

**Environment and Natural Resources Trust Fund
2011-2012 Request for Proposals (RFP)**

Subd: 03d

Project Title: Updating the National Wetland Inventory for Minnesota - Phase III

Category: A1. Natural Resource Data and Information: Collection

Total Project Budget: \$ 1,500,000

Proposed Project Time Period for the Funding Requested: 3 yrs, July 2012 - June 2015

Other Non-State Funds (secured): \$ 0

Summary:

This is the third phase of a multi-phase project to update and enhance the National Wetland Inventory for Minnesota. This phase will update wetland maps for southern Minnesota.

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Sponsoring Organization: DNR

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Web Ad <http://www.dnr.state.mn.us/eco/wetlands/index.html>

Location:

Region: NE, Central, SW, SE

Ecological Section: ed River Valley (251A), North Central Glaciated Plains (251B)

County Name: Statewide

City / Township:

2011-2012 MAIN PROPOSAL

PROJECT TITLE: Updating the National Wetlands Inventory (NWI) for Minnesota: Phase 3

I. PROJECT STATEMENT

Over the past 100 years, about half of Minnesota's original 22 million acres of wetlands have been drained or filled. Some regions of the State have lost more than 90 percent of their original wetlands. Urban development, agricultural drainage, mining, road construction, and utility projects result in additional losses each year (attached figure). The function and quality of remaining wetlands are often impaired. Updating the NWI is a key component of the State's strategy to monitor and assess wetlands in support of efforts to assure healthy wetlands and clean water for Minnesota.

- NWI is the only comprehensive inventory of wetlands for Minnesota. To protect wetlands, we need to know how many wetland acres we have and where they are. We can't manage what we don't measure. Unfortunately, the current NWI is inaccurate in many places because it is 25-30 years out-of-date and some of the original imagery used was relatively coarse scale.
- NWI is an important screening tool for identifying potential wetland impacts. Wetland programs such as Minnesota's Wetland Conservation Act and the US Army Corps' Clean Water Act Permit Program rely on the NWI as the initial resource for identifying potential impacts of proposed projects. Having accurate maps upfront prevents problems later on; saving time and money for permit applicants and wetland program managers as well as preventing wetland impacts.
- NWI is useful for strategic wetland restoration planning. Funds for wetland restoration are limited; therefore, it is important to get the most benefit possible for our restoration dollars. Wetland maps provide useful information for strategic wetland restoration planning. The NWI includes information about partly drained and ditched wetlands that can identify potential wetland restoration opportunities. In addition, the updated NWI will provide enhanced attributes to support assessment of ecosystem services. The updated and enhanced NWI will also help target wetland restoration in a way that complements the functions and values of existing wetlands.

This is the third phase of a multi-phase project to update the NWI for Minnesota using modern, high-resolution imagery and elevation data. The goal for this specific phase is to produce updated wetland maps for 30 counties in southern Minnesota (attached map). Funding for this phase will be needed starting July 1, 2012, to maintain project continuity and staffing.

Benefits of this project include improved accuracy of wetland maps, improved compliance with wetland protection programs, and better wetland and water quality planning. Data required for this project phase will be available by 2012. Wetland maps will be produced by contractors under the supervision of the DNR. The University of Minnesota will assist in this effort by collecting independent field validation data. All wetland map data will be available free of charge to the public.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: *Updated Wetland Maps for Southern Minnesota* **Budget:** \$ 910,000

Produce updated wetland maps for 30 counties in southern MN (attached map). The map production will be conducted by contractors under the supervision of the DNR and will be based on recommendations for wetland mapping developed by the University of Minnesota through a previous phase of this project. This work will consist of digital photo-interpretation, topographic analysis of LiDAR data, and analysis of ancillary data such as soils maps and forest inventory maps, as well as quality control review. Completed digital map data will be available to the public through several websites, including the DNR and the U.S. Fish and Wildlife Service.

