A photograph of a wetland landscape. In the foreground, there is a dense field of green grasses. In the background, numerous tall, thin, vertical trees stand against a pale, overcast sky. Some of the trees appear to be dead or dormant, with bare branches. The overall scene is misty and somewhat somber.

U.S. Fish & Wildlife Service

National Wetlands Inventory Draft Strategic Plan:

*Conserving America's Wetlands for
Future Generations*

**A Strategic Response to
Climate Change 2011 to 2015**

Cover Photo:

Blackwater National Wildlife Refuge, on Virginia's Chesapeake Bay, showing combined climate change and other impacts on wetlands, with dead or dying trees from salt water intrusion. Elsewhere on the Refuge, saltmarsh has been converted to open water as climate change compounds pollution, invasive species, disease, and other threats.

Photo by Mary Konchar ©.

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Okefenokee Swamp, Georgia
Credit: Joe Doherty/USFWS



Executive Summary

For more than 30 years, the Fish and Wildlife Service's (Service) National Wetlands Inventory (NWI) has been providing wetlands information for the Nation. Wetlands, vital to all citizens, are vulnerable to climate change. Secretary of the Interior Salazar recognized that open access to accurate, up-to-date geospatial wetlands information is critical to meeting the challenge of climate change. To address this need, NWI has revised its strategic plan to better support the Service's commitment to partnership-driven, results-oriented landscape conservation actions that address the unprecedented challenges posed by accelerating climate change. We reviewed all aspects of the program to identify activities that will inform Service and state wildlife agency planning and conservation implementation and foster protection of clean water and other wetlands functions for current and future generations.

In developing this strategic plan, NWI considered program mandates; the needs of partners, cooperators, and data users; and its opportunities and challenges. The strategic plan contains a revised vision, mission, and goals.

NWI goals and objectives are based on Congressional and Administration mandates. Our overarching responsibilities are to produce and deliver complete, current, mission-critical wetlands geospatial data in state-of-the-art digital formats and habitat information needed to guide the conservation and stewardship of the Nation's wetlands, related habitats, and wildlife. Our goals are:

- Acquire, produce, manage, and deliver data.
- Assist in wetlands conservation.
- Use state-of-the-art technologies.
- Increase support for NWI.
- Enhance our workforce.

The primary focus of NWI will be to provide data stewardship for standards-compliant wetlands geospatial data. Data stewardship includes acquiring, producing, managing, securing, distributing, and archiving existing data and providing coordination, training, and quality control for data contributed by cooperators. We will emphasize coordination with governmental and non-governmental cooperators to increase modernized data collection to complete the national wetlands data layer as mandated by Congress and to reach the 20 percent annual update level desired by users, a ten-fold increase over the current rate of production. The program also has the marketable expertise to provide other mapping, analysis, and data delivery technology assistance to the Service in other areas, such as upland or invasive species mapping,



Canoeing on Kanuti Lake, Alaska
Credit: Steve Hillebrand/USFWS

Vision

The National Wetlands Inventory provides current scientifically-based information on the location, status, extent, characteristics, and functions of wetlands and related habitats for the Nation to promote the understanding and conservation of these resources.

climate change analyses, and wildlife or plant community mappers.

A companion Action Plan outlines activities, performance measures, responsibilities, and timelines. All NWI Regional Coordinators are encouraged to work closely with their appropriate management team to develop step-down plans to support NWI's Vision and the Action Plan.

NWI is committed to "growing the future" of wetlands and the fish, wildlife, and people who depend on them, including future generations.



Teaching today's youth about wetlands during outdoor education event, Oregon. Credit: Paul Heimowitz/USFWS

Mission

NWI supports national, Department, and Service policies and initiatives to further conservation of the Nation's wetlands and related riparian and deepwater habitats by:

1. Producing, maintaining, and delivering current and historical geospatial wetland data and information for the Nation, in partnership with others.
2. Analyzing and reporting on status, trends, threats, and assessments of wetlands and related habitats, with a focus on habitats that have experienced substantial wetland change or that are changing rapidly.
3. Promoting sound decision making and policy formulation through the development and dissemination of wetlands data and information through a variety of media.

Introduction

There is no doubt the negative impacts of climate change on fish and wildlife will be significant. A major conservation challenge is predicting the level of those impacts and determining what management actions can be taken to help species adapt. And open access to accurate, up-to-date geospatial wetlands information is critical to meeting this challenge.

Secretary of the Interior Salazar

Wetlands are the foundation of our Nation's ecosystems, both ecologically and economically important, benefiting fish, wildlife, and people. Wetlands provide clean water, flood and carbon storage, storm-surge abatement, fish and wildlife habitat, recreation, science and educational opportunities, food, and much more. Wetlands also are the most vulnerable landscape feature because of the dynamic nature with which they respond to climate change and human impacts (Inter-governmental Panel on Climate Change Water Report 2008). In addition to climate change, emerging conservation issues that affect wetlands include sea-level rise; diminishing water quality and quantity; infrastructure, energy, and suburban development; invasive species; and pollution. In order to effectively address these issues, decision makers must know the location, status, and trends of wetlands and understand the societal and wildlife values of different types of wetlands and related habitats.

For more than 30 years, the role of the U.S. Fish and Wildlife Service's (Service) National Wetlands Inventory (NWI) has been to provide this information, in the form of geospatial data and reports on the status, change, trends, and threats to wetlands that inform planning and the policy making process. Updated digital wetlands data and habitat assessments are in high demand. The growing demand is evident in the 60 million times that NWI's website was accessed in the last year, up 20 percent in just two years. The demand is rapidly expanding as digital data form the underpinning of landscape-level assessment, change studies, and modeling for resource planning and management, infrastructure development, and emergency preparedness and remediation.

