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The National Geospatial Programs Office

A Plan for Action

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Core Team

An undertaking as ambitious and comprehensive as that of unifying and simplifying national geospatial assets is not achieved without the professional dedication and personal commitment of a special group of people. It has been my singular privilege and pleasure to have the following individuals with me every step of the way as we have begun this extraordinary journey to ensure that we will be able to fulfill the vision for the National Spatial Data Infrastructure and to place geographic knowledge at the fingertips of the Nation. Leadership is a task made easier and better by those on whom a leader can depend. I would like to take this opportunity to thank them for their individual contributions and their collective counsel to me. Together we have set the National Geospatial Programs Office on an ambitious path that is grounded in thoughtful and well-informed guidance.

Karen Siderelis
Associate Director for Geospatial Information

Ivan DeLoatch, who brought his knowledge and considerable experience of the Federal Geographic Data Committee and the essential notion of broad collaboration into the team;

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The USGS Family

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Executive Summary

Establishing the National Geospatial Programs Office

In a strategic move to consolidate national geospatial programs for which it has a leadership role, the USGS Director created the National Geospatial Programs Office (NGPO), organizationally housed in the Geospatial Information Office (GIO), and under the authority and accountability of the Associate Director for Geospatial Information. With the creation of the NGPO, the essential components to implement the National Spatial Data Infrastructure (NSDI) will be managed as a unified portfolio that benefits the entire geospatial community. The NGPO will engage partners in planning to ensure that their needs are met.

Leadership for the Future

In establishing the NGPO and determining its purpose, vision, and mission, the Core Team defined the purpose of the NGPO as *"**Providing leadership to place geographic knowledge at the fingertips of the Nation."*** To achieve that purpose, the NGPO will look at how Government needs to change in order to be prepared for the future and be responsive to its citizens and stakeholders. The vision of the NGPO is "***By June 30, 2006, transform the processes of Government necessary to implement key components of the NSDI."***

The mission of the NGPO is twofold. One mission component focuses on leadership and the prominent role of partners and stakeholders; the other focuses on the operational aspects and technical services needed to implement the NSDI and provide useful geospatial information to decisionmakers. These two mission components inform the structure of the NGPO. In concert with its mission, the NGPO and its leaders are committed to core values of national leadership, partnership, service, value and impact, and professionalism, which will guide the NGPO into the future.

A Culture of Transformation

The NGPO envisions three transformations that will be necessary to fulfill the vision of the NSDI.

Toward a national geographic information system: Transformation to an enterprise information system for the Nation's geospatial assets is essential. The NGPO will lead the development of a national geographic information system (GIS) that will provide access to quality, timely, digital geospatial data and resources. This approach will facilitate the adoption of a common architecture and best practices and leverage the resources of a distributed network of data stewards to implement the NSDI. Data stewards are a federation of Federal, State, local, and tribal government organizations, along with nongovernmental and academic communities and the private and nonprofit sectors. The primary roles for the USGS will be demonstrating leadership, providing useful information to decisionmakers, providing meaningful incentives to partners, and promoting data models, standards, and best practices. The USGS will shift its emphasis from producing maps to providing access to the creation of map products and geographic knowledge, thus empowering partners to achieve their geospatial information needs.

Toward matters and places of national importance: While much of our society and infrastructure is supported by available geospatial assets, other issues and places, ranging from rural and coastal communities to natural hazards and homeland security, need more attention. Those who are not direct users of geospatial information, such as emergency responders, public health workers, and government officials, also need what that information can tell them about resources, processes, patterns, or threats. The NGPO will focus on that untapped potential of issues, places, and users.

Toward management excellence: The President's Management Agenda calls for a performance-oriented approach by Government that shows improved accountability. The NGPO will adopt the discipline of project management as a means to realize its strategic vision, effect change in the organization, and implement new business procedures. Best practices of the information technology community will ensure that life cycle management guides project planning. One of the hallmarks of the President's agenda is to make access to Government information transparent to citizens. The NGPO shares that commitment to transparency and accountability. Accountability to the lines of business and performance management goals set forth by the Office of Management and Budget (OMB), the Department of the Interior (DOI), and the Government Performance and Results Act are embedded in the NGPO strategic plan for action.

Transforming Geographic Knowledge

In its concept of *The National Map*, the NGPO envisions a tapestry that weaves together a national GIS, data stewards, incentive-based partnerships, a national geospatial enterprise architecture, revitalized USGS products and services, and well-managed investments. The weaving together of disparate threads will create a strong and sustainable "fabric," a rich and colorful graphical representation of the landscape of the Nation.

A Strategy for Success

The NGPO has embraced several strategic priorities and accompanying strategic actions to guide its progress. These priorities were developed through internal deliberations, interactions with partners and stakeholders, and reflections on the major transformations needed to implement the NSDI. Establishing and championing a national geospatial enterprise architecture, promoting a governance structure for the future, and providing business value through incentive-based partnerships are the cornerstones on which to build the NSDI.

The Cornerstones

National Geospatial Enterprise Architecture
Strategic Actions

- Adopt geospatial enterprise architecture principles
- Establish advisory council and technical working group
- Promote use of common standards

Governance Structure for the 21st Century
Strategic Actions

- Explore governance models and review FGDC governance efforts

- Promote national governance and its benefits
- Create a national geospatial coordinating body

Incentive-Based Partnerships
Strategic Actions

- Promote an incentive-based partnership model
- Implement best practices for incentives
- Support NGPO demonstration pilots

The Heart of Success

Tapestry of Base Content
Strategic Actions

- Ensure a tapestry of base content by December 2006
- Integrate geospatial information systems
- Strengthen steward relationships

A Geospatial System of Systems
Strategic Actions

- Create a national geospatial information system of distributed data systems
- Provide multipurpose, standards-based technology and tools
- Support and sustain stewards of component systems through incentive-based partnerships

The Resulting Value

National Geospatial Investment Management
Strategic Actions

- Identify interagency investment strategies
- Increase efficiency of expenditures
- Begin a dialog of efficiency

Revitalized Suite of USGS Topographic Products and Services
Strategic Actions

- Derive digital 1:24,000-scale topographic map
- Implement map-on-demand service
- Institutionalize a process for developing new and innovative services

Stakeholder Input

A range of stakeholders gave input on the formation of the NGPO. From this input, the NGPO has developed its strategic priorities and its plan for action. Listening to and learning from everyone involved—partners in the States and local communities, Federal agency partners, other stakeholders, and individuals and interests that are served by geospatial information—is a core value of the NGPO. One message that was repeated again and again is the need for effective communication. This strategic plan for action includes a communication strategy from which specific plans and actions can be developed, and each strategic priority identifies specific communication tactics.

External Stakeholders

A listening session was held in early October 2004 with external stakeholders and partners from other Federal agencies, State and local governments, nongovernmental organizations, academia, and the private sector. Resounding messages from that session were that the NGPO should provide leadership and guidance, expand the stakeholder base, provide incentives, support decisionmakers and facilitate problem-solving (with the use of geospatial information), and develop an effective communication plan.

Internal Stakeholders

In a listening session in the fall of 2004, USGS employees brought forward recommendations to the NGPO leadership. It is clear that employees want to be a part of the NGPO as it moves forward and need to be engaged in the process to be ambassadors for the mission. NGPO leaders are committed to responding to those recommendations and communicating with employees.

Study Teams Input

In early November 2004, Study Teams were chartered to investigate several key areas: Unified Geospatial Enterprise Architecture, Geospatial Technology Integration, Partnership Offices, Unified NSDI Web Presence, Measuring Geospatial Investments, and USGS Geospatial Products and Services. A member of the NGPO Core Team sponsored each Study Team. The contributions of the Study Teams, their investigations, interviews, and deliberations have been invaluable. The Study Team reports were drawn upon heavily for this plan and will be used as springboards for future actions. Some of the Study Teams track directly to Strategic Priorities in the plan for action; in other instances, the Study Team's charter encompassed all of the priorities.

Other Input

Everyone has a stake in the tapestry of place. From many sources and through various venues, it was clear that the time was right and the need was paramount to create the NGPO and to transform the processes of Government to ensure the implementation of the NSDI. The leaders took the message of the NGPO on the road and gathered many suggestions and criticisms from every level of government and every walk of life. This input was also incorporated in the plan for action.

Early Actions

Although it is early in what the NGPO hopes will be an extremely successful endeavor, there have been some early achievements. Early successes are noted in each of the Strategic Priorities and include the following:

Geospatial Enterprise Architecture. Efforts are underway to update the Federal Enterprise Architecture (FEA) to include locational data. NGPO is taking the lead on developing what would become the geospatial overlay to the FEA's various reference models, joining the one for security and privacy released in early fall 2004. This effort recognizes that geographic information is a major asset of any organization and of every entity of government.

Geospatial One-Stop. In February 2005, after a highly competitive procurement process, a $2 million+ contract was awarded to Environmental Systems Research Institute (ESRI) to develop a second generation of the Geodata.gov portal. Geospatial One-Stop is one of 24 E-Government initiatives to help make Federal technology resources more accessible. Version 2 of the popular portal will be easier to use, with its search tools powered by a partnership with a commercial search engine provider. It will support the merger of the map viewers of Geospatial One-Stop and *The National Map* and will manage a broad array of knowledge resources from Federal, State, local, and private sources. This is an important step toward a unified Web presence for the NSDI.

Leveraging Project Homeland. The energy and resources of homeland security must be captured in support of a national geospatial information system and production of *The National Map*. The more than 200 Homeland Security Infrastructure Program (HSIP) variables identified by Project Homeland are recognized by the States and locals as key elements that are needed. Developing specifications with the National Geospatial Intelligence Agency (NGA), Department of Homeland Security (DHS), and the States for these data elements will ensure that framework data layers of *The National Map* can be distilled from the HSIP elements.

Unified Web Presence. This Web site becomes the premiere place to begin a search for GIS data, written content, papers, presentations, educational materials, and links to related sites. Redundant content and functionality will be eliminated from the various program component Web sites to enhance the experience of partners and customers when coming to the new unified site.

National Geospatial Technical Operations Center (NGTOC). A national capability of production activities and technical services associated with the NGPO was consolidated by the USGS Director's memo in January 2005. Included are the activities and services of the Cooperative Topographic Mapping Program, the Federal Geographic Data Committee, the Geospatial One-Stop portal, and the DOI Enterprise Geospatial Information Management activity. A business strategy for the NGTOC has been developed, and a scoping process is underway to look at the most efficient way to carry out its functions.

Next Steps

The development of this strategic plan for action has been a significant step in the formation of the NGPO. With an expectation of constructive feedback regarding priorities and actions, the NGPO leadership will set a specific implementation plan in place for the remainder of this fiscal year and integrate NGPO priorities into the broader USGS and DOI budget process. In the coming months, the NGPO leadership will take this plan for action out to its employees, partners, stakeholders, and customers in a series of presentations, discussions, and planning sessions. Additional reports and marketing materials will be used to generate support and engagement in the NGPO and in implementation of the NSDI.

Introduction to the National Geospatial Programs Office

What is the NGPO and why was it created?

"…current and accurate geospatial data will be available to contribute locally, nationally, and globally to economic growth, environmental quality and stability, and social progress." ***(*NSDI Future Directions Initiative)**

Background

When the National Spatial Data Infrastructure (NSDI) was first envisioned more than a decade ago as a means for sharing geographic data among all users, it was seen as producing significant savings for data collection and use and as enhancing decisionmaking at all levels of government and in society. Since that time, technological innovations and the demands and applications for geospatial information have increased exponentially, and there is now an imperative to embrace the potential of the NSDI vision.

The NSDI evolved out of the concept of the National Information Infrastructure, which would provide citizen access to essential Government information and, consequently, strengthen the democratic process. That commitment to citizen access to Government information and services is borne out in the President's Management Agenda in its Expanded E-Government initiative, which seeks to provide single points of access to Government services, to make Government more transparent and accountable, to share information—in this case geospatial information—more quickly and conveniently between Federal, State, and local government entities, and to collaborate across public and private sector boundaries.

A governmental imperative to effectively manage the Nation's geospatial assets was recognized at the time the NSDI was envisioned. The national scope of the NSDI—as reflected in its emphasis on promoting economic development, improving stewardship of natural resources, and protecting the environment—requires Federal leadership of a coordinated effort that includes State and local governments, academia, the private sector, professional societies, and other partners.

The Secretary of the Interior was given Executive Branch authority to coordinate the Federal Government's development of the NSDI and was named as chair of the Federal Geographic Data Committee (FGDC). The U.S. Geological Survey (USGS) was given the responsibility to provide the Executive Secretariat in the conduct of the FGDC as the coordinating body for the NSDI.

