

# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Framework Data Content Standard – Transportation: Inland Waterways

### Course Information

The National Spatial Data Infrastructure (NSDI) Framework is a collaborative initiative to develop a set of commonly used geographic datasets that are compatible based upon spatial location and content. The Framework approach allows data collected for variety of reasons and agencies to work together seamlessly; which can ultimately reduce project costs and increase interagency cooperation. The Framework Data Content Base Standards Suite dictates the requirements for Framework data.

This course covers the fundamentals of the Framework Data Theme: Transportation: Inland Waterways as developed by the Framework Data Content Standard. It is designed for users who are both interested in an overview of the Framework Data Content Standard Transportation: Inland Waterways theme as well as designers and developers implementing Framework data, and associated tools specific to Transportation: Inland Waterways data.

### Prerequisites

- General Understanding of GIS, Geospatial Data and Metadata
- Familiarity with the Federal Geographic Data Committee (FGDC)
- Familiarity with the National Spatial Data Infrastructure (NSDI)
- Basic knowledge of Geographic Data Standards (specifically ISO 19100 series)
- Completion of Framework Data Content Base Standard Course

### Related Topics

#### NSDI Training Tracks:

An initiative to define areas, topics, and materials for training within the NSDI.

#### ISO 19100 Series:

Suite of standards developed for geographic data and datasets. The most notable is ISO 19135 which pertains to metadata.

#### ANSI Standards:

Similar work to ISO, but standards directly apply to data created within the United States.



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Learning Objectives

**Understand Transportation:  
Inland Waterways Data**

**Comprehend Basics of  
Transportation: Inland  
Waterways Framework  
Standard**

**Understand How to Implement  
the Standard**

## Course modules

- **Understanding Transportation: Inland Waterways Data**
- **Transportation: Inland Waterways (Part 7e) of the Framework Data Content Standard**
- **Implementing the Transportation: Inland Waterways Standard**
- **Course Review**

## Estimated Time

**Estimated time for the entire course is 100 minutes.**



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Module 1: Understanding Transportation: Inland Waterways Data

### Topics

Time Requirement

Estimated time for this module is 30 minutes

- **What is Transportation: Inland Waterways Data?**
- **Types of Transportation: Inland Waterways Data**
- **Transportation: Inland Waterways in Action Module Exercise**
- **Summary**

### First Topic

**What is Transportation: Inland Waterways Data?**



## What Are Transportation: Inland Waterways Data?

Transportation: Inland Waterways data are defined as spatial data, as well as related attributes and metadata, which can be used to depict navigable rivers. These rivers are the travel paths used by barges to ship cargo to destinations accessible by river.

The movement of cargo on inland and intracoastal waterways by barge. About 14% of the bulk movement of commerce in the United States moves by barge, amounting to over  $6 \times 10^8$  tons ( $5.4 \times 10^8$  metric tons) annually. Barges directly serve 87% of all major United States cities, accounting for 65% of all domestic waterborne traffic.

Barges move on the 25,543-mi (41,107-km) network of commercially navigable inland and intracoastal waterways. Generally, barges are either pushed or towed by towboats on the inland waters. Barges require standard operating depths of at least 9 ft (about 3 m). Certain sections of the inland waterways are deep enough to support ocean-going vessels, including the Hudson River to Albany, New York, the Lower Mississippi north to Baton Rouge, Louisiana, the Houston Ship Channel, the Delaware River, the James River, and portions of the Columbia-Snake River.

### **Inland Waterway Regulation:**

With the exception of the New York State Barge Canal, which is state-run, the inland waterways of the United States are maintained on a federal level by the Army Corps of Engineers. Since 1980, barge operators have paid a fuel tax that pays for a percentage of the construction, operation, and maintenance costs for inland waterway projects. Before this time, all projects were entirely federally funded with appropriations from Congress.

## Next Topic

**More about Inland Waterways**



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## More about Inland Waterways and their Usage

Three major types of barges are used on the inland and intracoastal waterways: the open hopper, the covered dry cargo, and the tank barge. The open hopper barge is used to transport cargo that does not need to be protected from the elements, such as coal, sand, and gravel. Cargoes that need protection, such as grain, are shipped on covered dry cargo barges. Tank barges carry liquid commodities, such as petroleum and chemicals.