The NWI role is guided by statutes and Executive Branch directives. In 1934, Congress passed the Fish and Wildlife Coordination Act, authorizing the Secretary (Secretary) of the Department of the Interior (Department) to provide assistance to and cooperate with Federal, State, and public or private agencies and organizations for wildlife conservation and to make surveys of the Nation's lands and waters. The Clean Water Act of 1977, as amended, authorized \$6,000,000 to be used to complete the National Wetlands Inventory and to provide information from the Inventory to States, as it became available, to assist them in the development and operation of programs under the Act. The Emergency Wetlands Resources Act of 1986 (EWRA), as amended, directs the Secretary, through the Service, to map the Nation's wetlands and deepwater habitats, distribute and archive maps and data, and produce scientific reports on the status and trends of wetlands by given deadlines.

The Office of Management and Budget Circular A-16 (OMB A-16) further required that the Department, through the Service, provide the coordination, management, and maintenance/update of NWI's wetlands data. These data form the Wetlands Layer of the National Spatial Data Infrastructure (NSDI), through which NWI provides stewardship for all Federal wetlands data. NWI is a major component of the Department's geospatial business portfolio and E-government initiative (Geospatial One-Stop and The National Map) and is a standards-compliant layer on the new Data.gov. As stewards of the wetlands layer, the program must meet OMB, Departmental, and Service requirements related to data management, information technology, and the Information Quality Act, as well as comply with Federal Geographic Data Committee (FGDC) standards (see Appendix I).

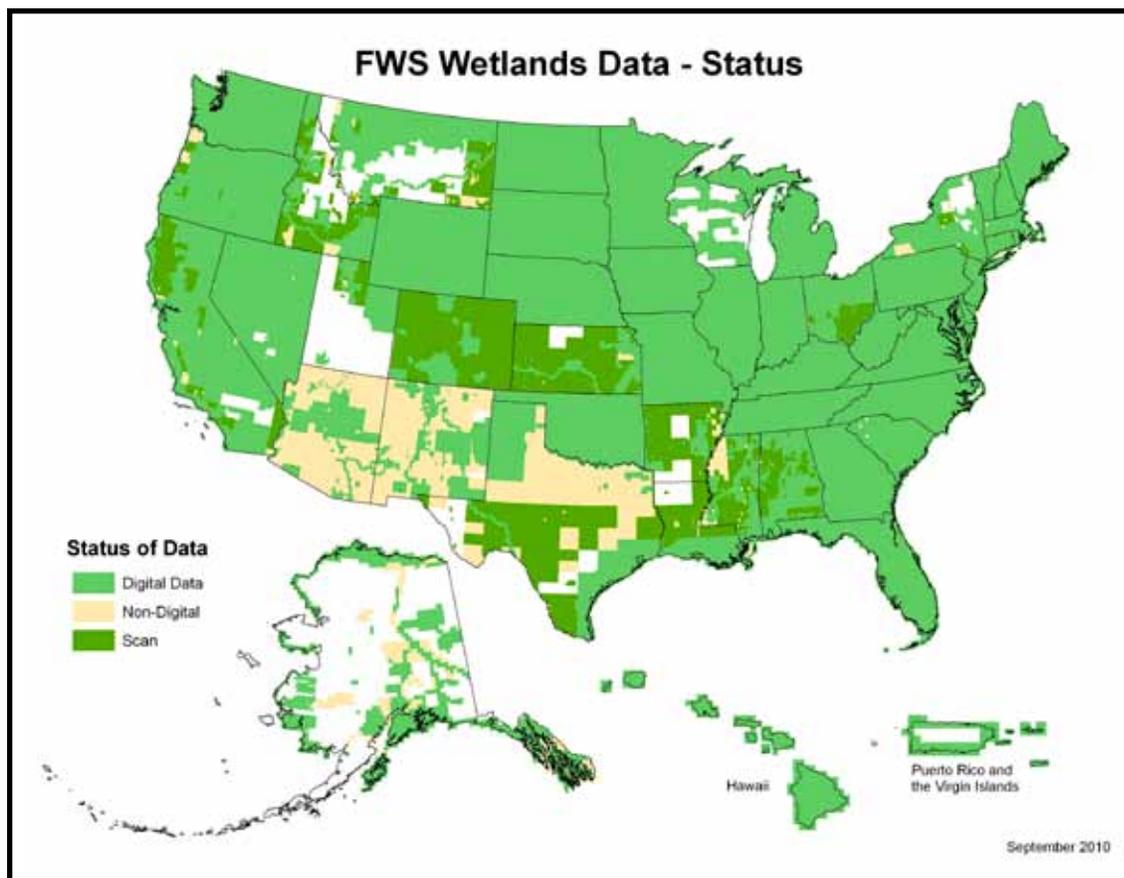
The Program is further guided by the Secretary's Climate Change Order No. 3289, the Service's Strategic Plan for Responding to Accelerating Climate Change (September 2009), the Service's strategy for completing the Wetlands Layer of the NSDI (December 2007), and other policy documents.

In response to these mandates, NWI and partners have produced online digital wetlands data for 73 percent of

the lower 48 states, 30 percent of Alaska, all of Hawaii, Guam, and Saipan, and part of Puerto Rico (see map). Wetlands also are identified on NWI hard-copy maps for an additional 13 percent of the Nation. These are available as scanned images awaiting digitizing. About 10% of the Nation has wetlands data that are current. The program's recent rate of production hovers at less than one percent per year, increasing to two percent with partners' data contributions. NWI also has prepared decadal national wetlands status and trends reports and other special reports.

