

Testimony of
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I thank the Honorable Chairman Costa and the Members of the Subcommittee on Energy and Mineral Resources for the opportunity to provide testimony for this hearing on Federal Geospatial Data Management and to contribute positively to the dialog about the value of geospatial data to the nation and efforts to create the National Spatial Data Infrastructure (NSDI).

My experience with the subject of geospatial data includes my present position as Geospatial Information Officer for Department of the Interior (DOI) and my current role as Acting Chair of the Federal Geographic Data Committee (FGDC). I also have served as Associate Director for Geospatial Information and Chief Information Officer for the U.S. Geological Survey and worked a number of years in the State of North Carolina as the Director of the Center for Geographic Information and Analysis.

Chairman Costa's letter of invitation stated that this hearing will examine 1) the usefulness of geospatial data to the nation; and 2) the status of federal efforts to create a National Spatial Data Infrastructure, reduce redundant geospatial data investments, promote data sharing, and increase coordination of geospatial data gathering activities within the federal government and between federal agencies and non-federal entities.

To address the first point of the usefulness of geospatial data to the nation, I will briefly share with you some examples of how geospatial information and technology have and are being used to address issues of national significance, and invite you to explore with me the possibilities of the future National Spatial Data Infrastructure.

To address the second point, my testimony includes observations of the Federal progress that has been made over the last decade to ensure more effective investments in geospatial data, promote data sharing, and improve coordination both within the federal government and between federal agencies and non-federal entities. I will also alert you to opportunities and challenges we face in realizing a robust and coordinated NSDI, and describe directions the current Administration is pursuing to address these opportunities and challenges. The testimony is centered on efforts of the FGDC and its responsibilities outlined in OMB Circular A-16 and Executive Order 12906.

Usefulness of Geospatial Data to the Nation

A report prepared by the National Geospatial Advisory Committee entitled *The Changing Geospatial Landscape* states a remarkable truth:

“Practically overnight, access to terabytes of geographical information, much of it in three dimensions, has changed the way people work, live, and play.”

Geospatial information and technology are now ubiquitous and embedded in numerous aspects of society. They support planning, decision-making, and action in many disciplines, professions and organizations literally around the world. Geospatial information is being used to address the nation’s critical issues and applications include natural resource management, land records management, conservation and environmental restoration, facility management, transportation and logistics, human health, security, natural and human disasters, humanitarian relief, climate and environment – just to name a few. Today the consumer market has exploded and geospatial information and technology are being used in ways never imagined even a decade ago.

Geospatial information has been a valuable tool in the Nation’s response to the events of September 11, 2001, Hurricane Katrina, the annual fire season, avian influenza, Census data collection and analysis, weather forecasting, and now the economic recovery. The impact and benefits of this information in each of these efforts was significant.

However most of these uses and applications still arise issue-by-issue and project-by-project and require extensive time to prepare and synthesize information. Imagine the United States with a National Spatial Data Infrastructure that enables easy access to current, high quality, application-ready information -- information that is produced once, used many times, and satisfies a broad range of users from scientists to end consumers. The National Spatial Data Infrastructure of the future could place geographic knowledge at the fingertips of the nation.

Federal Progress, Achievements, and Status

Over the last decade remarkable Federal progress has been made toward a National Spatial Data Infrastructure. I call your attention to achievements in 7 key areas: strategic planning, improved Federal governance and accountability, partnerships with the non-Federal community, data sharing mechanisms, streamlined investment management, shared operational data assets, and support to key national issues.

Strategic Planning

Over the past several years federal partner agencies have conducted two significant efforts to develop strategic approaches for geospatial coordination.

