



# Environment and Natural Resources Trust Fund

## 2023 Request for Proposal

### General Information

**Proposal ID:** 2023-159

**Proposal Title:** Water Protection Geomatic and Geospatial Intensive Data Capture

### Project Manager Information

**Name:** Bradford Folta

**Organization:** Minnesota Geospatial & Geomatics Institute

**Office Telephone:** (651) 433-7199

**Email:** Bradford.Folta@honeybadgeranalytics.com

### Project Basic Information

**Project Summary:** The goal is to establish a data foundation, with intensive data collection and educate the new and current workforce with modern tools that preserve, conserve and to protect Minnesota waters .

**Funds Requested:** \$2,478,000

**Proposed Project Completion:** May 31, 2026

**LCCMR Funding Category:** Foundational Natural Resource Data and Information (A)

### Project Location

**What is the best scale for describing where your work will take place?**

Region(s): Central

**What is the best scale to describe the area impacted by your work?**

Statewide

**When will the work impact occur?**

During the Project

## Narrative

### **Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.**

The opportunity we seek to address is to build a solid data foundation to discover the appropriate level of monitoring that is both economical and information sufficient, utilizing tools and methods available on the market today to monitor and care for the lakes, rivers, and water bodies of Minnesota.

Often data capture events are one-sided and don't relate to other data events based on time, lack of awareness, or because funding is specific to one concern. Our goal is to build a solid data foundation that not only includes a myriad of data capture methods, but also gives state agencies and local organizations a better understanding of the lake or area's lake health and well-being.

Because of the information being captured, we will employ the use of the Minnesota Geospatial and Geomatic Institute of Brainerd, Mn, with its partner Honey Badger Analytics LLC, to drive this project. This will help give aspiring students at the institute research and practical experience while supporting local businesses who will maintain and run operations making sure tasks are accomplished, and the data is presentable to the general public.

### **What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.**

We are offering an intensive study and modern methodologies to be better aware and train the next generation of geospatial/geomatic professionals on how to best preserve and protect our environment with the latest tools. Too often, we aim to answer many questions with a narrative focused on people rather than data. What if we did both? The people's stories and the hard facts to back it up.

We are seeking funds to pay for the professional services, implementation, and monitoring of systems and support participation and funding for MGGI to research and present student findings. From that, the monetization of the data to outside organizations will support ongoing efforts to maintain the current lakes studied and increase or add lakes to the portfolio.

In doing so, we are ensuring the protection of data collected and share it with those interested in or are participating while educating the current/future workforce yet aiming for self-sufficiency as we continue to grow the program. As it were, the students can move on, but the business side will protect and maintain the data ongoing.

### **What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?**

The specific project outcomes are centered around two aspects. Training the current and future workforce at MGGI to be job ready through hands-on equipment deployment, data collection methods, system/hardware calibration & troubleshooting, and data analysis/visualization with state-of-the-art equipment and software. The second aspect is to better prepare our students and public/educational professionals with methodologies that efficiently and effectively capture data to meet the needs of environmental agencies or projects. These two aspects create a professional workforce with a better understanding and knowledge of how to meet/protect/preserve our current and future environment.

## Activities and Milestones

### Activity 1: Bathymetry Data Collection

**Activity Budget:** \$1,810,200

**Activity Description:**

Over the course of three years, we will perform a bathymetric assessment of each of the lakes. We are looking for anomalies to differentiate vegetated areas, sediment signature (mud/sand), and other variables.

**Activity Milestones:**

Description	Completion Date
Device Deployment/Data Collection	May 31, 2023
Data Processing	June 30, 2023
Device Deployment/Data Collection	May 31, 2024
Data Processing	June 30, 2024
Device Deployment/Data Collection	May 31, 2025
Data Processing	June 30, 2025

### Activity 2: Aerial Data Collection

**Activity Budget:** \$120,000

**Activity Description:**

Collecting orthometric, near infrared and thermal imagery once a year over the course of three years will give a land-based understanding of potential issues that the selected lake may be facing for a terrestrial input. By conducting these surveys, we can identify differences in vegetation, areas of concern with regard to a certain plant disease, plant speciation signatures, as well as thermal zones that are above, within, or outside normal parameters.

