Federal Geographic Data Committee

Geographic Information Framework Data Content Standard

Part 7e: Transportation – Inland Waterways

May 2008

Federal Geographic Data Committee

Established by Office of Management and Budget Circular A-16, the Federal Geographic Data Committee (FGDC) promotes the coordinated development, use, sharing, and dissemination of geographic data.

The FGDC is composed of representatives from the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Homeland Security, Housing and Urban Development, the Interior, Justice, Labor, State, and Transportation, the Treasury, and Veteran Affairs; the Environmental Protection Agency; the Federal Communications Commission; the General Services Administration; the Library of Congress; the National Aeronautics and Space Administration; the National Archives and Records Administration; the National Science Foundation; the Nuclear Regulatory Commission; the Office of Personnel Management; the Small Business Administration; the Smithsonian Institution; the Social Security Administration; the Tennessee Valley Authority; and the U.S. Agency for International Development. Additional Federal agencies participate on FGDC subcommittees and working groups. The Department of the Interior chairs the committee.

FGDC subcommittees work on issues related to data categories coordinated under the circular. Subcommittees establish and implement standards for data content, quality, and transfer; encourage the exchange of information and the transfer of data; and organize the collection of geographic data to reduce duplication of effort. Working groups are established for issues that transcend data categories.

For more information about the committee, or to be added to the committee's newsletter mailing list, please contact:

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Geographic Information Framework Data Content Standard
Part 7e: Transportation – Inland Waterways

FGDC-STD-014.7e-2008

Contents

Foreword

Geographic information, also known as geospatial information, both underlies and is the subject of much of the political, economic, environmental, and security activities of the United States. In recognition of this, the United States Office of Management and Budget issued Circular A-16 (revised 2002), which established the Federal Geographic Data Committee (FGDC) as a coordinating organization.

Work on this standard started under the Geospatial One-Stop e-Government initiative. The standard was developed with the support of the member agencies and organizations of the FGDC and aids in fulfilling a primary objective of the National Spatial Data Infrastructure (NSDI), that is, creation of common geographic base data for seven critical data themes. The seven core data themes are considered framework data of critical importance to the spatial data infrastructure.

As the Geographic Information Framework Data Content Standard was developed using public funds, the U.S. Government will be free to publish and distribute its contents to the public, as provided through the Freedom of Information Act (FOIA), Part 5 United States Code, Section 552, as amended by Public Law No. 104-231, "Electronic Freedom of Information Act Amendments of 1996".

Introduction

The primary purpose of this part of the Geographic Information Framework Data Content Standard is to support the exchange of navigable river (inland waterway) transportation data. This part seeks to establish a common baseline for the semantic content of inland waterway transportation databases for public agencies and private enterprises. It also seeks to decrease the costs and simplify the exchange of inland waterway transportation data among local, Tribal, State, and Federal users and producers. That, in turn, discourages duplicative data collection. Benefits of adopting this part of the standard also include the long-term improvement of the geospatial inland waterway transportation data within the community, the improved integration of safety, emergency response, and enforcement data, and streamlined maintenance procedures.

This effort is derivative of an ongoing program within the U.S. Army Corps of Engineers (USACE), called the Inland Electronic Navigation Charts (IENCs). The IENCs are posted on the Internet for direct download for use as navigational charts for several of the major rivers within the United States.

Part 7e: Inland Waterways is one of five parts within the Transportation theme of the Geographic Information Framework Data Content Standard. Together, these five parts provide a multi-modal view of transportation, including road infrastructure, rail systems, air transportation, and conveyances or public transit. The Inland Waterways part is unique, in that the USACE maintains 8,200 miles of rivers in 22 States. As a part of the Geographic Information Framework Data Content Standard, the Inland Waterways part can enable a capability to construct a detailed multi-modal description of a transportation system.

1 Scope

The Geographic Information Framework Data Content Standard, Part 7e: Inland Waterways provides common definitions and syntax to enable the use and exchange of geospatial data content as compiled for the IENC. The part describes authoritative data content derived from the IENC. It is expected that in conjunction with the other parts of the Transportation theme, this data will support the construction of a complex multi-modal model from disparate data collections and from a variety of different government entities.

2 Conformance

Each thematic part of the Framework Data Content Standard includes a data dictionary based on the conceptual schema presented in that part. To conform to the Base Document (Part 0), a thematic dataset shall satisfy the requirements of the data dictionary for that theme. It shall include a value for each mandatory element, and a value for each conditional element for which the condition is true. It may contain values for any optional element. The data type of each value shall be that specified for the element in the data dictionary and the value shall lie within the domain specified for the element.

