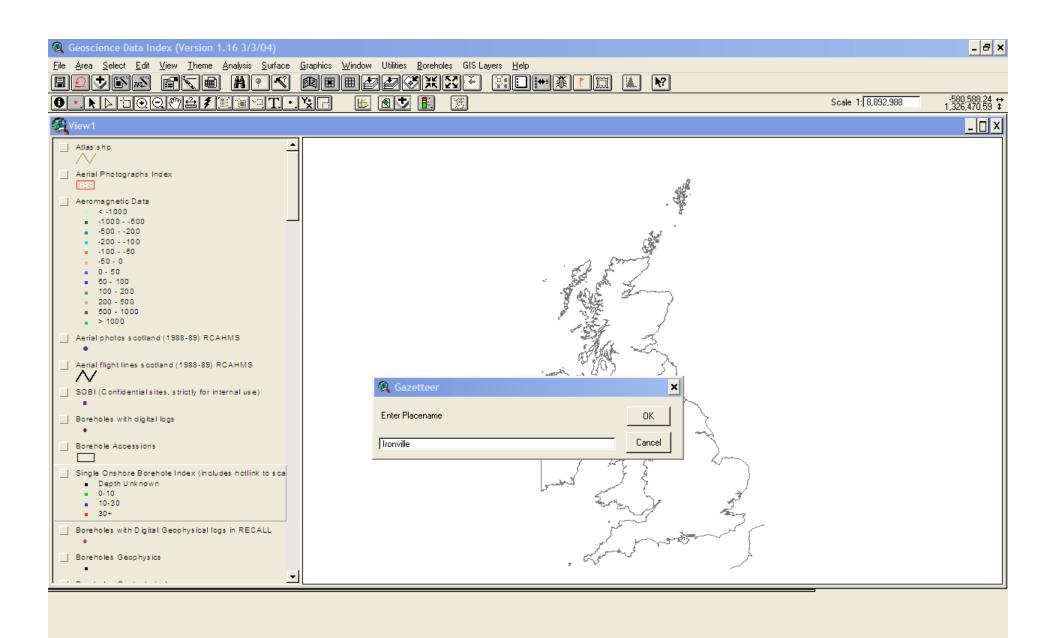


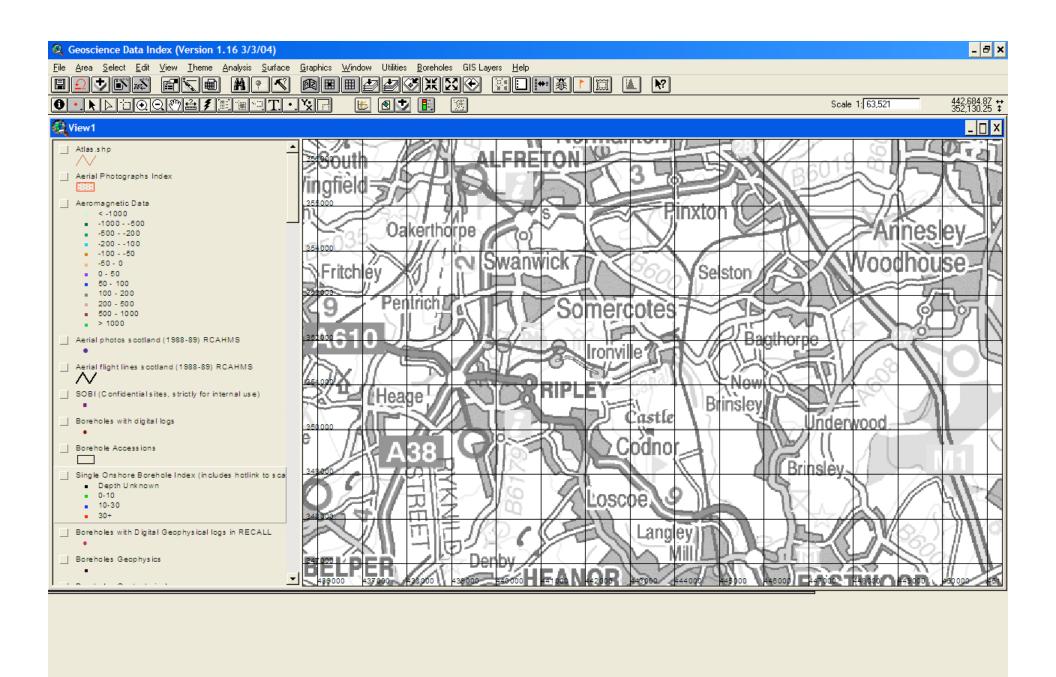


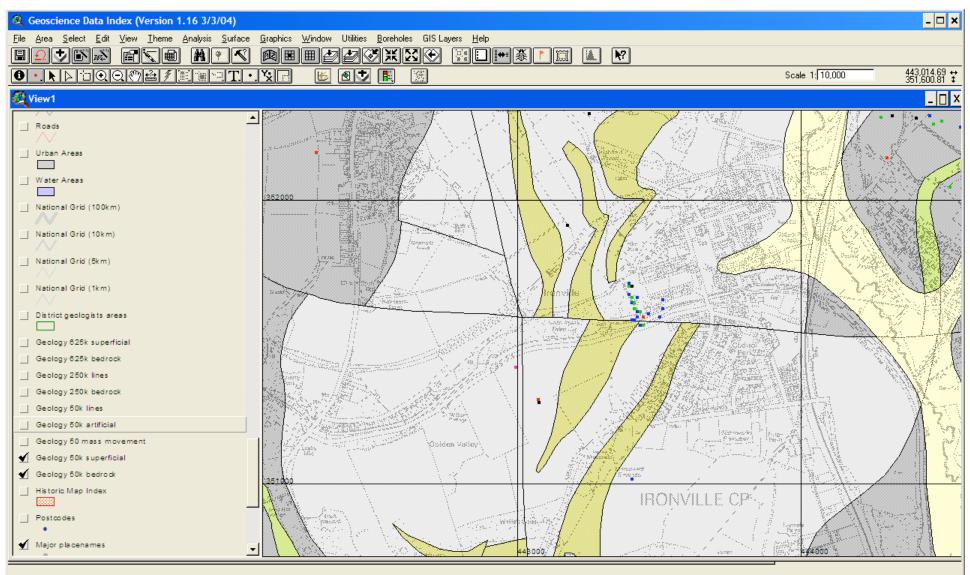
Geospatial Indexes - Internal



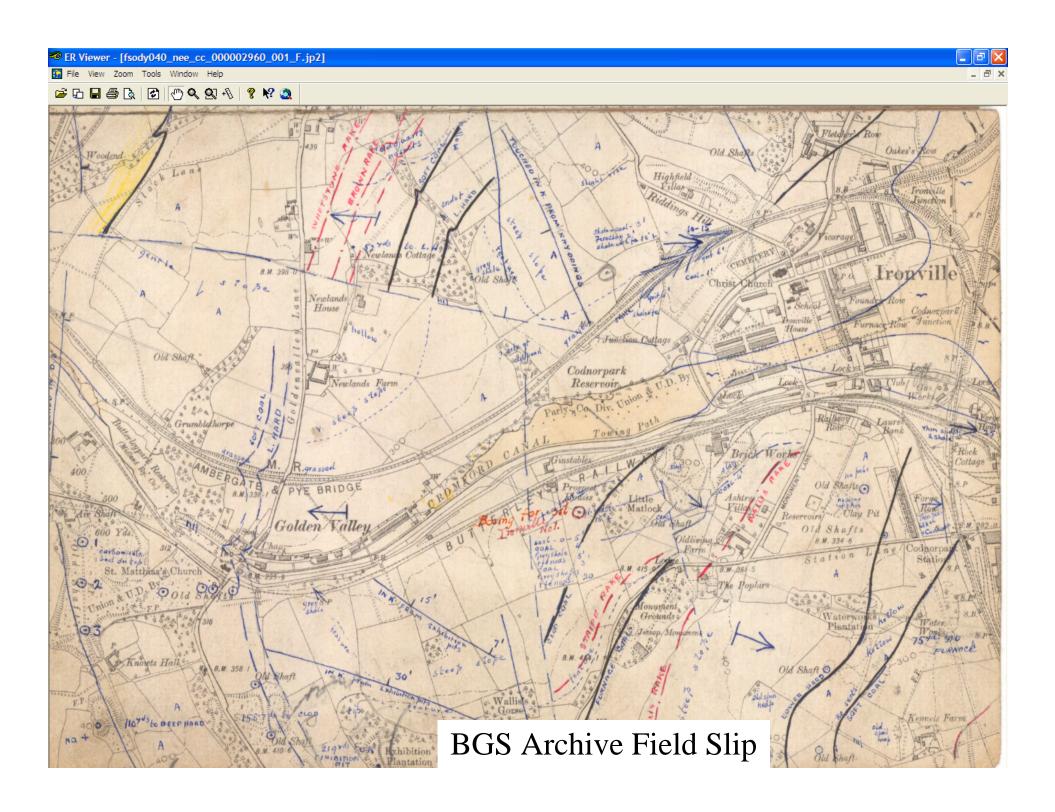




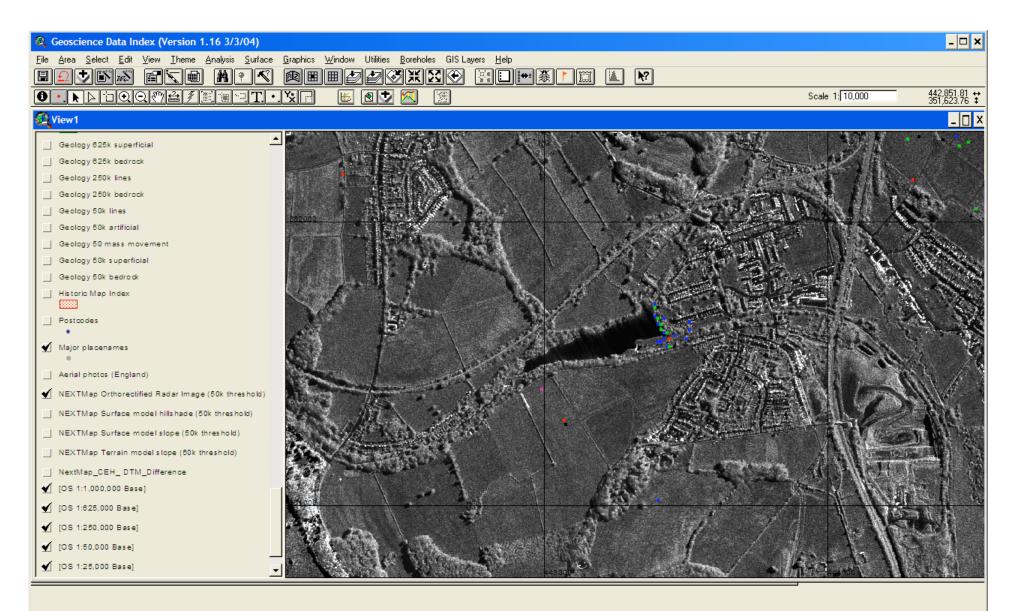




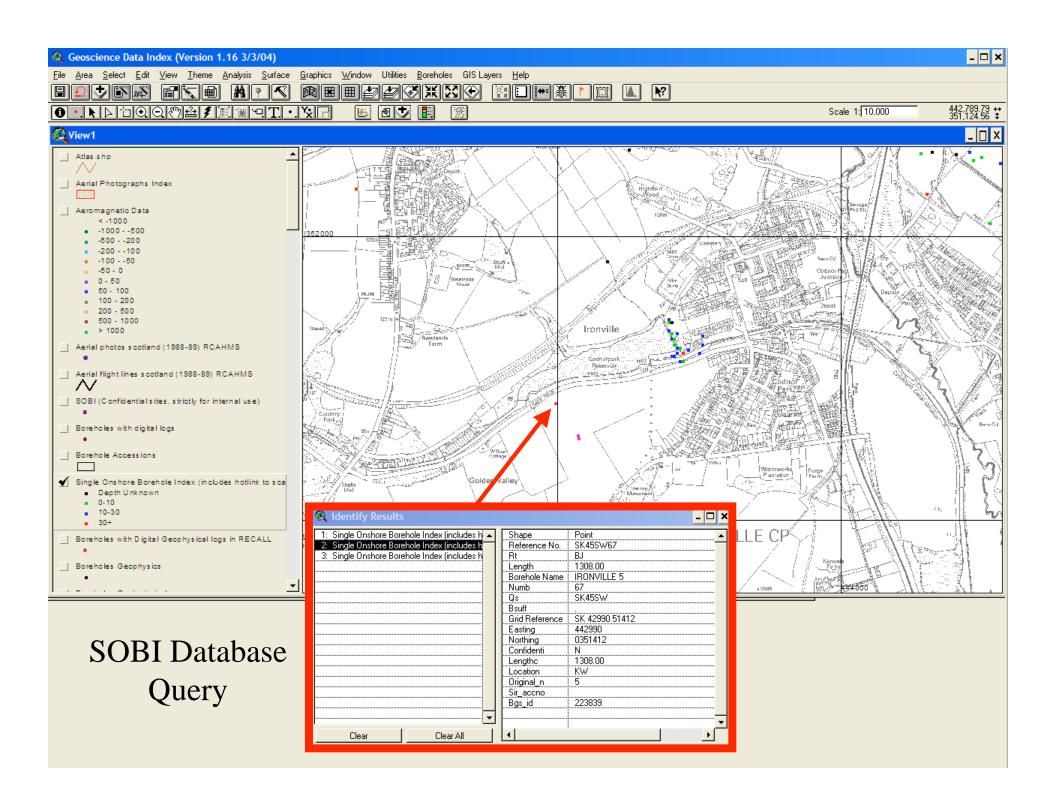
1:50, 000 Scale Bedrock Geology

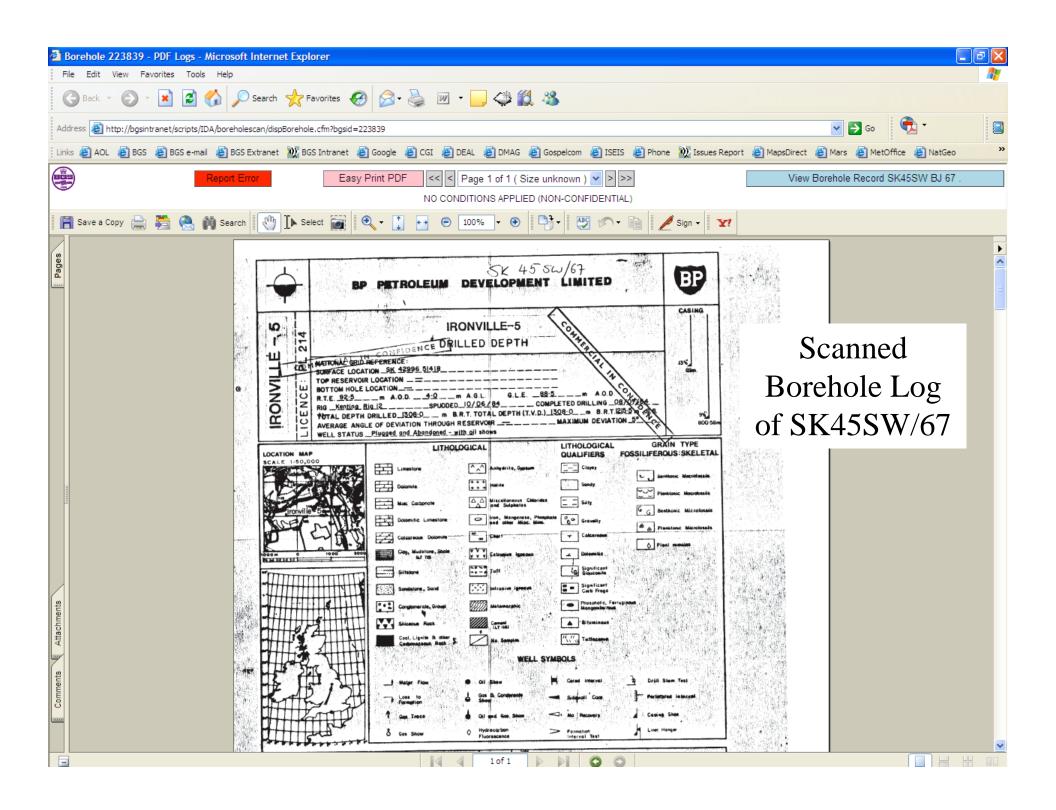


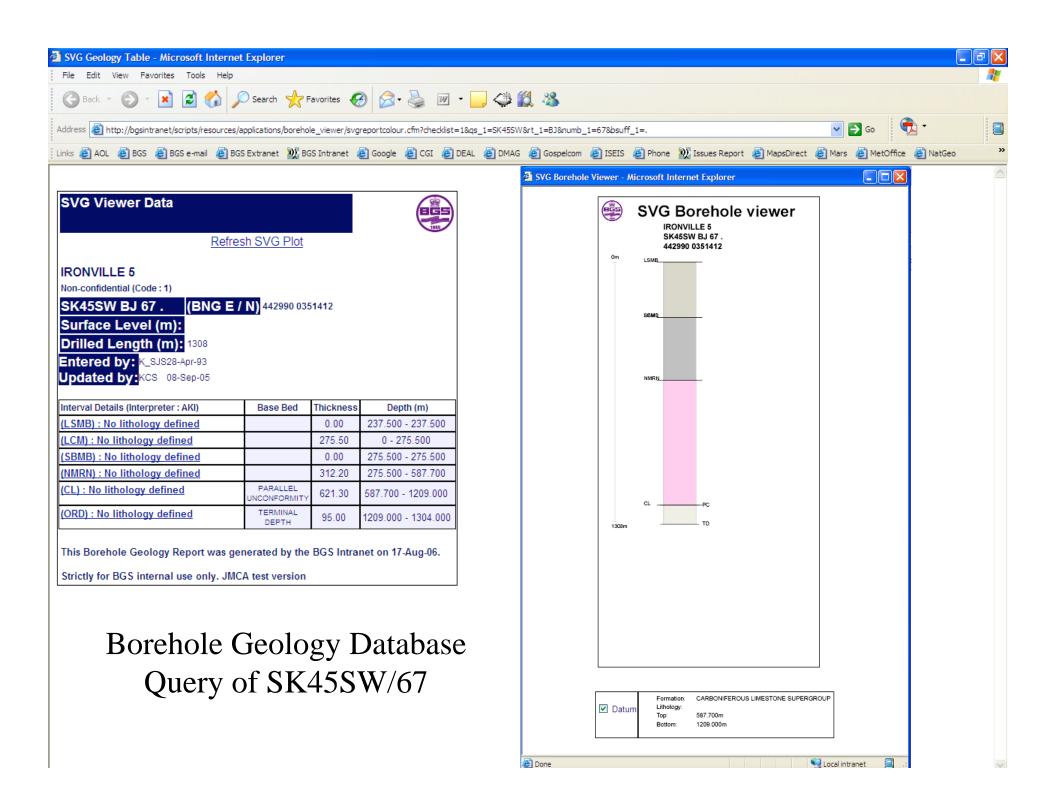


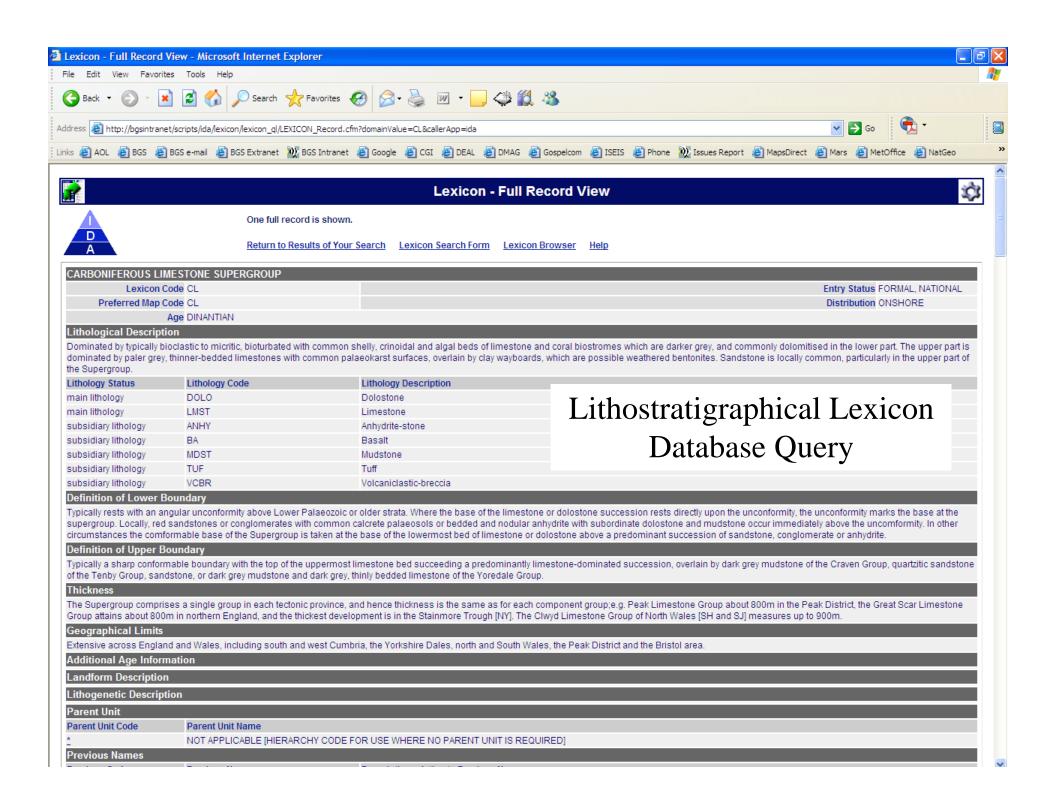


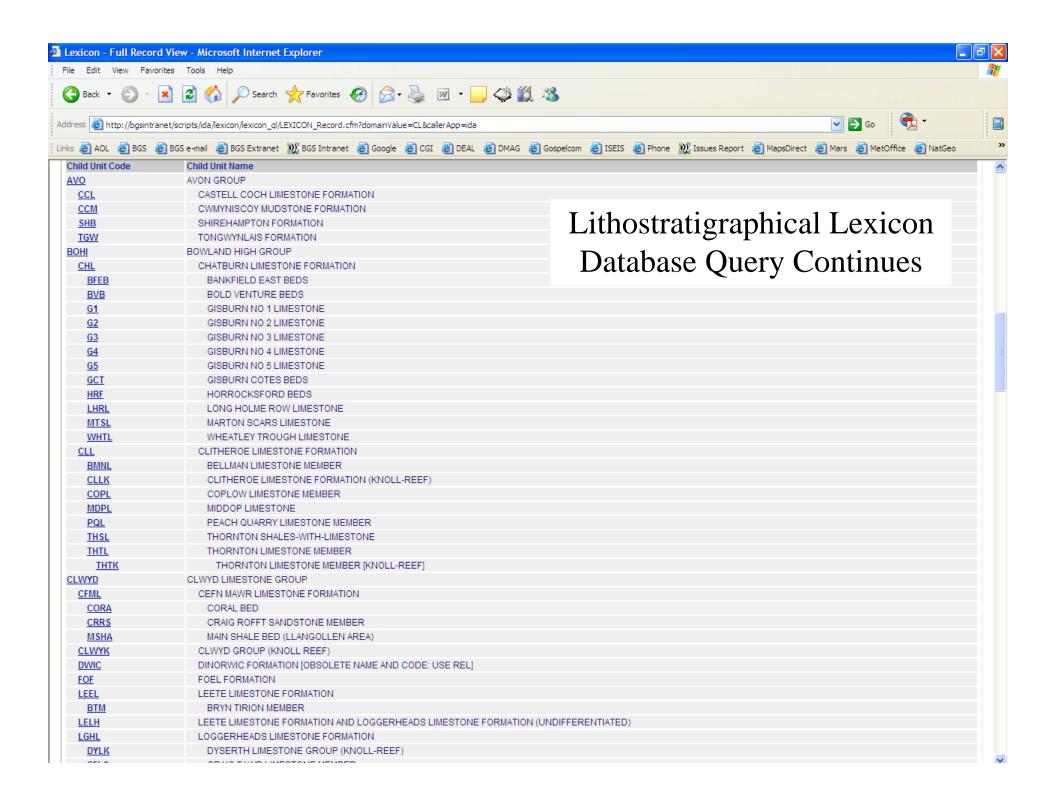
NEXTMAP Othorectified Radar Image

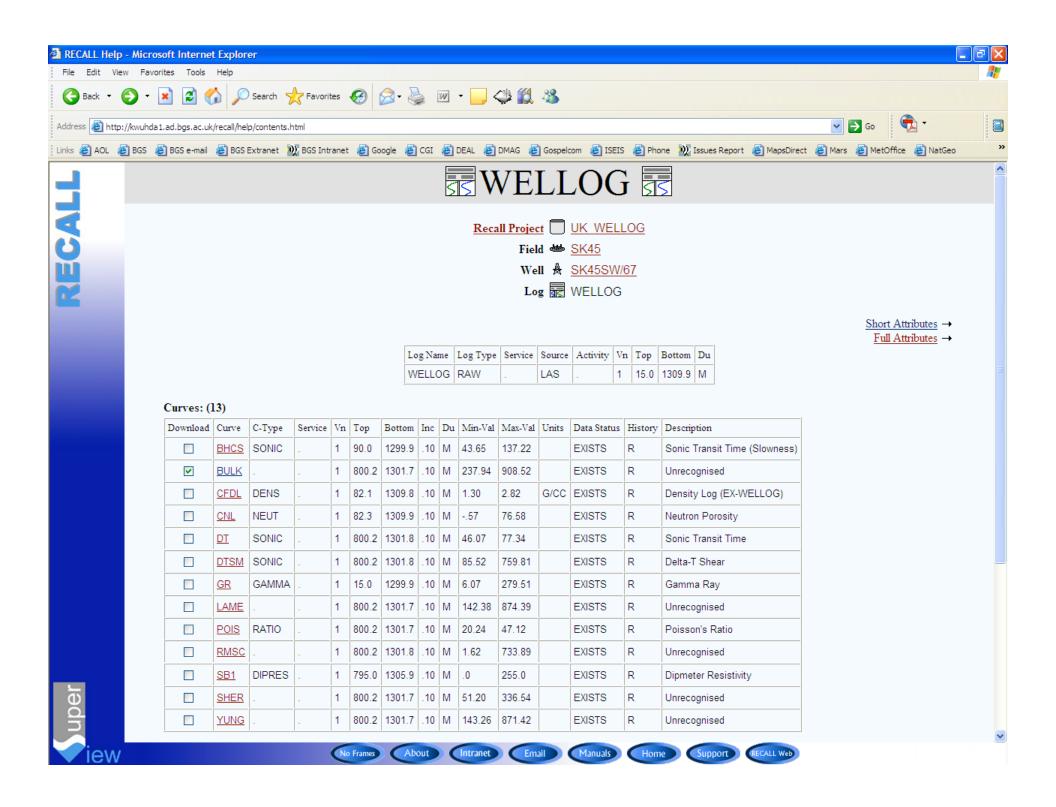


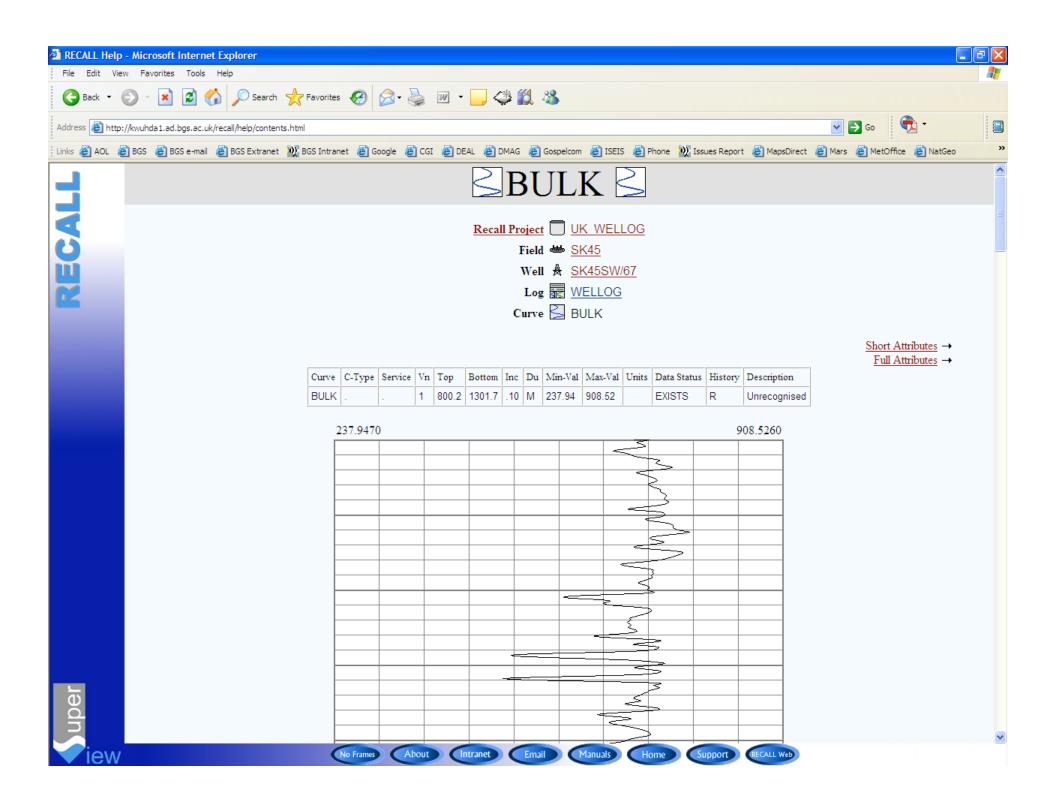








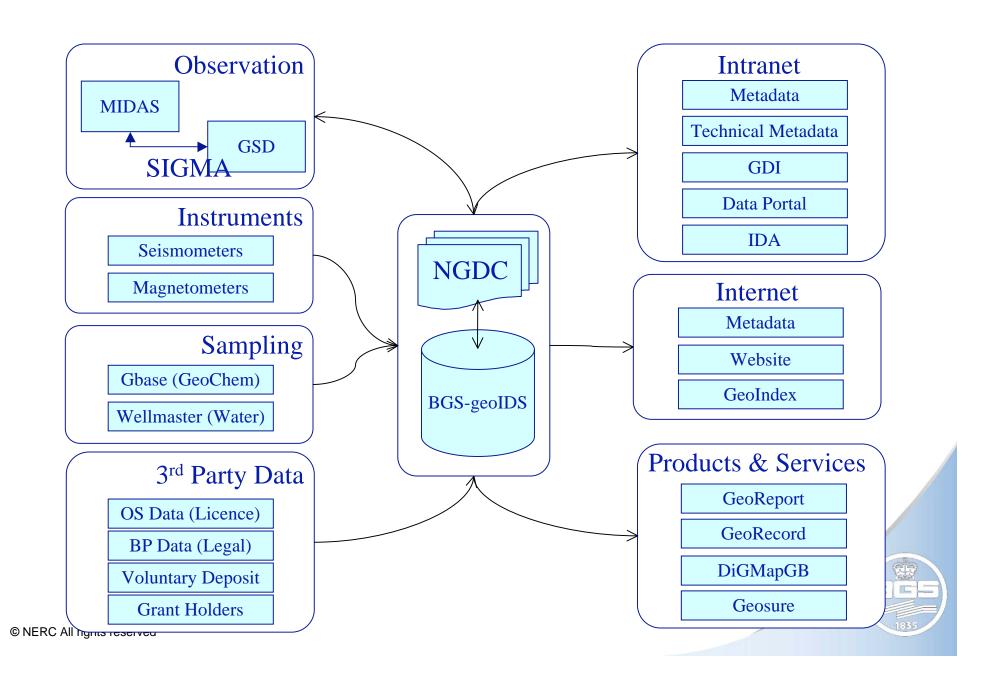


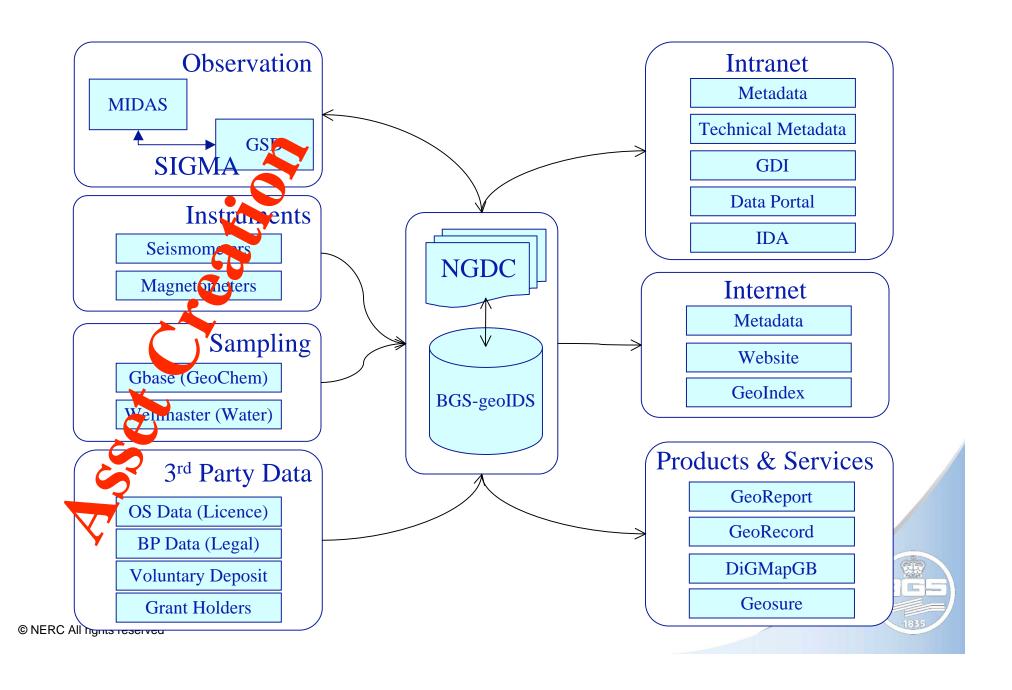