NSDI Strategic Directions

In 2004, the FGDC launched the NSDI Future Directions Initiative to craft a national geospatial strategy and implementation plan to further the development of the NSDI. The resulting document, “NSDI Future Directions Initiative, Towards a National Geospatial Strategy and Implementation Plan”, drew on the collective insights and contributions of the geospatial community at-large and requires a variety of organizations and individuals to become involved and share the responsibility for implementation in order to achieve success. This report provides a context for action to address the needs of the geospatial community, built on past successes and providing the blueprint for collective action. The strategy described in the report:

- Is based on communication, cooperation, and partnerships;
- Reflects an integrated approach to access critical geospatial data and products;
- Recognizes the need to communicate the NSDI’s value beyond current constituents;
- Emphasizes coordination of resources and appropriate technical services for all Federal and non-federal entities;
- Focuses on achieving interoperability and framework standards compliancy and adoption; and
- Outlines procedures, defined more concretely in its accompanying Action Plans, for achieving each objective and serves as a starting point to address the issues.

Geospatial Line of Business

Subsequent to development and execution of this National Strategy, the FGDC embarked on a follow-up effort to enhance coordination across federal agencies. The FGDC used a business process approach in developing the next iteration of its strategic efforts in 2006 through the OMB sponsored Geospatial Line of Business Initiative. The Geospatial Line of Business is a government-wide initiative, sponsored by the Office of Management and Budget that focuses on improving government effectiveness by promoting the use of geospatial information in order to improve both the policy decisions and the internal business processes of Federal agencies. This initiative has produced a Common Solutions and Target Architecture document that has served as the operational framework for federal geospatial coordination over the past three years. Two of the major accomplishments that this initiative produced are the Geospatial SmartBUY Blanket Purchase Agreements (BPAs) and the OMB Circular A-16 Supplemental guidance. These specific accomplishments will be described in more detail later in this testimony.

Improved Federal Governance and Accountability

Implementation of the strategic vision required executive participation and concurrence from partner agencies, a mechanism to guide the Steering Committees efforts, clarification of the Federal roles and responsibilities directed in A-16, and recognition of the importance of managing geospatial investments. Improved governance and accountability mechanisms include the following items.

Senior Agency Officials for Geospatial Information

In March of 2006, OMB directed select executive departments and agencies that produce, maintain, or use geospatial information to designate a senior agency official who has

agency-wide responsibility, accountability, and authority for geospatial information issues, referred to as a Senior Agency Official for Geospatial Information or SAOGI. Each SAOGI is responsible for internal coordination and implementation of geospatial-related initiatives and activities in their agency and also serve as the policy-level official to represent the agency on the FGDC Steering Committee.

FGDC Executive Committee

In April 2008, a subset of the Steering Committee members, along with the Chair and Vice-chair were chartered as an Executive Committee. The Executive Committee meets frequently and is responsible for providing guidance, making recommendations and helping move forward critical issues for the Steering Committee. The Executive Committee member agencies are the seven agencies with the majority of the Federal geospatial investments, including: Department of the Interior (DOI), Department of Agriculture (USDA), Department of Commerce (DOC), Department of Defense (DoD), Department of Homeland Security (DHS), Environmental Protection Agency (EPA), and National Aeronautics and Space Administration (NASA). OMB serves as the Vice-chair. The Executive Committee has taken the lead on advancing Federal geospatial initiatives, such as Imagery for the Nation (IFTN), and has enabled the FGDC to progress efficiently and maintain continuity during the administration transition period.

A-16 Supplemental Guidance

Draft Supplemental Guidance for OMB Circular A-16 has been developed to clarify roles, responsibilities, and management processes to help lead agencies more systematically and effectively implement their geospatial management responsibilities. The Guidance sets the framework for lifecycle-based portfolio management and establishes a reporting process to increase transparency in the development and maintenance of nationally significant geospatial datasets. It also provides a standard lexicon of terms for use in this process. It offers a decision process for adding, modifying, or deleting specific themes or datasets from the Circular based on alignment with long-term national strategies or goals, specific business requirements, benefits, and costs. Most importantly it establishes a meaningful process for continuously improving nationally important geospatial data.