**Activity Milestones:**

Description	Completion Date
Deployment/ Data Collection	May 31, 2023
Data Processing	June 30, 2023
Deployment/ Data Collection	May 31, 2024
Data Processing	June 30, 2024
Deployment/ Data Collection	May 31, 2025
Data Processing	June 30, 2025

### Activity 3: Water Quality Sample Data Collection

**Activity Budget:** \$50,400

**Activity Description:**

Water sampling data collection will go above normally collected variables to capture a complete picture of what is suspended in the surface water. Water Sampling will take place over 12 months. Occurring 1 time per month for three years.

**Activity Milestones:**

Description	Completion Date
Water Sampling Event (1 per month)	December 31, 2023
Water Sampling Events (1 per month)	December 31, 2024
Water Sampling Event (1 per month)	December 31, 2025

## Activity 4: Buoy Data Collection

**Activity Budget:** \$411,000

**Activity Description:**

Real-time water information like turbidity, conductivity, etc. will be collected every 5 minutes and sent over the cellular connection to Honey Badger Analytics LLC for collation into datasets. With that, each buoy will be equipped with a weather station to monitor weather every six minutes from ice out to ice over three years. The estimated time on the water for the buoys is 185 continuous days.

**Activity Milestones:**

Description	Completion Date
Deployment/Data Collection	May 31, 2023
Deployment/Data Collection	May 31, 2024
Deployment/Data Collection	May 31, 2025

## Activity 5: GIS Platform Implementation/Support

**Activity Budget:** \$86,400

**Activity Description:**

Honey Badger Analytics will provide the software/data backup framework and the host system to house, store, and maintain data and its products. Subscribers will pay Honey Badger Analytics which will earmark the proceedings to further the data collection to other lakes.

**Activity Milestones:**

Description	Completion Date
Deployment/Maintenance of Geospatial System	May 31, 2023

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Brian Wallace	White Sand Lake Association	President	No

## Long-Term Implementation and Funding

**Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?**

Data and products will be made and used for educational and student training purposes at MGGI. Non-profit, Educational, and Government Agencies that would like to utilize raw or finished data may do so at a discounted monthly rate (subscription) for research and grant support purposes only. Businesses or private firms will be charged accordingly for data deliverables at market rate. This is to support the maintenance and operations of MGGI increasing the number of collected lakes without need to obtain more funding from LCCMR. Our aim is to make a sustainable platform for our students to learn from.

## Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Groundwater Contamination Mapping	M.L. 2017, Chp. 96, Sec. 2, Subd. 03h	\$400,000
Landslide Susceptibility, Mapping, and Management Tools	M.L. 2017, Chp. 96, Sec. 2, Subd. 03i	\$500,000
Mapping Taxonomy and Environmental Toxicology of Minnesota Freshwater Sponges	M.L. 2017, Chp. 96, Sec. 2, Subd. 03m	\$258,000
Mapping Avian Movement in Minnesota	M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 03h	\$200,000
Develop Sonar Data Mapping on Three Rivers to Assess Suitability for Native Mussel Habitat	M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 03j	\$200,000
Mapping Antibiotic Resistance in Minnesota to Help Protect Environmental, Animal, and Human Health	M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 04h	\$750,000
Mapping Habitat Use and Disease of Urban Carnivores	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03g	\$500,000
Accelerated Aggregate Resource Mapping	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03h	\$700,000
Mapping Aquatic Habitats for Moose	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03i	\$199,000
Improving Statewide GIS Data by Restoring the Public Land Survey	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03m	\$135,000
Mapping Unprofitable Cropland for Water and Wildlife	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 04n	\$100,000

## Project Manager and Organization Qualifications

**Project Manager Name:** Bradford Folta

**Job Title:** Executive Director - Minnesota Geospatial & Geomatics Institute & Owner - Honey Badger Analytics LLC.

**Provide description of the project manager's qualifications to manage the proposed project.**

Bradford Folta Jr. MPSc. has been in the Geospatial and Geomatics industry since 2008. Mr. Folta's education consist of field and traditional experience. He holds a Bachelor of Arts from the University of Minnesota in Geological Sciences, and

a Master of Professional Science in Geographic Information Systems.

