

***The National Map* – primary products, services and supporting activities**

June 19, 2009

***The National Map* is a collaborative effort to improve and deliver topographic information for the nation.**

The goal: *The National Map* is to become the nation's source for trusted, nationally consistent, integrated and current topographic information available online for a broad-range of uses.

The vision:

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

The National Map provides the nation with base geospatial information that describes the landscape of the United States and its territories. It is a dynamic system of maps, geospatial data and services managed by the U. S. Geological Survey (USGS) and a network of state and Federal partners. Geographic information professionals and public map consumers across the country use *The National Map* products and services by the thousands every day. Our customers use maps and data services to support their scientific missions, make life saving decisions, enhance their recreational experience and for countless other activities. Nationally consistent geospatial data from *The National Map* enable better policy and land management decisions and the effective enforcement of regulatory responsibilities. *The National Map* is accessible for viewing on the web, as downloadable data, and as map products to include printed or digital topographic maps.

Partnerships are fundamental to the success of *The National Map*. A majority of all data come from partner Federal agencies, state governments, Tribal governments and the private sector. *The National Map*, in most cases, does not replace the systems in these organizations but rather complements their services with a national or regional perspective. USGS assigns a Geospatial Liaison to each state to coordinate these partnership activities. In addition, liaisons are assigned to the Department of Homeland Security, the National Geospatial Intelligence Agency and the Department of Agriculture, U.S. Forest Service.

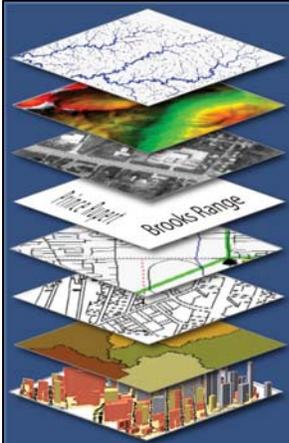
The National Map is foremost a system of managed data layers designed to meet geospatial data service and information product needs within the USGS, across Federal agencies, state government, and Tribal governments. The long term plan is to have stewardship programs where partners supply high quality data to *The National Map*. The geographic data available from *The National Map* include orthoimagery, elevation, hydrography, transportation, boundaries, structures, geographic names, and land cover.

National Map data are maintained at a level of detail suitable for many on-the-ground planning and operational activities, although they are not generally suitable for engineering detail work. The greatest value from *The National Map* is derived through the delivery of geospatial services in support of national programs and where regional perspectives are required thus complementing other Federal, state and local systems.

When geospatial data come into *The National Map*, operations teams are responsible for formatting, loading and integrating data to be managed in the enterprise database. Data are modified to create a level of uniformity that is required to support geospatial mapping and analytical needs specific to each of the datasets. This may include transforming the data to a common data model, matching data across jurisdictional boundaries, supporting partners to create data which conforms to a national standard, or generalizing very detailed data. The level of consistency which is created for each dataset can be different depending on the funding and information requirements being addressed.

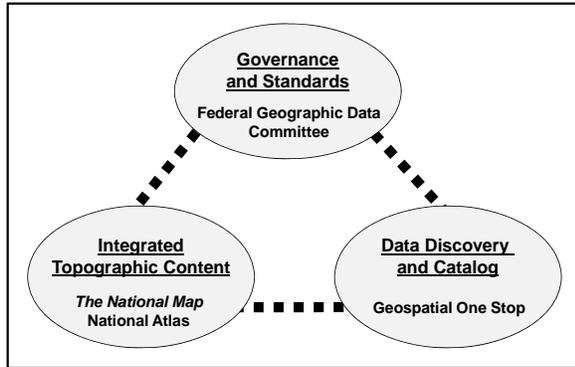
These managed datasets become the source for various web services, data download services and information products. The Office of Management and Budget (OMB) has designated (circular A-16) the USGS as the lead or co-lead agency for elevation, orthoimagery, hydrography, geographic names and land cover. For the other data layers represented in *The National Map*, USGS looks to the lead Federal agencies to provide this coordination support.

Office of Management and Budget A-16 themes Leads

	Hydrography – Department of Interior, USGS
	Elevation – Department of Interior, USGS
	Orthoimagery – USDA, Farm Services Agency and USGS
	Geographic Names – Department of Interior, USGS
	Boundaries – DOC, NOAA, DOI (MMS, BLM), Dept. of State
	Transportation – Department of Transportation
	Land Cover- USGS, USFWS (Wetlands), USDA (Vegetation)
	Structures – General Services Administration

***The National Map* and other National Geospatial Program activities**

The National Map is one program activity within the National Geospatial Program (NGP). The NGP supports the USGS operational aspects of *The National Map*, Geospatial One-Stop (GOS), National Atlas of the United States® and the Federal Geographic Data Committee (FGDC). This integrated portfolio of geospatial information and data support services are essential components of the National Spatial Data Infrastructure (NSDI). The NSDI is a physical, organizational, and virtual network designed to enable the development and sharing of this nation's digital geographic information resources.



NSDI Activities at USGS – *The National Map* relies on NSDI governance and policy development from the Federal Geographic Data Committee. The working relationship to FGDC is similar to that of other Federal Agencies with geospatial data management responsibilities. Geospatial One-Stop, while not a *National Map* activity, is also managed by the National Geospatial Program. Geospatial One Stop catalog services are shared between *The National Map* and the GOS application. The National Atlas is a companion product to *The National Map* that serves the needs of individuals with information derived from over 2,000 data layers.

The Federal Geographic Data Committee (FGDC) is an interagency committee that promotes the coordinated development, use, sharing and dissemination of geospatial data on a national basis. FGDC activities are administered through the FGDC Secretariat, hosted by the NGP of the U.S. Geological Survey. The Office of Management and Budget (OMB) established the FGDC in 1990 and rechartered the committee in its August 2002 revision of Circular A-16, "Coordination of Geographic Information and Related Spatial Data Activities." The FGDC is a 19 member interagency committee composed of representatives from the Executive Office of the President, and Cabinet level and independent Federal agencies. The Secretary of the Department of the Interior chairs the FGDC, with the Deputy Director for Management, Office of Management and Budget (OMB) as Vice-Chair. Numerous stakeholder organizations participate in FGDC activities representing the interests of state and local government, industry, and professional organizations.

The Geospatial One-Stop (GOS) portal is the official means for accessing metadata resources managed in the NSDI Clearinghouse Network. This includes metadata held by Federal, State, Tribal and local entities, and by academic and non-profit organizations and the private sector. The GOS portal is a catalog service supporting data discovery needs of anyone wanting to gain access to public data. *The National Map* data are accessible through the GOS portal in the same way that thousands of other datasets and services are accessed. The National Geospatial Program at USGS provides management support for the portal.