Today, the NSDI comprises of the technology, policies, criteria, standards, and people necessary to promote geospatial data sharing throughout all levels of government, the private and nonprofit sectors, and academia. It provides the essential base or structure of practices and relationships among data producers and users that facilitates data sharing and use. The entire geospatial community—and the public as a byproduct of that community effort—will have a more comprehensive means to analyze data in making decisions, setting policy, and choosing the best course of action when the NSDI is viewed as a set of actions and

innovations for accessing, sharing, and using geographic data, and when all partners cooperatively engage in those actions and innovations. In realizing the vision of the NSDI, the Nation has the powerful force of its geospatial assets available for any need that arises.

Rationale and Organizational Background

In response to these national imperatives and Government mandates, the Director of the USGS in August 2004 created the National Geospatial Programs Office (NGPO) to act as a catalyst for realizing the potential of the NSDI. The NGPO is organizationally housed within the USGS Geospatial Information Office (GIO) and is overseen by the Associate Director for Geospatial Information. The NGPO portfolio of national geospatial assets and activities includes *The National Map*, the FGDC, the Geospatial One-Stop portal, and the DOI Enterprise Geospatial Information Management activity, as well as the National Atlas™ and the Web-based GEODE—Geologic Data Explorer. Brought together, these components can be woven into a rich tapestry of geospatial assets to serve the Nation.

The creation of the NGPO allows the various program components of the NSDI to be managed as a unified portfolio that benefits the entire geospatial community. By unifying the components of *The National Map* (integrated base data), the FGDC (coordination of policy and standards), and Geospatial One-Stop (information discovery and access), the geospatial community and the Nation will realize the vision that *"current and accurate geospatial data will be available to contribute locally, nationally, and globally to economic growth, environmental quality and stability, and social progress"* (NSDI Future Directions Initiative).

Part of the organizational strategy in transferring management and oversight of *The National Map* from its previous home within the USGS Geography Discipline to the GIO was to allow USGS expertise in geography to focus on research and to enhance USGS leadership in both geospatial programs and geographic research.

Management of these geospatial assets was reorganized in response to discussions with many constituent groups over several years about how best to meet their geospatial data needs, as well as recommendations by the National Research Council of the National Academy of Sciences in "Weaving a National Map" (see appendix).

In asserting its roles as leader of a national geospatial program, coordinator among all stakeholders, and facilitator for implementing the NSDI, the NGPO is mindful that no one entity owns the Nation's geospatial assets—they are a shared resource and a national treasure for everyone.

As the NGPO begins to operate as a unified program and to restructure its budget, it will streamline and refine its internal management structure and organization (see Internal Streamlining, p. 26). Key aspects of that restructuring include the following:

- Incorporating practices that enable management of a single, unified program instead of a simple realignment of program components
- Adopting a community of practice around portfolio management and project management disciplines

- Transforming the workforce to be poised for opportunities afforded by innovations in technology and being flexible enough to react to the mutable expectations of public resources and support

The National Geospatial Technical Operations Center (NGTOC) was created in January 2005 as the operational component of the NGPO. The NGTOC will be a national capability of the USGS and will support NGPO activities by which the USGS will provide the geospatial information that will be produced mostly by a network of State and local partners. It would provide technical support, through the NSDI Partnership Offices, to partners and customers in the States. A business strategy for the NGTOC has been developed (March 2005), and a scoping process conducted (April 2005) to recommend whether it is feasible and appropriate to compete NGTOC activities under OMB Circular A-76 guidelines.

Federal Enterprise Architecture

The OMB Federal Enterprise Architecture (FEA) is a business-based framework for governmentwide improvement. It is being constructed through five interrelated "reference models" designed to facilitate analysis and identification of duplicative investments, gaps, and collaborative opportunities within and across Federal agencies. Its foundation is the Business Reference Model, which describes the Government's lines of business and its services, independent of the agencies and offices involved. The model provides a common framework for improvement in key areas, including budget allocation, horizontal and vertical information sharing, performance measurement, budget and performance integration, cross-agency collaboration, E-Government, and component-based architectures. Other reference models focus on performance, service components, data, and technology. As this action plan was being prepared, the FEA was being updated to include location-based data. This effort is being led by the USGS/NGPO within the Architecture and Infrastructure Committee of the Chief Information Officers (CIO) Council. A policy document or "overlay" on privacy and security affects all of the FEA reference models, and there will be a similar overlay for geospatial information.

Business Reference Model

The Business Reference Model separates Government operations into four categories relating to the purpose of Government (Services for Citizens), the mechanisms the Government uses to achieve its purpose (Mode of Delivery), the support functions necessary to conduct Government operations (Support Delivery of Services), and the resource management functions that support all areas of the Government's business (Management of Government Resources). These four business areas are composed of 39 lines of business, 19 of which are within Services for Citizens and describe the purpose of Government in functional terms (external lines of business). The remaining 20 are internal and are included in the other three business areas. The NGPO purpose, to "place geographic knowledge at the fingertips of the Nation," is inherent in many of these lines of business.

> **Services for Citizens**: The significant role of geospatial information in providing services for citizens crosses many of the external lines of business (for example, Homeland Security, Transportation, Health, Environmental Management, Natural Resources, Disaster Management, Economic Development, and General Science and

Innovation). Lines of business not called out here—Community and Social Services, Education, Law Enforcement, International Affairs and Commerce, Litigation and Judicial Activities, Correctional Activities, Energy, Income Security, and Workforce Management—might be included as well. It is difficult to name any aspect of the daily lives of citizens in which the concept of "where" does not come into play or in which some aspect of national geospatial information might not be incorporated into a service.

Mode of Delivery: The mechanisms the Government uses to achieve its purpose of services for citizens include financial vehicles and direct and indirect Government delivery. Government Service Delivery includes all modes of delivery in which Government employees (or contracted employees) perform tasks that directly support the improvement of a Service for Citizens, and is further delineated into Knowledge Creation and Management, Public Goods Creation and Management, Regulatory Compliance and Enforcement, and Direct Services for Citizens. Geospatial information comes into play primarily in Knowledge Creation and Management in that it involves the creation by the Federal Government of a body of knowledge that can be manipulated and analyzed to benefit both the Federal and private sector. Geospatial information functions also play a role in Public Goods Creation and Management.

Relation to DOI and USGS Performance Goals. The DOI strategic plan includes performance goals for the mission areas of Resource Use, Resource Protection, Recreation, and Serving Communities. The USGS supports DOI primarily through the goal of Serving Communities and, in turn, supports the lines of business within Services for Citizens (General Science and Innovation) and Modes of Delivery (Knowledge Creation and Management, and Public Goods Creation and Management). Specific USGS goals in Serving Communities are to advance knowledge through scientific leadership, inform decisions through the application of science, and improve information base, information management, and technical assistance. In addition, geospatial information provided through NGPO is vital to the accomplishment of goals and objectives in all of DOI's mission areas.

DOI also supports the President's Management Agenda through a goal of Modernization, in which Citizen-Centered E-Government and Information Technology Management are key strategies. The twofold mission of the NGPO—providing leadership and guidance for key stakeholders and implementing key components of the NSDI—supports the goal of Serving Communities, as geospatial information serves communities in their broadest sense—not only the communities in which people live but also "communities of interest" wherein stakeholders and partners have vested interests in how geospatial information is used in policy and management decisions and the "communities of practice" in which the users of geospatial information operate. Furthermore, Geospatial One-Stop's innovative delivery of geospatial information is one of the Government's 24 citizen-centered E-Government initiatives. The goal of Modernization will be realized as the unified Web presence for the NSDI evolves and brings the complete portfolio of national geospatial assets into a modern and easily accessible "portal of portals."

An Action Plan for Success
What will the NGPO do and how will it measure success?

Purpose, Vision, and Mission
The NGPO will engage partners throughout the geospatial community to ensure that its unified program portfolio meets the needs of those on the national landscape. It will help the Nation realize the NSDI vision that *"current and accurate geospatial data will be available to contribute locally, nationally, and globally to economic growth, environmental quality and stability, and social progress"* (NSDI Future Directions Initiative). That vision will be reinforced by communicating the importance of the NSDI to a broad audience of users and potential users of geographic knowledge. To guide its progress in support of the NSDI and its service to the national geospatial community, the NGPO has developed the following statements of purpose, vision, and mission.

Purpose
The purpose of the NGPO is providing leadership to place geographic knowledge at the fingertips of the Nation.

Vision
By June 30, 2006, transform the processes of Government necessary to implement key components of the NSDI.

Mission
The mission of the NGPO is twofold. One mission component focuses on leadership and the prominent role of partners and stakeholders; the other focuses on the operational aspects and technical services needed to implement the NSDI and provide useful geospatial information to decisionmakers.

Providing leadership and guidance for key stakeholders to

- Develop policy
- Provide incentives to potential partners
- Develop key standards and data models
- Coordinate and facilitate the governance structure for the NSDI
- Negotiate collaborative agreements with partners
- Develop a national geospatial enterprise architecture
- Provide a forum for technology transfer, best practices, and program guidance

Implementing key components of the NSDI

- Host spatial datasets, Web sites, knowledge base, and tools for discovery and access
- Provide data integration and quality assurance of spatial data
- Staff enterprise architecture, governance body, and spatial operations
- Conduct and sponsor research for geospatial information science
- Provide contract management for operations

- Conduct training, education, and consultation
- Adopt a posture of being the data producer of last resort
- Make map products accessible

Core Values

The success of the NGPO rests largely on the commitment of its leaders to core values that will guide their deliberations and decisionmaking.

National Leadership

As leaders in the national geospatial community, NGPO management will embrace a "bias for action" in transforming Government processes needed to implement the NSDI.

Partnership

As colleagues and collaborators in providing geographic information, NGPO leaders will honor the role of partners by listening and learning from them.

Service

As public servants in the national geospatial community, NGPO leaders are committed to provide timely, quality service to meet geospatial information needs across the Nation.

Value and Impact

As stewards of national geospatial investments, NGPO leaders are committed to ensuring that each investment is an opportunity to return value to stakeholders and the Nation.

Professionalism

As professionals in the geospatial community, NGPO leaders are respectful of others, demonstrate the highest integrity, and strive for excellence in all that they do.

Major Transformations

The NGPO envisions three transformations that will be necessary to fulfill the vision of the NSDI. Those transformations must be embraced by the entire geospatial community.

Toward a national geographic information system

Just as the Federal Government recognized the need for an enterprise architecture that would inform all of its business lines and practices (the FEA), the NGPO believes that a transformation to an enterprise information system for the Nation's geospatial assets is essential to ensure the implementation of the NSDI. Geographic information systems are developing at all levels of government and throughout the private sector. These systems, when employed individually, often result in duplicate data development and redundant investments. They seldom follow common standards of practice that facilitate data sharing. The NGPO is in a unique position to lead the development of a national geographic information system (GIS), an integrated "system of systems" to provide access to quality, near real-time, digital geospatial data and resources to

- Support real-world decisionmaking and problem solving (for example related to natural disasters, homeland security, economic development, and public health)

- Support the daily business of Federal agencies and avoid duplication and redundancy
- Facilitate regional and national analyses of data for a wide range of applications
- Serve as the basis for a revitalized suite of USGS mapping products and services
- Provide a place-based context and geographic framework for scientific studies
- Display and share geographic resources through *The National Map*

This "system of systems" approach will facilitate the adoption of a common architecture and best practices and leverage the resources of individual organizations in implementing the NSDI. The national GIS will be composed of a distributed network of data stewards who contribute their expertise, data, and resources to an enterprise solution that will leverage geospatial data assets into strategic national resources. The steward organizations will be a federation of local, State, and Federal Government organizations, with contributions from the academic community and from the private and nonprofit sectors (see **A Governance Structure for the 21st Century, p. 24**).

As part of this concept of a national GIS, USGS geospatial activities will focus on demonstrating leadership, providing meaningful incentives to partners, and promoting data models, standards, and best practices. The USGS would shift its emphasis from producing maps to providing access to the creation of map products and geographic information and empowering State and local partners to meet their geospatial information needs. No single organization would have sole ownership of the "system of systems." It would be a national asset shared—and valued—by all. The USGS will continue its long and proud role as the Nation's civilian mapping agency but with a 21st century approach that modernizes and integrates technology, rewards innovation, and is based upon a partnership ethic.

Toward matters and places of national importance

There is a growing recognition of the many ways geospatial data can be applied throughout society and within business, commerce, public safety, and national security. GIS technology is a mechanism for visualizing and understanding what is going on in one or many locations, allowing users to observe and measure an event, analyze disparate data, develop plans, and decide on a course of action. Bringing nonspatial data into a spatial environment combines information in new ways to allow for true integration of various lines of business within Government. Adding the spatial component—that sense of place—to basic business processes can transform how the business of Government, or of any component of society, is conducted.

