Interoperability Initiatives in Government Geoscience Agencies

Access to geoscience information from the Australian and state governments. Choose a link below to enter the portal.

Enter the portal as:
- general public
- mineral explorer
- petroleum explorer
- coal explorer
- geophysicist
- legal
- student

Quick Links:
- Australian Exploration Tenement Mapping System

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John Tuttle - GGIPAC
Acknowledgements

• Speaking on behalf of GGIPAC committee members

• Web development and support teams at GA – the web warriors

• Simon Cox and Rob Woodcock of CSIRO – what does this all mean??????

• Yes I’ve also borrowed some slides and report text
Government Geoscience Information Policy Advisory Committee (GGIPAC)

- Comprises a representative from each State and Territory geological survey, Geoscience Australia and New Zealand – Government geoscience agencies
- Operating mandate from the Chief Government Geologist Committee (CGGC) – all tasks done on behalf of and with approval from CGGC
- A valuable interoperable communication network for the geosciences community
- Focus on attaining an information consistency and connectivity framework across jurisdictions
GGIPAC’s Role

- Develop and implement national geoscience related information standards and data models
- Focus on data access and delivery solutions and monitor new and emerging trends
- Make recommendations to CGGC to sponsor projects that will improve data and information exchange
- Oversee CGGC approved projects
- All achieved through agency working parties and financial contributions, technical development support from GA and stakeholder relationships with CSIRO
Government Geoscience Agencies

- Responsible for data and information about the State’s/Australia’s geology – geoscience data nodes
  - Collection – geological and mineral occurrence mapping
  - Acquisition – geophysics and company reporting
  - Analysis & Interpretation – prospectivity
  - Consolidation & integration
  - Custodianship – quality & standards
  - Management – databases, spatial data, document systems, archives
  - Distribution – digital media, hard copy, Internet – Is this efficient??? – What better ways are there????
Assisting The Exploration Industry

• **Agency custodial responsibility** - this data resource is a major catalyst for exploration activity throughout Australia
  - investment \(\rightarrow\) resource discovery \(\rightarrow\) income

• The collective value of geoscience data and company report collections runs into the billions of $\text{billion}$. 
Unlocking The Potential

- Exploration process made easier by efficient access to consistent and standardised data – our clients are national and global
- GGIPAC gets involved in the access equation
- Looking to new technology to deliver data and information – linking of nodes to create a geoscience GRID
The Issues

- The digital data revolution has created high expectations - fast easy access, simple to use
- Reality at present is that agencies hold data in a range of formats at their own centralised locations
- Explorers shop in each jurisdiction to compile Australia wide data sets
- Issues of data replication and versioning and data management overheads for companies
- Geology does not obey State boundaries
- How do we make availability and distribution easier and more efficient???
- Standards, warehousing, centralised data views, web services?? GGIPAC and SEEGRID
Exploration Industry

- WA Databases
- NT Databases
- SA Databases
- Victorian Databases
- NSW Databases
- Queensland Databases
- GA Databases
- Tasmanian Databases
OGC Compliant?? – A Toe in The Water

• All Geological Surveys have web mapping applications displaying exploration tenure and geological data sets
• A range of viewers to deliver an ArcIMS service with some jurisdictions WMS enabled
• Embracing WFS capabilities will allow geological surveys to participate in data interoperability initiatives – however there are hurdles to overcome
GGIPAC’s Recent and Current Working Brief

- Digital company reports
- Geoscience portal
- Web mapping atlas
  - Exploration tenements
  - Mineral occurrence
- GADDS
- Geology data model
- XMML project
- AUSIndustry demonstrator project geochemistry
Digital Company Reports

- A standard series of digital formats for reports and data developed for submission – pdf, ascii text and raster (1999)
- Implementation nationally of mandatory digital reporting for exploration companies based on these standards – education included
- Development of metadata reporting template to accompany data files
- Creates consistent report archives for most data types across Australian jurisdictions
- Impetus for agencies to digitise hard copy report collections and create online document management systems – DIGS and QDEX
Geoscience Portal