Outcome	Completion Date
1. Updated wetland maps for 30 counties in southern MN	09/2014

Activity 2: Data Acquisition for Phase 4 (Central, Minnesota)

Budget: \$ 590,000

This component will include acquisition of imagery along with field verification data for the next anticipated mapping phase in central Minnesota. We will acquire high-resolution, spring leaf-off, multi-spectral aerial photography for 22 counties. The imagery will be used as a base for updating the NWI maps for central Minnesota. Data acquisition will also include a field-based assessment of wetland type for 400 to 500 sites chosen using a stratified random selection process. The field data will be used to assess the accuracy of the wetland maps developed from remote sensing data. To maintain the independence of the field data, the field data acquisition will be managed by University of Minnesota, Remote Sensing and Geospatial Analysis Laboratory and not shared with the mapping contractor.

Outcome	Completion Date
1. High-resolution, spring, multi-spectral digital aerial imagery for 22 counties in central MN	12/2013
2. Field validation data acquisition for 22 counties in central MN	09/2014

III. PROJECT STRATEGY

A. Project Team/Partners

The University of Minnesota, Remote Sensing and Geospatial Analysis Laboratory will receive \$88,000 for Activity 2 (field data acquisition).

Other primary partners providing in-kind services for this project include the Minnesota Pollution Control Agency, the Minnesota Board of Water and Soil Resources, the U.S. Fish and Wildlife Service, and the Minnesota Dept. of Administration’s Geographic Information Office.

B. Timeline Requirements

This project is a phase of a larger effort (see section III-C below). In order to maintain project continuity and staffing, funding for this phase will be needed by July 1, 2012. This project is designed so that the data required for updating wetland maps in any given phase is acquired in the preceding phase and field validation data are collected during the growing season as contemporaneously as possible with the imagery acquisition (attached project timeline).

C. Long-Term Strategy and Future Funding Needs

This is the third phase of a multi-phase project to update the NWI for the entire state of Minnesota. The NWI provides critical baseline data that inform many wetland management actions and policies. We anticipate initiating a new phase every other year for two additional phases (attached project timeline). The estimated total budget for the project is \$7.5 million. So far, we have received or have been recommended to receive a total of \$1.65 million (about 22%) from ENTRF. By the start of the project phase proposed here (July 2012), we will have completed 100% of the methods evaluation, 50% of imagery and field validation data acquisition for the state, and 10% of the updated wetland maps for the state. The proposed phase will bring our progress up to 75% completion for imagery and 33% completion for wetland mapping.

2012-2014 Detailed Project Budget

IV. TOTAL TRUST FUND REQUEST BUDGET - 3 years (FY2013 - FY2015)

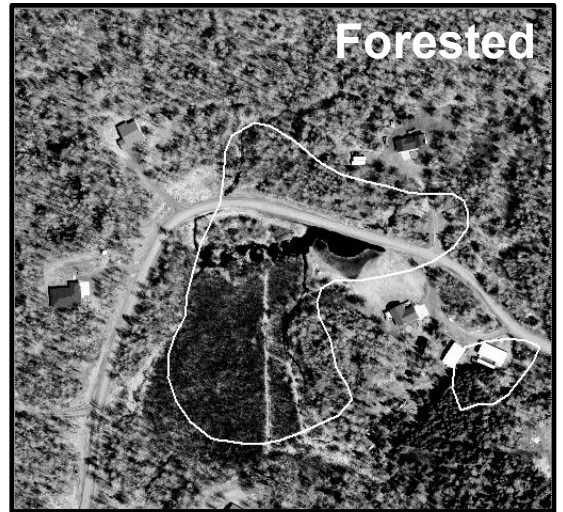
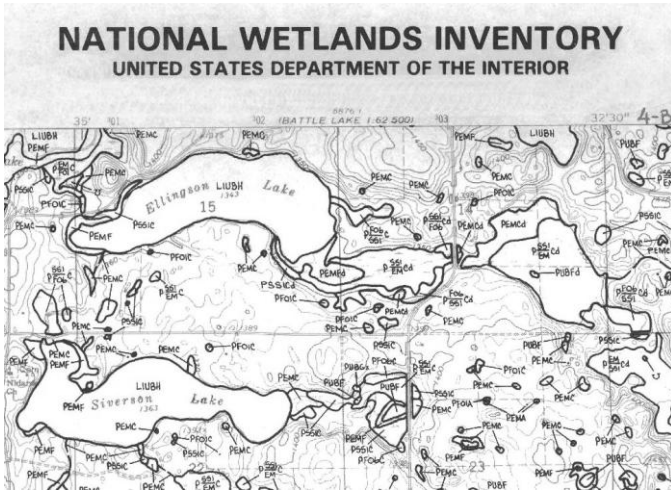
BUDGET ITEM <i>(See list of Eligible & Non-Eligible Costs, p. 13)</i>	AMOUNT
Personnel: MnDNR Project Coordinator, 2 yrs at 0.65FTE for FY2013 & FY2014 (allocated 70% toward activity 1 and 30% toward activity 2) - unclassified position	\$ 139,000
Contracts:	
(Competitive Bid) Technical services contract for wetland photointerpretation, terrain analysis, QA/QC and digital wetland mapping in southern Minnesota	\$ 812,000
(Competitive Bid) Acquisition of digital aerial imagery for Minnesota Central Lakes Region under spring, leaf-off conditions.	\$ 456,000
University of Minnesota, Remote Sensing and Geospatial Analysis Laboratory -- for field validation data acquisition and quality control consulting.	\$ 88,000
Equipment/Tools/Supplies: <i>field supplies (GPS batteries, insect repellent, sunscreen, misc. protective equipment, paint for photo control points, etc.) - \$500, office supplies/equipment (printing, shipping, digital storage media) - \$1500</i>	\$ 2,000
Travel: In-state mileage, lodging and miscellaneous travel expenses for project coordination and outreach.	\$ 3,000
Additional Budget Items:	\$ -
TOTAL ENVIRONMENT & NATURAL RESOURCES TRUST FUND \$ REQUEST	\$ 1,500,000