NWI disseminates wetlands information to the public over the Internet. Easily accessible, current, and scientifically-sound wetlands data and information save time and money for Federal, State, Tribe, Territory and local agencies, businesses, and the public. Wetlands data are easily accessible at <http://www.fws.gov/wetlands> for viewing, printing, simple analysis, download, and transfer through a web mapping service (WMS) and for viewing through Google Earth.TM NWI wetlands publications are easily searchable at the same website.

Current NWI data has never been more relevant to the Service. Wetlands geospatial data, combined with other biological information, supports the Service's Strategic Habitat Conservation adaptive management approach.



This map shows the status of wetland mapping in the U.S. Digital geospatial data available through the online Wetlands Mapper, which can be used in GIS analysis, are shown in light green. Dark green areas have “dumb” scanned map images that can be viewed but not used in GIS analysis. Non-digital maps are available in paper copies from distribution centers.

The data supply habitat and trend information to guide, prioritize, and assess species recovery, wildlife resource management, wetlands restoration and to support State Wildlife Action Plans. The data also support research, analysis, and modeling (e.g., sea-level rise) in the Service's landscape conservation cooperatives (LCCs). Other Service programs that rely on NWI data include the National Wildlife Refuge System, Migratory Birds, Fisheries, Endangered Species, Partners for Fish and Wildlife, Coastal Program, Conservation Planning Assistance, Coastal Barrier Resources Act (CBRA), and Contaminants.

NWI is a relatively small program. The FY 2010 appropriation for the program was \$5.3 million, with 16 filled FTEs to carry out NWI's activities. Much of the program's work is conducted through cooperative agreements and contracts. The program's many challenges and opportunities have led us to develop this Strategic Plan. This Strategy incorporates stakeholder input and builds on internal and external capabilities to address emerging issues and current national priorities.

Our overarching responsibilities are to produce and deliver complete, current, mission-critical wetlands geospatial data in state-of-the-art digital formats and habitat information needed to guide the conservation and stewardship of the Nation's wetlands, related habitats, and wildlife. Since receiving a 50 percent budget cut in 1996, the NWI Program has had to rely more heavily on contributed data to help meet its objectives. The NWI Program worked with the FGDC to develop national wetland mapping standards so that federally-funded wetland mapping projects would produce standards-compatible data that could be used to complete and update the national wetlands geospatial inventory for the country. After completion of the 2010 national status and trends report, the primary focus of NWI is to provide data stewardship for standards-compliant wetlands geospatial data. Data stewardship includes managing, distributing, and archiving existing data and providing coordination, training, and quality control for data contributed by cooperators. We will emphasize our coordination with governmental and non-governmental cooperators to increase modernized data collection to complete the data layer as mandated by the EWRA and to reach the 20 percent annual update level desired by users. The program also has the marketable expertise to provide other mapping, analysis, and data delivery technology expertise to assist the Service in other areas, such as upland or invasive species mapping, climate change analyses, and wildlife or plant community mappers.

This Strategy was developed to guide the Program over the next five years and includes our Vision, Mission, Goals, and Objectives. All Team NWI Regional Coordinators are encouraged to work closely with their appropriate management team to develop step-down plans to support NWI's Vision and the Action Plan.

Program Structure

NWI has national staff based both at Headquarters (Washington, D.C.) and remotely at the National Standards and Support Team (NSST) in Madison, WI. It also has staff representing each Region.

- Two staff in Headquarters provide national program coordination with Service programs, Department, and other Federal agencies. They also conduct planning, budget, and performance coordination.
- Six staff at NSST manage the wetlands geospatial database; deliver the data online to the public; provide data verification, technical assistance, and training; implement OMB, Department, and Service IT, security, and information quality assurance requirements; and conduct the national status and trends analysis.
- Eight Regional Wetlands Coordinators and one Assistant in Alaska work with cooperators to coordinate, analyze, and report wetland information needs within a Region; provide training and technical assistance for the development and uses of NWI data; support the Regions' landscape-level planning, analysis, and modeling; provide quality control for produced or contributed wetlands data; assist on national program development or projects; and respond to customer and national data or information inquiries.

Conserving America's Wetlands for Future Generations

Vision: The National Wetlands Inventory provides current scientifically-based information on the location, status, extent, characteristics, and functions of wetlands and related habitats to promote the understanding and conservation of these resources.

Mission:

Producing, maintaining, and delivering current and historical geospatial wetland data and information for the nation, in partnership with others.

Analyzing and reporting on status, trends, threats, and assessments of wetlands and related habitats, with a focus on habitats that have experienced substantial wetland change or that are changing rapidly.

Promoting sound decision making and policy formulation, through the development and dissemination of wetlands data and information through a variety of media.

Strategic Goals:

Acquire, produce, manage, and deliver data. We will create, manage, and deliver wetlands data that meet established data standards and Service needs.

Assist in Wetlands Conservation. We will provide information and offer assistance in landscape conservation that supports the mission of the Service, its Strategic Habitat Conservation adaptive management approach, Landscape Conservation Cooperatives, and climate change activities.

Use State-of-the-art Technologies. We will deploy state-of-the-art technologies to support efficient and effective science.

Increase support for NWI. We will develop and implement an effective communication strategy to enhance the Service's ability to provide complete, current wetlands information that supports wetlands conservation.

Enhance our Workforce. We will develop a workforce responsive to our mandates and the needs of our partners.

