

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

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**Project Title:**

**ENRTF ID: 140-CH**

Groundwater: Education to Action

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**Category:** H. Proposals seeking \$200,000 or less in funding

**Sub-Category:** C. Environmental Education

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**Total Project Budget: \$** 180,000

**Proposed Project Time Period for the Funding Requested:** June 30, 2022 (2 yrs)

**Summary:**

Leverage existing state funding to move water professionals (SWCD) from understanding to action addressing specific local groundwater projects; and repackage existing materials to support revised Grade 9 Earth Science Standards

**Name:** Paul Putzier

**Sponsoring Organization:** MN DNR

**Job Title:** Hydrogeologist Supervisor

**Department:** Ecological and Water Resources

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**Web Address:** https://www.dnr.state.mn.us

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**Location:**

**Region:** Statewide

**County Name:** Statewide

**City / Township:** St. Paul

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**Alternate Text for Visual:**

N/A

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



**PROJECT TITLE: Groundwater: Education to Action**

**I. PROJECT STATEMENT**

**Project type or category: Category H – Small Projects (Environmental Education)**

This project addresses two serious, clearly identified gaps in how Minnesota protects groundwater. The purpose of this two-part project is 1) to leverage existing state funded projects providing a mechanism for water professionals (SWCDs and others) to move from understanding to action, to address specific local groundwater/surface water projects; and 2) to repackage existing materials in support of Minnesota’s revised Grade 9 Earth Science Standards for groundwater.

The proposal leverages other existing projects and programs to address several specific and well documented gaps in our ability to manage the state natural resources, and in particular, challenges related to groundwater. First, many professionals with responsibilities for groundwater challenges lack the knowledge, confidence and ability to access the rich data available and translate that into specific actions in their geography (Pradhananga and others, December 2015). Secondly, young adults lack the basic knowledge of groundwater to be effective partners in the future best management of our state resources (Minnesota Ground Water Association, December 2016).The management information gaps can lead to misinformation and misunderstanding when dealing with water issues.

Communication of “complex science and statutes” can be more effective with an educated populace, and this project would help working professionals address urgent groundwater issues today, and young adults understand and address water resource challenges of the future. Recommendation number eight in the “2019 Legislative Recommendations: Legislative Water Commission” memorandum of January 2, 2019 is to “Enhance Water Education.” The recommendation states that, “The timing is right to educate and engage youth to become water stewards.” This project responds to that recommendation.

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1: Learning Alliances: Understanding to Action**

**Budget: \$95,000**

DNR will leverage the work being completed by Minnesota Department of Health, Freshwater (a non-profit that has an explicit mission to protect groundwater), and the University of Minnesota Water Research Center (WRC), by organizing and hosting half-day Learning Alliance events for SWCDs and others. The DNR will assist in developing online groundwater training, then work with the state and local water resource professionals who have completed the training to address one or two specific groundwater and surface-water projects in their geography and take action.

State professionals with the departments of Natural Resources, Health, Agriculture, Pollution Control Agency, and the Board of Water and Soil Resources have access to and knowledge of the immense volume of raw data available to address the complex issues facing local resource managers (e.g., county geologic & groundwater atlases, groundwater observation wells, stream flow and precipitation, water chemistry, etc.). The goal of each half-day Learning Alliance event is to move from understanding to action, from data to Best Management Practices, focusing on one or two high priority local projects.

To accomplish this the local professionals in the three Groundwater Management Areas will complete the new WRC groundwater training (available Winter 2020), then bring one or two specific high priority groundwater/surface-water projects to the Learning Alliance event. The goal will be to develop specific actions to address those challenges by the end of the event. The DNR will host and lead the event, with other agency participation as available.

Outcome	Completion Date
Compile existing information from the groundwater agencies as needed for the Learning Alliance events.	October 31, 2020



**Environment and Natural Resources Trust Fund (ENRTF)**

**Project Title: Groundwater Education to Action**

<b>Outcome</b>	<b>Completion Date</b>
Organize and host Learning Alliance events within groundwater management areas with participating SWCDs. Outcome: Action plan on specific projects.	June 30, 2021

**Activity 2: Training Next Generation Groundwater Resources Managers**

**Budget: \$85,000**

In Activity 2, the DNR will leverage and repackage existing groundwater training materials (videos, groundwater atlas and other workshops, online resources, booklets, etc.) to prepare materials that target and align with the groundwater goals of Minnesota’s new Grade 9 Earth Science standards currently in development.