V. OTHER FUNDS

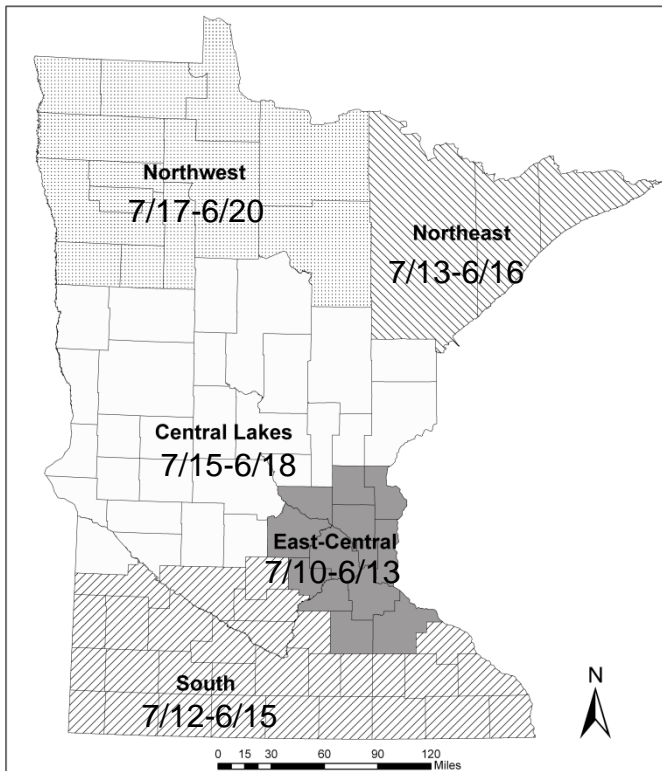
SOURCE OF FUNDS	AMOUNT	Status
Other Non-State \$ Being Applied to Project During Project Period: During the first phase of the project we were able to secure approximately \$125,000 in local and federal matching funds for imagery acquisition. We anticipate that we will be able to find an additional \$50,000 to \$75,000 in non-state matching funds during this grant phase.	See note at left	Pending
Other State \$ Being Applied to Project During Project Period: During the first phase of the project we were able to secure approximately \$146,000 in other state funds for imagery acquisition. We anticipate that we will be able to find an additional \$25,000 to \$50,000 in state funds during this grant phase. Additionally, the DNR anticipates estimated Department Shared Services of \$31,468 and estimated Division Support Costs of \$90,000. Funding for these support costs will be from DNR Division Funds appropriate for support of the project activities, pending approval of the FY12-13 biennial budget.	See note at left	Pending
In-kind Services During Project Period: In-kind labor contribution from DNR Wetland Program Coordinator.	\$ 10,000	
Remaining \$ from Current ENRTF Appropriation (if applicable): \$171,000 has been spent and another \$359,000 has been legally obligated from the first phase grant of \$550,000 covering FY2008 & FY2009 (M.L. 2008, Chap. 367, Sec. 2, Subd. 5(a)). The second phase of this project has been recommended for \$1,100,000 of funding by the LCCMR covering FY2010 & FY2011.	\$ 20,000	Unspent and Not Legally Obligated
Funding History: Env. Trust Fund 2008 (M.L. 2008 Chap. 367, Sec. 2 Subd. 5(a))	\$ 550,000	

