

2018 Annual Report

Federal Geographic Data Committee



National Spatial Data Infrastructure
Partnerships | Policies | Standards | Procedures | Data | Technology



**PRESIDENT'S
MANAGEMENT
AGENDA**

DATA, ACCOUNTABILITY, AND TRANSPARENCY:
*CREATING A DATA STRATEGY AND
INFRASTRUCTURE FOR THE FUTURE*



The Federal Geographic Data Committee's notable successes implementing portfolio management processes for Federal geospatial data assets and investments helped agencies to more efficiently support their mission and priorities.

**National Geospatial Data Asset
(NGDA) Portfolio
Management**

NGDA Theme

NGDA Theme

NGDA
Datasets

NGDA
Datasets

NGDA Lifecycle Stages and Reporting



**NGDA
Themes**



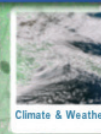
Address



Biodiversity & Ecosystems



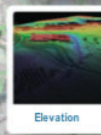
Cadastral



Climate & Weather



Cultural Resources



Elevation



Geodetic Control



Geology



Administrative & Statistical Units



Imagery



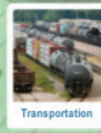
Land Use & Land Cover



Real Property



Soils



Transportation



Utilities



Inland Water



Oceans & Coasts



GEOPLATFORM.gov
Connecting the Geospatial Ecosystem

Federal Geographic Data Committee
IVAN DELOATCH, Executive Director

Federal Geographic Data Committee, Reston, Virginia: 2019

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

I am pleased to present the Federal Geographic Data Committee's (FGDC's) annual report for fiscal year 2018. This report provides a summary of management and performance information and describes the FGDC's actions over the past year to facilitate continued, sustainable development of geospatial data and technology. Key FGDC accomplishments over the past year include the following:

- The FGDC continued to make significant progress in advancing the Geospatial Platform, enhancing critical tools for providing shared services and capabilities across the Government and to external partners. The GeoPlatform team implemented enhancements, including a new search feature and the launch of the GeoPlatform application programming interface to connect and bridge government and vendor data resources.
- The FGDC initiated a collaborative planning process to develop a new strategic plan for the National Spatial Data Infrastructure (NSDI). The planning process builds upon the 2017 NSDI Strategic Framework, which was developed as a transitional document for the new Administration. The NSDI Strategic Plan is also being developed to align with the goals and objectives of the Federal Data Strategy, which is a key component of the President's Management Agenda.
- The FGDC continued to advance the National Geospatial Data Asset (NGDA) portfolio management process. In 2018, FGDC agencies completed an NGDA Dataset Lifecycle Maturity Assessment (LMA) and Dataset and Theme Summary Reports for all 176 NGDA Datasets across 17 Themes. More than 60% of the NGDA Datasets are now accessible through GeoPlatform web services, a 30% improvement over the previous year.
- The National Geospatial Advisory Committee (NGAC) continued its role in providing constructive and actionable advice and recommendations on key geospatial topics to the FGDC agencies. In 2018, the NGAC developed products addressing geospatial support for infrastructure investments, recommendations for future Landsat missions, the feasibility of using data cubes for forecasting, and geospatial data as a service. The NGAC also provided ongoing feedback on the GeoPlatform, the NSDI strategic planning process, cultural and historical geospatial resources, and other key issues.
- The FGDC launched an exciting new internship program in 2018, the GeoPathways Initiative, to attract and prepare the future workforce for geospatial careers. During the year, a diverse group of 20 interns from 18 universities participated in the workforce development program, supporting national and international mission needs of FGDC agencies.
- The FGDC partnered with the Open Geospatial Consortium to launch a 5-year initiative to advance the use of geospatial services for disasters.

Looking forward, fiscal year 2019 will be a significant year for the FGDC. With the passage of the landmark Geospatial Data Act of 2018 (GDA), FGDC agencies will take on greater roles and responsibilities in advancing and coordinating the development of geospatial data and services nationwide and in ensuring their alignment with the broader Federal Data Strategy. The GDA includes new responsibilities and processes and will change the way that we manage geospatial programs across the Government. We are committed to working collaboratively to implement the GDA in an effective manner. We look forward to working with FGDC agencies and partners on this important new legislation and to supporting our shared interest in advancing the NSDI.

Sincerely yours,

Dr. Timothy Petty
FGDC Chair
Assistant Secretary for Water and Science
U.S. Department of the Interior

Doug D. Nebert NSDI Champion of the Year Award



Doug D. Nebert

In 2014, the FGDC announced the establishment of the Doug D. Nebert National Spatial Data Infrastructure (NSDI) Champion of the Year Award in honor of a respected colleague, technical visionary, and recognized national and international leader in the establishment of spatial data infrastructures.

The vision of the NSDI is to assure that spatial data from multiple sources—Federal, State, Tribal, regional, and local governments, academia, and the private sector—are available and easily integrated to enhance the understanding of our physical and cultural world. Each year, the award is announced in the FGDC Annual Report and presented to an individual or team representing Federal, State, Tribal, regional, and (or) local governments, academia, or nonprofit and professional organizations for development of an innovative and operational geospatial tool, application, or service capability used by multiple organizations.

Congratulations to our colleagues at the Bureau of Ocean Energy Management (BOEM) and the National Oceanic and Atmospheric Administration (NOAA) for receiving the 2017 Doug D. Nebert National Spatial Data Infrastructure (NSDI) Champion of the Year Award for MarineCadastr.gov. The Award was presented at the FGDC Steering Committee Ceremony on July 26, 2018.

Ivan DeLoatch, Executive Director of the FGDC, presented the award to Christine Taylor of BOEM's Office of Strategic Resources and David Stein and Mark Finkbeiner of NOAA's Office for Coastal Management, who accepted the award on behalf of the 16-person team. "We appreciate the leadership of both BOEM and NOAA in exhibiting exemplary values in managing geospatial data and technology for MarineCadastr.gov, an amazing GIS [geographic information system] mapping system for ocean uses," DeLoatch said.

MarineCadastr.gov provides "an ocean of information" and epitomizes the NSDI in its use of FGDC-endorsed standards, metadata guidelines, and adoption and delivery of National Geospatial Data Asset (NGDA) Themes and more than a dozen NGDA Datasets.



Bureau of Ocean Energy Management (BOEM) and National Oceanic and Atmospheric Administration (NOAA) team members receive the 2017 Doug D. Nebert National Spatial Infrastructure Champion of the Year award for exemplary management of MarineCadastr.gov. Coleads Christine Taylor (BOEM, center) and David Stein and Mark Finkbeiner (NOAA, center) accepted the award from FGDC Executive Director Ivan DeLoatch (left) and U.S. Department of the Interior Assistant Secretary for Water and Science Tim Petty (second from left). Photograph by Marjorie Weisskohl, BOEM.



Christine Taylor accepts the Doug D. Nebert National Spatial Data Infrastructure Champion of the Year award from FGDC Executive Director Ivan DeLoatch on behalf of the Bureau of Ocean Energy Management (BOEM) team. Photograph by Marjorie Weisskohl, BOEM.

In 2018, [MarineCadastre.gov](https://marinecadastre.gov) was also recognized by the President in a new executive order on ocean policy, which noted that the system can assist in implementing the policy set forth by the executive order to advance the economic, security, and environmental interests of the United States.

The FGDC has initiated the process for selecting the 2018 recipient of the award and will announce the decision in the 2019 FGDC Annual Report.



David Stein, National Oceanic and Atmospheric Administration (NOAA), accepts the Doug D. Nebert National Spatial Infrastructure Champion of the Year award from FGDC Executive Director Ivan DeLoatch on behalf of the NOAA team. Photograph by Marjorie Weisskohl, Bureau of Ocean Energy Management

Highlights for Fiscal Year 2018

2018 National Spatial Data Infrastructure Strategic Planning.

In fiscal year (FY) 2018, the FGDC initiated a collaborative planning process to develop a new strategic plan for the National Spatial Data Infrastructure (NSDI). The planning process builds upon the 2017 NSDI Strategic Framework, which was developed as a transitional document for the new Administration. The NSDI Strategic Plan is also being developed to align with the goals and objectives of the Federal Data Strategy, which is a key component of the President's Management Agenda. For more information, *see page 2*.

Geospatial Platform. The FGDC continued to advance [GeoPlatform.gov](https://www.fgdc.gov/geoplatform) as the premier gateway to the Nation's geospatial ecosystem. Enhancements included implementation of a new search feature and launch of the GeoPlatform application programming interface (API) to connect and bridge government and vendor resources to enable on-demand access to the Nation's vast and diverse geospatial ecosystem. For more information, *see page 2*.

FGDC Disaster Initiative. The FGDC partnered with the Open Geospatial Consortium (OGC) to launch a 5-year initiative to advance the use of geospatial services for disasters. For more information, *see page 4*.

GeoPathways Initiative. The FGDC Office of the Secretariat (FGDC OS) launched the GeoPathways internship program to attract and prepare the future workforce for geospatial careers. In 2018, a diverse group of 20 interns from 18 universities participated in the workforce development program, supporting national and international mission needs of FGDC agencies. For more information, *see page 6*.

Advancing National Geospatial Data Asset (NGDA) Portfolio Management.

To advance Federal geospatial information portfolio management per Office of Management and Budget (OMB) Circular A-16 and the Circular A-16 Supplemental Guidance and to increase data management efficiency, data quality, accountability, discovery, and usability, the FGDC OS accomplished many strategic actions. After the second NGDA Dataset Lifecycle Maturity Assessment (LMA), associated Dataset and Theme Summary Reports were completed for all 176 NGDA Datasets across 17 Themes, and the supporting GeoPlatform LMA dashboard results were published. Also, significant progress was made in data service availability through extensive interaction with Dataset Managers and Theme Leads. More than 60% of the NGDA Datasets are now live and accessible through GeoPlatform web services, a 30% improvement over the previous year. For more information, *see page 6*.

National Geospatial Advisory Committee (NGAC). The NGAC was established by the U.S. Department of the Interior (DOI) to provide external advice and recommendations to the FGDC. During the past year, the NGAC has provided feedback and recommendations on issues including geospatial support for infrastructure investments, future Landsat missions, the feasibility of using Landsat data cubes for forecasting, and geospatial data as a service, as well as a set of use cases describing the utility of geospatial information for infrastructure. In FY 2019, the NGAC will continue to provide advice and feedback on key geospatial topics, including the development and implementation of the new

NSDI Strategic Plan, the continued development of the Geospatial Platform, the Landsat program, and key geospatial issues such as infrastructure development and data as services. For more information, *see page 11*.

International Activities. The FGDC participates in international activities to advance the NSDI and promote spatial data infrastructures globally. This year, the FGDC provided leadership and support in advancing open data in the Americas, Kazakhstan, and Vietnam. For more information, *see page 12*.

Fiscal Year 2018 Accomplishments

2018 NSDI Strategic Planning

In FY 2018, the FGDC initiated a collaborative planning process to develop a new strategic plan for the NSDI. The planning process builds upon the 2017 NSDI Strategic Framework, which was developed as a transitional document for the new Administration.

The NSDI Strategic Framework described a broad national approach for the continued sustainable development of the NSDI, including goals and objectives for the Federal Government's role, as well as strategies and actions for the greater geospatial community to work collaboratively on national issues. The framework was developed with input from a variety of sources, including FGDC member agencies and geospatial partner organizations. The NGAC played a critical role in the development of the framework by providing extensive input through working groups, subcommittee reports, and comments.

In 2018, the FGDC established an interagency core team to begin the process of revising the framework and developing the next full version of the NSDI Strategic Plan. The core team held planning sessions with senior FGDC agency officials and had collaborative discussions at a series of FGDC Steering Committee, Executive Committee, Coordination Group, and NGAC meetings. The discussions with the NGAC included the following:

- Review of and dialogue regarding the vision for the NSDI.
- Feedback and advice concerning the GeoPlatform.
- Discussion of potential goals and objectives for the new NSDI Strategic Plan.

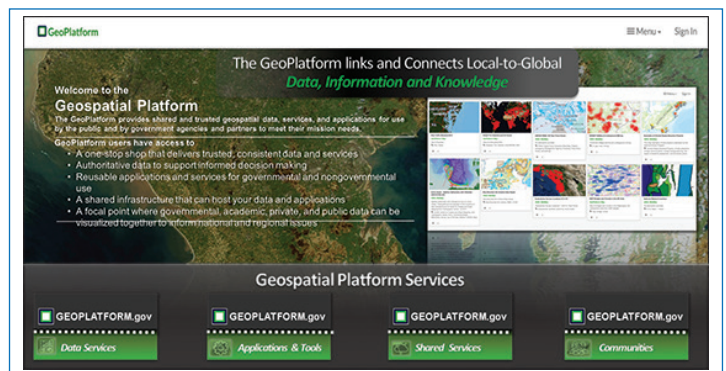
The passage of the Geospatial Data Act of 2018 (GDA) formalized the requirement for an NSDI Strategic Plan and established a set of new responsibilities for the FGDC and FGDC member agencies. The planning activities completed during 2018 provide an excellent foundation for the development of the NSDI Strategic Plan described in the GDA. The FGDC, working with partners, will adapt the work that has been completed to date and finalize the new strategic plan, consistent with the requirements of the act.

FGDC leadership will align the NSDI strategic planning process with the President's Management Agenda and the Federal Data Strategy, developing common goals and implementation approaches to address national priorities.

National Geospatial Platform

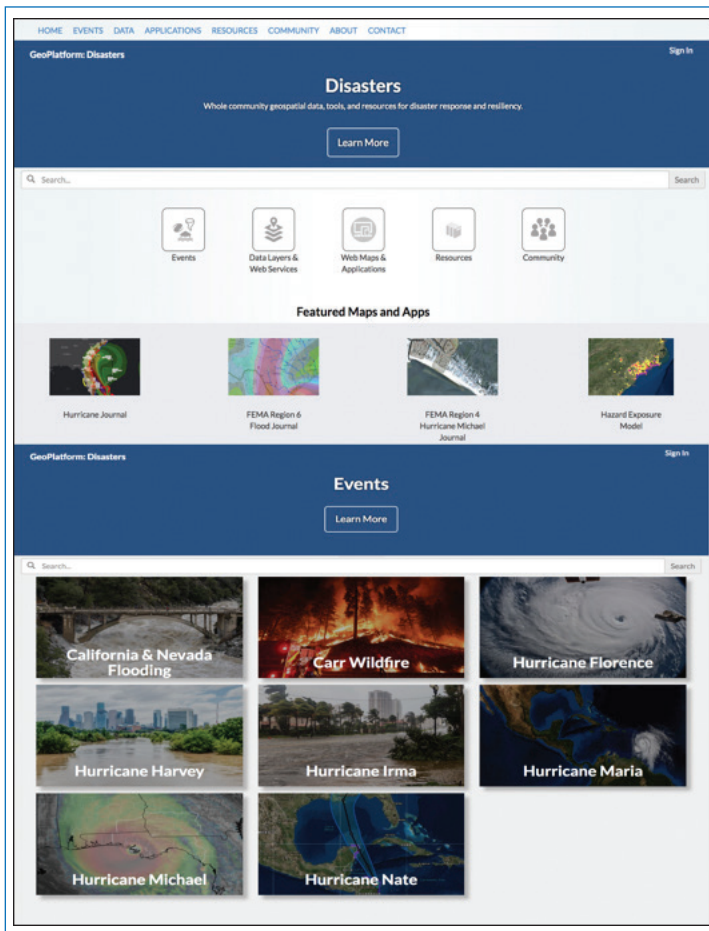


The National Geospatial Platform ([GeoPlatform.gov](https://geoplatform.gov)) is the FGDC's shared solution that couples information visualization tools with a data access and discovery engine integrated with data.gov. [GeoPlatform.gov](https://geoplatform.gov) provides a shared online environment where communities of interest can meet virtually to share and aggregate local-to-international data into information products to understand and address important issues. The National Geospatial Platform Initiative is driving towards a more seamless, system-of-systems experience for users who wish to quickly find and exploit geospatial assets, drawing upon the Nation's vast and diverse geospatial ecosystem.







[GeoPlatform.gov](https://geoplatform.gov) continued to improve its means for stakeholders to better manage their diverse portfolios through enhanced data, metadata, and services lifecycle management, supporting improved transparency, cost efficiencies, and open-data sharing. This interagency initiative supports the implementation of OMB's Circular A-16 Supplemental Guidance, which directs Federal agencies to manage their NGDA as a single portfolio for use across Federal agencies, their partners, and the public, while making it available through [GeoPlatform.gov](https://geoplatform.gov).

