The earth resource data exchange model (EarthResourceML) - a tool for delivering ProMine and INSPIRE mineral resource data

INSPIRE2010 – Krakow 22-25.6.2010

by

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OUTLINE OF THE PRESENTATION

• GeoSciML - > OneGeology - OneGeologyEurope

• Background of EarthResourceML - Australia - 2006

• EarthResourceML - short description

• How to deliver mineral resources data
  – Deliver data through the Australian Geoscience Portal -> AuScope portal

• Future plans - how to deliver mineral resources data
  – AuScope - > ProMine - > INSPIRE - > Globally?
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Map data - all over the world - one portal - now OneGeologyEurope and later INSRIRE etc

http://portal.onegeology.org/

J Vuollo 24.6.2010
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Australian Mines Atlas


Interactive Mapping

Create a map showing Australia's mines. You can use the Quick Search tool to locate a mine by name, or for more in-depth research, the Advanced Search tool has a wider selection of search options. The mapping application also allows you to view points in Google Earth and print maps in PDF format.

- Create a Map
- Quick Search
- Advanced Search

Information about Mineral Resources

Read in-depth information about Gold, Bauxite, Iron Ore, Copper and other major mineral commodities in the annual Australia's Identified Mineral Resources report.

View Fact Sheets and Rock Files about some of Australia's key metals and minerals in our Education section. Also available is Minerals Downunder - a student resource with information about Gold, Copper, Silver, Mineral Sands and Iron, as well as interactive quizzes.

- Australia's Identified Mineral Resources
- Mineral Fact Sheets
- Mineral Rock Files
- Minerals Downunder
- Geoprovience-Scale Assessment of Mineral Potential

History of the Minerals Industry

View a history of the minerals industry in Australia in Google Earth and read about its role in Australia's economic development.

- History of the Minerals Industry in Australia

Your Feedback
# Mines Atlas Response

- provided annually
- centralised database
- manually reformatted
- limited information

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<th>Other ID</th>
<th>Name</th>
<th>Project</th>
<th>Status</th>
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**Location**

- Longitude: 148.1776
- Latitude: -35.3439
- Datum: GDA94

Why?

• Deliver data through the Australian Geoscience Portal - RELEVANT TO YOU, THE EXPLORERS AND SOCIETY!

• How?
  - Permit data transfer between organisations
  - Develop a standard data model
  - Develop standard vocabularies
What?

Current ‘Systems’

- Few standards
- Organisation specific
- Access, Excel, Proprietary GIS
- Files, DVD, CD

GeoSciML System

- Controlled Vocabularies
  - EarthResourceML, GeoSciML, O&M
- Syntax (Data Language)
  - GML, XML
- Schematic (Data Structure)
- Semantic (Data Content)
- Systems (Data Services)

interoperability
How?

- Extension of GeoSciML
- Based on other international standards
- Real-world objects classified into types based on a characteristic set of properties
EarthResourceML Governance

- Australian/NZ Government Geologists Information Committee (GGIC)
- GGIC Mineral Occurrence Task Group
- Commenced work in November 2006
- MineralOccurrences v1.0 released March 2007
- Tested in AuScope portal June 2009
- EarthResourceML v1.1 released July 2009
- Production services by GSV, PIRSA, MRT, NTGS, GSWA
- Consumed by AuScope Discovery Portal (http://portal.auscope.org/gmap.html)
- Future governance by CGI as per GeoSciML?
- Potential uptake by international community (eg INSPIRE)
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Methodology

- Lessons learnt from GeoSciML development:
  - No right or wrong way, just agreed way
  - Use UML to capture all
  - Don’t maintain classes you don’t have to
  - Re-use other domain (GeoSciML, GML) classes where possible
  - Re-use patterns
- Identify Use Cases from Scenarios
  - This part is rarely done well!
  - Required for testing
- Interoperable communities share a language
  - Community standard data model
  - This may be formalized as an ‘Application schema’
  - In a serialized form (file format) this is used for data transfer (i.e. ‘standard exchange format’)
  - In general this is different from the storage format
- Goal
  - One normative artefact – the UML model
  - Everything must either be in the model or the rules for converting from model to schema
  - Software and documentation generated automatically
  - ‘How to’ and ‘Cookbook’ documentation
- Map users data to model – modify model if necessary
- Establish WFS – modify model if necessary
GeoSciML - EarthResourceML
Geology View of Earth Resources
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### AuScope Discovery Portal – Mineral Occurrence