Examples of potential new lines of business include the following:

- Providing services for citizens such as water-resource management and disaster preparedness
- Planning how Government services are delivered to citizens
- Disseminating knowledge
- Managing large databases

Not all segments of society, or of our Nation's infrastructure, are currently supported by available geospatial assets. The NGPO will focus on that untapped potential of new users and

new constituencies to extend the power and use of Government-provided geospatial information.

Geospatial information provides a common framework for sharing information across all levels of government. Perhaps the best example in the area of government service is that of first responders in the event of a natural or human-caused disaster. A common framework of geospatial information will ensure that all responders have access to the same information about the situation. Neighboring jurisdictions can cooperate effectively, and one part of the country can learn from and model its responses based on plans developed elsewhere. A national strategy for information integration must ensure a common geospatial framework for all potential users for every aspect of emergency operations. Different views of the data may be needed by data producers and consumers. With all of the geospatial data on a common framework, the data can be overlaid onto a single common picture tailored for a particular audience or mission. Whether it is a raging wildfire in a suburban hillside community outside Los Angeles or a category 4 hurricane sweeping across the panhandle of Florida, dispatching an ambulance requires the same kind of information on transportation routes, infrastructure, and location of health facilities. Common response systems can be deployed based on reliable and accurate geospatial information that is standards based and similarly formatted. A unified Web presence will ensure access to that common picture for everyone, especially first responders, who can draw upon graphics and mapping products that have proven useful in other emergencies.

In the Natural Hazards Initiative for Fiscal Year 2007, the USGS is committing its varied program resources to ensure that the people, property, and infrastructure of the Nation are prepared for and protected from natural hazards.

There are many issues and places of national importance for which geospatial information is needed and for which it is not yet uniformly and commonly available, and each issue and place is as critical as the next—urban and metropolitan areas, borders and crossing points, transportation corridors (railways, highways, and waterways), airports and seaports, and coastal areas and flood plains. While major metropolitan areas have received Federal, State, and local attention in developing and deploying geospatial assets, places with lower population density and economic means and limited computer processing capability do not have the ability to use those assets effectively. As a Nation, we cannot afford not to provide equal access to the rural consumer of geospatial information. The time is right for a National Map for Rural America, and working effectively with rural communities will be a critical charge to the NSDI Partnership Offices of the NGPO.

Burgeoning population centers in coastal areas on both sides of the continent and in the Gulf of Mexico region—many of which face significant threats from natural hazards—are another *place* where we must ensure that geospatial assets are being developed and deployed.

Geospatial information also plays a critical role in the development and implementation of public policy and management of land, resources, and the environment. Ensuring that elected officials at the national, State, and local levels have the place-based information they need to create legislation, effect policy, and manage public resources is critical in addressing matters

and places of national importance. These decisionmakers must also understand how geospatial information can be used and how investments in the consistent availability of such information can provide a solid return to citizens and communities. Effective communication with elected officials, particularly on Capitol Hill, will be a focus for the NGPO.

Looking to the future, the NGPO will leverage and coordinate existing efforts in support of homeland security. There are many positive relationships to build upon and opportunities to collaborate across the homeland security community at every level of government, as well as with the private sector. All facets of homeland security have a common component, that of geography. Geography is the common reference point to describe, understand, apply resources to, and evaluate an event. As with first responders to natural disasters, those who deal with homeland security need that common, national framework of data in place immediately. Over the last year or so, agreements have been put in place among Federal agencies to make that framework a reality, and additional agreements will be coming on board.

This description of *places* in rural America and the coastlands and of *issues* in public safety and national security as they relate to hazards, whether natural or human caused, is not exhaustive. Other places and issues will be added as the NGPO and the national geospatial community move forward with these actions.

Toward management excellence

For the NGPO to lead these transformations, it must set a standard of management excellence. The President's Management Agenda calls for a performance-oriented approach by Government that shows improved accountability. Each Federal dollar invested must reflect that standard of management. The NGPO is committed to adopt a culture that uses the discipline of project management as a means to realize its strategic vision, to effect change in the organization, and to implement new business procedures. Best practices of the information technology community will ensure that life-cycle management guides project planning. For example, in acquiring and investing in new systems or capacity, commercial off-the-shelf software will be the norm, not the exception. Investments should be based upon demonstrated business needs and should be consistent with the National Geospatial Enterprise Architecture. One of the hallmarks of the President's agenda is to make access to Government information transparent. It should not be a mystery to citizens—or to other government entities—how Government works, what actions it is taking, or where citizens can access the information their tax dollars have helped to create. Citizens should not have to understand the structure of government or wade through complex, confusing, or contradictory points of access to arrive at what they need. Because of the critical importance of geospatial information to the lives of every citizen, the NGPO shares that commitment to transparency and accountability to its citizen stakeholders. It is the right of all citizens to access the place-based information they need. A unified Web presence for the NSDI—which is envisioned as the framework and roadmap to geographic knowledge for use in mapping, managing, and understanding our world—is part of the commitment to management excellence. Accountability to the lines of business and performance management goals set forth by OMB, DOI, and the Government Performance and Results Act are embedded in the NGPO strategic plan for action.

A Strategy for Success

In providing leadership to place geographic knowledge at the fingertips of the Nation and transforming the processes of Government necessary to implement key components of the NSDI, priorities must be established, and strategic actions outlined that can be tracked to measure their success. The NGPO Core Team has set forth the following strategic priorities. While all of the priorities are essential, there was overwhelming internal consensus, combined with the resounding voice of external partners, that establishing and championing a geospatial enterprise architecture are the foundation on which the other priorities would be based.

Strategic Priority: National Geospatial Enterprise Architecture

Geospatial data, information, and technology provide a foundation for innumerable applications that can address the lines of business of government and private industry. Currently, geospatial enterprise architectures are proliferating at all levels of government. In general, these efforts are not well coordinated and may be incompatible, which can hinder the goal of a seamless information environment where data, applications, and services can flow freely between entities.

The NGPO will lead the efforts of the geospatial community to unify disparate geospatial enterprise architectures, aligning them with the FEA and ensuring that the needs of the non-Federal community are accommodated. A national geospatial enterprise architecture will be a common point of reference for the development of physical architectures that will ensure geospatial interoperability at all levels of government. A unified geospatial enterprise architecture will demonstrate management excellence by identifying common lines of business and be the model for further transformations necessary to implement the key components of the NSDI.

Strategic Action: Adopt geospatial enterprise architecture principles.

To ensure that interoperability in geospatial systems architecture is broad and sustainable, each participating system should adopt the following principles:

- Avoid nonstandard data syntaxes
- Register the semantics of shared data elements
- Document service interfaces in a standard way
- Implement the standard interface for information discovery
- Implement the standard interfaces for geospatial data

Strategic Action: Establish advisory council and technical working group.

Establish the National Geospatial Enterprise Architecture Management Advisory Council (NGEA-MAC), which will coordinate with the FEA and other enterprise architecture efforts. Establish the NGEA-MAC Technical Working Group, which will develop a conceptual framework for constructing more detailed physical geospatial architectures at the Federal, State, and local levels. The NGEA-MAC will provide a critical link to the budget processes of

Federal, State, and local governments. The draft templates for the Business Case, Project Plan, Methodology and Process, and Timelines and Milestones will be refined.

Strategic Action: Promote use of common standards.

The NGEA-MAC will promote the use of common standards within the national geospatial community, thereby advancing the implementation of national framework standards for content and nationally adopted international standards, as well as open interoperability specifications developed by Open Geospatial Consortium and other consortia.

Measuring Success

A geospatial enterprise architecture will be realized when

- It is supported by the geospatial community; is composed of a common set of reference models, business practices, standards, and best practices; is implemented and aligned with the FEA; and accommodates the needs of both the Federal and the non-Federal community
- Inconsistencies and incompatibilities are reduced among independent geospatial enterprise architecture efforts
- An NGEA-MAC exists to coordinate and unify disparate geospatial enterprise architecture efforts
- The NGEA-MAC demonstrates to its stakeholders, including Congress, OMB, and State/local legislatures, that the national geospatial community is unified around this enterprise

Early Successes

- **Internal Support**: The NGPO is taking steps to simplify, unify, and organize its priorities according to lines of business. These steps are fundamental tenets in enterprise architecture reengineering. Staff members who are involved in architectural components are more enthusiastic and are expressing appreciation that senior managers see the value of such an approach.

- **External Support**: The NGPO staff has met with favorable response when sharing ideas and plans for developing a national geospatial architecture at conferences, workshops, and meetings. The NGPO is being recognized as having the mission and the capability to lead this effort. For example, the Architecture and Infrastructure Committee (AIC) of the Federal CIO Council asked the NGPO to co-sponsor a geospatial enterprise architecture workshop, which took place in March 2005 and was met with enthusiasm and excellent input. The AIC was provided a draft of the Geospatial Enterprise Architecture Study Team report and is preparing a response.

Communication Tactics

- Use the venues on the 2005 NGPO events calendar and other communication vehicles, such as Web pages and information products, to inform stakeholders and foster a climate of acceptance for a geospatial enterprise architecture.
- Identify and coordinate educational, informational, and training resources specific to geospatial enterprise architecture.

- Facilitate communications with other agencies and external partners about national issues, programs, policies, and budget initiatives relating to geospatial enterprise architecture.

SIDEBAR

Geospatial Enterprise Architecture Principles

In many geospatial initiatives, a key goal is to be as inclusive as possible, spanning geospatial systems managed at all levels of government (Federal, State, local, and tribal), as well as academic, commercial, and other nongovernment organizations. This goal demands a high level of interoperability, (that is, differences among systems must not pose a barrier to tasks that span those systems. Therefore, participating geospatial systems must have mechanisms that accommodate system-to-system differences. Those mechanisms become components of a common geospatial systems architecture.

Interoperability in the geospatial systems architecture should be broad and sustainable at a strategic level. Fewer agreements accommodating most systems are preferred over many agreements accommodating few participants. Interoperability agreements also should entail minimal impact on affected systems other than their interfaces with the geospatial architecture. Active participants that specialize in particular interfaces may have a lead role in building consensus on interoperability agreements (for example, a certain government agency may have a mandate to build consensus on a particular set of interfaces).

As a practical matter, interoperability agreements must be driven by specific needs as they are identified at the interfaces among participants. Wherever possible, interoperability agreements must be based on nonproprietary standards, and profiles should be specified when standards are not sufficiently specific. All interface implementations should be specified in a platform-independent manner and verified through interoperability testing and public demonstrations.

The following principles should be agreed upon by each participant.

1. Avoid nonstandard data syntaxes. Data can be represented in a number of ways, and each way has its peculiar strengths and weaknesses. Converting between different data representations can degrade the data; therefore, participants must agree on a small number of robust data representation syntaxes for data that traverse shared interfaces. Examples include the international standard known as Abstract Syntax Notation (ASN.1) and the emergent industry standard Extensible Markup Language (XML).

2. Register the semantics of shared data elements. Interfaces among participant systems are typically composed of a large number of data elements, and it is difficult to gain a common understanding of their meaning. (The syntax information in an XML schema or an ASN.1 definition does not fully address the requirements of semantic interoperability.) The agreed international standard for representing such understandings in a commonly accessible registry is ISO 11179 (formally designated ISO/IEC 11179, Information Technology--Metadata Registries). This standard supports registration of data using virtually any syntax and also provides a basis for interoperability among industry-led registry initiatives.

3. Document service interfaces in a standard way. Interoperability within the geospatial systems architecture is dependent on specifying common interfaces among disparate information systems. In addition to specifying the syntax and semantics of the data elements defined at the interface, it is necessary to describe how the systems interact at

the interface. A common mechanism for describing such interaction is an "interface definition language" (IDL). An elaborate example is the IDL for CORBA (Common Object Request Broker Architecture). Industry-led movements have recently shifted toward WSDL (Web Services Definition Language) or WebXML specifications to describe service interfaces. Each of these service interface description mechanisms has an associated mechanism to automate discovery and access of service interfaces. Unified Modeling Language (UML) is also commonly used to document the interactions occurring at a service interface. Participants should agree to use any one of these standard mechanisms to describe service interfaces and to convert to a single standard when appropriate.

4. Implement the standard interface for information discovery. A common objective across interoperable geospatial systems is to enable the discovery of and access to a wide range of information resources and services. Support of a common service interface for information discovery is therefore an important information architecture principle. (The term "information discovery" refers to the process of finding relevant data and information resources without prior knowledge of where those resources may reside, how they are organized, or how they are usually accessed.) The agreed service interface implements the international standard ISO 23950 Protocol for Information Search and Retrieval that is well supported and broadly adapted to most information search and retrieval system interfaces. This interoperable search service interface applies to discovery of resources in the form of traditional library, museum, and archives holdings, as well as digital resources distributed across global networks. This service supports XML and ASN.1 data syntaxes; data element semantics are registered according to ISO/IEC 11179; and service interfaces have been defined by using CORBA IDL and WSDL, and published via UDDI (Universal Description, Discovery, and Integration).