The following major [GeoPlatform.gov](https://geoplatform.gov) developments were released during FY 2018. These efforts focused on enhancing productivity and mission effectiveness while streamlining operational efficiencies:



- **Unleashing Data and Services—Connecting the Nation’s Geospatial Resources.** Launched **Enterprise Search** and the **GeoPlatform API** to connect and bridge government and vendor resources, enabling on-demand access to the Nation’s vast and diverse geospatial ecosystem. Developers and practitioners can discover and seamlessly access datasets, map layers, map services, maps, applications, and other hosted services to generate products or seamlessly share information for their mission. Support for more types of open standards services was added to **Map Manager** and **Map Viewer**, as well as a feature that supports point data aggregation.
- **Digital Communities—Enabling National Collaboration.** Developed and implemented an enhanced digital communities resource that provides an expansive catalog of new plugins, widgets, and APIs to enhance collaboration, workflow, and utility of data and integrate business process support. Several new communities were launched in 2018 to support mission needs for imagery, disaster resilience, the National Address Database (NAD), GeoPathways students’ projects, and the Group on Earth Observations (GEO).
- **Improving Stewardship—Making Data Actionable.** Implemented new features that enhanced portfolio management, standards compliance, health and status analytics, and other performance indicators through enhancements to portfolio tools and dashboards. The initial version of the **Resource Performance Module**, a tool that presents data on site, tool, and services use, was released to identify high-interest assets, as well as data and lifecycle elements that require improvement, completion, or updates.
- **Shared Infrastructure—High Performing Digital Infrastructure for Mission Delivery.** Continued refinements that streamlined operations and enhanced the reliability and robustness of mission services and made improvements to the identity management systems.

 Data Services	 Applications & Tools	 Communities	 Shared Services
Delivers <i>trusted, nationally consistent, authoritative, geographically enriched social, economic, environmental, and other data.</i>	Provides a suite of <i>applications and tools</i> for integrating, synthesizing, <i>analyzing, problem-solving, and visualizing</i> geographically enriched data.	Provides <i>collaborative tools and social resources</i> to advance the use of geospatial resources by <i>communities to achieve measurable results.</i>	A shared hosting infrastructure that allows agencies to <i>publish their geospatial data, applications, and tools</i> in a <i>secure cloud-computing</i> environment.

Advancing Disaster Spatial Data Infrastructures

In 2018, the FGDC partnered with the OGC to advance the use of geospatial services for disasters. Geospatial information has been proven effective in supporting both the understanding of and response to disasters. However, the ability to effectively share, use, and reuse geospatial information and applications across and between governments and nongovernmental organizations in support of disaster response and resilience is dependent upon having the required partnerships, policies, standards, architecture, and technologies already in place when disaster strikes.

Are we taking full advantage of geospatial services for resilient communities?



Making Data Actionable for Disasters

In partnership with the OGC, the FGDC, the U.S. Department of Homeland Security (DHS), and the U.S. Geological Survey (USGS) initiated a concept development study to gather information from national and global stakeholders through surveys, workshops, and interviews. The FGDC participated in national and international conferences and engaged a variety of disasters committees, executives, and stakeholders to encourage participation. The FGDC coled two well-attended workshops with more than 200 representatives from over 80 organizations, including Federal, State, local, academic, commercial, international, and other nongovernmental organizations. The resulting study identified key challenges, gaps, needs, lessons learned, best practices, and other information critical for crafting a strategy to advance the use of geospatial data and services in disaster response, including the following:

2018

Concept Development Study

Assessed the current state of geospatial readiness in disaster planning, response, and recovery.



- The **lack of an integrated policy and operational framework** to facilitate rapid acceptance, qualification, ingestion, and use of relevant geospatial information from a range of government and commercial providers and citizens.
- The **inability with existing metadata approaches to quickly discover and understand which information sources are most useful** in the context of a user's need, especially for first responders.
- The **inability to properly fuse and synthesize multiple data sources** locally to derive the knowledge necessary for rapid disaster-response decisions.
- The **need for a persistent platform to organize and manage disaster-related geospatial information and tools** necessary for collaborating organizations to address the full disaster lifecycle—preparedness, response, and recovery.

OPEN GEOSPATIAL CONSORTIUM (OGC)

REPORT: Analysis of RFI Responses
OGC Disasters Interoperability Concept Development Study



release: September 30, 2018

The Open Geospatial Consortium (OGC)

35 Main Street, Suite 5 Wayland, MA 01778 Telephone: +1-508-655-5858

2019-2023 Disaster Pilots

Connect communities, educate stakeholders, address gaps and needs, and conduct demonstration pilots

Over the next 5 years, the FGDC and other collaborators will engage the disasters community to address elements of the concept development study through workshops, pilots, and other initiatives. We will demonstrate how data standards help stakeholders and decision makers gain new and beneficial perspectives into social, economic, and environmental issues related to disasters by providing access to the vast online geospatial ecosystem of resources that improve the sharing, use, and integration of information tied to locations across the globe.



Strengthen Partnerships	Increase and strengthen current partnerships and expand partnerships with additional stakeholders
Outreach & Education	Create awareness of the data and services stakeholders provide to support disaster preparedness/resilience
Address Needs and Gaps	Improve understanding of community needs and close gaps in data, tools, services, skills and other barriers to using stakeholder and other institutional related services for disasters
Usability Pilots	Engage a broad community of users through interviews, workshop, and pilots to use stakeholder data and services and provide stakeholder feedback on additional needs



GeoPathways—Developing the Future Workforce for Geospatial Careers

The FGDC OS launched the GeoPathways internship program to attract and prepare the future workforce for geospatial careers. Highlights for 2018 include the following:

- The FGDC engaged stakeholders on workforce needs to inform development of the GeoPathways internship program and developed a coalition of internal and external collaborators to provide work-based learning, mentoring, and networking opportunities to develop geospatial skills for participants.
- The FGDC pursued strategic recruiting strategies to attract interns for participation through the State Department's Volunteer Student Federal Service program.
- A diverse group of 20 interns from 18 universities participated in the program, which responded to administration priorities, mission needs of participating agencies, and workforce diversity objectives.
- The students supported 15 projects that included communication efforts, workshops, and development of prototypical tools to analyze infrastructure, ecosystems, disaster planning, land use, water availability, and a variety of other national and international initiatives.

Advancing National Geospatial Data Asset (NGDA) Portfolio Management

THE FEDERAL GEOSPATIAL DATA COMMITTEE'S
NOTABLE SUCCESSES IMPLEMENTING PORTFOLIO
MANAGEMENT PROCESSES FOR FEDERAL
GEOSPATIAL DATA ASSETS AND INVESTMENTS
HELPED AGENCIES TO MORE EFFICIENTLY
SUPPORT THEIR MISSION AND PRIORITIES.

2018 President's Management Agenda

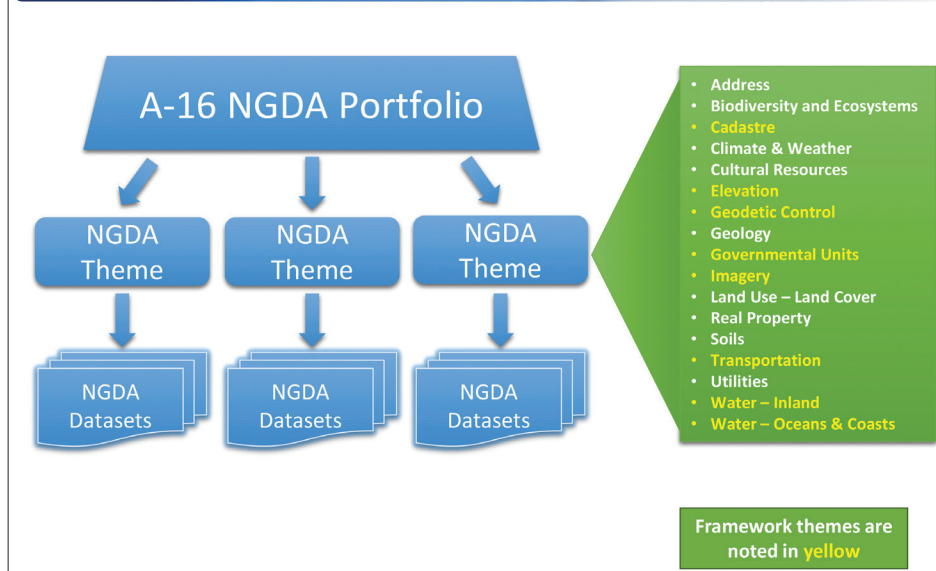
As described in the 2018 President's Management Agenda, "the Administration is building a Federal Data Strategy to leverage data as a strategic asset to grow the economy, increase the effectiveness of the Federal Government, facilitate oversight, and promote transparency." One of the key components of the Federal Data Strategy outlined in the Agenda is Enterprise Data Governance, which establishes priorities for managing Federal Government data as a strategic asset. The governance strategy will build on the FGDC's "notable successes implementing portfolio management processes for Federal geospatial data assets and investments," which in turn "helped agencies to more efficiently support their mission and priorities."

The OMB Circular A-16 Supplemental Guidance directs Federal agencies to implement and use a portfolio management approach to ensure NGDAs are managed by officially designated agencies, on behalf of all users, as national capital assets. Portfolio management is described "as 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 the 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."

The NGDA Portfolio, like the NGDAs within the portfolio, continues to evolve to meet business and mission requirements as set forth by the President's Management Agenda and the evolving NSDI Strategic Plan. Priorities and activities that will enhance future NGDA Portfolio management include continually updating NGDA Theme communities to create a robust collaborative environment that works across agency silos; engaging NGDA Lead Agencies, Theme Leads, and Dataset Managers to improve and expand NGDA metadata; providing links to persistent



NGDA Themes and Structure



The LMA revealed a majority of NGDA Datasets are actively maintained and are undergoing regular enhancements, revisions, and updates. These actions range from initial data creation to the creation of web services and data download capabilities. The assessments provide transparency into the contents, coverage, and health of the data. They also provide a method for identifying where new data or additional investments in existing data effectively and efficiently support the priorities of the Nation and missions of the agencies and their Federal and non-Federal partners. The results are organized and visualized in the LMA Dashboard. The 2017 NGDA Dataset and Theme Summary Reports, which have been approved by the FGDC, were published in 2018, and the LMA Analysis and Recommendations and Portfolio Summary Reports are under review.

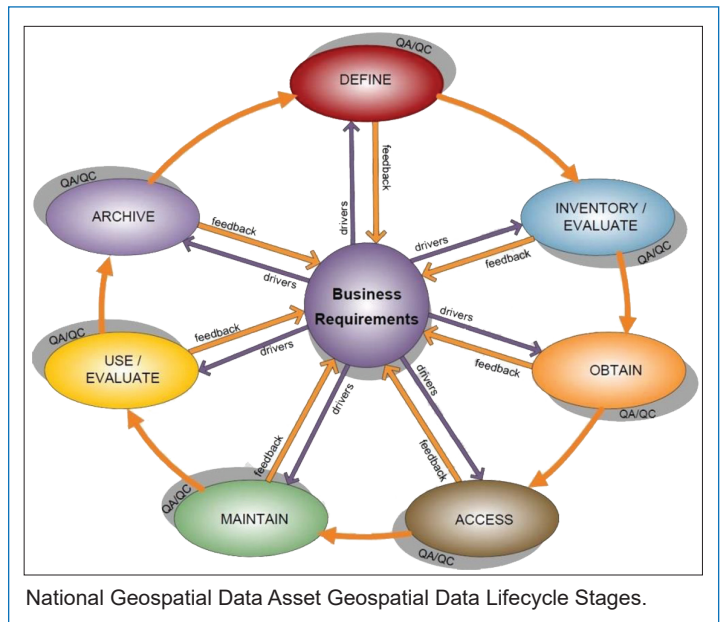
web services and data download capabilities that enable discovery of, and access to, the NGDA Datasets; and encouraging the transition to International Organization for Standardization (ISO) metadata standards. A full list of the NGDA Themes and Datasets is available on the FGDC NGDA Datasets web page (fgdc.gov/ngda-reports/NGDA_Datasets.html).

NGDA Portfolio Changes

Several Executive Theme Champions, Theme Leads, and Dataset Managers have changed. For a current list of NGDA points of contact, see fgdc.gov/what-we-do/manage-federal-geospatial-resources/a-16-portfolio-management/index.html.

Lifecycle Maturity Assessment

To support NGDA Portfolio management, the OMB Circular A-16 Supplemental Guidance requires that NGDA Dataset Managers regularly assess the maturity of their datasets based on the geospatial data lifecycle ["OMB Circular A-16 (Revised)," Sections 8(e)(d), 8(e)(f), and 8(e)(g)]. The NGDA LMA is designed to be a recurring process that takes into account changing business requirements and supports the second goal of the *NSDI*: enhance the management of Federal geospatial assets. These periodic assessments provide insight into maturity trends. The maturity level is not a grade; it is a continuous evolution indicating how the NGDA Dataset is meeting changing business requirements. The 2017 LMA was completed for all 176 NGDA Datasets, which represents 100-percent completion for the NGDA Portfolio.



Theme Strategic and Implementation Plans

Each NGDA Theme has a high-level Theme Strategic Plan developed by the Federal agencies with Theme leadership roles to guide the Theme's development and management. These 5-year plans describe the goals and objectives for the Themes and are assessed annually and updated as needed for significant changes. In FY 2018, 70% of the

Themes completed full Implementation Plans, and all 17 Themes provided an extracted Implementation Plan table to report progress on each Theme Strategic Plan's goals and objectives. Initial versions of the 2017 LMA Analysis and Recommendations and Portfolio Summary Reports were drafted with finalization targeted in early 2019. The NGDA Portfolio continues to improve data discovery, access, and usability. These accomplishments represent significant coordination and work, and they improve the quality and usability of federally managed data assets, a key part of the NSDI.

NGDA Metadata and Web Services

The NGDA metadata and web services project was launched in 2016 after the 2015 LMA results indicated that NGDA Datasets had very limited web services available. The goal of this project is to provide reliable web services embedded within quality metadata to improve discoverability and access to the NGDA Datasets and enhance the GeoPlatform experience. As part of this ongoing project, the NGDA Metadata Guidelines were updated again this year. These guidelines help metadata creators describe their web services and data download links in a consistent format using metadata standards such as ISO 19115-1. See the “Metadata Working Group” section (*page 29*) for additional insights into work done to optimize the value and use of metadata.

In 2016, 41 of the 176 NGDA Datasets reported having web services. In 2018, 110 of the 176 NGDA Datasets reported having web services. This represents an approximately 40-percent increase in NGDA Datasets with web services, and over 60% of the NGDA Portfolio now has web services. Efforts will continue to support enhanced access to NGDA Datasets through web services as well as improving the quality of metadata for enhanced discoverability. The delivery of NGDA metadata and available data and map services is through the GeoPlatform (GeoPlatform.gov).

NGDA Collaboration and A–16 NGDA Theme Communities

The NGDA Community Sites within GeoPlatform.gov are being upgraded to support delivery of consistent information to the public and the FGDC community regarding initiatives and activities that support implementation of OMB Circular A–16 requirements, the NGDA Portfolio, Theme and Dataset goals, and collaboration across the FGDC OS, NGDA agencies, subcommittees, and working groups. These collaborative environments will facilitate “routine processes that identify priorities, improve coordination, and promote maturity over time” for lead agencies, personnel, and working groups managing and supporting the NGDA's Themes and Datasets on behalf of the Nation, which directly supports the President's Management Agenda goal to “build agile organizations and processes to quickly respond



and align to changing mission needs, innovations, and technological advancements.”

NGDA Theme Activities

The A–16 NGDA Portfolio is organized by NGDA Themes made up of one or more associated NGDA Datasets. NGDA Datasets support the critical business and mission requirements of the Federal Government, as well as its partners and stakeholders. Currently, 17 NGDA Themes and 176 NGDA Datasets make up the portfolio; a full list is available on the A–16 NGDA Theme Community website (geoplatform.gov/communities/#ngda_communities). The NGDA Themes are managed by Theme Leads who provide cross-agency leadership and coordination. The NGDA Datasets are managed by Dataset Managers who provide coordination for the NGDA Datasets at a national level.

In FY 2018, the NGDA Theme Leads and Dataset Managers worked together to accomplish several activities within each Theme.

Address Theme.—The FGDC approved the creation of the Address Theme in 2016 to support a collaborative national effort for developing and curating geospatial address data. The co-Theme leads are the U.S. Department of Transportation (USDOT) and the U.S. Census Bureau. The 2018 accomplishments include the following:

- Made the National Address Database (NAD) available on the FGDC GeoPlatform;
- Continued monthly Address Subcommittee meetings;
- Established the NAD Content Subgroup of the Address Subcommittee; and
- Continued the Address Subcommittee Workflow Subgroup meetings.

The Address Theme Strategic Plan is in development. The Address Theme team and the DOI laid groundwork for a pilot to use the GeoPlatform as a collaboration site for the

NAD. The goals of the project involve data and service delivery and data production.

Address Theme representatives raised awareness of the NAD with the OMB through participation in the White House Roundtable on Leveraging Data as a Strategic Asset. Leveraging Federal data is a Cross-Agency Priority Goal of the President's Management Agenda. As a result of the roundtable event, the NAD was cited in the Federal Data Strategy draft as a use case for the Data Incubator Project.

Additional outreach activities focused on presentations and briefings on the Address Theme and the NAD at various conferences, professional events, and FGDC-related meetings, including the 2018 annual GIS for Transportation Symposium, the National States Geographic Information Council (NSGIC) annual and midyear events, the Coalition of Geospatial Organizations meeting during the 2018 Environmental Systems Research Institute (Esri) User Conference, and NGAC quarterly meetings.

