GIS IN THE FEDERAL GOVERNMENT

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Dear Colleague,

The Federal Government is a major user of GIS technology. This book presents dozens of examples of how GIS analysis and visualization are making a difference in the way America is managed. Geographic information systems are being applied to protect citizens, deliver services, and build a safe and sustainable nation. This book provides insight into both how GIS is being used for specific projects as well as how it is being used to create whole new types of spatially organized information systems. There are also many examples that show how the government is using GIS to better communicate with its citizens.

These illustrations were part of a large exhibit presented on GIS Day in November, 2003. The event featured both historic and current capabilities of the Federal enterprise to organize and analyze geographic data. Examples include maps from the 200-year-old *Lewis & Clark Corps of Discovery* expedition as well as the New National Map program which envisions a continuous digital topographic map for the 21st century. In the area of data access, one of the more visible examples shown is the government's new Geospatial One-Stop portal for searching GIS data and map services. This web-based portal (Geodata.gov) supports easier, faster, and less expensive access to government produced geospatial information. This GIS portal also provides a foundation for partnerships and knowledge sharing among various government agencies as well as the private sector. From land management, water modeling, and habitat protection, to public health, forestry, agriculture, and beyond, GIS is helping so many to accomplish so much.

I hope you enjoy viewing the GIS work represented in these pages, and will continue exploring the important and innovative ways that geographic knowledge can be shared today and beyond.

Regards,

Jack Dangermond
President, ESRI

It is exceedingly gratifying to be part of *GIS and the Federal Government,* a book that pays tribute to the remarkable and creative exhibits developed by the federal geographic information system (GIS) community for GIS Day™ 2003. These exhibits highlight the many ways that we are working together to make the National Spatial Data Infrastructure (NSDI) a reality.

I find it particularly rewarding that the idea for the GIS Day federal exhibit came about when a group of friends decided we needed to document the federal government's commitment and accomplishments in the use of GIS. After the success of GIS Day, we also wanted to share, in a more permanent form, the impressive progress that we as a community have made toward building the NSDI. In a larger sense, this book is a record of all of us—a community of friends committed not only to the value of GIS but also to using this exciting technology to enable the federal government to both serve its citizens and benefit the global community.

The actual GIS Day 2003 event was a resounding success, bringing together 13 federal agencies to demonstrate their work in the geospatial arena. More than 1,000 participants from across the federal government together with students from local schools were able to learn from and enjoy the displays and participate in information sessions. The variety of applications was impressive—ranging from the National Park Service's archaeological excavations of pipe stems in historic Williamsburg, Virginia, to the work of the U.S. Geological Survey in building *The National Map* to unify and integrate information from across the nation.

More than anything, GIS is about people, and I was struck during the event by a profound sense of history, of just how far we have all come. It was symbolic and poignant that Roger Tomlinson, considered by many the "father" of GIS, was there with us on GIS Day 2003. It was Roger who coined the term GIS and spawned the creative and extensive movement that we know today.

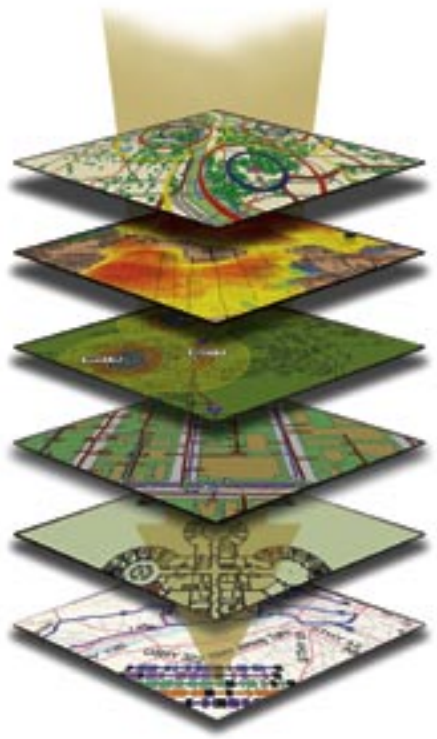
GIS is also about partnerships, and through the creativity of the displays, our federal community demonstrated that the value of GIS stretches throughout our federal government as well as our numerous partnerships with state, local, tribal, and academic communities. It is this community approach and communal effort to provide the foundation for an integrated infrastructure that is responsible for the groundbreaking work we have seen in the GIS Day exhibits.

The concept of the NSDI has been with us for more than a decade now, and thanks to the ongoing stewardship of the Federal Geographic Data Community (FGDC), to accelerated efforts such as the Geospatial One-Stop Presidential E-Gov Initiative, and to the commitment of individual agencies, we are now seeing the fruits of our labors. One of the major accomplishments of the GIS Day exhibit, and, now, the book is that they emphasized the essential value of the basic tenets of the NSDI to show how the principles of common architecture, standards, and accessibility through a common portal can bring unity to what might otherwise seem a chaotic collection of federal programs.

I personally am approaching a quarter of a century as a professional in the field of GIS. As I look at these exhibits and the tremendous amount of work they represent, I truly feel that we as a community are now transforming the federal government, and GIS is now living up to the promises that we first heard from Roger years ago. Our community has taken this technology and responded to the new challenges we face as a nation. Our federal GIS community can take pride in the work that was displayed on GIS Day 2003 and the way in which we are using GIS to carry out the critical missions of the federal government. We, indeed, have a National Spatial Data Infrastructure, and it is symbolized in the pages that follow.

Karen Siderelis
Geographic Information Officer
U.S. Geological Survey

What Is GIS?



GIS—geographic information systems for better decisions through modeling and mapping our world

Mapping geography is one of humanity's most ancient arts, but today it is on the cutting edge of information analysis. Technologically enabled maps created by GIS help people from many lands and occupations make better decisions for their communities. Whether business, government, education, or science, from the largest enterprise to the single worker, GIS offers boundless possibilities.

GIS is computer software that links geographic information (where things are) with descriptive information (what things are like). With a flat paper map "what you see is what you get," but a GIS-generated map has many layers of information for many ways of thinking about a geographic space. For example, if you look at a store represented on a paper map, you see the name of the store and a point noting where it is located. However, if you view a GIS map on your computer, you can click on the same store and see its location, name, annual revenue, customer flow, square footage, product mix, quarterly sales, and the store manager's name. You can even see a photo of the storefront and receive a virtual tour of the facility.

Many companies have a database management system in which day-to-day information is stored. If information has location attached to it, that information can be mapped. Using GIS, a business can unlock this spatial data and provide the perspective for the analysis needed to succeed. From the everyday business database GIS can represent

- Customer profiles by location, demography, and purchasing power
- Sales success by product, site, and sales representative
- Site locations of stores, factories, and warehouses
- Asset location (e.g., utility poles, pipes, and cables)
- Resource locations of staff, products, and equipment
- Delivery routes by land, sea, and air

GIS can integrate georeferenced imagery as data layers or themes and link them to other data sets to produce geospatial representations of data. These geographical pictures not only depict topographical boundaries, but they also offer special insight to planners across disciplines such as health, agriculture, city management, natural resources, telecommunications, and transportation. Whatever people can imagine that needs mapping, GIS can help.

GIS also helps users anticipate future outcomes by depicting regression analysis for forecasting future events and processes. These studies may include drought repercussions on wildlife, dam influences on urban and agrarian economies, the spread of communicable disease, and the impacts of population growth on a township's economic development. The ability of GIS to manage, correlate, predict, model, and share geographic information makes GIS an essential analytical tool.

Geospatial One-Stop

Geospatial One-Stop Portal Is Key to President's E-Government Strategy

"Implementation of e-government is important in making government more responsive and cost-effective."

This statement from a Presidential memo documents the Bush administration's commitment to technology. This is further detailed in the E-Government Act signed by President George W. Bush in 2002, which calls for expanding the use of the Internet and computer resources to deliver government services for a citizen-centered, results-oriented, and market-based government. To achieve these goals the Office of Management and Budget is overseeing 24 e-government initiatives. The Geospatial One-Stop Initiative is one of these 24 initiatives.

The purpose of Geospatial One-Stop is twofold. The first purpose is to support the business of government. Almost every aspect of government, including, but not limited to, disaster management, recreation, planning, homeland security, public health, and environmental protection, has a geographic component and requires geospatial data and tools to appropriately manage it. The second purpose is to support decision making-issues occur in places (e.g., floods, events, crimes) and decisions addressing one issue often have broader implications, sometimes affecting entire communities. Geospatial information allows decisions to be viewed in a community context and can facilitate cross-agency coordination.

The results of implementing geopartnerships.

Geospatial One-Stop builds on investments already made to develop a National Spatial Data Infrastructure (NSDI) and capitalizes on advances in geospatial information technologies to encourage greater collaboration and coordination in their use across all levels of government. The Geospatial One-Stop Initiative has several components, but the most visible is the development of a portal to make it easier, faster, and less expensive for all levels of government and the public to access geospatial information.

Geospatial One-Stop Portal Vision

Homeland security and other critical e-government initiatives depend on quick and easy access to geospatial data. To meet this urgent need the federal government determined that it needed to deliver a sustainable, interoperable portal. And it had to do this quickly. First, the Geospatial One-Stop team defined a vision for the portal. The Geospatial One-Stop portal would be the Internet-based organizational umbrella for federal agency channels addressing geospatial activities. The portal would be the virtual repository for spatial data and Web services to support local, state, and federal programs and decision making. The portal would be the gateway to find

- Existing local, state, and federal data and users-a network of distributed networks
- Planned data development activities
- Map services and problem solving applications
- Standards
- Geospatial best practices

What Is the Geospatial One-Stop Portal?

In order to deliver a fully functional portal in a matter of weeks, the Geospatial One-Stop team is working with ESRI to leverage the portal development work already being done for the Bureau of Land Management (BLM) for the National Integrated Land System (NILS) project and the Geography Network. The NILS GeoCommunicator portal provided a perfect time- and money-saving jump-start for developing the Geospatial One-Stop portal. As a result, ESRI was tasked with quickly creating this portal, using past experience and standards-based commercial off-the-shelf technology. Additionally, the Geospatial One-Stop portal would be open and interoperable and would incorporate industry-approved interoperable standards.

In June 2003, ESRI delivered the Geospatial One-Stop portal to the government. The portal is the one-stop Web utility that provides the ability to search for geospatial data, Web mapping services, data collection activities, references, and contact information about GIS professionals at a national scale through the Geospatial One-Stop network. Geospatial One-Stop portal users are now able to

- Search the Geospatial One-Stop network for image and feature Web services, images, geographic data sets, contacts, activities, and clearinghouses.
- Register for notification when new or updated data, maps, activities, references, and so forth, have been added in a favorite search area.
- View metadata to determine if the product is suitable for the intended use.
- Access and view available geographic data and Web services directly through the portal.
- Download large data sets from providers through feature streaming or FTP services.
- Publish (register) map services, images, geographic data sets, geoservices, spatial solutions, geographic and land reference material, and geographic activities or events to share with others through submission of online provider forms within the Geospatial One-Stop portal.

Geospatial One-Stop Builds a GIS for the Nation

The Geospatial One-Stop program is the foundation for building a GIS for the nation: a realization of the National Spatial Data Infrastructure. The Geospatial One-Stop program is responding to a variety of federal business drivers demanding better service to citizens, more collaboration, improved efficiency, and improved homeland security. The entire GIS user community is encouraged to participate in the Geospatial One-Stop. To start, go to geodata.gov to register your geospatial data and Web services.

Geospatial One-Stop Portal

Map Viewer

geodata.gov

The One-Stop Portal for Geospatial Access

- Metadata publishing
- Documentation and organization
- Discovery and access
- Build once and use many times

Sets a Bold New Course for Organizing Geospatial Information

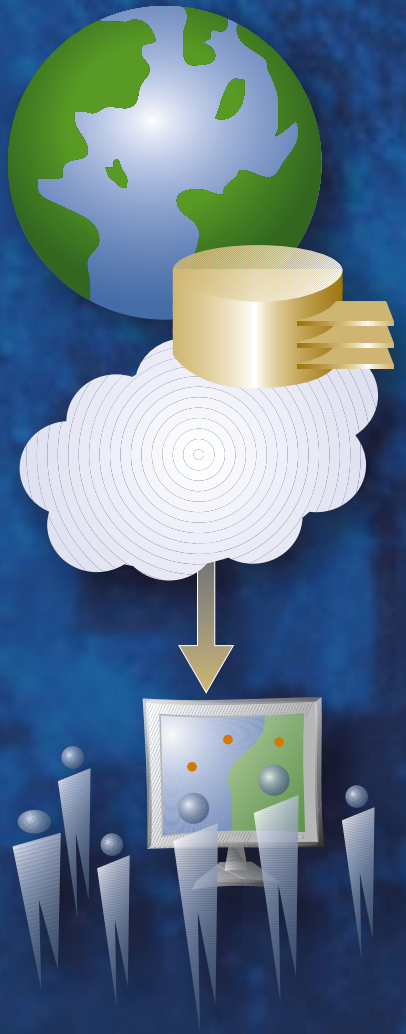
- Inclusive and owned by the community
- Minimal effort to share and find data and services
- Two clicks to content
- Enhanced search capabilities
- Interoperable

Benefits

Supports/Facilitates

- Faster discovery
- Direct access and use
- Minimization of redundant data, metadata servers, services
- Improvement of data quality and coverage
- Collaboration for new data collection
- Partnerships that leverage resources, add value, and reduce costs
- Standards to advance data sharing

Promoting Citizen Access to Government Geographic Data



...Via Geospatial One-Stop.

E-Government Initiatives

In his February 2002 budget submission to Congress, President Bush outlined a management agenda for making government more focused on citizens and results, which includes expanding Electronic Government—or E-Government. E-Government uses improved Internet-based technology to make it easy for citizens and businesses to interact with the government, save taxpayer dollars, and streamline citizen-to-government communications.

The President's E-Government Strategy has identified several high-payoff, government-wide initiatives to integrate agency operations and information technology investments. The goal of these initiatives will be to eliminate redundant systems and significantly improve the government's quality of customer service for citizens and businesses.

E-Gov Is Not Just Putting Forms Online

E-Gov does not mean putting scores of government forms on the Internet. It is about using technology to its fullest to provide services and information that is centered around citizen groups.

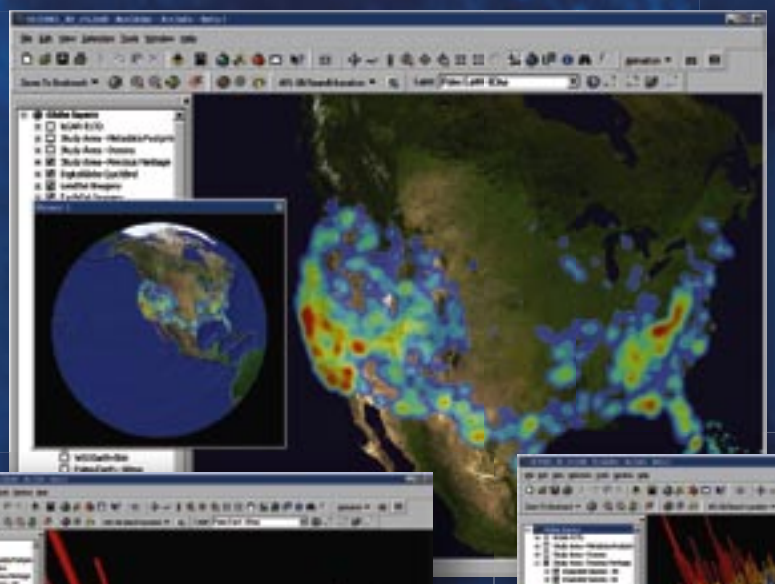
DisasterHelp.gov Provides Support to the Southern California Fire Fighting Efforts

DisasterHelp.gov part of the Disaster Management E-Gov initiative, is providing support to the fire fighting efforts in Southern California. DisasterHelp.gov is enabling the air support responders to continuously upload pictures of the fire and additional data to a secure portion of the site to be shared with people engaged in the response effort. This will also soon incorporate a secure connection to a live video feed. Though this portion of the site is unavailable to those who have not been granted access, daily updates are being made to the publicly-accessible DisasterHelp.gov home page highlighting announcements and available resources as provided by the National Fire Information Center (NIFC), the Federal Emergency Management Agency (FEMA), and other partner organizations.

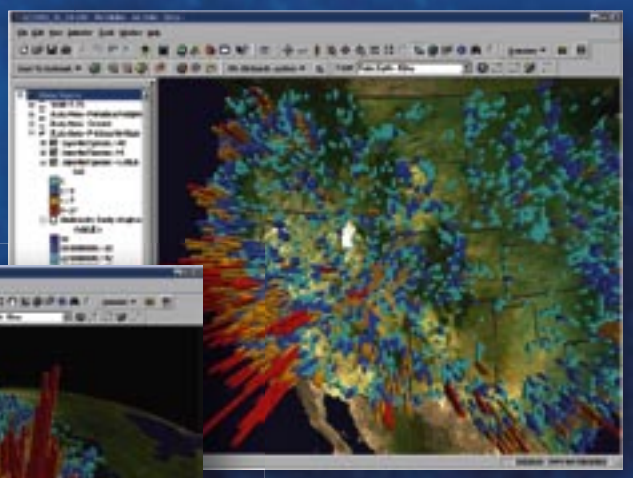
egov

Changing Planet

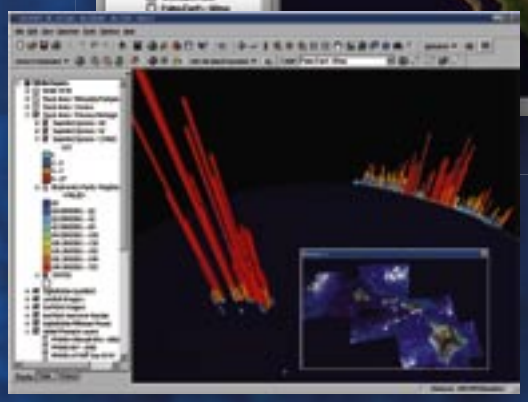
Biodiversity in the United States



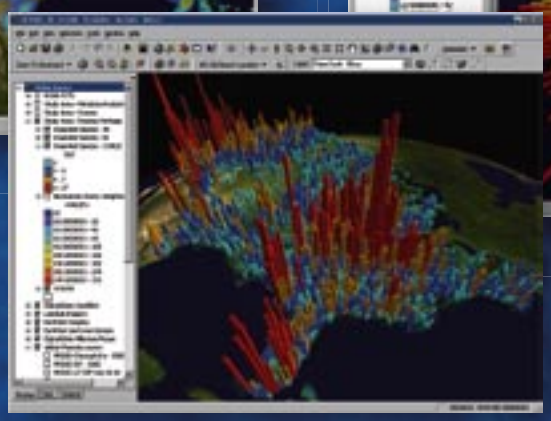
Hot spots of rarity and richness—Bright red colors show hot spot areas with rare imperiled species.



Frequency of Imperiled Species



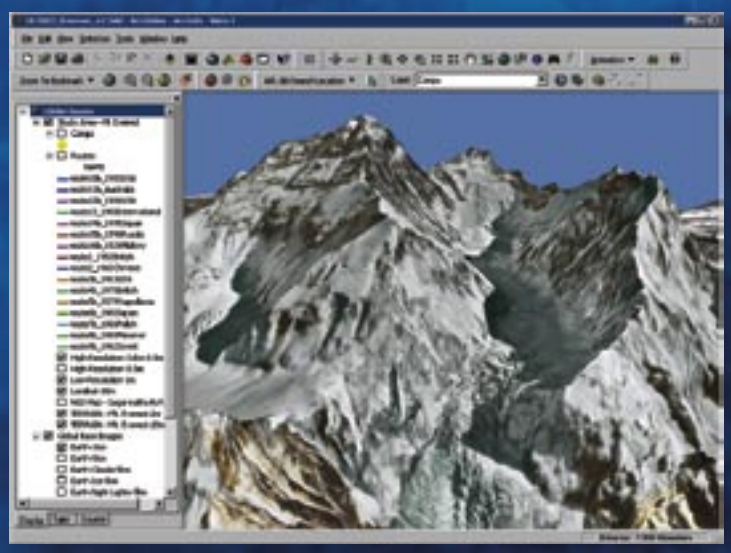
Frequency of Imperiled Species in Hawaii



Perspective Global View of Imperiled Species

Exploring Mt. Everest

Exploration Routes and Camps



3D Visualization Model of Mt. Everest

For more information, visit Changing Planet at www.changingplanet.net

ChangingPlanet

Department of Agriculture

- Food Safety & Inspection Service (FSIS)
- Foreign Agricultural Service (FAS)
- Natural Resources Conservation Service (NRCS)
- US Forest Service (USFS)

USDA
Food Safety Inspection Service

Mission

The Food Safety and Inspection Service (FSIS), a public health regulatory agency of the U.S. Department of Agriculture (USDA), protects consumers by ensuring that meat, poultry, and egg products are safe, wholesome, and accurately labeled. Under the Federal Meat Inspection Act, the Poultry Products Inspection Act, and the Egg Products Inspection Act, FSIS inspects all meat, poultry, and egg products sold in interstate commerce and reinspects imported products to ensure that they meet U.S. food safety standards. FSIS tests for microbiological, chemical, and other types of contaminants and conducts epidemiological investigations in cooperation with the Centers for Disease Control and Prevention (CDC) based on reports of food borne health hazards and disease outbreaks. In addition, the agency conducts enforcement activities to address situations where unsafe, unwholesome, or inaccurately labeled products have been produced or marketed.

Programs

Food Security and Emergency Preparedness; Program Evaluation, Enforcement, and Review; Education and Outreach; International Affairs; Office of Public Health and Science , Office of Policy and Program Development; Office of Field Operations; and Office of Management

For more information, visit www.usda.gov

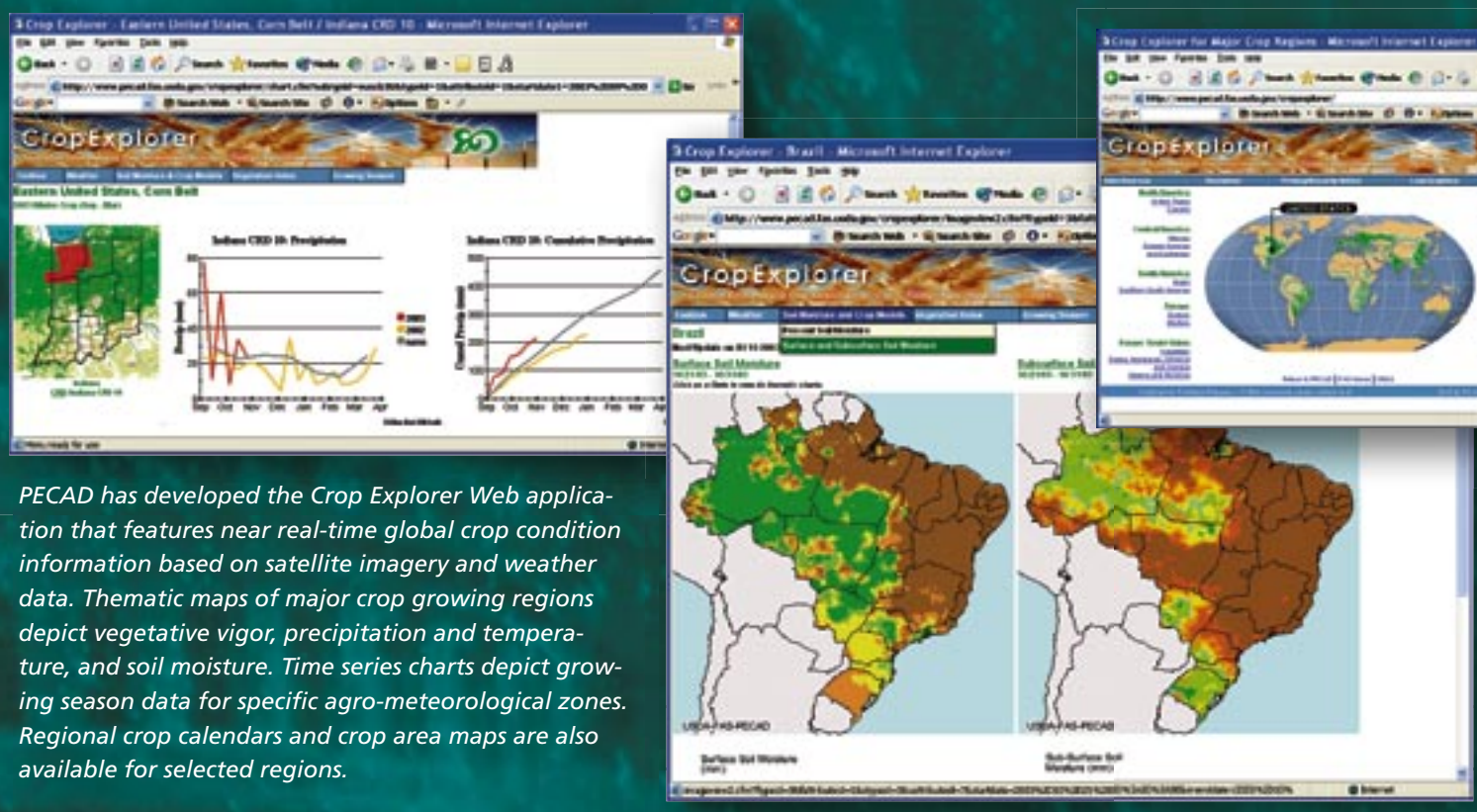
USDA UNITED STATES DEPARTMENT OF AGRICULTURE

Production Estimates and Crop Assessment Division

USDA Foreign Agricultural Service

Mission

The Production Estimates and Crop Assessment Division (PECAD) of USDA's Foreign Agricultural Service (FAS) is responsible for global crop condition assessments and estimates of area, yield, and production for grains, oilseeds, and cotton. The primary mission of PECAD is to produce the most objective and accurate assessment of the global agricultural production outlook and the conditions affecting food security in the world. Regional analysts use a geographic information system (GIS) to collect market intelligence and forecast reliable global production numbers for grains, oilseeds, and cotton.



PECAD has developed the Crop Explorer Web application that features near real-time global crop condition information based on satellite imagery and weather data. Thematic maps of major crop growing regions depict vegetative vigor, precipitation and temperature, and soil moisture. Time series charts depict growing season data for specific agro-meteorological zones. Regional crop calendars and crop area maps are also available for selected regions.

U.S. producers, traders, researchers, and the public can use Crop Explorer to visualize this information through a Web browser. Regional droughts or excessively wet conditions can be easily identified by the amount of ground–surface "greenness" depicted by the Normalized Difference Vegetation Index (NDVI). In addition, daily satellite image composites originating from the NASA MODIS Rapid Response System are now directly linked to selected agricultural regions within Crop Explorer.

For more information, visit www.pecad.fas.usda.gov/cropexplorer

USDA

Natural Resources Conservation Service

Mission

The Natural Resources Conservation Service (NRCS) provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

Key Programs

- Conservation of Private Grazing Land Program
- Conservation Reserve Program
- Conservation Security Program
- Emergency Watershed Protection
- Environmental Quality Incentives Program
- Farmland Protection Program
- Grassland Reserve Program
- National Resources Inventory
- Resource Conservation and Development Program
- Snow Survey and Water Supply Forecasting
- Soil Survey Program
- Watershed Protection and Flood Prevention
- Wetlands Reserve Program
- Wildlife Habitat Incentive Program

For more information, visit www.itc.nrcs.usda.gov

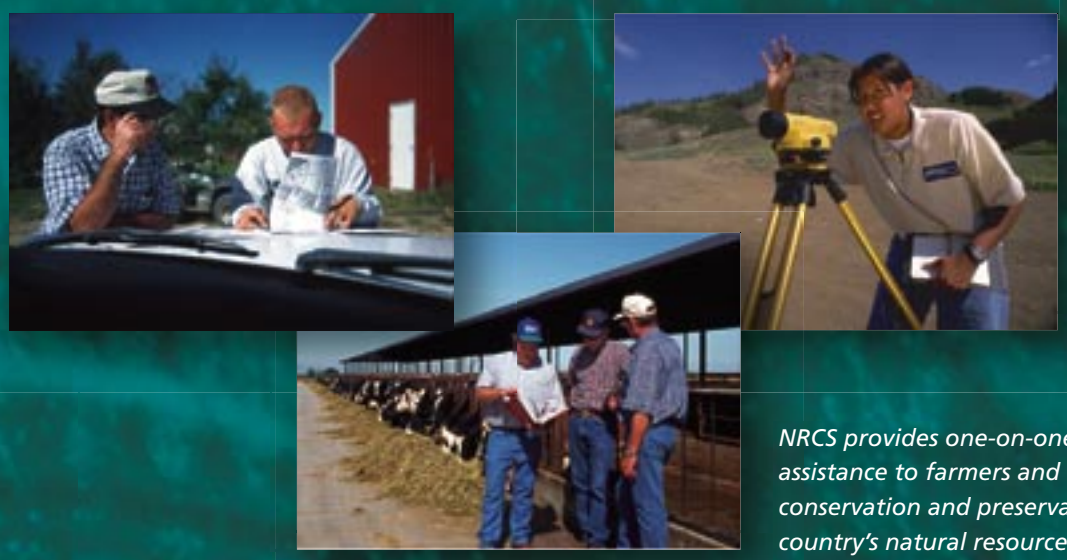
United States Department of Agriculture
NRCS

Customer Service Toolkit—
Providing Resource Information to Producers

Natural Resources Conservation Service

Background

NRCS provides one-on-one planning assistance to farmers and ranchers in the conservation and preservation of our country's natural resources. Customer Service Toolkit (CST) is a collection of software tools for USDA field employees who work with the public, primarily with farmers and ranchers. The purpose of the tools is to help natural resource planners provide information to farmers and ranchers that result in land conservation. The tools incorporate commercial software products such as Microsoft Outlook, Excel, Access, and ESRI® ArcView®.



NRCS provides one-on-one planning assistance to farmers and ranchers in the conservation and preservation of our country's natural resources.

The GIS Component

CST provides an ArcView extension for mapping and analyzing natural resource information. CST allows the user to take advantage of geospatial data sets, such as orthoimagery, soils, and conservation practice themes, to develop professional conservation map products for customers.

For more information on the Customer Service Toolkit, visit www.itc.nrcs.usda.gov/toolkit

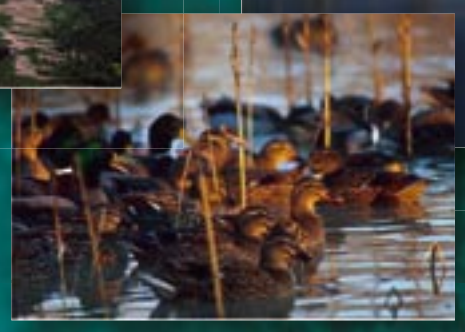
United States Department of Agriculture
NRCS

Using GIS to Manage the WRP Program

Natural Resources Conservation Service

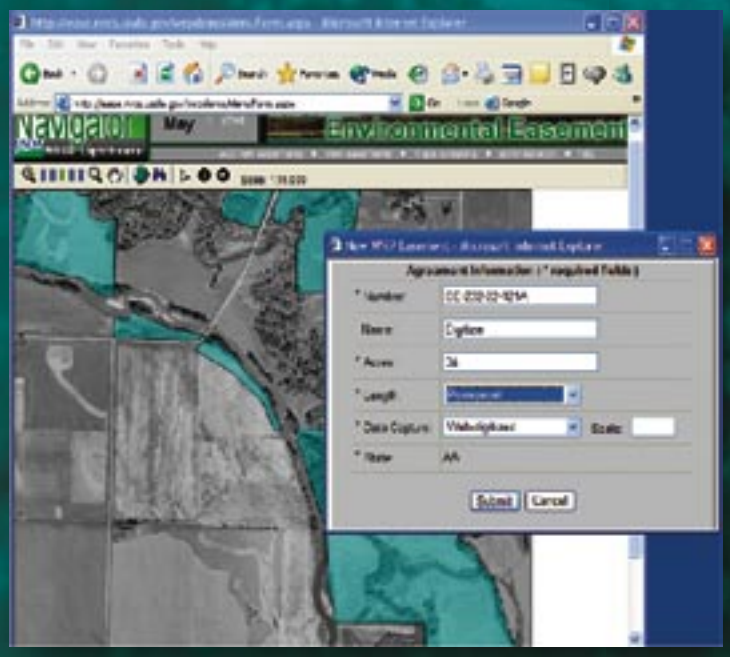
What is the WRP?

The Wetlands Reserve Program (WRP) is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The USDA NRCS provides technical and financial support to help landowners with their wetland restoration efforts. NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program.



NRCS is using GIS-based tools to better manage the acres enrolled in the Wetland Reserve Program.

The Environmental Easement Navigator is used to locate the easement area.

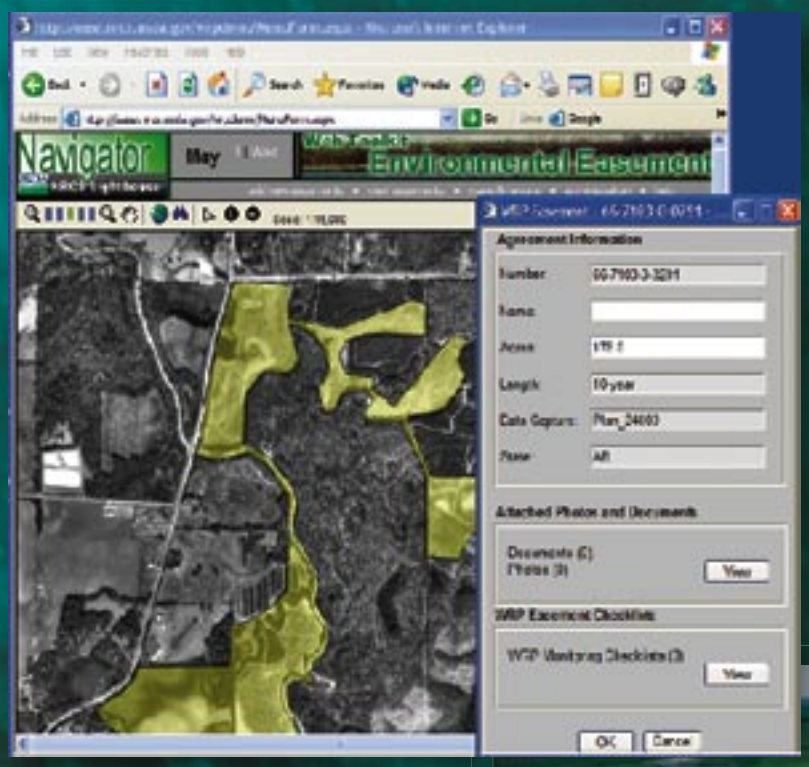


Easement boundaries are digitized over the Internet.

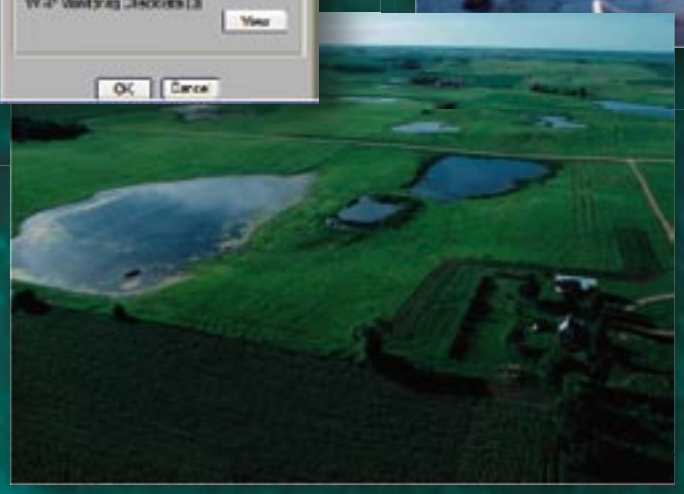
Benefits

The Environmental Easement Toolkit

- **Manages environmental easements at the local, state, and national levels.**
- **Monitors Wetland Reserve Program easements.**
- **Updates the National WRP Easements Geospatial Data Layer**
- **Develops conservation products such as wetland restoration plans, soil maps, and cost-share contracts for environmental easements.**



Attribute information is collected and stored with the Easement Boundary



Web Environmental Easement Toolkit, Georeferenced Photos, and Documents

For more information on the Environmental Easement tools visit,
www.itc.nrcs.usda.gov/toolkit/Easements.htm

United States Department of Agriculture
NRCS

Geospatial Data Gateway

Natural Resources Conservation Service

Vision

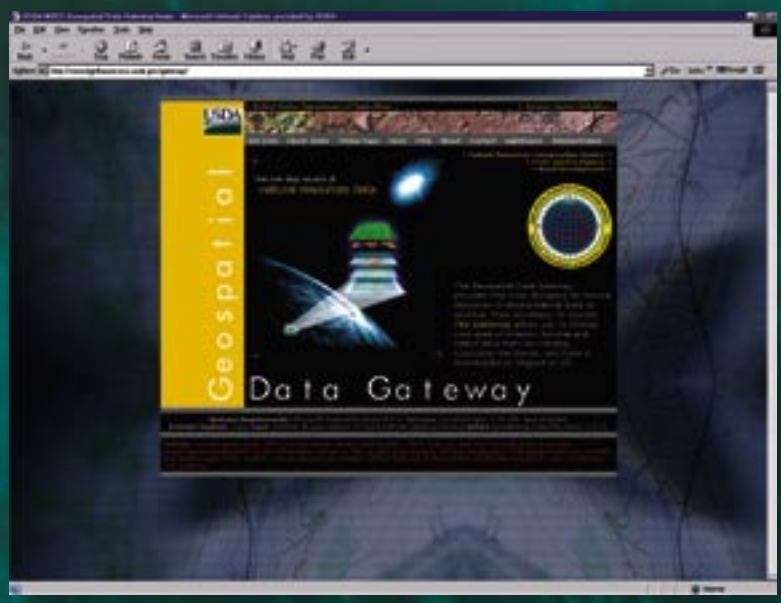
The vision of the Geospatial Data Gateway is to provide easy access and delivery of geospatial environmental data to internal and external customers including the general public. Our goal is to deliver data to anyone, anywhere, anytime.

