

2013 Annual Report

Federal Geographic Data Committee

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FGDC Releases Newest Version of the Geoplatform On July 11, 2013, the FGDC released the latest v...

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University of Arizona - This statewide data set consists of polygons representing the ALRIS Tile Index for the state of Arizona. Each tile covers a geographic area 30 mins Latitude...

Landscape Conservation Cooperatives Map Services
US Fish and Wildlife Service, Department of the Interior - Landscape conservation cooperatives (LCCs) are conservation-science partnerships between the U.S. Fish and Wildlife Service, U.S. Geological Survey (USGS)...

Urban Waters Mapper
The Urban Waters Mapper strives to provide a common operating picture to watershed practitioners across the public-private-NGO spectrum and relies on the crowdsourcing of project information to get us there.

Lake Michigan basin golf gnls
Great Lakes Commission - The Geographic Name Information System (GNIS), developed by the U.S. Geological Survey in cooperation with the U.S. Board on Geographic Names (BGN), contains...

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Trending Data

Alternative Fuel Stations
This map shows the locations of alternative fuel stations, their address, hours, forms of payment accepted, and phone number.

Hurricane Season 2013 Mashup
This map provides a number of layers that help support the 2013 hurricane season.

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Featured Maps

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Dataset Type Clear All

Geospatial (47) x

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Tags Clear All

Earth Science (18)

Environment (16)

Biota (15)

Oceans (15)

English (11)

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Formats Clear All

HTML (16)

TAR (8)

ZIP (8)

WMS (7)

Show More Formats

Groups Clear All

Ecosystems (47) x

Ocean (5)

Energy (1)

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Dataset Catalog

Note that only datasets marked as "Federal" are subject to the U.S. Federal Government and Data.gov's Data Policy. Non-federal participants (e.g., universities, organizations, and tribal, state, and local governments) maintain their own data policies. It is important that users understand the data policies of participating entities in order to best utilize these datasets. A description of this catalog and information about the datasets presented and associated metrics is available [here](#).

Search datasets...

47 datasets found Order by: Relevance

Dataset Type: geospatial Groups: Ecosystems

A GLOBAL DATABASE OF SOIL RESPIRATION DATA, VERSION 2.0 **Federal**
National Aeronautics and Space Administration - This data set provides an updated soil respiration database (SRDB), a near-universal compendium of published soil respiration (RS) data. Soil respiration, the...

AERONET **Federal**
National Aeronautics and Space Administration - AERONET (AErosol RObotic NETwork) is an optical ground based aerosol monitoring network and data archive supported by NASA's Earth Observing System and expanded...

Atlantic Offshore Seabird Dataset Catalog **Federal**
U.S. Geological Survey, Department of the Interior - Several bureaus within the Department of Interior compiled available information from seabird observation datasets from the Atlantic Outer Continental Shelf...

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NOAA Home | **Featured Datasets** | **Map Gallery** | **Featured Applications** | **Hurricanes and Storms** | **Data Groups**

Welcome to NOAA
The NOAA Community on the National Geoplatform provides NOAA customers, partners, and staff members with a centralized platform for discovering and accessing much of NOAA's distributed geospatial data, services, and applications.

Overview

Hurricanes & Storms

MarineCadastr.gov

NOAA is an agency that enriches life through science. Our reach goes from the surface of the sun to the depths of the ocean floor as we work to keep citizens informed of the changing environment around them.

This ArcGIS Online group provides access to authoritative NOAA web map services and applications in support of the 2013 hurricane season.

MarineCadastr.gov, a partnership between the Bureau of Ocean Energy Management and the National Oceanic and Atmospheric Administration's Coastal Services Center, provides spatial data, viewers, tools, and technical support for offshore renewable and conventional energy projects and marine planning.



Federal Geographic Data Committee
IVAN DELOATCH, Executive Director

Federal Geographic Data Committee, Reston, Virginia: 2013

For more information on the Federal Geographic Data Committee
World Wide Web: <http://www.fgdc.gov/>
E-mail: fgdc@fgdc.gov

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Suggested citation:
Federal Geographic Data Committee, 2013, 2013 Annual report: Reston, Virginia, USA,
Federal Geographic Data Committee, 44 p.

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Message from the FGDC Chair

It is my pleasure to present the Federal Geographic Data Committee's (FGDC's) annual report for 2013. This report provides management and performance information and describes the significant actions the FGDC has taken over the past year to facilitate continued, integrated, and sustainable development and dissemination of geospatial data and technology. This year in an Executive Order, President Obama recognizes the importance of data that is open to, and accessible by, the public. One of Secretary of the Department of the Interior Sally Jewell's priorities is to elevate the understanding of our Nation's resources to a landscape level. The FGDC's accomplishments and goals not only are consistent with these directives but give us a running start at completing these missions.

During the past year the FGDC has undertaken a major effort to develop an updated strategic plan for the National Spatial Data Infrastructure (NSDI). The plan is being developed through extensive outreach and collaboration with Federal agencies, the National Geospatial Advisory Committee, leadership in the commercial and academic geospatial communities, and other external partners. The strategic plan will describe a shared national vision for the NSDI and will include a clear set of goals and objectives for the FGDC agencies. I believe the plan will provide a clear roadmap for the FGDC's activities over the next several years. To maximize its utility, the plan will also provide guidance for Federal agencies and other stewards of geospatial information.

The FGDC and its partners have made great strides in the continued development of the Geospatial Platform. The Geospatial Platform is a "one-stop" shared technology environment that enables the publication and organization of geospatial data provided by government agencies and their trusted partners. Version 2.0 of Geoplatform.gov, which was released in July 2013, includes major new features such as a completely redesigned website, close integration with Data.gov and other national information sharing efforts, the establishment of Geoplatform.gov "communities," and a Marketplace function that supports better coordination of Federal geospatial investments. In 2013 and 2014, we will continue to release new features and capabilities on a regular basis.

The FGDC has also taken important steps to implement the management practices described in the Supplemental Guidance to Office of Management and Budget (OMB) Circular A-16, "Coordination of Geographic Information and Related Spatial Data Activities." The FGDC has developed a draft implementation plan for the Supplemental Guidance that outlines a process to use portfolio management approaches to more effectively manage Federal geospatial assets and investments. The implementation plan will assure consistent recordation and management of geospatial data, facilitating the use and accessibility of the data among a spectrum of Federal agencies. In fiscal year 2014, the FGDC will finalize the plan and continue the implementation of this important process.

The FGDC has continued to make progress in the area of establishing standards for various types of geospatial data. The FGDC endorsed five geospatial standards in calendar year 2013 and continued its longstanding efforts to increase awareness and implementation of geospatial metadata standards.

The FGDC made substantial progress on multiple levels in the past year, despite significant budgetary constraints. The staff of the FGDC Secretariat and the Senior Agency Officials for Geospatial Information at the various Federal agencies worked diligently and efficiently to address the increasing and accelerating needs for integrated geospatial information. The accomplishments over the past year have been



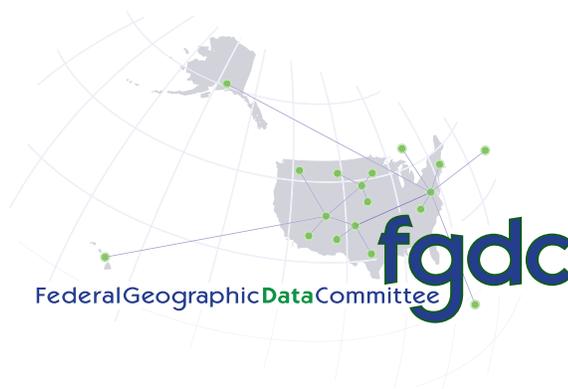
Anne Castle with some of the original National Geospatial Advisory Committee during the September 2013 NGAC meeting. Left to right, Ivan DeLaotch, Anne Castle, Anne Hale Miglarese, Matt O'Connell, Jack Dangermond, Jerry Johnston, and Dick Clark.

informed by extensive collaboration and coordination with our network of partners in other levels of government, the private sector, nonprofit organizations, and academia through the National Geospatial Advisory Committee. I appreciate the hard work of the dedicated employees from multiple organizations across the country who carry out the work of the FGDC.

Fiscal year 2014 will focus on continued collaboration with Federal and non-Federal partners to advance national geospatial programs. The FGDC will finalize and begin implementation of the NSDI Strategic Plan and the A-16 Implementation Plan and will work with partners to enhance the Geospatial Platform for the benefit of the agencies and the public we serve. We look forward to continuing our progress and partnerships in the coming year.

Sincerely,

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



Highlights for Fiscal Year 2013

Geospatial Line of Business

The Geospatial Line of Business (LoB) successfully transitioned to activities focused on the implementation of the Geospatial Platform as a mechanism for developing and delivering shared services for geospatial information across government agencies. The Geospatial Platform offers access to trusted geospatial data, services, and applications managed in the Federal Geospatial Portfolio to support Federal, State, Tribal, and local governments in meeting their mission objectives, and to provide efficiencies and cost savings through shared infrastructure and enterprise solutions. The Portfolio is defined in the Office of Management and Budget (OMB) Circular A-16 Supplemental Guidance. For more information see page 10.

OMB Circular A-16 Supplemental Guidance

OMB Circular A-16 Supplemental Guidance provides the foundation for a portfolio management approach to the National Geospatial Data Asset (NGDA) portfolio. This approach is based on management units called Themes and their associated NGDA Datasets. Activities during fiscal year 2013 included: completion of the 16 NGDA Theme definitions and their approval by the FGDC Steering Committee, continued identification of datasets associated with each NGDA Theme, identification of the NGDA Theme lead agencies, NGDA Theme Executive Champions and Theme Leads, development of baseline maturity assessment tools for NGDA Themes and Datasets, registration of many of the NGDA Datasets to the Geospatial Platform, and the creation of a Theme Lead collaboration

community on the Geospatial Platform. For more information see page 11.

GeoCloud Initiative Supports the Geospatial Platform

Two geospatial services with a national scope were placed into operation in the Geospatial Cloud (GeoCloud) in fiscal year 2013: the U.S. Department of Education School District Demographics System (SDDS) and the U.S. Army Corps of Engineers Inland Electronic Navigation Charts (IENC). Both services are now operating in the Amazon cloud infrastructure. The services support the interactive use and standards-based application programming interfaces (APIs) that enable access by other software clients. For more information see page 13.

NSDI Strategic Plan

The FGDC organized and led an effort to develop a new strategic plan for the National Spatial Data Infrastructure (NSDI). The plan is being developed through extensive outreach and collaboration with Federal agencies, external partners, and the National Geospatial Advisory Committee. The plan will describe a shared national vision for the NSDI and outline the actions the Federal Government will take to contribute to this vision. The plan will provide a roadmap for the FGDC's activities over the next several years. For more information see page 14.

National Geospatial Advisory Committee

During the past year the National Geospatial Advisory Committee (NGAC) analyzed and provided

feedback and recommendations to the FGDC on the NSDI Strategic Plan, the Geospatial Platform initiative, the National Hydrography Dataset, and the proposed National 3D Elevation Program and National Address Database. For more information see page 14.

Standards

The FGDC endorsed five standards in calendar year 2013: (1) ISO 19156:2011, Geographic Information - Observations and Measurements; (2) OGC® WaterML 2.0: Part 1- Time Series Encoding Standard; (3) Geopolitical Entities, Names, and Codes (GENC) Standard Edition 1; (4) Revision of the Classification of Wetlands and Deepwater Habitats of the United States Standard; and (5) Time Space Position Information (TSPI) standard, Version 2.0. For more information see page 15.

Geospatial Metadata

Working with several Federal agencies, the FGDC Secretariat organized and led an International Organization for Standardization (ISO) Metadata Implementation Webinar that addressed the 2011 FGDC Metadata Summit recommendations to increase awareness about ISO geospatial metadata standards and develop strategies to move agencies forward with implementation. Additionally, the Metadata Working Group released an updated charter in July 2013. For more information see page 16.

NSDI Training Program

The NSDI Training Program began shifting toward implementation of the standards, policies, technology, and human resources that comprise the NSDI, including ISO metadata, an

Open Data Policy, A-16 Supplemental Guidance, the Geospatial Platform, and the NSDI Strategic Plan. For more information see page 19.

NOAA's Senior Agency Official for Geospatial Information Honored



Mr. Joseph Klimavicz, the Department of Commerce Senior Agency Official for Geospatial Information (SAOGI), was recently recognized with the fiscal year 2012 Distinguished Presidential Rank Award as an exceptional leader who has demonstrated his ability to bring people, processes, and technology together, working across organizational boundaries, to create efficiencies and increase mission effectiveness by delivering large-scale complex transformations.

Since 2007 Mr. Klimavicz has been NOAA's Chief Information Officer (CIO) where he leads NOAA's management of information and implementation of information technology (IT), which includes NOAA's high-performance computing and communications infrastructure and NOAA's Homeland Security program to ensure NOAA's emergency response and business continuity. As a SAOGI he is an active member of the FGDC Executive and Steering Committees where he provides invaluable leadership and insight to activities related to OMB Circular A-16 and the implementation of the National Spatial Data Infrastructure. Mr. Klimavicz led the development of the initial instance of Geoplatform.gov and its migration to the new national Geospatial Platform, which included the creation of a NOAA community within the Platform's website.

Geospatial Platform 2.0 Released this Year



Introduction

The Geospatial Platform (Geoplatform.gov) is a major initiative of the FGDC and considerable progress has been made on its development throughout the year. At its core, the Platform features a shared technology environment that enables the publication and organization of geospatial data provided by government agencies and their trusted partners. This effort is a component of the Administration's Information Technology (IT) Shared Services initiative and is designed to help agencies more effectively produce and share their geospatial data, services, and applications across the government and externally.

More specifically, the Geospatial Platform initiative is designed to offer a number of features to Federal agencies and their partners, including:

- a “one-stop-shop” to deliver trusted, nationally consistent data and services;
- authoritative data to support informed decisionmaking;
- problem-solving applications and services that are built once and used many times across multiple Federal agencies and other organizations;
- a shared cloud-computing infrastructure to host data and applications; and
- a national and Federal focal point where governmental, nongovernmental, private, and public data and applications can be visualized together to inform and address national and regional issues.

Our past efforts in this area have led to the development of the Business Plan for the Geospatial Platform, approved by the FGDC Steering Committee in September 2012. This document, along with the companion “Modernization Roadmap for the Geospatial Platform” and “Building the Business Case for the Geospatial Platform—The Value Proposition” have served as the blueprint for our work in transforming the prototype implementation of Geoplatform.gov into a fully operational set of capabilities. As a part of that effort, this year the FGDC released a completely new and greatly improved version of Geoplatform.gov.

Improved Capabilities Supporting Improved Outcomes

Version 2.0 of Geoplatform.gov was released in July 2013 and, in the spirit of continuous improvement, new features and capabilities are being released on a regular basis. Major new features in the Version 2.0 release include the following:

A Redesigned Website

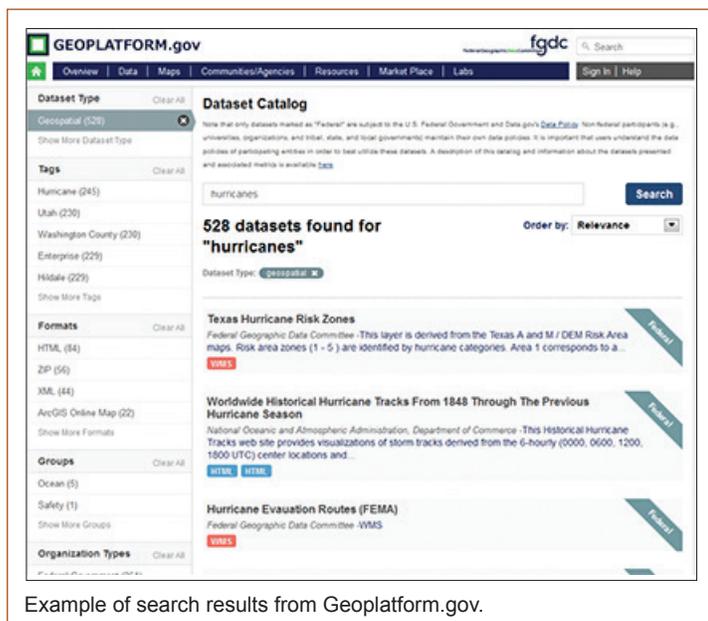
The Geoplatform.gov website was completely redesigned for this release. Built using Drupal, an open source Web content management system (www.drupal.org), the content of the new site is arranged based on user needs and the types of services available. The site also now includes a prominent space for featuring stories about the Platform and a number of other capabilities designed to enhance community engagement and collaboration.



Home page for Geoplatform.gov.

Tight Integration with Data.gov

Since the beginning of the Data.gov program, the national geospatial community and the FGDC members have been leaders in providing the vast majority of metadata records to the governmentwide clearinghouse. From a usability perspective, though, we have been challenged in the past by the fact that geospatial catalog holdings have been maintained and discoverable via separate user interfaces and tools from other portions of the Data.gov catalog holdings. For the Version 2.0 release of Geoplatform.gov, we have worked very closely with the Data.gov team to bring these capabilities together, and we are now using the master Data.gov catalog as a service for the benefit of Geoplatform.gov users.



Example of search results from Geoplatform.gov.

Integration with National Information-Sharing Efforts

One of the most exciting developments for the Geospatial Platform this year has been our interaction and engagement with several whole-of-government initiatives designed to improve our Nation's capabilities for effectively sharing geospatial information. This includes efforts to integrate the capabilities of the Geospatial Platform with the Department of Homeland Security's Sensitive but Unclassified environment for geospatial data sharing, the "Geospatial Interoperability Infrastructure," and efforts to collaborate with the Homeland Infrastructure Foundation-Level Data (HIFLD) Working Group community to define and implement improved governance, coordination, and technical capabilities for information sharing. Additionally, the Geospatial Platform team has been working closely with the Office of the Program Manager for the Information Sharing Environment (PM-ISE) to codify the role of the Geospatial

A Shared Catalog Solution

In fiscal year 2013, the FGDC participated in the design and deployment of a shared catalog solution for both Data.gov and the Geospatial Platform—known as Catalog.Data.gov. This solution, based on the open source CKAN (Comprehensive Knowledge Archive Network) distribution originally deployed as the national solution for the United Kingdom (*data.gov.uk*), replaces two separate catalogs and allows search access to all governmental data. Its single index includes all spatial and nonspatial metadata from Federal agencies and their non-Federal partners' catalogs. The catalog user interface allows for the discovery of data based on "search facets"—fields that can be selected by a user to rapidly focus on topics, sources, and locations. Where data are associated with geospatial data or services of a known type, they can be launched in one of two available interactive viewers. A rich application programming interface (API) is available to enable developers to further refine the search and presentation experience. The collaboration has also produced the Communities Web portal module created for Data.gov to be used in the Geospatial Platform environment. This module will be used as a template for OMB Circular A-16, agency, and cross-cutting activities to customize their own community resource environments under the Geoplatform.gov portal.