Biodiversity and Ecosystems Theme.—Three USGS datasets were renamed to provide more accurate descriptions:

- The U.S. Geological Survey Gap Analysis Program Species Distribution Models dataset was renamed U.S. Geological Survey - Gap Analysis Project Species Habitat Maps CONUS_2001.
- The U.S. Geological Survey Gap Analysis Program Species Ranges dataset was renamed U.S. Geological Survey - Gap Analysis Project Species Range Maps CONUS_2001.
- The Terrestrial Ecosystems of the Conterminous United States dataset was renamed USGS National Potential Ecosystems.

The USGS anticipates nominating the GAP/LANDFIRE National Terrestrial Ecosystems 2011 dataset as an NGDA. The dataset is available for download at gapanalysis.usgs.gov/gaplandcover/data/download/, and web services are available at gapanalysis.usgs.gov/data/web-services/.

Theme Leads and Dataset Managers are continuing work to complete updates to finalize the Theme Implementation Plan.

Cadastral Theme.—This year, the Cadastral Theme focused on goals in the following areas: cadastral reference, land management agency coordination, and coordination and education. For the cadastral reference objectives, improvements to the Public Land Survey System (PLSS) focused on new surveys, Tribal areas, and additional control. Land management agency coordination accomplishments included increased engagement with

the Federal Lands Working Group (FLWG) and a new Memorandum of Understanding (MOU) between the States of Wyoming and Nebraska for data maintenance that expanded the use and application of PLSS and parcel-level data into land surveyor, mineral and energy, conservation, and resource management areas. Coordination and education activities included outreach with story maps and expanded use of cadastral data supporting decision making in the Bureau of Land Management (BLM) and other Federal agencies, which was indicated by increased data use by multiple resource programs.

Cultural Resources Theme.—Joy Beasley (National Park Service, Acting Associate Director for Cultural Resources, Partnerships, and Science) was selected as the new Executive Champion for the Theme. The Dataset Managers completed the work on 2017 LMA Reports for their NGDA Datasets, showing development since the 2015 assessment. A working draft was finalized for a spatial data transfer standard containing feature-level metadata fields, domain values, and a data structure. A guideline document draft describing the need for the standards, their content, and an implementation plan is in review.

Elevation Theme.—The Elevation Theme has adopted a vision of the United States as a 3D Nation, where contributions are made to make communities more resilient and the U.S. economy more competitive by working to build a modern, accurate elevation foundation from our highest mountains to our deepest oceans. Critical decisions that depend on elevation data are made across our Nation every day, ranging from immediate safety of life and property concerns to long-term planning for infrastructure projects. The quality and timeliness of these decisions depend upon actionable information supported by accurate elevation data. The 12 NGDAs of the Elevation Theme are managed by the USGS on behalf of the 3D Elevation Program (3DEP) member agencies, the NOAA on behalf of the Interagency Working Group on Ocean and Coastal Mapping (IWG-OCM) member agencies, and the Federal Emergency Mapping Agency (FEMA) Flood Map Service Center. Strong coordination across all agencies assures wise investments in data programs to serve Federal, State, and other national needs.

Geodetic Control Theme.—The Theme Strategic Plan was updated and web services were completed for the four NGDAs within the Theme. Over 20 years of data from thousands of Global Positioning System stations in the Continuously Operating Reference Station Network was reprocessed to provide improved and updated positioning. Airborne gravity collection is at 72%, and data are being shared with the National Geospatial-Intelligence Agency (NGA) to aid in the development of the Earth Gravitational Model for global use in 2020.

Governmental Units, and Administrative and Statistical Boundaries Theme.—In 2018, the geographic update programs, working groups, and subcommittee activities maintained the 39 NGDAs of the Governmental Units, and Administrative and Statistical Boundaries Theme (reduced from 40 NGDAs in 2017 due to a consolidation of two BLM datasets into one dataset—BLM Administrative Unit Boundary Polygons and Office Points). The NGDA Dataset Managers and agency representatives continued to provide consistent national boundaries with authoritative datasets, multiagency geodatabases, online tools, and web map services guided by current dataset-maturity reporting guidelines. Metadata updates maximized visibility of the datasets. Current activities and meetings of the National Boundaries Group, the Federal Lands Subgroup, and the Tribal Boundaries Subgroup are documented on the GeoPlatform’s Governmental Units Theme Community web page (communities.geoplatform.gov/ngda-govunits/). Direct links to the Governmental Units NGDAs from the Homeland Infrastructure Foundation-Level Data (HIFLD) open catalog were initiated in 2018 for the 115th Congressional District, 2010 Census Population & Housing Unit Counts, 2010 Census Urban Area, American Indian/Alaska Native/ Native Hawaiian (AIANNH) Homeland Areas, Metropolitan Statistical Area/Micropolitan Statistical Area (CBSA), County and Equivalent, and State and Equivalent datasets. The 2010 Census Population & Housing Unit Counts and CBSA datasets are new additions to the HIFLD Open Catalog.

By midyear 2018, the Census Bureau exceeded expectations with an 88-percent response rate for the Boundary and Annexation Survey. Approximately 40,000 Tribal, State, and local governments were invited to provide legal boundaries, names, and governmental status for geographic areas that are current, accurate, consistent, accessible, and integrated. Additional jurisdiction boundaries from the U.S. Environmental Protection Agency (EPA), BLM, the International Boundary Commission, and the International Boundary and Water Commission contribute to the diverse NGDA portfolio of the Governmental Units Theme.

Imagery Theme.—The NSDI Imagery Theme focuses on the dynamic imagery requirements across all levels of government for observing the planet at all scales throughout the year. Work progressed on nearly all objectives, and the Theme convened its first National Imagery Summit on September 20–21, 2018. This government-only event was attended by a broad cross section of more than 550 Federal, State, and local participants attending in person or by webinar. The purpose of the Summit was to facilitate enhanced community awareness of current land-imaging programs, discuss program gaps and challenges, and begin dialogue on the establishment of a land-imaging collection framework.

Real Property Theme.—The Real Property Theme Dataset Managers completed the LMA Reports for the Theme’s datasets. The General Services Administration (GSA) completed the Theme’s Strategic Plan and corresponding Implementation Plan, detailing the Theme’s goals, objectives, and actions. The GSA is making progress on the high-level goals, such as increasing coordination and outreach with other Themes, specifically the Address Theme and the NAD initiative. The GSA has continued to improve the collection of geolocation data for the Federal Real Property Profile through data validation and standardization with the Geographic Names Information System.

Soils Theme.—The U.S. Department of Agriculture (USDA)—Natural Resources Conservation Service ((NRCS) Soil Survey Geographic (SSURGO) database was updated 1 year ago for FY 2018 and is available on the NRCS Web Soil Survey web page at websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

The SSURGO database is the most detailed soil inventory offered through the NRCS and was accessed more than 2.5 million times during FY 2018. A raster version of the SSURGO database called gSSURGO (gridded SSURGO) is now available in 10-meter and 30-meter resolution through the USDA Geospatial Data Gateway (datagateway.nrcs.usda.gov/).

Transportation Theme.—The Transportation Theme made several significant accomplishments in FY 2018, including continued progress for the Intermodal Freight Facility database and the Transit data layer. The first phase of the Intermodal database focused on rail intermodal terminals for Trailer-On-Flatcar and Container-On-Flatcar transportation and airport terminals that serve air and truck connections. As part of the National Transit Map Initiative, the Transit layer was published in the April and September collection cycles. Each collection cycle improves upon the retrieval, compilation, storage, and publication processes. In FY 2018, special attention was given to developing the stop-times data, which will enable the transportation community to identify stop types and study the frequency of service.

Water-Inland Theme.—The USGS produced National Hydrography Dataset Plus High Resolution (NHDPlus HR) datasets in Beta version for over one-fourth of the Nation, bringing the nationwide total to nearly 70%. As of August 23, 2018, wetlands data for over 24 million acres were contributed to the U.S. Fish and Wildlife Service (FWS) National Wetlands Inventory by eight Federal, State, and local agencies. The U.S. Army Corps of Engineers (USACE) is collecting data from State and Federal agencies to update the National Inventory of Dams database. The National Levee Database website was updated and migrated to the GeoPlatform.

Water-Oceans and Coasts Theme.—The Water-Oceans and Coasts (W-O&C) Theme completed all A-16 NGDA Portfolio management requirements during FY 2018. The W-O&C Theme is currently operating under its Strategic Plan, and in 2018, the Theme submitted and received final approval for its Theme Implementation Plan. The Theme underwent a leadership change and continued to work towards increasing awareness and visibility of the NGDAs in the Theme.

Standards

The FGDC provided leadership in the development of national and international standards by chairing the International Committee for Information Technology Standards (INCITS) GIS Technical Committee (INCITS L1) and represented the United States in ISO Technical Committee 211 (ISO/TC 211).

The FGDC members continued participation and leadership in INCITS L1 activities that support the development of ISO/TC 211 standards processes, including participation in two of the six working groups. Eight of the INCITS L1 members are standards-development project leads. Additionally, INCITS L1 members are leading 4 of the 12 advisory/maintenance/ad hoc working groups.

Metadata Serves as Foundation for Geospatial Data Management

Metadata standards facilitate development, sharing, and use of geospatial data and services. The FGDC adopts geospatial standards that support NSDI implementation and geospatial data management best practices. Federal agencies are required to use FGDC-endorsed standards, and non-Federal organizations are encouraged to use these standards to facilitate data sharing. As the fundamental component critical for data discovery and use, metadata continued to play a key role across FGDC-related initiatives.

ISO Standards for FGDC Endorsement

In FY 2018, the Metadata Working Group provided support to the FGDC standards programs and proposed the endorsement of two metadata-related standards. The FGDC Coordination Group voted to approve endorsement of the following two standards, and both are advancing through the FGDC review process to receive Steering Committee endorsement.

- **INCITS/ISO 19115-3:2016[2017], Geographic information—Metadata—Part 3: XML schema implementation for fundamental concepts** complements INCITS/ISO 19115-1:2014, Geographic information—Metadata—Part 1: Fundamentals, which

focuses on content and was previously endorsed by the FGDC. INCITS/ISO 19115-3:2016[2017] provides details on how ISO 19115-1:2014 should be implemented, such as the order of elements or if the elements are mandatory and (or) repeatable. Once INCITS/ISO 19115 Part 3 is fully endorsed, the FGDC will retain the FGDC Content Standard for Digital Geospatial Metadata (CSDGM) for ISO 19115:2003 and ISO 19139:2007 as legacy standards.

- **INCITS/ISO 19157-2:2016[2017], Geographic information—Data quality—Part 2: XML schema implementation** complements INCITS/ISO 19157:2013[2014], Geographic information—Data quality, which the FGDC previously endorsed. **INCITS/ISO 19157-2:2016[2017]** defines data quality encoding in Extensible Markup Language (XML) that provides insights for “fit for use” and “fit for purpose” decisions. The XML schema implementation is derived from INCITS/ISO 19157:2013[2014], and data quality-related concepts are from INCITS/ISO 19115-2:2009[R2014], Geographic information—Metadata—Part 2: Extensions for imagery and gridded data.

National Geospatial Advisory Committee

The National Geospatial Advisory Committee (NGAC) is a Federal Advisory Committee sponsored by the DOI to provide external advice and recommendations to the member agencies of the FGDC. The NGAC includes a balanced membership of 28 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 2018 activities include the following:

- Several important NGAC products were adopted in 2018, including papers on geospatial support for infrastructure investments, recommendations for future Landsat missions, the feasibility of Landsat data cubes for forecasting, geospatial data as a service, and a set of use cases describing the utility of geospatial information for infrastructure.
- The NGAC continued to provide feedback on the GeoPlatform and the development of the new NSDI Strategic Plan.
- The NGAC is also finalizing additional papers and use cases addressing geospatial technology and

National Geospatial Advisory Committee 2018 Membership

Ms. Julie Sweetkind-Singer, Stanford University (NGAC Chair)
Mr. Keith Masback, U.S. Geospatial Intelligence Foundation (NGAC Vice-Chair)
Dr. David Alexander, U.S. Department of Homeland Security
Mr. Frank Avila, National Geospatial-Intelligence Agency
Dr. Sarah Battersby, Tableau Software
Mr. Talbot Brooks, Delta State University
Mr. Gar Clarke, State of New Mexico
Mr. Gareth Couch, National Tribal Geographic Information Support Center
Ms. Patricia Cummins, Environmental Systems Research Institute (Esri)
Mr. Stuart Davis, State of Ohio
Mr. Matthew Gentile, Deloitte Financial Advisory Services, LLP
Mr. Frank Harjo, Muscogee (Creek) Nation
Mr. Xavier Irias, East Bay Municipal Utility District
Ms. Roberta Lenczowski, Roberta E. Lenczowski Consulting, LLC
Mr. Roger Mitchell, MDA Information Systems, Inc.
Ms. Rebecca Moore, Google, Inc.
Mr. Kevin Pomfret, Centre for Spatial Law and Policy
Dr. Laxmi Ramasubramanian, Hunter College, City University of New York
Dr. Carl Reed, Carl Reed and Associates, LLC
Ms. Amber Reynolds, City of Topeka, Kansas
Dr. Douglas Richardson, American Association of Geographers
Mr. Cy Smith, State of Oregon
Ms. Rebecca Somers, Somers-St. Claire GIS Management Consultants
Ms. Jennie Stapp, State of Montana
Dr. Harvey Thorleifson, Minnesota Geological Survey
Mr. Jason Warzinik, Boone County, Missouri
Dr. May Yuan, University of Texas at Dallas

infrastructure, data as services, cultural and historical geospatial resources, and cost sharing options for Landsat data.

In 2019, the NGAC will continue to provide advice and feedback on key geospatial topics, including the development and implementation of the new NSDI Strategic Plan, continued development of the Geospatial Platform, and the development of portfolio management approaches. The FGDC, in collaboration with NGAC leadership, will update NGAC policies and procedures to be consistent with the new requirements of the GDA. The NGAC is a key means for the FGDC to effectively collaborate, communicate, and engage with partners in the geospatial community. These multifaceted activities will be a major focus of the NGAC's work over the coming year.

Supporting International Activities

This year, the FGDC provided leadership and support in advancing open data sharing and interoperability standards for accessing, discovering, and utilizing geographic data, information, knowledge, technologies, and services. The FGDC actively participated with the intergovernmental Group on Earth Observations (GEO), the Global Spatial Data Infrastructure Association, and the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM).



Group on Earth Observations (GEO)

GEO: An intergovernmental body that promotes open Earth Observation data availability, access and use.

MISSION

GEO's mission is to connect the demand for sound and timely environmental information with the supply of data and information about the Earth.

Vision

To realize a future where decisions and actions, for the benefit of humankind, are informed by coordinated, comprehensive and sustained Earth observation information and services.

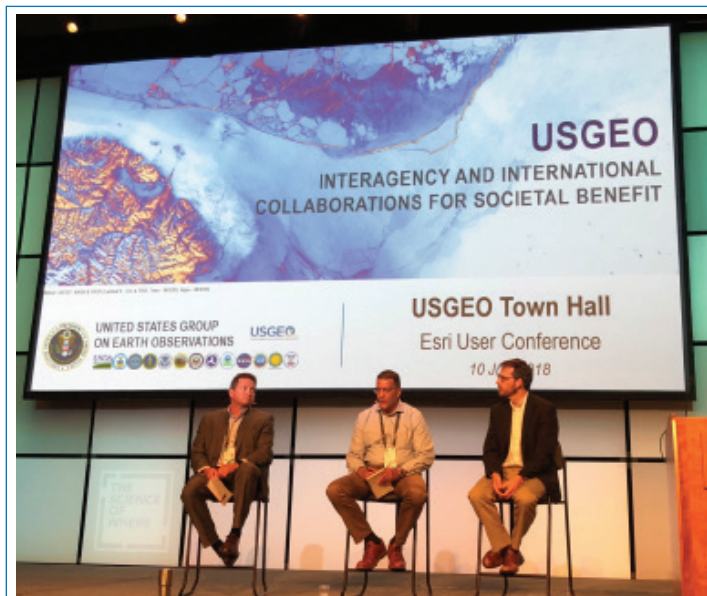
Together, the GEO community is creating a **Global Earth Observation System of Systems (GEOSS)** to better integrate observing systems and share data by connecting existing infrastructures using common standards.

Countries have borders
Earth Observations don't

The FGDC provided leadership and technical resources to support GEO efforts to make Earth observation assets available through the Global Earth Observations System of Systems (GEOSS.) The FGDC Executive Director served as cochair of the GEO Programme board, the GEOSS Evolve initiative, and the UN-GGIM Americas. These strategic partnerships and initiatives respond to specific challenges faced by nations by facilitating the use of geospatial data and developing knowledge-based tools and products to support decision makers.