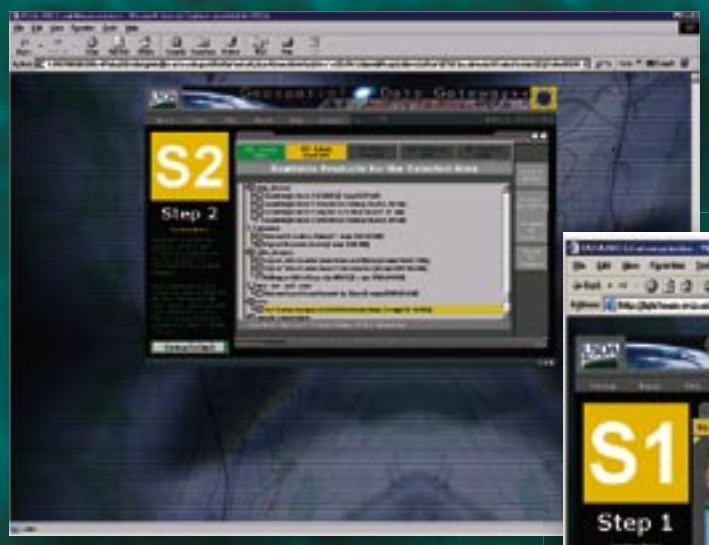
Prior to creating the Gateway, customers would visit many Web sites, make telephone calls to numerous data centers, and wait days or weeks to get their information. Today the data is distributed across many servers, many data centers, in different parts of the country, and managed by different organizations.

Benefits

The Geospatial Data Gateway

- **Provides a single access point for resource data**
- **Provides a way to easily locate data that exists for selected geographic areas**
- **Allows delivery of data packaged in formats that are compatible with commercial and service center applications**





The Geospatial Data Gateway provides easy and consistent access to a variety of natural resource data sets. You can search for available data by geographic area such as county or state, use our point and click map tool to find your area of interest, or by entering latitude and longitude coordinates.

The Geospatial Data Gateway can be accessed at
www.lighthouse.nrcs.usda.gov/gateway

United States Department of Agriculture
NRCS Natural Resources Conservation Service

Soil Data Viewer

Natural Resources Conservation Service

Mission

NRCS is the federal agency responsible for mapping soils and developing databases of information about soils. Many groups, including farmers and ranchers, state and local governments, universities, developers, and Realtors, come to NRCS for soil data. Traditionally, soils information was provided on paper, but most of the soil data across the country has now been converted into electronic databases.

Key Programs

Benefits of the Soil Data Viewer (SDW)

- Shields users and applications from the complexity of the soil database
- Encapsulates business rules for appropriate use of soil data
- Insulates users and applications from structural changes to the soils database
- Provides easy-to-use tool for analyzing and using soil data
- Generates both soil maps and tabular reports for sites with digitized soil surveys

The user specifies the criteria for the desired output.

SDV displays results spatially, in thematic maps, and in tabular reports.

For more information about Soil Data Viewer, visit
www.itc.nrcs.usda.gov/soildataviewer

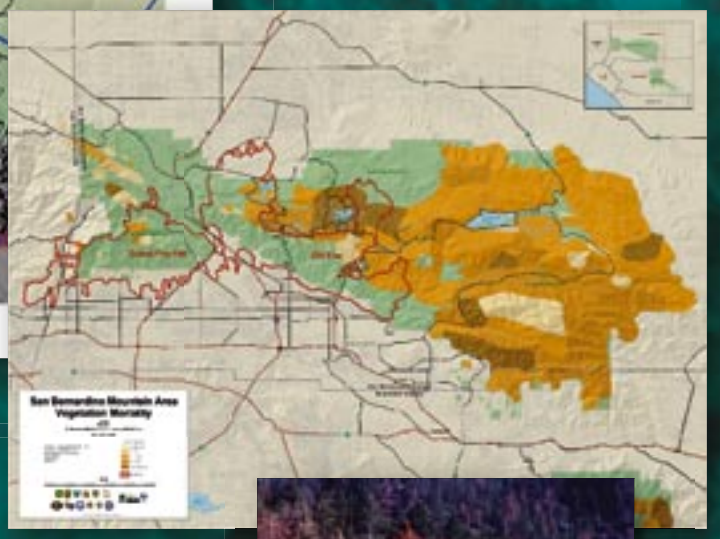
United States Department of Agriculture
NRCS

Support for Southern California Wildfires–October 2003

U.S. Department of Agriculture

Vegetation Mortality—Bark Beetle and Drought

The mountains in and around San Bernardino, California are experiencing significant drought causing the pine trees to die in large quantities. As of July 2003, over 400,000 acres are dead or dying in the San Bernardino and San Jacinto Mountains on both private and public lands. It is estimated that more than 900,000 trees have already died. The number of dead trees will increase as bark beetles continue to attack the drought-weakened forests.



In June of 2003, the federal land management agencies, fire protection agencies, and other government and private organizations, banded together seeking to provide short- and long-term solutions to this complex problem. ESRI is providing Geographic Information Systems (GIS) software to assist the public and private organizations understand and assess potential solutions. GIS has allowed personnel from multiple agencies with various perspectives to visualize the problem, develop a common understanding of the problem, and prioritize the issues. These issues include:

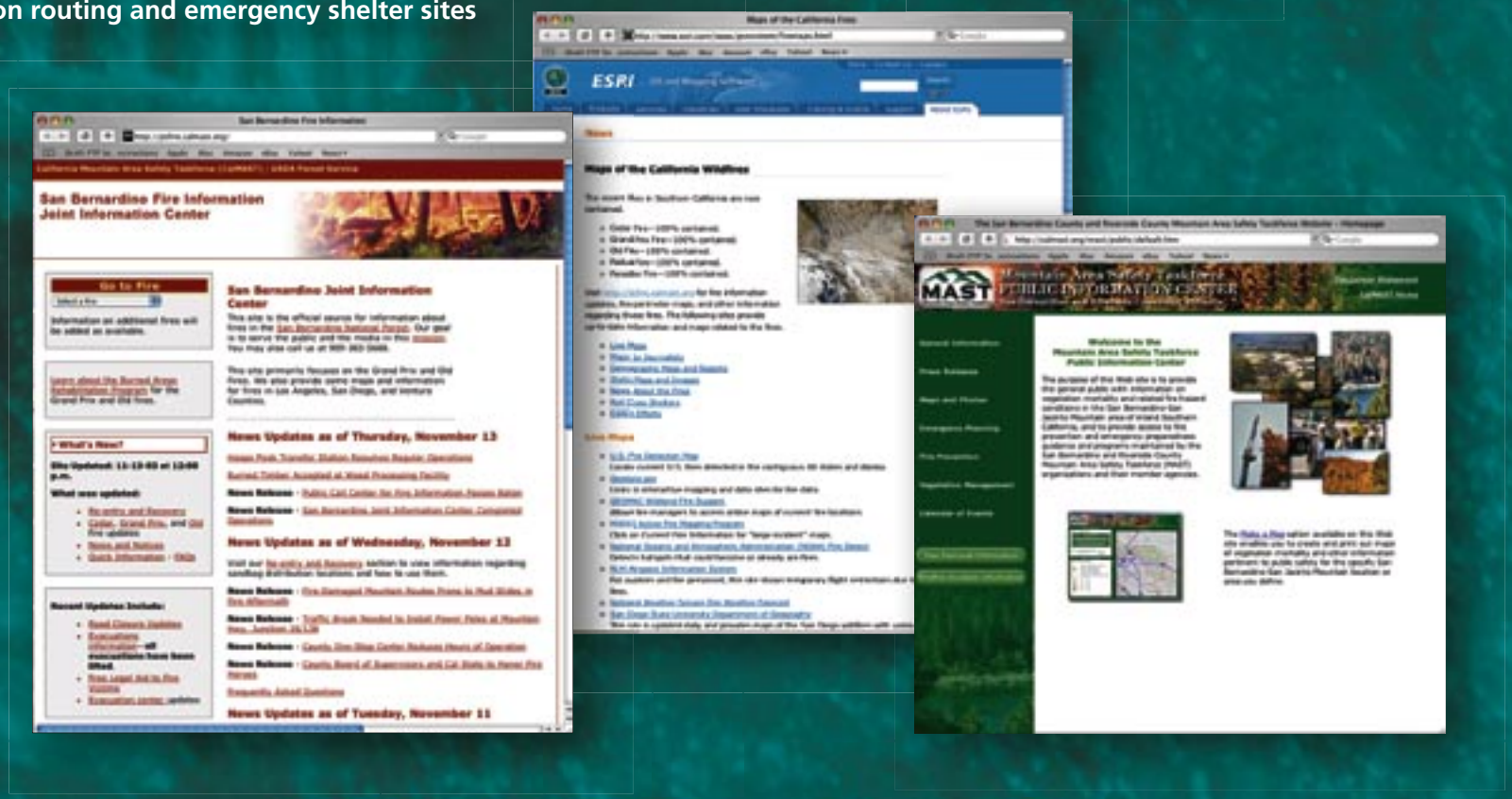
- *Assure public safety. Critical elements to this action include developing evacuation plans, clearing potential hazardous trees from routes into and out of the mountains, and providing emergency planning and hazard mitigation information to the public.*
- *Obtain funds. Work with local, state, and federal legislators to obtain funds to combat the problem.*
- *Reduce fuel and create fuel breaks. This means planning and organizing the removal of dead standing trees, the reduction of fuel on the ground, and the creation of defensible space around developed areas and homes.*
- *Develop commercial use or disposal options for wastelwood products.*
- *Identify and develop plans for ensuring long-term forest sustainability.*

Summary of So California Wildfires

In October of 2003, Santa Ana wind conditions resulted in several fires erupting, which threatened the mountain communities in and around San Bernardino. The planning that had occurred using GIS became invaluable to agencies responding to and managing the disastrous fire siege. Because of this planning and the use of GIS, agencies were able to move quickly to evacuate thousands of people safely, predict fire spread, assist in developing fire suppression tactics and strategy, and develop rehabilitation and recovery plans.

This disastrous emergency was handled professionally, calmly, and without incident by all agencies involved. GIS was key in identifying evacuation routes, emergency shelter locations, fire perimeters, and areas at extreme risk. ESRI worked closely with all of the agencies involved proving GIS support (including software, hardware, and personnel) to serve:

- Incident mapping and status reports
- Routing information for fire agencies
- Public information via the Web
- Fire modeling and predictions
- Visual and tactical deployments
- Evacuation routing and emergency shelter sites



For more information, visit http://calmast.org

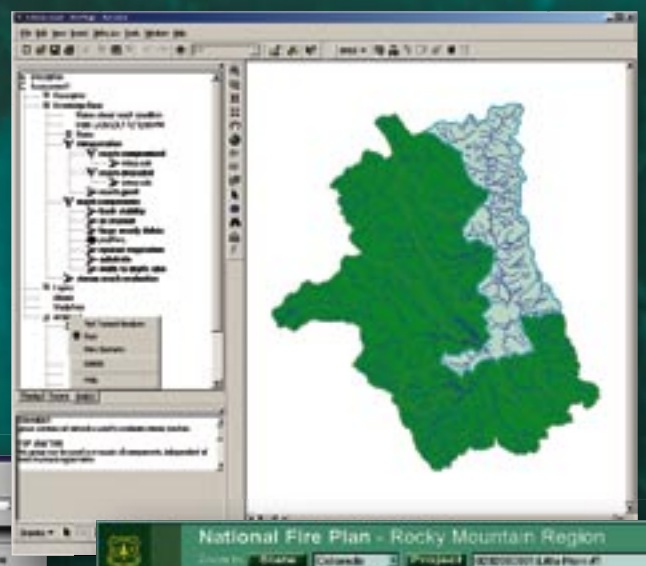
USDA

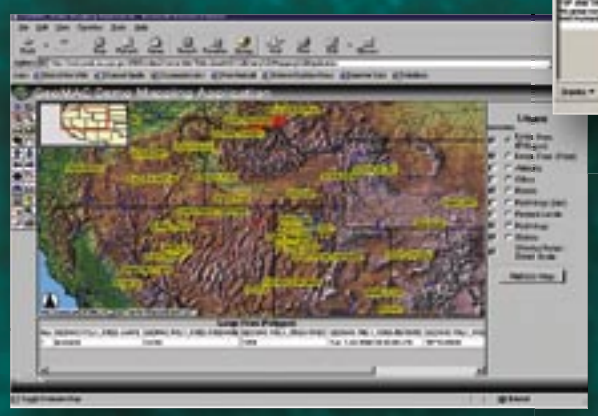
Caring for the Land and Serving People

USDA Forest Service

Mission

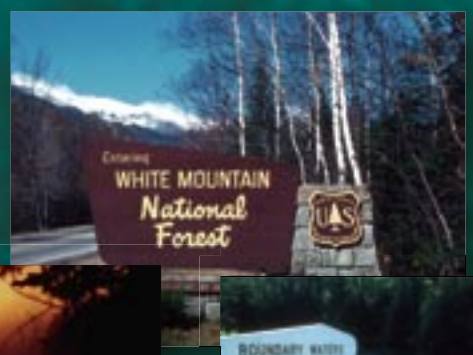
One source of information supports Forest Service management needs. Information needed for day-to-day resources management is in an electronic environment, quickly accessible to all who need it. Resource specialists develop interdisciplinary analyses using accurate and consistent shared information. Upward reporting systems can rely on the same information field units collect and store for their own needs, without requiring separate "feeding." Communication and interacting with the public and oversight agencies about complex resources issues is greatly facilitated by easy-to-understand GIS graphics.





Key Programs

- Timber
- Planning
- Engineering
- Fisheries
- Wildlife
- Fire



For more information, visit www.fs.fed.us

Department of Homeland Security

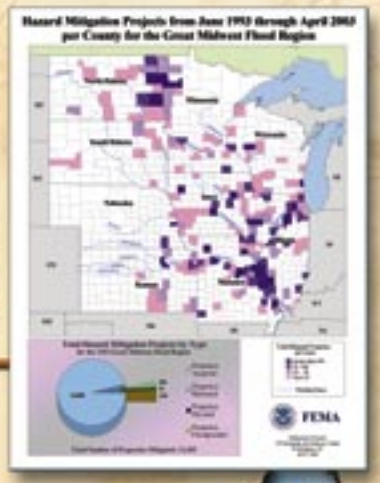
- Federal Emergency Management Agency (FEMA)

Federal Emergency Management Agency

Integrated Mapping for Decision Makers

Risk Assessment

HAZUS Groundshaking Output
Nisqually, WA, Earthquake



Risk Reduction

Hazard Mitigation Projects
1993 Midwest Floods

Risk Identification

Multi-Hazard Mapping
2003 California
Wildfires

Risk Insurance

National Flood
Insurance Program
Hurricane Isabel

Risk Communication

Safe Room Initiative
Oklahoma Tornadoes

Know Your Risks and Effectively Communicate Them to the Public

FEMA

Federal Emergency Management Agency

Identifying the Nation's Flood Risks...

FEMA's Multi-Hazard Flood Map Modernization Program

Provides a single access point for national geospatial data sets.

Provides a community-level GIS tool to enable many applications including:

- Asset management
- Community development
- Planning, zoning, and building code enforcement

Digital Flood Insurance Rate Maps (DFIRMs)

FEMA is updating its flood hazard data, converting the current inventory from a paper system to a digital one and implementing a state-of-the-art infrastructure enabling all-hazard mapping.

Data Sharing

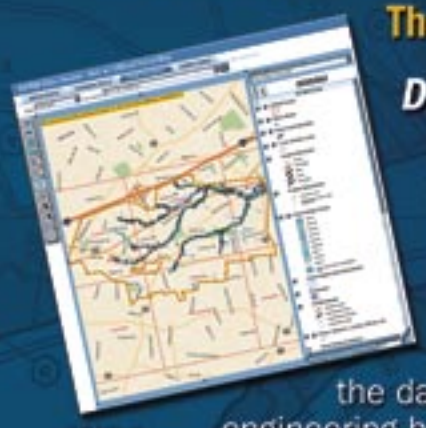
The Cooperating Technical Partners (CTP) program works towards improving and maintaining the quality and accuracy of flood hazard data.

As a CTP, a state such as North Carolina can integrate flood data into statewide GIS systems that allow a variety of uses to leverage resources and share data.

Data Delivery and Product Development

The FEMA Map Store

Digital flood hazard risk identification information via the Internet



These products will have links built into the database to access the engineering backup materials used to develop the map.

Decision makers can use the maps to:

Prepare for emergencies

- **Identify** evacuation routes
- **Show** the extent of flooding that will affect homes and businesses

Identify land parcels located in high-risk flood areas to ensure effective floodplain management.

Communicate risks effectively to businesses, associations, property owners, and the media.

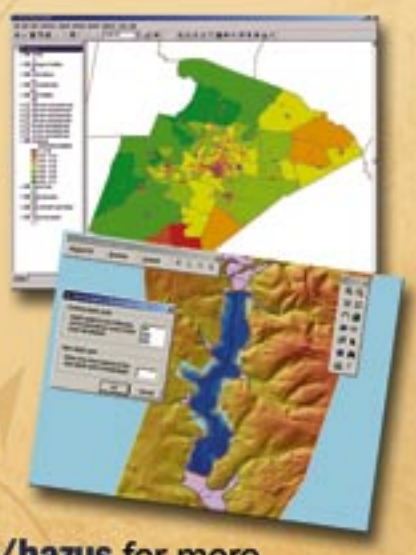
FEMA

Federal Emergency Management Agency

Tools for Decision Makers

HAZUS^{MH} can estimate losses from earthquakes, hurricane winds, and floods.

Use GIS technology to combine hazard layers with national databases and apply a standardized loss estimation and risk assessment methodology.



Nationwide database includes datasets on demographics, building stock, essential facilities, transportation, utilities, and high-potential-loss facilities.

Visit **www.fema.gov/hazus** for more information.

HazardMaps.gov

The Multi-Hazard Mapping Initiative – MMI

A means to share data with others–

www.HazardMaps.gov

FEMA worked in partnership with NOAA to:

Foster exchange and collection of geospatial hazards data.

Increase hazard awareness by providing an Internet-based multi-hazard mapping capability.

Encourage data providers to establish standards-based services that facilitate data access and distribution.

Tools for Decision Makers

FEMA

Department of Commerce

- Census Bureau
- National Oceanic and Atmospheric Administration (NOAA)

U.S. Census Bureau

Mission

The Census Bureau serves as the leading source of quality data about the nation's people and economy by producing accurate, timely, and relevant information about the United States and its population, economy, and governments; population estimates for funding allocation and other purposes; and statistics by developing new samples that reflect the current characteristics and geographic location of the population.

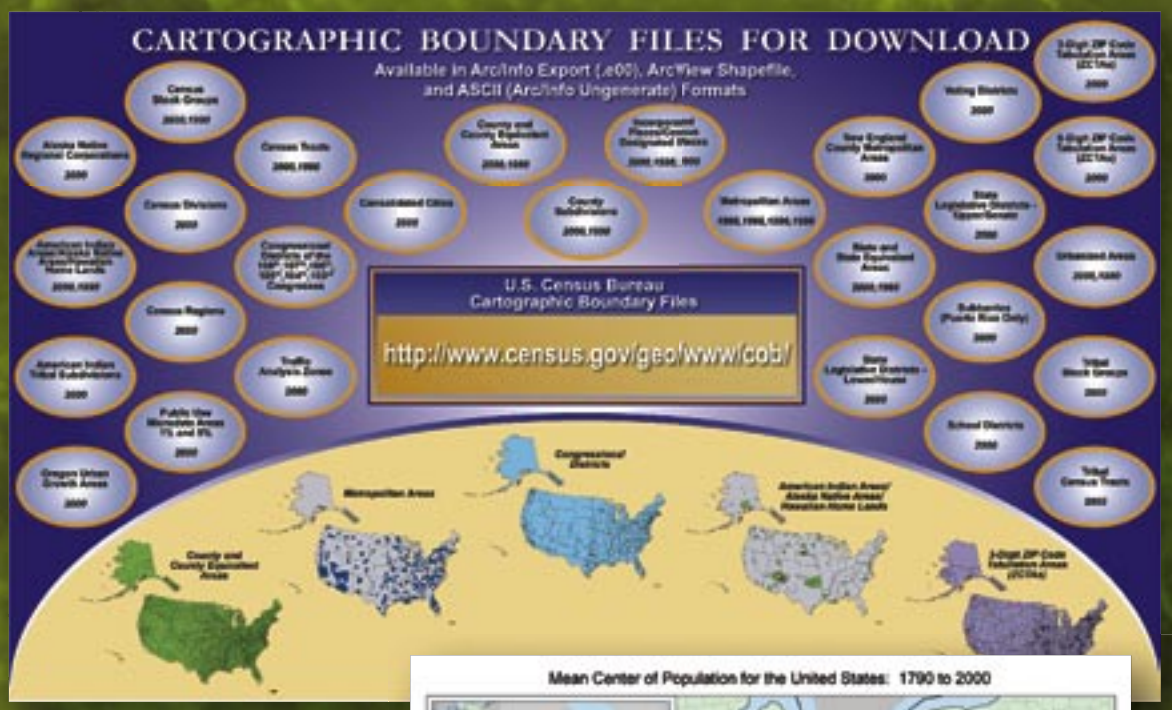
The MAF/TIGER Enhancements Program is one of the cornerstones in achieving the Census Bureau's mission and strategic goals, improving the accuracy of the street and map features used for the American Community Survey and the 2010 census. The results of this program also supports the Geospatial One-Stop e-government initiative, *The National Map,* and the National Spatial Data Infrastructure.

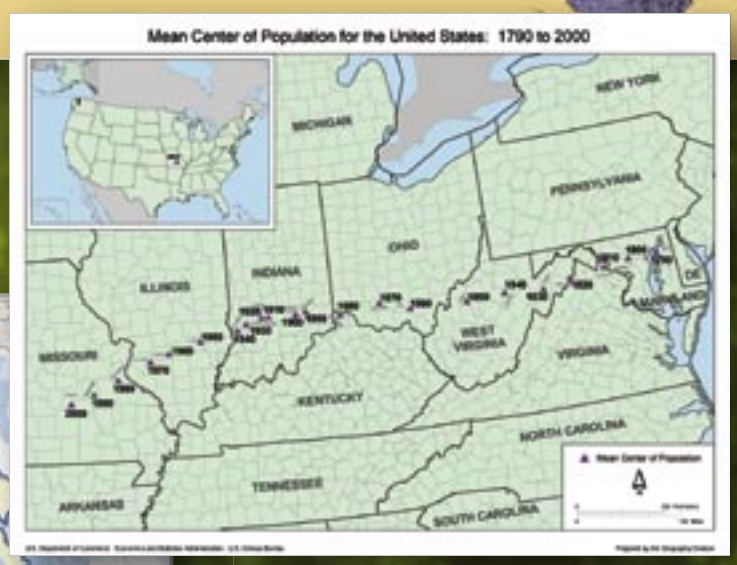
Key Programs

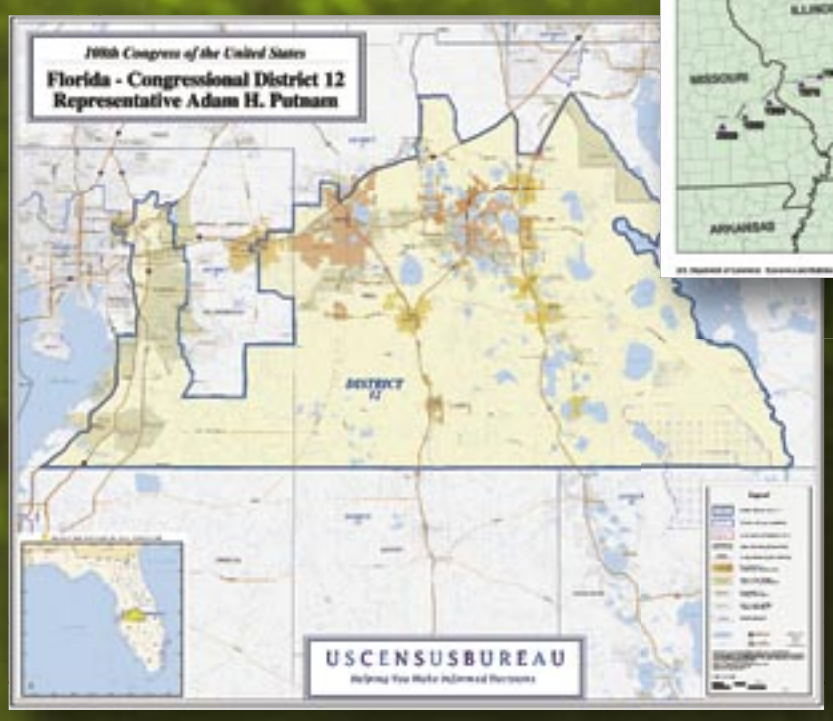
- 2010 Decennial Census
- American Community Survey
- Economic Census
- Population Estimates Program
- Current Surveys and Censuses

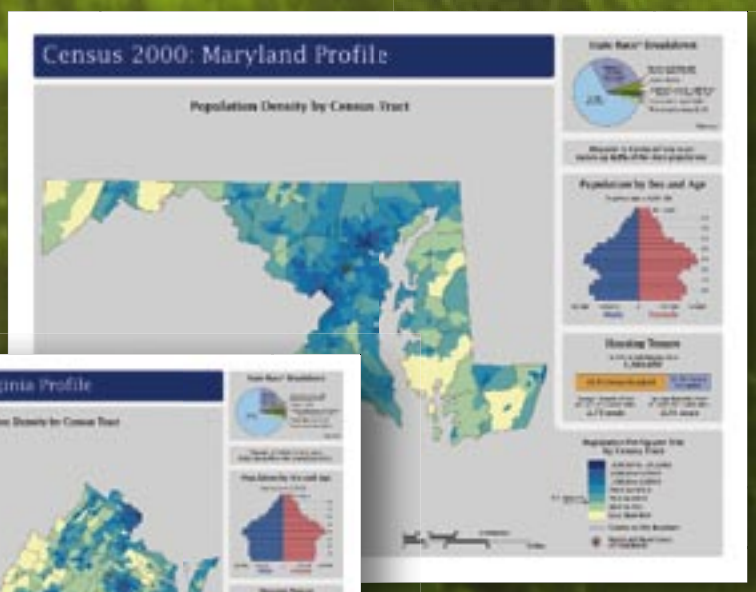
MAF/TIGER Enhancements Program

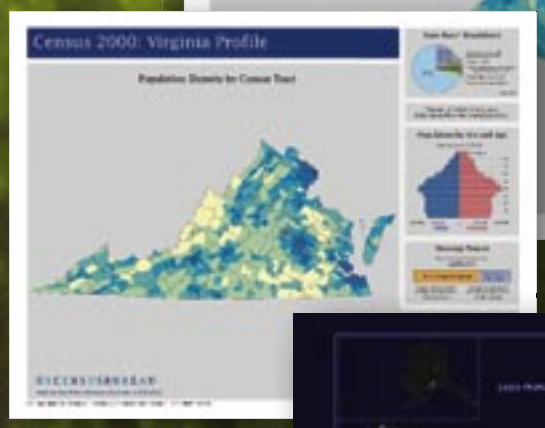
- Improved spatial accuracy
- Improved commercial off-the-shelf (COTS) solutions
- Improved partnerships
- Improved address components
- Improved quality measures











For further information, visit www.census.gov

U.S. Census Bureau

For further information, visit www.census.gov

National Oceanic and Atmospheric Administration

Mission

- Protect, restore, and manage coastal and ocean resources.
- Understand climate change, prediction, and aid in public response.
- Support safe, efficient, and environmentally sound transportation for the Nation.

Key Programs

NOAA Line Offices

- National Weather Service
- National Ocean Service
- National Marine Fisheries Service
- National Environmental Satellite, Data, and Information Service
- Office of Oceanic and Atmospheric Research
- NOAA Marine and Aviation Operations

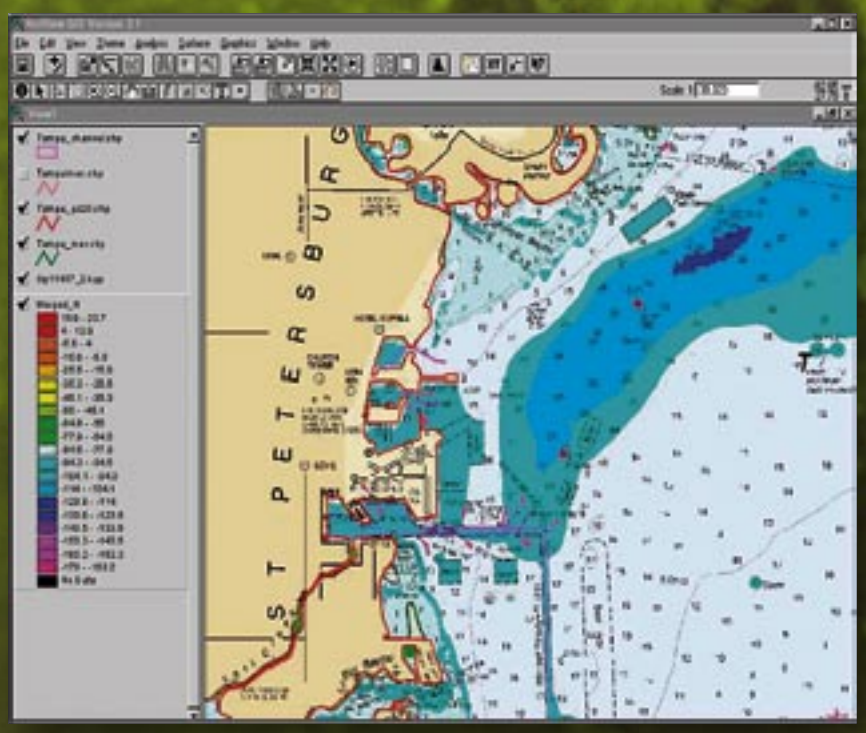
For further information, visit www.noaa.gov

Oceans and Estuaries

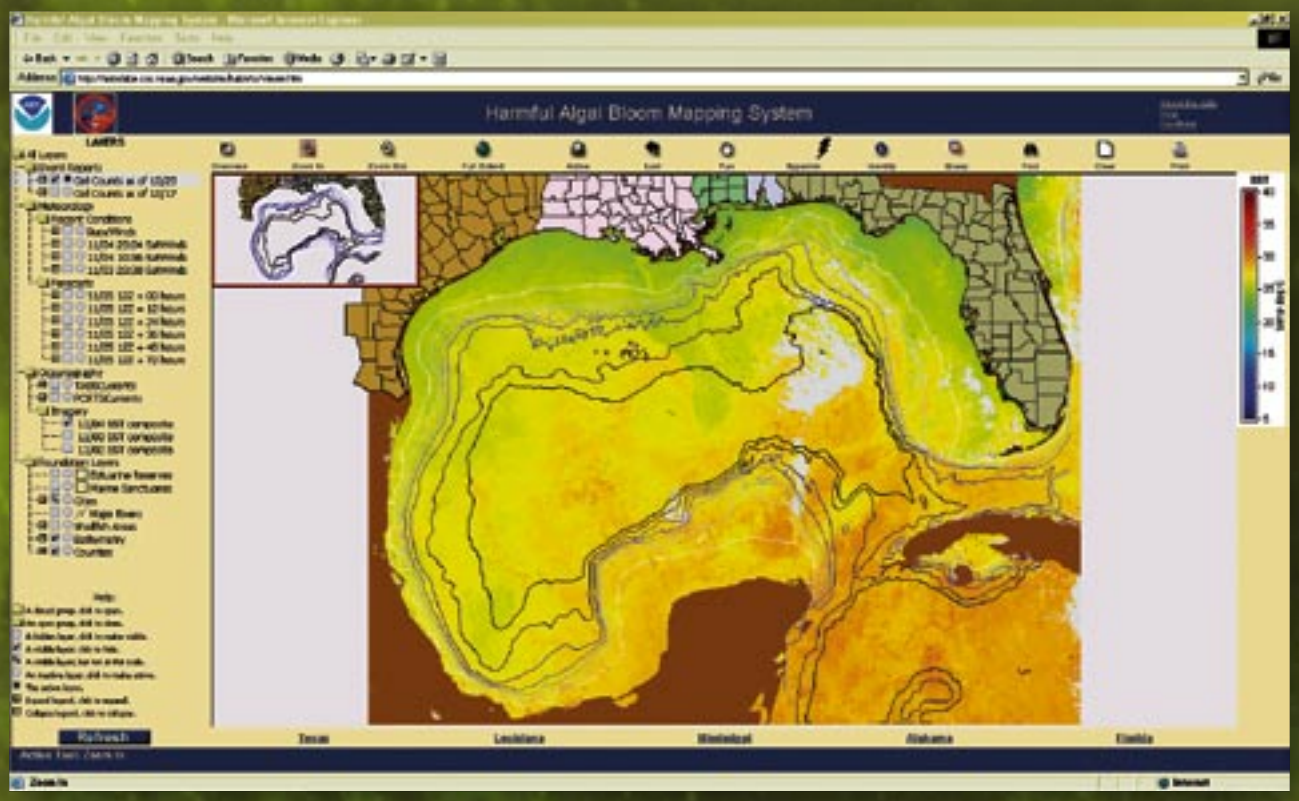
National Oceanic and Atmospheric Administration

NowCoast provides NOAA's Ocean Services Center forecast model developers and the coastal community witheasy and centralized access to online, real-time physical meteorological, oceanographic, river, and air/water quality information.

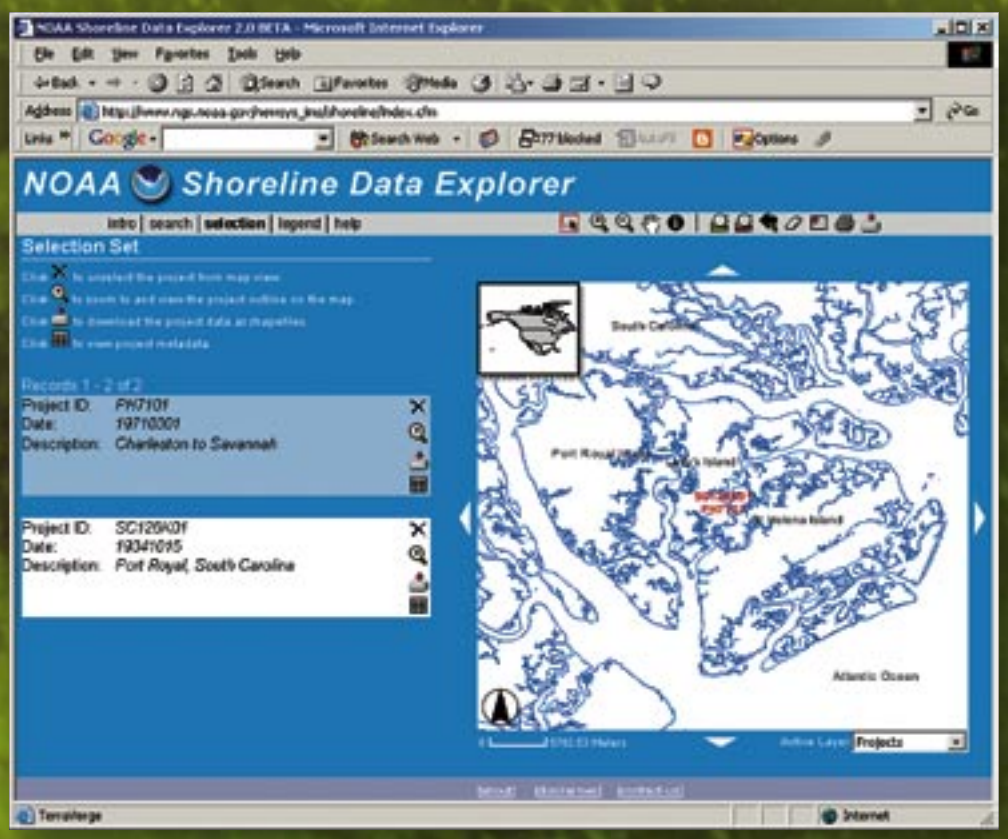
NOAA's Coral Reef Information System (CoRIS) is a single point of access to NOAA coral reef information and data products, especially those derived from NOAA's Coral Reef Initiative Program. CoRIS will evolve and grow in the months ahead to encompass an ever widening array of product and information offerings.



This is a raster nautical chart, a bathy/topo digital elevation model (DEM), National Ocean Service (NOS) of St. Petersburg, Florida, showing a raster nautical chart, a bathy/topo DEM, NOAA shoreline, and an Electronic Navigational Charts (ENC) dredge depth area for St. Petersburg, Florida. The color mapping table for the NOAA raster chart and the DEMs were set to a transparent mode so other data layers could be seen.



The harmful algal blooms (HAB) Mapping System (HABMapS) is an interactive mapping tool developed by the NOAA Coastal Services Center that is used to access recent data on harmful algal blooms in the Gulf of Mexico and on the environmental conditions that may affect the spread of these blooms. HABMapS is a component of the Harmful Algal Blooms Observing System (HABSOS).

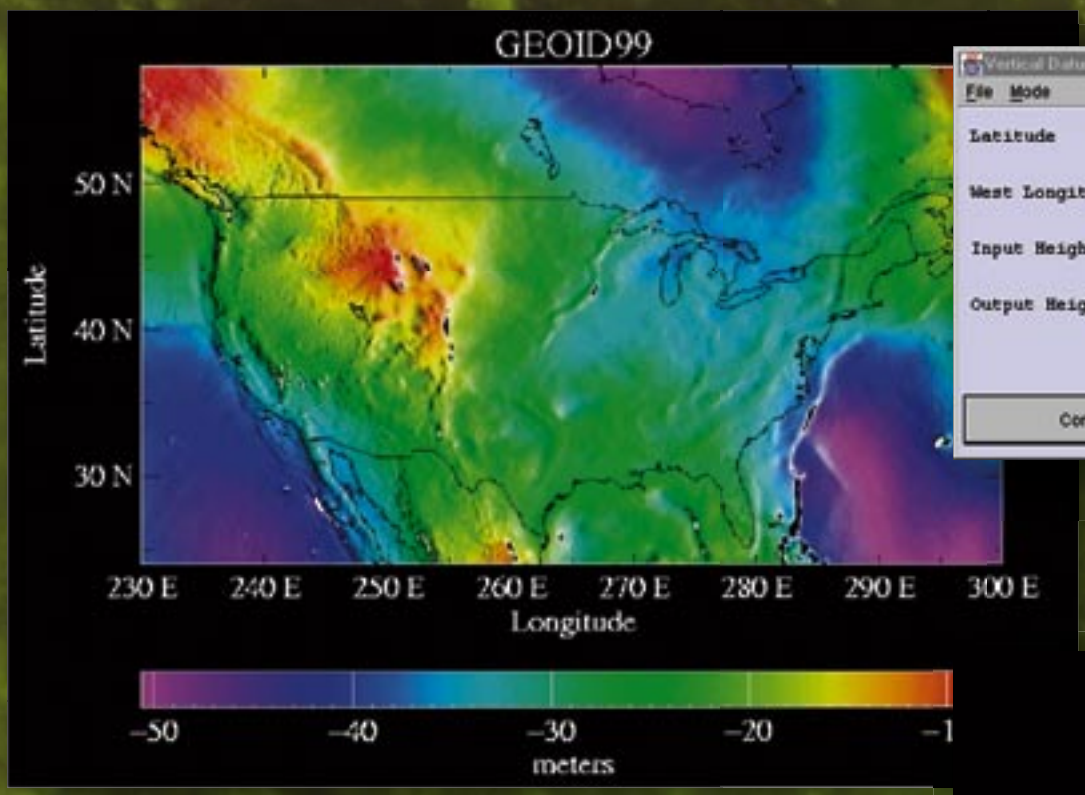


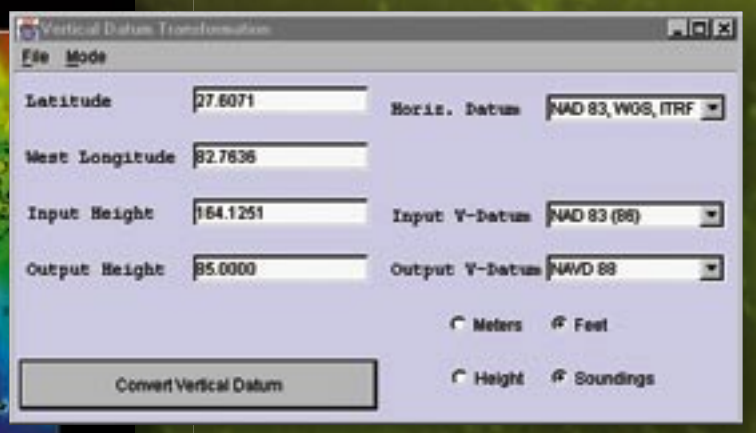
The Shoreline Data Explorer provides high-resolution digital shoreline from multitemporal surveys of our nation's coastline. Users can view available shoreline project boundaries and vector shoreline data, make printable maps, and download FGDC-compliant metadata and vector shoreline shapefiles.