5. Implement the standard interfaces for geospatial data. In the geospatial systems architecture especially, data and information resources usually include references to places. Although such geospatial data may be viewed in the form of a map, the underlying digital data may be applied in many other forms. Interfaces to discover and use these data and services have been standardized, ranging from "yellow pages" and "product catalogs" to "technical manuals." International standards supporting discovery of and access to geospatial data and services are agreed upon through various initiatives such as the U.S. National Spatial Data Infrastructure (NSDI). These include the discovery interface standard referenced above (ISO 23950), as well as a range of international standards covering documentation and representation (ISO 19115) and place codes (for example, ISO 3166). In addition, participants should support formal standards such as the range of geospatial interfaces being developed through the Open Geospatial Consortium (for example, OGC Web Map Service).

Strategic Priority: A Governance Structure for the 21st Century

Government agencies and other organizations face many challenges in their business of providing services for citizens. One example is the necessity for quick responses to natural disasters, industrial accidents, environmental crises, and homeland security alerts. Much of the information needed to make informed decisions in such cases is placebased: that is, geospatial. Those who must meet these challenges share a goal of making those decisions in a more cost-effective and efficient manner. Accurate and current geospatial data must be coordinated and made available to all, and a clearly articulated process of governance for the Nation's geospatial assets is necessary for that shared benefit to occur.

The vision for the NSDI Strategic Plan (1997) that *"Current and accurate geospatial data will be available to contribute locally, nationally, and globally to economic growth, environmental quality and stability, and social progress"* has been reconfirmed in the planning and organizing of the NGPO. A more forward-thinking vision for the NSDI that moves toward both a national GIS and management excellence could be stated as *Federal, State, and local government agencies, the private sector, academia, and others are engaged in an unprecedented national project to design, build, and maintain a highly accurate, distributed, and consistent geospatial framework, services, and collaborative work during the first decade of the 21st century. This revolutionary partnership continues to leverage resources, technologies, and investments to create the geospatial component that supports the national information infrastructure and enables informed decisionmaking at all levels of society.*

A well-coordinated effort inclusive of the private sector, academia, and all levels of government, and supported by the NGPO, is needed to leverage resources, minimize redundancies, and solve problems to achieve this revolutionary partnership.

A new governance structure that includes representatives of all stakeholder groups is needed to guide the development of the NSDI. It must foster collaboration and shared responsibilities among stakeholders and guide the development of partnerships and core datasets. Furthermore, the governance structure must have the power to transform policies, resource allocation, and services.

The issue of governance is at the heart of the NGPO vision of transforming the processes of Government necessary to implement key components of the NSDI. It is also embedded in the component of the NGPO mission to "coordinate and facilitate the governance structure for the NSDI." For this strategic priority, the NGPO will leverage the work of the Governance Action Team for the FGDC Future Directions Initiative, whose purpose is to investigate and recommend options for the operation of the NSDI (a report due in June 2005).

Strategic Action: Explore governance models and review FGDC governance efforts.

Examine governance models used by other entities and develop options with advantages and disadvantages that allow a more inclusive membership. Draw on the FGDC Future Directions-Governance effort and, by 2005, identify, evaluate, and act upon options for restructuring the governance model of the NSDI. The Future Directions effort has completed its charter, organized a 30-member team, established working groups, and is completing tasks to have a restructured governance model by June 2005. Governance is being defined as the organizational structure, leadership and authority roles, and all associated regulations, policies, and procedures for management, coordination, and operation of the NSDI. In light of Future Directions findings, review the current structure of FGDC, including membership, structure, and roles of the Steering Committee, Coordination Group, subcommittees, and working groups. Develop an action plan to implement the revised governance model.

Strategic Action: Promote national governance and its benefits.

To be effective, the NSDI must have national leadership that incorporates all affected sectors. The governance process must build in accountability, include all interested parties, and

provide clearly defined roles and responsibilities. Much of the discussion of governance has involved the producers of geospatial data. The users of geospatial data must be brought into the discussion as well. The potential benefits of effective governance—improving services to citizens, coordinating public services, improving management of natural and human resources, and improving public safety and emergency response—need to be supported, and resources need to be invested by data users as well as by data producers.

Strategic Action: Create a national geospatial coordinating body.

It is clear from the efforts of the Future Directions group that a national geospatial coordinating body is needed as part of the governance of the NSDI. The body would have equitable representation from Federal, State, and local components, tribal governments, national trade groups, and national nonprofit organizations. A proposal and options for such a body will be part of the June 2005 report of the Future Directions group.

Measuring Success

The NGPO, FGDC, and the NSDI will have successful governance when

- There is positive movement toward that more forward-thinking vision of the NSDI as that *"highly accurate, distributed, and consistent geospatial framework, services, and collaborative work during the first decade of the 21st century"*
- There is less duplication of effort and more gaps in data and information are filled.
- Similar problems at the Federal, State, and local levels are recognized and solutions are created because of the availability of the geospatial framework and an efficient governance model

Early Success

- A sense of urgency that it is time for a new governance model has been articulated by focus groups conducted by the Future Directions effort.

Communication Tactics

- Use upcoming events of interested parties and organizations to discuss needs of governance and problems that need resolution.
- Maintain the contact information database being created as part of the Future Directions work and use this for future interaction.
- Develop a communication plan when the June 2005 report is released to promote its recommendations.

Strategic Priority: Incentive-Based Partnerships

With the rapid advancement of geospatial technologies coupled with limited resources at all levels of government, geospatial information operations are focusing on meeting specific business needs rather than on developing systems for general use. Managers at the State and local level, for example, cannot justify changing their processes to participate in Federal initiatives unless they can show that such participation increases their ability to meet their business needs. At the same time, the growing community of data producers has increased the need for coordination to maximize investments and avoid redundancy.

The traditional approach to the development of the NSDI will not achieve the results needed to meet the collective vision in a timely manner. Thus, the NGPO must develop an incentive-based partnership strategy that will engage partners who must first meet their own bottom lines. Such incentive-based partnerships for geospatial data have been successful in North Carolina, Utah, and New Jersey, where they have been used to achieve a high level of intergovernmental cooperation. The NGPO must set the Federal example of this new approach and offer a suite of monetary and nonmonetary incentives that are tailored to the needs of partners in exchange for their commitments to advance the NSDI.

The focus will not be on short-term or one-time exchanges of data. Transformation toward an enterprise information system for the Nation will require a cultural change in partner relationships. Incentive-based partnerships will accelerate the development of the content of the NSDI, in terms of data completeness, quality, and reliability, by encouraging participation by State and local governments and other key data producers. Following a business model, in which all partners commit resources to achieve mutually beneficial goals, will mean that more NSDI stakeholders (for example, State and local governments) will be invested in a successful outcome; that is , the sustainability of the NSDI. Finally, promoting the use of a menu of possible partnership incentives should encourage greater Federal interest in supporting NSDI partnerships, including agencies and Departments that have not heretofore been active NSDI participants.

***Strategic Action*: Promote an incentive-based partnership model.**

Develop and circulate a white paper that describes the incentive-based partnership model, how this approach will benefit all NSDI stakeholders, how this strategy will be coordinated throughout the NGPO, and details of an action plan for the next 2 years. Meet with geospatial stakeholders and their representatives to seek their input and support in promoting these potential actions to their membership.

***Strategic Action*: Implement best practices for incentives.**

Provide interested Federal agencies and Departments with the information and tools for implementing incentive-based NSDI partnerships. Develop and communicate best practices on the types of incentives or incentive categories that can be provided and develop examples (such as templates) for negotiated partnership agreements that can be disseminated across the NSDI stakeholder community.

***Strategic Action*: Support NGPO demonstration pilots.**

Demonstrate to the Federal community how incentive-based partnerships can be successful. Identify NGPO resources (funding, in-kind services and support) that can be made available, beginning in FY 2005, to support several State-based pilots, and communicate their progress. Each pilot should include an agreement between the State and the USGS that articulates NSDI needs and incentives for each State and begins the process of long-term planning to meet those needs.

Measuring Success

The success of incentive-based partnerships will be seen in

- An increasing number and quality (that is, effectiveness in meeting requirements, sustainability) of incentive-based partnership agreements
- An increasing number of agencies and organizations (including those from nontraditional sectors) engaged in one or more such agreements
- Various measures relating to the content of the NSDI (for example, completeness of framework data layers, addition of higher resolution, more timely or accurate data). The *Fifty States Initiative Action Plan* developed in 2004 by the NSGIC-FGDC Work Group includes some suggested metrics that could be adapted for broader use in measuring success of this priority
- A greater quantity and breadth of spatial data applications and increased use of the NSDI for decisionmaking, problem-solving, or improving services (according to the NSGIC-NACo-USGS Best Practices model). While it is hard to quantify how geospatial information improves decisionmaking or services, anecdotal information will be captured.

Early Successes

- *Fifty States Initiative Action Plan* recommends the use of incentive-based partnerships that focus on meeting specific mutually defined business goals.
- A key finding of the NSGIC-NACo-USGS Best Practices Model affirms this approach, indicating significant support within the leadership of these important stakeholder groups.
- A broad range of agencies and organizations is involved in the NSDI Future Directions initiative; NSDI Partnership Liaisons are discussing the future of partnerships and identifying opportunities for enhancing USGS capabilities in this area. The Cooperative Agreements Program (linking *The National Map* funds and FGDC funds) was begun in FY 2004.

Communication Tactics

- Develop a coordinated communications/outreach strategy that encompasses all NGPO programs.
- Provide briefings and discussions at NSGIC midyear and annual conferences.
- Meet with interested organizations to introduce them to NGPO leadership and staff; establish contact and regular communications on progress of the incentive-based partnership priority.
- Communicate regularly with constituent groups, highlighting NGPO activities of interest, contacts in each State, and ways to participate.
- Provide NSDI Partnership Liaisons with information on incentive-based partnerships to use in communicating with their existing partners and in identifying new, prospective partners.
- Feature partnership activities in the unified NSDI Web presence.
- Hold regular conference calls with NGPO and stakeholder staffs to discuss progress, identify pitfalls, and establish next steps.

Strategic Priority: Tapestry of Base Content

A significant priority for the NGPO is to build upon USGS resources, leverage the resources of partners, and organize them into a rich and textured tapestry of geographic content. The importance of place-based content in everyday life cannot be overstated. Each decision made by a government entity, whether it affects the environment, transportation, social services, public safety, or health care, occurs *somewhere* on the national landscape. In turn, those decisions and those places do not happen or operate in isolation but affect adjacent places. Planning and analyses in support of these decisions requires accurate, up-to-date, and standards-based data for those places. To achieve the goal of becoming *the* provider of place-based content, the NGPO will need to focus on three areas: ensuring a tapestry of base content, integrating information systems, and strengthening relationships with those who are stewards of geospatial data.

The envisioned tapestry will include

- High-quality national datasets compiled from many sources
- Integrated themes, scales, and resolution
- National templates with specific implementation guidance
- Support and sustainability through incentive-based partnerships

Because of its long-standing role as the purveyor of the Nation's topographic maps, the USGS is uniquely suited to be the trusted source for accurate information about Earth processes and the Nation's landscape, natural resources, and infrastructure. As such, the USGS becomes the Federal Government's provider of choice for place-based content. The use of the word "provider" rather than "producer" is intentional. While the role of the USGS in the past has been to produce the map products that contained base content, its future role will be to facilitate and coordinate so that there is broad national access to place-based content. The new role ensures that the resources invested in the USGS provide a significant return to the American public.

The scientific resources of the USGS weave together a rich tapestry of geospatial and tabular data that is, in turn, transformed into knowledge, information products, and visualization services to meet the strategic planning, analysis, and response needs of organizations and individuals across the Nation. Outside organizations expect the USGS to be the provider and integrator of place-based content. Since the Organic Act of 1879 that created the USGS, it has been part of the Bureau's mission to map the "national domain." The mandate to classify public lands and examine the geological structure, mineral resources, and products of the national domain, expanded to include topographic surveys, is part of what makes the USGS uniquely qualified to assume the leadership role for national geospatial assets. Topographic maps have been signature products throughout the Bureau's long and rich history. The USGS has broad brand recognition that should not be discarded but rather transformed into a new market force for the future of place-based content.

Strategic Action: Ensure a tapestry of base content by December 2006.

