



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2014 Work Plan

Date of Report: January 15, 2014
Date of Next Status Update Report: January 1, 2015
Date of Work Plan Approval:
Project Completion Date: June 30, 2016
Does this submission include an amendment request? No

PROJECT TITLE: Drainage Records Modernization and Statewide Geographic Information System Database

Project Manager: Al Kean
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Location: Statewide

Total ENRTF Project Budget:	ENRTF Appropriation:	\$230,000
	Amount Spent:	\$0
	Balance:	\$230,000

Legal Citation: M.L. 2014, Chp. 226, Sec. 2, Subd. 05c

Appropriation Language:

\$230,000 the second year is from the trust fund to the Board of Water and Soil Resources to develop a template and Web-based geographic information system (GIS) database portal to facilitate statewide modernization of public drainage records under Minnesota Statutes, chapter 103E, and integrate new specifications into existing drainage records modernization guidelines. This appropriation is available until June 30, 2017, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Drainage Records Modernization and Statewide GIS Database

II. PROJECT STATEMENT: This project will develop a geographic information systems (GIS) database template along with data standards and a web-based data portal, for M.S. Chapter 103E public drainage system records. These tools will draw on recent drainage records modernization experience of county and watershed district drainage authorities and their consultants, as well as the experience of the Minnesota Geospatial Information Office (MnGeo) creating geospatial data portals. The database template will be available to interested parties statewide and its use, together with systematic data portal access, are anticipated to be required for drainage authorities to receive competitive drainage records modernization cost-share, when available. This project will not include drainage records modernization cost-share.

The electronic drainage system records enabled by the project database template and data portal will improve GIS data statewide for records such as public drainage system location, type, alignment, dimensions, profile, and road crossings. This will also improve the National Hydrography Dataset, which is critical for multipurpose water management modeling, planning and implementation in Minnesota. The database template and data portal will be developed through and/or by the MnGeo, which is focused on *“Improving services statewide through the coordinated, affordable, reliable and effective use of GIS”*. This project will also update Drainage Records Modernization Guidelines, published in September 2008 by the Board of Water and Soil Resources, including conversion to a web-based document reflecting the project GIS database template and associated data standards. (2014 Funding Priority A. Foundational Natural Resource Data and Information)

Approximately 100 counties and watershed districts serve as public drainage authorities under Chapter 103E drainage law. Their public drainage system administration encompasses more than 21,000 miles of drainage ditches and many thousands of miles of subsurface tile. Historically, records for these drainage systems have been maintained by drainage authorities primarily in hard copy form using different production methods and materials of the time. Many of these records are more than 100 yrs. old and are becoming faded and fragile. Drainage records modernization typically first involves creation and cataloguing of electronic copies (scans) of drainage system records. Advanced levels of modernization include creation of associated GIS data layers enabling the use and incorporation with other spatial data.

Since 1997, BWSR has administered incentives for public drainage system inventories and records modernization to advance drainage management, through Local Water Planning Challenge Grants and Drainage Records Modernization Grants, when available. The stakeholder Drainage Work Group, which involves more than 20 associations, organizations, agencies and academic institutions facilitated by BWSR, has been a proponent of drainage records modernization and preservation guidelines and cost-share. Up to 55 drainage authorities have conducted some level of records modernization to date, with a much smaller number having developed some GIS compatibility. This project will provide a consistent database template with data standards that can be used by the approximately 46 drainage authorities that have not yet conducted drainage records modernization, and enable drainage authorities with prior drainage records modernization to advance their records to a consistent, higher level, when motivated by cost-share and/or local priorities. The Chapter 103E public drainage system records using the GIS database template will be available through a statewide, web-based data portal.

III. PROJECT STATUS UPDATES:

Project Status as of January 1, 2015:

Project Status as of July 1, 2015:

Project Status as of January 1, 2016:

Overall Project Outcomes and Results:

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Develop project team, investigate and define scope of products and data standards.

Description: This activity includes execution of an interagency agreement between BWSR and MnGeo, which will serve as the prime GIS services provider for this project. A project advisory committee will be established, oriented, and consulted to help guide the development of project goals, scope and outcomes. Members of the stakeholder Drainage Work Group, the interagency Drainage Management Team, drainage authority representatives with drainage records modernization and use experience, and other practitioners with relevant expertise (such as hydrologic modelers who have interest in drainage system hydrographic data), will be recruited to serve on the project advisory committee. RFP(s) will be developed by MnGeo, in collaboration with BWSR, to hire consultant(s) with experience in applicable GIS database and data portal development, and having knowledge required to update the Drainage Records Modernization Guidelines. It is anticipated that the database template will focus on drainage system characteristics such as type (ditch or tile), location, alignment, dimensions, profile, road crossings, hydraulic structures, and dates of establishment and improvement (as applicable). In coordination with BWSR and the project advisory committee, MnGeo and consultant(s) will solicit input of drainage authorities and applicable practitioners via survey and focus groups to help define business requirement characteristics and data standards for the GIS database template and data portal, as well as an associated scope for updating the Drainage Records Modernization Guidelines.

