

national spatial data infrastructure training program

## NSDI Standards

# *Introduction to NSDI Standards*

An overview of the organizations and activities that drive the development of National Spatial Data Infrastructure standards



vers. 20070702



## After completing this lesson, the student can:

- ▶ Explain the difference between a *de jure* standard and a *de facto* standard
- ▶ Discuss the benefits of implementing standards
- ▶ Identify key organizations that affect the development of NSDI standards
- ▶ Explain functional relationships among standards organizations
- ▶ Refer to the federal policies that affect geospatial standards development
- ▶ Describe the scope of FGDC standards program of work
- ▶ Identify the communities to which FGDC standards shall or may apply
- ▶ Participate in voluntary consensus standards bodies
- ▶ Access standards and information about standards organizations



### Definition of 'Standard'

- ▶ [*de jure*] Standards are documented *agreements* containing technical specifications or other precise criteria to be used *consistently* as rules, guidelines, or definitions of characteristics to ensure that materials, products, processes, or services are fit for their purposes - from ISO (International Organization for Standardization)
- ▶ Contrast with *de facto* standards, which have achieved recognition **not** through consensus, but through market dominance

ISO is not an acronym! See **What ISO's name means**,  
<http://www.iso.org/iso/en/aboutiso/introduction/index.html#three>



## What are the benefits of standards?

### The use of standards

- ▶ facilitates the development, sharing, and use of geospatial data
- ▶ lowers technical barriers to trade and supports the missions of organizations including:
  - World Trade Organization (WTO)
  - North American Free Trade Agreement (NAFTA)



### WTO Technical Barriers to Trade (TBT) Agreement

- ▶ Requires that technical regulations “are not prepared, adopted or applied with a view to, or with the effect of, creating unnecessary obstacles to trade”
- ▶ Encourages members to use international standards for national regulations, unless “their use would be ineffective or inappropriate” to fulfill a given policy objective
- ▶ Encourages members to participate in the work of international bodies for the preparation of standards and guides or recommendations for conformity assessment procedures

Source: [http://www.wto.org/english/tratop\\_e/tbt\\_e/tbt\\_info\\_e.htm](http://www.wto.org/english/tratop_e/tbt_e/tbt_info_e.htm)



### NAFTA TBT Language

- ▶ Prohibits standards-related measures that create an unnecessary obstacle to trade between the U.S., Canada, and Mexico.
- ▶ Directs the U.S., Canada, and Mexico to use international standards, except where these standards are ineffective or inappropriate for fulfilling *legitimate* objectives, due to particular climatic, geographical, technological or infrastructural factors, and scientific justification.
- ▶ Permits the U.S., Canada, and Mexico to adopt, maintain, or apply measures that result in a higher level of protection than with an international standard.

Source:

<http://www.worldwideschool.org/library/books/hst/northamerican/Nafta/chap10.html>



### International Standards Organizations

- ▶ International Organisation for Standards (ISO)

ISO is a **network of national standards bodies** through which international voluntary consensus standards are developed. The national standards bodies may be either governmental or non-governmental organizations

- ISO Technical Committee 211

supports standardization of *geographic information*

- ▶ Open Geospatial Consortium (OGC)

**consortium of government, private, non-profit and academic organizations** dedicated to the development of publicly available interface specifications that '**geo-enable**' the Web, wireless and location-based services