As envisioned, *The National Map* represents core geospatial data about the United States and its territories that are in the public domain and that can be extended, enhanced, and referenced by other agencies. *The National Map* has the potential to be that tapestry of base content,

woven into a seamless, continuously maintained and nationally consistent set of databases. The color and richness of the tapestry will be added by NSDI partners. State, local, Federal, and tribal GIS organizations will be encouraged to provide access to data and services for their geographic areas and datasets under partnership agreements with the NGPO. This model will ensure that the NGPO is the source organization that makes relevant and timely data available to support the interests of science, land and resource management, recreation, policymaking, and homeland security. Steps to ensure the base content by December 2006 include

- Developing content and process models for framework layers
- Demonstrating Quality Assurance/Quality Control, maintenance, and updating workflow
- Designing a strategy for outreach and implementation of framework content and process models on the national level
- Designing a strategy for developing content and process standards and models for data layers identified in OMB Circular A-16

SIDEBAR

Foundation for the Tapestry – The Nation's Topographic Base Map for the 21st Century

The National Map is

- A seamless, continuously maintained, nationally consistent set of base geographic data
- Developed and maintained through partnerships
- A national framework for science, land and resource management, recreation, policymaking, and homeland security
- Available over the Internet
- The source for revised topographic maps

The USGS provides the foundation of the tapestry through *The National Map* by ensuring complete and consistent coverage for eight basic data themes. The USGS will develop and manage centralized databases for these eight themes (see table below), which will allow all the data to be viewed and accessed over any selected space. A user asking for data in Utah, for example, would get the same content, format, and model as a user asking for data in Cook County, Illinois, or for a watershed that crosses several States.

The National Map "Blanket"

Theme	**Resolution (*or Accuracy)***
Elevation	1/3 arc second or finer
Orthoimagery	1 meter or finer
Land Cover	30 meters or finer
Geographic Names	
Hydrography	Better than or equal to 1:24,000 scale
Transportation	Better than or equal to 1:24,000 scale
Boundaries (civil)	Better than or equal to 1:24,000 scale
Boundaries (State and Federal lands)	Better than or equal to 1:24,000 scale
Structures*	Better than or equal to 1:24,000 scale variable

* Structures will not be "complete." These data will be loaded as they become available from partners.

The National Map will serve as the base dataset for the Geospatial One-Stop portal and as the source for a revitalized suite of USGS map products and services for the future. Geospatial One-Stop will be the Internet Portal for resource publishing, discovery, and access, enabling Federal, State, and local users to organize and share geospatial knowledge (data, scientific reports, models, decision-support tools, and problem-solving applications). By combining place-based knowledge with the geographic base content of *The National Map*, the NGPO can support many diverse lines of business.

Strategic Action: Integrate information systems.

Viewing the intricate patterns, the varying textures, and the complementary colors of a tapestry transforms threads into a beautiful whole. One generally does not see the back of the tapestry with its mix of knots and clipped ends. Similarly, when customers view the services offered by USGS through *The National Map* tapestry, many technologies and activities behind the scenes will be transparent to the user. At the heart of the technology strategy will be the integration of *The National Map*, Geospatial One-Stop, and the NSDI Clearinghouse. A single system approach will couple the seamless national base map with the ability to find, access, and overlay datasets maintained by steward organizations.

To achieve this goal, it will be necessary to

- Develop a coordinated information system that delivers geospatial data and services
- Conduct a business process analysis of all NGPO components
- Utilize standard information technology business practices across NGPO activities

Strategic Action: Strengthen steward relationships.

Partners will play a critical role in the creation of a tapestry of base content for the Nation. Negotiated partnership agreements will govern the relationships among steward organizations, Federal stewards, and the NGPO. These agreements will outline roles and responsibilities, as well as incentives for participation. A model for this distributed partner environment might include the following characteristics:

> **NSDI Partner Role**. A State, regional consortium, county, and/or metropolitan city will agree to be the geospatial information steward for a given geographic region, such as a State, ecosystem, or region. In partnership with NGPO, the steward will agree to be responsible for data development and maintenance, 24/7 Web access to data, strategic planning for new data development, adoption of relevant data models and standards, and coordination with local organizations. Resulting data will be shared with the Federal Government, through the national stewardship of the NGPO, as part of the national geographic information system.
>
> **USGS-NGPO Role**. The USGS, through the NGPO, will use the network of NSDI Partnership Liaisons to negotiate a partnership agreement with each steward. A range of incentives will be available as part of the agreement. Incentives can include funding, training, technical or consulting resources, hosting services, and contracting services (such as orthoimagery). In addition to providing incentives, USGS will coordinate the development and promote the use of relevant data models and standards as a resource for partners in their implementation efforts and to facilitate data sharing and consistency.

The role of partners and the benefits of using incentives to generate a stronger culture and practice of partnering are discussed in the section on Strategic Priority on Incentive-Based Partnerships, which precedes this Priority**.**

Measuring Success. A tapestry of base content will be realized when

- The tapestry within USGS is enriched. As the NGPO integrates the information resources of the USGS, the development of a knowledge base of scientific information comes closer to realization. Other USGS-sponsored information systems, such as the National Atlas™ (a component of *The National Map*), GEODE, the National Biological Information Infrastructure, and the National Water Information System can share data and analyses and be viewed in concert with the national geospatial system of systems.
- There is spatial access to USGS scientific reports. By including location attributes and metadata, USGS scientific reports will be made spatially accessible. This will allow nonspatial data and information to be easily accessed through a visual geographic interface.
- The NSDI Partnership Liaison program expands. NGPO staff will be strategically located to work with other stakeholders in developing partnerships. The goal is at least one NSDI Partnership Liaison in every State.
- NGPO programs that provide discovery and synthesis of geographic data and services (Geospatial One-Stop and *The National Map*) can rely on partners to catalog and produce data.

Early Successes

- Discussions for implementing partnership models are underway with the NSGIC and NACo.
- Other Federal agencies are linking their geospatial data holdings by documenting metadata, participating in Geospatial One-Stop, and partnering with *The National Map.*

Communication Tactics

- Mark milestones when framework components of the tapestry are completed.
- Use national conferences and other venues to show the strengthening and enriching of the tapestry—a continually enhanced exhibit that visibly becomes that tapestry of base content.
- Showcase the tapestry of base content when it is completed in December 2006.

Strategic Priority: A Geospatial System of Systems

An enterprise information system for the Nation's geospatial assets is essential to ensure the implementation of the NSDI. Geographic information systems are developing at all levels of government and throughout the private sector; however, these systems, when employed individually often result in duplicate data development and redundant investments. They seldom follow common standards of practice that facilitate data sharing. The NGPO is in a

unique position to lead the development of a national geographic information system (GIS), an integrated system of systems, to provide access to quality, near real-time, digital geospatial data and resources. Development of this "GIS for the Nation" would be based on modern, multipurpose technology and on national standards. It will be the distributed yet shared tool to manage the tapestry of base content. It will also provide tools for access, discovery, and use amongst all data stewards and data users. The national system will constitute a distributed network of data stewards who agree to contribute their expertise, data, and resources to construct a shared enterprise solution that will leverage geospatial data assets into strategic national resources. The steward organizations will be a federation of local, State, and Federal Government organizations, with contributions from the academic community and the private and nonprofit sectors. Adherence to the discipline of project management and the employment of Information Technology best practices will facilitate the development of the system of systems. By consolidating geospatial Exhibit 300's and establishing a working capital fund, investments in and performance of the systems approach can be effectively tracked and measured.

***Strategic Action*: Create a national geospatial information system of distributed data systems.**

One key component in creating a national GIS is to develop a modernization blueprint to understand existing systems and the desired future state. A second key component is to develop a prototype systems implementation plan that will include critical elements of project management and IT Best Practices, such as

- Project cost, schedule, benefits, and risk
- Project plan and a Work Breakdown Structure
- Project tracking and performance evaluation
- Governance and configuration management process
- Contracting and acquisition strategy
- Risk assessment and monitoring process
- Communications and change management strategy
- Human capital strategy

***Strategic Action*: Provide multipurpose, standards-based technology and tools.**

Promoting the use of geospatial technology in a consistent fashion will provide for more discoverable, interoperable, and user-friendly geospatial information. To move toward the desired future state, technology and tools will focus on the key elements of data creation, data management, and data dissemination. Information requirements must be multipurpose to meet the needs of the many interests and uses of stakeholders, partners, and citizens. Technology must be designed to ensure that

- Spatial data are created, stored, available, and maintained at the most appropriate level
- It is possible to combine spatial map and data services from different sources across the community in a consistent manner and share them among multiple users and applications
- It is easy to discover available spatial data, to evaluate their fitness for purpose, and to know the conditions applicable to their use

- Interoperable schemas, methods, definitions, and products are derived from the infrastructure

Strategic Action: Support and sustain stewards of component systems through incentive-based partnerships.

As in the strategic priorities "Tapestry of Base Content" and "Incentive-based Partnerships", the role of partners and stakeholders in the development of a national geospatial system of systems is paramount. By providing incentives in various forms to the steward organizations of system components (Federal, State, tribal, and local), the NGPO will ensure that those component systems are supported and sustained. Models of partnership engagement and sustainability as discussed in other strategic priorities should be thoroughly investigated, and a plan developed to implement this network of support to the stewards who are at the heart of a modern national geospatial database.

Measuring Success

The system of systems strategy will be realized when

- It is possible to combine spatial data from different sources across the user community in a consistent way and share them between several users and applications
- There are simple and widely understood means for discovering and accessing available geospatial resources and evaluating their fitness for use
- There is a technology framework that supports collaborative development and sharing of geospatial information
- Steward organizations are full partners in implementing and managing the Nation's geospatial information assets as a system of systems, which will allow access to current local data through Internet mapping services

Early Successes

- Discussions for implementing partnership models are underway with the National States Geographic Information Council (NSGIC) and the National Association of Counties (NACo)
- Other Federal agencies are linking their geospatial data holdings by documenting metadata, participating in Geospatial One-Stop, and partnering with *The National Map*

Communication Tactics

- Develop a marketing plan and communication strategy to introduce and promote the system of systems concept
- Feature new stewards in various communication venues
- Promote the system of systems within USGS to highlight opportunities to integrate with other systems
- Showcase the tapestry of base content when it is completed in December 2006.

Strategic Priority: National Geospatial Investment Management

The value of geospatial data and technologies to Federal programs is generally recognized, and the efforts to coordinate activities have been acknowledged. The national geospatial community has emphasized metadata, clearinghouses, standards, partnerships, and articulation of framework data. Federal programs, too, are embedding geospatial capabilities in their activities and systems.

Federal investments in geospatial data, systems, and applications are not well coordinated, and OMB does not have a support arm in any of the Federal agencies to help track and monitor these investments. A recent Government Accountability Office (GAO) report, *Geospatial Information: Better Coordination Needed to Identify and Reduce Duplicative Investments* (GAO-04-703), recognized the need for improvement in coordinating Federal geospatial investments. GAO recommended development of a national geospatial strategic plan, better criteria for assessing investments, and improved oversight of geospatial projects. The USGS, through the NGPO, has the opportunity to address these recommendations and support OMB by serving as an information clearinghouse and a source of national expertise on Federal geospatial investments.

The transformations toward a national GIS and toward management excellence will both be enhanced by effectively managing national geospatial investments. An enterprise system requires knowledge of the investments necessary to develop and operate that system; hence, the need for an investment strategy arm of the NGPO. One of the key areas of the Federal Government that must be transformed if this vision is to be achieved is to develop a strategic plan for geospatial investments. An enterprise system of geospatial data and applications will require not only an organized method for understanding national investments but also a commitment to ensure that those investments meet business needs and are sustainable.

Strategic Action: Identify interagency investment strategies.

Identify opportunities for interagency investment strategies and implement those strategies. Next steps will include

- Estimating supply and demand for Federal programs
- Comparing supply and demand to identify opportunities for investments
- Identifying current interagency interactions for accomplishing common goals and modeling the successful ones
- Developing an outline of an investment strategy

Strategic Action: Increase efficiency of expenditures.

Provide tools to increase efficiency of expenditures and monitor their effectiveness. Coordinate investment review activities with the Capital Planning and Investment Control (CPIC) process.

Strategic Action: Begin a dialog of efficiency.

Work to change the conversation about geospatial activities from one about duplication to one about steps being taken to improve efficiency. Duplication is at best a problem that can be managed, not solved. Next steps will include preparatory work on investment strategy and expenditures and education of key stakeholders on the complexity of the duplication issue (for example when are parallel activities wasteful duplication?). Consider sponsoring a summit for executive stakeholders to communicate their ideas.