Individual Agency Governance Improvements

Many improvements in geospatial governance have occurred within individual agencies. For example in 2008, DOI issued a Secretarial Order entitled “Enhanced Geospatial Governance” that, among other things, established the position of Geographic Information Officer. This formally recognizes the importance the Department places on the need for strategic oversight and management of geospatial investments and operations. Two other examples of Federal Departments establishing GIO positions are the EPA and the U.S. Army.

Partnerships with the Non-Federal Community

Non-Federal partners are key to the success of the NSDI. Advancements in Federal coordination with these important stakeholders are described below.

National Geospatial Advisory Committee

One of the most effective new developments to enhance our partnership and governance process has been the establishment of the National Geospatial Advisory Committee (NGAC). The NGAC is a Federal Advisory Committee established by the Interior Department in 2008 to provide external advice and recommendations to the member agencies of the FGDC. Two of my colleagues on the panel today, Michael Byrne and John Palatiello, currently serve as members of the committee. The NGAC includes a balanced membership of 28 committee members representing a variety of organizations involved in geospatial issues, including the private sector, non-profit organizations, academia, and all levels of government. The NGAC has staggered membership terms, and Secretary Salazar issued a call for nominations earlier this month for the next round of appointments to the committee.

In the short period that the NGAC has been in existence, it has proven to be an invaluable source of advice and feedback for the FGDC. The NGAC promotes two-way communication on issues of common interest to the national geospatial community and provides a forum to convey views representative of our partners and stakeholders. The NGAC meets on a quarterly basis 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 Imagery for the Nation, Geospatial Line of Business, National Land Parcel Data, Transition Recommendations, “Changing Landscape” of Geospatial Technology, Economic Stimulus, and FGDC Governance. For next steps, the NGAC is working with us to conceptualize an approach for a new National Geospatial Policy and Strategy. This is a very complex activity, and I anticipate that this issue will be a major focus of the NGAC’s work over the coming year.

Cooperative Agreements Program

The NSDI Cooperative Agreements Program (CAP) was established by FGDC to help form partnerships among organizations to implement the NSDI. The CAP funds innovation in the GIS community to build the NSDI. This broad effort includes a focus on people, organizational know-how, best business practices, collaboration, education, tools, technology, the Internet, standards and data. The NSDI CAP is a success story for the NSDI, FGDC, and our constituents.

CAP participation is now open to all sectors, except for Federal agencies, and has included: Federal agencies (prior to 2008), State governments, county and city governments, Tribal organizations, academic institutions, regional organizations, and private organizations. Since 1994, \$18 million has been spent on CAP, funding over 600 projects, each of which is matched by non-Federal funds in the form of in-kind services. These matches typically range from 25 percent to 100 percent of the award.

50 States Initiative

This initiative provides seed money, requiring in-kind matches from the awardees, to help states develop geospatial strategic and/or business plans in support of the NSDI. These

plans can then be utilized by the Federal agencies who can, through their programs and state liaisons, improve the integration of efforts between and across levels of government and between agencies. Currently, 46 states have received awards.

NSDI Training

The FGDC supports NSDI training through a distributed network of partners including State GIS Coordinators, university GIS programs, independent consultants, and Federal programs including the National Biological Information Infrastructure (NBII) and the National Oceanic and Administrative (NOAA) Coastal Services Center. NSDI training focuses on Geospatial Metadata and NSDI Clearinghouse implementation to aid individuals in documenting and publishing their geospatial data resources. An Online Training Initiative provides training modules on Geospatial Data Discovery and Access, Geospatial Data Integration, Geospatial Partnerships, Policy and Planning, the NSDI, GOS, geospatial web services, NSDI Standards, NSDI data themes, geospatial business planning, and the CAP. The FGDC also provides ‘train-the-trainers’ sessions where attendees can learn the methods and materials for specific topics and become ‘certified’ trainers. These trainers can then train others in their agencies, organizations, or geographic areas.

Data Sharing Mechanisms

We have advanced our capabilities for data sharing within and among Federal agencies, and also between Federal agencies and our not-federal partners.