Towboats with barge flotillas commonly operate on the inland waterways, where they are fully protected by land on either side. The barges are kept together by wire rigging and are lashed against the towing knees of the towboat which pushes them ahead. On open channels, such as the Atlantic and Gulf intracoastal waterways, tugboats are used, which pull barges on a hawser.

The image to the right shows a barge at work on the Tennessee River.



[http://www.perryvillemarina.net/images/marina/tennessee\\_river\\_barge.jpg](http://www.perryvillemarina.net/images/marina/tennessee_river_barge.jpg)

## Next Topic

**Types of Transportation: Inland Waterways Data**



## Types of Transportation: Inland Waterways Data

Transportation: Inland Waterways Data can be include 3 main types of data:

1. Depth Contours
2. Mile Markers
3. Sailing Lanes

Each of these will be explained further in the following slides.



[http://upload.wikimedia.org/wikipedia/commons/0/03/Chicago\\_River\\_towboat\\_and\\_barge\\_080405.jpg](http://upload.wikimedia.org/wikipedia/commons/0/03/Chicago_River_towboat_and_barge_080405.jpg)

**Next Topic**

**Types of Transportation: Inland Waterways Data**

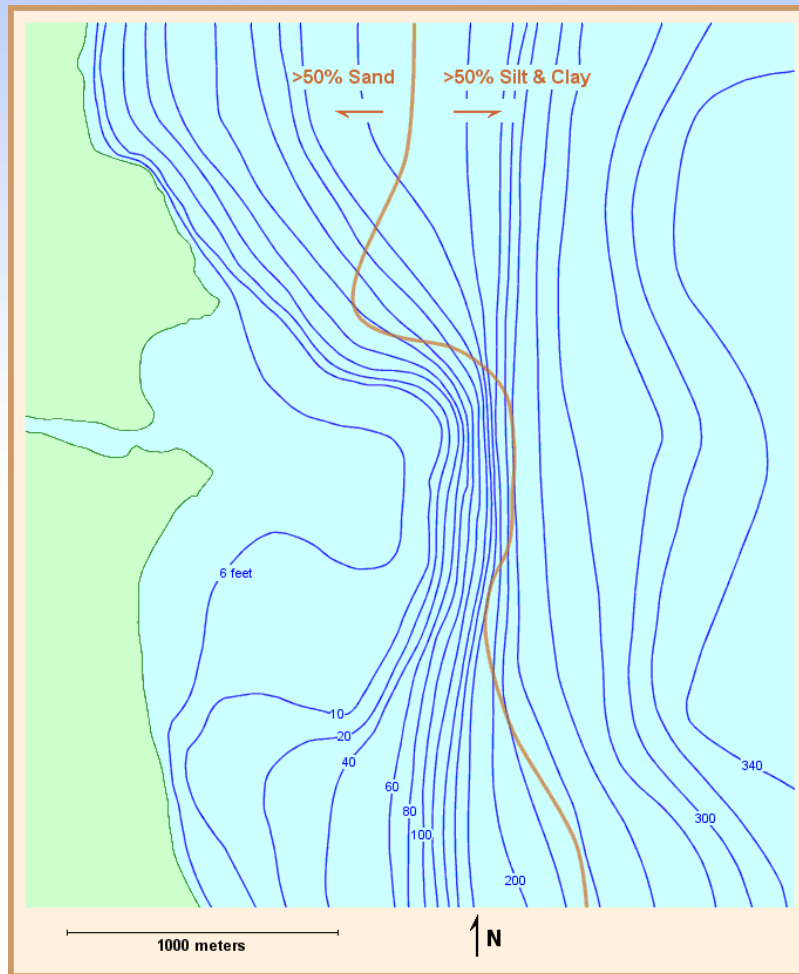


## Types of Transportation: Inland Waterways Data

**Depth Contours:** are lines of equal water depth, which is sometimes significantly displaced outside of soundings, symbols, and other chart detail for clarity as well as generalization

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

The image to the right shows contour lines along a section of the Boquet River.



