ProMine: Architecture, portal and web services to provide a European mineral resources information system.

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Nano particle products from new mineral resources in Europe

FP7 project, theme 4: Nanosciences, nanotechnologies, materials and new production technologies

2009 – 2013

Total budget 17 M€, EU contribution: 11 M€

27 partners from 11 EU countries
Main Objectives:

- To develop high value products based on nano-scale raw materials delivered by the extractive industry.
- To develop the first pan-European information system containing the known and predicted metalliferous and non-metalliferous resources, which together define the strategic reserves (including secondary resources) of the EU.
- To calculate the volumes of potentially strategic metals and minerals that are currently not extracted in Europe.
- Coordinator: GTK (Finland)
- 5 Mining companies (Boliden Minerals, KGHM Cuprum, Hellas Gold, …)
- 5 Geological Surveys: GTK (FI), BRGM (FR), IGME (SP), IGME (GR), INETI (PO)
- 6 Universities
- 11 Industry and research institutions
OBJECTIVE:

Development of a Pan-EU GIS data management and visualization system for natural and man-made mineral endowment and the realization of a Pan-EU predictive resource assessment.

In order to reach this objective, WP1 will fulfill three main assessments:

- **Assessment of EU mineral resources** (including new strategic and 'green' commodities such as Ga, Ge, In, Li, Nb, Ti, Ta, PGE and REE);

- **Assessment of secondary (industrial) minerals and resources in combination with metalliferous ores** (will be realized at the same time as previous task);

- **Assessment of valuable mining and metallurgical residues.**
DATABASES (MD, AC, DISTRICT): Improvement

- General info.
- Deposit
- Mineralisation
- High-tech metals
- Economy
- Comments
- Iconography
- Bibliography

ANTHROPOGENIC CONCENTRATION DATABASE NEW!

- General info.
- Wastes & products
- Environmental parameters
- Comments
- Iconography
- Bibliography

MINERAL DEPOSIT DATABASE (based on BRGM database)

MINING DISTRICT DATABASE (based on BRGM database)
ProMine WP1

Create metadata

Publish metadata

Services available for applications and portals

ProMine Portal

Local structures

For interoperability: Use of standards for metadata, data models and services

ProMine has to be ‘INSPIRE (ISO, OGC) compliant’

Data access (WFS)

Data access (WCS)

View (WMS)

Discovery (CSW)

Metadata Database

Metadata

Geology layer(s)

Geophysics layer(s)

Predictive maps

MD & AC maps

Standard data model for Mineral Resources

Standard data model for Ant. Concentrations ??

DB Geol, …

Mineral Deposit

Anthropogenic concentrations

Provide data

Create metadata
ProMine WP1

Create metadata

Publish metadata

Services available for applications and portals

ProMine Portal

DONE

mineral deposit

anthropogenic concentrations

provide data

local structures

For interoperability: Use of standards for metadata, data models and services

ProMine has to be ‘INSPIRE (ISO, OGC) compliant’
Symbols => SLD encoding

« vocabularies » => Web service and SKOS encoding
INSPIRE metadata elements for discovery (from ISO 19115 and ISO 19119)

1. IDENTIFICATION
   1.1. Resource title
   1.2. Resource abstract
   1.3. Resource type
   1.4. Resource locator
   1.5. Unique resource identifier
   1.6. Coupled resource
   1.7. Resource language

2. CLASSIFICATION
   2.1. Topic category
   2.2. Spatial data service type

3. KEYWORD
   3.1. Keyword value
   3.2. Originating controlled vocabulary

4. GEOGRAPHIC LOCATION
   4.1. Geographic bounding box

5. TEMPORAL REFERENCE
   5.1. Temporal extent
   5.2. Date of publication
   5.3. Date of last revision
   5.4. Date of creation

6. QUALITY AND VALIDITY
   6.1. Lineage
   6.2. Spatial resolution

7. CONFORMITY
   7.1. Specification
   7.2. Degree

8. CONSTRAINT TO ACCESS AND USE
   8.1. Conditions applying to access and use
   8.2. Limitations on public access

9. ORGANISATIONS RESPONSIBLE
   9.1. Responsible party
   9.2. Responsible party role

10. METADATA ON METADATA
    10.1. Metadata point of contact
    10.2. Metadata date
    10.3. Metadata language

Elements used only for services:
   1.6. Coupled resource,
   2.2. Spatial data service type
Complementary metadata elements (from OneGeology-Europe project *)

For the dataset itself:
- Completeness
- Maintenance frequency
- Delivery format (name, version)
- Reference System name
- Software (GIS and Database)
- Digitizing method
- Validated topology

+ Elements to describe the geological source used to create the dataset (often by digitizing):
  - Source title
  - Source description
  - Mapping method
  - Date of mapping
  - Mapping scale
  - Reference system
  - Citation of mapping project

+ Elements to describe the topographic source used to create the dataset:
  - Source title
  - Source description
  - Date of mapping
  - Mapping scale
  - Reference system

(*) These complementary elements are also from ISO 19115 and ISO 19119.
Mapping of database elements to EarthResourceML model:

Some elements are already mapped to EarthResourceML:
- Deposit name,
- Country, district,
- Status,
- Exploitation type,
- Deposit type,
- Main morphology,
- Main deposit, potential and class
- All other commodities
- Mineralization age,
- Host rock formation and age
Conclusions from WP1:

- Use of standards (ISO/OGC)
- Use of experience and components from OneGeology-Europe:
  - Architecture
  - Metadata profile
  - Rules for services implementation
  - Connector component on top of services
  - Web service and encoding of vocabularies (SKOS)
- EarthResourceML: good candidate for the INSPIRE Mineral Resources data model (Annex III)
- Good example of a mapping between a internal data model to an exchange data model, at European scale
- Good example of portrayal rules for mineral resources data
Thanks a lot for your attention

http://promine.gtk.fi/