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The use of GeoSciML harmonised layers in geological applications

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The new target for Geological Surveys is to produce data and web services compliant with wider international schemas, where there are more options to provide data, with specific attributes that are important to obtain the derived geothematic map as, e.g., geohazard map. Therefore in the last years we have decided to apply to some datasets the GeoSciML schema to exploit the benefit in use geologic harmonised layer as input in the geohazard applications.

Based on two different project perspectives Geological Survey of Italy have built a common methodology to analyse dataset and transform them into INSPIRE compliant format following the Data Specification on Geology and/or GeoSciML data model that represents a natural extension of the previous one.

We performed several tests, in order to contribute the data model development, but also to evaluate the feasibility and the resources needed to transform the data at server side "physically" or "on the fly".

One of the test has been performed on the 1:100,000 scale Geological Map of Italy;pending the eENVplus [1] European project we have analysed the presence of semantic discrepancy along the sheets border and harmonised [2] where possible. The semantic description was redefined and the geometry of the polygons in geological maps were adjusted according to a lithostratigraphic approach that takes into account the homogeneity of age, lithology, depositional environment and consolidation degree of geological units. On this database, starting from the cross border region we have modified the database view to be more consistence and then the semantic content mainly using the CGI vocabularies and INSPIRE code-lists. The new database views have been used to customise the web service using the Geoserver application schema.

At the same time we have explored the usability of GeoSciML 4.0 Data model [3] to encode the landslide database to realize a susceptibility map; some test has been done on the landslide dataset too to identify the best way to share information. The landslide inventory database is wider than geological data model domain and to simplify the transformation we have tested the feasibility part that is mapped in GeomorphologicFeature class of GeoSciML Basic module.

The last test has been performed on the deep and shallow boreholes databases, where most of the geological attributes are recompiled following semantic terminology provides by CGI and INSPIRE code-lists.

The aim of this work is to present the results of some tests and examples concerning the data harmonisation process, in which an important role is played by the semantic harmonisation using the

ontology service and/or the hierarchy vocabularies available as Link Data or Link Open Data by means of URI directly in the data spatial services.

References:

[1] eENVplus project, http://www.eenvplus.eu

[2] Cipolloni et al., (2014) Geophysical Research Abstracts, Vol. 16, DOI: EGU2014-12908, 2014

[3] GeoSciML (2016) – GeoScience Markup Language version 4. http://www.geosciml.org