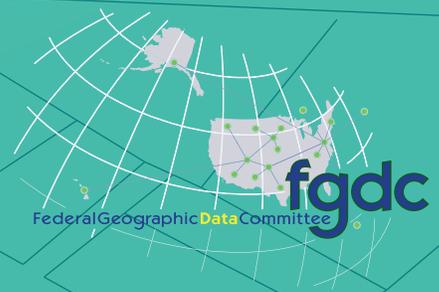


2009 Annual Report

Federal Geographic **Data** Committee



Federal Geographic Data Committee
IVAN DELOATCH, Executive Director

Federal Geographic Data Committee, Reston, Virginia: 2009

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The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service works with landowners to enhance and restore this wetland area in Arkansas. Photo by Robert G. Price, USDA Natural Resources Conservation Service.

Message From the FGDC Chair

I am pleased to present the Federal Geographic Data Committee's (FGDC's) 2009 annual report. The theme of this year's report is "The U.S. Mortgage Crisis and Land Parcel Data." Land parcel data combined with other geographic information are essential to such functions as the management of emergency situations, development of domestic energy resources, management of private and public lands, support of business activities, and monitoring of regulatory compliance. The feature story of this year's report underscores the need for a coordinated system of land parcel information across the country.

The purpose of this annual report is to describe the progress being made by the FGDC to address timely, critical issues that affect our Nation. This includes the progress the FGDC has made in its primary mission of promoting coordination of the National Spatial Data Infrastructure (NSDI), which makes possible the coordinated development, use, sharing, and dissemination of geospatial data on a national basis. It also includes the accomplishments of the FGDC in meeting the Federal Government's internal, external, and international geospatial responsibilities.

In particular, the FGDC is pleased to announce its approval of the Record of Decision of the Phase 1 plan for the Imagery for the Nation (IFTN) initiative, which is an important 2009 milestone. Also, the FGDC is contributing to the Office of Management and Budget's American Recovery and Reinvestment Act (ARRA) Web site (www.recovery.gov) by designing the infrastructure and adding place-based attribution to recipient data and expenditures. In addition, the FGDC is continuing to improve public access to Federal geospatial data and innovative applications of these data by supporting the Data.gov platform.

The success stories featured in this report illustrate how geospatial information supports diverse functions, including ones that are often not sufficiently appreciated. I am privileged to serve as the acting FGDC Chair, and I thank all who have contributed to these success stories and to all the activities of the FGDC during the past year.

Sincerely yours,

Karen Siderelis, *U.S. Department of the Interior
Chair (acting), FGDC Steering Committee*



National Spatial Data Infrastructure Champion



Bill Wilen

Champions are leaders. They take charge, lead by example, see beyond mere trends, and overcome distractions and obstacles to perform the task at hand. They uphold their convictions as they welcome opposing views. As natural visionaries, champions often see possibilities long before they are visible to others. Each year, the FGDC recognizes as a champion one who has taken a strong leadership role in the development of the National Spatial Data Infrastructure (NSDI). This year's honoree is Bill Wilen.

Mr. Wilen's leadership is well recognized within the geospatial community, as are his exemplary efforts to advance the management and preservation of wetlands. Secretary of the Interior Ken Salazar's announcement of the adoption of the Wetlands Mapping Standard in August 2009 came about largely as a result of the tireless commitment, leadership, and dedication to the development of this standard by Mr. Wilen. It is in recognition of his trusted leadership within the NSDI community that Mr. Wilen is recognized as this year's NSDI Champion.

Biography

Bill Wilen graduated from the University of Massachusetts in 1976 with a Ph.D. in forestry with competencies in forest hydrology and forest soils. That same year, he began working on the National Wetlands Inventory Project in the Office of Biological Services, U.S. Fish and Wildlife Service. He became the Project Leader of the National Wetlands Inventory in 1979 and held that position until becoming Director of the National Wetlands Inventory Center in April 2002. He is currently the Senior Wetland Scientist at the Center's Washington office. He also chairs the FGDC's Wetlands Subcommittee, which under his leadership has produced the FGDC's Wetlands Classification System and Wetlands Mapping Standard.

Mr. Wilen has also been involved with the Sea Level Affecting Marshes Model (SLAMM) for nearly 25 years and with the online viewer, SLAMM-view, since its inception. He has been involved with many of the wetland reports produced by the Council on Environmental Quality. The first of these reports, *Our Nation's Wetlands*, was published in 1978; the most recent is *Conserving America's Wetlands 2008: Four Years of Partnering Resulted in Accomplishing the President's Goal*, which was published in 2008.



Aerial view of wetlands in Butte County, Calif. Photo by Lynn Betts, USDA Natural Resources Conservation Service.

Highlights 2009

1. Geospatial Line of Business

During fiscal year 2009, Geospatial Line of Business (Geospatial LoB) moved from early concepts and ideas to a more robust programmatic approach. Such projects as geospatial SmartBUY, which was created in partnership with the General Services Administration, have lowered the cost of doing business and improved access to geospatial software technologies. Other stakeholder needs are being met through defining, optimizing, and standardizing the use and management of geospatial information, which is helping to make Federal performance reporting easier and more transparent. Each of the five Geospatial LoB work groups are contributing to the development of quality geospatial information and applying it to the needs of taxpayers and Federal, State, and local government stakeholders. For more information, see page 8.

2. National Geospatial Advisory Committee

The National Geospatial Advisory Committee (NGAC) was chartered by the U.S. Department of the Interior in 2008 to provide external advice and recommendations to the FGDC. During the past year, the NGAC has analyzed and provided recommendations on Imagery for the Nation, Geospatial LoB, the coordination of national land parcel data, activities related to the transition to the new Administration, and FGDC governance. In fiscal year 2010, the NGAC plans to work with the FGDC to decide on an approach for developing a new national geospatial policy and strategy. This complex activity will be a major focus of the NGAC's work for the coming year. For more information, see page 9.

3. National Policy and Strategy for Geospatial Information

In fiscal year 2009, the FGDC initiated planning for the development of a new national policy and strategy for geospatial information. To this end, the FGDC Executive Committee outlined a plan for development of the new policy and strategy, and the FGDC sought feedback from the NGAC to help refine the approach to this complex undertaking. The FGDC plans to initiate development of the new policy in fiscal year 2010, in part by hosting a national geospatial open forum that will employ social media techniques to gather input and suggestions from a broader audience. For more information, see page 10.

4. Fifty States Initiative

The Fifty States Initiative completed its fourth year in partnership with the National States Geographic Information Council (NSGIC). Eight new awards were made to support strategic and business plan development, and another highly successful awardees kickoff meeting was held in February 2009. Forty-one States, the District of Columbia, and the Virgin Islands have received more than \$2 million in funding during the past 4 years. A Federal stakeholder workshop was held in February as one of several activities to help develop guidance for the future of the initiative. Preliminary findings suggest that the initiative should be continued, with a focus on business planning. For more information, see page 11.

5. International Activities

The FGDC helped organize and conduct the Global Spatial Data Infrastructure (GSDI) world

conference, which was held in Rotterdam, Netherlands, in June 2009. Approximately 1,200 delegates from more than 80 countries attended. The FGDC continues to support the GSDI Association's small grants program and the GSDI Association's regional spatial data infrastructure (SDI) newsletters. In addition, the FGDC is hosting Mr. Wonkug Baek, a visiting scientist from the Republic of Korea, who is supporting GSDI activities.

The FGDC continued to collaborate with its counterparts in Canada. The FGDC and GeoConnections, Canada, organized the "First Nations and Native Tribal Government Geographic Information System Workshop" in June 2009. The workshop was held in Niagara Falls, N.Y., as part of midyear events at the National Congress of American Indians (NCAI). The workshop was effective in advancing cross-border SDI collaboration among aboriginal peoples. For more information, see page 13.

6. Geospatial One-Stop

The Geospatial One-Stop (GOS) portal (www.geodata.gov) continued its steady growth in fiscal year 2009. The portal saw a 25 percent increase in records with the addition of about 50,000 individual metadata records contributed by 418 publishers. A significant impetus behind this large increase was the integration of GOS with Data.gov. A new GEODATA catalog tab on the Data.gov Web site was the result of this collaboration. A search of the GEODATA catalog on Data.gov is actually a search of agency-selected Federal records from the GOS catalog. GOS will continue to work with Federal agency collections to promote records for discovery in Data.gov.

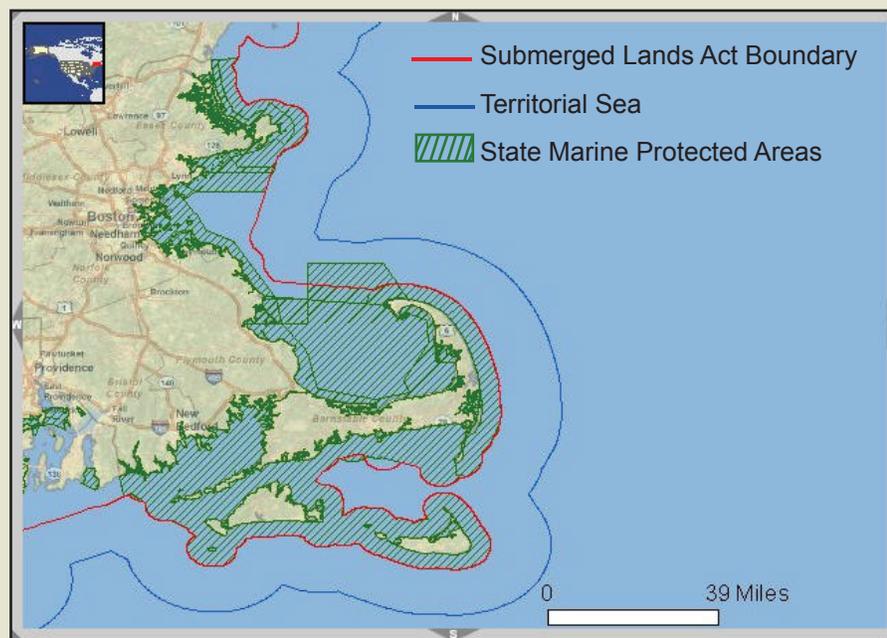
Success Stories

Multipurpose Marine Cadastre

Challenge: On June 12, 2009, the President issued an Executive Memorandum, "National Policy for the Oceans, Our Coasts, and the Great Lakes," which called for the establishment of an Interagency Ocean Policy Task Force. The Task Force was to develop, within 180 days and with appropriate public input, "a recommended framework for effective coastal and marine spatial planning." The framework was to have a "comprehensive, integrated, ecosystem-based approach that addresses conservation, economic activity, user conflict, and sustainable use of ocean, coastal, and Great Lakes resources consistent with international law, including customary international law as reflected in the 1982 United Nations Convention on the Law of the Sea."

Action: The U.S. Minerals Management Service (MMS) is leveraging its work on the Multipurpose Marine Cadastre (MMC) to help create an ecosystem-based framework for the long-term conservation and use of marine and coastal resources. The MMC is a multiagency effort to build a marine-based geographic information system (GIS) for U.S. waters that provides authoritative geospatial data. The primary purpose of the MMC is to inform decisionmaking on a range of ocean issues. The MMC contains marine cadastral data (including the spatial extent, usage, rights, restrictions, and responsibilities for marine areas) and regionally specific data to support planning, management, and conservation of submerged lands and marine spaces. The combination of marine cadastral and regionally specific data provides users with the spatial context needed to address such issues as alternative energy siting, aquaculture, submerged lands leasing, marine conservation, and comprehensive marine spatial planning.

Result: By implementing the MMC, the MMS is able to assist with offshore renewable energy planning and siting. Future plans for the MMC include expanding the data holdings, developing regional viewers, and supporting marine spatial planning requirements.



Map showing example of Multipurpose Marine Cadastre.

Cooperative efforts with the Interagency Working Group on Ocean and Coastal Mapping and the State GIS Inventory System continued to make significant contributions to increasing the content of GOS. Outreach related to GOS focused on increasing participation with State and local governments.

Several improved methods of accessing the GOS data were implemented in fiscal year 2009 to make the data more easily accessible outside of the portal interface. The GOS Search Widget, for example, is a new tool that can be embedded in any Web site to search the GOS data holdings. The search widget has been implemented by the governments of the State of Delaware and Westchester County, N.Y.

The GOS Marketplace provides a means for organizations to advertise their interest in collecting geospatial data and to seek partners for cost-sharing. An estimated 240 contacts were made regarding possible partnerships for data acquisition. For more information, see page 14.

7. Standards

In fiscal year 2009, the FGDC Standards Working Group (SWG) recommended endorsement of the Wetlands Mapping Standard. The FGDC Steering Committee subsequently endorsed the Wetlands Mapping Standard in July 2009.

The North American Profile (NAP) of the ISO metadata standard (ISO 19115: 2003, Geographic Information—Metadata) was published in 2009. Subject matter experts from the United States and Canada developed content to tailor the ISO metadata standard to meet the requirements of both countries. For more information, see page 15.

8. Imagery for the Nation

The Imagery for the Nation (IFTN) Phase 1 Project was initiated late in fiscal year 2008 to explore development of a comprehensive national imagery program, which would require an unprecedented level of cross-agency and cross-sector coordination and executive oversight. In fiscal year 2009, the Phase 1 Project ramped up to address these challenges and will conclude with publication of a report in late fiscal year 2009 or early fiscal year 2010. The report will establish a foundation and outline a set of next steps for implementing IFTN. Several significant accomplishments have been made toward achieving project goals, including the development of a draft plan and the completion of a memorandum of understanding between the U.S. Department of Agriculture and the U.S. Department of the Interior to help institutionalize funding for the 1-meter component of IFTN. For more information, see page 16.

9. National Land Parcel Data

In addition to the activities related to the mortgage crisis (see page 4) the FGDC Subcommittee for Cadastral Data provided updates to the existing national inventory of cadastral data (primarily in the West) and made a number of additions to this inventory in eastern locations. Updated sets of parcel data were provided to the wildland fire community for a number of western and eastern counties, and efforts were initiated to establish sustainable standardized parcel datasets at the State level. Significant progress was made toward the development of sustainable standardized datasets in New Mexico and Washington. Similar efforts have been initiated in California and Nevada. The development of standardized Public Land Survey

System (PLSS) datasets was supported in a number of States in accordance with the FGDC cadastral data content standards and publication guidelines. The subcommittee assisted States with the development of cadastral data management plans and the adoption of standards for data stewardship. In addition, minor modifications to the FGDC Cadastral Data Content Standard were proposed, reviewed, and adopted by the cadastral data subcommittee and approved and posted by the SWG. For more information, see page 17.

10. Homeland Security and Emergency Management

During 2009, members of the Homeland Security Working Group (HSWG) contributed to several initiatives of the FGDC, the Geospatial LoB, and the U.S. Department of Homeland Security (DHS). HSWG members supported the Geospatial LoB Lifecycle Management Work Group in drafting FGDC's supplemental guidance document for Office of Management and Budget (OMB) Circular A-16 supplemental guidance document, which included consideration of the homeland security and homeland defense data themes. HSWG members were invited to participate in a DHS-funded Symbology Standardization Project to expand standardized mapping symbols for emergency management. The HSWG continued to provide support to the DHS-sponsored and FGDC-supported Geospatial Data Model, a new revision of which was issued during fiscal year 2009. HSWG members also contributed to the National Spatial Data Infrastructure Cooperative Agreements Program, which was focused on a cross-border critical infrastructure and data interoperability project. For more information, see page 18.

Cadastral Data and the U.S. Mortgage Crisis: A Case for a National Land Parcel Database

Introduction

In early 2006, the U.S. housing bubble burst. Home values began falling and by early 2007, huge numbers of foreclosures were taking place across the country. Large segments of the U.S. subprime mortgage industry faced bankruptcy, and by January 2008, some of the Nation's leading investment banks had begun to fail. By February 2009, the value of the stock market had fallen by more than one-half from its peak in October 2007. As we head into the fourth quarter of 2009, economists, financial analysts, and policymakers are still wondering whether we have hit bottom.

The significance of the problem of mass foreclosures, which has led to the larger financial crisis, is huge. Millions of people have lost their homes and their jobs and trillions of dollars in personal wealth has been lost. The effect on whole communities is severe. As Federal Reserve Chairman Ben Bernanke describes it, "Foreclosures create substantial social costs. Communities suffer when foreclosures are clustered, adding further to the downward pressure on property values. Lower property values in turn translate to lower tax revenues for local governments, and increases in the number of vacant homes can foster vandalism and crime."

While not all agree on the root causes of the mortgage collapse, or on what the best approach to fixing the problem should be, it is clear that an "early warning system" to detect the shaky housing market sooner could have helped lessen the severity of the crash. Could a nationwide system of cadastral data that provides information about local land parcels across the country,

in combination with timely and standardized mortgage data, become one component of this early warning system for decisionmakers?

What are cadastral data?

Cadastral data describe the rights, interests and authorizations in real property, including their geographic extent and changes over time. The geographic features of cadastral data include parcels, boundaries, corner locations, and cadastral reference systems, such as the Public Land Survey System. Cadastral data also include information about parcels, including a unique parcel identifier, the value, ownership, tax classification, zoning, address, and legal description of the real property. A map

Why a National Land Parcel Database?

The National Geospatial Advisory Committee (NGAC) observed that the Federal Government's land parcel data is missing a process for acquiring the detailed property-related data necessary to make decisions during times of emergency, such as a natural disaster. In addition to emergency response to disasters, other perceived needs for a national land parcel database include responding to the home mortgage foreclosure crisis, dealing with wildfires, managing energy resources on Federal lands, dealing with the effects of climate change, and possibly more.

Source: Congressional Research Service

representation of land parcels provides useful information about their location, boundaries, extent, and relationships to other geographic features.

Decisionmakers regularly rely on cadastral information for such varied uses as emergency response, site selection, land use administration, and transportation planning. The ways in which land parcel data are vital to effective wildfire response are described in the 2008 FGDC annual report. This 2009 report addresses how a nationwide system of cadastral information could also be an essential part of an early warning system to help policymakers identify future problems with the U.S. housing market.

How could having an early warning system in place have helped forestall the mortgage crisis?

A report by a joint task force of the Department of Housing and Urban Development (HUD) and the U.S. Department of the Treasury, "Curbing Predatory Home Mortgage Lending" (2000), pointed out the usefulness of an early warning system to help spot potential mortgage problems. The report suggested, for example, that cross-referencing of loan information with parcel data could enhance detection of potential predatory lending and provide an early indicator of potential mortgage troubles.

The first direct look at how parcel data could help identify potential mortgage problems was a workshop sponsored by the FGDC in May 2009, which looked at the issue of how parcel information could improve decisionmaking. The participants

Federal land parcels are an important component of a national parcel database. The U.S. Department of the Interior (DOI) manages 500 million acres of surface and 700 million acres of mineral interests in the United States. DOI also has jurisdiction over approximately 1.76 billion acres of the Outer Continental Shelf, on which it manages active oil and gas leases.

focused on the following three areas: (1) Home Mortgage Disclosure Act (HMDA) reporting, (2) mortgage contagion, and (3) a parcel-based early warning system. The following is a summary of their conclusions.

