



Environment and Natural Resources Trust Fund (ENRTF)

M.L. 2018 ENRTF Work Plan (Main Document)

Today's Date: February 19, 2018

Date of Next Status Update Report: December 31, 2018

Date of Work Plan Approval:

Project Completion Date: June 30, 2021

Does this submission include an amendment request? ___

PROJECT TITLE: County Geologic Atlases - Part A

Project Manager: Dale Setterholm

Organization: Minnesota Geological Survey, University of Minnesota

College/Department/Division: College of Science and Engineering

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Location: statewide

Total Project Budget: \$2,500,000

Amount Spent: \$0

Balance: \$2,500,000

Legal Citation: M.L. 2018, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

I. PROJECT STATEMENT: Geologic atlases provide maps and databases essential for improved management of ground and surface water resources. This is foundational data that supports water management activities to the benefit of drinking water and aquatic habitat. 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. Geologic 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. The program goal of atlas coverage statewide has benefited from long-term support of LCCMR to accelerate the work.

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 (funded separately) and focused on hydrology. 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 are required to provide funds or in-kind service, typically by establishing accurate locations for water wells. The construction records of water wells are a fundamental data source that describe subsurface conditions, and also tell us where the population is obtaining water.

Atlases enhance natural resource management and regulation, and facilitate wise use of water resources. They support water management activities for sustainable water use and protection and improvement of water quality such as: permitting, land use planning, wellhead protection, remediation, nutrient management, monitoring, modeling, and well construction. Atlas information is used by citizens, local government, counties, and state agencies (SWCDs, MDH, DNR, MPCA, Ag). The atlases document existing conditions so that changes in the water system can be recognized and evaluated. A User's Guide to geologic atlases supports and educates users of all backgrounds.

This project continues an effort to provide county geologic atlases statewide. The first atlas was initiated in 1979. Funding from ENRTF in the early 1990s and from 2007 to the present has greatly accelerated production (see attached map). At this time 50 of the 87 counties (57%) have a completed Part A atlas, or a project underway (38 complete, 12 underway, 3 revised, 3 revisions underway). Annual funding of \$1,927,000 (aggregate from all sources) would achieve statewide coverage in about 11 years. We are creating atlases at a rate of about 5 per year.

This project originally requested \$4,121,625 to accomplish the equivalent of 10 county atlases. The award is 61% of the request, and the project will now accomplish the equivalent of 6 atlases. The term equivalent is used because these funds will finish some atlases already underway, and some that are started will not be complete at the end of the grant.

II. OVERALL PROJECT STATUS UPDATES: See Activity 1 below

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Initiate about 3 new county geologic atlases; continue existing projects- equivalent of about 6 atlases total.

Description: Current atlas projects in St. Louis, Lake, Olmsted, Dodge, Steele, Aitkin, Rock, Nobles, Kandiyohi, Pennington, and Otter Tail counties are those most likely to need funding from this grant to sustain progress. Atlases begin with compilation of a database of subsurface information including well records. The local project partner establishes accurate digital locations for these wells. 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 and geophysical, geochemical, and geochronologic surveys. Analysis of the 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. The number of counties we can map with these funds will be affected by the size, geologic complexity, and data availability of the counties that are chosen.

ENRTF BUDGET: \$2,500,000

Outcome	Completion Date
1. Completion of atlases initiated on prior grants (see list above). St. Louis and Lake may not be completely finished by this date.	June 30, 2021
2. Continuing digital release of geologic mapping and databases for subproject areas of the Lake and St. Louis project. The series of subprojects that cover parts of these counties allows us to put more people on the job with fewer delays. This will also allow us to complete and digitally publish subproject maps much sooner than maps of the entire county.	all products open-filed or printed by 1/1/2018
3. Progress on new atlas projects (mapping and associated databases). Projects are waiting for attention in Pipestone, Lincoln, Lac Qui Parle, Otter Tail, and Cook counties. Discussions are underway with several other counties likely to pursue atlas projects. We especially pursue those where water sensitivity, population, growth, water growth, or other management issues are present.	June 30, 2021

First Update December 31, 2018

Second Update June 30, 2019

Third Update December 31, 2019

Fourth Update June 30, 2020

Fifth Update December 31, 2020

Final Update June 30, 2021

IV. DISSEMINATION:

Description: Every atlas is produced in portable document format (PDF), as geographic information system files (GIS), and in printed form. The digital files are available as a DVD, and are also available from the University of Minnesota Digital Conservancy, and via link from the MGS web page http://www.mngs.umn.edu/county_atlas/countyatlas.htm. Each project culminates with a meeting held in the project area to present the results to the county staff, and any other interested parties. At these meetings the products are described, access to the products is explained, and examples of applications of the products to common resource management situations are demonstrated. The products of subprojects in St. Louis and Lake counties are being released in digital form immediately following technical review. When all the subproject areas are complete county-wide compilations will be created and distributed digitally and in print. The printed copies are shared with the county, who in turn can distribute them to libraries, schools, townships, and other agencies. They are also distributed by the MGS map sales office. Products are also made available to earth science teachers and other educators for classroom exercises. Atlas products are also displayed and explained at educational events for SWCD staff and onsite sewage treatment system contractors.

