

SEMANTIC GENERALIZATION OF GEOLOGIC MAPS FOR ENVIRONMENTAL STUDIES

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Geologic maps provide a wealth of spatial and descriptive information for environmental studies. Organization of this information in an appropriate data model in a GIS provides a mechanism to automate semantic generalization. A common class of environmental questions has to do with the bioavailability of elements such as aluminum, calcium, iron, magnesium, and potassium, which are also primary elements in the classification of rocks. Consequently, qualitative bioavailability of these elements can be mapped from geologic maps by reclassification or semantic generalization of lithologic information. A standard for digital geologic maps has been proposed for North America (<http://geology.usgs.gov/dm/>). This standard defines a data model for the storage of geologic-map descriptive information in a GIS. An implementation of this data model in Access connected to Arcview with lithologic reclassification tables provides a simple mechanism to automate semantic generalization for bioavailable macronutrients. Using this approach for the Lake Tahoe Basin demonstrates the semantic generalization of geologic maps to map macronutrients important to natural lake clarity and forest health.