National Atlas - The National Atlas of the United States® (<http://nationalatlas.gov/>) is an effort by the United States government to make geographic information easier to find, get, and use. More than two dozen Federal agencies collaborate to provide accurate, integrated, and authoritative information about America's natural and human built landscapes. The National Atlas offers small-scale maps and stories about the information contained in these maps regarding the people and places of America. It includes attractive wall maps, innovative page-size maps for downloading, and an online map maker that includes more than 2,000 layers that may be used to craft custom maps. There are multimedia articles about Atlas maps as well as maps that illustrate how our country keeps changing. For geographic information professionals, the National Atlas offers integrated, documented geospatial data and web map services. These are integrated with similar data and services from Canada and Mexico to create an Atlas of North America (<http://www.cec.org/naatlas/>) and are contributed to the international Global Map project (<http://www.globalmap.org/english/index.html>)

The National Map and the National Atlas are different. A question often arises as to the differences between *The National Map* and the National Atlas of the United States. The three primary differences between these programs include the scale or resolution of their data products; the extent of their product

lines; and their primary customers. The National Atlas offers data that are designed to portray broad patterns, trends, history, and conditions at levels of detail useful for national assessments. Generally, *National Map* products are created to meet accuracy requirements of a printed map where an inch on a US topographic map equals 2,000 feet on the land surface whereas National Atlas maps are produced at a smaller scale where an inch on the map equal sixteen miles. At these scales, *The National Map* provides base mapping information for eight data layers while the National Atlas provides a less detailed mapping framework for more than 2,000 thematic layers of map information. Finally, the products of *The National Map* are intended for the use of professional consumers and field users of geospatial data while National Atlas products and services are designed for the use of individual American citizens.

The Center of Excellence for Geospatial Information Science (CEGIS) conducts, leads, and influences the research and innovative solutions required by the NGP. CEGIS pursues this charge by identifying, conducting, and collaborating on geospatial information science research issues of national importance in the areas of improved data access, innovative methods of modeling and information synthesis and geographic research tools and methods to support decision-making relative to the human and environmental consequences of land change. The NGP relies on CEGIS to provide research support to address needs critical to the success of *The National Map*. The current research agenda addresses issues under three research topics to include:

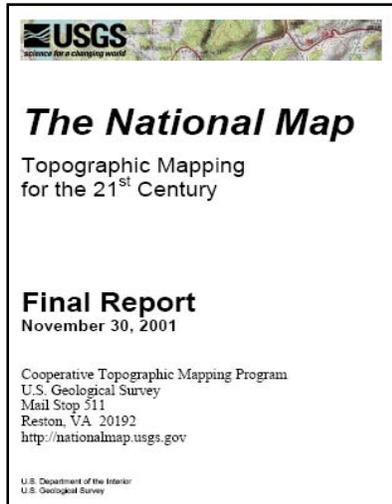
- Information Fusion, Visualization, and Ontology for *The National Map*
- Multi-scale Databases and Resolution
- Geospatial Modeling and Applications Research

Emergency Operations - To assist in responding to natural and potential man-made disasters, the USGS has established the Geospatial Information Response Team (GIRT). The primary purpose of the GIRT is to ensure rapid coordination and availability of geospatial information for effective response by emergency responders, and land and resource managers, and for scientific analysis. The GIRT is responsible for establishing monitoring procedures for geospatial data acquisition, processing, and archiving; discovery, access, and delivery of data; anticipating geospatial needs; and providing relevant geospatial products and services. The GIRT is focused on supporting programs, offices, other agencies, and the public in mission response to hazards. The GIRT leverages the Geospatial Liaison Network and partnerships with the Department of Homeland Security (DHS), National Geospatial- Intelligence Agency (NGA), and Northern Command (NORTHCOM) to coordinate the provisioning and deployment of USGS geospatial data, products, services, and equipment.

***The National Map* Products and Services**

The National Map as part of the National Geospatial Program operates in accordance with *The National Map* Cooperative Topographic Mapping Program report (2001), The National Geospatial Programs Office, Plan for Action (2005), and *The National Map* 2.0 Tactical Plan (2008). A new five year planning project is currently being initiated following the completion of the customer requirements study in 2009.

The National Map embodies 19 product lines and related services. The data products and services correspond to the eight framework geospatial data layers. These product lines are evolving and are at various stages of maturity in the product lifecycle. It is the goal of each dataset manager to create a product line that is responsive to the vision and objectives as stated in the 2001 *The National Map*



strategic plan and in the 2005 five year plan. Data web services and download services are available for each of the eight data layers.

Map products and online Information services supported by *The National Map* include historical maps in both print and digital form, current image maps and topographic maps in digital formats, map viewing services, and map web services. Most of the information product lines are currently going through a major redevelopment phase of their lifecycle. *The National Map* viewer is being modernized to dramatically improve the user experience to include improved user capability to mash these services with their own business specific map services. In fiscal year 2009 approximately 15,000 new digital topographic 7.5-minute quadrangle maps will be released and this new product will be refreshed on a three year cycle. Historical maps created over the last 100 years are being scanned at a

high resolution and will be made available through the USGS store for free download. These historical maps serve as companion products to the new digital maps.

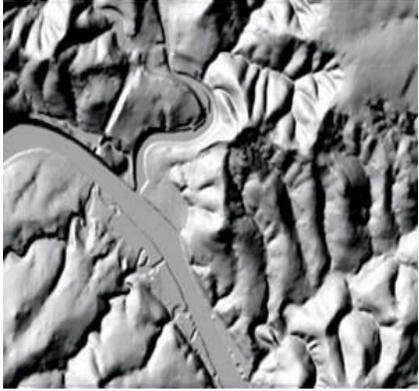
Along with the suite of data and map products, The National Geospatial Program provides a number of customer services designed to advance the NSDI with a primary focus on partnerships to support *The National Map*. These services include partnership coordination services as provided by the network of state and Federal Geospatial Liaisons, data acquisition to include quality assurance and quality control services, and the cooperative agreements program where grants are provided to promote the NSDI and *The National Map* partnerships. The services are rounded out by two important activities. The NGP allocates a portion of its funds to advancing the geography sciences through the Center of Excellence for Geospatial Information Sciences (CEGIS). The Department of Interior emergency operations center, while not a *National Map* function, relies on *The National Map* to provide quick response geospatial mapping and analysis support for disaster preparation and response throughout the United States and the world.

Data products



1. Orthoimagery - The USGS produces and disseminates digital orthoimagery data. These are typically high resolution aerial images that have the accuracy and reliability of a map. USGS digital orthoimage resolution may vary from six inches to one meter. In the former, this means that every pixel in an orthoimage covers a six inch square of the Earth's surface and in the later one meter square is represented in each pixel. *The National Map* offers a download service of public domain, one meter orthoimagery for the conterminous United States with many urban areas and other locations at one foot or finer resolution. Many states contribute orthoimagery to *The National Map* and the USGS relies heavily on a partnership with the USDA Farm Services

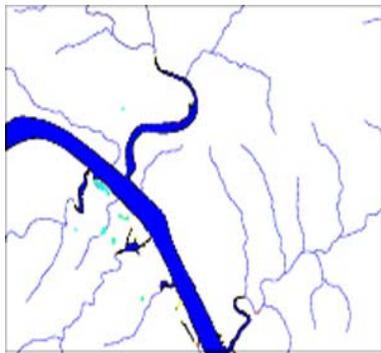
Agency which supplies national coverage of one meter data flown in the summer season and updated on a three year cycle.