He has worked for MPCA, IKEA, National Park Service: Cape Cod National Seashore, University of Delaware (UDel): Saltmarsh Habitat Avian Research Program (SHARP), and MaineDOT. The tools he architected, or the processes he was put in charge of were well researched, made efficient, and most of all effective to not only helping his workflow, but assisting his colleagues as well. At the National Park Service, Bradford conducted large area sediment surveys along the coast of cape cod capturing GPS data that would give him elevations to compare to previous data and years. At the UDel, he assisted the SHARP develop their GPS data collection arm by authoring the protocols the methodologies to properly conduct repeatable GPS surveys in saltmarsh environments from Maine to Virginia. At MaineDOT, Bradford architected the Transportation Risk Assessment to Planning and Production Decision tool that would allow bureaus to leverage their data and make informed decision on bridge or large culver rehabilitation or replacement.

Honey Badger Analytics LLC., is a geospatial and geomatic consulting and services firm that works with clients to provide accurate and precise data collection with data analysis and visualization. Projects managed range from small scale data projects with towns as small as 2,500 people all the way to scanning projects that cover 530 miles. To date he has led 20 projects utilizing state of the art equipment to accomplish any job put in front of him. Currently his company services two water districts in Maine, one city in Minnesota, and various other one-off projects.

**Organization:** Minnesota Geospatial & Geomatics Institute

**Organization Description:**

The Minnesota Geospatial & Geomatics Institute (MGGI) is a private career college centered on training students to become acquainted and think with a geospatial and geomatic perspective. At MGGI, students will learn and engage in the discussion and development of geospatial visualizations and workflows. Leveraging its Honey Badger Analytics connections and network, MGGI develops and maintains its state-of-the-art program where students will learn the most current methodologies and participate in the deployment and maintenance of geomatic hardware. This combination of principles forces the student to think through the whole problem or issue presented and know the limitations of systems or the data. While forming an outcome hypothesis, students are now fully aware of all the steps in the process that may have introduced errors creating better data sets. With regard to the market, MGGI plans to assist other universities and colleges with their academic programs by offering real-world projects and ongoing programs. Because of this, we are not specific to one field of study. Therefore, no matter the degree the student is seeking (e.g., Geology, Geography, Criminology, etc.), the student will learn the tools that will enable them to be more efficient and effective when entering the workforce.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
							<b>Sub Total</b>	-
<b>Contracts and Services</b>								
Honey Badger Analytics LLC.	Professional or Technical Service Contract	Over the course of three years, we will perform a bathymetric assessment of each of the lakes identified in this proposal. We are looking for anomalies to differentiate vegetated areas, sediment signature (mud/sand), and other variables that impact lake health.				1,810,200		\$1,810,200
Honey Badger Analytics LLC.	Professional or Technical Service Contract	Collecting orthometric, near infrared and thermal imagery 2 times a year over the course of three years will give a land-based understanding of potential issues that the selected lake may be facing for a terrestrial input. Flight Planning and Flight Management on-off site.				120,000		\$120,000
Honey Badger Analytics LLC.	Professional or Technical Service Contract	Water sampling data collection will go above normally collected variables to capture a complete picture of what is suspended in the surface water. Water Sampling will take place over 12 months. 1 time per month for three years.				50,400		\$50,400
Honey Badger Analytics LLC.	Professional or Technical Service Contract	Real-time water information like turbidity, conductivity, etc., will be collected every 5 minutes and sent over the cellular connection to Honey Badger Analytics LLC for collation into datasets. With that, each buoy will be equipped with a weather station to monitor weather every six minutes from ice out to in.				411,300		\$411,000
Honey Badger Analytics LLC.	Professional or Technical Service Contract	The software/data backup framework and the host system to house, store, and maintain data and its products. Subscribers will pay Honey Badger Analytics which will earmark the proceedings to further the data collection to other lakes.				86,400		\$86,400
							<b>Sub Total</b>	<b>\$2,478,000</b>

