
PROJECT APPLICATION
Dickinson County Water Quality Commission
Cover Sheet

1. Applicant Organization
U.S. Geological Survey, Illinois-Iowa Water Science Center (ILIA)
400 S. Clinton Street
Iowa City, IA
52240
Email: gmnalley@usgs.gov
Phone: (319) 358-3630
Organization contact: Greg Nalley

2. Project title: **Data collection and development of a hydrologic budget and flow model: tools for the protection and management of the Iowa Great Lakes Chain**

Location: **Various locations on Spirit Lake, East Okoboji Lake, West Okoboji Lake, and Milford Creek**

3. Project Director (if different than organization contact)
Street address _____
City _____
State _____
Zip _____
Email _____
Phone _____

4. Application submission date: September 30, 2016

5. Brief description (75 words or less) of project, including expected results:

Lake level and streamflow gages will be installed to quantify lake inflows and outflows in the Iowa Great Lakes Chain to develop a hydrologic budget and construct a high-resolution hydrologic model. Results will quantify and assess the extent and connectivity of lakes, rivers, and groundwater aquifers. Both tools will assist managers in making more informed decisions regarding quality, availability, and vulnerability of area water resources.

6. Amount requested through this grant application * : **\$148,500.00**

7. Matching funds:
Hard match \$99,000.00 (Anything paid for with real money)

Source(s) USGS Cooperative Funds
(If it is your intent to seek matching grants using the WQC funds, list those potential additional grants, the expected timing for funds to be available, and the dollars that will be requested)

Soft match _____ (Anything not paid with real money but has a value)

Source(s) _____
Other support _____

- a. Amount of Federal, State or other public cash match money already acquired or in process (list all and current status): \$ _____
- b. Amount of private cash match funds: \$ _____
- c. Source of public and/or private cash match (list all):

Is the project a portion of a larger, overall project to be implemented over a multi-year period?
Yes ____ No X If yes, describe in project narrative and include in budget form as instructed.

**** The Water Quality Commission will only obligate funds for current fiscal year.
Any multi-year projects will be allowed to re-apply in subsequent years***

Type of project (select all that apply):

- Public education, public awareness and information dissemination
- Creation or maintenance of Best Management Practices
- Erection and maintenance of storm water run off facilities
- Bank stabilization Water treatment
- Water monitoring
- Watershed protection
- Activities to abate and remove invasive species
- Any other activity which will improve, protect or enhance the quality of water in the lakes in Dickinson County

Estimated project dates:

- a. **Start :10/01/2017**
 - b. **Completion: 9/30/2018**
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Applicant's signature. Upon signing in the space provided below, the applicant agrees to conform to the requirements pertaining to:

- **Civil Rights Assurance of Compliance:** The applicant hereby agrees that it will comply with Title VI of the Rights Act of 1964, 1873 and the age Discrimination Act of 1975 to the end that no person in the United States shall on the grounds of race, color, national origin or otherwise subjected to discrimination under any program or activity for which the Applicant-Recipient receives grant funds and hereby gives assurance that it will immediately take any measures to effectuate this agreement.

This assurance is binding on the Applicant-Recipient, its successors, transferees, and assignees, and the person or person whose signature appears below are authorized to sign this assurance on behalf of the Applicant-Recipient.

Greg Nalley, Associate Director

Date

REQUIRED BUDGET FORM

See Application Guidelines for this form.

Proposed Budget for Current Grant Request Year (fill out with just the match for this year's WQC match if this is a multi-component, multi-year project, please fill out the second budget form with the entire budget and any anticipated grant dollars expected to be sought from WQC in future requests)

| | <u>Commission</u> | Hard Match* | Soft Match** | <u>Total</u> |
|--------------------------|----------------------|---------------------|-----------------|----------------------|
| 1. Staff | \$ 94,500.00 | \$ 63,100.00 | \$ _____ | \$ 157,600.00 |
| 2. Supplies and Services | \$ 20,220.00 | \$ 13,480.00 | \$ _____ | \$ 33,700.00 |
| 3. Equipment | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 4. Travel | \$ 3,300.00 | \$ 2,200.00 | \$ _____ | \$ 5,500.00 |
| 5. Water Monitoring | \$ 30,420.00 | \$ 20,280.00 | \$ _____ | \$ 50,700.00 |
| 5. Land Acquisition | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 6. Land Development | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 7. Other | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| Total | \$ 148,440.00 | \$ 99,060.00 | \$ _____ | \$ 247,500.00 |

* **Hard Match is "real money spent" toward project goal.**

** **Soft Match is money indirectly spent toward project goal. (This is important but not included in the dollar amount for points).**

Hard Match funds are provided by the U.S. Geological Survey Illinois-Iowa Water Science Center, the agency submitting this application.