Platform as the government's geospatial data publication and sharing environment for unclassified information.

Geospatial Platform Marketplace

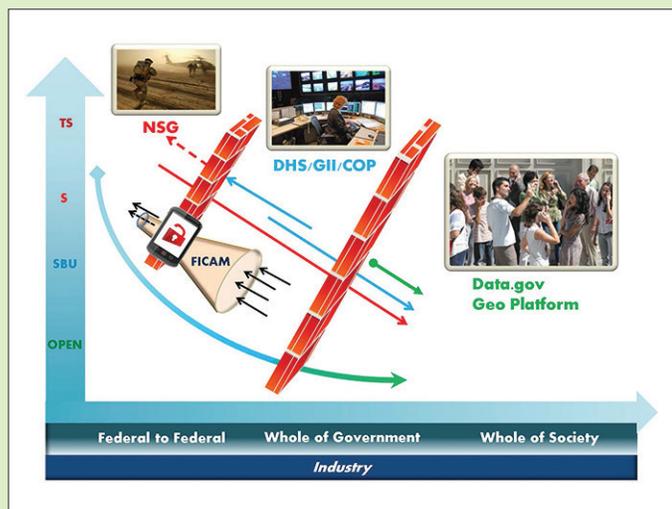
The Geospatial Platform's new Marketplace functionality was designed with three goals in mind: (1) to broker partnerships among organizations seeking to procure or create data of common interest; (2) to help agencies avoid duplicative or redundant spending; and (3) ultimately, to help measure the effectiveness of the Marketplace in terms of promoting these interactions and the derived cost savings and avoidance. With the Version 2.0 release of Geoplatform.gov, we have made progress toward achieving these goals, and users will be able to quickly and easily search for "planned" data acquisition activities that are provided by FGDC partners as metadata records to the Data.gov catalog. This represents only the most basic functionality that the Marketplace will ultimately feature, and more capabilities will be released in the near future.

Geoplatform.gov Communities

Perhaps the most prominent new feature of Geoplatform.gov is the incorporation of "communities"—interactive, topically

Information-Sharing Continuum

Efficient and seamless information sharing has been a longstanding challenge within components of the U.S. Government and our mission partners in other organizations. Working with our partners in the Department of Homeland Security (DHS) and the Office of the Program Manager for the Information Sharing Environment (PM-ISE), the FGDC is helping define the role of the Geospatial Platform in the broad geospatial information-sharing continuum. Through our shared efforts to develop an overall “Geospatial Interoperability Reference Architecture” (GIRA), we are working to establish the technology and policy standards framework that must be in place to ensure effective sharing of spatial information from classified networks (the National System for Geospatial Intelligence) to sensitive but unclassified networks (the DHS Geospatial Interoperability Infrastructure) to fully unclassified networks (the Geospatial Platform). This will enable sharing of content via a “no wrong door” access mechanism to authorized users from among all of our partners who have shared mission responsibilities.



focused sections of the website that are managed and used for collaboration by specific communities of interest. Version 2.0 of Geoplatform.gov features communities for a national collaborative environmental management program, for agency program leads who are responsible for Theme leadership under OMB Circular A-16, and for the benefit of an individual agency in presenting its data and tools to the public. Many more communities are under development for Geoplatform.gov, and this will be one of the most exciting areas of the site to continue to watch over the coming months.

High-Priority Work for Next Geoplatform.gov Releases

Heading into fiscal year 2014, we are continuing to advance Geoplatform.gov in a number of ways. Because this will be the first full year of funding support for the Geospatial Platform initiative, the FGDC members and our partners have much to look forward to as our shared capabilities advance. Some of the most prominent areas of effort in early fiscal year 2014 will include:

- 1. Development of Communities for A-16 Themes.** Each of the content Themes defined under the Supplemental Guidance to OMB Circular A-16 will be featured as a Theme community on Geoplatform.gov. Identified Theme Leads and Dataset Managers will be able to work collaboratively to feature their nationally significant data assets, as well as their tools and applications that are built using these and other data available on Geoplatform.gov. We will also begin the publication of Theme and Dataset lifecycle metrics on the site to create a series of information dashboards that will help users quickly and easily review key information on progress toward our shared goals. Theme communities will also have collaborative capabilities that will allow Theme participants and their stakeholders to share best practices, tips, and lessons learned from their efforts.
- 2. Geospatial Hosting Services.** The Geospatial Platform Managing Partner will be developing shared cloud-computing infrastructure for data and application hosting by the FGDC community. This will include opportunities for cloud hosting of data and map services defined as nationally significant data assets under the Supplemental Guidance. This shared data-hosting environment is potentially the most impactful component of the overall Geospatial Platform implementation, and we are looking forward to helping our partners serve their data, tools, and applications in an efficient, secure, and cost-effective manner.
- 3. Expansion of Self-Service Capabilities for Communities.** The Geoplatform.gov communities that were developed and released throughout fiscal year 2013 served as our prototyping efforts for defining a number of self-service content management and authoring capabilities that will be released to community administrators in fiscal year 2014. In the near future, community administrators will have the ability to assign content publication privileges to different members of their communities, invite others to register and access resources that are not available to public users, and much more.

Geospatial Platform Community Types to Foster Collaboration

The Geospatial Platform provides Geoplatform.gov communities with online work space and tools to enable them to address an issue collaboratively. A community coalesces around a common goal, such as understanding and addressing an issue, developing a resource, or providing a service. The Geospatial Platform Version 2.0 is currently supporting three types of content-organized communities representing different community focuses:

- focused or cross-agency collaboration communities,
- NGDA Theme communities, and
- agency “storefront” communities.

The Geospatial Platform provides geospatial tools and services that each community can choose to utilize for the community, regardless of its type.

The National Blueways System community focuses on integrated and adaptive watershed approaches to resource stewardship.

The National Blueways System community is an example of an issue-focused community. The focus in this type of community is collaboration across agencies and with partners and (or) the public on a common issue, priority, or mission. Other examples of this type of community include: event-focused communities such as a hurricane, wildfire, or the Gulf of Mexico oil spill; land management; and interagency collaborative activities supporting science and policy. The community pages provide collaboration and information resources for current and potential members, as well as for the public. Information on the community’s goals, history, community make-up, activities, opportunities, and other useful information are available. Geospatial data and map views designed by the community members provide the data presented to best inform users about their focus issue.

OMB Circular A–16 (A–16) provides for improvements in the coordination and use of spatial data and the effective and economical use and management of spatial data assets for the benefit of the Government and the Nation. The Geospatial Platform’s A–16 Theme communities provide agencies with (1) mission responsibility for the management and sharing of geospatial data, (2) Theme-focused communities with resources to address common issues, (3) Theme-focused map views made up of the Theme’s many Datasets, and (4) opportunities to collaborate on management best practices and data maturity reporting. These communities are focused on the management and delivery of the National Geospatial Data Assets of the Federal geospatial portfolio.

The A–16 Biota Data Theme community provides collaboration space for Federal agencies who manage spatial data related to this Theme.

The NOAA “storefront” community provides access to NOAA geospatial resources.

Agency “storefront” communities are designed to be a public portal for each agency’s geospatial data and services. Agencies can leverage the shared infrastructure and tools of the Geospatial Platform to reduce their internal investment. The NOAA community prototype on the national Geospatial Platform provides NOAA customers, partners, and staff members with a centralized platform for discovering and accessing the wide variety of NOAA’s distributed geospatial data, services, and applications without having to understand which NOAA office created them.

Many missions, priorities, events, and activities benefit from collaborative solutions. The Geospatial Platform provides multiple types of communities that support these efforts.

Technological advancements are important to the overall success of the Geospatial Platform; however, a true measure of success in this effort will be the volume and quality of nationally significant data that are made available through Geoplatform.gov. Throughout 2014, the entire

FGDC community will continue working together toward implementation of the Supplemental Guidance to OMB Circular A-16, and more and more high-quality content will be available through the infrastructure of the Geospatial Platform.

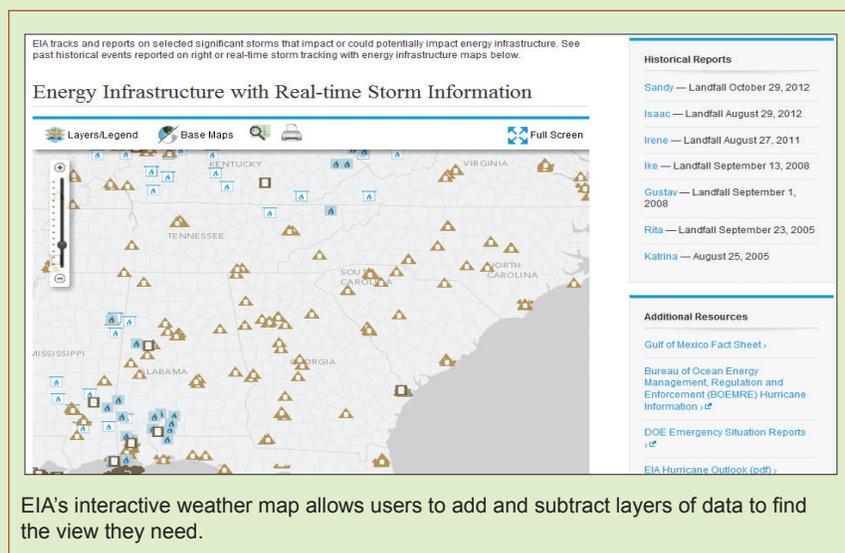
Success Story

A New Web Tool Highlights Hurricane Risk for Energy Infrastructure

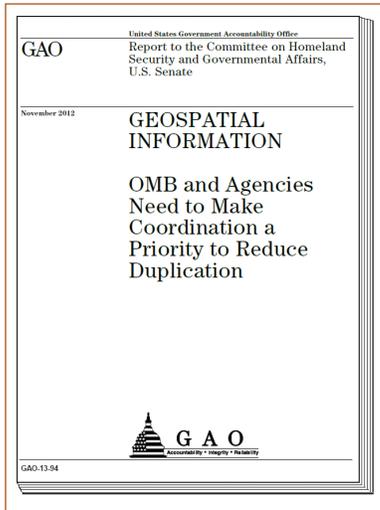
Challenge: Every year hurricanes and other extreme weather events threaten life and property, including the United States' energy infrastructure, especially when storm paths traverse offshore production rigs and pipelines, coastal refineries, power plants, and energy import and export sites. No existing tool allowed for the visualization and understanding of potential impacts of a storm on the Nation's energy network.

Action: The U.S. Energy Information Administration (EIA) developed an interactive energy disruption map, found at www.eia.gov/special/disruptions, which combines real-time storm information from NOAA with more than 20 infrastructure layers from the EIA, the U.S. Bureau of Ocean Energy Management, the U.S. Department of Transportation, and Ventyx. These organizations make their map layers and services in the same industry-standard format.

Results: Whenever a user views EIA's disruption map, the Web browser integrates the latest storm information directly from NOAA with energy infrastructure data from several sources stored on EIA servers. Upon its release on July 9, 2013, the disruption map was well received by the public and was reported on by Smithsonian Magazine, Federal Computer Week, Information Week, Government Technology, the Houston Business Journal, and others. Even the Wall Street Journal took note of the "nifty new tool" and its significance for oil and gas traders who typically need to track severe weather around the Gulf of Mexico because of the potential for disruption to the region's oil and gas production and delivery infrastructure. EIA's disruption map highlights the Department of Energy's commitment to coordinate their geographic information system (GIS) efforts with their Federal, State, and private partners to reduce GIS costs, improve the quality of services, and increase efficiency to support the interagency emergency response community. This Web mapping service is an example of a prospective application for inclusion in the Geospatial Platform.



FGDC Actions to Prioritize Coordination and Reduce Duplication



Background

In November 2012, the U.S. Government Accountability Office (GAO) culminated a year-long review of FGDC activities with the release of “Report to the Committee on Homeland Security and Governmental Affairs, U.S. Senate, GEOSPATIAL INFORMATION: OMB and Agencies Need to Make Coordination a Priority to Reduce

Duplication, GAO-13-94.” The GAO was asked to “determine the extent to which the Federal Government has established and effectively implemented policies and procedures for coordinating its investments in geospatial data and avoiding duplication.” To address this objective, GAO focused on governmentwide activities to implement the National Spatial Data Infrastructure (NSDI) as well as the efforts of the FGDC. The report includes recommendations to the FGDC and to each of the three Departments that were part of the GAO review—the Departments of the Interior, Commerce, and Transportation.

Recommendations to Departments

The actions directed to the Departments include departmental policy and planning activities, as well as activities to advance data themes and further align them with Office of Management and Budget (OMB) Circular A–16 responsibilities. The departmental actions include: preparing strategies for advancing geographic information and related geospatial data activities, policies for making metadata available through the NSDI clearinghouse, policies for searching the clearinghouse prior to expending funds on new data activities, preparing goals and implementation plans for populating the hydrography and transportation themes, and creating theme standards for the geodetic control, hydrography, and transportation themes. The report also recommends that OMB develop a mechanism to annually report on all geospatial investments, including dollars invested and the nature of the investment.

A number of the recommendations on departmental policy and theme activities are common across the Departments, and collaboration is occurring on common solutions. For example, it is recommended that all three Departments “prepare, maintain, publish, and implement a strategy for advancing geographic information and related geospatial data activities appropriate to its mission.” These departmental plans need to align with the overall NSDI Strategic Plan (see Recommendation 3 below). As such, these agencies make up part of the NSDI Strategic Planning core team that is providing weekly review and guidance for the NSDI Strategic Plan, helping to ensure this alignment.

Recommendations to the FGDC Steering Committee

Three recommendations are directed to the FGDC Steering Committee for action. In a January 15, 2013, memorandum, FGDC Chair Anne Castle, Department of the Interior (DOI) Assistant Secretary for Water and Science, directed the Steering Committee to take the actions required to address the recommendations and, in addition, to the implementation of the Geospatial Platform (which is closely tied to a number of the actions). These actions were the primary focus of the Steering Committee’s activities during the year. “Responsible officials” from the FGDC Executive Committee have been identified for each action and target completion dates have been set. A summary of each recommendation and the supporting actions is described below.

Recommendation 1: “Establish a time frame for completing a plan to facilitate the implementation of OMB’s portfolio management guidance, and implement the plan within the established time frame.” Responsible Officials: Adrian Gardner, NASA, and Ivan DeLoatch, FGDC Office of the Secretariat, DOI/USGS. Target Date: Fiscal Year 2014, First Quarter.

This recommendation refers to OMB’s A–16 Supplemental Guidance, which includes a governmentwide portfolio management approach to geospatial data asset management. In June 2013, a memorandum from the FGDC Chair was sent through the President’s Management Council to the FGDC member agencies to identify Theme Leads and Executive Theme Champions who will be responsible for implementing the plan and executing the roles and responsibilities outlined in the Supplemental Guidance. The implementation plan provides the steps to inventory, assess, document, and report on the Federal data

portfolio Themes and Datasets and utilizes the Geospatial Platform to form communities of interest for the Themes and provide a reporting dashboard.

Recommendation 2: “Develop and implement guidance for identifying planned geospatial investments using the Geospatial Platform, and establish a time frame for doing so.” Responsible Official: Jerry Johnston, Geospatial Information Officer, DOI. Target Date: Fiscal Year 2013, Fourth Quarter.

The Geospatial “Marketplace” is being implemented on the Geospatial Platform as an online service that enables agencies to post metadata records for “planned” data investments. Utilizing the shared data catalog between the Geospatial Platform and Data.gov, agencies can register a record that will be presented in the Marketplace community to enable collaboration by Federal and other agencies for the joint investment of data, to minimize redundant data collection, and to leverage saving of scale.

Recommendation 3: “Create and update a strategic plan to improve coordination and reduce duplication, and create and implement the plan within the established time frame ... outcome oriented goals and objectives that address all aspects of the NSDI.” Responsible Officials: Daniel Cotter, DHS, and Ivan DeLoatch, FGDC Office of the Secretariat, DOI/USGS. Target Date: Fiscal Year 2014, First Quarter.

The NSDI Strategic Plan is a national plan, and the FGDC has received valuable insight and recommendations for the plan from the National Geospatial Advisory Committee (NGAC) and through forum meetings with partnering organizations. The second version of the plan was made available for public comment in August 2013, and the comments were a focus for the Steering Committee, Executive Committee, and NGAC meetings in September. The plan takes the input from the broader community on the Federal agency roles, responsibilities, and priorities and combines it with the Federal agency input to set objectives, goals, and actions for the Federal agencies for the next 3 years. For more information on the development of a new NSDI Strategic Plan see page 14.

Summary

The FGDC member agencies are collaborating closely on these actions and actively engaging the broader community and partnering organizations. The actions are a positive step forward in implementing the NSDI, setting Federal geospatial goals for the next 3 years, and implementing tools to help increase efficiency and reduce redundancy. The FGDC would like to thank the NGAC members and members of the broader geospatial community who continue to provide valuable insight, recommendations, and advice relating to these key actions; the FGDC looks forward to continuing the dialog in support of advancing the NSDI as a key national asset.

Fiscal Year 2013 in Review

Geospatial Line of Business Focuses on the Geospatial Platform

The Geospatial Line of Business (LoB) successfully transitioned to activities focused on the implementation of the Geospatial Platform as a mechanism for developing and delivering shared services for geospatial information across government agencies. The Geospatial Platform activity demonstrates advancement in our collaborative effort to support geospatial activities across Federal agencies and helps to improve the efficiency of government by making geospatial data more accessible, reliable, and less expensive to acquire through enhanced data sharing and more effective management of resources. Access to the Geospatial Platform is at Geoplatform.gov. The Geospatial Platform offers access to trusted geospatial data, services, and applications managed in the Federal Geospatial Portfolio to support Federal, State, Tribal, and local governments in meeting their mission objectives. The Geospatial Platform also provides efficiencies and cost savings through shared infrastructure and enterprise solutions. The Portfolio is defined in the Office of Management and Budget (OMB) Circular A-16 Supplemental Guidance.