<b>Equipment, Tools, and Supplies</b>								
							<b>Sub Total</b>	-
<b>Capital Expenditures</b>								
							<b>Sub Total</b>	-
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								
							<b>Sub Total</b>	-
<b>Travel Outside Minnesota</b>								
							<b>Sub Total</b>	-
<b>Printing and Publication</b>								
							<b>Sub Total</b>	-
<b>Other Expenses</b>								
							<b>Sub Total</b>	-
							<b>Grand Total</b>	<b>\$2,478,000</b>



Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
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Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	-
Non-State				
			Non State Sub Total	-
			Funds Total	-

## Attachments

### Required Attachments

#### *Visual Component*

File: [bf2bc96f-0f7.pdf](#)

#### *Alternate Text for Visual Component*

This documents speaks to the level of information each data collection source will gain and provide perspective on along with how it will satisfy the LCCMR's Priorities for next year....

### Optional Attachments

#### *Support Letter or Other*

Title	File
Letter of Support White Sand Lake Association	<a href="#">46eab261-abd.pdf</a>

## Administrative Use

**Does your project include restoration or acquisition of land rights?**

No

**Does your project have potential for royalties, copyrights, patents, or sale of products and assets?**

Yes

**Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?**

No

**Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF? If so, describe here:**

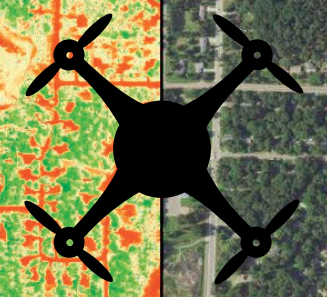
Yes, Data and products will be made and used for educational and student training purposes at MGGI. Non-profit, Educational, and Government Agencies that would like to utilize raw or finished data may do so at a discounted monthly rate (subscription) for research and grant support purposes only. Businesses or private firms will be charged accordingly for data deliverables at market rate. This is to support the maintenance and operations of MGGI increasing the number of collected lakes without need to obtain more funding from LCCMR. Our aim is to make a sustainable platform for our students to learn from.

**Does your project include original, hypothesis-driven research?**

No

**Does the organization have a fiscal agent for this project?**

No



## LCCMR 2023 Priorities

### A. Foundational Natural Resource Data & Information

- ✓ An easy-to-use GIS platform houses all of the data collected about the lakes. This allows for routine maintenance of the platform, As a part of this initiative, this easy-to-maintain platform, which is standard for GIS systems.

### B. Water Resources

- ✓ Aerial Imagery assists with a big picture of water coming into and out of the lake.
- ✓ Water Quality Sampling assist with how the water or how much water is moving.

### C. Environmental Education

- ✓ Schools/Groups can subscribe to gain access and create research projects with added data collection. and create informative graphics to support lake preservation/conservation.

### D. Aquatic & Terrestrial Invasive Species

- ✓ Bathymetry Data & Aerial Imagery helps understand the extent of soil type (mud/sand) in the water along with extent of underwater vegetation.

### E. Air Quality, Climate Change, & Renewable Energy

- ✓ Buoy's gather and reports real-time water quality information with weather and other features at specific timed intervals remotely.

### F. Methods to Protect or Restore Land, Water, & Habitat

- ✓ Aerial Imagery helps by identifying vegetation, impervious surface, etc.
- ✓ Bathymetry helps understand the extent of soil type(mud/sand) in the water along with extent of underwater vegetation.
- ✓ Buoy data helps by bringing some real-time water quality information with weather and other features.

### G. Land Acquisition, Habitat, & Recreation

- ✓ Utilizing the imagery subscribers can locate land, identify vegetation, and habitat that would be beneficial to protect or for recreation activities.

### H. Small Projects

- ✓ Lakes under 2,000 acres qualify for small single projects based on service fees.