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National Hydrographic Data Content Standard for Coastal and Inland Waterways

ABSTRACT

A project team of government agencies and private organizations has been working for approximately a year to develop a nationally focused hydrographic data content standard for coastal and inland waterways that supports safety to navigation. This standard is being developed using a combination of existing standards (IHO S-57, FACC, REEGIS, and TSSDS) to provide a consistent catalog of terms and definitions to ensure uniform interpretation of information across a variety of dataset and organizations. The new standard will support the exchange of spatial data between different GIS/CADD software packages and users. Specifically, this standard will facilitate semantic consistency when capturing hydrographic information in a spatial database and provide consistent data for applications that query, analyzes, and/or displays spatial data.

OBJECTIVE:

Geospatial hydrographic information for waterways, shorelines, coastlines, etc. that supports transportation applications has been specified as one of the key framework information layers for the National Spatial Data Infrastructure (NSDI.) The objective of this NSDI Hydrographic Data Content Standard for Coastal and Inland Waterways (hereafter called the Hydrographic Standard) project is to develop a nationally focused hydrographic data content standard for spatial data that supports safety to navigation. When complete, this standard will provide a consistent catalog of terms and definitions (semantics) to ensure uniform interpretation of information across a variety of organizations that develop and use hydrographic feature data and applications. This standard is based upon a well known logical data model for geospatial data of features, attributes, and domain values that is consistent with the Spatial Data Transfer Standard/Federal Information Processing Standard (SDTS/FIPS 173 part 2).

SCOPE:

The scope of this Hydrographic Standard project will first focus on developing a catalog of hydrographic feature terms and definitions pertaining to navigation of coastal and inland waterways. If the project team (and public) deems it desirable, this standard may also include an informative annex that contains additional information about presentation of

this information for charting and electronic chart display applications. This standard will not address data distribution formats, extraction criteria, or accuracy reporting methods.

JUSTIFICATION/BENEFITS:

There is currently no national data content standard for hydrographic data that support navigation applications; yet there has been interest from federal agencies, private industry, and the public for this type information. A data content standard that supports navigation applications will ensure effective use of geospatial data across different agencies, organizations, and other users.

METHODOLOGY:

This standard is being developed under the guidance and procedures specified by the Federal Geographic Data Committee (FGDC) under the leadership of the Bathymetric Subcommittee. The FGDC announced the initiation of this Hydrographic Standard project in Federal Register approximately a year ago and call for any interested party to participate on the project team to develop this standard. A team composed of experts from the National Oceanographic and Atmospheric Administration (NOAA) and National Imagery and Mapping Agency (NIMA), the U.S. Army Corps of Engineers and the U.S. Coast Guard, several pilot associations, and private industry representatives has been working together for the past year to develop this Hydrographic Standard. In addition to the expertise brought to this project team from the various organization represented, there are a handful of key documents being used to develop this standard. The project team is examining these documents that consist of adopted standards and systems that develop and use hydrographic feature data.

The first step after the formation of a Hydrographic Standard project team was to agree upon the scope of this Hydrographic Standard. The next step for the project team was to develop a cross-matrix of features extracted from the following standards documents:

International Hydrographic Organization's S57 Appendix A, Object Catalog for Digital Hydrographic Data,

North Atlantic Treaty Organization's (NATO) Digital Geographic Information Exchange Standard (DIGEST) Part 4, Feature Attribute Coding Catalog (FACC),

Tri-Service Spatial Data Standard (TSSDS version 1.8), and

U.S. Army Corps of Engineers (USACE) Regional Engineering and Environmental Geographic Information System (REEGIS) project's data dictionary for inland waterways information.

Next, the project team culled out some of the features that did not pertain to navigation from this comprehensive list of features extracted from these four standards. Then, the Hydrographic Standard project team examined the correlation between related feature terms and definitions extracted from these standards. From this effort, the team was able to derive a standard feature term and definition for each feature. As a byproduct of this activity, a matrix was developed, which provides a mapping to related terms contained in each standards document. This matrix will be included in an appendix to this document.

The project team is also extracting all the attributes derived from the standards documents listed above. The project team will then cull this list of attributes down to a subset of core attributes to include in this standard. The project team will then create a domain range or list for all attributes included in the standard. Finally, a draft Hydrographic Standard document will be generated, which will include the features, attributes, and domain terms and definitions lists, and additional descriptive documentation as specified by the FGDC's directives on creating an NSDI standard.

STATUS:

As of the date of this paper, the project team has just started to develop the list of attributes to include in this standard. The Hydrographic Standard project team optimistically anticipates having a draft of this document available for public review by the summer of 1999.

TARGET AUTHORIZATION BODY:

The Bathymetric Subcommittee originally proposed and is pursuing the development of this Hydrographic Standard as an FGDC standard. The Bathymetric Subcommittee and the Standards Working Group of the FGDC may pursue a joint FGDC and American National Standards Institute (ANSI) adoption of this standard. This would require the development of an ANSI standard proposal and potentially a joint ANSI and FGDC public review of this standard. The Bathymetric Subcommittee may also consider pursuing (at a later date) the promoting of parts of this standard (e.g., inland waterways information) that are not currently part of the S57 standard to International Hydrographic Organization for inclusion in their standard.

CONCLUSION:

This Hydrographic Data Content Standard for Coastal and Inland Waterways will facilitate semantic consistency when capturing geospatial hydrographic information in a GIS or CADD database. This standard will support the exchange of spatial data between different

GIS/CADD software packages. The standard will also facilitate effective exchange of geospatial data across multiple agencies, organizations and other users.

This standard will provide for consistency of semantics contained in spatial hydrographic data that enable the development of consistent military and commercial navigation applications for that query, analyze this information and interpreted this information for display of electronic charts. Cost savings associated with reducing the translating geospatial hydrographic information and building navigation applications should also be realized.