Geospatial Platform Capabilities Demonstrated

Federal and State agencies joined forces to test the inaugural Geospatial Platform capabilities for use as part of a Hurricane Response community. Led by the Federal Geographic Data Committee Office of the Secretariat, participants included: the Department of the Interior, U.S. Geological Survey, EROS, Department of Commerce/ National Oceanic and Atmospheric Administration, Department of Homeland Security, Federal Emergency Management Agency, and the Texas Natural Resources Information System, with technical support from Esri. The group developed the “Geospatial Platform: Concepts, Roles, and Responsibilities for Communities and Groups, February 22, 2013” white paper and created a video providing a use-case example showing how collaborative map products can be created and how they would apply in relation to a hurricane event. All these efforts were accomplished utilizing virtual meetings and centrally registered, remotely managed geospatial data services.

For recent developments in the Geospatial Platform see the feature article on page 3.

SmartBUY Saving Taxpayer Dollars

The FGDC’s Geospatial Line of Business (LoB) initiative has been committed to helping government agencies discover and efficiently procure the best available geospatial software solutions for their mission needs. A component of the Geospatial LoB was established and it provided information necessary to help organizations determine a best value geospatial software solution, or transition an existing agreement or license to more advantageous terms under the Geospatial Software SmartBUY Blanket Purchase Agreement (BPA). Cost savings from the September 30, 2009, award to summer 2013 are shown in the chart and support the value and success of the Geospatial LoB SmartBUY.

Geospatial Total Sales	SmartBUY Sales	GSA Schedule Value	Cost Avoidance
SAIC	\$8,202,315	\$8,681,123	\$478,808
ISC	\$6,446	\$6,529	\$83
Planet Associates	\$2,904,291	\$3,959,696	\$1,055,405
Onix Networking	\$10,238,983	\$50,876,357	\$40,637,374
Esri	\$68,940	\$625,006	\$556,066
Total (Inception To Date)	\$21,420,975	\$64,148,711	\$42,727,736

OMB Circular A–16 Supplemental Guidance Implementation Moves Forward

The NSDI vision is that the NSDI leverages investments in people, technology, data, and procedures to create and provide the geospatial knowledge required to understand, protect, and promote our national and global interests. This enhances the understanding of our physical and cultural world by gathering spatial data from multiple sources (Federal, State, Tribal, and local governments, academia, and the private sector) and sharing access to the data so that the data are readily available and easily integrated. The intent is to improve support of mission-critical business requirements of the Federal Government and its stakeholders. The Supplemental Guidance to OMB Circular A–16 plays a key role in meeting this vision. It further defines and clarifies elements outlined in OMB Circular A–16 to facilitate the adoption and implementation of a coordinated and effective Federal geospatial asset management capability. The Supplemental Guidance also provides the foundation for a portfolio management approach to National Geospatial Data Asset (NGDA) Themes and their associated NGDA Datasets. Each Theme contains multiple associated geospatial datasets (with attribute records and coordinates) that are documented, verifiable, and officially designated to meet recognized standards.

Portfolio management, described in the Supplemental Guidance, is the coordination and management of Federal geospatial data assets and investments to most efficiently support national priorities and government missions. Portfolio management applies consistent management approaches that help increase the quality of data through use of best practices and documentation in a manner that reduces duplication and cost, provides greater accessibility, and supports shared services across the Federal Government. Through portfolio management, NGDA Datasets are organized into management units called Themes, which are managed by Theme Leads who are to provide cross-agency leadership and coordination for the Theme. The Datasets are managed by Dataset Managers who are to provide coordination and standards for the Datasets at a national level. Datasets within Themes will be made available through the Geospatial Platform (Geoplatform.gov).

During fiscal year 2013, the FGDC Steering Committee approved a reduction of Themes from 17 to 16 and refined definitions for several of the NGDA Themes, which update the themes identified in OMB Circular A–16, Appendix E. The Theme descriptions, scope, and initial list of associated Datasets will continue to evolve as business and stakeholder needs warrant.

Lead agencies for all NGDA Themes with the exception of the Terrestrial portion of the Utilities Theme were also approved by the FGDC Steering Committee this year. Theme Leads were identified for all but two NGDA Themes, and Executive Champions were approved for 9 of the 16 NGDA Themes. Dataset managers have been identified for all NGDA Datasets. The NGDA Themes, lead agencies, descriptions, and scope are outlined in Appendix C. A link to the NGDA Datasets list is available at www.fgdc.gov/initiatives/portfolio-management.

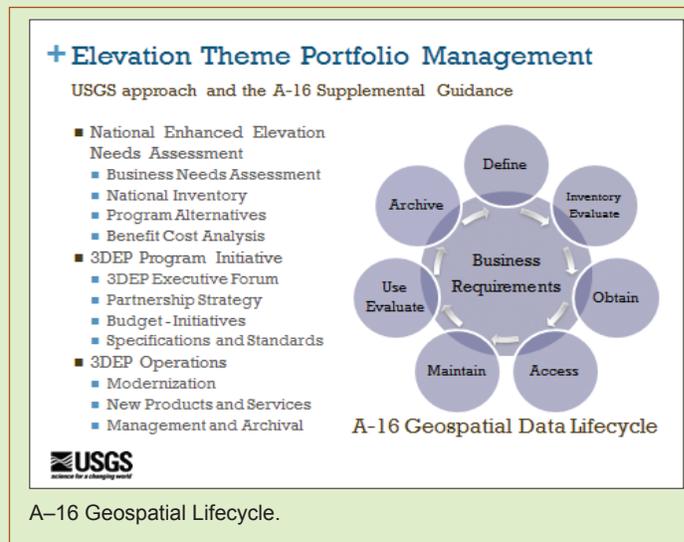
The FGDC is developing an online Geospatial Data Lifecycle Evaluation and an NGDA Theme and Dataset Administrative Assessment to assist Theme Leads and Dataset Managers in assessing/evaluating the current maturity of NGDA Themes and Datasets. The results of the evaluations and baseline assessment are intended to be the basis of Theme Leads and Dataset Managers to report on the maturity of their respective NGDA Themes and Datasets within the NGDA Portfolio as required by the OMB A–16 Supplemental Guidance. As a start, the Theme Leads for Elevation and Governmental Units and Administrative and Statistical Boundaries presented at the June and September 2013, respectively, FGDC Steering Committee meetings.

In May 2013, the Federal Government released a new unified data catalog that supports both Data.gov and the Geospatial Platform. In an effort to maximize discovery of Datasets in the NGDA Portfolio, the FGDC performed a metadata evaluation and registration assessment of NGDA Datasets on the joint Geospatial Platform/Data.gov catalog. The results of this evaluation were presented to Theme Leads who are currently coordinating with Dataset Managers in their respective Themes to complete action items for data registration and metadata compliance for NGDA Datasets.

As implementation of the A–16 Supplemental Guidance across Federal agencies moves forward, a key factor in the success of implementation will be the ability for Theme Leads, Dataset Managers and stewards, and other stakeholders to coordinate and work together on implementation. To help encourage and strengthen this across agencies and within communities, the FGDC will begin establishing NGDA Theme communities on the Geospatial Platform. These communities will serve as space for cooperation as well as provide access to Theme-specific data and resources. It is the vision of the FGDC to have a community on the Geospatial Platform for each of the 16 NGDA Themes and to begin to establish these communities in fiscal year 2014. For additional information about NGDA Theme communities and other communities on the Geospatial Platform see page 6.

Elevation Theme Portfolio Management

The terrestrial elevation component of the OMB A-16 Elevation Theme is led by the USGS and includes the 3D Elevation Program (3DEP) and other datasets. The primary goal of 3DEP is to systematically collect over an 8-year period (1) high-quality light detection and ranging (lidar) data over the conterminous United States, Hawaii, and the U.S. territories; and (2) interferometric synthetic aperture radar (ifsar) data over Alaska, where cloud cover and other conditions limit lidar acquisition. To fulfill its responsibilities for A-16 Elevation Theme Portfolio Management, the USGS has made significant progress in addressing all aspects of the data lifecycle management guidelines in developing 3DEP and will be assessing the other NGDA Elevation Theme datasets as part of the process.



A-16 Geospatial Lifecycle.

Starting in fiscal year 2013 the FGDC Steering Committee began to receive reports from the A-16 Theme Leads on their Theme's status, development, and management plans as part of the implementation of the A-16 guidance. The co-leads from the USGS and NOAA for the Elevation Theme were the first to report on the Theme status to the FGDC Steering Committee at the June 2013 meeting. Highlights from the report include:

- 3DEP Executive Forum was established in February 2013 and will be recognized by the FGDC as the A-16 coordination body for the terrestrial component of the Elevation Theme, which includes participation from the 3DEP member agencies.
- United States Interagency Elevation Inventory (USIEI) is an integral part of planning for and monitoring the 3DEP data acquisition, provides a comprehensive snapshot of high-resolution lidar and ifsar coverage in the United States, and contains project-level information for both terrestrial and bathymetric data. The USIEI is jointly maintained by NOAA and the USGS. More information is available at www.csc.noaa.gov/inventory.
- Implementation plan for 3DEP includes activities to support the program launch in January 2015; activities will also address primary data lifecycle management components of A-16 Theme leadership.

More information is available at nationalmap.gov/3DEP.

In the response to a recommendation made by the GAO, the FGDC is currently developing an A-16 Implementation Plan outlining steps and an associated time frame for implementing the requirements of OMB Circular A-16 Supplemental Guidance across Federal agencies. It will include implementation goals and performance measures that will be reportable to OMB on the progress of implementation. This plan will also institute portfolio management processes that will include developing meaningful and consistent performance metrics for NGDA Themes and Datasets.

GeoCloud Initiative Supports the Geospatial Platform

In fiscal year 2013, the Geospatial Cloud (GeoCloud) initiative sponsored the operational deployment of key public-facing geospatial Web services and engaged several new projects as part of the Shared Services strategy in support of the Geospatial Platform. GeoCloud offers agencies an "incubator" or testbed environment where cloud hosting costs and core software platforms are provided by the FGDC for up to one year. Once the projects are operational they may be (1) transferred back to an agency for payment and operations in the cloud, (2) converted to a reimbursable status hosted in the cloud by the FGDC/Platform but funded by agencies through interagency agreement, or (3) retired from the cloud where such services are not cost effective. Project results including computational performance, costing, and comparison with non-cloud hosting are posted on the FGDC and Geospatial Platform websites to enable future projects to learn from their experiences and plan for the cloud environment.

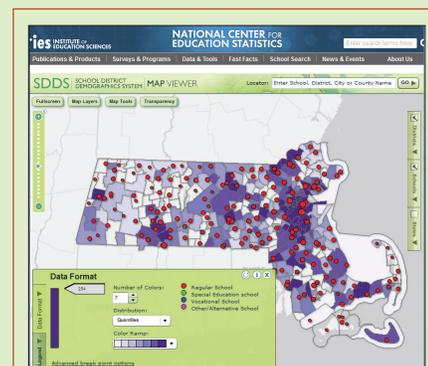
Two national services were made operational in GeoCloud this fiscal year. Both provide user interfaces and standards-based APIs that can be used to view or access the data in other applications. The School District Demographics System (SDDS) is an interactive map service and set of standard Web services operated by the National Center for Education Statistics (NCES) of the U.S. Department of Education (see text box on right). The second national service is the Army Corps of Engineers Inland Electronic Navigation Charts (IENC) that are now published as Web services and as a download user interface in GeoCloud. The IENC service is a nautical charting service that focuses on inland waterways and provides raster maps that are downloaded and used by GPS navigation devices in watercraft.

Using the Cloud to Access School District Demographics

The GeoCloud initiative provided the U.S. Department of Education an opportunity to explore the Amazon Web Services hosting platform for its geospatial applications. The Department of Education's National Center for Education Statistics (NCES) gained experience with the cloud-based Windows 2008R2 Server and Esri ArcGIS for the Server 10.1 platform. This resulted in a successful migration of its on-premises ArcGIS platform for the School District Demographics System (SDDS). Success for NCES equates to high availability, increased efficiency, and increased innovation with a platform that supports rapid deployment of its geospatial solutions for accessing school district demographic and related geographic data.

The information system supporting the SDDS Map Viewer (nces.ed.gov/surveys/sdds) is the main NCES system migrated. This is a publicly available application (also with a mobile version) that allows access from NCES to information about demographics, social characteristics, and the economics of children and school districts. It is the only national system in the United States to visually link the exact geographic location of schools to their demographic and economic information.

Since deployment in the GeoCloud Program, NCES has added two new geospatial solutions to its architecture. NCES, with support from the U.S. Census Bureau, has started collecting school boundaries for over 13,000 U.S. school districts and is using the cloud servers to support this effort. As with the school district files, NCES disseminates data from sources such as the Census American Community Survey (ACS) mapped against school boundaries and allows relationships between schools in the same district or across the Nation to be examined. The Demographic Profile Viewer (nces.ed.gov/surveys/sdds/ed/profiles/) provides a unique way to better understand patterns in our school systems and visualize key demographic data within school districts and school boundaries for the entire Nation for approximately 600 economic and social characteristics from the ACS profile data and 2010 Decennial Census.



Example from SDDS map viewer.

Developing a Federal Strategic Plan for the NSDI

The FGDC initiated the development of a new strategic plan for the NSDI in 2013. The new plan is being developed through extensive consultation with partners and stakeholders across the geospatial community. This plan will describe a shared national vision of the NSDI and include a set of goals and objectives for the Federal Government's role in achieving this vision. The goals and objectives in the plan will define areas of critical importance to the continued development of the NSDI and provide a framework for the Federal geospatial community's responsibilities over the next 3 years. The plan will also describe the steps the FGDC community will take to implement the goals, objectives, and actions, including development of project plans and performance measures in collaboration with partners and stakeholders.

One of the FGDC's responsibilities under OMB Circular A-16 is to "prepare and maintain a strategic plan for the development and implementation of the NSDI." Executive Order 12906 describes the NSDI as "the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data." A new NSDI plan is important and timely for several reasons. First, while the FGDC has engaged in a series of strategic initiatives over the past several years (including the Geospatial Line of Business and Geospatial Platform initiatives), the current NSDI Strategic Plan has not been revised for a number of years. Second, geospatial technologies, industries, and applications have seen tremendous growth and change over the past several years, and our strategies need to be modernized to align with and leverage these changes. In addition, a recent report by the Government Accountability Office (GAO), "Report to the Committee on Homeland Security and Governmental Affairs, U.S. Senate, GEOSPATIAL INFORMATION: OMB and Agencies Need to Make Coordination a Priority to Reduce Duplication, GAO-13-94," reaffirmed the importance of improving coordination and reducing potential duplication and recommended the development of an updated NSDI strategy.

As the plan has been developed, the FGDC has provided multiple opportunities for participation and input. These opportunities have included forums for leaders of key geospatial organizations, workshops for Federal leaders, sessions at geospatial professional conferences, and public meetings of the FGDC Coordination Group, the FGDC Steering Committee, and the National Geospatial Advisory Committee (NGAC). The goal has been to engage leaders of key geospatial organizations in the early stages of the planning process, gather initial input, and seek continuing involvement.



NSDI Leaders Forum, March 2013.



Developing the NSDI Strategic Plan.

The NGAC, in particular, has provided extensive and thoughtful input into the plan. The NGAC established a subcommittee and work groups to provide input on a shared vision for the NSDI, the roles and responsibilities of the Federal Government, and key external factors impacting the geospatial community. The NGAC also provided extensive comments on the draft versions of the plan. The input and suggestions received from our partners, both within and outside of the Federal Government, have been instrumental in shaping the new plan.

The updating of the NSDI Strategic Plan is also consistent with the Department of the Interior's priorities on the use of geospatial technology to deliver data and information to other government entities and the general public in an understandable and comprehensive manner. The NSDI framework is intended to govern the way Federal agencies share and maintain geospatial data and to reduce duplication of effort. For more information about the NSDI Strategic Plan visit www.fgdc.gov/nsdi-plan.

Promoting Communications via the National Geospatial Advisory Committee

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 a balanced membership of 29 committee members representing a variety of organizations involved in geospatial issues, including all levels of government, the private sector, nonprofit organizations, and academia. The NGAC meets three to four times per year and has established subcommittees that conduct research and develop draft products between committee meetings. Over the past year, the NGAC has analyzed and provided recommendations on a number of key geospatial policy issues. Highlights of the NGAC's 2013 activities include the following:

- Developed recommendations and provided feedback on several important topics, including the Geospatial Platform initiative, the National Hydrography Dataset, and the proposed National 3D Elevation Program and National Address Database.
- Provided extensive input and comment in the development of the draft NSDI Strategic Plan.
- Adopted a National Geospatial Policy paper outlining the role of geospatial information technology in supporting cost-effective government and stimulating economic growth through job creation. The paper described a set of recommendations for development of a National Geospatial Strategy and the effective utilization of geospatial technology. The recommendations were based on the work and the recommendations of the NGAC since its inception in 2008.
- Adopted a set of papers summarizing the activities and feedback provided by NGAC subcommittees that studied the proposed National Address Database, the proposed National 3D Elevation Program, the National Hydrography Dataset, and OMB Circular A-16 topics.
- Approved a resolution commending the U.S. Department of Transportation's work on the Transportation for the Nation and MAP-21 (Moving Ahead for Progress in the 21st Century) initiatives to partner with other levels of government to create a single road and highway map for the Nation. The NGAC recommended that these efforts include the collection and integration of street address data with the Highway Performance Monitoring System linear referencing framework.



Breakout discussion group during June 2013 NGAC meeting.

- Developed papers identifying key questions regarding future issues facing the geospatial community. The topics included geolocation privacy, the National Address Database, and the National 3D Elevation Program.

Standards Progressing Forward

In calendar year 2013, the FGDC endorsed five standards:

- ISO® 19156:2011, Geographic information - Observations and Measurements
- OGC® WaterML 2.0: Part 1- Time Series Encoding Standard
- Geopolitical Entities, Names, and Codes (GENC) Standard Edition 1
- Revision of the Classification of Wetlands and Deepwater Habitats of the United States Standard
- Time Space Position Information (TSPI) standard, Version 2.0

International Organization for Standardization (ISO) 19156:2011, Geographic information - Observations and Measurements defines a conceptual schema for observations and for features involved in sampling when making observations. It provides models for the exchange of information describing observation acts and their results, both within and between different scientific and technical communities.