Home Mortgage Disclosure Act (HMDA) Reporting

Mortgage and property information collected by the Federal Government under the Home Mortgage Disclosure Act (HMDA) is aimed at tracking discriminatory lending practices; it is not a monitor of the current housing market. The HMDA data contain loan information, including individual loan application records with a census tract identifier and other jurisdictional information. These data are updated on an annual basis. Although HMDA data are extensive, they do not provide complete information for the entire country and are not linked to parcels. As such, the level of spatial and temporal aggregation currently available from HMDA data does not allow the detailed level of analysis that could be provided by authoritative locally maintained parcel information.

Whereas HMDA data provide a snapshot of the land value at the time of a mortgage transaction, parcel data provide current individual property information, which allows other information, such as utility shutoffs, code violations, and undelivered mail to be linked to parcels. Parcel data make it possible to relate disparate

data from different sources to get a more complete picture of mortgage and housing conditions. Parcel data provide an improved means for Federal and State governments to work with local governments who can best respond to the community mortgage conditions.

Adding a parcel identification number (PIN) would greatly enhance the ability to tie the HMDA data to locally maintained information, and would facilitate linking HMDA data to other information that could be valuable in monitoring distressed mortgages. The Federal Reserve Board, which oversees HMDA, and HUD, which implements HMDA data collection, have already begun the lengthy process of including a PIN in the HMDA data collection process.

Mortgage Contagion

Investigations of the mortgage crisis have revealed that distress in the housing market acts like a contagious disease. Foreclosures are 'infectious' in that they have a tendency to spread to nearby properties. In a paper titled "The Contagion Effect of Foreclosed Properties" (2008), Harding, Rosenblatt and Ya suggest that "The discount [loss in value] is roughly one percent per nearby foreclosed property and appears to be roughly proportional to the number of nearby distressed properties. The discount diminishes rapidly as the distance to the distressed properties increases." Foreclosures also affect the entire community by lowering property values, which in turn lowers the tax revenue for local governments.

Harding, Rosenblatt and Ya argue that the land parcel is the essential unit for monitoring and analyzing mortgage information and tracking the contagious effects of mortgages. Parcels provide the right level of granularity to track foreclosures. When parcel data are combined with value and use information from local governments, the information can help policymakers

and the private sector make informed decisions on the solutions to mortgage issues community by community. With the right parcel data available, it is possible to conduct spatial analysis and mapping related to mortgage concerns.

Although nearly 82 percent of parcels nationwide are available in a digital format, many of these data are not well standardized. A minimal set of standardized parcel data would need to be implemented. Furthermore, more than 1,000 counties have no digital parcel data. These jurisdictions, which are generally poor, rural areas, would need to have their parcel data placed into a standardized digital format.

Parcel Early Warning System

An early warning system is a tiered process that would first identify "hot spots" within the housing market. Within these hot spots, additional and more detailed and granular information could be collected for further analysis. For example, The New York Times developed an interactive warning system for the New York metropolitan area. (See www.nytimes.com/interactive/2009/05/15/nyregion/0515-foreclose.html.) In this system, trends in foreclosure rates are monitored at the Census Tract level (or any other level of aggregation) on a regular basis and can be dynamically mapped through time. By focusing on a specific neighborhood, one can see a point level pattern of specific foreclosed properties.

What steps have been taken thus far to create a system of national land parcel data?

A 2007 National Research Council report, "National Land Parcel Data: A Vision for the Future," is the most recent of several NRC reports dealing with land parcels. The first such report by the National Research Council was a report titled "Need for a Multipurpose Cadastre," which was issued in 1980. Developing a national land parcel

database is a key step toward having cadastral data to use for national needs.

The following is a summary of the National Research Council's recommendations in 2007 for how to move forward with the creation of a national land parcel database:

- The FGDC should identify the role of parcel data with respect to public buildings and facilities, cultural resources, governmental units, and housing.
- The Federal Government should establish the positions of Federal land parcel coordinator and national land parcel coordinator to develop a single land parcel database for all federally managed lands, as well as develop a land parcel business plan and a funding plan.
- Every State should establish the position of parcel coordinator and develop a business plan for border-to-border parcel coverage within each State.
- The Department of the Interior should establish an Indian lands parcel coordinator who would coordinate and develop a program for Indian trust parcels.

- To be eligible to participate in Federal geospatial programs, State and local governments should be required to make a minimal set of land parcel attributes (which are needed for a national land parcel database) available in the public domain.
- Congress and the U.S Census Bureau should explore options for placing addresses and their coordinates in the public domain while protecting privacy.

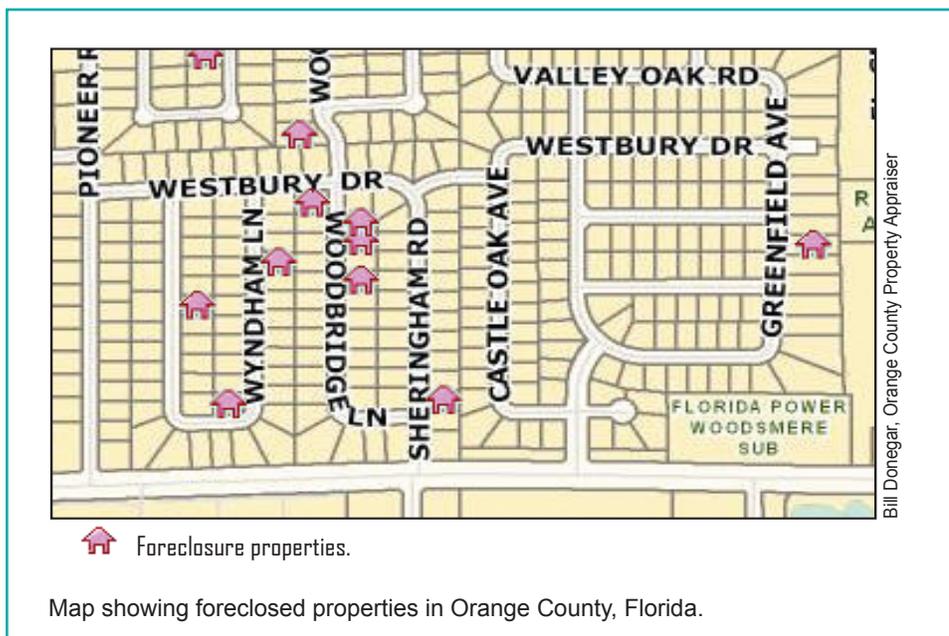
In 2008, after examining the recommendations of the 2007 NRC report, the National Geospatial Advisory Committee (NGAC) endorsed the recommendations. In October 2008, based on this endorsement, the FGDC Steering Committee charged the FGDC Cadastral Subcommittee with organizing a meeting of key stakeholders in the financial and mortgage arena to document their requirements for parcel information. In preparation for this meeting, the Subcommittee conducted 5 months of research and more than 100 pre-meeting interviews with local governments, Federal regulatory agencies, banking and loan industry representatives, assessment and appraisal professionals, private sector

data providers, State agencies, and elected officials. Those interviewed included representatives from the Federal Reserve Board, HUD, The Urban Institute, the Federal National Mortgage Association (known as Fannie Mae), the Federal Home Loan Mortgage Corp. (known as Freddie Mac), and the U.S. Census Bureau. The purpose of these interviews was to understand the business processes involved in making mortgage loans, determining value, packaging loans for mortgage-backed securities, and regulating and reporting on these processes. The meeting was held in Washington, D.C., in May 2009 and explored potential uses of land parcel data for more effective management of mortgage and financial oversight programs.

What is the recommended next step?

The FGDC has recognized the value of land parcel data by designating cadastral data as one of the framework themes of the National Spatial Data Infrastructure. However, the challenges of collecting, monitoring, analyzing, reporting, mapping, and coordinating these critical data for the country's 150 million land parcels across the span of Federal, State, tribal, and local rights and interest in the real property remain complex.

The NGAC recommends that immediate action be taken to put in place a national land parcel coordinator. Because establishing this position will require resources and because the job is likely be a difficult one, the NGAC also recommends that a review be done of Bureau of Land Management (BLM) authorities to understand who could take on this work.



Conclusion

The effects of the 2008 mortgage crisis can be seen in distressed mortgages, foreclosures, and decreasing real estate values across America. A national land parcel database could be an important component of an early warning system to help detect future problems with the U.S. housing market. A successful national land parcel database, however, will require Federal Government commitment and backing. The additional benefits of such a database would be in how it could help the Government meet its policy objectives, such as by enabling the Government to respond more effectively to emergencies, manage Federal lands more efficiently, and deal successfully with other national needs.

Success Stories

Enterprise GIS

Challenge: The State of Vermont wished to develop and implement an Enterprise GIS for the State.

Action: With support through the Fifty States Initiative, Vermont developed an Enterprise GIS Strategic Plan and established an Enterprise Geospatial Consortium (EGC) to support the ongoing implementation and management of the strategic plan. The EGC serves as an advisory team to State agencies. For example, an agency seeking an image server submitted its proposal to the EGC for review and recommendations.

Result: Vermont is establishing a dynamic Enterprise GIS framework that promotes and leverages efficient use of the State's geographic information technology resources. The U.S. Geological Survey Geospatial Liaison is an active member of the EGC and is helping to ensure that Vermont's Enterprise GIS framework benefits Federal geospatial programs as well. Efforts are being made to engage local and Federal users of these State geospatial resources.

"Hopefully the need for parcel data to monitor the mortgage crisis will serve as the catalyst for concrete action. If not now...when?"

—David J. Cowan

Dr. Cowan is a member of the National Geospatial Advisory Committee and chaired the committee that produced the 2007 National Research Council report, "National Land Parcel Data: A Vision for the Future."



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FGDC Leading the Way...

Geospatial Line of Business Promotes the Business of a Geo-enabled Government

The participants across the Geospatial Line of Business (Geospatial LoB) initiative focused on achievement of the key goals and objectives identified in the Geospatial Line of Business strategic plan. A team conducted an evaluation and update of charters as called for under FGDC's "OMB A-16 Supplemental Guidance" to enhance governance. The FGDC Coordination Group accepted the updated Geospatial LoB Strategic Plan. The activities of the work groups are summarized below.

The vision of the Common Services Work Group (CSWG) is to ensure that every Federal agency and its partners have access to a common and complete portfolio of the best

geospatial tools, data, software, and services available. Working with the General Services Administration (GSA) SmartBUY team, the CSWG issued a request for quotation (RFQ), evaluated proposals, and successfully awarded contracts to vendors. To enhance the SmartBUY program, the RFQ was issued for comment through an 'Industry day'. As a result, the work group learned that using separate contract line items would allow a larger number of vendors to participate. Because many Federal agencies work with State, tribal, and local governments, they wish their partners to have access to the same software and buying opportunities. The geospatial SmartBUY program is the first to allow State, tribal, and local governments to make purchases through the GSA SmartBUY agreement.

The Lifecycle Work Group (LCWG) seeks to promote and improve the quality of geospatial data throughout the data lifecycle and to recommend sound governance and a consistent process for managing geospatial data across the Government based on the guidance provided in OMB Circular A-16. The work group developed the supplemental guidance document to OMB Circular A-16; this document was adopted by FGDC member agencies in December 2008. With these guidelines in place, the work group is authoring approaches to measure Federal Governmentwide project and portfolio management processes, definitions, standards, and reporting for nationally significant geospatial datasets. The work group has tested the lifecycle model using actual datasets and recommended several best practices to aid agencies. The LCWG is engaging agencies to continually educate the group about the value of a consistent data lifecycle as part of the business process.

The purpose of the Geo-Enabled Business Work Group (GEBWG) is to demonstrate and communicate the value of geospatial approaches to business processes and agency mission functions. In 2009, the work group published seven new fact sheets that present 'mini' business cases of successful agency implementations of geospatial processes and products. These fact sheets are very popular with the agencies for which they were prepared. In addition, the GEBWG helped develop a conference booth for the Geospatial LoB. The GEBWG continues to promote the success of all Geospatial LoB work groups by developing the content for posters,

Success Stories

Use of Geospatial Data for Program Compliance

Challenge: The U.S. Department of Agriculture's (USDA's) Risk Management Agency (RMA) suspected that improper crop insurance claims for planting were being made in a Midwestern State. Field visits by USDA staff did not provide enough information to make an eligibility determination.

Action: Using four consecutive years of National Agricultural Imagery Program (NAIP) data and common land unit polygons, the USDA Farm Service Agency helped the RMA analyze areas suspected of improper claims.

Result: NAIP imagery allowed the RMA to identify large areas that were ineligible for payment, thus preventing more than \$700,000 in improper payments in one State.

demonstrations, and presentations and by serving as the outreach leader for Geospatial LoB initiatives.

The Grants and Contracts Work Group (GCWG) develops common policies for grants, cooperative agreements, and contracts through recommended policy bodies, such as the Grant Policy Committee (a Federal Governmentwide special committee) and the Federal Acquisition Council. The primary goals of the work group are to promote the widest possible access to geospatial data, obtain value for the Federal dollars invested, and improve interagency coordination related to geospatial data.

The Technology and Architecture Work Group (TAWG) develops geospatial requirements and recommendations for the technology and telecommunications infrastructure. In fiscal year 2009, the TAWG refined and delivered the Geospatial Profile (V2) of the Federal Enterprise Architecture to the CIO Council for approval and adoption. The work group coordinates with the Office of Management and Budget and the Architecture and Infrastructure Committee of the Chief Information Officer Council to establish a clear process for development and adoption of a new Geospatial Segment Architecture. Part of the Geospatial LoB efforts result in stronger outreach to agency chief architects, especially those with geospatial technology in their agency.

Geospatial LoB annual work plans have been presented, and the FGDC Coordination Group has accepted the plans and milestones. Thus, milestones through 2010 are in place. For additional information, see www.fgdc.gov/geospatial-lob.

National Geospatial Advisory Committee Provides Valuable Advice

One of the most effective new developments to enhance the FGDC partnership and governance process has been the establishment of the National Geospatial Advisory Committee (NGAC). The NGAC was chartered by the U.S. Department of the Interior in 2008 under the Federal Advisory Committee Act to provide external advice and recommendations to the member agencies of the FGDC.

The NGAC has a balanced membership of 28 committee members that represent a variety of

organizations involved in geospatial issues, including the private sector, nonprofit organizations, academia, and all levels of government. The NGAC has staggered membership terms, and the Secretary of the Interior issued a call for nominations on July 6, 2009, for the next round of appointments to the committee.

In the short period in which the NGAC has been in existence, the committee has proved to be a valuable source of advice and feedback for the FGDC. The NGAC promotes two-way communication on issues of common interest to the national geospatial community and provides a forum for the community to convey its views. The NGAC meets quarterly

Success Stories

Sea Level Change Model for Wetlands

Challenge: One concern about global climate change is its effect on the global sea level, which evidence suggests is rising at an increased rate. Coastal habitats, which are among the most important habitats for fish and wildlife, are being threatened by sea level rise. Given the rising sea level, what tools could be developed to help understand the likely harmful effects, and what "adaptation" measures could be taken to improve our ability to cope with or prevent these harmful effects?

Action: A Sea Level Affecting Marshes Model (SLAMM) was developed to simulate the wetland conversions and shoreline modifications during long-term sea level rise. In addition, a complementary Web mapping tool, SLAMM-View, facilitates the comparison of SLAMM results from different dates and sea level rise scenarios.

Result: The SLAMM is being used to predict changes that could result from sea level rise. The model uses wetlands data from the U.S. Fish and Wildlife Service, elevation data from the U.S. Geological Survey (USGS), tide data and sea level trends from the National Oceanic and Atmospheric Administration (NOAA), land use and land cover data from the USGS or from NOAA's Coastal Change Analysis Program, and vertical datum transformation from NOAA. The model maps predicted wetland distributions under various conditions of accelerated sea level rise, and summarizes the results in tabular and graphical form. The model takes into account the five primary processes that affect a wetland's fate under different scenarios of sea level rise: inundation, marsh accretion, erosion, overwash, and soil saturation. The results can be displayed in conjunction with other thematic layers to provide context, including State and county boundaries, roads, and protected areas. The results can also be viewed at various scales; for example, as a large region that encompasses the Chesapeake Bay, or as an area the size of a small barrier island.

and has established subcommittees that conduct research and develop draft products between committee meetings. During the past year, the NGAC has analyzed and provided recommendations on Imagery for the Nation, Geospatial LoB, the coordination of national land parcel data, activities related to the transition to the new Administration, the changing landscape of geospatial technology, geospatial issues related to national economic stimulus legislation, and FGDC governance.

Planning has Begun for a New National Policy and Strategy for Geospatial Information

The FGDC began planning for the development of a new national policy and strategy for geospatial information in fiscal year 2009. The current framework for the FGDC and the development of the National Spatial Data Infrastructure are embodied in OMB Circular A-16 and Executive Order 12906.

The purpose of a new national policy would be to review Federal agency missions and responsibilities and set priorities for the use of geospatial technologies, align geospatial investments with Federal goals, and outline strategies for cooperation with other sectors. This new policy and strategy will describe new approaches to maintaining U.S. technological leadership, ensuring effective intergovernmental coordination, and targeting research investments.

The development of a new policy will build upon previous FGDC planning activities, including the following two significant efforts to develop strategic approaches for geospatial coordination:

(1) *Future Directions for the National Spatial Data Infrastructure.*—In 2004, the FGDC launched the NSDI Future

Directions Initiative to craft a near-term strategy and implementation plan to further the development of the NSDI. The resulting document, “NSDI Future Directions Initiative, Towards a National Geospatial Strategy and Implementation Plan,” drew on the collective insights and contributions of the geospatial community.

(2) *Geospatial Line of Business.*—In a followup effort, the FGDC used a business process approach to develop the next iteration of its strategic efforts in 2006 through the OMB-sponsored Geospatial Line of Business Initiative. This initiative produced a common solutions and target architecture document that has served as the operational framework for Federal geospatial coordination for the past 3 years.

One way that the FGDC is planning to initiate the national policy planning process is by convening a national geospatial open forum, which is expected to be held early in fiscal year 2010. The open forum will use social media and Web 2.0 techniques to garner input from a broad range of stakeholders.

Cooperative Agreements Program Promotes the NSDI

Since 1994, the FGDC has sponsored the Cooperative Agreements Program (CAP) with the goal of encouraging and enabling all levels of the geospatial data community to participate in building the National Spatial Data Infrastructure (NSDI). The NSDI CAP provides organizations with funding; it also validates an organization’s geospatial work, which can lead to new opportunities. The CAP has created collaborations within all sectors of government, helped develop an understanding of geospatial information in organizations and disciplines new to the NSDI, provided seed money to enable

geospatial organizations to participate in the national effort to implement the NSDI, promoted the development of standardized metadata in hundreds of organizations, promoted the importance of geospatial data standards, and greatly expanded implementation of Web mapping services and Web feature services.