Summary Budget Information for Activity 1:

ENRTF Budget: \$45,000
Amount Spent: \$ 0
Balance: \$45,000

Activity Completion Date: March 15, 2015

Outcome	Completion Date	Budget
1. Written and executed project agreement between BWSR and MnGeo, as the prime GIS services provider	August 2014	\$0 (in-kind match)
2. Project management documents and procedures developed and coordinated	September 2014	\$3,000
3. Project information materials developed, and project advisory committee established, oriented and consulted	October 2014	\$5,000
4. RFP(s) and selection process(es) for consultant(s) to assist with the development of a GIS database template, data portal, and updated Drainage Records Modernization Guidelines are prepared; proposals solicited and consultant(s) selected, in accordance with applicable state procedures	November 2014	\$13,000
5. Survey and focus groups (est. 2 to 4) with drainage authorities and applicable practitioners are conducted to help define business requirements and data standards for GIS database template and Drainage Records Modernization Guidelines	January 2015	\$10,000
6. Specific objectives, business requirements, data standards and other key characteristics are defined for the GIS database template and web-based data portal as well as the scope for the update of the Drainage Records Modernization Guidelines	March 2015	\$14,000

Activity Status as of January 1, 2015:

Activity Status as of July 1, 2015:

Activity Status as of January 1, 2016:

Final Report Summary:

ACTIVITY 2: Develop GIS database template and web-based data portal for public drainage system records.

Description: MnGeo, serving as the prime GIS services provider, will work with the project consultant hired for the development of a GIS database template, data portal and user guidance documentation for public drainage system records. These products will be developed in accordance with the specific objectives, business requirements, data standards and associated key characteristics defined in Activity 1. Data portal development will be coordinated with the MnGeo GeoCommons, as appropriate. The database template will be populated with one to three pilot county or watershed district data sets for testing.

Summary Budget Information for Activity 2:

ENRTF Budget: \$147,000
Amount Spent: \$ 0
Balance: \$147,000

Activity Completion Date: June 30, 2016

Outcome	Completion Date	Budget
1. Draft outline and characteristics of GIS database template and web-based data portal structure and functionality are defined by consultant and MnGeo	May 2015	\$11,000
2. Review and feedback from MnGeo and appropriate project advisory committee members completed	June 2015	\$6,000
3. Preliminary draft GIS database template and data portal developed	October 2015	\$55,000
4. Review and feedback from MnGeo and appropriate project advisory committee members provided on preliminary draft GIS database template and data portal	November 2015	\$5,000
5. Final drafts of GIS database template, data portal, and user guidance are developed and pilot data incorporated for testing	March 2016	\$45,000
6. Review and feedback from MnGeo and appropriate project advisory committee members provided on final draft GIS database template, data portal and user guidance	April 2016	\$5,000
7. GIS database template, data portal, and associated user guidance completed	June 2016	\$20,000

Activity Status as of January 1, 2015:

Activity Status as of July 1, 2015:

Activity Status as of January 1, 2016:

Final Report Summary:

ACTIVITY 3: Update Drainage Records Modernization Guidelines

Description: MnGeo, as the prime GIS services provider, in consultation with BWSR, will oversee the update of the Drainage Records Modernization Guidelines, September 2008, including conversion to a web-based document by the applicable project consultant, in accordance with the scope of work defined in Activity 1 and informed by Activity 2. The project GIS database template, portal and associated data standards will help advance these guidelines.