OGC® WaterML 2.0: Part 1- Time Series Encoding Standard is an OGC® Encoding Standard for the representation of hydrological observations data with a specific focus on time series structures. WaterML 2.0 is implemented as an application schema of the Geography Markup Language Version 3.2.1, making use of the OGC® Observations and Measurements standards. It is designed as an extensible schema to allow encoding of data to be used in a variety of exchange scenarios.

The Geopolitical Entities, Names, and Codes (GENC) Standard Edition 1 standard specifies a profile of the ISO 3166 country codes standard and codes for the representation of names of countries and their subdivisions. This profile addresses unique U.S. Government requirements for restrictions in recognition of the national sovereignty of a country; identification and recognition of geopolitical entities not included in ISO 3166; and use of names of countries and country subdivisions that have been approved by the U.S. Board on Geographic Names (BGN).

The FGDC Wetlands Classification Standard (WCS) provides minimum requirements and guidelines for classification of wetlands and deepwater habitats that are consistent with the FGDC Wetlands Mapping Standard, FGDC-STD-015-2009. The WCS is intended for all Federal

or federally funded wetlands inventory mapping, including activities conducted by States, federally recognized Tribal entities, nongovernmental organizations, universities, and others. The revised WCS has been formatted to be consistent with more recently endorsed FGDC standards. Some portions were rewritten because the scientific foundation upon which the original classification was developed has advanced.

The Time Space Position Information (TSPI) standard Version 2.0 provides a single means of encoding spatiotemporal information for storage, manipulation, interchange, and exploitation. It specifies a core XML schema for spatial, temporal, and accompanying quality assessment characteristics of the real world and a registry-based extension mechanism enabling the development and reuse of additional spatiotemporal XML schema components.

In addition, the draft National Shoreline Data Content Standard was released for public review in 2013. The public review period closed July 31, 2013.

FGDC/USGS OGC Sponsored Standards

Open Web Services-9 (OWS-9) Interoperability Testbed

USGS sponsorship of the OWS-9 testbed involved (1) expanding semantic mediation to include conflation; (2) additional sources of data, including more complex data and unstructured data; (3) keeping track of provenance of the data; (4) single query and access capability across multiple Federal geographic names databases; and (5) further investigation into encoding mappings.

Global Earth Observing System of Systems (GEOSS) Architecture Implementation Pilot (AIP)

FGDC sponsored the GEOSS AIP-5 pilot with priority actions that included GEOSS research and prototyping, GEOSS interoperability analysis and support, encouraging mature systems to interoperate with GEOSS Common Infrastructure, and ensuring access to GEOSS Data Collection of Open Resources for Everyone (Data-CORE).

Hydrology Interoperability Experiment

This interoperability experiment advanced the application of several OGC standards (WaterML, WFS, WMS, CSW, GML, and O&M) to the needs of hydrologic information systems. This included addressing several approaches for water-quality data and forecasting. The experiment engaged a broader community that is developing an international information model by harmonizing with and extending existing initiatives, such as Ground Water Markup Language (GWML), the European INSPIRE Groundwater Model, and others.

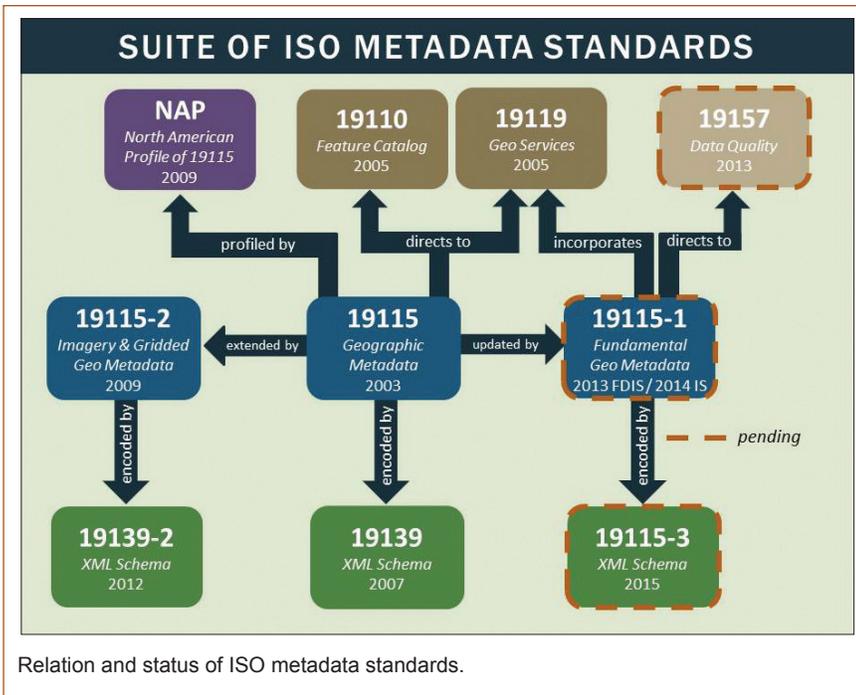
Metadata Program: Putting ISO Metadata into Practice

On April 16 and 17, 2013, working with the National Oceanic and Atmospheric Administration, U.S. Census Bureau, U.S. Environmental Protection Agency, and U.S. Geological Survey, the FGDC Secretariat organized and led an International Organization for Standardization (ISO) Metadata Implementation Webinar. The webinar was the result of recommendations that came out of the FGDC-sponsored Metadata Summit in October 2011. During presentations and discussions held during the two half-day webinar sessions, 46 participants representing 14 agencies sought to (1) develop a common language and understanding of ISO geospatial metadata standards and implementation issues, (2) focus on actions (roadmaps) required to transition an agency to ISO metadata, (3) identify available ISO metadata resources, and (4) establish a community of practice with regular communication and interaction.

An outcome of the webinar was the recommendation to continue enhancing interagency cooperation through establishment of a regularly hosted ISO information series, continue development of ISO metadata implementation training materials, and the creation of an ISO implementation pilot community. All presentations and materials are available through the FGDC website (www.fgdc.gov/metadata/events/ISO_Implementation_Webinar).

The ability to create, edit, and publish ISO geospatial metadata records continues to be an important implementation issue for many organizations. To facilitate the information available about a variety of tools, the FGDC, with input from the Metadata Working Group, is updating the ISO Metadata Editor Review. The review focuses on editors that support ISO 19115 and is designed based on Metadata Working Group member input as to key editor selection criteria including: metadata standards supported, user interface, operating platform, proprietary nature, Extensible Markup Language (XML) capabilities, validation, and import/export operations. The review also provides editor developers with text options in order to more fully describe support features, edit operations, customization, metadata management, and publication capabilities.

To support communication about activities, available resources, and training, the FGDC Metadata Program website is undergoing an update to reflect transition to the ISO metadata standards and to help the community locate and use resources in their implementation process. Several key pages have been updated and enhanced this year and more will continue to be added.



To support the Geospatial Platform and Data.gov implementation, the metadata community contributed to the development of a best practices document for geospatial metadata creation and publishing (www.geoplatform.gov/sites/default/files/document_library/MetadataPractices07-2013_Linked_0.pdf). The document also includes examples of quality metadata records in both the Content Standard for Digital Geospatial Metadata (CSDGM) and the ISO format. Metadata support was also provided to identify and update information about metadata publishers that had previously contributed to Geodata.gov. Given the importance of metadata to effective data discovery, a spreadsheet was developed that outlines the mandatory and equivalent elements between CSDGM and ISO 19115 and to further support CKAN (Comprehensive Knowledge Archive Network) catalog implementation.

Cooperative Agreements Program Advances the NSDI

Since 1994 the FGDC has sponsored the Cooperative Agreements Program (CAP) to encourage and enable building the NSDI at all levels of the geospatial data community. The community not only benefited financially but more importantly validated an organization's geospatial initiatives, which opened new opportunities. The CAP continued to (1) create collaborations within all sectors of government, (2) help develop an understanding of geospatial information in organizations new to the NSDI, (3) provide seed money to enable geospatial organizations to participate in the national effort to implement the NSDI, (4) promote the importance of geospatial data standards, (5) promote the development of standardized metadata by countless organizations, and (6) greatly expand implementation of geospatial services on the Internet. For more information see www.fgdc.gov/grants.

This year, 19 CAP projects were concluded. As in past years, training and outreach continued to be valued outcomes of the program. Over 240 individuals received metadata training through a number of workshops that were offered in Arizona, Florida, and Iowa. Many Native American Tribe representatives attended the Arizona

Benefits Seen by Census Bureau's ISO Metadata Implementation

As members of the Federal Metadata Coordinator ISO Metadata Implementation planning team, NOAA, USGS, EPA, and the Census Bureau cooperatively developed a Use Case framework to document and compare their individual agency experience with ISO Metadata implementation. Given that agency expertise and implementation stage varied, the use cases were highly effective in illuminating key implementation factors, including agency mission and structure. The use case outcomes were incorporated into an ISO Metadata Implementation Model Workflow that can be utilized by other agencies and organizations to plan and initiate ISO metadata implementation.

The Census Bureau Use Case highlighted several key activities. The staff participated in several training opportunities, including the NOAA training highlighted in the 2012 Annual Report. While policies are under development within the Department of Commerce, the Census Bureau has focused its efforts on implementing the ISO standard format 19115-2 for only new metadata being created. The Bureau has noted benefits including reducing the size of metadata files by incorporating reusable components for contact information and keywords, as well as a tenfold reduction in file size (from over one thousand lines to less than one hundred lines) by using reusable components for contact info and entity attributes in the 19110 file. While full implementation of reusable components is targeted for 2014 products, ISO metadata has been created for TIGER Web map services and for the 2013 cartographic data products and TIGER/Line shapefiles. All of the records will be published to the master catalog used by Data.gov and Geoplatform.gov.

workshops. Use of the ISO geospatial metadata standards was promoted by the Northwest Straits Commission, and the FGDC United States Thoroughfare, Landmark, and Postal Address Data Standard was enhanced through the development of two prototype applications (github.com/candrsn/FGDCAddressTool). Furthermore, the wetlands science community developed technical recommendations to address key technical challenges referenced within the FGDC Wetland Mapping Standard and in its implementation plan. In an effort to continue the expansion of the NSDI Clearinghouse, Maryland conducted a successful campaign to populate the National States Geographic Information Council's GIS Inventory System (also known as Ramona, and accessible at gisinventory.net). State agencies from Massachusetts, North Carolina, and Oregon addressed issues of integrating and sharing geospatial data to expand the use of best practices within their States.

In 2013, six Fifty States Initiative projects were completed in Louisiana, Minnesota, Nebraska, New Jersey, Utah, and Wisconsin that resulted in strategic or business plans for advancing geospatial planning activities in these States. As the Louisiana Geographic Information Center was completing its business plan for statewide address management, it simultaneously championed the importance of the FGDC United States Thoroughfare, Landmark, and Postal Address Data Standard. Minnesota produced a detailed business plan for acquiring, integrating, managing, and providing access to accurate, current, and consistent parcel data for the entire State—a system that is based on maintained and authoritative county sources. Nebraska developed an enterprise-level strategic plan to guide the development of the State's spatial data infrastructure. New Jersey created a strategic business plan that makes the business case for improvements to its “core four” datasets, for new investments in the modernization of the New Jersey Geographic Information Network, and for evolution of governance in the State. Utah's Automated Geographic Reference Center launched three initiatives to support its strategic objectives for the State's spatial data infrastructure.

Finally, Wisconsin completed a business plan that summarizes the current state of aerial imagery projects in the State, proposes a number of unique models that could be used to implement an imagery program, and identifies the broad steps needed to build the program.

Other significant CAP projects that were successfully completed included Return on Investment (ROI) studies by Maine, New York, and Oregon. Maine conducted a cost-benefit analysis of a statewide orthoimagery program, projecting that the return on investment would range from 421 percent to 1,264 percent. New York also studied its orthoimagery program and concluded that without the statewide program, many public and private users would be challenged in carrying out their essential functions, and if they were indeed able to carry out those functions, their costs for doing so would be much higher and the quality of their services or products would be lower. The ROI study in Multnomah County, Oregon, focused on two GIS platforms used for emergency response. They reported that in the past year, the benefit-cost ratio for one platform was 6.73:1 and was 3.48:1 for the other, showing a significant advantage for the use of the emergency response platforms.

International Activities

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

In 2005, the U.S. Group on Earth Observations (USGEO) was established as a work group under the White House Office of Science and Technology Policy's Committee Environment and Natural Resources to be the principal coordination mechanism in the Federal Government for Earth observations to achieve a national Integrated Earth Observation System (IEOS). The United States, through USGEO, supports the cooperative, international efforts to build the Global Earth Observation System of Systems (GEOSS) in partnership with 88 other governments and the European Commission. The USGEO had representatives from sixteen U.S. Federal agencies and the Executive Office of the President and was co-chaired by representatives from the White House Office of Science and Technology Policy (OSTP), the National Oceanic and Atmospheric Administration (NOAA), and the National Aeronautics and Space Administration (NASA).

USGEO formulated U.S. positions and inputs to the international GEOSS, taking into account the requirements of the widest range of decisionmakers, researchers, service



Statewide workshop for the Nebraska strategic plan.

providers, the public, and other stakeholders. Significant progress has been made in areas such as data sharing and data delivery and integration, as well as building capacity in developing nations so that they may realize greater benefits from Earth observations. Additionally, significant strides have been made to achieve benefits from greater collaboration and integration of Earth observations in areas such as agricultural and coastal monitoring.

This year the USGEO was established as a subcommittee of the Committee of the Environment, Natural Resources and Sustainability (CENRS) with a strengthened mandate and new charter. The charter refreshes the mandate of the subcommittee in three areas:

- ongoing coordination and assessment of civil Earth observation programs taking over the work of the National Earth Observation Task Force as described in the draft National Strategy for Civil Earth Observations;
- improving data management and interoperability of Earth system data, in particular through coordination of the activities addressing “Big Earth Data”; and
- international sharing, exchange, and coordination of Earth observations and data through the intergovernmental Group on Earth Observations (GEO).

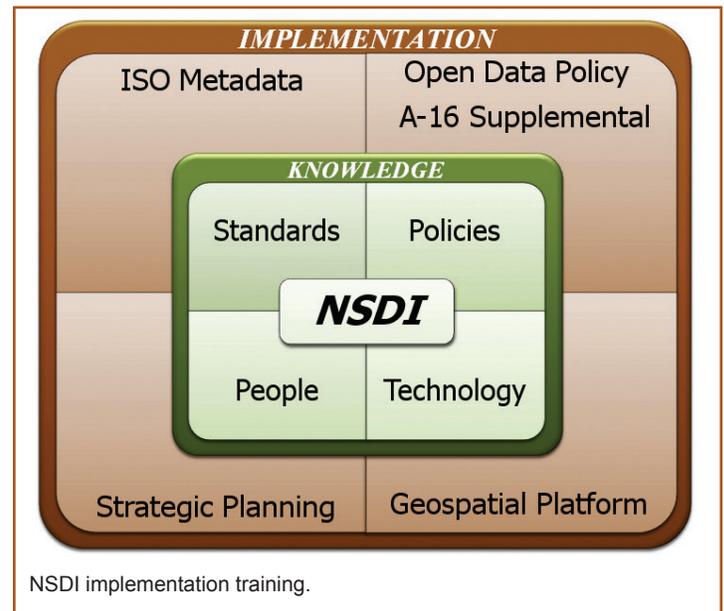
OSTP will chair the USGEO subcommittee. OSTP has also designated three agencies to provide vice-chairs for USGEO: DOI/USGS, NASA, and NOAA. Also, OSTP will chair a new USGEO Senior Steering Group, comprised of leaders from the three vice-chair agencies plus the National Science Foundation, as specified in the charter. This steering group will provide high-level guidance, resources as appropriate, and oversight for USGEO activities.

Looking ahead, USGEO foresees great opportunities to enhance understanding and prediction of climate change, implement a carbon observation and analysis system, develop a global land cover dataset, expand observations

of the oceans to better protect coral reefs and coastal and marine ecosystems, build a robust observation network in the Arctic, monitor our water resources, and improve human health.

New Direction for the NSDI Training Program

The NSDI Training Program has traditionally focused on developing an understanding of the value and content of geospatial standards. However, with the use of standards firmly established as an NSDI best practice, FGDC training activities have shifted toward implementation of the standards, policies, technology, and human resources that comprise the NSDI, including ISO metadata, Open Data Policy, A-16 Supplemental Guidance, Geospatial Platform, and NSDI Strategic Plan.



NSDI implementation training.



USGEO subcommittee membership.

FGDC Subcommittees and Working Group Reports

Cadastral Subcommittee

The Cadastral Subcommittee develops and implements plans to coordinate cadastral data-related activities among Federal, State, Tribal, and local governments and the private sector. In the Western United States, the Subcommittee works 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 works with State coordinators to identify county cadastral data contacts and to develop authoritative sources of data with the States. The Subcommittee coordinates with the Bureau of Land Management (BLM) to develop sustainable datasets for rights and interests in land parcels that are compliant with the national standards.

The Federal Lands Working Group was established in 2011 under the Cadastral Subcommittee. The Working Group is an expansion of the Federal Parcels Working Group that was formed in 2010. The long-term goal of the Federal Lands Group is to develop a parcel-level national cadastre of Federal lands that can be used to meet common Federal agency needs.

Highlights for the Subcommittee include:

- BLM contributed the definitions and data standards for federally managed land to support individual agency efforts in developing rights and interests datasets conformant with the national standards. Significant progress has been achieved in establishing a Federal Surface Management Agency (SMA) dataset that is built from parcel-level information in agency datasets.
- The BLM established SMA definitions and core attribute requirements for parcel-level Federal surface-management datasets. The national SMA standardized Geographic Information System (GIS) dataset depicts Federal land for the United States and classifies this land by its active Federal SMA. A Federal SMA refers to a Federal agency with administrative jurisdiction over the surface of Federal lands. Participating agencies are expected to submit the necessary land status records to the appropriate BLM State Office for recordation into the Land Status Systems and to collaborate with BLM to reconcile discrepancies in the records.
- Worked with FGDC Cooperative Agreements Program award recipients and States and local agencies in the deployment and sustained delivery of standardized data. Presentations were made to the Appalachian Development Council, International Association of Assessing Officers (IAAO), and many State-based GIS, assessment, and homeland security meetings. Several papers were published in a variety of national and State journals.
- The Public Land Survey System (PLSS) Working Group completed the definition of Version 2 of the PLSS publication standard and is in the process of migrating PLSS datasets to this standard.
- The Federal Lands Working Group attained representation from the U.S. Forest Service, Bureau of Land Management, National Park Service, Fish and Wildlife Service, U.S. Census Bureau, U.S. Geological Survey, Bureau of Ocean Energy Management, Bureau

of Indian Affairs, Bureau of Reclamation, and Department of Defense. The Working Group collaborated with BLM to produce and maintain their SMA standardized GIS and with the National Boundaries Group to heighten awareness of the national cadastre of Federal lands effort.

