



Implementing the International Geo Sample Number (IGSN) in Australia

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MINERAL RESOURCES

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What is IGSN and what does it do?

- Provides identifiers that are guaranteed to be unique via a hierarchical governance system (like assigning IP addresses)
- Facilitates internet-based discovery and access to physical samples:
 - Web applications and programmatic access to sample metadata catalogues
 - Networks with sample repositories and data centres
- Ensures preservation of, and access to sample data
- Aids in the identification of samples in the literature and of data derived from them

- Try it out: <http://igsn.org/ICDP5054ESYI201> or <http://igsn.org/AU1101>

IGSN in Australia

- IGSN currently has three members in Australia:
 - CSIRO
 - Geoscience Australia
 - Curtin University
- Joint governance of the use of IGSN in Australia.
- Community building (e.g. workshops) to introduce sample identifiers to other institutions and other science disciplines.



Australian Government
Geoscience Australia



IGSN @ CSIRO

The screenshot displays the IGSN web interface for sample CSRWA276. At the top, there is a search bar with the text "BROWSE" and a CSIRO logo. Below the search bar, the sample ID "CSRWA276" is prominently displayed next to a QR code. To the right of the ID, there are fields for "Datum: EPSG:3830" and "Date Sampled: 16May2013". Below this, a table lists sample details:

Sample	
Collection Project	Stawberry Pass Road Progress
Location	03-L3
Sample IGSN	CSRWA276
CSIRO Sample Id	HW97
CSIRO Borehole Id	
Container	
Collection Id	N00001

Below the table, a "Sample Coordinates" section shows a map of the sample location. A red pin marks the site on a map of the Stawberry Pass area. A pop-up window for "CSRWA276" provides the following coordinates and details:

- Datum: EPSG:3830
- Lat: 40.0000
- Lon: 178.24276
- Depth: 0
- Type: Rock
- EPSG:4326
- Lat: -21.40881747702084
- Lon: 178.82381124060284

- CSIRO became a member of IGSN in 2013.
- IGSN are currently used for:
 - Collection of the Australian Resources Research Centre
 - Mineral Reflectance Spectra Reference Collection
 - Capricorn Distal Footprints minerals exploration project
- Future use cases:
 - Soils collection
 - Insect collection

Tracking the sample life cycle

IGSN is used in CSIRO for tracking samples and to support sample logistics.

- In the field: unambiguous identification, metadata capture with mobile app.
- In the lab: identification and tying data to samples.
- Storage: identify collections and samples in storage, catalogue, manage sample logistics.

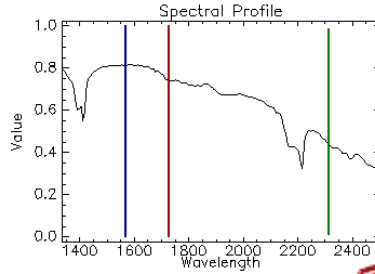


Linking Samples with Data and Publications

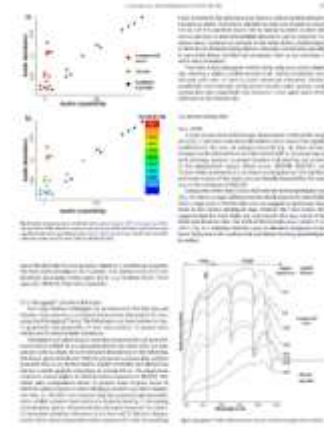
Specimen (Rock Store)



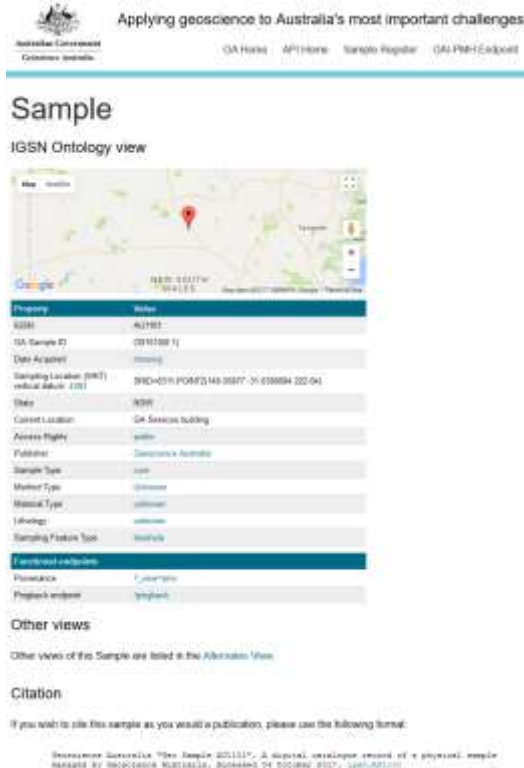
Spectrum
(Data Access Portal)