- The government geoscience agency and information gateway for explorers – topic based catalogue to agency web sites
- Host and management at GA; continued promotion to industry
- GGIPAC ensures that most new information system and standards developments are accessible via the portal
- GGIPAC will post strategic plans and committee deliberations to encourage communication with industry and stakeholders
Web Mapping Atlas

- Web based visualisation of mineral exploration tenements and high level mineral occurrence data
- Download capability for mineral occurrence data
- Working party devised standardised mineral occurrence data model – many iterations
- Tenements a lot simpler – data model by GSWA
- Individual agencies prepare data sets; GA centralises agency prepared data and develops, implements and manages common web delivery system
Web Mapping Atlas

- Access to **seamless data themes** across Australia
- Building up a collection of map services on a common interface, accessible via the portal
- However data sets not live!!!!
- Projects to be used as framework to further understand interoperability technology - WFS capability the next progression – live data feed
- The AUSIndustry Roadmap Project – Geochemistry Demonstrator
The Workflow Model

Tenement data from each State and Territory provided as shapefile

emailed to GA

Tenement Atlas on "Geoscience Portal"

HTTP

Customer uses Atlas interface to search & view tenements

Source: Bandy, Stephen, GSWA
Data Warehousing

- Geophysical Archive Data Delivery System (GADDS) – GA developed application using Intrepid’s Jetstream technology
- Geophysical data is stable lending itself to centralised distribution
- View and download whole or part surveys
- Participating agencies prepare data to an agreed industry standard
- Fits the GRID philosophy – data node already up and running
Geology Data Model

- Objective to develop a logical national model from which States and Territories can develop an implementation (physical) model (2002)
- Working group established from GA, NSW and WA
- Issues arose concerning differing expectations of the model and differing definition of terms – eg surfical???
- Advice given that model should be developed independent of any applications
- What other models are there?? NADM – Adopt this or Australian centric – application drivers in the agency
Geology Data Model

- Working party of all State representatives completes initial model release in 2004
- Geology Data Model posted to the Geoscience Portal for public scrutiny
- Implementation derivatives in place in GA, WA and NSW; work in progress for the other jurisdictions
- Recommendations to GGIPAC including the development of a compatible XML schema for Australia’s national geological data model
- GGIPAC now involved with the CGI Data Modelling Group
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Quick Link:
- Australian Exploration Tenement Mapping System
Topics

Exploration
- minerals
- petroleum
- coal
- reports
- petroleum leases

Data
- online databases
- standards
- geophysics
- drill core
- free data

Online Maps
- maps
- petroleum data

Work program
- exploration initiatives

Resources
- resources
- geological overview

Recent earthquakes

Geological Survey websites
- Western Australia
- Northern Territory
- South Australia
- Victoria
- Tasmania
- New South Wales
- Queensland
- Geoscience Australia
Projection: Lambert Conformal Conic (134, 0, -18, -36) GDA94
Approximate scale 1:252000
Tenements Map

Please Note: The tenement data displayed here are only updated monthly. Current and additional information should be sought from the appropriate jurisdiction.

Symbols & Layer Name
- Geological Regions
- Land at 7 (2000) [Raster Image]
- 1:250K Map Index
- Tenements: Victoria (Feb '05)
- Tenements: Queensland (Feb '05)
- Tenements: Tasmania (Feb '05)
- Tenements: South Australia (Sep '04)
- Tenements: Western Australia (Feb '05)
- Tenements: New South Wales (Feb '05)

Load Layers

Map Tools
- [Zoom In]
- [Zoom Out]
- [Pan]
- [Query]

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Tenements Map

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Symbols & Layer Name

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Load Layers

Results from Layer: Tenements: South Australia (Sep '04)

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Geophysical Archive Data Delivery System

This system provides magnetic, radiometric, gravity and digital elevation data from Australian National, State and Territory Government geophysical data archives.

Define your area of interest

Basic Instructions
Option 1:
Enter the extents in the Lat/Long Rectangle form as decimal degrees (e.g. 137.821) then click the "proceed to download" button beside it.

