National Digital Geospatial Data Framework

Applications of digital geospatial data vary greatly, but users seem to have a recurring need for a few common themes of data. These themes include transportation, hydrography (rivers and lakes), geodetic control, digital imagery, government boundaries, elevation and bathymetry, and ownership or cadastral information. A lack of investment, common standards, and coordination have created many situations where these needs are not being met. As a result, important information is not available for many areas, and multiple organizations support duplicate data for other areas. A means to maintain and manage the common information being collected by the public and private sector does not exist. This results in increased costs and reduced efficiency for individual organizations, as well as for the Nation.

The concept of a framework to organize and enhance the activities of the geospatial data community to meet these needs is proposed. The concept was developed in a series of meetings in 1994, attended by representatives of county, regional, State, and Federal organizations under the auspices of the Federal Geographic Data Committee (FGDC).

The framework will provide a current base on which to collect, register, or integrate information accurately. To be successful, the framework data must be dependable, be of known quality, be created from the "best" data available, and be easy to access and use. Demands placed on data contributors must be minimized. The features encoded in the framework should include a minimum set of information needed to classify, name, and uniquely identify a feature.

Both data contributors and users will enjoy benefits from the framework. These benefits include reduced expenditures for data, increased ease of obtaining and using data collected by others, accelerated development of mission-critical applications, increased number of customers for data products linked to the framework, and improved recognition of programs.

The framework has technical, operational, and institutional contexts. The technical context considers the needs to provide data at different resolutions and time periods, to ease the burden of using the framework, and to maintain the integrity of data contributed to the framework. The following technical aspects are proposed for the framework: a feature-based data model; permanent, unique feature identification codes; reference to existing horizontal and vertical geodetic datums; methods to integrate data for geographic areas that are adjacent or overlap; and the provision of metadata. The proposed operational context requires the ability to process changes to framework data using transactions, access past version of framework data, and locate framework data using the National Geospatial Data Clearinghouse. Several of the

proposed techniques in the technical and operational contexts are not well understood, and may be demanding to implement. To make certain that framework data are used widely, an institutional context is advocated that minimizes financial, organizational, and technical barriers to accessing and using the framework.

Innovative institutional arrangements are needed to ensure a robust and well-maintained framework. Ideally, the framework data for a geographic area will be developed, maintained, and integrated by organizations that produce and make use of data for that area. In addition, there is a need to guarantee that the geographically-based units of framework data can be integrated to support applications for different or larger geographic areas. To accommodate these sometimes conflicting needs, six institutional responsibilities for framework development and maintenance are proposed:

- policy establishment — to provide overall guidance for the framework.
- theme expertise — to guide the development of the framework to meet new trends and needs in the user community.
- framework management — to provide continuing, operational support for the framework.
- area integration — to incorporate contributions of data into the framework for a geographic area.
- data production — to generate data used to build and maintain the framework.
- data distribution — to provide framework data to users.

These roles could be filled by many organizations from the geospatial data community.

The proposed framework sets ambitious goals for the development of creative institutional arrangements and technical capabilities needed for the full implementation of the framework. A phased implementation strategy is proposed to allow these to be developed, tested, implemented. and improved.

The first phase, named "Version 0," makes use of existing capabilities such as the National Geospatial Data Clearinghouse and the FGDC metadata standard to identify data and data producers that may contribute to the framework.

"Version 1," to be conducted from 1995 to 1998, calls for the establishment of initial institutional arrangements, development of basic specifications and procedures, pilot projects to test these arrangements and specifications, a "Framework '98" project to focus on the needs of the decennial census of 2000 for some themes of data, and investigation of advanced capabilities required to implement the full suite of framework capabilities. Representatives of numerous framework "pilot" examples from around the Nation are currently meeting and discussing challenges to making the framework concept a reality.

"Version 2," to be phased in starting in 1998, envisions the continued evolution of institutional arrangements, expansion of framework operations to include data collection and maintenance, and implementation of advanced capabilities developed in Version 1.

The framework concept proposes a means by which government agencies, the private sector, and others can work together to develop data needed for successful GIS implementation. This cooperation will yield benefits by increasing the availability of more current and accurate data, and by sharing costs with others. The FGDC invites interested organizations to join the next phase of implementing and testing the framework.

To obtain additional information, to provide comments about the framework, or to participate in framework development activities, please contact the FGDC at the address above.