Geodetic Control Subcommittee

The Federal Geodetic Control Subcommittee exercises governmentwide leadership in coordinating the planning and execution of geodetic surveys, in developing standards and specifications for these surveys, and in the exchange of geodetic survey data and technical information.

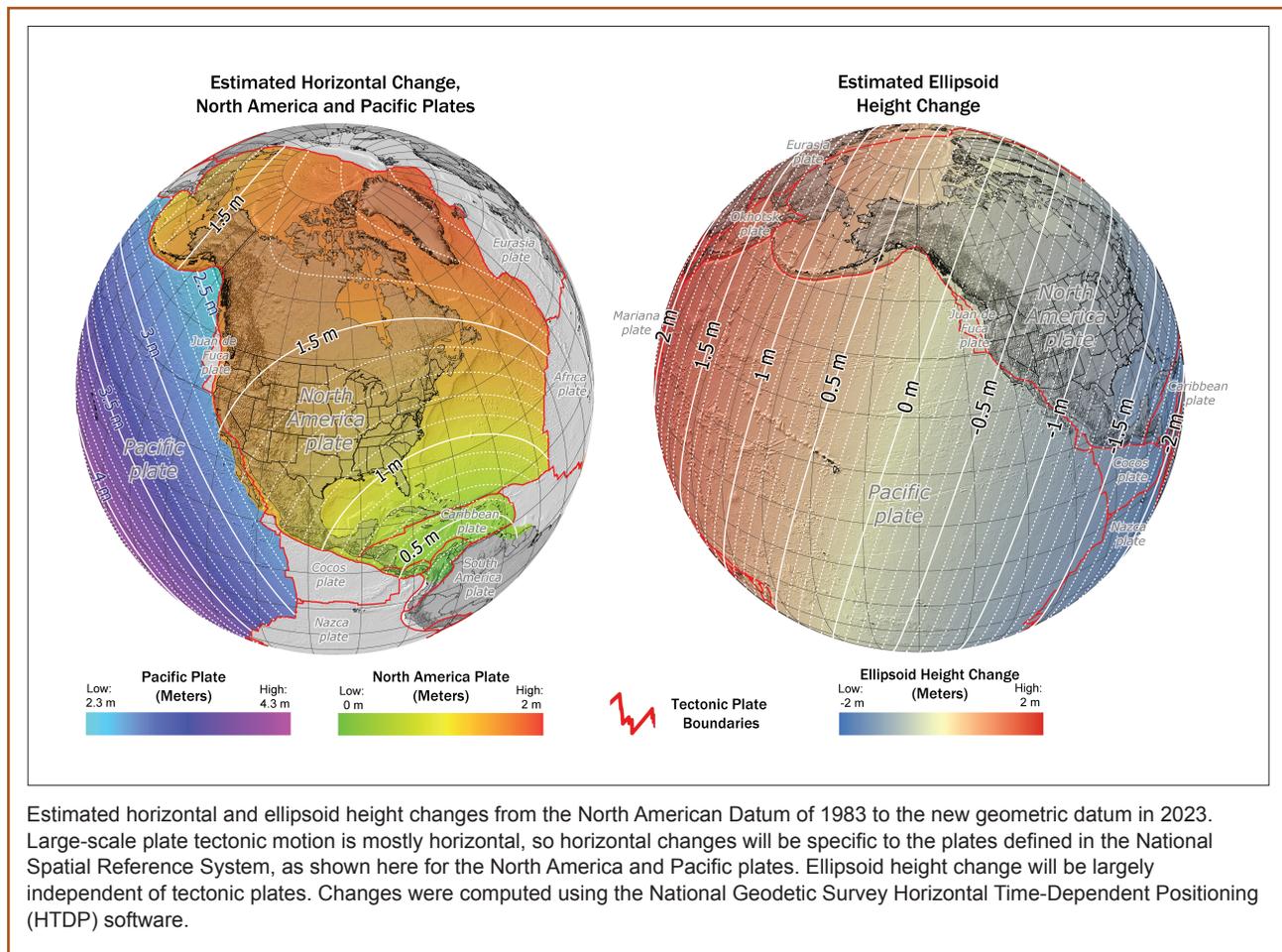
Throughout 2013 the National Geodetic Survey (NGS) conducted a comprehensive inventory and review of the agency's existing geodetic control standards, specifications, and guidelines documents. NGS then determined updates needed for those existing documents and scheduled the updates. These updated documents will be a critical part of how NGS will prepare the Federal community and other users for the transition to new geometric and geopotential datums.

In March 2013 the National Geodetic Survey's GRAV-D (Gravity for the Redefinition of the American Vertical Datum) project reached an important milestone on time and within budget: 25 percent of airborne gravity data has been acquired across the United States and its territories. Those data will support the release of a new geopotential (vertical) datum in approximately 2023 that will enable more accurate determination of elevations. That increased accuracy will result in improved inundation mapping, better monitoring of sea level, and more accurate heights for the surveying community in support of the construction of highways, bridges, and suburban development, among other improvements.

In February 2013 the NGS staff presented talks at the Esri Federal Users Conference in Washington, D.C., in a session titled "Geodesy and National GIS." At the Esri International User Conference in San Diego, California, in July 2013, the NGS led discussions on the fundamental aspects of geodesy and positioning and the latest GIS developments, with NGS staff providing training and information on NGS products and services.

Geologic Data Subcommittee

The Geologic Data Subcommittee coordinates Federal and non-Federal interests in geologic data, including the facilitation of exchange of information and transfer of data; the establishment and implementation of standards for quality, content, and transferability; and the coordination



of the identification of requirements and the collection of spatial data to minimize duplication of effort where practicable and economical. The Subcommittee website is at ngmdb.usgs.gov/fgdc_gds/. On behalf of the Subcommittee, the USGS, the National Park Service, and the Association of American State Geologists (representing the State geological surveys) have continued to make progress on development and evaluation of a draft standard database design for dissemination of geologic maps. This design is named NCGMP09 to indicate its origin, under the auspices of the National Cooperative Geologic Mapping Program (NCGMP). In the past year, several agencies have published maps in this design, and acknowledgment of this design as a possible standard is gaining broader acceptance. Monthly teleconferences are now being held in order for the various agencies to share technical questions and to resolve issues related to whether the draft standard needs modification. Regarding the FGDC Digital Cartographic Standard for Geologic Map Symbolization, the Subcommittee continues to support it, through responses to technical questions regarding implementation, and by soliciting suggestions for updates to the standard.

Marine and Coastal Spatial Data Subcommittee

The Subcommittee represents a distributed network of agencies and staff working to advance and implement the marine and coastal elements of the National Spatial Data Infrastructure through the development of coastal and marine data standards, enhanced access to and utility of coastal and ocean framework data, and creation and fostering of strategic partnerships. This past year, the Subcommittee:

- Continued its leadership role for the Ocean Community on Data.gov through management of the community Web pages, adding appropriate content to the community, and providing technical support to the marine portal community.
- Complied with all requirements from the OMB Circular A-16 Supplemental Guidance including the identification of an Executive Champion for the Water – Oceans and Coasts Theme, refinement of National Geospatial Data Asset Datasets, and inclusion of appropriate content from the Water – Oceans and Coasts Theme in Data.gov and the national Geospatial Platform.

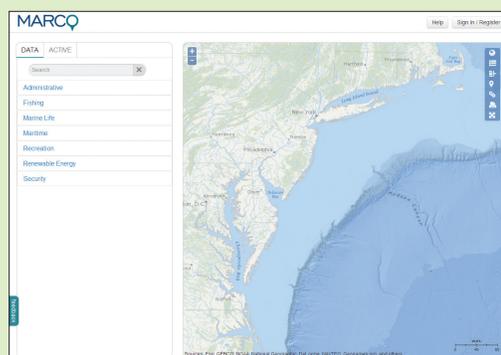
Success Story

Marine Planning Portal Network Created to Support Regional Marine Planning

Challenge: A growing number of users rely on coastal and marine geospatial data to support research, planning, and decisionmaking processes. Accordingly, numerous atlases, portals, and catalogs have emerged to supply these users with such data. While each system has its own unique purpose and constituencies, the proliferation of systems creates a need and opportunity to leverage experience, expertise, and data across regions and between regional and national systems.

Action: A series of meetings were held with representatives from national, regional, and State data-management systems to build awareness of the current status of existing regional and national marine information systems, identify common data-management and exchange standards and procedures to be adopted by regional and national planning bodies and ocean governance groups, and identify methods to increase collaboration among marine data-management entities. These considerations led to the idea of creating a national network that would facilitate technical integration and collaboration across multiple systems.

Results: The Marine Planning Portal Network was formed in September 2012. With over 100 active members, the Network, through a combination of a listserv, webinar series, and informational resources, is intended to serve as one of the main conduits for communication between national, State, and regional portals, applications, and planning efforts. During fiscal year 2014, members will work to strengthen the existing Network by identifying topics of mutual interest and by discussing a shared vision for future data sharing and hosting.

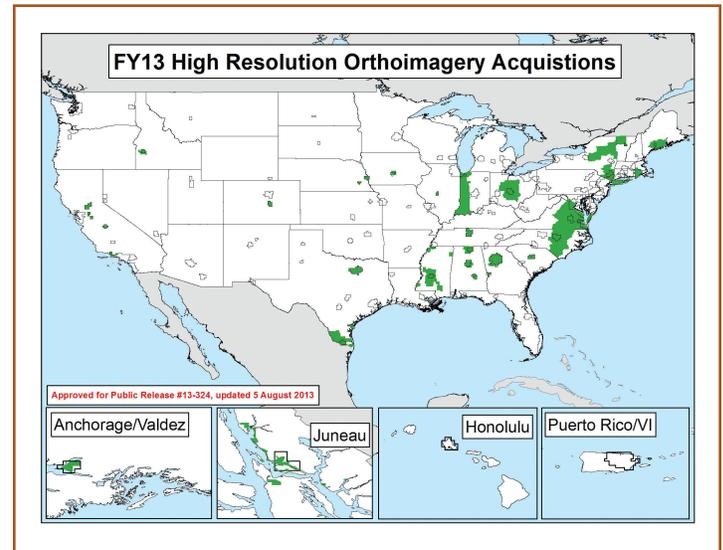
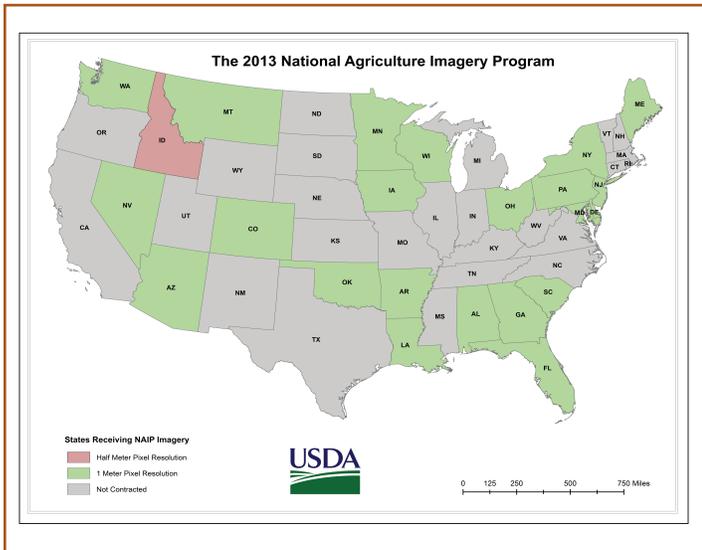


MarineCadastr.gov and the MARCO Marine Planner are two marine planning portals that participate in the Network and have seen benefits from coordination.

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, Tribal, local, and private organizations. The U.S. Department of Agriculture (USDA) Farm Service Agency (FSA) National Agriculture Imagery Program (NAIP) includes funding partnerships with the U.S. Department of the Interior, the U.S. Forest Service (USFS), and the Natural Resources Conservation Service (NRCS). NAIP is a

1-meter resolution, leaf-on, digital, 4-band imagery program with an optional buy-up of ½-meter resolution. Despite difficult financial circumstances, the funding agencies identified 92 percent of the planned funding, allowing a total of 23 States to be flown in 2013. The Urban Areas Program is a high-resolution, leaf-off program funded by the National Geospatial-Intelligence Agency (NGA) in partnership with the U.S. Geological Survey (USGS). Partnerships frequently include Federal, State, and local government agencies combining funding and efforts to produce a product that meets multiple needs and saves costs.



Imagery data storage and distribution continue to be topics of concern for NDOP agencies. The technical committee is investigating compression techniques to reduce file sizes and storage costs while maintaining image quality needed to meet mission requirements. The Geospatial Platform and cloud technology are being considered as potential solutions for delivery and storage. The USGS and the FSA established a Memorandum of Understanding to improve the coordinated distribution of NAIP data. FSA is also exploring techniques for rapid delivery, within 4 to 7 days of capture, of NAIP imagery to support emergency operations. The NRCS and the National Oceanic and Atmospheric Administration (NOAA) continue to collect imagery in hard-to-capture areas such as the Pacific Islands, Hawaii, Puerto Rico, and Alaska. The USGS is assuming responsibility for Landsat 8 operations following the successful launch of the satellite on February 11, 2013. Working with the Alaska Statewide Mapping Initiative, the Alaska Executive Committee and its member agencies are pursuing a number of efforts to cooperatively collect data over the State. The committee continues to discuss how it may support A-16 Theme responsibilities. Of particular interest is the ability to account for satellite datasets within the Imagery Theme.

Spatial Water Data Subcommittee

The Advisory Committee on Water Information (ACWI) and FGDC created the Subcommittee on Spatial Water Data (SSWD) to assist coordination of Federal and non-Federal interests in spatial water data, including (1) facilitating the exchange of information and transfer of data; (2) establishing and implementing standards for quality, content, and transferability; and (3) coordinating the identification of requirements and the collection of spatial data to minimize duplication of effort where practicable and economical. This past year, the Subcommittee:

- Changed leadership due to changes in staff assignments.
- Assisted FGDC in ensuring each National Geospatial Data Asset Dataset in the Waters—Inland Theme has metadata that are complete and accurate.
- Continued to focus on the national delivery of water quality and quantity results using standard geography and internationally adopted standards to harmonize the delivery of sampling points and time series data on flow, water levels, water quantity, and water quality.
- Began discussions among Subcommittee members on the appropriate integration of National Hydrography Dataset (NHD) and National Wetlands Inventory (NWI) data based on user needs.

Transportation Subcommittee

The Transportation Subcommittee works to coordinate and support the NSDI and other transportation data-related activities among stakeholders. The Subcommittee's current areas of interest include all modes of transportation, transportation networks, terminals, and services (including intermodal freight and passenger), and the movements of people and commodities using them. The fiscal year 2013 Subcommittee major achievements are listed below.

- Following the approval by the FGDC, the intermodal survey to develop an improved intermodal database was distributed by the Subcommittee. The results were gathered and survey recipient questions answered. The survey responses were compiled and summarized by the Subcommittee and presented to the FGDC in April 2013.
- To meet a 2013 goal identified by the Subcommittee and the Transportation for the Nation, leaders in the transit industry were contacted to discuss the possibility of transit being the next transportation component in the development of the Transportation for the Nation.

Alaska Mapping Initiative

Alaska is at the forefront of many nationally important issues including climate change, minerals and energy development, indigenous peoples' heritage preservation, and natural resources management. Modern applications to address these critical issues require accurate, current data. Much of the existing statewide base map for Alaska was created around 1960 and at a lower resolution than the maps made over the conterminous United States. The U.S. Geological Survey National Geospatial Program is working with multiple Federal and State partners on a multi-year Alaska Mapping Initiative to help improve topographic maps and data statewide. Through the leadership of the Alaska Mapping Executive Committee, chaired by the Assistant Secretary for Water and Science of the Department of the Interior, and the Alaska Statewide Digital Mapping Initiative (SDMI), significant progress was made during the year toward the following joint goals:

- Five-meter-resolution ifsar elevation data are being collected statewide to replace older 60-meter data. Forty percent of the State will be complete after the fiscal year 2013 collection.
- Surface-water information in the National Hydrography Dataset (NHD) is being updated by multiple Federal and State stewards.
- Federal partners in Alaska are updating boundary data over their lands.
- The improved data layers, including a State-provided satellite imagery layer, are being used to produce 11,273 1:25,000-scale digital US Topo maps statewide to replace the original 1:63,360-scale map series. Four hundred new maps are being made available this year.
- New data and US Topo maps are being made viewable and available for download on *The National Map* viewer as they are produced.



Vegetation Subcommittee

The mission of the Vegetation Subcommittee is the coordination of terrestrial vegetative data-related activities among Federal agencies and the establishment of mechanisms for the coordinated development, use, sharing, and dissemination of terrestrial vegetation data. In fiscal year 2013, the Subcommittee completed the following activities:

- Developed a new Memorandum of Understanding to formalize the partnership between Federal and non-Federal partners working toward the vegetation goals.
- Finalized Phase II of the vegetation hierarchy revisions, which is a revision of the types and descriptions for the upper three levels of the U.S. National Vegetation Classification (USNVC) standard. Progress by the working group can be found at usnvc.org.
- Initiated a pilot project U.S. National Vegetation Process Testing Peer Review to identify new types and performance modifications to vegetation types currently described in the NVC standard. Results of the process will document the peer review process and the policy decisions necessary to standardize the evaluation of proposals for revising the dynamic content of the NVC. Peer reviews for the groups are completed. Also completed are the revised alliance concepts and the screening of the association descriptions (with funding from U.S. Forest Service agreements and U.S. Geological Survey contracts). The processes were developed by the Ecological Society of America (ESA) Vegetation Classification Panel.
- Continued to develop the cyber infrastructure to support the NVC and established a site to support the peer review process for finalizing the groups and for the alliance concept reviews. Also, continued to maintain a public archive for vegetation records in vegbank.org.
- Participated in an NSDI Cooperative Agreements Program project with the California Native Plant Society and the California Department of Fish and Game to establish an alliance and association-level classification for California using the NVC.
- Saw the adoption of the NVC standard by the Landscape Fire and Resource Management Planning Tools Project (LANDFIRE program), U.S. Forest Inventory and Analysis (FIA) program, Bureau of Land Management (BLM)

guidance to field offices, National Park Service (NPS) Inventory and Monitoring Program, Natural Resources Conservation Service, and NPS and BLM for the Grand Canyon-Parashant National Monument and Lake Mead Natural Recreation Area.