Option 2:
Use the map query tool ( ) to define your area of interest. The Lat/Long rectangle form will be automatically populated with the extents of the area you define, then click the "proceed to download" button beside the form.

Option 3:
Use the "Quick Start" menu to choose an area of interest based on a 250k map sheet. Choosing a map sheet will populate the Lat/Long Rectangle form, then click on the "proceed to download" button beside it to find data in that area.

Click here for more detailed GADDS help.
eXploration and Mining Markup Language (XMML)

- Project sponsorship from mining companies and industry consultants, geological surveys (GGIPAC/CGGC) and the WA State Government through MERIWA
- GGIPAC’s role to oversee the geological surveys interests
- GGIPAC’s interest - XMML is primarily designed to contribute to a geoscience community language, as part of a Geoscience Grid or spatial data infrastructure
- Success - XMML schemas and documentation now publicly available
XMML – The potential

- XMML developments leveraged into the AUSIndustry geochemistry demonstrator project
- GGIPAC now recognise its potential as a data submission, archive and distribution medium for agency exploration report and geoscience data collections
- Exploration companies recognise its business potential for seamless information exchange
- The geoscience domain’s payload for the emerging web services paradigm
AUSIndustry Demonstrator Project

- CGGC approve $$ contributions to become one of the project sponsors on GGIPAC recommendations
- The Roadmap demonstrator – leverage of established standards for interoperability of geochemistry data
- Successful implementation of the technologies at three Geological Surveys (PirSA, GSWA, and Geoscience Australia)
- Development of test Web Client to provide one possible application of the web services
- Geoscience Australia independently developed a Geochemistry Reporting application
Our projects Technology Viewpoint in Detail

Web Map Composer (Proprietary)

Client Applications

GA Reporting Application

GA PLOT-IT Application

XMMML, GML

Geoserver (Open Source)

PostGIS (Open Source)

South Australia

SA Web Feature Service (WFS)

SA Geochemistry Feature Data Source

Western Australia

WA Web Feature Service (WFS)

WA Geochemistry Feature Data Source

Geoscience Australia

GA Web Feature Service (WFS)

GA Geochemistry Feature Data Source

Source Wyborn, Lesley Presentation on MCA/AusIndustry Testbed Interoperability Demonstrator
The WFS project has delivered the ability to gather live data sets from different state agencies – report or spatial views.

### Geochemistry from Web Feature Services

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The Next Phase – A Roadshow

- Application for another AusIndustry Innovation Access Fora grant to extend the testbed to the remaining State and Territory survey geochemistry databases
- The technology awareness and diffusion roadshow – executive briefings and implementation workshops with those who will do it!!
- GGIPAC recommending to CGGC to be involved – in kind cost only
The Next Phase – A Roadshow

- Project is looking for support from private sector people involved in the minerals side of the business
- Want to demonstrate the achievements to other state data custodial and innovation agencies who might be interested in WFS developments
- Leverage testbed outcomes into an ICIP proposal – let’s fully implement geochemistry and other data themes – tenements???????
The Future??

- GGIPAC needs to have a long-term view of spatial and aspatial geoscience information exchange trends
  - A strategic planning workshop this year – what’s our role?
  - Current initiatives are converging to produce improved data and information access benefits
  - Leverage off current project achievements
  - Continue to foster and participate in future developments for interoperability
  - Promotion and education for agency senior management, those who hold the purse strings
  - Promotion and education for industry, support services and software vendors
Governance – what will we confront?

- **Feature type catalogues**
  - Who manages the business process?
- **Conformance**
  - Who defines the standards? How are they changed?
- **Repository management**
  - Who is responsible? What are the rules?
- **Community standards and support technologies**
- **Hosting of services and standards**
  - What is the level of availability required?
  - Defining an SLA?

Source: Mackey, T., 2004 Enterprise Viewpoint, AUSIndustry sponsored workshop
The Future

- Interoperable web services are a major evolutionary jump - the first steps are in place in the geosciences community
- Geoscience agencies will be involved and their clients will benefit from proactive adoption of the Web Services paradigm
- The opportunity to access data reflecting geological rather than geographical boundaries – win/win situation for Australia and the States