

## Topographic Mapping Ontologies Derived from U.S. Geological Survey Topographic Mapping Feature Inventories

Researchers at the U.S. Geological Survey (USGS) currently (2007) are analyzing digital topographical inventories for the development of ontologies for *The National Map*. The objective of this research is to better understand the ontology of feature-based topographical mapping and its application to the modernization of existing inventories for increasing data integration, translation, generalization, and other processes. Several USGS models serve as the foundation for this effort. The Digital Line Graph-Enhanced (DLG-E) structure was designed in 1988 by specifying feature objects, their attributes, and relations with other features or spatial objects. Feature classifications were organized by five “views” (perspectives) on the landscape. Users of DLG-E retrieved information lexically; that is, by feature name or label or other verbal characterization. Relations among objects based on functions of assemblages were identified by text-based, action-oriented networks. Although user-defined geographical processes were not intended to be formalized, the objectives of DLG –E were to enable transportation process modeling. Following DLG-E and its implementation, the USGS Spatial Data Transfer Standard (1992), Standards for the Digital Line Graph Quadrangle Maps (1996), and the Best Practices Data Model (2006) specify feature lists for structuring the ontology. Research in 2007-08 explores the theoretical context of geospatial ontology for relevance to further development of proposed ontological structures for *The National Map*, whose objectives include the integration of geospatial data collected at several geographical scales by various agencies into a unified, Internet-based, distributed network. Using transportation data as a case study theme, a structure is being developed to meet these objectives.