

**Environment and Natural Resources Trust Fund  
2020 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 008-A**

Foundational Hydrology Data for Wetland Protection and Restoration

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**Category:** A. Foundational Natural Resource Data and Information

**Sub-Category:**

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**Total Project Budget: \$** 461,499

**Proposed Project Time Period for the Funding Requested:** June 30, 2023 (3 yrs)

**Summary:**

This project will improve wetland protection, management and restoration in Minnesota by completing a partially established long-term wetland hydrology monitoring network that will provide critical knowledge of wetland hydrology dynamics.

**Name:** Doug Norris

**Sponsoring Organization:** MN DNR

**Job Title:** Wetland Program Coordinator

**Department:** Ecological and Water Resources Division

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**Location:**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

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**Alternate Text for Visual:**

Photo of a wetland hydrology monitoring station and a table showing the distribution of monitoring sites among wetland types and location.

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



**PROJECT TITLE:** Foundational Hydrology Data for Wetland Protection and Restoration

## I. PROJECT STATEMENT

**This proposal seeks to improve wetland protection, management and restoration in Minnesota by completing a partially established long-term wetland hydrology monitoring network.** Effective wetland management and restoration requires a fundamental understanding the frequency, timing, duration and depth of water level fluctuations in different types of wetlands -- the hydrologic regime. Also, because wetlands are frequently connected to and dependent on groundwater, understanding wetland hydrology can better inform groundwater management. The hydrology of lakes and streams has been systematically monitored for decades, yet there has never been a comprehensive program to monitor wetland hydrology. To address this lack of foundational data, we designed a monitoring framework that requires installing hydrology monitoring equipment in 60 reference (minimally disturbed) wetland sites across the state (see attachment). This number of sites (60) is the minimum necessary to adequately sample the wide variety of wetland types that occur in Minnesota as well as account for geographic variation.

In 2017 we began a pilot monitoring effort by installing equipment at 10 wetland sites and collecting continuous hydrology data. In 2018, the U.S. Environmental Protection Agency (EPA) awarded the DNR a grant of \$200,160 to fund 20 monitoring stations, which will include upgrading the existing pilot installations. **This proposal seeks ENRTF funds to complete the monitoring network by purchasing and installing hydrology monitoring equipment at an additional 40 sites.** The proposed ENRTF funding is solely for purchasing and installing the monitoring equipment (wells/gauges and automatic data loggers) and to conduct baseline vegetation surveys. Subsequent, long-term data collection and maintenance of the monitoring network will be done by the DNR using other funding sources.

The wetland hydrology data from this long-term monitoring effort will:

- Improve the design and implementation of wetland restoration and management projects;
- Improve our understanding of how alterations to groundwater affect wetlands and their associated benefits and allow more informed and objective management of both wetlands and groundwater;
- Improve our understanding of the relationship between hydrology and wetland plant communities;
- Reveal long-term changes to the state's wetlands that may result from a variety of factors such as land use changes, climatic changes and changes in surface and groundwater use.

These data will complement wetland data collected by other programs including the DNR groundwater program, the DNR wetland program, the Minnesota Biological Survey, the U.S. Fish and Wildlife Service, and the Board of Water and Soil Resources' wetland restoration monitoring. The information will be available to local, state, and federal land and water managers as well as to the public.

## II. PROJECT ACTIVITIES AND OUTCOMES

### **Activity 1: Install Wetland Hydrology Monitoring Equipment at 40 Sites ENRTF BUDGET: \$422,399**

**Description:** Purchase and install hydrology monitoring equipment at 40 reference (minimally-disturbed) wetlands around the state over two field seasons. Conduct elevation surveys for each site to calibrate the monitoring equipment and establish ground surface elevations. Conduct follow-up site visits as needed to ensure all sites are operating properly. The monitoring equipment at each site consists 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.



**Environment and Natural Resources Trust Fund (ENRTF)  
2020 Main Proposal Template**

<b>Outcome</b>	<b>Completion Date</b>
1. <i>First season installation of wetland monitoring stations</i>	<i>September 2020</i>
2. <i>Second season installation of wetland monitoring stations</i>	<i>September 2021</i>
3. <i>Initial data analysis and project completion report</i>	<i>June 2023</i>

**Activity 2: Conduct Wetland Vegetation Surveys at 40 Hydrology Monitoring Sites ENRTF Budget: \$39,100**

Wetland vegetation surveys will be conducted at each of the reference wetlands where hydrology monitoring equipment is installed. Vegetation and hydrology data will be analyzed to understand how long term wetland hydrology patterns influence wetland plant communities, which in turn relates to various wetland benefits, especially fish and wildlife habitat.

<b>Outcome</b>	<b>Completion Date</b>
1. <i>Wetland vegetation survey reports completed</i>	<i>September 2021</i>

**III. PROJECT PARTNERS AND COLLABORATORS:**

The project team includes:

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

Collaborators in the monitoring network design and site selection include staff from the Minn. Board of Water and Soil Resources, the Pollution Control Agency, the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers. The USEPA has provided funding for installing a portion of the monitoring network.

We will coordinate this project with other related efforts, including the following ENRTF projects or proposals:

- “Statewide Monitoring Network for Minnesota’s Changing Habitat” conducted by the Minnesota Biological Survey.
- “Peatland forest management,” which involves hydrology monitoring in peatlands.

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

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:** This grant will fund a portion of 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.

**V. SEE ADDITIONAL PROPOSAL COMPONENTS:**

- A. Proposal Budget Spreadsheet**
- B. Visual Component or Map**
- C. Project Manager Qualifications and Organization Description**





Example of installed wetland hydrology monitoring station.

Wetland Characteristics			Ecological Province		
Hydro-Geomorphic Class	Water Regime Class	Plant Community	Prairie Parkland	Eastern Broadleaf	Laurentian Mixed Forest
Depression/Flat	Temporarily Flooded to Saturated	Wet Meadow	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 Flats	Temporarily to Seasonally Flooded	Forested and Shrub Floodplain	3	3	3
Depression/Sloped	Saturated	Rich Fen and Poor 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 hydrology monitoring design. The grid indicates the proposed number of monitoring sites for each wetland type and ecological province. Twenty of these sites will be installed using non-ENRTF funding sources.

## **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