This year, 27 CAP projects were completed. These projects continue to demonstrate the program’s range in scope and geography. In the area of framework client development, advancements were made in geospatial interoperability using open source software solutions. In particular, a service-oriented architecture was implemented that provides access to the National Hydrography Dataset (NHD-Plus) and delivers watershed characteristics. To advance geo-enabling Federal business processes, a Web-based Spatial Decision Support System that uses free and open source software and open standards was created to facilitate comprehensive baseline tracking and analysis of wetlands change over time. West Virginia integrated locally produced, high-resolution, spatially and temporally accurate structure and transportation data for the State into the NSDI; these data serve as the foundation for statewide geographic information system (GIS) layers. Communities of northeast Minnesota established a GIS collaborative that set up a long-term plan for maintenance of its mapping interface and integrated datasets, which include boundaries, imagery, transportation, zoning, utilities, parcels, and environmental data. In Oklahoma, the geospatial community worked together to implement the National Vegetation Classification Standard (Version 2), FGDC-STD-005-2008. Finally, metadata training was provided in person and by way of webinars to more than 550 individuals with diverse backgrounds, experience, and knowledge from across the

United States. A sample of the training materials created is available at innovateteam.com/projects/epa-and-partners-geospatial-metadata-training/.

In the 2009 program, CAP awards went to 25 projects that address the seven categories outlined below.

1. The Metadata Trainer and Outreach Assistance category is designed to enable organizations with metadata expertise, knowledge, and experience to assist other organizations with training and implementation. CAP awarded assistance to two projects to advance metadata training.
2. The Behind the Portal—Use of GOS Map and Data Services category helps promote the development and sharing of client or server-mediated applications (for example, desktop GIS, decision-support software, models, and other portals) that can access and exploit the geospatial data and services referenced by GOS in support of a specific

transferable and popular geographic or discipline requirement. Four awards were made in this category.

3. The Fifty States Initiative category is designed to accelerate statewide coordination activities through consistent strategic and business plan development. CAP awarded assistance to eight States to begin developing State plans.
4. In the Enabling Use of Government Tabular Data in a Geographic Context category, one award was made to develop, demonstrate, and operate a high-performance, public standards-based Web service to create geospatial datasets automatically from tabular government data merged with geospatial features. The resulting data and services will allow the data to be discovered, accessed, and applied in its geographic context.
5. The Building Data Stewardships for *The National Map* and the NSDI category helps organizations and consortia develop stewardship

agreements and the capabilities that provide long-term maintenance of geospatial information that is needed by all sectors of the community. The CAP awarded assistance to four projects to foster stewardship of transportation data.

6. The FGDC-Endorsed Standards Implementation Assistance and Outreach (excluding Metadata Standards) category is designed to enable organizations with knowledge of and experience with geospatial standards to help other organizations implement FGDC-endorsed standards. The CAP awarded assistance to two projects.
7. The Demonstration of Geospatial Data Partnerships across Local, State and Federal Government category supports the NSDI vision of integrating data from all levels of government, to include processes for feeding local data into State holdings, which in turn feed into Federal programs, such as *The National Map*. The four awards made in this category will support the further development and documentation of partnerships and processes to implement this nested approach for one or more data themes of the NSDI.

More information about these projects, including descriptions and reports, is available at www.fgdc.gov/grants/2009CAP/2009CAPDescriptions.

The CAP budget for fiscal year 2010 is planned for about \$1.3 million, and these funds will be used to support approximately 30 projects. For more information about the CAP, please see www.fgdc.gov/grants.

Fifty States Initiative Reaches More States

The primary focus of the Fifty States Initiative is the development of strategic and business plans for statewide geospatial coordination. As of July 2009, 24 States had finished

Success Stories

Wetlands Reserve Program

Challenge: The Natural Resources Conservation Service (NRCS) was directed to create a spatial database of its land easements to help with their management.

Action: The NRCS created and maintains a database of the easements enrolled in the Wetlands Reserve Program. The Wetlands Reserve Program is a voluntary program that offers landowners the opportunity to protect, restore, and enhance wetlands on their property. The program helps landowners establish long-term conservation and wildlife practices and protection for their property. The NRCS also provides technical and financial support to help landowners with their wetlands restoration efforts.

Result: The U.S. Department of Agriculture's NRCS Easement Locations Web site (gdweb1.ftw.nrcs.usda.gov/Easements/default.aspx) shows the land easements managed by the NRCS.

- Stress consistent strategic and business plans
- Look for alignment with other Federal grant programs

A complete report on the next steps for the Fifty States Initiative was released in September 2009.

International Spatial Data Infrastructure Activities Advance

The FGDC was active in organizing the eleventh Global Spatial Data Infrastructure (GSDI) world conference in Rotterdam, Netherlands, in June 2009. The GSDI conference was a combined effort of five organizations and the GSDI Association, and it proved to be a huge success.

The conference theme was “Convergence: Building Bridges to Address Global Challenges.” It attracted approximately 1,200 participants along with 26 exhibitors that represented 80 nations, and it was the largest GSDI conference to date. The forum featured 31 workshops, 67 parallel sessions, 9 plenary sessions, 12 roundtable discussions, and a number of business and committee meetings.

Dr. Abbas Rajabifard of Australia was inaugurated as the President of the GSDI Association. Mr. Ivan DeLoatch of the United States was elected to a second term on the GSDI Board. The next GSDI conference is scheduled to

be held in Singapore in October 2010 and will be hosted by the Singapore Land Authority. The theme will be “Spatially Enabled Societies.”

The FGDC continues to promote spatial data infrastructures (SDIs) globally as cosponsor of the GSDI Small Grants Program. Working together with the GISCorps, which is a program of the Urban and Regional Information Systems Association (URISA), and the GSDI Association, small grants of \$2,500 and (or) in-kind support are awarded to national and subnational SDI efforts. Also, the FGDC provides partial financial support for the publication and dissemination of regional SDI newsletters. The FGDC is hosting a scientist from the Republic of Korea who is working on GSDI issues.

The FGDC, in collaboration with the National Congress of American Indians (NCAI) and GeoConnections, Canada, hosted the “First Nations and Native Tribal Government Geographic Information System Workshop” on June 14, 2009, in Niagara Falls, N.Y.; the workshop was part of the NCAI midyear conference. Approximately 30 participants from the United States and Canada participated in the workshop throughout the day.

The FGDC, through the U.S. Geological Survey (USGS), is a participant in the Group on Earth Observations’ (GEO’s) Global Earth Observation System of Systems (GEOSS). The USGS is a participant in and sponsor of the GEO and the

GEOSS, respectively. The FGDC participates on the Architecture and Data Committee of the GEO.

Lastly in the area of international activities, FGDC helped organize “The Second Circumpolar Conference on Geospatial Sciences and Applications” (GeoNorth II), which was held in Fairbanks, Alaska, in August 2009. This international conference was held to discuss issues and present current research related to geospatial activities in the Arctic and to help the movement toward an Arctic SDI.

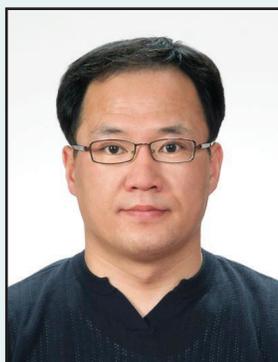
Metadata Stays Vital

The FGDC Metadata Working Group (MWG) benefits by representation from all sectors of the geospatial community: Federal, State, tribal, local, academic, nongovernmental, and private. Quarterly teleconferences keep the working group informed of developments in the metadata community.

During the past 3 years, the MWG participated in reviews of the North American Profile (NAP) (ISO 19115: 2003, Geographic Information—Metadata). The MWG participation contributed to the adoption and publication of the NAP by the InterNational Committee for Information Technology Standards (INCITS) for the American National Standards Institute (ANSI). This contribution to the metadata standards community is a significant accomplishment because the NAP provides for an American National Standard. Furthermore, the NAP, one of two national profiles of the ISO metadata standard, was developed in coordination with the Canadian General Standard Board. For more information, see www.fgdc.gov/nap.

The MWG and Land Information Ontario (Canada) agreed to develop, review, and share NAP metadata implementation materials. The agreement allows both entities to take

Mr. Wonkug Baek of the Republic of Korea arrived at the FGDC Secretariat in November 2008, and works jointly with the FGDC and the GSDI Association. He is helping to prepare the Spatial Data Infrastructure (SDI) Newsletter for Asia and the Pacific and translating the SDI Cookbook into Korean. As an employee of the Government of the Republic of Korea, he worked on policy for the country’s NSDI in the Ministry of Land, Transportation and Maritime Affairs. He is the third visitor to FGDC from the Republic of Korea.



advantage of the other's strengths. Whereas the FGDC materials focus on implementation and training, the Ontario materials focus on the business of metadata. All materials developed under this agreement will be posted to the FGDC Web site.

The MWG has volunteered to update the ISO metadata Editor Review. The original review, which was published in May 2008, was a three-stage process: first, features were collected from the developers; second, a user's review was collected for all the tools; and third, the results were compiled. The developers were queried on the operating environment, metadata development, and metadata management. The ISO metadata Editor Review update will include three new editors.

The MWG welcomes Winston-Salem University's Transforming Communities Research Lab and Penobscot Indian Nation as new members. They join the 2008 NSDI CAP awardees, which are as follows: Innovate!; George Mason University's Joint Center for Intelligent Spatial Computing; Northern Arizona University's Merriam Powell Research Laboratory; and the Sonoma Ecology Center. These awardees have provided classroom training, Web-enabled training, and academic and curriculum consultations in service to Federal, State, tribal, regional, and local governments, academia, and nonprofit organizations.

Geospatial One-Stop Continues to Grow and Improve

The Geospatial One-Stop (GOS) portal is the official means for accessing metadata resources managed in the National Spatial Data Infrastructure Clearinghouse Network. Metadata held by Federal, State, tribal, and local entities, and by academic and nonprofit organizations and the private sector are published through

the Clearinghouse Network at geodata.gov.

Because of intergovernmental cooperation and support, the GOS portal continued its steady growth in fiscal year 2009 with the addition of about 50,000 individual metadata records contributed by 418 publishers, which is a 25 percent increase in the number of records over the previous year. The integration of GOS with Data.gov was a significant impetus behind this large increase in records. GOS plans to continue to work with Federal agency collections to promote their discovery in Data.gov.

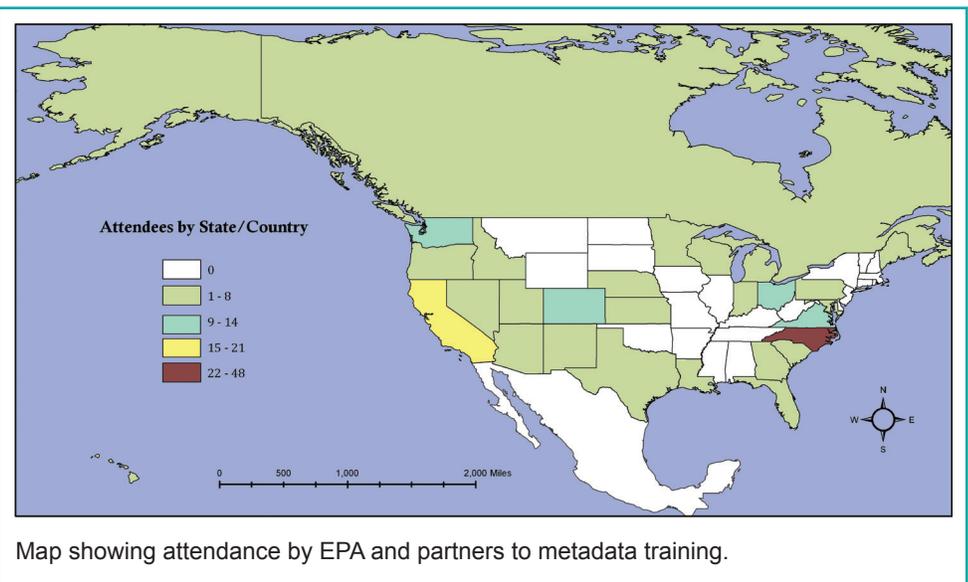
The efforts of the Interagency Working Group on Ocean and Coastal Mapping and the State GIS Inventory System also contributed significantly to GOS. GOS continued to focus on outreach and on increasing the participation of State and local governments. The GOS project team with the USGS Geospatial Liaisons initiated an effort to identify Web mapping services from State and local governments and to register them in GOS.

GOS averaged about 40,000 portal users per month. Several new ways of searching the GOS database were opened up this year. Besides accessing the GOS

data through Data.gov, a new GOS search widget can be embedded in any Web site to search GOS holdings. The search widget has been implemented by the State of Delaware (stateplanning.delaware.gov/dgdc/catalogue.shtml) and Westchester County, N.Y. (giswww.westchestergov.com/wcgis/DataWarehouse.htm).

Four CAP Grant awardees are focusing on external applications to access the GOS data catalog without using the GOS Web portal. For example, The Carbon Project is developing a GOS search gadget for use in Windows Vista® and Windows 7® operating systems, and MobiLaps LLC is integrating the GOS catalog with the National Aeronautics and Space Administration's (NASA's) WorldWind viewer. In addition, GOS continues to implement the map service checker. The service checker provides publishers with tools for checking the quality of metadata and Web mapping services. GOS portal search results are integrated with the checker.

These new enhancements provide value to the data-partnering opportunities available through the GOS Marketplace, which is a site where organizations can advertise their



interest in or intent to collect geospatial data and seek partners to share the cost. This year, the level of activity in the GOS Marketplace remained steady; approximately 2,100 records were available for discovery through the Marketplace and an estimated 238 contacts were made regarding possible partnerships for data acquisition.

Standards Press Forward

Standards are critical to the development, sharing, and use of geospatial data. The FGDC develops geospatial data standards for implementing the NSDI, in consultation and cooperation with State, tribal, and local governments; academic institutions; the private sector; and, to the extent feasible, the international community.

The FGDC Standards Working Group promotes and coordinates FGDC standards activities; provides guidance on FGDC standards policy and procedures; facilitates coordination between subcommittees having overlapping standards activities; and reviews and makes recommendations on the approval of standards proposals, committee-drafted standards for public review, and final draft standards for FGDC endorsement.

In fiscal year 2009, the FGDC Standards Working Group recommended endorsement of the final draft of the Wetlands Mapping Standard. The FGDC Steering Committee subsequently endorsed the Wetlands Mapping Standard in July 2009.

OMB Circular A-119, "Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities," directs Federal agencies to use voluntary consensus standards in lieu of standards that are unique to the Government whenever possible and to participate in voluntary consensus

standard activities. To that end, the FGDC and member agencies have joined the InterNational Committee for Information Technology Standards (INCITS) Technical Committee L1 on Geographic Information. INCITS Technical Committee L1 is the means by which Federal and non-Federal organizations participate in geospatial standardization activities through the ANSI and the ISO.

ISO and ANSI standardization activities provide the "building blocks" for developing standards for geospatial data themes, such as those identified in OMB Circular A-16. ISO and ANSI standardization activities have not been concerned with requirements unique to geospatial data themes.

INCITS 453-2009, the North American Profile (NAP) (ISO 19115:2003, Geographic Information—Metadata), was published in fiscal year 2009. U.S. and Canadian experts from INCITS Technical Committee L1 and its Canadian counterpart, the Canadian General Standards Board

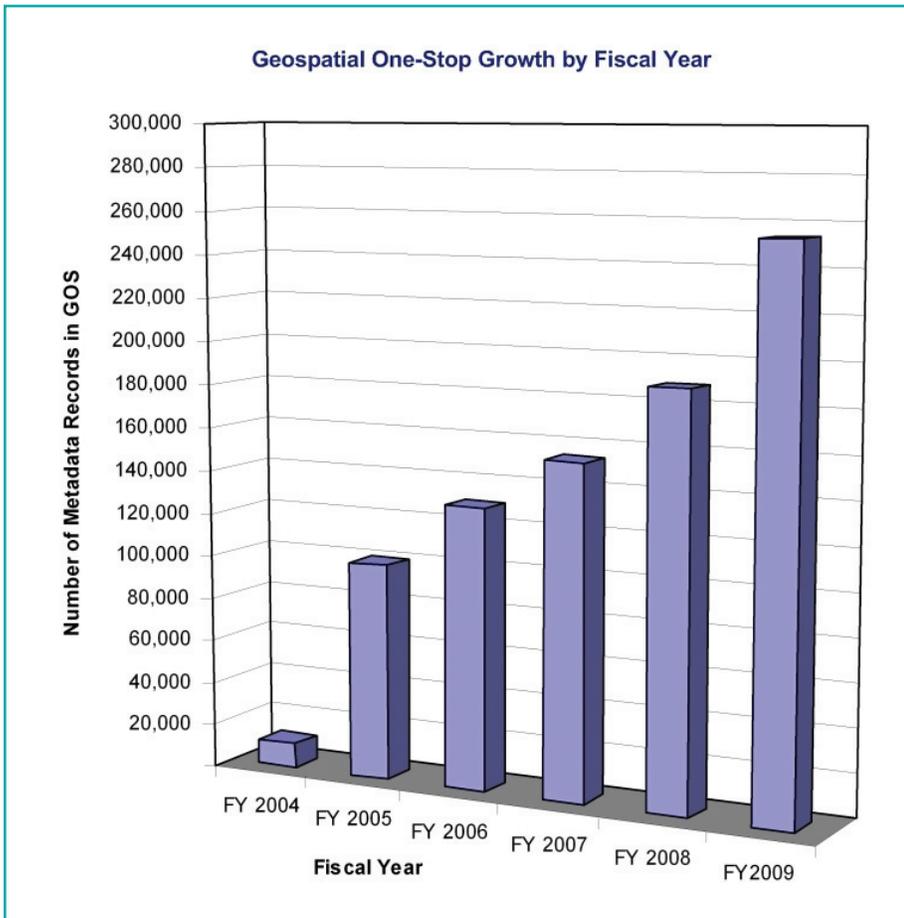
Committee on Geomatics, developed content to tailor ISO 19115:2003 to meet the requirements of both countries. Implementation of the NAP will advance as software tools are developed.

National Spatial Data Infrastructure Training Partnerships Remain Strong

The NSDI Training Program continues to offer courses in partnership with the NSDI CAP and the USGS Geospatial Liaisons, as well as with the Federal Emergency Management Agency (FEMA) and the U.S. Fish and Wildlife Service (FWS). The NSDI and metadata sessions are presented in courses offered six times per year at FEMA's Emergency Management Institute and in courses offered eight times per year at the FWS's National Conservation Training Center. These courses are also offered in the field twice a year. As part of FEMA's multihazard and risk assessment cadre, NSDI concepts are invaluable to the analysis of potential losses

The screenshot shows a web browser window displaying the State of Delaware Spatial Data Catalogue. The page features a search widget with the text "Search geodata.gov" and a list of data categories including "Map and Aerial Photo Inventory", "Delaware Census 2000 SF1 ArcIMS Service", "Delaware Census 2000 SF1 WMS Service", "Delaware 1954 Orthophotography", "Delaware Orthophotography Tile Index", "State Boundary Monument Data Base", "USGS Delaware Roads", "Digital Line Graph, Hydrography Layer (Quad-based; 1:24,000-scale)", and "USGS Delaware Contours". The page also includes a navigation menu on the left and a footer with contact information for Mike Mahaffie.