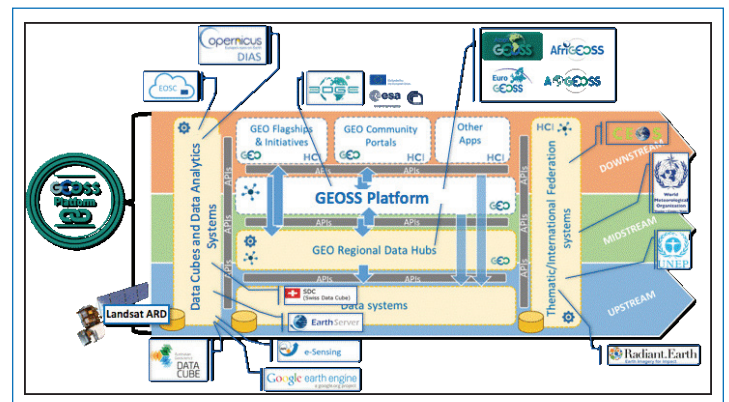
Key accomplishments include the following:

- The FGDC actively participated in the U.S. Group on Earth Observations (USGEO), a subcommittee of the Committee of the Environment, Natural Resources and Sustainability, with representatives from 16 Federal agencies and the Executive Office of the President. The USGEO continues to champion GEO's role in the coordination of Earth observation data for the good of all and enabling societal and economic benefits in the United States and across the world. Earth observations, including both remote sensing and in situ data provided through GEO collaborations, back multiple private and public sectors, help to drive scientific innovation, and support a robust science and technology infrastructure. The GEO products support many critical areas for national security, health, forecasts, and early warning systems for improved resilience to natural hazards. These products also support crucial economic sectors, such as agriculture, energy, new technologies, and medical innovation, thus providing the public, industry, academia, and the nonprofit sector with improved tools for economic vitality and societal well-being. The USGEO hosted an audience of approximately 200 national and international attendees at the Esri User Conference and responded to a variety of questions that pertained to developing the next National Plan for Civil Earth Observations, sustaining Landsat data as free and open, and advancing the use of analysis-ready data for decision making.



Tony LaVoi, FGDC Executive Committee Representative from the National Oceanic and Atmospheric Administration; Ivan DeLoatch, FGDC Executive Director; and Lawrence Friedl, National Aeronautics and Space Administration, U.S. Group on Earth Observations Cochair, at the 2018 Environmental Systems Research Institute (Esri) User Conference.

- The FGDC Executive Director served as cochair of the GEO Programme Board, providing leadership and support for the ongoing implementation of “GEO Strategic Plan 2016–2025: Implementing GEOSS” through multiyear GEO Work Programme tasks. The Programme Board worked to strengthen and emphasize delivery in response to the three priorities identified by GEO–XIII Plenary and the GEO Executive Committee: advancing the use of Earth observations to support the United Nations (UN) Sustainable Development Goals (SDGs) and respond to disasters and climate change. The Programme Board initiated the development of the 2020–2022 Work Programme and provided a set of recommendations to improve the understanding and implementation of the regional initiatives. The new Work Programme framework will improve overall coherence and alignment across activities, especially the Flagships; support resource prioritization; and foster collaboration and synergies towards achievement of GEO's strategic objectives and priorities.
- The GEOSS Common Infrastructure was transitioned to the GEOSS Platform to add new functionalities and extend capabilities to support community and thematic needs.
- The GEOSS Evolve conceptual architecture was developed and presented to the GEO community as the recommended next-generation capability to strengthen partnerships and improve data sharing and governance in the Earth observation community.
- The FGDC cosponsored and supported planning for the GEO Data Providers Workshop to advance open data sharing, demonstrate the use of Earth observation data, provide training, and develop actions to advance GEOSS. The event was heralded as a major success, having attracted the workshop's largest audience ever with over 97 speakers, 20 scientific sessions, 11 training sections, and 250 attendees representing 130 public agencies and organizations from five continents. GEOSS will evolve in the coming decade to provide data, information, and knowledge-based products and services that will play an essential role in helping communities understand



local-to-global implications, anticipate effects, prepare for changes, and reduce the risk associated with decision making in a changing environment.

Advancing Open Geospatial Data and Services in the Americas

The FGDC led the development of the AmeriGEOSS Community Platform, a pilot project that brings together social, economic, environmental, geospatial, and other data from the Americas. The platform increases regional capacity to acquire, share, store, maintain, and use Earth observation data. The FGDC worked with member nations to improve open data sharing through their national portals to mobilize resources into the platform and developed prototypes and use cases to respond to societal challenges.



As a result of advocacy from the United States, member nations have increased their open data sharing efforts, showing a marked increase in contributions—16 national open data portals, approximately 344,000 datasets, tools, applications, knowledge products, roughly 15,300 geospatial services, and other resources are provided through the AmeriGEOSS Platform. U.S. contributions to the global sharing of data are strengthened by the regional collaboration of the 16 countries in the Americas who support GEO’s vision through the AmeriGEOSS initiative.

Supporting Development of National Spatial Data Infrastructures

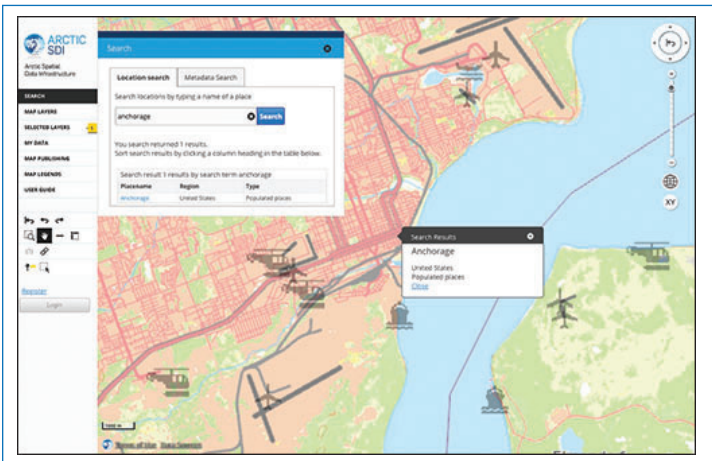
The FGDC OS participated in State Department- and USGS-sponsored engagements to strengthen U.S. collaboration and partnerships with Kazakhstan and Vietnam. The exchanges contributed to the signing of an MOU with Kazakhstan and supported efforts to establish a national spatial data infrastructure in Vietnam.

Arctic Spatial Data Infrastructure

The FGDC supported the international efforts of the Arctic Spatial Data Infrastructure (SDI), which provides an invaluable opportunity to increase international collaboration and strengthen relationships among the eight national mapping agencies of the Arctic Council member nations. On the basis of an MOU, the Arctic SDI initiative brings together geospatial experts and scientists in a voluntary cooperation between the eight national mapping agencies of the Arctic countries (Canada, Kingdom of Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States) in direct support of the priorities of the Arctic Council and other important stakeholders. Understanding and responding to the changing Arctic requires accessible and reliable data to facilitate monitoring, research, business development, public management, emergency preparedness, and decision making.

New services being delivered by the Arctic SDI agencies include the following:

- As reflected in the map legend in the image below, the Arctic SDI base map now uses a common cartographic specification agreed upon by the eight mapping agencies.
- A Pan-Arctic Gazetteer was implemented using web services from the mapping agencies.
- The Arctic SDI developed an agreement on a joint framework with the Arctic Regional Marine SDI Working Group (ARMSDIWG), which falls under the International Hydrographic Organization (IHO) and is chaired by the



NGA, to build on existing infrastructure and work towards an Arctic SDI that seamlessly brings land and water data together.

- The Arctic SDI and ARMSDIWG agreed to exploit opportunities in an OGC Marine SDI Concept Development Study, such as collaborating on a joint scenario covering land and water data.

Global Geospatial Information Management Working Group

The purpose of the FGDC Global Geospatial Information Management Working Group (GGIM WG) is to define the United States' position on national, regional, and global geospatial topics in support of the mission of the United Nations Committee of Experts on Global Geospatial Information Management (UN–GGIM). The GGIM WG provides technical expertise on geospatial topics for UN–GGIM meetings and conferences, UN–GGIM Expert and Working Groups, and the UN–GGIM Americas Regional Committee.

Eighth Session of the United Nations Committee of Experts on Global Geospatial Information Management

The FGDC GGIM WG represented the U.S. Delegation to the Eighth Session of the UN–GGIM held from July 30 to August 3, 2018, at the UN Headquarters. This session drew international geospatial experts and senior officials from national geospatial information and statistical organizations from 88 Member States and 2 non-Member States, totaling 445 participants. The United States welcomed Deirdre Bishop (Chief, Geography Division, Census Bureau) as the Head of Delegation for the Eighth Session, which focused on the following:

- The management of global geospatial information;
- Fundamental geospatial data themes;
- The integration of geospatial and statistical data;
- Marine geospatial information;
- The Arctic SDI;
- Land administration and management;
- Geodesy and global geodetic reference frame; and
- Legal and policy frameworks.

The U.S. Delegation prepared three interventions with approval from the State Department and the U.S. Mission to the UN. The first intervention supported the terms of reference for the UN–GGIM Subcommittee on Geodesy and its work in 2018 to develop the “Road Map for the Global Geodetic Frame for Sustainable Development Implementation Plan.”

In the second intervention, the United States endorsed the work of the Expert Group on the Integration of Statistical

and Geospatial Information towards the development of the five Global Statistical Geospatial Framework principles. The United States encourages the strengthening of national spatial data infrastructure capacities and use of a common platform to create, disseminate, and utilize geospatially enabled statistics.

The third U.S. intervention, supported by the UN–GGIM Marine Geospatial Information Working Group, recommended further collaboration with the Expert Group on Land Administration and Management and endorsed the IHO's standards for nautical charting. The presentation resulted in a general endorsement of the working group's 22-year work plan and three new working group members—Canada, New Zealand, and Tonga.



United Nations Headquarters, New York



Deirdre Bishop (Census Bureau), Head of the U.S. Delegation at the Eighth Session of the United Nations Committee of Experts on Global Geospatial Information Management.

On July 30–31, the National Aeronautics and Space Administration's (NASA's) Applied Sciences Remote Sensing Training program conducted a training at the UN on uses of Earth observations for managing water, classifying land cover, and monitoring land degradation as part of the UN SDGs. The training was conducted in collaboration with UN–GGIM Americas and Mexico's National Institute of Statistics and Geography. Approximately 35 people from the Americas participated, with the majority from Small Island Developing States in the Caribbean. The presentation materials are available online at arset.gsfc.nasa.gov/all/workshops/GGIM-SDGs-18.

United Nations High-Level Political Forum 2018

Representatives from NASA attended portions of the UN High-Level Political Forum (HLPF), which focused on “transformation towards sustainable and resilient societies.” The HLPF provided an opportunity to review progress on six SDGs: Goals 6, 7, 11, 12, 15, and, 17. The Australian Government organized a special side event around uses of Earth observations and SDGs at the UN Headquarters, followed by two hands-on workshops at the Permanent Mission of Australia to the UN.

Participation in the United Nations Working Group on Geospatial Information

The United States (NASA) is a Member Country of GEO and cochairs the Earth Observations for the Sustainable Development Goals (EO4SDG) initiative, along with Mexico (National Institute of Statistics and Geography) and Japan (Japan Aerospace Exploration Agency). In 2018, EO4SDG continued its engagement with the UN Inter-Agency

and Expert Group on SDG Indicators Working Group on Geospatial Information and is actively involved in supporting a task stream of this working group led by two UN Member States—Colombia and Sweden.

United Nations Statistical Commission

NASA participated in the Statistical-Geospatial Integration Forum, organized by the UN Statistics Division as part of the 49th Session of the United Nations Statistical Commission. The event, titled “*Integrating statistical, geospatial, and other Big Data to leave no one behind*,” focused on the integration of statistical, geospatial, and Earth observation information as inputs to the SDG targets and indicators. During the event, the Committee on Earth Observation Satellites released the [Earth Observations Handbook on SDGs](#), which focuses on the strategic importance of satellite Earth observations to the 2030 Agenda for Sustainable Development.

Online Surveys

Two online surveys were conducted in 2018. The first, the 2018 UN–GGIM Geospatial Standards Survey, collected responses on the review and update of the “Guide to the Role of Standards in Geospatial Information Management” and companion documents and assessed the participants’ use of the standards guide and implementation of standards within individual national frameworks. The second, the UN–GGIM Geodesy Subcommittee’s Global Geodetic Reference Frame (GGRF) Competency Survey, was used to identify geodetic capacity building of GGRF infrastructures and capabilities within individual countries and developing nations through training and implementation of GGRF.



Participants of the Sustainable Development Goals training workshop held July 30–31, 2018, during the Eighth Session of the United Nations Committee of Experts on Global Geospatial Information Management at the United Nations Headquarters, New York.

Goals for Fiscal Year 2019

NSDI Strategic Planning Process—Working collaboratively with partners, the FGDC will develop the new strategic plan for the NSDI, consistent with the requirements of the GDA. The NSDI Strategic Plan will describe a broad national approach for the continued sustainable development of the NSDI, including goals and objectives for the Federal Government's role and strategies and actions upon which the greater geospatial community can work collaboratively. The new strategic plan will be aligned with and supportive of the Federal Data Strategy.

Geospatial Platform.—Goals for 2019 include the following:

- Expand and strengthen engagements with communities of interest and partners. Leverage the GeoPlatform's digital communities to support disasters response and other mission priorities.
- Improve the linkage between GeoPlatform assets and the ability of commercial search engines to find the authoritative sources of NGDAs.
- Execute enhancements to efficiently support agencies' compliance with the GDA.
- Improve the GeoPlatform Marketplace so that users can search for government and commercial geospatial products to collaborate on data investments.
- Support OGC demonstration pilots to advance interoperability in support of disaster management.

NGDA Portfolio Management.—The coming year will focus on finalizing the delivery and publication of the 2017 LMA Reports, increasing the number of web services available for datasets, and evaluating methods to optimize and streamline the NGDA LMAs required by OMB Circular A-16, portfolio reporting and web services delivery, and monitoring processes and procedures. The FGDC will work collaboratively with Theme Leads and agencies to exploit opportunities to use the OGC Disaster Pilot activities to accomplish the following:

1. Expose the value of NGDAs and increase understanding of why they are a national asset within the disasters domain.
 - A. Begin to understand how NGDA Datasets are used in support of stakeholders and other priority use cases and needs.
2. Community engagement and participation—Future OGC pilots will bring data owners, managers, and users together with providers of standards-compliant tools,

including the GeoPlatform, to identify actions and prioritize efforts to best serve stakeholders.

3. Validate and Test—Improve the dynamic responsiveness of NGDAs to meet stakeholder needs and other priority uses.
 - A. Assess readiness.
 - B. Identify gaps.
 - C. Enable web services.
4. Establish processes and procedures to optimize the availability of analysis-ready data, tools, and services to support stakeholders

Geospatial Metadata.—The FGDC will continue work to document processes and establish foundational documents that will result in improved management of geospatial data and their metadata. The FGDC will also continue to build and manage tools for consistently transforming Federal and potentially non-Federal geospatial metadata records. The FGDC Metadata Working Group efforts will include the following:

- Create consensus for a single element mapping between existing metadata standards, including CSDGM and ISO, to enable consistent transformations and create standardized ISO records.
- Enrich and extend metadata content to improve user experience and shift focus from data discovery to use.
- Understand the complexities of metadata and identify opportunities for streamlining metadata use processes to get users closer to source metadata records, improve service and trust in data, and reduce agency burdens and costs.

National Geospatial Advisory Committee.—The NGAC will hold three to four public meetings in FY 2019. The FGDC will manage the review, disposition, and implementation of NGAC recommendations. Goals for the NGAC in FY 2019 include the following:

- The FGDC, in collaboration with NGAC leadership, will update NGAC policies and procedures to be consistent with the new requirements of the GDA.
- The NGAC will provide ongoing review, feedback, and recommendations regarding ongoing topics, including the development of the new NSDI Strategic Plan and the continued development of the Geospatial

Platform. The NGAC will also provide ongoing advice and recommendations addressing key geospatial policy issues.

- The FGDC will review and respond to advice and recommendations from the NGAC.
- The FGDC will complete the next cycle of NGAC appointments in FY 2019 and initiate the nominations and appointments that will be completed in FY 2020.

FGDC Subcommittees and Working Group Reports

The FGDC is supported by subcommittees and crosscutting working groups to address geospatial issues for the specific data types. The FGDC subcommittees and working groups are comprised of representatives from Federal agencies and FGDC-recognized stakeholder groups who share a common interest. Each subcommittee focuses on issues that pertain to coordination and standards associated with a geospatial data focus area with regard to data collection, access, exchange, and applications using those data. Working groups address activities that crosscut or affect several subcommittees. Many of the FGDC subcommittees actively assist in the implementation of the NGDA Portfolio management activities and, in fact, many members of the subcommittees are designated as NGDA Theme Leads or NGDA Dataset Managers. Further information is available at fgdc.gov/organization/index_html#wg-sc.

