

Project 1

(Date Rev. Approved Jan. 2008)

Agency: Oklahoma's Office of the Secretary of Environment
In Cooperation with:
Oklahoma Conservation Commission
Oklahoma Water Resources Board
Oklahoma State University
US Fish & Wildlife Service

Title: **National Wetland Inventory Map Digitization**

Background:

Comprehensive wetland management in the State of Oklahoma is hindered by the limited accessibility of pertinent information. Wetland maps are available from the US Fish & Wildlife Service (USFWS), but accessing the information can be inconvenient and the usability is somewhat limited. The National Wetlands Inventory (NWI) maps are housed at only one agency in Oklahoma. This inaccessibility hampers planning and management of wetland resource for the public and private sectors. Furthermore, this information is only available in hard copy, which constrains the utility of the data for in depth evaluation and detailed management applications.

As the USFWS states on their web page, the NWI maps are a critical management tool used by scores of agencies and groups. These maps are widely viewed as a determinant factor in identification and subsequent management of wetland resources. This point alone illustrates the importance of unfettered accessibility to the resource.

“Users of NWI maps and digital data are as varied as are the uses. Maps are used by all levels of government, academia, Congress, private consultants, land developers, and conservation organizations. The public makes extensive use of NWI maps in a myriad of applications including planning for watershed and drinking water supply protection; siting of transportation corridors; construction of solid waste facilities; and siting of schools and other municipal buildings. Resource managers in the Service and the States are provided with maps which are essential for effective habitat management and acquisition of important wetland areas needed to perpetuate migratory bird populations...for fisheries restoration; floodplain planning; and endangered species recovery plans. Regulatory agencies use the maps to help in advanced wetland identification procedures, and to determine wetland values and mitigation requirements. Private sector planners use the maps to determine location and nature of wetlands to aid in framing alternative plans to meet regulatory requirements. The maps are instrumental in preventing problems from developing and in providing facts that allow sound business decisions to be made quickly, accurately, and efficiently. Good planning protects the habitat value of wetlands for wildlife, preserves water quality, provides flood protection, and enhances ground water recharge, among many other wetland values.”

The Emergency Wetland Resources Act of 1986 requires the development of a digital wetland database. However, due to the number of maps to be digitized and “the 100% user-pay basis on

which NWI digitizes most of the wetland maps,” a number of government and private agencies have initiated in-house digitization of NWI maps. In order to be able to accept NWI maps digitized by other entities, USFWS prepared a guidance document titled “*Procedures for Acceptance and Testing of Digital Data From Other Producing Agencies.*” The document details procedures and quality assurance requirements for data to be included in USFWS’s national wetlands digital database.

With the creation of the digital wetlands data, users within the state, as well as around the country and world, will be able to access the information. By making the digitized wetland maps available through a web based mapping system, such as ArcIMS, the public would be able to access this information through a user-friendly interface. The ArcIMS site would allow users to combine the wetland information with other data layers currently available in the State of Oklahoma such as the Digital Orthophotography. This would not only allow the public access to the important wetland data but also the ability to view this data with other information that would give the general user the ability to make informed decisions about their specific area of interest in Oklahoma. As an educational tool this site could be combined with wetland related information to not only allow people to locate the wetlands in Oklahoma but also educate them about the precious resource that is so valuable to the state.

Numerous state, federal, local, and private organizations have supported the conversion of wetland information to digital data across the country, but Oklahoma lags behind. The Oklahoma Conservation Commission (OCC) is currently digitizing over 100 maps; however, this equates to only ~10% of the state. This project will digitize another 340 maps and will address the accessibility of those maps from two perspectives. First it would allow for the creation of digital information, and second it would provide the public and private sectors access to the information necessary to make informed decisions as well as provide computer interface features to interact with the data. The digital maps produced through this project will meet USFWS’s “*NWI Technical Specifications for Digitizing*”.

The OCC and the Oklahoma Water Resource Board (OWRB) would work jointly in both of these endeavors under the guidance and oversight of the Office of the Secretary of the Environment (OSE). The OCC would enter into agreement with the USFWS to digitize the NWI maps according to their specifications. In return, the digital information would be provided to the USFWS for incorporation into their NWI system. The OWRB and the OCC would work together in developing a user-friendly access system that would allow Oklahomans, as well as anyone else with web access, to directly interact with maps and several other information layers regarding wetlands within the State. The Oklahoma wetlands mapping system will allow an in-depth analysis of wetlands and using USFWS codes it will also be possible to create wetland maps by type and to analyze the relationship of type to natural features such as geology, streams, aquifers, etc. Other data layers would include, but would not be limited to, Digital Orthophotography, streams, lake, roads, cities and towns, water quality data, cultural, agriculture, etc.

Goal:

To create an Oklahoma specific interactive wetland mapping system, which will provide increased analytical opportunities for the public as well as the private sectors.