Graphic showing the GOS Search Widget that is embedded in the State of Delaware Spatial Data Catalogue. Photo credit: State of Delaware.



- Transportation—Roads (posted 2009)
- Governmental Boundaries (posted 2009)
- Hydrography (posted 2009)

Usage of the training modules is measured annually. For fiscal year 2009, metadata continued to be popular. The “Value of Metadata” and “What is Metadata?” modules had the highest number of downloads, and the “Introduction to Geospatial Web Services” module was the next most popular course.

Imagery for the Nation Takes Off

Imagery for the Nation (IFTN) is envisioned as a Federal program that is conducted in partnership with State and local governments to address the Nation’s basic business needs for imagery at 1-meter resolution and higher. The IFTN Phase 1 Project was initiated late in fiscal year 2008 to explore development of a comprehensive national imagery program, which requires an unprecedented level of cross-agency and cross-sector coordination and executive oversight.

The goal of the Phase 1 Project has been to complete an initial plan for community review by the close of fiscal year 2009. This plan will establish a foundation and a set of next steps for implementing IFTN. Specific goals of the Phase 1 Project are to define Federal imagery requirements and document expenditures, improve Federal imagery acquisition within existing resources and capabilities, define a pathway for IFTN implementation, institutionalize imagery funding, and model a process for Federal enterprise geospatial data acquisition efforts. Several accomplishments have been made toward these goals, including the following:

from flood, hurricane winds and earthquakes. These courses are well attended by students from Federal, State, tribal, and local governments.

The NSDI Online Training Program is a suite of training materials prepared in response to a requirements analysis conducted by the FGDC. The “NSDI Training Program Requirements Analysis Report” summarizes NSDI expectations and needs and outlines a core curriculum for the NSDI Training Program. Subject matter experts were identified to develop a set of lessons for each of the curriculum topics. Initial content development was focused on the development of introductory lessons for each of the topics. The program encourages users to take advantage of the lessons offered online and in the classroom. Users are asked to provide comments on the content and value of the lessons.

Suggestions for combining lessons into training courses and workshops are provided on the FGDC Web site.

The NSDI Training Program’s modules are reviewed and updated annually, and new modules are added as they become available. The modules below were created or updated during fiscal year 2009:

- Value of Metadata (2009-04-22)
- Discover and Access Data With Geospatial One-Stop (2009-06-23)
- Publishing to Geospatial One-Stop (GOS) (2009-08-26)
- Introduction to the CAP (version 2008-10-14)
- How to Submit a CAP Proposal (version 2009-04-20)
- How to Implement Your NSDI CAP Project (version 2009-06-26)
- Framework Data Themes:
 - Transportation Base Standard (posted 2009)

- A survey of Federal imagery requirements was conducted in the fall of 2008.
- Federal contract vehicles to acquire imagery products and services were surveyed.
- A survey of both airborne and satellite industries was conducted to determine the private sector capacity to implement IFTN. Results showed that two times or more capacity exists.
- A memorandum of understanding was signed between the U.S. Department of Agriculture and the U.S. Department of the Interior to help institutionalize funding for the 1-meter component of IFTN.
- A draft executive summary was presented by the IFTN work groups to the FGDC Executive Committee on December 19, 2008. Feedback and guidance were provided by the executives to further refine the 1-foot and higher resolution strategy and more fully define a governance process for IFTN.
- In August 2009, a record of decision was approved by the Executive Committee to finalize the program configuration, establish its governance, and document the basic agreements to complete the IFTN plan. A high-level funding strategy is being considered, as well as plans for a potential fiscal year 2011 budget initiative.

Plans under discussion for fiscal year 2010 include establishing a virtual project management office to implement the governance structure and advancing the funding strategy for full implementation in fiscal year 2011.

National Land Parcel Data Becomes a Priority

The primary goals of the FGDC Cadastral Subcommittee during fiscal year 2009 were to work in collaboration with cadastral data producers and stakeholders to implement policies and procedures for standardizing and sharing cadastral data.

The subcommittee maintained an inventory of contacts, cadastral status, Web sites, and related documents. This inventory is being migrated to the NSGIC GIS inventory (Ramona) to consolidate information into one system.

The subcommittee continued to work with the wildfire community to develop sustainable State-managed systems to provide standardized parcel data. These data are essential to the planning for and response to wildfires.

The subcommittee developed guidance for implementation of the cadastral standards in a series of documents that describe the State stewardship levels, roles, and responsibilities, and the activities required to achieve the different levels. This documentation was reviewed by the NSGIC parcel

work group and is being incorporated into the NSGIC 2009 survey of States.

Work is underway in seven Western States to standardize the Public Land Survey System (PLSS) data. This data conforms to the Cadastral Data Content Standard and publication guidelines and has been provided to the States for publication. The maintenance and stewardship roles for this data are being developed in cooperation with Federal, State, and local agencies. For a status map of the completed and planned PLSS standardization efforts, see page 35.

As recommended by the National Research Council in its study “National Land Parcel Data—A Vision for the Future” (2007), the Cadastral Subcommittee proposed creating the position of national land parcel

Success Stories

Data.gov

Challenge: The Federal Government creates huge amounts of data. Although these data are often generated and managed by a single agency, they are not always accessible to others outside the agency or else access requires significant effort. How can access to Federal data be improved and expanded to encourage creative use both within the Government and beyond its walls?

Action: The Data.gov Web site (www.data.gov) was established to increase public access to high-value, machine readable datasets generated by the executive branch of the Federal Government. The Federal geospatial community responded to the request for data from the Data.gov team by supplying tens of thousands of geospatial records with supporting metadata. This response leveraged components of the Geospatial One-Stop by using existing capabilities, thus avoiding data duplication and redundant storage. The Data.gov Web site now has three catalogs of data—“raw” data, geodata, and tools (including some geospatial tools).

Result: The inclusion of geospatial data on the Data.gov site means that public and private users can now use the Federal data access Web site for both non-spatial and geospatial Federal data, as well as tools that they can use for information access. The new portal will encourage new and innovative uses of Federal information and provide a better return on investment for the Federal data collections.

coordinator, as well as funding for three full-time positions at the U.S. Bureau of Land Management (BLM) to take on lead responsibilities for national coverage and stewardship of cadastral data.

The BLM completed the adoption of the PLSS and Parcel Data Standard. The standard was sent out for review within the BLM and was accepted following agency standard adoption procedures.

The subcommittee completed an inventory of the use of cadastral data by Federal agencies. This report led to the mortgage stakeholders meeting that was held in Washington, D.C., in May. The Federal agency use of cadastral data report was presented to the FGDC Steering Committee in August 2009.

Homeland Security and Emergency Management Readiness Improves

The FGDC Homeland Security Working Group (HSWG) continued to support the identification of geospatial information content, symbology, interface, and other specifications, guidelines, and standards required to ensure that geospatial information technologies support the homeland security mission.

The Homeland Security Infrastructure Program (HSIP) dataset was reviewed by members of the HSWG to develop a series of overarching principals related to nationally significant data themes. Coordination and the development of the HSIP have been a joint effort of the Department of Homeland Security (DHS), the National Geospatial-Intelligence Agency (NGA), and the USGS.

For the Geospatial Data Model (GDM) and the National Information Exchange Model (NIEM), the HSWG members were available to review modifications

and new releases to the data model. The GDM was originally based on the data models developed by the NIEM, the FGDC Framework Data Content Standards, and the Project Bluebook Model. The DHS released version 2.7 of the GDM logical data model, which was harmonized with the new release of HSIP version 2008, including more than 340 geospatial datasets that are pertinent to the mission of homeland security and homeland defense.

HSWG members were given the opportunity to review other GDM activities, including the development of the Schema Generation Tool (SGT), which is a Web-based tool that generates GIS-ready data schema directly from the DHS GDM logical model. This tool has been revised over the course of the past year to include the updates to GDM Version 2.6 and 2.7. By incorporating the SGT into their workflow, State and local users can either transition their existing model into a DHS conformant data model or use the tool to implement a standards-based model as the basis for sharing data. The SGT is supported by the FGDC. Additional information about the tool can be found on the FGDC Web site at www.fgdc.gov/participation/working-groups-subcommittees/hswg/dhs-gdm/index_html.

The HSWG performed the original development of the 2006 Homeland Security Mapping Standard—Point Symbology for Emergency Management (ANSI INCITS 415-2006), which was sponsored by FEMA. To further advance this American National Standard, the HSWG will review the findings of a DHS-funded initiative to establish a symbology expansion process whereby additional categories of homeland security-related data may be used to establish standardized symbol sets.

Challenges and Opportunities for a Dynamic National Spatial Data Infrastructure

Since the early 1990s, establishing the National Spatial Data Infrastructure (NSDI) has been the basis for leveraging and applying geospatial data, technologies, and analysis to national issues. The NSDI is broadly defined in Executive Order 12906 as the *“technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data.”*

Many entities use geospatial information as a tool for effective decisionmaking. Consequently, reliable, accurate, and readily accessible spatial information about the world around us is coming to be an integral and expected part of the information systems we use to make decisions. These decisions range in complexity from the simple choice of where to go for a social event, to significant financial and societal choices, such as where a business should locate its new office, where a State should perform transportation improvements, and how the Federal Government can best invest in the Nation’s future.

Of central importance in the decision of whether to support improved collection and use of geospatial technology and data is the most basic of questions: How does geospatial information help us make decisions?

For example, think of the daily commute. When you leave for work, you know where you are going and you have a concept of how you will get there. You also know approximately how long it will take to reach your destination, how close you will be to the others with whom you will interact on the way, and, throughout the journey, you know where you are.

In a similar way, efficient and effective use of geospatial data and technology across the Federal Government helps our Nation understand its situation properly; in essence, it helps us know “where we are.” Knowing where we are is a basic premise of a successful NSDI, and it is a major challenge. Our Nation depends on a spatial data infrastructure of hardware and software, and relies on large stores of data that come from myriad sources and on the analysis of that data (the real advantage of geospatial information).

Those at the highest levels of the Federal government are showing renewed interest in geospatial capabilities. This interest is reflected in recent Congressional hearings, the use of geospatial capabilities in two of the Administration’s key initiative public applications (Data.gov and Recovery.gov), and the recent award of a geospatial SmartBUY contract vehicle available to Federal, State, tribal, and local governments. The efforts of many Government agencies and the private sector to bring about geospatial private/public partnerships reflects a reality that the NSDI is not intended to be only a Federal effort. The challenge facing the geospatial community now is how to realize the vision of the NSDI by maturing it from the conceptual stage to the stage at which it becomes a part of the fabric of our daily business and can be used to help manage our national resources better and make the work of the Government more effective and efficient.

While geospatial coordination efforts by the Federal Government go back more than 100 years, the FGDC was established in the early 1990s to

address the need for a coordinated spatial data infrastructure particularly as digital spatial information was becoming more prevalent. In 2009, the attempt to build an NSDI still faces significant challenges that the geospatial community as a whole needs to confront and solve in order to realize the NSDI vision. These major challenges are outlined below.

Educate the public and policymakers about the NSDI

The question that the public and policymakers want answered is: Why should the Government be investing public money and resources in an expensive, complex, and somewhat intimidating technology when there are so many other competing investment areas?

On the other hand, because an estimated 80 percent of all Government information has some geospatial component, the real question, perhaps, is not why should we invest, but why are we not leveraging the investments already being made? Communicating and educating our leadership and policymakers on the use, return on investment, and increased reliability of decisions made with geospatial information (as opposed to decisions made without this information) is as important to achieving the vision of the NSDI as getting the champions and the required funding.

Improve the development strategy for the NSDI

The concept of an NSDI is not unique to the United States. More than 50 countries have developed their own NSDI, and each is at a different level of maturity. To be successful, an NSDI requires strong senior

leadership; dedicated resources; a commitment to public and private partnerships; a strategic national plan; a successful model of shared data, infrastructure, and resources; and a clear understanding of the goals. In fiscal year 2010, the FGDC will begin planning for the development of a new policy and strategy for geospatial information. This strategy will be designed to encompass the requirements and leverage the capabilities of the Federal, State, tribal, and local governments and the private sector into an NSDI that is among the best in the world.

Find national leaders who will champion the NSDI

The coordination of dozens of Federal agencies, programs, national initiatives, and constituent bodies and interests requires strong Government leadership. Over the years, many champions have helped define the NSDI, raised its level of visibility, pushed important initiatives (such as Imagery for the Nation), and established valuable advisory and leadership groups. The NSDI is at a stage of unprecedented participation, expectation, and demand. Political-level champions are now needed who recognize the NSDI's worth and strategic value to the Nation and can help make a positive difference in moving it forward. Champions can help develop funding authorizations, provide oversight, and introduce potential legislation that supports the NSDI.

Incorporate strategic and business planning more effectively at the Federal level

A number of valuable efforts across all levels of government, constituent groups, and the private sector have worked for the past two decades to implement components of the NSDI. This work has been conducted using grassroots efforts and resources leveraged with other programs. It is time to define an operational

model for the NSDI so that defined and measured goal-based and requirements-based implementation can occur.

The FGDC has supported the creation of strategic and business plan guidelines for the statewide geospatial coordination councils. A similar process at the Federal level could be equally beneficial. It would bring the entire geospatial community together through coordination and consensus building and gain credibility for the program among executive and congressional leadership.

Define specific measurable outcomes and monitor the progress of NSDI development

The FGDC is tasked with reporting on the progress of the NSDI. With the current focus on Government accountability and transparency, it is important to define the metrics and measures necessary for effective and transparent management of the NSDI.

Also, as the implementation of the NSDI begins to move forward, its progress must be monitored to ensure that we are on track with our goals, are meeting the defined requirements, and are implementing the technology appropriately. This should be done as each of the NSDI components is addressed. Defining the metrics and measures will make it possible to track and monitor the condition of the Federal geospatial enterprise; specifically, those assets available to the Federal Government that can be brought to bear against any issue, emergency, or decision. Only in this way will we know when to adjust our efforts to meet new and changing national priorities.

Develop a working model for the next generation of public/private partnerships

A national geospatial strategy requires partnership with, and effective understanding and use of, private

sector capabilities. How might the geospatial community establish the next generation of public/private partnerships to enable it to find solutions to such issues as competing services, data licensing, information retention, nonpropriety services, personal information protection, system security, and other potential roadblocks?

It is time to develop and implement new working models of public/private participation for developing data and services, such as Web hosting and archiving. The NSDI and the requirements for Federal Government data are driven by public domain access, but creative access solutions may exist that support both private and Government requirements. Furthermore, the Government must consider commercial solutions because in some cases they can be more cost effective, promote fair and open competition, and can address those areas of service that may fall to the Government to maintain, such as historic data preservation. The Government will need to ensure that rural and under-served areas receive equitable data and services because these areas are often not as profitable to the private sector. FGDC should renew efforts to foster productive partnerships with the private sector that advance the NSDI.

Encourage greater participation from Federal agencies

A persistent hurdle in developing the NSDI is the lack of necessary support from Federal employees who support the NSDI as a secondary activity. Most Federal employees who provide time and leadership for NSDI development have other primary responsibilities outside of the geospatial arena against which they are measured. How can we establish a pool of dedicated Federal personnel with the required expertise who have the freedom to focus on the development of the NSDI and the Federal geospatial portfolio?

Even though Federal participation in the FGDC is directed by Office of Management and Budget (OMB) Circular A-16, and although Executive Order 12906 directs Federal agencies to adopt and support the NSDI and its components, this direction falls short of dedicating or enforcing participation by the Federal agencies. This shortfall is reflected in the inconsistent and variable participation in the FGDC coordinating bodies (although some agencies have provided both leadership and implementation-level support). Currently, Federal geospatial coordination relies on a limited number of agencies and personnel taking the brunt of the effort, which has a tendency to limit perspective and resources. The participation model needs to change in order to bring about the required level of participation and expertise for effective Federal geospatial coordination.

Change the paradigm for Federal participation

All Federal agencies have a defined mission that they support and upon the success of which Federal employees are held accountable. If the agency is not successful in achieving its mission, the consequences can be dire for both the program and the personnel. The existing paradigm encourages agencies not to share data, infrastructure, applications, and resources because shared resources are at higher risk of loss and therefore add higher risk of failure to the participating programs. How do we change this paradigm so that the sharing of resources is encouraged, rewarded, and an expected part of Federal program operating models?

Geospatial capabilities are used daily at the front lines of our Nation's defenses. They are used and shared by multiple entities within and across the defense agencies. Why does this sharing of resources appear to be so "easy" within the defense establishment and so much more

difficult in the civilian domain? The answer is accountability; the idea that if one fails, all lose.

For many reasons, geospatial information also lends itself to being a shared and multiagency-managed Federal commodity. With respect to geospatial information, therefore, an agency's success or failure affects the success or failure of the other agencies that use or rely on the information the agency produces or manages. Such mutual dependency encourages coordination, collaboration, and efficiency.

Develop a "fast-track" method for creating standards

Whether they are for data, interoperability, documentation (metadata), Web services, or other geospatial technology, standards are the cornerstone of any Federal geospatial enterprise. How do we revamp the current standards development, review, and update process to adapt it to a fast-moving area of technology that encompasses a very broad range of disciplines?

The FGDC works with national and international standards bodies to identify, develop, and adapt new and existing standards to meet U.S. requirements. When no national or international standard for geospatial data exists to meet the U.S. demand, the FGDC uses its own process to develop, draft, vet, and approve a new standard. Currently, the FGDC's standards process includes 12 steps, and producing a final standard using these steps may take several years, depending on a number of variables. This process is very similar to the processes used by other national and international standards bodies and was built on their best practices. The process is rigorous but makes it difficult to accommodate rapidly changing technologies. There may be opportunities to leverage new social media capabilities to help expedite

the standards process while still maintaining the rigor needed to ensure the legitimacy of a standard.

Summary

The challenges listed above and others related to geospatial coordination and the NSDI are faced daily and must be addressed to move forward with development of the NSDI. Strong, high-level leadership; implementable, goal-based strategies; shared responsibility and accountability; education and outreach; improved processes; and more effective public/private partnerships are all part of the next generation NSDI.

FGDC Goals for Fiscal Year 2010

1. Advance the Geospatial Line of Business

The Geospatial Line of Business (Geospatial LoB) work plans are in place and funding is approved for five work groups for fiscal year 2010. The major goals include:

- Establish at least one additional multiagency enterprise license agreement for the geospatial community.
- Develop a repeatable process for adjusting Office of Management and Budget (OMB) Circular A-16, Appendix E themes and associated datasets.
- Submit a proposal for Governmentwide lifecycle management of significant geospatial datasets.
- Develop a timeline for changes to Federal Acquisition Regulations and Defense Federal Acquisition Regulations or additions to contracts with approval from the OMB.
- Develop requirements and a prototype for trusted geospatial Web services to support nationally significant geospatial datasets.

