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The harmonize and interoperability skill of the geologic data of the Geological Survey of Italy

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The Geological Survey of Italy, based on the experience matured during the realization of the OneGeology-Europe project, and in the use of GeoSciML as member of the Interoperability Working Group of IUGC-CGI, has applied the Geoscience standards to some national cases.
The geological information are achieved from several databases: the first is the Geo1MDB (Cipolloni et alii, 2009) based on the descriptive legend of the Geological Map of Italy at 1:1,000,000 scale, where each feature is related to the geologic units information (i.e. lithology, chronostratigraphy, orogenetic phase, geologic event, tectonic event, tectonic structure, depositional environment, petrography, metamorphic grade, metamorphic phase).
The second one is the deep borehole database where the available geological information are lithology, formation description, chronostratigraphy, biostratigraphy, etc.
Another specific application of the data model has been pointed out on the detailed geological database realized for the Italian Geological Cartography Project (CARG project); these data are more abundant and we decide to use for testing the detail case model and/or in other part of the GeoSciML model that aren't evaluated in the lower scale data.
Following the semantic structure defined by the "1:1M pan-European Scientific Data Specification, Identification and Sourcing" realized by the specific working group (WP3) of the OneGeology-Europe project, we are working to harmonize the 1M Italian geological datasets, particularly on composition (lithology –chronostratigraphy) and structure of the surface geology.
The data model is developed mainly on GeoSciML schema version 2.1.1 that represent the geologic schema for OneGeology-Europe project that will represent, with great probability, the model for INSPIRE Data Specification - Annex II.
Each feature require terms and definitions, referred to existing definitions and standards. A major basis for the Data Specification work come from the GeoSciML scheme and the CGI/GeoSciML vocabularies.
To match the national terms versus the harmonised vocabulary we have created some bridge tables where all the local information are reconfigured with international ontology. A challenge is represented by a new testbed that use the new integration of the geologic data model made by ESRI that easily re-create a compliant model.
The access to geological datasets are deployed as web map service (WMS) and web feature service (WFS) using a specific Java-connector, developed by BRGM for the OneGeology-Europe project; this connector allow us to configure a OGC standard WMS (1.3) and WFS (1.1.0) to INSPIRE data sharing service in multiple-language and in GeoSciML response.
At the moment our web map service is available in different format to spread the accessibility to the user; the metadata of data and services, according to INSPIRE rules, are stored in multilingual format in two different metadata catalogues, accessible from OneGeology-Europe portal (http://www.onegeology-europe.eu) and Geological Survey of Italy portal (http://sgi.isprambiente.it/geoportal).

References

Cipolloni C., Pantaloni M. Ventura R., Vitale V. & Tacchia D. (2009) – The GEO1MDB: the database of the 1:1,000,000 scale geological map of Italy. Proceeding of "6th European Congress on Regional Geoscientific Cartography and Information System", 1, 235-237 pp., Munich (Germany).