2. National Elevation Dataset - The National Elevation Dataset (NED) is a seamless raster product derived primarily from USGS 10 and 30 meter Digital Elevation Models (DEMs), and increasingly, from higher resolution data sources such as LiDAR, IFSAR, and high-resolution imagery. NED data is available as one arc-second (approximately 30 meters) for the conterminous United States, and at 1/3 and 1/9 arc-seconds (approximately 10 and 3 meters, respectively) for parts of the United States. NED resolution for Alaska is primarily two arc-seconds (approximately 60 meters). The American Recovery and Reinvestment Act (ARRA) will provide initial investment in a new LiDAR data acquisition partnership.

While this new program has limited funding, the prospects for *The National Map* elevation dataset are greatly improved.

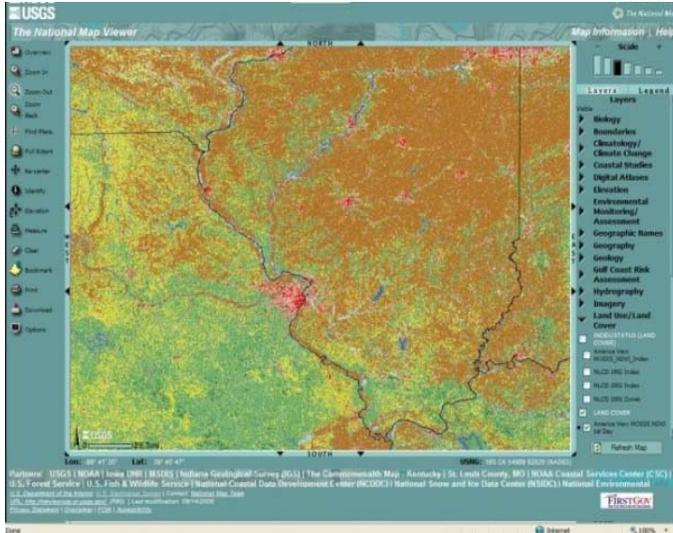
3. Geographic Names Dataset - The USGS maintains the authoritative data base of official United States geographic names, developed in cooperation with the United States Board on Geographic Names, known as the Geographic Names Information System (GNIS). USGS topographic maps display selected place and feature names. These may include physical and cultural features such as mountains, valleys, bays, populated places, hospitals, schools, churches and cemeteries. The GNIS does not contain the names of streets or roads, and does not currently define the extent of features; however it does contain attributes to help determine their relative extent. The geographic names dataset is being integrated with the enterprise database in FY09. The expected result is that names consistency across datasets will improve dramatically and the maintenance procedures will be streamlined.



4. National Hydrographic Dataset - America's surface waters are available from the USGS in the National Hydrography Dataset (NHD). The NHD includes national data sets covering all streams and lakes at scales of 1:24,000 and 1:100,000. In some areas, the NHD is being supplemented with data larger than 1:24,000-scale. The NHD provides a true network that supports the analysis of any type of movement (navigation, sediment transport, effluent dispersion, for example) by surface waters. The NHD is currently transitioning from a primarily USGS maintenance program to a partner network supported stewardship program. Many of the states are upgrading the data to larger map scales.



Watershed Boundary Dataset – The United States is subdivided into a nested hierarchy of drainage areas available from the USGS and USDA Natural Resource Conservation Service (NRCS) in the Watershed Boundary Dataset (WBD). This analysis has been produced at 1:24,000-scale (1:63,360-scale in Alaska). These hydrologic units are used to define areas affected by environmental events. The WBD is integrated with the National Hydrographic Dataset and is part of the NHD product line.



5. National Land Cover Dataset - The USGS collects and maintains data that shows both natural and anthropogenic land cover of the United States. These data are collected from orbiting satellites and have been produced for two years 1992 and 2001. The 1992 date set encompasses the conterminous US, while the 2001 data set encompasses all 50 states and Puerto Rico. In addition a land cover change product between 1992 and 2001 has been produced. These data sets utilize a 21-class land cover classification scheme that includes urban, agricultural, rangeland, forest, surface waters, wetlands, barren lands, tundra, and perennial ice and snow classes. The spatial

resolution (ground sample distance or GSD) of the data are 30 meters. This means that every grid cell covers an area 30 meters square.

6. Boundaries Dataset - Boundaries data represents major civil areas including states, counties, Federal and Native American lands, and incorporated places such as cities and towns. This data is useful for understanding the extent of jurisdictional or administrative areas for a wide range of applications, including managing resources, responding to natural disasters, or recreational activities such as hiking and backpacking. Boundary data are being updated in FY09 from Bureau of Census boundary files.

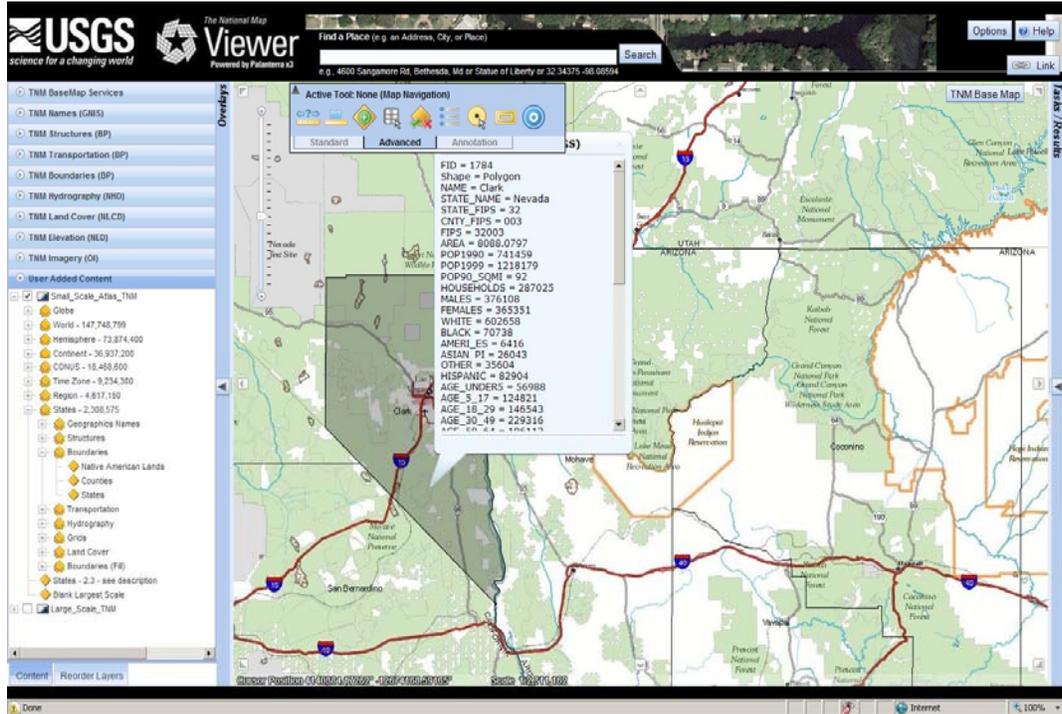
7. Structures Dataset - USGS data portrays selected structures data, including the location and characteristics of manmade facilities. Characteristics consist of a structure's physical form (footprint), function, name, location, and other information about the structure. The types of structures collected are largely determined by the needs of the disaster planning and response and homeland security community.



