

A DATA MODEL FOR SPATIAL DATA PROCESSING

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ABSTRACT

In the past, a wide variety of methods have been developed to represent spatial data digitally. Some of these methods can be categorized as access-oriented implementations of a specific data model. The spatial data of concern are limited to those either defining a surface or occurring upon a surface at a given point in time. All objects in the data model, including surfaces, may be called features. Data describing or defining features are classified as one of three types: (1) locational, (2) attribute, or (3) topological. These three descriptive data types in turn define various access paths for specific implementations (sometimes called data structures) of the model. Various existing data structures used to represent spatial data are analyzed with respect to access orientation and specific methods of representing the three descriptive data types. The completeness of the model is illustrated by outlining methods for generating all of the three access orientations from known structures. Finally, a single implementation is presented for accommodating all access orientations of the model. It is hoped this implementation will serve as a basis for a planned U.S. Geological Survey-designed integrated spatial data processor.

Publication authorized by the Director, U.S. Geological Survey, on January 2, 1985.