

## “A Data Model for Named Features of the Natural Landscape”

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There is a certain class of features on maps that are difficult to generate from traditional GIS database – named features of the natural landscape. Physical features, such as mountain ranges, canyons, ridges and valleys, and named water bodies, such as capes, bays and coves, are often not found in GIS databases. This results in their omission of maps or at best their addition to the map as mere graphic text that is often not georeferenced to the data used to make the map. In this presentation, we demonstrate a GIS data model for physiographic features and by extension named water bodies. We discuss the semantic model (what features to include), the representation (how to define the geometry of the features and their attributes), the symbology (the labeling specifications and how they are driven by the software used), the rules for data capture (how to identify the features on source documents and digitize them into the GIS as well as the QC/QA process), and the process model (how to use the software to place the labels relative to other symbolized features on the map).

There are a number of interesting issues relating to such a named features data model. First, it is inherently multi-scale and may be used to create many different maps. This requires that non-point features be captured as polygons and the text be placed dynamically within the extent of the polygon at the scale mapped. There is also an interesting question of the mereological relationships between features – that is, the relationships of parts to the whole. What features are included in a mountain range, and when does a gulf stop being a gulf and become an ocean? Additionally, there is the more pragmatic question of how to capture these features for inclusion in the GIS database. Is it sufficient to digitize the apparent extent from existing maps, can local knowledge be used to define more precisely the extent, or can computation methods be used to generate features such as hills, valleys, canyons and ridges using DEMs and other digital source data?

We review the issues above in the hope that our work will allow others to use GIS for making maps that include these features. Without the addition of these names, the resulting maps are the poor cousins of the information-rich and cartographically-embellished maps of the past.

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