



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2016 Work Plan

Date of Report: May 29, 2016

Date of Next Status Update Report: December 30, 2016

Date of Work Plan Approval: June 7, 2016

Project Completion Date: June 30, 2019

Does this submission include an amendment request? no

PROJECT TITLE: State Spring Inventory for Resource Management and Protection – Phase II

Project Manager: Jim Berg

Organization: Minnesota Department of Natural Resources

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Location: Statewide

Total ENRTF Project Budget:

ENRTF Appropriation: \$370,000

Amount Spent: \$0

Balance: \$370,000

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd. 03h

Appropriation Language:

\$370,000 the second year is from the trust fund to the commissioner of natural resources to continue a systematic inventory of springs statewide to provide fundamental data needed to maintain spring flows and protect groundwater-dependent resources. Increased outreach to the public and other entities must be conducted to assist in the identification, documentation, and publication of spring locations. This appropriation is available until June 30, 2019, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: State Spring Inventory for Resource Management and Protection, Phase 2

II. PROJECT STATEMENT:

Springs are natural points of groundwater discharge. Springs provide flow for:

- coldwater (trout streams) and cool water fisheries;
- base flow in streams during dry periods;
- create and sustain unique ecological habitats; and
- maintain the integrity of aquatic systems against invasive species.

An existing research database of southeast Minnesota springs maintained by the Minnesota Geological Survey identifies about 2,600 of the estimated 15,000 to 22,000 springs statewide.

This project is a continuation of a current project to develop a statewide spring inventory. Significant progress has been made during the first year of the Phase 1 project with approximately 1,100 springs added to a working version of the database. The current spring inventory project is developing the procedures and methods for conducting spring mapping statewide, including evaluating the effectiveness of thermal imaging technology for certain areas.

Existing spring information from various agency records is being collected for inclusion in the statewide spring database that is in development. Responses to requests for information have been very positive. Citizens across the state have also supplied spring information and have been extremely enthusiastic and interested in the current project. Local governments have been very positive as well when contacted for information. This Phase 2 project will capitalize on this citizen appreciation of springs by promoting submittal of spring locations through a special email address.

The database will contain both reported and verified spring location information and physical, chemical, and historical data for spring sites if available. The current and proposed projects will maintain the spring inventory database at the Minnesota Department of Natural Resources for long-term management and public access.

Specific uses of these data include:

- Environmental Assessment Worksheet (EAW) and Environmental Impact Statement (EIS) resource. Springs and associated biota can be adversely affected or entirely eliminated by construction or development projects that pump groundwater.
- Impaired waters remediation strategies using Total Maximum Daily Load (TMDL) models. These surface water quality modeling efforts need reliable groundwater contribution data to produce accurate water quality estimates.
- Trout stream and calcareous fen management. Springs are commonly a major source of water to these critical natural resources. Understanding the contribution of associated springs is critical to predicting effects of nearby high capacity groundwater pumping through the appropriation permitting process.
- Local land and water management decisions. Springs have their own aesthetic and historical value that creates a special “sense of place” for local residents and visitors. Preserving springs contributes to a love of the land and an environmental ethic that helps create a Minnesota quality of life. You can’t protect something if there is no public or government awareness of its existence.

III. OVERALL PROJECT STATUS UPDATES:

Project Status as of *December 30, 2016*:

Project Status as of June 30, 2017:

Project Status as of December 30, 2017:

Project Status as of June 30, 2018:

Project Status as of December 30, 2018:

Overall Project Outcomes and Results: (information to be added here at the end of the project)

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Inventory existing spring information (office) and data management

Description: Continue compiling existing and reported spring location information from Department of Natural Resources-Fisheries records, topographic maps, and other federal, state, and local sources. Determine and document, where possible, the geologic context of known springs.