- Hosted meetings, gave presentations, and manned a booth at that annual ESA Conference in August 2013.
- Held monthly teleconferences and developed educational materials that are available to the public.

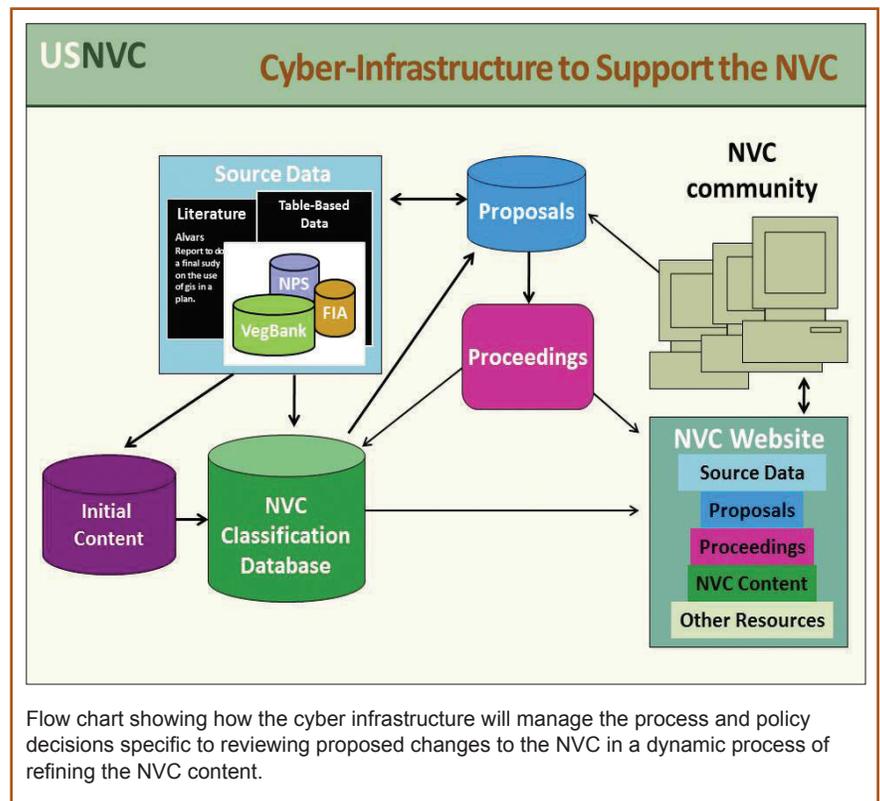
Wetlands Subcommittee

The Wetlands Subcommittee promotes standards of accuracy and consistency in Federal geospatial wetlands data, exchanges information on technological improvements for collecting spatial wetlands data, encourages Federal and non-Federal communities to identify and adopt standards and specifications for spatial wetlands data, and collects and processes the requirements of Federal and non-Federal organizations for spatial wetlands data. This year the Subcommittee:

- Continued outreach under the Implementation Plan for the Wetlands Mapping Standard through the support of the Association of State Wetlands Managers and the Wetlands Mapping Consortium via workshops, webinars, and information venues.
- Finalized the second edition of the Classification of Wetlands and Deepwater Habitats of the United States, which was endorsed by the FGDC.
- Worked with the Association of State Wetlands Managers to document the wide variety of uses of the wetlands layer of the NSDI.
- Completed the largest one-time increase in the amount of digitized legacy National Wetlands Inventory (NWI) data in the program's history.
- Developed a Surface Waters and Wetlands Inventory that is an enhancement to the wetlands layer of the NSDI that includes the conversion of never-before served legacy NWI linear data with stream connections from various hydrologic datasets.

Architecture and Technology Working Group

The Architecture and Technology Working Group (ATWG) works to improve the understanding and integration of geospatial concepts by mainstream governmental business planners and technical practitioners through varied outreach mechanisms. The ATWG evaluates and develops



the technical architecture for the Geospatial Platform, identifies suitable standards and applicability, sponsors training and outreach activities, and supports testing of and enhancements to the Geospatial Platform. In fiscal year 2013, the Working Group:

- Oversaw a third year of GeoCloud hosting and facilitation using the two developed reference platform software “stacks” for open-source and commercial geospatial solutions to expand shared services capability in the Geospatial Platform.
- Developed metadata recommendations for optimal indexing by *Catalog.Data.gov* and the Geospatial Platform.
- Provided an online publishers’ webinar for the Geospatial Platform and *Catalog.Data.gov*.

Metadata Working Group

The Metadata Working Group promotes awareness and best practices among FGDC member agencies and other interested stakeholders about the metadata component of geospatial data; facilitates the coordination, development, use, sharing, and dissemination of geospatial metadata; supports the implementation of geospatial metadata and other related semantic and structural (that is, non-geospatial) metadata standards established by Federal,

national, and international standards organizations such as the FGDC, Open Geospatial Consortium (OGC), American National Standards Institute (ANSI), International Organization for Standardization (ISO), Dublin Core Metadata Initiative (DCMI), Open Source Metadata Framework (OMF), Ecological Metadata Language (EML), and the World Wide Web Consortium (W3C).

In fiscal year 2013, Metadata Working Group (MWG) members provided direct support to the FGDC Metadata Program and participated in the Standards Working Group. Members contributed to quarterly teleconferences, several agencies helped organize and actively participated in the ISO Metadata Implementation Webinar, provided constructive feedback in the development of the ISO Metadata Editor Review critical features, and contributed comments to the NSDI Strategic Plan. In July 2013, the MWG released an updated charter that includes activities related to ISO metadata standards implementation, the Geospatial Platform, National Geospatial Data Asset Themes, as well as support for recently released national policies and guidance. The MWG continues to serve as the primary conduit for the distribution of information about geospatial metadata and other related semantic and structural (non-geospatial) metadata standards, tools, training, and implementation. Coordinating with the INCITS-L1 group, they provided regular ISO geospatial metadata updates for the MWG.

Standards Working Group

The FGDC Standards Working Group is responsible for promoting the development and implementation of standards in support of the NSDI. For fiscal year 2013, the Working Group reported the following accomplishments:

- Recommended FGDC endorsement of five geospatial standards, including four externally developed standards. For more information see page 15.
- Recommended public review of the National Shoreline Data Content Standard.
- Completed review of FGDC member agency participation in the FGDC Standards Working Group with FGDC Coordination Group members.

Users/Historical Data Working Group

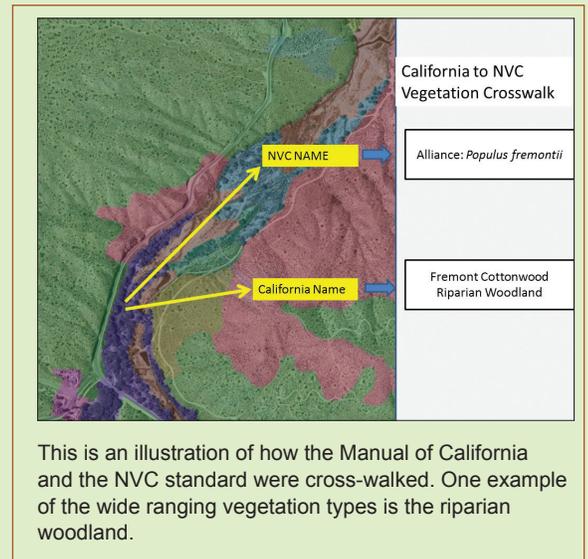
The Users/Historical Data Working Group (UHDWG) promotes and coordinates activities among Federal agencies who are primarily users of, not generators of, geospatial data. The intent is to provide a vehicle for those agencies that may not have a significant geospatial infrastructure to collectively share their experiences and needs with the larger geospatial community. In the past year, the UHDWG:

- Continued a program of outreach to prospective members. The listserv (sun8.loc.gov/listarch/uhdwg.html) for UHDWG members and those interested in its work has been active, not only in announcing meetings, but also as a conduit for discussion of topics such as the appraisal of digital assets and digital preservation.
- Held monthly Web and phone meetings for members to discuss issues and share presentations on related topics.
- Submitted a document titled “Guidance on the Selection and Appraisal of Geospatial Content of Enduring Value” to the FGDC Coordination Group for review and possible future use by Federal agencies and others.

Integrating the National Vegetation Classification Standard

A nationwide vegetation classification system is necessary to produce uniform statistics on vegetation resources across the Nation, facilitate information sharing between Federal agencies and other public and private organizations, and foster cooperation on vegetation management issues that transcend jurisdictional boundaries. The FGDC National Vegetation Classification (NVC) Standard was developed to serve this function; however, many existing classification systems for local vegetation types are still in use. For the NVC to be useful, local classification systems must be cross-walked with the NVC.

With support from the NSDI Cooperative Agreements Program, California is one of the first States to perform a crosswalk at the alliance and group levels of the NVC hierarchy. The California Native Plant Society (CNPS) and the California Department of Fish and Game (CDFG) collaborated with NatureServe and the FGDC Vegetation Subcommittee to evaluate the NVC standard's revised classification hierarchy in terms of California vegetation. They established links between the 480+ alliances in California to the mid and upper levels of the NVC hierarchy, including the new Groups and Macrogroups. NatureServe conducted an initial crosswalk between the NVC Standard (Version 2, FGDC-STD-005-2008) and the Manual of California Vegetation (cnps.org/cnps/vegetation/manual.php). Information was provided in the form of MS Access databases, Excel spreadsheets, and supporting documents, including Word documents of peer-reviewed NVC Group descriptions. This effort can serve as a model for others to use when they crosswalk vegetation classifications for regional databases. The relationships between the California classifications of alliances to the NVC hierarchy will be posted on websites so that users can access this information. For more information see www.fgdc.gov/grants/2012CAP/projects/G12AC20142.



This is an illustration of how the Manual of California and the NVC standard were cross-walked. One example of the wide ranging vegetation types is the riparian woodland.

Goals for Fiscal Year 2014

Geospatial Line of Business /Geospatial Platform Initiative

- Coordinate with partners to provide and share National Geospatial Data Assets (NGDA) through the Geospatial Platform.
- Continue to provide the management oversight for the Office of Management and Budget (OMB) Circular A–16 Supplemental Guidance.
- FGDC endorsement of the implementation plan for OMB’s portfolio management guidance (“Implementation Plan”), with established milestones, to reduce duplication in the development and utilization of geospatial information.

Challenges: Obtaining continued participation from Federal partner agencies and finalizing the implementation plan for OMB’s portfolio management guidance.

OMB Circular A–16 Supplemental Guidance

- Finalize the initial list of NGDA Datasets and have agencies identify their Theme Champions and Dataset Stewards.
- Develop the A–16 Theme communities on the Geospatial Platform.
- Have agencies register all available NGDA Datasets with the Geospatial Platform.
- Complete a high-level baseline assessment of the maturity level of the Themes and initiate the baseline assessment of NGDA Datasets.
- Finalize annual Theme reporting requirements and maturity metrics for Themes and Datasets.
- Initiate Theme strategic plans and Dataset management plans.
- Finalize the A–16 Implementation Plan.

Challenges: Developing meaningful and consistent performance metrics for NGDA Themes and Datasets and ensuring adequate resources to implement the portfolio and its supporting tools.

Geospatial Cloud Initiative for the Geospatial Platform

- Leveraging recent Federal Risk and Authorization Management Program (FedRAMP) certifications from other agencies and building on the new offerings of secure cloud services for the Department of the Interior (DOI), the Geospatial Platform will provide system and application certification for Geospatial Cloud (GeoCloud) shared services that are hosted through the DOI Foundation Cloud acquisition vehicle.
- Continue the work of the Geospatial Platform team with member agencies to clear certification of the ArcGIS Online environment for multiagency use as an underlying technology by the Geoplatform.gov portal.
- Plan key new GeoCloud offerings for fiscal year 2014, including the National Hydrography Dataset (NHD-Plus) and the Homeland Security Infrastructure Program (HSIP) Freedom data—both will provide data download and access to standard map services.

Challenges: Deployment of cloud services by Federal agencies has been hampered by the lack of system security accreditation through the new governmentwide approval FedRAMP process.

NSDI Strategic Plan

- Finalize the NSDI Strategic Plan through adoption by the FGDC Steering Committee.

- Seek endorsement of the NSDI Strategic Plan by the National Geospatial Advisory Committee.
- Designate officials, appointed from the FGDC Executive Committee, who will serve as the champion for each strategic goal in the plan. The champions will be responsible for overseeing team leaders and action teams, addressing each objective and its supporting actions. Each action team leader will develop a project plan, following adoption of the NSDI Strategic Plan, outlining how the goals and objectives will be achieved. The project plans will include tasks and milestones, responsible parties, performance measures, and resources required for each of the objectives.
- Continue to collaborate with the broader geospatial community in the implementation of the plan.

Challenges: A key challenge in implementing the goals in the NSDI Strategic Plan is the limited FGDC member agency staff and resources available to devote to the activities described in the plan. Successful implementation of the plan will also require extensive communication and collaboration with a broad range of partners and stakeholders.

National Geospatial Advisory Committee

- The National Geospatial Advisory Committee (NGAC) will provide ongoing review, feedback, and recommendations regarding the development and implementation of key issues and initiatives, including implementation of the NSDI Strategic Plan, the continued development of the Geospatial Platform, development of portfolio management approaches, geolocation privacy issues, and

partnerships with other levels of government.

- The NGAC will hold three to four public meetings in fiscal year 2014.
- The FGDC will continue to manage the review, disposition, and implementation of NGAC recommendations, assess and respond to advice and recommendations from NGAC, and complete the next cycle of NGAC nominations and appointments in fiscal year 2014.

Challenges: The NGAC will face continuing challenges in developing effective advice and recommendations that reflect a consensus view across multiple sectors and perspectives on key issues such as the implementation of the NSDI Strategic Plan, geospatial portfolio management, and the Geospatial Platform, as well as emerging issues such as geolocation privacy.

Standards

- Continue to focus on implementation of core SDI standards, as identified in Chapter 10: Standards Suites for Spatial Data Infrastructure, www.gsdi docs.org/GSDIWiki/index.php/Chapter_10, of the SDI Cookbook that supports the Geospatial Platform.
- Build a repository of Geography Markup Language (GML)/eXtensible Markup Language schemata to promote uptake and implementation of geospatial standards.
- Continue participation in ISO, ANSI, and GWG geospatial standardization activities, as resources allow.
- Continue supporting activities within the OGC, including (1) sponsorship of Open Web Services-10 (OWS-10) Interoperability Testbed; (2) sponsorship of work with the Global Earth Observing System of Systems (GEOSS) Architecture Implementation Pilot (AIP); and (3) improvement of the information flow.

Challenges: Limited resources constrain the FGDC standards program; in particular, limited

resources will prevent full participation in ISO, ANSI, GWG, and OGC geospatial standardization activities.

Geospatial Metadata

- Identify geospatial metadata education and outreach crosscuts with national initiatives such as the Geospatial Platform, the National Geospatial Data Asset (NGDA) Themes, and other emerging priorities.
- Establish a regular “Information Series” on ISO metadata implementation.
- Implement online metadata resources including new training materials, the FGDC Metadata Website redesign, and the ISO Metadata Editor Review.

Challenges: The greatest challenge that the FGDC Metadata Program faces is the ability to develop specific ISO metadata standard implementation guidance and support to ensure compliance with a series of recently released policies and directives. In addition, the technical expertise, software dependency, and geospatial metadata investment of NSDI stakeholders including NGDA Theme Leads varies greatly, resulting in the need to address an extremely wide range of implementation issues and needs.

International Activities

- The Group on Earth Observations/Global Earth Observation System of Systems (GEO/GEOSS) will continue to focus on simplifying access to quality Earth observation data and services. The FGDC will participate and continue to support the reorganized U.S. Group on Earth Observations (USGEO).

Challenges: Coordinating the variety of data access and distribution policies worldwide, and a need for expanded outreach to promote the use of GEOSS to find and access Earth observation data.

NSDI Training Program

- Increase the number and type of available NSDI training materials.
- Increase the number of NSDI training materials available online.
- Improve access to online training materials as part of the FGDC website redesign.
- Provide more Web-based live training.

Challenges: There are two metadata directives for geospatial data—Office of Management and Budget (OMB) Circular A–16 and the Open Data Policy. Guidance to agencies on how to fulfill both with a single implementation will be issued and training will need to be included as part of the solution.

FGDC Subcommittees and Working Groups

Cadastral Subcommittee

- Work with other Federal agencies to complete an initial dataset for the Surface Management Agency dataset that is built from parcel-level information in agency datasets; establish a data feature for Federal parcel information that can be integrated into the Cadastral National Spatial Data Infrastructure (CadNSDI) Publication guidelines.
- Coordinate with States and regional organizations to continue to promote the development and access to standardized parcel data that is based on authoritative data sources; the data should be easily accessible by data users. This activity includes the continued support for the national inventory of the status of parcel data development and access and the national inventory on State programs.
- The Public Land Survey System (PLSS) Working Group will continue to support the data quality improvement of the standardized PLSS datasets, complete as many Eastern States PLSS datasets as possible, and promote shared

data stewardship for non-federally managed lands.

- The Federal Lands Working Group will develop prioritization rules to manage topology (boundary overlaps and gaps) while correcting authoritative data and, using one or two Western States with Federal parcel data, develop a prototype aggregated Federal boundary geodatabase.

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.
- Update existing guidelines, standards, and specifications to support the transition to new datums.
- Engage with international standards activities via the InterNational Committee on Information Technology Standards Technical Committee L1 (INCITS L1) and the ISO Technical Committee 211.

Challenges: Support activities related to OMB Circular A–16 Supplemental Guidance and the Geospatial Platform.

Geologic Data Subcommittee

- Promote among geologic map-producing agencies an improved technical understanding of the draft standard geologic map database design, named NCGMP09. Continue to hold monthly teleconferences among those agencies in order to raise, address, and resolve any technical or procedural issues related to its evaluation and implementation.
- Using comments and suggestions from users, consider revising the FGDC Digital Cartographic Standard for Geologic Map Symbolization that was released in 2006.

