

U.S. Fish and Wildlife Service

**The Wetlands Master Geodatabase
Annual Report FY 2005**

**U.S. Fish and Wildlife Service
Branch of Habitat Assessment
Washington, D.C.**



Program Contacts

David Stout
Acting Chief, Division of Habitat and Resource Conservation
U.S. Fish and Wildlife Service
703-358-2161

John Cooper
Chief, Branch of Habitat Assessment
U.S. Fish and Wildlife Service
703-358-2161

Thomas E. Dahl
Technical Project Manager
U.S. Fish and Wildlife Service
608-783-8425

David McCulloch
Office of Water Information – Chief, CAPP
U.S. Geological Survey
608-238-9333



Annual Report FY 2005

The Wetlands Master Geodatabase

The concept for a comprehensive Wetlands Master Geodatabase (MGD) stems from past successes in producing and distributing wetlands maps and wetlands status and trends information. With the advent of computer technologies that now allow the integration of large relational databases with spatial information and display, the Master Geodatabase provides the Service an opportunity to capitalize on years of data collection effort by developing scientifically sound, technologically relevant tools for data analysis, distribution, archiving and updating aquatic resource information.

The MGD became operational on December 3, 2003 (NWI Memo #001-2004). It contains five units or segments that are populated with digital data. These units include Conus (conterminous U.S.), Alaska, Hawaii, Puerto Rico and the U.S. Virgin Islands and, the Pacific Trust Territories. Each unit of the geodatabase contains seamless digital map data in ArcSDE geodatabase format. Data are in a single standard projection (Albers Equal-Area Conic Projection), horizontal planar units in meters, horizontal planar datum is the North American Datum of 1983 (also called NAD83), and minimum coordinate precision of one centimeter.

As of 2005 the Master Geodatabase also contains other propriety Service datasets such as the Wetlands Status and Trends database.

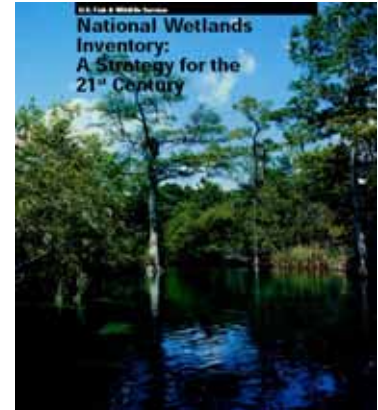
General Disclaimer

The use of trade, product, industry or firm names or products is for informative purposes only and does not constitute an endorsement by the U.S. Government or the Fish and Wildlife Service.

Contemporary Geospatial Wetlands Information

Resource managers increasingly need contemporary information on aquatic habitats to address increasingly complex issues. The Fish and Wildlife Service is often asked to provide scientific information to other federal and state agencies, industry and the public. These types of analyses rely on digital information to provide fast, efficient and scientifically sound mechanisms for resolving resource management issues. Computer technologies now allow the integration of large relational databases with spatial information and display providing the Fish and Wildlife Service an opportunity to develop scientifically sound, technologically relevant tools for data analysis, distribution, archiving and updating aquatic resource information. The common structures, methodology and exchange formats provided by the geographic information system technologies greatly facilitate this process and lead to the development of a comprehensive Wetlands Geodatabase.

In 2002, the Fish and Wildlife Service developed a comprehensive and forward looking strategy to guide digital wetland mapping and assessment efforts of the National Wetlands Inventory. This Plan mirrors the Department's Strategy to improve the scientific information base for resource management, technical assistance, and decision-making, as well as the President's Management Agenda and E-Government initiatives. It also encompasses the geospatial goals and objectives laid out in the Information Resources and Technology Management (IRTM) and the Service's Geographic Information Systems Strategic Plan.



There were two important yet distinct purposes for the creation of the Wetlands Master Geodatabase (MGD). The first was to improve the editing, storage and distribution capability of the wetlands digital data. The second objective was to greatly enhance the Service's capability to use ancillary GIS data sets and integrate digital map data with other resource information to produce timely and relevant management and decision support tools.

