Environment and Natural Resources Trust Fund
2018 Request for Proposals (RFP)

Project Title: **ENRTF ID: 005-A**

Building a Long-Term Wetland Hydrology Monitoring Network

Category: A. Foundational Natural Resource Data and Information

Total Project Budget: $ 573,413

Proposed Project Time Period for the Funding Requested: 2 years, July 2018 to June 2020

Summary:

This proposal is to fund installation a statewide monitoring network for collecting long-term, foundational data for wetland hydrology. Funds are sought for monitoring equipment acquisition and installation costs.

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Sponsoring Organization: MN DNR

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Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

The top of the figure shows a grid for the proposed monitoring site distribution across eight wetland types by three ecological regions. The bottom of the figure shows photos of examples of six (of the seven) different wetland types.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____%

PROJECT TITLE: Building a Long-Term Wetland Hydrology Monitoring Network

I. PROJECT STATEMENT

The objective of this proposal is to install a statewide monitoring network for collecting long-term, foundational data for wetland hydrology. This proposal seeks funds for monitoring equipment acquisition and installation costs. The Division of Ecological and Water Resources (EWR) of the DNR will be responsible for the long-term operation and maintenance of this network after it is installed.

Minnesota supports a range of different wetland types including marshes, wet meadows, swamps, bogs, fens, and floodplain forests. The type of wetland, its plant and animal species, and its ecological functions are all heavily dependent upon the frequency, depth, and duration of inundation or saturation by water – its hydrologic regime. Changes to wetland hydrology, whether natural or human-caused, may result in change in wetland type or ecological function. Understanding the hydrologic requirements of wetlands is critical for effective wetland management and protection, and despite the fact that we have similar programs to monitor hydrology for lakes, streams, and groundwater, there has never been a comprehensive program to monitor wetland hydrology.

Under this project, we will install water level monitoring devices (wells/gauges) and automatic data loggers at 50 reference wetland sites across the state and representing a range of wetland types. The attached table depicts the initial monitoring scheme, which may be refined as the project progresses. We plan to install a 10-site pilot network in 2017 using other sources of funding prior to the full-scale implementation proposed here. Most sites will initially consist of a single monitoring well/gauge located in the dominant wetland plant community for the wetland site. However the installations are designed to allow additional monitoring equipment to be added at selected sites in the future for monitoring other variables such as precipitation, conductivity, or adjacent groundwater levels.

Following installation of the monitoring network under this proposal, the DNR will continue to collect fundamental, long-term hydrologic data for wetlands. The data will be used to identify the ecological water requirements for different wetland types, which will inform wetland protection and restoration efforts. These data will complement wetland data collected by other programs including the Wetland Status and Trends Monitoring Program (quantity and quality), the Statewide Monitoring Network for Minnesota's Changing Habitats (Minnesota Biological Survey) and other similar programs.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Installation of Wetland Monitoring Network **Budget: $573,413**

Under this activity, the project team will purchase equipment and install 50 hydrology monitoring stations over two field seasons. Elevation surveys and wetland vegetation surveys will also be conducted for each site. This activity also includes follow-up troubleshooting to ensure all sites are operating properly. The equipment specification for a wetland monitoring site calls for the installation of a shallow water table monitoring well (a pipe with slotted or perforated walls along its length) and a continuously recording data logger with sensors to record water level.

Outcome	Completion Date
1. First season installation of wetland monitoring stations	September 2018
2. Second seasons installation of wetland monitoring stations	September 2019
3. Wetland vegetation survey reports	July 2020
4. Initial data analysis and project completion report	July 2020

III. PROJECT STRATEGY

A. Project Team/Partners

The project team includes:

Doug Norris (DNR – EWR) – Project manager
Steve Kloiber (MNIT@DNR) – Monitoring design as well as data analysis and reporting
Keylor Andrews (DNR – EWR) – Installation and operation of monitoring equipment

We will coordinate this effort with others within the DNR and among other state and federal agencies. This includes staff from the Minnesota Biological Survey as they implement their strategy for a Statewide Monitoring Network for Minnesota's Changing Habitat. Their program focuses primarily on monitoring plants in native habitats. We will be working to co-locate wetland hydrologic monitoring stations at sites selected for the MBS monitoring program. This will allow us to use our monitoring data to identify eco-hydrologic thresholds for plant communities, and to better understand the impact of changing hydrology on important ecosystems. We will also coordinate this effort with the ENRTF proposal, "Maximizing water, wildlife, and timber from peatland forests," which involves hydrology monitoring in peatlands, if both projects are funded.

All funds will be spent within DNR or MNIT@DNR. In-kind contributions of time will be provided by Doug Norris, Steve Kloiber, and Keylor Andrews.

B. Project Impact and Long-Term Strategy

This project will enable the acquisition and analysis of the foundational natural resource data needed for effective wetland protection, restoration and management. This grant will fund the start-up costs for this effort. The long-term operation of the program will be funded from a combination of other funding sources. The DNR is committed to the long-term operation of this monitoring network.

C. Timeline Requirements

Because the grant funding starts on July 1, 2018, the first field season is only a partial season. Equipment purchase and installation at all sites will be completed by the end of the second field season. All of the installation and troubleshooting and vegetation surveys will be complete by June 30, 2020.