## Next Topic

Types of Transportation: Inland Waterways Data

<http://www.denniskalma.com/bathymapsed.png>

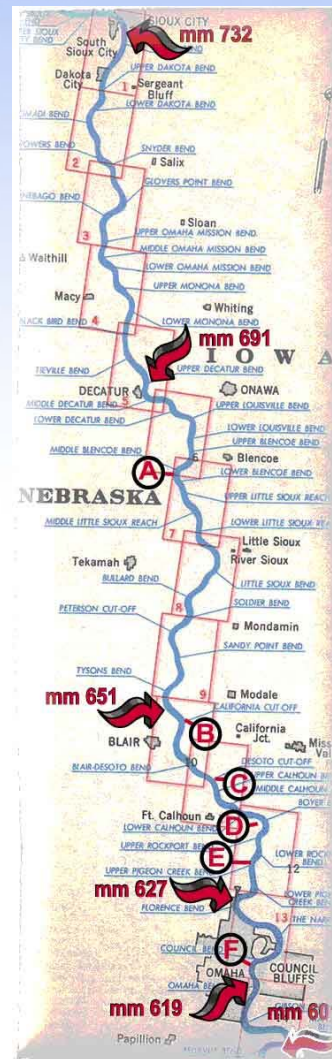


# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Types of Transportation: Inland Waterways Data

**Mile Markers:** are a distance mark not physically installed, denoting a system of reference for position along a waterway

The image to the right shows a section of river including specific mile markers long the Upper Missouri River.



Next Topic

Types of Transportation: Inland Waterways Data





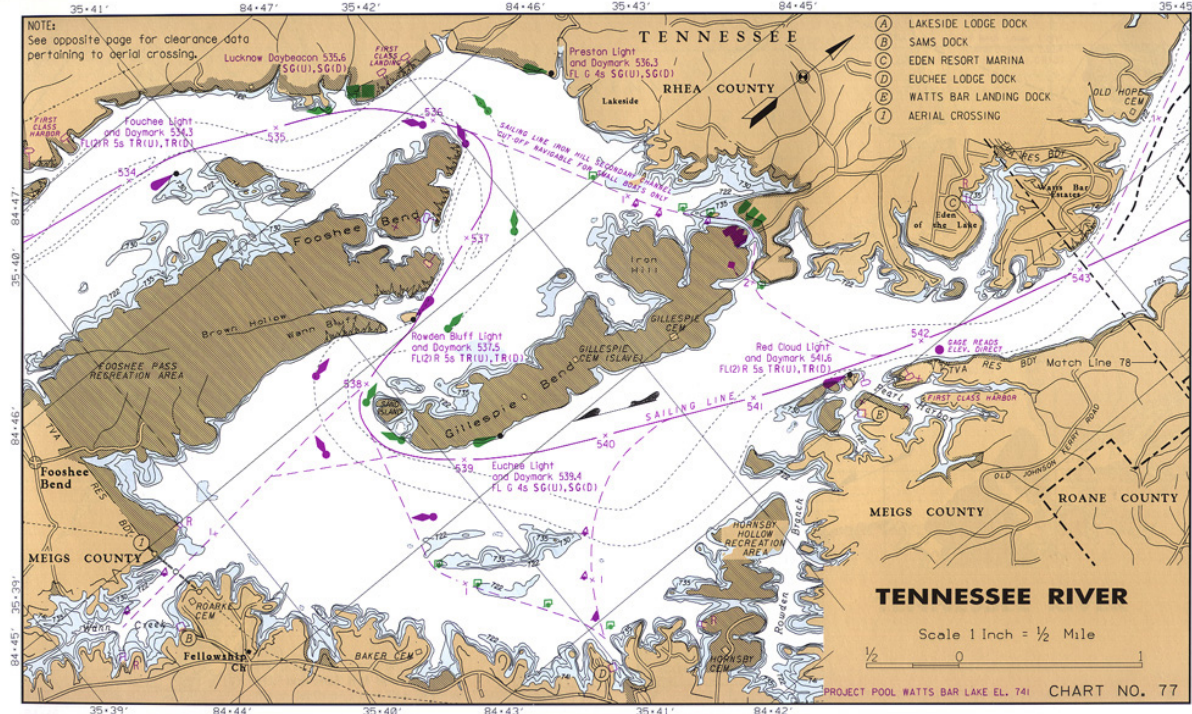
# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Types of Transportation: Inland Waterways Data

**Sailing Line** : a generally accepted course or route on inland waterways used for navigation by commercial vessels.

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

The image to the right shows a section of the Tennessee River including the sailing line in dark blue. Notice how the line doesn't follow the centerline of the river in all locations.