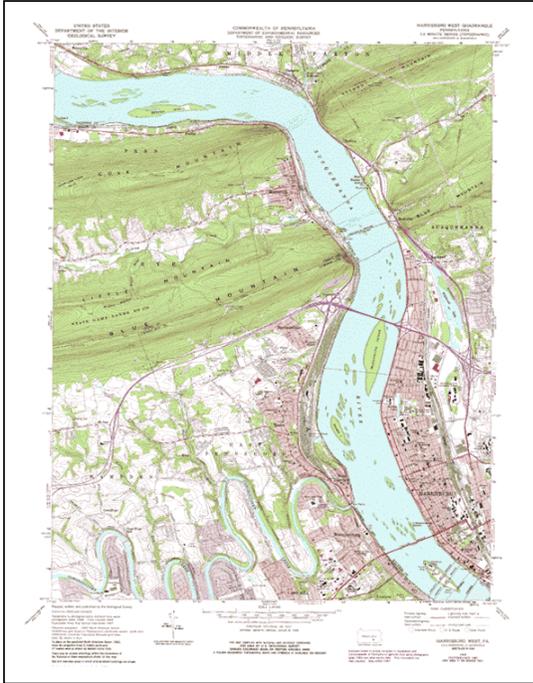
8. Transportation Dataset - The transportation data theme consists of roads, airports, railroads and other features associated with the transport of people or commerce. The data include the location, classification, name or route designator, and for most roads, address ranges. Initial national coverage of transportation data supports mapping and limited geographic analysis for traffic safety and disaster planning and response. Future capabilities will look towards support of geographic analysis for applications including routing and navigation, congestion mitigation, and more comprehensive disaster planning and response. In FY09 the newly updated Bureau of Census transportation dataset will be made available through *The National Map*.

Map products and online services

9. Map viewer - *The National Map Viewer* is the Internet face of *The National Map* and allows the user to interactively view *The National Map* data as a map, customize the view, and print a map. It provides public access to high-quality, *National Map* data from multiple Federal, State, and local partners. Map tools allow the user to move around the map, zoom in and out, identify features, and perform other functions. The image below is of the new *National Map* viewer that will be released in FY09.



10. New Release US Topographic map in GeoPDF format. In the summer of 2009 the USGS will begin releasing new versions of the topographic map. These will be available as a GeoPDF file that anyone can download from the USGS store for free. Initially, the product will be released as an orthoimage map with transportation and name features. In year two, of this new program, hydrography and contours will be added. The new topographic map will be produced on a three year cycle so in year one, approximately one third of the conterminous United States will be released. The production schedule will follow the USDA Farm Services NAIP schedule with topographic map products being released one year after photography is flown for any given state. The image to the left is the lower right corner of the Cat Mountain, AZ topographic map illustrating the image, names and transportation features that will be available on the first release product. Production plans call for 15,000 of these new maps to be released in FY09.



11. Historical US Topographic map print, Digital Raster Graphic (DRG), GeoPDF - The USGS was entrusted with the responsibility for mapping the country in 1879 and has been the primary civilian mapping agency of the United States ever since. The best known USGS maps are the 1:24,000-scale topographic maps, also known as 7.5-minute quadrangles. More than 55,000 7.5-minute maps were made to cover the 48 conterminous States. This is the only uniform map series that covers the conterminous United States in considerable detail. The 7.5-minute map series was officially completed in 1992 and only minor revisions have been made to the printed product in recent years as the program has moved to a digital format. The hard copy maps are available for sale through the online USGS Store and business partner retailers. High resolution georeferenced scans of these historical maps will eventually replace the older format DRG product that is currently available.

12. Custom Maps Service On-the-fly is a planned service identified in the FY08 – FY09 tactical plan. This activity has not been funded.

13. Web services - *The National Map* offers a series of web map and data services that provide system developers and web tool application users with high-speed access to data. The services include Web Mapping Services (WMS), Web Feature Services (WFS), and soon Web Coverage Services (WCS). Through these services, the USGS provides real-time access to its data through new and evolving interoperable specifications. In FY08 and 09 USGS completed a pilot project demonstrating its framework data as web feature service. In FY10 the first web coverage services will be initiated for the most recent East coastal imagery data.

14. Data download services - *The National Map* offers data download services for all of the products described in the products section of this paper. In FY10 these download services will be incorporated into the new TNM viewer providing an improved new single point of entry to facilitate customer access. In addition, access to download thousands of partner data sets is also provided through the ongoing NGP FY09 and FY10 activities better integrating *The National Map* and the data catalog of the Geospatial One-Stop portal.

15. Data Catalog – as the Managing Partner to the Geospatial One-Stop E-Gov project, The National Geospatial Program provides a national geodata catalog to thousands of data sets and map services from Federal, State, local and Tribal government. In FY09 this catalog has grown to over 200,000 records and now provides capabilities for any partner to provide a search of this resource directly from their own web page. In FY10 this data catalog will also be utilized as an important search function in *The National Map* viewer.

16. Marketplace – The National Geospatial Program provides the data ‘Partnership Marketplace’ through the Geospatial One-Stop portal as a mechanism to enhance the leveraging of Federal, State and local

resources to acquire and build new geospatial data. Data acquisition requests and plans can be posted, visualized and owners contacted to explore cost sharing opportunities. The Marketplace also provides more transparency on government acquisitions and helps reduce duplicative spending. In FY09 interested parties can be notified through email and news feeds about new opportunities without having to directly visit the portal itself. In FY2009 the marketplace has over 2,500 opportunities listed. In FY10 *The National Map* will also be the base map for the partnership marketplace.

Partnership services

17. Federal and state Geospatial Liaisons - The National Geospatial Program's partnership network cultivates and maintains long-term relationships with partners and develops agreements for *The National Map*, Geospatial One Stop, and other initiatives that advance the NSDI. The partnership network is comprised of headquarters and regional liaisons who coordinate with other Federal agencies and national organizations, and USGS Geospatial Liaisons who are distributed throughout the nation to work with geospatial communities in the states. Partnerships are the foundation of USGS geospatial programs because they leverage funding across organizations to provide cost savings and reduce redundancy in geospatial data acquisition and stewardship. In FY08 alone:

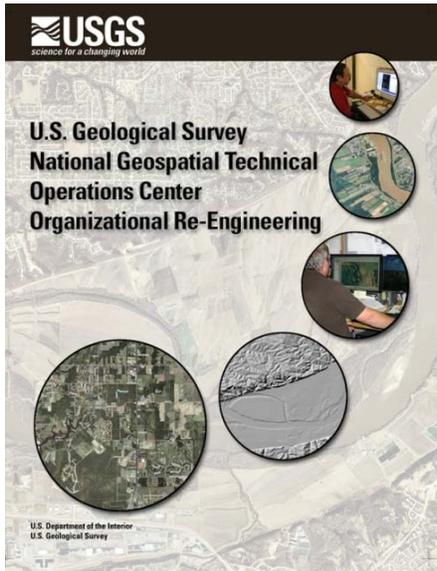
- The partnership network leveraged twelve partner dollars for every one USGS dollar made available for data through *The National Map*.
- Geospatial Liaisons coordinated over 80 GIS workshops and training sessions for over 2000 participants.
- Geospatial liaisons supported their communities by serving as Federal representatives on over 200 councils and committees.