Measuring Success

The NGPO and the Nation will have a successful strategy for geospatial investments when

- The NGPO is recognized as the principal, objective source for information regarding Federal geospatial investments
- Measurement of investments and benefits is limited to that which supports investment strategies. Data are "rolled up" from common agency reports of benefits and investments from field and agency activities
- Investments are discussed in terms of an investment strategy, shared benefits, and related costs, not total Federal expenditures and redundancy
- An interagency decisionmaking structure conducted by those with relevant program responsibilities is in place

Early Success

The NGPO is leading by example by using an enterprise approach to measure its own geospatial investments and implementing a portfolio management process to monitor those investments. Additional work is required before showcasing the portfolio management process, but even today, every dollar that the NGPO spends on field activities is managed as a series of projects.

Communication Tactics

- Explore communication vehicles and Federal partner venues to build trust. It will be important to move forward cautiously in communicating this priority, recognizing that other Federal agencies are sensitive to proposals that may affect their budgets.
- Build a relationship with OMB. Future interaction with OMB regarding investment strategies will require diplomacy and tact; here, too, a sense of trust will need to be earned.
- Develop and foster an open communication culture and practice. NGPO will need to operate with an open book approach to its own investments if others are expected to follow suit.
- Explore producing joint publications. Join with another Federal agency or agencies to produce a publication that explains the national investment strategy approach. This strategy will help to underscore the cooperative nature of this activity.

Strategic Priority: Revitalized Suite of USGS Topographic Products and Services

For many years, the primary comprehensive map series for the Nation has been the USGS 7.5-minute topographic map series. Because this map series was developed in an analog world, it

has become progressively more obsolete in terms of both data content and format. A successor to this map series is vitally important to the Nation for numerous applications not generally addressed by local mapping and geospatial data programs.

The USGS has established the NGPO to facilitate the development of *The National Map* as a national geospatial data blanket that will serve as the successor to the Nation's primary map series and to consolidate the activities of related USGS geospatial programs, such as Geospatial One-Stop and the FGDC. As the primary civilian mapping agency of the Federal Government, the USGS is responsible for ensuring that *The National Map* is deployed expeditiously and that it is a comprehensive, standardized, quality-assured, public domain data framework for the entire Nation, border to border, coast to coast.

This strategic priority requires decisive leadership and clear and effective communication. Further, adequate resources are necessary to support internal USGS activities, as well as to foster and sustain partnerships in data acquisition, development, and integration, particularly in areas where data acquisition programs are nonexistent or inadequate.

Information and services useful to customers are at the core of an enterprise information system. The products and services of the NGPO, including the successor to the traditional topographic mapping series, will be key contributions in the transformation to an enterprise information system for the Nation. *The National Map*, as the principal expression of the USGS topographic mapping program, is central to the success of this system.

Strategic Action: Derive a digital 1:24,000-scale topographic map.

Derive a USGS-sanctioned, 1:24,000-scale topographic map product from data in *The National Map*. This should be a digitally derived, printed product, sourced from the blanket data in *The National Map* as much as possible. Where data are required outside the eight data themes of *The National Map*, a consistent, national source of these data should be identified. It is desirable that the standard printed map products adhere to the familiar tiling and naming system in place for the current 7.5-minute topographic map series. This does not, however, preclude inclusion of capability for custom map footprints on demand.

- Develop minimum and optional content standards for this product within 90 days of the release of the NGPO Plan for Action.
- Develop prototype products showing the minimum and optional content within the same timeframe.
- Distribute the standards and the prototype maps to internal USGS and external audiences for review and comment.
- Develop prototype USGS topographic map products in cooperation with partners by using the minimum data or blanket standards and minimum graphic standards for a 1:24,000-scale product.
- Produce a prototype map 90 days after the draft minimum standards are outlined.
- Develop a prototype of a 1:24,000-scale graphic product incorporating optional data content.

Strategic Action: Implement map-on-demand service.

Implement a prototype map-on-demand (MOD) service, and work with both public and private sectors to provide the necessary technology and printing and distribution services.

- Working with the State of Texas, establish a team to implement a MOD solution for the revitalized USGS topographic map series.
- Use the above solution to include both the public and private sectors to print and distribute the map.
- Discontinue distribution of older vintage lithographic maps where newer MOD maps exist, using data from *The National Map*.
- Implement MOD for legacy topographic maps that have little or no sales.

***Strategic Action*: Institutionalize a process for developing new and innovative services.**

The NGPO will institute an annual process to gather ideas for new and innovative products and services that will include collaboration with the USGS science disciplines, other partners, and data users. The NGPO will work collaboratively with the private sector to assure respect for the role of the private sector in the development and marketing of new products and services.

Measuring Success

A revitalized suite of USGS map products and services will be realized when

- The USGS is meeting the Nation's demand for current, accurate base-mapping information, both digitally and in paper formats
- That production is being accomplished through partnerships with all levels of government, the private sector, and academic institutions
- The name of the USGS continues to be synonymous with high-quality maps for the Nation
- A program is in place to sustain those accomplishments

Early Success

Partnerships with the U.S. Forest Service and the State of Texas have been successful.

- The U.S. Forest Service maintains the USGS topographic maps over Forest Service Lands (about percent of the Nation).
- The State of Texas has updated all 4,400 of the USGS topographic maps of the State.

Communication Tactics

- Speak and act with pride about the future. The USGS accomplished something that few can equal in completing the 1:24,000-scale topographic map series.
- Recognize and champion shared ownership of the mapping future with customers and constituents.

Internal Streamlining
How the NGPO is organized

To effect organizational change, it is not enough to simply realign functions. Transformation requires internal streamlining, consolidation of activities, and fundamental changes in processes and practices; however, this transformation cannot be an insular exercise but must be informed by best practices in government and the broader community. The administration of the NGPO—the organizational structure, budget structure and authority, and its operational processes—will need to be streamlined and made more responsive to the strategic priorities that have been set forth.

Managed as a Single Program

The NGPO has made a commitment to "portfolio management," which a change intended to signal a new way of doing business. What is meant by this style of management? It is not enough to say that national geospatial assets have been put into a single portfolio; the assets in that portfolio will be managed as unified, interdependent assets that have unique strengths.

The life cycle management model used for information technology (IT) has much to inform organizational change. Three of the components of that model are to ***co-locate*** systems and assets, then to ***integrate***, and finally to ***optimize*** them. The first step has been taken by creating the NGPO, which integrates the geospatial assets for which the USGS has a leadership role. Now the hard work begins of integrating those program components, their companion systems and technology, and, most importantly, the workforce that will be the generators, facilitators, and coordinators of geospatial information for the future.

Information Technology Best Practices

The NGPO must embrace IT best practices of the private sector, government, academia, and the nongovernmental community, recognizing that IT is the intersection of computers and networks, of mission and business process reengineering. Coupled with contracting, budget and finance, change management, human resources, security, privacy, data integrity, and architecture, using best practices ensures that IT planning incorporates all facets of the business of the NGPO. The life cycle model must be used in planning. Life cycle costs are decided early; 90 percent of costs are typically determined in the first 5 percent of the development. As a result, decisions made at the outset of the project drive the long-term costs. At the beginning, then, decisions such as make versus buy, standards versus custom configuration, stove-pipe versus integrated, data warehouse versus duplication, central versus decentralized processing, and commercial off-the-shelf versus "home grown" must be carefully evaluated and built into the investment strategy.

Project Management

Embracing IT best practices segues logically to the best practice of project management. The NGPO is committed to using the discipline of project management to realize its strategic vision, effect change in the organization, and implement new business procedures. Tomanage the Nation's geospatial assets as a single portfolio, each leader and manager will need to demonstrate capabilities in project management, specifically in the areas of integration, scope, time, cost, quality, human resources, communications, risk, and procurement. Life cycle comes into play in that projects are divided into several phases to improve management

control and to link to ongoing operations. Collectively, the phases become the project life cycle. Many of the best practices of IT life cycle management are mirrored in project management and serve as an organizing strategy. Just as a system can be examined to see if it does what it is supposed to do and performs with the desired response time, availability, and reliability, a project can be examined in the same manner.

The concept of project stakeholders is important to the NGPO, as well. Project stakeholders are individuals and organizations that are involved in the project or whose interests may be affected. The expectations of these stakeholders should be managed as part of the project. The commitment of the NGPO to provide leadership and guidance for key stakeholders will be facilitated through the discipline of project management.

Organization and Staffing

To reinforce the NGPO's twofold mission of facilitation and implementation, the Associate Director for Geospatial Information has created two organizational components: Geospatial Coordination (GIC) and Geospatial Integration and Analysis (GIIA). Additionally, a National Geospatial Technical Operations Center (NGTOC) has been created as the operational arm of the NGPO (January 2005). A business strategy for the NGTOC was developed in March 2005. As a necessary companion effort to the development of a business strategy for the NGTOC, a scoping process is being conducted to decide if an OMB Circular A-76 study is appropriate. The NGPO must transform the workforce from producers of base topographic mapping products to providers of geospatial data and services. The scoping process on geospatial production and technical services will ensure that the operational functions of the NGPO are the right ones for the Nation's geospatial assets, that program dollars are being invested to their best advantage, and that the workforce has the skills necessary to realize NGPO goals.

National Geospatial Technical Operations Center

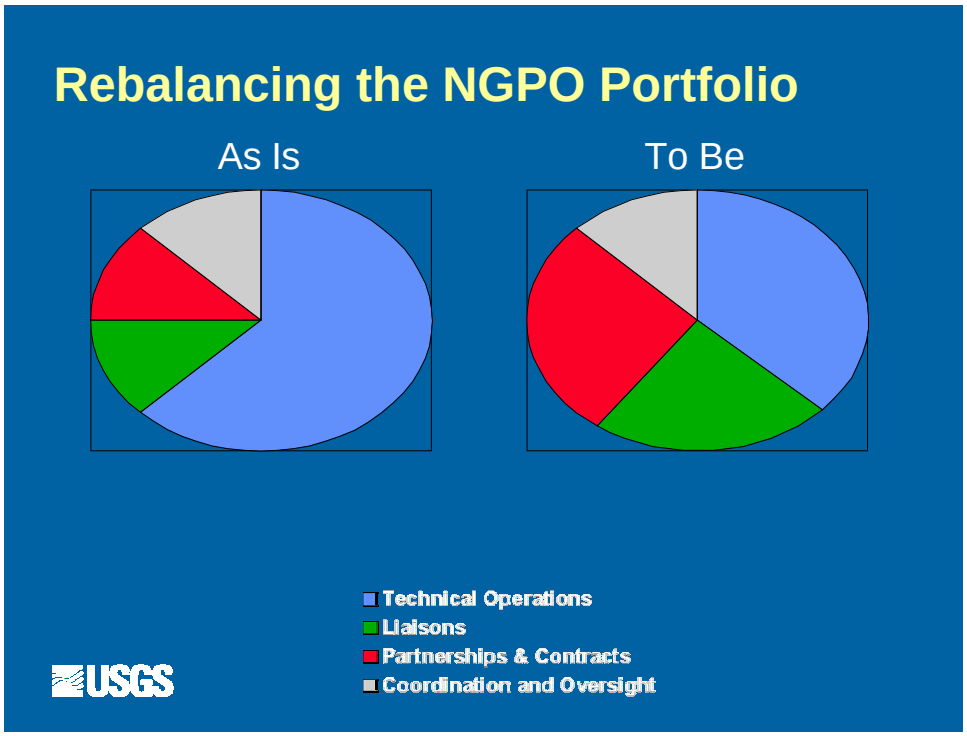
The following purpose, vision, and mission functions have been established by the NGPO for the NGTOC.

> **Purpose**: The National Geospatial Technical Operations Center (NGTOC) provides geospatial technical expertise, services, and innovative solutions in support of the National Geospatial Program Office (NGPO) in its implementation of key components of the National Spatial Data Infrastructure (NSDI).
> **Vision**: By March 2007, the NGTOC will serve as a center of Government excellence for geospatial information and technology for key partners and stakeholders of the NSDI.
>
> **Mission:** In fulfilling the NGPO mission of implementing key components of the NSDI, the NGTOC will
>
> - Provide IT infrastructure (servers, portals, expertise) to support the NGPO
> - Manage multipurpose geospatial data products and services contracts
> - Perform integration and quality assurance of geospatial data from contractors and partners
> - Support geospatial standards and data model development, testing, and implementation

- Provide geospatial data systems integration and technical support for a National Geospatial Enterprise Architecture
- Provide for archive and access for digital geospatial data holdings, including dissemination to the public (involving an E-commerce solution)
- Provide access to map products
- Provide technical assistance on geospatial data issues to the USGS and its partners
- Provide education and training related to the program activities of the NGPO
- Conduct and sponsor research in geospatial information technologies and innovative solutions
- Provide incentives to partners in developing technical solutions for geospatial activities

A Budget for the Future

To manage the NGPO as a single program, the USGS will seek authority to restructure its budget to reflect the creation of the NGPO and to incorporate appropriations from the former Cooperative Topographic Mapping Program into a new line item. By bringing that funding and the other elements of the NGPO into a single line item, the leadership role of the USGS for national geospatial assets will be readily identifiable in the Federal budget. A consolidated budget structure will also facilitate DOI's Activity-Based Costing approach. The current Federal budget climate also requires accounting for every dollar appropriated and ensuring that it is invested wisely.



