

# INCITS L1 Standards Program

## L1 - Geographic Information Systems (GIS)

INCITS/L1 was established in 1993; it is **accredited** by the American National Standards Institute (ANSI) to develop US National Standards for Geographic Information Systems (GIS). It also represents the US and serves as the US Technical Advisory Group for ISO/TC211. L1 has completed work on Seven ANSI standards. TC211 supports the work on some 40 ISO/TC211 projects; many of the standards generated by those projects will eventually be adopted as US National Standards through the ANSI/INCITS process.

Geographic Information Systems form a distinct class of information systems through their unique requirements for collecting, converting, storing, retrieving, processing, analyzing, creating, and displaying geographic data. The generic nature of GIS, organizing information by location, is interdisciplinary and not specific to any application.

The work of L1, Geographic Information Systems (GIS) consists of adopting or adapting information technology standards and developing digital geographic data standards. Digital geographic data standards are concerned with creating, defining, describing, and processing such data. This technical committee is the U.S. TAG to ISO/TC 211.

## INCITS L1 Activities

### 1. Adoption of ISO/TC 211 Standards (41) –

INCITS holds the U.S. TAG to ISO/TC 211, Geographic Information/Geomatics, with technical responsibilities assigned to L1, GIS.

The U.S. has/had the project leaderships for **fourteen** of the forty-one ISO/TC 211 work items. As many of these ISO/TC 211 work items become International Standards, L1, GIS will be making recommendations for adoption by the US.

Due to changes in the ISO/TC 211 programme of work a restructuring of ISO/TC 211, occurred at the Lisbon, Portugal Plenary in March 2001. The U.S. convenorship for the Framework and Reference Model WG1 and three other Working Groups were retired and four new Working Groups were established, these consisted of; Working Group 6 – Imagery, Working Group 7 – Information Communities, Working group 8 – Location Based Services, and Working Group 9 – Information Management.

### 2. North American Profile(s)-

Approach for cooperation between ANSI INCITS and CGSB-COG addressing the relationship between ANSI INCITS (International Committee on Information Technology and Standards) and the CGSB COG (Canadian General Standards Board – Committee on Geomatics) which is the equivalent national committee in Canada for the development of common geographic information standards bilaterally between Canada and the US. (Approved by INCITS Executive Board February 2003)

### 3. ANSI/INCITS Projects (8)

- Project 1107-L: Formal Liaison with X3H2, Database  
Close cooperation with X3H2, U.S. TAG to ISO/IEC JTC 1/SC32/WG4 on Part 3, Spatial of SQL Multimedia and Application Packages
- Project 987-D: Spatial Data Transfer  
ANSI INCITS 320:1998, Information Technology - Spatial Data Transfer Standard is the official designation.

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- Project 1411-D: Spatial Data Standard for Facilities, Infrastructure, and Environment (SDSFIE) INCITS 353:2001, Title standard Information Technology - Geographic information systems - Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE)
- Project: 90-M X3.38 – 1988 Identification of the States, the District of Columbia, and the Outlying Areas of the U.S. for Information Interchange [Revised 02/14/01]
- Project: 91-M X3.31 – 1988 Structure for Identification of the Counties and County Equivalents of the U.S. and its Outlying and Associated Areas for Information Interchange [recommended for revision]
- Project: 92-M X3.47-1988 [R2000] Structure for the Identification of Named Populated Places, Primary County Divisions and other Entities of the U.S. and Its Outlying Areas for Information Interchange
- Project: 93-M X3.61-1986 [R1997] Representation of Geographic Point Locations for Information Interchange
- Project: 510-M X3.145-1986 [R1997] Codes for Identification of Hydrologic Units in the U.S. and the Caribbean (Outlying) Areas
- Project 1149-3 INCITS TR-34 Geographic Feature Cataloguing Methodology, submitted 13 March 2003 for closure

#### 4. NIST FIPS Reduction Program (8) (FIPSPUBS that may be transferable to INCITS L1 for maintenance)

- 5-2: Codes for the Identification of the States, the District of Columbia and the Outlying Areas of the United States, and Associated Areas
- 6-4: Counties and Equivalent Entities of the United States, Its Possessions, and Associated Areas
- 8-6: Metropolitan Areas (including MSAs, CMSAs, PMSAs, and NECMAs)
- 9-1: Congressional Districts of the United States
- 10-4: Countries, Dependencies, Areas of Special Sovereignty, and Their Principal Administrative Divisions
- 55-DC3: Guideline: Codes for Named Populated Places, Primary County Divisions, DC3 and Other Locational Entities of the United States, Puerto Rico, and the Outlying Areas
- 55-3: Guideline: Codes for Named Populated Places, Primary County Divisions, and Other Locational Entities of the United States, Puerto Rico, and the Outlying Areas, 1994 December 28. Same as FIPSPUB 55-DC3; (documentation only)
- 173-1: Spatial Data Transfer Standard (SDTS) (NOTE: INCITS L1 already maintains INCITS 320:1998, which is a modification of FIPSPUB 173-1. NIST may be able to withdraw FIPSPUB 173-1 in favor of the ANSI version.)