Address Subcommittee

The Address Subcommittee assists the Address Theme managing agencies in developing and promoting a national strategy to coordinate, prioritize, and implement geospatial address data-related activities. This includes supporting open and accurate spatially referenced national address data aggregation in partnership with Tribal, Federal, State, county, local, private, and nonprofit organizations. In 2018, the subcommittee primarily supported the development of the National Address Database (NAD). The NAD now contains addresses for 22 States and is publicly available for download on the USDOT [NAD web page](#) and the [GeoPlatform Address Theme Community web page](#).

The Address Subcommittee supported the NAD this year through the following:

- Establishing an Address Content Subgroup, whose responsibilities include the review of pilot and Beta versions of the NAD, along with the minimum and optimal content requirements for State and local address providers. The subgroup also ensures compliance of the NAD schema with FGDC and U.S. Civic Location Data Exchange Format address standards and the NG9-1-1 GIS Data Model.
- Continuing the work of the Workflow Subgroup, including the development of requirements for a Universally Unique Identifier for addresses provided to the NAD by State and local governments and the establishment of a transactional workflow. The subgroup also made recommendations for State-level workflow validation requirements. These requirements are now being reviewed by the Address Content Subgroup.
- Facilitating collaboration with other Federal agencies, including the following:
 - DOI, which hosts the NAD on the GeoPlatform for open access and download.
 - The U.S. Postal Service (USPS), which evaluated Zone Improvement Plan (ZIP) Codes in the NAD and is providing USPS-generated ZIP Codes for inclusion in the NAD. The USPS ZIP Codes are now being reviewed by the Address Content Subgroup.
 - FEMA, which presented on address use cases and implementation of address standards.
 - The White House Office of Science and Technology Policy, Natural Disaster Resilience, which is offering assistance to promote the NAD.
- Working in conjunction with DOI to plan an NAD pilot for the GeoPlatform. The goal of the pilot is to explore the use of the GeoPlatform as a collaboration site. The pilot will be conducted primarily during FY 2019.
- Holding monthly subcommittee meetings (excluding July and August) for a total of 10 meetings in FY 2018.
- Holding regular meetings for the Workflow Subgroup (bimonthly) and the Address Content Subgroup (monthly). Both subgroups are led by the Census Bureau.

Cadastral Subcommittee

The Cadastral Subcommittee coordinates cadastral data-related activities among Federal, State, Tribal, and local governments and the private sector. The subcommittee faced a major challenge this year when both long-time committee coauthors retired from the BLM in January 2018. Their combined experience, vision, and leadership were essential to past successes and direction for the subcommittee and the BLM. The leadership transition will continue into 2019. Highlights for the subcommittee include the following:

Cadastral Reference - Including the Pubic Land Survey System (PLSS) and Others.—The national PLSS dataset has reached full maturity and is updated and published on a regular basis. National PLSS rest services have been established. The rest services allow users to add the national PLSS directly to their GIS map canvas without downloading the data, providing a continuously updated view of the PLSS data. The rest services provide rectangular and nonrectangular data in the PLSS Intersected feature.

Public Lands Surface Agency Management.—The BLM completed the publishing of the Surface Management

Agency dataset, including BLM-managed lands, through the National Operations Center rest services and the navigator download portal. The subcommittee coordinated with other agencies and provided data to other organizations, such as the Protected Areas Database of the United States (PAD-US), a representation of federally owned lands and management designations.

Federal Subsurface Management Areas - Including Offshore and Continental.—The BLM is continuing the inventory and standardization of data for federally managed mineral interests, including the eastern States. Identifying and locating Federal subsurface interests can involve extensive title and legal document research. The PLSS foundation is essential to this inventory.

Land Management Agency Coordination.—Land management agency coordination provides harmonization of activities related to the collection, maintenance, standardization, access, and publication of cadastral datasets within the scope and responsibilities of OMB Circular A-16. Cadastral data by its nature is used by many other themes and consumes data from other themes. Several related themes have been identified, and coordination will continue with sponsoring agencies to facilitate the standardization of boundary positions, vertical alignment, and vintage consistency.

The BLM Wyoming State Office and the State of Nebraska signed a Memorandum of Understanding (MOU) in 2018,

describing shared PLSS data maintenance responsibilities and authorities. Publishing a single PLSS dataset with contributions from the BLM and the State of Nebraska will advance the uses and provide a more robust data set for all users.

The State of Utah and the BLM have a similar MOU and have seen significant use and advantages to the shared PLSS data resource. Within the BLM, the PLSS Cadastral National Spatial Data Infrastructure (CadNSDI) is used to obtain location, acreage, and lease information for oil lease sales. It is also used by BLM land surveyors to display ownership, identify structures, and verify legal land descriptions. The BLM's program specialists can view the location and ownership of any point in the State. The State of Utah's Automated Geographic Reference Center maintains the non-Federal land PLSS CadNSDI. The BLM and the State work together to update and maintain the CadNSDI, which is made available for the public to download. The PLSS CadNSDI was recently added to the BLM Utah Interactive Map (blm-egis.maps.arcgis.com/apps/webappviewer/index.html?id=6be0174d44f04f1c853197cadcf89f0).

Coordination and Education.—The subcommittee participated with States and local governments through the parcel data availability survey. The subcommittee maintains an outreach website (nationalcad.org) that provides educational and training materials for maintaining and publishing PLSS data—an inventory of State-developed cadastral standards and articles and publications of interest to the wider national cadastral community.

The BLM General Land Office Records Automation Program publishes a story of the week that relates historical records to current news and activities using PLSS data (blm.gov/News/default.aspx). In 2018, the General Land Office published a story map describing the origins, uses, and status of the original BLM survey plats.

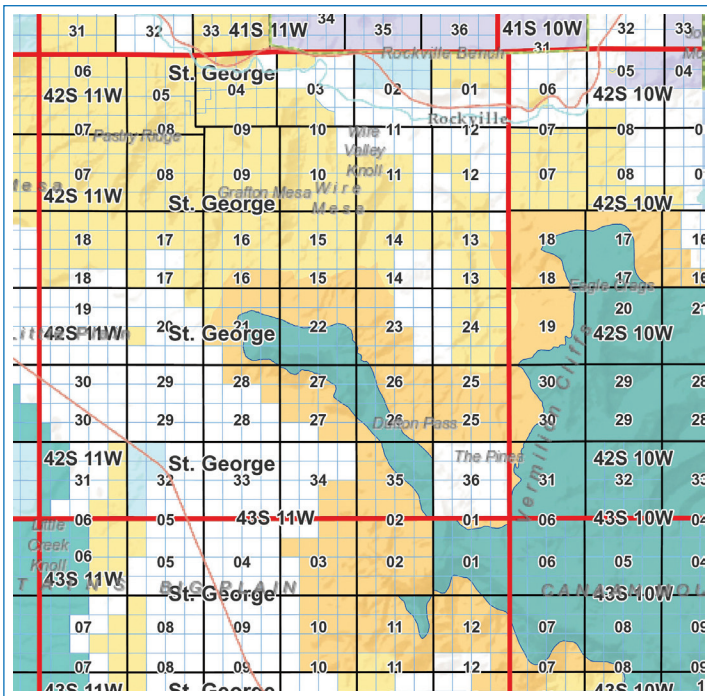


Image from the Bureau of Land Management Utah Interactive Map showing Public Land Survey System divisions, public lands, and areas of environmental concern in southwest Utah.



Image from a Bureau of Land Management (BLM) General Land Office story map describing the original BLM survey plats.

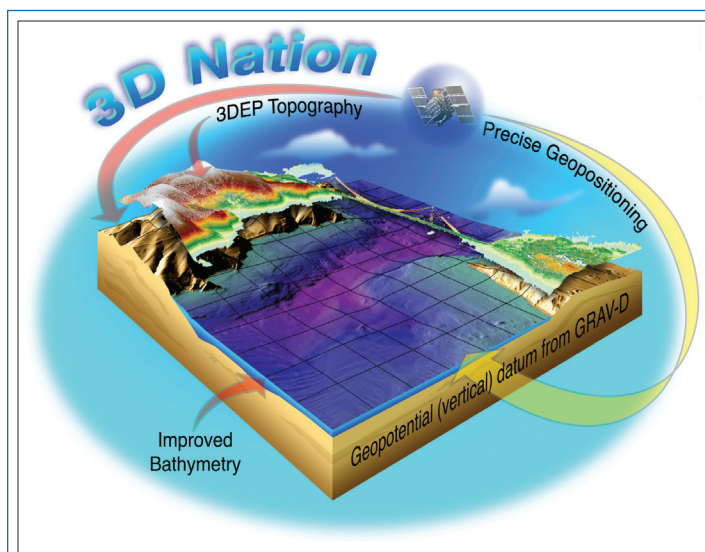
Cultural Resources Subcommittee

The purpose of the Cultural Resource Subcommittee is to identify, prioritize, implement, coordinate, and oversee the strategies and tasks required to support the Cultural Resources Theme and to coordinate these activities across Federal, State, Tribal, local, and private sector geospatial programs to that end. Because each State and (or) Tribal historic preservation office, certified local government, and Federal agency operates independently to collect, maintain, and utilize their portion of the repository of over five million cultural resources nationwide, coordination in data standards is a key aspect for the utility of the data required for Federal regulatory needs, disaster response and preparedness, as well as general planning. The subcommittee provides the framework for developing cultural resource data standards to facilitate data sharing, in addition to fostering coordination of data collection efforts among stakeholders. The subcommittee's accomplishments for 2018 include the following:

- Developed a final working draft of the proposed cultural resource data transfer standard. The subcommittee members agreed on a data structure for the standard, as well as feature-level metadata fields and domain values for those fields. This feature-level documentation will help facilitate the exchange of data between Federal, State, Tribal, and local governments. The subcommittee is currently reviewing a draft guideline document prepared during 2018 for the spatial data standards. The document articulates the purpose, need for, and components of the standard, as well as an implementation policy.
- Confirmed and updated the NGDA Theme Strategic and Implementation Plans on the basis of input from the Dataset Managers and the subcommittee participants. Both plans are now posted on the GeoPlatform.
- Revised the existing support agreement with the National Park Service (NPS) National Register of Historic Places program to accommodate their new database and prepare for the ability to accept digital boundary submissions, which would be incorporated into the NGDA dataset.
- Collaborated with the newly formed NGAC Cultural and Historical Resources Subcommittee to provide information on existing regulations regarding the maintenance and distribution of sensitive cultural resource spatial data.
- Participated in the development of interview questions posed to Federal cultural resource spatial data managers in various agencies to identify key concerns in the release of sensitive data and how to control that release. Information and conclusions generated by the NGAC Cultural and Historical Resources Subcommittee will be coordinated with the FGDC Cultural Resources Subcommittee.

3D Nation Elevation Subcommittee

The 3D Nation Elevation Subcommittee provides a foundation for mapping our changing world by uniting terrestrial and coastal/ocean mapping efforts from the highest mountains to the deepest oceans to ensure public access to an accurate, authoritative national elevation dataset.



Elements of the 3D Nation concept.

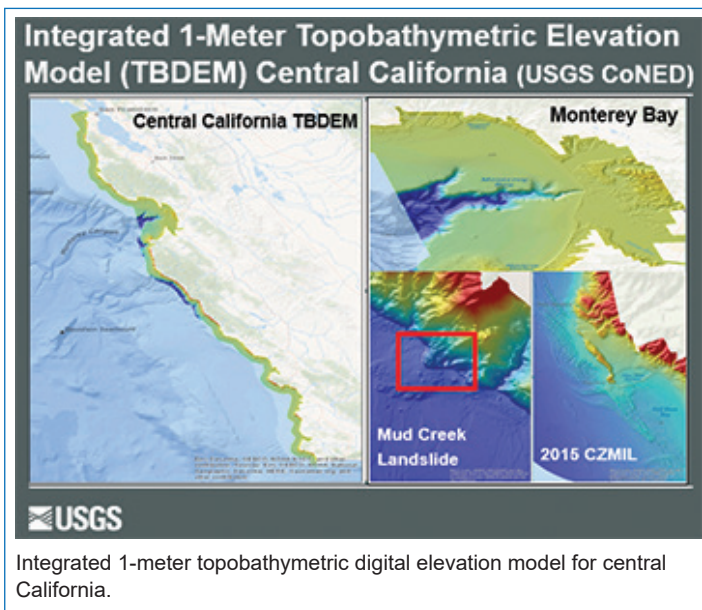
The subcommittee's 2018 accomplishments include the following:

- NOAA and the USGS, on behalf of the Interagency Working Group on Ocean and Coastal Mapping (IWG-OCM) and the 3D Elevation Program (3DEP), launched the 3D Nation Elevation Requirements and Benefits Study. Learning about the business uses and benefits of improved 3D elevation data will help agencies prioritize and direct mapping investments to best serve national business needs. The agencies are currently administering the questionnaire, with aggregation and analysis to follow.
- The [U.S. Federal Mapping Coordination site](#) continues to be a strong vehicle for collaboration. The site collates national requirements, facilitates collaborative efforts, and guides program direction.
- The 3DEP program, a Federal mapping agency partnership to acquire nationwide high-resolution elevation data, continues its mission to complete national coverage of light detection and ranging (lidar), with interferometric synthetic aperture radar (IfSAR) in Alaska, by 2023. These data support critical applications, including flood hazard mapping, infrastructure planning and development, natural resource management, critical mineral exploration, and more. Strong, ongoing

interagency coordination in the 3DEP Executive Forum and 3DEP Working Group supported increased investment in 3DEP data acquisition from \$83 million in FY 2017 to a projected \$107 million in FY 2018. The 3DEP data were contracted for 15.5% of the Nation, which will result in 3DEP coverage for another 550,000 square miles of the country, totaling over 1.8 million square miles of coverage made freely available at [The National Map](#). The total coverage of 3DEP data (lidar and IfSAR) available or in progress is approaching 50% of the Nation.

- IWG–OCM and 3DEP agencies received supplemental funding for topographic/bathymetric lidar and hydrographic surveys in response to Hurricanes Harvey, Irma, and Maria and the California wildfires of 2017. In hurricane-affected areas, the high-resolution mapping data are needed for many purposes, including to help communities and ports recover economically and to model storm surge to understand the effects of wave height and coastal erosion from future storms. Lidar data are also used in predicting wildfire risk and in analyzing post-wildfire hazards such as mudslides and floods. The data help to improve understanding of the vulnerability of communities, farms, and infrastructure to future wildfires.
- The USGS is working collaboratively with NOAA and the USACE to construct integrated high-resolution topobathymetric digital elevation models (TBDEMs) for U.S. coastal regions to support coastal and marine spatial planning and science applications. In FY 2018, TBDEMs were completed for central California and Puget

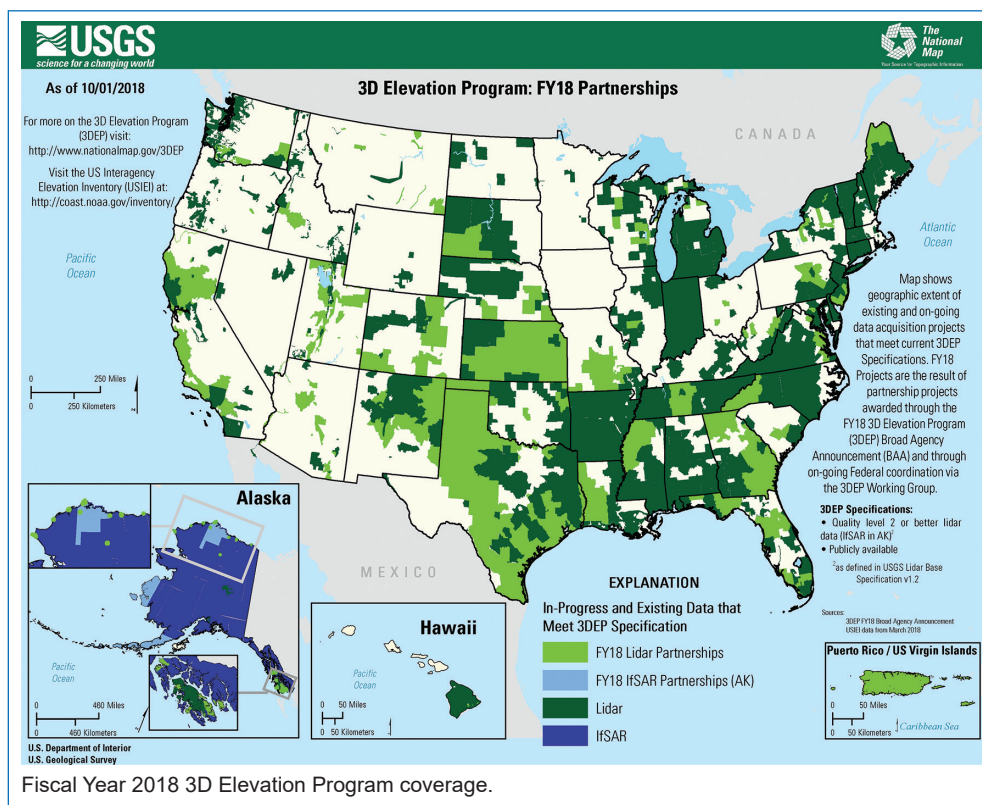
Sound. These Coastal National Elevation Database (CoNED) models are available for download on USGS ScienceBase, NOAA Digital Coast, and the CoNED Project Viewer (topotools.cr.usgs.gov/topobathy_viewer).