Summary Budget Information for Activity 1

ENRTF Budget: \$ 301,000

Amount Spent: \$ 0

Balance: \$ 301,000

Outcome	Completion Date
<i>1. Continue to compile existing and reported spring location information and enter reported data into the spring inventory database.</i>	<i>June 30, 2019</i>
<i>2. Manage and improve database; further develop and improve web usability of spring inventory data for public access.</i>	<i>June 30, 2019</i>

Activity Status as of December 30, 2016:

Activity Status as of June 30, 2017:

Activity Status as of: December 30, 2017

Activity Status as of: June 30, 2018

Activity Status as of: December 30, 2018

ACTIVITY 2: Field verification of existing spring information, inventory unmapped priority areas, and interoffice travel.

Description: Field verify compiled spring information to collect location, elevation, and site information such as geologic setting, aquifer source, flow, temperature, and the source of spring water if known. Enter data into the DNR spring inventory database for long-term management and web access to the public.

Conduct field surveys in unmapped priority areas to collect spring locations and site information such as geologic setting, aquifer source, flow, temperature, and the source of spring water if known. Unmapped priority areas include state parks, scientific and natural areas, wildlife management areas, state historic sites, state forests, and city, local, and possibly federal lands. Other priority areas are expected to be identified by detailed analysis of the verified spring data. Some interoffice travel is anticipated to gather records and to meet with state and local government staff.

Summary Budget Information for Activity 2

ENRTF Budget: \$ 69,000

Amount Spent: \$ 0

Balance: \$ 69,000

Outcome	Completion Date
1. Field verify location and characteristics of compiled, preliminary spring information.	June 30, 2019
2. Conduct field surveys of springs in priority areas to locate and collect site-specific data	June 30, 2019

Activity Status as of December 30, 2016:

Activity Status as of June 30, 2017:

Activity Status as of: December 30, 2017

Activity Status as of: June 30, 2018

Activity Status as of: December 30, 2018

Final Report Summary:

V. DISSEMINATION:

Description: This project will reduce the fragmentation of groundwater spring data by providing a single spatial database for all DNR collected spring data, consistent with DNR's enterprise hydrological data domain. It will facilitate cross-agency cooperation to manage and protect Minnesota's groundwater resources and provide standardized structure to store data for good long-term retention of data. The completed spring inventory database should provide capability for sharing data collected by the DNR with the Minnesota Geological Survey in a way that is compatible with their karst feature database and create an efficient means to share this data with the public via the Minnesota Geospatial Commons and a web map application. The senior project staff for this project plan to present the project results at public meetings and conferences so that people who need to use this information know of its existence.

Status as of December 30, 2016:

Status as of June 30, 2017:

Status as of December 30, 2017:

Status as of June 30, 2018:

Status as of December 30, 2018:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	\$ Amount	Overview Explanation
Personnel:		
Research Scientist 3	\$24,000	1 classified @ 0.1 FTE for two years, 74.2 % salary, 25.8 % benefits

Hydrologist 3	\$67,000	1 classified @ 0.3 FTE for two years, 73.3% salary, 26.7% benefits
Research Analysis Specialist	\$137,000	1 unclassified @ 1 FTE for two years, 79% salary, 21% benefits
Hydrologist 1 temporary	\$56,000	1 unclassified @ 0.6 FTE for two years, 100% salary
subtotal	\$284,000	
Professional/Technical/Service Contracts:		
Minnesota Geological Survey	\$10,000	Geologic interpretations of spring location data, field review of selected spring sites to confirm geologic conditions, and assistance and coordination with development of the spring inventory database. MN Geological Survey
MN.IT	\$15,868	Database and specialty programming services; web design and user support. MN.IT service level agreement
	\$25,132	Direct and Necessary Services*
Equipment/Tools/Supplies:		
Field equipment	\$9,000	Two field chemistry meters and probes (\$3,500), one field data tablet with GPS capabilities (\$1,000), sub-meter GPS data collector (\$4,000) and misc. tools and supplies for field data collection and equipment maintenance (\$500).
Travel Expenses in MN:	\$21,000	Fleet charges, lodging and meals for travel to statewide spring locations for on-site verification of reported springs and to find new locations. Provides funding for approximately 4 months of total field work time.
Other:	\$2,000	Required and necessary project personnel training for safety, technical, web and data management, and professional development in support of and to enhance the spring inventory project. This is not the same as the direct and necessary funding which is for office administration personnel and expenses and not project personnel.
	\$3,000	Expenses in support of developing presentations and communicating the results of this project at events such as the Minnesota Ground Water Association, the Minnesota Water Resources conference, or the Minnesota Area Watershed District. These presentations are an important part of outreach and dissemination.
TOTAL ENRTF BUDGET:		\$370,000

