



**Clean Water Indiana
SWCD Led
Competitive Grant Application**

Contact Information

Lead District	Marshall County SWCD
Amount Requested	\$35,148.41
Participating District(s), if applicable	N/A

Grant Contacts

Role	Authorized Contract Signatory
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Project Information

<i>Project Title</i>
Cyanobacteria Testing, Education and Awareness for Lake Communities

<i>Project Description</i>
<p>Cyanobacteria/Blue-Green Algae Monitoring, Education, Advisory and Mitigation Strategies at the County level.</p> <p>Thousands of algal species inhabit the surface of the world's waterways in varying concentrations. Present in all climatic regions in almost any type of aquatic habitat in various abundances, algal species composition, distribution, and growth are mainly determined by the hydrology and aquatic parameters of an area in addition to the physical and chemical properties of the photic zone. Several abiotic factors such as temperature, light availability, nutrient availability, pH, and seasonal vertical mixing can affect algae composition and photosynthetic output. The conditions under which algae thrive vary from species to species. If environmental conditions meet the cellular needs of a species, dense concentrations of algae can form. This situation is often referred to as algal blooms. Many algal blooms are believed to be caused by nutrient enrichment and eutrophication from anthropogenic loading as a result of</p>

runoff from lawns, farmland, and industry. Increased temperature, mass die-offs of herbivores/grazers, overfishing, poor water circulation, and areas of extreme weather events (i.e., floods, droughts, etc.) are also potential causes of algal blooms. According to the article "Aquatic Ecosystems in a Shifting Indiana Climate: A Report from the Indiana Climate Change Impacts Assessment", warming waters, combined with elevated nutrient levels, will lead to more algal blooms, reduced water clarity, and depleted oxygen levels. Some species of algae produce biotoxins that form harmful algal blooms (HABs). Cyanobacteria (also known as blue-green algae) are microscopic organisms found naturally in aquatic surfaces. Because cyanobacteria growth is favored in warm lake waters, they often become the primary constituents of summer algal blooms as they outcompete other forms of algae and diatoms for nutrients. Microcystis is a genus of freshwater cyanobacteria that includes the species *Microcystis aeruginosa*. *M. aeruginosa* is the most common toxic form of cyanobacteria found in fresh water algal blooms and produce toxins called microcystins. Elevated levels of microcystins are toxic with the potential to cause acute poisoning in humans and domestic animals and thus often lead to the closure of recreational waters. The World Health Organization suggests that an appropriate guideline for microcystin levels in recreational waters is 20 ppb. Some regional governing bodies use more conservative guidelines. For example, the Massachusetts Department of Public Health requires microcystin levels to be less than 14 ppb in recreational water for safe body/water contact. Marshall County has 17 water bodies, none of which are currently monitored for cyanobacteria. We are proposing to implement a county-wide cyanobacteria monitoring program, host multiple education events, erect educational signage at priority swimming areas and create an on-line tool for the public to access testing results. After the grant is complete, the plan would be to fund ongoing annual costs with partner donations and dedicating funds from the SWCD operating budget.

Provide the specific issue, problem or need that the project will address.

Throughout the last several decades, an increase in the number, frequency, and location of HABs around the United States has been documented and observed in new locations where previous blooms have never been recorded. Indiana Department of Environmental Management regularly tests state owned public beaches and posts advisories. The Lilly Center for Lakes and Streams tests the lakes in Kosciusko County and posts advisories. Currently, there is no statewide program for cyanobacteria and each lake community is left to fend for themselves. There are 17 lakes in Marshall County, none of which have any kind of testing or signage. This project will be a that warning system and will include regular testing of water bodies during the season, year-round education and outreach to inform the general population about the dangers of cyanobacteria and symptoms of exposure. This outreach will also incorporate the SWCD and NRCS programs emphasizing nutrient reduction through Best Management Practices. Signage installed at regularly used beaches and access points will keep the public informed of the current risk of exposure to cyanobacteria, with trained volunteers monitoring those locations through the season. Online tools will be created to access results of testing, which will be conducted by partners at Moontree Studio with equipment provided through the grant.