In FY09, the partnership network has continued its aggressive pursuit of mutually beneficial geospatial partnerships and support of coordination and training at the state and national levels.

18. Cooperative agreements - The partnership network developed and funded a new category (Category 7) under the FGDC Cooperative Agreements Program (CAP). Four grants were awarded to states to demonstrate and document best practices for a nested approach to data development between levels of government. The goal is for states to successfully engage local government to provide data to statewide infrastructures, which are then drawn upon for ingestion at the national level into *The National Map*. In FY10, these partnership efforts will continue, and CAP grants will be completed and results shared with the geospatial community. Further, additional emphasis will be given in FY10 to strengthening Federal agency-to-agency partnerships and coordination for *The National Map* and the NSDI, and to improving communications materials on the partnership component of the National Geospatial Program.

19. Data acquisition, Quality Assurance, and Stewardship Support services – In addition to providing funding support, the USGS provides technical services to assist partners in acquiring and maintaining geospatial data that become part of *The National Map*. Acquisition support includes task order development and management of a set of very broadly scoped contracts designed to include a wide range of geospatial data acquisition and processing capabilities. The USGS also provides quality assurance services to partners to assist them in ensuring the data they acquire through either USGS contracts or via other mechanisms meet specifications. Finally, the USGS provides stewardship support services, including extensive training for partners interested in assisting in the maintenance of the National Hydrography Dataset (NHD). It is the intent of the USGS to extend this stewardship model to other *National Map* data themes.

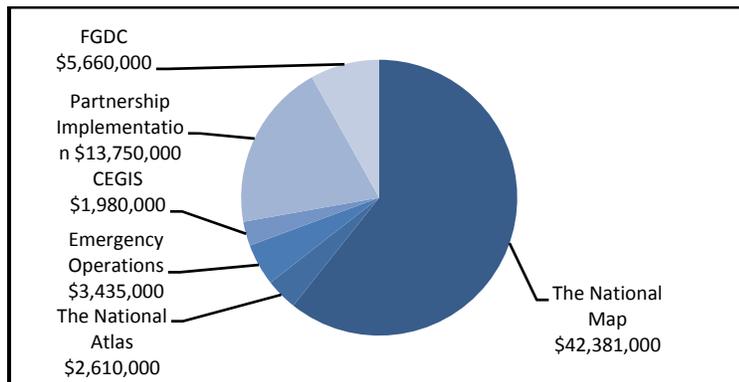
National Geospatial Program Information



The National Geospatial Technical Operations Center (NGTOC) is the primary operational organization supporting the National Geospatial Program. Functions performed by the NGTOC include: geospatial data acquisition, quality assurance, data integration, data management and modeling, providing technical support and training, development and maintenance of standards, product and service development, and applied geospatial research and systems development

The NGTOC began an organizational re-engineering effort in 2008 to streamline and prepare for working as efficiently as possible into the future. Fiscal year 2009 is a critical year in the implementation of the re-engineering plan. Several key tasks are in the implementation phase, including filling key technical and management positions, standing up a new organization and management structure, offering targeted early retirement incentives; implementing employee development programs, streamlining IT infrastructure across two physical locations; and finally, communicating plans to key stakeholders inside and outside the USGS. The resulting organization will be optimized to provide customers and partners quality products and services from locations in Rolla, MO and Denver, CO. Information about the NGTOC is available at: <http://ngtoc.usgs.gov/>.

The National Geospatial Program Budget is \$69.8 million in fiscal year 2009. It supports six program activities as described in this document. *The National Map* activity funded at \$42.4 million supports the products and services described under Data Products and Map Products and Online Services in this document. The partnership implementation elements shown in the pie chart funds the Federal and state geospatial liaisons, cooperative agreements, and data acquisition, quality assurance, and stewardship support services as described under Partnership Services above. The allocation of funds varies from year to year depending on the ongoing business requirements and resulting priorities.



Topographic map production system. The USGS is developing a suite of applications designed to incorporate data from *The National Map* into derived cartographic products, including a digital map which will ultimately be similar in content and design to the USGS Topographic Map. Current systems make use of desktop components for review and edit as well as a “map-on-demand” component which

automatically assembles the cartographic products and presents them in a layered GeoPDF output. The “map-on-demand” system will also be made available directly via the internet in the 2011 timeframe to enable users to assemble maps over a specified area of interest (verses a predefined tile or quadrangle).

Data acquisition planning and geospatial data inventory. The Integrated Requirements Information System (IRIS) will support data acquisition planning by tracking status and timelines of partner developed data for *The National Map*. A companion system called Inventory Management System (IMS) will keep track of inventory information about NGP internal operational data holdings. The IMS will enable data inventory control and management for *The National Map* by supporting geospatial data archive, data dissemination, and product generation systems. IMS development began in 2009 and is based on existing systems integrated into a web service framework. These systems are focused on improving NGP operations by helping us improve data asset tracking and managing our internal workflow systems. In addition to improving our internal management control systems, the ability to report data holding status to our partners will be greatly enhanced.

National Map viewer. The USGS is working with the National Geospatial-Intelligence Agency (NGA), Geospatial Visualization Group to utilize their Palantir3 (PX3) viewer technology. The NGA product is being customized to meet USGS needs and will be released in FY10 as the new *National Map* viewer. Through this partnership USGS will be able to focus its resources on developing base map and data services and NGA will support the viewer framework and tools. *The National Map* digital services team will release a beta version at the end of FY09 that will linked to new geospatial data download and KML services. In addition, users will be able to search the Geospatial One Stop portal and display registered map services on the USGS base map.

The National Geospatial Program five year plan and The National Map plan will be updated in 2010. Work began on this activity in 2008 with a customer requirements assessment. The results of that study are compiled and will be released as an open file report in FY09. Customers were clear about their data and information priorities and the need to focus on *National Map* quality and service delivery improvements. The requirements assessment has helped the USGS with key decisions on content and quality improvements for the new digital map, the pursuit of high priority data (namely orthoimagery and elevation data), and the need to focus on data and quality as a core requirement of *The National Map*.