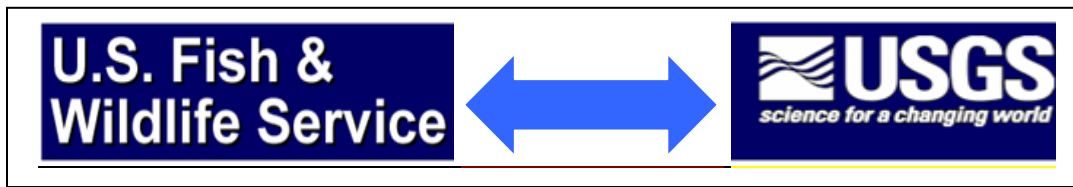
The outcome of these strategic program changes is to provide mission critical habitat information in state-of-the-art digital formats to help guide the conservation and stewardship of the nation's wetlands and aquatic resources for the benefit of people. To meet these new objectives the Service in cooperation with the U.S. Geological Survey planned, developed and implemented a Wetlands Master Geodatabase (MGD).

Successfully managing geospatial data resources and technology is one key to accomplishing the U.S. Fish and Wildlife Service's mission and goals today.

FWS GIS Strategic Plan 2006

Collaboration with the U.S. Geological Survey

The Service has developed and maintains a close working relationship with the U.S. Geological Survey's (USGS) Office of Water Information in Madison, WI. Through this partnership the USGS assists the Service with emerging technologies, geographic information science, database management and support. The MGD Manager continues to assist the Service with integrating updated information into the database, providing data summaries for special projects and technical assistance regarding data manipulation and verification.



With the finalization of the Re-organization Plan for the National Wetlands Inventory, the Service's collaboration with USGS will be expanding and in FY 2006 the Service's MGD administrator will be co-located in the USGS offices. This will further enhance collaboration, and shared technical exchange on such subjects as geographic information system applications, web mapping interface and database structure.

Geodatabase Status – October 2005

The MGD contains over 30,743 maps in a seamless ArcSDE geodatabase. This represents wetland map data for approximately 54.3 percent of the conterminous U.S.; 19.3 percent of Alaska; 100 percent of the windward islands of Hawaii; 62.1 percent of Puerto Rico and the U.S. Virgin Islands and; 100 percent of Guam and Saipan in the Pacific Trust Territories.

Percent area covered by digital wetlands map data by Service Region at the end of FY 2005:

- Region 1 - 61.4 %
- Region 2 - 9.8
- Region 3 - 81.2
- Region 4 - 65.1
- Region 5 - 92.6
- Region 6 - 47.6
- Region 7 - 19.3

The Service has achieved noteworthy performance gains as a result of these efforts. Capitalizing on this data modernization effort and partnerships has resulted in the Service converting over 985 million acres of landscape into seamless format for modernized Internet delivery to improve customer use and assessment capabilities. Through these developments the Service is now able to

provide digital wetlands map data never before available to the public. The production of digital data has more than doubled since FY 2003. Important information about mapping status has also been provided by the MGD. We now have a much more accurate picture of the status of digital data for the Nation.

During FY 2005, the MGD dataset expanded by adding digital wetlands map data here-to-fore not available. A total of 3,505 quadrangles of data were added (6.5 percent of the national total). Most noteworthy were digital data from the States of California¹, Kentucky², Tennessee and portions of Alabama³ totaling about 3,089 quadrangles.

The MGD also houses the Wetlands Status and Trends digital plot data. It contains all supporting status and trends databases including those with geophysical information and supporting field data.

The Service's wetlands geodatabase is believed to be one of world's largest polygonal datasets (in the civilian sector). It currently supports over 16 million features.

Types of Data and Metadata Available

Improvements and redesign of the type of metadata available for the Service's digital wetlands map holdings now enable users to access the Federal Geographic Data Committee compliant metadata, as well as project level metadata (for specific updated project areas) and some of the "historic" metadata collected when the original mapping was completed. Supplemental metadata linked to individual polygon features in the database now allow the incorporation of contributed data to be added to the wetlands layer. This will be especially important as data are contributed to the database by other state, federal and partner organizations.



The MGD fuels an important Internet data delivery tool used by the Service to reach a larger user audience. The outcome of this effort provides mission critical habitat information in state-of-the-art digital formats to help guide the conservation and stewardship of the nation's wetlands and aquatic resources. Wetlands data in the MGD are served to resource managers and the public through a direct and secure web connection supported by USGS. In January 2005 the Service launched new map viewer interface provided by Geocortex.