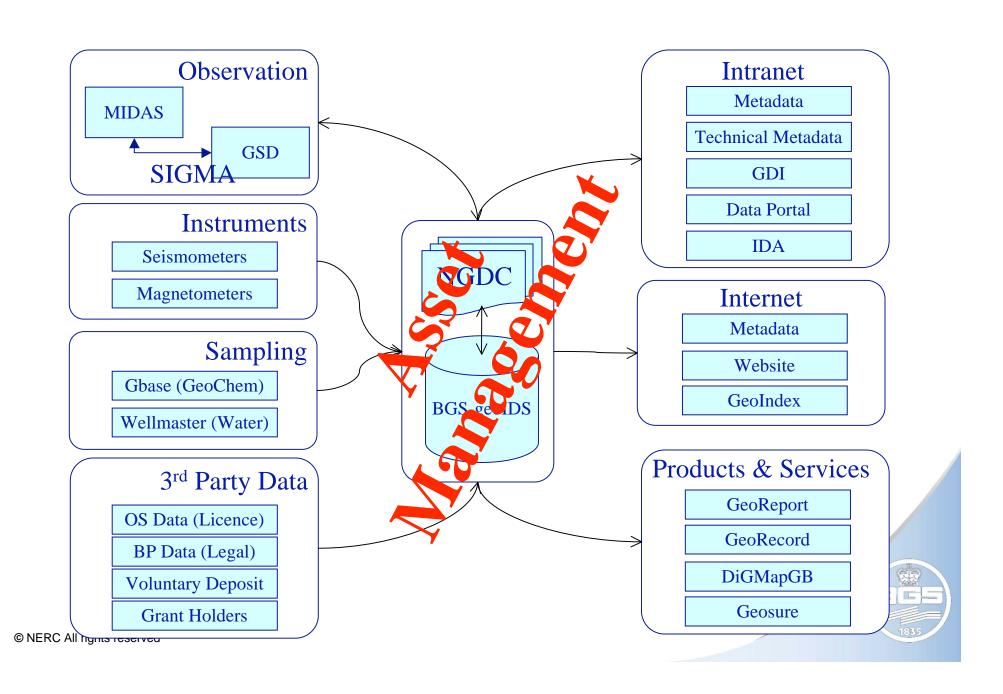
Information Asset Management

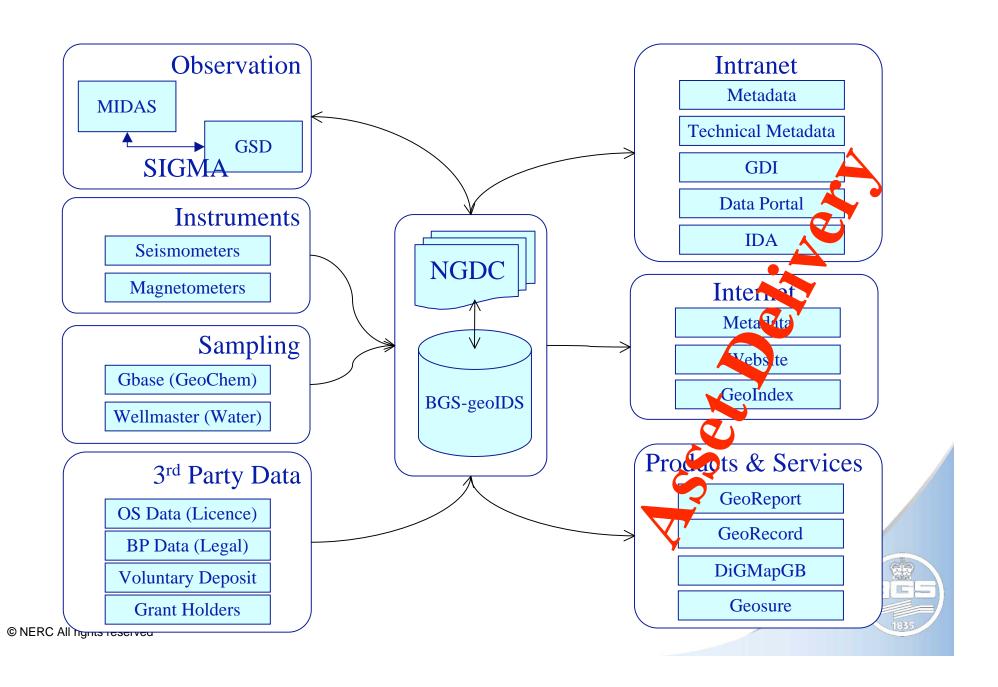
- BGS has adopted an asset based approach to information management
 - Manager appointed for each dataset
 - Metadata compiled for each dataset
 - Data management plan compiled for each dataset
 - Develop management procedures as appropriate
 - IPR Protected



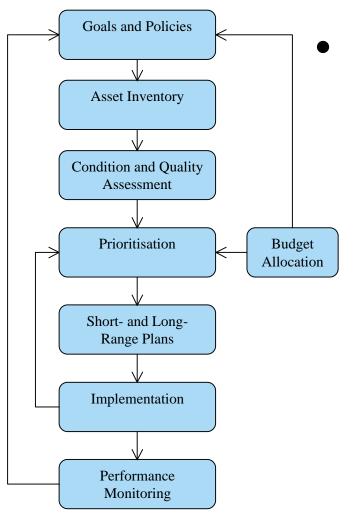








Information Asset Management Primer



Some of the Key Questions

- What is the goal of managing these assets?
- What is included in the inventory of assets?
- What is the purpose of the asset?
- What is the quality of the asset?
- What is the lineage of the asset?
- How can we preserve the asset?