Geospatial Standards

Standards are critical to the sharing of geospatial information. The FGDC in cooperation with partners develops geospatial standards for implementing the NSDI. These include standards on: thematic data content, metadata, transfer protocols, positional accuracy, cartographic representation, and others. The FGDC’s standards process incorporates established Federal requirements, and complements other National and International standards development efforts including the International Organization for Standardization (ISO), the American National Standards Institute (ANSI), and the InterNational Committee on Information Technology Standards (INCITS).

There are currently 24 FGDC endorsed geospatial standards and another 14 currently in development. Since 2003, the 7 Framework data themes, and 4 additional data themes, have been endorsed. These include cadastre, digital orthoimagery, elevation, geodetic control, governmental unit boundaries, hydrography, transportation, bathymetry, geology, vegetation, and wetlands.

A significant amount of data collected by non-Federal partners becomes part of the NSDI. FGDC standards facilitate the contribution of data to the NSDI by non-Federal partners and provide guidance for the partners producing their own data. For example, last year, only one third of the new and updated data added to the wetlands layer of the

NSDI was produced using funds appropriated to the U.S. Fish and Wildlife Service's National Wetlands Inventory. The rest was contributed by cooperators.

Geospatial One Stop

Geospatial One-Stop (GOS) is an e-government initiative sponsored by OMB. GOS makes it easier, faster, and less expensive for all levels of government and the public to access geospatial information. The GOS portal, also known as geodata.gov, serves as a public gateway for improving access to geospatial information and data. It provides a robust geospatial data catalog and tools for searching Federal and non-Federal geospatial information. It also includes a "Marketplace" where geospatial data purchase/development efforts are posted to foster partnerships for data collection and reduce costs. Use of the GOS continues to grow. From 2004 to 2008 the number of records registered with the GOS has increased from 11,000 to 188,000.

Data.gov and Recovery.gov

Geospatial technology and expertise have been used to support Data.gov and Recovery.gov, two new Administration initiatives to increase public access to government information and activities. Data.gov deals specifically with access to high-value government generated data sets. For example the USGS's "Global Visualization Viewer" provides access to 1.5 million aerial photographs of U.S. sites and 8.5 million images captured worldwide by U.S. Earth-observing satellites. Recovery.gov specifically provides information about the American Recovery and Reinvestment Act, providing information to the public about the use of stimulus funds.

Streamlined Investment Management

In the last few years, several important steps have been taken to streamline Federal investments in geospatial information and technology.

Geospatial SmartBuy

The Geospatial Line of Business, through the FGDC, has established a SmartBuy contract vehicle to consolidate purchase of geospatial technology. The acquisition initiative is led by the Department of the Interior and GSA. Multiple Blanket Purchase Agreements, provide significant cost savings and greatly improve the government's access to high quality commercial geospatial software, packaged data, and related products. BPAs will be available to Federal civilian and defense agencies as well as state, local, and Tribal governments.

Investment Reporting

As a part of the Geospatial Line of Business, a 2008 data call was issued to the Lead Agencies responsible for each of the 34, OMB Circular A-16 Data Themes of National Significance. This information is being used to develop a framework for geospatial data portfolio management.

The FY 2007 budget passback guidance issued by OMB to all Federal agencies directed agencies to "update and report to OMB by March 30, 2007, their inventories of geospatial

data and systems using a common set of investment definitions”. Agency information obtained through this investment reporting request was intended to be used to coordinate agency investments in geospatial data and services through FY 2009. Analysis of agency responses is contained in the “2007 Data Call Analysis Report” and some of the key findings were:

- For the specific data sets included in the reporting request, the Federal government financed or plans to invest, directly or indirectly, \$1.89 billion in spatial data and geospatial services during the FY 2007 – FY 2009 period.
- The level of geospatial investment each year was relatively consistent.
- Fifty two percent (52%) of agencies reported a three year average of less than one million (\$1M) per year in geospatial data and services investments within the scope of the investment data request.
- DHS, DOC, DOI, and USDA investments when combined total over 90% of total reported federal geospatial data and services investments and these agencies are lead federal agencies for 87% of the data themes within the scope of the 2007 geospatial investment reporting request.
- A high degree of redundant investment types was not readily apparent in comparison with other LoB initiatives (i.e. Human Resources LoB, Financial Management LoB, Grants, etc.)

