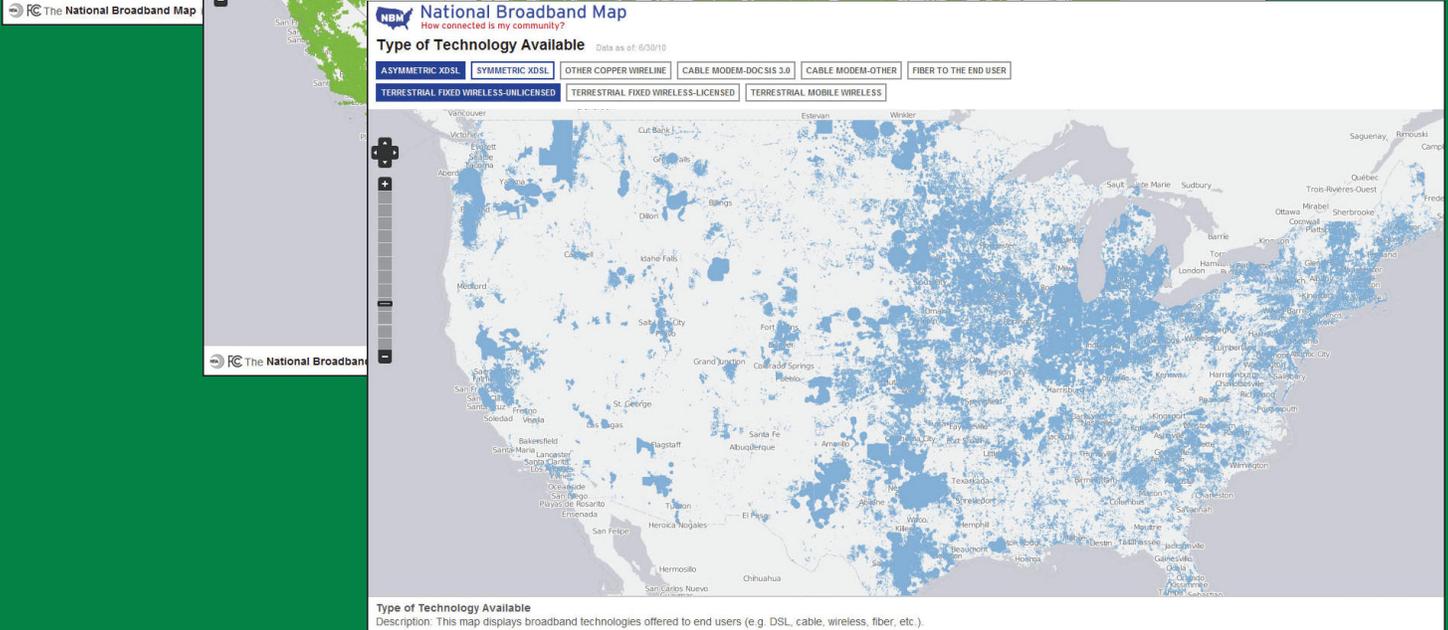
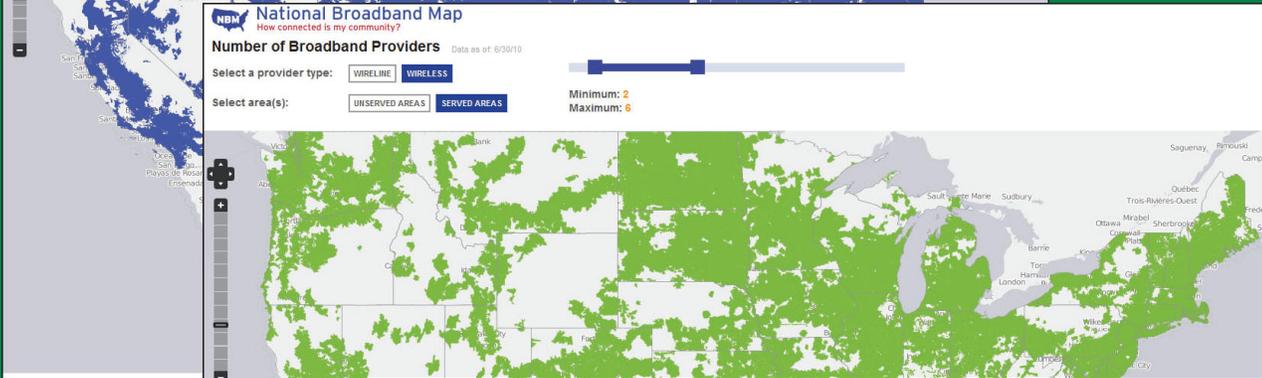
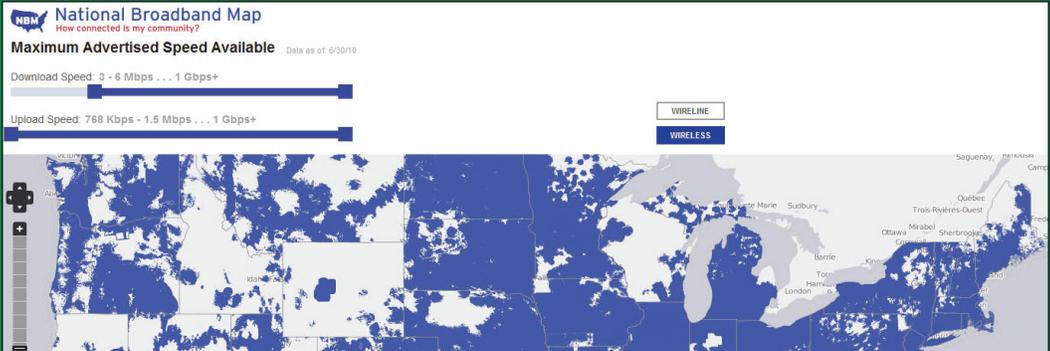


# 2011 Annual Report

## Federal Geographic Data Committee



**Federal Geographic Data Committee**  
IVAN DELOATCH, Executive Director

Federal Geographic Data Committee, Reston, Virginia: 2011

For more information on the Federal Geographic Data Committee  
World Wide Web: <http://www.fgdc.gov/>  
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# Message from the FGDC Chair

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I am pleased to present the Federal Geographic Data Committee's (FGDC's) annual report for 2011, describing the activities and accomplishments of the FGDC partner agencies over the past year. 2011 has been a year of accomplishment and progress, with significant advances in the development of collaborative geospatial data and technology. We look forward to continuing this progress in the coming year.

Over the past year, the partner agencies of the FGDC have made significant progress on a number of fronts. For example, the FGDC has made significant progress in conceptualizing and beginning implementation of the Geospatial Platform initiative. The Geospatial Platform, which was described in the President's fiscal year 2011 budget, will be an accessible, reliable, and cost-effective collection of data, applications, and services that will provide a foundation to help address the White House's priorities for data sharing, transparency, and collaboration. In 2011, the FGDC developed a conceptual roadmap for the Platform and received very helpful feedback from external partners on the National Geospatial Advisory Committee and through a public outreach process. The FGDC also began the implementation of the first operational phase of the Platform in 2011. We are excited by the prospects for this new initiative, and we look forward to working with our partners in the coming year to realize the vision for the Platform.

The FGDC has also provided support for key White House initiatives. For example, the FGDC worked with the Office of Management and Budget (OMB) to develop new Supplemental Guidance to OMB Circular A-16, "Coordination of Geographic Information and Related Spatial Data Activities." The new guidance outlines a process to use portfolio management approaches to more effectively manage Federal geospatial assets and investments. OMB issued the new guidance to agencies in November 2010.

In addition, the FGDC has made significant progress in the area of geospatial standards. The FGDC adopted 64 external standards, including many from the International Organization for Standardization (ISO) and the Open Geospatial Consortium, and also adopted the U.S. Thoroughfare, Landmark, and Postal Address Data Standard. In addition, the FGDC is coordinating standardization activities with the Department of Defense. Standards are a key component of the National Spatial Data Infrastructure and we are pleased with the progress in this vital area.

Fiscal year 2012 will focus on continued collaboration to better enable public-private partnerships and investments, and continued progress on development of the Geospatial Platform and other tools and data for the benefit of the agencies and public we serve. We are also rejuvenating the FGDC Steering Committee and working with senior officials in our partner agencies to advance national geospatial programs. We look forward to a productive year.

I thank all of you who have contributed to the success of the FGDC over the past year.

Sincerely yours,

Anne Castle  
FGDC Chair  
Assistant Secretary of the Interior for Water and Science





# FGDC Accomplishments for Fiscal Year 2011

## 1. Geospatial Line of Business

The Geospatial Line of Business obtained the Office of Management and Budget (OMB) endorsement for the OMB Circular A-16 Supplemental Guidance, which includes processes, roles, and responsibilities for managing National Geospatial Data Assets datasets and themes, and a repeatable process for adjusting OMB Circular A-16 Appendix E that describes the National Spatial Data Infrastructure geospatial data themes. For more information see page 10.

## 2. Portfolio Management

The Geospatial Line of Business continues to make strides towards portfolio management through the development of an implementation strategy and agency implementation plan templates. Another significant accomplishment is the development of a current inventory of National Geospatial Data Assets. For more information see page 10.

## 3. Geospatial Platform

The “Modernization Roadmap for the Geospatial Platform” document, completed in March 2011, provides a framework to describe how the concepts and goals of the Geospatial Platform were developed and released. This “Roadmap” concludes the upfront planning process for the Geospatial Platform and paves the way for implementation activities.

The redesigned Geospatial Platform website ([www.geoplatform.gov](http://www.geoplatform.gov)) was released. The Platform is a managed portfolio of common geospatial data, services, and applications contributed to and administered by authoritative sources and hosted on a distributed, cloud-based infrastructure. The

Geospatial Platform is used by government agencies and partners to meet their mission needs and the broader needs of the Nation. For more information see page 11.

## 4. Geospatial One-Stop and the Clearinghouse Network

In fiscal year 2011, the Geospatial One-Stop (GOS) project continued to focus on integrating its geospatial data with Data.gov. Connectivity between GOS and Data.gov takes place using GOS Web service capabilities that enable searches for geospatial data through applications beyond the GOS portal. During fiscal year 2011, the GOS data collection grew to over 678,000 records, of which over 391,000 are shared through Data.gov. The GOS to Data.gov integration is in its final stages and many of the capabilities of GOS will be integrated into Data.gov in the coming months (early fiscal year 2012). At that time, the GOS portal, [www.geodata.gov](http://www.geodata.gov), will cease to exist, and visitors to that portal will be redirected to a geospatially enabled page for Data.gov. For more information see page 11.

## 5. National Geospatial Advisory Committee

The National Geospatial Advisory Committee (NGAC) was established by the Department of the Interior to provide external advice and recommendations to the FGDC. During the past year, the NGAC has analyzed and provided feedback and recommendations on the Geospatial Platform Initiative, *The National Map*, geolocation privacy, the National Land Imaging Program, Transportation for the Nation, and the Federal Aviation Administration’s laser pointer

issue. The NGAC has also adopted white papers on local government Geographic Information System best practices and best practices for interagency data sharing. For more information see page 13.

## 6. Standards

The FGDC endorsed the United States Thoroughfare, Landmark, and Postal Address Data Standard. The standard covers street addresses, which are the location identifiers most commonly used by all levels of government and the public. Addresses are critical for administrative records, emergency and first response, research, marketing, mapping, geospatial information systems, routing and navigation, and law enforcement. For more information see page 14.

## 7. Geospatial Metadata

The FGDC led a community effort to generate and compile input to the “ISO 19115: Geographic Information – Metadata” five-year review. The information collected from the community provided critical insight into issues experienced when applying the standard to real world geospatial data and operations. A revised draft international standard is expected to be released in November 2011 as “ISO 19115-1 Geographic Information – Metadata - Fundamentals.” For more information see page 16.

## 8. Fifty States Initiative

Nine States completed and began implementing strategic and (or) business plans that facilitate the coordination of geospatial programs, policies, technologies, and resources in their States and with the Federal Government. For more information see page 17.

## 9. NSDI Training Program

The FGDC partnered with all sectors of government, academia, Tribal Nations, and the private sector to provide National Spatial Data Infrastructure (NSDI) related training. Cooperative agreements, memorandums of understanding, contracts, and cost sharing were utilized to design and

lead workshops, develop training materials for the classroom and the Web, and support travel and logistics. In most cases, Federal agencies, including the National Oceanic and Atmospheric Administration and the U.S. Geological Survey, provided trainers and training materials; State and local governments and U.S. Geological Survey Geospatial

Liaisons provided logistical support; and private-sector companies sometimes contributed facilities and supplies. By sharing resources, these organizations were able to collectively address the NSDI training needs of their communities. For more information see page 18.

## Success Story

### Monitoring Trends in Burn Severity Program

**Challenge:** There is a need to provide summary information regarding the effects of large wildfires to agency leaders, elected officials, and the general public. The Wildland Fire Leadership Council (WFLC), which implements and coordinates National Fire Plan (NFP) and Federal Wildland Fire Management Policies, adopted a strategy to monitor the effectiveness and effects of the National Fire Plan and the Healthy Forests Restoration Act (HFRA). One component of this strategy is to assess the environmental impacts of large wildland fires and identify the trends of burn severity on all lands across the United States.

**Action:** Monitoring Trends in Burn Severity (MTBS), a project initiated in 2005, is conducted through a partnership between the U.S. Department of Agriculture's Forest Service Remote Sensing Applications Center (RSAC) and the U.S. Geological Survey's National Earth Resources Observation and Science (EROS) Center. The project's main objective is to provide a national analysis of trends in burn severity for the National Fire Plan. The geospatial and tabular data generated by MTBS can be used at a range of spatial, temporal, and thematic scales and are intended to meet a variety of information needs that require consistent data about fire effects.

**Result:** The project generates a suite of geospatial data products for each fire including burned area perimeters, 30 meter pre/post-fire Landsat imagery subsets, burn severity data, and summaries based on Geographic Information System (GIS) analysis with key geospatial data layers. To date, over 13,000 fires have been mapped by the MTBS project. The number of fires that will be mapped during the course of the project is estimated to exceed 15,000. MTBS developed a public-facing website ([www.mtbs.gov](http://www.mtbs.gov)) with robust data delivery capabilities. Users can pull data bundles at multiple scales, including national, regional, and fire level. In addition to accessing geospatial data bundles, the website also allows users to query the extensive MTBS database. Visualization and analysis tools are provided to assess fire trends at various scales and in the context of key geographic strata. Tabular data for specified queries can also be downloaded for further, customized analysis.

# The National Broadband Map: Collaboration Works



## Introduction

A unique collaboration among Federal agencies, State governments, and the private sector paved the way for the Nation's first geospatial dataset of broadband availability and the first public, searchable nationwide map of broadband availability. Launched on February 17, 2011, the National Broadband Map, available at [www.broadbandmap.gov](http://www.broadbandmap.gov), is an unprecedented searchable database of information on high-speed Internet access. The Map and its accompanying dataset fill an important policy gap, providing—for the first time—information at a detailed geographic level about broadband availability across the country. The products also represent the culmination of two years of committed partnership by State agencies and non-profit organizations, public and private sector broadband providers, and the Federal Government. The effort exemplifies the goals of the Office of Management and Budget (OMB) Circular A–16, which established a coordinated approach to developing the National Spatial Data Infrastructure (NSDI), including the development of national data and collaborative partnerships.

The National Broadband Map supports efforts to expand broadband access and adoption in communities at risk of being left behind in the 21st century economy and to help businesses and consumers seeking information on their high-speed Internet options. It does this by providing better data with which consumers, business leaders, and policymakers can make more informed decisions. The first dataset resulting from this Federal-State-private sector partnership included 25 million searchable records showing where broadband Internet service is available, the technology used to provide the service, the maximum advertised speeds of the service, and the names of the providers offering the service. In addition, they include the type and speed of the service to which community anchor institutions—such as libraries, schools, and hospitals—subscribe. The interactive and searchable website displaying the data allows users to search by address to find the broadband providers and services available in the corresponding census block or road segment, view the data on multiple maps, or use other interactive tools to compare

broadband across various geographies, such as States, counties, or congressional districts.

## A Call to Action

The National Broadband Map implements the joint purposes of the American Recovery and Reinvestment Act (Recovery Act) and the Broadband Data Improvement Act (BDIA), which envisioned a comprehensive program, led by State entities or non-profit organizations working at their direction, to facilitate the integration of broadband and information technology into State and local economies. In calling for the National Broadband Map, the Recovery Act required the National Telecommunications and Information Administration (NTIA) to:

*Develop and maintain a comprehensive nationwide inventory map of existing broadband service capability and availability in the United States that depicts the geographic extent to which broadband service capability is deployed and available from a commercial provider or public provider through each State. Not later than 2 years after the date of the enactment of this Act, the Assistant Secretary shall make the broadband inventory map developed and maintained pursuant to this section accessible by the public on a World Wide Web site of the National Telecommunications and Information Administration in a form that is interactive and searchable.<sup>1</sup>*

In addition, the Recovery Act provided the funding for the Map and linked the development of the Map to Public Law 110-385, the State Broadband Data and Development Grant program, a key component of BDIA.

With only 24 months to meet its congressional deadline, NTIA and its partners worked quickly. Less than five months after Congress passed the Recovery Act, in July 2009, NTIA released program rules through a Notice of Funds Availability. Making one grant award available per State, Assistant Secretary Lawrence E. Strickling noted that the data States gathered would be “used to create the national

<sup>1</sup>Section 6001(1) of the American Recovery and Reinvestment Act of 2009, Public Law No. 111-5 (2009), codified at 47 U.S.C. 1305(1).

broadband map, and in addition, States will be able to create their own broadband maps tailored to their specific needs.<sup>2</sup> NTIA awarded the grants beginning in October 2009 and all but a few of the 56 grantees had funding in-hand by the end of January 2010, just 13 months prior to the statutory deadline for publication of the National Broadband Map.

## Critical Partnerships

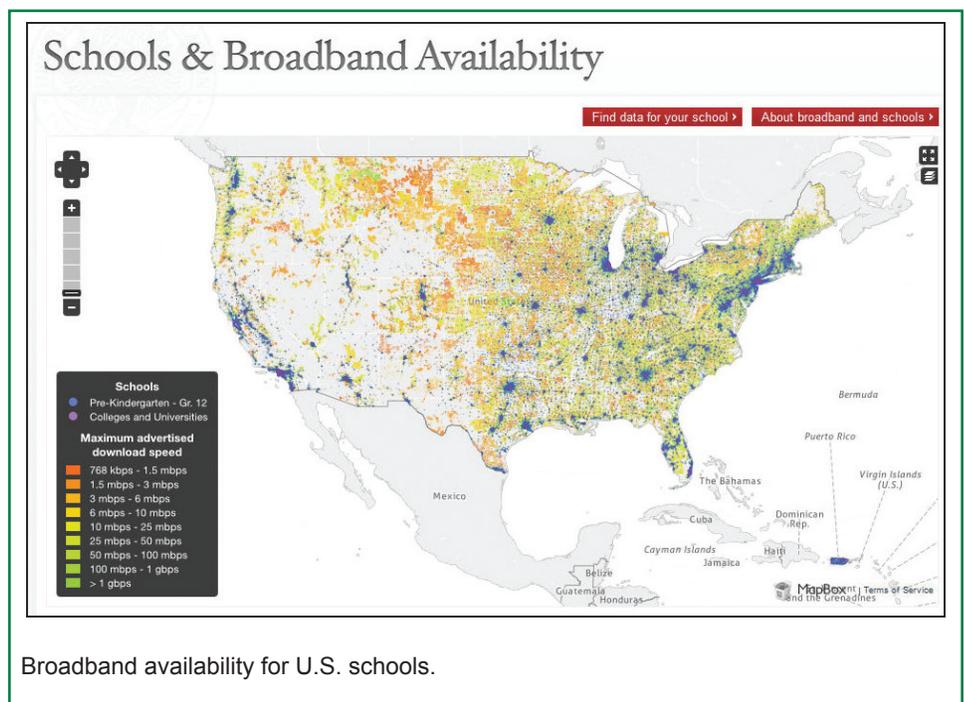
Collaboration between grantees and broadband providers was critical to the timely launch of the National Broadband Map. In nine short months between January and October 2010, States—many with no initial broadband availability dataset from which to expand—completed two rounds of data collection, ultimately gathering information from approximately 3,400 State-based broadband providers representing more than 1,650 unique broadband providers. Each grantee first developed relationships with broadband providers across its State to explain the program's purpose. Identifying providers and communicating the need for the information was a time and resource intensive task, and grantees used multiple sources to identify the potential community of broadband providers. In many cases, providers and NTIA's grantees worked out specific agreements for the disclosure of information. This provider-offered data resulted in an important base of information and required a significant voluntary investment of resources by broadband providers across the country.