For more information: <http://www.iso.org/iso/en/aboutiso/introduction/>



### US National Standards Organizations (non-federal)

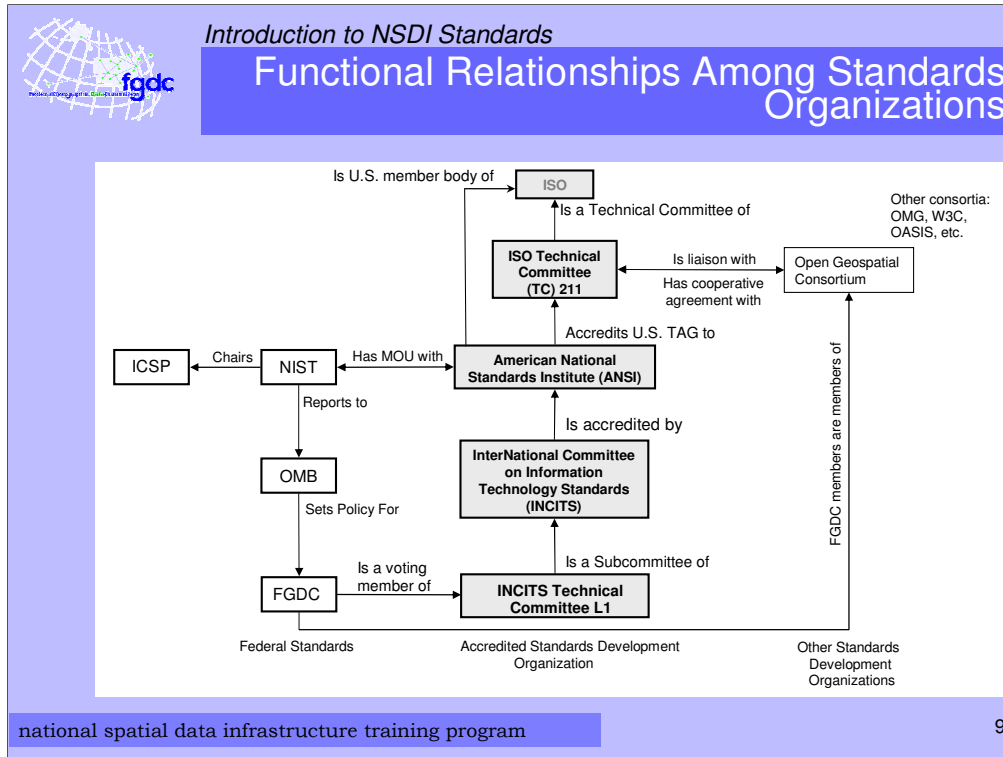
- ▶ American National Standards Institute (ANSI)  
U.S. standards body that oversees the creation, promulgation and use of norms and guidelines that impact nearly every sector
- ▶ InterNational Committee for Information Technology Standards (INCITS)  
a non-governmental organization sponsored by the Information Technology Industry Council (ITI) focused upon Information and Communications Technologies standards
  - INCITS Technical Committee L1  
adopts or adapts information technology standards and developing standards used in creating, defining, describing, and processing digital geographic data





### U.S. Federal Standards Organizations

- ▶ Federal Geographic Data Committee (FGDC)  
Federal interagency committee charged with the leadership, development, implementation, and review of spatial data standards
- ▶ National Institute for Standards and Technology (NIST)  
Non-regulatory federal agency that coordinates standards activities with responsible government agencies to use voluntary standards to the extent practicable, to participate appropriately in their development, and to ensure that they meet Federal agency needs



### Organizational relationships

**INCITS Technical Committee L1** is a subcommittee of the InterNational Committee on Information Technology Standards. INCITS. The work of INCITS L1 consists of adopting or adapting information technology standards and developing standards used in creating, defining, describing, and processing digital geographic data.

INCITS L1 serves as the U.S. technical advisory group (TAG) to ISO Technical Committee 211 (ISO TC 211), Geographic information/Geomatics.

INCITS L1 membership is the means by which an organization or individual can participate in ISO and ANSI standards activities.

**INCITS** is accredited by and operates under rules approved by the American National Standards Institute (ANSI) and is sponsored by the Information Technology Industry Council (ITI) a trade association

**ANSI**, American National Standards Institute, is the U.S. member body of **ISO**, the International Organization for Standardization.

**ISO Technical Committee 211** is one of many technical committees of ISO which supports standardization of geographic information.

The **Open Geospatial Consortium (OGC)** develops interface specifications that "geo-enable" the Web, wireless and location-based services. OGC has a cooperative agreement with ISO TC 211. Other standards organizations or individuals participate in OGC activities through OGC membership. Others consortia include (OMG, W3C, etc.)

