Applications for Unique Identifiers in the Geological Sciences

EGU2013-11809

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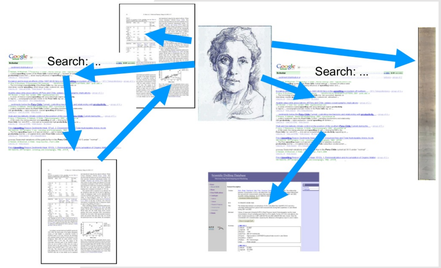
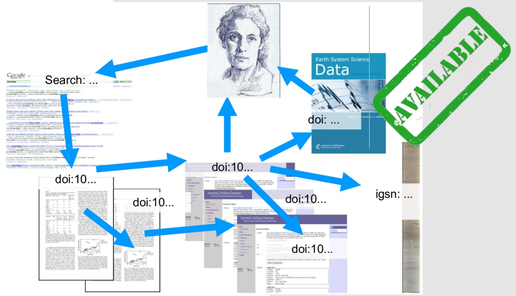
Identifiers in Science

Information technology offers new ways to link scientific resources over the internet. A requirement of addressing objects is to use persistent identifiers for (digital) objects. The use of persistent identifiers greatly enhances discovery of resources, data mining and exploratory data analysis.



In the past literature, data, and samples were semantically connnected only in our minds. Semantic web technology and the application of unique and persistent identifiers in the geosciences will aid discovery through systematic data mining, exploratory data analysis, and serendipity effects.



AVAILABLE

www.gfz-potsdam.de
www.ldeo.columbia.edu
www.iedadata.org

Identifiers for Publications

A digital object identifier (DOI) is used to uniquely identify an object such as an electronic document.

The DOI for a document is permanent, whereas its location may change.

Most of the scientific literature is already identifiable by DOI.

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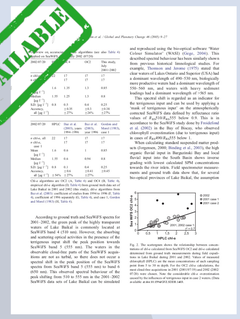

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DOI for data

DOI are also available for data. In analogy to literature, the DOI identifies a data object or a collection of data.

DOI for data are operated by DataCite and are assigned by major research libraries and data centres worldwide.

Data that have been assigned a DOI are citable and become part of the record of science.

www.datacite.org

Identifiers for Authors

Unique identifiers for authors are important to uniquely attach a person as author or contributor to research objects such as datasets, equipment, articles, media stories, experiments, patents, and notebooks. Author IDs make it possible to distinguish researchers with similar names to unambiguously link them to research activities and research grants.

Several types of author identifiers are currently in use: ORCID, VIAF, ISNI, and others. ORCID and ISNI are interoperable. VIAF is maintained by the national libraries.

AVAILABLE

CC BY

International Geo Sample Number - IGSN

AVAILABLE

IGSN e.V.

Most data in the geosciences are derived from samples. It is crucial to be able to identify the samples from which data were derived.

The International Geo Sample Number (IGSN) provides solutions to the questions of unique sample identification and discovery.

Use of the IGSN allows building links between samples and their related data in the literature and in web accessible digital data repositories.

The IGSN is operated by the International Geo Sample Number Implementation Organization - IGSN e.V.

www.igsn.org

Future Developments

The successful application of persistent identifiers for the identification of literature, data, authors and samples can now be transferred to other use cases.

Identifiers for scientific cruises, analytical instruments and analytical methods have the potential to greatly enrich published research results.

Cruise IDs

At present scientific cruises or expeditions in most cases are not uniquely idenfiable and cannot be linked to results and materials from these cruises.

An example of a catalogue of research cruises can be found at http://www.rvdata.us/catalog

Identifiers for Instruments and Methods

Is it a phenomenon, a systematic error, or operator bias? Identification of instruments, methods and procedures will help to enhance transparency and appraisal of analytical results and sensor data.

In addition, instrument and method IDs will be useful in the compilation and interpretation of data synthesis studies and for data mining analytical databases.

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