Many grantees also chose a collaborative governance model that supported the successful collection and verification of data. In many cases, the State teams included staff with Geographic Information Systems (GIS), economic development, and telecommunications backgrounds. Broadband providers have only recently begun to organize telecommunications data in a spatial format or relative to census geography; as a result, grantees used significant GIS resources, converting data into the census block or road segment level NTIA required for the program. Grantees also used a range of analysis and verification methods, from drive-testing wireless broadband service across highways to performing field investigations. After reviewing existing data available at regulatory

commissions or meeting with State and local officials, many grantees returned to broadband providers, large and small, to confirm data or suggest more accurate depictions of their service areas.

Grantees delivered their State datasets to NTIA on October 1, 2010, only 4.5 months before the congressional deadline. At this point, another partnership took center stage: NTIA and the Federal Communications Commission (FCC). As two Federal agencies at the forefront of assessing and expanding broadband deployment in the United States, their expertise in these areas made them natural partners for the National Broadband Map. The agencies together developed requirements for the intake, review, and publication of data at the national level. These requirements resulted in the award of three contracts by the FCC, approximately concurrent with the grantees' data submissions. With State data, FCC and NTIA staff support, and contractual resources, the two agencies were able to meet the tight statutory deadline for launching the map.

While the Federal Government provided technical assistance and ideas to support grantees during the data collection and validation process, grantees served as a critical technical support mechanism for each other. Grantees have developed best practice methodologies for evaluating changes in provider participation, defining the composition of various classes of broadband technology types, and evaluating satellite coverage, just to name a few examples. National groups that include a large number of grantees also support this effort. The data model in use by grantees was first developed by members of the National



Broadband availability for U.S. schools.

<sup>2</sup>Available at: [www.ntia.doc.gov/press-release/2009/ntia-unveils-program-help-states-map-internet-infrastructure](http://www.ntia.doc.gov/press-release/2009/ntia-unveils-program-help-states-map-internet-infrastructure). Accessed: September 5, 2011.

States Geographic Information Council (NSGIC) and has continued to be improved through grantee collaboration. The National Association of Regulatory Utility Commissioners, the Rural Telecommunications Congress, and NSGIC have all devoted tracks at their regular member meetings to discuss and share best practices among the grantees present. The unprecedented nature of this work resulted in these national member groups serving an even more important role than they might have in a more established program.

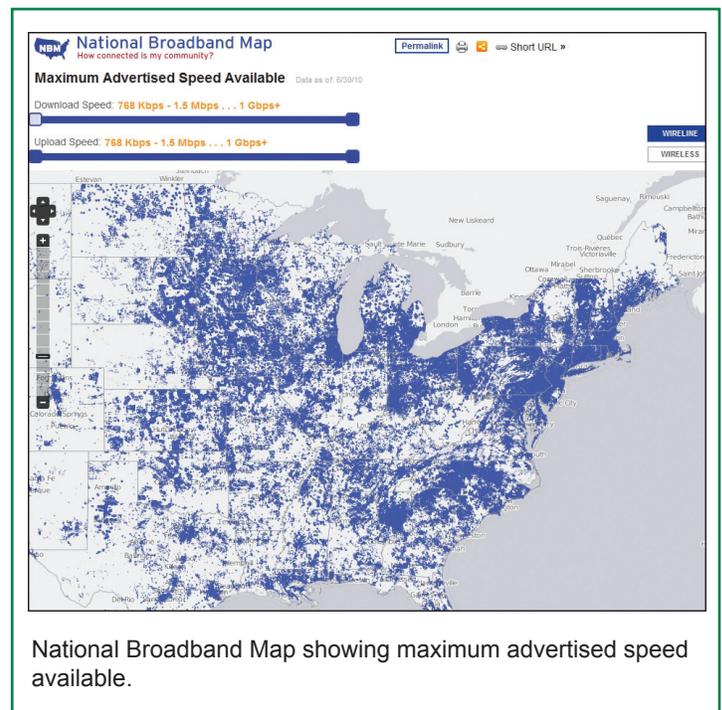
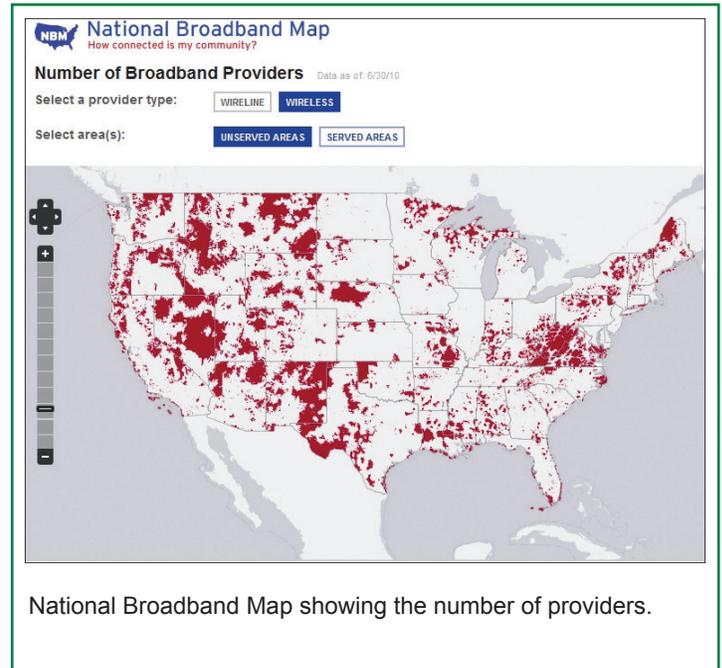
## From Collection To Publication

The Map meets the requirements of the Recovery Act's mandate, complementary White House initiatives, and the needs of potential users. The Recovery Act required that the final product be comprehensive, interactive, and searchable, and display broadband service capability and availability. Consistent with the White House Open Government Initiative, the team also incorporated transparency, participation, and collaboration as necessary elements for a successful final product. With these core requirements in place, staff then considered who would use the product and designed the requirements for the National Broadband Map platform based on the needs of those potential users.

Stakeholder feedback underpinned the development of use cases for distinct groups and important website functionality. For example, policymakers represent one stakeholder group. Consumers and small businesses represent two others. Stakeholders also expressed an expectation to see their search queries quickly and in a digestible format. After reviewing these needs, NTIA and the FCC identified three core functions: search, analyze, and map. A consumer is able to search broadband options at a neighborhood level (in the case of the Map, a neighborhood equates to a census block or road segment). A researcher or an economic developer analyzes the data and is able to determine where his community ranks in comparison to similar areas. A policymaker is able to view maps that tell the story of broadband availability both across the entire country and at a granular level.

The openness and transparency of the data and process, both to drive use and to ensure accountability, align this project with the White House Open Government Initiative. While the final product allows users to view broadband data in the context of demographic information, and across multiple political boundaries, the Federal team expected that stakeholders would have additional uses for the data. For this reason, the entire National Broadband Map is available through 37 application programming interfaces (APIs) ([www.broadbandmap.gov/developer](http://www.broadbandmap.gov/developer)) and through a download ([www.broadbandmap.gov/data-download](http://www.broadbandmap.gov/data-download)). These tools allow developers to leverage the data and

allow researchers to analyze the data in innovative ways. Moreover, the complete technical process that the FCC and its contractors implemented to assemble the 25 million records provided by grantees into a geospatial dataset that could meet the program's needs are fully detailed on the Map's Technical Overview page ([www.broadbandmap.gov/about/technical-overview](http://www.broadbandmap.gov/about/technical-overview)).



## What's Next?

In only the first few months, more than 500,000 unique visitors used the website. On average, they stayed for over 10 minutes. Federal and private sector groups are consuming APIs in exciting ways and researchers and others have downloaded the data over 1,000 times and are beginning to publish their findings. On September 21, 2011, NTIA, in collaboration with the FCC, and using data that each State, Territory, and the District of Columbia (or their designees) provided, updated the National Broadband Map.

Collaboration between and among State governments, non-profit organizations, Federal agencies, broadband providers, and many other stakeholders helped bring the National Broadband Map to fruition. Every partner in this project was committed to meeting the deadline set by Congress. This support—and the agility demonstrated daily by so many of the key partners and stakeholders—has been critical to the project meeting its goals. States are currently funded to continue updating their datasets through the end of 2014, and NTIA and the FCC plan to continue working together to update the National Broadband Map website twice a year with new data from grantees. Through its collaboration with State and other Federal agencies, the National Broadband Map team will continue to make the project a vibrant example of the NSDI.

# State of the Standards

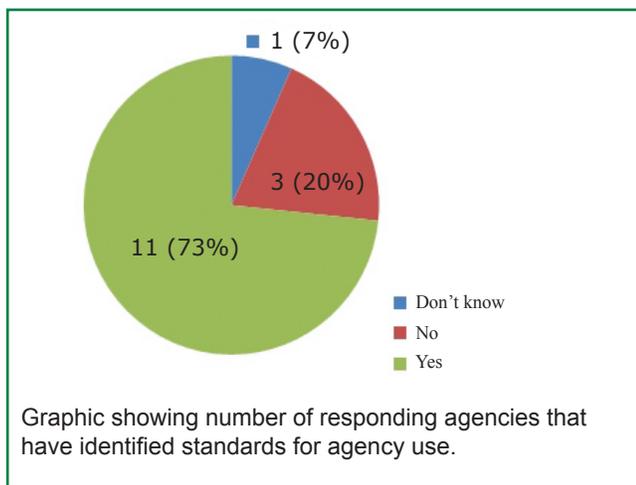
## Survey of Standards Usage

Standards facilitate the development, sharing, and use of geospatial data. The FGDC develops geospatial data standards for implementing the National Spatial Data Infrastructure, in consultation and cooperation with State, local, and Tribal governments; the private sector and academic community; and, to the extent feasible, the international community. The FGDC develops geospatial data standards only when no equivalent voluntary consensus standards exist, in accordance with Office of Management and Budget (OMB) Circular A-119 on Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities.

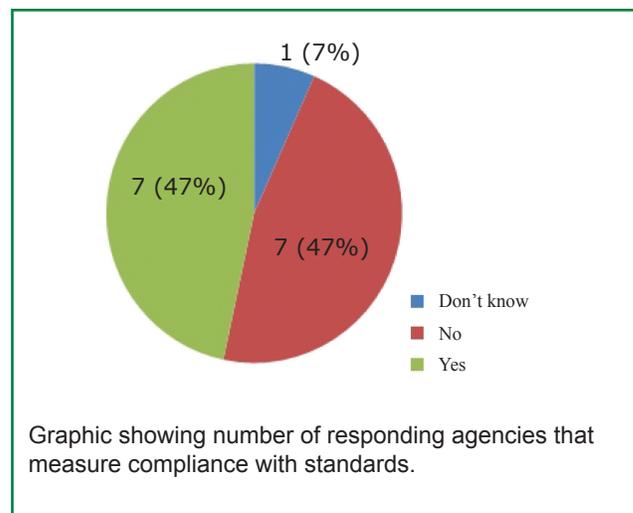
In 2011, the FGDC conducted its first survey on FGDC member agency use of FGDC-endorsed standards and requirements for standards. Fifteen FGDC member agencies from 11 of the 31 FGDC Departmental level members provided complete responses to the survey. It should be noted that agencies need to use only the standards applicable to their mission areas. A select subset of the survey results are presented here.

### Agency Policies on Standards

Survey results show that 11 FGDC member agencies (73 percent of respondents) have developed internal guidance on geospatial standards that are applicable for their use. Three responding agencies (20 percent) reported that their agencies have not identified standards that are applicable for their use.



The survey queried FGDC member agencies on whether they measured compliance with standards. Seven agencies reported that they measure compliance with standards, while an equal number reported that they do not measure compliance with standards.



### Use of Standards

The survey queried FGDC member agencies on their use of 100 FGDC-endorsed standards, including the 64 externally developed standards that the FGDC endorsed in 2010 in support of the Geospatial Platform.

Table 1 lists the ten standards with the highest level of use, based on responses. As metadata is key to geospatial data sharing through data documentation, discovery, and determining applicability of use, it is not surprising that it ranks as the standard of highest use.

Table 2 identifies the five standards with the highest number of planned implementations. Since the processes and tools to migrate to the International Organization for Standardization (ISO) metadata standard are currently a hot topic, it is not surprising to see it ranking as the number 2 “plan to use” standard.

The FGDC-endorsed standards usage survey is intended to become an annual reporting mechanism aligning with the broader OMB Circular A-16 Supplemental Guidance implementation of geospatial data portfolio management

**Table 1.** The ten most widely used FGDC-endorsed standards.

Standard		Number (Percentage) of responding FGDC member agencies that use the standard
1.	Content Standard for Digital Geospatial Metadata (version 2.0)	12 (80.0%)
2.	Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy	9 (60.0%)
3.	Classification of Wetlands and Deepwater Habitats in the United States	8 (53.33%)
4.	Geospatial Positioning Accuracy Standards, Part 1: Reporting Methodology	8 (53.33%)
5.	INCITS 455:2009, Information Technology - Codes for the Identification of Congressional Districts and Equivalent Areas of the United States, Puerto Rico, and the Insular Areas	7 (46.67%)
6.	OpenGIS (OGC) KML (version 2.2.0)	7 (46.67%)
7.	National Vegetation Classification Standard (version 2)	7 (46.67%)
8.	Part 6, Hydrography, FGDC-STD-014.6-2008	7 (46.67%)
9.	GeoTIFF Revision 1.0	7 (46.67%)
10.	Content Standard for Digital Orthoimagery	6 (40.0%)

**Table 2.** FGDC-endorsed standards planned for use.

Standard		Number (Percentage) of responding FGDC member agencies that plan to use the standard	Number (Percentage) of responding FGDC member agencies that are using the standard
1.	United States Thoroughfare, Landmark, and Postal Address Data Standard	7 (46.67%)	4 (26.67%)
2.	INCITS/ISO 19115:2003 [R2008] ISO 19115:2003 w/ISO 19115 Cor. 1:2006, Geographic information - Metadata + Corrigendum 1	6 (40.0%)	0 (0.0%)
3.	OpenGIS (OGC) Web Map Service Implementation Specification (version 1.3.0)	5 (33.33%)	5 (33.33%)
4.	Cadastral Data Content Standard	5 (33.33%)	4 (26.67%)
5.	INCITS 453: 2009, Information technology - North American Profile of ISO 19115:2003 - Geographic information - Metadata (NAP - Metadata)	5 (33.33%)	5 (33.33%)

and reporting. This year's responses will serve as an initial baseline for future standards usage reporting.

## FGDC Response to NIST Request for Information

The FGDC responded to a Request for Information (RFI) from the National Institute of Standards and Technology (NIST) on "Effectiveness of Federal Agency Participation in Standardization in Select Technology Sectors for the National Science and Technology Council's Sub-Committee on Standardization" that was published in the Federal Register. In this RFI, NIST invited interested parties to provide their perspectives on the effectiveness of participation by Federal agencies in the development and implementation of standards and conformity assessment activities and programs.

In its response to the RFI from NIST, the FGDC noted that it uses voluntary consensus standards, as defined in OMB Circular A-119, in lieu of government-unique standards whenever possible. In 2010, the FGDC endorsed 64 external standards, many of which were voluntary consensus standards.

The FGDC emphasized its participation in the InterNational Committee on Information Technology Standards Technical Committee L1 (INCITS L1), Geographic Information Systems; International Organization for Standardization (ISO) Technical Committee 211, Geographic information/ Geomatics; the Open Geospatial Consortium, Inc. (OGC); and the Geospatial-Intelligence Standards Working Group (GWG). By participating in these standards bodies, the FGDC leverages the knowledge, skills, and talent of the geospatial community in the development of standards that enable information, data, and service interoperability.

The FGDC, in its response to the RFI, identified factors that hinder participation in standardization activities and (or) the adoption and use of standards:

- **ISO and the American National Standards Institute (ANSI) charge a fee for standards.** It is difficult to promote the adoption of standards when State and county agencies and local and Tribal governments are obliged to purchase standards, even if they were involved in their development and (or) review.
- **Voluntary consensus standards often have copyright restrictions that negatively affect their promulgation and use.** Nonetheless, OMB Circular A-119 directs Federal agencies to "observe and protect the rights of the copyright holder and any other similar obligations."
- **Federal agencies have limited resources to commit to standardization activities.** The return on investment for standardization activities is often a long-term outcome.

The priority level for standardization activities is reduced when agencies need to show short-term benefits.

- **The Federal civilian community needs better incentives to adopt standards.** The FGDC noted that one disincentive to adopting and using standards is the current lack of a mechanism to enforce the use of standards.

More information on the RFI is available at: [www.nist.gov/director/sco/index.cfm](http://www.nist.gov/director/sco/index.cfm) (search on "SOS RFI Comments Summary").

# FGDC Advances the National Spatial Data Infrastructure

## The Geospatial Line of Business Advances

Priorities for the Geospatial Line of Business in fiscal year 2011 have been to (1) increase the Federal Government's return on investment for geospatial data and technology, (2) increase the ability of Federal agencies to utilize existing geospatial data from Federal and non-Federal partners, (3) increase the Federal Government's ability to utilize high-value geospatial data for decisionmaking in a timely manner, and (4) provide a platform for the service and use of common geospatial data, applications, and services.

These goals are being met through the continued cross-agency development of a Federal geospatial asset portfolio management capability, as outlined in the "Geospatial

### Geospatial Line of Business Accomplishments

- The Office of Management and Budget endorsed and released Circular A-16 Supplemental Guidance, November 10, 2010.
- The FGDC Steering Committee endorsed the new list of National Geospatial Data Asset Themes in alignment with A-16 Supplemental Guidance.