Shared Operational Data Assets

The FGDC has provided leadership to align the efforts of the Federal agencies and worked collaboratively with our non-Federal partners to move toward a national goal of shared operational data assets being available on-line for multiple uses and purposes.

Imagery for the Nation

Imagery for the Nation (IFTN) is a proposed Federal program, to be conducted in partnership with State and local governments, to address the nation’s basic business needs for imagery. The vision for IFTN is that the nation will have a sustainable and flexible digital imagery program that meets the needs of local, State, regional, Tribal and Federal agencies. Imagery is used for countless applications in all levels of government and sectors, and has been embraced by the public through its use in online tools such as Google Earth and Microsoft Virtual Earth. Partnerships between levels of government to acquire imagery data have been successful and growing because the benefits of a coordinated approach are clear: lower costs, reduced duplication of effort, greater standardization and more data available for the full spectrum of uses and users. IFTN has been endorsed by the National Geospatial Advisory Committee and many other stakeholder groups. We are finalizing a project plan for IFTN and working with our partner agencies to develop a funding strategy.

National Land Parcel Data

Land parcel data is another key data asset that has received focus by the FGDC. Digital land parcel data are a critical component supporting key national programs and priorities. Parcel information, combined with other geographic information, is used to support numerous other programs such as management of emergency situations (including

wildland fire and hurricanes), the development of domestic energy resources, management of private and public lands, support of business activities, and monitoring regulatory compliance. A recent National Research Council report, “National Land Parcel Data: A Vision for the Future” provided a set of recommendations on the development of a national approach to parcel data. The NGAC has also reviewed and endorsed the recommendations in the report. The FGDC has begun to address the parcel data recommendations. For example, the NGAC and other stakeholders have identified how parcel level information across the country can be used in developing effective responses to the current mortgage crisis. The FGDC Cadastral Subcommittee convened an outreach conference in May with partners and stakeholders in the financial community to demonstrate how parcel information can help support a data-driven response to the mortgage crisis. We are working with our partner agencies to address the recommendations that resulted from the meeting.

Support for Key National Issues

Geospatial technologies and data are used at all governmental levels and by non-Federal constituents to monitor, respond, and prepare for a multitude of issues. Geospatial technologies and data are currently being used to address many key national issues including: climate change, economic recovery, energy exploration, homeland security, and managing our environmental resources and critical infrastructure. During the 9-11-2001 response, daily monitoring and mapping of ‘ground zero’ using aerial imaging was performed to monitor structural stability and locate heat signatures of survivors and fires. The most costly U.S. natural disaster, Hurricane Katrina was both tracked prior to its landfall and responded to using geospatial technologies. The Indonesian Tsunami’s impact and response by U.S. Federal, private sector, and international agencies relied on geospatial technologies. During the recent wildfires in the west, public postings online of minute-by-minute fire location changes utilized online mapping technologies. The question is no longer where can geospatial data help, but how can we more efficiently prepare and manage our geospatial portfolio and increase our spatial readiness to be prepared for, respond to, and minimize time, expense and loss.

I call your attention to an attachment to this testimony that provides web links to some outstanding geospatial activities in the Federal agencies that are supporting critical national issues. For example, the National Geospatial Program (NGP) in the US Geological Survey collects and integrates base national geospatial datasets, maintains standards, coordinates data discovery and access, and ensures consistent and current data are available for the Nation. Two of NGP’s primary products are The National Map and The National Atlas, which present current, accurate, and consistent geospatial data and map services online. These products contain data and information describing the landscape of the U.S. and locational features that can be fused or integrated and displayed online or in a traditional map format. The National Map represents the starting point—the basic framework—from which land and resource decisions and economic and environmental policies can be made.