- How often is the asset used?
- What is the cost of preserving the asset?
- What are the consequences of not maintaining the asset?
- What is the **priority** of the asset?

Derived from: US Department of Transport

Technical Metadata

- Object is to provide enhanced metadata for the Corporate Oracle® database
- Based around the concept of 'Databank' which is an aggregation of related relational tables and objects
- Reverse engineer physical model of databanks
- Identifies missing relationships and other orphaned database objects in the data architecture for action
- Documents the roles of key staff
 - Data curator (understands the information content)
 - Application manager (understands the database design and relationships)



Vision Statement



BGS Database Design Standards and Documentation
Vision Statement

Vision Statement

Development Guidelines

Technical Metadata

Corporate Dictionaries

Database Activities

Best Practice Documents

Documentation

External Links

Case Tool

<u>Glossary</u>

BGS Data Architecture Vision Statement

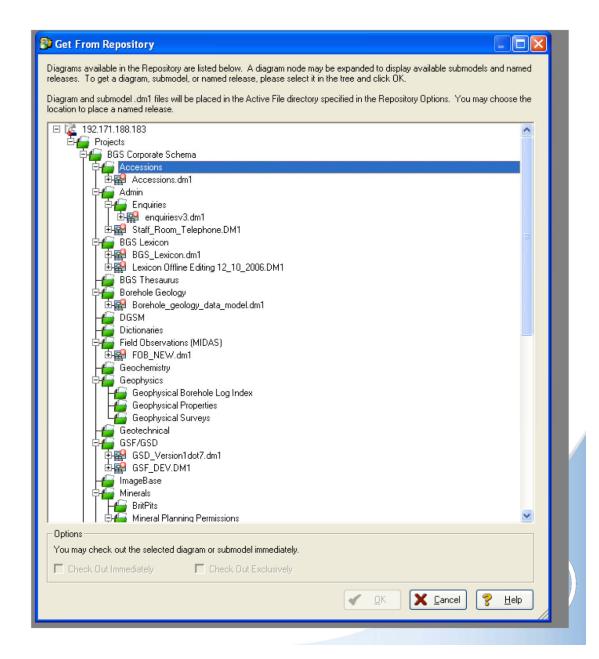
The BGS data architecture will be the single, integrated geoscientific data model for all BGS digital data that are appropriate to relational database management technology. It will encapsulate the business of the organisation and all of its data interrelationships, and it will have a strong emphasise on the integration of spatial and non-spatial datasets. The major business rules will be captured, implemented, validated and fully documented.