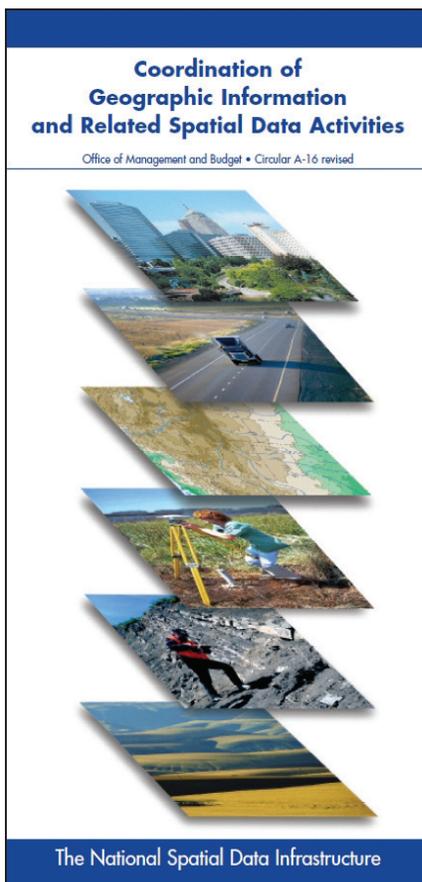
Line of Business, OMB Circular A-16 Supplemental Guidance," released by OMB November 10, 2010; and the development of the Geospatial Platform, as defined in the "Modernization Roadmap for the Geospatial Platform," March 2011; and the ongoing drafting of the "Building the Business Case for the Geospatial Platform, the Value Proposition" document. Many of the 2011 tasks have moved the FGDC toward the Phase I implementation of the Geospatial Platform. The major efforts for the Geospatial Line of Business have been OMB Circular A-16 Supplemental Guidance approval, beginning portfolio management implementation, and planning and initial implementation of the Geospatial Platform. These efforts demonstrate forward movement in how we do business for geospatial activities. Below is a summary of each effort and highlights of accomplishments.

### A-16 Supplemental Guidance Endorsed

The 2011 endorsement of the OMB Circular A-16 Supplemental Guidance document by the Office of Management and Budget provides definition and clarity to selected elements of OMB Circular A-16 to help facilitate the adoption and implementation of a coordinated and effective Federal geospatial asset management capability. This management capability improves support of mission-critical business requirements of the Federal Government and its stakeholders. The Supplemental Guidance primarily focuses on geospatial data as capital assets and provides the foundation for a portfolio management approach to a National Geospatial Data Asset (NGDA) Portfolio comprised of NGDA Themes and their associated NGDA Datasets.

### Portfolio Management Begins Implementation

A key tenant of the Circular A-16 Supplemental Guidance is having an understanding of the inventory of NGDA datasets. The development of the current NGDA inventory affords NGDA Theme Leads the opportunity to review,



The Circular A-16 report cover.

validate, and evolve those data assets for which their organizations hold stewardship responsibilities. In order to effectively show how the NDGAs support the business requirements of the Federal Government and its partners, the data inventory needs to compare characteristics such as content, quality, application, validity, and definition in order to have a consistent process for determining the data that belongs in the inventory. This initial NGDA inventory activity identified a baseline portfolio in support of an emerging full portfolio management process.

The portfolio management implementation strategy serves as a guide for the actions needed to reach full management of the portfolio of NGDA datasets. A phased approach for achieving full implementation includes continual improvements and annual reporting on progress. Each phase supports the outcomes identified in the OMB Circular A-16 Supplemental Guidance. The portfolio management process consists of six stages: inventory, selection, organization, management, evaluation, and monitoring. This process also includes the setting of Federal geospatial dataset priorities to ensure that NGDA Datasets are available to support the mission needs of the Federal Government and its partners, as determined by Federal agencies and their partners and as recommended to OMB.

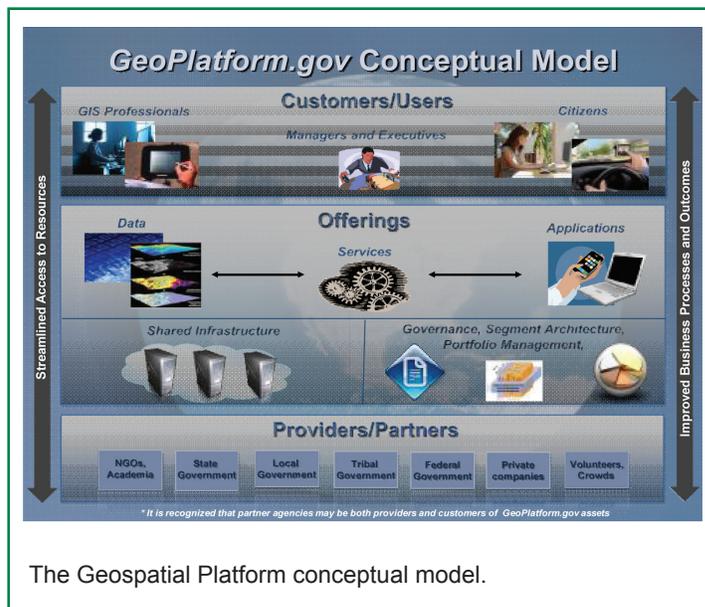
### The Geospatial Platform Initiative

Geospatial assets are an integral part of government and private day-to-day operations. While the business needs



**The Geospatial Platform** will function as the service and delivery mechanism for the Federal portfolio of geospatial data, applications, and services, and as the integration point for the discovery, access, and joint use of Federal and non-Federal geospatial data and services. The accomplishments for the year include:

- Developed the “Modernization Roadmap for the Geospatial Platform, Version 4” (released by OMB).
- Developed and launched IdeaScale to solicit comments on the Modernization Roadmap for the Geospatial Platform.
- Released the redesigned Geospatial Platform website ([www.geoplatform.gov](http://www.geoplatform.gov)).
- Members of the Geospatial Platform’s Technical Deployment Task Team (TDTT) developed a “Platform” prototype and architecture to frame requirements for future platform offerings.

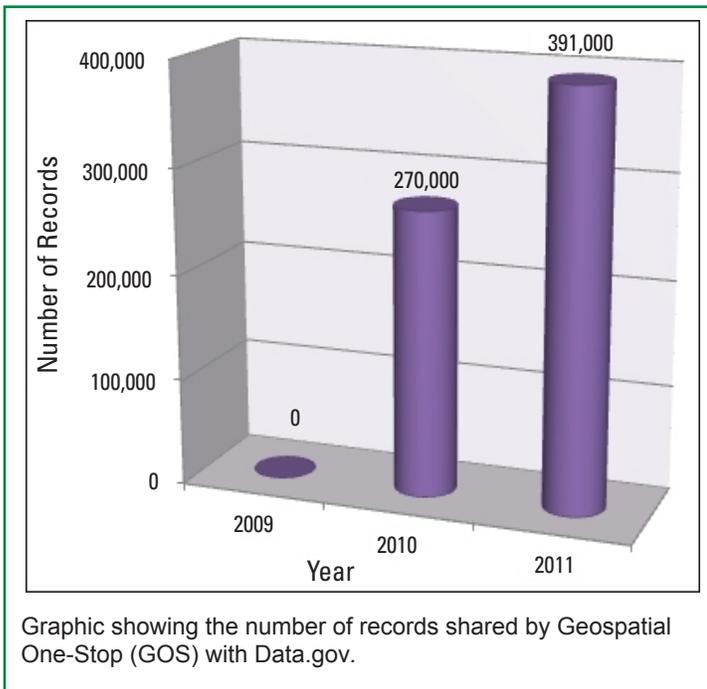


The Geospatial Platform conceptual model.

of stakeholders vary, different operations often require the use of similar assets. Coordinating the development and integrated use of the Nation’s geospatial assets is a complex effort, but the geospatial community has come together to create an initiative—the Geospatial Platform—to promote improved coordination and more effective use of geospatial information. The Geospatial Platform is designed to leverage geospatial expertise and existing geospatial data, services, applications, and infrastructure from across the government to enhance the Nation’s utilization of geospatial resources. The Geospatial Platform is an Internet-based capability providing shared and trusted geospatial data, services, and applications for use by government agencies and partners to meet their mission needs and for use by the public and provides opportunities to view and conduct business in new and innovative ways.

### Geospatial One-Stop Migrating to Data.gov

The Geospatial One-Stop (GOS) portal and catalog continued to be a central resource for inventory of geospatial assets in the United States in support of the Geospatial Line of Business and the National Spatial Data Infrastructure (NSDI). The catalog and data visualization capabilities of GOS are also identified as key components of the technical solutions in the proposed Geospatial Platform Version 0 and Version 1 implementations. Federal, State, local, academic, and Tribal data and service resources are registered through individual metadata entries. The holdings of the GOS database grew substantially in fiscal year 2011. With more than 678,000 individual metadata records contributed by 450 publishers, this is a 52-percent increase in records from fiscal year 2010. The National Oceanic



and Atmospheric Administration, U.S. Census Bureau, and U.S. Geological Survey were the main contributors of these additional records. The significant increase in the number of records in the GOS database continued to be driven by the integration of GOS with Data.gov. The GOS metadata catalog plays a central role in the population of Data.gov, now contributing both Federal and non-Federal geospatial assets. In all, over 391,000 records are shared from GOS with Data.gov, which means that 90 percent of the records available in Data.gov are geospatial data from GOS. This is a good example of how shared and integrated capabilities can increase governmental transparency and efficiency.

The GOS team continued to work with Federal agencies to promote collections of records through GOS for discovery in Data.gov. Several large collections of metadata were added to GOS/Data.gov, supplementing additions from the U.S. Census Bureau, the U.S. Environmental Protection Agency, and other agencies. These include US Topo (the next generation of digital topographic maps from the U.S. Geological Survey), high-resolution aerial orthoimagery from the U.S. Geological Survey, and Shuttle Radar Topography Mission data from the National Geospatial-Intelligence Agency and the National Aeronautics and Space Administration.

The GOS portal began its integration with Data.gov during fiscal year 2011, and this transition is expected to be complete in fiscal year 2012. At that time, Data.gov will become the official means for accessing metadata resources managed in the NSDI Clearinghouse Network. The goal is to create an integrated system to catalog and provide access to geospatial and non-geospatial data

and services and to support the existing requirements and objectives of NSDI and the Geospatial Platform. Content has been migrated from the GOS catalog to a new repository integrated with Data.gov at the U.S. General Services Administration. This forms the basis of metadata management and search for the NSDI. The integration task will also provide the initial capabilities required for the Geospatial Platform activity—cataloging, visualization, and access to remote (agency) and common services, and leveraging cloud-based and agency-hosted data and services.

Once the GOS metadata collection is migrated to Data.gov, Data.gov will include more than just the Federal, downloadable datasets that are currently available. Data.gov will utilize the catalog for search and access to Federal validated data, and the Geospatial Platform will utilize the catalog for search and retrieval of Federal and non-Federal records and registered services. Geospatial data visualization capabilities in Data.gov will be enhanced and a geospatial data search capability will be added. In these ways, Data.gov will encompass and extend much of the functionality that was formerly available through the GOS portal.

## GeoCloud Sandbox Initiative

The GeoCloud Sandbox Initiative is an FGDC–General Services Administration sponsored activity to develop geospatial application server software packaging that can be used in the Cloud environment. The FGDC Technology and Architecture Working Group sought Federal participants with application server software who are interested in prototyping deployment of public geospatial data and service offerings in a Cloud environment for up to one year.

The objective of the GeoCloud Sandbox Initiative is to provide technical assistance; external hosting monitoring; and reporting on configuration options, results, usage, and costs for mission-critical geospatial data and software within a Federal cloud-computing environment. Key items addressed in fiscal year 2011 were:

- identifying requirements-driven solution architectures (comprehensive software environments) for variously sized deployments of geospatial data and services;
- documentation and cost analysis to support scalability, reliability, and redundancy;
- addressing system security concerns to expedite Federal Information Security Management Act (FISMA) certification and accreditation for agency adoption; and
- supporting and collecting cost comparison information from agencies for existing and externally hosted Cloud solutions.

### Accomplishment of the GeoCloud Sandbox Initiative

Amazon Cloud services are being used in the GeoCloud Sandbox Initiative to support both open source and commercial geospatial application servers for nominated FGDC member agency projects. Benefits of the Cloud include scalable capacity, performance, shared system security profiles, reduced time to deploy, and manageability though variable monthly costs of operation. Projects range from small to large and project experience can be shared and applied by other agencies.

Ten projects were identified within the U.S. Census Bureau, U.S. Department of Agriculture, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Geological Survey, and National Oceanic and Atmospheric Administration. These projects were typically existing, public-facing Web service environments that included standard geospatial software for access and (or) analysis. By starting with existing systems, a fair comparison of in-house and cloud-hosting costs and procedures can be made. Through the redeployment of certified systems, the system security approval process can be accelerated. By sharing common packages of software, agency projects can share the “platform” certification burden and accelerate deployment times, adding in only their data and minor customization.

Two geospatial “platform as a service” environments (also known as reference platforms) were developed based on the requirements of the participating projects. Common software and operating systems were identified to create the reference platforms in order to maximize re-use. An open-source reference platform includes Linux (CentOS), Apache, MySQL, PostgreSQL, Java, Tomcat, OpenGeo’s GeoServer, and GeoNetwork products. The commercial reference platform includes Windows 2008 Server R2, IIS, Java, Tomcat, and Esri ArcGIS Server, and related programming environments. Installation scripts were written using the Amazon CloudFront technology that enables projects to rapidly configure and deploy virtual machines in Amazon. Periodic assessments of dependencies between the software packages were made, resulting in adjustments to the versions and installation scripts.

The U.S. Census Bureau deployed its 2009 TIGER Line file server using the Linux CentOS image, offering an enhanced ftp/http data access service for all public access to 2009 TIGER data. In the Windows environment, the key system deployed was the Wetlands Mapper Application using the ArcGIS Server, developed by the U.S. Fish and Wildlife Service and deployed by the U.S. Geological Survey information technology staff. Performance and reliability of the deployed services in both cases was comparable or

superior to the legacy service environment in the agency data centers. Additional configuration capabilities exist in the Cloud environment for load balancing and to automatically scale additional service capacity in times of high demand.

The most challenging aspect of migration to the Cloud has been acquiring agency security approval for the Cloud applications. In most cases, the existing agency system security approval (Certification and Accreditation - C&A) was used as a basis for a Cloud C&A, but the hosting infrastructure, interconnect agreements, and service-level agreements desired by the agencies were sometimes difficult to document or acquire in order to issue an Authority to Operate (ATO). These infrastructure-based security issues are being addressed through GeoCloud use of the recently GSA-approved Infrastructure as a Service (IaaS) Blanket Purchase Agreement for Cloud services, acquired through Apps.gov. This has provided a Federal-wide security approval for the IaaS solutions that agencies can accept and incorporate into their systems-accreditation process.

### National Geospatial Advisory Committee Promotes Communication

The National Geospatial Advisory Committee (NGAC) is a Federal advisory committee sponsored by the Department of the Interior to provide external advice and recommendations to the member agencies of the FGDC. The NGAC includes 28 committee members representing a variety of organizations involved in geospatial issues, at all levels of government, the private sector, non-profit organizations, and academia. The list of members is available at [www.fgdc.gov/ngac](http://www.fgdc.gov/ngac). The NGAC meets three to four times per year and has established subcommittees that conduct research and develop draft products between committee meetings.

The NGAC promotes two-way communication on issues of common interest to the national geospatial community and provides a forum to convey views representative of our partners and stakeholders. The NGAC has served as a valuable source of advice and feedback for the FGDC. Over the past year, the NGAC has analyzed and provided recommendations on a number of key geospatial policy issues. Highlights of the NGAC’s 2011 activities include the following:

- The NGAC developed recommendations on several important topics in 2011, including the Geospatial Platform Initiative, *The National Map*, geolocation privacy, the National Land Imaging Program, Transportation for the Nation, and the Federal Aviation Administration’s laser pointer issue, which could impact the collection of LiDAR data.

- The NGAC adopted an Action Plan for committee activities in 2011/2012, including goals and subcommittees organized under the following areas:
  - Innovative Strategies for Geospatial Programs and Partnerships
  - Geospatial Platform
  - Geospatial Workforce Development
  - Emerging Technologies
  - Geospatial Partnerships with Tribal Governments
- The NGAC also designated Points of Contact (POCs) for significant Federal geospatial programs and initiatives. The role of the POCs is to monitor program activities and keep NGAC members informed of key developments.
- The NGAC engaged in a dialogue with FGDC Chair Anne Castle regarding the White House budget initiative for the National Land Imaging Program and adopted the following resolution:
 

“The NGAC strongly supports the establishment of the National Land Imaging Program as described in the Administration’s fiscal year 2012 budget proposal

and we encourage the Department of the Interior to implement the program as soon as possible. NGAC looks forward to providing advice to the Department on the development and implementation of the program. This recommendation is made in the context of a more comprehensive multi-agency, multi-resolution, multi-sensor imagery program for the nation.”

- The NGAC adopted a paper on local government GIS best practices.
- The NGAC adopted a paper on best practices for interagency data sharing.
- The NGAC held a series of “spotlight sessions” that brought together experts on key topics to discuss new approaches and identify best practices and lessons learned. The spotlight sessions focused on the topics of interagency data sharing, geospatial workforce development, and national land parcel data.

In 2012, the NGAC will continue to provide advice and feedback on the development and implementation of key geospatial topics, including innovative strategies for geospatial programs and partnerships, the Geospatial Platform, geospatial workforce development, emerging technologies, and partnerships with Tribal governments. These multifaceted activities will be a major focus of the NGAC’s work over the coming year.

### NGAC Leadership Transition

In February 2011, Secretary of the Interior Ken Salazar appointed a new Chair and Vice Chair to lead the NGAC. Dr. David Cowen, Professor Emeritus of Geography at the University of South Carolina, was appointed as NGAC Chair. Dr. Jerry Johnston, the Geospatial Information Officer at the U.S. Environmental Protection Agency, was appointed as Vice Chair. Dr. Cowen and Dr. Johnston are well-known and respected leaders in the geospatial community, and they bring a wealth of experience and expertise to their new leadership roles.

The new leadership team replaces the outgoing Chair and Vice Chair, Anne Hale Miglarese of Booz Allen Hamilton and Steven Wallach, recently retired from the National Geospatial-Intelligence Agency. Ms. Miglarese and Mr. Wallach served with distinction as the first leadership team for the NGAC to establish the NGAC as a trusted voice for the geospatial community.



Wallach



Migliarese



Cowen



Johnston

### Standards Progressing Forward

#### United States Thoroughfare, Landmark, and Postal Address Data Standard

In February 2011, the FGDC Steering Committee endorsed the United States Thoroughfare, Landmark, and Postal Address Data Standard (“Address Data Standard”). The standard contains four parts: address data content, classification, transfer, and quality.

Street addresses, which are covered by the Address Data Standard, are the location identifiers most commonly used by various levels of government and the public. Street addresses are critical for administrative records, emergency and first response, research, marketing, mapping, geospatial information systems, routing and navigation, and law enforcement. The standard provides Federal, State, local, and Tribal agencies with a means to share address information, as well as a methodology for improving response to emergency and non-emergency service requirements, with associated improvements in efficiency, effectiveness, and economy.

“The United States Thoroughfare, Landmark, and Postal Address Data Standard will have a significant impact at all levels of government and is an essential component of the National Spatial Data Infrastructure,” said Ivan DeLoatch, Executive Director of the FGDC. “We encourage

government agencies, as well as others, to implement the standard for it provides a foundation for understanding and developing solutions for the many challenges in our communities.”