BUDGET NARRATIVE:

Expenses listed in Supplies and Services, and Water Monitoring costs reflect those incurred for installation and one-year of operation of a lake level gage on East Okoboji Lake, flow gages on the East-West Okoboji channel and the outlet of Lower Gar Lake, and a stage gage at the outlet of Spirit Lake; and the installation and one-year operation of groundwater level monitoring at ten groundwater wells. In all cases, labor and QA/QC of measurements and collected data are included.

Expenses listed in Staff are salary for 3 Hydrologists and reflect time spent on archival data collection, analysis, interpretation, presentation and publication.

Expenses listed in Travel include two trips to the Okoboji area: one trip related to public engagement early in the timeline, and a second trip to present results to the public and stakeholders.

TASKS AND DELIVERABLES: Attach a list of Tasks and Deliverables following the Application Guidelines included in this packet.

Primary deliverables are:

- A geographic information systems database (GIS) containing shape files of all data used in creation of Reports, eg. Well locations, water levels, subsurface geology, landcover, soil types, etc
- Report: summary of exiting stream discharge, lake level, groundwater, and geological data and interpretation of those data in the framework of a hydrologic budget and conceptual hydrologic model for the Iowa Great Lakes Chain.
- Report: Hydrologic Budget and High-resolution Hydrologic Model for the Iowa Great lakes Chain.
- Proposal: 2017 Grant submission outlining funds needed to:
 - Continue operation of stream and lake level gages
 - Delineate extent and connectivity of glacial aquifer with the surface water network using geophysical surveys.
 - 2-year budget for construction of a high-resolution, surface water-groundwater model for the Iowa Great Lakes.

Timeline:

| Task | Oct-18 | Nov-18 | Dec-18 | Jan-19 | Feb-19 | Mar-19 | Apr-19 | May-19 | Jun-19 | Jul-19 | Aug-19 | Sep-19 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Program management and Public Engagement | | | | | | | | | | | | |
| Kick-off meeting with Stakeholders | | | | | | | | | | | | |
| Public engagement meeting for public feedback/comment/coop | | | | | | | | | | | | |
| Collect and organize regional data into a GIS database | | | | | | | | | | | | |
| Lake level, stream discharge, and hydrogeologic data | | | | | | | | | | | | |
| Geology, stratigraphy, landcover, climate records, soils, etc. | | | | | | | | | | | | |
| Landowner well information | | | | | | | | | | | | |
| Field Data Collection Activities | | | | | | | | | | | | |
| Deployment of instrumentation: lake, and streamflow and stage gages | | | | | | | | | | | | |
| Deployment of instrumentation: Groundwater level sensor network. | | | | | | | | | | | | |
| Compile existing time series data, analyse, and interpret results QA/QC new data sets from gage and well network | | | | | | | | | | | | |
| Conceptual, Analytical, and Computational Modeling | | | | | | | | | | | | |
| Construct a conceptual Groundwater Flow Model and Hydrologic Budget for the Okoboji Chain | | | | | | | | | | | | |
| Construct and calibrate high-resolution hydrologic model for the Okoboji Chain | | | | | | | | | | | | |
| Analysis and Synthesis | | | | | | | | | | | | |
| Analysis of existing streamflow data and groundwater data to formulated a conceptual groundwater flow model for the Okoboji chain | | | | | | | | | | | | |
| Incorporate preliminary interpretations newly acquired hydrologic data into hydrologic budget and high-resolution hydrologic model | | | | | | | | | | | | |
| Preparation of results in Scientific Investigations Report (SIR) | | | | | | | | | | | | |
| Year 1 Deliverables | | | | | | | | | | | | |
| Presentation: Results at Stakeholder/Public Meeting | | | | | | | | | | | | |
| Publication 1 | | | | | | | | | | | | |
| Publication 2 | | | | | | | | | | | | |
| Proposal | | | | | | | | | | | | |

Optional Proposed Budget for Future Project Components & Years (If needed)

| | <u>Commission</u> | Hard Match* | Soft Match** | <u>Total</u> |
|--------------------------|-------------------|-------------|--------------|--------------|
| 1. Staff | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 2. Supplies and Services | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 3. Equipment | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 4. Travel | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 5. Water Monitoring | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 5. Land Acquisition | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 6. Land Development | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| 7. Other | \$ _____ | \$ _____ | \$ _____ | \$ _____ |
| Total | \$ _____ | \$ _____ | \$ _____ | \$ _____ |

* **Hard Match** is “real money spent” toward project goal.