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## 5. INCITS Maintenance Program –

- Maintenance Plan - for information systems-codes-Identification of hydrologic units (ANSI X3.145) (USGS Cir 878-A)
- Maintenance Plan - for information systems - codes - Structure for the identification of counties and county equivalents of the United States and its outlying and associated areas for Information interchange (ANSI X3.31) (FIPS 6)
- Maintenance Plan - for information systems - representation of the geographic point locations for information exchange (ANSI X3.61) (FIPS 70-10) (ISO 6709)
- Standard Spatial Data Standard for Facilities, Infrastructure, and Environment (SDSFIE), updates to NCITS 353
- Project 987-D: Spatial Data Transfer, ANSI INCITS 320:1998, Information Technology - Spatial Data Transfer, Standard is the official designation.

## 6. Standards Outreach INCITS Project: 1574-D–

The purpose of a Standards Outreach Program is to provide information about current standards and the standards development process to users of geographic information. One goal of an outreach program would be to involve as many GIS professionals in the development process as possible. Another goal would be to offer information about standards to those who will be required to use the standards.

## 7. ISO/TC 211 Working Groups/ Advisory Groups –

Working Group 4 Geospatial Services  
Working Group 6 Imagery  
Working Group 7 Information Communities  
Working Group 8 Location Base Services  
Working Group 9 Information Management  
Advisory Group on strategy  
Advisory Group on outreach  
Advisory Group on web server interface  
Terminology Maintenance Group  
Harmonized Model Maintenance Group  
ISO/TC 211/OGC co-ordination group (TOCG)  
ISO/TC 204/TC 211 task group  
ISO/TC 211 Liaisons Internal/External (see TC 211 Below)

## 8. Geospatial One-Stop –

Framework standards will comply with the ISO Geographic information series of standards being developed through ISO Technical Committee 211, Geographic Information/Geomatics, and ANSI standards, wherever applicable.

Additionally, other standardization activities have yielded feature catalogs, conceptual data models, and data content standards for Framework data themes. These activities include the Federal Geographic Data committee (FGDC), NATO's Digital Geographic Information Working Group (DGIWG), the International Hydrographic Organization (IHO), and U.S. Federal, State, local agencies, and other private and public sector organizations. These standards and data models will be considered as input into this project.

## 9. Liaison Activities -

- INCITS H2, Database
- INCITS H3 - Computer Graphics & Image Processing

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- INCITS L8, Metadata
- Standards Development Board (SDB) Liaison – Donald Deutsch
- INCITS TC Liaison – Ed Barrett

### **10. FGDC Standards (@40)**

The Federal Geographic Data Committee (FGDC) was established in 1990 to coordinate the production of geographic information among Federal agencies and to establish the National Spatial Data Infrastructure (NSDI). The FGDC began developing standards as a step towards accomplishing this goal. The FGDC has completed work on 19 standards, of which the most widely used is the Content Standard for Digital Geospatial Metadata, and has 18 standards in work. At the same time, Federal standardization policy has changed in favor of the use of non-government standards. As a result, the FGDC and several of its member agencies are actively involved in the work of INCITS/L1 (approximately 40 standards). The purpose of this activity is to evaluate those FGDC Standards, which lend themselves to elevation to either national or international Status.

### **11. ISO Metadata Extension(s) -**

The purpose of this Technical Amendment is to provide a means by which a dataset compliant with Version 2.0 of the FGDC Content Standard for Digital Geospatial Metadata (CSDGM) can be compliant with the *ANSI adopted version of 19115*.

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## International GIS Standards

The technical committee 211 (TC 211) of the International Organizations for Standardization (ISO) has been developing standardization in the field of digital geographic information, aiming to establish a structured set of standards for information concerning objects or phenomena that are directly or indirectly associated with a location relative to the Earth. These standards may specify, for geographic information, methods, tools and services for data management (including definition and description), acquiring, processing, analyzing, accessing, presenting and transferring such data in digital/ electronic form among different users, systems and locations, linking to appropriate standards for information technology and data where possible, and provide a framework for the development of sector-specific applications using geographic data.

