Geophysical Research Abstracts
Vol. 12, EGU2010-6851-2, 2010
EGU General Assembly 2010

Cat herding on a global scale - the challenge of building a vocabulary for the geology of Europe with compatibility to a global ontology

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The OneGeology Europe (1G-E) project is delivering a web accessible, semantically and technically interoperable geological dataset for the whole of Europe at a 1 : 1 million scale, and attempting to make as much progress as possible in harmonising that dataset. The initiative is based on the foundation of geological data held by each geological survey in Europe. These data differ considerably with respect to their content, description and geometry. To make these data interoperable is a substantial task and OneGeology-Europe Work Package 3 is delivering, as the essential foundation, the terms and classification system - the 1G-E Geology Data Specification (Asch et al., in preparation). This is going to include a vocabulary to describe lithology, age and genesis of the rocks and the tectonic structures and the term definitions and relations. This specification will be the base for the Geological Surveys participating in OneGeology-Europe to describe the geology of their country within the project.

However, Europe is not an island, neither are the rocks of Europe unique, and the vocabulary is being developed on the base of the existing vocabulary of the global IUGS-CGI Concept Definition Task Group: a global group of experts which is developing a vocabulary for the GeoSciML model. As a result of scrutiny of the existing global base and examination of the needs of European geology, new terms were added, new concepts introduced, definitions altered and adapted. The outcome is that what is being developed to describe the geology of Europe is going to be a part of what can be used to describe geological units globally.

However, the challenges in patricular regarding "Lithology" are considerable. An example for the terminology of sedimentary rock types would be the definition of "arenite: is it a "pure" sandstone with less than 10 % matrix or a type of clastic sedimentary rock with sand grain size and less than 10 or 15% matrix (depending on the reference). This then leads to another question - Which classification should be adopted for the definition of "grain size": Wentworth (1922), Folk (1962), ISO 14688-1 (2003) or even another one? However, the quotation of F. J. Pettijohn (1975): "The classification of the sedimentary rocks is a problem on which much thought has been expended and one for which no mutually satisfactory or complete solution has yet been found" does not only apply to sedimentary rock types; there are numerous "bones of classication contentions" also for igneous and metamorphic rock types.

Based on the vocabulary specification OneG-E will identify the generic and specific geometric and semantic harmonisation issues and will then "rework" these existing national datasets to make significant progress towards a harmonised dataset - a crucial step towards INSPIRE goals. The standards, architecture and framework developed here can then be "up-scaled" to more detailed levels and progressively deployed for higher resolution geological data.

The work on the OneG-E data vocabulary is contributing to enrich and improve the global CGI vocabulary and ontology and will provide a solid base for the description of geology of each EC country when the EC INSPIRE Directive's specification is defined.

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