**EarthResourceML - MineralOccurrence**

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<th>Type</th>
<th>Id</th>
<th>Commodity</th>
<th>Id</th>
<th>Date</th>
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AuScope Discovery Portal – Mining Activity

EarthResourceML - MiningActivity

- **Mining Activity Type**: unspecified
- **Mining Activity Id**: urn:cgi:feature:GSV:MiningActivity:372429:27924
- **Start Date**: 1996-01-01
- **End Date**: 1996-12-31
- **Associated Mine Name**: 
- **Associated Mine Id**: urn:cgi:feature:GSV:Mine:372429
- **Amount of Ore Processed**: 255540 t
- **Commodity**: 
- **Commodity Id**: urn:cgi:feature:GSV:Commodity:372429:cu
- **Product Name**: Copper
- **Production Amount**: 2639 t
- **Recovery %**: 1.1090066830851 %
- **Associated Earth Resources**: 
- **Earth Resource Id**: urn:cgi:feature:GSV:MineralOccurrence:372429

**Filter Properties**
- **Associated Mine**: 
- **Produced Materials**: Copper
- **Activity Start Date**: 1996-01-01
- **Activity End Date**: 1996-12-31
- **Min. Ore Processed**: 
- **Min. Prod. Amounts**: 

**More Details**
- **Name**: urn:cgi:feature:GSV:MiningActivity:372429:27924
- **Location**: 147.88748 -37.00356
- **Activity Start Date**: 1996-01-01
- **Activity End Date**: 1996-12-31
- **Activity Type**: unspecified
- **Associated Mine**: urn:cgi:feature:GSV:Mine:372429
- **Deposit**: urn:cgi:feature:GSV:MineralOccurrence:372429
- **Product**: Copper
- **Commodity Description**: urn:cgi:feature:GSV:Commodity:372429:cu
AuScope Discovery Portal – Mines

AuScope.org  AuScope Discovery Portal  Login

Feature Layers
- Earth Resource Mine
- Earth Resource Mineral Occurrence
- Earth Resource Mining Activity
- Geodesy
- National Virtual Core Library

Add Layer to Map

Active Layers
- Title
- Visible
- Earth Resource Mine

Remove Layer

Filter Properties
- Mine Filter Properties
- Mine Name:

Table:
- Name: IRMNGfeature PIRSA-Mine 739
- Preferred Name: GUM CREEK MINE
- Location: 139.7876777, -32.8005937
- Status: abandoned
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GeoSciML - EarthResourceML

- Governance
  - INSPIRE
    - GeoSciML accepted as ”standard” for Geology theme - Annex II - 6.4
    - EarthResourceML
      - As a candidate for Mineral Resource theme - Annex III - 7.21
      - Modification - INSPIRE needs?
Future work - AuScope - Australia - IUGS - CGI

• Model needs the Mineral Systems part developed
  – Source: melt composition, physical properties, metal endowment
  – Pathways: propagation, complexity, flow regime
  – Traps: efficiency, periodicity, scale
• Awaiting development of software to allow delivery
• Industry and software vendors need to adopt
Global investment in exploration 2006-2007

Canada: 697 M USD
Kanada 2100 M USD

USA: 283 M USD
USA 300 M USD

Europe: 143 M USD
Europe 200 M USD

Africa: 774 M USD
Africa 1700 M USD

Latin America: 774 M USD
South America 2600 M USD

Russia: 350 M USD

Asia: 1600 M USD

Other Asia: 300 M USD

China: 175 M USD
India: 75 M USD

South East Asia: 155 M USD

Australia: 524 M USD
Australia 1300 MSD

Sources: RMG, MEG
AuScope - Promine Grid - test

Provider benefits → delivery to multiple clients

Data Providers

SGU - GEUS TNO - ETC
GTK BRGM
MRT
GA
GSV
NTGS

User benefits → access to multiple providers

Standard format

GIS
WMS WFS
Report
Simulation and Modelling

User benefits → access to multiple providers

Provider benefits → delivery to multiple clients
Mineral resource data - AuScope - one portal - new plans - Europe - ProMine - INSPIRE - AEGOS - > Global portal
Thanks for your attention -
current data -