Objectives:

1.1 Provide current wetlands geospatial data for the nation.

1.2 Maintain and publish NWI data for public use.

1.3 Ensure that data quality and delivery methods support the needs of stakeholders, customers, and cooperators.

1.4 Seek necessary support to accomplish the tasks needed to complete and maintain the wetlands layer as current.

2.1 Provide current wetlands geospatial information that supports wetland conservation policies.

2.2 Foster wetlands analyses and modeling for climate change.

2.3 Provide landscape-level wetlands information.

3.1 Implement technologies for efficient mapping and producing accurate wetlands geospatial data.

3.2 Use technology to effectively deliver wetlands geospatial data.

4.1 Build Service, Department, and OMB support for the National Wetlands NWI to ensure sustainability and for the use of the NWI for landscape-level planning, analysis, and modeling.

4.2 Build and coordinate Federal, State, Territorial, Tribal, and local agency support of the National Wetlands Inventory for uses of wetlands geospatial data..

4.3 Develop well-informed users to increase the reach and impact of National Wetlands Inventory data for wetlands conservation.

5.1 Maintain a program structure that supports the needs of the Service.

5.2 Hire and train staff to meet current and projected workloads and advances in technologies.

Our Response to Climate Change

*Strategic Goal:
Acquire,
produce,
manage, and
deliver data.*

To address program mandates and assist in the Nation's collective response to climate change, NWI has developed five Goals and Objectives to meet those Goals, outlined below. For each Objective, we include why it is included and how it will be addressed. A companion Action Plan will further outline strategies, activities, performance measures, responsibilities, and timelines.

Goal 1 - Acquire, produce, manage, and deliver data.

Objective 1.1: Provide current wetlands geospatial data for the Nation.

Natural resource conservation efforts addressing accelerating climate change and habitat loss require current wetlands geospatial data for landscape-level planning. To meet these requirements, we will manage and deliver seamless data online, available whenever it is needed. We will acquire data and encourage contributed data to support national priorities, Landscape Conservation Cooperatives, and similar landscape level initiatives priorities; provide and leverage funding and support to enhance mapping partnerships; and meet mapping targets, OMB requirements, and EWRA mandates.

Objective 1.2: Maintain and publish all NWI data for public use.

OMB A-16 requires the Service to provide available standards-compliant data for the wetlands layer. We will maintain and publish available, qualitatively acceptable, wetlands geospatial data.

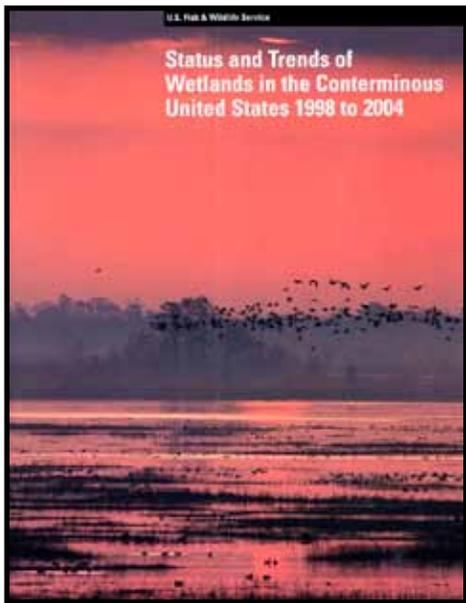
Objective 1.3: Ensure that data quality and delivery methods support the needs of stakeholders, customers, and cooperators.

OMB A-16 requires the Service to meet users' data needs, distribute data, provide information about the appropriate data uses, and ensure that data standards reflect the needs of users. We will emphasize providing qualitatively acceptable data that conforms with Department, Service, and FGDC requirements for use by a wide group of users.

Objective 1.4: Seek necessary DOI support to accomplish the tasks needed to complete and maintain a current wetlands layer.

OMB A-16 requires the Department, through the Service, to support allocations of agency resources to fulfill the responsibilities of effective spatial data collection, production, and stewardship. The program will work closely with and build program support from DOI.

Strategic Goal: Assist in Wetlands Conservation.



A special 5-year Status and Trends report was completed in 2005 at the request of the President. The 10-year report, mandated by Congress, will be completed in 2010.

Goal 2 - Assist in Wetlands Conservation.

Objective 2.1: Provide current wetlands geospatial information that supports wetland conservation policies.

To comply with EWRA, we will publish the National Wetlands Status and Trends report of the conterminous U.S. in late 2010, as required. We also will work with Federal and other partners to complete reports on wetlands resources. These reports will inform Federal agency wetlands decisions for climate change and other threats to wetlands. As funding allows, we will conduct additional special analyses of wetlands location and change in critical areas.

Objective 2.2: Foster wetlands analyses and modeling for climate change.

The Secretary's Climate Change Order No. 3289 and the Service's Strategic Plan for Responding to Accelerating Climate Change require all programs to address climate change, especially sea-level rise. NWI will actively support data needs for monitoring the potential impacts of sea-level rise on coastal habitats, an important planning tool for coastal habitats, species, communities, and infrastructure planning. We will provide technical assistance to support wetlands as a base data layer used for all climate change analyses and modeling that use wetlands data. We will prioritize mapping updates in coastal areas expected to be impacted by sea-level rise, especially where Coastal Barrier Resources Act (CBRA) units are located.

Objective 2.3: Provide landscape-level wetlands information.

Landscape-level habitat assessments are needed to plan for, adapt to, and manage for climate change. We will take steps to provide data for applications that assist Federal, State, Tribal, and local agencies striving to protect and increase fish and wildlife habitats, water quality and quantity, storm water retention, and wetland carbon storage estimates. As funding allows, we will conduct analyses of landscape-level wetlands functions and potential restoration sites.