The National Map Framework Data-layer reports that follow this document describe the FY09-10 priority activities and status of each data layer relative to the plan. In addition, an accounting of the data product lifecycle management activities and the long term product needs have been identified. The Line of Business (LOB) lifecycle guidance is currently in draft form and this is the first order response to documenting the status relative to the guidance for each of the eight data layers and associated datasets managed under the umbrella of *The National Map*. Some of these reports will be more complete than others based on the maturity of each product and the availability of individual geospatial data layer plans. The orthoimagery dataset has benefited from the completion of the Imagery for the Nation plan. The National Hydrography Dataset (NHD) is a more mature product line and most recently, it was used to formally test the proposed LOB lifecycle guidance.

This report was created for *The National Map* subcommittee of the National Geospatial Advisory Committee (NGAC). The objective is to describe *The National Map* products and services and to provide a status of planned activities. It is intended to be a high level document to answer basic questions about *The National Map* and to describe how it relates to other activities within the National Geospatial Program (NGP) at USGS. The report was compiled from existing documents and interviews with the product and services managers and others within the NGP in May of 2009. Contact Larry Sugarbaker, Strategic Advisor for *The National Map*, with questions or comments at lsugarbaker@usgs.gov or by phone at 703 648 5741.

Orthoimagery Dataset
Product Manager – Jim Mauck

Orthorectified digital aerial photo imagery and satellite images of 1 meter resolution or finer make up the orthoimagery component of *The National Map*. The USGS orthoimagery planned coverage is as follows:

- Conterminous US files of 1-meter resolution, leaf-on, digital orthoimagery are acquired through the Farm Services Agency (FSA) NAIP on a three year cycle.
- Partial Conterminous US coverage of 2-ft or finer resolution leaf on and leaf off orthoimagery are acquired by USGS through contracts; agreements with other Federal, State, tribal or regional organizations; or as direct purchases from private industry data vendors. The USGS-National Geospatial-Intelligence Agency (NGA) partnership for 1-ft leaf-off imagery over urban areas for security and emergency operations. The USGS National Geospatial Technical Operations Center (NGTOC) oversees contracts and partnerships.
- In Alaska, the USGS has partnered with NGA, BLM and regional partners to collect 1-ft orthoimagery over the Anchorage urban area including Elmendorf AFB: the Fairbanks urban area is scheduled for collection in FY10 as part of the 133 UA program. In August 2008, the NDOP met with Alaskan agencies to review state-wide mapping plans. At that meeting it was determined that a corrected geoid and elevation data were the initial datasets required by the State. NDOP has adopted that plan.

FY09 – FY10 high priority activities:

- Partner with USDA in first year of a 3-year national coverage cycle for 1meter, leaf-on NAIP.
- USGS performing QC of NGA Canada/US-Mexico/US Border project comprised of 40-mile swathe (30 miles on US side and 10 miles into Canada and Mexico).

USGS Orthoimagery Dataset	Status	Comments and Planned Activities FY09 – FY10
Conterminous US 2ft and higher Orthoimagery	Green	Approximately 45% complete. State and Federal (NGA primarily) partnerships are the funding sources for this data. ARRA, SIR and NGA funds
Conterminous US 1Meter Orthoimagery	Green	U.S. coverage for 1-mt, leaf-off, data is dated. . Partnership for new, leaf-on 1-meter NAIP with FSA for 29 States in FY09.
Alaska	Yellow	Per AK SDMI of August, 2008, the USGS will follow recommendations to focus on elevation data collections primarily for the State of Alaska. Higher resolution elevation data will ensure new orthoimagery collections over the state will meet standards. Some orthoimagery will be collected as part of NGA and Alaska requirements over urban areas during FY10.

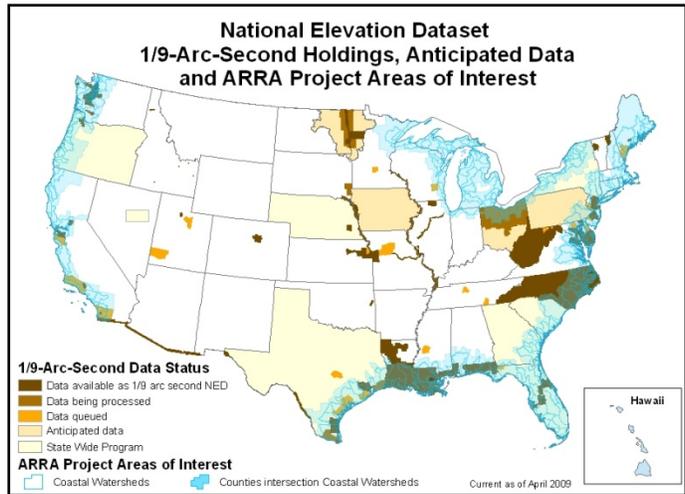
Orthoimagery Lifecycle Management	Status	Comments and Planned Activities
Requirements assessment	Yellow	NDOP leading Imagery for the Nation proposal and will soon become official FGDC body representing orthoimagery interests.
Status and Inventory including partner holdings	Yellow	Inventory and status system will be implemented in FY09
Acquisition/Collection	Green	USGS has entered into partnership with USDA to acquire 100% coverage of conterminous US over 3 year period with 1meter NAIP orthoimagery starting in 2010.
Integration and Maintenance	Yellow	Maintain 1meter data on a 3-year cycle. Partnership with NGA on high resolution leaf-off orthoimagery for 133 Urban Areas.
Access	Green	Existing data available through seamless server
Archive	Yellow	Archival plan has been established under NARA specifications.
Lifecycle Management Plan		Not started although some elements are addressed in IFTN work
Funding	Red	IFTN defined funding requirement is \$100M per year. NGP funding is very small in comparison.

**National Elevation Dataset (NED)
Product Manager – Jim Mauck**

The National Elevation Dataset (NED) is a seamless raster product derived primarily from USGS 10 and 30 meter Digital Elevation Models (DEMs) and, increasingly from higher resolution data sources such as LiDAR, IFSAR, and high-resolution imagery. NED data are available as one arc-second (approximately 30 meters) for the conterminous United States, and at 1/3 and 1/9 arc-seconds (approximately 10 and 3 meters, respectively) for parts of the United States. NED resolution for Alaska is primarily two arc-seconds (approximately 60 meters). The 1/9-arc-second NED is being developed from high resolution (1-3 meter or better point spacing from LiDAR, photogrammetry, or other sources). As data are acquired and made available in the public domain, they are incorporated into the NED. The higher resolution data are then used as sources to update the NED-1/3 and the NED.

FY09 – FY10 high priority activities:

- Acquisition of LiDAR data in partnership with Federal agencies and States that would triple the current 1/9-second NED, currently at 5.3% or 159,623 sq. miles of the United States. This will result in approximately 16% or 500,000 sq miles of US coverage with LiDAR and 1/9 arc-seconds elevation data.
- Populate status and inventory system with USGS and partner holdings



National Elevation Dataset (NED)	Status	Comments and Planned Activities FY09 – FY10
Conterminous US - 1 Arc-Second NED	Green	Complete coverage
Conterminous US - 1/3 Arc-Second NED	Green	U.S. coverage 10 m. Alaska partial coverage. 2 nd year of 3-year activity to revise 10-m data nationally.
Conterminous US - 1/9 Arc-Second NED	Yellow	Appropriated and ARRA funds planned in high priority areas. Fastest growing layer of the NED.
Alaska - 2 Arc-Second NED	Yellow	Appropriated and \$1M ARRA funds available for 5-m LiDAR based collection per AK SDMI recommendations. LiDAR over Kenai Peninsula being collected at higher res as part of a regional consortium partnership. Mat-Su LiDAR collection set for Spring 2010.