2. Collaborate with the National Geospatial Advisory Committee

The National Geospatial Advisory Committee (NGAC) plans to hold three or four public meetings in fiscal year 2010. The FGDC will continue to manage the review, disposition, and implementation of NGAC recommendations. The NGAC will assist in coming up with a concept for a new national policy and strategy for geospatial information. This complex activity will likely be a major focus of the NGAC in the upcoming year. The next cycle of NGAC nominations and

appointments will be completed. The NGAC will review and make recommendations on key geospatial policy and management issues, and the FGDC will review and respond to advice and recommendations from the NGAC.

3. Kickoff Development of a National Policy and Strategy for Geospatial Information

The FGDC, with recommendations and input from the NGAC, will develop an initial framework for a national policy and strategy for geospatial information to advance the development of the National Spatial Data Infrastructure (NSDI). The FGDC intends to hold a national geospatial open forum, using social media techniques, to bring together the best ideas from around the country on how to enhance the NSDI and the national geospatial strategy.

4. Transition the Fifty States Initiative

In fiscal year 2010, five new Fifty States Initiative awards are planned, with a kickoff meeting scheduled for March 2010. In addition, a transition for the initiative is planned—to transition from the initial strategic and business plans toward implementation. Efforts will focus on actions recommended in the Next Steps report, which was released in September 2009, and to advance best practices for implementation of business plans.

5. Advance International Activities

The FGDC will continue to support the GSDI Association small grant program and the monthly regional electronic newsletter program along with the 12th international GSDI conference, which

will be held in Singapore in October 2010. In addition, the FGDC will continue its collaboration with foreign agency counterparts.

6. Improve Geospatial One-Stop

Goals for Geospatial One-Stop (GOS) for fiscal year 2010 include integration of GOS with the new Viewer, continuing enhancements and improvements in the operation of the portal, and integration of Data.gov requirements. The new Viewer will become the primary map viewer for GOS. It will use the new *The National Map* base maps and provide improved performance and interoperability. New GOS portal enhancements will leverage Web 2.0 technologies for building communities and content management. The service status checker will be expanded to test more types of Web mapping services, as well as metadata catalog services that feed into GOS. Overall goals of GOS are to improve the quality of live data and map services and to increase portal usage.

7. Advance the Development and Acceptance of Standards

The following standards documents are expected to be completed in fiscal year 2010:

- Final drafts of the Federal Trails Data Standard and Shoreline Data Content Standard
- Working draft of the Cultural Resources Geospatial Data Content Standard
- Committee draft of the Coastal and Marine Ecological Classification Standard
- Committee draft of the Address Data Standard

8. Implement Imagery for the Nation

The goal of the Imagery for the Nation (IFTN) Phase 1 Project is to complete an initial plan for community review by the close of fiscal year 2009. Plans under discussion for fiscal year 2010 include establishing a virtual project management office to implement the governance structure and to advance the funding strategy for full implementation in fiscal year 2011.

9. Advance National Land Parcel Data

For fiscal year 2010, the focus for advancing the development of a national land parcel system is to establish sustainable standard cadastral datasets provided by States and consumable by Federal, State, tribal, and local government agencies, private citizens, and other users. These efforts will include working cooperatively within the Fifty States Initiative to provide standard datasets that originate from Federal, State, and local sources and support national and regional applications. Work will continue with business applications that consume cadastral data, including energy, wildland fire, and mortgage crisis response. In addition, planning will start on ways to support the assembly and standardization of Federal parcel data.

10. Support Homeland Security and Emergency Management

The FGDC Homeland Security Working Group's goals and activities for fiscal year 2010 include the following:

- Review the Geospatial Data Model (GDM), including physical data model implementations, GDM documentation, National Information Exchange Model (NIEM) integration, and development of automated Web-based tools intended to help users adopt the Department of Homeland Security (DHS) GDM and NIEM.

- Review the DHS-sponsored Homeland Security Symbology Standardization process and symbol set evaluation.
- Participate in the NSDI Cooperative Agreements Program (CAP)
- Support a national implementation of the U.S. National Grid.

Success Stories

Recovery.gov

Challenge: In the midst of the ongoing economic crisis in the United States, the American Recovery and Reinvestment Act (ARRA) of 2009 made a significant financial investment in our country's future. To foster greater accountability and transparency in the use of these funds, the Recovery Accountability and Transparency Board (RATB) established a public Web site (www.recovery.gov). How can Federal Recovery investments (contracts, grants, and loans) be portrayed and understood in their geographic context in relation to other data?

Action: Early in the planning for the Recovery.gov Web site, the FGDC's Executive Committee provided advice concerning the planned site's capabilities to ensure that geospatial viewing and analysis tools would be available to the public. The FGDC then established a team that would share its geospatial expertise and provide representation on the Recovery.gov development team. The FGDC team developed geospatial use cases for the site and provided basic guidance to Federal agencies to help ensure a consistent look and feel among the central site's geospatial interface and the other Federal agencies' individual recovery reporting sites.

Result: The FGDC's consistent geospatial interaction with the Recovery.gov development team led to the establishment of new geospatial mapping capabilities on the Recovery.gov site. For example, Government users and the public can use a geospatial map interface to search for ARRA-funded projects throughout the country. Thus, the power of spatial visualization and analysis is part of the ARRA's accountability and transparency reporting toolbox.



Example of a map from the Recovery.gov Web site that shows where expenditures are being made.

Appendix A

FGDC Leadership Profiles



Karen Siderelis

Geographic Information Officer, U.S. Department of the Interior
Acting Chair, FGDC Steering Committee and Executive Committee

Ms. Karen Siderelis became the first Geographic Information Officer for the Department of the Interior when she was appointed to the position in September 2008. She previously served as Associate Director for Geospatial Information and Chief Information Officer for the U.S. Geological Survey. Before that, she was Director of the North Carolina Center for Geographic Information and Analysis. She earned her master's and bachelor's degrees from the University of Georgia.



Michael Howell

Deputy Administrator for Electronic Government and Information Technology
Office of Management and Budget
Acting Vice Chair, FGDC Steering Committee and Executive Committee

Mr. Michael Howell was the Chief Information Officer for the Department of the Interior and previously served as Chief Information Officer for the U.S. Fish and Wildlife Service. His career began with the U.S. Forest Service. He graduated in 1977 from Pennsylvania State University with a bachelor of science degree in forest science.



Ivan B. DeLoatch

Executive Director
Federal Geographic Data Committee

Mr. Ivan B. DeLoatch previously served as Chief of the Data Acquisition Branch in the U.S. Environmental Protection Agency's Office of Environmental Information. He earned a bachelor of science degree in biology from Bowie State University.

FGDC Executive Committee

Picture
Not
Available



Daniel M. Cotter
Chief Technology Officer
U.S. Department of Homeland Security

Mr. Daniel M. Cotter is responsible for the Department of Homeland Security enterprise architecture, enterprise data management, and geospatial programs. He holds a master's degree in business administration from Texas A&M University and a master of science degree in geospatial and cartographic sciences from George Mason University. He is a Fellow of the American Association for the Advancement of Science.



Charles J. Gay
Deputy Associate Administrator for the Science Mission Directorate
National Aeronautics and Space Administration

Mr. Charles J. Gay was previously Deputy Director of the Office of System Safety and Mission Assurance at Goddard Space Flight Center. He received a bachelor's degree in civil engineering and a master's degree in structural engineering from the University of Maryland.

Jerry J. Johnston
Geographic Information Officer
U.S. Environmental Protection Agency

Dr. Jerry J. Johnston holds a master's degree and doctorate in environmental science from Indiana University, Bloomington, as well as a bachelor of science degree in environmental science from Michigan State University. He is a member of the National Geospatial Advisory Committee.

FGDC Executive Committee (continued)



Joseph F. Klimavicz

Chief Information Officer and Director, High Performance Computing and Communications, National Ocean and Atmospheric Administration
U.S. Department of Commerce

Mr. Joseph F. Klimavicz previously served at the U.S. Department of Defense as the National Geospatial-Intelligence Agency Deputy Chief Information Officer. He received a bachelor of science degree and a master's degree in engineering from Virginia Polytechnic Institute and State University.



Stephen Lowe

Associate Chief Information Officer for Technology Planning, Architecture, and E-Government
U.S. Department of Agriculture

Mr. Stephen Lowe holds graduate degrees in management of information technology (University of Virginia) and public administration (Virginia Polytechnic Institute and State University). He also holds a bachelor of political science degree from James Madison University.



Steven P. Wallach

Technical Executive
U.S. Department of Defense

Mr. Steven P. Wallach serves on the National Geospatial-Intelligence Agency's Executive Committee. He holds a master's degree in computer resources management from Webster University and is a graduate of the Armed Forces Staff College and the Industrial College of the Armed Forces. He is a member of the National Geospatial Advisory Committee.

Appendix B

FGDC Structure and Membership

The Federal Geographic Data Committee (FGDC) operates under Office of Management and Budget (OMB) Circular A-16 (revised August 2002). The circular incorporates Executive Order 12906 and reaffirms the FGDC's role to provide leadership for the National Spatial Data Infrastructure (NSDI) and coordinate the development, use, sharing, and dissemination of the Nation's geospatial data. The effective use of geospatial information requires close coordination among the many agencies involved in its development.

State, tribal, and local governments, as well as industry and academic and professional groups. All participants initiate and (or) support the following activities that are crucial to expanding the NSDI:

- Developing and establishing the National Geospatial Data Clearinghouse on the Internet.
- Developing and implementing standards.

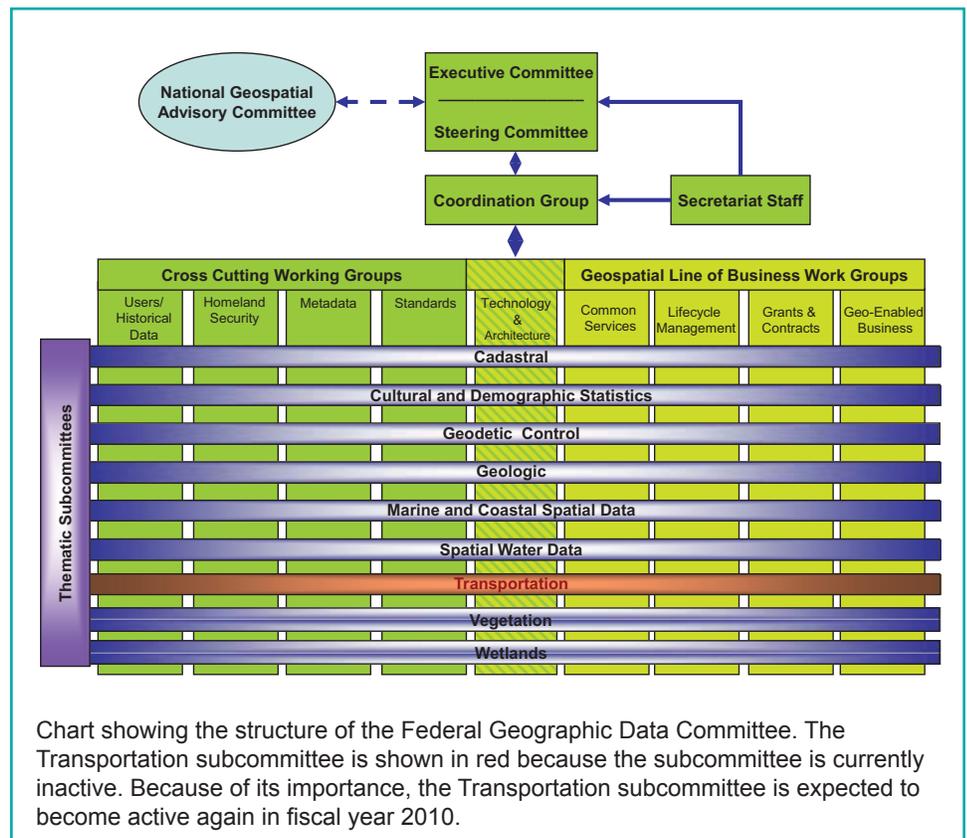
- Creating a national digital geospatial data framework. The framework covers seven fundamental geographic themes: cadastral information, elevation, geodetic control, governmental units, hydrography, orthoimagery, and transportation.
- Promoting collaborative relationships for sharing geospatial data among non-Federal partners.
- Developing policies and processes to better harmonize collective action.

FGDC Structure

The FGDC is governed by a Steering Committee that sets the FGDC's high-level strategic direction. The Executive Committee, which is a subset of the Steering Committee, provides advice and guidance to the Chair and the Vice Chair.

The National Geospatial Advisory Committee (NGAC) is a Federal advisory committee that provides advice and recommendations on Federal and national geospatial programs. The FGDC Coordination Group conducts the FGDC's day-to-day business. The work of the Coordination Group is facilitated by the FGDC Secretariat, which is located at the U.S. Geological Survey in Reston, Va.

The FGDC infrastructure also includes committees, agency-led working groups and subcommittees, Geospatial Line of Business Work Groups, and collaborating partners that represent



Steering Committee

The FGDC Steering Committee is the policy-level interagency group that is responsible for overseeing OMB Circular A-16-related activities and implementation of the NSDI. It provides executive leadership and establishes policy to coordinate geospatial activities within, between, and among Federal agencies. The Steering Committee meets three to four times per year in Washington, D.C., and is composed of senior agency officials for geospatial information.

The Secretary of the Interior or designee chairs the FGDC Steering Committee, which is composed of representatives from Federal organizations, including the Executive Office of the President and Cabinet-level and independent Federal agencies. The Deputy Director for Management of the OMB or designee serves as Vice Chair.

A subset of the Steering Committee, the Executive Committee, meets more frequently and is responsible for providing guidance and helping move forward critical decisions. The Executive Committee makes recommendations to the Steering Committee and provides a focal point for coordination with the NGAC.

2009 Steering Committee Members

Acting Chair, U.S. Department of the Interior	www.doi.gov	Karen Siderelis
Acting Vice Chair, Office of Management and Budget	www.omb.gov	Michael Howell
Federal Communications Commission	www.fcc.gov	Julius Knapp
General Services Administration	www.gsa.gov	*Diane Herdt
Library of Congress	www.loc.gov	John Hébert
National Academy of Sciences	www.nas.edu	vacant
National Aeronautics and Space Administration	www.nasa.gov	*Charles Gay
National Archives and Records Administration	www.archives.gov	*Michael Kurtz
National Capital Planning Commission	www.ncpc.gov	vacant
National Science Foundation	www.nsf.gov	*Clifford Jacobs
Nuclear Regulatory Commission	www.nrc.gov	*Darren Ash
Office of Personnel Management	www.opm.gov	*Janet Barnes
Small Business Administration	www.sba.gov	*Deborah Anderson
Smithsonian Institution	www.si.edu	*vacant
Social Security Administration	www.socialsecurity.gov	*Linda Maxfield
Tennessee Valley Authority	www.tva.gov	*Roy Teal
U.S. Agency for International Development	www.usaid.gov	*vacant
U.S. Army Corps of Engineers	www.usace.army.mil	James Dalton
U.S. Department of Agriculture	www.usda.gov	*Stephen Lowe
U.S. Department of Commerce	www.commerce.gov	*Joseph Klimavicz
U.S. Department of Defense	www.defenselink.mil	*Steven Wallach
U.S. Department of Education	www.ed.gov	*Stuart Kerachsky
U.S. Department of Energy	www.doe.gov	*Thomas Pyke
U.S. Department of Health and Human Services	www.dhhs.gov	*John Teeter
U.S. Department of Homeland Security	www.dhs.gov	*Daniel Cotter
U.S. Department of Housing and Urban Development	www.hud.gov	*Raphael Bostic
U.S. Department of Justice	www.usdoj.gov	*Harrell Watkins
U.S. Department of Labor	www.dol.gov	*vacant
U.S. Department of State	www.state.gov	*Susan Swart
U.S. Department of the Treasury	www.treasury.gov	*Lawrence Gross
U.S. Department of Transportation	www.dot.gov	*Steven Dillingham
U.S. Department of Veterans Affairs	www.va.gov	*Mark Gorenflo
U.S. Environmental Protection Agency	www.epa.gov	*Jerry Johnston

*Designated senior agency official for geospatial information.

Coordination Group

The FGDC Coordination Group provides advice on the day-to-day business of the FGDC to facilitate interagency coordination and implementation of the NSDI at the operational level. It also helps oversee the work of the FGDC subcommittees and working groups, as well as Geospatial Line of Business Work Groups. The Coordination Group meets monthly in Washington, D.C., and is composed of representatives from Federal agencies and collaborating partners.

2009 Coordination Group Members

Federal Communications Commission	Donald Draper Campbell
Federal Energy Regulatory Commission	Susan Tseng
General Services Administration	John D'Alessandro
Library of Congress	Colleen Cahill
National Academy of Sciences	vacant
National Aeronautics and Space Administration	vacant
National Archives and Records Administration	Brett Abrams
National Capital Planning Commission	Shane Dettman
National Science Foundation	vacant
Nuclear Regulatory Commission	Stuart Reider
Office of Management and Budget	vacant
Office of Personnel Management	vacant
Small Business Administration	Trisha Christian
Smithsonian Institution	vacant
Social Security Administration	David Timmons
Tennessee Valley Authority	Charles Smart
U.S. Agency for International Development	vacant
U.S. Department of Agriculture	Dennis Crow
U.S. Department of Commerce	Tony LaVoi
U.S. Department of Defense	William Mullen
U.S. Department of Education	Tai Phan
U.S. Department of Energy	David Morehouse
U.S. Department of Health and Human Services	vacant
U.S. Department of Homeland Security	Jeff Booth
U.S. Department of Housing and Urban Development	Jon Sperling
U.S. Department of the Interior	Robert Pierce
U.S. Department of Justice	Rani Balasubramanyam
U.S. Department of Labor	Edward Hugler
U.S. Department of State	Ray Milefsky
U.S. Department of the Treasury	vacant
U.S. Department of Transportation	Mark Bradford
U.S. Department of Veterans Affairs	Dat Tran
U.S. Environmental Protection Agency	Wendy Blake-Coleman

Secretariat Staff

The FGDC Secretariat staff provides support for the FGDC and performs the following tasks:

- Administers the FGDC standards program
- Initiates and participates in FGDC subcommittees and working groups
- Drafts policies and procedures for consideration and approval by the Coordination Group, the Steering Committee, and the Executive Committee
- Provides support to the NGAC
- Administers the NSDI Cooperative Agreements Program (CAP)
- Administers the FGDC International Spatial Data Infrastructure program
- Manages the NSDI training and outreach program
- Maintains the FGDC Web site
- Manages all administrative requirements associated with scheduling and conducting meetings
- Undertakes staff analysis, technical development, and other activities on behalf of the Coordination Group

2009 Secretariat Staff

Executive Director	Ivan DeLoatch
Deputy Executive Director	Kenneth Shaffer
Senior Advisor	John Mahoney
Program Assistant	Carol Greenough
Program Assistant	Vanessa Hardnett
Program Analyst	Arista Salimi Maher
Technology Advisor	Douglas Nebert
FGDC Interagency Liaison	Patricia Phillips
Framework and Cooperating States Coordinator	Milo Robinson
Metadata Coordinator	Sharon Shin
Standards Coordinator	Julie Binder-Maitra
Training and Education/Tribal Liaison Coordinator	Bonnie Gallahan
NSDI CAP Coordinator	Brigitta Urban-Mathieux
Volunteer (International Coordination)	Alan Stevens
Visiting Scientist GSDI	Wonkug Baek
Student Assistant	Steven Hak
Webmaster	Vaishal Sheth
Senior Program Analyst	Lewis Sanford
Program Analyst	Roxanne Lamb

National Geospatial Advisory Committee

The National Geospatial Advisory Committee (NGAC) was established under the Federal Advisory Committee Act and is sponsored by the U.S. Department of the Interior. It is an advisory body that provides advice and recommendations on Federal geospatial policy and management issues and a forum to convey views representative of partners in the geospatial community. NGAC membership includes representatives from 28 Government and nongovernmental organizations. The committee holds public forums to discuss geospatial activities and solicits input from State, tribal, regional, and local governments, academic institutions, and the private sector.