**FGDC** is a voting member of INCITS L1. The **US Office of Management and Budget (OMB)** sets policy for the FGDC and other Federal entities. FGDC member agencies are also members of OGC.

Another Federal entity, the **National Institute for Standards and Technology (NIST)** has a memorandum of understanding with ANSI. NIST also chairs the **ICSP**, the Interagency Committee on Standards Policy. NIST submits a report on Federal compliance to OMB Circular A-119 to OMB.



### Functional relationships

- ▶ ISO TC 211 focuses on abstract specifications, design framework, and international political consensus
- ▶ The Open Geospatial Consortium specializes in extending the abstract model into implementation specifications
- ▶ FGDC and INCITS Technical Committee L1 support the development of thematic data content standards.
- ▶ Organizations such as the Internet Engineering Task Force (IETF) and World Wide Web Consortium (W3C) develop the Web infrastructure that support online geographic information applications



### OMB Circular A-119

- ▶ directs Federal agencies to:
  - use voluntary consensus standards in lieu of government-unique standards whenever possible
  - participate in voluntary consensus standards bodies
- ▶ defines a voluntary consensus standards body as abiding by the principles of:
  - openness
  - balance of interest
  - due process that gives fair consideration to all objections
  - consensus, that is, general agreement, but not necessarily *unanimity*

OMB Circular A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities, establishes policies on Federal use and development of voluntary consensus standards and on conformity assessment activities.

More information at: <http://www.fgdc.gov/policyandplanning>



## FGDC-related Federal Directives

### OMB Circular A-16 Revised (August 19, 2002)

directs Federal agencies to:

- ▶ use FGDC data standards, FGDC Content Standard for Digital Geospatial Metadata, and other appropriate standards
- ▶ develop and implement relevant FGDC standards for NSDI data themes

### EO 12906/13286

directs the FGDC to:

- ▶ develop standards for implementing the NSDI with non-Federal organizations, consistent with OMB Circular No. A-119 and other applicable law and policies

[OMB Circular A-16](#), Coordination of Geographic Information, and Related Spatial Data Activities, provides direction for federal agencies that produce, maintain or use spatial data either directly or indirectly in the fulfillment of their mission. This Circular establishes a coordinated approach to electronically develop the National Spatial Data Infrastructure and establishes the Federal Geographic Data Committee (FGDC).

[Executive Order 12906](#): COORDINATING GEOGRAPHIC DATA ACQUISITION AND ACCESS: THE NATIONAL SPATIAL DATA INFRASTRUCTURE, signed by President Bill Clinton on April 11, 1994, launched the initiative to create the NSDI. President George W. Bush amended EO 12906 by issuance of Executive Order 13286 on March 5, 2003.

More information at: <http://www.fgdc.gov/policyandplanning>



## FGDC Standards Program of Work

### Twenty-two endorsed standards including:

- ▶ Data Exchange and Integration
  - Geospatial Metadata
  - Positional Accuracy
  - Spatial Data Transfer
  - US National Grid
- ▶ Cartography and Classifications
  - Vegetation
  - Wetlands & Deep Water Habitats
  - Geological Symbolization
- ▶ Thematic Content
  - Cadastral
  - Soil
  - Utilities
  - Remote Sensing Swath
  - Orthoimagery

The FGDC Standards program of work is published at:

[http://www.fgdc.gov/standards/projects/FGDC-standards-projects/index\\_html](http://www.fgdc.gov/standards/projects/FGDC-standards-projects/index_html)



### Twenty-one standards in development including:

- ▶ Data Exchange and Integration
  - ISO 19115 Geospatial Metadata
- ▶ Cartography and Classifications
  - Biological   ▪ Vegetation (rev)   ▪ Riparian and Wetland
  - Geologic Model and Symbolization
- ▶ Thematic Content
  - Elevation   ▪ Trails   ▪ Hydrography
  - Earth cover   ▪ Shoreline   ▪ Gov't Boundary
  - Facilities   ▪ Street Address

