Management of Public Geoscience Data

A Guide to Australian Practice

GIRAF Workshop

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Management of Public Geoscience Data - A Guide to Australian Practice

Based on a paper by Professor Margaretha Scott, Director, SMI WH Bryan Research Centre, The University of Queensland to be published by IM4DC as part of its Guide to Australian Practice series.
Australian public geoscience data repositories

• The cumulative efforts of generations of inquiry – 130 year history
• Strategic tools to meet challenges of future demands for mineral and energy resources
• Vital to informed decision-making by governments and communities on natural resources management.
• Ensure that public geoscience data is properly managed and that the data is secure, reliable, and readily accessible.
• To realise the value of data:
  ● Use technology
  ● Develop mindset that ‘establishes a community of practice’ and commitment to freely available data
• Government, industry, and the research community in Australia support these goals.
Resource economy in Australia: bigger than traditionally measured

**Gross Value Added – resource economy 2011-12**
Share of nominal GVA, financial year
(has more than doubled in past 10 years)

- Resource extraction
- Resource-related

Resource economy accounts for **18% of GVA**
- **11.5% directly** from extraction and processing
- **6.5% from other sectors** providing inputs

**Resource employment by industry 2011-12**
Share of total employment, financial year

Resource economy accounts for **10% of employment**
- **3.25% directly** from extraction and processing
- **6.75% from other sectors** providing inputs

Mineral exports $164 billion (2011-12), or 52% of total exports

Source: Rayner and Bishop, Reserve Bank of Australia February 2013
Factors of success

- A rich and diverse natural endowment plus global demand for wide range of mineral and energy resources
- A number of large discoveries of global significance – cemented perceptions of Australia's prospectivity
- Steadily improving infrastructure
- Innovative mining and processing technologies, skilled work force, and strong mining equipment, technology and services (METS) sector
- Strong policy, fiscal and legislative frameworks
- Stable government and security of tenure
- Provision of high quality public or 'pre-competitive' regional-scale geoscience information.
Pre-competitive data available include:

- Regional surveys
  - airborne geophysical surveys (magnetics, radiometrics, digital elevation data, some airborne electromagnetics, airborne gravity gradiometry)
  - ground gravity
  - geochemical surveys
- Geological mapping
- Mineral occurrence mapping (geological and statistical information on operating and abandoned mines, active and dormant mineral prospects and occurrences),
- Core photography and hyperspectral core scanning
- Geochronology
- Rock property data (magnetic susceptibility and density).
Australia's pre-competitive geoscience archives are extensive, and collectively comprise a high value national asset.

- GSOs also receive data through collaborative studies with universities and research institutions
- Reporting requirements on industry through licenses
  - Reports on exploration activity form a vital part of the exploration database
- Physical collections remain an important part of GSO archives.
  - paper reports, maps, plans and sections; drill core and chip samples; mineral, rock and palynology samples; rock slabs and thin sections.
- Still a large amount of data that is generated but not added to GSO archives.
  - Companies’ mineral and energy reserves would address current gaps in resource reserve information base
  - Mining Lease data could be collected by GSOs and added to the archives
- Selected drill core is acquired from companies under legislation and through co-funded government-industry collaborative programs.
- Clients sampling core held by GSOs must provide the resulting analysis reports and data
Reviews of public funding of pre-competitive geoscience information have found benefits in:

- Encouraging exploration in high risk, potentially high return frontier regions
- Applying geological knowledge of known deposits to increase the chances of finding more
- Reducing risk and uncertainty across the exploration industry
- Encouraging participation of a larger number of small investors
- Preventing exploration activity falling to ineffectively low levels
- Reducing expensive re-acquisition of data, thus focussing expenditure on acquiring new data
- Maintaining Australia’s competitive edge in attracting exploration and resource investment
- Increasing competition through processes for granting or renewal of licenses, tenements and concessions
- Harmonising data at provincial and continental scales to underpin policy-making and regional development decisions
Empirical evidence

• Increased exploration activity – and discovery of economic resources – can be directly attributed to the release of pre-competitive data.

• South Australia: investments in pre-competitive data directly stimulate private exploration by a factor of 3 to 5 times the cost of providing basic data.

• Queensland: for every $1 spent on pre-competitive data and data management, explorers spent $15 on their work programs.

• Geoscience Australia cites studies that each pre-competitive dollar generated, on average, $5 of private exploration expenditure.

• Newmont Australia: uses pre-competitive geoscience data in Australia as an argument to support its budget bids, when competing against other projects from around the world.
Overarching direction on data management and delivery

- **Australia New Zealand Land Information Council (ANZLIC).**
  - the peak intergovernmental organisation providing leadership in the collection, management and use of spatial information
  - policies and guidelines include: spatial data access and pricing policy (eg free via Web), custodianship guidelines, common data standards

- **Exploration Investment and Geoscience Working Group (EIGWG)**
  - make recommendations on collaborative geoscience data acquisition programs, promotion and marketing plans, trialling of new exploration technologies, and standards for management and delivery of geoscience information

- **Australian Governments Open Access and Licensing Framework (AusGOAL)**
  - provides support and guidance to government and related sectors to facilitate open access to publicly funded information
State and Territory practices and policies

- Centralised Data Warehousing
- Standard Agency GIS Environment
- Company Reporting
- Direct Data Transfer
- Auditing and Audit Trails
- Data Assurance (Integrity and Security)
- Custodianship
- Monitoring Usage and Feedback
Australian Governments' Geoscience Portal: a single point of access to geological and geophysical data and information about legal requirements for exploration in all Australian jurisdictions (http://www.geoscience.gov.au/)
Strong customer response to web-served data

Data groups with more than 1000 downloads July-December 2012 (Western Australia)

- 1:250 000 Explanatory Notes
- 1:100 000 Explanatory Notes
- Report
- Non-series map
- 1:250 000 geological map
- Article
- 1:100 000 geological map
- Record-series publication
Web-based delivery tools typically comprise:

- **Electronic Document Management system**
  - online lodgement and retrieval
  - template for statutory reporting of company exploration activities and results
  - template for mines and prospects
  - search, select, and download exploration reports
  - access to other collections such as maps and reports produced by GSOs

- **Online GIS system**
  - viewer to assemble and visualise spatial data sets, (e.g. geology, geochemistry, geothermal; tenure (mining tenements and petroleum titles) plus other administrative layers
  - download service (zipped ESRI SHP files, PDFs)

- **Direct access to archives**
  - using Web Map, Content, and Feature Services (WMS, WCS, and WFS), clients use their own software tools to communicate directly with the data archive

- **Static Web Site content**
  - web pages of information about projects and services
  - simple PDF and JPG document downloads
  - online product store (under development) with e-payment gateway
Conclusions

• The primary purpose of public geoscience data is to attract the largest competitive field of exploration investors who will discover a new generation of large low-cost mineral deposits and deliver returns to the community as rents/tax revenues and improved infrastructure.

• Pre-competitive data is seen as vital for the government and community to make informed decisions on broader economic, social and environmental management issues.

• Sophisticated information management systems are required not only to deal with the vast volumes and diversity of geoscience data but to ensure data security and integrity.

• Pricing policies should encourage the use of geoscience data by the widest possible field of clients.
  • data are provided free of charge over the internet
  • at no more than the marginal cost of transfer for packaged products
  • or at the full cost of transfer for customised services.
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