

**Environment and Natural Resources Trust Fund
2012-2013 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 083-E1

MGS County Geologic Atlases (Part A) for Improved Water Management

Topic Area: E1. NR Info Collection /Analysis - Statewide

Total Project Budget: \$ 1,200,000

Proposed Project Time Period for the Funding Requested: 3 yrs, July 2013 - June 2016

Other Non-State Funds: \$ 0

Summary:

Continuing statewide effort to provide comprehensive geologic mapping essential to effective and efficient management of surface and ground water resources. Users include local, state, and federal agencies and private businesses.

Name: Dale Setterholm

Sponsoring Organization: U of MN - MN Geological Survey

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Location

Region: Statewide

County Name: Statewide

City / Township:

<input type="checkbox"/> Funding Priorities	<input type="checkbox"/> Multiple Benefits	<input type="checkbox"/> Outcomes	<input type="checkbox"/> Knowledge Base
<input type="checkbox"/> Extent of Impact	<input type="checkbox"/> Innovation	<input type="checkbox"/> Scientific/Tech Basis	<input type="checkbox"/> Urgency
<input type="checkbox"/> Capacity Readiness	<input type="checkbox"/> Leverage	<input type="checkbox"/> Employment	<input type="checkbox"/> TOTAL <input type="checkbox"/> %



Environment and Natural Resources Trust Fund (ENRTF) 2012-2013 Main Proposal

PROJECT TITLE: MGS County Geologic Atlases (Part A) for Improved Water Management

I. PROJECT STATEMENT

Geologic atlases provide maps and databases necessary for improved management of ground and surface water resources to the benefit of the people, fish, wildlife, and habitat that depend on water. County Geologic Atlases are specifically identified as essential data in the Statewide Conservation Plan, and in the efforts of the Environmental Quality Board, DNR Waters, and the Water Resources Center at the University of Minnesota to design a sustainable water management process.

Atlases:

- Define aquifer boundaries and the connection of aquifers to the land surface and to surface water resources to enable a comprehensive water management effort.
- Facilitate and enhance natural resource management, regulation, and wise use of water resources
- Support management activities designed to evaluate sustainable water use and to protect or improve water quality such as: permitting, land use planning, wellhead protection, source water protection, planning and development of public and private water supplies, remediation and spill response, monitoring, modeling, addressing TMDL problems.
- Document existing conditions so that changes in the water system can be recognized, analyzed, explained, and remedied where appropriate.
- A complete geologic atlas consists of Part A constructed by the Minnesota Geological Survey (MGS) and focused on geology and the County Well Index, and Part B constructed by the DNR Division of Waters and focused on hydrology (not funded by this proposal). Local participation is a primary factor in determining which counties are chosen for this work, while ground water sensitivity, water demand, and the size of the population served are also considerations. The counties must request an atlas, and provide funds or in-kind service.

This project continues an effort to provide county geologic atlases statewide. The first atlas was initiated in 1979 but the program languished without a reliable source of funding. Funding from ENRTF in the early 1990s and from 2007 to the present has greatly accelerated production (see attached map). This funding would cover the costs of 3 or 4 county atlases depending on their size, complexity, and location.

Users include local government units involved in environmental services, land use and water planning, and permitting; state and federal agencies responsible for water and mineral management and planning; contractors and other businesses, including well drillers, onsite wastewater treatment installers, road and building construction; and homeowners and cities with wells and wastewater treatment systems.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: Initiate three or more county geologic atlases

Budget: \$1,200,000

Atlases begin with compilation of a database of subsurface information. The most abundant data source is the construction records of water wells. With the cooperation of the local project partner, accurate digital locations are established for these wells to support their use in mapping. Concurrently, geologists visit the project area to describe and sample landforms, and exposures of rock or sediment. An initial assessment of the geologic data is then completed to focus additional data gathering including shallow and deep drilling programs. Analysis of the complete data set is then completed and maps and associated databases are formalized and prepared for use in geographic information systems and

distribution via DVD and web. Most of the products are also printed for use in the field, and by users who prefer this format.