ISO/TC 211 has been developing a series of GIS standards majority of which will be adopted as International Standards by the end 2003. The principal sources of geographic information standards in the United States are the Federal Geographic Data Committee (FGDC) and the Geographic Information Systems subcommittee of the InterNational Committee for Information Technology Standards (INCITS/L1).

### Internal Liaisons

- ISO/IEC JTC 1/SC 2 Coded character sets
- ISO/IEC JTC 1/SC 24 Computer graphics and image processing
- ISO/IEC JTC 1/SC 32 Data Management and Interchange
- ISO/IEC JTC 1/SC 35 User interfaces
- ISO/TC 20 /SC 13 Space data and information transfer systems
- ISO/TC 23/SC 19 Agricultural electronics
- ISO/TC 46/WG 2 - Coding of country names and related entities
- ISO/TC 82 Mining
- ISO/TC 130 Graphic Technology
- ISO/TC 184/SC 4 Industrial data and global manufacturing languages (WG3 CSL, Express, STEP)
- ISO/TC 204 Transport Information and Control Systems (WG3 GDF)

### External Liaisons

- CEOS, Committee on Earth Observation Satellites
- DGIWG, Digital Geographic Information Working Group
- EPSG, European Petroleum Survey Group
- FIG, International Federation of Surveyors
- GSDI, Global Spatial Data Infrastructure
- IAG, International Association of Geodesy
- ICA, International Cartographic Association
- ICAO, International Civil Aviation Organization
- IEEE Geoscience and Remote Sensing Society
- IHB, International Hydrographic Bureau
- ISCGM, International Steering Committee for Global Mapping
- ISPRS, International Society for Photogrammetry and Remote Sensing
- JRC, Joint Research Centre, European Commission
- OGC, Open GIS Consortium, Incorporated
- PCGIAP, The Permanent Committee on GIS Infrastructure for Asia and the Pacific
- UN Economic Commission for Europe, Statistical Division
- UNGIWG, United Nations Geographic Information Working Group
- WMO, World Meteorological Organization
- PC IDEA, Permanent Committee on Spatial Data Infrastructure for the Americas
- SCAR, Scientific Committee on Antarctic Research
- UNGEGN, United Nations Group of Experts on Geographical Names
- CEN/TC 287, Geographic information

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## ISO/TC 211 Geographic Information Program

- 19101 (15046-1): Geographic information - Reference model
- 19102 (15046-2): Geographic information - Overview (Project deleted, see resolution 192 - Adelaide)
- 19103 (15046-3): Geographic information - Conceptual schema language
- 19104 (15046-4): Geographic information - Terminology
- 19105 (15046-5): Geographic information - Conformance and testing
- 19106 (15046-6): Geographic information - Profiles
- 19107 (15046-7): Geographic information - Spatial schema
- 19108 (15046-8): Geographic information - Temporal schema
- 19109 (15046-9): Geographic information - Rules for application schema
- 19110 (15046-10): Geographic information - Feature cataloguing methodology
- 19111 (15046-11): Geographic information - Spatial referencing by coordinates
- 19112 (15046-12): Geographic information - Spatial referencing by geographic identifiers
- 19113 (15046-13): Geographic information - Quality principles
- 19114 (15046-14): Geographic information - Quality evaluation procedures
- 19115 (15046-15): Geographic information - Metadata
- 19116 (15046-16): Geographic information - Positioning services
- 19117 (15046-17): Geographic information - Portrayal
- 19118 (15046-18): Geographic information - : Encoding
- 19119 (15046-19): Geographic information - Services
- 19120 (15854): Geographic information - Functional standards
- 19120/Amedmend 1: Geographic information - Functional standards - Amendment 1
- 19121 (16569): Geographic information - Imagery and gridded data
- 19122 (16822): Geographic information/Geomatics - Qualifications and Certification of Personnel
- 19123 (17753): Geographic information - Schema for coverage geometry and functions
- 19124 (17754): Geographic information - Imagery and gridded data components
- 19125-1: Geographic information - Simple feature access - Part 1: Common architecture
- 19125-2: Geographic information - Simple feature access - Part 2: SQL option
- 19125-3: Geographic information - Simple feature access - Part 3:COM/OLE option
- 19126: Geographic information - Profile - FACC Data Dictionary
- 19127: Geographic information - Geodetic codes and parameters
- 19128: Geographic information - Web Map server interface
- 19129: Geographic information - Imagery, gridded and coverage data framework
- 19130: Geographic information - Sensor and data models for imagery and gridded data
- 19131: Geographic information - Data product specifications
- 19132: Geographic information - Location based services possible standards
- 19133: Geographic information - Location based services tracking and navigation
- 19134: Geographic information - Multimodal location based services for routing and navigation
- 19135: Geographic information - Procedures for registration of geographical information items
- 19136: Geographic information - Geography Markup Language (GML)
- 19137: Geographic information - Generally used profiles of the spatial schema and of similar important other schemas
- 19138: Geographic information - Data quality measures
- 19139: Geographic information - Metadata - Implementation specifications
- 19140: Geographic information - Amendment to the ISO 191\*\* Geographic information series of standards for harmonization and enhancements
- 6709: Standard representation of latitude, longitude, and altitude for geographic point locations.