<http://www.lrn.usace.army.mil/opn/TNRiver/charts/77.jpg>

## Next Topic

Transportation: Inland Waterways Exercise



## Transportation: Inland Waterways Module 1 Exercise

Transportation: Inland Waterways data is being applied and used in real world projects for a variety of different projects and application. In this exercise we will explore a simple application that highlights Inland Waterway Navigation.

**Step 1) Open an Internet Browser and proceed to:**

[http://www.portofportland.com/nvgt\\_home.aspx](http://www.portofportland.com/nvgt_home.aspx)

**Step 2) Explore the page**

**Step 3) After exploring that page proceed to:**

[http://www.portofportland.com/Marine\\_Terminals\\_Map.aspx](http://www.portofportland.com/Marine_Terminals_Map.aspx)

**Step 4) Explore the page**

**Step 5) Close all Internet windows and proceed with the course**

### Questions to Consider:

1. What is the goal of these applications?
2. Do the applications highlight any of the components of actual Inland Waterway spatial data?
3. Could you tell where the sailing line(s) are in the aerial imagery associated with the second application

Next Topic

Module Summary



## Transportation: Inland Waterways Module 1 Summary

In this module we have explored Transportation: Inland Waterways Data, the different types and why it is important.

- Transportation: Inland Waterways data are defined as spatial data, as well as related attributes and metadata, which can be used to depict navigable rivers. These rivers are the travel paths used by barges to ship cargo to destinations accessible by river.
- There are three specific components to Transportation: Inland Waterways data
  - **Depth Contours**
  - **Mile Markers**
  - **Sailing Lines**

### Next Topic

**Module 2: Transportation: Inland Waterways (Part 7e) of the Framework Data Content Standard**



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Module 2: The Framework Data Content Standard: Transportation: Inland Waterways

Time Requirement

Estimated time for this module is 30 minutes

### Topics

- **What is the Transportation: Inland Waterways Standard?**
- **Purpose for Standard**
- **Goals of the Standard**
- **Capacities of the Standard**
- **Standard Related Contact Information**
- **Module Exercise and Summary**

### Key Terms

Transportation: Inland Waterways Framework Standard  
Framework  
Conceptual model

### Next Topic

**What is the Transportation: Inland Waterways Standard?**



## What is the Transportation: Inland Waterways Standard

**The Transportation: Inland Waterways Framework Data Content Standard is:**

- **One of the seven themes defined by the FGDC as Framework data**
- **Establishes a baseline for Transportation: Inland Waterways data collection and distribution**
- **Builds on the Framework Data Content Base Standard and Framework Transportation: Inland Waterways Standard.**
  - *Only when a dataset meets the requirements set forth in its thematic standard part and the Framework Base Standard can it be considered Framework data.*

### Quick Facts

Each Framework standard part was developed and edited by thematic experts

Transportation: Inland Waterways is one of the seven themes of Framework data. Each has a separate standard, some including subparts.

All standards use the Framework Data Content Base Standard as the baseline for this data.

## Next Topic

**Purpose for the Standard**



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Purpose for the Transportation: Inland Waterways Standard

The primary purpose of the Geographic Information Framework Data Content Standard, Part 7e: Inland Waterways is to support the general use and exchange of geospatial information concerning the navigable rivers (inland waterways). 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.

### **More about the Standard:**

The Inland Waterways components 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.

Additional benefits of this part of the standard the establishment and availability of inland waterway data through Web data services.

## Next Topic

**Goals of the Standard**



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Goals for the Transportation: Inland Waterways Standard

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.

Further, 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. Thus the Inland Waterways part and components inherently conform with the Transportation Base and Framework Base Standard elements.