The U.S. Postal Service (USPS) and the National Emergency Number Association (NENA) were involved in the development of profiles for the Address Data Standard. The “Postal Addressing Profile of the Federal Geographic Data Committee United States Thoroughfare, Landmark, and Postal Address Data Standard” outlines the equivalencies and differences between the Address Data Standard and USPS Publication 28, “Postal Addressing Standards.” Similarly, the “Profile Reconciling the FGDC United States Thoroughfare, Landmark, and Postal Address Data Standard” and the NENA’s “Next Generation 9-1-1 (NG9-1-1) Civic Location Data Exchange Format (CLDXF) Standard” outline equivalencies and differences between the two standards. The FGDC awarded Spatial Focus, Inc. a 2011 National Spatial Data Infrastructure Cooperative Agreements Program (NSDI CAP) grant for prototyping data quality and data exchange tools to assist government agencies in implementation of the Address Data Standard.

### Coastal and Marine Ecological Classification Standard

Coastal and marine planners and managers are faced with complex challenges when making decisions about habitat conservation and resource management. Given this complexity, and recognizing the vastness of the marine environment for which the United States has jurisdiction, the requirement for a standard national classification for coastal and marine systems was identified. To fulfill this requirement, the National Oceanic and Atmospheric Administration and NatureServe developed the Coastal and Marine Ecological Classification Standard (CMECS). CMECS is relevant to all U.S. coastal and marine environments and can be applied locally, regionally, nationally, and even globally. A standardized approach enables coastal and marine planners and managers to develop strategies for resource management and conservation for all of North America’s coasts and oceans.

CMECS was released for public and peer review in 2010. The FGDC awarded a 2011 NSDI CAP grant to NatureServe to support resolution of comments from public and peer review and production of a final draft. A final draft CMECS is expected in December 2011.

### Return on Geospatial Investment: Iowa LiDAR Project

The State of Iowa is seeing many benefits and savings from its LiDAR elevation project and from freely sharing the data with city, county, State, and Federal agencies and private engineering firms. Business benefits and cost savings have been seen in numerous areas, including reducing the cost of planning topographic surveys for construction projects, county planning for wind farm and industrial siting, city water and sewer improvement projects, and emergency and disaster management. These benefits and savings are backed up by a recent Return on Investment study completed by the Iowa Geographic Information Council and utilized components of the FGDC Return on Investment methodology developed through the Cooperative Agreements Program. The study showed an estimated benefit of \$5 million per year.

Here are several examples of how free LiDAR data provides benefits and saves time and money.

- The city of Leon in Decatur County took advantage of the availability of the data to put in place a plan for a sewer improvement project. Since the project was deemed “shovel ready” the city received about \$2 million in American Recovery and Reinvestment Act funding for the improvement project.
- Private engineering firms using the free LiDAR data are able to save small cities several thousand dollars per project and reduce the project times by 50 percent.
- County governments are able to reduce the cost of their aerial photography projects by as much as \$36 per square mile, or about \$21,000 for a typical county. The LiDAR data also improves the accuracy and quality of the photos.
- Using LiDAR data, aerial photos, and other data, the U.S. Army Corps of Engineers was able to determine that if a potential breach of the Iowa River near Marshalltown occurred, it would most likely flow in such a manner as to not be of danger or risk to the Sutherland Power Plant. This analysis determined that a \$500,000 streambed enhancement project would not be necessary at that time, saving money for the local government and taxpayers.
- Iowa’s LiDAR data was also recently used to recalculate flood inundation by the Missouri River in western Iowa.
- The study is recognized as being conservative in its estimates—recent Web statistics indicate that one terabyte of the LiDAR data is being downloaded freely every week by a variety of academic, government, and business users. See [www.geotree.uni.edu/lidarProject.aspx](http://www.geotree.uni.edu/lidarProject.aspx).

These examples show how data partnering and sharing provide positive, measureable cost savings and cost avoidance.

## Federal Trails Data Standard

In 2011, the FGDC Steering Committee endorsed the Federal Trails Data Standard for FGDC endorsement. Governmental agencies and the public recognize trails as important recreational and cultural resource corridors. The National Park Service, the Bureau of Land Management, U.S. Fish and Wildlife Service, and U.S. Forest Service have worked with each other and with States, local governments, and trail organizations for many years to promote and develop trails for the benefit of the public.

Trail information is a necessity throughout the trails management lifecycle, from planning through design, construction, operation, and maintenance. The U.S. National Park Service, Bureau of Land Management, U.S. Fish and Wildlife Service, and U.S. Forest Service developed the Federal Trails Data Standard to facilitate the access, exchange, and use of trail information and increase the capability for enhanced and consistent trails mapping, inventory, monitoring, condition assessment, maintenance, costing, budgeting, information retrieval, and summary reporting.

## Geospatial-Intelligence Standards Working Group

The FGDC recognizes the need for common standards across the defense, intelligence, and civilian communities, as these communities establish a common operating environment. The FGDC is a member of the Geospatial-Intelligence Standards Working Group (GWG) chaired by FGDC member agency the National Geospatial-Intelligence Agency. The GWG provides a consensus-based community forum authorized to prescribe and mandate geospatial standards for use by Federal Government organizations within the Department of Defense and the intelligence community. The FGDC is the GWG's link to the civilian community. In 2011, the FGDC worked to develop a standards review and approval process to align with the process used by the GWG so that there will be common standards among the defense, intelligence, and civilian communities.

## Geospatial Metadata: Workhorse of the NSDI

Metadata continues to be a fundamental component of NSDI initiatives across the board. Metadata records published through the Geospatial One-Stop (GOS) portal comprise the majority of Federal records within Data.gov. As the transition from GOS to Data.gov as a catalog for the Geospatial Platform progresses, the FGDC will continue to provide a venue for non-Federal records in support of data sharing among the broader NSDI community within an integrated catalog shared with Data.gov. Data sharing is increasingly recognized as a GIS best practice by NSDI

stakeholders, and much of the 2011 effort was focused on supporting the National Science Foundation (NSF) DataONE data sharing effort and the National States Geographic Information Council (NSGIC) Data Sharing Working Group.

Metadata is also fundamental to data development in compliance with Framework and other spatial data standards. The NSDI Cooperative Agreements Program (NSDI CAP) sponsored the development of data and metadata that demonstrate the application of the recently approved United States Thoroughfare, Landmark, and Postal Address Data Standard. Products from the NSDI CAP project will serve as examples for use by NSDI stakeholders as they implement the standard.

With an eye to the future, focus is also directed toward the challenges, tools, and processes for migrating from the FGDC's Content Standard for Digital Geospatial Metadata to the International Organization for Standardization (ISO) Geographic Information – Metadata standard. Planning is underway for a Metadata Summit that will bring together a group of metadata subject matter experts to identify challenges and opportunities presented by the new metadata standard and to begin identifying strategies for effective implementation.

## Cooperative Agreements Program Builds the NSDI

To encourage and enable building the NSDI at all levels of the geospatial data community, the FGDC sponsors the Cooperative Agreements Program (CAP). The benefits to the community are not only financial but more importantly validate an organization's geospatial endeavors, which leads to new opportunities. The CAP has created collaborations within all sectors of government, helped develop an understanding of geospatial information in organizations new to the NSDI, provided seed money to enable geospatial organizations to participate in the national effort to implement the NSDI, promoted the importance of geospatial data standards, promoted the development of standardized metadata in hundreds of organizations, and greatly expanded implementation of geospatial services on the Internet.

### Feedback on the NSDI CAP

Montana: "[The program] improves the quality of data available at the national level by facilitating the movement of local authoritative data to the State, then to the national level. It also helped to foster relationships with local data providers and emphasize the importance of data sharing which in turn benefits the Federal level."

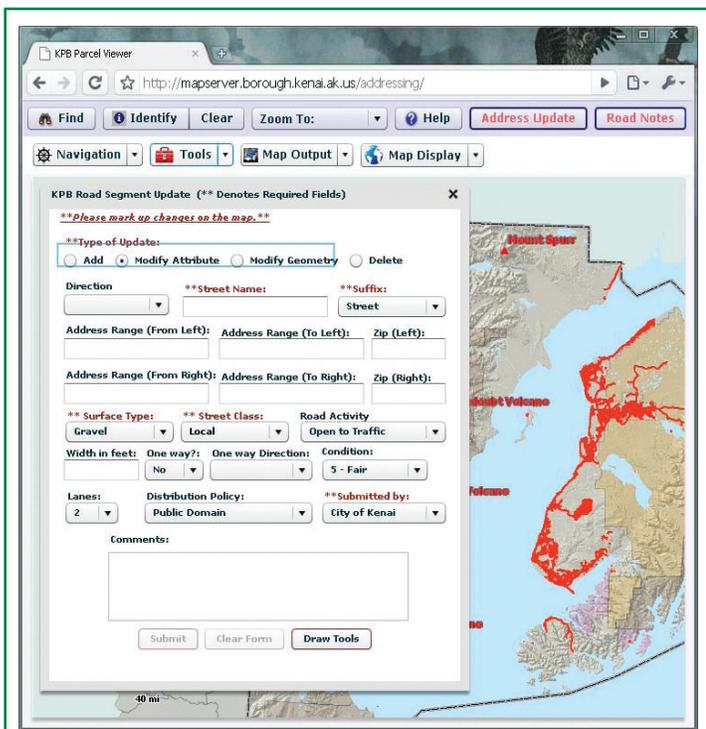
The program's diversity can be seen in the 27 CAP projects completed this year. The GeoCommons platform was extended to enable it to dynamically georeference Federal Government tabular data, which will allow data to be discovered, accessed, and applied in its geographic context; Geocommons.com. Four projects developed client/server-mediated applications that can access, search, and exploit the geospatial data and services referenced by the Geospatial One-Stop portal to support specific geographic or discipline requirements. For more information see [www.fgdc.gov/grants/2009CAP/2009CAPDescriptions#category2](http://www.fgdc.gov/grants/2009CAP/2009CAPDescriptions#category2). Illinois, Indiana, and Missouri created or enhanced numerous partnerships between regional and local governments and demonstrated viable solutions to solve data interoperability problems. Projects in Alaska, Michigan, Montana, and Utah focused on building data stewardship for transportation geospatial information. Complete guides to the National Vegetation Classification Standard (Version 2) were developed for online and classroom use; [mtnhp.org/ecology/nvcs/](http://mtnhp.org/ecology/nvcs/). Finally, the CAP continued to sponsor projects that serve to train a variety of interest groups in the value of metadata and in its implementation and sharing. This year over 141 people were introduced to metadata concepts through a variety of workshops and online and in-person presentations.

In the 2011 program, CAP awards were given to 20 projects that address six categories. The planned CAP budget for fiscal year 2012 is just over \$800,000, and these funds will be used to support up to 41 projects. For more information, please see [www.fgdc.gov/grants](http://www.fgdc.gov/grants).

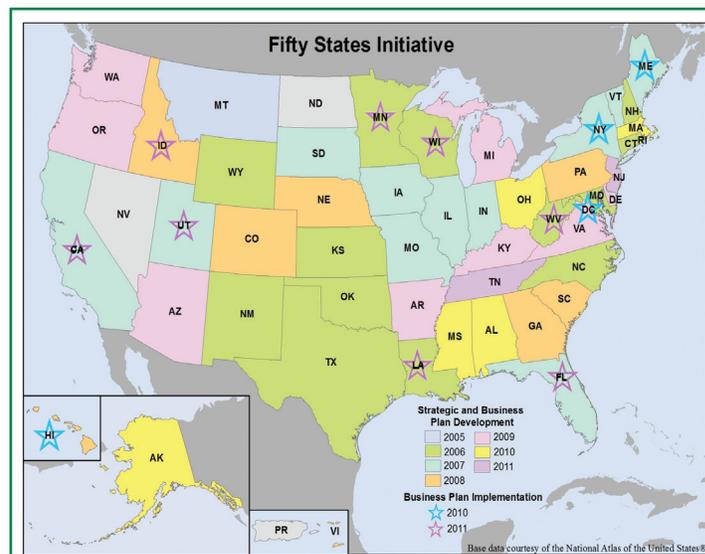
## Fifty States Initiative Promotes Coordination

This year marked the sixth anniversary of the Fifty States Initiative. The Initiative strengthens statewide coordination by advancing strategic and business plans and helps identify activities where strategy for Federal partnerships can and should occur. Since 2006, 48 States plus the District of Columbia and the U.S. Virgin Islands have received support through the NSDI CAP program. In 2011, eight States (Delaware, Hawaii, Idaho, Kentucky, Maine, Michigan, Mississippi, and Oregon) plus the U.S. Virgin Islands completed Initiative projects and ten awards were given to projects in California, Florida, Idaho-Montana (joint project), Louisiana, Minnesota, New Jersey, Tennessee, Utah, West Virginia, and Wisconsin.

This year's "Measuring Progress of the Fifty States Initiative" status report noted that NSDI CAP helps to formalize efforts toward and improvement of statewide coordination, communication, and collaboration among stakeholders. In addition, States that have plans in place were in a better position to compete for American Reinvestment and Recovery Act (ARRA) funds that furthered their geospatial capabilities and their contributions to national level data. As the Fifty States Initiative continues into its seventh year,



Kenai Peninsula Borough, Alaska, Parcel Viewer showing the road notes application, [www.borough.kenai.ak.us/GISDept/AGS.html](http://www.borough.kenai.ak.us/GISDept/AGS.html).



Map showing status of the Fifty States Initiative at the end of fiscal year 2011.

the emphasis will be on furthering business planning and the plan implementation process that helps States forge key partnerships. For more information about the Initiative, please see [www.fgdc.gov/policyandplanning/50states](http://www.fgdc.gov/policyandplanning/50states).

## International Activities Progressing

The FGDC Secretariat continues to support international efforts through the Global Spatial Data Infrastructure (GSDI) Association and the intergovernmental Group on Earth Observations. These activities are underpinned by the adoption of common techniques and standards to promote interoperability worldwide and thereby facilitate access to geospatial data and services.

The FGDC supports the GSDI Association efforts to increase international collaboration on spatial data infrastructure (SDI) development. In support of this, the FGDC coordinates and supports the GSDI Small Grants Program that promotes SDI adoption in developing countries around the world. In 2011, fourteen projects were supported.



West Africa SDI Workshop, Obafemi Awolowo University Campus, Ile-Ife, Nigeria.

The GISCorps of Urban and Regional Information Systems Association partners in the GSDI Small Grants Program and provides professional services in support of this effort. Through the GSDI Association, FGDC funds the publication of regional SDI newsletters. In addition, the FGDC hosts a visiting scientist from Korea who supports the Asia Pacific regional newsletter and other GSDI activities.

The FGDC Secretariat continued support for the intergovernmental Group on Earth Observations (GEO) and its Global Earth Observation System of Systems (GEOSS). In fiscal year 2011 the Secretariat supported the revision of the 2012–2015 workplan and committee structure. Ivan DeLoatch, FGDC Secretariat Executive Director, is a co-chair for the Architecture and Data Committee, and Doug Nebert, FGDC Secretariat Senior Advisor for Geospatial Technology, is Task Lead for the key architectural task (AR-09-01A) within GEO. The FGDC and U.S. Geological Survey developed and continue to operate and evolve core catalog service capabilities for GEOSS—the GEOSS Clearinghouse and Component and Service Registry—through technical support agreements with George Mason University. Significant enhancements to the capability of GEOSS were developed for presentation to the GEO Plenary Session in November 2011.

## NSDI Training Expands Beyond Metadata

FGDC continues to work with stakeholders to develop a range of NSDI-related training materials. A cooperative agreement with the University of Wyoming resulted in the development of a full suite of NSDI Framework Data training materials that go beyond basic presentation slides by including links to resources, an audio track, quizzes, and



GeoCircle is a new website that facilitates communication about geospatial issues. It allows Native American Tribes to connect with the Department of the Interior (DOI). GeoCircle allows users to share information about:

- Tribal points of contact for geospatial activities
- DOI liaisons to Tribes for geospatial issues
- Grant and funding resources
- Training resources
- Enterprise license agreements
- Conference passes
- Documents contributed by both the Tribes and DOI
- Dynamic content contributed by Tribes and DOI

If you would like to participate in building and using GeoCircle, please take the first step by registering. If you register, you will be able to read and contribute content to the GeoCircle website. For instructions on how to register see [www.fgdc.gov/geocircle/GeoCircle\\_HowToRegister\\_v3.pdf](http://www.fgdc.gov/geocircle/GeoCircle_HowToRegister_v3.pdf).

The FGDC is proud to support GeoCircle and provides information on FGDC activities and opportunities of interest to the GeoCircle community.

other dynamic features. The materials are available from the NSDI Online Training Program website ([www.fgdc.gov/training/nsdi-training-program/online-lessons#lessons](http://www.fgdc.gov/training/nsdi-training-program/online-lessons#lessons)).

FGDC supports the National Science Foundation (NSF) DataONE program efforts to develop training materials that encourage and guide scientists in best practices for sharing research data within their scientific communities and with the public. The materials are being developed through the DataONE Community Engagement and Education Working Group and will be available from the DataONE website ([www.dataone.org](http://www.dataone.org)) once completed.

Metadata remains the most commonly requested NSDI training topic. FGDC partnered with the U.S. Geological Survey National Biological Information Infrastructure (NBII) program to lead a metadata "Train the Trainer" workshop for the Bureau of Land Management. FGDC also partnered with the National Oceanic and Atmospheric Administration's National Coastal Data Development Center (NCDDC) to provide introductory metadata training to coastal partners in State and local governments and their private-sector associates. Through the Cooperative Agreements Program, FGDC supported university, Tribal, and private-sector stakeholders in developing and delivering metadata training workshops for State, local, and Tribal communities.

## FGDC Subcommittee and Working Group Reports

The FGDC currently has nine subcommittees that form communities of interest for nine data themes. In addition, four FGDC working groups crosscut the subcommittees and focus on infrastructure issues common



The geospatial metadata "Train the Trainer" workshop, held in Portland, Oregon, was targeted toward Federal data managers who have an interest in expanding metadata implementation and training within their own operations.

to or supporting many of the NSDI data themes. Federal agencies lead and have responsibility for the thematic subcommittees and working groups. Below are the subcommittee and working group high-level summaries of this year's activities. Additional information is available at [www.fgdc.gov/participation](http://www.fgdc.gov/participation).

### Cadastral Subcommittee

- The FGDC Subcommittee for Cadastral Data continued to provide updates to the existing national inventory ([www.gisinventory.net](http://www.gisinventory.net)) of cadastral data. Almost all the States now have an identified State Cadastral Coordinator and many States have assumed responsibility for sustaining the inventory of local contacts.
- Updated sets of parcel data were provided to the wildland fire community, and efforts to establish sustainable standardized parcel datasets at the State level built on last year's efforts. The States of Arizona, California, New Mexico, Nevada, and Washington made significant advances toward a sustainable system.
- The development of standardized Public Land Survey System (PLSS) datasets has been completed and updated in nine western States, and this data is being provided to the States as requested.
- The Federal Parcel Work Group completed the first draft of their report on the inventory of Federal and management agencies and a proposed core data standard for Federal land parcels.

### Cultural and Demographic Statistics Subcommittee

- The United States Thoroughfare, Landmark, and Postal Address Data Standard was completed and adopted as an FGDC standard in February 2011.