Outcome	Completion Date
1. Create database of well construction records to support the mapping, to document water use in specific aquifers, and to help resolve well problems for 3 or 4 counties	June 30, 2015
2. Complete any unfinished ENRTF supported County Geologic Atlas projects (ex; from 2011 appropriation).	June 30, 2015
3. Make progress on or complete maps of bedrock geology, surficial geology, subsurface Quaternary geology, bedrock topography, and thickness of glacial deposits for 3 or 4 counties.	June 30, 2016
4. Distribute completed atlases to county, schools, libraries; hold workshops for users.	After completion and publication of maps

III. PROJECT STRATEGY

A. Project Team/Partners

The MGS team will include as many as 15 staff members (approx. 3.5 FTE) including database specialists, geologists, geophysicists, geographic information system specialists, and an editor. After completion of the MGS work DNR will construct Part B of the atlas which addresses water levels, water chemistry, and sensitivity using separate funding. The local partner, typically a county or SWCD, will provide services, such as establishing accurate well locations. The local partner is also consulted in the project design phase to establish specific issues, needs, and preferences.

B. Timeline Requirements

The work associated with this project will be initiated in 2013 and continue for three years. Most atlases require 3 to 4 years to complete, so projects started in this proposal may not be completely finished and may require additional funding. In the first year well locations are established and field work on the surficial geology is started. In the second year the bulk of field work is completed, drilling is completed, and map compilations begin. In the third year map and database compilations are completed and prepared for printing and GIS distribution, including web access. Workshops are held to familiarize the public and other users with the products.

C. Long-Term Strategy and Future Funding Needs

MGS is the geologic mapping agency of the state and is striving to provide comprehensive geologic mapping and associated databases at appropriate scales statewide as quickly as possible. The County Geologic Atlas program is the primary vehicle for completing this goal. Atlases are complete or under construction for 35 of the 87 counties in Minnesota. The MGS receives \$200,000 to \$250,000 per year from DNR Waters, and also leverages federal cost share dollars from the National Cooperative Geologic Mapping Program of the United States Geological Survey. MGS competes for these cost share dollars annually and they cover half of the costs of each map product incurred in that one-year window. MGS intends to propose project map elements for cost share and if successful may garner an additional \$125,000. MGS atlas development is also supported by a Clean Water Fund grant (\$305,000 from July 2010 to June 2013; applied to Winona and Houston County Atlases). The attached chart of recent and future funding of the program illustrates how ENRTF appropriations have increased activity to a level of approximately \$800,000 per year. At this level of spending statewide coverage and updating of several existing atlases could be achieved in approximately 20 years.