National Geospatial Advisory Committee Mission Statement

The mission of the NGAC is to provide strategies for the creation, management, and dissemination of cohesive geospatial data, information, and knowledge to enable commercial, academic, and nonprofit organizations and all levels of government to more effectively—

- Empower and serve the public
- Protect the homeland
- Foster economic growth
- Advance science
- Manage the Nation’s resources
- Govern the Nation
- Prepare for and respond to emergencies

2009 National Geospatial Advisory Committee Members

Anne Hale Miglarese, Chair	Booz Allen Hamilton Inc.
Steven Wallach, Vice Chair	National Geospatial-Intelligence Agency
Sean Ahearn	Hunter College—City University of New York
Bull Bennett	North Dakota Association of Tribal Colleges
Michael Byrne	State of California
Allen Carroll	National Geographic Society
Richard Clark	State of Montana
David Cowen	University of South Carolina
Jack Dangermond	Environmental Systems Research Institute, Inc.
Donald Dittmar	Waukesha County, Wisconsin
Dennis Goreham	National States Geographic Information Council
Kass Green	The Alta Vista Co.
Randall L. Johnson	Metropolitan Council, St. Paul, Minnesota
Randy Johnson	Hennepin County, Minnesota
Jerry Johnston	U.S. Environmental Protection Agency
Barney Krucoff	District of Columbia
Timothy Loewenstein	Buffalo County, Nebraska
David Maune	Dewberry
Charles Mondello	Pictometry International
Zsolt Nagy	State of North Carolina
Kimberly Nelson	Microsoft Corp.
Matthew O’Connell	GeoEye, Inc.
John Palatiello	Management Association for Private Photogrammetric Surveyors
Jay Parrish	State of Pennsylvania
Michael Ritchie	Photo Science
David Schell	Open Geospatial Consortium Inc.
Eugene Schiller	Southwest Florida Water Management District
Christopher Tucker	Consultant

Note: Ivan DeLoatch, Executive Director, Federal Geographic Data Committee, is the NGAC Designated Federal Official.

Thematic Subcommittees

OMB Circular A-16 enumerates 34 data themes of national significance and assigns responsibility for each of the themes to one or more Federal agencies. FGDC thematic subcommittees are established for nine of the data themes.

Federal agencies lead the thematic subcommittees; each subcommittee focuses on a particular NSDI spatial data theme. Lead agency responsibilities and new data themes may be added or altered by FGDC recommendation and OMB concurrence.

Definitions of the nine active thematic subcommittees appear in the chart opposite. The Transportation subcommittee is currently inactive. Because of its importance, the subcommittee is expected to become active again in fiscal year 2010.

Thematic Subcommittees by Lead Agency and Definition

*Cadastral	DOI BLM	The geographic extent of past, current, and future right, title, and interest in real property; the framework to support the description of that geographic extent. Geographic extent includes survey and description frameworks.
Cultural and Demographic Statistics	DOC USCB	Geospatially referenced data that describe characteristics of people: nature of structures in which they live and work; economic and other activities they pursue; facilities they use to support their health, recreational, and other needs; environmental consequences of their presence; boundaries, names, and numeric codes of geographic entities used to report information collected.
*Geodetic Control	DOC NOAA	Common reference system for establishing coordinates for all geographic data. All NSDI framework data and users' applications data require geodetic control to accurately register spatial data. The National Spatial Reference System is the fundamental geodetic control for the United States.
Geologic	DOI USGS	Geologic mapping information and related geoscience spatial data that can contribute to a National Geologic Map Database as pursuant to Public Law 106-148.
Marine and Coastal Spatial Data	DOC NOAA	The subcommittee, through its member agencies and the FGDC, develops strategic partnerships, relevant standards, collaborative tools, and outreach that will enhance access to and utility of coastal and ocean framework data.
*Spatial Water Data (Advisory Committee on Water Information)	Co-leaders: DOI USGS and USDA NRCS	The Advisory Committee on Water Information (ACWI) advises the Federal Government, through DOI USGS, on the coordination of Federal water information programs. The purpose of ACWI is to represent the interests of water information users and professionals on activities and plans related to Federal water information programs and the effectiveness of those programs in meeting the Nation's water information needs.
*Transportation	DOT BTS	Used to model geographic locations, interconnectedness, and characteristics of transportation systems in the United States; includes physical and nonphysical components representing all modes of travel that enable movement of goods and people between locations.
Vegetation	USDA Forest Service	Collection of plants or plant communities with distinguishable characteristics that occupy an area of interest. Existing vegetation covers or is visible at or above land or water surface and does not include abiotic factors that tend to describe potential vegetation.
Wetlands	DOI FWS	Provides classification, location, and extent of wetlands and deepwater habitats; no attempt is made to define the proprietary limits or jurisdictional wetland boundaries of any Federal, State, or local agencies.

* Indicates framework theme.

Note: Abbreviations are defined in the glossary in Appendix D.

FGDC Working Groups

FGDC working groups crosscut the subcommittees and focus on infrastructure issues common to many of the NSDI data themes. Descriptions of the active working groups are listed in the chart to the right.

Geospatial Line of Business Work Groups

The Geospatial Line of Business Work Groups were developed by the OMB to support electronic government. The OMB has assigned responsibility for these work groups to the FGDC. These work groups operate under the FGDC. Each work group has work plans that are updated and approved annually through the Coordination Group and the Steering Committee. Descriptions of the active work groups are listed in the chart below.

FGDC Working Groups by Lead Agency and Description

Technology and Architecture	FGDC	The primary objective the Technology and Architecture Working Group is to develop requirements and recommendations for the Federal Enterprise Architecture to better organize the use of geospatial technology and data across the Federal enterprise. The working group also supports the Geospatial LoB technical and architecture tasks.
Users/Historical Data	NARA	The Users/Historical Data Working Group promotes awareness among Federal agencies of the historical dimension to geospatial data to facilitate the long-term retention, storage, and accessibility of selected historically valuable geospatial data. In addition, the group is exploring becoming a general users group, for which historical data would be one subactivity.
Homeland Security	DHS	The Homeland Security Working Group ensures that the NSDI supports the preparation for, prevention of, protection against, response to, and recovery from threats to the Nation's population centers and critical infrastructures; these threats may be of terrorist, criminal, accidental, or natural origin.
Metadata	FGDC	The Metadata Working Group promotes and coordinates geospatial metadata activities among FGDC member agencies in support of the NSDI. The Metadata Working Group promotes awareness among FGDC member agencies of the metadata dimension to geospatial data; facilitates the evolution and revision of the Content Standard for Digital Geospatial Metadata; and establishes a mechanism for the coordination, development, use, sharing, and dissemination of geospatial metadata among FGDC member agencies.
Standards	FGDC	The FGDC Standards Working Group actively promotes and coordinates FGDC standards activities. The Standards Working Group provides guidance on FGDC standards policy and procedures, facilitates coordination between subcommittees having overlapping standards activities, and reviews and makes recommendations on the approval of standards proposals, draft standards for public review, and draft standards for FGDC endorsement.

Note: Abbreviations are defined in the glossary in Appendix D.

Geospatial Line of Business Work Groups by Lead Agency and Description

Common Services	EPA	The Common Services Work Group is responsible for evaluating and expanding Governmentwide and intergovernmental procurement opportunities related to geospatial services and data sharing.
Geo-enabled Business	FGDC	The purpose of the Geo-Enabled Business (GEB) Work Group is to demonstrate and communicate the value of geospatial approaches to business processes and agency mission functions, especially to audiences that have had limited experience with geo-enabled decision support.
Grants and Contracts	FGDC	The Grants and Contracts Work Group is responsible for developing and implementing common grants and cooperative agreements and contract language requirements for geospatial data, products, and services to better leverage geospatial data produced by Federal partners. The overall goal of the Grants and Contracts Work Group is to capture, for the greater benefit of the geospatial community and agency program managers, the large amount of geospatial information produced with Federal funding.
Lifecycle Management	EPA	The Lifecycle Management Work Group (or Lifecycle Work Group) is responsible for evaluating existing geospatial data lifecycle management frameworks and, based on these assessments, developing standard terminologies and processes for the geospatial data lifecycle. This group proposed actions affecting Office of Management and Budget (OMB) Circular A-16 and governance in the geo-community.
Technology and Architecture	FGDC	The primary objective of the Technology and Architecture Work Group is to develop requirements and recommendations for the Federal Enterprise Architecture to better organize the use of geospatial technology and data across the Federal enterprise. The work group also supports the FGDC's working group technical and architecture tasks.

Note: Abbreviations are defined in the glossary in Appendix D.

Collaborating Partners

The FGDC solicits the involvement of public interest groups who participate within the committee structure to ensure that their needs are included in the developing NSDI. These collaborating partners include State, tribal, and local governments; academic institutions; and a broad array of private sector geographic, statistical, demographic, and other business information providers and users. NSDI strives to build upon local data wherever possible.

Collaborating partnerships are open to public, private, and nonprofit organizations whose missions are complementary to the mission of the FGDC. Organizations interested in becoming partners are invited to send a written request to the FGDC Chair. Current non-Federal collaborating partners include the organizations listed to the right.

Collaborating Partners and Descriptions

American Congress on Surveying and Mapping (ACSM)	A nonprofit educational organization that advances the sciences of surveying and mapping and related fields to further the welfare of those who use and make maps.
Association of American Geographers (AAG)	A scientific and educational society whose members share interests in the theory, methods, and practice of geography and geographic education.
Cartographic Users Advisory Council (CUAC)	An organization of representatives from national and regional library organizations, dedicated to cartographic interests.
Geospatial Information and Technology Association (GITA)	A nonprofit educational association serving the global geospatial community.
International City/County Management Association (ICMA)	A professional and educational organization for chief appointed managers, administrators, and assistants in cities, towns, counties, and regional entities throughout the world.
National Association of Counties (NACo)	Advances issues with a unified voice before the Federal Government, improves the public's understanding of county government, assists counties in finding and sharing innovative solutions through education and research, and provides value-added services to save counties and taxpayers money.
National Association of State Chief Information Officers (NASCIO)	Represents State CIOs and information resource executives and managers from the 50 States, the District of Columbia, and 6 U.S. territories.
National League of Cities (NLC)	Strengthens and promotes cities as centers of opportunity, leadership, and governance.
National States Geographic Information Council (NSGIC)	Provides a unified voice on geographic information and technology issues, advocates State interests, and supports its membership in their statewide initiatives.
Open Geospatial Consortium, Inc.® (OGC)	A nonprofit, international, voluntary consensus standards organization of more than 365 companies, government agencies, research organizations, and universities; leads the development of standards for geospatial and location-based services.
University Consortium for Geographic Information Science (UCGIS)	A nonprofit organization of more than 50 universities and other research institutions.
Urban and Regional Information Systems Association (URISA)	A multidisciplinary educational association for geospatial professionals around the world.
Western Governors' Association (WGA)	Addresses important policy and governance issues in the West, advances the role of the western States in the Federal system, and strengthens the social and economic fabric of the region.

Appendix C

Status of NSDI Data Themes

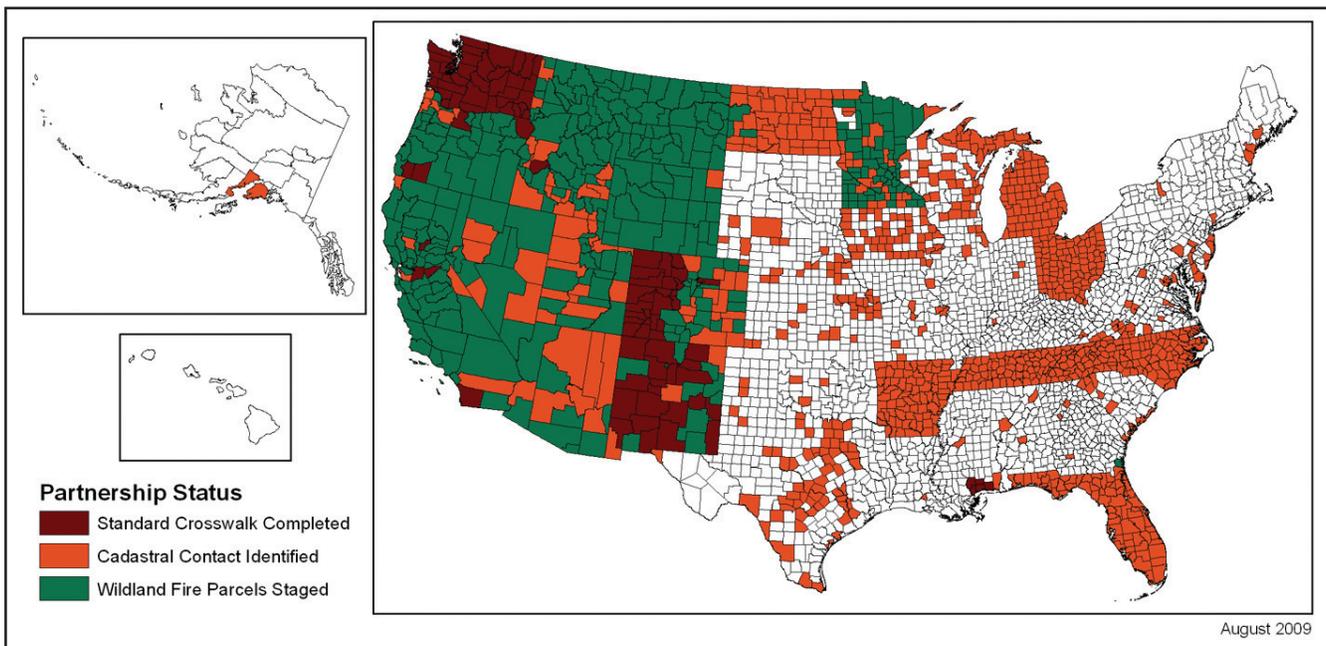
Office of Management and Budget (OMB) Circular A-16 provides direction for Federal agencies that produce, maintain, or use spatial data in the National Spatial Data Infrastructure (NSDI). The circular identifies 34 data themes of national significance and denotes which are framework data themes. This appendix includes descriptions of the following data themes: cadastral, digital orthoimagery, elevation, hydrography, soils, watershed boundaries, and wetlands.

Framework Data Theme: Cadastral

Responsible agency: U.S. Department of the Interior, Bureau of Land Management (BLM)

Description: The BLM is the lead Federal agency for cadastral data and chairs the FGDC Cadastral Subcommittee. Cadastral data describe the geographic extent of rights and interests in real property. The term “cadastral data” is synonymous with “land parcel data.” Under BLM’s leadership, the Cadastral Subcommittee develops and implements plans to coordinate cadastral data-related activities among Federal, State, tribal, and local governments and the private sector and reports on its activities to the FGDC. In the western United States, the FGDC Cadastral Subcommittee continues to work with the wildland fire community to identify sources of parcel data, standardize available data, and build sustainable systems to provide parcel data in coordination with States. In other regions of the country, such as the Midwest and the Southeast, the subcommittee continues to work with State coordinators to identify county cadastral data contacts.

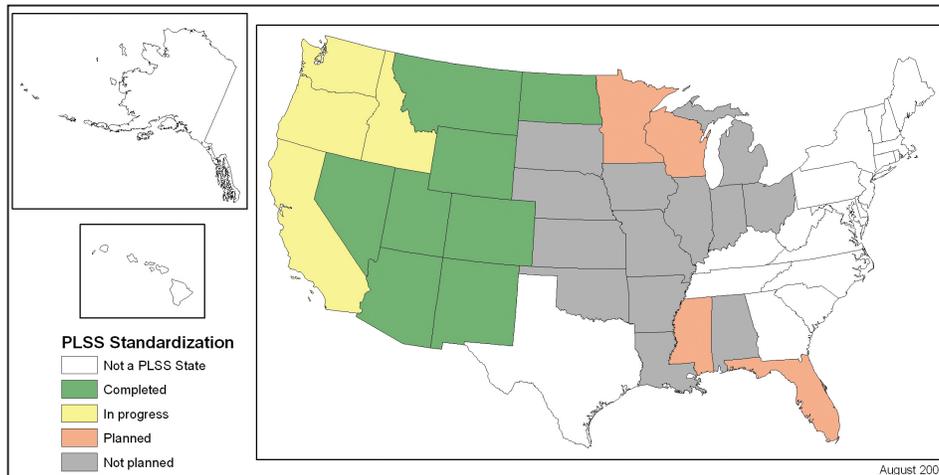
County Parcel Partnership Status



Framework Data Theme: Cadastral (continued)

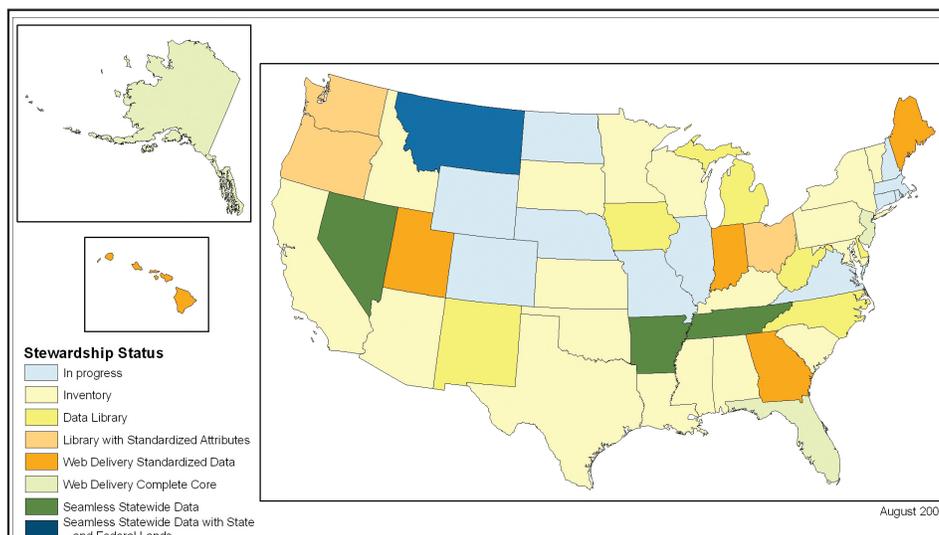
The Public Land Survey System (PLSS) is a cadastral reference system used to divide public domain lands, which are lands owned by the Federal government. The original public domain included the land ceded to the Federal Government by the thirteen original States, supplemented with acquisitions from native Indians and foreign powers. It encompasses major portions of the land area of 30 States. Standardized PLSS representation supports geographic information system (GIS) applications that facilitate data integration, which enables searches by PLSS location. The statewide standardization PLSS representation is linked to PLSS legal survey records.