### Geodetic Control Subcommittee

- In fiscal year 2011, the subcommittee continued to engage its partners in its planning and preparation for the new geometric and geopotential datums. Two key subcommittee meetings were held that brought together representatives from 17 Federal agencies, 3 State offices, several private companies, and the National Society of Professional Surveyors. The overarching focus of those meetings was to plan and prepare for the datums of the future that will shift our Nation from a National Spatial Reference System (NSRS), defined by passive monuments, to a system based on observations of real-time Global Navigation Satellite Systems and measurement of the earth's gravity field. Those changes will result in (1) profound improvements to the accuracy of the NSRS, and (2) enhanced access to the NSRS.

## Geologic Subcommittee

- On behalf of the FGDC, the Digital Cartographic Standard for geologic maps continues to be supported by the U.S. Geological Survey National Geologic Map Database project. Collaboration with Esri has resulted in the release and subsequent update of a subset of the FGDC symbols, created as Cartographic Representations for use in ArcGIS. The Subcommittee is now planning for a significant update to the standard (pending available funding), to begin in late 2011. Guidance on the plan was sought from technical experts at the annual Digital Mapping Techniques (DMT) meeting in May 2011.
- A new database design for publication of geologic maps (“NCGMP09”) was proposed by the U.S. Geological Survey; the Subcommittee has begun evaluation of this and other designs, targeted at a Federal standard.

## Marine and Coastal Spatial Data Subcommittee

- Member agencies of the Marine and Coastal Spatial Data Subcommittee were active participants in the development of the Coastal and Marine Spatial Planning National Information Management System (NIMS). This effort, led by staff from the National Ocean Council, included participation by 15 Federal agencies.
- Deployed phase two of the Multipurpose Marine Cadastre (MMC), a Web-based geospatial platform, that provides the baseline information needed for coastal and marine spatial planning efforts, particularly those that involve finding the best location for renewable energy projects and their permit review process. The Bureau of Ocean Energy Management was the first bureau to provide data content directly to the MMC via Web services.
- Subcommittee members continued to develop the Coastal and Marine Ecological Classification Standard (CMECS) and guide it through the FGDC Standards Approval Process.

## National Digital Orthoimagery Program (NDOP) Subcommittee

The NDOP Subcommittee is responsible for developing a national strategy for acquisition of orthoimagery data for Federal agencies while creating and utilizing partnerships with State, local, Tribal, and private organizations.

- Details for the two major NDOP programs, the National Agriculture Imagery Program (NAIP) and the Urban Areas Program, are contributed to by the U.S. Department of Agriculture and the U.S. Geological Survey, respectively, and are described on page 36–38.
- Projects conducted by the Technical Management Subgroup include improving color balancing on mosaicked images, horizontal and vertical accuracy testing, evaluating compression ratios, pan-sharpening techniques, and ground control point collection.

## Spatial Water Data Subcommittee

- The Subcommittee for Spatial Water Data, a subcommittee of both the Advisory Committee for Water Information and the FGDC Spatial Water Data Committee, has been focused on implementing water Web services in the hydrologic community using a services-oriented architecture (SOA) for water information. The National Science Foundation’s funding of the Consortium of Universities for the Advancement of Hydrologic Science’s (CUAHSI) research has produced a framework that supports national water observations data synthesis. The Subcommittee has been examining this SOA approach for common use among the Federal water agencies, realizing that this significant SOA framework goes hand in hand with FGDC’s major efforts on the Geospatial Platform.

## Transportation Subcommittee

- A revised Transportation Charter was presented to FGDC to reinstate the subcommittee. The charter was drafted by an internal working group comprised of representatives from the U.S. Department of Transportation (DOT), the U.S. Census Bureau, and the U.S. Geological Survey.
- An open meeting of the subcommittee was held at the Esri Federal User Conference. The meeting had representation from the DOT, the U.S. Census Bureau, the U.S. Geological Survey, and the private sector.

## Vegetation Subcommittee

- Developed the National Vegetation Classification Standard Logo.
- Agreed on the development of keys for the National Vegetation Classification.
- Met with the Ecological Society of America Vegetation Panel and established a naming peer review process.
- Revised the National Vegetation Classification Standard Implementation Plan.





# FGDC Goals for Fiscal Year 2012

## Geospatial Line of Business

- Develop Office of Management and Budget (OMB) Circular A-16 Supplemental Guidance implementation plans that support portfolio management.
- Implement roles and responsibilities identified in the Supplemental Guidance that support adoption of National Geospatial Digital Asset (NGDA) portfolio management.
- Develop and host targeted trainings around Supplemental Guidance implementation that support the vision for Federal NGDA portfolio management.

**Challenges:** Obtaining continued participation from Federal partner agencies.

## Portfolio Management

- Implement the portfolio management roles and responsibilities of the OMB Circular A-16 Supplemental Guidance.
- Refine the inventory of the NGDA datasets and themes.
- Identify potential automated systems to support performance measurement for the NGDA dataset and themes that can be offered through the Geospatial Platform.

**Challenges:** Identifying stewardship responsibility and theme ownership and developing meaningful and consistent performance metrics for datasets and themes.

## Geospatial Platform

- Develop an implementation plan for the outreach/communication

strategy in support of the Geospatial Platform.

- Deploy Version 1.0 capabilities for the Geospatial Platform in the Cloud environment in concert with Data.gov.
- Identify and launch pilot geospatial services and (or) applications on *www.GeoPlatform.gov*.
- Develop high-level requirements for offering infrastructure, data, and software as services on the Geospatial Platform.

**Challenges:** Continuing support from Federal partner agencies, identification of a managing partner for Geospatial Platform operations, and identifying a share investment strategy to support the effort.

## Geospatial One-Stop and Data.gov

- The primary goal in 2012 will be completing the migration or integration of the Geospatial One-Stop catalog and capabilities into the Data.gov environment hosted by the U.S General Services Administration.

**Challenges:** Continuity of capabilities from the legacy environment into the new environment, seamless integration of geospatial and nongeospatial data, and deployment of an intuitive data access interface.

## GeoCloud Sandbox Initiative

- In fiscal year 2012, the GeoCloud Sandbox Initiative seeks to continue deployment of the open source and commercial Cloud images for a

new set of projects with a targeted focus on common services and data services for the Geospatial Platform and OMB Circular A-16 data.

**Challenges:** Securing information technology system security approvals for Cloud solutions within existing agency processes and allowing the purchase of usage-based Cloud services that vary monthly like a utility bill.

## National Geospatial Advisory Committee

- The National Geospatial Advisory Committee (NGAC) will hold three to four public meetings in fiscal year 2012.
- The NGAC will provide ongoing review, feedback, and recommendations regarding the development and implementation of key issues and initiatives, including innovative strategies for geospatial programs and partnerships, the Geospatial Platform, geospatial workforce development, emerging technologies, and partnerships with Tribal governments. These areas will be a primary focus of the NGAC's work.
- The FGDC will review and respond to advice and recommendations from NGAC.
- The FGDC will complete the next cycle of NGAC nominations and appointments.

**Challenges:** A key challenge (and opportunity) for the NGAC will be to develop advice and recommendations that identify opportunities to develop partnerships and leverage scarce resources to continue to develop interagency and intergovernmental

geospatial initiatives in an environment of declining resources.

## Standards

- The Coastal and Marine Ecological Classification Standard (CMECS) will go forward for FGDC endorsement.
- Additional external standards from ISO, ANSI, OGC, and other sources will be submitted for FGDC recognition in 2012. In this regard, the FGDC will leverage the resources of the Geospatial-Intelligence Standards Working Group to identify and recommend standards from ISO, ANSI, OGC, and other sources for FGDC recognition and use by FGDC member agencies.

**Challenges:** The FGDC standards activity needs more active participation, particularly from data-producing agencies represented on the FGDC Executive Committee. The FGDC needs additional member agency participation on focus groups within the Geospatial Intelligence Standards Working Group (GWG) to evaluate standards under consideration by the GWG for adoption and use by the civilian community.

## Metadata

- Initiate the National Spatial Data Infrastructure stakeholder transition from the Content Standard for Digital Geospatial Metadata (CSDGM) to the ISO suite of geospatial metadata standards.
- Increase the number and type of online resources available from the FGDC Geospatial Metadata website and organize the information so that resources are more easily accessed.

**Challenges:** Development of and access to the training, guidance, and tool resources necessary to support ISO metadata implementation; coordinating staff time to develop, coordinate with others to develop,

and post online training for the resources; expanding the number and quality of Federal agency metadata records; and demonstrating that metadata development is the “context” component of all data and should be integrated into the data development and management process.

## Fifty States Initiative

- In fiscal year 2012, eight NSDI Cooperative Agreements Program awards are planned for the Fifty States Initiative, with a kickoff meeting in spring 2012. The initiative will continue to support the Geospatial Platform.

## International Activities

- The Global Spatial Data Infrastructure (GSDI) Small Grants Program will award up to eighteen projects that will support the advancement of spatial data infrastructures in developing countries around the world.
- In terms of goals for the Group on Earth Observations/Global Earth Observation System of Systems (GEO/GEOSS), a current focus is on simplifying access to quality Earth observation data and services. This will be achieved through enhancements to the existing portal and search components, two of which are hosted and maintained by the FGDC/USGS.

**Challenges:** Limited registration of datasets that support critical Executive Order 12906 parameters, a variety of data access and distribution policies worldwide, and a need for expanded outreach to promote use of GEOSS to find and exploit Executive Order data.

## NSDI Training

- Enhance the Web presentation of materials by utilizing Online Learning System technology and organizing

the formation so that resources are more easily accessed.

- Expand the number and type of online training materials available to NSDI stakeholders.

**Challenges:** Enlisting and supporting participation from subject matter experts for NSDI initiatives.

## FGDC Subcommittees and Working Groups

### Cadastral Subcommittee

- The Cadastral Subcommittee’s Federal Parcel Work Group will develop a draft core data standard for Federal parcel data and develop a strategy to implement it.

### Cultural and Demographic Statistics Subcommittee

- United States Thoroughfare, Landmark, and Postal Address Data Standard — Completion of profiles of the standard that will work with the U.S. Postal Service’s Publication 28 and the National Emergency Numbering Association’s Next Generation 9-1-1 Civic Location Data Exchange Format Standard.

### Geodetic Control Subcommittee

- Continue education, outreach, development of transition tools and applications, and capacity-building activities to prepare users for the transition to new geometric and geopotential datums. These activities will converge at the National Geodetic Survey’s second Geospatial Summit, which will be held in San Diego, California, in July 2012.
- Identify common objectives and find opportunities for cooperative projects and tasks related to standardization and updates to vertical datums.
- Within each Federal agency, identify products and services that will be impacted by new vertical datums.
- Update existing guidelines, standards, and specifications to

support the transition to new vertical datums.

### Geologic Subcommittee

- Coordinate with various agencies in the United States and Canada to create an Esri “style file” implementation of the FGDC Geologic Map Symbolization standard. Work with Esri regarding revisions to their Cartographic Representations implementation of the Standard.
- The Standard was published in 2006; since then, suggestions for revisions have been received and compiled. In 2012, pending available funding, begin the first update to the Standard. Release revised sections to the Standard as appropriate.
- Evaluate the “NCGMP09” database design for publication of geologic maps that was proposed by the U.S. Geological Survey. Evaluate database designs used by other agencies. Work toward consensus on an overall Federal standard design, or standard database elements (such as common science terms and database field names).

### Marine and Coastal Spatial Data Subcommittee

- Release of the Coastal and Marine Spatial Planning National Information Management System (NIMS) Prototype Portal.
- FGDC adoption of the Coastal and Marine Ecological Classification Standard (CMECS).

### National Digital Orthoimagery Program (NDOP) Subcommittee

- Future NDOP plans include devising a new 3-year NAIP partnership agreement. All agencies that use NAIP imagery are encouraged to contribute to the plan.

### Spatial Water Data Subcommittee

- The Subcommittee, mindful of the framework for services-oriented architecture, will focus on the

national delivery of water quality and quantity results using standard geography, GIS, and internationally adopted standards to harmonize the delivery of sampling points and time series data on flow, water levels, water quantity, and water quality.

- The Subcommittee for Spatial Water Data will begin contacting Federal water agencies to work with them to assess what would be the advantages, disadvantages, and level of effort involved in implementing this services-oriented architecture.

### Transportation Subcommittee

- Identify a baseline of transportation datasets (non-road) that would complete Transportation for the Nation.
- Identify issues and solutions on how to utilize transportation geospatial data that would contribute to livability analyses in the coming years.

### Vegetation Subcommittee

- Host a field trip and organized session for the 2012 Ecological Society of America annual meeting.
- Develop a training workshop related to the use of the National Vegetation Classification Standard in Federal agency activities.
- For the National Vegetation Classification, review the basic statements in the key concepts document.
- Complete the Permanent Housing database, establish a database system between Federal agencies, and improve system communication between Federal and non-Federal vegetation databases.
- Foster international collaboration efforts.

### Wetlands Subcommittee

- Continue outreach for the Wetlands Mapping Standard and expand the training course and opportunities.
- Submit the Wetlands Classification Standard proposed maintenance

update through the Federal Register for public review and comment.

### The Architecture and Technology Working Group

- In the coming year the Working Group will oversee a second year of GeoCloud hosting and facilitation using the two developed reference platform software “stacks” for open-source and commercial geospatial solutions.

### Metadata Working Group

- Inform members about ISO metadata and support members in ISO metadata implementation.

### FGDC Standards Working Group

- Follow up on findings from the standards use survey. For more information see page 7.
- Identify and recommend ISO, ANSI, and OGC standards for FGDC endorsement in support of the Geospatial Platform.
- Evaluate interconnections among standards bodies and what voting by FGDC member agencies in external standards bodies signifies.
- Review the FGDC standards program of work to identify standards that should be retired or revised and standards projects that should be discontinued.
- Review and recommend the Coastal and Marine Ecological Classification Standard (CMECS) for FGDC endorsement.

### User/Historical Data Working Group

- Continue outreach to all interested parties, both inside and outside the Federal Government.
- Continue to provide input on the Geospatial Platform.
- Provide coordinated input to the Library of Congress Geospatial Data Preservation Resource Center.
- Inventory guidance documents on geospatial formats for long-term preservation and access.

## Appendix A

# FGDC Leadership Profiles



### Anne Castle

**Assistant Secretary for Water and Science, Department of the Interior  
Chair, FGDC Steering Committee**

Ms. Anne Castle, confirmed as Assistant Secretary for Water and Science in June 2009, is responsible for overseeing water and science policy for the Department of the Interior (DOI), specifically through oversight of the U.S. Bureau of Reclamation and the U.S. Geological Survey. In addition to her leadership on water issues, Ms. Castle has been a champion of the National Land Imaging Program. Prior to joining the DOI, Ms. Castle practiced law for 28 years in Denver, Colorado, focusing on water issues. She received a bachelor of science degree in applied mathematics, with honors, from the University of Colorado and earned a juris doctorate from the University of Colorado.



### Dominic Sale

**Acting Deputy Director, Office of E-Government and Information Technology  
Office of Management and Budget  
Vice Chair, FGDC Steering Committee**

Mr. Dominic Sale joined the Office of Management and Budget's Office of E-Government and Information Technology in 2008, working with portfolio management in support of several governmentwide information technology initiatives. Mr. Sale began his Federal career at the Department of Transportation in the Office of the Chief Information Officer. Preceding this, he managed enterprise architecture, capital planning, and security initiatives for various Federal agencies as a contractor for BAE Systems and BearingPoint. Mr. Sale earned a bachelor's degree from the University of Virginia.



### Karen Siderelis

**Geographic Information Officer, U.S. Department of the Interior  
Acting Chair, FGDC 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. Ms. Siderelis earned her master's and bachelor's degrees from the University of Georgia.



### Ivan DeLoatch

**Executive Director  
Federal Geographic Data Committee**

Mr. Ivan DeLoatch has served as the Executive Director of the FGDC for the past eight years. Previously he 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



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

Mr. Daniel Cotter is responsible for the Department of Homeland Security's 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.



**Adrian Gardner**  
**Chief Information Officer, Goddard Space Flight Center**  
**National Aeronautics and Space Administration**

Mr. Adrian Gardner came to the National Aeronautics and Space Administration from the National Weather Service where he had served as Chief Information Officer since January 2007. Mr. Gardner completed a master's degree in public administration at the University of Southern California School of Public Policy and Planning. He also holds a master of science degree in environmental studies from Hood College and a bachelor of science degree in biological science and ecology from the Tuskegee Institute.



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

Prior to joining the U.S. Environmental Protection Agency in 2005, Dr. Jerry Johnston conducted research on complex environmental systems modeling and served as the project manager for numerous geospatial projects in the private sector. He 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 currently serves as Vice Chair for the National Geospatial Advisory Committee.

## FGDC Executive Committee (continued)



**Joseph Klimavicz**  
**Chief Information Officer and Director, High Performance Computing and Communications, National Oceanic and Atmospheric Administration**  
**U.S. Department of Commerce**

Mr. Joseph Klimavicz previously served at the U.S. Department of Defense as the National Geospatial-Intelligence Agency's 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.



**James Kwolek**  
**Geospatial Information Executive and Director, Office of IT Strategic Planning and Policy**  
**Office of the Chief Information Officer, National Geospatial-Intelligence Agency**

Prior to his current assignment, Mr. James Kwolek was the Functional Executive in the Office of Geospatial Intelligence Management at the National Geospatial-Intelligence Agency. In 2010 he served as the Associate Deputy Director of Mission Management at the National Counterterrorism Center. He began his career with the Defense Mapping Agency. Mr. Kwolek completed a master of science in technology management from the University of Maryland and received a bachelor of science in geography/cartography from Penn 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 from the University of Virginia and in public administration from Virginia Polytechnic Institute and State University. He also holds a bachelor of arts degree in political science from James Madison University.

# 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 to 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.

The FGDC is an organized structure of Federal geospatial professionals and constituents that provide executive, managerial, and advisory direction and oversight for geospatial decisions and initiatives across the Federal Government. In accordance with OMB Circular A-16, the FGDC is chaired by the Secretary of the Interior or his/her designee, and the OMB Deputy Director for Management or his/her designee serves as Vice Chair.

### 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 FGDC Office of the Secretariat, which is located at the

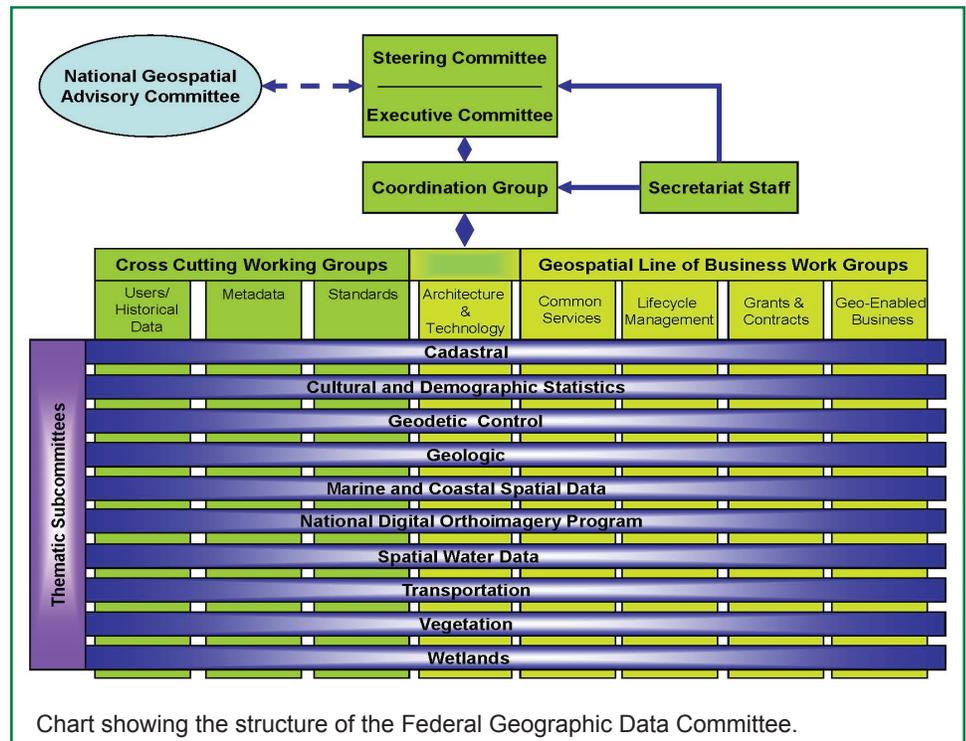
U.S. Geological Survey headquarters in Reston, Virginia, provides strategic support and management for FGDC committees, components, and initiatives.