For further information, visit www.noaa.gov

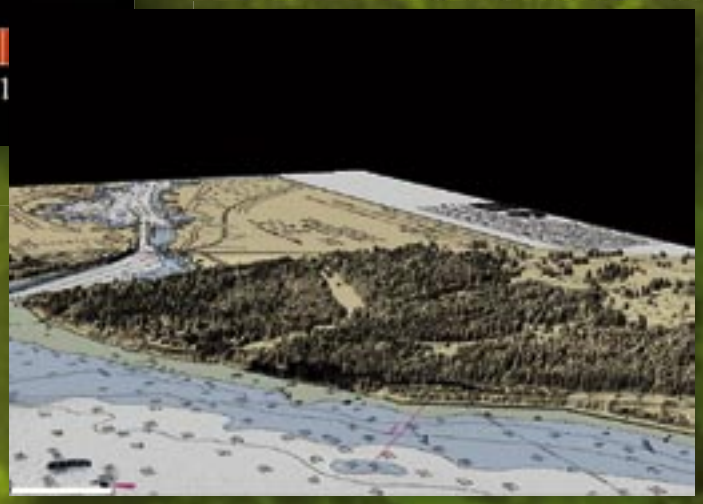
Locations and Geodetic Networks

National Oceanic and Atmospheric Administration

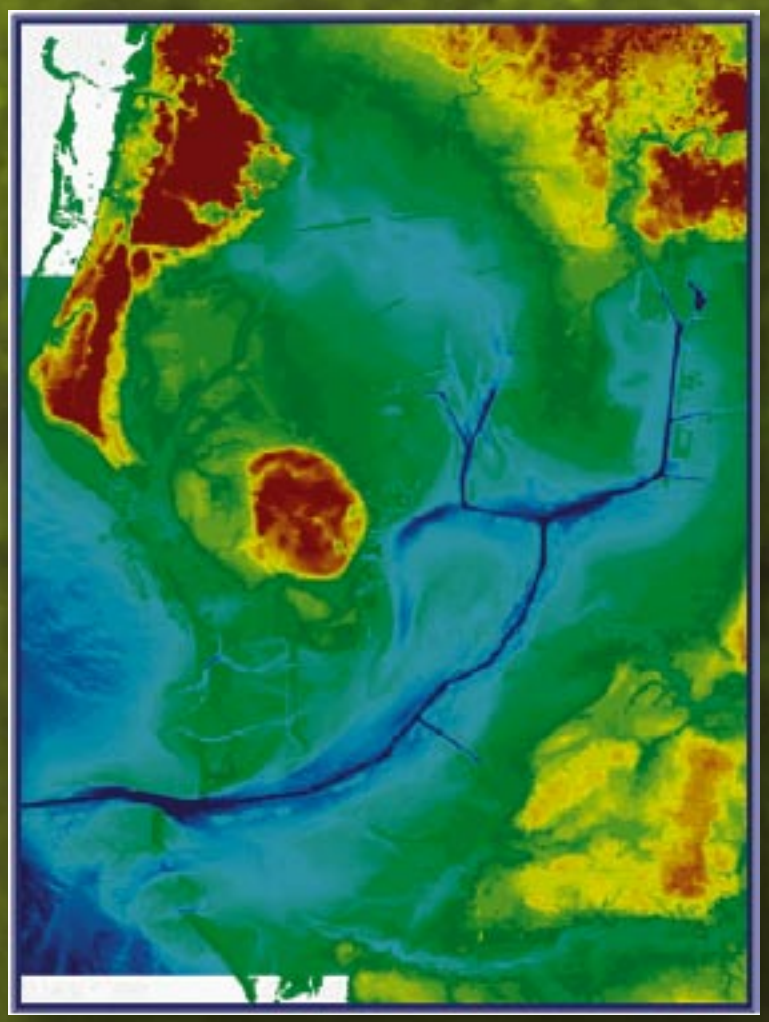




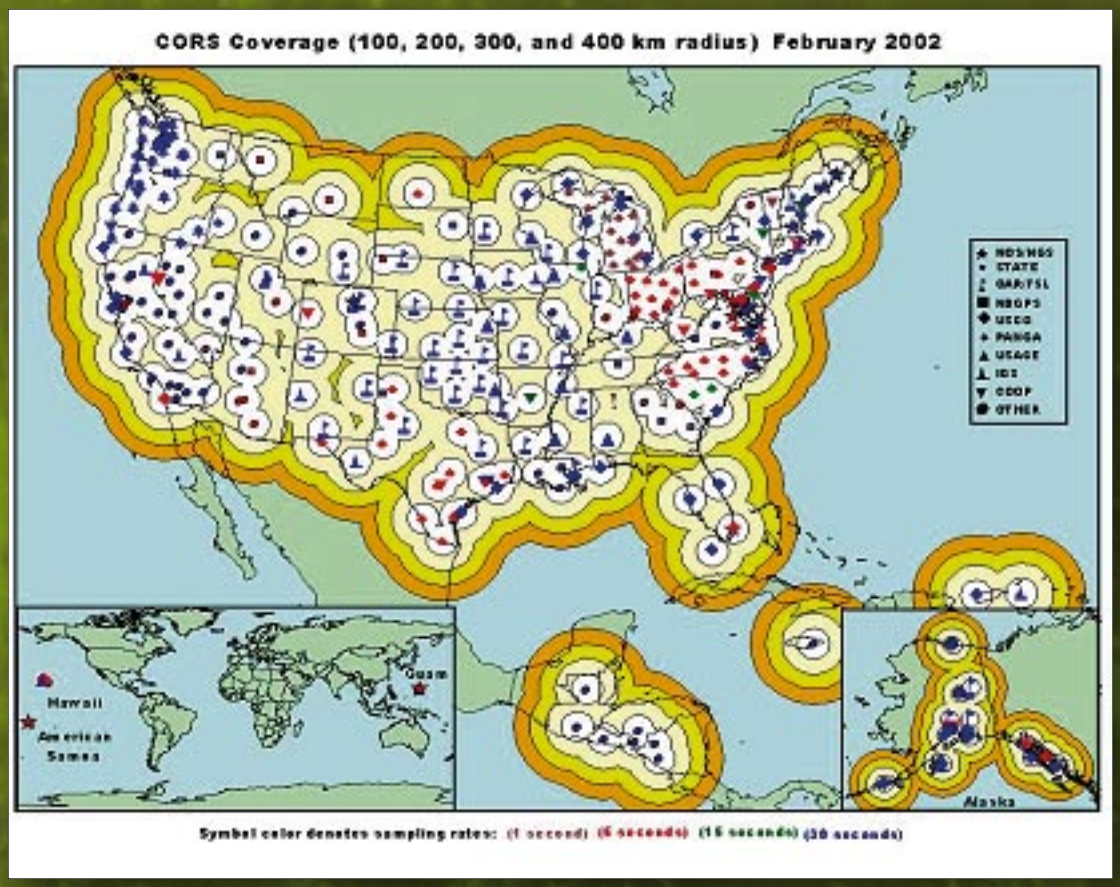
Bathy/Topo LIDAR data, which is referenced to the ellipsoid, can be transformed to any vertical datum with the Vdatum transformation tool developed by the National Geodetic Survey.



Vertical datum transformation is the key to successfully producing a seamless merge of topographic and bathymetric data at the land/water interface. Standard vector and raster GIS tools work well for preprocessing and merging topographic and bathymetric data.



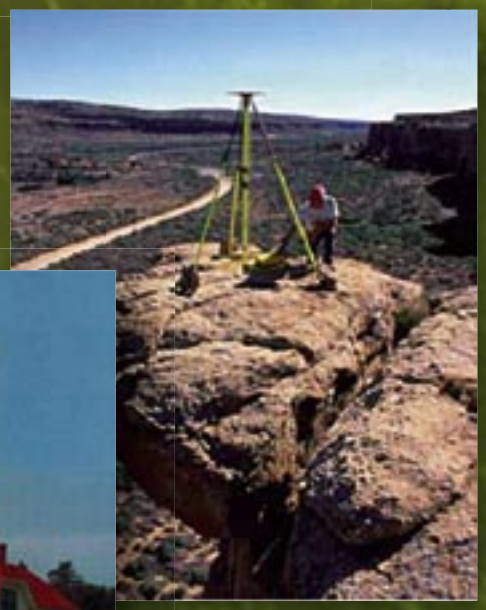
Merged topographic/bathymetric digital elevation model (1 arc second grid spacing) for Tampa Bay, Florida



The Continuously Operating Reference Stations (CORS) data set is comprised of dual-frequency global positioning system (GPS) observations collected continuously from several hundred ground-based stations.

This GPS CORS, located in Chatham, Massachusetts, at the U.S. Coast Guard Chatham Light facility, is one of more than 300 stations in the National CORS network managed by NOAA in cooperation with numerous partners. NOAA makes data from CORS publicly available to provide users with three-dimensional positioning with an accuracy of a few centimeters.

Photo credit: Rick Yorcyzk.



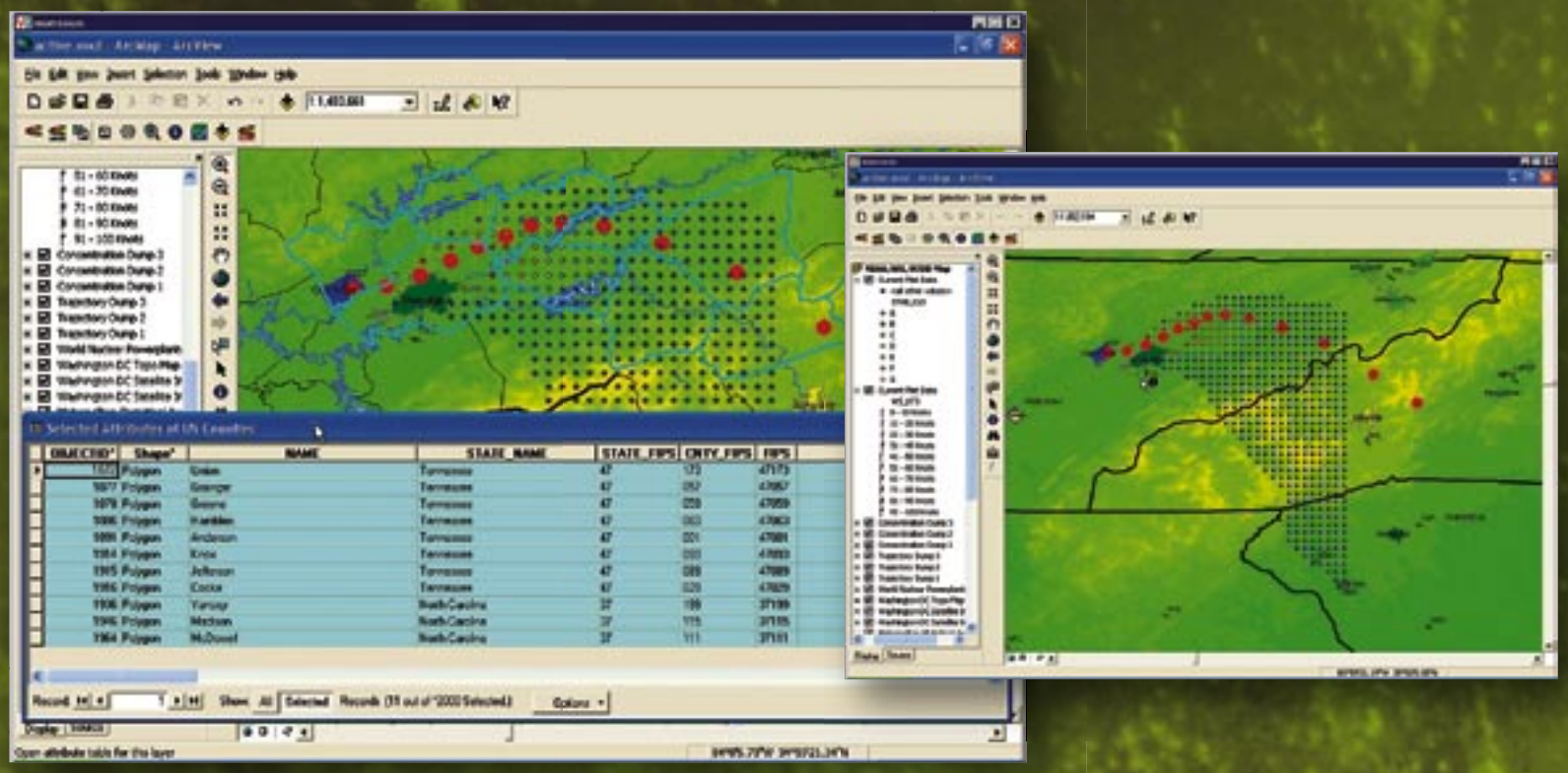
Former NOAA Corps officer and National Geodetic Survey (NGS) employee, Phil Tuwaletstiwa, shown setting a high-accuracy geodetic control marker using GPS on Hopi Tribal land in Arizona.

Photo credit: Bill Stone, NGS's State Geodetic Advisor to New Mexico.

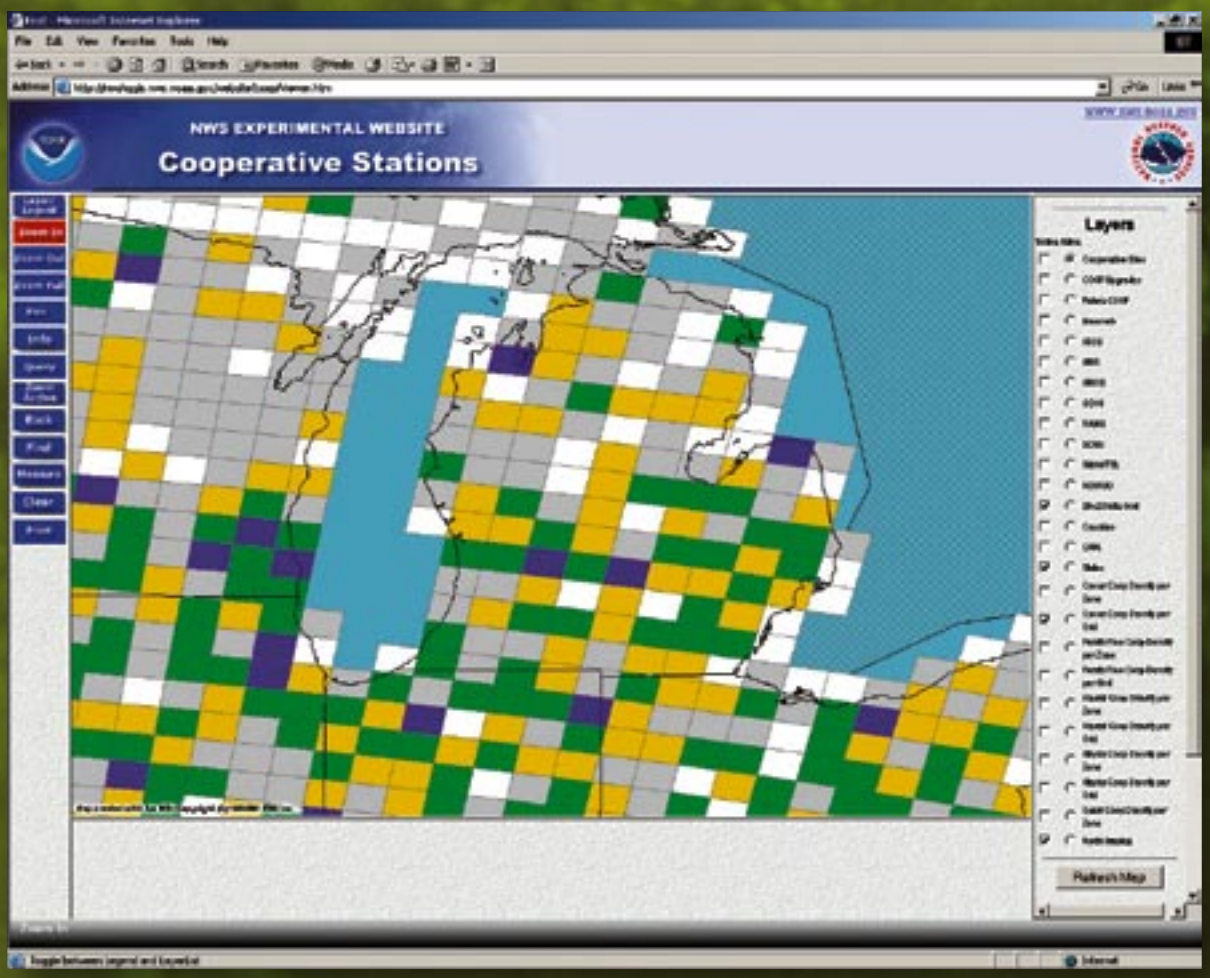
For further information, visit www.noaa.gov

Atmosphere and Climate

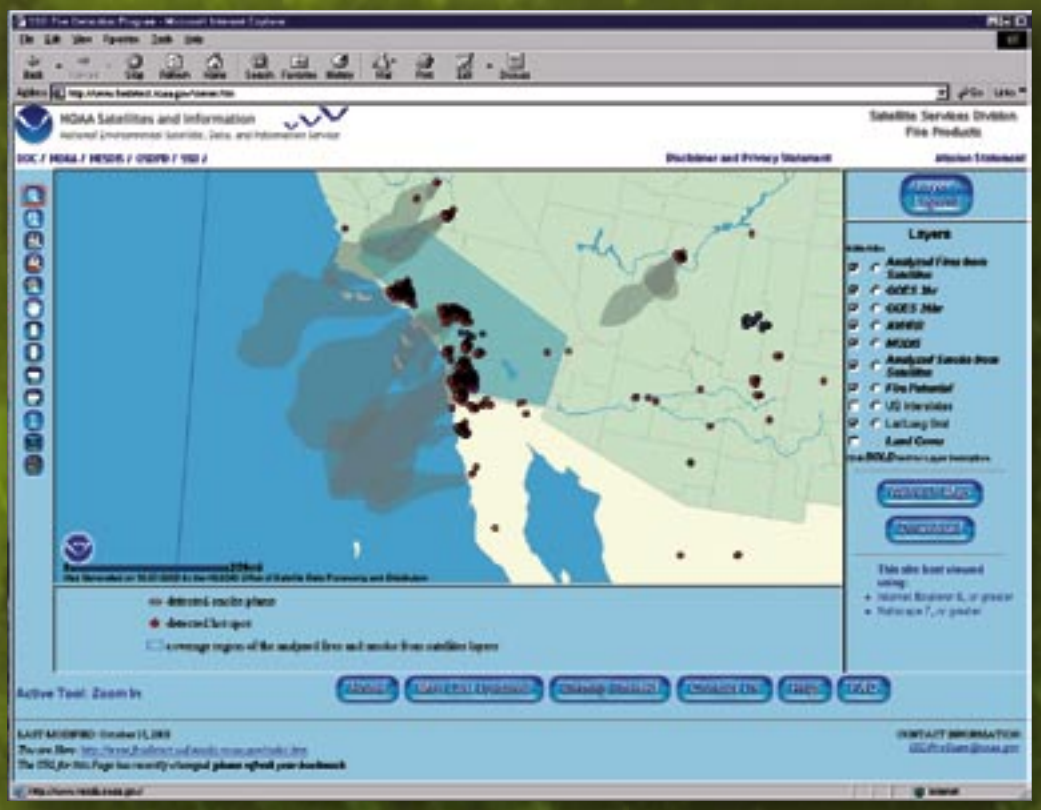
National Oceanic and Atmospheric Administration



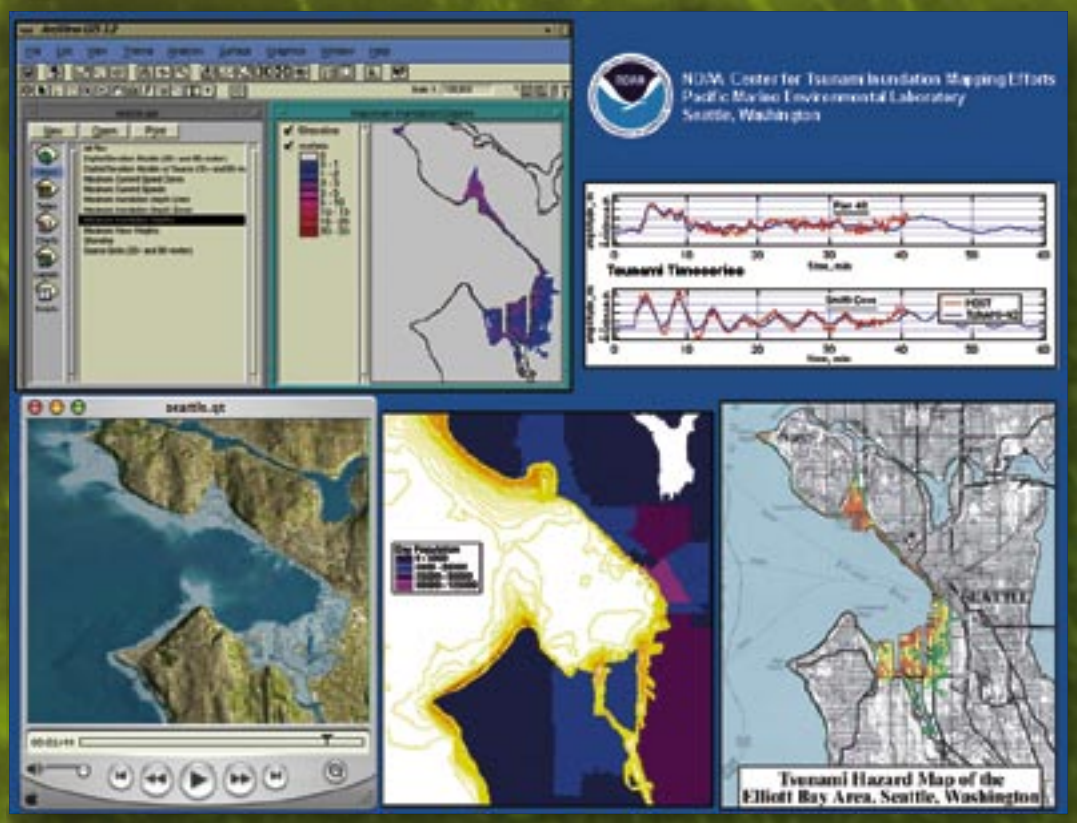
The ESRI ArcMap™ interface for the NOAA/ARL HYSPLIT atmospheric dispersion system was developed at the Air Resources Lab (ARL) to provide users with a simple point-and-click interface to run the HYSPLIT atmospheric dispersion model. Real-time data is provided to the ArcMap interface by a Linux-based data server. The data server provides hourly updated surface observations from around the continental United States, Alaska, Hawaii, Canada, and Mexico.



The National Weather Service (NWS) has developed several Web sites that display the location and characteristics of various NWS systems and equipment. These sites are being designed to provide NWS staff with a decision support tool conveniently accessed through a common Web portal. The graphic on the left displays the density of Cooperative Observer Network sites within 20 x 20 mile grids.



The Hazard Mapping System is an interactive processing system that allows trained satellite analysts to integrate data from various automated fire detection algorithms with geostationary operational environmental satellites (GOES) and polar Advanced Very High Resolution Radiometer (AVHRR), Moderate Resolution Imaging Spectroradiometer Fire Algorithm (MODIS), Defense Meteorological Satellite Program/Operational Linescan System (DMSP/OLS) images. The result is a quality controlled display of the locations of fires and significant smoke plumes detected by meteorological satellites.



The NOAA Center for Tsunami Inundation Mapping Efforts has been developing a series of GIS interpretive aids for emergency managers to assess the tsunami hazard in their coastal communities. Tsunami inundation, maximum wave heights, and maximum wave velocities are combined with day/night populations and critical facilities to determine evacuation routes and mitigation procedures.

For further information, visit www.noaa.gov

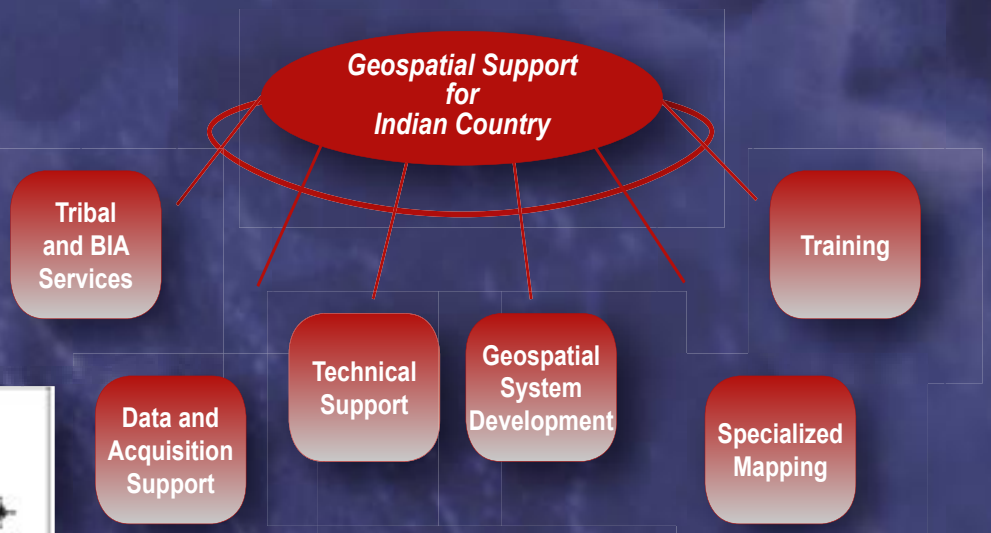
Department of the Interior

- Bureau of Indian Affairs (BIA)
- Bureau of Land Management (BLM)
- Bureau of Reclamation (BOR)
- Fish & Wildlife Service (FWS)
- Minerals Management Service (MMS)
- National Park Service (NPS)
- US Geological Survey (USGS)

Bureau of Indian Affairs

Mission

... to fulfill the government's trust responsibilities and promote self-determination on behalf of Tribal governments, American Indians, and Alaska Natives.



Contributor: Floyd Phillips 2003

For more information, call **303-231-5120**

OFFICE OF THE CIO

Bureau of Indian Affairs

Special Purpose Mapping

The Bureau of Indian Affairs (BIA) has the capability to rapidly develop and create map products using various government and public data sources. The BIA provides cartographic services and standards as well as customized GIS analysis and mapping for Indian country.

For more information, call 303-231-5120

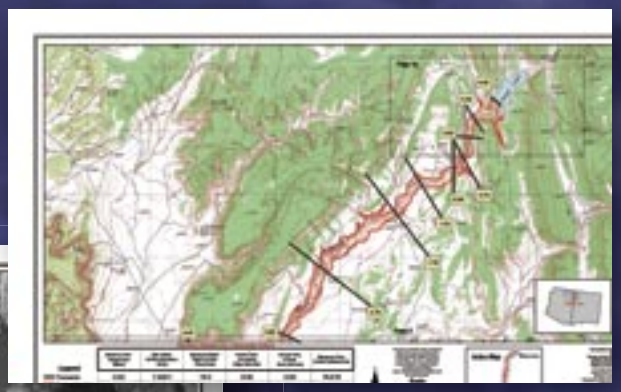
OFFICE OF THE CIO

Bureau of Indian Affairs

Geospatial System Development

The BIA has the expertise to develop specialized GIS applications utilizing life cycle development methodology. The BIA Geographic Data Service Center has a proven record of successful system development and Web applications in support of trust programs.

Displays spatial and tabular data for a variety of BIA and Tribal-related GIS data sets



The Safety of Dams (SOD) program performs flood modeling and mapping of potential flood inundation from dams.

Web-based data entry application for assessing dam hazards affecting Tribal lands

Irrigation, Power, Safety of Dams (IPSOD) provides a Web-based interface for deferred maintenance accounting.

An interactive map for the analysis of irrigation facilities

Land Title Mapper (LTM) creates surface and subsurface land maps showing trust land status on Indian lands.

The BIA reviews permit applications submitted to the Federal Energy Regulatory Commission (FERC) for their potential impact on Indian lands.

For more information, call 303-231-5120

Geographic Data Service Center
OFFICE OF THE CIO

Bureau of Indian Affairs

GIS Services

The BIA provides technical support for all geospatial technology such as GIS, GPS, and remote sensing. Services include training, help desk, application design and development, mapping services, database management, and other geoprocessing activities.

Training

- Provide GIS and GPS training to BIA and Tribal employees.
- Training available at various regional/field offices and at the Geographic Data Service Center (GDSC).
- The BIA has two GIS instructors:
  - Authorized ESRI Instructor
  - GPS Instructor

FY2003 Field Training

Course Name	# Of Courses	# BIA Students	# Tribal Students	Student Total
Introduction to ArcGIS I	11	53	80	133
Introduction to ArcGIS II	4	21	24	45
TOTALS	14	74	104	178

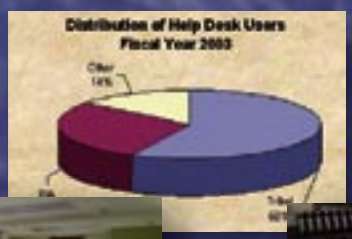
FY2003 GDSC In-House Training

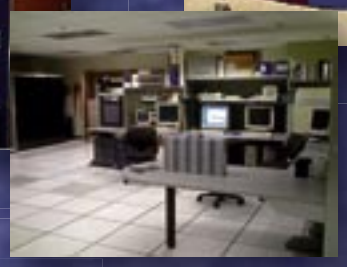
Course Name	# Of Courses	# BIA Students	# Tribal Students	Student Total
Introduction to ArcGIS I	2	8	22	30
Migrating from 3.x to ArcGIS 8.x	3	1	27	28
ArcGIS Workshop	2	3	19	22
GIS Entry Using GPS	3	7	22	29
TOTALS	10	19	90	109

Technical Support

Timely and expert technical assistance is available through the help desk. Support is provided on

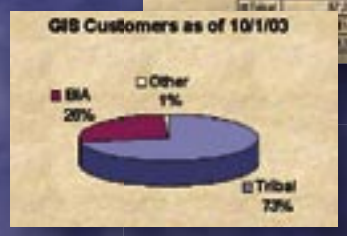
- Software
- Hardware
- Communications
- Data Management





Enterprise Licensing

- Expands and standardizes GIS technology in Indian country
- Includes both BIA and Tribes
- Improves operation efficiency
- Decreases overall expense
- Reduces paperwork burden
- Centralizes license management
- Enables prompt GDSC technical support



Data Acquisiton

The BIA can provide assistance with obtaining, organizing, accessing, and keeping data current.

For more information, call 303-231-5120

OFFICE OF THE CIO

Bureau of Indian Affairs

Looking to the Future...

The Bureau of Indian Affairs geospatial strategic plan calls for an enterprise approach for implementing geospatial technology. Policy and operations will be focused through the Office of the CIO. The use of the technology will be expanded to fulfill the diverse mission requirements in the Bureau, consistent with the Department of the Interior's implementation of the President's Management Agenda.

BIA Geospatial Enterprise Architecture will include support for BIA's diverse mission.

Cultural Preservation
- Archaeological Modeling and Mapping
- Reparation Act
- Ethnicity
- Linguistics Mapping

Economic Development
- Business Site Analysis
- Demographics
- Workforce Analysis

Education
- School Planning
- Bus Routing
- Statistics
- K–12 GIS Education
- Tribal College Education

Energy and Minerals
- Exploration and Development
- Economic Analysis

Environmental Protection
- Hydropower Relicensing
- Hazard Modeling
- Inventory
- Permitting
- Impact Assessment (EIS) and Cleanup

Facilities Management (Development and Construction/ Management)
- Inventory
- Site Analysis
- GIS/MAXIMO Integration

Forestry and Fire
Fire:
- Fuels
- Rehabilitation
- Behavior
- History
- Monitoring

Forestry:
- Timber Inventory
- Harvest Modeling
- Management

Homeland Security
- Border Protection
- Risk Analysis
- Infrastructure Protection
- Planning
- Emergency Response

Land Consolidation Amendment
- Fractionation Status/Mapping
- Strategic Planning

Law Enforcement and Emergency Services
- 911 Service
- Crime Status
- Routing
- Jurisdiction

Reservation Boundary and Land Asset Mapping
- Trust Asset Locations
- Adjudication

Substance Abuse and Prevention
- Site Analysis
- Health Statistics
- Marketing Services

Transportation
- Road Atlas (Inventory and Condition)
- Railroads
- Accident Events
- Traffic Statistics
- Signage

For more information, call 303-231-5120

OFFICE OF THE CIO

Bureau of Land Management

Mission

The Bureau of Land Management (BLM), an agency within the U.S. Department of the Interior, administers **261 million surface acres** of America's public lands, located primarily in 12 western states. The BLM sustains the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.

BLM Facts

- The Bureau of Land Management is responsible for managing **261 million surface acres** of land—about one-eighth of the land in the United States—and about 300 million additional acres of subsurface mineral resources. The BLM is also responsible for wildfire management and suppression on 388 million acres.
- Most of the lands the BLM manages are located in the western United States, including Alaska, and are dominated by extensive grasslands, forests, high mountains, arctic tundra, and deserts. The BLM manages a wide variety of resources and uses, including energy and minerals; timber; forage; wild horse and burro populations; fish and wildlife habitat; wilderness areas; archaeological, paleontological, and historical sites; and other natural heritage values.
- The Bureau of Land Management administers public lands within a framework of numerous laws. The most comprehensive of these is the Federal Land Policy and Management Act of 1976 (FLPMA). All BLM policies, procedures, and management actions must be consistent with FLPMA and other laws that govern use of public lands.

One of the key spatially enabled programs of BLM is the **National Integrated Land System (NILS)** (http://www.blm.gov/nils/).

The National Integrated Land System is a joint project between the BLM and the USDA Forest Service in partnership with states, counties, and private industry to provide business solutions for the management of cadastral records and land parcel information in a GIS environment.

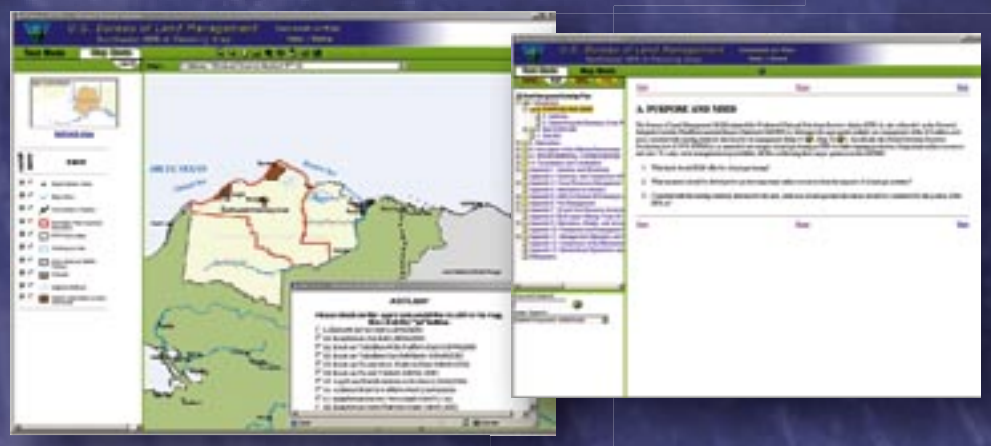
The goal of NILS is to provide a process to collect, maintain, and store parcel-based land and survey information that meets the common, shared business needs of land title and land resource management. The NILS project will be developed in **four modules:** *Survey Management (S), Measurement Management (M), Parcel Management (P), and GeoCommunicator (G).*

For more information, visit www.blm.gov

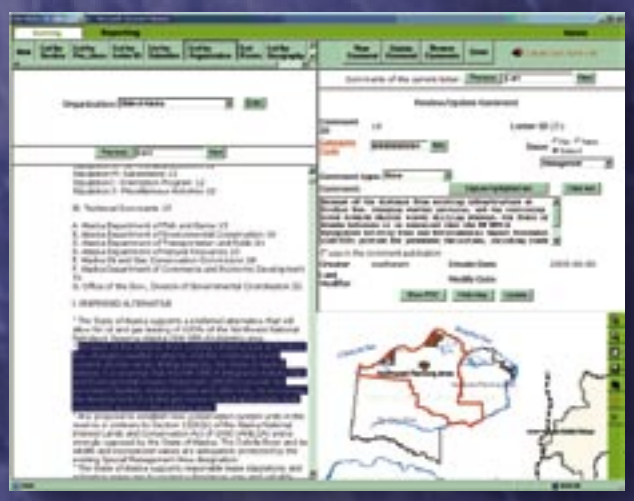
Decision Support

Bureau of Land Management

Resource Management Planning



Digital output from BLM's ePlanning database will generate content and publish to an "interactive document." The document can be reviewed in either map or text mode.



Comment letters are entered into the database via the Web site or by BLM staff. Using the Comment Analysis tools, comments are parsed from the parent letter and assigned to the table of content and/or Issue-Topic. Comments can also be tied to custom polygons on the map.

Once comments are parsed and assigned to Plan content (TOC or Issue-Topic) the writer/editor uses the Manage Issues tool to build Summary Responses by Issue, input individual comment responses, and relate the above back to the content using the search functions.

End users are given the ability to submit custom maps with their written comments.

Highlighted text in the Plan can be easily added to the Comment Submission form to better enable text-specific comments.