NED Lifecycle Management	Status	Comments and Planned Activities
Requirements assessment	Yellow	NDEP active, FGDC community process planned for FY10
Status and Inventory including partner holdings	Yellow	Inventory and status system will be implemented in FY09
Acquisition/Collection	Yellow	1/9 arc sec data acquisition inadequate to meet long term need
Integration and Maintenance	Yellow	1/9 arc sec data inadequate to meet need
Access	Green	Existing data available through seamless server
Archive	Yellow	Long term archival plan is under funded
Lifecycle Management Plan		LOB Lifecycle Management Plan not initiated
Funding	Red	Initial estimates for full national coverage of 1m LiDAR over 2-3years – \$600M (largely unfunded) Maintenance approximately \$5M/ year (unfunded)

**Geographic Names Information System (GNIS)
Product Manager – Lou Yost**

The Geographic Names Information System (GNIS) is a seamless vector product initially derived from USGS 1:24,000-scale topographic maps, and augmented by data from State, local, and historical sources. GNIS data are available through an on-line retrieval form, as downloadable files, as well as web map, and feature services.

FY09 – FY10 high priority activities:

- Acquisition of GNIS data in partnership with Federal and State agencies, and through contracts will be for administrative features, buildings, and structures. The data will further enhance the 100% coverage at 1:24,000 scale.
- Populate status and inventory system with USGS and partner holdings

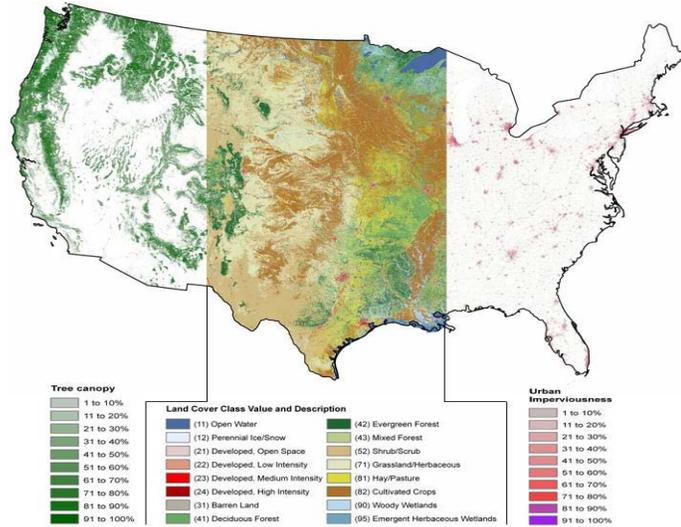
Geographic Names Information System (GNIS)	Status	Comments and Planned Activities FY09 – FY10
Geographic names compiled from USGS 1:24,000-scale topographic maps; USFS visitor maps; NOS charts	Green	Complete coverage
Geographic names compiled from State, county, city, historic, tribal sources	Yellow	Complete except for ongoing contracts for AK, KY, MI, NY
Compilation of administrative features, buildings, and structures	Yellow	Funds investment planned in high priority areas
Alaska - Geographic names compiled from State, county, city, historic, tribal sources	Yellow	Ongoing – Year 2 of a 4 year contract

NED Lifecycle Management		
Requirements assessment	Yellow	Toponymic community active, Graphics process for FY10
Status and Inventory including partner holdings	Yellow	Inventory and status system will be implemented in FY09
Acquisition/Collection	Yellow	Collection of administrative features, buildings, and structures; update of coordinates needed for 7.5 minute GeoPDF production
Integration and Maintenance	Yellow	Integration with Structures and Boundaries 90% complete. Integration with NHD in FY10.
Access	Green	Existing data available through an on-line retrieval form, as downloadable files, as well as web map, and feature services.
Archive	Green	Database is dynamic and not archived.
Lifecycle Management Plan		LOB Lifecycle Management Plan not initiated
Funding	Red	

**National Land Cover Dataset (NLCD)
Product Manager (Product and Service Lead) – Dave Greenlee**

The National Land Cover Database 2001 contains a 19-class land cover classification scheme applied consistently over the United States, from Landsat data at 30 meter resolution. In addition, the NLCD 2001 database includes a percent tree canopy layer, and a percent impervious layer. These layers are complete for the entire U.S. (except Alaska which still has some areas with incomplete tree canopy).

Since the early 1990’s, The USGS Geography Program has participated in a Multi-Resolution Land Characteristics consortium, leading to the creation of a National Land Characteristics Dataset (NLCD). A proposed 2006 land cover update of the canopy layer would provide the most up to date version for *The National Map* graphics. Other NLCD classes and the impervious surface layer may also be useful in generating new and novel extended content for *The National Map*. The potential for extended content is a subject for further investigation.



National Land Cover Dataset (NLCD)	Status	Comments and Planned Activities FY09 – FY10
Conterminous US NLCD – 1992	Green	Complete coverage
US (including Alaska and Hawaii) NLCD – 2001	Green	Derivative products for topographic map are being developed to include woodland and urban tints
Conterminous US Change Product 1992-2001	Green	Complete coverage
US (including Alaska and Hawaii) NLCD – 2006	Green	Product currently being developed. Planned FY10 completion

NLCD Lifecycle Management		
Requirements assessment		Requirements for high resolution urban area Land Cover being considered.
Status and Inventory including partner holdings	Yellow	Inventory and status system will be implemented in FY09
Acquisition/Collection	Green	Activity has shifted to a five year update cycle and the NLCD team is investigating the feasibility of including partner high resolution data.
Integration and Maintenance	Green	Moved to five year update cycle and NLCD will be used more extensively for other derivative products in the future. (i.e. wetlands and water integration)
Access	Yellow	Data are readily available through the seamless server. Longer term improvements are needed
Archive	Green	Archiving for 1992 and later products are in place to include off site.
Lifecycle Management Plan		LOB Lifecycle Management Plan not initiated
Funding	Yellow	Continuation of Landsat program with planned future launch and operations funding has been proposed.

**National Hydrography Dataset (NHD)/Watershed Boundary Dataset (WBD)
Product and Service Lead – Jeff Simley**

The National Hydrography Dataset (NHD) is a seamless vector product derived primarily from USGS topographic maps. In some cases the topographic maps have been updated by state and federal agencies. In Texas and parts of Alaska the hydrography was compiled from imagery. Increasingly states are beginning to derive hydrography at 1:5,000-scale or greater from high resolution imagery or LiDAR. Over some lands the stream network is densified from contour crenulations. GNIS names are integrated with the data. The data are networked into downstream flow and use a linear referencing system to attach linked water information. This provides for cause and effect analysis. NHD data are available from *The National Map* by hydrologic units.