The FGDC infrastructure also includes committees, agency-led working groups and subcommittees, and collaborating partners that represent State, Tribal, and local governments, as well as industry and academic and professional organizations. All participants initiate and (or) support the following activities that are crucial to expanding the NSDI and addressing national priorities:

- Providing advice and leadership in applying geospatial capabilities to address national priorities and Presidential initiatives.

- 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, elevation, geodetic control, governmental units, hydrography, orthoimagery, and transportation) and is used in concert with many other mission-specific data resources.
- Promoting collaborative relationships for sharing geospatial data among non-Federal partners.
- Developing policies and processes to better harmonize collective action.

More information about the FGDC structure and specific membership can be found at [www.fgdc.gov/participation](http://www.fgdc.gov/participation).



## Steering Committee

The FGDC is governed by the Steering Committee, which is the policy-level interagency group whose central focus is to provide executive leadership for the coordination of Federal geospatial activities between, among, and within agencies. The Committee does this by establishing policy and providing guidance and direction to the member agencies, based on business best practices. The Steering Committee is responsible for overseeing OMB Circular A-16 related activities and for the implementation of the National Spatial Data Infrastructure. The FGDC Chair and Vice Chair lead the Committee, which is made up of senior agency officials for geospatial information (SAOGIs) and includes representatives from Federal organizations, including the Executive Office of the President, the Federal Executive Departments, and independent Federal agencies.

A subset of the Steering Committee, the Executive Committee, provides advice and guidance to the FGDC Chair and the Vice Chair on major Federal geospatial priorities and initiatives. The FGDC Chair and Vice Chair lead this committee, which includes representatives from the OMB and the seven Federal agencies that have the largest investments in geospatial technologies. The Executive Committee makes recommendations to the Steering Committee and provides a focal point for coordination with the National Geospatial Advisory Committee.

### 2011 Steering Committee Agencies

Federal Communications Commission (non-voting member)
General Services Administration
Library of Congress
National Aeronautics and Space Administration
National Archives and Records Administration
National Capital Planning Commission (non-voting member)
National Science Foundation
Office of Management and Budget (tie-breaking vote only)
Office of Personnel Management
Small Business Administration
Smithsonian Institution
Social Security Administration
Tennessee Valley Authority
U.S. Agency for International Development
U.S. Army Corps of Engineers (non-voting member)
U.S. Department of Agriculture
U.S. Department of Commerce
U.S. Department of Defense
U.S. Department of Education
U.S. Department of Energy
U.S. Department of Health and Human Services
U.S. Department of Homeland Security
U.S. Department of Housing and Urban Development
U.S. Department of the Interior
U.S. Department of Justice
U.S. Department of Labor
U.S. Department of State
U.S. Department of Transportation
U.S. Department of the Treasury
U.S. Department of Veterans Affairs
U.S. Environmental Protection Agency
U.S. Nuclear Regulatory Commission

# Appendix C

## Status of NSDI Data Themes

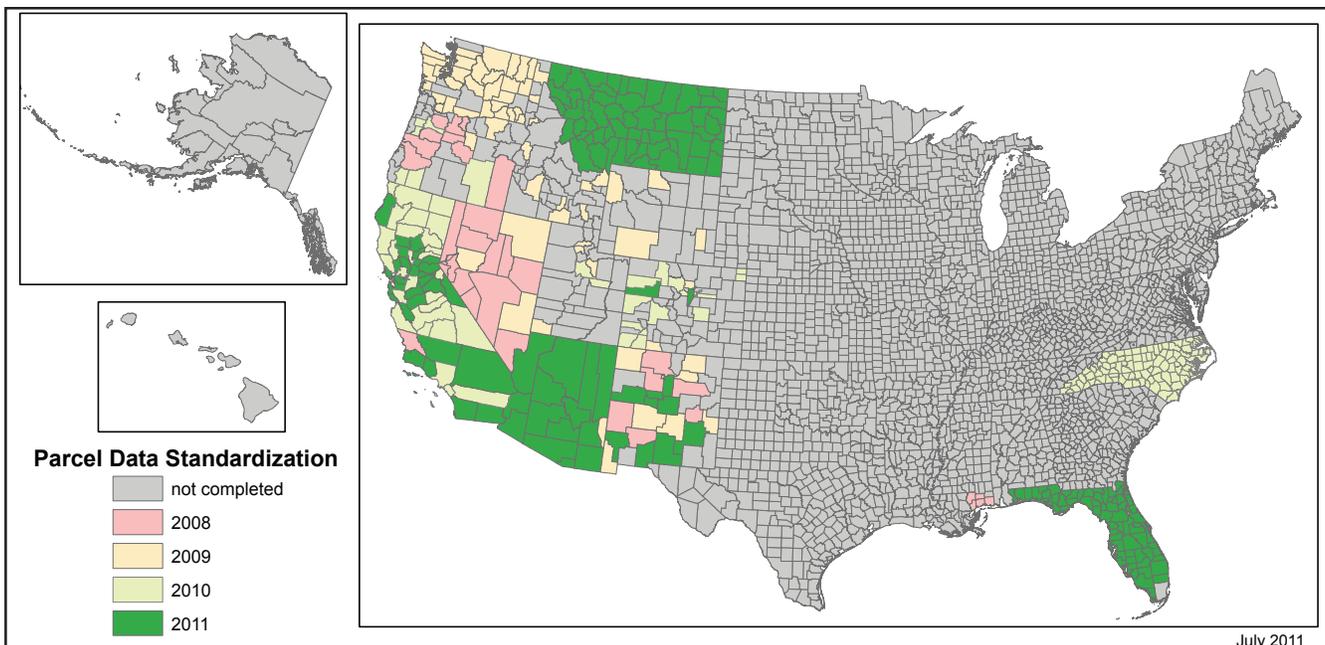
Office of Management and Budget (OMB) Circular A-16 provides direction for Federal agencies that produce, maintain, or use spatial data in the National Spatial Data Infrastructure (NSDI). The circular identifies 34 data themes of national significance and denotes which are framework data themes. This appendix includes descriptions of the following framework data and data themes: cadastral, elevation, geodetic control, hydrography, orthoimagery, cultural and demographic statistics, 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. Cadastral data include cadastral reference data (see following page) and 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 land parcel data, standardize available data, and build sustainable operational procedures to provide land 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. The graphic below represents progress as of July 2011. Through September 2011, all of California data and available data in Utah and Wyoming have been standardized.

Parcel Data Standardization Status by County

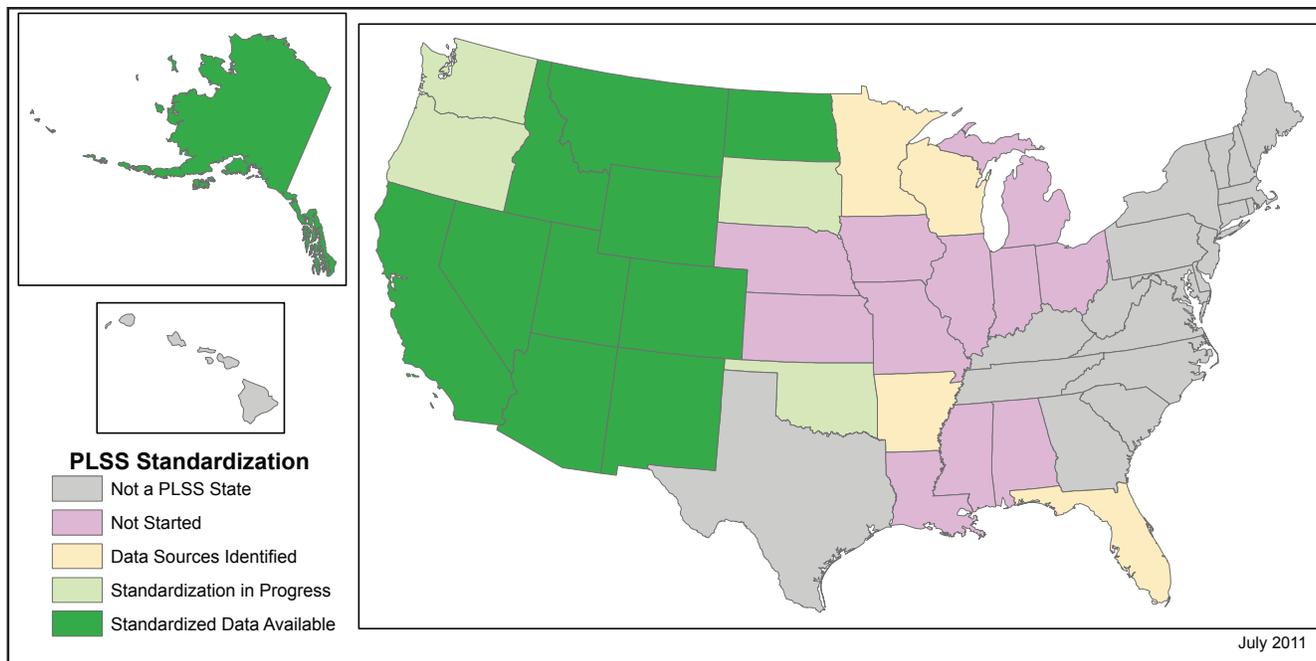


## Framework Data Theme: Cadastral (continued)

The Public Land Survey System (PLSS) is a cadastral reference system used to divide public domain lands, which are lands managed 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 and enables searches by PLSS location. The statewide standardization PLSS representation is based on legal cadastral survey records. The graphic below indicates progress through July 2011.

The Cadastral Subcommittee has developed guidance for States to use when developing, publishing, and maintaining all standardized cadastral information (cadastral reference and land parcel data) 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 cadastral data.

PLSS Standardization Status by State

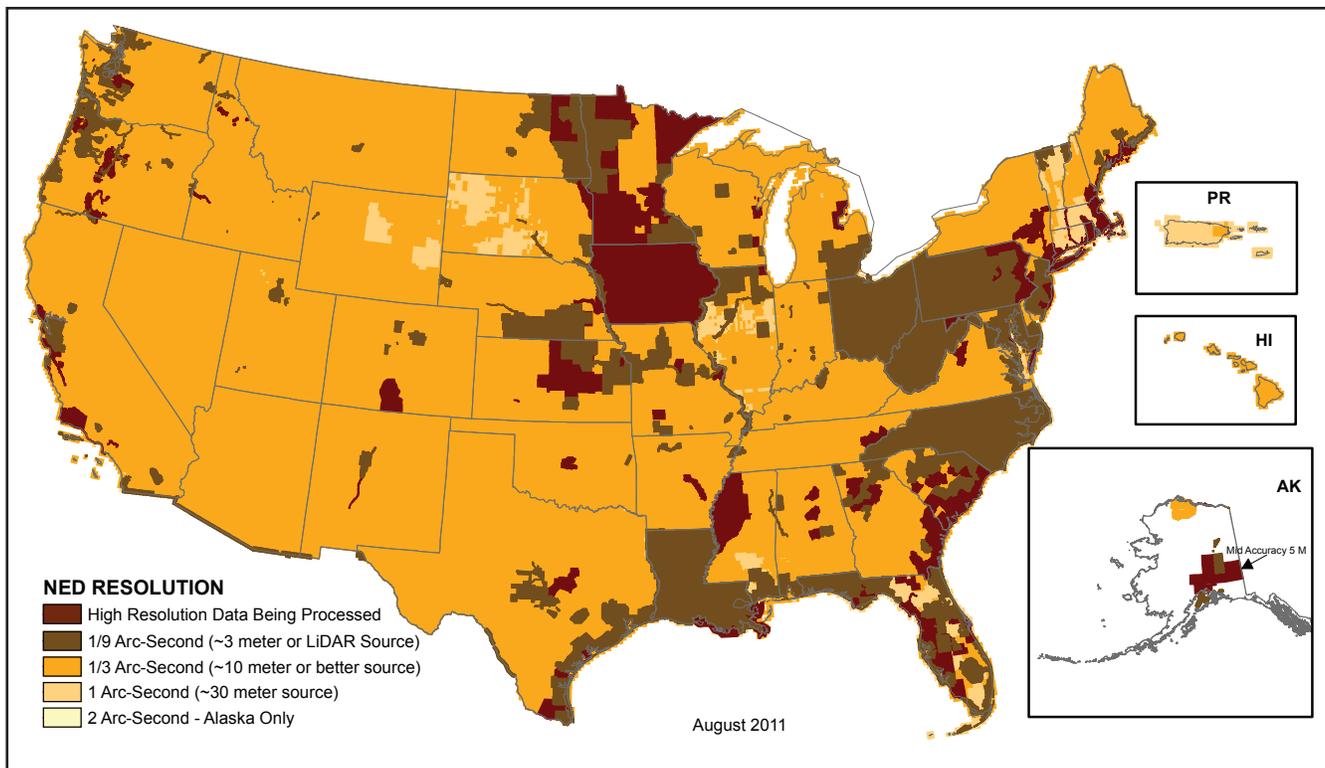


## Framework Data Theme: Elevation

**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 National Oceanic and Atmospheric Administration, 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 are 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.

National Elevation Dataset Source Resolution

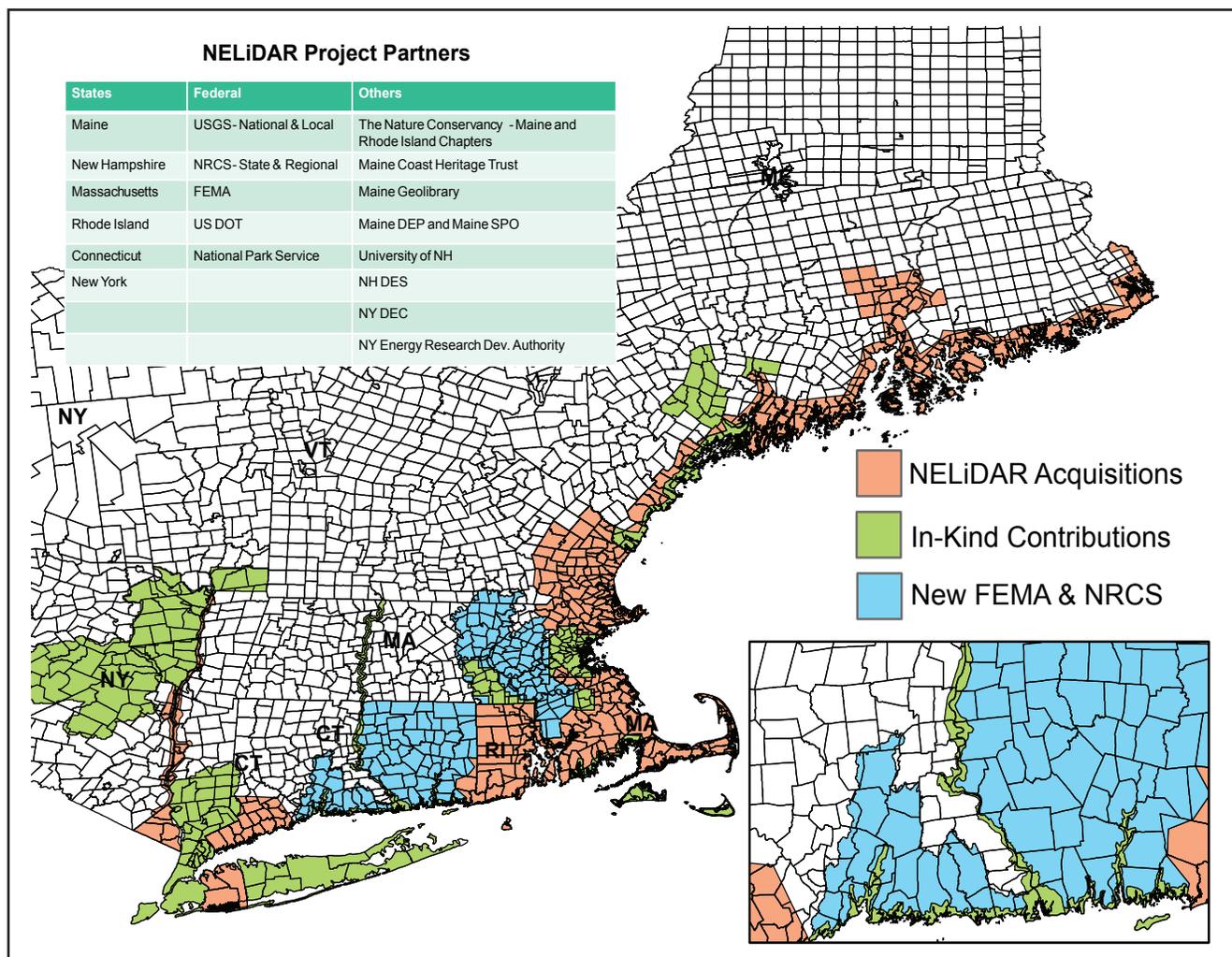


## Framework Data Theme: Elevation (continued)

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

In fiscal year 2011, all high-resolution elevation projects funded through the American Recovery and Reinvestment Act (ARRA) in 2009–10 are to be completed and the data made available for dissemination as Digital Elevation Models from the NED and also, as in the case of LiDAR source data, Log ASCII Standard (LAS) files from the Center for LiDAR Information Coordination and Knowledge (CLICK). Many of these ARRA-funded projects are large, multiple-partner cooperative arrangements requiring precision coordination. One such project is the LiDAR for the Northeast project covering the coastline of New England, New York to the Canada–United States border in Maine. Six States, five Federal agencies, and eight State agencies and nongovernmental organizations are partners in this project, which will result in approximately 13,500 square miles of new and in-kind LiDAR data in the public domain.