# INCITS L1 Standards Program

## Status of FGDC Standards

Final Stage - FGDC Endorsed Standards

Review Stage

Draft Stage

Proposal Stage

### Final Stage - FGDC Endorsed Standards

Content Standard for Digital Geospatial Metadata (version 2.0),  
FGDC-STD-001-1998

Content Standard for Digital Geospatial Metadata, Part 1: Biological Data  
Profile, FGDC-STD-001.1-1999

Metadata Profile for Shoreline Data, FGDC-STD-001.2-2001

Spatial Data Transfer Standard (SDTS), FGDC-STD-002  
(a modified version was adopted as ANSI NCITS 320:1998)

Spatial Data Transfer Standard (SDTS), Part 5: Raster Profile and  
Extensions, FGDC-STD-002.5

Spatial Data Transfer Standard (SDTS), Part 6: Point Profile,  
FGDC-STD-002.6

SDTS Part 7: Computer-Aided Design and Drafting (CADD) Profile,  
FGDC-STD-002.7-2000

Cadastral Data Content Standard, FGDC-STD-003

Classification of Wetlands and Deepwater Habitats of the United States,  
FGDC-STD-004

Vegetation Classification Standard, FGDC-STD-005

Soil Geographic Data Standard, FGDC-STD-006

Geospatial Positioning Accuracy Standard, Part 1, Reporting Methodology,  
FGDC-STD-007.1-1998

Geospatial Positioning Accuracy Standard, Part 2, Geodetic Control  
Networks, FGDC-STD-007.2-1998

Geospatial Positioning Accuracy Standard, Part 3, National Standard for  
Spatial Data Accuracy, FGDC-STD-007.3-1998

Geospatial Positioning Accuracy Standard, Part 4: Architecture,  
Engineering Construction and Facilities Management,  
FGDC-STD-007.4-2002

Content Standard for Digital Orthoimagery, FGDC-STD-008-1999

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Content Standard for Remote Sensing Swath Data, FGDC-STD-009-1999

Utilities Data Content Standard, FGDC-STD-010-2000

U.S. National Grid, FGDC-STD-011-2001

Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing Metadata, FGDC-STD-012-2002

### **Review Stage**

#### **Completed Public Review**

Address Content Standard

Content Standard for Framework Land Elevation Data

Digital Cartographic Standard for Geologic Map Symbolization

Facility ID Data Standard

Geospatial Positioning Accuracy Standard, Part 5: Standard for Hydrographic Surveys and Nautical Charts

Hydrographic Data Content Standard for Coastal and Inland Waterways

NSDI Framework Transportation Identification Standard

#### **Out for Public Review**

Note: "(month date, year)" indicates closing date for public review.

#### **In Review by SWG Prior to Public Review**

##### **Draft Stage**

Earth Cover Classification System

Encoding Standard for Geospatial Metadata

Geologic Data Model

Governmental Unit Boundary Data Content Standard

Biological Nomenclature and Taxonomy Data Standard

#### **Proposal Stage**

FGDC Profile(s) of ISO 19115, Geographic information - Metadata - suspended. Work underway by NCITS L1 to develop a national metadata standard.

Federal Standards for Delineation of Hydrologic Unit Boundaries

## INCITS L1 Standards Program

National Hydrography Framework Geospatial Data Content Standard

National Standards for the Floristic Levels of Vegetation Classification in the United States: Associations and Alliances

Revisions to the National Standards for the Physiognomic Levels of Vegetation Classification in the United States: Federal Geographic Data Committee Vegetation Classification Standards, FGDC-STD-005, October 1997

Riparian Mapping Standard

**Discontinued from FGDC Standards Process**  
(by notice of FGDC Subcommittee or Working Group)

Metadata Profile for Cultural and Demographic Data (draft stage)

Environmental Hazards Geospatial Data Content Standard (draft stage)

Transportation Data Content Standard (proposal stage)