



**Clean Water Indiana  
2021 Non-SWCD Led  
Competitive Grant Application**

**Contact Information**

Lead Entity	Lake Maxinkuckee Environmental Council
Address	116 N Main St
City, State, ZIP	Culver, IN 46511
Lead Entity Contact Name	Deborah Palmer
Email Address	Lmec@lakemax.org
Phone	574-842-3686
Amount Requested	\$10,000
Authorized Signatory Name	Deborah Palmer
Authorized Signatory Email	Lmec@lakemax.org

**Local SWCD Contact**

Cooperating SWCD	Marshall
Point of Contact	Jodie Overmyer
SWCD Phone	574-936-2024 x3
SWCD Email	Jodie.overmyer@in.nacdnet.net

**Project Information**

<i>Project Title</i>
A Scientific Approach to Assess Lake Maxinkuckee Restoration Strategies

<i>Project Description</i>
<p>Lake Maxinkuckee Environmental Fund (LMEF) will contract with Ecosystems Connections to conduct a year-long scientific assessment of sediment and nutrient loads relative to strategic watershed restoration. The purpose of the study is to generate scientifically robust data that quantifies nutrient and sediment loads entering Lake Maxinkuckee via the Kline Wetland and Conservation Area over the course of an entire year, in order to identify areas of high conservation priority for remediation and restoration in the watershed. A gage station will be installed at the newly restored Kline Levee to collect daily samples every four hours April - June. July-March samples will be collected from first significant rainfall of each month, otherwise weekly grab samples will be collected and analyzed. This will give LMEF more accurate data as to</p>

nutrient and sediment loading into the lake.

This project includes a strong education component. In addition to collecting water samples and generating data, Ecosystems Connections will establish a standard operational procedure, in partnership with Culver Academies and Culver Public Schools, to monitor three tributaries and lake outflow to determine the efficacy of conservation efforts in the three wetlands that play a role in the water quality of Lake Maxinkuckee, the Wilson, the Curtiss and the Kline wetlands (Watershed Map attachment). This provides real world, project based learning curriculum for local schools that can be replicated and shared across school districts.

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

The EPA lists sediment as the most common pollutant in our waterways, natural erosion accounts for 30% of the total sediment, accelerated erosion from human use of land accounts for the remaining 70%. Depending on where the sediment originates from determines what other pollutants may be included in the runoff. The source can be from bare soil from construction sites or farm fields, poorly maintained dirt and gravel roads, or degrading stream banks. Any soil that is not protected from rainfall or runoff may be vulnerable to erosion and become a source of sediment pollution. We suspect sediment and nutrients are an issue but first we must determine if that is true. That is what this study will tell us.

Historically LMEF has outsourced water monitoring via grab sampling. While this method serves a purpose, it only provides a snapshot of the water at a specific point in time. It is not a true representation of the actual nutrient loading taking place. (Sample Bottles Visual attachment) Ecosystems Connections will install a gage station that collects samples automatically at pre-programmed intervals. This is especially important in the time frame April - June, when soils are the most vulnerable to erosion. Lake Maxinkuckee has numerous farm fields to the south east as well as a golf course, where run-off flows first through the constructed Kline Wetland, then into the lake. Data collected from these water samples will tell us how much nutrient loading is taking place from these areas and whether the wetland is functioning as intended. Without data, we only have theories and conjecture, which doesn't lend it self to supporting change.

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

Culver Community Public Schools - in kind contribution in the form of curriculum development - 15 hours @ \$20/hr = \$300 - (Theresa Hammond A/P Biology Teacher)  
Culver Academies - in kind contribution in the form of curriculum development - 15 hours @ \$20/hr = \$300 - (Dr. Rebecca Sam A/P Environmental Science Teacher)  
Marshall County SWCD - in kind contribution in the form of education and marketing - 10 hours @ \$20/hr = \$200  
Arrow Head Country RC&D - Cash contribution \$2,500

*Describe how the funds will be utilized.*

CWI funds would be utilized to pay a portion of the invoices from Ecosystems Connections for water analysis in the lab. With the significant number of samples that

will be collected and analyzed, testing fees account for the majority of expenses associated with this study. Lake Maxinkuckee Environmental Fund (LMEF) has the cash reserves to pay for the bulk of the project but due to construction overruns of the Kline Levee Restoration Project, we need to conserve in any way we can. But as John F. Kennedy said in 1962, "The time to repair the roof is when the sun is shining." We must be ever vigilant in our continued protection of Lake Maxinkuckee, its wetlands and watershed and can't afford to put off continued study and research for watershed planning until we have all the funds necessary.

