A Framework for Scaleless Feature-based Topographic Map Database

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Abstract：Topographic maps are the essential data for a variety of applications in spatial area. They offer GIS systems a rich visual illustration. Due to different requirements of end user, traditional topographic maps were produced with multiple scales. On the other hand, the concept of “feature” made possible by recent developments of technologies. Then, a spatial object of a map (with a particular scale and time) can be recorded as a spatial representation of a particular feature. A feature-based topographic database can provide the essential “spatial description” component for a particular feature. However, a spatial phenomenon may be represented differently in maps of diverse scales. A feature-based topographic database must be able to provide an appropriate spatial representation, which is a spatial representation of the existing multiple scales of topographic maps. This paper analyzes of the existing multi-scale representation of a particular feature in a topographic map. Then, propose a framework for the feature-based topographic database, which can effectively maintain necessary links among all of its related spatial representation. The linking among related spatial representations of the same feature is implemented by developed standardized identifier. An identifier provides the ability to identify a feature via spatial or non-spatial properties of a feature. Based on developed standardized identifier, all spatial representations in different time of a feature can be linked, and can be queried by proposed method. We propose the critical parts of a feature-based topographic map database, including the design of the identifier and how spatial presentations of a feature are linked. Then, we use a case to illustrate the how to establish a scaleless topographic map database by proposed framework.

Keyword: Feature, Topographic Maps, Scaleless.