Northeast LiDAR Partners Project

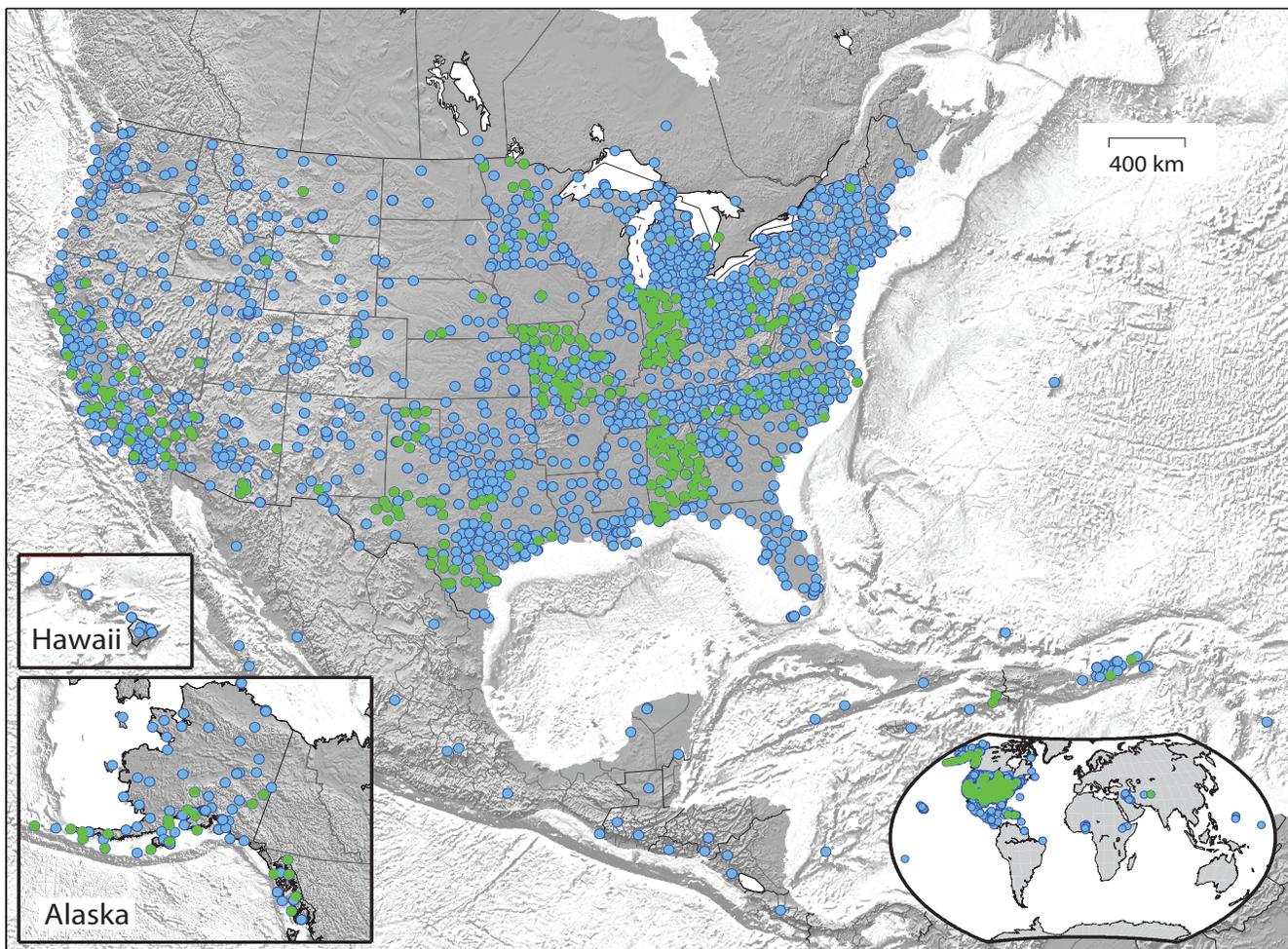


## Framework Data Theme: Geodetic Control

**Responsible agency:** National Oceanic and Atmospheric Administration (NOAA), National Geodetic Survey

**Description:** NOAA's National Geodetic Survey manages a network of continuously operating reference stations (CORS) that provide Global Navigation Satellite System data to define and maintain the National Spatial Reference System. As a multipurpose cooperative endeavor involving more than 200 government, academic, and private organizations, CORS data support three-dimensional positioning, meteorology, space weather, and geophysical applications. Improved coordinates for these geodetic control stations, which are the result of improved analysis of more than 10 years of data, will be made available in fiscal year 2012. The map shows the distribution of 1,826 stations, including 221 recent additions (green dots).

Continuously Operating Reference Stations (CORS) Network, July 2011





## Framework Data Theme: Orthoimagery

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

**Description:** The USGS is the designated lead Federal agency for the NSDI orthoimagery data theme and executes its OMB Circular A–16 responsibilities as the theme lead through the National Digital Orthophoto Programs (NDOP). NDOP was chartered in 1993 as a consortium with the purpose of developing and maintaining national orthoimagery coverage in the public domain by establishing partnerships with Federal, State, Tribal, local, and private organizations. The consortium members include the Bureau of Land Management, the Farm Service Agency, the Federal Emergency Management Agency, the National Geospatial-Intelligence Agency (NGA), the National Oceanic and Atmospheric Administration, the National Resources Conservation Service, the National States Geographic Information Council, the U.S. Census Bureau, the U.S. Forest Service, and the U.S. Geological Survey. The primary Federal programs for NDOP are the Farm Service Agency's National Agriculture Imagery Program (NAIP), the NGA Homeland Security Infrastructure Program (HSIP) 133 Cities Urban Area Initiative, 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. The USGS, along with other Federal and State agencies, contributes funds annually to support the USDA-FSA's National Agriculture Imagery Program (NAIP) current maintenance cycle. In addition to direct funding support, the USGS (through the Geospatial Liaisons) coordinates partnerships with State and local agencies to further leverage the NGA's 133 Cities Urban Area Initiative funding pool and expand the project to support local needs. The USGS also provides quality assurance support for the 133 Cities Urban Area Initiative. The USGS makes all public domain digital orthoimagery acquired through its partnership agreements available to the general public through *The National Map* Seamless Server and provides for data archiving. Currently, 1-meter orthoimagery from the NAIP and higher resolution orthoimagery in support of the 133 Cities Urban Area Initiative are available on the Seamless Server. Data availability graphics can be found at [seamless.usgs.gov/data\\_availability.php?serviceid=Dataset\\_5](http://seamless.usgs.gov/data_availability.php?serviceid=Dataset_5) and [seamless.usgs.gov/data\\_availability.php?serviceid=Dataset\\_7](http://seamless.usgs.gov/data_availability.php?serviceid=Dataset_7).

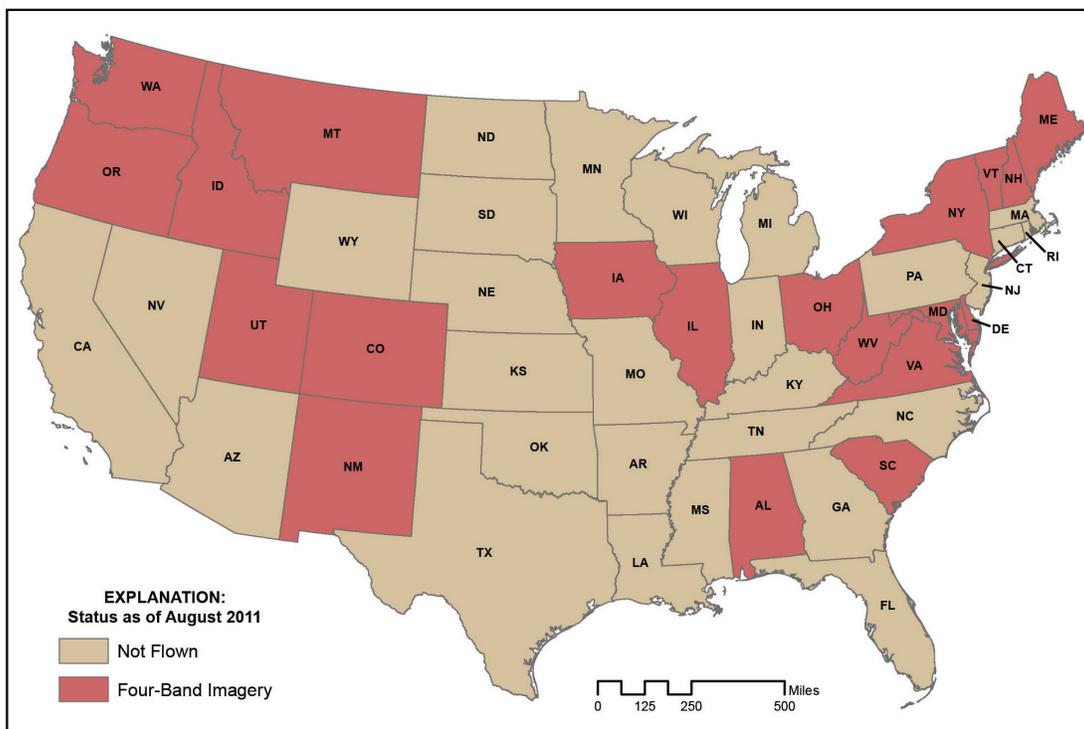
The USGS National Orthoimagery Program supports the National Geospatial Program by making the imagery available in US Topo maps and through USGS Web services. The USGS National Orthoimagery Program also supports the USGS science programs.

### USDA-FSA National Agriculture Imagery Program

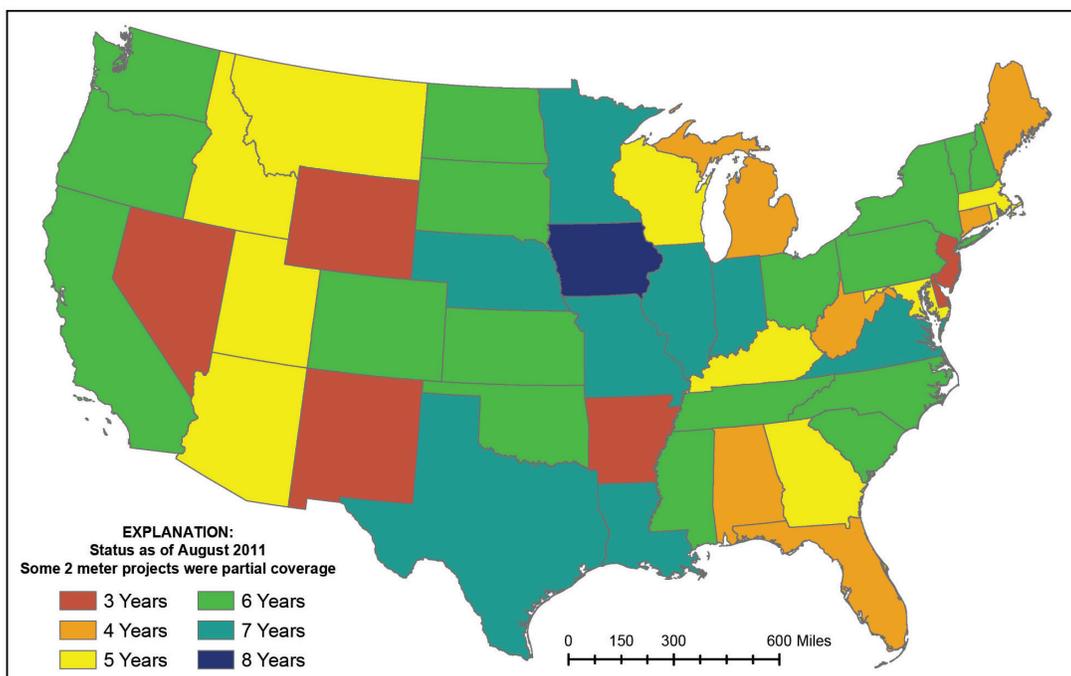
The National Agriculture Imagery Program (NAIP) annually acquires imagery during the growing season and is the largest single civilian mapping program in U.S. history. The Farm Service Agency (FSA) and other U.S. Department of Agriculture (USDA) agencies use the imagery to administer farm programs and 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. FSA's priority is to collect data on privately owned farmland as identified by common land unit boundaries, and the agency has established effective cost-share participation with other Federal and State partners for collection outside of those areas. The funding level for NAIP in 2011 supported acquisition of 1-meter imagery for 20 States. Since the program began as a pilot in 2002, it has provided nearly three full cycles of complete 1-meter coverage of the continental United States, giving all States in the lower 48 an imagery currency age of 3 years or less.

## Framework Data Theme: Orthoimagery (continued)

2011 NAIP Data Acquisitions



Total Years of NAIP Imagery, 2003–2011 (1- or 2-meter coverage)

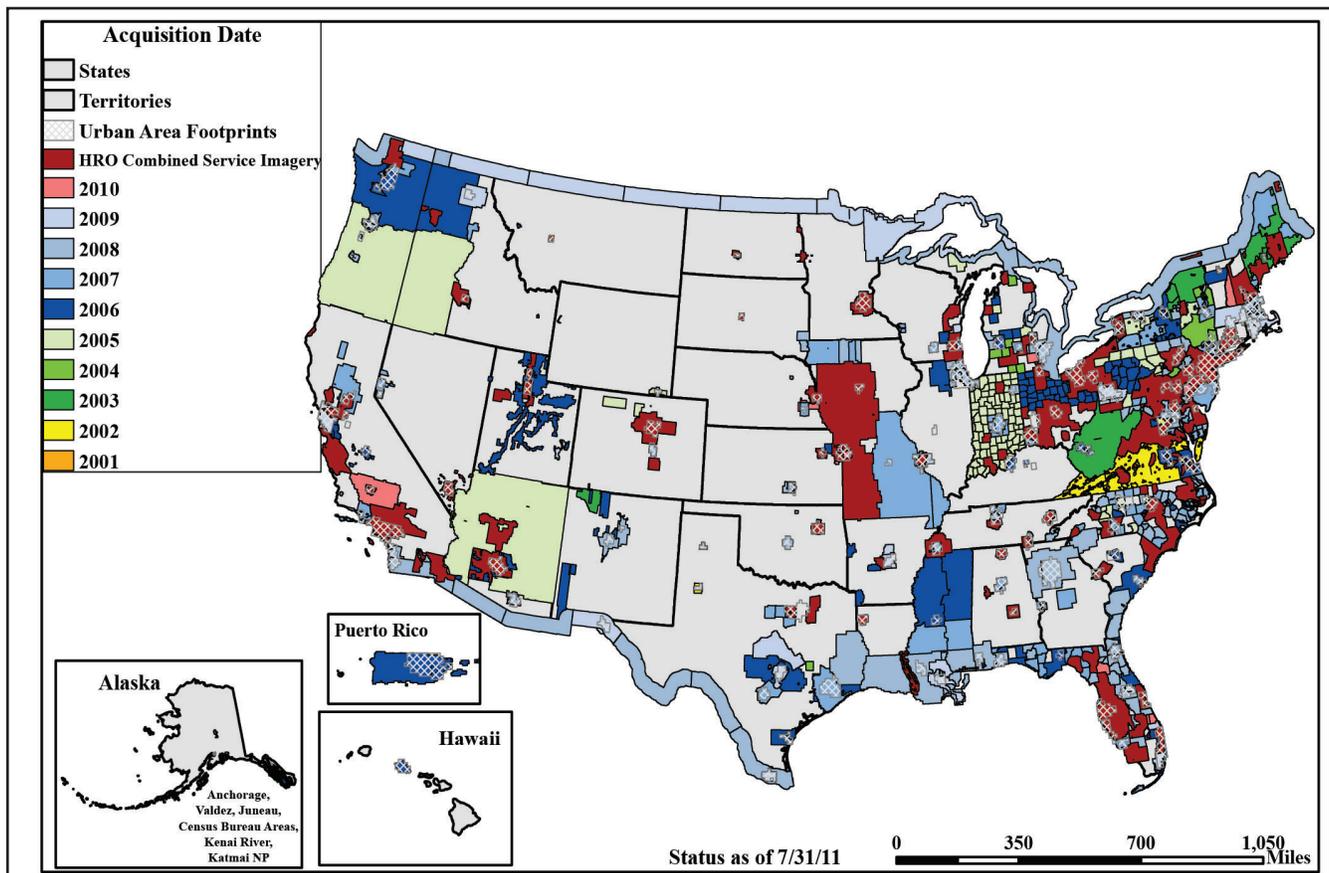


## Framework Data Theme: Orthoimagery (continued)

### NGA HSIP 133 Cities Urban Area Initiative

The Homeland Security Infrastructure Program (HSIP) 133 Cities Urban Area Initiative annually acquires imagery during the spring and fall leaf-off seasons; the focus of this initiative is the 133 cities that are defined in the 2002 tiger team report that was produced jointly by the National Geospatial-Intelligence Agency (NGA) and the USGS. NGA collects this imagery through partnership with the USGS and uses it to support the Homeland Defense, Homeland Security, and Emergency Preparedness, Response, and Recovery mission to protect the Nation's infrastructure in accordance with Homeland Security Presidential Directive/HSPD-7 and the National Strategy for the Physical Protection of Critical Infrastructure and Key Resources. The collected imagery data also support mutually beneficial partnerships to both enhance and share data among Federal Government agencies and with State and local jurisdictions. This initiative supports partnership and coordination efforts with other Federal agencies such as the Department of Homeland Security, the USGS, and the U.S. Army Corps of Engineers. The collected imagery is largely in the public domain and is widely used by Federal, State, and local agencies, as well as by commercial, private, and nonprofit entities. The USGS provides this imagery to the civilian community through *The National Map* Seamless Server located at the EROS Data Center, and the NGA coordinates imagery distribution to its mission partners. The goal for this initiative is to refresh imagery for the 133 cities on a 2- to 3-year cycle, which has been largely accomplished since the initiative's inception in 2002; imagery for nearly all the cities has been collected twice and collections for many cities are on their fourth or fifth iteration. In fiscal year 2011, the initiative funded 32 projects in 22 States, as well as in the Territory of Guam.