## Next Topic

**Capacities of the Standard**



## Capacities for the Transportation: Inland Waterways Standard

The development of this part of the Framework Data Content Standard, used in conjunction with the Transportation Base Data Content Standard will greatly assist in mitigating the following issues:

- Duplication of data and application development
- Complications exchanging Transportation: Inland Waterways data and information
- Difficulties in integrating data
- Poor framework/support for analytic activities
- Establishment and availability of Inland Waterway data web services

### More Information

The FGDC is the responsible organization for coordinating work on all parts of the Geographic Information Framework Data Content Standard including the Transportation: Inland Waterways Theme.

## Next Topic

Contact Information





# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Who to Contact for Questions about the Transportation: Inland Waterways Standard Part

Federal Geographic Data Committee Secretariat  
c/o U.S. Geological Survey  
590 National Center  
Reston, Virginia 20192 USA  
Telephone: (703) 648-5514  
Facsimile: (703) 648-5755  
Internet (electronic mail): [gdc@fgdc.gov](mailto:gdc@fgdc.gov)  
WWW Home Page: <http://www.fgdc.gov>

### Standard Coordination

The FGDC is the responsible organization for coordinating work on all parts of the Geographic Information Framework Data Content Standard. The development and maintenance authority for Part 7e: Transportation: Inland Waterways is held jointly by the U.S. Geological Survey and U.S. Environmental Protection Agency.

The FGDC shall be the sole organization responsible for direct coordination with the InterNational Committee for Information Technology Standards (INCITS) concerning any maintenance or any other requirements mandated by INCITS or ANSI.

Next Topic

Module 2 Exercise



## Transportation: Inland Waterways Module Exercise

1. **Open an Internet browser**
2. **Open the following Web Mapping Application:**  
<http://ims.usace.army.mil/applications/opj/r000/>
3. **Explore the map and all the tools along the top**
4. **How is GIS being used for this specific Transportation: Inland Waterways need?**
5. **Can you find all the different components of Inland Waterway spatial data?**
6. **Close web browser and continue on with the next part of the module**

## Next Topic

Module Summary



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Module summary

- The goal of the Transportation: Inland Waterways part of the Framework Data Content Standard is to provide common definitions and model to enable collaborative development, use, and exchange of Transportation: Inland Waterways data.
- Transportation: Inland Waterways establishes common data requirements for the exchange of National Spatial Data Infrastructure (NSDI) framework data for the Transportation: Inland Waterways theme
- The Transportation: Inland Waterways part is just one piece of the seven themes of Framework Data that collectively in unison with the Base Standard comprise the Framework Data Content Standards
- The Transportation: Inland Waterways part establishes and availability of Inland Waterway data web services

## Next Topic

**Module 3: Transportation: Inland Waterways Standard Requirements**



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Module 3: Transportation: Inland Waterways Requirements

Time Requirement

Estimated time for this module is 60 minutes

### Topics

- Framework Data Content Transportation: Inland Waterways Standard Requirements
- Encoding and Implementing the Standard
- Module Summary

Key Terms

UML  
Coding Elements  
Feature Relationships

### First Topic

Transportation: Inland Waterways Standard Requirements



## Framework Data Standard Transportation: Inland Waterways Requirements

In this module you will learn about the two main requirements for Framework Transportation: Inland Waterways data, as specified in the standard. Each requirement is addressed as a separate topic, however more attention may be given to certain requirements as they are the most crucial requirements for creating Framework quality Transportation: Inland Waterways data. The two main requirements are:

1. Inland Waterways Model
2. Data Dictionary

These materials assume a basic understanding of UML diagrams and flow charts, if you need more information about these topics please visit <http://www.uml.org>