Coastal habitats are among the most important habitats for fish and wildlife. The large number of National Wildlife Refuges along coasts are tremendously important to myriad migratory birds and endangered species. In its draft climate change action plan, the U.S. Fish and Wildlife Service recognizes that and states that it will use the Sea Level Affecting Marshes Model (SLAMM) to develop adaptive strategies for coastal Refuges. Absent Federal geospatial data readily available over the internet, the use of SLAMM would be limited due to cost and limited access to the data. These data sets include wetlands data from the U.S. Fish and Wildlife Service, elevation from the U.S. Geological Survey, and tide data from the National Oceanic and Atmospheric Administration.

Opportunities and Challenges

In spite of this record of achievement, the United States still has work to do to achieve a cost effective National Spatial Data Infrastructure that ensures the nation's geospatial readiness to address critical issues across all sectors and disciplines. Although there has been a dramatic shift from the Federal government being the primary producer of geospatial data, the expectation remains that the Federal government will provide competent and appropriate leadership to realize a coordinated NSDI. We must continue to refine and develop spatial data policy, increase our understanding of the collective geospatial capacity of the Federal government and its partners, and provide the means to oversee and control Federal investment in geospatial data and technology. Mechanisms to ensure the accountability of Federal agencies and incentives for non-Federal participation in a collaborative, coordinated NSDI must continue to be a focus.

At the same time there are tremendous opportunities to leverage the intersection of an era of "unprecedented transparency and accountability", a renewed commitment to innovative government, geospatially literate society, and a period of unparalleled technological sophistication in order to put geospatial information at "the fingertips of the nation."

The Administration's Geospatial Directions

The Administration is committed to the National Spatial Data Infrastructure and considers "geo-enabling the government" an obvious and essential direction. We will do this through:

- Encouraging innovation, both in the use of new technologies and transformed business practices;
- Ensuring broad and effective collaboration with State, local and tribal governments;
- Leveraging industry progress;
- Clearing policy obstacles; and
- Focusing on performance.

In the short term we will concentrate in 3 areas:

1. We will engage the nation in a dialog about its geospatial future. We plan to hold a “National Geospatial Open Forum”, using new media, to garner input from all corners of the country to seek out the best ideas for enhancing the National Spatial Data Infrastructure.
2. We will bring creative energy to making Imagery for the Nation (IFTN) a reality. We are listening to the non-Federal stakeholders and concur that this important project can serve as a superb demonstration of the principles and concepts of the NSDI and meet a key national need.
3. We will bolster the geospatial governance structure that we now have in place. We will ensure that the FGDC is successful in providing unprecedented leadership to meet the geospatial needs of the Federal government and of the nation in the 21st century.

Summary

Today, American society demands and expects geospatial information to be at their fingertips. Leveraging advancements in the private sector and leadership from state, local and tribal governments, the Nation stands poised to enjoy the benefits of a robust National Spatial Data Infrastructure.

As I have discussed through this testimony, highlighting numerous accomplishments over the last decade, the Federal Government is continuing and will continue to play a key role in the NSDI. We are making significant strides towards meeting user expectations, leveraging private sector innovation, collaborating with non-Federal partners, and managing our investments. While there is substantial work to be done to realize the National Spatial Data Infrastructure, we have advanced national geospatial efforts in order to:

- quickly and effectively respond to the Nation’s priorities;
- be the leader in the global spatial data infrastructure;
- stay at the forefront of technology;
- respond to disasters and national security events;
- meet the increasing demand for access and use of geospatial information; and
- provide transparency and accountability to citizens.

I look forward to working with the Subcommittee on any further efforts toward the National Spatial Data Infrastructure and appreciate your leadership in convening this hearing. Thank you for the opportunity to present this testimony. I would be pleased to answer any questions.