3 Normative references

Annex A of the Base Document (Part 0) lists normative references applicable to two or more parts of the standard, including those other than the transportation parts. No additional normative references are specified in the Transportation Base (Part 7). Informative references applicable to the Inland Waterways part only are listed in Annex A. Informative references applicable to two or more transportation parts only are listed in Annex C of the Transportation Base. Annex D of the Base Document lists informative references applicable to two or more of the parts, including those other than the transportation parts.

4 Maintenance authority

4.1   Level of responsibility

The FGDC is the responsible organization for coordinating work on all parts of the Geographic Information Framework Data Content Standard. The United States Department of Transportation (USDOT), working with the FGDC, is the responsible organization for coordinating work on the Geographic Information Framework Data Content Standard, Part 7: Transportation Base and subparts (Parts 7a, 7b, 7c, and 7d, excluding 7e) and is directly responsible for development and maintenance of the transportation parts (excluding Part 7e) of the Framework Data Content Standard. The development and maintenance authority for Part 7e: Inland Waterways is the U.S. Army Corps of Engineers.

4.2   Contact information

Address questions concerning this part of the standard to:

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590 National Center
Reston, Virginia 20192 USA

Telephone: (703) 648-5514
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Internet (electronic mail): gdc@fgdc.gov
WWW Home Page: http://fgdc.gov

5 Terms and definitions

Definitions applicable to the Inland Waterways part are listed here. These definitions derive from the IENC encoding guide [USACE].   Other terms and definitions applicable to multiple transportation parts of the standard are listed in the Transportation Base (Part 7). More general terms and definitions can be found in the Base Document (Part 0) part of the standard. Users are advised to consult these documents for a complete set of definitions.

5.1
depth contour

contour of equal water depth, which is sometimes significantly displaced outside of soundings, symbols, and other chart detail for clarity as well as generalization

NOTE   Depth contours, therefore, often represent an approximate location of the line of equal depth as related to the surveyed line delineated on the source.

5.2
mile marker

distance mark not physically installed, denoting a system of reference for position along a waterway

5.3
sailing line

generally accepted course or route on inland waterways used for navigation by commercial vessels

NOTE   The line is not always in the center of the river or waterway.

6 Symbols, abbreviated terms, and notations

The following symbols, abbreviations, and notations are applicable to the Inland Waterways part. Those common to two or more transportation parts are listed in the Transportation Base (Part 7). Symbols, abbreviations, and notations applicable to multiple parts, including the transportation parts, are listed in the Base Document (Part (0).

IENC – Inland Electronic Navigation Chart

USACE – U.S. Army Corps of Engineers

7 Inland waterways model

7.1   Conceptual model for inland waterways

Subsections are presented below for this UML model. The following information includes a narrative for context and understanding, and a table to define the contents.
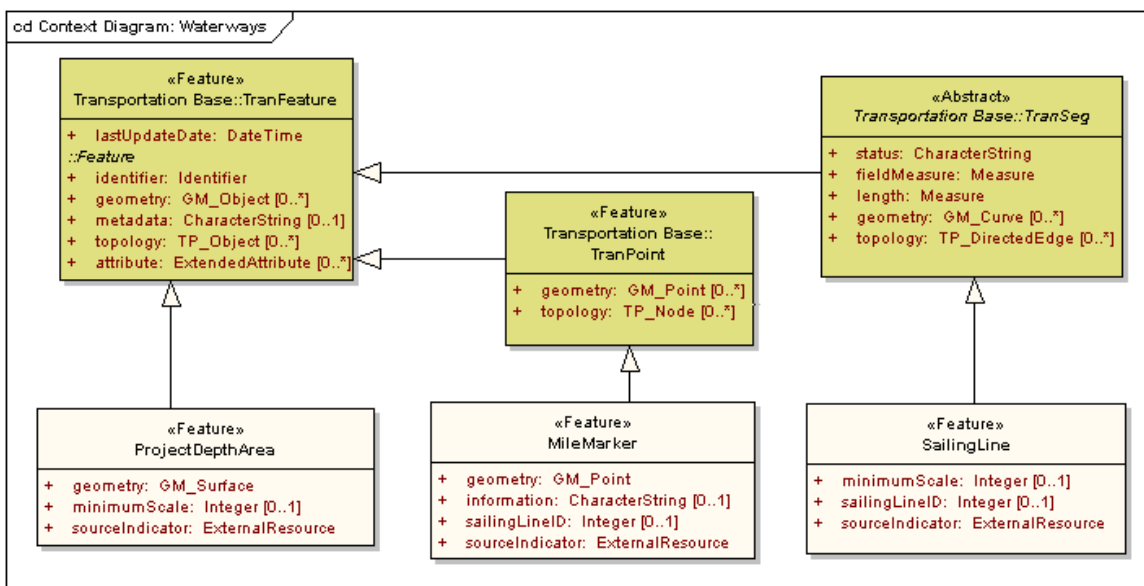
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Figure 1 – Primary UML classes for inland waterways