### Next Topic

Transportation: Inland Waterways Requirements Continued

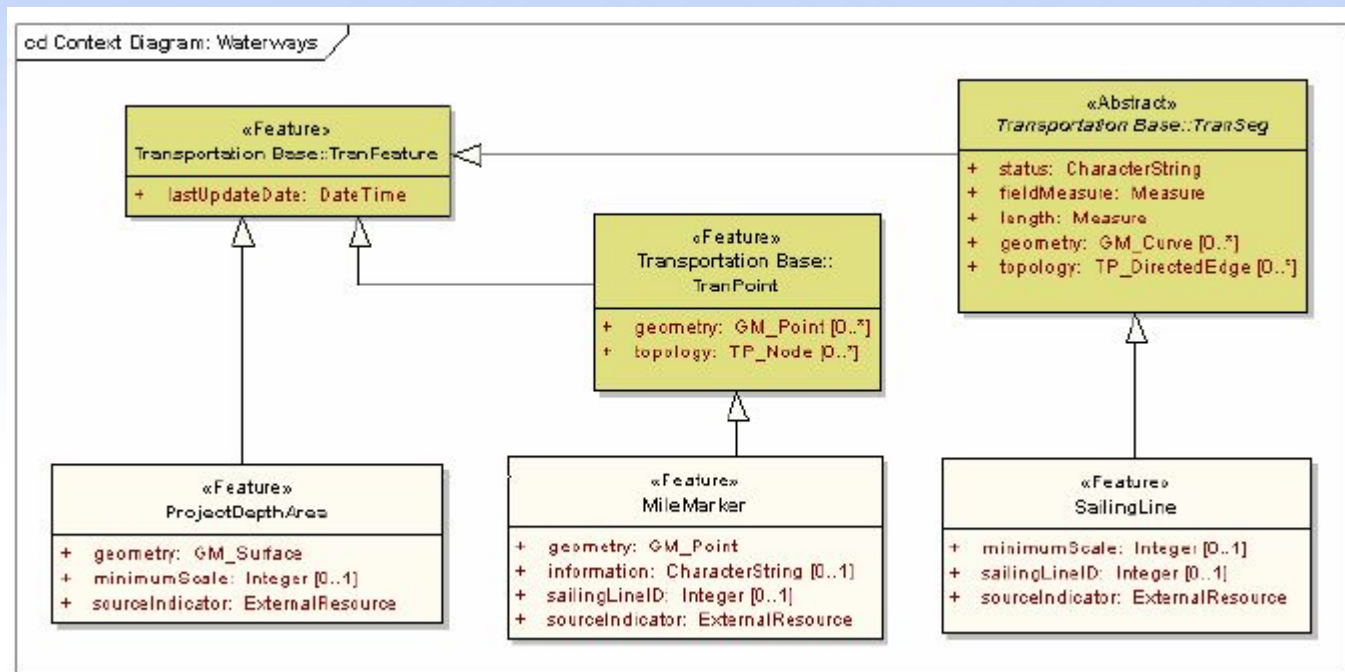


# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Framework Data Standard Transportation: Inland Waterways Requirements

The diagram to the right is the UML flow chart for the Framework Transportation: Inland Waterways Standard. This diagram shows the components and relationships that comprise the Framework Transportation: Inland Waterways Standard. UML is designed to show these relationships in a generic manner without specifying a coding language or specific software needed to complete the task. For more information about UML visit:

<http://www.uml.org>



## Next Topic

Transportation: Inland Waterways Requirements Continued



## Framework Data Standard Transportation: Inland Waterways Requirements: Model Components

**The following is a list of the main components to the Transportation: Inland Waterways Standard model element.**

**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.

**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.

**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.

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

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

**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.

### More Information

- Each of the elements described in this slide are an element item in the UML diagram and are the key components to implementing Framework quality data with regards to Inland Waterways.

## Next Topic

**Transportation: Inland Waterways Requirements Continued**



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Framework Data Standard Transportation: Inland Waterways Requirements: Data Dictionary

A data dictionary is a collection of definitions, rules and advisories of data, designed to be used as a guide or reference with the data warehouse. The directory includes definitions, examples, relations, functions and equivalents in other environments. Each Framework Data Content Standard Part has its own data dictionary that describes the necessary elements needed to define that theme as Framework. Below is the Transportation: Inland Waterways Data Dictionary.