Publication



IGSN @ Geoscience Australia



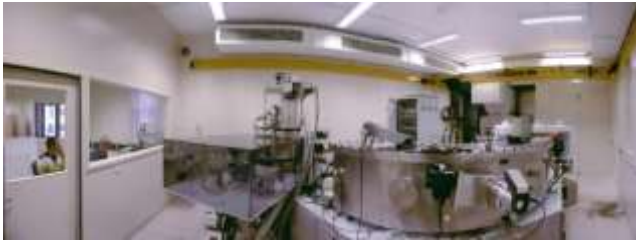
The screenshot shows the Geoscience Australia website with the header "Applying geoscience to Australia's most important challenges". Below the header, there are navigation links: "GA Home", "API Home", "Sample Register", and "GA PSH Ecosystem". The main content area is titled "Sample" and "IGSN Ontology view". It features a map showing the location of the sample in Australia, with coordinates 138° 30' 17" W and 34° 15' 55" S. Below the map is a table of properties for the sample GA11001.

Property	Value
IGSN	GA11001
GA Sample ID	02101000 1
Data Acquired	Missing
Sampling Location (WKT)	BND-CEN-PORFD 140 30007 -36 010004 200 04
Initial Date (ISO)	
State	NSW
Current Location	GA Services building
Access Rights	public
Publisher	Geoscience Australia
Sample Type	rock
Method Type	Unknown
Material Type	unknown
1-phasing	unknown
Sampling Feature Type	bedrock

Below the table, there are sections for "Geological collection", "Other views", "Citation", and a note about citation format.

- GA became a member of IGSN in 2014.
- IGSN are currently used in the GA collection.
- 1.6 Million samples registered.
- GA is the IGSN Registration Agent for the geological surveys of the Australian states and territories.

IGSN @ Curtin



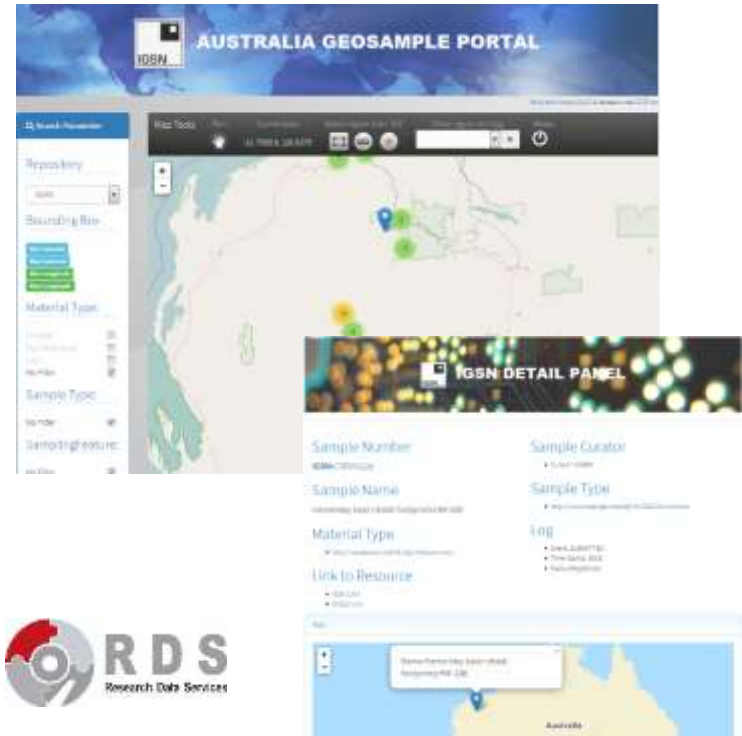
- Curtin University became a member of IGSN in 2015.
- IGSN is currently used in the John de Laeter Centre for Geochemistry.
- IGSN and data management are supported by the Curtin University Library.
- JdLC, CSIRO, Univ. Western Australia and Geol. Survey of Western Australia work together in the Natural Resources Research Precinct.

