

An Interactive Semantic Translation Service for Classified Maps

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Abstract

This paper describes ongoing work to create a Semantic Translation Service that allows users to: (i) experiment with the design of map classification schemes, (ii) explore how the use of different schemes affects what is apparent on the map and (iii) translate maps--as far as possible--from one classification scheme to another. Semantic equivalences and similarities are supported via underlying ontologies, and it is these that facilitate the merging and re-grouping of classes. Users can create their own map re-classification schemes, which can be serialised for later use.

The classification systems and taxonomies used throughout the geosciences for land cover and land use, soils, geology are neither static nor universal; the classes that we use to represent the Earth vary over time and from place to place. This is to be expected, given that: (i) new science, social and economic agendas change what we may wish to differentiate when we look at a map and (ii) new technologies make differentiation of some classes more reliable, thus viable. Semantic Translation Services are a relatively new technology. The examples built to date are typically very limited in terms of flexibility and extensibility, the scripts used for describing the supported translations are hard-wired, and there is little or no support for users to experiment with new schemes. Our work makes two important contributions:

- The Service has a highly interactive, graphical interface, allowing users to compare classification schemes from two maps, and to plan, test and refine new classification schemes
- Classification schemes, once created can be serialised into a library, browsed through and applied in new situations, by the same or different users.

The technologies we use are fully open and standards compliant ... RDF for the ontology store, SPARQL for ontology queries, WMS for the GIS Web Services, and SLD for styling maps and experimenting with new classification schemes. Results are described using the service to experiment with, and interoperate between some of the various standard land cover and land use schemes used in New Zealand including: LCDB1, LCDB2, LUCAS and EcoSat. It is fully extensible to cover other kinds of GIS-based, classified maps, including soils, geology, forestry and agricultural data.

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