On-line SLAMM View, showing Sea Level Affecting Marshes Model visualization at St. Simon's Island, GA, based on NWI data.

Strategic Goal: Use State-of-the-art Technologies.

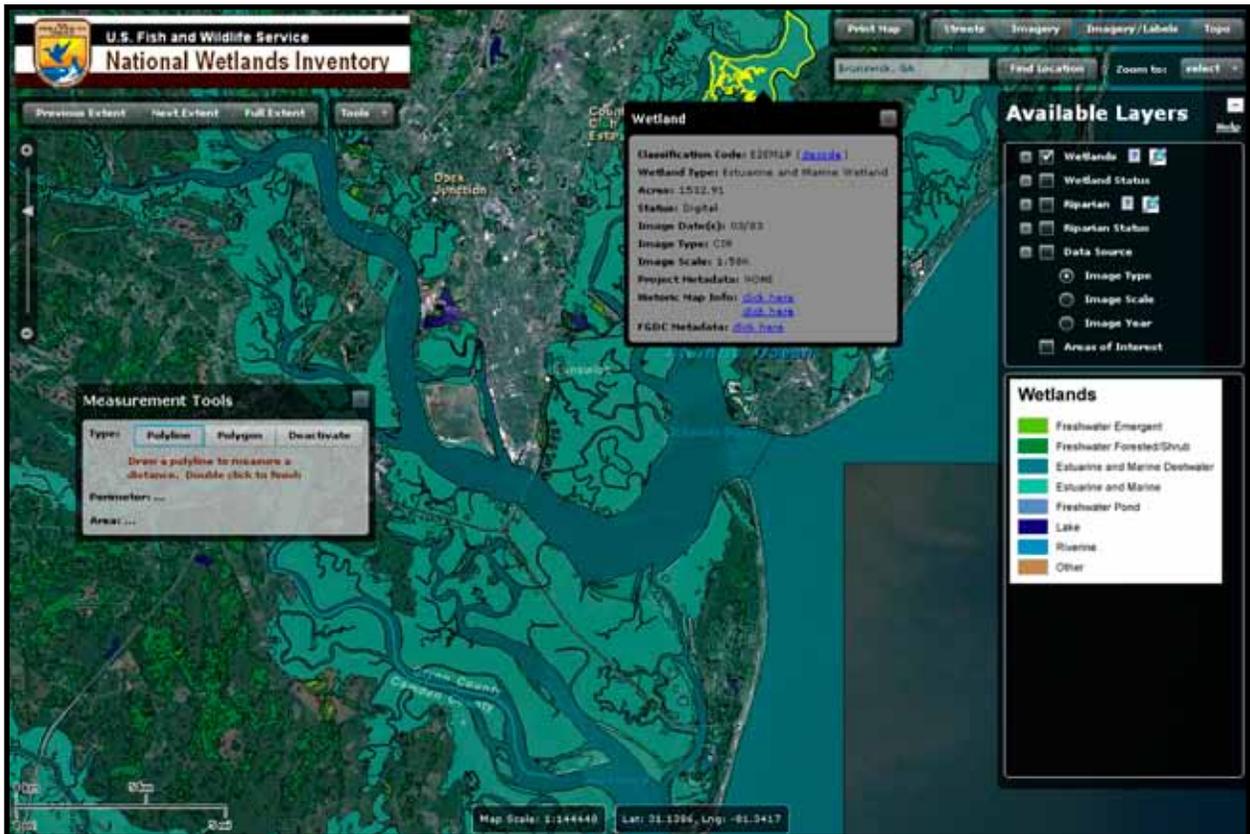
Goal 3: Use State-of-the-art Technologies.

Objective 3.1: Implement technologies for efficient mapping and producing accurate wetlands geospatial data.

Technologies related to mapping are evolving rapidly. We will stay current on technologies that improve the quality of wetlands data and increase efficiency in producing these data. We will support the investigation or use of these technologies where applicable to and compatible with the Service's mission and where they control costs and increase efficiency.

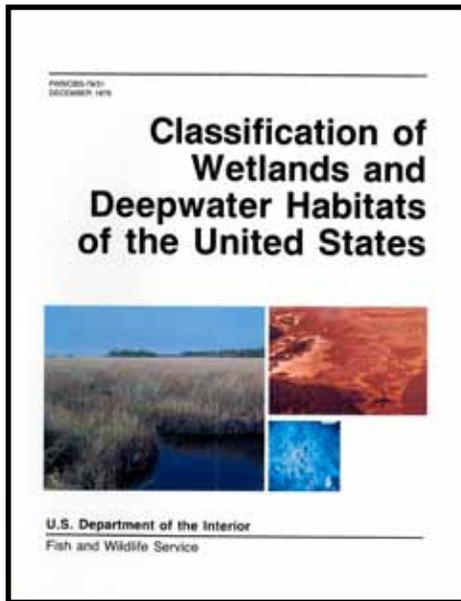
Objective 3.2: Use technology to effectively deliver wetlands geospatial data.

NWI has the largest polygonal habitat database in the world. With only 63 percent complete, it is still growing and will grow even faster as data are updated at a finer scale. Our customers have increased 20 percent in just the last two years to 60 million visits. To meet these growing demands plus Administration requirements, we will use cutting-edge technology in data management and delivery, implementing applications that are cost effective.



New state-of-the-art Wetlands Mapper, faster, with additional information and tools, and additional riparian data layer.