As a result the Oracle implementation of the data architecture will be the definitive source of digital datasets in the BGS that are quality assured and have appropriate safeguards in place to minimise legislative compliance risk; e.g. data protection and freedom of information issues. It will position the BGS uniquely for our research, knowledge transfer, collaboration, products and service delivery challenges now and in the future.

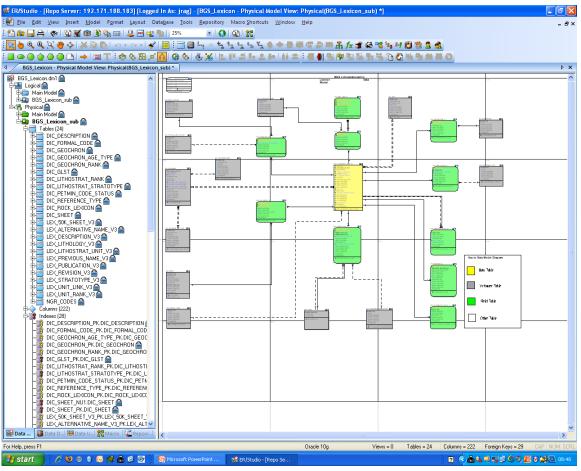
Rack

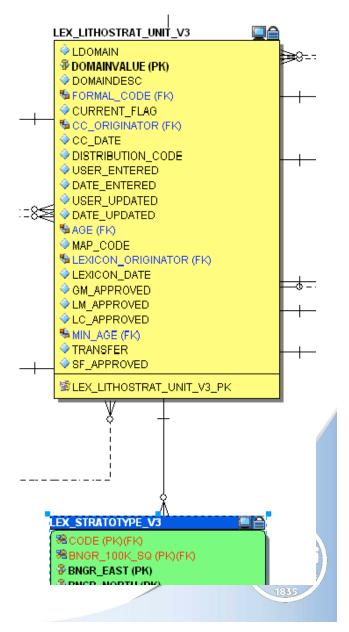
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ER Studio Data Model Repository