| Line | Name/Role name   | Definition   | Obligation/Condition | Maximum Occurrence | Data Type                                       | Domain               |
|------|------------------|--|----------------------|--------------------|---|----------------------|
| 1    | ProjectDepthArea | An 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>><br>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  | A character string referencing the authoritative source of the data entity               | M                    | 1                  | <<DataType>><br>Framework::<br>ExternalResource | Unrestricted         |
| 5    | MileMarker       | The abstraction of the mile markers along the waterway                                   |                      |                    | <<Feature>>                                     | Lines 6-9            |
| 6    | geometry         | A unique point that represents the position of a waterway mile marker                    | M                    | 1                  | <<Type>><br>GM_Point                            | Defined in ISO 19107 |
| 7    | information      | Additional information related to the mile marker  | O                    | 1                  | CharacterString                                 | Unrestricted         |
| 8    | sailingLineID    | A unique integer that associates MileMarker with a particular SailingLine                | O                    | 1                  | Integer   | >0                   |
| 9    | sourceIndicator  | A character string referencing the authoritative source of the data entity               | M                    | 1                  | <<DataType>><br>Framework::<br>ExternalResource | Unrestricted         |
| 10   | SailingLine      | The 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                   |

## Next Topic

### Encoding and Implementation

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



## Encoding and Implementation

**The process of encoding is simply formatting or structuring data in a regulated manner. The Framework standards are encoded by applying the application schemas through the use of several different modeling and markup languages:**

- **Unified Modeling Language (UML)**
- **Extensible Markup Language (XML)**
- **Geographic Markup Language (GML)**

**Specific knowledge of each language is important for data and tool designers; for more information see the Framework Base Standard Training Materials.**

### The Bigger Picture

The Framework Standards do not have a specific application schema that can be implemented. Implementation of the Framework Standards in relation to data and tool creation occurs at the thematic level. Each thematic part complies with the Framework Base Standard. As such a layer (for example) created in accordance with the Framework Transportation: Inland Waterways part meets all Framework requirements.

## Next Topic

**Module Review**



## Module 3: Transportation: Inland Waterways Requirements Summary

- **Transportation: Inland Waterways Data is available in many different formats however the standard dictates the specific requirements to ensure it is Framework**
- **There are 5 separate model flows, and associated data dictionaries, and nearly 40 code lists associated with this standard.**
- **This module covers the specifications for Transportation: Inland Waterways framework data implementation**
  - **Inland Waterway Model**
    - **Element Definitions**
  - **Data Dictionary**
- **Provides rigid requirements to ensure proper structure and documentation for Transportation: Inland Waterways data**
- **UML diagrams and data dictionaries provide specifics for programmers and data creators to develop Transportation: Inland Waterways data that meets Framework specifications**

## Next Topic

**Module 4: Standard Implementation**



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Module 4: Examples, Exercise, and Certificate

### Topics

- **Transportation: Inland Waterways Implementation Example**
- **Transportation: Inland Waterways Review Exercise**
- **Certificate of Completion**

### First Topic

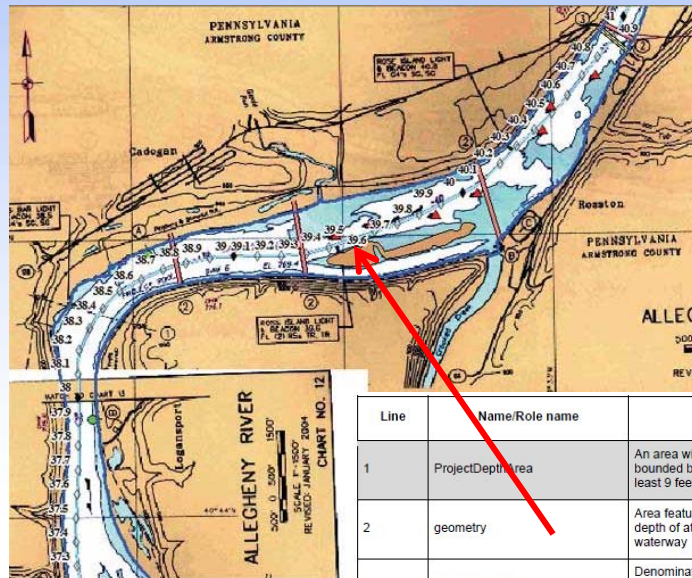
**Review Exercise**



# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Implementation Example

This example illustrates how Transportation: Inland Waterways data can be implemented and how that data applies directly to the data dictionary elements and how that information can be displayed in an attribute table.