The original NWI maps for Minnesota were developed 25 to 30 years ago as hard copy paper maps.

Examples of inaccuracies in the original NWI maps resulting from development are shown on top of modern aerial photos.



NWI update schedule by geographic region



The NWI will be updated using modern, high-resolution digital imagery, digital elevation data from LiDAR, and the best-available ancillary GIS data.

Schedule for the National Wetland Inventory Update

Mapping Region

East-Central

South

Northeast

Central Lakes

Northwest

FY09-11
\$550,000
Approp.
ML2008
367/2/5a

Acquire Input Data
- Imagery
- Field Data

Acquire Input Data

FY11-13
\$1,100,000
Approp.
ML2010
362/2/3b

Map Production
- Preprocessing
- Delineation
- Classification

Quality Review
- Inspection
- Automated Checks
- Error Analysis

Data Delivery
- Web Servers
- Web Maps
- Outreach

Acquire Input Data

FY13-15
\$1,500,000
Recomm.

Map Production

Quality Review

Data Delivery

Acquire Input Data

FY14-16
\$1,630,000
Future

Map Production

Quality Review

Data Delivery

Acquire Input Data

FY16-18
\$1,760,000
Future

Map Production

Quality Review

Data Delivery

FY18-20
\$1,580,000
Future

Map Production

Quality Review

Data Delivery

Organizational Description: Minnesota DNR

The Minnesota Department of Natural Resources (DNR)'s mission is to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life. The department consists of several divisions based on the state's natural resources, such as Fish and Wildlife, Forestry, Lands and Minerals, Parks and Trails, and Ecological Resources and Waters, as well as four regions and four support bureaus.

Project Manager Qualifications: Steve Kloiber, Ph.D., P.E.

SUMMARY	Steve Kloiber is the wetland monitoring coordinator for the Minnesota Department of Natural Resources. He has twenty years of experience in the water resources field with a special focus on geospatial analysis and environmental informatics. He has managed dozens of projects, ranging in size from tens of thousands to over a million dollars. Steve has authored or co-authored several peer-reviewed journal articles or book chapters on water resources, remote sensing, and GIS. He also serves on the Board of Managers for the Nine Mile Creek Watershed District.
EDUCATION	Ph.D. Civil (Environmental) Engineering/Water Resource Minor University of Minnesota, Minneapolis, Minnesota, 2002 M.S.C.E. Civil (Environmental) Engineering University of Minnesota, Minneapolis, Minnesota, 1992 B.A. Chemistry/Computer Science Concentration St. Olaf College, Northfield, Minnesota, 1988
PROFESSIONAL REGISTRATION	Professional Engineer in Minnesota (Registration #23804) First Issued February 1995
AWARDS/HONORS	Academic Excellence Award 2002 Central States Water Environment Association
EMPLOYMENT HISTORY	Minnesota Department of Natural Resources, St. Paul, MN Wetland Monitoring Coordinator, October 2008 to Present Metropolitan Council, St. Paul, Minnesota Lead Environmental Analyst, September 2002 to October 2008 Senior Water Resource Planner, September 2001 to September 2002 Water Resource Planner, January 1998 to September 2001 Montgomery Watson, Wayzata, Minnesota Professional Environmental Engineer, November 1995 to December 1997 Associate Environmental Engineer, June 1992 to November 1995 University of Minnesota, Minneapolis, Minnesota Research Assistant, September 1989 to March 1992

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