The lack of protocols and procedures is state-wide. This program can serve as a guide for other counties to implement their own monitoring and education program.

Describe each partner and their specific contributions and anticipated match to the project.

Marshall County Soil and Water Conservation District - LEAD \$9,000 cash match and \$1500 in-kind contribution for administration of grant and management of website
Lake Maxinkuckee Environmental Fund - \$5,000 cash match and \$2250 in-kind contribution to help develop educational materials, workshops, submit samples for analysis, consulting
Moontree Studio - \$16,575.00 in kind contribution - will house the equipment, staff will conduct sampling analysis as part of their outreach to the community
Marshall County Lakes and Waters Council - \$500 in kind contribution to collaborate on information distribution, workshops
Marshall County Health Department - \$500 in kind contribution to collaborate on information distribution, workshops
Town of Culver, Parks Department - \$200 in kind contribution - staff to install signage at the public beach
Indiana DNR - in kind contribution by allowing signage at public access sites

Describe how the funds will be utilized.

Establish Laboratory and Versatile Testing System
Lab Costs x 3 years
Literature addressing homeowner and agricultural BMPs to address nutrient loading
Host at least 2 workshops
Website Development for public to access test results
Advisory Signage at Public Access Sites

What are the primary goals for the project?

Conduct sampling at targeted lakes in Marshall county to assess risk for cyanobacteria and microcystin levels.

Install signage at designated lakes to raise cyanobacteria awareness and the risk it poses for human and animals. Signage would have panels that can be changed out depending upon current level of risk.

Increased awareness of one factor in cyanobacteria blooms, nutrient loading, and the steps to reduce that loading. Because the need for education about cyanobacteria is so great, we will be focusing on this educational aspect first. But we will be making county residents and producers aware of the causes of these blooms, and also the programs that the SWCD has in place that can be utilized to reduce these pollutants and nutrient loads, such as the current CWI grant with the St. Joseph County SWCD for cover crops, no-till and pollinator habitat, and NRCS programs for filter strips and other important conservation practices.

Create webpage, hosted on the Marshall County SWCD website, for cyanobacteria testing results.

Develop cyanobacteria literature.

Train citizen scientists on the different types of algal blooms. Only those lakes that have a trained representative will have the ability to submit water samples for analysis. This is how we get buy-in from lakeshore property owners.
Reassurance to the public that local partners are monitoring local waterbodies for their safety, as well as their pet's safety.
Raise awareness of Marshall County SWCD to local government and the public, and the value it brings to the community, which can be an important leveraging tool.

Budget Information

<i>Item Description</i>	<i>CWI Funds Requested</i>	<i>Cash Match</i>	<i>In Kind Match</i>
Materials and lab fee for Microcystin testing	\$30,000.00	\$0.00	\$0.00
Microcystin Manual Assay System & training for 3 people	\$5,148.41	\$5,200.00	\$0.00
SIGNAGE - 24 x 30 signs with removable/interchangeable color panels w/ hardware	\$0.00	\$2,200.00	\$425.00
Website development	\$0.00	\$1,500.00	\$500.00
Laboratory freezer, water bath, refrigerator	\$0.00	\$1,600.00	\$0.00
Labor from Moontree Studio - testing and lab setup	\$0.00	\$0.00	\$16,575.00
Labor - educational activities, water sample collection, materials distribution	\$0.00	\$0.00	\$3,500.00
Materials - educational flyers and handouts	\$0.00	\$0.00	\$525.00
Taxonomic Training	\$0.00	\$2,500.00	\$0.00
Reference books	\$0.00	\$1,000.00	\$0.00

Self Assessment

These items are not specified in district law but are considered essential for district operations and will be considered for CWI 2021.