Strategic Goal: Increase support for NWI.



Cowardin et al., the Service's wetlands classification system that was created in 1979 and adopted as an FGDC National Standard in 1996, is under a multi-step maintenance review.



The NWI website provides wetlands information, wetland reports, data downloads, and a new state-of-the-art Wetlands Mapper.

Goal 4 - Increase support for NWI.

Objective 4.1: Build Service, Department, and OMB support for NWI to ensure its sustainability and use for landscape-level planning, analysis, and modeling.

Maintaining and improving the NWI program requires visibility, planning, and management at all levels of the organization. NWI's wetlands geospatial data is the only standards-compliant landscape-scale national wetlands habitat data available today. Its future is dependent on broad support and the program's ability to produce and acquire up-to-date information. To meet the current needs of the Service, NWI will provide technical support and analysis to foster the needs of LCCs or similar landscape initiatives. NWI will seek opportunities to train Service personnel in use of the Wetlands Mapper and current technologies. NWI will develop innovative education tools to introduce the program capabilities to incoming Service personnel. At all levels, NWI will seek to expand partnerships and institutionalize NWI data in relevant policy, management, and research activities of the Federal government.

Objective 4.2: Build and coordinate Federal, State, Territorial, Tribal, and local agency involvement in the National Wetlands Inventory to promote update, refinement, and uses of wetlands geospatial data.

Support for NWI is critical to completing, modernizing, and refining the wetlands layer of NSDI for multiple uses. To strengthen coordination, NWI staff will continue to chair the FGDC Wetlands Subcommittee to foster support of wetlands mapping; partner with other agencies to develop and maintain national standards; and integrate and coordinate wetland classification and mapping standards with other habitat and vegetation standards. We will further strengthen partnerships with international, other Federal, State, Tribe, Territorial, and local government agencies and non-government organizations. NWI also will provide technical support and training to other programs and agencies to enable them to map wetlands in their areas of interest and to contribute these data to the national wetlands data layer.

Objective 4.3: Develop well-informed users to increase the reach and impact of National Wetlands Inventory data for wetlands conservation.

Successful wetlands conservation requires public engagement and support for the conservation actions of government agencies and other organizations. To encourage public engagement, we will enhance our website and online Wetlands Mapper to assure that data and information are provided in ways that meet the needs of our customers and partners. We will provide information to engage people and inform them about wetlands and their functions and encourage them to use wetlands data for planning and landscape-level assessments. Communication works both ways. We will use our website and scientific, technical, and user association meetings as venues to hear from our data users.

*Strategic Goal:
Enhance our
workforce.*

Goal 5 – Enhance our workforce.

Objective 5.1: Maintain a program structure that supports the needs of the Service.

Based on the needs of the Service, rapidly changing technology, expected increase in contributed data, rapid growth in data users, and Regional coordination needs, we will continue to support our national and Regional structure of NWI. We will review the organizational structure as necessary to ensure that it meets the Service's and our partners' needs within a changing financial environment.

Objective 5.2: Hire and train staff to meet current and projected workloads and advances in technologies.

We will conduct a workload assessment that evaluates current and projected workforce needs to accomplish the strategic plan. We will develop a succession plan, recruit staff, and train current and future NWI staff and develop expertise to meet the needs and priorities of the Service as resources permit.



Team NWI staff meeting July 2010

Conclusion

Wetlands, critical for fish, wildlife, and people, are threatened by climate change and other human-induced threats. Maintaining, improving, restoring, and protecting wetlands for current and future generations requires knowing their locations, how they are changing, and what functions they provide. This information is used to analyze, model, and plan for threats and future development. The Secretary of the Interior through the Director of the Service is responsible for building, maintaining, and disseminating the wetlands layer of National Spatial Data Infrastructure. Leadership responsibility lies with NWI. Resource limitations require that NWI provides mandated stewardship of existing standards-compliant wetlands data, produces national status and trends reports, and develops strong partnerships with cooperators and stakeholders to collect complete, modernized, and refined data for the Nation. This Strategic Plan outlines the Vision, Mission, Goals, and Objectives to accomplish these tasks. A separate Action Plan will outline the strategies and activities under each objective, including measurable performance standards, responsible parties, and estimated target dates. All Service Regions are encouraged to develop annual step-down plans.



Scenic view of salt marsh wetlands and spartina grass in Savannah, Georgia.
Credit: George Gentry/USFWS

Glossary: Abbreviations and Definitions for Strategic and Action Plans

ASWM – Association of State Wetland Managers

CBRA – Coastal Barrier Resources Act

Current – For performance reporting, NWI presently considers wetlands geospatial data “current” when the image-interpretation is based on imagery that is 10 years old or less.

Department – Department of the Interior

EPA – Environmental Protection Agency

EWRA – Emergency Wetlands Resources Act of 1986

FGDC – Federal Geographic Data Committee

FTE – Full-Time Equivalents (Federal staff ceiling)

GIS – Geographic Information System

LCC – Landscape Conservation Cooperative

LiDAR – Light Detection And Ranging - optical remote sensing technology that measures properties of scattered light to find range and/or other information of a distant target.

LLWW – Landscape position, Landform, Waterflow Path, Waterbody (Tiner 2003), NWIPlus mapping system used for analysis of landscape-level functional assessment.

Maintenance – Maintenance of the wetlands layer includes management and security of existing data, but also includes update to assure the data are maintained as current.

Modernized – Wetlands geospatial data are modernized when they are refined to a finer scale required in the new Wetland Mapping Standard when being updated by interpreting up-to-date imagery, which yields current, more-detailed data.