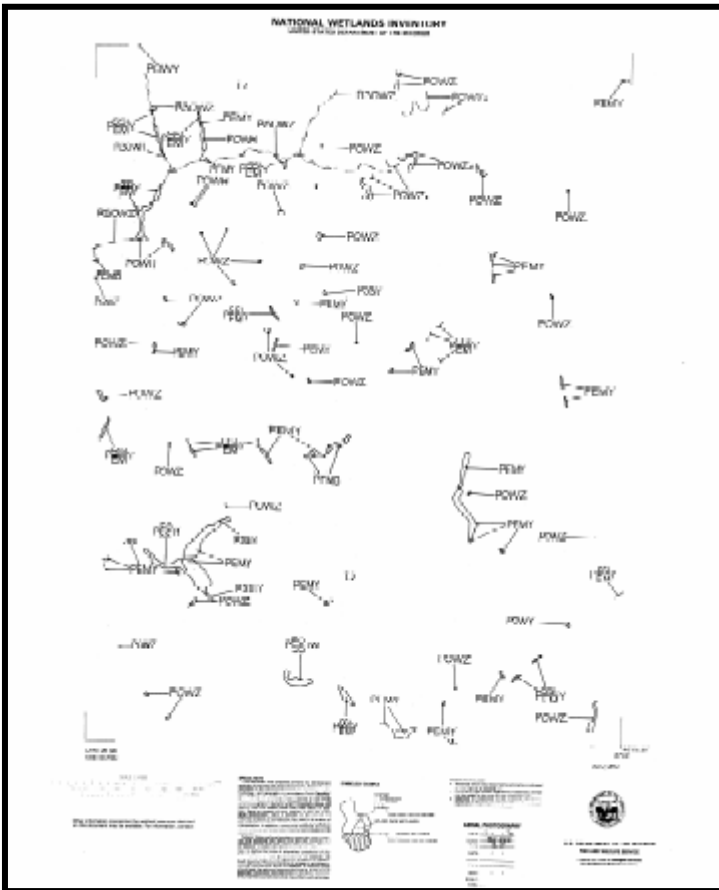
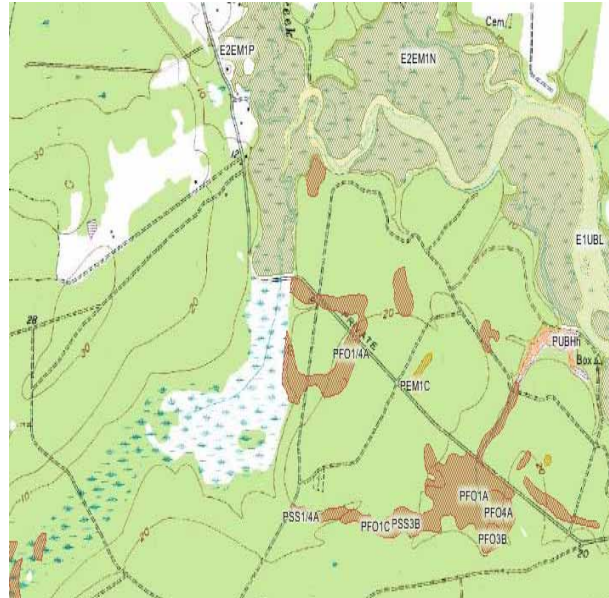
The **Wetlands Mapper** is designed to promote greater awareness of wetlands map data applications and deliver easy to use, map-like views of America's wetland resources in a digital format. The Mapper is both Section 508 and OGC (Open GIS Consortium) compliant, which allows outside site administrators the ability to include wetlands in their own ArcIMS viewers as background layers.

¹ CA data represented newly digitized map areas

² KY data digitized by the State of KY

³ Data from TN and AL were contributed by TVA

The Wetlands Mapper is fueled by the MGD dataset and is designed to integrate digital map data with other resource information to produce timely and relevant management and decision support tools. In this example, the Service's wetlands data have been combined with topographic map information to give the user a more complete perspective of land use.