2018 Detailed Project Budget

Project Title: Building a Wetland Hydrology Monitoring Network

IV. TOTAL ENRTF REQUEST BUDGET *2* years

BUDGET ITEM	AMOUNT
Personnel: DNR field hydrology crews will install and troubleshoot equipment for 50 wetland hydrology monitoring stations. Work will occur in teams of two. The total estimated level of effort required for field crew time is 2600 hours (approximately 1.3 FTE). Salaries include ~15-25% fringe benefits as per state union contracts.	$ 130,000
Personnel: DNR staff will conduct wetland vegetation surveys for 50 wetland monitoring stations. The total estimated level of effort required for field crew time is 1000 hours (approximately 0.5 FTE). Salaries include ~15-25% fringe benefits as per state union contracts.	$ 40,000
Equipment/Tools/Supplies: *Monitoring equipment including well screen, bubbler systems, dataloggers, power supply, and cables) .*	$ 375,000
Travel: *In state travel for installation and troubleshooting of wetland water level monitoring network and vegetation surveys. Costs include mileage and per diem for DNR monitoring staff.*	$ 10,000
Additional Budget Items: *Direct and Necessary expenses: HR Support (~$2,672), Safety Support (~$614), Financial Support (~$7,251), Communication Support (~$1,271), IT Support (~$5,534), and Planning Support (~$1,072) necessary to accomplish funded programs/projects.	$ 18,413
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 573,413

*Direct and Necessary expenses include Department Support Services (Human Resources, IT Support, Safety, Financial Support, Communications Support, and Planning Support). Department Support Services are described in the agency Service Level Agreement and billed internally to divisions based on rate that have been developed for each area of service. These services are directly related to and necessary for the appropriation. Department leadership services (Commissioner's Office and Regional Directors) are not assessed. Those elements of individual projects that put little or no demand on support services such as large single-source contracts, large land acquisitions, and funds that are passed through to other entities are not assessed Direct and Necessary costs for those activities.

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State $ To Be Applied To Project During Project Period:	$ -	*NA*
Other State $ To Be Applied To Project During Project Period:	$ -	*NA*
In-kind Services To Be Applied To Project During Project Period: *Overall project management will be provided at an estimated value of $5,000/year. Project coordination, data analysis, and reporting will be provided in-kind at an estimated value of $12,000/yr. Field operations and coordination will be provided in-kind at an estimated value of $16,000.yr.*	$ 99,000	*Secured*
Past and Current ENRTF Appropriation:	$ -	NA
Other Funding History: *The DNR is currently developing a statewide wetland hydrologic monitoring plan and installing a 10-site pilot of this monitoring system.*	$ 45,000	*Secured*

Building a Long-Term Wetland Hydrology Monitoring Network

Hydro-Geomorphic Class	Water Regime Class	Plant Community	Ecological Province		
			Prairie Parkland	Eastern Broadleaf	Laurentian Mixed Forest
Depression/Flat	Temporarily Flooded to Saturated	Wet Meadow, Wet Prairie	3	3	3
Depression/Flat	Temporarily to Seasonally Flooded	Wooded and Shrub Swamps	3	3	3
Depression	Seasonally Flooded	Shallow Marsh	3	3	3
Depression	Semi-Permanently Flooded to Intermittently Exposed	Deep Marsh	3	3	3
Riverine Floodplain	Temporarily to Seasonally Flooded	Forested and Shrub Floodplain	3	3	3
Sloped	Saturated	Fen	3	3	3
Organic Peatland	Saturated	Open and Coniferous Bog	--	3	3
Lacustrine	Semi-Permanently to Permanently Flooded	Aquatic	Monitored by Shallow Lakes Program		

Proposed wetland water level monitoring design. The grid indicates the proposed number of monitoring sites for each wetland type and ecological province. We propose to install 50 of these sites under this project. Another 10 sites are being established as a pilot project in the summer 2017.

Examples of different types of wetlands. Top row: wet meadow, forested swamp, shallow marsh. Bottom row: deep marsh, floodplain forest, bog. (photo credits – Steve Eggers)

Project Manager Qualifications and Organization

Project Manager: Doug Norris, Wetlands Program Coordinator
Minnesota Department of Natural Resources
Ecological and Water Resources Division

Qualifications:
DNR Wetlands Program Coordinator since 1992. Primary responsibilities include:

- Representing the DNR in developing state wetland regulatory policies and programs. Participated in developing the original rules for the Minnesota Wetland Conservation Act and has collaborated on numerous subsequent legislative and rule revisions.
- Providing guidance and technical assistance to DNR staff in reviewing wetland permits and in complying with wetland regulations for DNR projects.
- Managing the DNR's program for identifying and regulating impacts to calcareous fens.
- Providing technical expertise in developing wetland assessment methods such as the Minnesota Routine Assessment Method.
- Providing management oversight for programs to develop and acquire data to improve wetland policy and regulatory decisions, such as updating the National Wetlands Inventory in Minnesota and the Minnesota Wetlands Status and Trends Monitoring Program.

Has managed numerous projects, including development of the Minnesota Wetland Conservation Plan, the Minnesota Comprehensive Wetland Assessment, Mapping and Monitoring Strategy, an analysis of the effects of aquaculture on wetlands/shallow lakes and, most recently, a legislatively directed study of the feasibility of state assumption of the federal Clean Water Act Section 404 permitting program. Several of the projects were funded through U.S. Environmental Protection Agency state wetland program development grants, requiring budget tracking and reporting.

Education:
B.S., Wildlife Science, Purdue University, 1978
M.S. Fisheries and Wildlife, University of Missouri, 1982

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