*Direct and Necessary expenses include both Department Support Services (Human Resources \$5,820, IT Support \$11,176 Safety \$1,372, Financial Support \$4,464, Communications Support \$1,236, Planning Support \$829, and Procurement Support \$235) and Division Support Services \$0. Department Support Services are described in the agency

Service Level Agreement, and is billed internally to divisions based on rates 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. Division Support Services include costs associated with Division business offices and clerical support. 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-thru to other entities are not assessed Direct and Necessary costs for those activities. For this work plan, database development and maintenance activity (Activity 1) with an associated cost of \$15,868 has not been assessed Direct and Necessary costs.

Explanation of Use of Classified Staff: Any classified position paid for with ENRTF funds will either be 1) backfilled with a new position or 2) the work previously done by this position will be delayed, eliminated, or completed by the start of the project.

There are two classified positions currently working on a separate ENRTF project to be paid partially by this grant: 1) Hydrologist 3 (0.3 FTE) provides technical expertise in the subject matter which will add value to the database design and the development of procedures and methods. 2) Research Scientist 3 (0.1 FTE) who will be managing the project.

Explanation of Capital Expenditures Greater Than \$5,000: N/A

Number of Full-time Equivalent (FTE) Directly Funded with this ENRTF Appropriation: 4.0 FTE

Number of Full-time Equivalent (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 0.2 FTE

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Non-state, state, and federal			We anticipate getting help from a full range of government entities and resource management organizations. These entities are often eager to provide in-kind assistance with technical guidance and known spring locations. Assistance for the first phase of the spring inventory has been received from: University of Minnesota – Departments of Entomology and Earth Sciences; Minneapolis Park & Recreation Board; Wisconsin Geological and Natural History Survey; US Forest Service; City of Grand Marais; Cook County SWCD; and several Watershed Management Organizations.
TOTAL OTHER FUNDS:	\$ N/A	\$	

VII. PROJECT STRATEGY:

A. Project Partners: The Minnesota Geological Survey will assist with geologic interpretations of spring location data, field review of selected spring sites. They will also provide assistance and coordination with development of the spring inventory database.

B. Project Impact and Long-term Strategy: Springs are natural features that return groundwater to surface waters. The groundwater that discharges from springs is critical for maintaining surface stream flow in