For more information, visit www.blm.gov

Web Distribution

Bureau of Land Management

NILS Land Survey Information System

The Land Survey Information System or LSIS is the official government Web site for the distribution of the Public Land Survey System (PLSS) of the United States.

The Bureau of Land Management cadastral survey program is responsible for the official boundary surveys for all federal agencies in the United States. that together manage more than 700 million acres.

Download Data by Township and Range

Below shows the download of PLSS data by Township and Range.

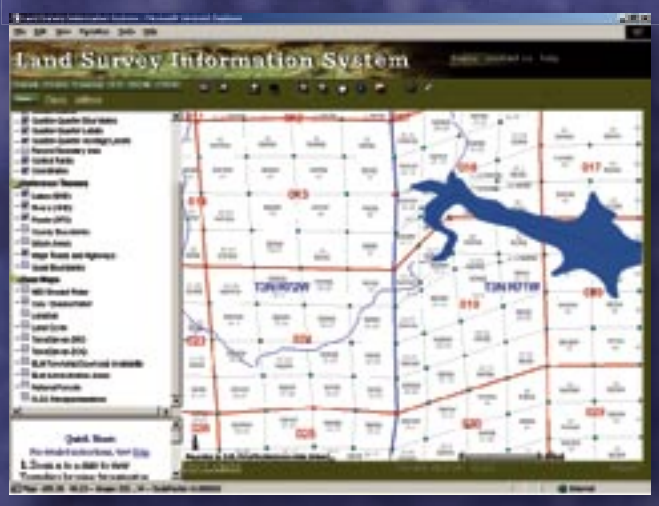
Many Reference Themes Available

There are many reference layers available to aid the user in the selection of survey data. These layers include

- NED Shaded Relief
- Landsat imagery
- TerraServer DRG and DOQ Imagery

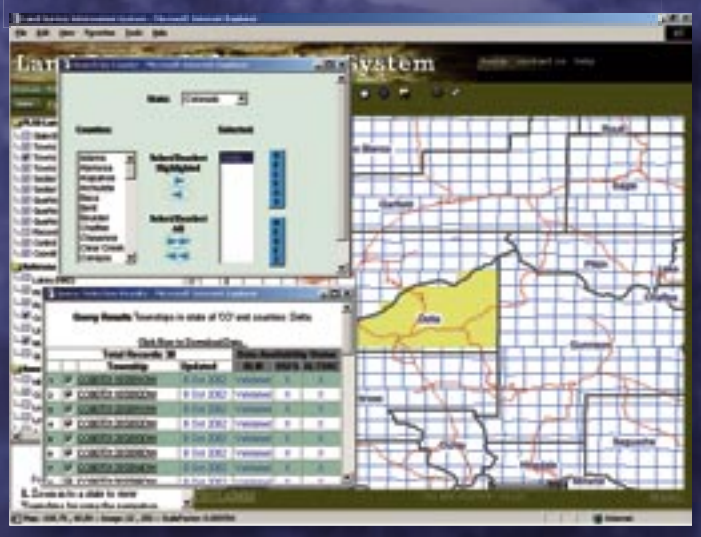
PLSS Data

The PLSS data shown in the image below is computed from BLM survey records (official plats and field notes), local survey records, and geodetic control information.



Download Data by County

The image below shows the download of PLSS data by County.



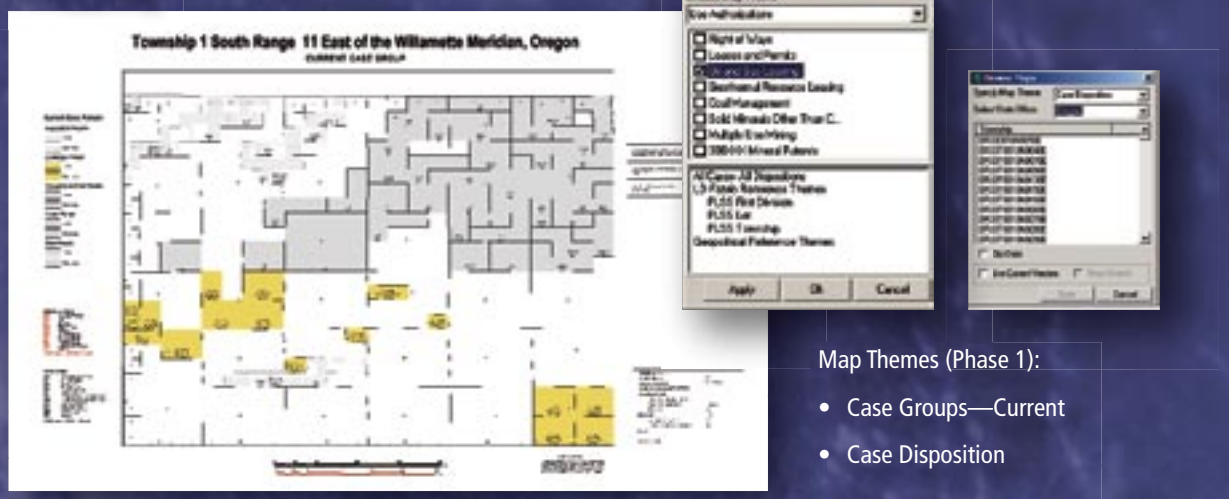
For more information, visit www.blm.gov

Parcel Maintenance

Bureau of Land Management

National Integrated Land System Parcel Management

Workflow for Case Mapping

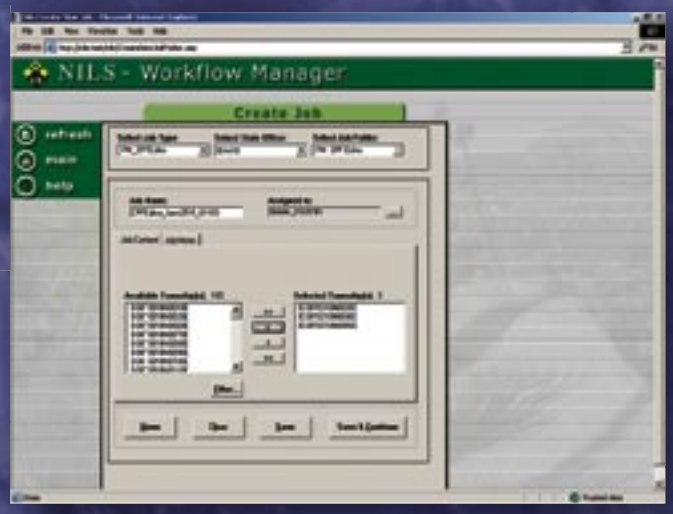


Map Themes (Phase 1):

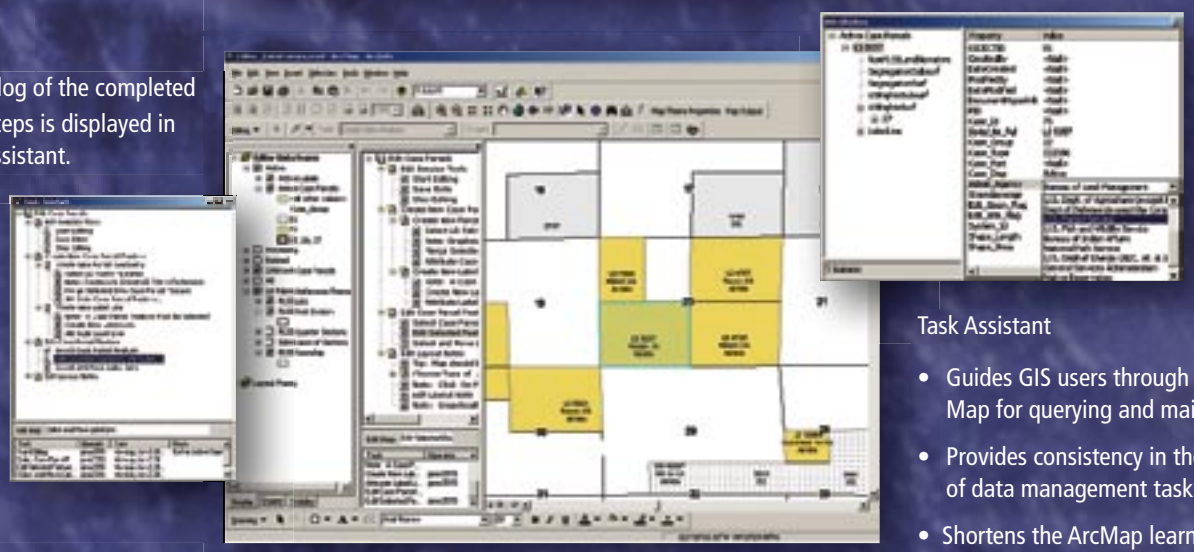
- Case Groups—Current
- Case Disposition

Geometry Editing Task Assistants

When ArcMap is started through the NILS Workflow Manager, all relevant layers and required tools are loaded as defined by the map template and Task Assistant.



A running log of the completed edit task steps is displayed in the Task Assistant.



Task Assistant

- Guides GIS users through steps in ArcMap for querying and maintaining data
- Provides consistency in the completion of data management tasks
- Shortens the ArcMap learning curve

For more information, visit www.blm.gov

Bureau of Reclamation

Mission

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

What is the Bureau of Reclamation?

Established in 1902, the Bureau of Reclamation is best known for the dams, power plants, and canals it constructed in the 17 western states. These water projects led to homesteading and promoted the economic development of the West. Reclamation has constructed more than 600 dams and reservoirs including Hoover Dam on the Colorado River and Grand Coulee on the Columbia River.

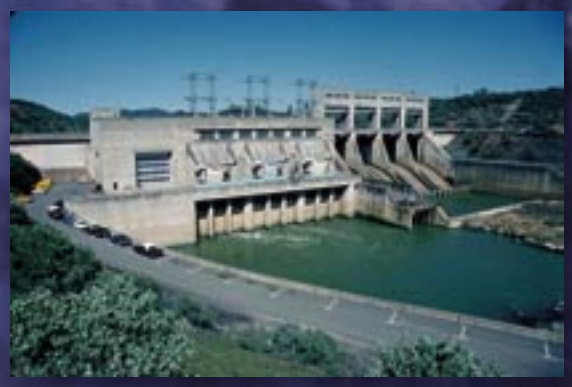
Today, we are the largest wholesaler of water in the country. We bring water to more than 31 million people and provide one out of five western farmers (140,000) with irrigation water for 10 million acres of farmland that produce 60 percemts of the nation's vegetables and 25 percents of its fruits and nuts.

Reclamation is also the second largest producer of hydroelectric power in the western United States. Our 58 power plants annually provide more than 40 billion kilowatt hours generating nearly $1 billion dollar in power revenues and produce enough electricity to serve 6 million homes.

This is a map that is used widely within the Mid-Pacific Region, USBR, to show the location of water districts along with other ancillary data.

The map shows just the northern half of California.

Today, Reclamation is a contemporary water management agency with a Strategic Plan outlining numerous programs, initiatives, and activities that will help the western states, Native American Tribes, and others meet new water needs and balance the multitude of competing uses of water in the West. Our mission is to assist in meeting the increasing water demands of the West while protecting the environment and the public's investment in these structures. We place great emphasis on fulfilling our water delivery obligations, water conservation, water recycling and reuse, and developing partnerships with our customers, states, and Indian Tribes and in finding ways to bring together the variety of interests to address the competing needs for our limited water resources.



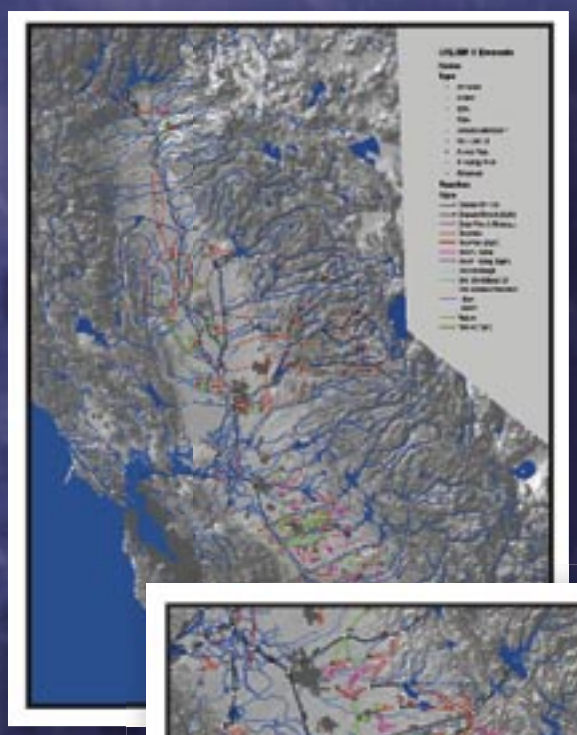
For more information, visit www.usbr.gov

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Bureau of Reclamation

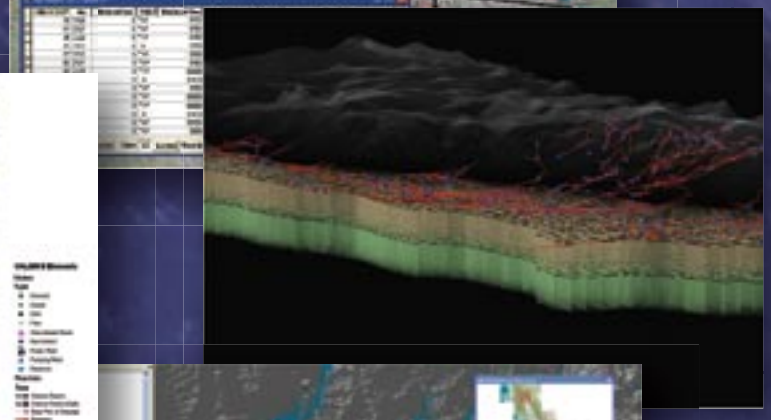
How does Reclamation use GIS in support of its mission?

Reclamation uses GIS and related geospatial technologies to improve its ability to make good business decisions associated with water resources management; efficient and effective land use; and facilities management, natural resources, and earth science applications. Activities range from monitoring and managing water usage on the Colorado River to administering Reclamation lands for watershed protection and recreation to developing flooding inundation maps in support of the emergency management programs associated with its facilities.

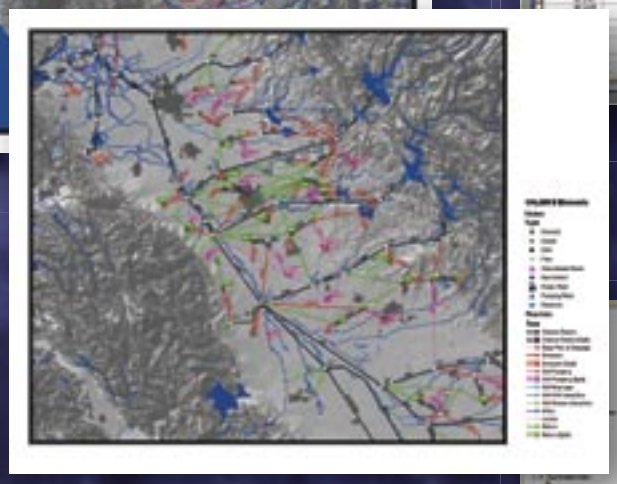


Overview of CALSIM Model. CALSIM is the new California state water operational planning model.

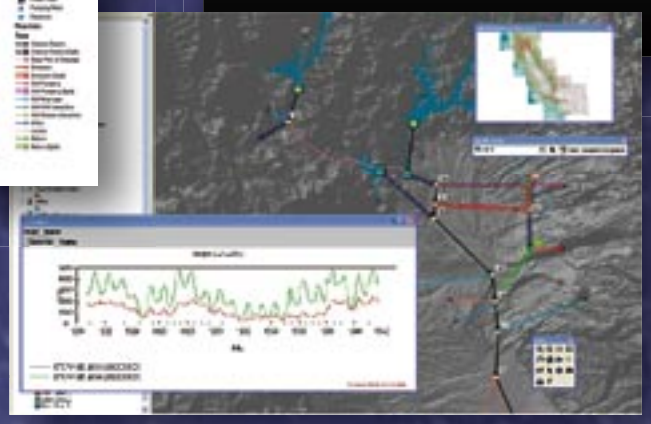
Zoom of model components in the Feather River area showing tools that allow for visualization of model parameters



Use of ArcScene to evaluate the potential of integrating CALSIM with CVGSM (ground water model)



Zoom of model components in the San Joaquin Valley



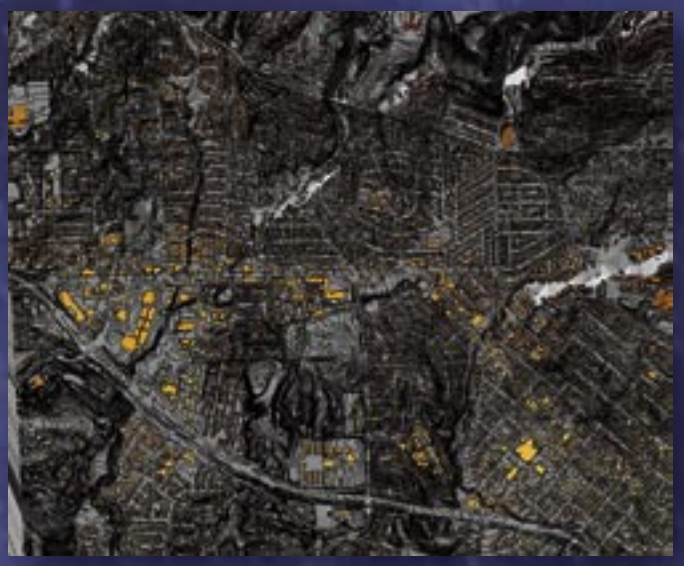
Interface designed in ArcObjects to display hydrographic data related to model nodes.

For more information, visit www.usbr.gov

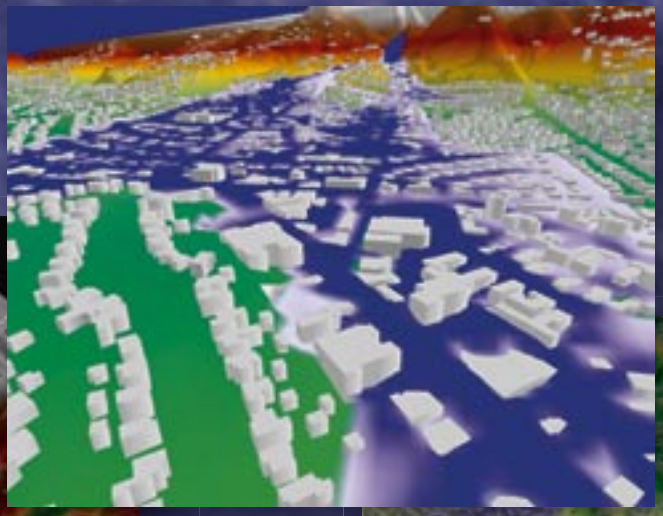
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Bureau of Reclamation

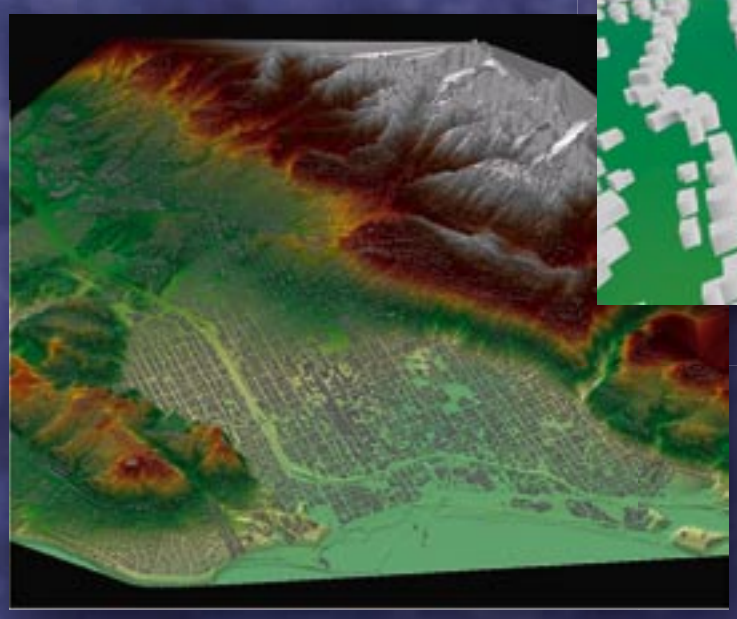
This map was presented at the 2003 ESRI User Conference. It shows reservoir capacities in California in an interesting display format. Clouds were processed in PhotoShop and brought into ArcMap.



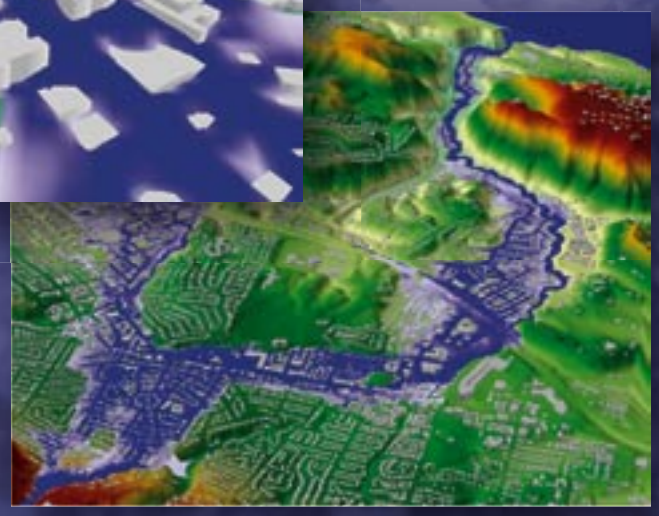
Source data used to generate elevation model to submit to hydrodynamic model. Obtained 2-foot contours, retaining walls, and building footprints from city in CAD format. Converted to ArcGIS.



Interesting zoom of buildings being inundated



Resultant elevation model visualized in ArcScene



Maximum inundation resulting from model scenario

For more information, visit www.usbr.gov

U.S. Fish and Wildlife Service

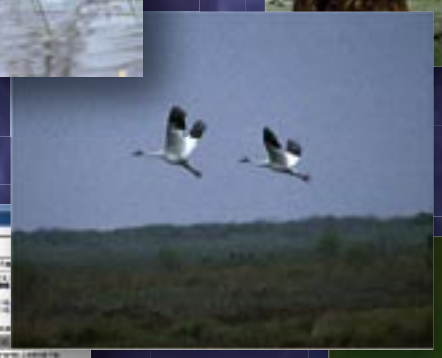
Mission

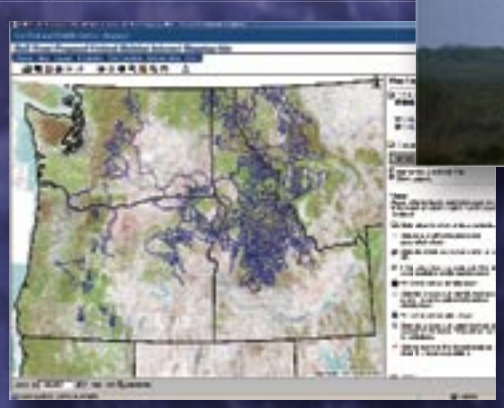
Working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

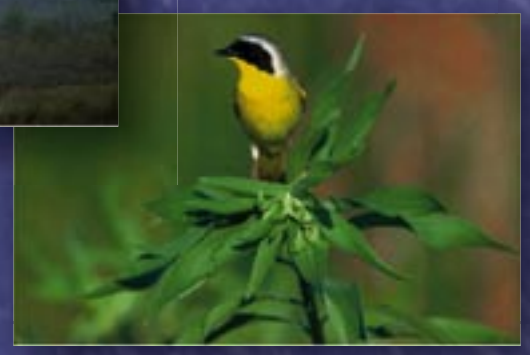
Migratory Bird Program

Vision

Migratory bird populations and their habitats are effectively conserved and managed, through sound science and diverse partnerships, at levels that recognize their ecological significance and provide continued opportunities for human use and enjoyment.







Use of GIS by the Migratory Bird Program

The Bird Conservation Node provides access to bird population and habitat information relevant to population management, conservation planning, and evaluation. To make important agency databases available through the Bird Conservation Node, the Fish and Wildlife (FWS) and USGS formed the Migratory Bird Data Center. Building on the complementary capabilities of FWS and the USGS, the objectives of this center are to: (1) assemble and document bird population and habitat data maintained by these agencies at their finest levels of spatial and temporal resolution; (2) ensure that databases remain current through periodic update, and (3) provide Web-based access to the data by researchers and managers for strategic planning and evaluation of avian conservation strategies.

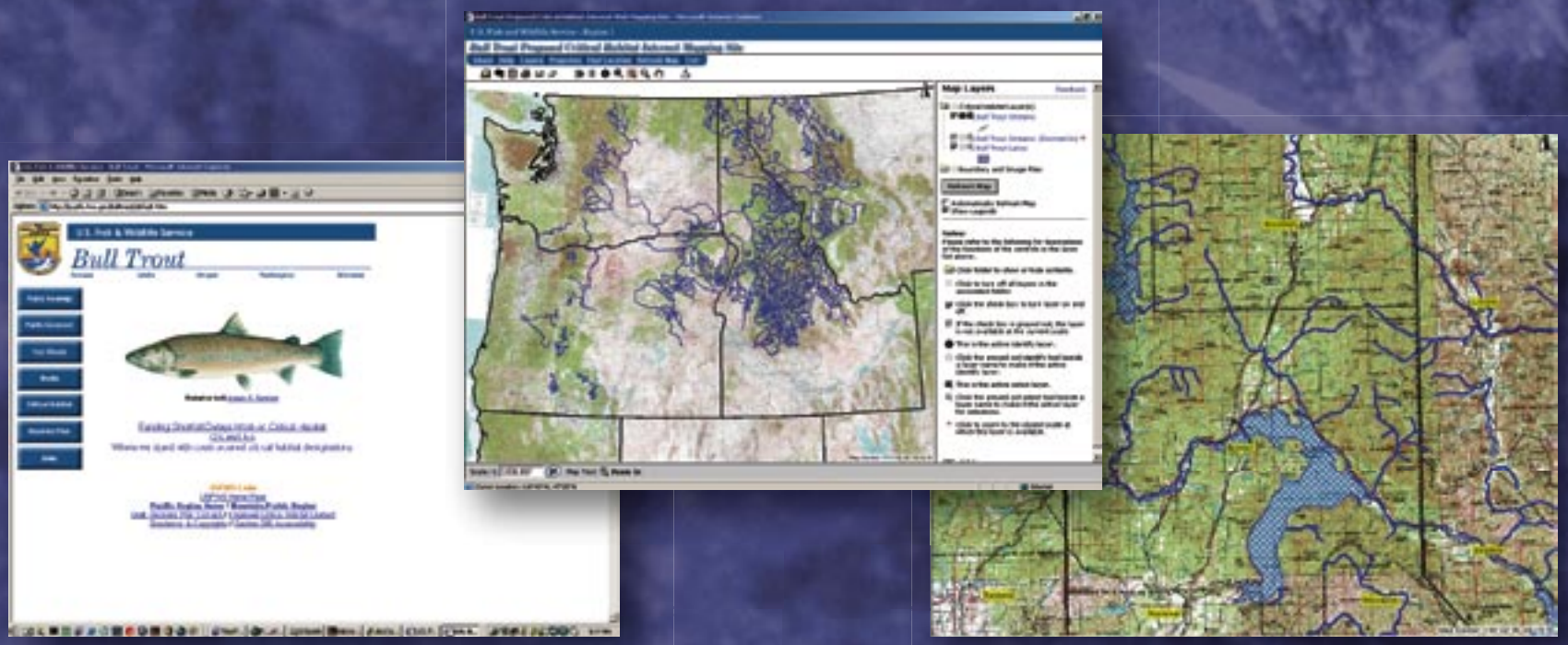
For more information, visit http://birddata.fws.gov

U.S. Fish and Wildlife Service

The Endangered Species Program

The purpose of the Endangered Species Act is to conserve "the ecosystems upon which endangered and threatened species depend" and to conserve and recover listed species. The Fish and Wildlife Service, in the Department of the Interior, and the National Oceanic and Atmospheric Administration (NOAA) Fisheries, in the Department of Commerce, share responsibility for administration of the Endangered Species Act.

The Portland, Oregon, Regional Office of the FWS has been using Internet mapping technologies to facilitate the sharing of data about critical habitat for endangered species. For more information, please visit http://region1ims.r1.fws.gov/



For more information, visit http://endangered.fws.gov

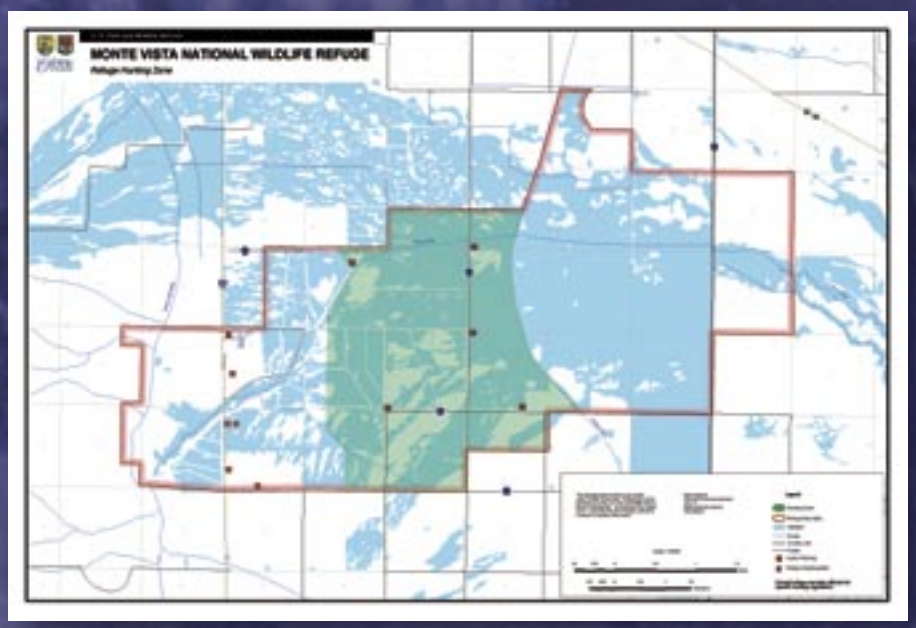
U.S. Fish and Wildlife Service

National Wildlife Refuge System

Vision

To administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

The National Wildlife Refuge System was 100 years old in 2003! We've grown a lot since Pelican Island National Wildlife Refuge (NWR), the first refuge, was created by President Theodore Roosevelt. Please visit us at ***http://refuges.fws.gov/centennial/index.html*** *to learn abut our history and how you can celebrate with us.*



The Refuge System is now using GIS in many ways. An updated map displaying where the refuges are located can be found at ***http://refuges.fws.gov***

We are also using GIS technology to help create comprehensive conservation plans for every refuge in the system. These plans include information on activities such as hunting on the refuges.

For more information, visit http://refuges.fws.gov

U.S. Fish and Wildlife Service

Branch of Habitat Assessment—Wetlands Inventory Providing Wetland Information to the American People

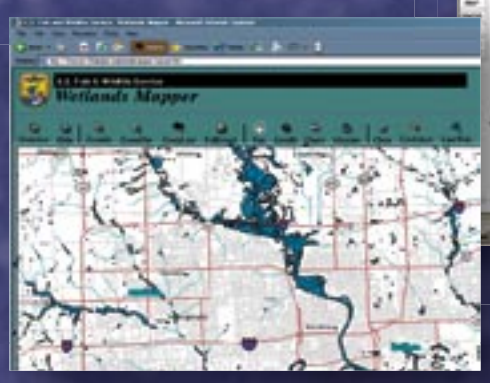
Goal Statement

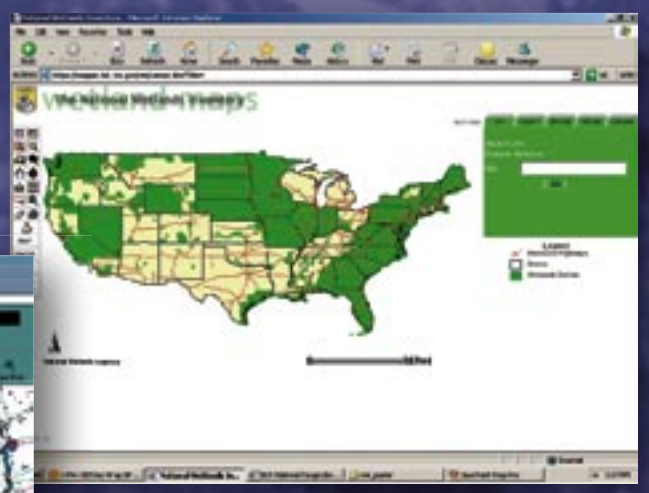
The goal of the National Wetlands Inventory (NWI) Project is to provide the citizens of the United States and its Trust Territories with current geospatially referenced information on the status, extent, characteristics, and functions of wetlands, riparian, deepwater and related aquatic habitats in priority areas to promote the understanding and conservation of these resources.

As part of the Branch of Habitat Assessment, the wetland inventory component provides ecological information and habitat assessment tools for the protection, restoration, and management of the nation's fish and wildlife. These items in addition to the wetlands status and trends reporting decision making by the Service and others. This information is an important indicator of the habitat conservation needs and successes of the nation.

Use of GIS by the National Wetlands Inventory

The National Wetlands Inventory is using GIS to more efficiently update digital maps and to make wetlands information more readily available on the Internet. The wetlands map site provides a number of GIS tools to view data, save graphics, download data, and discover information about wetlands across the country.





For more information, visit http://www.nwi.fws.gov

Minerals Management Services

MMS

U. S. Department of the Interior
Minerals Management Service

Offshore Energy, Science and Technology

Provide Energy for America's Future

The Minerals Management Service (MMS) is the Federal agency in the U.S. Department of the Interior that manages the Nation's oil, natural gas, and other mineral resources on the Outer Continental Shelf (OCS) in an environmentally sound and safe manner. It also collects, accounts for and disburses mineral revenues from Federal and American Indian leases.

Resource Evaluation

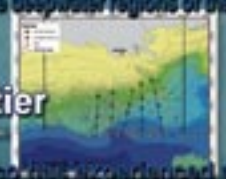
The Federal Government leases the right to explore and develop oil and gas resources on the OCS. The Minerals Management Service issues permits for prelease activities, evaluates resources, leases acreage, and regulates drilling and production activities. Resource assessment and reserves estimation are based on acquisition and analysis of geological and geophysical (seismic) data.

Protect the Environment and Regulate the Industry

As manager of the Nation's offshore mineral resources, the Minerals Management Service continually strives to maintain a balance between providing energy and protecting the Nation's unique and sensitive coastal and marine environments. The safety of offshore personnel and protection of the environment are paramount goals for MMS and OCS operators.

Offshore Technology Rivals The Space Program

Advances in technology supported by a Federal regulatory system incorporate sound scientific research. The development of new technology is encouraged to enhance current production in the deepwater regions of the Gulf of Mexico.

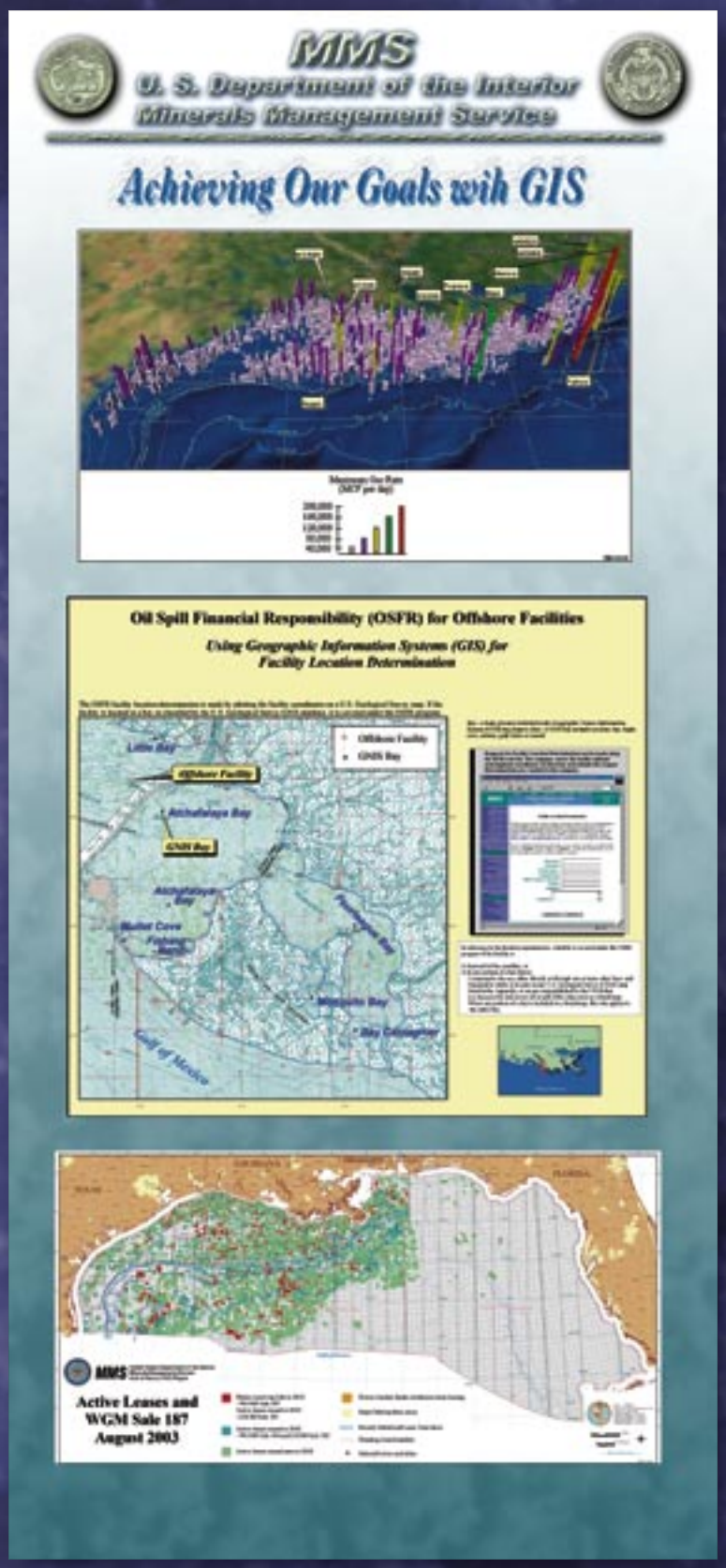


America's Expanding Frontier

Since 1992, the deepwater Gulf of Mexico has experienced a phenomenal growth in oil and gas activities. The estimated 570 million barrels of oil produced in year 2001 is a 9% increase over the 522 million barrels in 2000. This increase occurred solely because of the tremendous increase coming from the deepwater (1,000 ft. or greater). In the past year, deepwater oil production has grown 24% to 335 million barrels.