Subject matter experts will be interviewed including educators and educational media coordinators (e.g., Washington County school districts, DNR Project WET, FWS, etc.). Pilot materials will be developed that include a downloadable **booklet** illustrating how groundwater works, how it is studied, who is involved in Minnesota, and potential careers, common groundwater scenarios based on frequently asked questions, and exercises in how to deal with them and take action.

The booklet would be accompanied by an instructional **video** of a live groundwater model with animation and voice-over that illustrates the basics of how aquifers work, how groundwater travels, and how our actions affect others. The video will be based on a live groundwater sand model with dye representing how groundwater moves after a rain through aquifers, lakes, septic systems, and pumps. Specific effects of pumping and surface contamination will be addressed. Karst geology and groundwater conditions may be included. Animation effects are planned to make it more engaging.

The materials will be presented to the Washington County school district earth science teachers for comment and trial as they have experience with and avid interest in water issues, then made available statewide for other earth science teachers.

**ENRTF BUDGET: \$85,000**

<b>Outcome</b>	<b>Completion Date</b>
Compile existing educational requirements from the Minnesota revised Grade 9 Earth Science Standards for groundwater.	December 30, 2020
Repackage and refine existing materials to address the Minnesota revised Grade 9 Earth Science Standards for groundwater.	March 30, 2021
Produce the booklet and video with script.	October 1, 2021
Distribute final products through print and online.	December 30, 2021

**III. PROJECT PARTNERS AND COLLABORATORS:**

DNR project staff will collaborate as needed with Freshwater, University of Minnesota Water Resource Center, Washington County school district, and other organizations that work with earth science education.

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

This proposal will span two years. When complete the booklet and video will be posted on a DNR website in groundwater and Project WET. The DNR will offer teacher professional development opportunities at conferences, district professional development events and workshops. An announcement with the links and a description of the project will be distributed by GovDelivery, MGWA, the school district, and other educational organizations such as the Minnesota Science Teachers Association, Minnesota Earth Science Teachers Association and Minnesota Groundwater Association.

Feedback for future updates will be accomplished through normal interactions with students and educators and the project team.

Attachment A: Project Budget Spreadsheet  
 Environment and Natural Resources Trust Fund  
 M.L. 2020 Budget Spreadsheet  
 Legal Citation: M.L. 2020 XXXXXXXX  
 Project Manager: Paul Putzier  
 Project Title: Groundwater: Education to Action  
 Organization: Minnesota Department of Natural Resources  
 Project Budget: \$180,000.00  
 Project Length and Completion Date: Two years. Ending June 30, 2023  
 Today's Date: April 12, 2019



ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
<b>BUDGET ITEM</b>				
<b>Personnel (Wages and Benefits)</b>		\$ 151,600	\$ -	\$ 151,600
Hydrologist Supervisor (classified, 0.01 FTE, two years) Hydrologist 3 (classified, 0.05 FTE, one year) Hydrologist 1 (classified, 0.5 FTE, two years) Information Officer 2 (classified, 0.3 FTE, two years) Videographer/RAS (classified, 0.2 FTE, for one year) Salaries include ~15-25% fringe benefits as per state union contracts. Staff salaries for these positions are currently paid with ENRTF funds.				
<b>Professional/Technical/Service Contracts</b>		\$ -	\$ -	\$ -
<b>Equipment/Tools/Supplies</b>				
Office supplies required to complete the project work, including materials for five meetings		\$ 1,895	\$ -	\$ 1,895
<b>Professional Services for Acquisition</b>		\$ -	\$ -	\$ -
<b>Printing</b>				
Costs for printing booklets and making copies of videos as needed.		\$ 2,500	\$ -	\$ 2,500
<b>Travel expenses in Minnesota</b>				
In-state vehicle mileage, travel and meeting hosting expenses primarily for three Learning Alliance meetings the GWMA's (two outstate, one metro). Also travel for two meetings with school systems and collaborators. All travel per DNR travel policy.		\$ 9,300	\$ -	\$ 9,300
<b>Other</b>				
*Direct and Necessary expenses: HR Support (~\$2,866), Safety Support (~\$519), Financial Support (~\$1,977), Communication Support (~\$1,388), IT Support (~\$6,817), and Planning Support (~\$1,138) necessary to accomplish funded programs/projects.		\$ 14,705	\$ -	\$ 14,705
<b>COLUMN TOTAL</b>		\$ 180,000	\$ -	\$ 180,000
*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.				
<b>SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT</b>	<b>Status (secured or pending)</b>	<b>Budget</b>	<b>Spent</b>	<b>Balance</b>
Non-State: N/A		\$ -	\$ -	\$ -
State: N/A		\$ -	\$ -	\$ -
In kind: In kind work by collaborators (school districts, SWCD, others) estimated		\$ 5,000	\$ -	\$ 5,000
<b>Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS</b>		<b>Budget</b>	<b>Spent</b>	<b>Balance</b>
N/A		\$ -	\$ -	\$ -