Summary Budget Information for Activity 3:

ENRTF Budget: \$38,000
Amount Spent: \$ 0
Balance: \$38,000

Activity Completion Date: June 30, 2016

Outcome	Completion Date	Budget
1. Outline for updated Drainage Records Modernization Guidelines defined by consultant, in consultation with MnGeo and BWSR	July 2015	\$4,000
2. Review and feedback from MnGeo, BWSR and appropriate project advisory committee members completed for outline	August 2015	\$2,000
3. Preliminary draft of updated Drainage Records Modernization Guidelines developed by consultant	December 2015	\$17,000
4. Review and feedback from MnGeo, BWSR and appropriate project advisory committee members provided on preliminary draft update of Drainage Records Modernization Guidelines	January 2016	\$4,000
5. Final draft of updated Drainage Records Modernization Guidelines is developed	March 2016	\$6,000
6. Review and feedback from MnGeo, BWSR and appropriate project advisory committee members provided on final draft of updated Drainage Records Modernization Guidelines	April 2016	\$2,000
7. Updated Drainage Records Modernization Guidelines completed	June 2016	\$3,000

V. DISSEMINATION:

Description: When complete, the GIS database template and data standards for public drainage system records developed through this project will be made available via a MnGeo website portal. Information about availability of these products will be disseminated to all Chapter 103E drainage authorities and their respective associations (Association of Minnesota Counties, Minnesota Association of Watershed Districts), including at their annual meeting / convention. Information about the availability of the associated data portal at MnGeo and the current status of public drainage records information available via the portal, will be posted on the MnGeo website. BWSR will also include an applicable article in the BWSR Snapshots publication, which is distributed to local government units.

Status as of January 1, 2015:

Status as of July 1, 2015:

Status as of January 1, 2016:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	\$ Amount	Explanation
Personnel:	\$ 69,000	MnGeo fees for services: 1 Supervisor, GIS Project Services, 0.025 FTE, 2 yrs.; 1 Sr. GIS Specialist, 0.05 FTE, 2 yrs.; 1 GIS Specialist, 0.1 FTE, 2 yrs.
Professional/Technical/Service Contracts:	\$157,000	Consultant(s) to provide expertise and services for the development of a GIS database template, data standards, data portal, user guidance, and update of the Drainage Records Modernization Guidelines, through competitive bid or State Master Contract
Travel Expenses in MN:	\$4,000	Meetings with project participants and focus groups (est. 2 -4 focus group mtgs.)
TOTAL ENRTF BUDGET:	\$230,000	

Explanation of Use of Classified Staff: MnGeo staff have the GIS database and data portal expertise required to serve as the prime GIS services provider for this project, including contracting, direction and oversight of services provided by qualified consultant(s) through professional - technical contracts. One of the business functions of MnGeo is to provide GIS expertise in these and other areas on a cost-recovery basis. The planned MnGeo staff positions to be involved are classified positions. MnGeo is the best state office to host the web-based database template and data portal developed through this project.

Explanation of Capital Expenditures Greater Than \$5,000: None

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 0.35 FTE MnGeo

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 0.9 FTE Consultant(s)

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Non-state			
	\$0	\$	
State			
	\$20,000 (GF)	\$	In-kind BWSR staff time for project management and project advisory cmte.
TOTAL OTHER FUNDS:	\$20,000	\$	

VII. PROJECT STRATEGY:

A. Project Partners:

Supervisor, GIS Project Services, MnGeo: Lead contract and production manager

Sr. GIS Specialist, MnGeo: Technical development and review

GIS Specialist, MnGeo: Technical development and review

Private Consultant(s): Technical development and support of a GIS database template, data standards, data portal and guidance documentation for public drainage system records, and technical development and support for update of the Drainage Records Modernization Guidelines.

B. Project Impact and Long-term Strategy: This project will create a GIS database template, data standards, and web-based data portal tools for public drainage system records, as well as updated Drainage Records Modernization Guidelines. These products will improve public drainage system GIS hydrographic data availability for multipurpose water management modeling, planning and implementation in Minnesota. If, or when, BWSR is appropriated cost-share funding for public drainage records modernization, it is anticipated that the use of these tools and guidelines by Chapter 103E drainage authorities will be required as a condition of receiving a cost-share grant.

C. Spending History:

Funding Source	M.L. 2007 or FY08
General Fund appropriation for development of Drainage Records Modernization Guidelines	\$150,000

VIII. ACQUISITION/RESTORATION LIST: N/A

IX. VISUAL ELEMENT or MAP(S): See attached graphic.

X. ACQUISITION/RESTORATION REQUIREMENTS WORKSHEET: N/A

XI. RESEARCH ADDENDUM: N/A

XII. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than January 1, 2015; July 1, 2015; and January 1, 2016. A final report and associated products will be submitted between June 30 and August 15, 2016.