For more information, visit www.mms.gov

Minerals Management Services



For more information, visit www.mms.gov

National Park Service

Mission

The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The National Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

Goals

- Preserve Park Resources.
- Provide for the Public Enjoyment and Visitor Experience of Parks.
- Strengthen and Preserve Natural and Cultural Resources and Enhance Recreational Opportunities Managed by Partners.

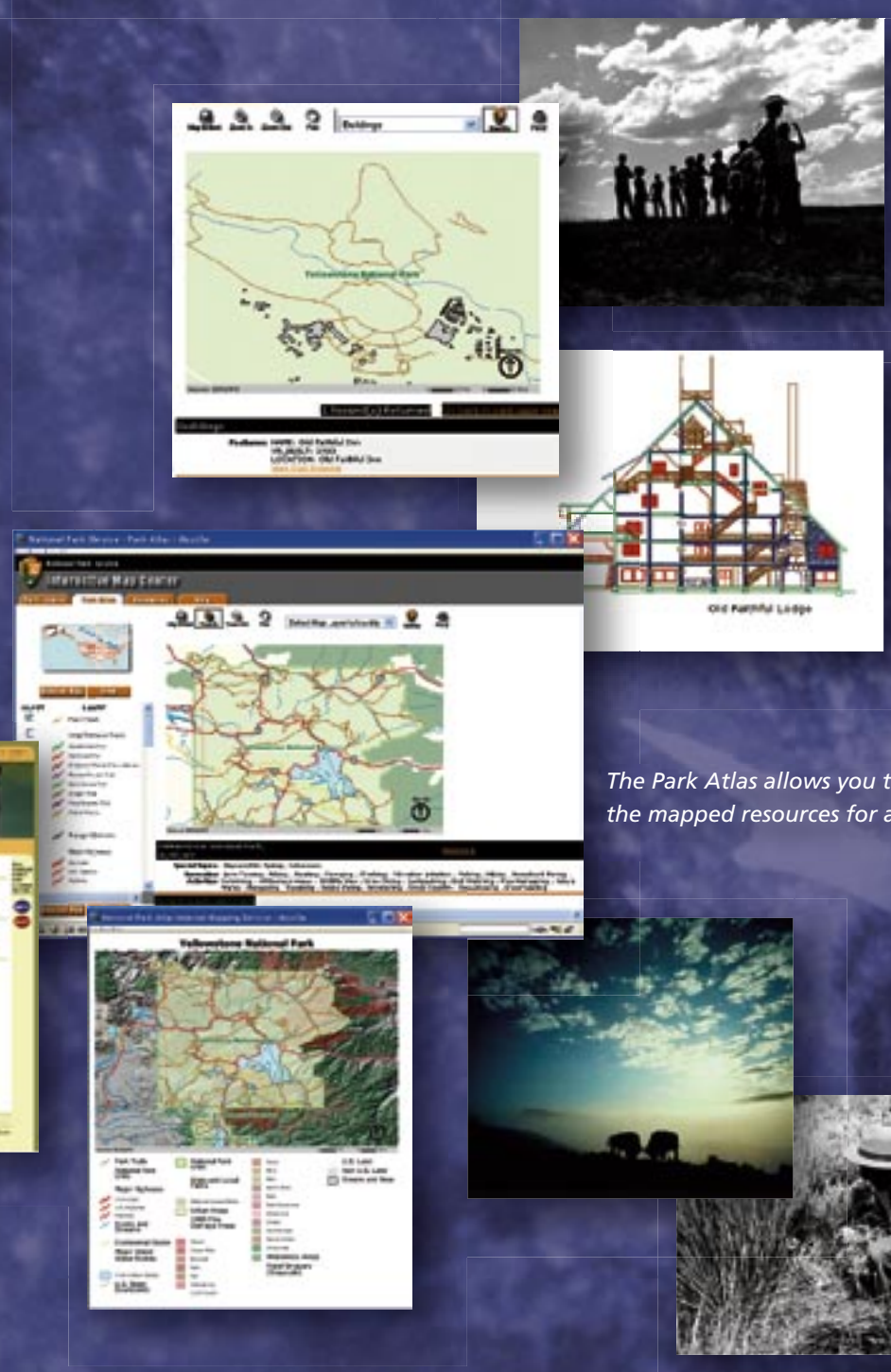
For more information, visit www.nps.gov

National Park Service

Interactive Map Center

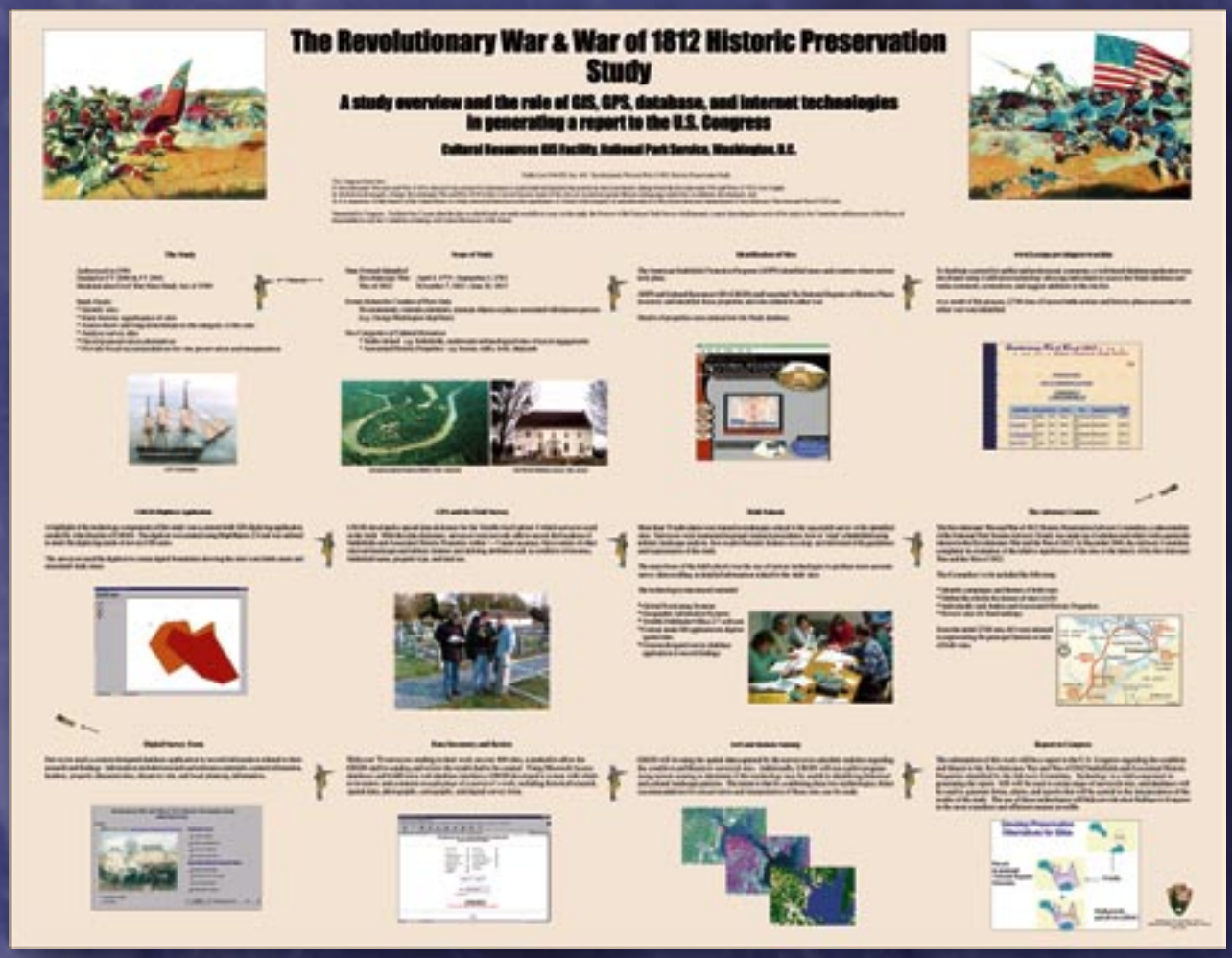
The Interactive Map Center (IMC) contains information about and maps of national parks. The IMC delivers basemaps and park brochure maps for geographic reference and navigation to and within parks. Across the top of the Web page are tabs that switch you from Park Locator to Park Atlas to Resource Links, and Online Help. The Park Locator gives you the ability to identify and navigate to any park in the National Park System. The Park Atlas allows you to explore the mapped resources for all parks. In both Atlas and Locator applications, you can view maps from a national view down through high-resolution views of individual parks (http://maps.nps.gov/).

The Park Locator gives you the ability to identify and navigate to any park in the National Park System.

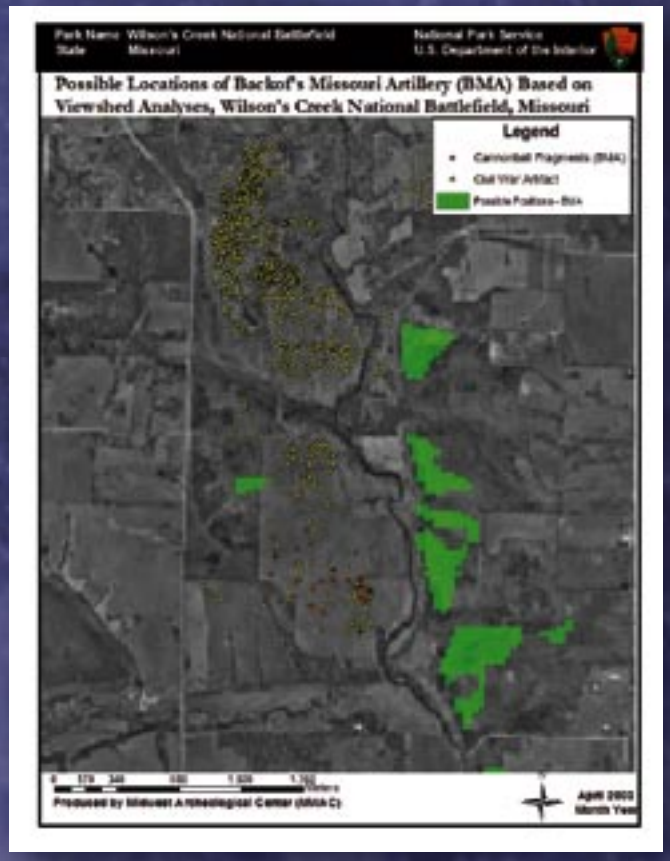


The Park Atlas allows you to explore the mapped resources for all parks.

For more information, visit www.nps.gov



Integration of GIS, GPS, remote sensing, and digital database technologies used to survey Revolutionary War and War of 1812 sites



Viewshed analysis illustrating positions from which Backof's Missouri Artillery (US) could have fired on the Confederate cavalry camps during the opening stages of the battle

Cultural Resource GIS for Appomattox Court House

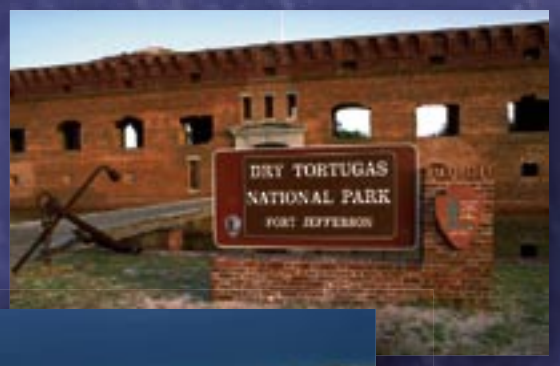
For more information, visit www.nps.gov

National Park Service

Visitor Recreation

Park rangers and others who share their knowledge of our national park lands are always looking for ways to inspire visitors. This is a constant challenge for park interpreters, as visitors grow increasingly sophisticated in what they expect from gift shops, museums, trailside displays, brochures, and Web sites. Park interpreters now have a new and exciting tool to communicate a sense of place to park visitors. National parks, in partnership with the U.S. Geological Survey, have created GIS maps that offer stunning 3-D images of park topography and key features.

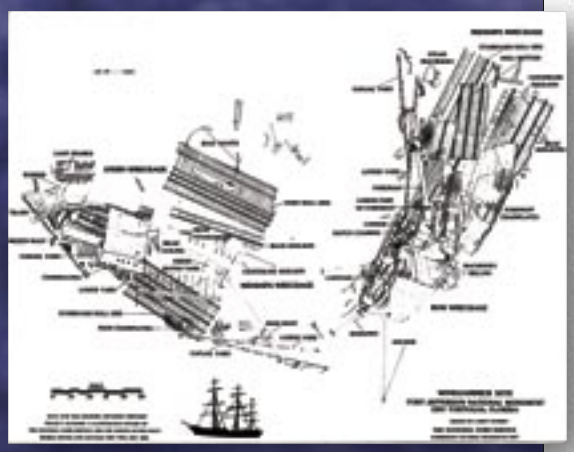
Canal Boat Interpretive Program at Great Falls



Fort Jefferson on Garden Key at Dry Tortugas National Park.

View of Potomac River looking toward Mather Gorge

Visitors to the Windjammer wreck site can use the underwater trail guide to enjoy this historic wreck site.



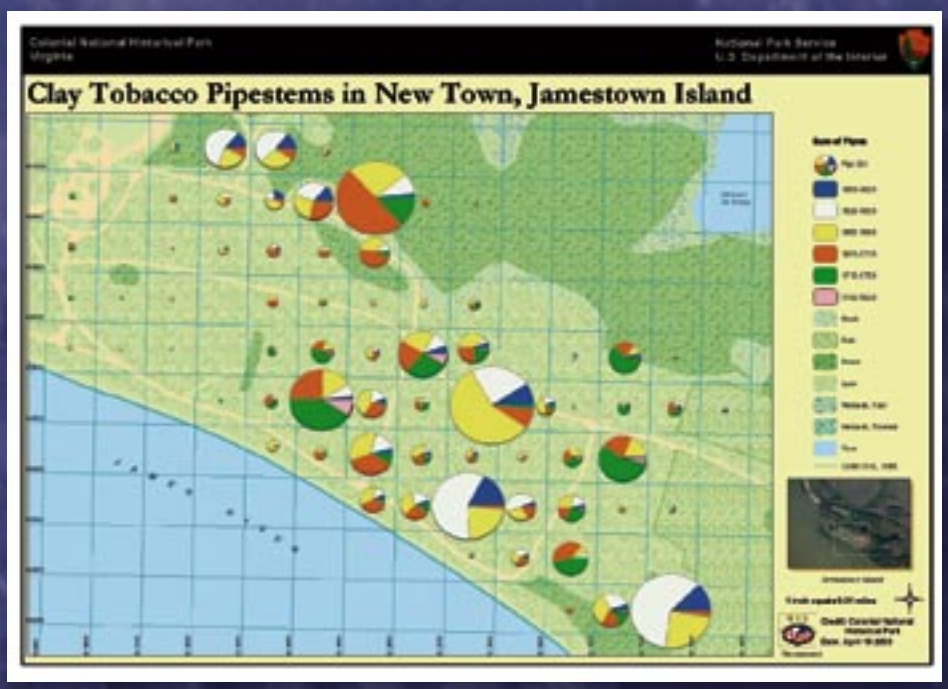
Windjammer trial guide

For more information, visit www.nps.gov

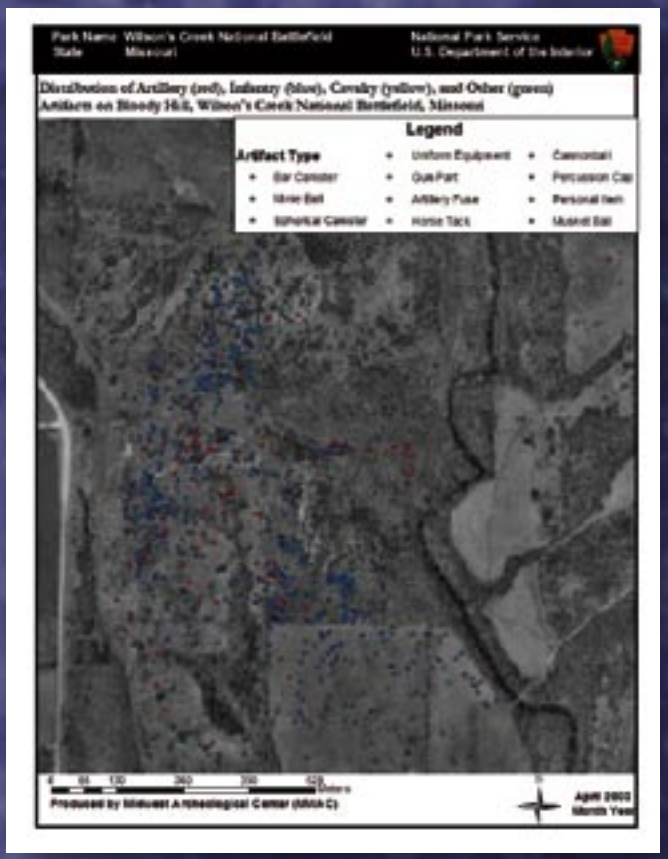
National Park Service

Cultural Resources

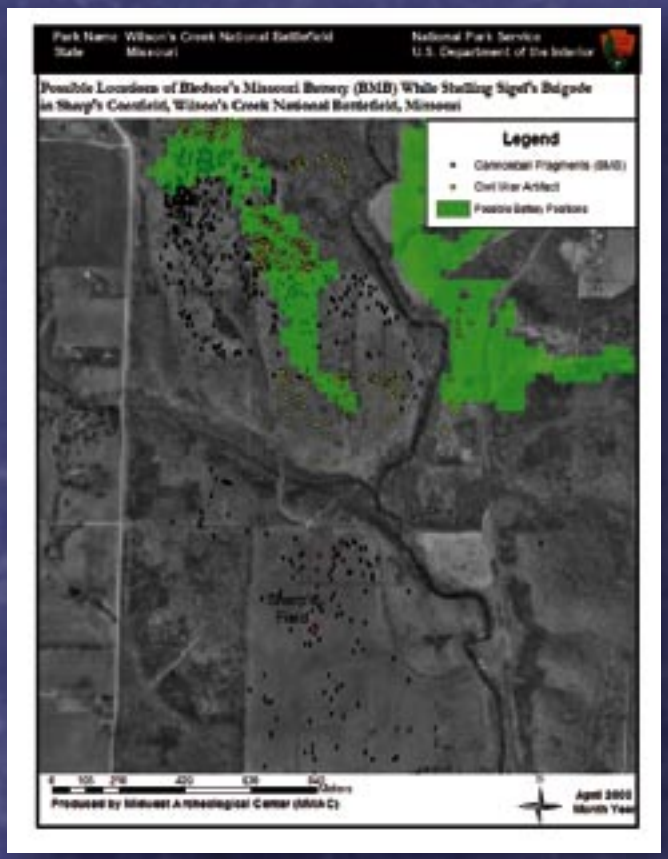
The National Historic Preservation Act became law on Oct. 15, 1966. Congress noted "the historical and cultural foundations of the nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people." Preserving archaeological sites, and historic buildings and landscapes must take place within the context of the evolution of American communities. Making this concept a reality is no easy task.



English settlers from the Jamestown colony in Virginia have left us a blueprint of urban growth, if clay tobacco pipe stems found in the "New Towne" area are any indication. Widespread excavations of the first permanent English colony nearly 400 years ago have turned up an enormous number of artifacts in the New Towne, pipe stems among them. Updating earlier findings, Colonial National Historical Park imported archaeological site data into an ESRI geodatabase to show the numbers and sizes of pipe stems found in 100-foot square grids overlaid on the New Towne area of Jamestown Island. The park service, which administers the site together with the Association for the Preservation of Virginia Antiquities, assigned a range of dates to the pipe stems based on their bore diameter and on J.C. Herrington's archaeological 1954 work, "Dating Stem Fragments of Seventeenth and Eighteenth Century Clay Tobacco Pipes." The findings help plot the haphazard course on New Towne settlement, daily life, and later abandonment in the 17th century.



Artifact distribution on Bloody Hill



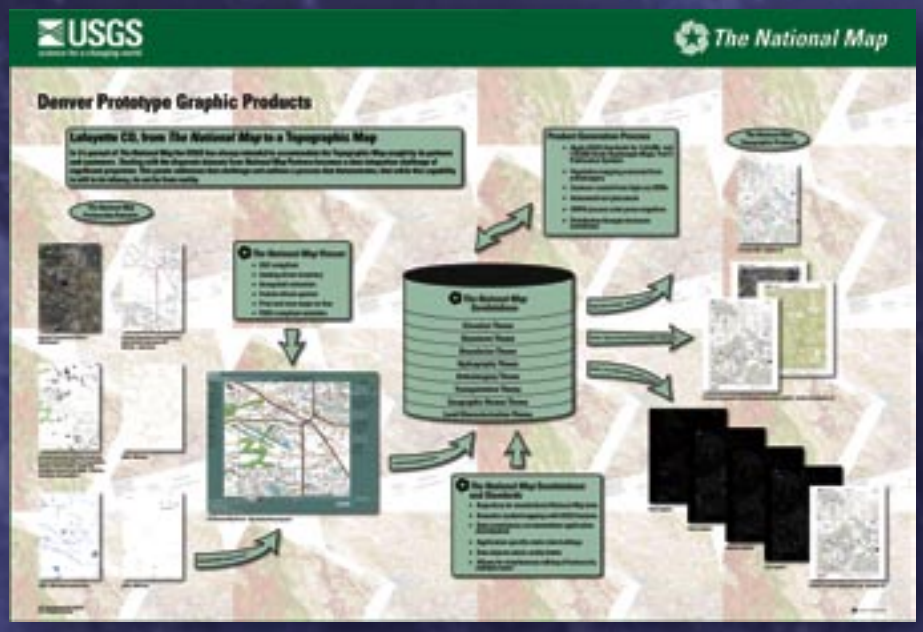
Viewshed analysis illustrating positions from which Bledsoe's Missouri (CS) battery could have fired on Sigel's Brigade in Sharp's Cornfield

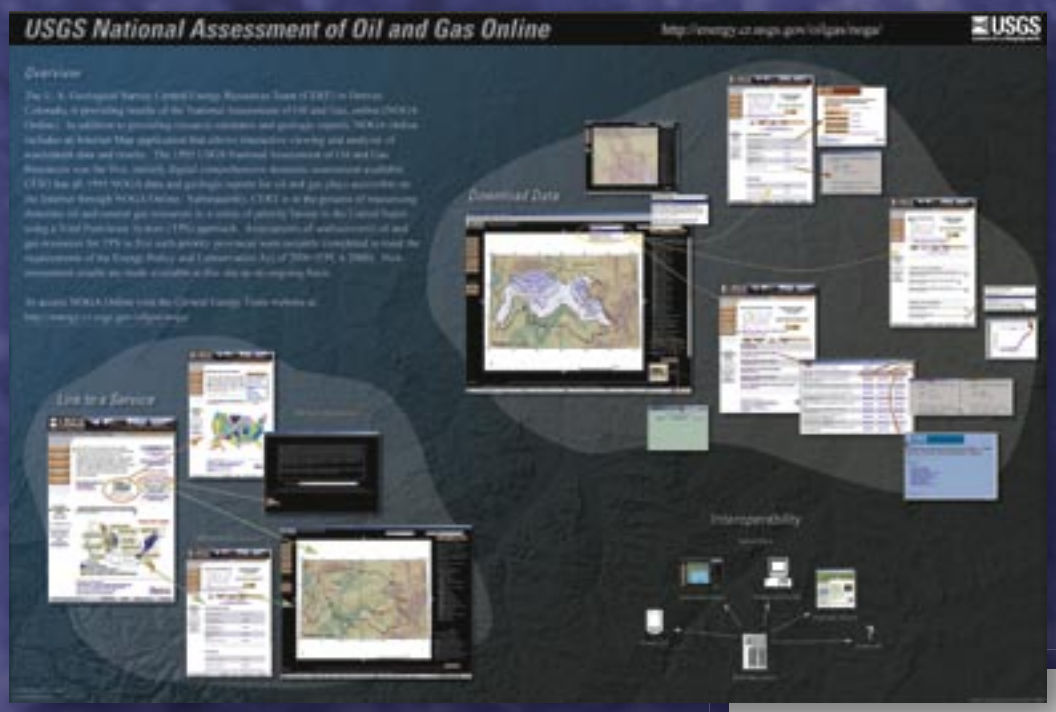
U.S. Geological Survey

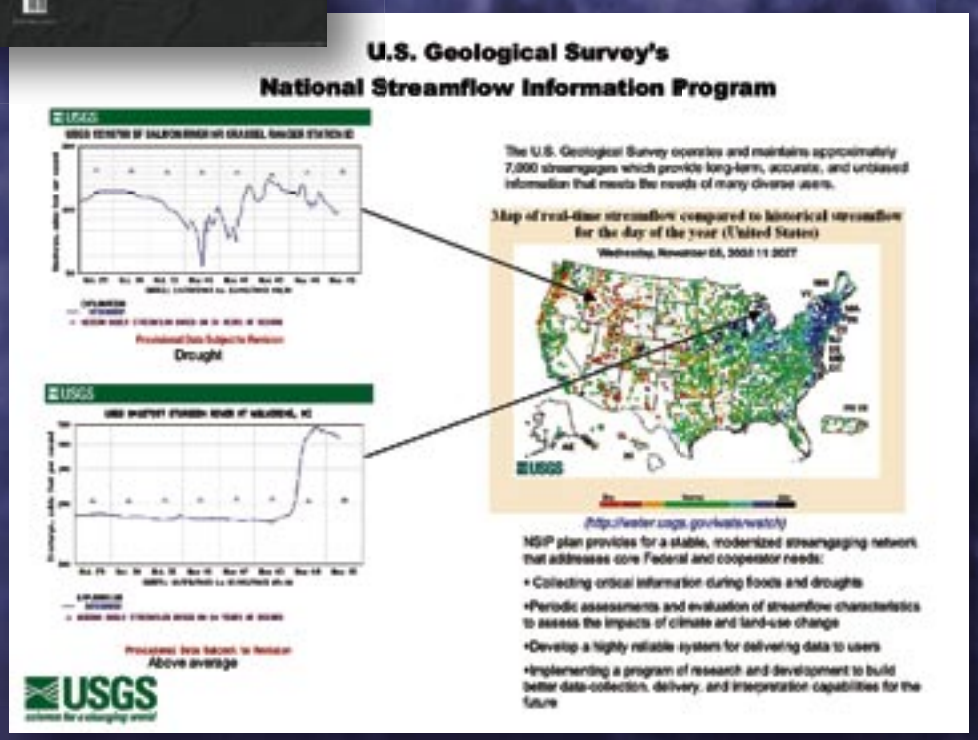
Mission

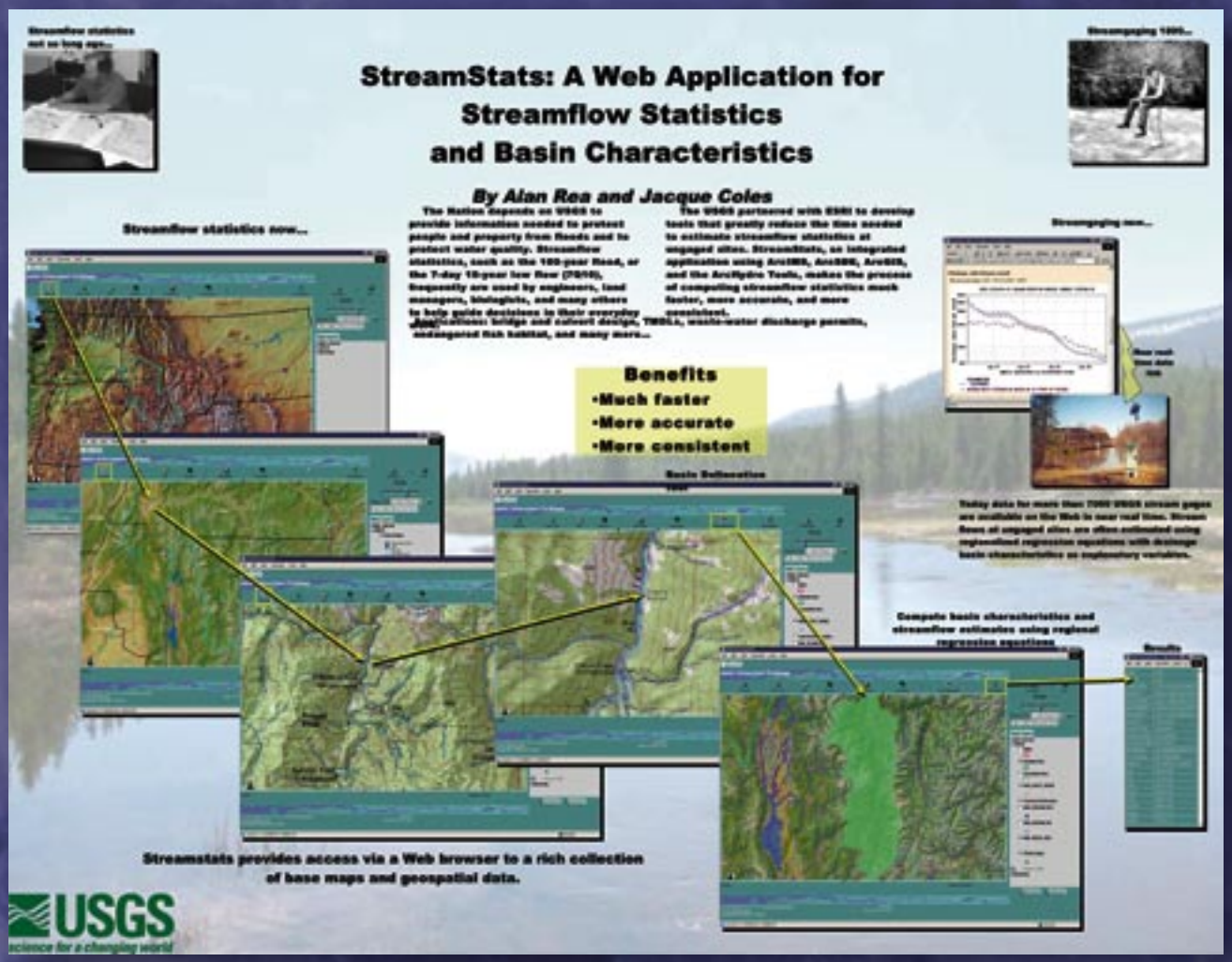
The USGS serves the nation by providing reliable scientific information to

- **Describe and understand the Earth.**
- **Minimize loss of life and property from natural disasters.**
- **Manage water, biological, energy, and mineral resources.**
- **Enhance and protect our quality of life.**









For more information, visit www.usgs.gov

USGS
science for a changing world

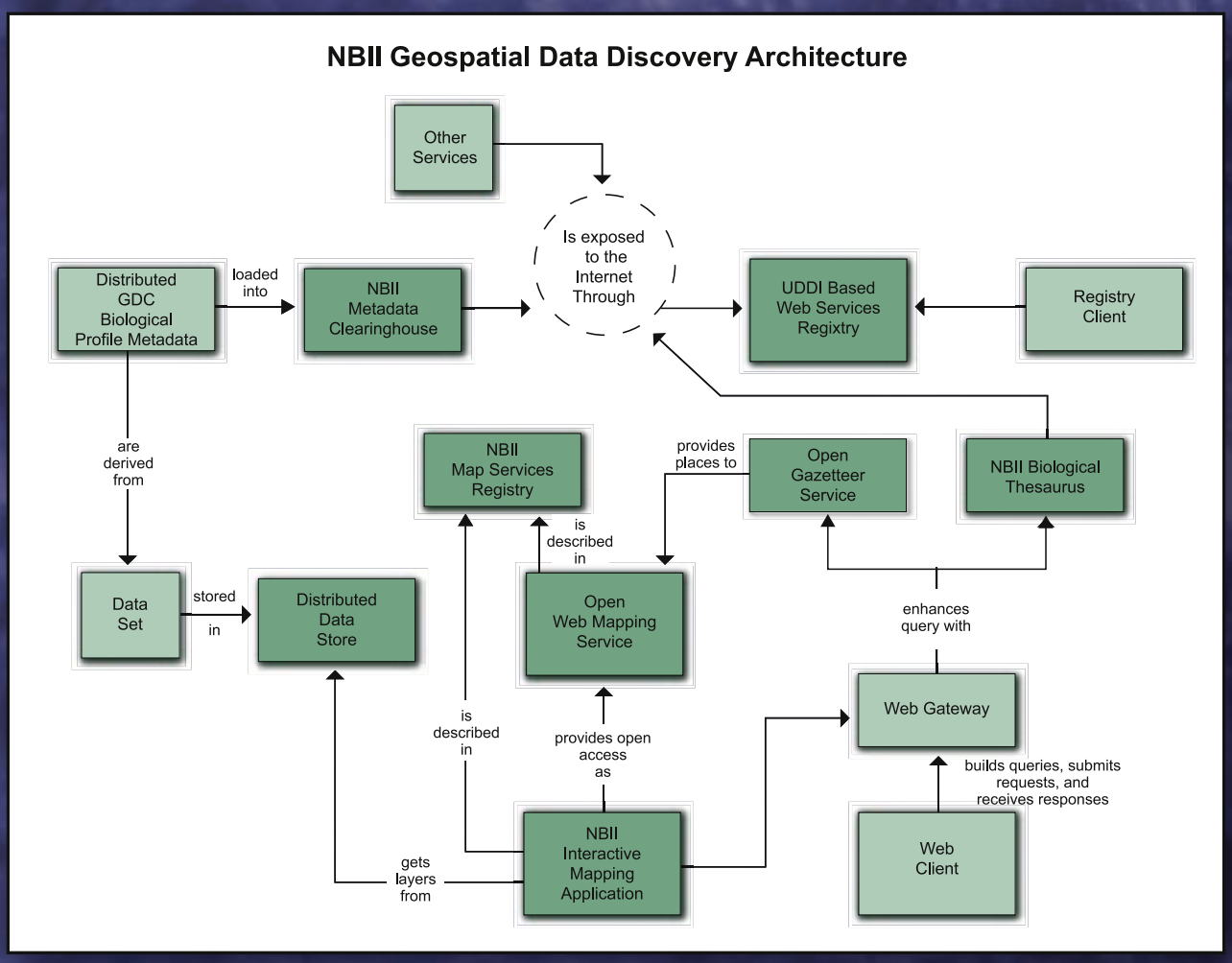
National Biological Information Infrastructure

Mission

The National Biological Information Infrastructure (NBII) is a broad, collaborative program to provide increased access to data and information on the nation's biological resources. All resources, information, and data within the NBII Web, when spatially relevant, will be geographically referenced, thereby extending the NBII's capability by providing geography as a key criterion for biological information gathering.

Geospatial Interoperability Program Goals

- Facilitate data discovery and visualization of data sets within the NBII Metadata Clearinghouse.
- Prototype Open GIS standards and development implementation guidelines.
- Create transparency within NBII interactive mapping applications across the distributed node structure of the NBII.
- Develop toolkits to assist in implementation of Web Mapping Service (WMS) standards for NBII nodes and partners.
- Provide integration with *The National Map* and the Geospatial One-Stop.



For more information, visit www.nbii.gov

Department of Health and Human Services

* Agency for Toxic Substances and Disease Registry (ATSDR)
- Center for Disease Control (CDC)
- National Cancer Institute (NCI)

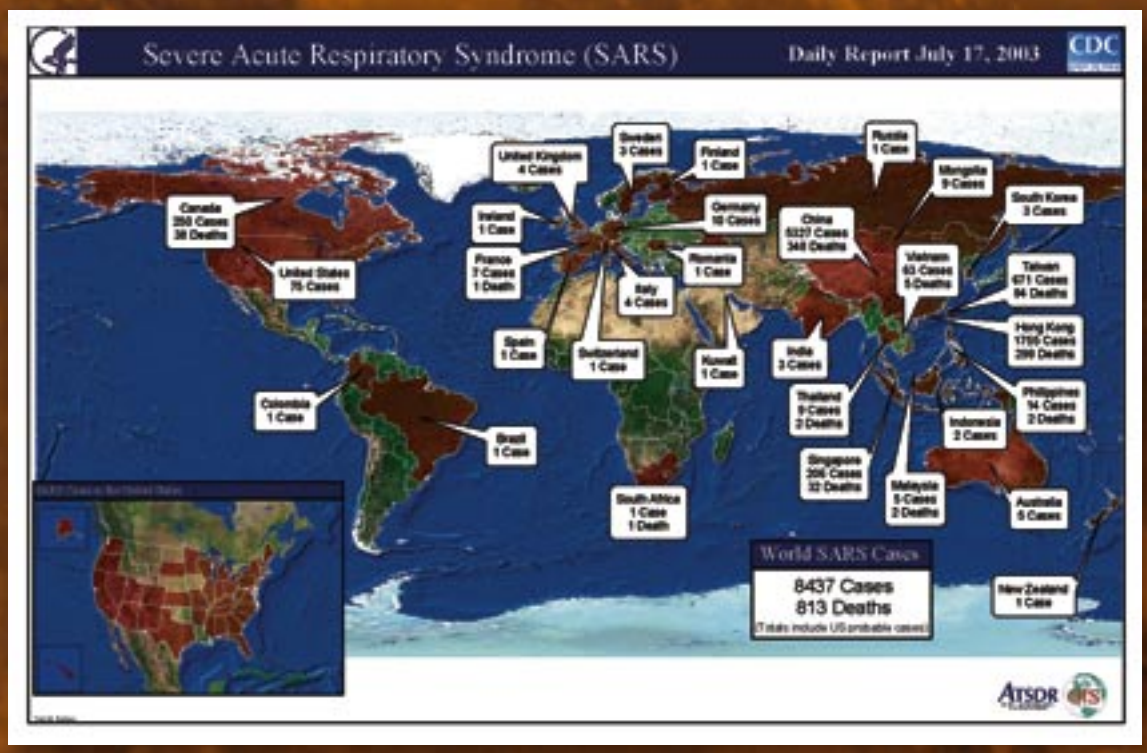
Department of Health and Human Services

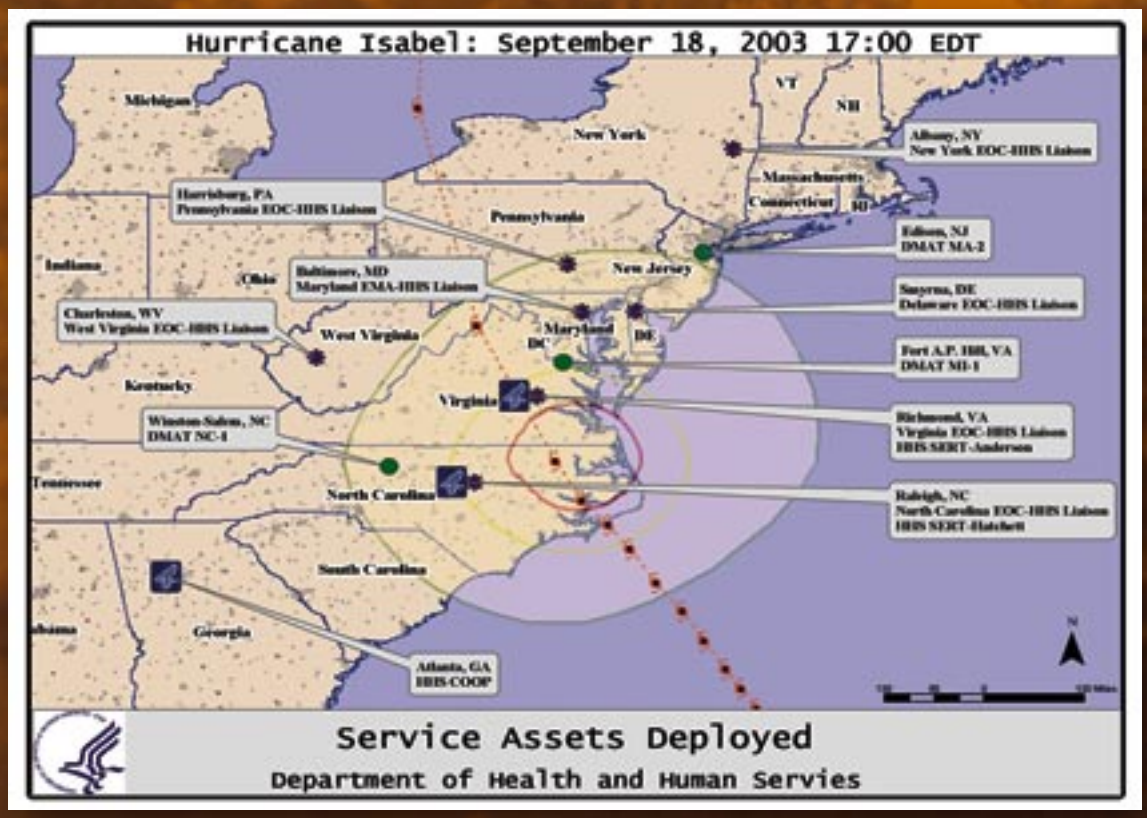
Leading America to Better Health, Safety, and Well-Being

Mission

The mission of Health and Human Service (HHS) is to enhance the health and well-being of Americans by providing effective health and human services and fostering strong, sustained advances in the sciences underlying medicine, public health, and social services.

