

**A TOPOGRAPHIC GRAMMAR FOR ANTARCTICA: FEATURES, SEMANTICS AND ONTOLOGY**

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Advances in knowledge representation (e.g. formal ontologies) present the possibility of more effective and possibly automated or semi-automated information and knowledge integration. The paper presents the results of a workshop which examined the implementation potential for emerging forms of computer-based geographic information and knowledge representation. The research was carried out under the Antarctic Spatial Data Infrastructure and SCAR Spatial Data Model project (cf. Brolsma & Ryan, 2002).

Following current developments in research and practice a multi-stage semantic modelling methodology was adopted including: incorporation of an existing feature catalogue used to define topographic terminology; establishment of a taxonomic model representing hierarchical relationships observed in sample topographic databases; development of an axiomatic set of 'rules' which explicitly models data usage within an application context. In a geographic information environment, rule development involves modelling features - an abstraction of a real world phenomenon associated with a location relative to the Earth - and feature relationships.

The results of this preliminary workshop on geographic information semantics include: an explicit framework model representing the linguistic and "conceptual" underpinnings of a set of geographic conceptualizations; visualizations of the resulting model; formal representation of the model for use with Internet based geographic information services.

The process and results of the study suggest that ontological analysis of geographic information can provide an improved understand of geographic information in the Antarctic domain. Ongoing work based on these results aims to develop implementation specifications that can facilitate exchange of information within and between information communities (i.e. scientific disciplines, policy, general public). The paper concludes with a discussion of remaining challenges and future work.