Environment and Natural Resources Trust Fund										
M.L. 2014 Project Budget										
Project Title: Drainage Records Modernization and Statewide Geographic Information System Database										
Legal Citation: M.L. 2014, Chp. 226, Sec. 2, Subd. 05c										
Project Manager: Al Kean										
Organization: Board of Water and Soil Resources										
M.L. 2014 ENRTF Appropriation: \$230,000										
Project Length and Completion Date: 2 Years, June 30, 2016										
Date of Report: January 15, 2014										

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	Activity 3 Budget	Amount Spent	Activity 3 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	<i>Develop project team, investigate and define product scope and data standards.</i>			<i>Develop GIS database template and web-based data portal</i>			<i>Update Drainage Records Modernization Guidelines</i>				
Personnel (Wages and Benefits)	\$32,000	\$0	\$32,000	\$30,000	\$0	\$30,000	\$7,000	\$0	\$7,000	\$69,000	\$69,000
<i>Supervisor, GIS Project Services, MnGeo: \$12,000 (70% salary, 30% benefits) 0.025 FTE for 2 years (0.05 FTE)</i>											
<i>TBD Sr. GIS Specialist, MnGeo: \$23,000 (70% salary, 30% benefits) 0.05 FTE for 2 years (0.1 FTE)</i>											
<i>TBD GIS Specialist, MnGeo: \$34,000 (70% salary, 30% benefits) 0.1 FTE for 2 years (0.2 FTE)</i>											
Professional/Technical/Service Contracts											
TBD (competitive bid or State Master Contract) GIS database template, data standards, web-based data portal and user guidance development	\$10,000	\$0	\$10,000	\$116,500	\$0	\$116,500				\$126,500	\$126,500
TBD (competitive bid or State Master Contract) Drainage Records Modernization Guidelines update							\$30,500	\$0	\$30,500	\$30,500	\$30,500
Travel expenses in Minnesota	\$3,000	\$0	\$3,000	\$500	\$0	\$500	\$500	\$0	\$500	\$4,000	\$4,000
Meetings with project participants and focus groups (est. 2 -4 focus group mtgs.)											
COLUMN TOTAL	\$45,000	\$0	\$45,000	\$147,000	\$0	\$147,000	\$38,000	\$0	\$38,000	\$230,000	\$230,000



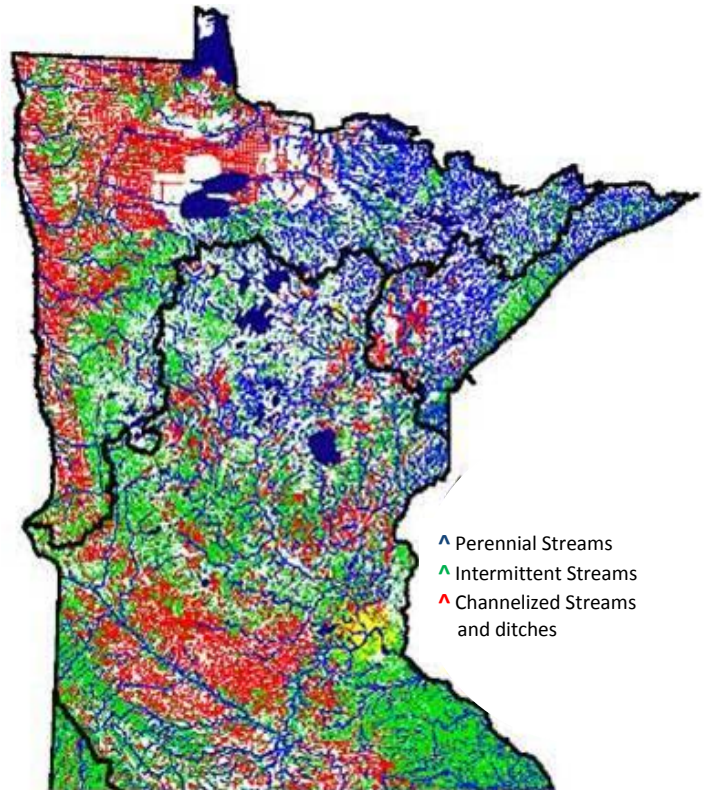
Drainage Records Modernization and Statewide GIS Database