HSIP 133 Cities Urban Area Imagery Initiative:  
Fiscal Year 2011 Imagery Acquisitions

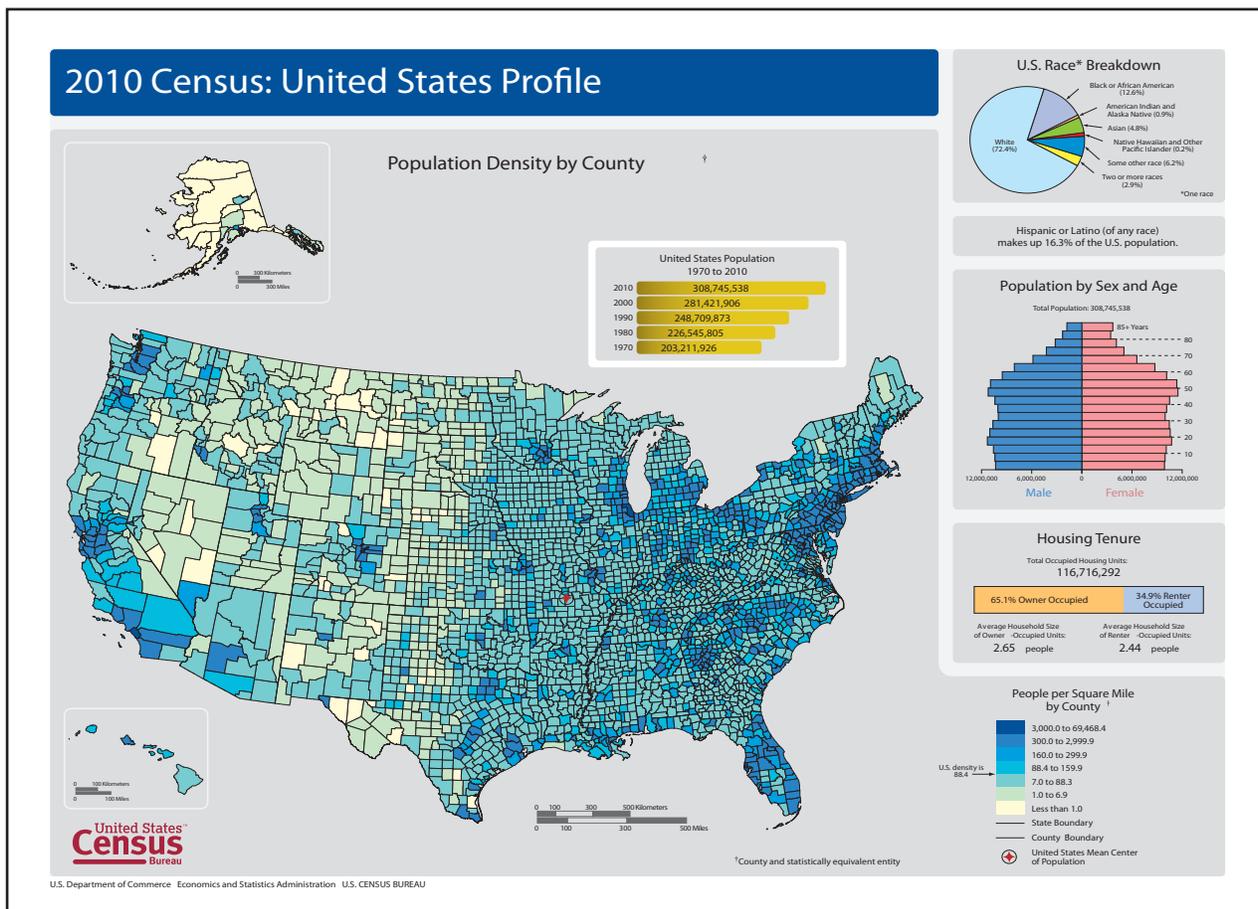


## Data Theme: Cultural and Demographic Statistics

**Responsible agency:** U.S. Census Bureau

**Description:** This U.S. Census Bureau-managed theme contains characteristics of people, the nature of the structures in which they live and work, the economic and other activities they pursue, the facilities they use to support their health and recreational and other needs, the environmental consequences of their presence, and the boundaries as well as names and numeric codes of geographic entities used to report the information collected. The U.S. Census Bureau's 2010 Census Profile maps offer a graphic overview of selected demographic information from the 2010 Census of Population and Housing. In addition to a population density map, each page includes a pie chart showing percent of total population by race, a population pyramid, and a bar chart illustrating housing occupancy rates. The map series consists of one page-sized map for each State in the United States, the District of Columbia, and Puerto Rico, as well as a national map. Initial census counts became available in December 2010. As 2010 census data are tabulated and released, the Census Bureau creates many geospatial products including thematic and reference maps and posts them at: [www.census.gov/geo/www/](http://www.census.gov/geo/www/). As 2010 data continue to be released, the Census Bureau will continue to provide geospatial products reflecting the status of America—changes in population trends and geographic areas—as determined by the 2010 census.

2010 Profile Map United States



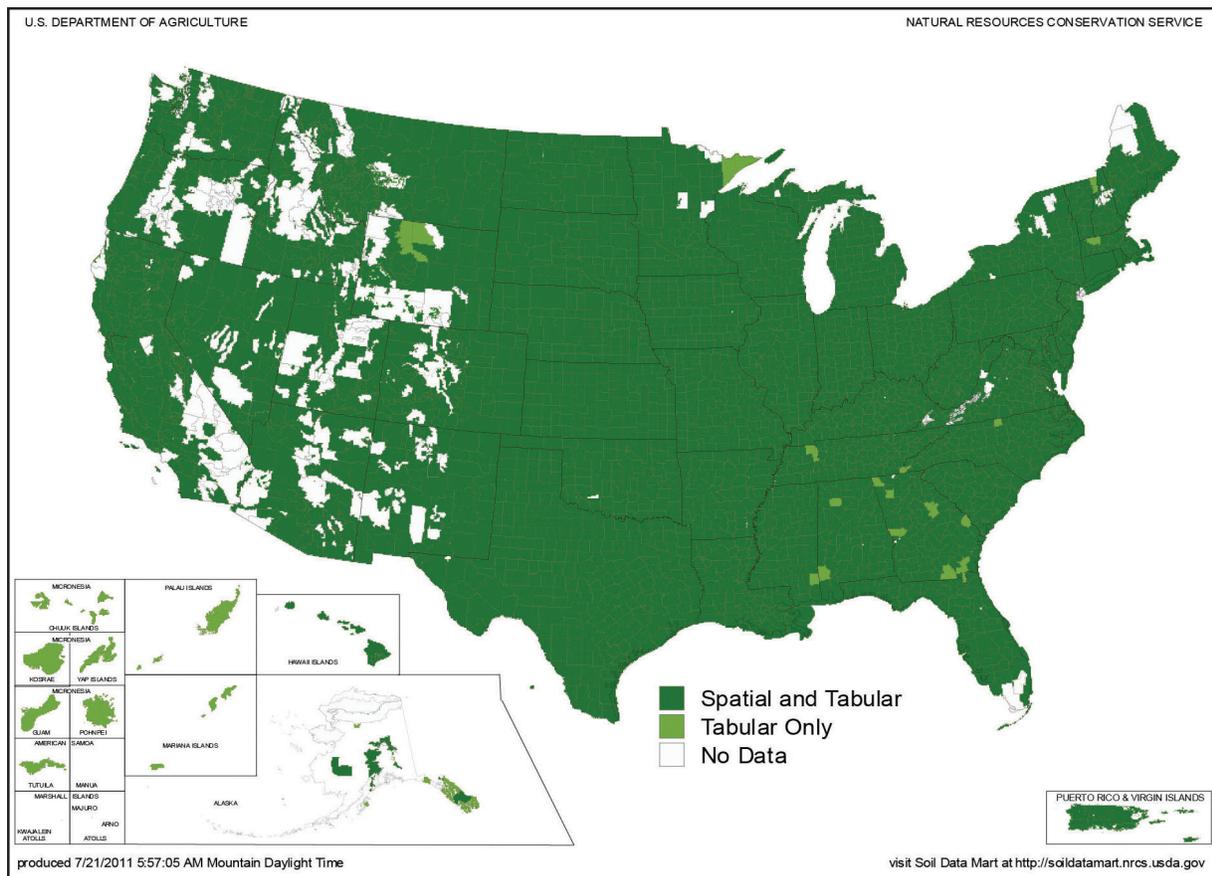
## Data Theme: Soils

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

**Description:** The USDA National Resources Conservation Service Soil Survey Division provides leadership and services to produce and deliver science-based soil information (including digital maps, attribute tables, and other types of publications) to help in the understanding and management of global resources. This service is provided through the National Cooperative Soil Survey (NCSS) program. The NCSS is a nationwide partnership of Federal, State, and local agencies, and private entities and institutions. This partnership works collaboratively to investigate, inventory, document, classify, interpret, disseminate, and publish information about soils of the United States and its trust territories and Commonwealths. The activities of the NCSS are carried out on national, regional, and State levels.

The map below illustrates the current status of the Soil Survey Geographic database (SSURGO) for the United States. Dark green color indicates that detailed digital maps and associated attribute tables are available. Light green color indicates that only attribute tables are available. White areas indicate that no soil survey has been completed. During fiscal year 2011, NCSS staff completed 34.8 million acres of initial and update soil survey mapping. In fiscal year 2010, 38.8 million acres of initial and update soil survey mapping were completed.

Available Soil Survey Data, July 21, 2011



## Data Theme: Watershed Boundaries

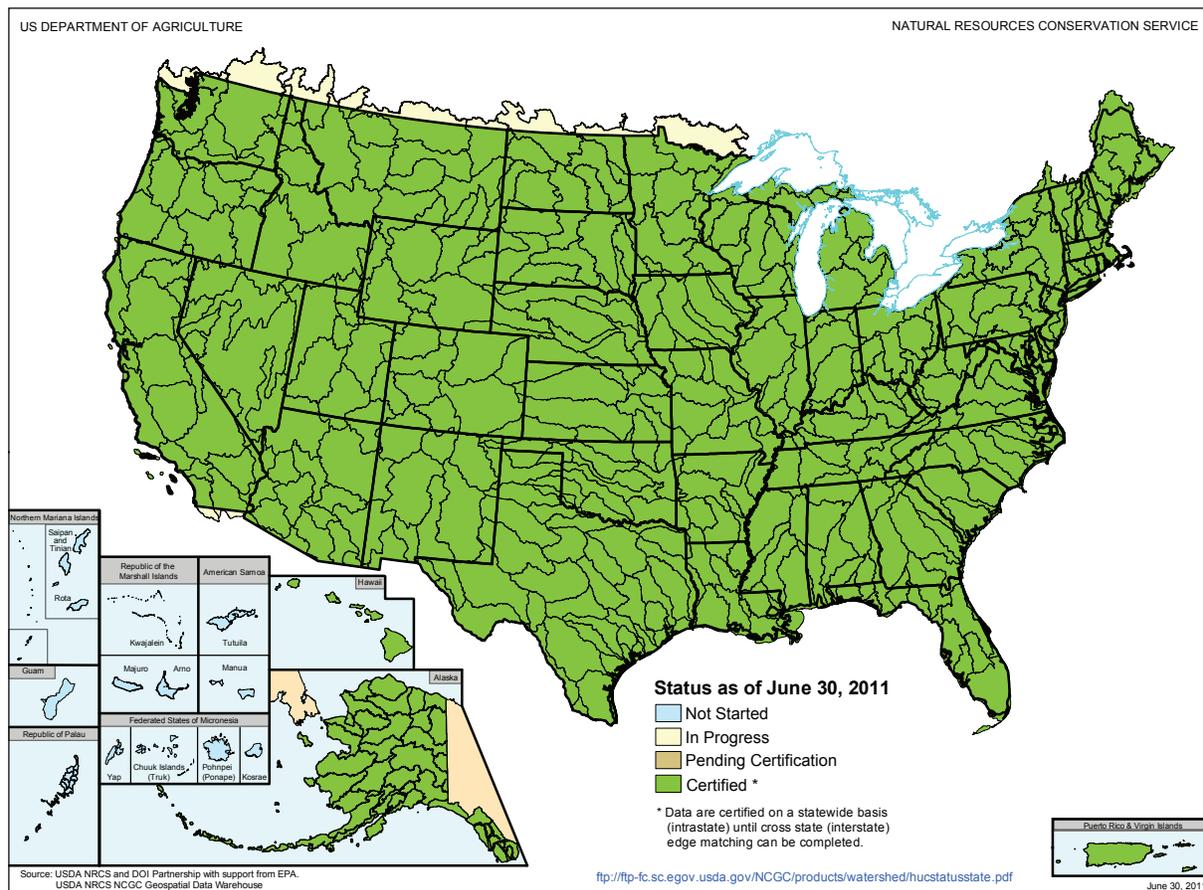
**Responsible agency:** U.S. Department of the Interior, U.S. Geological Survey (USGS), and U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)

**Description:** The seamless, national Watershed Boundary Dataset (WBD) is a hydrologic unit framework of uniform size for the United States. It is used for programmatic planning, implementation, and reporting at the national, regional, and local levels. This includes use in multiple analytical and statistical applications. The WBD is certified to national certification standards for the conterminous United States and Hawaii at 1:24,000 scale, the Caribbean at 1:25,000 scale, and Alaska at 1:63,360 scale. Its development and strategic direction is guided under the leadership of the interagency Subcommittee on Spatial Water Data. The USDA-NRCS and USGS have joint management responsibilities under OMB Circular A-16.

Current efforts are focused on stewardship and integration of the WBD with the National Hydrography Dataset (NHD) and other datasets such as the Geographic Names Information System (GNIS) and harmonization of hydrologic units with Canada and Mexico. Additional data enhancements; for example, improved interpretations along coastal areas, and value-added attribution to facilitate WBD and NHD applications are in progress. WBD planning allows for (but does not require) the incorporation of local partner data at high resolution, plus two additional next down nested tiers at the 14- and 16-digit levels.

This dataset is available through the Geospatial Data Gateway, located at [datagateway.nrcs.usda.gov](http://datagateway.nrcs.usda.gov).

### Watershed Boundary Dataset (WBD) Status



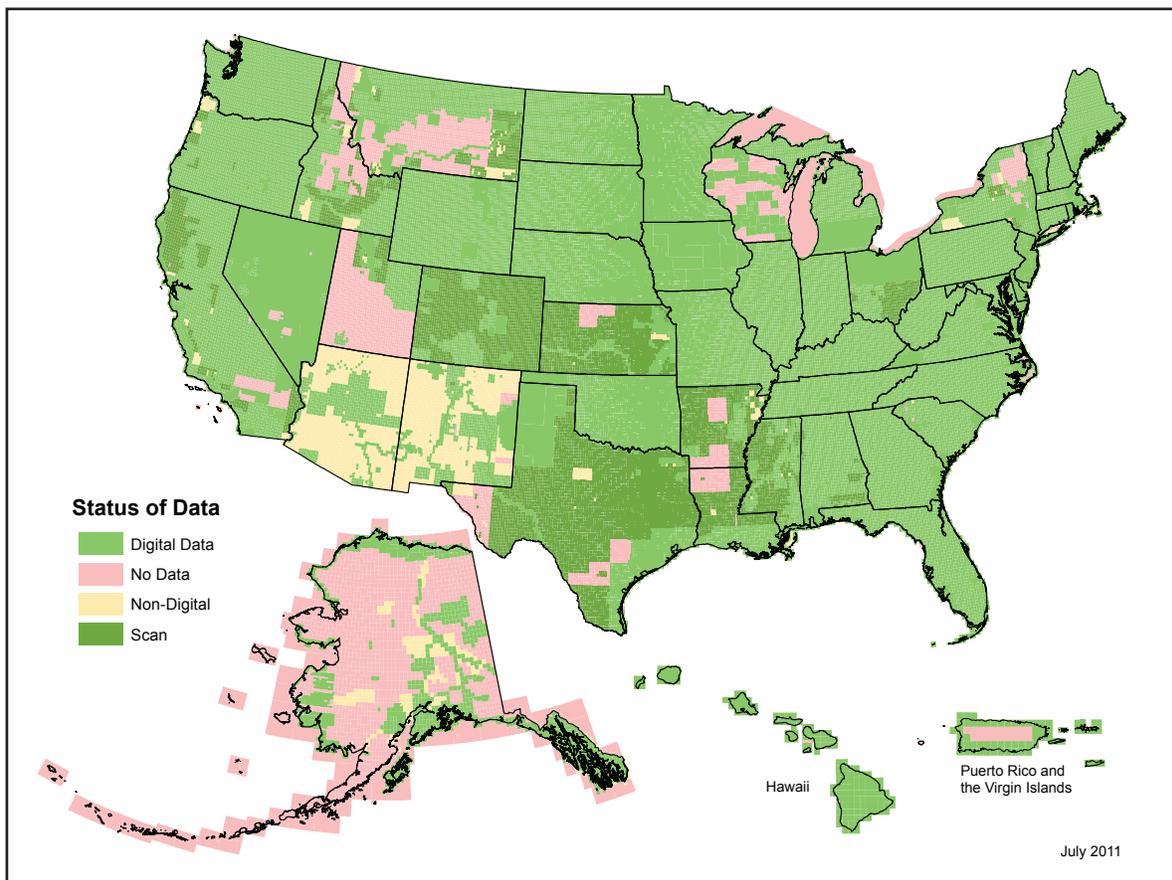
## Data Theme: Wetlands

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

**Description:** The National Wetlands Inventory (NWI) provides management, coordination, and delivery of the Wetlands Layer of the NSDI as required under the Emergency Wetlands Resources Act and as part of OMB Circular A-16. The Wetlands Layer consists of wetlands, deepwater, and riparian geospatial data that are served in a seamless geospatial data repository using a state-of-the-art Wetlands Mapper, served through a Web Mapping Service (WMS), downloaded by State, registered through Geospatial One-Stop and Data.gov, and available on the Google Earth™ mapping service. 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 extendable, 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.

The wetlands data layer is 65 percent complete as shown in the status map: 71 percent of the conterminous United States plus another 8 percent in raster scans; 30 percent of Alaska; 100 percent of Hawaii, Guam, and Saipan; and 65 percent of Puerto Rico and the U.S. Virgin Islands. In fiscal year 2011, NWI created a new online Wetland Mapping Training course with training on the Wetlands Mapping Standard and the Wetlands Classification Standard, initiated a Wetlands Subcommittee Working Group maintenance review of the Classification Standard, participated in the Federal GeoCloud effort, and expects to receive over 55 million data requests. The current availability of wetlands data is shown below.

Status of Online Wetlands Data



## Appendix D

# Glossary of Abbreviations and Terms

ANSI	American National Standards Institute	NBII	National Biological Information Infrastructure
ARRA	American Reinvestment and Recovery Act	NCDDC	National Coastal Data Development Center
ATO	Authority to Operate	NCSS	National Cooperative Soil Survey
BDIA	Broadband Data Improvement Act	NDOP	National Digital Orthophoto Programs (rechartered in 2010 as the National Digital Orthoimagery Program, a subcommittee of the FGDC)
CAP	Cooperative Agreements Program	NED	National Elevation Dataset
CLDXF	Civic Location Data Exchange Format	NENA	National Emergency Number Association
CLICK	Center for LiDAR Information Coordination and Knowledge	NGA	National Geospatial-Intelligence Agency
CMECS	Coastal and Marine Ecological Classification Standard	NGAC	National Geospatial Advisory Committee
CORS	Continuously Operating Reference Stations	NGDA	National Geospatial Data Asset
DMT	Digital Mapping Techniques	NHD	National Hydrography Dataset
DOI	U.S. Department of the Interior	NIMS	National Information Management System
DOT	U.S. Department of Transportation	NIST	National Institute of Standards and Technology
EPA	U.S. Environmental Protection Agency	NOAA	National Oceanic and Atmospheric Administration
FCC	Federal Communications Commission	NRCS	Natural Resources Conservation Service
FEMA	Federal Emergency Management Agency	NSF	National Science Foundation
FGDC	Federal Geographic Data Committee	NSDI	National Spatial Data Infrastructure
FSA	Farm Service Agency	NSGIC	National States Geographic Information Council
FWS	U.S. Fish and Wildlife Service	NSRS	National Spatial Reference System
FY	Fiscal Year	NTIA	National Telecommunications and Information Administration
GEO	Group on Earth Observations	NWI	National Wetlands Inventory
Geospatial LoB	Geospatial Line of Business	OGC	Open Geospatial Consortium, Inc.
GEOSS	Global Earth Observation System of Systems	OMB	Office of Management and Budget
GIS	Geographic Information System	PLSS	Public Land Survey System
GNIS	Geographic Names Information System	POC	Point of Contact
GOS	Geospatial One-Stop	RFI	Request for Information
GSA	General Services Administration	SDI	Spatial Data Infrastructure
GSDI	Global Spatial Data Infrastructure	SOA	Services-Oriented Architecture
GWG	Geospatial Intelligence Standards Working Group	SSURGO	Soil Survey Geographic Database
HPMS	Highway Performance Monitoring System	TDTT	Technical Deployment Task Team
HSIP	Homeland Security Infrastructure Program	TFTN	Transportation for the Nation
ISO	International Organization for Standardization	USDA	U.S. Department of Agriculture
LiDAR	Light Detection and Ranging	USGS	U.S. Geological Survey
MMC	Multipurpose Marine Cadastre	USPS	U.S. Postal Service
MOU	Memorandum of Understanding	WBD	Watershed Boundary Dataset
NAIP	National Agriculture Imagery Program	WMS	Web Mapping Service
NARA	National Archives and Records Administration		