*If requesting disbursement of up to 50% of funds at the beginning of the grant, please provide a justification.*

N/A

*What are the primary goals for the project?*

Destination Imagination lists 10 benefits of PBL: Collaboration, Problem Solving, Creativity, In-Depth Understanding, Self-Confidence, Critical Thinking, Perseverance, Project Management, Curiosity, Empowerment. By involving local high school students in our project, from beginning to end, they will be involved with a real world project and experience science in action. They will work alongside environmental scientists and contribute data for the final report.

Develop curriculum for our local high schools that can be replicated and shared. Protocols and curriculum will be developed for the local high schools to follow for future classes to continue with water sampling, thus establishing a long-term project. This curriculum can then be shared for other schools to incorporate water sampling projects at their own sites, hopefully increasing the number of waterbodies being monitored.

Gather detailed data to be used for watershed restoration justification. If the data reveals elevated levels of sediment/pollution from this area of the watershed, we can then work towards addressing those problem areas. As explained in Thompson, A., & Prokopy, L. S. (2016). The Role of Sense of Place in Collaborative Planning, one key component of collaborative planning is the willingness of stakeholders to take action to address an issue. We must first be able to show stakeholders what the issue is in order to get buy-in to fix it.

Educate lakefront property owners, agriculture producers and the community about nutrient loading into the lake.

There is often a disconnect between actions on the land and the impact they have on the water. The data gathered in this study will be used in outreach presentations and marketing materials to educate stakeholders on this issue.

Educate lakefront property owners, agriculture producers and the community about the role wetlands play in water quality and the value of maintaining those wetlands. Everyone wants a beautiful lake for recreation but there is often a disconnect among those who use the lake about the value of the surrounding wetlands. The results of

this study will hopefully demonstrate the role the wetlands are playing in the water quality of the lake.

Gather detailed data to be used to narrow the focus of watershed restoration. The data will show what pollutants, if any, are at elevated levels and allow us to focus our conservation efforts on specific pollutants. For example, if sediment is shown to be a problem, we will know to look for erosion issues and traditional farming in the watershed. We can then work with NRCS/SWCD to promote cover crops and no-till as one way to mitigate the problem.

Quantify hydraulic retention time of the lake and fate of nutrients and sediment.

#### **Budget Information**

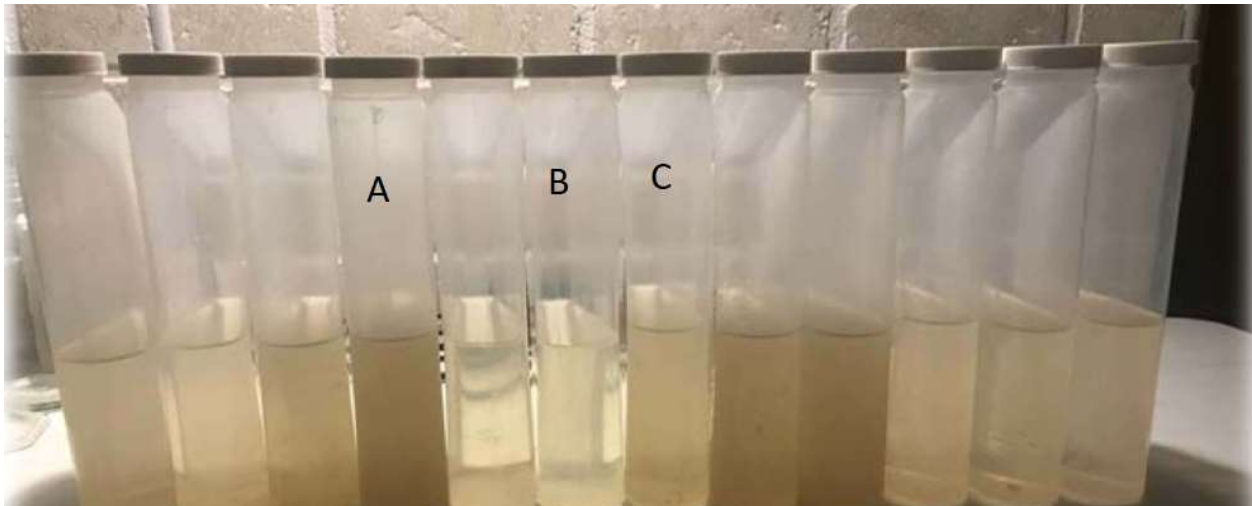
<i>Item Description</i>	<i>CWI Funds Requested</i>	<i>Cash Match</i>	<i>In Kind Match</i>
Water Sample Collection and Analysis	\$10,000.00	\$30,000.00	\$800.00
<b>Totals</b>	<b>\$10,000.00</b>	<b>\$30,000.00</b>	<b>\$800.00</b>