| Line | Name/Role name   | Definition   | Obligation/Condition | Maximum Occurrence | Data Type                                       | Domain               |
|------|------------------|--|----------------------|--------------------|---|----------------------|
| 1    | ProjectDepthArea | An 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>><br>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  | A character string referencing the authoritative source of the data entity               | M                    | 1                  | <<DataType>><br>Framework::<br>ExternalResource | Unrestricted         |
| 5    | MileMarker       | The abstraction of the mile markers along the waterway                                   |                      |                    | <<Feature>>                                     | Lines 6-9            |
| 6    | geometry         | A unique point that represents the position of a waterway mile marker                    | M                    | 1                  | <<Type>><br>GM_Point                            | Defined in ISO 19107 |
| 7    | information      | Additional information related to the mile marker  | O                    | 1                  | CharacterString                                 | Unrestricted         |
| 8    | sailingLineID    | A unique integer that associates MileMarker with a particular SailingLine                | O                    | 1                  | Integer   | >0                   |
| 9    | sourceIndicator  | A character string referencing the authoritative source of the data entity               | M                    | 1                  | <<DataType>><br>Framework::<br>ExternalResource | Unrestricted         |
| 10   | SailingLine      | The 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                   |

## Next Topic

Transportation: Inland Waterways Final Exercise

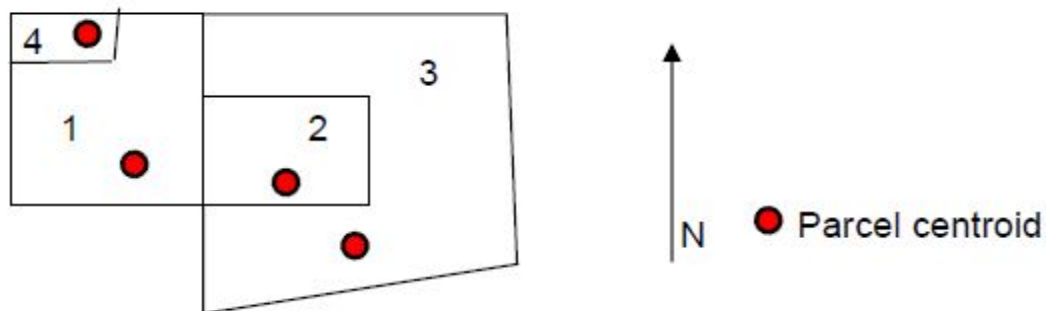


# NATIONAL SPATIAL DATA INFRASTRUCTURE FRAMEWORK DATA

## Implementation Example

Currently there is no known example for the Inland Waterways standard. This example is from the Cadastral standard and illustrates the general process for implementing framework data and how that data applies directly to the data dictionary elements and how that information can be displayed in an attribute table.

The diagram below shows four parcel polygons each with a centroid and a related table that contains attributes for those features.



**Figure B.1 – Four parcel polygons with centroids and ParcelIDs**

The table below contains attributes for the features in the figure above.

**Table B.1 – ParcelIDs related to a ParcelSource and OwnerType**

| ParcelID | ParcelSource | OwnerType       |
|----------|--------------|-----------------|
| 1        | 39-063       | TribalNation    |
| 2        | 39-063       | LocalGovernment |
| 3        | 39-063       | Private         |
| 4        | 39-063       | Private         |

## Next Topic

Transportation: Inland Waterways Final Exercise

## Transportation: Inland Waterways Final Exercise

1. Click on the following hyperlink:

[http://gis.sam.usace.army.mil/MapRoom/C002/Default.asp?theTitle=eCoastal Navigation Base Map](http://gis.sam.usace.army.mil/MapRoom/C002/Default.asp?theTitle=eCoastal%20Navigation%20Base%20Map)

2. Review the application. Zoom in and pan around.
3. After reviewing the site, you should have noticed that there isn't any specific navigation data.  
Can you determine the purpose of this map?  
Why data should be included to highlight Framework Inland Waterways Data?
4. Close your web browser and continue with the course.

## Next Topic

Course completion



## Course Certificate

Congratulations, you have successfully completed the Framework Transportation: Inland Waterways Standard Training! In order to print the certificate below you will need a copy of Adobe Acrobat Reader, <http://www.adobe.com/products/acrobat/readstep2.html>.

After you open the certificate file, type your name and today's date on the name/date line and print.

[Click here to receive course certificate](#)