Governance Model

- The governance model of IGSN is based on hierarchical delegation.
- IGSN identifiers are registered through IGSN agents.
- Each IGSN agent is given namespaces for the registration of IGSN.
- Examples:
 - AU... Geoscience Australia
 - CS... CSIRO
 - CSCAP... CDF Project (CSIRO)

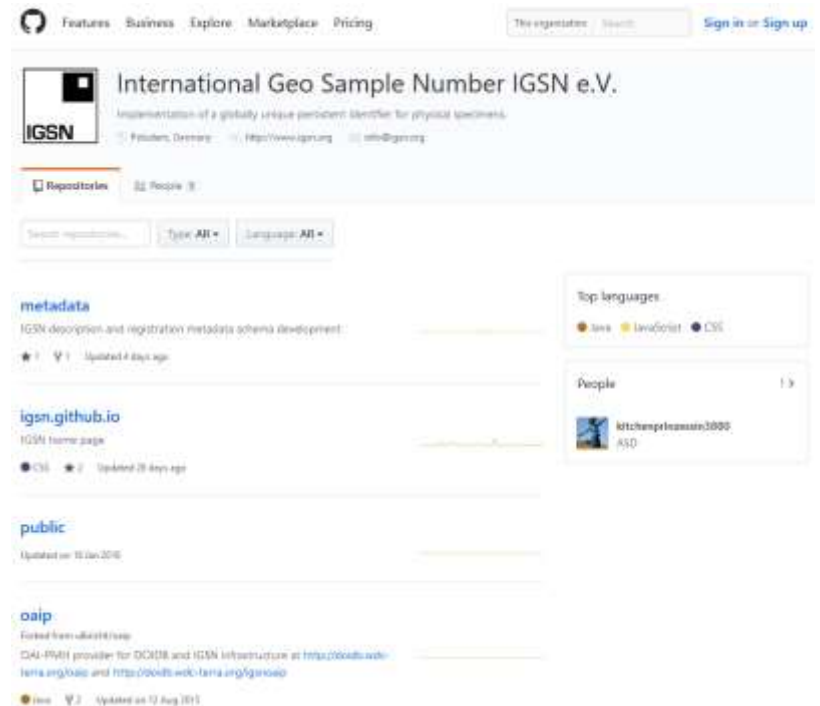
Australian IGSN Portal

- A grant from the NCRIS Research Data Services programme made it possible to develop a demonstrator for a common Australia Geo Sample Portal.
- Metadata are harvested into a common metadata portal to facilitate the discovery of samples curated by Australian IGSN members.
- Samples are described in a common metadata schema based on the international IGSN description schema.



Technical Base

- IGSN builds upon an existing technical base and community.
- IGSN are based on the Handle System.
- The IGSN technical architecture is developed in close alignment with DataCite.
- <http://igsn.github.io> (documentation)
- <https://github.com/igsn> (repository)



The screenshot shows the GitHub repository page for 'International Geo Sample Number IGSN e.V.'. The repository is implemented in JavaScript and CSS. It includes a 'metadata' repository for schema development, an 'igsn.github.io' homepage, a 'public' directory, and an 'oaip' directory for OAI-PMH services. The page also features navigation links for Features, Business, Explore, Marketplace, and Pricing, along with a search bar and a 'Sign in or Sign up' button.

Samples Moving Between Institutions

- What happens when samples move from one institution to another?
- Case 1: Laboratory
 - IGSN available: The laboratory uses the already assigned IGSN.
 - IGSN not available: The laboratory assigns a new IGSN.
- Case 2: Subsampling
 - A subsample should be identified by its own IGSN. This case depends on the details of the setting.



Future Outlook

- Build a developer community around IGSN, document best practices, build reference implementations of services.
- Expand identifying and linking to objects in other domains.
- Other domains start reusing IGSN technology.



Conclusions

- IGSN was introduced in Australia through a collaboration of national labs (CSIRO), government agencies (GA) and academia (Curtin Uni).
 - CSIRO, GA and Curtin Uni work together to build a community of IGSN users, develop common sample descriptions and online catalogues.
 - The use of IGSN is to be expanded to novel use cases.
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- General info: <http://www.igsn.org>
 - Technical info: <http://igsn.github.io>
 - Demo portal: <http://igsn.org.au>

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