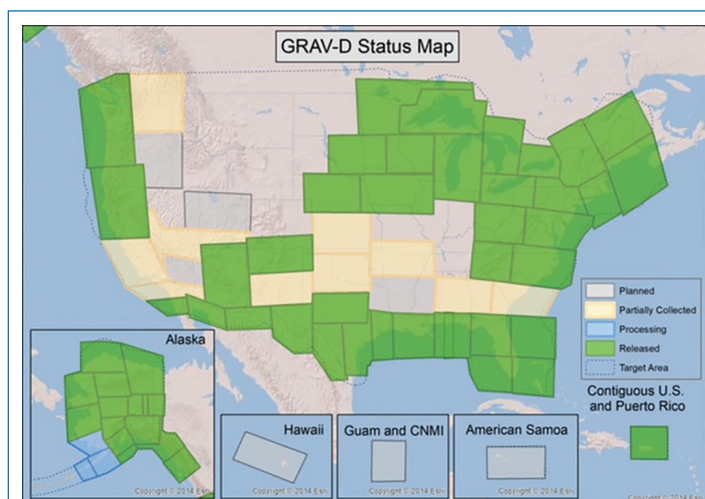
Federal Geodetic Control Subcommittee

The Federal Geodetic Control Subcommittee helps coordinate planning and execution of geodetic surveys, developing standards and specifications for these surveys, and exchanging geodetic survey data and technical information among Federal agencies. To provide effective leadership in these activities, subcommittee members participate in international meetings to collaborate on international reference frames, national meetings to educate the public on U.S. national reference frames, and smaller regional meetings to discuss the dynamics of local geographies. Meetings in 2018 include the following:

- SIRGAS (Geocentric Reference System for the Americas) 2018 Symposium
- Eighth Session of the UN–GGIM
- Second meeting of the UN–GGIM Subcommittee on Geodesy



- 103rd and 104th semiannual meetings of the Great Lakes Coordinating Committee
- International Lidar Mapping Forum
- American Society for Photogrammetry and Remote Sensing 2018 Annual Convention
- Commission on Space Research Reference Frames for Applications in Geosciences (REFAG2018)
- Institute of Navigation (ION) International Technical Meeting
- ION GNSS+ (Global Navigation Satellite System) Meeting
- European Geosciences Union General Assembly 2018
- North American Geoid Workshop (cohosted by the Federal Geodetic Control Subcommittee)
- International Federation of Surveyors Congress 2018
- INTERGEO Conference and Trade Show
- International Association of Geodesy Commission 1 Symposium on Reference Frames for Applications in Geosciences (REFAG2018)
- National Society of Professional Surveyors Young Surveyors Network Meeting
- American Geophysical Union 2017 Fall Meeting
- Transportation Research Board Summer Meeting
- American Society of Civil Engineers Utility Engineering Surveying Institute meeting
- International Association of Seismology and Physics of the Earth's Interior
- The **National Geodetic Survey Coordinate Conversion and Transformation Tool** was released. The tool combines several transformation tools into a single browser-based user interface that supports single- and multipoint conversions, web services, and downloadable software. This one-stop coordinate conversion and transformation tool makes it convenient to convert and (or) transform coordinates for a variety of geospatial applications. It is available as a web service or to download for offline processing.



GRAV-D Survey Data blocks map.

Other highlights in 2018 include the following:

- The **National Spatial Reference System (NSRS) Modernization Industry Workshop** was held to engage industry stakeholders in discussions concerning the NSRS Modernization effort. This event targeted vendors of surveying equipment that create their own software; vendors of GIS, computer-aided design (CAD), and transformation software; and some vendors of mobile laser scanning systems. The NSRS Modernization effort will culminate in 2022 with the replacement of the North American Datum of 1983 (NAD 83) and the North American Vertical Datum of 1988.
- Collection of airborne gravity data over all U.S. States and territories for the **Gravity for the Redefinition of the American Vertical Datum (GRAV-D)** initiative passed 71% and is on track for completion by the end of 2022. Each percentage of the project area equates to approximately 100 flight hours, and approximately 4.2 million square miles of data have been collected. (See map.)
- A Federal Register Notice solicited comments on [Draft Policy](#) and [Draft Procedures](#) documents concerning changes to the **State Plane Coordinate System (SPCS)**. SPCS 83 (tied to NAD 83) will be replaced by SPCS 2022, which will be related to the 2022 Terrestrial Reference Frames.

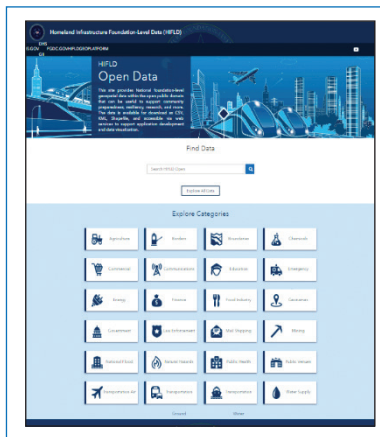
Homeland Infrastructure Foundation-Level Data Subcommittee



The Homeland Infrastructure Foundation-Level Data (HIFLD) Subcommittee develops, promotes, and executes a coordinated strategy for acquisition or development of homeland infrastructure geospatial information for Federal agencies while creating and utilizing partnerships with State,

Local, Tribal, territorial, and private sector organizations. The subcommittee is supported by a HIFLD Program Management Group, which is composed of the following organizations: U.S. Department of Homeland Security (DHS) Geospatial Management Office (GMO), DHS National Protection and Programs Directorate, FEMA, U.S. Department of Defense Office of the Assistant Secretary of Defense for Homeland Defense and America's Security Affairs, DOI Office of the Geospatial Information Officer, and the NGA. Accomplishments in FY 2018 include the following:

- Successful migration, functional update, and seamless cut over for HIFLD Open to be a formal operational tenant within the GeoPlatform (hifld-geopatform.opendata.arcgis.com).



- Continued increases in users (new and returning), sessions, page views, and downloads among HIFLD Open and Secure online geospatial platforms.
- A simplified Data Use Agreement for HIFLD Licensed data and the related, newly reimagined HIFLD website were made live on August 23, 2018.



- Continued to support open data aggregation, curation, and end user support related to HIFLD Open Data sites following the devastating effects of Hurricanes Harvey, Irma, and Maria.
- Conducted the Annual HIFLD Feedback Session. There were more than 125 attendees at the daylong event, which included breakout sessions centered on identifying data stewards throughout the community. The session was met with very positive feedback and set the path forward for geospatial data requirements and priorities among HIFLD community members for the coming year. It was a launching point for DHS GMO and NGA personnel to continue to strengthen HIFLD program transition timelines and to simplify the HIFLD DUA.
- HIFLD Subcommittee representatives participated in several outreach events, including the following:



- National States Geographic Information Council (NSGIC) Preparedness Subcommittee and Annual Conference
- National Alliance for Public Safety GIS National Geospatial Preparedness Summit
- National Fusion Center Association Annual Training Event
- State of Alabama GIS Conference
- Esri Federal User Conference
- Esri National Security and Public Safety Summit
- Esri International User Conference with HIFLD “office hours”
- FGDC Coordination Group Meetings and Steering Committee Meetings (as needed)
- National Geospatial Advisory Committee (NGAC) meeting
- Numerous informational webinars and virtual briefings for specific HIFLD informational and instructional purposes
- HIFLD Subcommittee members responded to and assisted with a wide variety of Homeland Security events and natural disasters. HIFLD data were used to help provide foundation situational awareness for events like the State of the Union Address, Super Bowl LII, the Boston Marathon, the Boy Scout Jamboree, the 72nd UN General Assembly, and Sail Boston. HIFLD data were also used in the Ardent Sentry National Level Exercise between the National Guard Bureau, FEMA, and other U.S. Department of Defense/DHS components.

Marine and Coastal Spatial Data Subcommittee

The mission of the Marine and Coastal Spatial Data Subcommittee is to develop and promote the Marine and Coastal NSDI. The vision of the Marine and Coastal NSDI is that current and accurate geospatial coastal and ocean data will be readily available to contribute locally, nationally, and globally to economic growth, environmental quality and stability, and social progress.

The subcommittee continues to work in an integrated manner, fostering partnerships with other Federal, State, and local governments, as well as with interagency and multisector activities in the marine and coastal environment focusing on spatial data. These engagements include the National Ocean Council and the ocean.data.gov data portal, the Integrated Working Group on Ocean and Coastal Mapping (W–O&C), and the Integrated Ocean Observing System, to name a few key initiatives. The subcommittee accomplishments for 2018 include the following:

- Continued expansion and application of the Coastal and Marine Ecological Classification Standard (CMECS) for coastal mapping. The subcommittee established a web-based Community of Practice for CMECS users, operationalized CMECS data collection by both NOAA and the BOEM, and developed new technical guidance documents for underwater video annotation. Additionally, the subcommittee developed a CMECS training course and delivered the course on the West Coast, created new demonstration products for CMECS in the Great Lakes, incorporated CMECS into the Northeast Ocean Plan, and coordinated the development of CMECS ontologies for European classification systems.
- Provided spatial data standards and data access requirements that underpin efforts like the Marine Cadastre. Marine Cadastre, a NOAA/BOEM collaboration, continues work with Federal and State organizations to expand the amount and type of spatial data available to coastal and ocean planners. In addition to providing data, the Marine Cadastre provides tools and supporting material to assist with applying the more than 260 datasets currently available. In 2018, the Ocean Reporting Tool was developed to provide summary information about areas of interest to reach policymakers and other nonspatial audiences. The team also improved the processing of vessel navigation data by the Automatic Identification System to increase the speed at which these data are available and added new formats that allow users more options in developing their own products. The Marine Cadastre also worked to support the U.S. Department of Commerce goal of expanding the domestic aquaculture industry.
- **NDOP Fall 2017 and Spring 2018 Meetings.** NDOP Subcommittee meetings were held in fall 2017 and spring 2018. Discussion topics included agency programs, imagery acquisition strategies, collection approaches, orthorectification procedures, and plans for a National Imagery Summit (NIS).
- **National Agriculture Imagery Program.** The National Agriculture Imagery Program (NAIP) is funded jointly by the USDA and the DOI and administered by the USDA Farm Service Agency (FSA). At the fall 2017 and spring 2018 NDOP meetings, the FSA expressed concern about its ability to maintain the NAIP as a community source of public domain imagery supported by shared funding from only a subset of the program's many users. The Federal agencies present at those meetings affirmed the importance of the NAIP to their missions and expressed concerns about the possibility of the NAIP being unavailable or restricted to a limited number of Federal users. The FSA indicated the NAIP will likely move to a 33-year contract cycle with a default resolution of 60 centimeters.
- **Alaska Imagery Request.** In 2017, the USGS requested commercial satellite imagery covering the State of Alaska from the NGA. The request, submitted through the Civil Applications Committee to the Director of the NGA, led to substantive dialogue between the USGS and the NGA. As a result, the NGA announced that restrictive aspects of its Intelligence Oversight provisions would be eliminated. This change will increase access to and use of NGA satellite data, though licensing restrictions will still limit sharing, a concern expressed during the spring 2018 NDOP meeting. Most attendees of the meeting agreed the September 2018 NIS would provide a unique forum for further discussion of this issue.
- **Imagery Acquisition Approaches.** The subcommittee discussed possible approaches and suitable interagency mechanisms for more coordinated collection of land imagery to meet the full range of NDOP member agencies' needs. Further conversation on these topics took place at the NIS.
- **NDOP Technical Management Subgroup.** The NDOP Technical Management Subgroup is developing a plan to review and test orthorectification procedures for historical aerial imagery, as well as a task to better understand digital imagery and orthorectification capabilities.
- **FEMA–Lidar for Disaster Response Efforts.** FEMA relies on the NAIP for nondisaster requirements and ad hoc aerial, commercial satellite, and unmanned aerial systems for its disaster response efforts. At the spring NDOP meeting, FEMA noted it has spent \$120 million on lidar data in collaboration with the USGS 3DEP.

National Digital Orthoimagery Program Subcommittee

The National Digital Orthoimagery Program (NDOP) is an activity of the U.S. Government responsible for managing and coordinating overhead imagery and applications to support the operational needs of civil government in the United States. This year, the subcommittee chair passed from NOAA to the USGS. Highlights for 2018 include the following:

Spatial Water Data Subcommittee

The Subcommittee on Spatial Water Data (SSWD) was established to assist in the 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 the duplication of effort where practicable and economical.

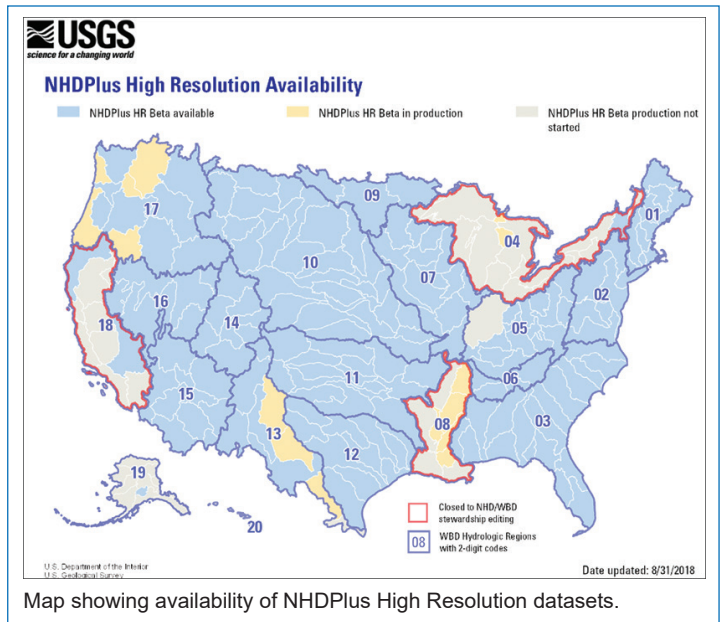
The SSWD has been leading efforts to engage the community and to design and scope the Open Water Data Initiative (OWDI), which was launched in 2014. The goal of the OWDI is to bring currently fragmented water information into a connected, national water data framework by leveraging existing systems, infrastructure, and tools to underpin innovation, modeling, data sharing, and solution development.

Since 2014, progress has been made through the OWDI by applying a common geospatial framework of rivers, watersheds, and other geographic features to water observations made by various Federal, State, and local agencies. This approach is beginning to take form into an infrastructure that leverages existing systems using a modern cloud-based big-data approach, to provide interoperable web data and map services. An API for water information (api.nasa.gov/, for an analogous example) is being unleashed for innovators and solution developers.

NHDPlus High Resolution

The foundation for the common geospatial framework underlying the OWDI will be the [NHDPlus High Resolution](#) (NHDPlus HR), which the USGS began releasing in Beta version in May 2017. As of the end of FY 2018, the NHDPlus HR Beta is available for more than 67% of the Nation. NHDPlus HR Beta production and release will continue on a drainage-area basis through 2020 for the conterminous United States, followed by Alaska, Hawaii, and the U.S. territories in later years. Users are invited to review the Beta version datasets, and their feedback will be used to update and improve subsequent NHDPlus HR dataset releases.

When completed for the entire Nation, the NHDPlus HR will provide a single, scalable hydrography framework that is open and accessible for use by everyone, including government, citizens, and industry. The NHDPlus HR will support a limitless range of applications, such as estimating when and where a toxic spill will affect downstream populations, ecosystems, and drinking water



intakes, or helping property owners to better understand water availability.

Other highlights from FY 2018 include the following:

- **Watershed Boundary Dataset (WBD) Steering Committee and Hydrography Governance:** The chairs of the WBD Steering Committee requested that the SSWD issue a vote to terminate the Steering Committee under article XI of the charter. The WBD Steering Committee is merging with the National Hydrography Dataset Management Team to form a single National Hydrography Infrastructure Working Group to serve the governance function that the two groups previously served. The SSWD approved the proposal, finalizing the decision in the January 2018 meeting.
- **Discussion of Bathymetry Data Issues:** The group had extensive discussions about inland bathymetry data. There are many issues and opportunities surrounding bathymetry data, and the group is interested in remaining engaged in discussions regarding inland bathymetry data.
- **Internet of Water:** Dr. Lauren Patterson of Duke University presented a summary of the Aspen Institute workshops exploring the concept called the Internet of Water. The report summarizing the workshops is available at aspeninstitute.org/publications/internet-of-water/. The OWDI will be an important component of the Internet of Water.
- **Open Water Data and the Private Sector:** Kelly Bennett of WaterSage.com (now known as B3) talked to the group about his work providing water information to the private sector. For example, lending institutions are interested in water issues because they affect property valuations, and the OWDI is of interest to consultants that service the financial services sector.

- **California's Open and Transparent Water Data**

Act: Chris McCready, California Department of Water Resources, gave a presentation on California's Open and Transparent Water Data Act, which has many elements in common with the OWDI. The act directs four State agencies to create, operate, and maintain a statewide integrated water-data platform. The agencies must also develop a strategic plan to guide program implementation and protocols for data sharing, documentation, quality control, public access, and promotion of open-source platforms and decision-support tools related to water data.