Measures of Success:

1. Generation of 340 digital wetland maps meeting USFWS standards.
2. Creation of a multi-page web-based wetland educational tool.
3. Development of an interactive web-based GIS mapping tool allowing the public to:
 - a) view the location of wetlands in Oklahoma
 - b) discover relationships between wetlands and the environment by creating maps using the digitized Oklahoma wetland maps coverage overlaid on Oklahoma specific coverages such as digital orthophotos, stream systems, geology, watershed maps, water quality data, etc.

Workplan:

October 2003 through September 2007

Task 1: Digitization of NWI Maps

The Oklahoma Conservation Commission will enter into agreement with the USFWS for assistance in digitizing the NWI maps. The USFWS will supply the necessary materials (overlays and bluelines) for the 340 NWI maps and the OCC will digitize the maps with the help of the Oklahoma State University or other entities. The digitization will meet all specifications as required by the USFWS. Selection of the 340 maps would be based on immediate need (scheduled and active projects involving wetlands resources), USFWS priorities, watershed boundaries, as well as from input from other agencies and Wetlands Working Group members. As a result of this project, approximately 1/3 of the NWI maps would be digitized for Oklahoma.

Milestone Date: January 2006

Deliverable: MOA with USFWS
Letter stating that the USFWS has accepted the digitized products as complete and accurate.

Costs: \$100,836 (\$75,627 federal)

Task 2: Development of Interactive Web Page Mapping System

ESRI's Internet Mapping System (Arc/IMS) will be utilized to create an interactive wetlands mapping and analysis tool. The system will provide the opportunity for users to display and query coverages along with pre-existing Oklahoma GIS coverages. The ability to create maps of the wetlands overlaid on Oklahoma coverages such as digital orthophotos, stream systems, etc. will provide increased analytical opportunities for the public. The site will be dynamic in nature allowing for the addition of coverages as they become available.

Visitors to this site will be guided through a multi-page wetland education section structured to help them understand wetlands and their importance to wildlife and the environment. The last

part of the web site will encourage them to visit a wetland. Using the interactive mapping and analysis tool, they will be able to locate wetlands to visit on Federal and state lands and in areas where digitized maps are available. Where available, pictures and information about wetlands areas on public lands will be provided.

Milestone Date: September 30, 2008
Deliverable: Letter report describing the features of the web page and a link to the web page for EPA review.
Costs: \$62,831 (\$47,123 federal)

Task 3: Quarterly and Final Reports

Milestone Date: December 2003 through September 30, 2008
Deliverable: Quarterly reports will be written to provide an update on the status of the project. A final report will be submitted to EPA, which summarizes all the activities associated with this project as well as a section that documents the utility of this effort.
Costs: \$3,000 (\$2,250 federal)

Budget Categories:

	<i>Federal</i>	<i>State</i>	<i>Total</i>
Personnel	\$24,662	\$8,220	\$32,882
Fringe Benefits	\$9,782	\$3,260	\$13,042
Equipment			0
Travel	\$2,303	\$768	\$3,071
Supplies	\$5,612	\$1,871	\$7,483
Contracting*	\$70,753	\$23,584	\$94,337
Total Direct Charges	\$114,967	\$38,322	\$153,289
Indirect Charges	\$11,888	\$3,963	\$15,851
<i>Total</i>	\$125,000	\$41,666	\$166,666

PERSONNEL:

	Person Years	Amount
OCC		
Executive Director	0.01	\$ 557.00
Assistant Director	0.01	\$ 580.00
Administrative Officer	0.01	\$ 550.00
Administrative Assistant	0.01	\$ 420.00
Wetlands Program Coordinator	0.11	\$ 3,320.00
GIS Specialist	0.08	\$ 3,000.00
OWRB		
GIS Developer	0.14	\$ 11,282.00
Web Developer	0.09	\$ 9,896.00
System Administrator	0.02	\$ 1,237.00
IT Manager	0.01	\$ 1,050.00
Database Administrator	0.01	\$ 990.00
Total		\$ 32,882.00

SUPPLIES:

	Amount
OCC	
Office Supplies (paper, pen, printer ink, etc)	\$ 350.00
Resource Materials	\$ 317.00
OWRB	
128 GB Disk Array	\$ 4,480.00
24U Rack	\$ 2,336.00
Total	\$ 7,483.00

CONTRACTUAL

	Amount
OCC	
OSU for digitizing and training	\$ 90,667.00
OWRB	
Training Courses	
Intro into ARC/IMS (1 person to attend)	\$ 1,200.00
ARC/IMS Administration (1 person to attend)	\$ 900.00
Learning ARC/IMS (Web based training - 3 people)	\$ 180.00
Customizing ARC/IMS (Advanced - 1 person to attend)	\$ 1,350.00
Customizing ARC/IMS Basic (Web based training - 1 person)	\$ 40.00
Total	\$ 94,337.00