

A New Marine Data Model

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Abstract: The ArcGIS Marine Data Model represents a new approach to spatial modeling via improved integration of many important features of the ocean realm, both natural and manmade. The goal is to provide more accurate representations of location and spatial extent, along with a means for conducting more complex spatial analyses of marine and coastal data by capturing the behavior of real-world objects in a geodatabase. The model also considers how marine and coastal data might be more effectively integrated in 3-D space and time. Although currently limited to 2.5-D, the model includes "placeholders" meant to represent the fluidity of ocean data and processes.

For users, an ArcGIS data model provides a basic template for implementing GIS projects (i.e., inputting, formatting, geoprocessing, and sharing data, creating maps, performing analyses, etc.); for developers, it provides a basic framework for writing program code and maintaining applications. A key advantage of the data model is that it should help users to take fuller advantage of the most advanced manipulation and analysis capabilities of ArcGIS, particularly its support of more complex rules that can be built into its geodatabases, and of objects with not only attributes, but behavior. ArcGIS data models also support existing data standards, so as to help simplify the integration of data at various jurisdictional levels (i.e., local, state/provincial, national, global).

Specific goals of the model include:

Production of a common structure, a "geodatabase template", for assembling, managing, and publishing marine data in ArcGIS.

For example:

Because UML code is easily converted to an ArcGIS geodatabase, users can immediately begin populating the geodatabase rather than having to design it from scratch.

Users can produce, share, and exchange data in similar formats.

Unified approaches encourage development teams to extend and improve ArcGIS software extending the power of marine GIS analyses by providing a framework for incorporating behaviors in data, and dealing more effectively with scale dependencies

Providing a mechanism for the implementation of data content standards, such as the FGDC's Hydrography Data Content Standard for Inland and Coastal Waterways, critical for the Coastal National Spatial Data Infrastructure.