Transportation Subcommittee

The Transportation Subcommittee enhances the Transportation Theme of the NSDI by facilitating partnerships, coordinating efforts, and heightening awareness among the geospatial-transportation community. The subcommittee promotes best practices and develops transportation standards to improve data quality, accessibility, and exchange. Ultimately, the subcommittee cultivates an understanding of the American transportation system. Highlights for 2018 include the following:

- The subcommittee hosted many interesting presentations by the USGS, the Census Bureau, and the Bureau of Transportation Statistics (BTS). Topics included Topologically Integrated Geographic Encoding and Referencing roads and the National Map collaborations, the On the Map Emergency Management tool, statistical geographic areas, the 2020 Participant Statistical Areas Program, connecting American Community Survey (ACS) commuting data to population geographies, and the BTS' use of ACS data.
- The United States Road Network Specification Working Group is detailing an explicit, comprehensive, and consistent definition of the features, attributes, and relationships needed to model road data in the United States. The specification will ease the collection, integration, publication, and use of U.S. road data by identifying an accurate and concise vocabulary, designing necessary data models, and establishing data-quality benchmarks. Since its inception in April 2017, the working group has defined requirements for the specification, catalogued attributes necessary to fulfil a number of use cases specific to U.S. road management, and considered conceptual and existing road models. In the following months, the working group will draw from ISO 14825:2011, Intelligent Transport Systems—Geographic Data Files, to define a base specification, which will model the location, identification, and function of roads. As the model matures and needs are prioritized, the base model will be extended to accommodate other missions

such as networking and linear referencing. The working group will also address the pressing need to build consensus among the greater geospatial-transportation community in the coming months. The community's support is integral to the success of the specification.

- The Federal Land Roads Working Group was formed in 2018 under the Transportation Subcommittee. The working group focuses on building an aggregated inventory of roads on Federal lands that will be used to support mapping, planning needs, resource allocation, land management, recreation, and other uses by members and stakeholders. The Federal Lands Roads Working Group is expanding its membership, establishing its leadership, and developing an action plan using the Federal Lands Working Group as an example of a successful collaboration framework.
- The Intercity Bus Working Group is leveraging the General Transit Feed Specification to publish a national intercity bus service dataset. The data support transportation decision making by Federal, State, local, and Tribal governments; metropolitan planning organizations; transportation-related associations; the private sector, including the freight community; and the public. The data are collected, compiled, analyzed, and published as part of a comprehensive set of statistics, which informs the Nation about the performance and impact of the national transportation system. With this dataset, the transportation community will study the extent, density, frequency, and accessibility of the Nation's intercity bus services to understand how the intercity bus services connect and enrich the Nation's transportation system.

Vegetation Subcommittee

The FGDC Vegetation Subcommittee is responsible for promoting accurate and current standards for vegetative data (financed in whole or in part by Federal funds), exchanging information on technological improvements, and encouraging Federal and non-Federal communities to identify and adopt the standards and specifications. Vegetation Subcommittee highlights for 2018 include the following:

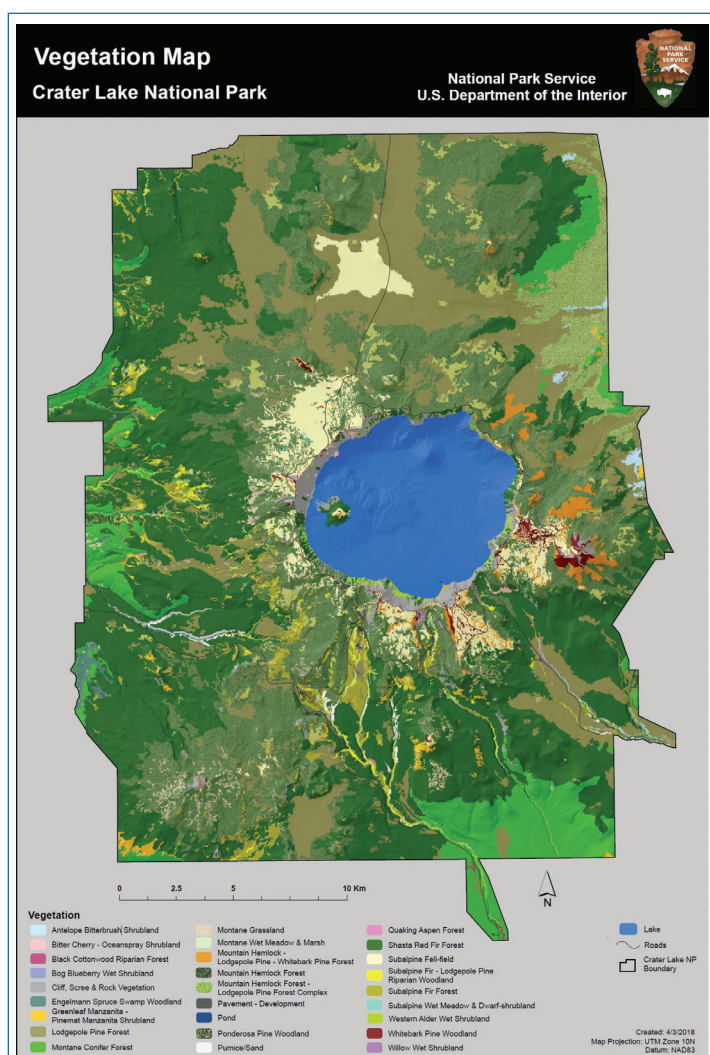
- In 2018, the National Park Service completed vegetation mapping for 10 park units and continued work in 12 additional units. The U.S. Forest Service (USFS) assessed the status of regional vegetation map products in meeting the FGDC standard and their readiness for publication. The subcommittee is working with the USGS LANDFIRE program to develop group-level vegetation maps for the 17 LANDFIRE production units. These maps are used in cross-boundary landscape-level analysis of vegetation and can provide information about fire

behavior, disturbance regimes, vegetation patterns, and vegetation condition and can be used with models to test management scenarios.

- In July, the subcommittee presented a full-day symposium on the U.S. National Vegetation Classification (NVC) at the International Association for Vegetation Scientists annual meeting in Montana. The symposium featured 11 papers outlining the history, status, and future work on the NVC. The conference included four additional presentations and two posters on current work on the NVC. The subcommittee organized a half-day symposium at the Natural Areas Association Conference in Colorado, which featured five speakers and one poster.
- An NVC workshop was held in Alaska. Participants from Federal and State agencies and academia, as well as consultants from Alaska, Canada, and Europe, are continuing work to update the Alaska NVC. The subcommittee is developing an NVC resource

library of presentation information to reach a larger audience. The BLM is developing an NVC user guide and a mobile application for keys to the alliances and associations in sagebrush systems. Six USFS regions completed crosswalks from vegetation dominance type classifications to the macrogroup level of the NVC. The USFS is working on a crosswalk from Society of American Foresters and Society for Range Management cover types to the NVC.

- The 2008 NVC Standard is a dynamic content standard, and the subcommittee anticipated a need for making changes to the content over time. In 2017, the subcommittee began publishing peer-reviewed updates to the NVC through the online journal “USNVC Proceedings,” hosted on the Ecological Society of America website. In 2018, the subcommittee reviewed the alliance- and association-level content of the NVC in the Rocky Mountains, the Southwestern United States, and California.
- For several years, software and server upgrades and maintenance have been deferred, and NVC server stability remains a concern. Funds for upgrades are limited. The USFS and the USGS continue to fund the education and content-management responsibilities for the NVC.



An example of a vegetation map recently completed by the National Park Service. The vegetation classification was based on the association-level of the U.S. National Vegetation Classification Hierarchy.

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 worked on the following:

- Wetlands data for over 24 million acres of the United States were contributed to the NSDI wetlands layer from eight Federal, State, and local agencies in FY 2018. All data submitted to the layer must comply with the National Wetlands Classification Standard and the FGDC Wetlands Mapping Standard. Rigorous quality-control and quality-assurance processes and tools are implemented at all points within the data creation and submission process.
- The user interface of the FWS Wetlands Mapper, the primary distribution point for the NSDI wetlands layer, was updated to improve clarity and functionality. The improvements include an enhanced informational window which can be displayed for each wetland or deepwater polygon within the layer. The window includes (1) a description of the polygon of interest, including habitat

size and type, as well as collection date and type of imagery used to identify the polygon; (2) easy access to historical map information and reports associated with the polygon of interest; and (3) an explanation of data limitations and appropriate use. In addition, a “zoom to project area” function was added to allow quick, easy display of the full extent of data production areas.

- The Wetland Mapping Targeting Tool (WMTT), an easy to use, interactive tool for prioritizing updates to the NSDI wetlands layer, was used to help initiate a forward-looking plan to guide the investment of limited resources to update the layer. The plan will leverage the WMTT with an enhanced dataset-update process to best meet the needs of diverse stakeholder communities.
- The Interagency Wetland Mapping Workgroup, which was created in 2016 to better coordinate national wetland mapping efforts at all spatial and temporal scales, was incorporated under the Wetlands Subcommittee to further enhance interagency communications and collaborations focused on wetland mapping. The group identified the importance of and worked towards producing a publication that will highlight synergies between wetland maps and related land cover maps when used to support diverse natural resource applications.
- The FWS produces wetlands Status and Trends reports on a decadal basis to supplement information contained within the NSDI wetlands layer. Whereas the layer provides site-specific details necessary to guide natural resources management decisions, primarily at the local scale, the Status and Trends reports provide temporally consistent information on acreage, as well as information on wetland and deepwater habitat acreage change to support the development of broader-scale policies. Wetlands Status and Trends data collection was initiated in FY 2018. Resultant data will be used to supplement information provided by the NSDI wetlands layer, as well as further target layer updates.

Metadata Working Group

The Metadata Working Group promotes awareness and best practices among FGDC member agencies and NSDI stakeholders about the metadata component of geospatial data; facilitates the coordination, development, use, sharing, and dissemination of geospatial metadata; and supports the implementation of geospatial metadata and other related semantic and structural (that is, nongeospatial) metadata standards established by Federal, national, and international standards organizations, such as the FGDC, OGC, American National Standards Institute, ISO, Dublin Core Metadata Initiative, Open Source Metadata Framework, Ecological Metadata Language, and the World Wide Web Consortium.

Improving Metadata Management, Tools, and Services

The FGDC is facilitating a Metadata Working Group activity to develop, align, and obtain broad geospatial metadata community understanding and endorsement of three activities: (1) an FGDC ISO 19115-1 metadata crosswalk, (2) a GeoPlatform ISO 19115-1 draft profile, and (3) a visualization of the metadata publication workflow. These activities will provide a foundation for improving the management of geospatial data and their metadata and for building and managing tools for consistently transforming Federal and potentially non-Federal geospatial metadata records.

The FGDC metadata crosswalk to ISO 19115-1 to define, and build consensus for, element mapping between existing metadata standards to ISO 19115-1 is based on a recommendation of the 2017 ISO Forum. The purpose of this crosswalk is to provide a baseline for users and tool providers to consistently transform foundational metadata from one standard to another. The outcome will be metadata that is populated consistently with information across all government departments, agencies, and bureaus and is consistent with ISO standards.

A profile of ISO 19115-1 has been drafted by the GeoPlatform team to ensure management and delivery of the full suite of services being developed to support data providers and users. The goal of this profile is to enable metadata to be used for value-added purposes and the broader metadata community needs. The method for meeting these needs within the ISO standard is under review.

The most valid metadata record is the one actively managed by the source agency. Agencies publish metadata records with the geospatial datasets, layers, or entities they describe. From there, metadata are published through the agency to data.gov and the GeoPlatform. A lifecycle workflow diagram has been generated to document this journey, any transformations that may be done on the metadata record, and whether the source metadata is directly available. This visual overview is meant to convey existing complexities (although it cannot capture all existing scenarios) in the process to help identify ways to streamline and improve the processes, including incorporating potential metadata content improvements into the source agency's business processes.

National Boundaries Group Working Group

The National Boundaries Group (NBG) is an interagency working group that contributes to the FGDC mission to foster collaboration and develop partnerships for the

advancement of the NSDI. The purpose of this group is to lead the development of nationally consistent boundaries that are integrated using the same geographic base, allowing for Federal boundary sources to be consistent, accurate, and integrated through interagency collaboration.

National Boundaries Group Organization and Operations

The NBG continued collaboration with the Cadastral Subcommittee to identify boundaries coincident with cadastral features such as parcels and the PLSS. In addition, the NBG moderated a discussion about public access to data for military, international, and Tribal boundaries from agencies.

Federal Lands Working Group

In FY 2018, the Federal Lands Working Group (FLWG), a subgroup of the NBG, updated data standards and organizational strategies to produce an aggregated Federal lands geodatabase to meet common agency needs for PAD-US 2.0, in collaboration with the USGS. The Federal lands geodatabase has been integrated into PAD-US 2.0 by the USGS and is under review. The NPS, USFS, and FWS automated the translation of their lands data files into the PAD-US 2.0 format to increase update efficiency and accuracy. The USGS updated the topology assessment

to identify boundary overlaps between agency datasets in PAD-US 2.0 and made provisional information available to the FLWG in an online tool. The tool provides a platform for interactive review to improve alignment between federally owned fee parcel boundaries within the framework of the PAD-US.

The FLWG shared updates about PAD-US 2.0 and agency data development efforts during the DOI's Office of Policy Analysis seminar series and assisted with the publication of a Federal recreation map, supported by the NPS, that highlights opportunities for public recreation on Federal land. The USGS released provisional Federal lands data from PAD-US 2.0 to facilitate development of the map and a National Wildfire Coordinating Group decision tool. The FLWG also drafted guidance for base-map developers to inform users of best practices and encourage a consistent approach for maintaining commonly used maps (for example, Esri, Google, and the USGS National Map).

Tribal Boundaries Workgroup

The Tribal Boundaries Workgroup is cochaired by members from the Census Bureau and the EPA, with membership consisting of Federal agencies, private companies, Tribal organizations, and federally recognized Tribes. In 2018, the group hosted presentations from multiple organizations.

Appendix A

FGDC Leadership Profiles



Timothy Petty, Ph.D.
Assistant Secretary for Water and Science
U.S. Department of the Interior
Chair, FGDC Steering Committee

Tim Petty brings a diverse portfolio to his position as the Assistant Secretary for Water and Science at the U.S. Department of the Interior (DOI). As Assistant Secretary for Water and Science, he oversees the Bureau of Reclamation and the U.S. Geological Survey. He previously served as Acting Assistant Secretary and Deputy Assistant Secretary for Water and Science at DOI during President George W. Bush's Administration.

Dr. Petty holds a Ph.D. from the University of Alaska Fairbanks, School of Engineering and Mining; a master's degree in Executive International Business Management from the University of Maryland, University College; and a Bachelor of Science degree in Geosciences from Purdue University.

Dr. Petty previously worked for three U.S. Senators: Senator Connie Mack III of Florida, Senator Rick Santorum of Pennsylvania, and Senator James Risch of Idaho. As Senator Risch's Deputy Legislative Director and Legislative Assistant, Dr. Petty was responsible for a broad portfolio of policy issues, including water resources, hydroelectric dams, environmental protection, science, technology, climate science, National Aeronautics and Space Administration, cyber security, infrastructure, and telecommunications. These duties included supporting Senator Risch as a member of the Energy and Natural Resources Committee.



Jamie Huang
Office of Management and Budget
Vice Chair, FGDC Steering Committee

Ms. Huang joined the Office of Management and Budget (OMB) in 2014 as an information technology (IT) performance analyst in the Office of the Federal Chief Information Officer (OFCIO; formerly known as E-Government). In addition to her commitment to elevating geographic information system (GIS) data and issues at OMB, she has experience working with the Office of Science Technology Policy and the National Security Council within the Executive Office of the President. Ms. Huang regularly works with DOI and Merit Systems Protection Board (MSPB) program examiners as the DOI and MSPB Agency Liaison, providing expertise on IT budgets and systems. During the summer of 2018, she served an internal OMB detail rotation, managing the U.S. Department of Homeland Security's National Protection and Programs Directorate portfolio as an OMB program examiner (resource management officer). Ms. Huang also manages all Governmental Accountability Office (GAO) IT audits at OMB in OFCIO, setting up a bimonthly meeting system with GAO to address the large volume of engagements.

Ms. Huang possesses management, monitoring, and evaluation skills, with training in qualitative and quantitative analysis (database operation: STATA, ArcGIS). She received her Bachelor of Science degree in Journalism from the University of Wisconsin-Madison. She completed her Master of Public Policy and Master of Arts in Middle Eastern Studies—a dual degree from the University of Chicago—in 2013.