7.1.1 TranFeature

TranFeature is a superclass as referenced by the inland waterways model. See the Transportation Base part of the standard for a full description of TranFeature. TranFeature generalizes all of the feature subclasses in the inland waterways model.

7.1.2 ProjectDepthArea

ProjectDepthArea is a subclass of TranFeature. ProjectDepthArea has polygon geometry that represents the area within the waterway bounded by a depth contour that denotes the designated navigation area with a minimum depth of 9 feet.

7.1.3 MileMarker

MileMarker is a subclass of TranPoint. MileMarker has point geometry that describes the position of a mile marker in or near the waterway to serve as a reference for distance along the waterway.

7.1.4 TranPoint

TranPoint is a subclass of TranFeature. See the Transportation Base part of the standard for a full description of TranPoint.

7.1.5 TranSeg

TranSeg is a subclass of TranFeature. See the Transportation Base part of the standard for a full description of TranSeg.

7.1.6 SailingLine

SailingLine is a subclass of TranSeg. SailingLine describes the sailing line, or recommended transit route, based on sufficient water depth and permitted passage along the waterway, between the 9-foot depth contours.

7.2 Inland waterways data dictionary

The data dictionary (see Table 1) describes the characteristics of the Inland Waterways part classes presented in the UML diagram in Figure 1. The data dictionary is structured in accordance with the Base Document (Part 0).

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Table 1 – Data dictionary for inland waterways

Line	Name/Role name	Definition	Obligation/ Condition	Maximum Occurrence	Data Type	Domain
1	ProjectDepthArea	Area within the waterway bounded by a depth contour of at least 9 feet			<<Feature>>	Lines 2-4
2	geometry	Area feature that denotes a water depth of at least 9 feet within the waterway	M	1	<<Type>> GM_Surface	Defined in ISO 19107
3	minimumScale	Denominator of a ratio that is the recommended minimum scale for viewing	O	1	Integer	> 0
4	sourceIndicator	Character string referencing the authoritative source of the data entity	M	1	<<DataType>> Framework:: ExternalResource	Unrestricted
5	MileMarker	Abstraction of the mile markers along the waterway			<<Feature>>	Lines 6-9
6	geometry	Unique point that represents the position of a waterway mile marker	M	1	<<Type>> GM_Point	Defined in ISO 19107
7	information	Additional information related to the mile marker	O	1	CharacterString	Unrestricted
8	sailingLineID	Unique integer that associates MileMarker with a particular SailingLine	O	1	Integer	> 0
9	sourceIndicator	Character string referencing the authoritative source of the data entity	M	1	<<DataType>> Framework:: ExternalResource	Unrestricted
10	SailingLine	Recommended transit route along the length of a waterway within the ProjectDepthArea			<<Feature>>	Lines 11-13
11	minimumScale	Recommended minimum scale for viewing	O	1	Integer	> 0

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Line	Name/Role name	Definition	Obligation/ Condition	Maximum Occurrence	Data Type	Domain
12	sailingLineID	Unique integer that identifies a particular SailingLine	O	1	Integer	> 0
13	sourceIndicator	Character string referencing the authoritative source of the data entity	M	1	<<DataType>> Framework:: ExternalResource	Unrestricted

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Annex A (informative): Bibliography

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Annex A
(informative)
Bibliography

The following documents contain provisions that are relevant to this part of the Framework Data Content Standard. Informative references applicable to two or more transportation parts only are listed in Annex C of the Transportation Base (Part 7). Annex D of the Base Document (Part 0) lists informative references applicable to two or more of the parts of the standard, including the transportation parts. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies.

ANSI and ISO standards may be purchased through the ANSI eStandards Store at
http://webstore.ansi.org/ansidocstore/default.asp, accessed October 2006.

USACE, April 2005, Inland electronic navigational chart, Chart no. 1 and encoding guide, (Version 3.0)