People—Analyzing Workforce Needs and Competencies

To embrace the potential of its vision and the reality of its mission, the NGPO will need a more flexible and differently configured workforce with a greater mix of Government and contractor-provided personnel and services. With an intent to send more dollars "out the door" to support contracts, partnerships, grants, pilot projects, and other external efforts, the goal will be to empower others to provide services and for the USGS to play a greater role in leadership, facilitation, coordination, and management. The initial step of a comprehensive analysis and realignment of its workforce will be a preplanning or scoping process that may become a full-fledged OMB Circular A-76 competitive sourcing study for the geospatial production and technical services functions currently being performed by USGS Mapping Centers, now incorporated into the NGTOC.

During the transition period to the workforce of tomorrow, the NGPO will be cautious in its Government hires, recognizing that every new hire is a $1 million investment. Managers will need to justify hiring within the Government rather than exporting a portion of that investment or capability. Each employee who is hired or remains a part of the NGPO in its post-transition structure will need to be equipped to meet the challenges of the future as data brokers and managers of the Nation's geospatial assets.

Internal Governance

In addition to providing a framework and structure of governance for the Nation's geospatial assets and the implementation of the NSDI, the NGPO will restructure and reorganize its internal governance, consolidate the standards and operations of its various program components, transition to common procedures and processes for all administrative functions, and align its internal and external communications and outreach. Thus, the NGPO will demonstrate to its external constituency its commitment to implementing the NSDI and transforming Government into a new model for the 21st century.

Schedule
When will the NGPO accomplish its priorities?

The following timeline shows significant milestones of the NGPO, beginning with its creation and looking ahead to future actions.

August 2004	NGPO created
January 2005	NGTOC created as operational arm of NGPO
February 2005	ESRI contract awarded to develop second generation Geospatial One-Stop portal
March 2005	NGTOC Business Strategy presented to Associate Director
March 2005	NGPO Plan for Action presented to Director
April 2005	Continuing the Dialogue—Listening session with external partners and presentation on NGPO ***Plan for Action***
	Presentation of NGPO ***Plan for Action*** to internal stakeholders
May 2005	Strategic Priorities and Actions of NGPO ***Plan for Action***—Public Comment Period (ends May 16)
June 2005	Future Directions Governance Report to NGPO and FGDC Steering Group
June 2006	Processes of Government necessary to implement NSDI transformed
December 2006	Tapestry of base content complete
March 2007	NGTOC recognized as a center of Government excellence for geospatial information and innovation for key partners and stakeholders of the NSDI

Stakeholder Input
How the NGPO is gathering input from stakeholders

Listening Sessions
The USGS Geospatial Information Office hosted a number of listening sessions with stakeholders in various locations during the initial 90-day period after the creation of the NGPO in late summer 2004. The term "stakeholder," as used in this plan, encompasses relationships from that of invested partners to informed constituents to influential customers. The realignment of the USGS geospatial program components, each of which has a solid customer and partner base, into a single program office was seen as benefiting stakeholders who have assets in and are contributing to the development of the NSDI. Their input was essential to developing the NGPO plan for action.

While the comments listed below were expressed primarily at a gathering of stakeholders in early October 2004 in Washington, D.C., the messages were repeated in other venues and by other voices. The October 2004 listening session was an opportunity to provide feedback on the creation of the NGPO and input into future decisions about organizational structure, functional alignment, role and scope, partnership relationships, and future USGS products and services. Representatives of Federal agencies, NonGovernmental Organizations, State and local entities, academia, and the private sector were invited to submit prepared remarks and/or to make a statement to the NGPO Core Team, all of whom were present.

Key Messages
A review of the October 2004 listening session and other opportunities in which the NGPO leadership engaged stakeholders reveals several key messages:

- ***Provide Leadership and Guidance***. USGS and DOI leaders are urged to provide strong, positive, visible support for the NGPO. The lack of a national-level champion for unified geospatial efforts is viewed as an impediment to the success of this effort.
- ***Expand the Stakeholder Base***. The NGPO is urged to focus on building a stronger, broader constituency to include DOI leadership, OMB, authorization and appropriations committees, the private sector, and user groups that benefit from USGS geospatial products and programs.
- ***Provide Incentives***. Incentives for partnerships should be more than financial and should include being involved in setting priorities, establishing landscape personnel criteria and locations, and seeking stakeholders to be service providers and product distributors.
- ***Support Problem-Solving***. The USGS is urged to view the development and timely delivery of products and services as a problem to be solved rather than to view a map as an end product. The products support the evaluation, analysis, and fusion of data and information to meet customer needs. NGPO products and services must be useful to decisionmakers.
- ***Develop a Communication Plan***. The NGPO is challenged to develop a proactive communication plan that allows for personal interactions with both internal and

external customers. All communication needs to be clear and consistent.

The messages from the listening sessions cut across all the components of the NGPO and are additional drivers for its strategic direction. The NGPO has accepted the challenge of providing leadership and is working to define what is meant by "national capabilities" related to creating, managing, sharing, and coordinating geospatial information. In establishing the strategic priorities, we have relied on the resources, both internal and external to the USGS, with the most accurate knowledge to identify and build these priorities.

Our stakeholders support the NSDI and support building a structure of practices and relations that facilitates data sharing and usage. Our stakeholders want to understand the strategic priorities of the NGPO to align their respective priorities. Our stakeholders want the NGPO to be the national leader for geospatial information.

Internal Engagement

The creation of the NGPO has not been without a measure of upheaval and anxiety for the employees of the program components and for the broader USGS family. In a listening session with USGS employees in the fall of 2004, facilitated focus groups brought the following 10 recommendations to the NGPO leadership:

- Explain the overall plan and timeframes of action and show how these will address the issues of reducing redundancy and creating efficiency
- Describe and show how the NGPO mission aligns with the USGS and the NSDI missions
- Compare goals of the NSDI Future Directions and priorities of the USGS with the NGPO goals
- Develop a mentoring program within NGPO to capture talent and institutional wisdom of those retiring and leaving
- Develop a communications mechanism and a structure of outreach and liaison with USGS disciplines and programs
- Meet for dialogue with data providers when NGPO leaders are traveling in the field and regions
- Clarify the geospatial assets of NGPO. Clearly articulate what is within its portfolio
- Develop an NGPO image or identity so that employees know they are part of the NGPO family
- Increase contact with employees. NGPO leaders must be committed to pushing information to employees and communicating as a way of daily business
- Tell the stories of NGPO successes. Help employees know and share what is happening and gain a sense of pride in the NGPO

The NGPO leadership takes to heart these messages from its employees and is committed to addressing their issues and concerns. Without the understanding and support of those who will carry out the strategic actions, the NGPO cannot succeed. As the new structure and internal governance of the NGPO is put in place, leaders and managers will ensure that employees are well informed and equipped to do their jobs.

Study Teams—Collaborators in the Creation of the NGPO

In early November 2004, the NGPO leadership commissioned a number of Study Teams to investigate key areas of national geospatial assets. A Core Team member was a sponsor of each of the teams. The Study Teams had an extremely tight timeframe in which to produce reports with recommendations to the NGPO. The contributions of the Study Teams in conducting their investigations, interviews, and deliberations have been invaluable to the NGPO leadership, and their reports were drawn upon heavily for this plan and will continue to be used as springboards for future actions. While the Study Teams will not continue in their existing incarnations, the NGPO will continue to seek their advice.

The Study Teams, their charters, and leaders are described below. Each Study Team was given a context that identified issues or concerns to be addressed and asked that their recommendations provide action plans for resolution. Some of the Study Team names track directly to Strategic Priorities in the plan for action; in other instances, the broad nature of the Study Team's charter, such as Geospatial Technology Integration and a Unified NSDI Web Presence, encompassed all of the strategic priorities.

Unified Geospatial Enterprise Architecture
Core Team Sponsor: Ivan DeLoatch
Leads: Timothy Haithcoat, Program Director, Geographic Resources Center, University of Missouri-Columbia; Ryan Cast, Geospatial Information Officer, Office of the CIO, Department of Homeland Security; Kevin Gallagher, USGS Chief Technology Officer; Kevin Hope, USGS Enterprise Engineering

Context

- Enterprise Architecture for NSDI
- Federal Enterprise Architecture (FEA)
- Enterprise Architecture in Federal and State agencies

Charge

Recommend an approach for unifying disparate geospatial architecture efforts, aligning them with the FEA and accommodating the needs of the non-Federal community.

Geospatial Technology Integration
Core Team Sponsor: Hank Garie
Leads: Leslie Cone, Project Manager for Land and Resources, Bureau of Land Management, DOI; Leslie Armstrong, Deputy, Federal Geographic Data Committee; Ken Boyko, Chief, USGS *The National Map* System Design Team

Context

- Disparate, confusing systems
- Customers need better service from systems
- Redundant and duplicative systems are not economical

Charge

Develop a technical vision, a modernization blueprint, and a systems integration plan for NGPO systems.

Partnership Offices
Core Team Sponsor: Stan Ponce

Leads: Dennis Gorham, State GIS Coordinator, State of Utah; Stan Ponce, USGS Senior Advisor for Partnerships and External Coordination; and Anne Frondorf, USGS Geospatial Information Office (**Note**: the existing NSGIC-NACO/*The National Map* partnerships team was already in place and working on similar issues, and its membership and interests were brought into the Study Team. Those members, in addition to the leads identified are Dan Cavanaugh, USGS; Beth Duff, USGS on detail to the Office of the Secretary, DOI; Bonnie Gallahan, USGS; Matt Heller, National Geographic Society; Vicki Lukas, USGS; Cheryl Morris, USGS; Virginia Peterman, State of Maryland; Zsolt Nagy, State of North Carolina; Tom Sturm, USGS; Dick Vraga, USGS; Leslie Wollack, USGS; Mike Domaratz, USGS; and Leslie Armstrong, FGDC.)

Context

- Existing USGS Mapping Partnership Offices
- Expanding expectations
- Landscape is where things happen

Charge

Develop a plan for restructuring and rescoping USGS Mapping Partnership Offices and the mapping liaison function to represent the full portfolio of NGPO activities.

Unified NSDI Web Presence

Core Team Sponsor: Bob Pierce

Leads: Karen Klima, USGS Enterprise Web Manager; Susan Fagan, Program Analyst for Policy, Communications, and Resource Management, U.S. EPA; and Alison Dishman, USGS

Context

- Current Web presence lacks coherence
- Potential of the Web yet to be realized

Charge

Develop a plan to unify Web activities of the individual entities of the NGPO and create a unified Web presence.

Measuring Geospatial Investments

Core Team Sponsor: Mark DeMulder

Leads: Brenda Smith, Geospatial Information Officer, U.S. EPA; Mike Domaratz, USGS; Kathy Covert, USGS; and Sal Majied, USGS

Context

- Recent questions and findings from the GAO, OMB, and so on.
- Responsible to taxpayers and stakeholders

Charge

Develop a proposal for how the NGPO can assist OMB in measuring geospatial investments and developing an investment strategy for the Federal Government.

USGS Geospatial Products and Services

Core Team Sponsor: Mark DeMulder

Leads: Tim Miller, USGS Chief, Office of Water Quality; Lorelei Weitzel, Acting Director, Texas Natural Resources Information System; and Kari Craun, USGS Chief, Mid-Continent Mapping Center

Context

- Proud history of products and services
- Continued and changing demand
- Managing customer expectations

Charge

Develop recommendations for a suite of 21st century geospatial products and services that USGS is uniquely positioned to offer.

Other Stakeholders

Others whose advice, criticism, and counsel were sought or thrust upon the NGPO are too many to list here. They include several reports from the National Academy of Sciences National Research Council, reports from the GAO, input from Congress, suggestions from the private sector, and comments from interested users from all walks of life. The NGPO leaders took the new message of the NGPO out on the road within weeks of the announcement of the creation of the office. There have been countless presentations and discussions with professional societies, trade and industry groups, State and Federal Government officials, nonprofit organizations, and private sector companies. The trade press has followed the development of the NGPO, and there have been frequent articles and interviews. This plan of action incorporates those voices as well, and the broad mission of the NGPO was developed to reflect a commitment to everyone who has a stake in the tapestry of place.