Ivan DeLoatch
Executive Director
Federal Geographic Data Committee

Mr. Ivan DeLoatch has served as the Executive Director of the FGDC for the past 14 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



Thomas Dabolt
Geospatial Information Officer
U.S. Department of Interior

In July 2016, Mr. Dabolt joined DOI as the Geospatial Information Officer. He is located in Washington, DC, and brings a wealth of experience to this position. Mr. Dabolt has served 20 years in the Federal Government. He started his career working for the U.S. Environmental Protection Agency (EPA), initially bringing geospatial expertise to the Nation's water-quality monitoring and assessment program and later the entire EPA water program, with stints supporting Emergency Management, Drinking Water Management, and Waste Water Management. In these roles, he partnered with State and Federal agencies, enhancing information-based public policy decision making. Prior to working with EPA, he contributed to the Nature Conservancy's conservation design efforts in Colorado and ran several small businesses. Mr. Dabolt earned his Master of Science degree in Environmental Management from Duke University and his Bachelor of Science degree in Environmental Science from the State University of New York at Plattsburgh.



Kevin Murphy
Program Executive for Earth Science Data Systems
Earth Science Division, Science Mission Directorate
National Aeronautics and Space Administration

Kevin Murphy is the Program Executive for Earth Science Data Systems at the National Aeronautics and Space Administration (NASA) Headquarters. Mr. Murphy manages a portfolio of programs encompassing the Distributed Active Archive Centers, Science Investigator-led Processing Systems, and a number of competitively funded programs. Prior to assuming his current role, Mr. Murphy served as System Architect for the Earth Observing System Data and Information System, where he conceived, developed, and managed major system development projects, including near real-time systems, search engines, large-scale visualization systems, and Earthdata.nasa.gov.



Harvey Simon
Acting Deputy Assistant Administrator and Associate Chief Information Officer,
U.S. Environmental Protection Agency

Mr. Harvey Simon serves as the United States Environmental Protection Agency (EPA) Acting Deputy Assistant Administrator and Associate Chief Information Officer.

He supports the implementation of the priorities established by the Chief Information Officer, in the Office of Environmental Information. Prior to that, Mr. Simon held the role of EPA's Geospatial Information Officer and was responsible for coordinating EPA's geospatial programs. He has an undergraduate degree and a master's degree from the State University of New York.

FGDC Executive Committee (continued)



Tony LaVoi
Geospatial Information Officer
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Tony LaVoi serves as the National Oceanic and Atmospheric Administration (NOAA) Geospatial Information Officer (GIO), as well as the U.S. Department of Commerce's Senior Agency Official for Geospatial Information. Tony and his GIO team are the focal point for enterprise geospatial projects, strategies, policy development, standards, and coordination activities across NOAA. He has worked over the past two decades to increase the use of geospatial tools and technologies to support all aspects of NOAA's mission. Tony serves on the Federal Emergency Management Agency's (FEMA) Technical Mapping Advisory Council, providing guidance to FEMA on the National Flood Insurance Program, and is active in the United Nations Global Geospatial Information Management Working Group. In the past few years, the NOAA GIS community was inducted into the Urban and Regional Information Systems Association GIS Hall of Fame and received two Environmental Systems Research Institute (Esri) Making A Difference Awards, the National States Geographic Information Council Distinguished Service Award, and the FGDC Doug D. Nebert NSDI Champion of the Year Award.



Bryon Folwell
Acting Geospatial Information Officer
U.S. Department of Agriculture



Donna Roy
Executive Director, Information Sharing and Services Office, Office of the Chief Information Officer
Department of Homeland Security



Sammie Jackson
Director GEOINT Enterprise Office
National Geospatial-Intelligence Agency

Appendix B

FGDC Structure and Membership

The Federal Geographic Data Committee (FGDC) operates under the Office of Management and Budget (OMB) Circular A-16 (revised August 2002), which affirms 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 decision-making 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 structure also includes agency-led subcommittees and working groups and collaborating partners that represent State, Tribal,

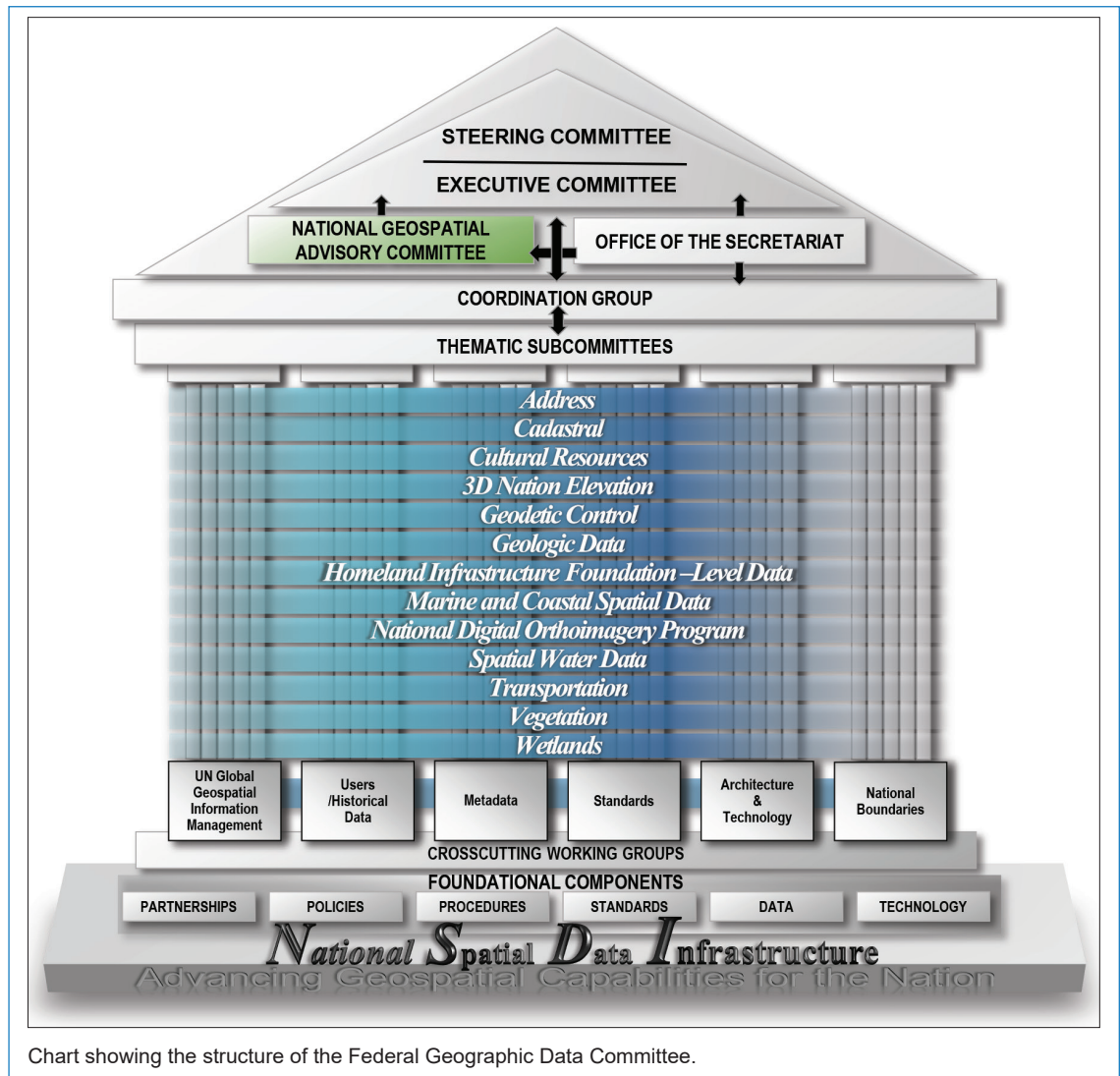


Chart showing the structure of the Federal Geographic Data Committee.

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 for mission execution and to address national priorities and Presidential initiatives.
- Developing and establishing the National Geospatial Data Clearinghouse through the Geospatial Platform Shared Service 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.

In addition, the United Nations Global Geospatial Information Management Working Group serves as the lead to develop and provide the United States' position on topics addressed by the United Nations. More information about the FGDC structure and specific membership can be found at fgdc.gov/organization.

Steering Committee

The FGDC is governed by the Steering Committee, which is the executive-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 on the basis of business best practices. The Steering Committee is responsible for overseeing activities related to OMB Circular A-16 and for the implementation of the NSDI. The FGDC Chair and Vice Chair lead the committee, which is made up of Senior Agency Officials for Geospatial Information 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,

2018 Steering Committee Agencies

Federal Communications Commission (nonvoting member)
General Services Administration
Library of Congress
National Aeronautics and Space Administration
National Archives and Records Administration
National Capital Planning Commission (nonvoting member)
National Science Foundation
Office of Management and Budget
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 (nonvoting 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

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 NGAC.

Appendix C

National Geospatial Data Asset Themes

Geospatial data is described in the Office of Management and Budget (OMB) Circular A–16 Supplemental Guidance, released November 10, 2010, 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 NGDA Datasets are associated with an NGDA Theme. These Themes serve as the management units for collections of related NGDA Datasets that benefit from coordinated development and management. In March 2017, the Federal Geographic Data Committee (FGDC) Steering Committee endorsed the revised version of the A–16 NGDA Themes and Theme Lead Agencies list. This endorsement revises the earlier list that was approved by the Steering Committee in 2013. The list of the NGDA Themes and Datasets and further information is available on the FGDC website (fgdc.gov/what-we-do/manage-federal-geospatial-resources/a-16-portfolio-management/index_html).

Framework Themes are noted with an asterisk (*) and provide the core, most commonly used set of base data. All Themes are identified in OMB Circular A–16 appendix E and maintained by the FGDC (fgdc.gov/policyandplanning).

NGDA Themes	Number of NGDA Datasets	Theme Lead Agency
Address	To be determined	Coleads: U.S. Department of Commerce, U.S. Census Bureau, and U.S. Department of Transportation
Biodiversity and Ecosystems	7	U.S. Department of the Interior, U.S. Geological Survey
*Cadastre	19	U.S. Department of the Interior, Bureau of Land Management
Climate and Weather	5	U.S. Department of Commerce, National Oceanic and Atmospheric Administration
Cultural Resources	2	U.S. Department of the Interior, National Park Service
*Elevation	12	Coleads: U.S. Department of the Interior, U.S. Geological Survey and U.S. Department of Commerce, National Oceanic and Atmospheric Administration
*Geodetic Control	4	U.S. Department of Commerce, National Oceanic and Atmospheric Administration
Geology	6	Coleads: U.S. Department of the Interior, U.S. Geological Survey and U.S. Department of the Interior, Bureau of Ocean Energy Management
*Governmental Units, and Administrative and Statistical Boundaries	40	U.S. Department of Commerce, U.S. Census Bureau
*Imagery	9	Coleads: U.S. Department of Agriculture, Farm Service Agency and U.S. Department of the Interior, U.S. Geological Survey
Land Use—Land Cover	14	Coleads: U.S. Department of Agriculture, U.S. Forest Service and U.S. Department of the Interior, U.S. Geological Survey
Real Property	14	General Services Administration
Soils	5	U.S. Department of Agriculture, Natural Resources Conservation Service
*Transportation	16	U.S. Department of Transportation
Utilities	2	Offshore Utilities: U.S. Department of the Interior, Bureau of Safety and Environmental Enforcement
Terrestrial Utilities		Lead to be determined
*Water — Inland	5	Coleads: U.S. Department of the Interior, U.S. Fish and Wildlife Service and U.S. Department of the Interior, U.S. Geological Survey
*Water — Oceans and Coasts	16	U.S. Department of the Commerce, National Oceanic and Atmospheric Administration

Appendix D

Fiscal Year 2018 FGDC Office of the Secretariat

Financial Summary

The Federal Geographic Data Committee (FGDC) is a 32-member interagency committee that promotes the coordinated development, use, sharing, and dissemination of geospatial data on a national basis. The FGDC Office of the Secretariat, administered in the U.S. Geological Survey (USGS) in the Department of Interior (DOI), provides committee support and program, management, coordination, administrative, and technical support for FGDC initiatives, activities, and priorities. The following table illustrates a summary of actual expenditures of appropriated funds for fiscal year 2018.

FGDC Office of the Secretariat Fiscal Year 2018 Expenditures

Activity	Function	Expenditure
Committee Support, Staff Operations and Projects	<ul style="list-style-type: none"> - National Spatial Data Infrastructure (NSDI) Strategic Plan, National Geospatial Data Asset portfolio management - Committee management activities - Contract execution and reporting - NSDI training and web services - Services registry - Special projects - Position, Navigation, and Timing 	\$2,087,500
Geospatial Platform Shared Service*	<ul style="list-style-type: none"> - DOI/USGS contribution - Geospatial Cloud Services 	\$631,500
National Geospatial Advisory Committee	<ul style="list-style-type: none"> - Committee management - Meetings and facilitation - Subcommittee activities 	\$183,000
International Activities	<ul style="list-style-type: none"> - Group on Earth Observations - Arctic Spatial Data Infrastructure - United Nations Global Geospatial Information Management 	\$133,000
Geospatial Standards	<ul style="list-style-type: none"> - Interoperability - FGDC and Geospatial Standards Working Group standards - Open Geospatial Consortium - International Committee for Information Technology Standards 	\$47,700
Bureau Shared Costs		\$127,600
Total Expenditures		\$3,214,000

*Contributions from other agencies are not included.

Appendix E

Glossary of Abbreviations and Terms

3DEP	3D Elevation Program	ISO	International Organization for Standardization
ACS	American Community Survey	ISO/TC 211	International Organization for Standardization Technical Committee 211
API	application programming interface		
ARMSDIWG	Arctic Regional Marine Spatial Data Infrastructure Working Group	IWG—OCM	Interagency Working Group on Ocean and Coastal Mapping
BLM	Bureau of Land Management	lidar	light detection and ranging
BOEM	Bureau of Ocean Energy Management	LMA	Lifecycle Maturity Assessment
BTS	Bureau of Transportation Statistics	MOU	Memorandum of Understanding
CadNSDI	Cadastral National Spatial Data Infrastructure	NAD	National Address Database
Census Bureau	U.S. Census Bureau	NAD 83	North American Datum of 1983
CMECS	Coastal and Marine Ecological Classification Standard	NAIP	National Agriculture Imagery Program
CoNED	Coastal National Elevation Database	NASA	National Aeronautics and Space Administration
CSDGM	Content Standard for Digital Geospatial Metadata	NBG	National Boundaries Group
DHS	U.S. Department of Homeland Security	NDOP	National Digital Orthoimagery Program
DOI	U.S. Department of the Interior	NGA	National Geospatial-Intelligence Agency
EO4SDG	Earth Observations for Sustainable Development Goals	NGAC	National Geospatial Advisory Committee
EPA	U.S. Environmental Protection Agency	NGDA	National Geospatial Data Asset
Esri	Environmental Systems Research Institute	NHDPlus HR	National Hydrography Dataset Plus High Resolution
FEMA	Federal Emergency Management Agency	NIS	National Imagery Summit
FGDC	Federal Geographic Data Committee	NOAA	National Oceanic and Atmospheric Administration
FGDC OS	Federal Geographic Data Committee Office of the Secretariat	NPS	National Park Service
FLWG	Federal Lands Working Group	NRCS	Natural Resources Conservation Service
FSA	Farm Service Agency	NSDI	National Spatial Data Infrastructure
FWS	U.S. Fish and Wildlife Service	NSGIC	National States Geographic Information Council
FY	fiscal year	NSRS	National Spatial Reference System
GAO	Government Accountability Office	NVC	U.S. National Vegetation Classification
GDA	Geospatial Data Act of 2018	OGC	Open Geospatial Consortium
GEO	Group on Earth Observations	OMB	Office of Management and Budget
GeoPlatform	National Geospatial Platform	OWDI	Open Water Data Initiative
GEOSS	Global Earth Observation System of Systems	PAD—US	Protected Areas Database of the United States
GGIM WG	Global Geospatial Information Management Working Group	PLSS	Public Land Survey System
GGRF	Global Geodetic Reference Frame	SDG	Sustainable Development Goal
GIO	Geospatial Information Officer	SDI	Spatial Data Infrastructure
GIS	geographic information system	SPCS	State Plane Coordinate System
GMO	Geospatial Management Office	SSURGO	Soil Survey Geographic
GRAV-D	Gravity for the Redefinition of the American Vertical Datum	SSWD	Subcommittee on Spatial Water Data
GSA	General Services Administration	TBDEM	topobathymetric digital elevation model
HIFLD	Homeland Infrastructure Foundation-Level Data	UN	United Nations
FHLFP	United Nations High-Level Political Forum	UN—GGIM	United Nations Committee of Experts on Global Geospatial Information Management
IfSAR	interferometric synthetic aperture radar	USACE	U.S. Army Corps of Engineers
IHO	International Hydrographic Organization	USDA	U.S. Department of Agriculture
INCITS	International Committee for Information Technology Standards	USDOT	U.S. Department of Transportation
ION	Institute of Navigation	USFS	U.S. Forest Service
		USGEO	U.S. Group on Earth Observations
		USGS	U.S. Geological Survey
		USPS	U.S. Postal Service
		WBD	Watershed Boundary Dataset

WMTT	Wetland Mapping Targeting Tool
W-O&C	Water-Oceans and Coasts
XML	Extensible Markup Language
ZIP	Zone Improvement Plan