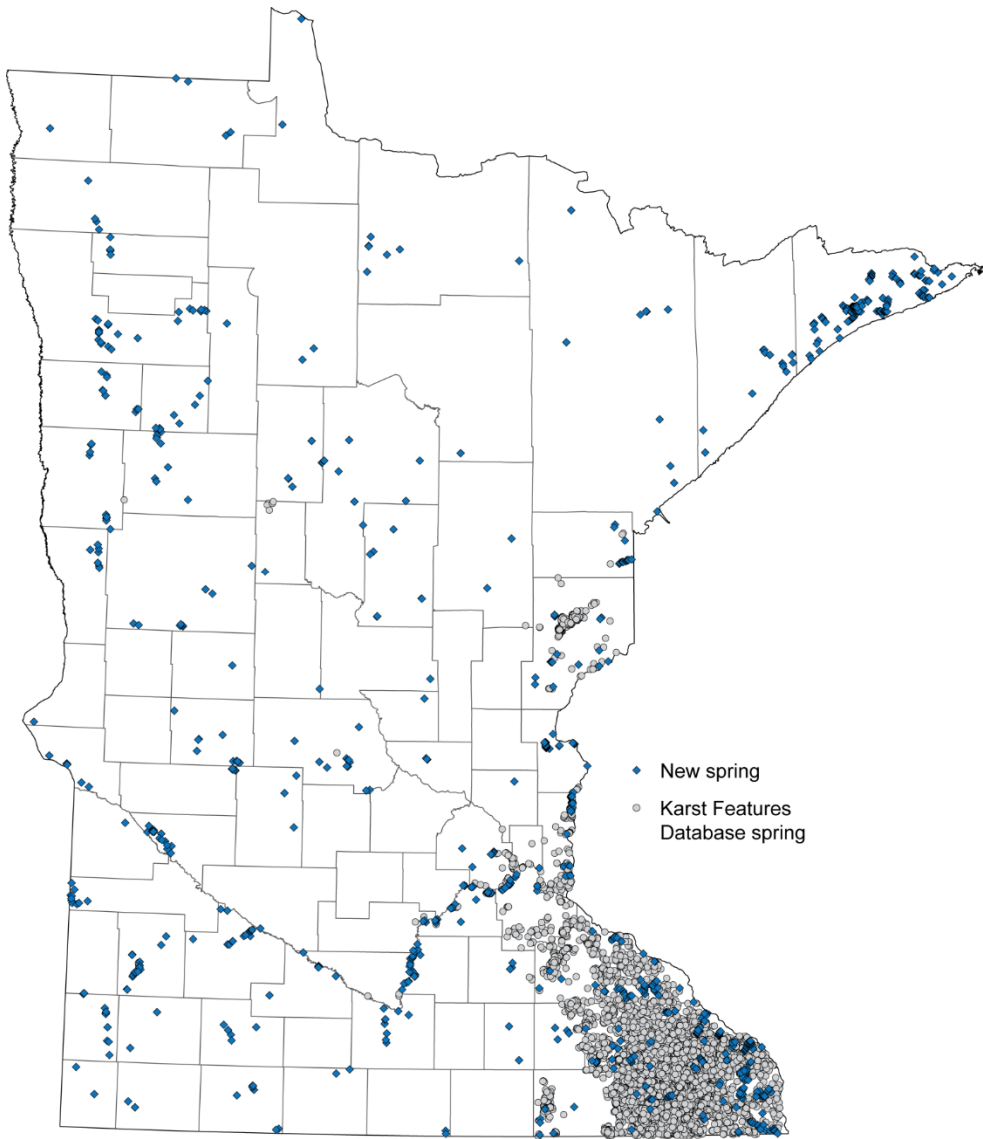
Minnesota’s streams and rivers. The quantity and quality of that water has a direct impact on surface water ecosystems and human use of those rivers and streams. This information is critical for Total Maximum Daily Load (TMDL) implementation strategies, impaired waters remediation; trout stream management, groundwater protection and allocation issues, and local land and water management decisions. The state spring inventory is part of a long-term continuing need to identify, assess, and monitor all parts of the hydrologic cycle so that observed or projected hydrologic system response to change, whether climatic or anthropogenic, can be measured and accurately evaluated. The long-term strategy is to conduct the inventory and establish the Spring Inventory at DNR as an ongoing hydrologic cycle database on the same basis as the existing DNR stream gaging, groundwater level monitoring, lake level, climatology, and related hydrologic cycle databases. On-going support of the Spring Inventory database will be needed to assure the assembled data are current and remain accessible to users.

C. Funding History:

Funding Source and Use of Funds	Funding Timeframe	\$ Amount
State Spring Inventory for Resource Management and Protection (Phase 1) M.L. 2014, Chp. 226, Sec. 2, Subd. 05b	July 1, 2014 to June 30, 2017	\$200,000
		\$
		\$

VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS: N/A

IX. VISUAL COMPONENT or MAP(S):



Spring locations as of October 2015 that are currently in working versions of the DNR spring database and the Minnesota Geological Survey Karst Features Database. The goals of this project include expanding the number of springs in this inventory; verifying some of these spring locations and documenting important characteristics; and established a permanent, web accessible map and comprehensive database.