NSDI – National Spatial Data Infrastructure

NSST – National Standards and Support Team, National Wetlands Inventory, Madison, WI.

NWI – National Wetlands Inventory

NOAA – National Oceanic and Atmospheric Administration

OMB – Office of Management and Budget

RWC – Regional Wetlands Coordinator, National Wetlands Inventory

Secretary – Secretary of the Department of the Interior

Service – U.S. Fish and Wildlife Service, Department of the Interior

SLAMM – Sea Level Affecting Marshes Model

USGS – U.S. Geological Survey, Department of the Interior

WO – Washington Office, Headquarters, National Wetlands Inventory

WMC – Wetlands Mapping Consortium

WMS – Web Mapping Service - standard protocol for serving georeferenced map images over the Internet that are generated by a map server using data from a GIS database, but does not include metadata.

Appendix I

Legislative and Executive Mandates

Legislative Mandates:

Clean Water Act, Title 33, Ch. 26, Subchapter II (h)i. Under State best management practices program, (2) there is authorized to be appropriated to the Secretary of the Interior \$6,000,000 to complete the National Wetlands Inventory of the United States, by December 31, 1981, and to provide information from such Inventory to States as it becomes available to assist such States in the development and operation of programs under this chapter. These funds were never appropriated.

Emergency Wetlands Resources Act of 1986. Public Law 99-645 (100 Stat. 3582), approved November 10, 1986, required the Secretary to report to Congress on wetlands loss, including an analysis of the role of Federal programs and policies in inducing such losses. In addition, as amended in the Wild Bird Act of 1992, it directed the Secretary, through the Service, to complete by September 30, 1998, mapping of the contiguous United States; produce, by September 30, 2000, National Wetlands Inventory maps for Alaska and other noncontiguous portions of the U.S.; produce, by September 30, 2004, a digital wetlands database for the U.S. based on the final wetland maps produced under this section; archive and make available for dissemination wetlands data and maps digitized under this section as such data and maps become available; and to produce, by September 30, 1990, and at ten-year intervals thereafter, reports to update and improve in the September 1982 "Status and Trends of Wetlands and Deepwater Habitat in the Conterminous United States, 1950's to 1970's."

Fish and Wildlife Act of 1965, the Act of March 10, 1934; Ch. 55; 48 Stat. 401), as amended by the Act of June 24, 1936, Ch. 764, 49 Stat. 913; the Act of August 14, 1946, Ch. 965, 60 Stat. 1080; the Act of August 5, 1947, Ch. 489, 61 Stat. 770; the Act of May 19, 1948, Ch. 310, 62 Stat. 240; P.L. 325, October 6, 1949, 63 Stat. 708; P.L. 85-624, August 12, 1958, 72 Stat. 563; and P.L. 89-72, 79 Stat. 216, July 9, 1965. In 1934, Congress passed the Fish and Wildlife Coordination Act, as amended, authorizing the Secretary of the Department of the Interior to provide assistance to and cooperate with Federal, State, and public or private agencies and organizations for wildlife conservation, and to make surveys of the Nation's lands and waters.

Information Quality Act (IQA), sometimes referred to as the Data Quality Act, was enacted December 2000 as Section 515 of the Treasury and General Government Appropriations Act for FY 2001 (P.L. 106-554). The act

requires OMB to issue guidance to federal agencies designed to ensure the "quality, objectivity, utility, and integrity" of information disseminated to the public. It also required agencies to issue their own guidelines and to establish administrative mechanisms that allow affected persons to seek correction of information maintained and disseminated by the agencies that does not comply with the OMB guidance. Under these guidelines, the Service developed the U.S. Fish and Wildlife Service Information Quality Guidelines, as updated August 2007, including requirements for meeting Service data standards and peer-review process.

Executive Mandates:

Department of the Interior Enterprise Architecture Blueprint, December 2007. DOI's business activities depend on geospatial information—knowing where things are and understanding how they relate to one other. The purpose of the Geospatial Modernization Blueprint is to define how geospatial data and technology will be used to enhance the business activities of DOI and its bureaus and to achieve their mission and goals.

Fish and Wildlife Service. *Rising to the Challenge: Strategic Plan for Responding to Accelerating Climate Change, and Appendix: 5-Year Action Plan*, September 21, 2009. Requires programs to examine everything we do through the lens of climate change; commit to a new spirit of coordination, collaboration, and interdependence with others; reflect scientific excellence, professionalism, and integrity in all our work; emphasize the conservation of habitats with sustainable landscapes, apply our "Strategic Habitat Conservation" framework; assemble and use state-of-the-art technical capacity to meet the climate change challenge; be a leader in national and international effort to address climate change; and (Action 2.7.1) specifically requires "the Assistant Directors for the National Wildlife Refuge System and Fisheries and Habitat Conservation to continue to evaluate and improve upon regional sea level rise models (such as the Sea Level Affecting Marshes Model-SLAMM) and application of these models to project future impacts to coastal National Wildlife Refuges. They will expand these models to additional important coastal areas, including Coastal Barrier Resources Act units."

Fish and Wildlife Service Administrative Manual. 270 FW 8 Geographic Information Systems. States the objectives of our spatial data management program and how we implement Geographic Information System (GIS) technology. It describes the roles and responsibilities of Service employees managing and implementing GIS

and describes the general authorities under which our GIS program operates. It ensures that we use GIS data and technology to enhance resource management and administrative activities through the cost-effective creation, analysis, and exchange of spatial data; avoid duplication of effort by coordinating projects within the Service and with our partners; and comply with FWS adopted standards.