The FGDC Standards program of work is published at:

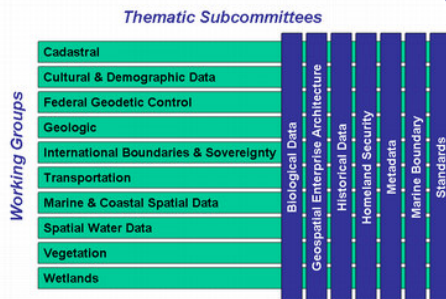
[http://www.fgdc.gov/standards/projects/FGDC-standards-projects/index\\_html](http://www.fgdc.gov/standards/projects/FGDC-standards-projects/index_html)



# Who participates in the development of FGDC Standards?

Standards are developed by:

► FGDC Thematic Subcommittees



Comprised of representatives from Federal agencies and FGDC recognized stakeholder groups who share a common interest in

- specific types of geospatial data or

- cross-cut or affect several data theme-based subcommittees

► FGDC Working Groups

Page includes a matrix diagram that shows the ten FGDC Thematic Subcommittees along the Y axis (Cadastral Cultural and Demographic Data, Federal Geodetic Control, Geologic, International Boundary and Sovereignty, Transportation, Marine and Coastal Spatial Data, Spatial Water Data, Vegetation, Wetlands) and the seven FGDC Working Groups (Biological Data, Geospatial Enterprise Architecture, Historical Data, Homeland Security, Metadata, Marine Boundary, Standards) traversing the Thematic Subcommittees along the X axis.





## Who participates in the development of FGDC Standards?

Standards are reviewed by:

- ▶ **FGDC Standards Working Group**  
Representatives from Federal agencies and FGDC recognized stakeholder groups with interest in the development of geospatial data standards
- ▶ **Public Review**  
A formal, multistage process in which the draft standard is made available for review by the public and comments are submitted using a standardized, formatted table



## Who uses FGDC standards?

### Federal Agencies

- ▶ OMB Circular A-16 states, “Federal agencies collecting or producing geospatial data, either directly or indirectly (e.g. through grants, partnerships, or contracts with other entities), *shall* ensure, prior to funds for such activities, that data will be collected in a manner that meets all relevant standards adopted through the FGDC process.”

Shall = mandatory



## Who uses FGDC standards?

### Non-federal Geospatial Data Developers

- ▶ Non-Federal agencies are encouraged, not required, to use FGDC standards to promote data sharing, except as noted above
- ▶ Many state, local, tribal and non-U.S government agencies have adopted and implemented FGDC standards



### Related Websites:

- ▶ WTO - Technical barriers to trade,  
[http://www.wto.org/english/tratop\\_e/tbt\\_e/tbt\\_info\\_e.htm](http://www.wto.org/english/tratop_e/tbt_e/tbt_info_e.htm)
- ▶ NAFTA Chapter Nine: Standards-Related Measures,  
<http://www.mac.doc.gov/nafta/chapter9.html>
- ▶ EO 12906/13286 and OMB Circulars A-16 and A-119  
<http://www.fgdc.gov/policyandplanning>
- ▶ FGDC Standards program of work  
<http://www.fgdc.gov/standards/projects/FGDC-standards-projects/index.html>

FGDC standards are free – no access or use constraints

The ANSI eStandards Store charges \$30 for each American National Standard

ISO standards are priced according to the size of the standard. If ANSI has approved the ISO standard as an American National Standard, the standard might be less expensive according to the ANSI flat rate.

OGC specifications are free, but require that you accept a licensing agreement before download.



### Related Websites:

- ▶ Voluntary standards organizations  
<http://www.fgdc.gov/standards/organization/external-standards-organizations>
- ▶ FGDC Standards publications  
[http://www.fgdc.gov/standards/standards\\_publications](http://www.fgdc.gov/standards/standards_publications)

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FGDC Standards:  
**FGDC Standards Process**