- **Diseases and Conditions**
- **Safety and Wellness**
- **Food and Drug Regulation**
- **Disasters and Emergencies**
- **Families and Children**
- **Aging**
- **Public Health Resources**





Key Areas

Office of the Secretary/ Secretary's Command Center

The Secretary's Command Center functions as the principle point for coordination and facilitates information sharing among public health partners. Geospatial analysis provides the cornerstone for the management of national and international public health issues.

Mapping Technology for Public Health Surveillance, Preparedness, and Response

Agencies in the Department of Health and Human Services utilize geospatial technologies to manage public health assets, monitor the health of the nation, and track disease.

Using Geospatial Tools to Characterize Affected Populations

Researchers at HHS agencies use mapping technologies to determine how many people are potentially affected by a public health emergency.

For more information, visit http://gis.cdc.gov

National Center for Environment Health/Agency for Toxic Substances and Disease Registry

To Protect America's Health From Toxic Exposures

Mission

The mission of National Center for Environment Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR) is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and disease related to toxic substances.

- **Prevent ongoing and future exposures and resultant health effects from hazardous waste sites and releases.**
- **Determine human health effects associated with exposure to Superfund-related priority hazardous substances.**
- **Mitigate the risks of human health effects at toxic waste sites with documented exposures.**
- **Build and enhance effective partnerships to protect the health of communities that reside near hazardous waste sites.**

NCEH/ATSDR uses mapping technologies to characterize populations around hazardous waste sites and to protect potentially sensitive subpopulations.

NCEH/ATSDR's Geospatial Public Health Analysis Program serves as the core mapping and spatial analysis team in support of many of CDC/ATSDR's key program areas.

GATHER (the Geographic Analysis Tool for Health and Environmental Research) is an online spatial data access system that provides members of the public health community and the general public access to spatial data that is pertinent to the analysis and exploration of public health issues.

GATHER is powered by a GIS data warehouse hosted by ATSDR/CDC and is enhanced with features that are of key value to members of the public health community.

For more information, visit GATHER at http://gis.cdc.gov

Centers for Disease Control and Prevention

Healthy People in a Healthy World

Mission

The mission of CDC is to promote health and quality of life by preventing and controlling disease, injury, and disability.

CDC seeks to accomplish its mission by working with partners throughout the nation and world to monitor health, detect and investigate health problems, conduct research to enhance prevention, develop and advocate sound public health policies, implement prevention strategies, promote healthy behaviors, foster safe and healthful environments, and provide leadership and training.

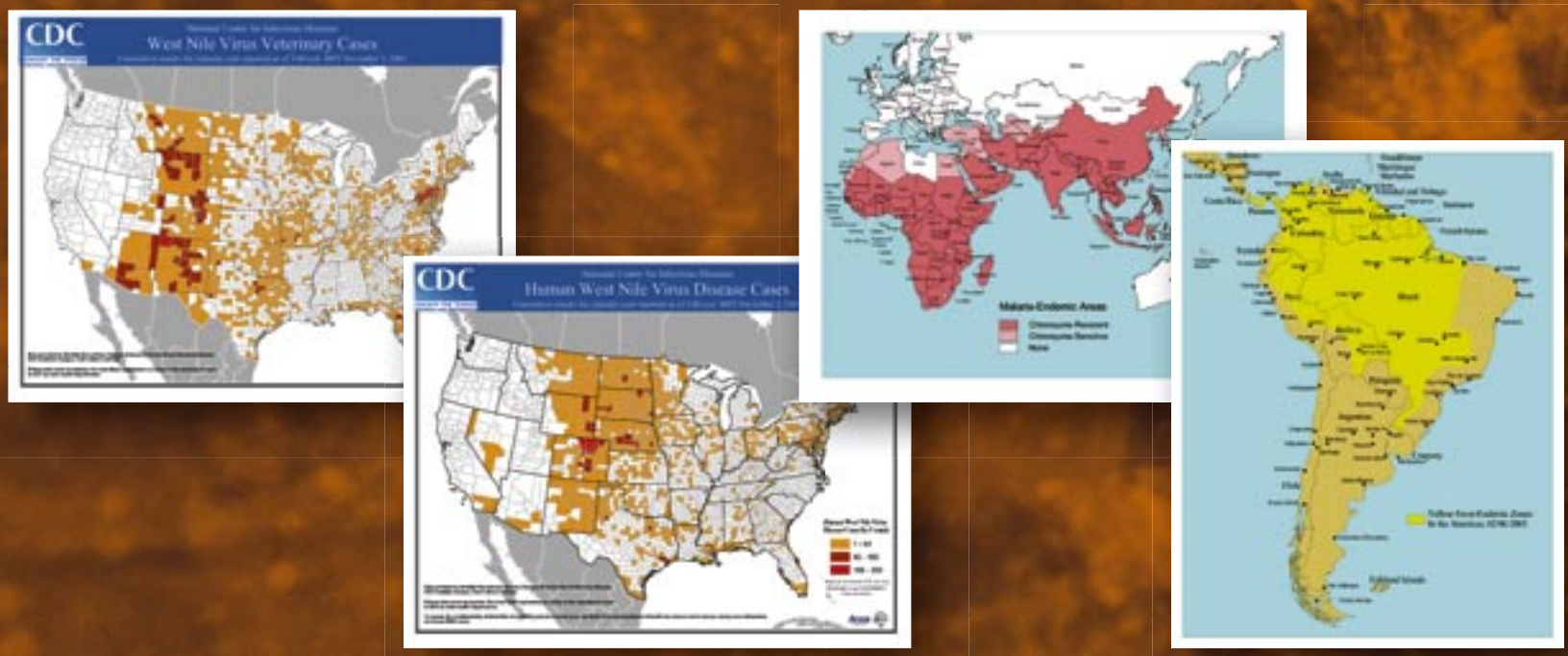
- **Prevents Illness, Disability, and Death Caused by Infectious Diseases in the United States and Around the World**
- **Protects Health and Safety**
- **Provides Credible Information to Enhance Health Decisions**
- **Promotes Health Through Strong Partnerships**
- **Prevents Violence and Unintentional Injury**

Mapping Technologies

CDC uses mapping technologies to monitor emerging infectious diseases.

Working with state and local governments, CDC is developing a public health information network to examine health trends and resource allocation in a geospatial context.

CDC uses geospatial tools and analyses to more effectively respond to public health emergencies and disasters, both natural and man-made.

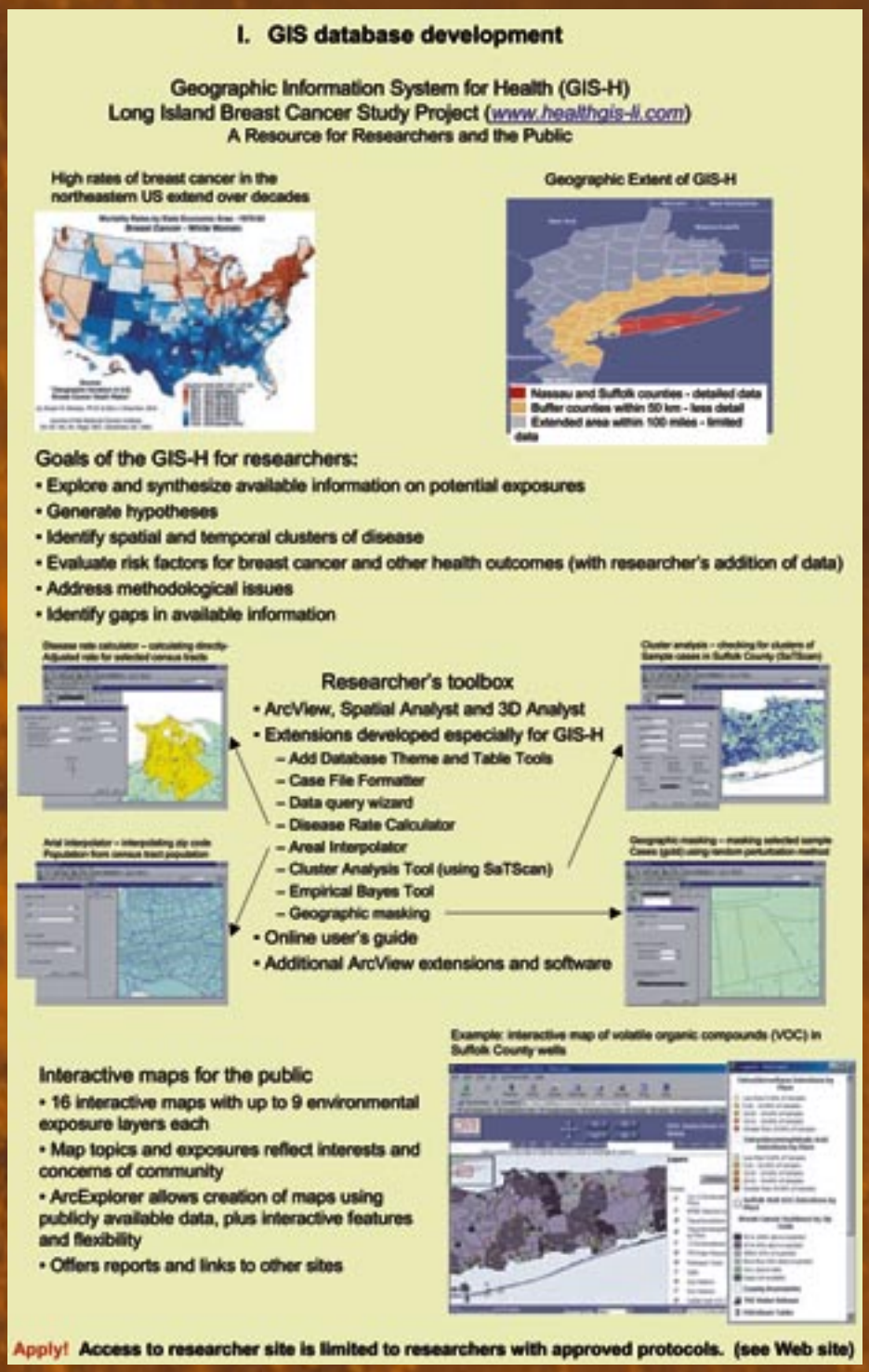


For more information, visit http://gis.cdc.gov

CDC
Centers for Disease Control and Prevention

Geographic-Based Research and Applications

National Cancer Institute



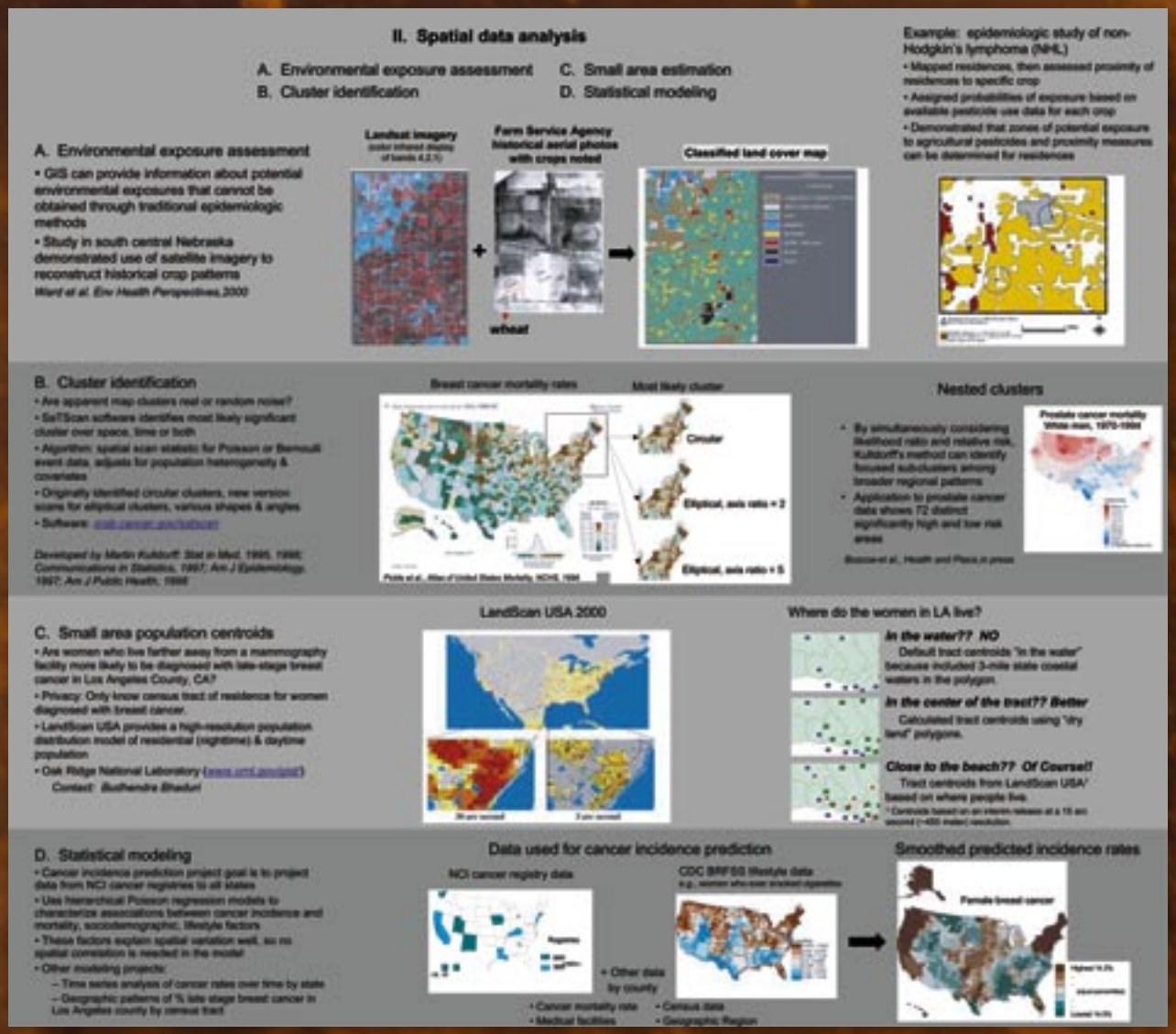
Linda Williams Pickle[1], Ellen F. Heineman[1], Mary H. Ward[1], B. Sue Bell[1], Dan J. Grauman[1], Daniel B. Carr[1], John R. Nuckols[2], Marcia Gumpertz[3]

National Cancer Institute, Bethesda, MD; 2Department of Environmental Health, Colorado State University, Ft. Collins, CO; 3Department of Statistics, North Carolina State University, Raleigh, NC

For more information, visit www.healthgis-li.com

Geographic-Based Research and Applications

National Cancer Institute



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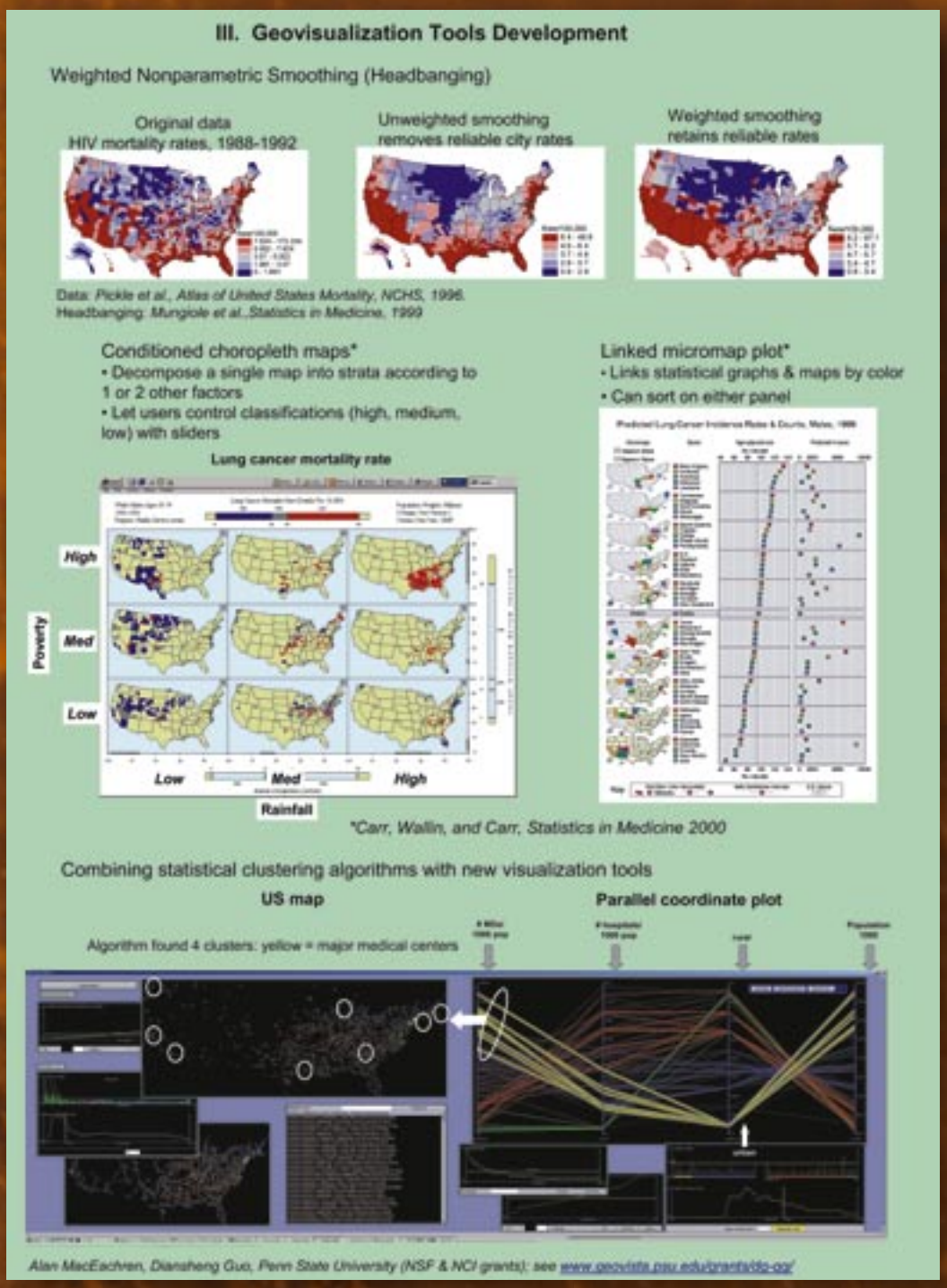
Sections II C, III, IV A: B. Sue Bell BellSu@mail.nih.gov

Section IV B: Dan J. Grauman GraumanD@mail.nih.gov

Geographic-Based Research and Applications

National Cancer Institute



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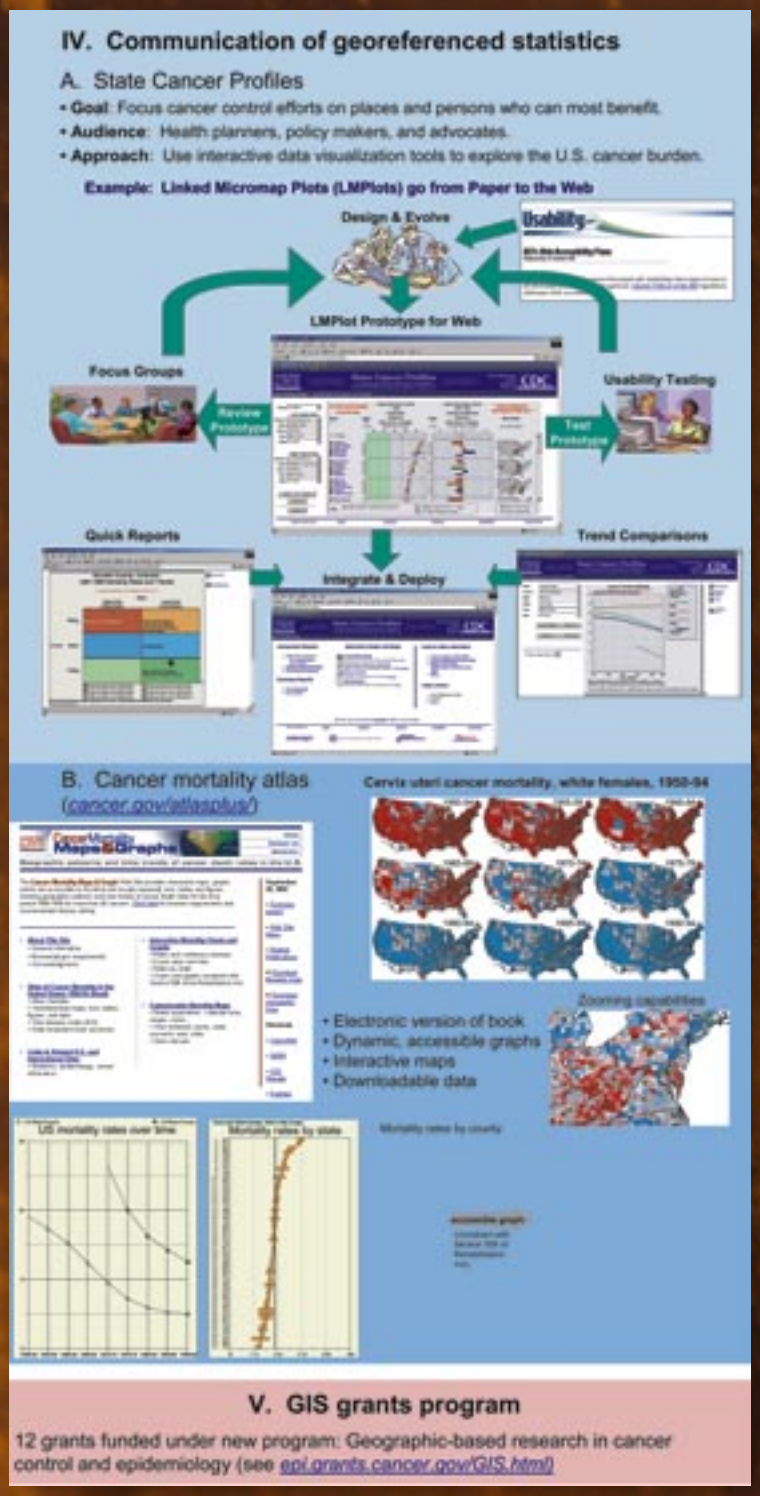
National Cancer Institute



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For more information, visit www.healthgis-li.com

Environmental Protection Agency

U.S. Environmental Protection Agency

Mission

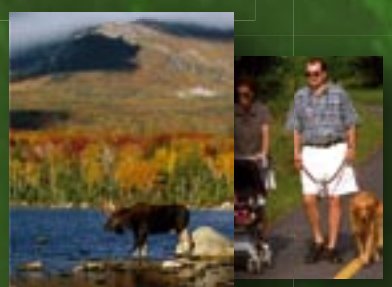
To protect human health and safeguard the natural environment—air, water, and land—upon which life depends.

Five Long-Term EPA Goals

Clean Air

Clean and Safe Water

Land Preservation and Restoration



Healthy Communities and Ecosystems

Compliance and Environmental Stewardship

Geospatial Blueprint Vision

EPA will improve protection of the environment and public health through the efficient and effective use of geospatial data and technologies to conduct business.

Five Geospatial Blueprint Goals

Goal 1: Improve EPA decision making by incorporating location-based approaches, data, tools, and knowledge into EPA business processes.

Goal 2: Provide EPA, its partners, and the public with the geospatial data they need to carry out EPA business processes and make environmental decisions.

Goal 3: Provide EPA staff, partners, and the public with applications and Web services to access, manage, use, analyze, present, and interpret geospatial data to conduct business and make environmental decisions.

Goal 4: Design and implement an enterprisewide technical infrastructure that supports access, use, management, and delivery of distributed geospatial data, applications, and Web services in a seamless manner.

Goal 5: Establish an effective governance structure for setting priorities for geospatial investments, coordinating geospatial efforts, and communicating how geospatial data and technologies are used within the agency.

For more information, visit www.epa.gov

Clean Air

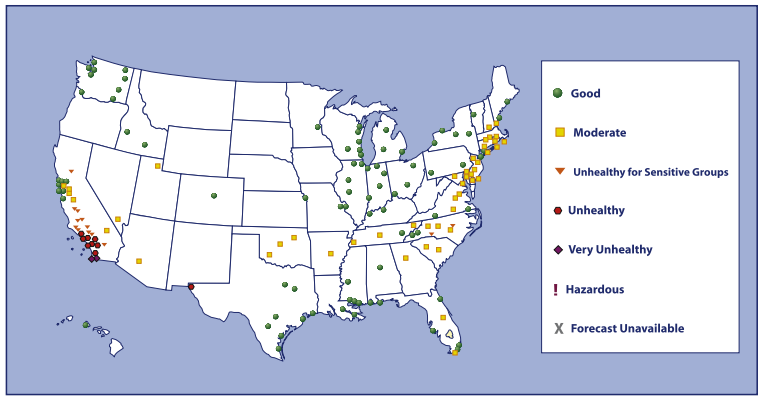
Goal

Protect and improve the air so it is healthy to breathe and risks to human health and the environment are reduced. Reduce greenhouse gas intensity by enhancing partnerships with businesses and other sectors.

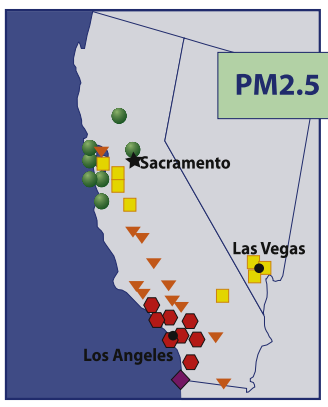
AIRNOW
www.epa.gov

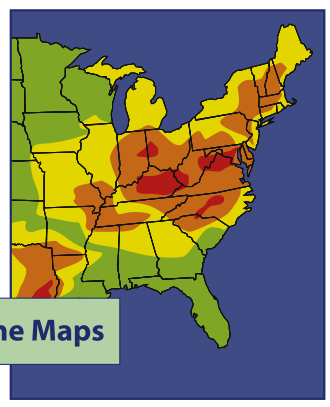
The U.S. EPA has developed the AIRNow website to provide the public with easy access to national air quality information. This website offers daily Air Quality Index forecasts as well as real-time conditions for over 300 cities across the U.S.

Ozone and PM2.5 Forecasts



Current Air Quality Conditions





For more information, visit www.epa.gov

Clean and Safe Water

Objectives

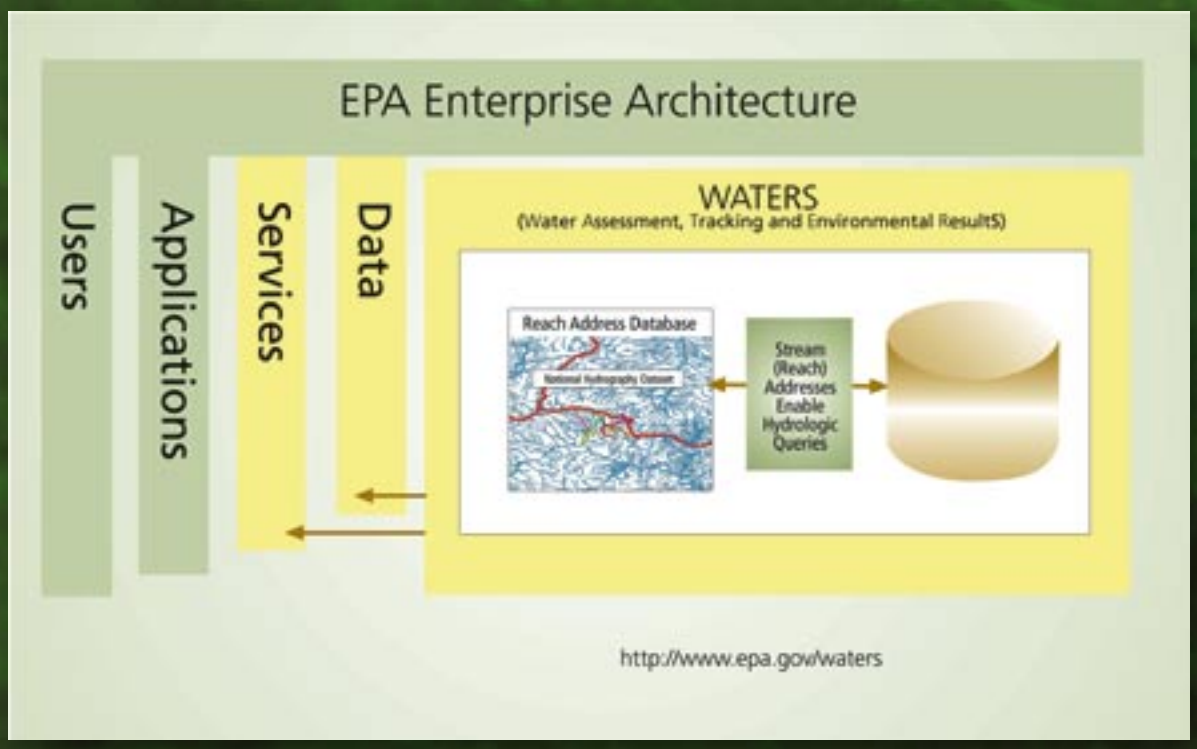
- Protect Human Health
- Protect Water Quality
- Enhance Science and Research

What is WATERS?

Watershed Assessment, Tracking, and Environmental ResultS (WATERS) is a data architecture that integrates information from EPA Office of Water databases by linking it to the surface water drainage network defined within the National Hydrography Dataset. WATERS improves program efficiency, communications and analytical capacity for achieving clean and safe water by linking the databases so the information they contain can by easily combined and shared. Through WATERS you can learn about

- The uses assigned by your state to local waters (fishing, swimming)
- Waters that are impaired and do not support their assigned uses
- The reasons why waters are impaired (i.e., the causes and sources of pollution in impaired waters)
- Water monitoring information
- Closures of swimming beaches
- The location of dischargers to water and more

WATERS within the EPA Enterprise Architecture



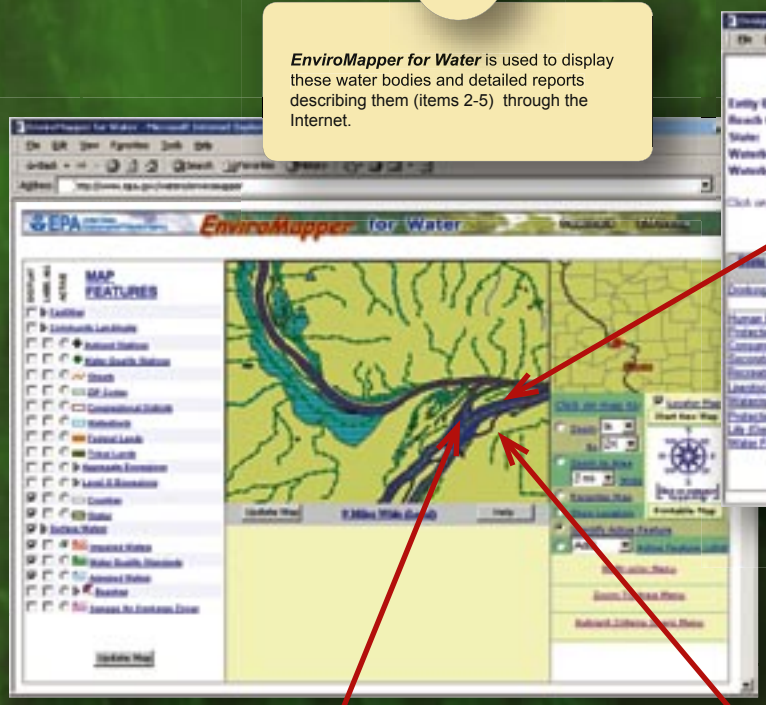
The multiagency WATERS team provides support, training, coordination, and outreach.

EnviroMapper for Water

Watershed Assessment, Tracking, and Environmental ResultS (WATERS) combines water quality information that describes the water bodies of the United States.

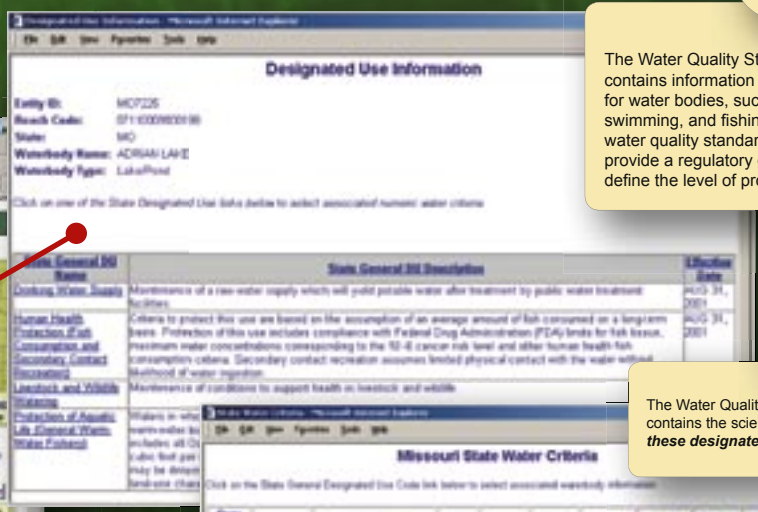
1

EnviroMapper for Water is used to display these water bodies and detailed reports describing them (items 2-5) through the Internet.



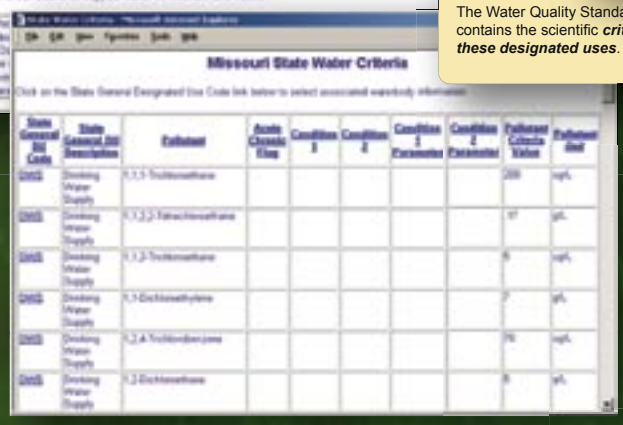
2

The Water Quality Standards Database contains information on the ***designated uses*** for water bodies, such as drinking water, swimming, and fishing. As part of a State's water quality standards, designated uses provide a regulatory goal for the water body and define the level of protection assigned to it.



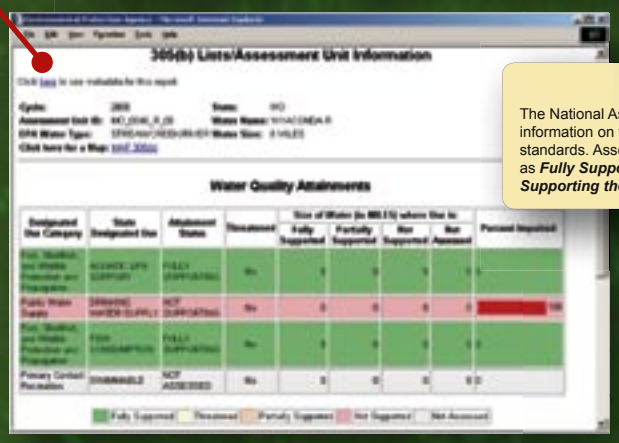
3

The Water Quality Standards Database also contains the scientific ***criteria to support these designated uses***.



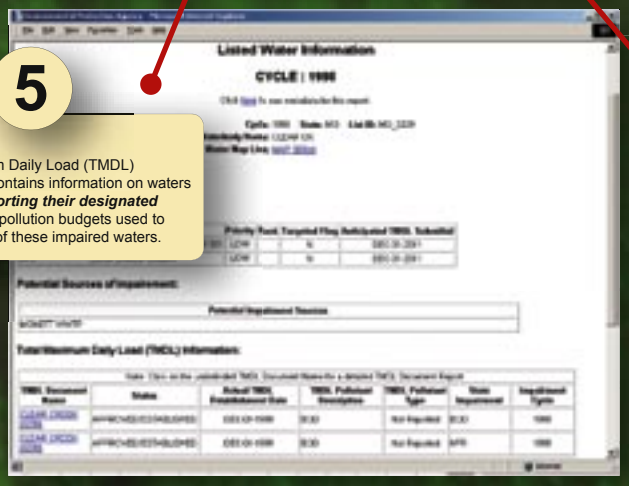
4

The National Assessment Database contains information on the attainment of water quality standards. Assessed waters are classified as ***Fully Supporting, Not Assessed or Not Supporting their designated uses***.