2012-2013 Detailed Project Budget

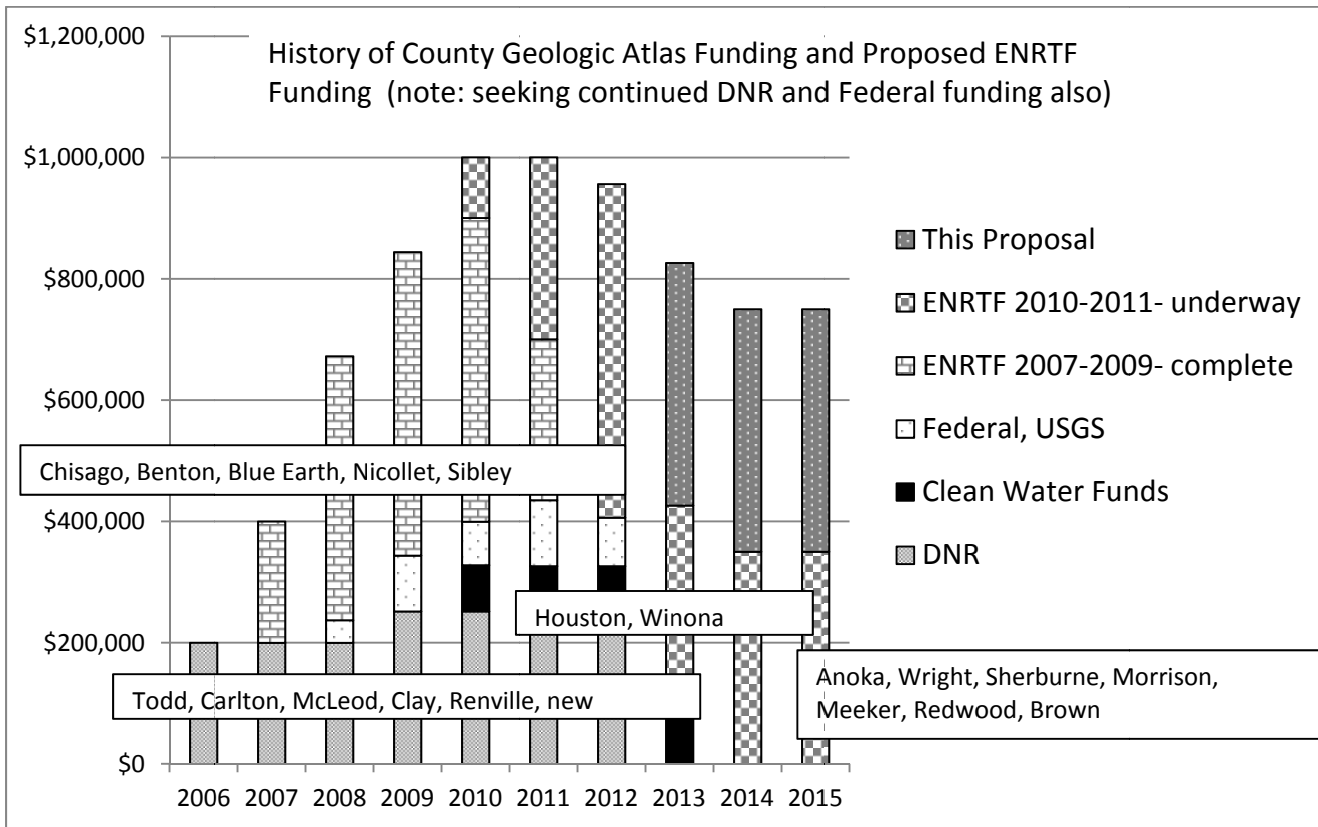
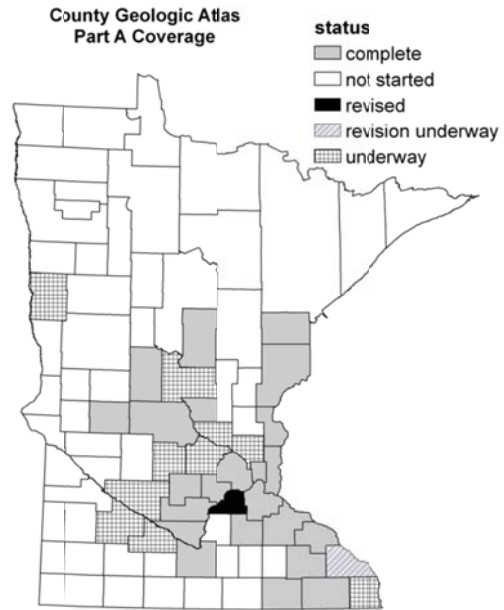
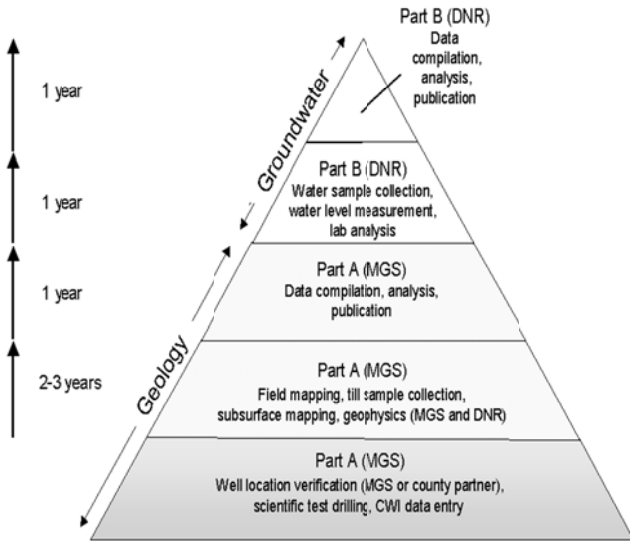
IV. TOTAL TRUST FUND REQUEST BUDGET 3 years beginning July 2013