Challenge: Progress toward establishing NCGMP09 as a Federal

standard; efforts to revise the FGDC Digital Cartographic Standard for Geologic Map Symbolization depends on sufficient availability of personnel and other resources. This is a particular challenge as agency budgets and staffing become increasingly restricted.

Marine and Coastal Spatial Data Subcommittee

- Continue to support and align the efforts of Data.gov, Ocean.Data.gov, Geoplatform.gov, and the A–16 Supplemental Guidance related to the Marine and Coastal Theme.

National Digital Orthoimagery Program (NDOP) Subcommittee

- Establish a new 3-year multiagency agreement (2015–2017) for cooperative funding of the National Agriculture Imagery Program (NAIP).
- Establish a Memorandum of Understanding between the Farm Service Agency and the U.S. Geological Survey for coordinated distribution of NAIP.
- Update the NGDA Dataset list for the Imagery Theme.

Challenge: Investigate the use of the Geospatial Platform “marketplace” capabilities for tracking and displaying Federal agency data-acquisition projects.

Spatial Water Data Subcommittee

- Continue to monitor the operations and maintenance activities associated with the core data layers that include the National Hydrography Dataset (NHD), the Watershed Boundary Dataset (WBD), and key derivatives of the National Elevation Dataset (NED).
- Continue coordination and technical exchanges related to the National Wetlands Inventory (NWI) and NHD.
- Provide input from participating agencies for the USGS Water Data Business Requirements Study.

- Continue efforts to review and inventory participating agencies’ surface-water monitoring and gaging datasets.

Transportation Subcommittee

- Identify a baseline of transportation datasets (non-road) that would complete Transportation for the Nation and would be adopted into the Transportation Theme as part of the NGDA Datasets.
- Assist in the development of the Transportation for the Nation plan documents and support the OMB A–16 Supplemental Guidance implementation plan.

Vegetation Subcommittee

- Further the avenues and resources for full U.S. National Vegetation Classification (USNVC) implementation.
- Provide access to the full hierarchy through *usnvc.org*.
- Submit revised and codified classification of California and adjacent Western States that will be the result of a NSDI Cooperative Agreements Program project.
- Continue outreach to potential users of the USNVC.
- Conduct a workshop/field trip in conjunction with the Ecological Society of America (ESA) education subcommittee and have a face-to-face meeting of this subcommittee.

Wetlands Subcommittee

- Implement the second edition of “Classification of Wetlands and Deepwater Habitats” by assuring updating of the Wetlands Mapping Standard, training, online tools, and other website references.
- Further the discussion, through the Subcommittee and the Association of State Wetland Managers and other stakeholder groups, of how the wetlands layer of the NGDA can be completed and updated

by stakeholders to implement the recent National Wetlands Mapping Standard.

- Launch the coordination of the new Inland – Water Theme; co-leads are the Fish and Wildlife Service (FWS) and U.S. Geological Survey, with the involvement of stakeholders.

Challenges: Although the FWS National Wetlands Inventory will continue to provide stakeholders with wetland data standards, quality, integrity, integration, maintenance, and distribution, the Subcommittee is challenged with encouraging stakeholders such as Federal, State, Tribal, and territorial agencies to assume wetland mapping responsibility for their areas of interest as the FWS shifts priorities away from producing new data and updated data to completing a wetlands layer of NSDI by digitizing legacy data. In addition, the Subcommittee is challenged with identifying additional avenues of support for the Wetlands Subcommittee and the Inland – Waters Theme as the FWS shifts its priorities and redirects National Wetlands Inventory staff.

The Architecture and Technology Working Group

- Convene technical outreach sessions for the Geospatial Platform.
- Finalize Assessment and Authorization (A&A) for shared geospatial services and portals for the Geospatial Platform.

Metadata Working Group

- Facilitate awareness about geospatial metadata standards, their application, and implementation, including those relevant to the NGDA Themes and the Geospatial Platform initiative.
- Advance the ISO geospatial metadata transition and identify implementation best practices.

Standards Working Group

- Working Group members will continue their participation in external geospatial standards bodies to identify and recommend standards for FGDC endorsement.
- The Working Group will continue to recommend standards for advancement through the FGDC standards process.

Users/Historical Data Working Group

- Continue Working Group outreach to all interested parties, both inside and outside the Federal Government.
- Continue to provide input on the Geospatial Platform.
- Remain active in the development and maintenance of the database, listing data steward contacts across the Federal Government.
- Continue work on the Selections and Appraisal of Records Guidance document.
- Continue to provide coordinated input to the Library of Congress Geospatial Data Preservation Resource Center.
- Explore ways to provide input to Data.gov on enhancing access to historic geospatial datasets.
- Report on and liaison with the International Council for Science's Committee on Data for Science and Technology (ICSU CODATA) Task Group on data at risk.

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 U.S. 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.



Scott Bernard

**Federal Chief Enterprise Architect, Office of E-Government and Information
Technology
Office of Management and Budget
Vice Chair, FGDC Steering Committee**

Prior to his 2010 appointment to OMB, Dr. Scott Bernard was the Deputy Chief Information Officer and Chief Enterprise Architect for the Federal Railroad Administration. He received a doctorate in Public Administration and Policy from Virginia Polytechnic Institute and State University and a master of science degree from Syracuse University.



Ivan DeLoatch

**Executive Director
Federal Geographic Data Committee**

Mr. Ivan DeLoatch has served as the Executive Director of the FGDC for the past 10 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
Director, Information Applications Division
U.S. Department of Homeland Security

Mr. Daniel Cotter is the Geospatial Information Officer for the Department of Homeland Security. Prior to this he was the Chief Technology Officer for the department. 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. Mr. Cotter 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. Department of the Interior

Prior to joining the U.S. Department of the Interior 2 years ago, Dr. Johnston served as the Geographic Information Officer for the U.S. Environmental Protection Agency (EPA). Before his time with EPA, Dr. 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. Dr. Johnston currently serves as Vice Chair for the National Geospatial Advisory Committee.



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 has over 26 years of Federal service that includes leading information technology operations and acquisitions. Mr. Klimavicz received a bachelor of science degree and a master's degree in engineering from Virginia Polytechnic Institute and State University.

FGDC Executive Committee (continued)



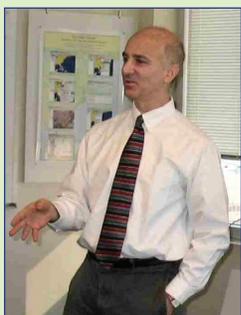
Stephen Lowe
Geospatial Information Officer
U.S. Department of Agriculture

Mr. Stephen Lowe has over 22 years of Federal Government business and technology transformation experience. He has also completed two term appointments supporting the White House Executive Office of the President and served as Senior Solutions Architect for Enterprise Innovation and Strategy with SRA International. Mr. 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.



Michele Motsko
Chief Enterprise Architect and Director of GEOINT Architecture and Standards
National Geospatial-Intelligence Agency

Dr. Michele Motsko directly supports the NGA Chief Information Officer in fulfilling his functional management responsibilities for GEOINT standards and architecture for the National System for Geospatial-Intelligence (NSG) community. Prior to her current assignment, Dr. Motsko was the Chief of the Systems Engineering Division, Acquisition Directorate, at NGA. Dr. Motsko received a doctorate in Systems Engineering from George Washington University, a master of arts degree in Geographic Information Systems from San Diego State University, and a bachelor of science degree in Geography and Cartography from Eastern Michigan University. She is one of two Federal representatives to serve on the National Geospatial Advisory Committee.



Harvey Simon
Geospatial Information Officer, Office of Environmental Information Immediate Office
U.S. Environmental Protection Agency

Mr. Harvey Simon has been EPA's Geospatial Information Officer since July 2012 and is responsible for coordinating EPA's geospatial program. Prior to that he was Chief of the Information Services Branch in the Office of Information Analysis and Access, which is responsible for the Envirofacts database, a number of national geospatial applications and services, and operational management of the EPA GeoPlatform. Previously, Mr. Simon held the role of Geographic Information System (GIS) Coordinator for Region 2 and Chair of the EPA GIS Workgroup, including its Emergency Response GIS subgroup. Mr. Simon brings 28 years of GIS and risk analysis experience to his current position. He has an undergraduate and a master's degree from the State University of New York.

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. Close coordination among the many agencies involved in Federal geospatial activities helps ensure the efficient and effective investment and use of geospatial resources.

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 and is the Federal decisionmaking body. The Executive Committee, which is a subset of the Steering Committee, provides advice and guidance to the Chair and the Vice Chair.

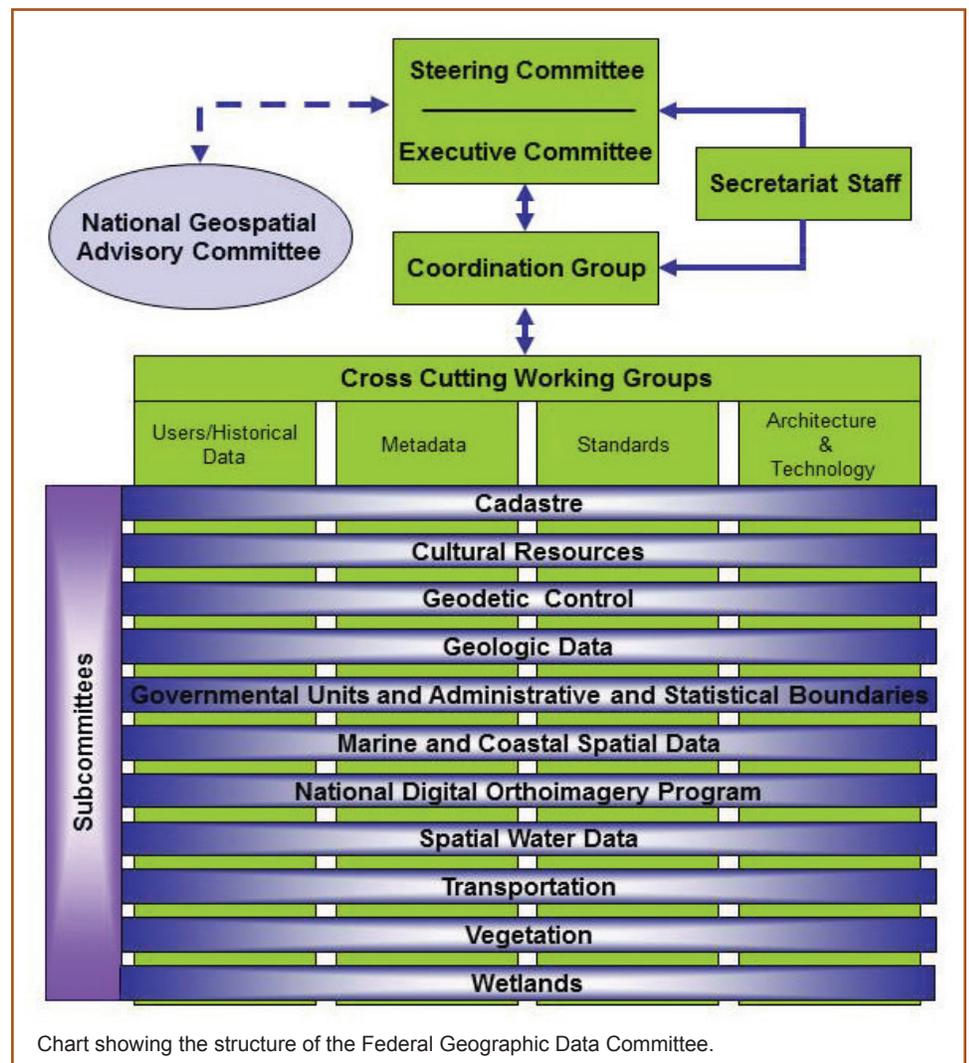
The National Geospatial Advisory Committee (NGAC) is a Federal advisory committee that provides advice and recommendations on Federal and national geospatial programs. The FGDC Coordination

Group consists primarily of geospatial program leads and technical experts and 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 subcommittees and working groups,

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.
- Promoting collaborative relationships for sharing geospatial data among and between Federal and 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.

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 activities related to OMB Circular A-16 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, 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.

2013 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

National Geospatial Data Asset Themes

The vast majority of Federal Government business is associated with a place and thus a sizable amount of data generated or used by government staff and partners have a geospatial component. These data when used in tandem with geospatial information systems provide a critical tool to people who solve problems associated with implementing Federal agency and partner missions. Ensuring this data is accessible and of sufficient quality to meet the needs of these programs is essential if programmatic objectives are to be fully met.

Office of Management and Budget (OMB) Circular A–16 provides management directions to Federal agencies that produce, maintain, or use spatial data either directly or indirectly in the fulfillment of their mission. The circular also provides processes for agencies that if followed improve the coordination and use of spatial data. This includes effective and economical use and management of spatial data assets in the digital environment. The circular directs the establishment of a National Spatial Data Infrastructure (NSDI) for the benefit of the Nation and launches the Federal Geographic Data Committee (FGDC) to facilitate its development.

The OMB Circular A–16 Supplemental Guidance, released November 10, 2010, further defines and clarifies implementation of OMB Circular A–16. It also elucidates a process to modify Circular A–16 Appendix E themes and associated datasets to reflect the current business of Federal agencies and their partners. The objective of this coordinated Federal-wide geospatial asset management is to increase the effectiveness of geospatial data and associated services in supporting mission-critical business requirements of the Federal Government and its stakeholders.

Geospatial data is described for the first time in the Supplemental Guidance as a capital asset, and its importance to the success of Federal Government and partner programs is emphasized. This focus provides the foundation for a portfolio management approach for Federal geospatial datasets of National Significance—a National Geospatial Data Asset (NGDA) portfolio called for by OMB in fiscal year 2011 budget guidance. All NGDAs are associated with a National Geospatial Data Asset Theme. These Themes serve as the management units for collections of related NGDAs that would benefit from coordinated development and management.

National Geospatial Data Asset (NGDA) Theme Selection Principles

Principle 1: Themes and associated Datasets are logical groupings of national capital assets serving the needs of citizens and are readily discoverable and accessible to anyone.

Principle 2: Themes and associated Datasets are national in scope and are created and managed in response to well-defined spatial data requirements that are common across multiple Federal agencies and other organizations.

Principle 3: Themes and associated Datasets reflect legislated mandates, clearly defined directives, or core spatial reference datasets.

Principle 4: Themes promote cohesive and collaborative development, maintenance, and evolution of multiple Datasets across Federal, State, Tribal, and local governments and the private or nonprofit sectors.

Principle 5: Themes focus on the spatial representation of natural and manmade assets that are important to the Nation, including boundaries (jurisdictional, legal, statistical, and analytical).

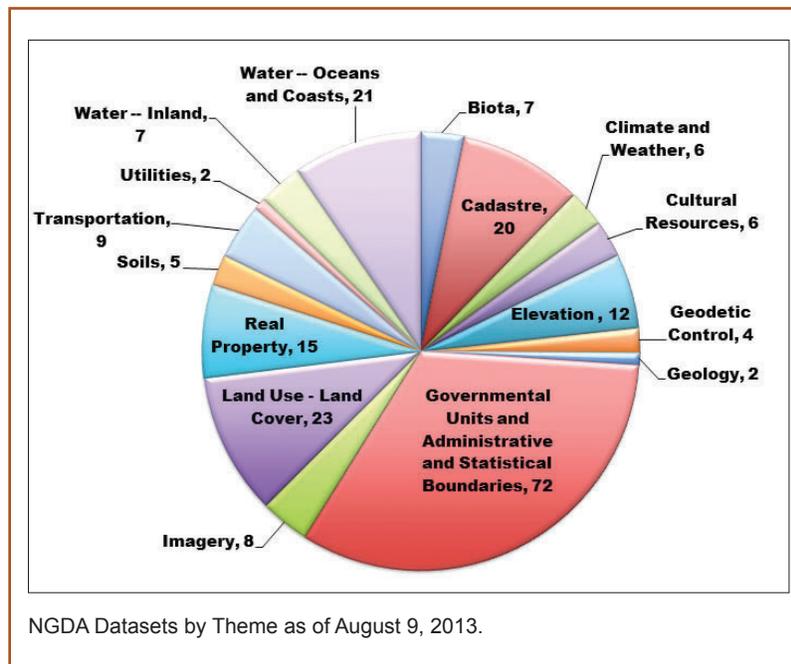
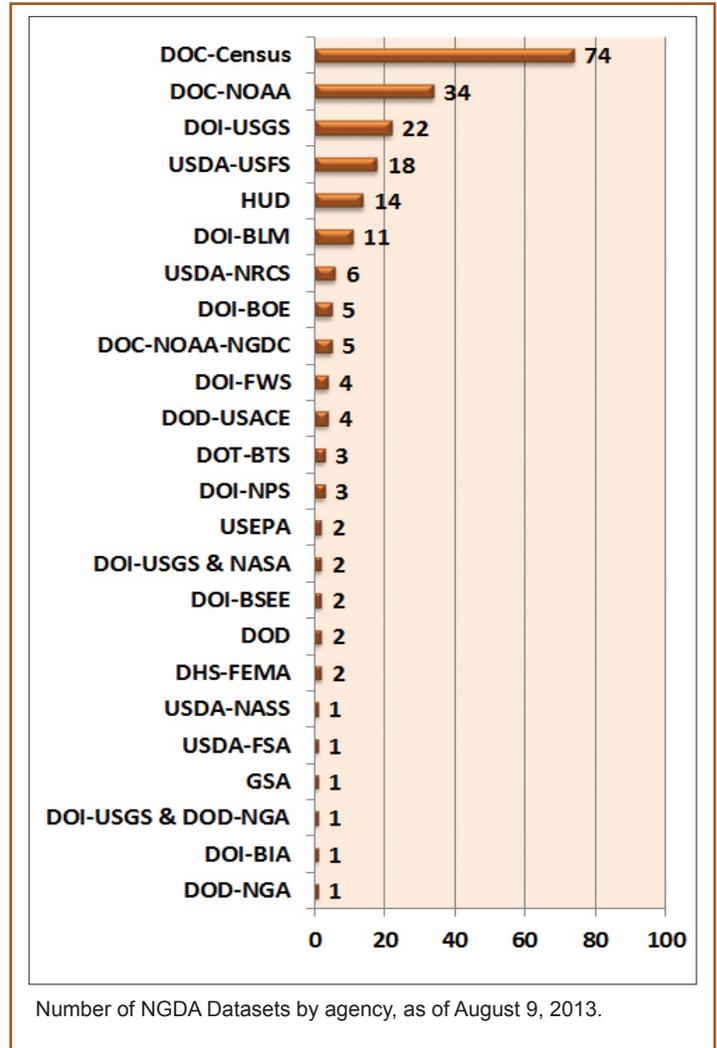
Management elements clarified by the Supplemental Guidance to aid this portfolio management approach include: the geospatial data life-cycle management approach, portfolio management roles and responsibilities, the process for updating themes, and an outline of the portfolio management investment strategy. The Supplemental Guidance and its five reference documents, which provide further details and information about implementing the portfolio management and the Supplemental Guidance, are available on the FGDC website (www.fgdc.gov/policyandplanning/a-16).