# Lake Maxinkuckee Environmental Fund

A Scientific Approach to Assess Lake Maxinkuckee Restoration Strategies

## Water Samples Collected Over 48 Hours

*Once every 4-hours with automatic sampler*



The automatic sampler gives a more complete picture of what is actually happening in the lake.

Sample "A" would indicate a sediment issue

Sample "B", collected 8 hours later, is very clear and would indicate no issue

Sample "C", collected 4 hours after "B", is fairly clear and, again, would probably indicate no issue

Each sample tells a story, but not the whole story.

### **Conclusion:**

If conservation efforts are based only on samples collected at Sample "B", they would be very different than efforts based on Sample "A".

**Proposed Budget:**

- Includes all equipment, consumables, travel, analysis, student intern compensation and liability for field equipment.

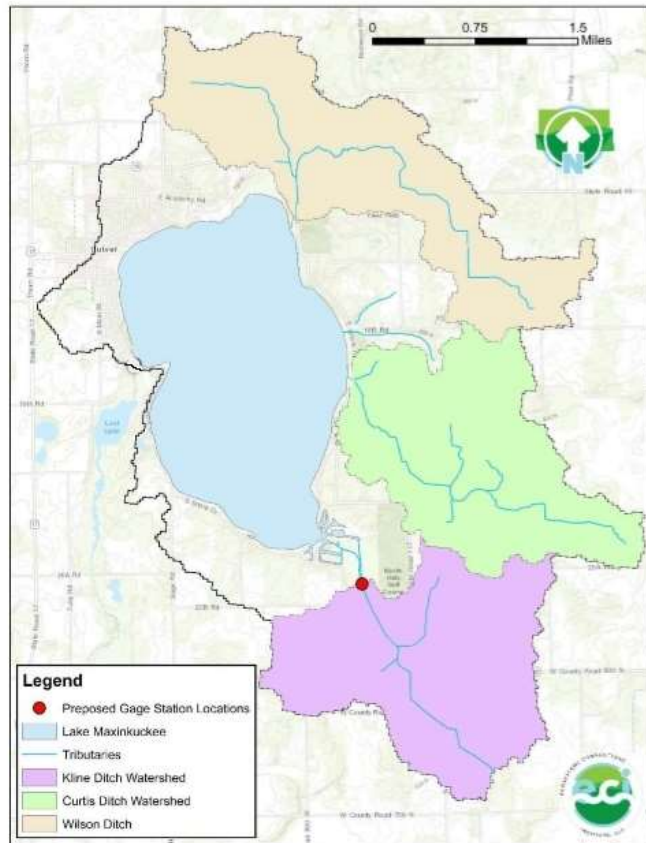
<b>Site</b>	<b>Cost/year</b>	<b>Water Samples/ year</b>	<b>Biotic samples/ year</b>
Kline Ditch	\$40,000	594	1

Proposal prepared by,

Jerry Sweeten, Ph.D., Senior Research Scientist  
Ecosystems Connections Institute, LLC  
9130 North 600 East  
Denver, Indiana 46926

Phone: 260-901-0561

Email: [jesweeten@ecosystemsconnections.com](mailto:jesweeten@ecosystemsconnections.com)



Map of Lake Maxinkuckee and proposed site for water quality gage station, indicated by red dot.