5

The Total Maximum Daily Load (TMDL) Tracking System contains information on waters that are ***Not Supporting their designated uses***. TMDLs are pollution budgets used to restore the health of these impaired waters.



The water bodies identified through WATERS are those found on topographic maps as represented in the EPA/USGS produced National Hydrography Dataset (http://nhd.usgs.gov).

The graphic above is for illustrative purposes only. The database reports shown do not necessarily describe actual water bodies displayed on the map.

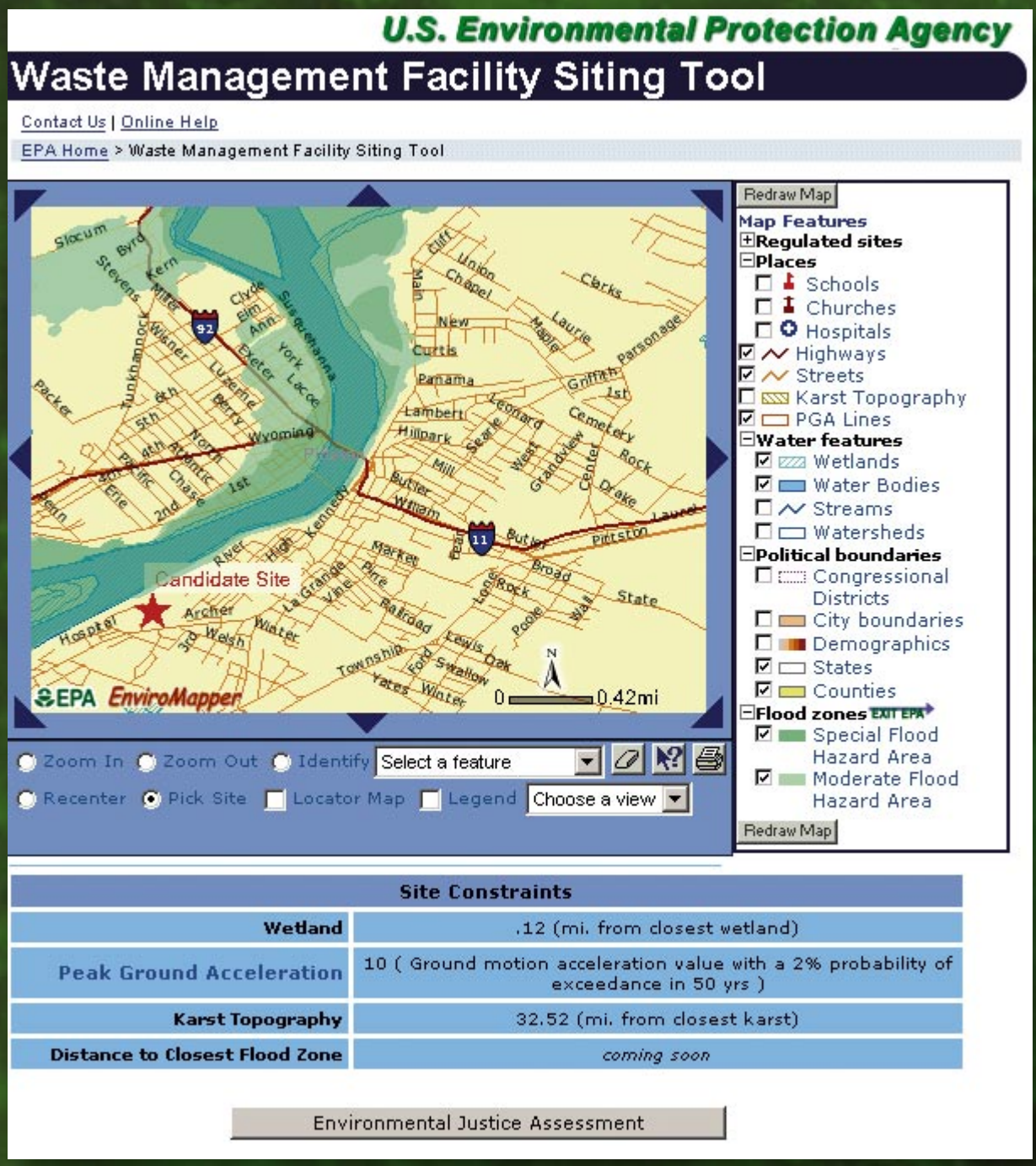
For more information, visit www.epa.gov/waters

Land Preservation and Restoration

Waste Management Facility Siting Tool

The Waste Management Facility Siting Tool is a powerful new Web-based tool that provides assistance in determining the viability of sites for prospective waste management facilities based on selected criteria.

This interactive GIS application provides objective analysis based on the proximity to flood zones, wetlands, karst topography, and fault zones.



For more information, visit www.epa.gov

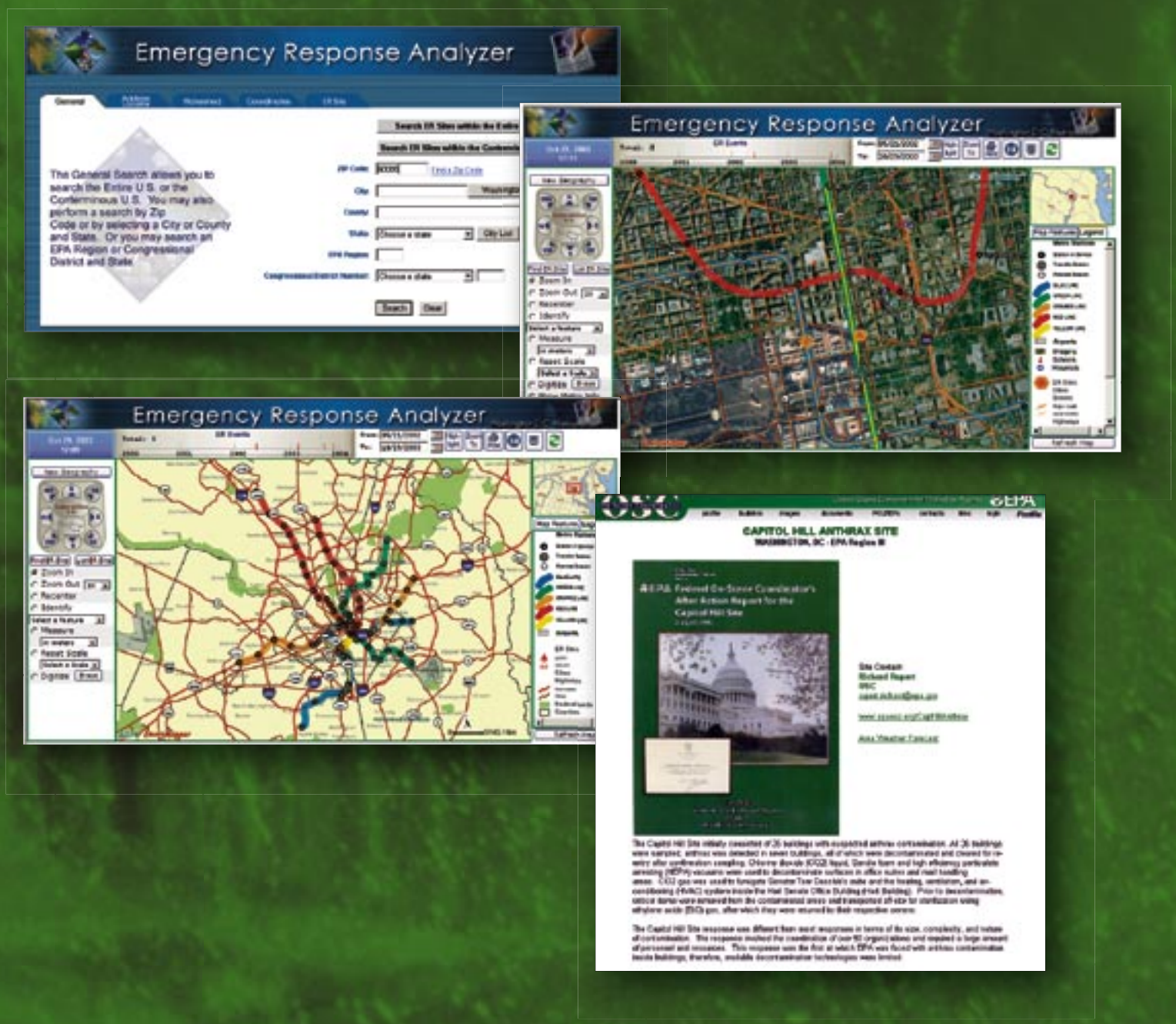
Healthy Communities and Ecosystems

Emergency Response Analyzer

EPA's Emergency Response Analyzer (ERA) facilitates the analysis of environmental conditions associated with day-to-day and emergency situations.

The ERA tool, based on the EPA EnviroMapper application, allows users to view the location of On-Scene Coordinators (OSC) emergency response efforts and associated reports. This interactive GIS application provides federal and regional emergency response staff and OSC with a tool to coordinate information based on various recent and historical emergency situations.

Within the tool, users can view the reported OSC sites both temporally and spatially.

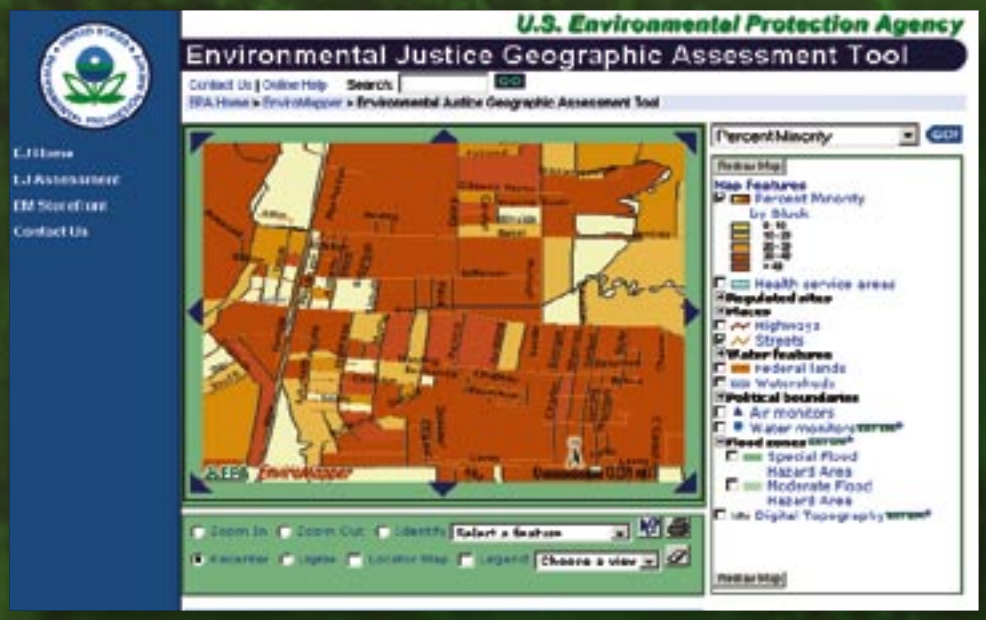


For more information, visit www.epa.gov

Healthy Communities and Ecosystems

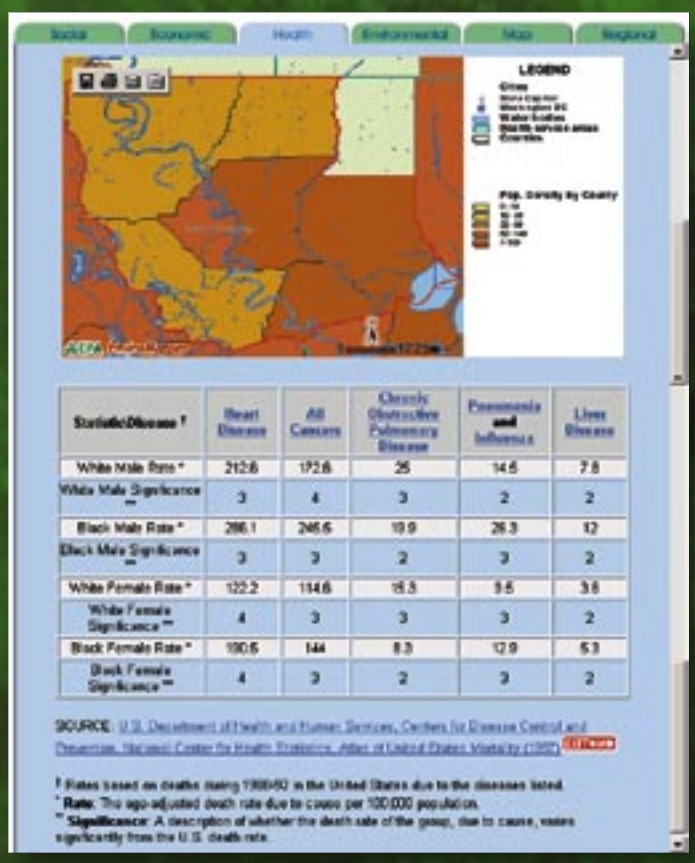
Environmental Justice Geographic Asssessment Tool

Environmental justice is achieved when everyone, regardless of race, culture, or income, enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.



The Environmental Justice Geographic Assessment Tool

- **Uses Web-based technology to access information relevant to any area in the continental United States with potential or existing environmental justice concerns**
- **Provides statistics pertinent to social, economic, health, and environmental conditions in communities of concern**



For more information, visit www.epa.gov

Healthy Communities and Ecosystems

Tools Supporting Tribal Activities

EPA's American Indian Environmental Office develops tools to assist Tribal environment managers in their decisions on environmental priorities.

Tribal Tools

EnviroMapper (EM) for Tribes

Tribal Information Management System (TIMS)

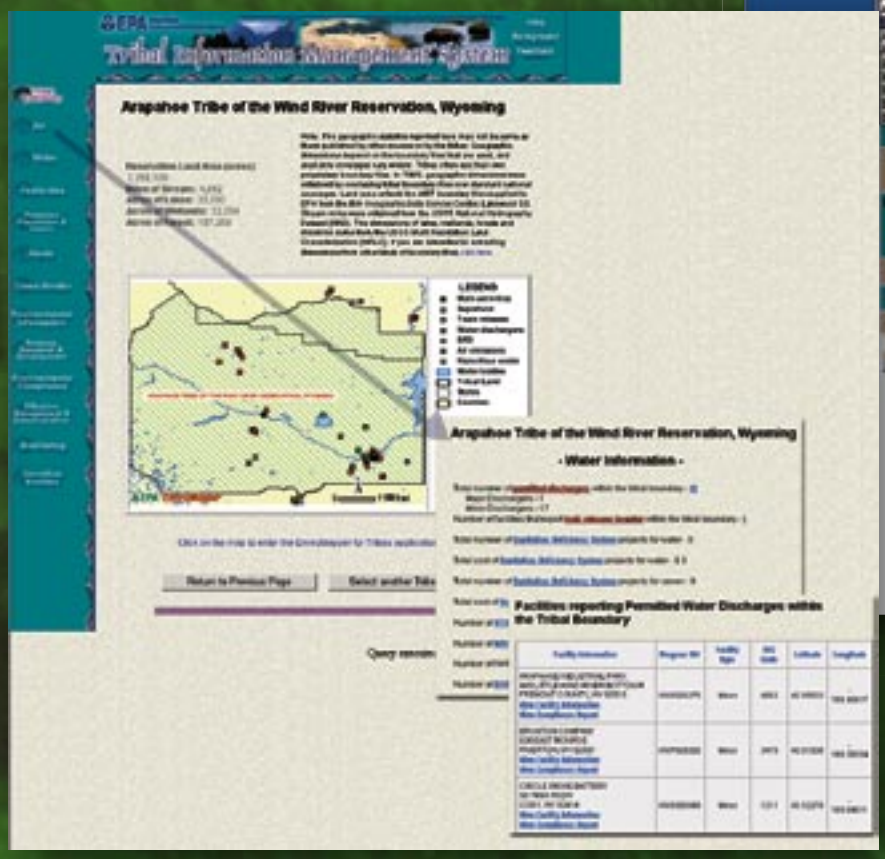
Tribal Accountability Tracking System (TATS)

TIMS Data Center

Tribal Grant Query System

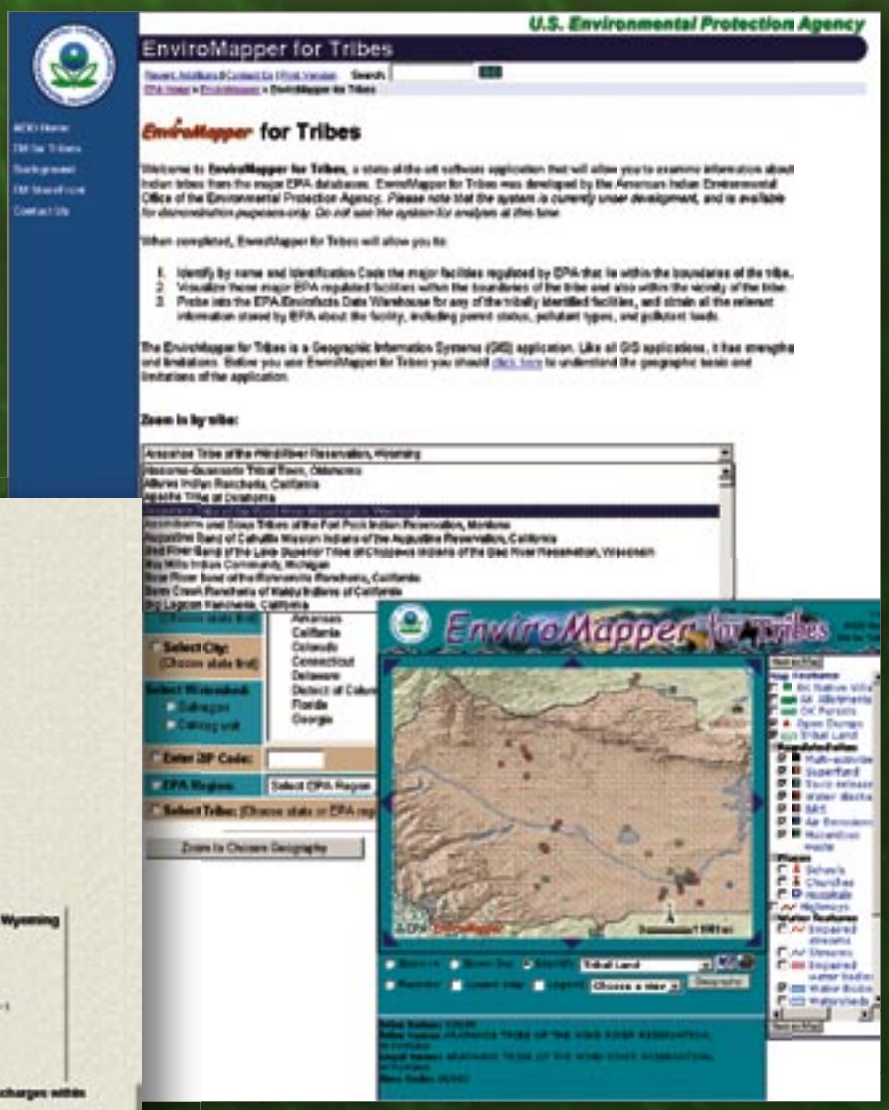
Tribal Regional/State Rollup

General Assistance Program (GAP) Tracking System



Tribal Information Management System

Collects public data from EPA and other federal agencies and integrates the information to paint a picture of environmental conditions and track the impacts of environmental programs in Indian Country



EnviroMapper for Tribes

Provides environmental information in and around Tribal lands from the major EPA databases

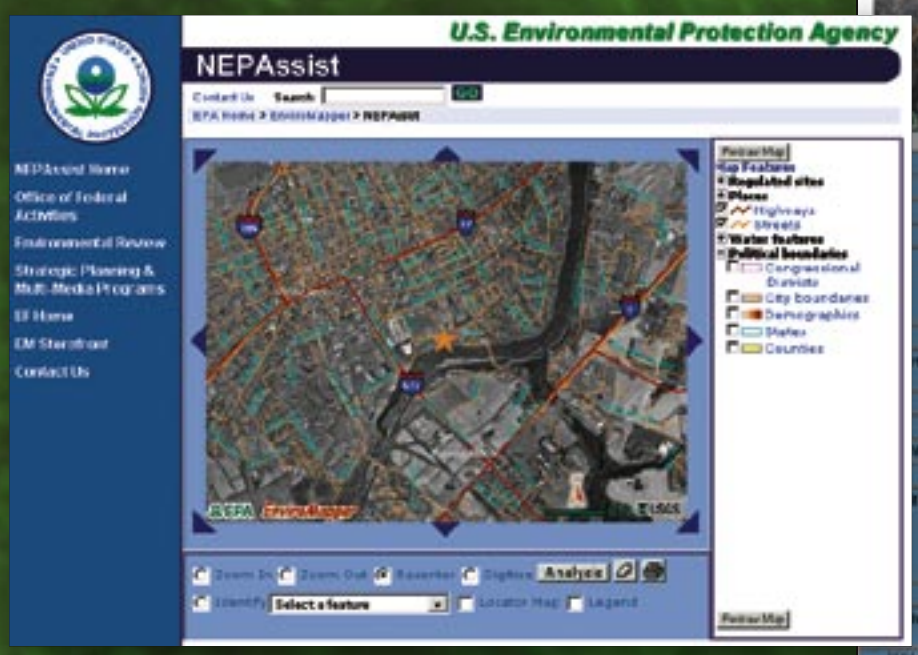
For more information, visit www.epa.gov

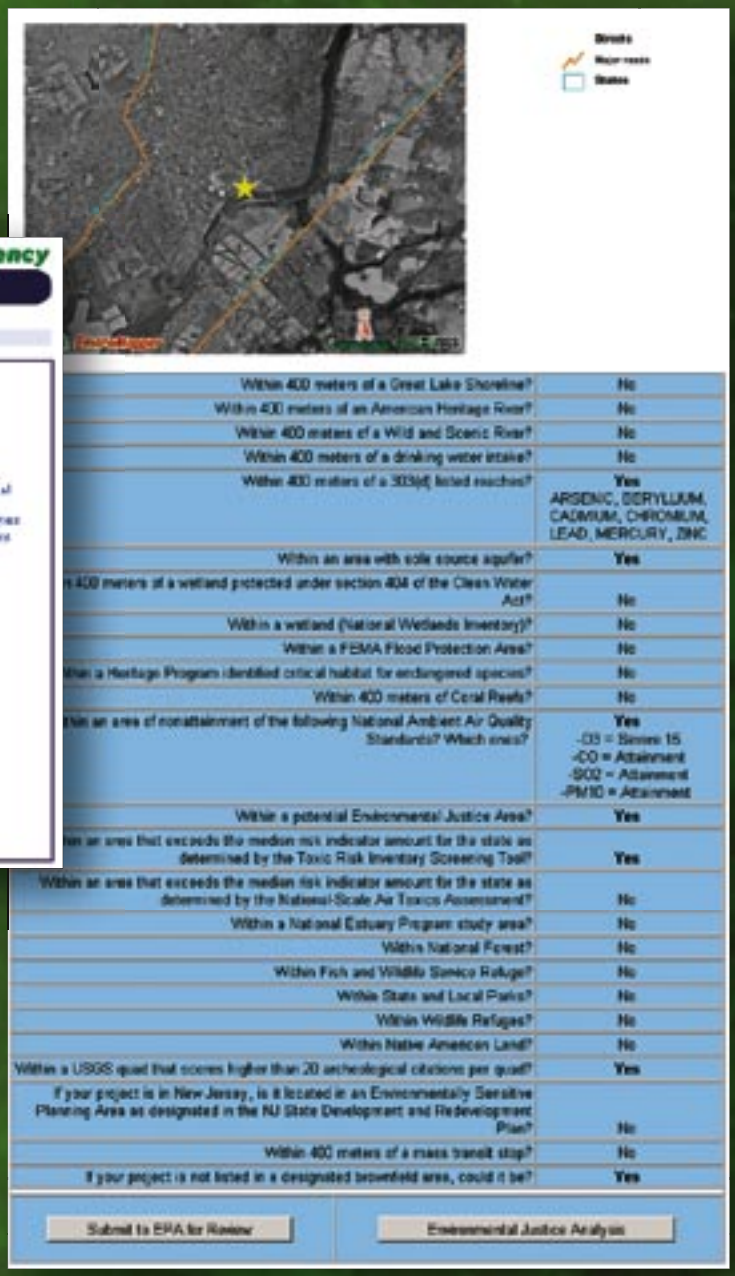
Compliance and Environmental Stewardship

NEPAssist

The National Environmental Policy Act (NEPA) requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions.

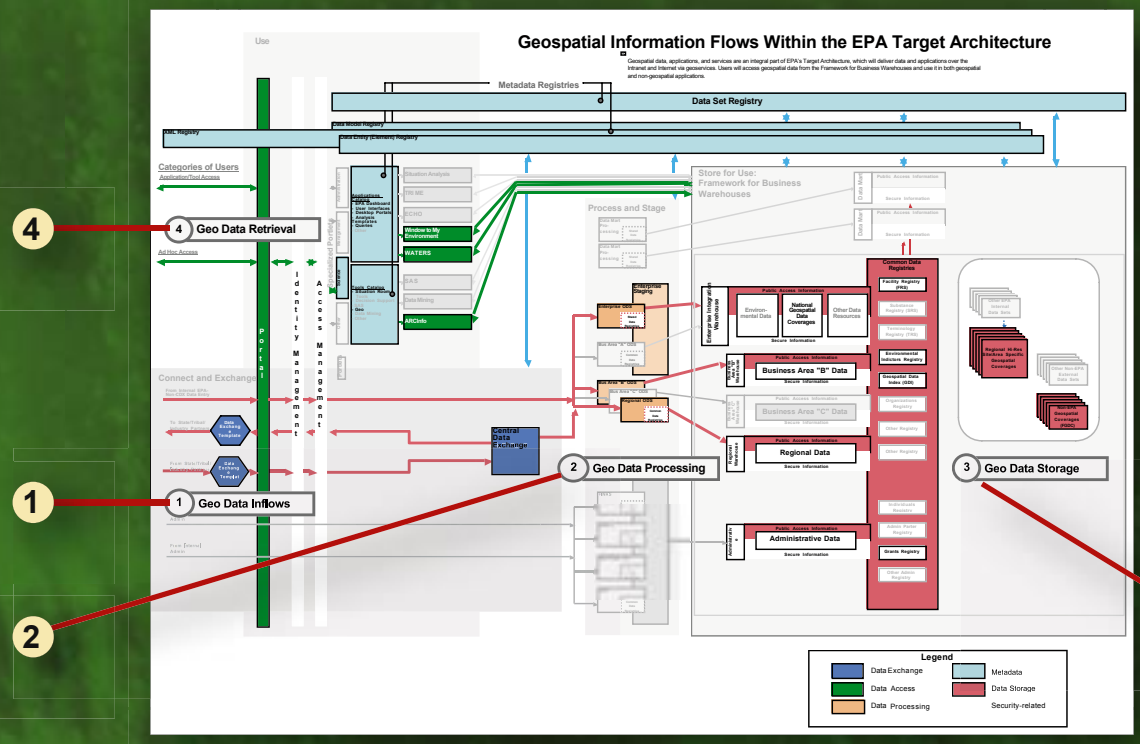
NEPAssist is an innovative GIS tool that assists with the filing and review process of environmental impact statements and environmental assessments.





For more information, visit www.epa.gov/enviro/nepa

EPA Enterprise Architecture



The Target Applications Architecture

The diagram above proposes how geospatial data will be collected, processed, stored, and accessed for use.

1. Geo Data Inflows: Geospatial data, whether collected by states or industry partners, flows into the agency through the Central Data Exchange (CDX) via Web services using standardized XML templates.

2. Geo Data Processing: Data is transferred from CDX to program data processing systems where it is cleaned, processed, and transformed into its target formats.

3. Geo Data Storage: Geospatial data is stored in a system of business data warehouses. These are actively linked to shared data categories call Registries. Geospatial data is essential to the Facility Registry, where the location of industrial facilities, monitoring stations, and sites are kept.

4. Geo Data Retrieval: Users both inside and outside the agency gain access to EPA's data warehouses through a shared portal, equipped with analytical tools. Many of these tools, such as Window to My Environment, allow users to see EPA's data through its geospatial dimension.

Goals of the EPA Target Enterprise Architecture

- Align IT investments with EPA mission and goals.
- Integrate data to permit faster, more powerful analysis across all programs.
- Improve access to data through an integrated agency portal, supported by a range of tools and applications.

The Role of Geospatial Information in the Target Architecture

EPA's programs are strongly geospatial in nature. Most pollution problems are about location-specific sources that affect location-specific populations, either human or non-human. Geospatial data is therefore essential for assessing the priorities, implementation, and results of efforts to ensure clean air, provide clean and safe water, and protect the land.

Geospatial is also the integrating dimension that lets us look across programs and assess our progress holistically. EPA's enterprise architecture integrates geospatial data throughout all phases of information flow across the agency.

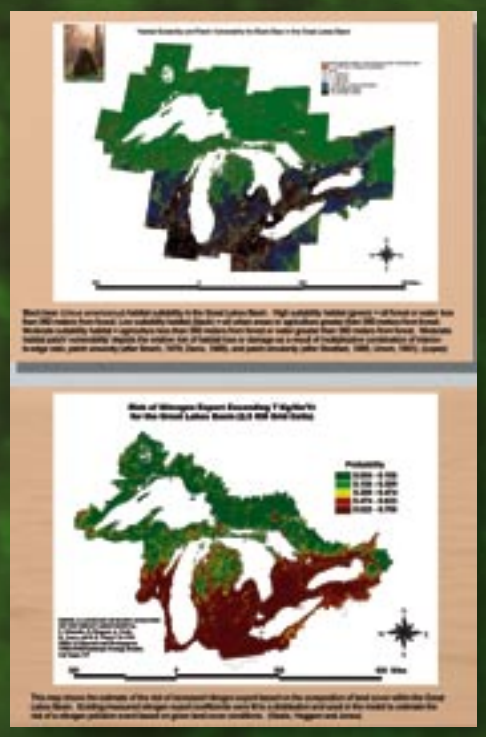
For more information, visit www.epa.gov

Supporting the EPA Mission Through Sound Science

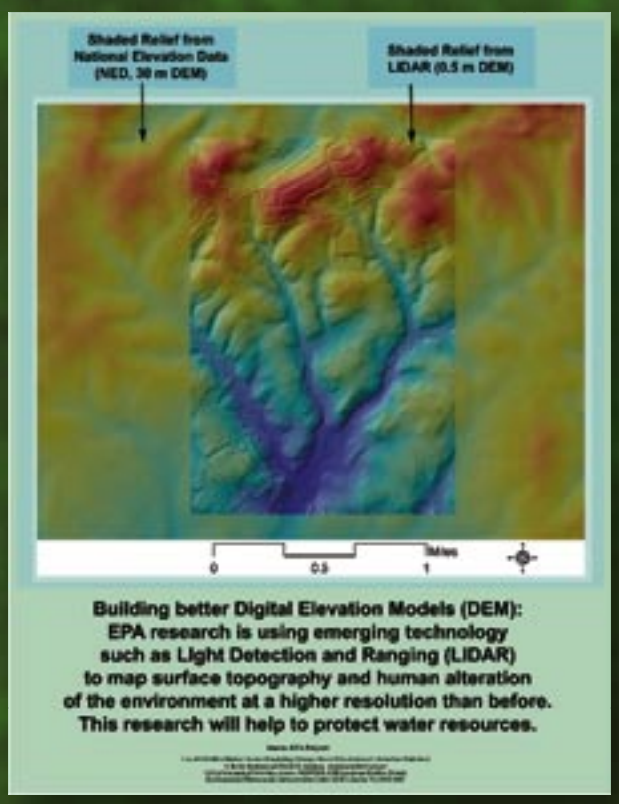
Goal

Provide sound science to improve the understanding of environmental risk and develop and implement innovative approaches for current and future environmental problems. We and our partners will need the best available scientific and economic information to establish priorities and make decisions. Sound science and technology will help us determine which problems pose important risks to our natural environment, human health, and quality of life. Reliable economic information will ensure our ability to make cost-efficient decisions.

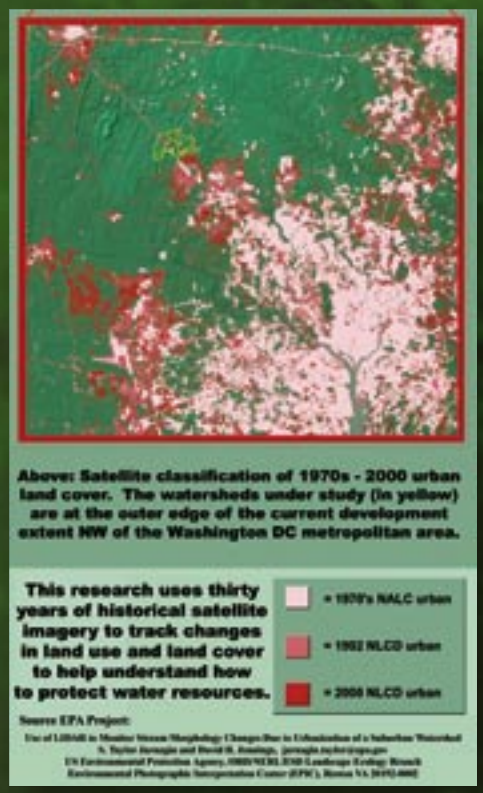
Great Lakes Ecological Assessment



Urbanization of a Watershed



Building better Digital Elevation Models (DEM): EPA research is using emerging technology such as Light Detection and Ranging (LIDAR) to map surface topography and human alteration of the environment at a higher resolution than before. This research will help to protect water resources.



Above: Satellite classification of 1970s - 2000 urban land cover. The watersheds under study (in yellow) are at the outer edge of the current development extent NW of the Washington DC metropolitan area.

This research uses thirty years of historical satellite imagery to track changes in land use and land cover to help understand how to protect water resources.

- = 1970's NALC urban
- = 1992 NLCD urban
- = 2000 NLCD urban

Brownfields

GIS map of Des Moines showing data derived from historical maps, aerial photos and property parcel databases. In addition, information from the Underground Storage Tanks (UST), RECRIS/CERCLIS, field surveys, tax trends, and historic landscape information will provide an INVENTORY methodology for identifying Browmfield sites.

Abandoned property in Des Moines: A possible brownfields Redevelopment Site.

Spring Valley Munitions Burial

Ground photos from the period also proved to be invaluable in identifying specific activities of interest such as this 1918 photo showing a pit where jugs of chemical agent are being buried.

For more information, visit www.epa.gov

Supporting the EPA Mission Through Partnerships and Public Access

Window to My Environment

EPA's Window to My Environment (WME) provides a "geographic portal" to community-based environmental information.

Your Map

Allows interactive mapping, zooming, and viewing of locations of regulated facilities, environmental monitoring sites, bodies of water, as well as land use, community demographics, streets, schools, and county boundaries.

Your Window

Provides pertinent facts about the selected community, its population and local watersheds and links directly to watershed and regulated facility profiles.

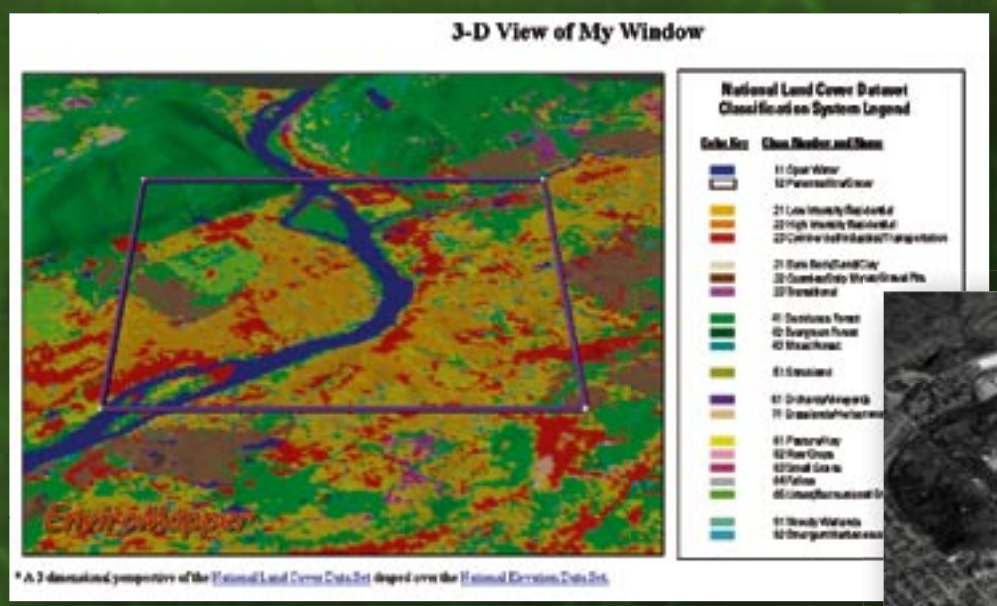
Your Environment

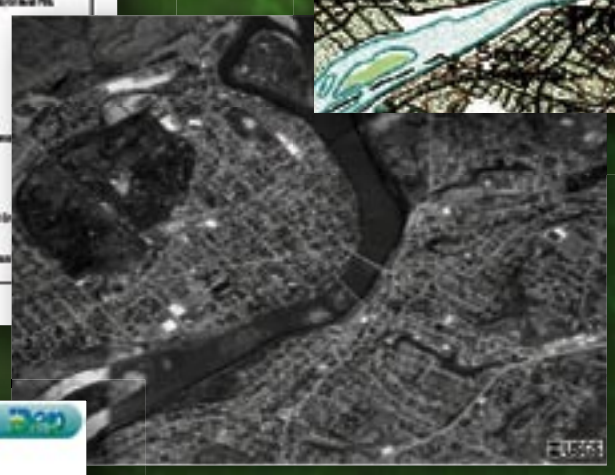
Answers basic environmental questions about the selected community using information from diverse government sources and other partners.