<i>District Annual Meeting Information: January 1, 2020</i>	Yes
<i>Updated SharePoint Directories: Within 30 days of changes</i>	Yes
<i>The district has a current business plan.</i>	Yes
<i>The district has had at least one current supervisor/staff/active associate attend a Leadership Institute workshop session since 2008. *Note that in order for an associate supervisor to count toward this item, they must be listed in the SharePoint directory.</i>	Yes
<i>The district has at least one current supervisor/staff/active associate graduate of the Leadership Institute program. *Note that in order for an associate supervisor to count toward this item, they must be listed in the SharePoint directory.</i>	No
<i>District Staff or supervisors participated in the most recent cover crop transects.</i>	Yes
<i>How many grants other than CWI has the district applied for in the last 3 years?</i>	8

In early June of this year, Lake Maxinkuckee, in Culver, Marshall County, experienced an algal bloom along the entire north shore. This bloom encompassed the public beach, the swimming area for dogs and the town park area.

The Lake Maxinkuckee Environmental Fund (LMEF) office began receiving comments and questions about the funny green color of the water on Wednesday, June 8th. The Town of Culver Park Superintendent was contacted regarding protocols for posting advisories and was informed there were none. The Marshall County Health Department was contacted, who said they were receiving calls and advised us to call IDEM, as they had no information. Clearly there was no local protocol for cyanobacteria advisories.

LMEF documented the bloom with photos and collected water samples for analysis. In the meantime, people and pets continued to recreate in the water. By Saturday, June 12th, there were multiple complaints of skin rashes and sick dogs. By the time the lab analysis was received, the bloom had subsided. However, the results confirmed a toxic, blue-green algae bloom.

According to the EPA “Climate change will lead to higher air temperatures which can have a corresponding effect on raising water temperatures. Higher water temperatures combined with increased stormwater runoff of nutrients can result in conditions favorable for algal blooms. Consequently, with a changing climate, harmful algal blooms can occur more often, in more fresh or marine waterbodies, and can be more intense.”

All information indicates that harmful algal blooms are going to become more frequent. As of now, the State of Indiana monitors its state-owned beaches and posts advisories. The Lilly Center for Lakes and Streams monitors lakes in Kosciusko County and posts advisories. However, it seems everyone else is left to fend for themselves. The incident on Lake Maxinkuckee demonstrates that an affordable and replicable program is needed to help lake communities across the state monitor for and educate about cyanobacteria and harmful algal blooms.

LMEF is willing to contribute \$5,000 cash match, as well as in-kind contribution of staff hours, to help implement such a program.

Thank you for your consideration.

Sincerely,

Debbie Palmer
President
Lake Maxinkuckee Environmental Fund

Jodie Winger



MoonTree Studios
Fearlessly Creating

Indiana State Department of Agriculture
CWI Grant Committee
1 North Capital Ave, Suite 600
Indianapolis, IN 46204

September 7th, 2021

Dear CWI Grant Committee Members,

MoonTree Studios, a non-profit ministry of the Poor Handmaids of Jesus Christ, challenges people to experience mindfulness as they fearlessly explore the inter-connectedness of Art, Nature, and the Spirit within. As an art-eco-spirituality center, our mission is to bridge the journey toward a planetary consciousness by cultivating experiential learning and transformation through the intersection of integrated arts, interspirituality, and integral ecology. Our vision is to foster a fully living and evolving Earth community within the Kankakee River Watershed fearlessly creating, lovingly rebelling, and mindfully exploring.

With a background in marine biology and as a previous Harmful Algal Bloom (HAB) scientist for both the South Carolina Department of Natural Resources as well as the National Oceanic and Atmospheric Administration, there is a clear need for HAB monitoring within Marshall County's lakes as there is currently no local protocol in place for dealing with HAB occurrences, specifically cyanobacteria.

Through my experience working with the Marshall County Lakes and Waters Council, I have experienced an active desire from Marshall County residents and stakeholders to work towards healthier water bodies. With my experience and background along with our mission and vision, I am at a pivotal moment to conduct HAB toxin analysis for Marshall County as part of our integral ecology outreach initiatives.

In pursuit of a more integral, ecological approach in Marshall County in regards to future algal blooms, human health, as well as environmental health, MoonTree Studios is committing \$5,000 to be used towards equipment needs, in-kind contribution of staff hours for toxin analysis, and laboratory space to help implement such a program.

Thank you for your consideration.

Elizabeth Symon
Program & Marketing Coordinator, MoonTree Studios

Witnessed by:

Matthew Celmer
Director, MoonTree Studios