PLSS Standardization by State



The Cadastral Subcommittee has developed guidance for States to use when developing, publishing, and maintaining standardized cadastral information for government to government data sharing. State stewardship of cadastral data has seven levels, or phases, that lead to a State aggregating and publishing authoritative local data and serving as a trusted source. The levels range from level 1, in which a State coordinator identifies and assembles a current inventory of the State's sources of cadastral data, to level 7, in which statewide data are assembled into a single dataset that can be combined seamlessly with other State and Federal land parcel data.

Cadastral Stewardship Status for Government to Government Data Sharing



Framework Data Theme: Digital Orthoimagery

Responsible agency: U.S. Department of the Interior, U.S. Geological Survey (USGS), and U.S. Department of Agriculture (USDA), Farm Service Agency (FSA)

Description: The USGS is the lead Federal agency for orthoimagery; however, a number of other Federal agencies, including the Bureau of Land Management, the Federal Emergency Management Agency, the FSA, the National Geospatial-Intelligence Agency (NGA), the National Oceanic and Atmospheric Administration (NOAA), the National States Geographic Information Council, the Natural Resources Conservation Service, and the U.S. Census Bureau cooperate in the National Digital Orthophoto Programs (NDOP) consortium to develop and maintain national orthoimagery coverage in the public domain. The primary Federal programs for NDOP are the USDA National Agriculture Imagery Program (NAIP), the NGA 133 Urban Areas Program, and the USGS National Orthoimagery Program.

USGS National Orthoimagery Program

The USGS National Orthoimagery Program concentrates on acquiring imagery through partnerships with Federal, State, tribal, regional, and local agencies. Quality assurance and data archiving and dissemination are other services that the USGS offers. These services support the following imagery types:

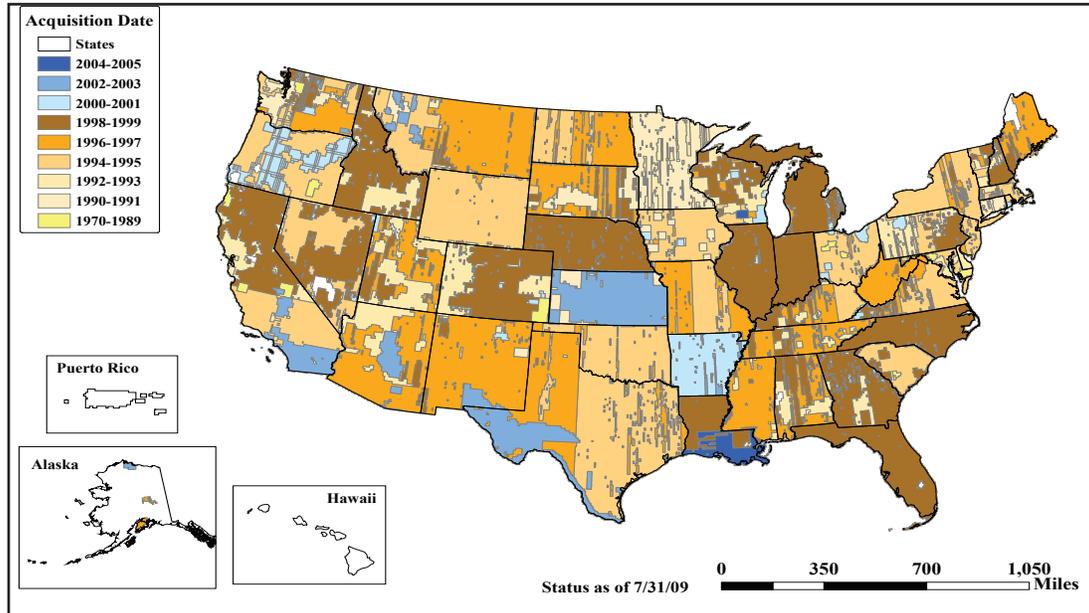
- (1) High-resolution (1-meter), leaf-on, natural color orthoimagery in support of the National Geospatial Program's digital topographic program and maintenance of the national orthoimagery dataset, and
- (2) Very-high-resolution (1-foot or greater), leaf-off, natural-color orthoimagery for urban areas for the Homeland Security Infrastructure Program.

In fiscal year 2009, base funding for the orthoimagery collection was about \$1.8 million, which was leveraged with partners to return \$6.2 million of data. The USGS contributed about \$900,000 to the 1-meter NAIP acquisition in fiscal year 2009, which, by the end of the leaf-on collection period, will have captured approximately two-thirds of the contiguous United States. In fiscal year 2009, the USGS national digital orthoimagery database grew largely through partnerships for collecting imagery at resolutions of finer than 1 meter.

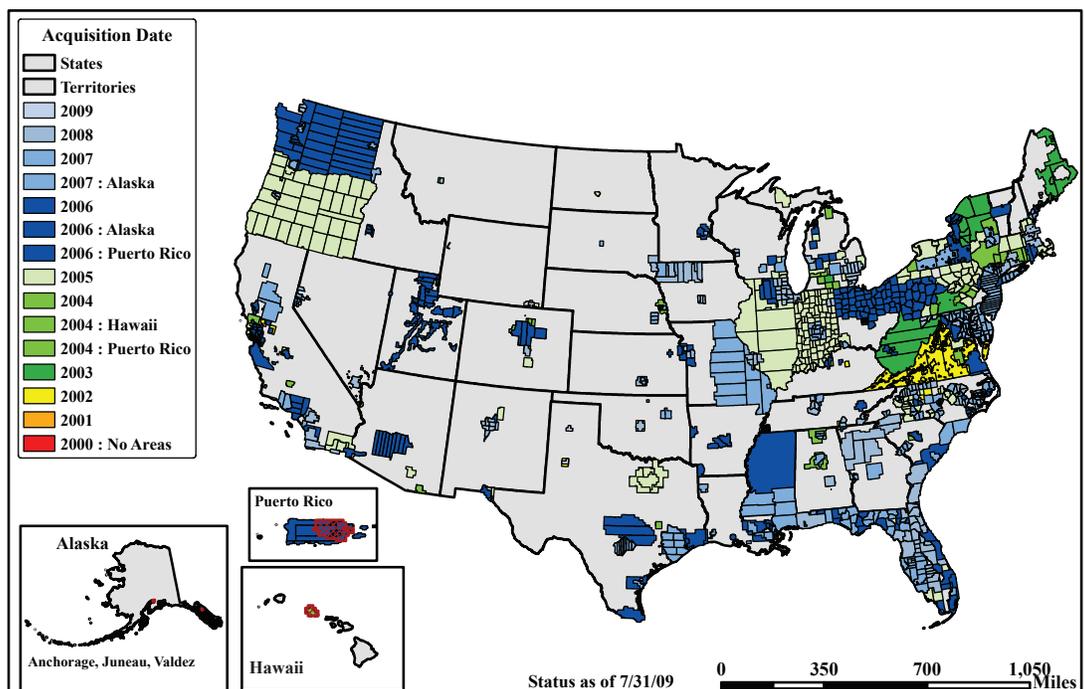
The USGS is providing quality assurance and dissemination services for very-high-resolution orthoimagery along the borders of the United States. This NGA-sponsored project is contributing more than 38 terabytes of imagery and is expected to be completed by the end of calendar year 2009. The USGS continues to work closely with the NGA to collect, validate, archive, and disseminate imagery for the 133 Urban Areas Program. Through this program, digital orthoimagery is collected through partnerships with Federal, State, tribal, regional, and local agencies and is in the public domain.

Framework Data Theme: Digital Orthoimagery (continued)

*The National Map 1-Meter Resolution
Orthoimagery by Acquisition Year*



*The National Map High-Resolution
Orthoimagery by Acquisition Year*

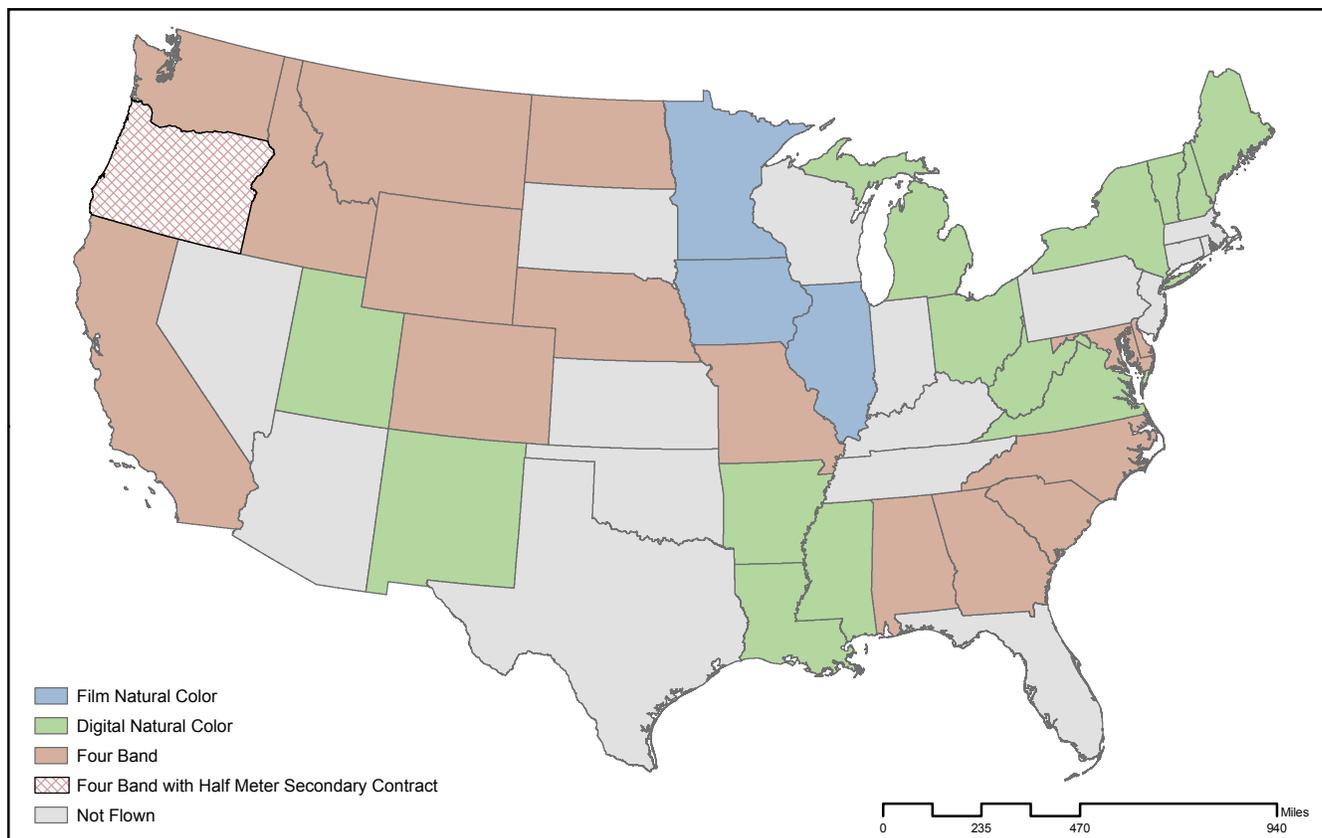


Framework Data Theme: Digital Orthoimagery (continued)

USDA National Agriculture Imagery Program

The NAIP is a program through which agricultural imagery is acquired annually during the growing season. The FSA and other USDA agencies use the imagery to manage farm subsidy programs and agriculture-related disaster recovery programs. The imagery is in the public domain and is widely used by Federal, State, and local agencies, as well as by private entities and businesses. A few examples of the business processes that the data have been used to support are economic development, emergency response, environmental management, growth planning, health and human services, homeland security, precision farming and other agribusiness activities, and transportation planning. The FSA will collect data on privately owned farmland as identified by common land unit boundaries and will require that the participation of other Federal and State partners be in place for collection outside of those areas. Areas flown over in fiscal year 2009 covered more than 2 million square miles.

NAIP Orthoimagery 2009



Framework Data Theme: Elevation

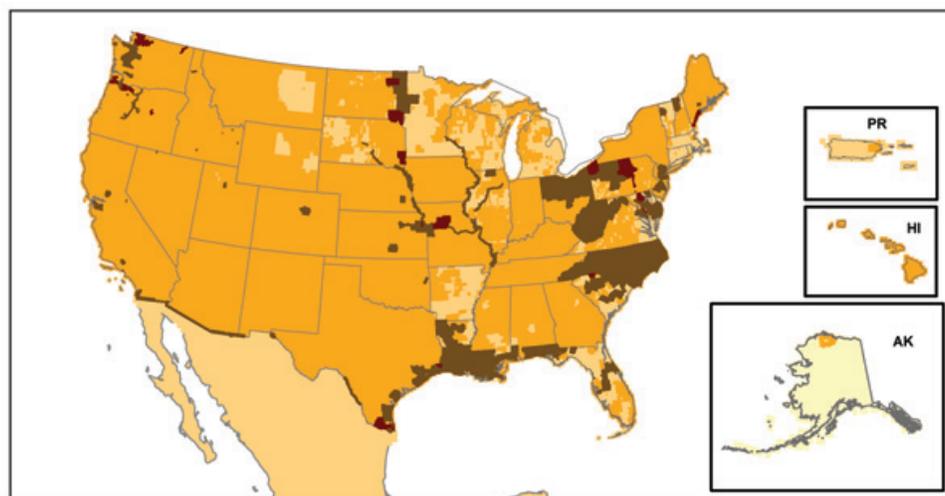
Responsible agency: U.S. Department of the Interior, U.S. Geological Survey (USGS)

Description: The National Elevation Dataset (NED) contains elevation data that provide three-dimensional surface models of the Earth's surface. The USGS makes elevation data available for land areas and, in cooperation with the NOAA, under coastal waters. The USGS identifies digital elevation data based upon the resolution (spacing between the points) of a grid. One arc-second-resolution (equivalent to 30-meter-resolution) elevation data are complete and available for the entire United States, except Alaska. Current USGS efforts were concentrated on providing finer resolution of elevation data at 1/3- and 1/9-arc-second (equivalent to 10- and 3-meter resolutions, respectively) grid spacing. The data are developed from the best available data from Federal, State, and local agencies and private sector partners.

The USGS continued to coordinate very-high-resolution lidar acquisitions to provide improved data for the NED. In fiscal year 2009, the program leveraged \$3.3 million against approximately \$40 million of partnership funds to acquire high-resolution elevation data, primarily from lidar sources. Lidar collection along the Beaufort Sea in Alaska was undertaken to study sea level rise and erosion. Alaska was and will continue to be a target for higher-resolution elevation collection because its elevation data are historically inexact. The USGS is partnering with others to acquire lidar data for the Matanuska-Susitna area of Alaska and Interferometric Synthetic Aperture Radar (IfSAR) data over a larger portion of the Alaskan interior as part of an initiative to provide that State with higher-resolution elevation data. The coastal areas of the United States are the priority areas for future lidar data collection.

Development of a USGS base lidar specification has been started, with the aim of ensuring that lidar data collected under this specification will be suitable for the NED at the 1/9-arc-second resolution and can also be used to generate the 1/3- and 1-arc-second NED resolutions. The specification will also ensure that the lidar point cloud data are handled by all vendors in a consistent manner and delivered to the USGS in well-defined formats. This specification is expected to be completed in fiscal year 2010.

National Elevation Dataset Source Resolution



NED is a multi-resolution data collection which provides the best available digital elevation data to the public. 173600 square miles of lower quality 30 meter data were replaced by 10 meter or better source data in 2009.

The NED 1/9-arc-second data layer has increased by 90,000 square miles and now cover 273595 square miles.

The country of Mexico was also added at 30 meter resolution in 2009.

NED RESOLUTION

- High Resolution Data Being Processed
- 1/9 Arc-Second (~3 meter or LIDAR Source)
- 1/3 Arc-Second (~10 meter or better source)
- 1 Arc-Second (~30 meter source)
- 2 Arc-Second - Alaska Only

September 2009

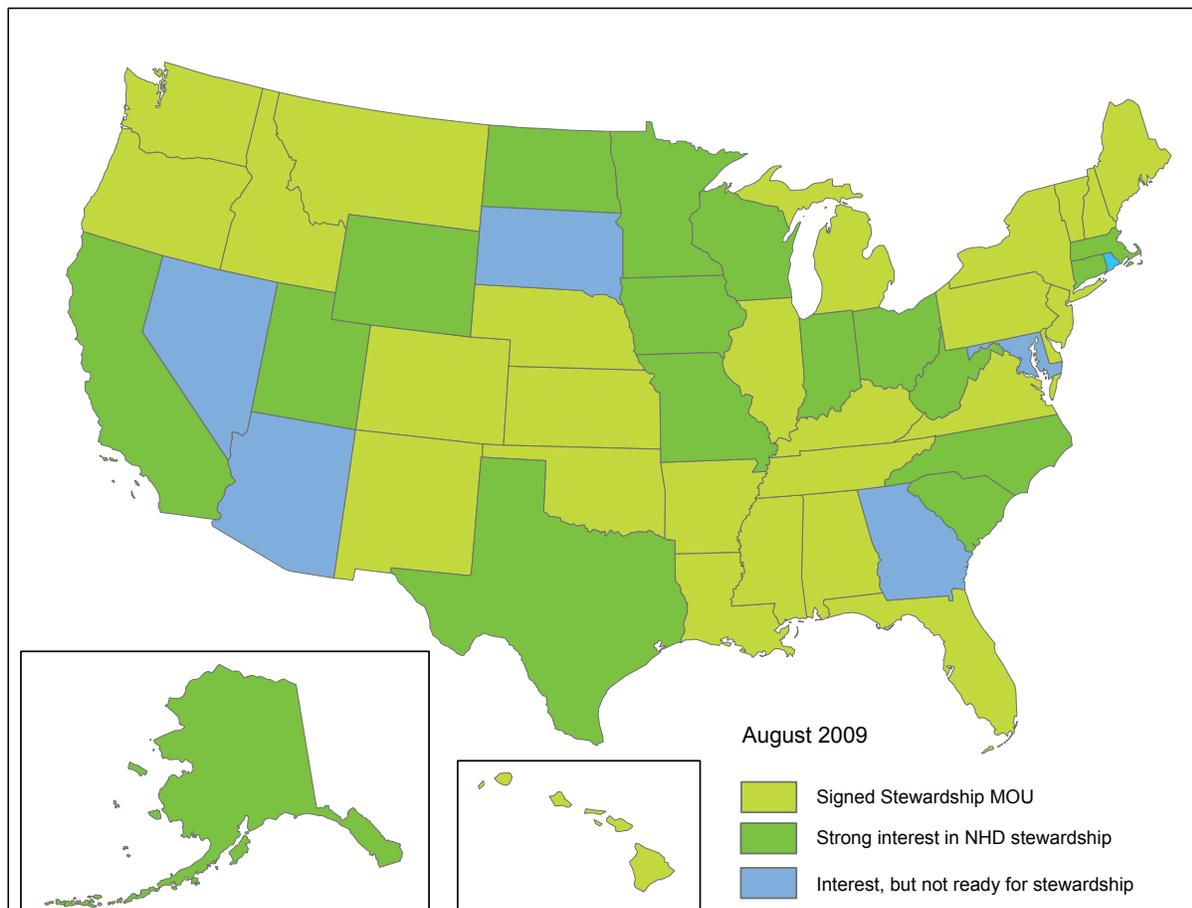
Framework Data Theme: Hydrography

Responsible agency: U.S. Department of the Interior, U.S. Geological Survey (USGS)

Description: The National Hydrography Dataset (NHD) includes a common data model that contains nationwide coverage of surface water features at 1:100,000 scale and 1:24,000 scale. These data provide a universal solution for hydrography across the Nation and have widespread application in pollution control, hydrology, resource management, and fisheries research. The USGS provides the central database, technical development, distribution, data integration, leadership, program management, coordination, and continuous maintenance of the dataset through stewardship partnerships with the user community.