BGS Lexicon Model

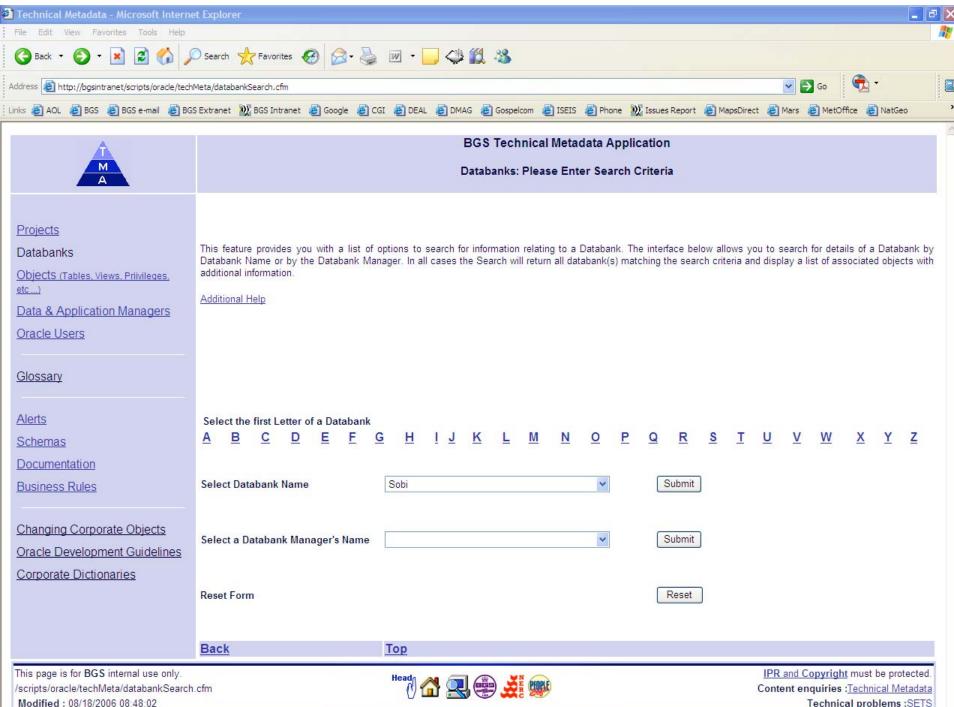




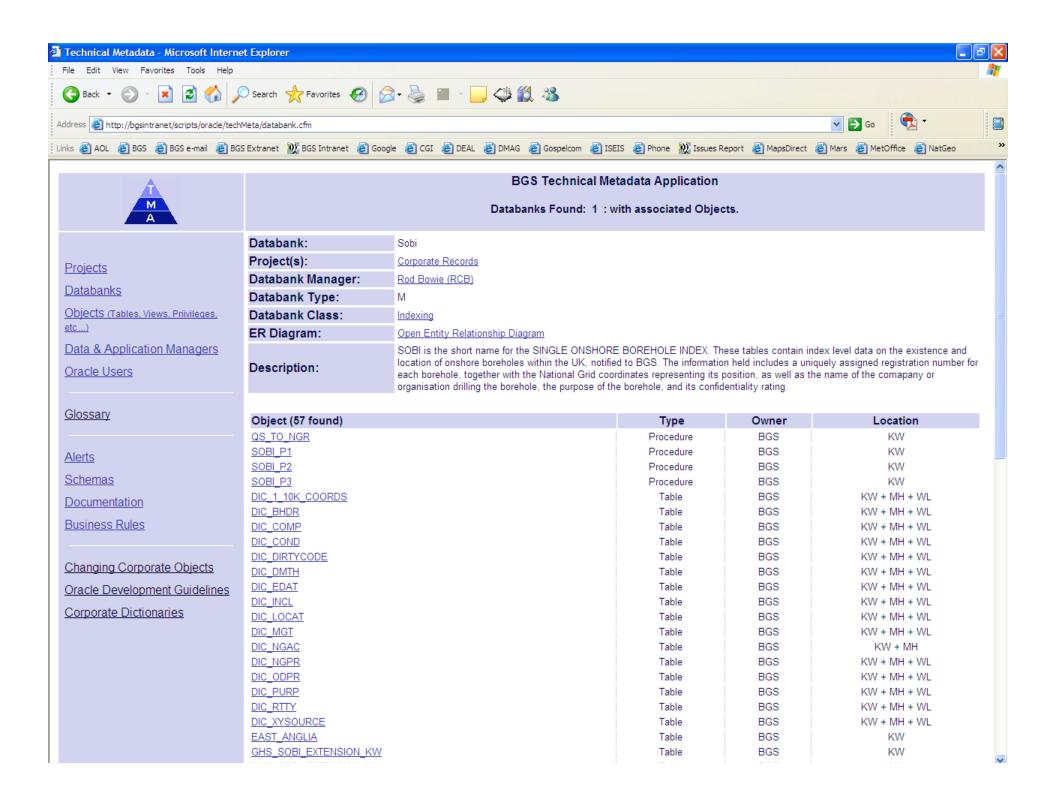
Technical Metadata

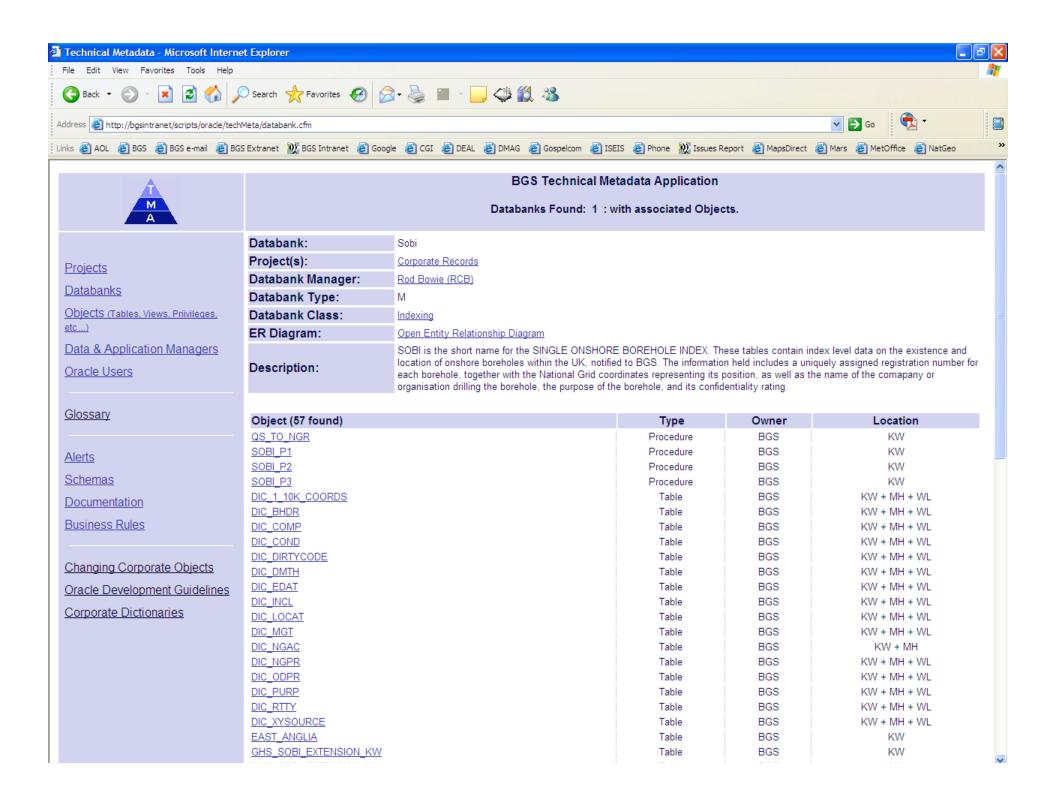
BGS Technical Metadata Application <u>Databanks</u> Objects (Tables, Views, Priivileges, etc ...) **Data & Application Managers Projects** Oracle Users BGS has numerous parts to its Oracle database system. These include databanks, tables, views, indexes, synonyms etc. The system as a whole contains some of Glossary BGS most critical digital data. The system is complex and to help users, the Technical Metadata is maintained. Alerts This system works to extend Oracle's own data dictionary and is designed to help those with a basic understanding of Oracle to navigate the objects that make up Schemas the BGS Data Architecture. <u>Documentation</u> This application front-end also provides â€"Best Practice Guidelines for Oracle **Business Rules** Development', Procedures for changing the structure of database objects and some documentation on data models. Changing Corporate Objects Development Guidelines Corporate Dictionaries Database Activities Database Standards