In February 2013, the FGDC Steering Committee endorsed the revised version of the A–16 National Geospatial Data Asset (NGDA) Data Themes and Theme Lead Agencies list. This endorsement revises the earliest list that was approved by the Steering Committee in 2011.

The FGDC Coordination Group continues identification of datasets associated with each NGDA Theme and identification of the NGDA Theme lead agencies, NGDA Theme Executive Champions, and Theme Leads.

Evolution of Data Themes

Appendix E of OMB Circular A-16 identified 34 Data Themes. During the development of the OMB Supplemental Guidance it was observed that many of the Themes were actually individual datasets that would more appropriately be grouped as collections under a streamlined set of Themes. The Themes were consolidated into 16 Themes that were approved by the FGDC Steering Committee in 2013. The purpose of the consolidation was threefold: to develop an NGDA Theme and Dataset structure for portfolio management that enables more efficient management and reporting, to ensure that all relevant Datasets associated with a particular Theme effectively support the business processes reliant on them, and to ensure the Datasets are produced in the most cost-effective manner. As the portfolio management process matures the NGDA Themes and Datasets will continue to evolve.



Below are the NGDA Themes that are the organizational constructs grouping and managing the NGDA Datasets. The list of the over 200 NGDA Datasets is available on the FGDC website (www.fgdc.gov/initiatives/portfolio-management).

Theme: Biota

Theme Lead Agency: U.S. Department of the Interior, U.S. Geological Survey

Description/Scope of Datasets: Pertains to, or describes, the dynamic processes, interactions, distributions, and relationships between and among organisms and their environments.

Theme: Cadastre

Theme Lead Agency: U.S. Department of the Interior, Bureau of Land Management

Description/Scope of Datasets: Past, current, and future rights and interests in real property including the spatial information necessary to describe geographic extents. Rights and interests are benefits or enjoyment in real property that can be conveyed, transferred, or otherwise allocated to another for economic remuneration. Rights and interests are recorded in land record documents. The spatial information necessary to describe geographic extents includes surveys and legal description frameworks, such as the Public Land Survey System, as well as parcel-by-parcel surveys and descriptions. Does not include Federal government or military facilities.

Theme: Climate and Weather

Theme Lead Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration

Description/Scope of Datasets: Meteorological conditions, including temperature, precipitation, and wind that characteristically prevail in a particular region over a long period of time. Weather is the state of the atmosphere at a given time and place, with respect to variables such as temperature, moisture, wind velocity, and barometric pressure.

Theme: Cultural Resources

Theme Lead Agency: U.S. Department of the Interior, National Park Service

Description/Scope of Datasets: Features and characteristics of a collection of places of significance in history, architecture, engineering, or society. Includes National Monuments and Icons.

Theme: Elevation

Proposed Theme Lead Agency: Co-Leads: U.S. Department of the Interior, U.S. Geological Survey and U.S. Department of Commerce, National Oceanic and Atmospheric Administration

Description/Scope of Datasets: The measured vertical position of the earth surface and other landscape or bathymetric features relative to a reference datum typically related to sea level. These points normally describe bare earth positions but may also describe the top surface of buildings and other objects, vegetation structure, or submerged objects. Elevation data can be stored as a three-dimensional array or as a continuous surface such as a raster, triangulated irregular network, or contours. Elevation data may also be represented in other derivative forms such as slope, aspect, ridge and drainage lines, and shaded relief.

Theme: Geodetic Control

Theme Lead Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration

Description/Scope of Datasets: Survey control points or other related data sets which are accurately tied to the National Spatial Reference System (the official, common federal system for establishing coordinates for geospatial data that are consistent nationwide). Geodetic control examples include: passive geodetic control marks, active geodetic observing systems, data from Global Navigation Satellite Systems (e.g., GPS), gravity measurements, and models of the earth's gravity field (geoid).

Theme: Geology

Theme Lead Agency: Co-Leads: U.S. Department of the Interior, U.S. Geological Survey and U.S. Department of the Interior, Bureau of Ocean Energy Management

Description/Scope of Datasets: Geographically referenced data pertaining to the origin, history, composition, structure, features, and processes of the solid Earth, both onshore and offshore. Includes geologic, geophysical, and geochemical maps, stratigraphy, paleontology, geochronology, mineral and energy resources, and natural hazards such as earthquakes, volcanic eruptions, coastal erosion, and landslides. Does not include soils.

Theme: Governmental Units and Administrative and Statistical Boundaries

Theme Lead Agency: U.S. Department of Commerce, U.S. Census Bureau

Description/Scope of Datasets: Boundaries that delineate geographic areas for uses such as governance and the general provision of services (e.g. States, American Indian reservations, counties, cities, towns, etc.), administration and/or for a specific purpose (e.g. Congressional Districts, school districts, fire districts, Alaska Native Regional Corporations, etc.), and/or provision of statistical data (census tracts, census blocks, metropolitan and micropolitan statistical areas, etc.). Boundaries for these various types of geographic areas are either defined through a documented legal description or through criteria and guidelines. Other boundaries may include international limits, those of federal land ownership, the extent of administrative regions for various federal agencies, as well as the jurisdictional offshore limits of U.S. sovereignty. Boundaries associated solely with natural resources and/or cultural entities are excluded from this theme and are included in the appropriate subject themes.

Theme: Imagery

Theme Lead Agency: Co-Leads: U.S. Department of Agriculture, Farm Service Agency and U.S. Department of the Interior, U.S. Geological Survey

Description/Scope of Datasets: Georeferenced images of the Earth's surface, which have been collected via aerial photography or satellite data. Orthoimagery is prepared through a geometric correction process known as orthorectification to remove image displacements due to relief and sensor characteristics, allowing their use as base maps for digital mapping and analyses in a GIS. Specific imagery datasets created through image interpretation and classification, such as a land cover image, can be found under Themes specific to the subject matter. Includes imagery such as Landsat, National Agriculture Imagery Program (NAIP), Digital Orthophoto Quarter Quadrangles (DOQQs).

Theme: Land Use–Land Cover

Theme Lead Agency: Co-Leads: U.S. Department of Agriculture, U.S. Forest Service and U.S. Department of the Interior, U.S. Geological Survey

Description/Scope of Datasets: LU/LC is a term referring collectively to natural and man-made surface features that cover the land (Land Cover) and to the primary ways in which land cover is used by humans (Land Use). Examples of Land Cover may be grass, asphalt, trees, bare ground, water, etc. Examples of Land Use may be urban, agricultural, ranges, and forest areas.

Theme: Real Property

Theme Lead Agency: General Services Administration

Description/Scope of Datasets: The spatial representation (location) of real property entities typically consist of one or more of the following: unimproved land, a building, a structure, site improvements, and the underlying land. Complex real property entities (that is, “facilities”) are used for a broad spectrum of functions or missions. This theme focuses on the spatial representation of real property assets only and does not seek to describe special purpose functions of real property, such as those found in the Cultural Resources, Transportation, or Utilities Themes.

Theme: Soils

Proposed Theme Lead Agency: U.S. Department of Agriculture, Natural Resources Conservation Service

Description/Scope of Datasets: Depicts the geography and attributes of the many kinds of soils found in the landscape at both large and small map scales. A living, dynamic resource providing a natural medium for plant growth and habitat for living organisms, soil recycles nutrients and wastes, stores carbon, and purifies water supplies. Soil has distinct layers (called ‘horizons’) that, in contrast to underlying geologic material, are altered by the interactions of climate, landscape features, and living organisms over time. For more information on Soils, see soils.usda.gov.

Theme: Transportation

Theme Lead Agency: U.S. Department of Transportation

Description/Scope of Datasets: Means and aids for conveying persons and/or goods. The transportation system includes both physical and non-physical components related to all modes of travel that allow the movement of goods and people between locations.

Theme: Utilities

Theme Lead Agency: Offshore Utilities: U.S. Department of the Interior, Bureau of Safety and Environmental Enforcement and Terrestrial Utilities: Lead to be determined.

Description/Scope of Datasets: Means, aids, and usage of facilities for producing, conveying, distributing, processing or disposing of public and private commodities including power, energy, communications, natural gas, and water. Includes sub themes for Energy, Drinking water and Water treatment, and Communications.

Theme: Water – Inland

Theme Lead Agency: Co-Leads: U.S. Department of the Interior, U.S. Fish and Wildlife Service and U.S. Department of the Interior, U.S. Geological Survey

Description/Scope of Datasets: Interior hydrologic features and characteristics, including classification, measurements, location, and extent. Includes aquifers, watersheds, wetlands, navigation, water quality, water quantity, and groundwater information.

Theme: Water – Oceans and Coasts

Theme Lead Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration

Description/Scope of Datasets: Features and characteristics of salt water bodies (i.e., tides, tidal waves, coastal information, reefs) and features and characteristics that represent the intersection of the land with the water surface (i.e., shorelines), the lines from which the territorial sea and other maritime zones are measured (i.e., baseline maritime) and lands covered by water at any stage of the tide (i.e., Outer Continental Shelf), as distinguished from tidelands, which are attached to the mainland or an island and cover and uncover with the tide.

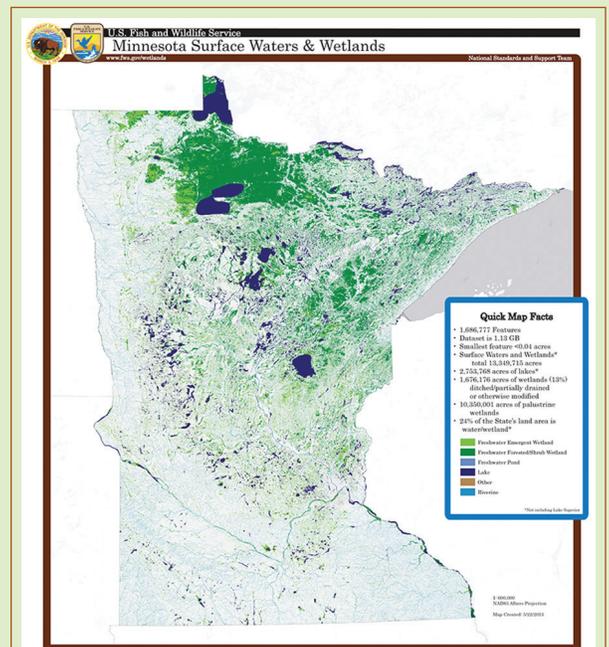
Surface Waters and Wetlands Inventory: A More Comprehensive Dataset of the Nation's Water Resources

Often referred to as version 2.0 of the National Wetlands Inventory, the Surface Waters and Wetlands (SWI) dataset provides more inclusive geospatial data of all wetlands and surface water features. This national geospatial data product will contribute substantially to improved modeling of flow and water movement in surface water basins, channels, and wetlands.

The SWI dataset is a more comprehensive characterization of all surface water features on the landscape. It stems from the need to represent all surface waters and wetlands as polygons in a geospatial dataset to facilitate accurate area calculations and provide consistent, standardized ecological classification to allow for adaptive management, geospatial summaries, and modeling. The SWI has been created by retaining the wetland and deepwater polygons that compose the NWI digital wetlands spatial data layer and reintroducing any linear wetland or surface water features that were orphaned from the original NWI hard copy maps by converting them to narrow polygonal features. Additionally, the data are supplemented with hydrography data, buffered to become polygonal features, as a secondary source for any single-line stream features not mapped by the NWI and to complete segmented connections.

Due in part to how wetlands were mapped in the past, coupled with improved geospatial processing techniques, the SWI dataset is a departure from the legacy NWI data in several ways. The SWI depicts all surface water and wetland features in a single database; it applies the FGDC Classification of Wetlands and Deepwater Habitats (Cowardin and others (1979), www.fws.gov/wetlands/Documents/classwet/index.html) system to provide consistent ecological descriptors intended to address wetlands and water bodies; and it imparts new and improved information about wetland extent and hydrologic connectivity.

There are many opportunities to apply SWI data to assist in resource management, planning, and strategic habitat conservation efforts. Applications include various geospatial analyses, tracing contaminant pathways through aquatic systems, identifying and prioritizing habitat restoration opportunities, examining continuity or dissection of habitat corridors, quantifying aquatic and wetland resource types, and facilitating ecological modeling. Additional information is available at www.fws.gov/wetlands/.



Map of Minnesota surface waters and wetlands.

Appendix D

Glossary of Abbreviations and Terms

ACWI	Advisory Committee on Water Information	ISO	International Organization for Standardization
AIP	Architecture Implementation Pilot	IT	Information Technology
ANSI	American National Standards Institute	lidar	light detection and ranging
API	Application Programming Interface	LU/LC	Land Use/Land Cover
ATWG	Architecture and Technology Working Group	MWG	Metadata Working Group
BLM	Bureau of Land Management	NAIP	National Agriculture Imagery Program
CAP	Cooperative Agreements Program	NASA	National Aeronautics and Space Administration
CKAN	Comprehensive Knowledge Archive Network	NCGMP	National Cooperative Geologic Mapping Program
CIO	Chief Information Officer	NDOP	National Digital Orthophoto Program
CSDGM	Content Standard for Digital Geospatial Metadata	NED	National Elevation Dataset
CSW	Catalog Service for the Web	NGA	National Geospatial-Intelligence Agency
Data-CORE	Data Collection of Open Resources for Everyone	NGAC	National Geospatial Advisory Committee
DHS	Department of Homeland Security	NGDA	National Geospatial Data Asset
DOI	U.S. Department of the Interior	NHD	National Hydrography Dataset
DOQQ	Digital Orthophoto Quarter Quadrangle	NOAA	National Oceanic and Atmospheric Administration
EPA	U.S. Environmental Protection Agency	NPS	National Park Service
EROS	Earth Resources Observation and Science Center	NRCS	Natural Resources Conservation Service
ESA	Ecological Society of America	NSDI	National Spatial Data Infrastructure
FedRAMP	Federal Risk and Authorization Management Program	NVC	National Vegetation Classification
FGDC	Federal Geographic Data Committee	NWI	National Wetlands Inventory
FSA	Farm Service Agency	O&M	Observations and Measurements
FWS	U.S. Fish and Wildlife Service	OGC	Open Geospatial Consortium, Inc.
GAO	Government Accountability Office	OMB	Office of Management and Budget
GEO	Group on Earth Observations	OSTP	Office of Science and Technology Policy
GeoCloud	Geospatial Cloud	OWS	Open Web Services
GEOS	Global Earth Observation System of Systems	PLSS	Public Land Survey System
GIS	Geographic Information System	ROI	Return on Investment
GML	Geography Markup Language	SAOGI	Senior Agency Official for Geospatial Information
GPS	Global Positioning System	SDI	Spatial Data Infrastructure
GSA	General Services Administration	SSWD	Subcommittee on Spatial Water Data
GSDI	Global Spatial Data Infrastructure	3D	Three dimensional
GWG	Geospatial Intelligence Standards Working Group	3DEP	Three-dimensional Elevation Program
GWML	Ground Water Markup Language	UHDWG	Users/Historical Data Working Group
ICSU CODATA	International Council for Science's Committee on Data for Science and Technology	USDA	U.S. Department of Agriculture
IENC	Inland Electronic Navigation Charts	USFS	U.S. Forest Service
ifsar	interferometric synthetic aperture radar	USGEO	U.S. Group on Earth Observations
INCITS	International Committee for Information Technology Standards	USGS	U.S. Geological Survey
INSPIRE	Infrastructure for Spatial Information in the European Community	WaterML	Water Markup Language
		WBD	Watershed Boundary Dataset
		WCS	Wetlands Classification Standard
		WFS	Web Feature Service
		WMS	Web Mapping Service
		XML	Extensible Markup Language

Success Story

Capitalizing on Joint Agency Coordination

Challenge: Since the inception of *The National Map*, roads data from the U.S. Census Bureau's Topologically Integrated Geographic Encoding and Referencing (TIGER) system have been an important component. The data are produced as part of the decennial Census program and are published in the public domain. In 2009, when the USGS began producing US Topo maps from *The National Map* data, TIGER was expected to be the source for roads features. However, initial investigations demonstrated that significant editing would be required. Consequently, the USGS purchased a license to use commercial roads data on US Topo maps and in *The National Map* viewer until such time that a suitable national, public domain dataset could be found. Since that time the Census Bureau has initiated several programs to improve the accuracy of the TIGER roads data, and with the USGS has forged a partnership to make TIGER data available via *The National Map*.

Action: In 2011, the Census Bureau and the USGS commissioned an interagency team to evaluate the use of TIGER as the primary source for roads data in *The National Map*. The goal of the group was to articulate requirements that support the USGS' use of TIGER data as the roads layer for *The National Map* and to evaluate TIGER against these requirements.

Results: The interagency team documented requirements for representation and attribution of roads features for both TIGER data and *The National Map*. While some minor differences continue, the team found a significant amount of commonality in the requirements, especially for the most critical features: interstate highways and local roads.

The team evaluated how well the Census Bureau's 2012 TIGER/Line® data met the requirements of *The National Map*. The findings showed that the quality of TIGER data has significantly improved since 2009, and subsequent update operations including the Census Bureau's Geographic Support Services Initiative (GSS-I) activities will continue to improve the data. As a result, USGS and Census Bureau management accepted the team's recommendation that TIGER data be adopted as the roads source for *The National Map*. A series of interagency teams have been formed to address implementation issues and a Memorandum of Understanding is being developed to document the roles and responsibilities of a long-term joint effort to use TIGER roads data in *The National Map*, including the US Topo maps.

This joint agency coordination effort capitalizes on the return on Federal investment in geospatial data by reducing costs and ensuring that users of *The National Map* have access to public domain data.