BUDGET ITEM (See list of Eligible & Non-Eligible Costs, p. 13)	AMOUNT
Personnel: Between 5 and 15 MGS staff will be assigned to work on geologic atlases on a part time basis; chosen based on the skill sets necessary for the geology of the selected counties. The total effort averages about 3 FTE per project or 9 to 12 FTE for this proposal. The cost includes the University benefits.	\$ 885,000
Contracts: rotasonic test hole drilling (awarded by a competitive bidding process). Generally 3-6 holes per county, based on 3 counties. Rotasonic method yields 4" undisturbed core of unconsolidated deposits. Rates increase from \$30 near surface to \$60 at depths exceeding 350'.	\$ 155,000
Contracts: printing (awarded by a competitive bidding process); typically 1000 copies each of 6 map plates per county; 3 or 4 counties; maps are about 3' by 3'. Total 18,000 to 24,000 prints. Print runs have been reduced with more digital users.	45000
Equipment/Tools/Supplies: Supplies and services (photocopying well records, maps, augers and other expendable parts for soil probe, repairs, sample bags, lab supplies, lab services, scans, plotter supplies)	\$ 30,000
Travel: lodging, food, and University fleet vehicle rental and mileage costs; based on cost averages from past projects. Adjustment may be needed depending on project locations.	\$ 85,000
Additional Budget Items:	\$ -
TOTAL ENVIRONMENT & NATURAL RESOURCES TRUST FUND \$ REQUEST	\$ 1,200,000

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State \$ Being Applied to Project During Project Period: MGS will compete for federal cost share dollars annually. These federal funds cover half of the costs of each map product produced within a one year window. We intend to try to cost share at least three of the map products associated with this proposal. Funding might be \$100,000 to \$165,000 over life of project.	\$ 65,000	pending
Other State \$ Being Applied to Project During Project Period: The MGS CGA program anticipates approximately \$700,000 from DNR during this period, but this will be applied to separate CGA projects. MGS has also received \$305,000 from Clean Water Funds in the period 2011-2014 for atlases in Winona and Houston	\$ 800,000	secured
In-kind Services During Project Period: Each of the participating counties will be asked to establish accurate locations for water wells with construction records in the county. This dollar value is only an estimate of their costs, and will vary depending which counties are selected.	\$ 90,000	pending
Remaining \$ from Current ENRTF Appropriation (if applicable): \$121k from ML 2009, Chap.143, Sec.2, Subd.3(b) dedicated to Anoka and Wright CGAs; \$541k from M.L. 2010, Chp. 362, Sec. 2, Subd. 3a dedicated to Sherburne and Morrison CGAs; \$1.17 from M.L. 2011, First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 03b1 dedicated to Meeker, Redwood, Brown CGAs. These figures are accurate as	\$ 1,832,000	Obligated to work underway.
Funding History: Indicate funding secured prior to July 1, 2011 for activities directly relevant to this specific funding request. State specific source(s) of funds. See line above and chart of funding history attached.	\$ -	

County atlas tasks and dependencies



MGS County Geologic Atlases for Improved Water and Mineral Resource Management

Project Manager: Dale R. Setterholm

Qualifications:

Education

MS in Management of Technology, Carlson School of Management
University of Minnesota, Minneapolis, MN, 1999

*Capstone Project: A Project Management System for the
Minnesota Geological Survey*

BS in Geology, Institute of Technology, University of Minnesota,
Minneapolis, MN 1979

Professional Experience

Geologist, Minnesota Geological Survey, 1979-2012
Assistant to the Director, Minnesota Geological Survey 1997-2006
Associate Director, Minnesota Geological Survey 2007-2012

Participate in strategic planning, budget development, program administration, project management, personnel administration, purchasing, facilities management, information systems planning, search and hiring procedures, contract development, grants administration, and client relations.

Geologic interests and experience include:

- building subsurface geologic databases and applying them to geologic mapping and water resource management.
- the relationship of geologic settings and ground water sensitivity.
- the influence of geologic settings on water levels and water quality in lake management.

Organization Description:

The Minnesota Geological Survey is the geologic mapping agency for the State of Minnesota, as directed by its enabling legislation. Its goal is to produce comprehensive geologic mapping and related databases statewide at a scale of 1:100,000 or more detailed. This mapping supports informed land use management and decision-making that protects and wisely allocates resources. The MGS is part of the N.H. Winchell School of Earth Sciences in the College of Science and Engineering at the University of Minnesota. It has existed since 1872 and has a current staff of approximately 25.