Back



Technical problems: SETS





Schema: BGS

Object: SOBI

Type: Table

Databank: Borehole Geology

Databank: Britrocks

Databank: Sobi

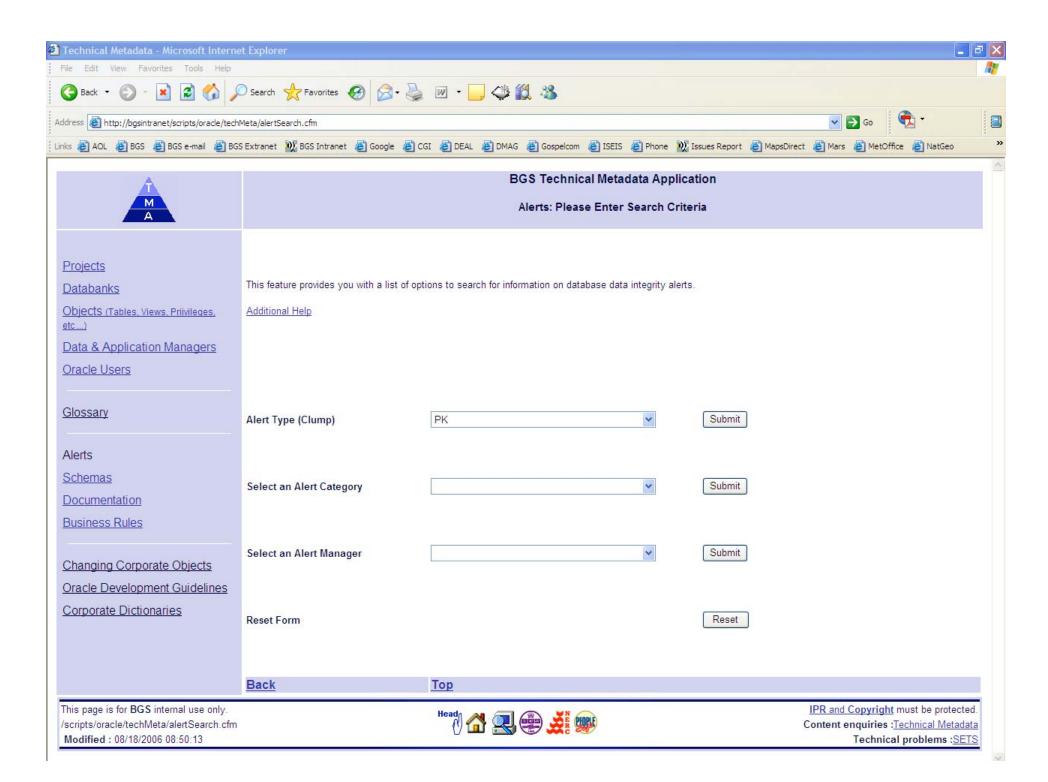
Data Administrator: Rod Bowie (RCB)

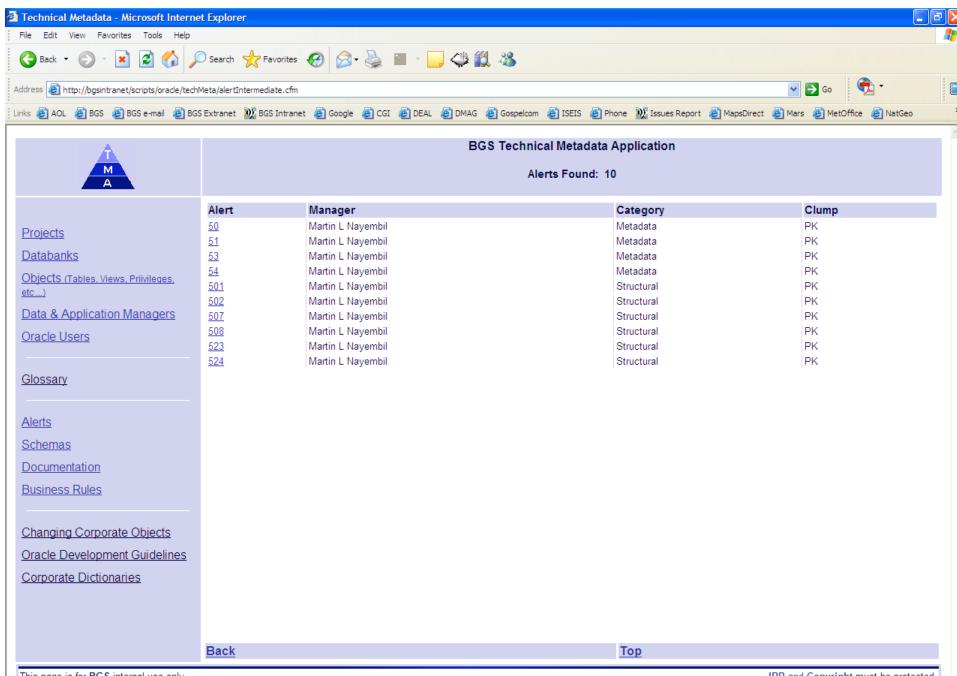
Applications Manager: Andrew Riddick (ATR)

Clear, Documented Responsibilities

Every database object has an assigned Data Administrator and an Applications Manager







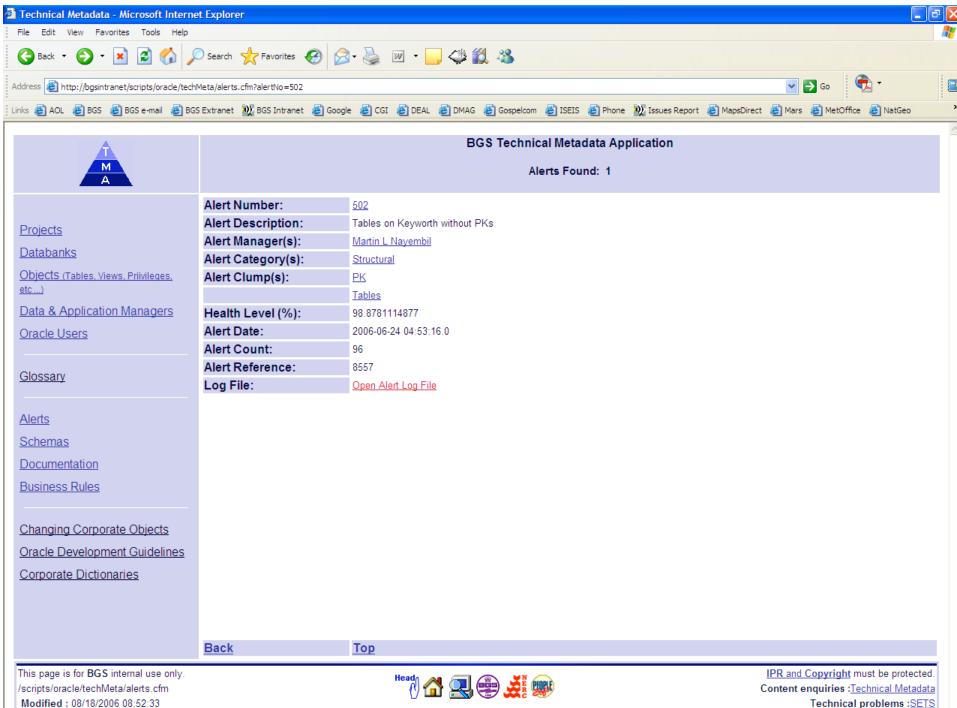
This page is for BGS internal use only. /scripts/oracle/techMeta/alertIntermediate.cfm Modified: 08/18/2006 08:54:16