With completion of national high-resolution coverage in fiscal year 2007, attention turned to maintaining these data through a program of data stewardship. The USGS is continuing to supply the methods, tools, training, and guidance to allow the States to assume the responsibility for data maintenance and data upgrades. The USGS provides grant funding to States to help them establish stewardship operations. A number of States are now revising their hydrography data to 1:4,800- and 1:2,400-scale resolutions with USGS assistance.

Status of National Hydrography Dataset Stewardship Program



Data Theme: Soils

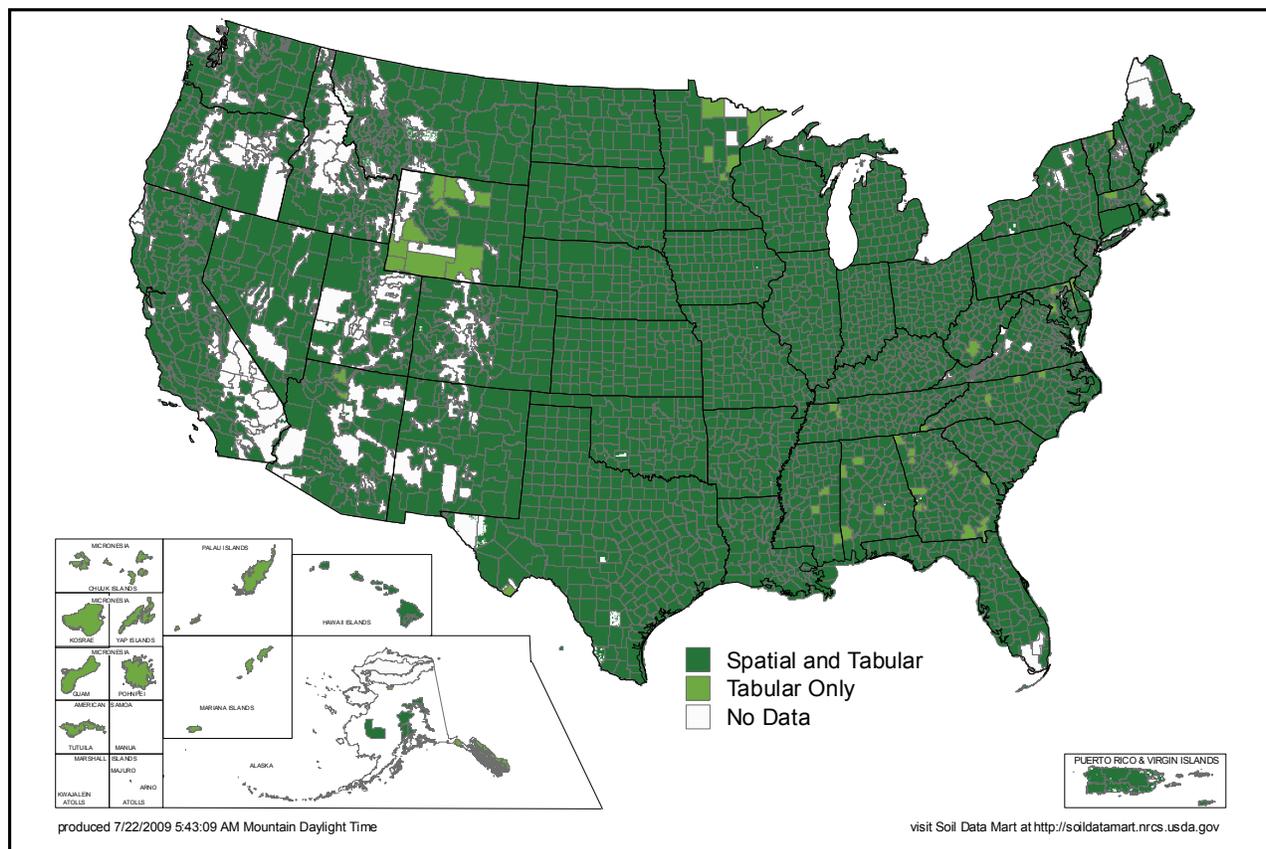
Responsible agency: U.S Department of Agriculture (USDA), Natural Resources Conservation Service Soil Survey Division

Description: The National Cooperative Soil Survey (NCSS) is a nationwide partnership of Federal, State, regional, and local agencies and private entities and institutions. The partners work together to investigate, inventory, document, classify, interpret, disseminate, and publish information about soils of the United States and its trust territories and commonwealths.

The map shows the current status of the Soil Survey Geographic database (SSURGO) for the United States. Dark green color indicates that detailed digital maps and attribute tables are available. Light green color indicates that only attribute tables are available. White areas indicate that no soil survey has been completed.

By the end of fiscal year 2009, the soil survey was expected to create 10 million acres of SSURGO data, 30 publications, and about 34.5 million acres of initial and updated soil survey mapping.

Soil Survey Data Status



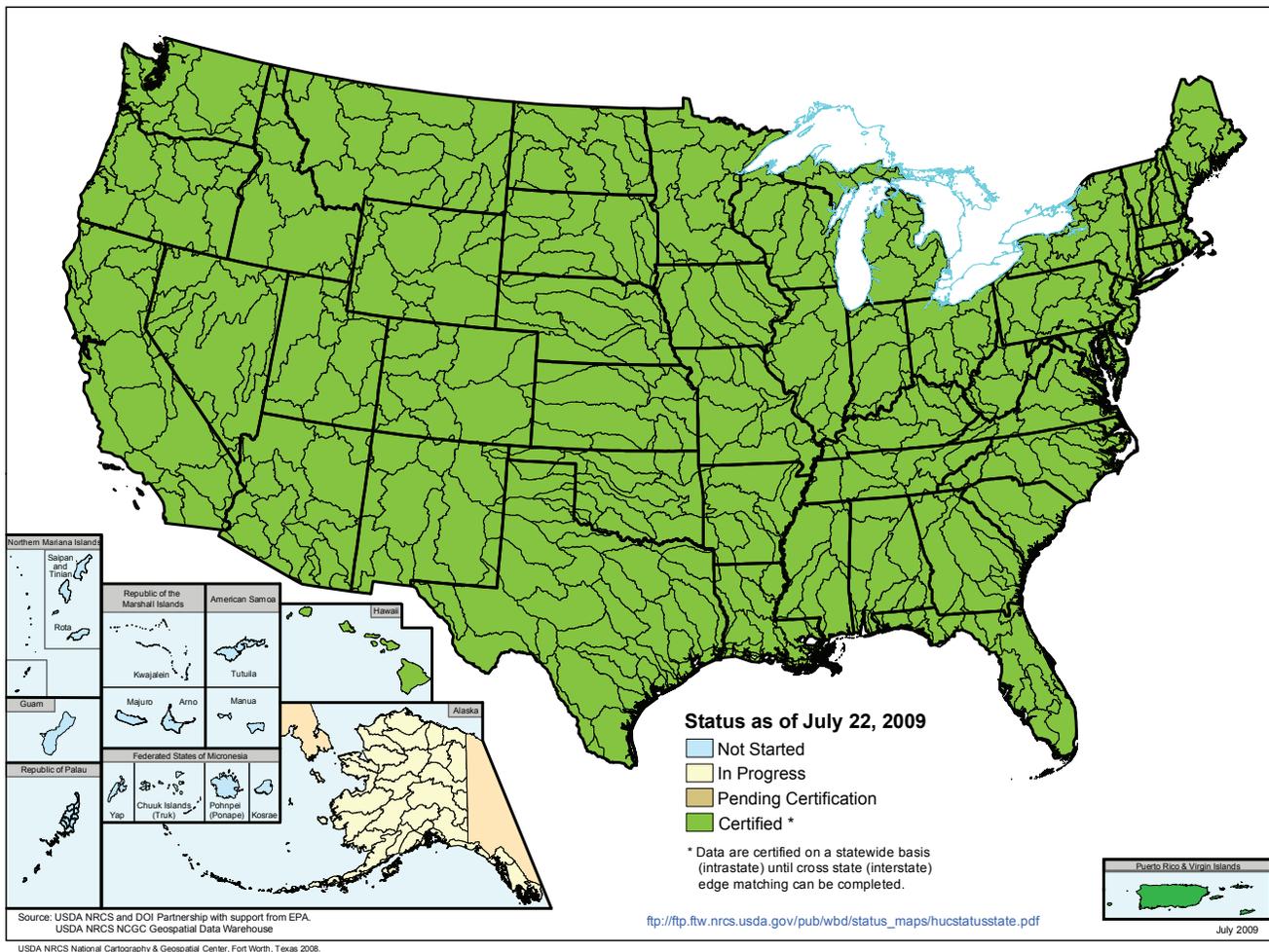
Data Theme: Watershed Boundaries

Responsible agency: U.S. Department of the Interior, U.S. Geological Survey (USGS), and U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)

Description: The Watershed Boundary Dataset (WBD) has been developed under the leadership of the FGDC Subcommittee on Spatial Water Data. The WBD is a complete digital hydrologic unit boundary layer to the sub-watershed (12-digit) 6th level at a 1:24,000 scale. The dataset consists of geo-referenced digital data and associated attributes created in accordance with the "FGDC Proposal, Version 2.0—Federal Standards for Delineation of Hydrologic Unit Boundaries." The hydrologic unit boundaries provide a uniquely identified and uniform method of subdividing large drainage areas.

This status map shows the WBD for the United States. Certified WBD data are now available for the contiguous United States, Hawaii, and Puerto Rico.

Watershed Boundary Dataset Status



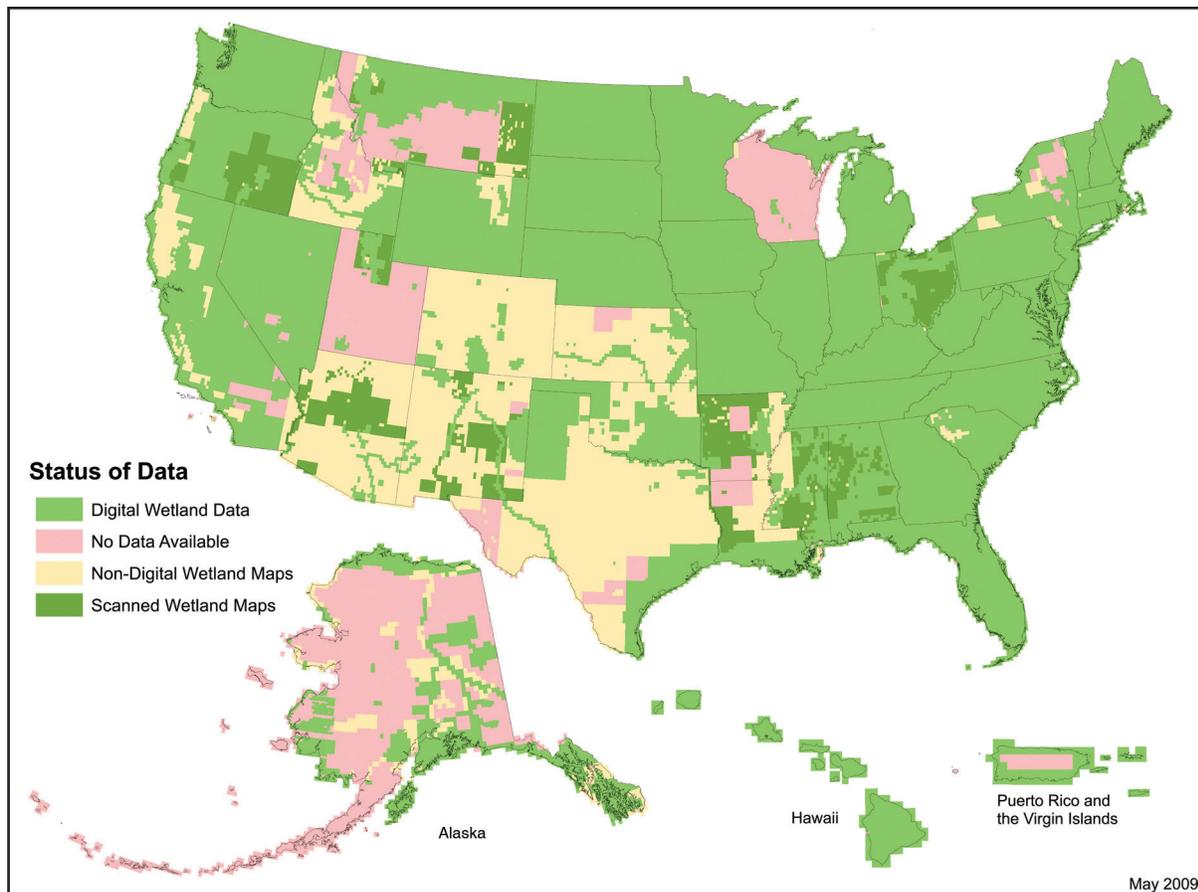
Data Theme: Wetlands

Responsible agency: U.S. Department of the Interior, Fish and Wildlife Service (FWS)

Description: Wetlands data provide the classification, location, and extent of wetlands and deepwater habitats. To facilitate wetlands data development, the FGDC endorsed the Wetlands Mapping Standard in July 2009. The Wetlands Mapping Standard is designed to support current and future digital mapping requirements. It is intended to be extensible, forward-looking, and able to accommodate technology enhancements over time. Adherence to the Wetlands Mapping Standard is required for all wetlands mapping activities funded or conducted by the Federal Government.

In fiscal year 2009, two-thirds of the new and updated data added to the national wetlands inventory was produced by cooperating contributors. With the new standard in place, other organizations interested in wetlands mapping have the information they need to contribute mapped wetlands data to the wetlands theme. In addition, wetlands data is a catalog component to *The National Map*. Wetlands data are registered through Geospatial One-Stop and Data.gov and can be viewed, analyzed, or downloaded on demand from the FWS's Wetlands Mapper; the data can also be viewed by the general public using the Google Earth™ mapping service. The current availability of wetlands data is shown below.

Status of Online Wetlands Data



Appendix D

Glossary of Abbreviations and Terms

AAG	Association of American Geographers	MMC	Multipurpose Marine Cadastre
ACSM	American Congress on Surveying and Mapping	MMS	U.S. Minerals Management Service
ANSI	American National Standards Institute	MWG	Metadata Working Group
ARRA	American Recovery and Reinvestment Act	NACo	National Association of Counties
BLM	Bureau of Land Management	NAIP	National Agriculture Imagery Program
BTS	Bureau of Transportation Statistics	NAP	North American Profile
CAP	Cooperative Agreements Program	NARA	National Archives and Records Administration
CIO	Chief Information Officer	NASA	National Aeronautics and Space Administration
CSWG	Common Services Work Group	NASCIO	National Association of State Chief Information Officers
CUAC	Cartographic Users Advisory Council	NCAI	National Congress of American Indians
DHS	Department of Homeland Security	NCSS	National Cooperative Soil Survey
DOC	Department of Commerce	NDOP	National Digital Orthophoto Programs
DOI	Department of the Interior	NED	National Elevation Dataset
DOT	Department of Transportation	NGA	National Geospatial-Intelligence Agency
EPA	U.S. Environmental Protection Agency	NGAC	National Geospatial Advisory Committee
FEMA	Federal Emergency Management Agency	NHD	National Hydrography Dataset
FGDC	Federal Geographic Data Committee	NIEM	National Information Exchange Model
FSA	Farm Service Agency	NLC	National League of Cities
FWS	U.S. Fish and Wildlife Service	NOAA	National Oceanic and Atmospheric Administration
GCWG	Grants and Contracts Work Group	NRCS	Natural Resources Conservation Service
GDM	Geospatial Data Model	NSDI	National Spatial Data Infrastructure
GEBWG	Geo-Enabled Business Work Group	NSGIC	National States Geographic Information Council
GEO	Group on Earth Observations	OGC	Open Geospatial Consortium, Inc.®
Geospatial LoB	Geospatial Line of Business	OMB	Office of Management and Budget
GEOSS	Global Earth Observation System of Systems	PLSS	Public Land Survey System
GITA	Geospatial Information and Technology Association	RATB	Recovery Accountability and Transparency Board
GOS	Geospatial One-Stop	RMA	Risk Management Agency
GSA	General Services Administration	SLAMM	Sea Level Affecting Marshes Model
GSDI	Global Spatial Data Infrastructure	SSURGO	Soil Survey Geographic database
HMDA	Home Mortgage Disclosure Act	SWG	Standards Working Group
HSIP	Homeland Security Infrastructure Program	TAWG	Technology and Architecture Work Group
HSWG	Homeland Security Working Group	UCGIS	University Consortium for Geographic Information Science
HUD	Department of Housing and Urban Development	URISA	Urban and Regional Information Systems Association
ICMA	International City/County Management Association	USCB	U.S. Census Bureau
IfSAR	Interferometric Synthetic Aperture Radar	USDA	U.S. Department of Agriculture
IFTN	Imagery for the Nation	USGS	U.S. Geological Survey
INCITS	InterNational Committee for Information Technology Standards	WBD	Watershed Boundary Dataset
ISO	International Organization for Standardization	WGA	Western Governors' Association
LCWG	Lifecycle Work Group		