Map Layers

- Interactive Layers
- Wetlands Data
 - Wetlands Data Availability

Scale > 1:100,000

 - Digital
 - Scan
 - Non-Digital
 - No Data

Non-digital wetland map data are also being served by the Wetlands Mapper. The image shown here is the original 1:24,000 wetlands map produced in hard copy the Service. These scanned PDF files are served as images of the maps in areas of the country where the data were never digitized. As a pilot effort, scanned maps were available for users to access on the Wetlands Mapper for eastern Ohio.

In FY 2005 the Wetlands Mapper received over 40 million successful requests for information. Average daily transfer of data was 547 megabytes. An additional 217,270 quadrangles of data were distributed to users by special requests to the MGD manager. The Service also responded to 542 requests for technical assistance or information through the Wetlands Mapper site in FY 2005.

E-Government - Geospatial One-Stop and OGC

Enabled by the Wetlands Master Geodatabase, all of the Service's digital wetlands data can now be viewed along with the project metadata and appropriate Bureau acknowledgements as part of *The National Map* project hosted by USGS. The incorporation of this dataset into *The National Map* represents a monumental step forward in the Service's ability to display data as well as expand our outreach capabilities. The Service's wetlands data reside on the 'Catalog' or contents page of *The National Map*, which is within the scope of the *Geospatial One-Stop*.



The Service continues to point large data users to the Web Map Service (WMS) capability. This option provides federal and state agencies as well as large institutional users an opportunity to establish OGC linkages to ensure they are getting the latest and most complete digital data provided by the Service.

Summary

A strong technical partnership between USGS and the Service has facilitated the development, deployment and operation of the Wetlands MGD. This technological advancement fulfills key elements of the Service's Strategic Plan and provides tremendous advantages in the management, storage and dissemination of the Service's digital wetland map holdings. Capitalizing on this data modernization effort and partnership has resulted in the Service converting over 30,700 wetland maps encompassing 980 million acres, into seamless format for modernized Internet delivery to improve customer use and assessment capabilities. In FY 2005, the amount of available digital map data exceeded 50 percent for the conterminous U.S. with over 40 million successful data requests from on-line users. This is a major achievement and reflects well on the Service, and the Department's ability to serve the resource community.

Related Master Geodatabase Documentation:

Automated Information System and Data Project Charter - The purpose of this document is to provide a project charter in compliance with Federal Information Resources Management Regulations.

National Standards and Quality Components for Wetlands, Deepwater and Related Habitat Mapping - This document presents the revised mapping and data automation standards as well as the protocols for map data collection and dissemination. This will serve as an operations tool but also help fulfill requirements for updated information quality information.

Addressing Information Quality Guidelines, U.S. Fish and Wildlife Service, Wetlands Master Geodatabase - This report meets the requirements of Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554) for Federal agencies to publish Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by a Federal agency, and to provide administrative mechanisms allowing the public to seek and obtain correction of information maintained and disseminated by the agency.

Plan for a Wetlands Master Geodatabase - Executive Summary - This presents the overall project strategy, planning steps and development sequence taken until the MGD became operational.

Wetlands Master Geodatabase - Wetland Resource Attribution and Verification Tools Version 2.5.1 - These are customized attribution and verification tools for resource mapping using geodatabases in ArcMAP and have been developed in a cooperative effort between the U.S. Fish and Wildlife Service and the U.S. Geological Survey. The tools, installation instructions, user information and technical help are available for download at: http://capp.water.usgs.gov/FWS_web/index.htm

Fact Sheet - Wetlands Master Geodatabase - Service fact sheet (#0015.2004) that describes the MGD purpose and characteristics. March, 2004.

Fact Sheet - Digital Wetlands Data - Interagency Cooperation - Joint Fish and Wildlife Service and USGS fact sheet on managing and web serving digital wetlands data. May, 2004.

New Database Systems for Wetland Resource Analysis - Fish and Wildlife News article, Summer, 2004.

Strategic Plan Implementation: Advances in Providing Digital Wetlands Data - Presentation to the Organization of Fish and Wildlife Information Managers, September, 2004. Available on line at: http://www.ofwim.org/docs/2004/PPT/Dahl_Allord_OFWIM_2004.ppt

Design of the Wetlands Geodatabase: Questions and Answers - MGD Technical Document 03-04. June, 2003.