Office of Management and Budget Circular A-16, Coordination of Geographic Information and Related Spatial Data Activities, as amended in 2002. OMB A-16 establishes the National Wetlands Inventory as the wetlands layer data theme of the National Spatial Data Infrastructure (NSDI) under the coordination of the Federal Geographic Data Committee (FGDC) and directs DOI through the Fish and Wildlife Service to:

1) Provide leadership and facilitate the development and implementation of needed FGDC standards.

(2) Provide leadership and facilitate the development and implementation of a plan for nationwide population of each data theme. Plans will include the development of partnership programs with States, Tribes, academia, the private sector, other federal agencies, and localities that meet the needs of users, address human and financial resource needs, identify needs for standards, metadata, and the Clearinghouse, and advance a timetable for the development of NSDI data themes.

(3) Prepare goals that support the NSDI strategy and, as needed, collect and analyze information from users about their needs for spatial data

(4) Administratively:

- (a) Designate a point of contact within the lead agency who will be responsible for development, maintenance, coordination, and dissemination of data using the National Spatial Data Clearinghouse;
- (b) Provide a performance report, at least annually, that documents data theme activities and implementation status, including progress toward goals.
- (c) Publish maps or comparable graphics online showing the current extent and status of the spatial data theme and always use FGDC specified Web mapping conventions; and
- (d) Identify and publish proven practices for the use and application of agency data sets.

Office of Management and Budget Circular A-11, Section 53, Information Technology and E-Government, 2010. The information required in Section 53 allows the agency and OMB to review and evaluate each agency's IT spending and to compare IT spending across the Federal Government. Specifically the information helps the

agency and OMB to (among other requirements):

- Ensure initiatives create a citizen-centered electronic presence and advance an E-Government (eGov) strategy including specific outcomes to be achieved;
- Identify costs for providing IT security as part of agency investment life cycle as well as IT security costs for supporting crosscutting or infrastructure related investments under the Federal Information Security Management Act (FISMA);
- Provide a full and accurate accounting of IT investments for the agency as required by the Clinger-Cohen Act of 1996;
- Ensure spending on IT supports agency compliance with the requirements of Section 508 of the Rehabilitation Act Amendments of 1998 (Electronic and Information Technology Accessibility) and Section 504 of the Rehabilitation Act of 1973 (Reasonable Accommodation); and
- Ensure compliance with E-Government Act of 2002 and Paperwork Reduction Act of 1995.

Office of Management and Budget Circular A-16 Supplemental Guidance (draft). Under the draft Supplemental Guidance, NWI is now considered a National Geospatial Data Asset (NGDA) Dataset. Each national dataset manager is expected to plan, develop, maintain, evolve, and archive dataset for which they are responsible according to the stages of the Geospatial Data Lifecycle (Guidance, Appendix B). The Geospatial Data Lifecycle stages are Define, Inventory/Evaluate, Obtain, Access, Maintain, Use/Evaluate and Archive, with multiple steps under each stage driven by business requirements. The expected outcomes of this lifecycle management framework include:

- Better understanding of the current maturity of NGDA Datasets;
- Identification of management practices that NGDA Dataset Managers use to develop datasets;
- Provision of timely and high-quality geospatial data to support business processes and operations;
- Creation of stronger partnerships across all levels of government and, when appropriate, the private sector, to increase cost efficiency and return on investment; and
- Improved strategies for completing and maintaining NGDA Themes and NGDA datasets associated with OMB Circular A-16 to enhance services to citizens.

NGDA Dataset Managers should evaluate their dataset against the Geospatial Data Lifecycle stages to report on the maturity and status of their datasets. In addition, they should report on how they are conforming to

NGDA Dataset Managers' responsibilities. NGDA Dataset Managers should also track resources, both in dollars and full time equivalent (FTE) as well as other performance measures concurred upon by the FGDC Steering Committee for inclusion in the annual NGDA Theme Report.

Office of Management and Budget Circular No. A-130, Management of Federal Information Resources. Provides uniform government-wide information resources management policies as required by the Paperwork Reduction Act of 1980, as amended by the Paperwork Reduction Act of 1995, 44 U.S.C. Chapter 35, and contains updated guidance on the "Security of Federal Automated Information Systems," Appendix III and makes minor technical revisions to the Circular to reflect the Paperwork Reduction Act of 1995 (P.L. 104-13).

President of the United States. Executive Order 12906 of April 11, 1994. *Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure.* Developed to strengthen and enhance A-16, the Executive Order states "the National Performance Review has recommended that the executive branch develop, in cooperation with State, local, and tribal governments, and the private sector; a coordinated

National Spatial Data Infrastructure to support public and private sector applications of geospatial data in such areas as transportation, community development, agriculture, emergency response, environmental management, and information technology."

Secretary of the Department of the Interior. Order # 3289, February 22, 2010. Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources. This order establishes a Department-wide approach for applying scientific tools to increase understanding of climate change and to coordinate an effective response to its impacts on tribes and on the land, water, ocean, fish and wildlife, and cultural heritage resources that the Department manages. For Landscape Conservation Cooperatives, the order requires bureaus and agencies to work together and with other federal, state, tribal and local governments, and private landowner partners, to develop landscape-level strategies for understanding and responding to climate change impacts. The Department also prioritized development of renewable energy on public lands and offshore waters to reduce our dependence on foreign oil and to reduce greenhouse gas pollution.



Wetland sunrise; water and reeds in foreground with plant growth in background.
Credit: Ryan Hagerty/USFWS

U.S. Department of the Interior
U.S. Fish & Wildlife Service

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