Images B. Visual Component or Map

**Minnesota's Groundwater Education Gap**  
**Preparing Students to Effectively Manage our Groundwater Resources in the Future**

MINNESOTA GROUND WATER ASSOCIATION  
 White Paper 02  
 DECEMBER 2016

1. Is my well water safe to drink? For what contaminants should I test my well water?

2. Who provides groundwater expertise for teachers?

3. What teaching resources are available?

4. Where does my drinking water come from?

This project addresses two serious, clearly identified gaps in how Minnesota protects groundwater.

**First Gap** - Professionals lack the knowledge, confidence and ability to access the rich data available and translate that into specific actions in their geography.

**Solution:** Leverage existing state funded projects providing a mechanism for water professionals (SWCDs and others) to move from understanding to action, to address specific local groundwater/surface water projects.

**Second Gap** - Young adults lack the basic knowledge of groundwater to be effective partners in the future best management of our state resources

**Solution:** Repackage existing materials in support of Minnesota's revised Grade 9 Earth Science Standards for groundwater.

5. How does groundwater become contaminated?

6. Are our aquifers being over pumped? Will we have enough groundwater for future generations?

4 gal/min      20 gal/min

Sand      Sand

Clay      Clay

Sand      Sand

60 Feet Deep

Gabbro - (hard, dense, bedrock)

260 Feet Deep

7. Do undergraduate degree requirements reflect employer hiring requirements?

8. Why is my well so much deeper than my neighbor's well?

The pictures represent most often asked questions that professionals receive from the public or other professionals regarding groundwater education.

[http://www.mgwa.org/documents/whitepapers/Minnesotas\\_Groundwater\\_Education\\_Gap.pdf](http://www.mgwa.org/documents/whitepapers/Minnesotas_Groundwater_Education_Gap.pdf)

## LCCMR ML2020 Component F

### Project Title: Groundwater Education to Action

#### Project Manager Qualifications and Organization Description

**Project Manager:** Paul F. Putzier

#### Degrees and Professional Certificates:

M.S. Geology, University of South Florida, Tampa, Florida	1987
B.S. Geology, University of Wisconsin, Madison, Wisconsin	1982
Minnesota Professional Geologist, License #30053	

#### Qualifications:

2011 to present DNR Hydrogeologist Supervisor

Provide technical and program direction for the completion of county groundwater atlases or regional hydrogeologic assessments. Directed the development of project databases, directed the editing and publication of groundwater atlases and documents, assured web access of project data, supported staff development of improved mapping tools and techniques, and assisted others in use of and access to project results and data.

#### Previous employment:

2008 - 2009	HDR Engineering. Section Manager/Senior Project Manager and Hydrogeologist. Managed Environmental Sciences (NEPA) Section including 35 scientists & GIS professionals, providing environmental permitting (EIS) for large capital projects.
2004 to 2008	STS Engineering. Manage Environmental Sciences Section including 12 engineers. Project manager/hydrogeologist for state & federal Superfund sites & Superfund site investigations.
1992 to 2004	The RETEC Group. Operations manager for office of 35 engineers, geoscientists, and environmental professionals. Managed the \$6 million Lower Fox River, Wisconsin Superfund project successfully through the remedial investigation, feasibility study (RI/FS), and risk assessments.(RA) steps of CERCLA to an approved ROD.
1984 to 1992	Groundwater Technology Inc. Operations manager responsible for four regional offices including over 60 engineers, geoscientists, and environmental professionals.

**Project Responsibilities:** The project manager will be responsible for: providing overall program management and technical direction for the project; directing project staff; contracting for professional services in support of the program; contracting laboratory and other services; coordinating with project partners; directing the development of atlas reports; and preparing and submitting project work plans, updates and final reports.

**Organization Description:** 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.