X. RESEARCH ADDENDUM: N/A

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than *December 30, 2016, June 30, 2017, and December 30, 2017, June 30, 2018, and December 30, 2018*. A final report and associated products will be submitted between June 30 and August 15, 2019.

**Environment and Natural Resources Trust Fund
M.L. 2016 Project Budget**



Project Title: State Spring Inventory for Resource Management and Protection – Phase II

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd. 03h

Project Manager: Jim Berg

Organization: Minnesota Department of Natural Resources

M.L. 2016 ENRTF Appropriation: \$ 370,000

Project Length and Completion Date: 3 Years, July 1, 2016 through June 30, 2019

Date of Report: May 29, 2016

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	<i>Inventory existing spring information (office) and data management</i>			<i>Field verification of existing springs, inventory unmapped priority areas, inter-office travel</i>				
Personnel (Overall Wages and Benefits)	\$245,000	\$0	\$245,000	\$39,000	\$0	\$39,000	\$284,000	\$284,000
Research Scientist 3 - 1 classified @ 0.1 FTE for two years, 74.2 % salary, 25.8 % benefits. Project manager (A1 \$24,000, A2 \$0)								
Hydrologist 3 - 1 classified @ 0.3 FTE for two years, 73.3% salary, 26.7% benefits (A1 \$55,000, A2 \$12,000)								
Research Analysis Specialist - 1 unclassified @ 1 FTE for two years, 79% salary, 21% benefits (A1 \$124,000, A2 \$13,000)								
Hydrologist 1 temporary - 1 unclassified @ 0.6 FTE for two years, 100% salary. Field and project support. (A1 \$42,000, A2 \$14,000)								
Professional/Technical/Service Contracts								
Geologic interpretations of spring location data, field review of selected spring sites to confirm geologic conditions, and assistance and coordination with development of the spring inventory database MN Geological Survey	\$10,000	\$0	\$10,000	NA	NA	NA	\$10,000	\$10,000
Database and specialty programming services; web design and user support. MN.IT service	\$15,868	\$0	\$15,868	NA	NA	NA	\$15,868	\$15,868
Direct and Necessary expenses include both Department Support Services (Human Resources \$5,820, IT Support \$11,176 Safety \$1,372, Financial Support \$4,464, Communications Support \$1,236, Planning Support \$829, and Procurement Support \$235)	\$25,132	\$0	\$25,132				\$25,132	\$25,132
Equipment/Tools/Supplies								
Field equipment such as current meters, data loggers, specific expenses for use of specialized field data tablets to collect field data, waders, hip boots, GPS equipment, GIS or specialty software, and misc. tools and supplies for field data collection and equipment maintenance.	NA	NA	NA	\$9,000	\$0	\$9,000	\$9,000	\$9,000

State Spring Inventory for Resource Management and Protection, Phase 2

Travel expenses in Minnesota								
Fleet charges, lodging and meals for travel to statewide spring locations for on-site verification of reported springs and to find new locations. Fleet estimated using \$0.575/mile and meal costs according to MAPE contract.	NA	NA	NA	\$21,000	\$0	\$21,000	\$21,000	\$21,000
Other								
Required and necessary project personnel training for safety, technical, web and data management, and professional development in support of and to enhance the spring inventory project. This is not the same as the direct and necessary funding which is for office administration personnel and expenses and not project personnel.	\$2,000	\$0	\$2,000	NA	NA	NA	\$2,000	\$2,000
Expenses in support of developing presentations and communicating the results of this project at events such as the Minnesota Ground Water Association, the Minnesota Water Resources conference, or the Minnesota Area Watershed District. These presentations are an important part of outreach and dissemination.	\$3,000	\$0	\$3,000	NA	NA	NA	\$3,000	\$3,000
COLUMN TOTAL	\$301,000	\$0	\$301,000	\$69,000	\$0	\$69,000	\$370,000	\$370,000