Unlocking NSW’s Geoscience Information Archives

Trisha Moriarty
Team Leader Geoscience Knowledge Management
Geological Survey NSW Data assets

Data is the currency of exploration

Worth ~ $2.5b
GSNSW Data Delivery Systems

Data Centric towards Service Design for integrated delivery

Accessible from www.resourceandenergy.nsw.gov.au

Mineral exploration and mining in New South Wales

Improved Management of Exploration Regulation

DIGS
Search for exploration and geoscience reports

EROL
Online lodgement of reports for exploration title holders

GDW
Discover geoscientific data using Google Earth and simple web queries

COMMON GROUND
Find current exploration and mining activity in your area

MinView
Display and query exploration tenement and geoscience information

GPC
Download geological and metallogenic maps, their vector data and other products
Which Data Delivery System to use...

- Geology map
- Gold occurrence
- Drill hole location
- Assay data
- Exploration report

- DIGS Document archive
- MinView web map
- Data warehouse point – related data
- Google Earth viewer to all data
- Product catalogue
Which Data Delivery System to use...

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Connections:
- Geology map
- Gold occurrence
- Drill hole location
- Assay data
- Exploration report
New DIGS : New Integrated Search

Sydney Mining Exploration Discussion Group
Overview

1. Explore the richness of (new) DIGS archive
2. Update Geoscience Information Gateway project
3. Describe the technical platform, design decisions & methodology employed
4. Demonstrate the New DIGS search engine
A Brief History of DIGS

1995 - 2000
• Digitisation of hardcopy (scanning)
• Report indexing (Metadata generation)
• Barcode (unique ids, RIN, DIN, BIN)
• File structure & open formats
• 32mb file limit

2000
• Online delivery (preview & download)
• digital reporting

2004 - 2009
• Rewrite – tape to file server
• Extended with submission tool (EROL)
• Automated in dexing
• Change to interface
• Aspatial document database

Oldest dated map - Map of the Colony of NSW 1834, by T L Mitchell with geology added by William Keene.
A Brief History of the Online Catalogue

2012

- Database
- Data driven pages
- Spatial search
- Keyword search
- Filter
- A-Z listing
- Product details
- Spatial Extent
- Preview
- Related products
- Download high resolution & georeferenced data files
## Available records in DIGS

### Reports Collection

- Exploration and mining company reports: geochemistry, geophysics, seismic, drill hole logs, downhole surveys, oil and gas surveys, mineral studies and geological interpretations
- Company environmental reports: EIS, MOP, REF, AEMR, POP, SMP, Rehabilitation and Relinquishment reports
- Licence conditions: grant, renewal etc
- Title plans: mine plans, record tracings and survey diagrams
- Mine records: mine inspector reports, geological notes, mine plans, analytical data/assay outputs and incidents pertaining to a mine.
- Technical and Research reports
- Cartographic Plans
- Parish Maps

* Heritage records – correspondence, field note books.

### Report Type Totals

<table>
<thead>
<tr>
<th>Report Type</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal exploration</td>
<td>8276</td>
</tr>
<tr>
<td>Mineral exploration</td>
<td>35384</td>
</tr>
<tr>
<td>Opal exploration</td>
<td>1979</td>
</tr>
<tr>
<td>Petroleum exploration</td>
<td>2548</td>
</tr>
<tr>
<td>Environmental reports</td>
<td>870</td>
</tr>
<tr>
<td><strong>Total Exploration reports</strong></td>
<td>49057</td>
</tr>
<tr>
<td>Licence conditions documents</td>
<td>2237</td>
</tr>
<tr>
<td>Record tracing</td>
<td>1049</td>
</tr>
<tr>
<td>Survey plan</td>
<td>70749</td>
</tr>
<tr>
<td>Working plan</td>
<td>46</td>
</tr>
<tr>
<td>Consolidated lease</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Title plans</strong></td>
<td>71850</td>
</tr>
<tr>
<td>Mine records,</td>
<td>5523</td>
</tr>
<tr>
<td>Research reports, Annual Report Compilations (ARC)</td>
<td>3035</td>
</tr>
<tr>
<td>Cartographic plans</td>
<td>2398</td>
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<tr>
<td>Parish maps</td>
<td>466</td>
</tr>
<tr>
<td><strong>Total records</strong></td>
<td>11422</td>
</tr>
</tbody>
</table>
Available records in DIGS