The Watershed Boundary Dataset (WBD) is a seamless polygon product derived from an analysis of a variety of vector and raster data and imagery to create hydrologic units. The WBD is a nested system of six levels of hierarchy with the lowest level forming 40-60,000 acre units. The data are available as a shapefile from the Natural Resource Conservation Service (NRCS) DataGateway.

FY09 – FY10 high priority activities:

- Continued development of 1:5,000-scale and greater data holdings.
- Continued development of a user stewardship process for maintaining and upgrading the data.
- Integration of NHD and WBD into an interoperable dataset available through *The National Map*.
- Quality improvements enhancing analytical functionality.
- Improved integration with other TNM themes.

Hydrography	Status	Comments and Planned Activities FY09 – FY10
1:100,000-scale NHD (Except Alaska)	Green	Complete coverage
1:24,000-scale NHD (1:63,360-scale Alaska)	Green	Complete coverage
1:5,000-scale NHD	Yellow	Ongoing coverage
1:24,000-scale WBD (1:63,360-scale Alaska)	Green	Complete coverage

NHD/WBD Lifecycle Management		
Requirements assessment	Green	Continuous
Status and Inventory including partner holdings	Green	Available
Acquisition/Collection	Green	Available nationwide at primary scale
Integration and Maintenance	Green	Continuous
Access	Green	Available through hydrography portals
Archive	Green	Continuous
Lifecycle Management Plan	Yellow	Started
Funding	Yellow	Limited stewardship development

**National Boundaries Dataset (NBD)
Product Manager – Paul Wiese**

Boundaries data represents major civil areas including states, counties, Federal and Native American lands, and incorporated places such as cities and towns. This data is useful for understanding the extent of jurisdictional or administrative areas for a wide range of applications, including managing resources, responding to natural disasters, or recreational activities such as hiking and backpacking. Boundary data are being updated in FY09 from Bureau of Census boundary files.

FY09 – FY10 high priority activities:

- Load Census TIGERLine boundary updates
- Acquire and integrate major Federal land boundaries consistent with 1:24,000-scale representation

National Boundaries Dataset	Status	Comments and Planned Activities FY09 – FY10
National Boundaries Dataset (NBD), including Alaska and Hawaii	Green	NBD as derived from Census TIGERLine Boundary dataset. Process in place, most states participating, limited staff support for assessment and enhancement, limited funding available for sustained partnership support
Federal Land Boundaries, including Alaska and Hawaii	Red	No resources available

NBD Lifecycle Management		
Requirements assessment	Yellow	Inconsistent representations from Federal sources (mission centric), limited Federal lands coordination, uncertain survey accuracy of source data
Status and Inventory including partner holdings	Yellow	Beta system available to track in-house data holdings. Partner agreement tracking system expected in FY10.
Acquisition/Collection	Red	Minimal capacity
Integration and Maintenance	Red	Minimal capacity
Access	Green	Available on-line
Archive	Red	Waiting on National Archives and Records Administration requirements for vector data archive
Lifecycle Management Plan		LOB Lifecycle Management Plan not initiated
Funding	Red	Minimal

National Structures Dataset (NTD)
Product Manager – Paul Wiese

USGS data portrays selected structures data, including the location and characteristics of manmade facilities. Characteristics consist of a structure’s physical form (footprint), function, name, location, and other detailed information about the structure. The types of structures collected are largely determined by the needs of the disaster planning and response and homeland security organizations.

FY09 – FY10 high priority activities:

- Coordinate with states to acquire, enhance and load HSIP Freedom updates
- Coordinate requirements, data calls, and future acquisitions with NGA, DHS, and DHS/FEMA
- Continue acquisition and establishing common baseline of national coverage of schools from FEMA, GNIS, Dept of Education and state sources

National Structures Dataset (NSD)	Status	Comments and Planned Activities FY09 – FY10
HSIP Freedom Updates, including Alaska and Hawaii	Yellow	Process in place, most states participating, limited staff support for assessment and enhancement, limited funding available for sustained partnership support

NSD Lifecycle Management		
Requirements assessment	Yellow	Joint working group in place with NGA and DHS, general agreement on content requirements at national level, limited agreement on content specifications
Status and Inventory including partner holdings	Yellow	Beta system available to track in-house data holdings. Partner agreement tracking system expected in FY10.
Acquisition/Collection	Red	Minimal capacity
Integration and Maintenance	Red	Minimal capacity, lack of consensus on release of geospatial data in the public domain
Access	Green	Available on-line
Archive	Red	Waiting on National Archives and Records Administration (NARA) requirements for vector data archive
Lifecycle Management Plan		LOB Lifecycle Management Plan not initiated
Funding	Red	Minimal

National Transportation Dataset (NTD)
Product Manager – Paul Wiese

The transportation data theme consists of roads, airports, railroads and other features associated with the transport of people or commerce. The data includes the location, classification, name or route designator, and for most roads, address ranges. Initial national coverage of transportation data supports mapping and limited geographic analysis for traffic safety and disaster planning and response. Future capabilities will look towards support of geographic analysis for applications including routing and navigation, congestion mitigation, and more comprehensive disaster planning and response. In FY09 the newly updated Bureau of Census transportation dataset will be made available through *The National Map*.

FY09 – FY10 high priority activities:

- Load Census TIGERLine road data with change detection to extract and reconcile updates
- Update Interstates, US highways and associated interchanges to align with acquisition of NAIP imagery and with graphics production for approximately 1/3 of lower 49 states per year
- Integrate state or regional road data where improvement over Census TIGERLine source
- Run railroad acquisition pilot to estimate level of effort for national data coverage consistent with 1:24,000-scale accuracy requirement, to replace 1:100,000 FRA geometry
- Aggregate and integrate DOI trails data as pilot towards national coverage under DOI trails initiative
- Acquire national polygon coverage of airport runways

National Transportation Dataset	Status	Comments and Planned Activities FY09 – FY10
Roads, including Alaska and Hawaii	Green	Data loads up-to-date, coverage complete, process in place to load future updates from Census
Railroads, including Alaska and Hawaii	Yellow	Pilot study to determine resources requirements to complete national coverage
Trails, including Alaska and Hawaii	Yellow	On hold until 2011, pending plan by DOI
Airport Runways, including Alaska and Hawaii	Green	Ongoing acquisition for once over coverage by 2010

NTD Lifecycle Management	Status	Comments and Planned Activities FY09 – FY10
Requirements assessment	Yellow	With exception of trails, very limited Federal or State-level coordination,
Status and Inventory including partner holdings	Yellow	Beta system available to track in-house data holdings. Partner agreement tracking system expected in FY10.
Acquisition/Collection	Red	Minimal capacity to acquire updates via contract or in-house resources
Integration and Maintenance	Yellow	Updating Interstate and US Highways from Census. Updating airport runways. Limited capacity to assess and integrate updates from external sources.
Access	Green	Available on-line
Archive	Red	Waiting on National Archives and Records Administration requirements for vector data archive
Lifecycle Management Plan		LOB Lifecycle Management Plan not initiated
Funding	Red	Requirements far exceed USGS capacity