Engagement for the Future

Vigorous and continuous engagement with stakeholders inside and outside the USGS will be essential if the actions in this ambitious plan are to be successful. Each of the NGPO leaders has committed to keeping the lines of communication with stakeholders open and active. The calendar of opportunities at conferences, trade shows, and meetings in the months ahead is full. Planned town hall meetings and other opportunities to engage USGS employees are part of many of those venues as the leaders take the message of the NGPO out to stakeholders.

The developing NGPO Web presence (http://www.usgs.gov/ngpo) will be a critical communication tool. The unified Web presence for the NSDI, in which the various components of the NGPO and of broader NSDI customers and partners will be brought together, will become the framework that leads to opportunities to explore geographic information services for activities, data, and people to use in mapping, managing, and understanding their world.

Communications Strategy
How will the NGPO inform its stakeholders?

Communication is embedded as a key component of the success of each of the Strategic Priorities in the NGPO ***Plan for Action***. To keep employees, stakeholders, partners, and customers involved in the implementation of the Plan and the overall success of the NGPO, it is critical to keep them informed through a wide range of communications activities.

Background

The communications strategy for the NGPO is the foundation from which annual plans for specific program components will be derived. The outward expression of the NGPO is critical to its successful transformation into a position of leadership for the Nation's geospatial assets and the implementing agent for the NSDI; however, that transformation must also be embraced inside the organization. The employees of the NGPO, the USGS GIO, and others within the Bureau need to feel they are a part of the success of the enterprise. The NGPO communications strategy recognizes the importance of instilling a culture of involvement from the inside of the organization outward to external audiences. A great deal of organizational change has gone on within the USGS in the formation of the NGPO within a relatively short period of time. The dynamics and processes of that organizational change, and the needs and interests of employees, are being addressed in a comprehensive communications planning effort that is being cooperatively developed by communications practitioners in the NGPO and the USGS Office of Communications.

Overall Strategy

Engage employees, key stakeholders, and partners in the success of the NGPO and in the implementation of the NSDI through effective communications in which they feel informed and, therefore, proactively involve themselves in supporting the purpose of "providing leadership to place geographic knowledge at the fingertips of the Nation."

Program Goals

- Provide leadership and guidance for key stakeholders of national geospatial assets.
- Implement key components of the NSDI.

These are the two major components of the NGPO mission. The first focuses on leadership and the prominent role of partners and stakeholders in the success of the endeavor, and the second on the operational aspects and technical services to be provided that will ensure the implementation of the NSDI. A commitment to strategic communications at every opportunity and at every level of the NGPO and throughout the staff of the USGS wherever they are located will ensure these goals will be met.

Communication Objectives

- Create an expectation for action in implementation of the NSDI.

- Engage and involve employees, partners, and stakeholders at all levels of government and in all communities of interest and practice as supporters of the NGPO and of NSDI implementation.
- Demonstrate leadership of the NGPO for national geospatial assets.
- Instill a partnership culture for successful implementation of the NSDI.
- Enlist support of NGPO employees and other USGS staff as ambassadors and champions in the implementation of the NSDI and the success of the NGPO.

Key Messages

All stakeholders have a role to play in building the NSDI.

- The whole is greater than the sum of its parts. All levels of government and all interested parties need to work together to communicate and collaborate to build the NSDI.
- Build once; use many times. Complying with standards saves time, money, and staff resources.
- Don't reinvent the wheel—the geospatial data you need may already be available.

Geospatial information gives decisionmakers the complete picture.

- Here's how it benefits the Nation…
- Here's how it benefits you…
- Here's how business and government use these data in their decisions to…
    - Locate new business, hospitals, schools, new communities
    - Respond to emergencies, natural hazards, and homeland security threats
    - Plan transportation routes and other critical infrastructure
    - Make the world a better and safer place

National geospatial programs and resources provide valuable information to meet local needs.

- Combining local data with national data aids decisionmaking.
- Sharing geospatial information across boundaries helps improve delivery of services to customers and citizens, and reduces costs.
- Being a part of the governance of national geospatial assets turns them into shared resources.

The Power of Place is a shared asset of everyone, everywhere.

- The ability to relate places with events is priceless.
- Everything happens somewhere.
- Seeing is believing…the ability to visualize geospatial information makes it more real and accessible.
- Geospatial data aid decisionmaking.

The system of systems is a roadmap of access and discovery for everyone.

- A single look and feel and single portal of access to national geospatial assets will enable everyone to share in the investment.

Target Audiences

Because geospatial information is important to every sector of society, it is easy to say that all audiences are targets for NGPO communications; however, it is important to prioritize and define communication plans and activities to ensure that the messages reach the most critical audiences first. The broad reach of the NGPO and the message of the NSDI are captured below.

Internal Audiences—Employees of the NGPO, the GIO, other USGS disciplines, programs, regions, and field centers who are important players in the use of geospatial assets and who can champion the benefits of integrating geospatial assets for their individual programs and customer needs. Special note is made of the need to involve the USGS employees who are liaisons in the field in support of the NSDI, who have been reconstituted as NSDI Partnership Liaisons and who will need the tools and materials to tell the story of the NGPO and how the NSDI will be implemented.

External Audiences—The Federal community, including DOI, other Federal agencies, Federal data stewards, and OMB; elected officials, authorizing and appropriating committees and staff, the Congressional Research Service, and GAO; nongovernmental organizations and nonprofit groups; the academic community and its associated organizations; State and local governments and community leaders; the private sector, not only in the geospatial realm but other sectors of business, industry, and commerce who use and need geospatial information; the news media, including daily press, trade publications, scholarly journals, and other communication vehicles of professional societies and commercial publishers; and community and citizen interest groups, as well as individual citizens.

Communication Opportunities and Tactics

The following communication opportunities and tactics represent some first steps that need to be taken. Successful tactics will become part of a communications toolkit of best practices for others to use.

Introduce the NGPO as the leader and implementing force for the NSDI.

- Enlist the support of NGPO employees and other USGS employees as champions for the unified portfolio of national geospatial assets and the implementation of the NSDI.
- Provide communications training for employees who are on the front lines of telling the NGPO story.
- Develop communication materials and toolkits to assist USGS internal champions in addressing external audiences.

Provide general NGPO information to customers.

- Bring the various and disparate audiences for *The National Map*, the FGDC, Geospatial One-Stop, the DOI Enterprise Geospatial Information Management activity, and other component programs into a unified body of support for the NGPO and its implementation of the NSDI.
- Continue to engage in listening sessions and other opportunities to listen and learn from others.
- Use partners and customers to validate new outreach and information products.
- Reach out to new constituencies.

Develop an annual calendar of opportunities for communications that includes all venues and all vehicles.

- Develop a list of target constituencies to identify their communication vehicles and venues.
- Target one or more new venues (conference, trade show, publication) in FY 2005 that reach a potential new constituency.
- Institutionalize the calendar and the opportunities that it presents as the basis of annual development of a communications plan.
- Leverage resources for outreach at conferences and trade shows by planning how program components will support a unified message and presence.
- Institute communications planning and outreach opportunities as part of NGPO budget planning and resource allocation.

Promote partnerships as an essential component of the NGPO and implementation of the NSDI.

- Identify constituencies, audiences, and venues that build and nurture partnerships.
- Engage USGS NSDI Partnership Liaisons in communicating the partnership message in their communities and States.

Engage the media.

- Develop contact lists for media, external newsletters, and trade publications.
- Sponsor a kickoff trade media roundtable event.

Engage elected officials and policy makers.

- Sponsor a series of congressional briefings to introduce the NGPO and its programs.
- Sponsor a National Geospatial Conference.
- Participate in the USGS 2005 Congressional Briefing Series.

Provide communications training and preparation for NGPO employees and, in particular, NSDI Partnership Liaisons.

- Develop a toolkit of brochures, fact sheets, talking points, and other hands-on aids to prepare them to engage internal and external audiences as NGPO and NSDI champions.

- Train Liaisons in basic communications techniques to help them deliver key messages, match messages and appropriate venues to target audiences, and handle interviews effectively.
- Ensure Liaisons are part of communications planning, receive all messages quickly and consistently, and transmit messages appropriately suited to audiences and vehicles.

Tailor information products to reach desired audiences and ensure understanding of the Nation's geospatial assets as a unified portfolio under the leadership of the NGPO.

- Develop a look and feel for NGPO information products.
- Create a unified approach to establish brand-name recognition of the NGPO as the leader for the Nation's geospatial assets.

Use the Web as a primary means of communication and customer engagement.

- Enhance the Web presence for the NGPO.
- Become the link of choice for the geospatial community.

Repurpose and, where appropriate and affordable, redesign materials of component programs into a unified NGPO approach to outreach.

- Organize a panel of internal and external participants to review existing products and materials; review for accuracy, effectiveness of messages; update as appropriate.
- Design new products as needed for publications, fact sheets, promotional items, and exhibits.
- Develop a budget and process for the development of outreach materials.

Strategic Priorities and Communication Tactics

As part of the development of the Strategic Priorities and Actions in the NGPO Plan for Action, communication tactics were outlined to provide a means to communicate with stakeholders, partners, and customers about each Priority. As Actions for each Priority take shape, these tactics will be refined, and others will be added.

Geospatial Enterprise Architecture

- Use the venues on the 2005 NGPO events calendar (under development) and other communication vehicles, such as Web pages and information products, to foster a climate of acceptance for a geospatial enterprise architecture.
- Identify and coordinate educational, informational, and training resources specific to geospatial enterprise architecture.
- Facilitate communications with other agencies and external partners about national issues, programs, policies, and budget initiatives relating to geospatial enterprise architecture.

Governance Structure for the 21st Century

- Use upcoming events of interested parties and organizations to discuss needs of governance and problems that need resolution.

- Maintain contact information database being created as part of the Future Directions work and use this for future interaction.
- Develop a targeted communication plan to promote its recommendations when the June 2005 report is released.
- Provide briefings to key leaders on the governance recommendations.

Incentive-Based Partnerships

- Develop a partnership outreach strategy that highlights each new partnership, promotes "best practices," and markets the suite of incentives available to partners.
- Provide briefings and discussions at NSGIC midyear and annual conferences.
- Meet with interested organizations to introduce them to NGPO leadership and staff and establish contact and regular communications on progress of the incentive-based partnerships.
- Communicate regularly with constituent groups, highlighting NGPO activities of interest, contacts in each State, and ways to participate.
- Provide NSDI Partnership Liaisons with information on incentive-based partnerships to use in communicating with their existing partners and in identifying new, prospective partners.
- Feature partnership activities in the unified NSDI Web presence.
- Hold regular conference calls with NGPO and stakeholder staffs to discuss progress, identify pitfalls, and establish next steps.

Tapestry of Base Content

- Mark milestones as framework components of the tapestry are completed.
- Use national conferences and other venues to show the strengthening and enriching of the tapestry—a continually enhanced exhibit that visibly becomes that tapestry of base content.
- Showcase the tapestry of base content when it is completed in December 2006.

Geospatial Information System of Systems

- Develop a marketing plan to introduce and promote the system of systems concept.
- Feature new stewards in various communication venues.
- Promote the system of systems within USGS to highlight opportunities to integrate with other systems.

National Geospatial Investments

- Explore communication vehicles and venues of Federal partner venues to build trust. (Use caution to mitigate any concerns that investment approaches might affect their budgets.)
- Build tactful and diplomatic relationship with OMB on the best approach to a national investment strategy.
- Develop and foster an open communication culture and practice. NGPO will need to operate with an open book approach to its own investments if others are expected to follow suit.

- Explore producing joint publications or other joint ventures with another Federal agency or agencies that would highlight the coordinated approach to a national investment strategy.

Revitalized Suite of USGS Products and Services

- Speak and act with pride about the products and services of the future. The USGS accomplished something that few can equal in completing the 1:24,000-scale topographic map series.
- Recognize and champion shared ownership of the mapping future with customers and constituents.
- Promote access to map products, in the USGS role as the provider of products and services rather than the producer. Build on the brand recognition and heritage of USGS-produced products with new customers and services as the producers.

Appendixes

In addition, the report of the National Research Council of the National Academy of Sciences, “Weaving A National Map,” can be found at
http://www.nap.edu/catalog/10606.html

The reports of the NGPO-commissioned Study Teams have been posted as Microsoft Word documents on the following page:
http://www.usgs.gov/ngpo/ngponews.html

- **Study Team Reports** (Microsoft Word)
  - Unified Geospatial Enterprise Architecture (1328kb)
  - Geospatial Investments (895kb)
  - Unified NSDI Web Presence (34kb)
  - NSDI Partnerships Offices (598kb)
  - Products and Services (1061kb)
  - Geospatial Technology Integration (671kb)