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V. PROJECT BUDGET SUMMARY:

A. Preliminary ENRTF Budget Overview: See attached budget spreadsheet

Explanation of Use of Classified Staff: NA

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

Enter Total Estimated Personnel Hours: 50,000	Divide by 2,080 = TOTAL FTE: 24
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Total Number of Full-time Equivalent (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation:

Enter Total Estimated Personnel Hours: not possible to calculate. Cost by foot, printed sheet, or analyses.	Divide by 2,080 = TOTAL FTE:
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B. Other Funds:

SOURCE OF AND USE OF OTHER FUNDS	Amount Proposed	Amount Spent	Status and Timeframe
Other Non-State \$ To Be Applied To Project During Project Period:			
USGS STATEMAP cost share	\$ 210,000	\$ 0	Pending, would apply to years 2 and 3; using year 1 to augment 2017 ENRTF grant
USGS Great Lakes Mapping cost share	\$75,000	\$0	Pending; annual application
Other State \$ To Be Applied To Project During Project Period:			
Clean Water Funds	\$250,000	\$0	Pending allocation
DNR contract	\$550,000	\$275,000	New contract pending for 2020-2022
Past and Current ENRTF Appropriation: see table below			

Funding Source and Use of Funds	M.L. 2007 or FY08-10	M.L. 2008 or FY09-12	M.L. 2009 or FY10-13	M.L. 2010 or FY11-14	M.L. 2011 or FY12-14	M.L. 2013 or FY14-16	M.L. 2015 or FY16-18	M.L. 2017 or FY 18-20
ENRTF Benton and Chisago	\$400,000							
ENRTF Blue Earth, Nicollet, Sibley		\$706,000						
ENRTF Anoka and Wright			\$820,000					
ENRTF Sherburne and Morrison and related research				\$1.13 mill.				
ENRTF Redwood, Meeker, Brown					\$1.2 mill.			
ENRTF Wadena, Hubbard, Becker						\$1.2 mill		
ENRTF St. Louis, Lake, Olmsted, Kandiyohi, Aitkin							\$2.04 mill.	
ENRTF Hennepin, Isanti, Cass, Rock, Nobles, Steele, Pennington, Otter Tail, Lac Qui Parle, Lincoln, Pipestone								\$2.0 mill.

VI. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
Under a separate workplan and budget DNR Waters and Ecological Services is receiving funds to work on Part B of County			

Geologic Atlases, and county partners will supply in-kind services.			
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B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role

VII. LONG-TERM- IMPLEMENTATION AND FUNDING:

VIII. REPORTING REQUIREMENTS:

- The project is for 3 years, will begin on July 1, 2018, and end on June 30, 2021.
- Periodic project status update reports will be submitted December 31 and June 30 of each year.
- A final report and associated products will be submitted between June 30 and August 15, 2021.

IX. SEE ADDITIONAL WORK PLAN COMPONENTS:

- A. Budget Spreadsheet
- B. Visual Component or Map

**Attachment A:
Environment and Natural Resources Trust Fund
M.L. 2018 Budget Spreadsheet**



Project Title: County Geologic Atlases - Part A

Legal Citation:

Project Manager: Dale Setterholm

Organization: Minnesota Geological Survey, Univ. of Minnesota

College/Department/Division: College of Science and Engineering

M.L. 2018 ENRTF Appropriation: \$2,500,000

Project Length and Completion Date: 3 years, June 30, 2021

Date of Report: February 19, 2018

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Budget	Amount Spent	Balance
BUDGET ITEM			
Personnel (Wages and Benefits)			
Between 20 and 25 MGS staff (mostly geologists but also GIS, hydrogeologist, editor, database specialists, field assistants) 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 4 FTE per atlas or about 24 FTE for this proposal. The cost includes the University fringe benefits (27.2% to 33.5% depending on class).	\$1,855,200	\$0	\$1,855,200
Professional/Technical/Service Contracts			
Rotary-sonic test hole drilling (awarded by a competitive bidding process). Generally 4-6 holes per county. Rotary-sonic method yields 4" undisturbed core of unconsolidated deposits. Average hole cost is \$12,767 but varies with depth. Depth corresponds to depth of bedrock surface. Drilling costs are shared with support from our DNR contract (about one quarter).	\$300,000	\$0	\$300,000
Professional/Technical/Service Contracts			
Offset printing; awarded by competitive bid; typically 350 copies of each of 6 plates (each 3' by 3' and four color) per county, current prices about \$14,000 per county. Print run has been lowered as there are more online users, and we are exploring means to lower this further. This amount would cover about 6 counties.	\$84,000	\$0	\$84,000
Professional/Technical/Service Contracts			
Geochemical and geochronological analyses to support aquifer correlation and delineation; laboratories will be evaluated based on cost and capabilities in accordance with U of M purchasing rules. Contracts or bids as necessary. We anticipate about 1,125 geochem analyses (\$50,625) and 12 geochron analyses (\$12,000).	\$62,625	\$0	\$62,625

Equipment/Tools/Supplies			
Equipment/Tools/Supplies: Field and lab expendables (batteries, sample bags, replacement augers as needed (\$305 each), Giddings Probe repair parts, maps, core boxes (\$7.75 each, about 950 boxes per county, \$7,362 per county, \$44,175 total, core to Hibbing repository), distilled water)	\$64,175	\$0	\$64,175
Travel expenses in Minnesota			
Travel: vehicle rental from U Fleet Services as needed, typically on weekly basis, and mileage (approx. \$245 sedan rental, \$0.17 per miles, \$275 per week truck, \$0.37 per mile); meals (up to \$46 per day); lodging as per University regulations. Amounts cannot be calculated until project locations (counties, distances) are known.	\$134,000	\$0	\$134,000
COLUMN TOTAL	\$2,500,000	\$0	\$2,500,000