** **Soft Match** is money indirectly spent toward project goal (this is important but not included in the dollar amount for points).

You must attach a letter of support for each contributor of Hard Match dollars and soft match dollars that specifies the amount of money or service being provided.

BUDGET NARRATIVE: Attach a Budget Narrative. Follow directions in Application Guidelines.

TASKS AND DELIVERABLES: Attach a list of Tasks and Deliverables following the Application Guidelines included in this packet.

PROJECT NARRATIVE

Attach project narrative following the instructions in application guidelines, including:

STATEMENT OF PROJECT NEED:

The waters of the Iowa Great Lakes serve as an important drinking water source for several communities, and as a large economic driver to the region, providing recreational opportunities that support a substantial tourist industry and seasonal increase in population. Securing the quality of the waters is a paramount issue for public health and the regional economy. Although many of the lakes in the chain are dominated by surface water runoff, some lakes have significant groundwater contributions from unverified aquifers with unknown extents and recharge areas. Before a sound model can be constructed to assist in the management and protection of the Iowa Great Lakes, the sources of lake inflows must be determined and quantified, and a complete hydrologic budget and high-resolution hydrologic model must be built for the entire Iowa Great Lakes Chain. The hydrologic budget and model will be tools that can be used throughout the Iowa Great Lakes Chain in water-quality management and watershed protection decisions.

STATEMENT OF PROJECT BENEFITS TO WATER QUALITY

The hydrologic budget determined by this project will provide water managers with improved influxes and outflows for each lake and the entire system. The hydrologic model will provide quantitative contributions of surface water and groundwater amounts for historic, extreme, and future climate events, as well as runoff contributions from specific landscape units to each lake. Both tools can be useful in assessing effects of contaminant sources in the watershed, applying improved lake residence times, and in the source, timing, and pathways of nutrients in the Iowa Great Lakes Chain.

PUBLIC AWARENESS PLAN

We are planning a public engagement meeting early in the project cycle to ask for stakeholder and the public's help in locating and gaining access to existing wells that are no longer being used, qualitative data about water from their wells through times of drought and deluge, and increase their understanding of the current and future risks to their water supply. All reports will be accessible to the public after completion, and a public meeting can be held after project completion to explain results and answer questions.

LAND ACQUISITION AND DEVELOPMENT: *If the project involves land acquisition and development, fill out the requested information below. See application guidelines for details. (Note: Land Development is any activity on a piece of ground that constitutes improving the land, developing the land, or otherwise impacting the land)*

Project Location:

Environmental, Economic and Social Impacts of Project (Demonstrate project impact to water quality and project need in this section)

Historical, Archaeological, and Architectural Features/ Impacts/Land Acquisition, Development

Project's Relationship to State, Local and County Plans

Agreements and Easements/Land Acquisition/Development

Itemized Cost Estimate Land Acquisition/Development



To: Chairman Brad Jones,
Dickinson County Water Quality Commission

From: General Manager Eric Stoll
Milford Municipal Utilities

Subject: Letter of Support for the "USGS Hydraulic Budget and Modeling Grant Application"

Milford Municipal Utilities would like to state that it supports the Grant Application of the USGS that studies the Hydrologic Budget and Modeling of the Iowa Great Lakes Chain. This Project will assist us in making informed decisions regarding water quality, availability and vulnerable areas that need additional protection.

Milford Municipal Utilities has drawn from the Iowa Great Lakes Watershed since 1914. We continue to seek information and data to develop strategies so we can continue to serve the Great Lakes area with drinking water for another 100 years.

In summary, this project has the potential to point us in new directions on how to preserve the quality of water in the Great Lakes Watershed.

Sincerely,

A handwritten signature in black ink, appearing to read 'Eric Stoll', written over a light gray rectangular background.

Eric Stoll
General Manger Milford Municipal Utilities