OGC Standards and Working Groups for Geoscience

GeoSciML

The GeoScience Markup Language (GeoSciML) is a data model and data transfer standard for geological data.

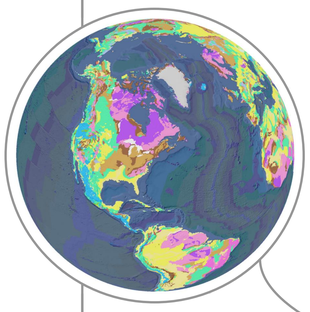
It formalizes the description of geological features commonly portrayed in geological maps, cross sections, geological reports and databases. It provides geological surveys, and other geoscience data providers, a common vocabulary for the electronic dissemination of geoscientific information.

GeoSciML is an XML–based data transfer standard for the exchange of digital geoscientific information. It accommodates the representation and description of features typically found on geological maps (eg, geologic units, structures, earth materials), as well as being extensible to other geoscience data such as drilling, sampling, and analytical data.

Supporting objects such as the geologic timescale and vocabularies are also provided as linked resources, so that they can be used as classifiers for the primary objects in the GeoSciML standard.

GeoSciML is used in the OneGeology project to propose a dynamic digital geological map data for the world.

Resources: http://www.geosciml.org/
https://www.opengeospatial.org/standards/geosciml



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The Open Geospatial Consortium (OGC) is an international organization committed to develop and promote open standards for the global geospatial community. Its membership includes more than 500 organizations that come from across government, commercial organizations, non-governmental organizations, academic, and research institutes.

OGC activities address both semantic and technological standardization in a wide variety of domains including: Geosciences & Environment; Smart Cities, IoT & Sensor Webs, mobile technology, 3D & Built Environment, Emergency Response & Disaster Management, Energy & Utilities, and many more.

With the main objective to propose standards to the International Organization for Standardization (ISO), OGC regularly collaborates with other international organizations, such as Research Data Alliance, the World Meteorological Organization or building Smart International and many more in order to propose consistent standards and solutions.

ISO International Organization for Standardization · RDA RESEARCH DATA ALLIANCE · WORLD METEOROLOGICAL ORGANIZATION · buildingSMART International ...

GroundWaterML2

The GroundWater Markup Language 2 (GroundWaterML 2 or GWML2) is is an international standard for the online exchange of groundwater data that addresses the problem of data heterogeneity.

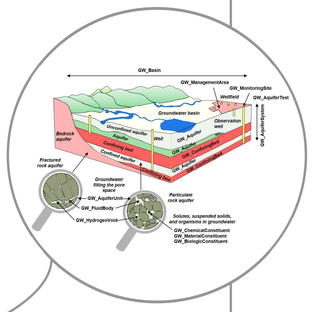
This problem makes groundwater data hard to find and use because the data are diversely structured and fragmented into numerous data silos. Overcoming data heterogeneity requires a common data format; however, until the development of GWML2, an appropriate international standard has been lacking.

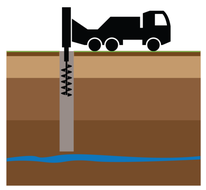
As part of the WaterML 2.0 standard and linked to GeoSciML, GWML2 introduces some concepts such as aquifers and water wells, as well as related measurements and groundwater flows.

It describes a conceptual and logical model for the exchange of groundwater data, as well as a GML/XML encoding with examples.

GWML2 has developed, tested and implemented by several groundwater data providers from North America, Europe, and Australasia, and facilitates many forms of data exchange, information representation, and the development of online web portals and tools.

Resources: https://www.opengeospatial.org/standards/gwml2





Even though several standards already exist to describe a borehole, its associated data and their position along a borehole (including OGC standards), they all restrict themselves to a specific viewpoint.

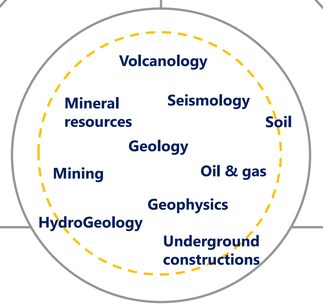
Involving key implementers and editors of the existing standards, the Borehole Interoperability Experiment (Borehole IE) aims at defining a domain agnostic and comprehensive (umbrella) vocabulary for a general concept of boreholes, which may eventually become its own specification and be properly reused by various domains when needed.

Based on a wide variety of use cases such as 'scientific exchange within and across research infrastructures', 'industrial', 'building and construction', 'regulatory obligations' and 'geo-resources monitoring and exploitation' it will provide the basis for establishing a better integration of existing standards and possibly a future common approach for describing boreholes.

The Borehole IE is defining a domain neutral semantic for a general concept of borehole and its associated data. It will also produce a public OGC engineering report summarizing the overall cross-domain, inter-standard findings and recommendations for a best practice implementation that should follow.

Resources:
https://github.com/opengeospatial/boreholeie/
http://www.opengeospatial.org/projects/initiatives/boreholeie

BoreholeIE



The GeoScienceDWG is a joint group between OGC and the Commission for the Management and Application of Geoscience Information of the International Union of Geological Sciences (CGI-IUGS).

The GeoScience Domain Working Group (DWG) is a forum to discuss, organize and harmonize geoscience related standards.

In this context, Geoscience encompasses several scientific domains which all aim to provide a better understanding and representation of the Earth: Geology, Geomechanics, Geophysics, Geotechnics, Hydrogeology, Mineralogy, Seismology or Volcanology.

Goals of GeoScienceDWG include: 1- Foster technical solutions which support interoperable concepts, data definitions, formats and services for publishing, search, and exchange of geoscience information; 2- Ensure thematic/semantic coherence within the Geoscience domains and the Geoscience related ones; and 3- Establish a workable approach to managing standards for geoscience spatial features, their temporal aspects, related metadata, and other business information.

First actions of the group focus on the realization of three Interoperability Experiments : 1 – Linked Data for Environmental Features, 2 – Borehole and associated data information description, and 3 - 3D-4D model discovery capabilities.

Resources: https://external.opengeospatial.org/twiki_public/GeoScienceDWG/WebHome

GeoScienceDWG

The Environmental Linked Features Interoperability Experiment (ELFIE) is intended to test existing OGC and W3C standards with the goal of establishing a best practice for exposing links between and among environmental domain and sampling features in a highly adoptible standards compliant way that is compatible with modern web search technology.

The IE is focused on two cross-domain use cases:
1) exposing topological and domain feature model relationships between features and
2) description of sampling data available for and linked to sampled domain features

While addressing these use cases, the IE has aimed to address issues of encoding data as specific views of a linked data graph that would be passed between systems. These linked data graph views are expected to support architectures involving linked data catalogs and registries.

For example, data providers can use the linked data graph views as a way to advertise their monitoring or domain features to catalogs or other applications that want to crawl and index available data. Similarly, integrated catalogs that index and construct links between features can use the views as a linked data response to search queries.

The IE has produced numerous experimental demonstration JSON-LD instance files and a number of demonstration visualizations.

Resources:
https://opengeospatial.github.io/ELFIE/

ELFIE

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