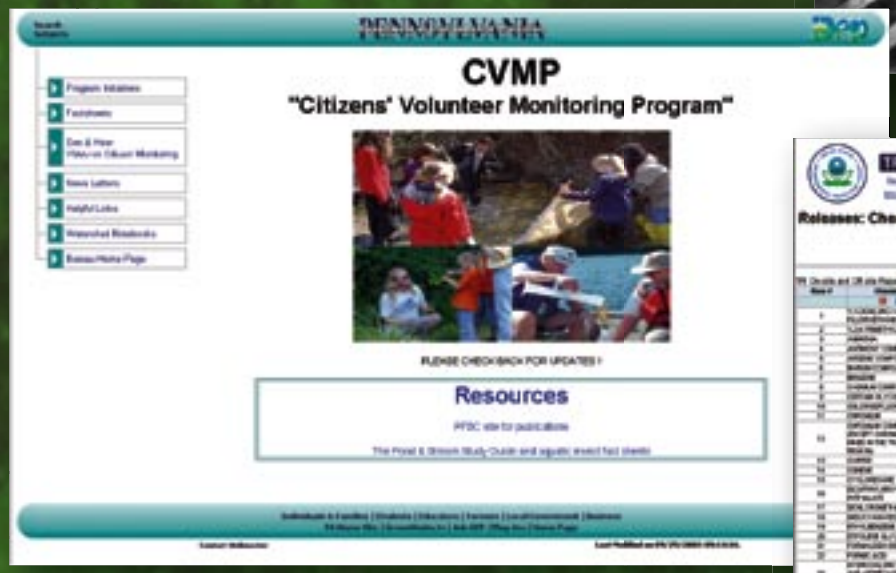
Innovative public access tool, which helps answer popular questions about a community's air, land, and water, as well as what is being done locally to protect the environment.

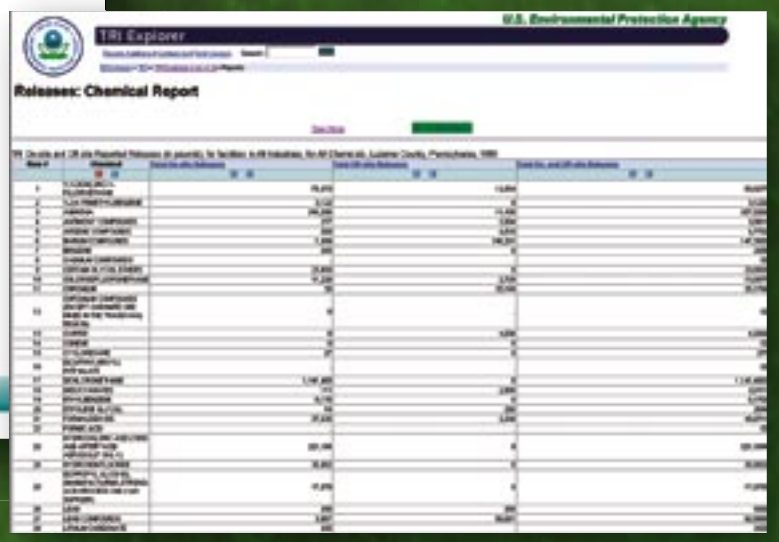
Developed in partnership with federal, state, Tribes, local governments and other organizations.

Offers a new approach to integrating, managing, and providing comprehensive community-based environmental information.









For more information, visit www.epa.gov/envio/wme

Department of Defense

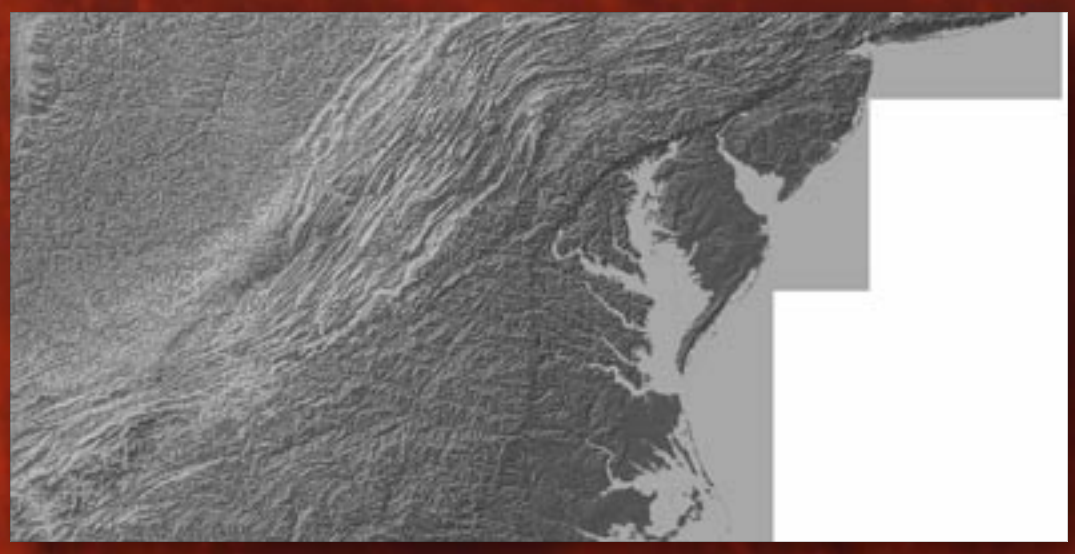
- National Geospatial-Intelligence Agency (NGA)
- US Army
- US Army Corps of Engineers

National Geospatial-Intelligence Agency (NGA)

Mission, Vision, and Core Values

Our Mission

NGA provides timely, relevant, and accurate Geospatial Intelligence in support of national security.



Our Vision

Know the Earth...Show the Way

We provide Geospatial Intelligence in all its forms, and from whatever source--imagery, imagery intelligence, and geospatial data and information--to ensure the knowledge foundation for planning, decision, and action.

We provide easy access to Geospatial Intelligence databases for all stakeholders. We create tailored, customer-specific Geospatial Intelligence, analytic services, and solutions.

Our Core Values

In NGA, we are committed to...

Customers...both as a National Intelligence and a Combat Support Agency.

People...their personal integrity, professionalism, growth, leadership, and accountability. Culture...our diversity, teamwork, creativity, risk-taking, and mutual trust and respect.

...Excellence in all we do.

For more information, visit www.nga.mil

U.S. Army

Office of the Assistant Chief of Staff for Installation Management

Overview

The U.S. Army Office of the Assistant Chief of Staff for Installation Management (OACSIM) establishes the Army's policy for installation of an enterprise GIS. GIS efforts include standardizing and supplementing existing programs, establishing resources for new programs, and integrating requirements for cross services application. In support of these efforts, the OACSIM is establishing a centralized program that includes a GIS repository (GISR).

Benefits

- **Implementing an Armywide enterprise GIS to support Installation Management.**
- **Cross service coordination in support of the Installation Visualization Tool (IVT).**
- **Integration of stovepipe GIS implementation into a sustained servicewide resource.**
- **Increased situational awareness at all levels, at one or many locations.**

For more information, visit http://gis.hqda.pentagon.mil

Electronic Charting for Inland Navigation

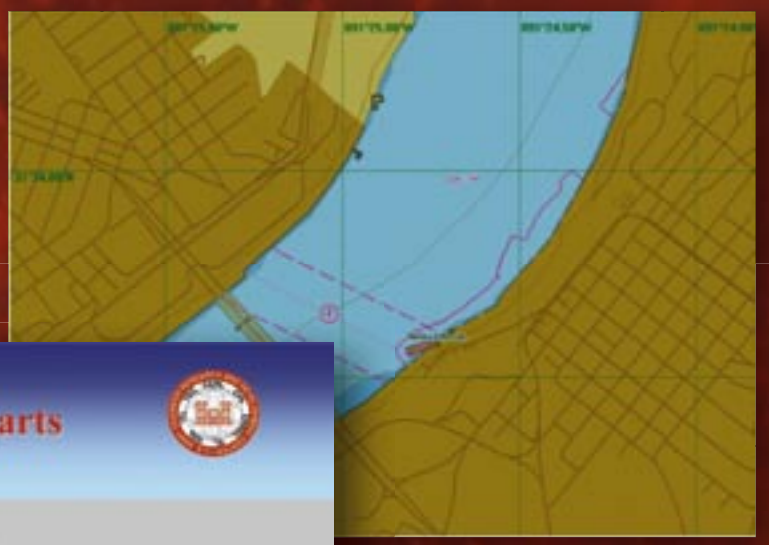
U.S. Army Corps of Engineers

Background

The U.S. inland navigation system consists of 8,200 miles of rivers maintained by the Corps of Engineers in 22 states and includes 276 lock chambers with a total lift of 6,100 feet. The highly adaptable and effective system of barge navigation moves more than 625 million tons of commodities annually, which include coal, petroleum products, various other raw materials, food and farm products, chemicals, and manufactured goods. Following recommendations by the National Transportation Safety Board, the National Academy of Science, and the American Waterways Operators, Congress directed the Corps of Engineers to develop and publish electronic charts for the inland waterways.

Key Capabilities

Large-scale, accurate, and up-to-date Inland Electronic Naviagation Charts (IENCs), such as those being developed, enable electronic chart systems that provide accurate and real-time display of vessel position relative to waterway features; voyage planning and monitoring; training tools for new personnel; and integrated display of river charts, radar, and automatic identification systems.



IENCs are available for download from the Corps E-Charting Web site at www.tec.army.mil/echarts

US Army Corps of Engineers®

National Capital Planning Commission

National Capital Planning Commission

Mission

The National Capital Planning Commission (NCPC) provides overall planning guidance for federal land and buildings in the National Capital Region, which includes the District of Columbia; Prince George's and Montgomery Counties in Maryland; and Arlington, Fairfax, Loudoun, and Prince William Counties in Virginia, including the cities and towns located within the geographic area bounded by these counties. Through its planning policies and review of development proposals, the Commission seeks to protect and enhance the extraordinary historical, cultural, and natural resources of the nation's capital.

NCPC's 2004–2009 Goals

- Preserve and enhance the unique beauty and image of the national capital and ensure its planned development.
- Ensure that the location and design of all federal buildings in the National Capital Region promote the effective functioning of the federal establishment and adhere to high architectural, planning, and urban design standards.
- Anticipate emerging development, transportation, environmental, and historic preservation needs that affect the quality of life and the economic vitality of the National Capital Region; proactively develop plans, establish partnerships, and execute projects to meet those needs.
- Protect and enhance historic and natural resources while accommodating change in the nation's capital.
- Promote state-of-the-art information technologies to support integrated planning in the National Capital Region.
- Educate and increase the involvement of local, national, and international audiences in planning and developing in the national capital.

For more information, visit www.ncpc.gov

2003 Shared Use, Off-Street Bicycle Trails Spatial Database

National Capital Planning Commission

Supporting the Mission

- In working to preserve and enhance the unique beauty and image of the national capital and ensure its planned develpment, the National Capital Planning Commission relies on summary statistics that define both the built environment and the proposed environment.
- Developing spatial databases within GIS ensures that the location and design of all recreational features in the national capital promote the effective functioning of the federal establishment and adhere to transportation planning and park recreation design standard that complement the capital's urbanized areas.
- A spatial database that represents existing and proposed shared use, off-street bicycle trails can help anticipate emerging development, and transportation, environmental, and historic preservation needs that affect the quality of life and the economic and physical vitality of those who live and work in the national capital.
- GIS promotes state-of-the-art information technologies used to support integrated planning by easily identifying existing conditions and determining how the relationship to the proposed condition can enhance or hinder the quality of life in the national capital.
- By educating and increasing the involvement of local and regional audiences in the planning and development of the national capital, regional spatial databases can influence participating jurisdictions to act responsibly through teamwork as a regional player, not as a stand-alone entity.

For more information, visit www.ncpc.gov

NCPC

Interactive 3D Project Mapping

National Capital Planning Commission

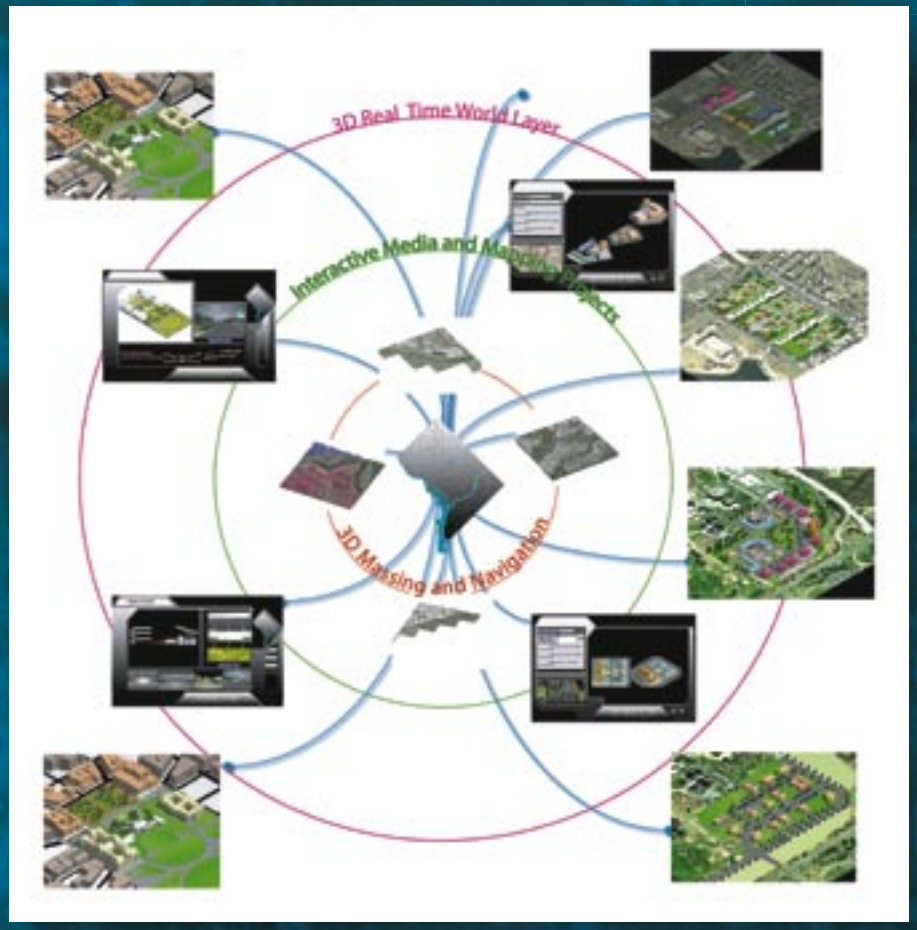
Vision

Interactive 3D project mapping provides a simple system for internal and external users to view key projects developed and reviewed by NCPC. The goal of the application is to engage the user with simple 3D maps in real time. The user can interpret complex planning and design projects and analysis, with no knowledge of GIS or CAD, and make planning decisions involving site lines, view sheds, massing datum, and other visual guidelines. The site can be adapted quickly using modular elements and XML to address other agency issues including security and visitation to the region.

Benefits

Interactive 3D project mapping allows user to

- Design projects quickly.
- Connect 3D and mapping content to a web-based application.
- Create a visual knowledge management system for cataloging, educating, and delivering project data.
- Explore the uses of real-time 3D in planning projects.



For more information, visit www.ncpc.gov

Courtesy of National Capital Planning Commission

Memorials and Museums (2M)

National Capital Planning Commission

Background

The memorials and museums that define Washington's monumental core express America's connections to its past and its direction for the future. From the Washington Monument and the Holocaust Museum to the Tomb of the Unknown Soldier and the Frederick Douglass Home, these cultural and commemorative public spaces are physical reminders of our collective past and repositories for our most precious artifacts; they help us understand what it means to be an American. How and where we honor our heroes and history and display our national treasures are matters of great importance to all Americans. As the demand for new memorials and museums in the national capital continues to grow, there are increasing concerns that the unabated construction of these attractions will overwhelm the historic open space in the traditional monumental core.

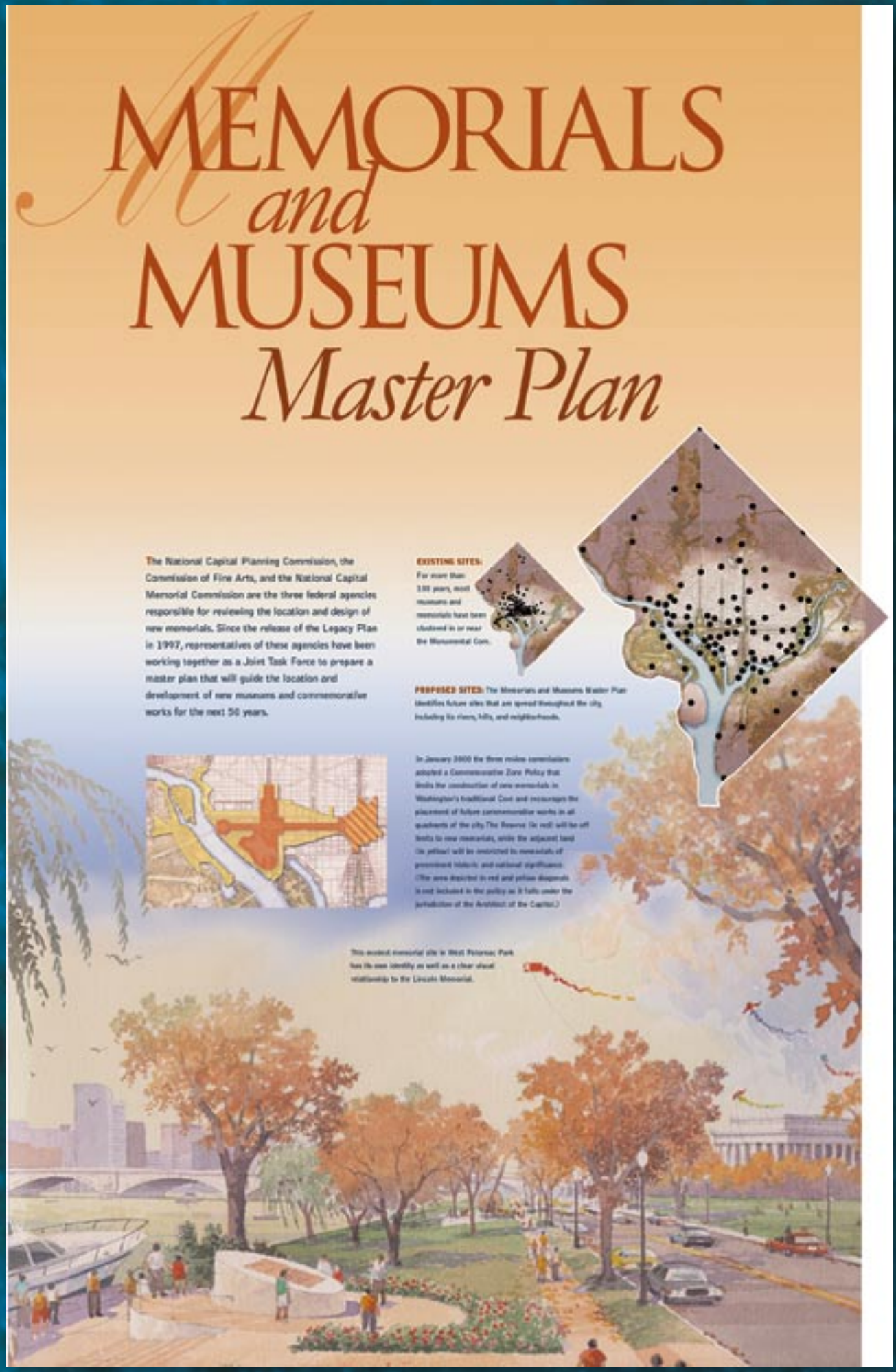
Geospatial Technology Supporting Mission Goals

The *Memorials and Museums Master Plan* (2M), an agency initiative addressing strategic goal #1 and completed in FY02, ensures that future generations of Americans will have sufficient supply of preeminent sites for their museums and memorials. In addition to identifying 100 potential sites for future commemorative works, the master plan provides general guidelines for where and how these facilities should be accommodated as well as siting criteria and implementation strategies. This plan also includes inventories of existing memorials and museums and a forecast of future requirements. A central feature of the master plan is an urban design framework for locating future sites. This framework is based on historic planning influences, urban design considerations, and current planning and development initiatives. The plan also includes the policies that will guide federal agencies in their review of future commemorative works and museums. While geospatial technologies assist with all of the agencies strategic goals, this technology specifically supported the identification of 100 new sites by assisting with evaluation of several criteria: location, size, traffic/transportation patterns, jurisdiction, and environmental and economic conditions. In FY04 this information will be used by the agency to assist with directing the location of new memorials and monuments. It will also be developed into an interactive Web-based Master Plan of Monuments and Museums (i2M) to aid prospective memorial sponsors and others in the site selection for future commemorative works within the Washington, D.C., monumental core. The i2M would act as an easy-to-navigate tool with streamlined search criteria and a central location of potential sites and planning data site analysis.

Supporting Geospatial One-Stop

The 2M plan will ultimately be available to the Geospatial One-Stop as a Web-based mapping application that allows users to find memorial locations based on defined criteria. This application is currently in a preBeta stage of development. The Web version will be available in FY05.

MEMORIALS and MUSEUMS Master Plan



For more information, visit www.ncpc.gov

NCPC

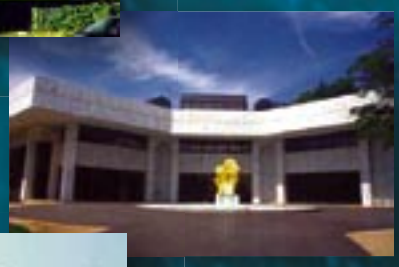
Courtesy of National Capital Planning Commission

Foreign Missions

National Capital Planning Commission

Kuwait and the United Arab Emirates are two chanceries within the International Center.

Finland

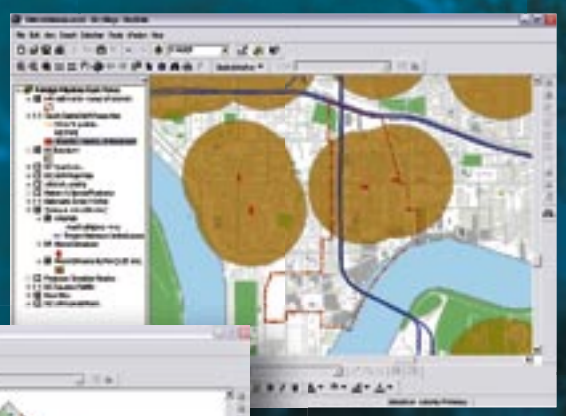


France

Italy

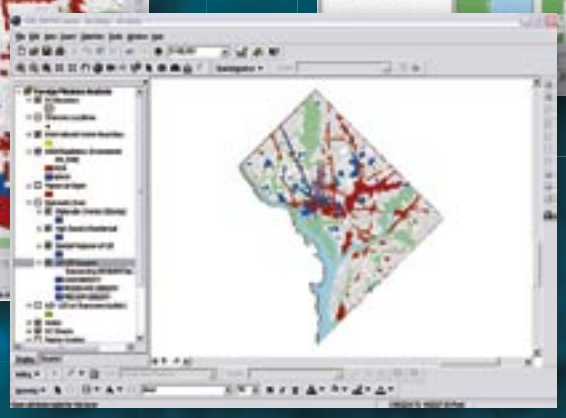
Germany

These images are of the International Center located in upper north-west Washington near the University of the District of Columbia.



Site analysis for looking at potential new areas for chancery locations.

Current location of chanceries within the District of Columbia.



Existing regulatory environment that dictates where chanceries can be located.

For more information, visit www.ncpc.gov

NCPC

Courtesy of National Capital Planning Commission

Other Featured Agencies

- Department of Education
- Department of Energy
- Department of Justice
- Department of State
- Department of Transportation
- Library of Congress
- US Small Business Administration (SBA)

Department of Education

Mission

To ensure equal access to education and to promote educational excellence throughout the nation.

Current Programs

No Child Left Behind (NCLB)

Signed by President George W. Bush on January 8, 2002, the No Child Left Behind act gives our schools and our country groundbreaking educational reform based on the following ideals:

- Stronger Accountability for Results
- More Freedom for States and Communities
- Encouraging Proven Education Methods
- More Choices for Parents

GIS Usage

GIS can be used to geographically display and analyze school perfomance data. Trends can be analyzed and corrective action taken as needed to allow for maximum school performance.

National Center for Education Statistics (NCES)

NCES is the primary federal entity for collectiing and analyzing data that is related to education in the United States and other nations.

GIS Usage

NCES currently uses ESRI products to publish national school data on the web. The public is able to log onto the Web site, select a school district, and gather information about the selected district. Results from various school districts can be viewed and compared. In conjunction with the census department, select demographic data is also displayed.

Department of Energy

Mission

The Department of Energy's (DOE) overarching mission is to advance the national, economic and energy security of the United States; promote scientific and technological innovation in support of that mission; and ensure the environmental cleanup of the national nuclear weapons complex.

Goals

The department has four strategic goals toward achieving the mission:

- Defense Strategic Goal: To protect our national security by applying advanced science and nuclear technology to the nation's defense.
- Energy Strategic Goal: To protect our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy.
- Science Strategic Goal: To protect our national and economic security by providing world-class scientific research capacity and advancing scientific knowledge.
- Environment Strategic Goal: To protect the environment by providing a responsible resolution to the environmental legacy of the Cold War and by providing for the permanent disposal of the nation's high-level radioactive waste.

National Nuclear Security Administration (NNSA)

The NNSA is a branch of the DOE with the following functions:

- To enhance United States national security through the military application of nuclear energy.
- To maintain and enhance the safety, reliability, and performance of the United States nuclear weapons stockpile, including the ability to design, produce, and test, in order to meet national security requirements.
- To provide the United States Navy with safe, militarily effective nuclear propulsion plants and to ensure the safe and reliable operation of those plants.
- To promote international nuclear safety and nonproliferation.
- To reduce global danger from weapons of mass destruction.
- To support United States leadership in science and technology.

National Laboratories and Technology Centers

GIS Usage *(Covers both DOE and NNSA)*

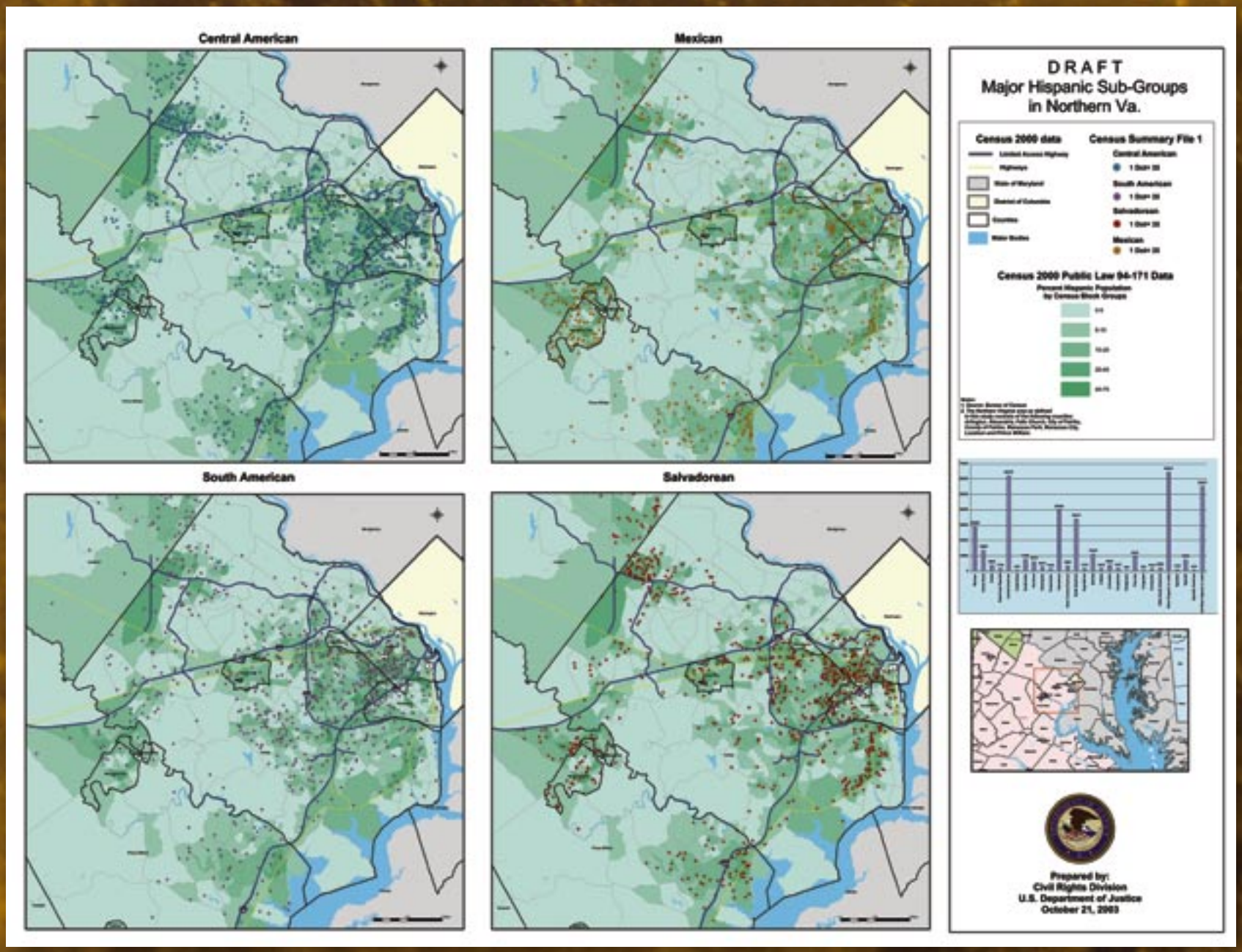
DOE's laboratories and technology centers house world-class facilities where more than 30,000 scientists and engineers perform cutting edge research. Each of these labs use GIS technology in several different aspects. Some examples of GIS usage include

- Monitoring environmental restoration and cleanup
- Facilities management
- Tracking of materials, both hazardous and nontoxic
- Tracking decontamination and restoration efforts after an incident
- Modeling and simulating efforts to monitor and track fissile and weapons-grade nuclear materials
- Using GIS in conjunction with GPS in hand-held units in real-time first response efforts by first responders
- Tracking release and dispersion of fissile material, radioactive material, and biological or chemical agents
- Applying radiation detection systems for emergency response
- Creating chemical and biological detection and warning systems
- Modeling and monitoring pipelines

For more information, visit www.energy.gov

Department of Justice

Demographic Analysis
Using Bureau of Census Data at the Civil Rights Division



For more information, visit www.usdoj.gov/crt

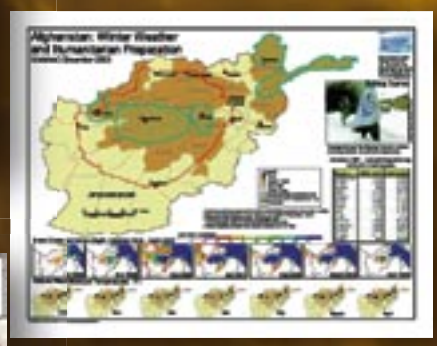
U.S. Department of State

Mission

The U.S. Department of State uses GIS to create a wide array of products and services to support U.S. foreign policy. GIS makes complex information understandable and presents the geospatial element of critical issues.

State Department uses GIS for

- Spatial database development for complex emergencies
- Cartographic reference products
- Maps to enhance foreign policy analysis
- Graphics to portray current humanitarian emergencies
- Boundary analysis and recovery
- Analytical briefing graphics for policy makers, combining data from many sources



For more information, visit www.state.gov

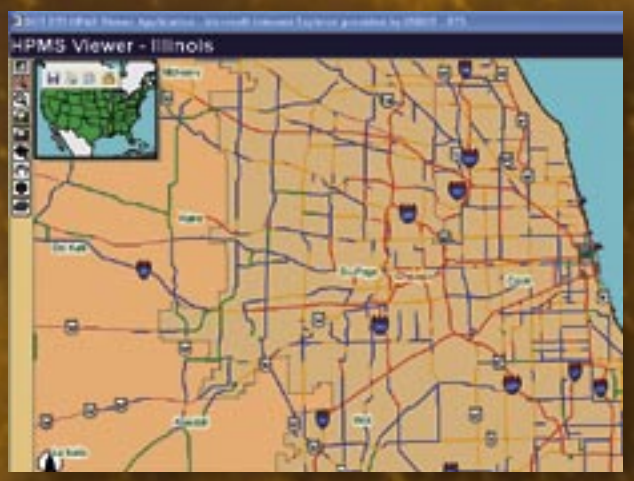
Department of Transportation

Bureau of Transportation Statistics (BTS)

Mission

The Geospatial Information Program at the Bureau of Transportation Statistics (BTS) acts as the lead for geospatial information within the U.S. Department of Transportation (USDOT). Our mission is to lead in developing spatial transportation data and information of high quality and advance their effective use in both public and private transportation decision making.

BTS creates, maintains, and distributes geospatial data through the National Transportation Atlas Database (NTAD) program and the BTS Internet Mapping Center. The Mapping Center provides access to mapping applications and spatial data downloads for public use of all transportation geospatial data collected and maintained by the USDOT.



GIS Usage

BTS carries out GIS-based transportation analyses using cartography and spatial analysis tools to aid in the USDOT's efforts to evaluate the scope and performance of the transportation system.

We have developed map-based transportation information and support systems for crisis and national security situations such as the 2003 wildfire incidents in California.

We have identified rural areas for which scheduled intercity transportation services are accessible and estimated the rural population served by scheduled transportation service.

We develop cartographic products to summarize freight movement trends in the United States.

For more information, visit www.bts.gov

Bureau of Transportation Statistics

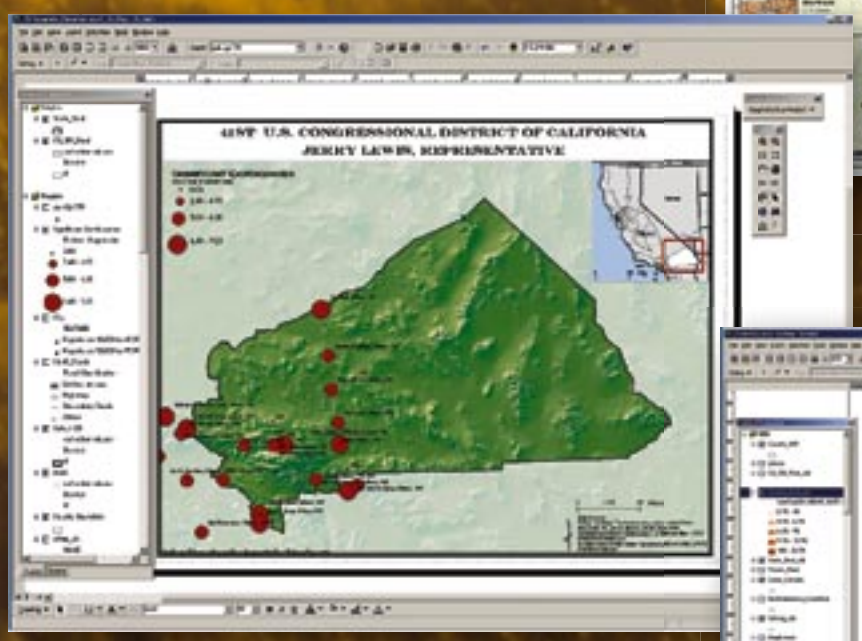
Library of Congress

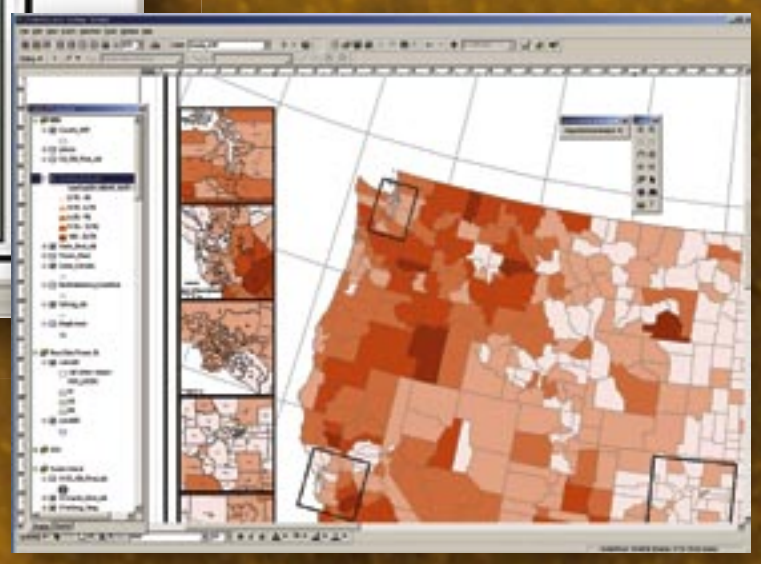
Mission

The Congressional Cartography Program, a unit of the Geography and Map Division, performs the essential data acquisition, data integration, and cartographic design to develop standardized and customized applications for members and committees of Congress and Congressional Research Service.

Services and Products

- Geospatial data analysis
- Customized cartographic design
- Map compilation, and production
- Standard maps of the United States and individual political and administrative entities





For more information, visit www.loc.gov/rr/geomap

THE LIBRARY OF CONGRESS

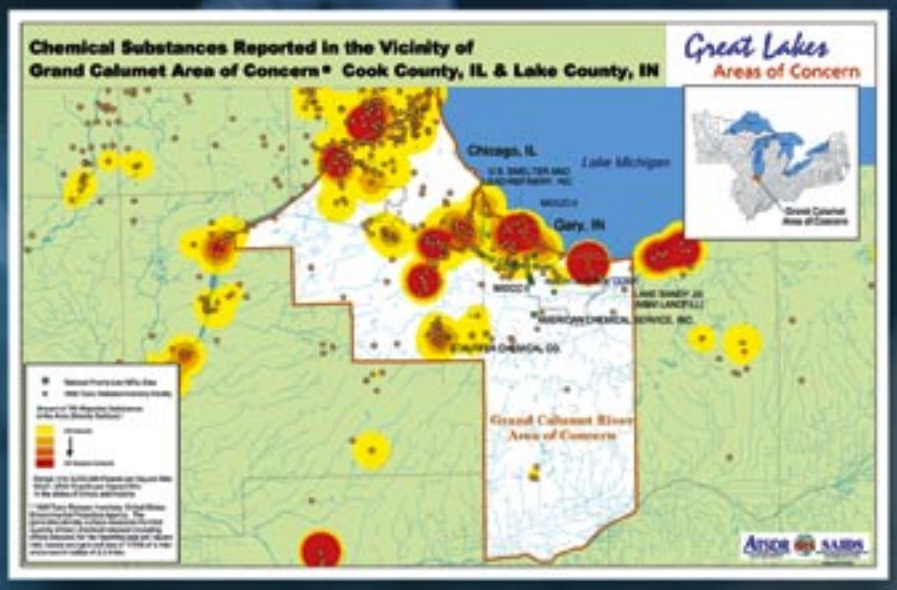
Small Business Administration (SBA)

Office of the Chief Information Officer
Productivity Enhancement Staff

GIS Usage

GIS is used as a resource locator for entrepreneurs to quickly locate the Small Business Administration(SBA) regional, district, branch, and disaster offices as well as partners in the training, counseling, and financial assistance programs. The tool provides driving directions and searching capability by state, ZIP code, and street address.

For more information, visit www.sba.gov



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