2014 LCCMR Proposal #010-A

Project Manager: Al Kean, Chief Engineer, MN Board of Water and Soil Resources

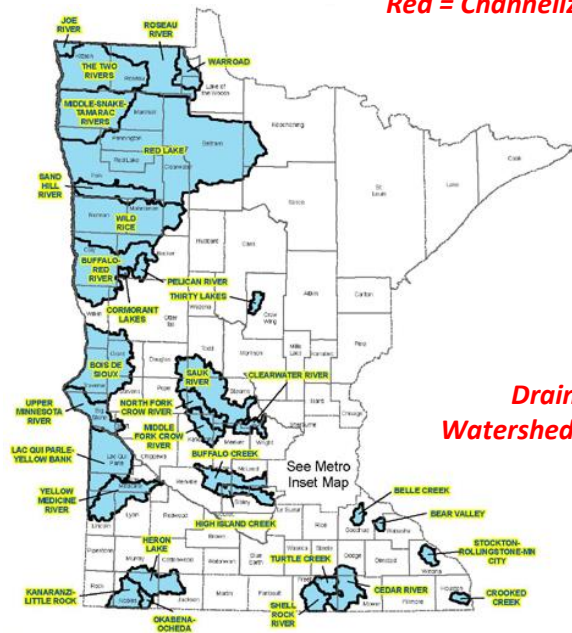
Background Information:

- Public drainage systems are a key component of water management infrastructure in Minnesota. There are approximately 21,000 miles of M.S. Chapter 103E public drainage ditches and thousands more miles of public subsurface tile.
- Multipurpose drainage management is critical for water quality protection and improvement, and drainage system hydrographic data is necessary for comprehensive water planning and design.
- Minnesota's 87 Counties and 46 Watershed Districts (total 133) can serve as public drainage authorities for M.S. Chapter 103E.
- The vast majority of Chapter 103E drainage systems were installed in the late 1800s and early 1900s.
- Drainage system records historically have been kept in hard copy on various types of materials of the day, many of which are substantially deteriorating.



▲ Perennial Streams
▲ Intermittent Streams
▲ Channelized Streams and ditches

Red = Channelized Streams and Ditches



**Drainage Authorities:
Watershed Districts and Counties**

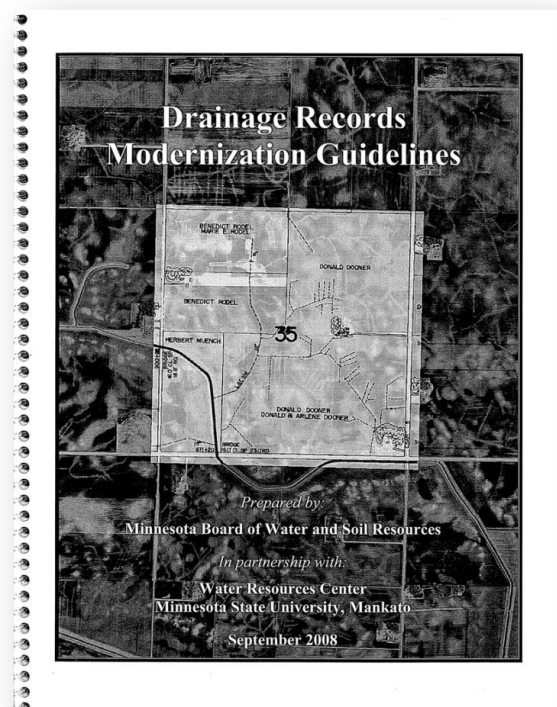
Actions to Date:

- In 2006, the stakeholder Drainage Work Group recommended state funding for Drainage Records Modernization Guidelines and cost-share for public drainage records modernization.
- BWSR received a legislative appropriation and published "Drainage Records Modernization Guidelines," September 2008.
- BWSR has provided cost-share to modernize public drainage system records since 1997 when funds have been made available.
- Up to 55 drainage authorities have conducted some level of drainage records modernization since 1997. A few have developed some GIS compatibility. One of these drainage record modernization projects involved development of a substantial GIS database and map viewer for available electronic drainage system records at the Rice Creek Watershed District.

Proposal Summary:

- Request: \$230,000
 - \$230,000 for database template and data portal development and update of Drainage Records Modernization Guidelines, Sep. 2008
- Create a GIS database template with standards for drainage authority use and a web-based data portal at the Minnesota Geospatial Information Office (MnGeo) for Chapter 103E drainage system record data.
- Update the Drainage Records Modernization Guidelines, including GIS database standards for the drainage records template developed and the web-based data portal created at MnGeo for Chapter 103E public drainage system records.

- Improve GIS data statewide with available records of public drainage system type, location / alignment, dimensions, profile and road crossings.
- Utilize a stakeholder advisory committee, including members of the Drainage Work Group, to advise and coordinate project development and outcomes.



Project Benefits:

- Improved access to data on public drainage systems, including shared data standards, coordinated access through a web portal, and use of authoritative data sources to avoid duplication of data management.
- Enhanced water management for water quality outcomes due to better information on public drainage systems.