Publication Collection

- Geology maps, metallogenic maps, mineral deposit maps, geophysical-geological maps, regolith maps, coastal quaternary maps, special interest
- Explanatory Notes for geological and metallogenic maps
- Bulletins
- Quarterly Notes
- Periodical such as Coal and Mineral Industry Profiles
- Non-periodicals (books such as the Geology field guide to NSW)
- Mineral Records, Memoirs, Annual Mineral compilations (ARC)
- Field excursion guides (from conferences and other events)
- Factsheets
- Scientific Posters
- Presentations
- Promotional posters, brochures and flyers

DIGS combined total - over 140 000 reports
approximately 3.5 million pages, or 2 terabytes of digital data
GSNSW’s Custodial role over DIGS

Custodian: a person who has custody; keeper; guardian, curator

Active custodian/curator is ... Data manager Format authority Metadata provider Knowledge Disseminator Quality arbiter Content specialists

Added value service provider DIGS Data mining project Assay data modeling Data Warehouse

+ System architects & developers & maintainers
System integration and renewal

Geoscience Information Gateway project

“Having worked in NSW for a number of years, I’ve worked out how to use (DIGS), and I see that as a competitive advantage over other companies just starting up in NSW”

stakeholder quote

Key Drivers
• Improved accessibility to all geoscience information held by GSNSW
• Aging technologies – custom made, not upgradable, not extendible, not std compliant, not mobile
• Good governance – robust, reliable systems, cost effective, secure

*Geoscience Information Gateway Scope is – front end interfaces only – not databases
Guiding design principles

“Easy public access to all validated non-confidential geoscientific and supportive reference data stored by the GSNSW from a single channel”

<table>
<thead>
<tr>
<th>System</th>
<th>Functions</th>
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</thead>
<tbody>
<tr>
<td>Flexible, Upgradeable</td>
<td>Meets user requirements</td>
</tr>
<tr>
<td>Scaleable, modulised design</td>
<td>Focus on Usability</td>
</tr>
<tr>
<td>Off the shelf technology</td>
<td>Function &amp; Performance over aesthetics</td>
</tr>
<tr>
<td>Best of breed</td>
<td></td>
</tr>
<tr>
<td>Configuration over coding</td>
<td>Fit for Purpose</td>
</tr>
<tr>
<td>Minimize dependencies/no plugins</td>
<td>Effective administration</td>
</tr>
<tr>
<td>Effective support</td>
<td>Secure</td>
</tr>
<tr>
<td><strong>Cost effective</strong></td>
<td>Mobile ready</td>
</tr>
</tbody>
</table>

FAST INTUITIVE INFORMATIVE FAST
**New DIGS Technology components**

- **Enterprise document management system**
  Document storage and workflows
- **Search engine**
  Harvest and indexes document contents for searching
- **Optical Character Recognition software**
  Convert images to text to allow direct searching
- **JavaScript library for interactive maps**
  Used for defining area of interest
Design – Pain Points

Known problems with existing systems

- Search metadata only
- Search dependent on quality metadata
- No field validation, text only
- Exact string match
- And Criteria applied between search fields
- Aspatial database

- Separate system for publications & GIS data files
- Duplication of records
- Single record download
### Search improvements

**Old**

<table>
<thead>
<tr>
<th>Search criteria: Uranium in Broken Hill region</th>
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</thead>
<tbody>
<tr>
<td>Subject = uranium</td>
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<tr>
<td>Location = Broken Hill</td>
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<tr>
<td><strong>Result 71 reports</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Search criteria: Asbestos</th>
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<tbody>
<tr>
<td>Subject = asbestos</td>
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<tr>
<td><strong>Result 134 reports</strong></td>
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<table>
<thead>
<tr>
<th>Search criteria: Shoshonite</th>
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<tbody>
<tr>
<td>Subject = Shoshonite</td>
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<tr>
<td><strong>Result 5 reports</strong></td>
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<table>
<thead>
<tr>
<th>Search criteria: fraccing</th>
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</thead>
<tbody>
<tr>
<td>Abstract = fraccing</td>
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<tr>
<td><strong>Result 5 reports</strong></td>
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</table>

**New**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Single search field = uranium</td>
</tr>
<tr>
<td>Draw shape over broken hill</td>
</tr>
<tr>
<td><strong>Result 137 reports</strong></td>
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</table>

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<th>Search criteria: Asbestos</th>
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<tbody>
<tr>
<td>Single search field = asbestos</td>
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<tr>
<td><strong>Result 190 reports</strong></td>
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<th>Search criteria: Shoshonite</th>
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<tbody>
<tr>
<td>Single search field = Shoshonite</td>
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<tr>
<td><strong>Result 794 reports</strong></td>
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<tbody>
<tr>
<td>Single search field = fraccing</td>
</tr>
<tr>
<td><strong>Result 325 reports</strong></td>
</tr>
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</table>
search.geoscience.nsw.gov.au