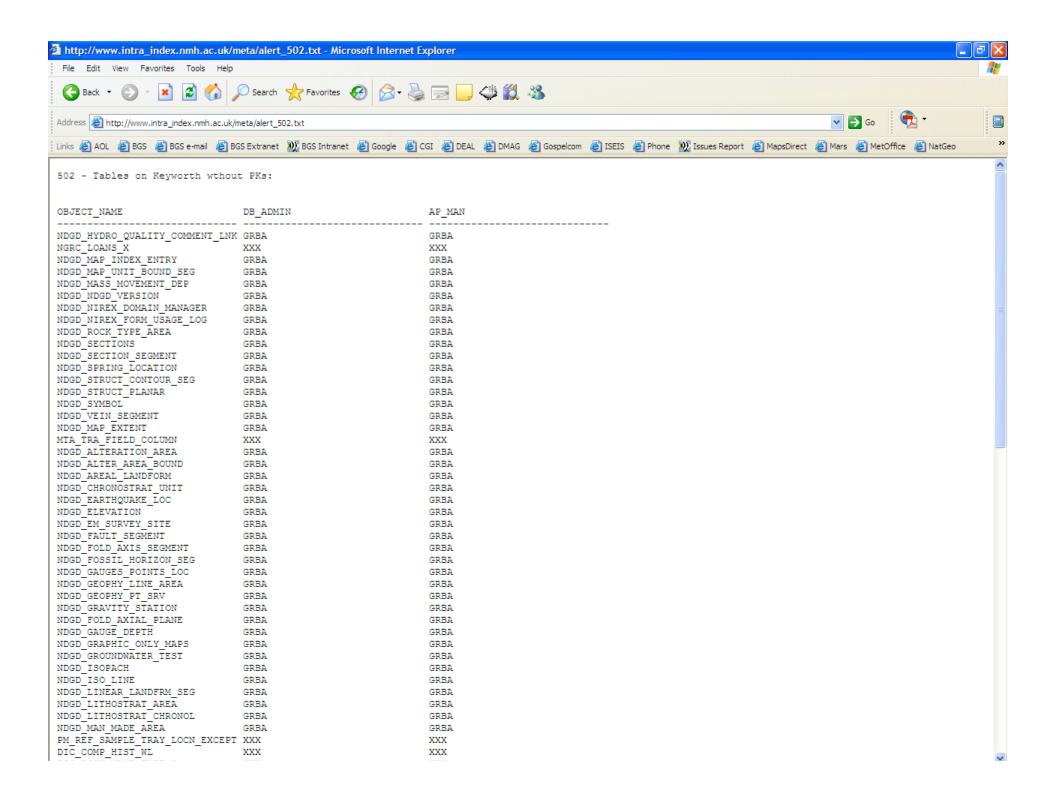




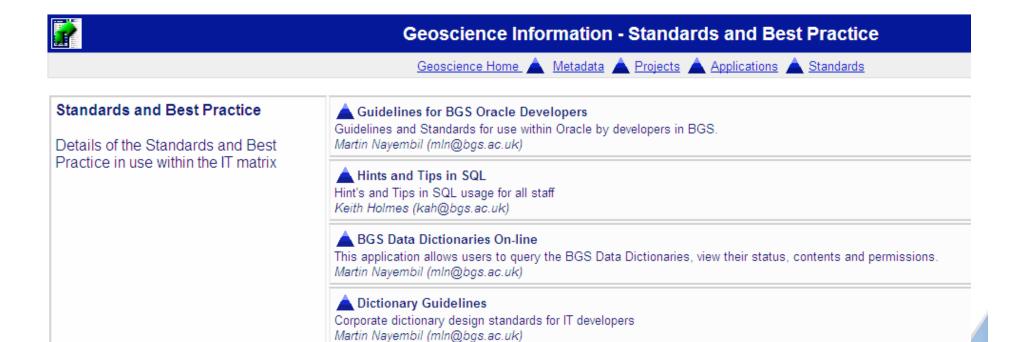




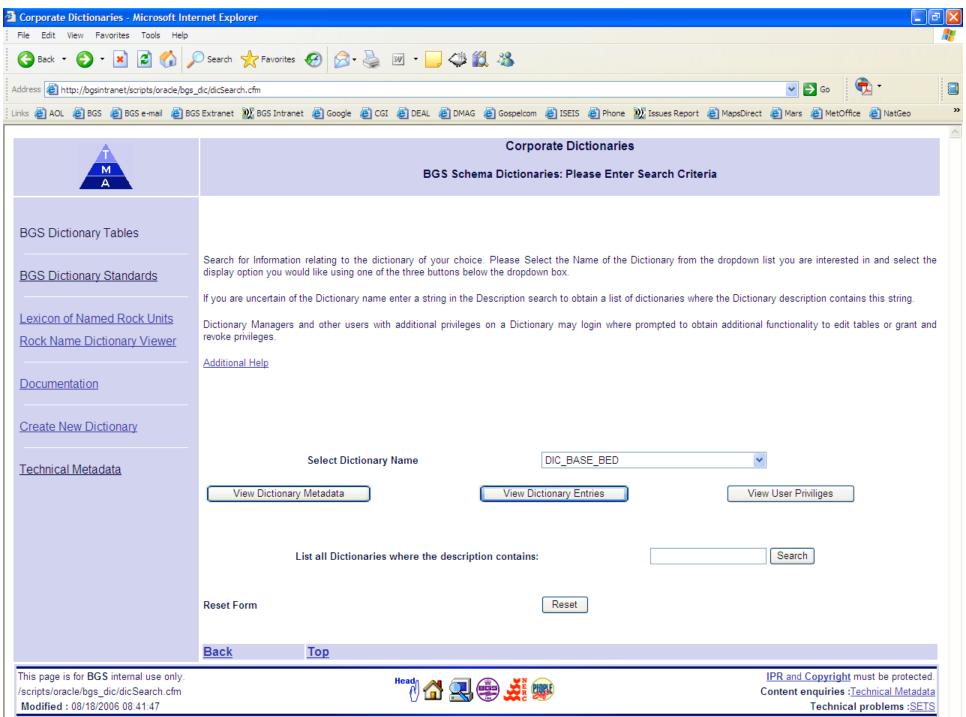
Technical problems: SETS

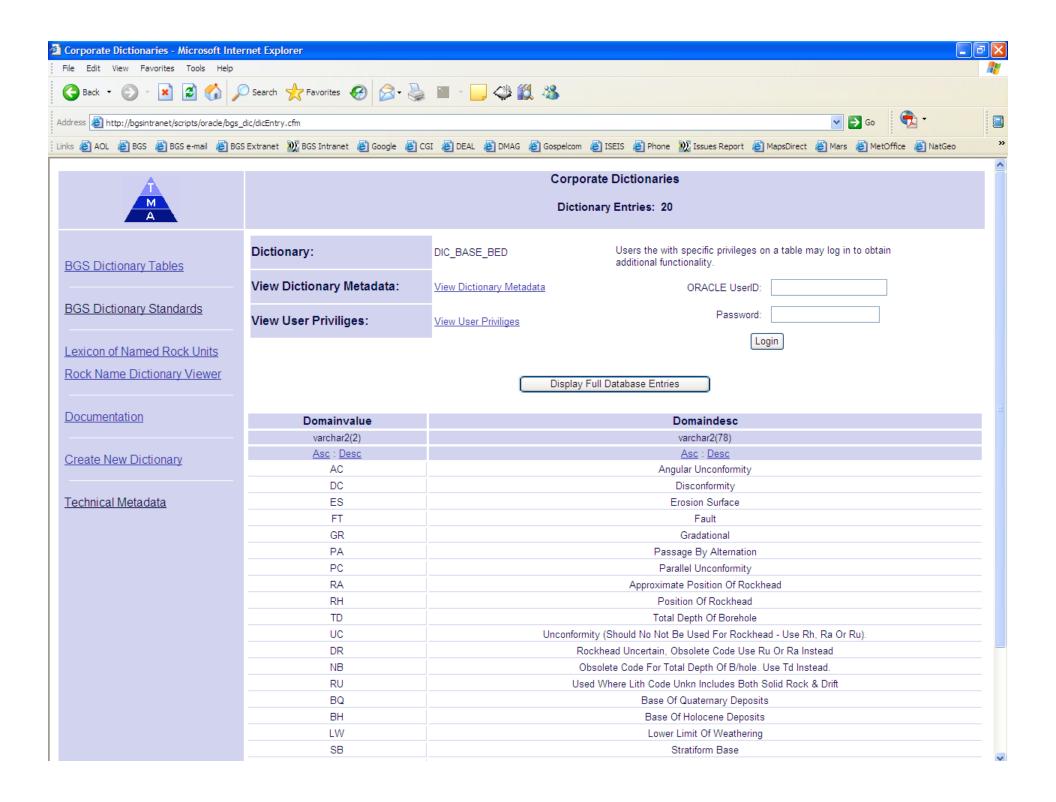


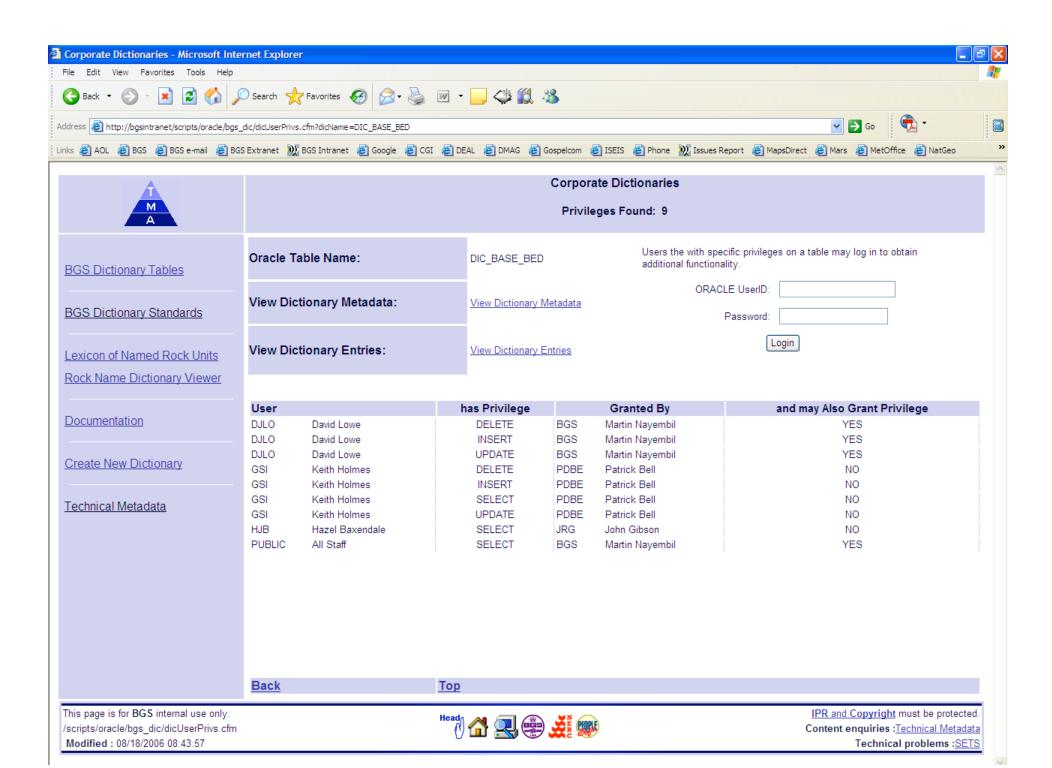
Data Standards











KEY ROLES

- Data Architect
- Application Architect
- Records Manager
- Archives Manager
- Collections Manager
- Information Manager













QUESTIONS

- Web addresses
 - http://www.bgs.ac.uk
 - http://www.bgs.ac.uk/geoindex
 - http://www.thebgs.co.uk/shop/home.cfm
 - http://www.bgs.ac.uk/discoverymetadata/home.html
- E-mail address
 - Enquires@bgs.ac.uk

