

## Project Summary

**Applicant organization:** Office of the Muskegon County Drain (AKA Water Resources) Commissioner

**Applicant Mailing Address:** 141 E. Apple Ave, Muskegon, MI 49442

**Applicant Contact:** Dallas Goldberg, Deputy, Muskegon County Drain Commission (232) 724-6319, GoldbergDa@co.muskegon.mi.us

**Project Title:** Reconnecting the Mona Lake Celery Flats Phase I: Engineering & Feasibility

**Site Location:** T9N R16W Section 9, approximate GPS Location -86.215, 43.186. Norton Shores, Michigan. (See attached Project Location Map). Mona Lake Watershed HUC 04060101

**Brief Project Description:** The applicant seeks funding for developing a feasibility study, construction designs, and permitting for the hydrologic reconnection of two shallow water lakes (wetlands), locally known as the Mona Lake Celery Flats to Black Creek, which flows into Mona Lake, a drowned river mouth that connects directly to Lake Michigan. **Our goal is to fully assess the most financially and ecologically sound alternative for restoration.**

**Relevance to Program Priorities:** The proposed project is being submitted under Focus Area 4 of the Great Lakes Restoration Initiative Action Plan III. The proposed project will advance efforts to protect, restore, and increase resiliency of aquatic species, such as the Great Lakes Spotted Muskellunge and other species of concern, that are significant to the Great Lakes ecosystem (Objective 4.1 and 4.2). The proposed project would advance efforts for several long term GLRI goals for the Great Lakes Ecosystem. Coastal wetland reconnection in the Southern Basin of Lake Michigan, a priority of the Lake Michigan Committee, would also be addressed.

**Habitat Issue(s) Addressed:** The proposed project addresses the loss of coastal/drowned river mouth wetlands critical to fish and wildlife through habitat fragmentation and agricultural conversion.

**Sustainability of Restoration Approach:** The proposed project design would increase resiliency to future climate change, Great Lakes water levels, improve available habitat, and increase the water quality creating a more sustainable ecosystem and fishery.

**Timeline:** The proposed investigation, design, and permitting activities are anticipated to span a two-year period. The first year would be used for surveying, sampling, and detailing pre-construction conditions while the second year would be utilized for developing construction designs and applying for relevant permits. Project activities will begin upon successful award.

**Permits and Approvals:** Future implementation projects stemming from this proposal will be required to meet state and federal permitting requirements. Specifically, future implementation will require an EGLE/USACE joint permit meeting the requirements of Part 301 (Inland Lakes and Streams), Part 303 (Wetlands), and Part 31 (Floodplains) of Michigan's Natural Resources and Environmental Protection Act 1994 PA 451, as amended. Future implementation projects will likely be defined as a Major Project and require concurrent federal review as defined in the

state and federal Clean Water Act Section 404 Program Memorandum of Agreement. Projects of this scale require a public notice period with opportunity to comment or request a public hearing to address details of the project. In addition, the project will require a Muskegon County Soil Erosion and Sedimentation Control Permit (SESC) as required by Part 91 of the Natural Resources and Environmental Protection Act (NREPA). The proposed project is seeking funding under feasibility and design. At this point a consulting engineer has not been selected and permits have not been drafted. Because the applicant, the Office of the Muskegon County Drain Commissioner, is an APA (Authorized Public Agency) and all employees are certified Construction Storm Water Operators, the office will issue and enforce its own SESC permit.

**Landowner(s):**

- |  |  |  |
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| 1. Muskegon Drain Comm.<br>141 E. Apple Ave<br>Muskegon, MI 49442            | 8. David Workman<br>1245 E. Norton Ave<br>Muskegon, MI 49444                     | 15. Frederick Hewitt<br>3867 Fink St.<br>Norton Shores, MI 49444                 |
| 2. Edward/Pamela Babbitt Trust<br>3712 Airline RD<br>Norton Shores, MI 49444 | 9. Yes Companies Fred LLC<br>5050 S. Sycamore STE 1200<br>Denver, CO 80237       | 16. Mary Nummerdor/Debra Cordo Trust<br>1520 E. Airport Rd.<br>Muskegon MI 49444 |
| 3. Dave/William/Marcia Workman<br>1245 E. Norton Ave<br>Muskegon, MI 49444   | 10. Alstrom Properties LLC<br>1575 E. Harbour Towne Circle<br>Muskegon, MI 49441 | 17. Daniel/Karen Buckley<br>3737 Taylor St.<br>Norton Shores, MI 49444           |
| 4. Franklin Contractors INC<br>3500 Getty St<br>Norton Shores, MI 49444      | 11. John Start<br>1459 Hendrick<br>Muskegon, MI 49441                            | 18. Carol Briggs Erickson<br>3850 Buck St.<br>Muskegon, MI 49444                 |
| 5. Steve R. Franklin<br>3500 S. Getty<br>Norton Shores, MI 49444             | 12. DBD Enterprises<br>1965 Sanford St.<br>Muskegon, MI 49441                    | 19. William/Laura Krisatis<br>3848 Fink St.<br>Muskegon, MI 49444                |
| 6. Martha Roest<br>1185 E. Norton Ave<br>Muskegon, MI 49444                  | 13. Kevin Bailey<br>1288 Bakker Rd<br>Muskegon, MI 49444                         | 20. Pat Filius<br>3705 Taylor St.<br>Muskegon, MI 49444                          |
| 7. Kenneth/Suzanne Kampenga<br>17275 Colfax St.<br>West Olive, MI 49460      | 14. Brian Nummerdor ET UX<br>3845 Buck St<br>Muskegon, MI 49444                  |  |

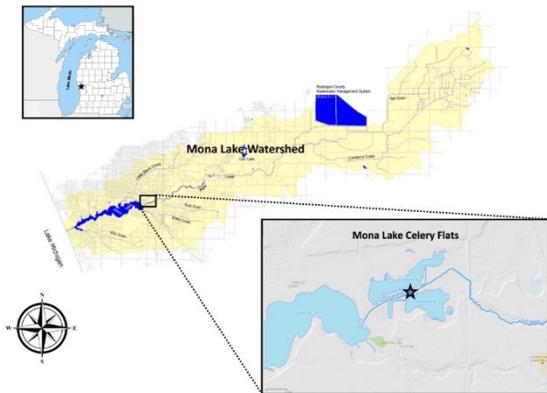
Above is a comprehensive list of property owners who collectively own the Mona Lake Celery Flats (see attached map). Future implementation projects will require cooperation and/or consent from these individuals to proceed. At this point many of the larger landowners have been contacted and support the proposal in its entirety and are enthusiastic about its potential. The Muskegon County Drain Commissioner has authorization to complete work associated with this proposal.

**Funding Request:** The Office of the Muskegon County Drain Commissioner is formally requesting \$474,174.00 in NOAA Funds. The office of the Muskegon County Drain Commissioner anticipates \$71,236.40 in matching funds which will be allocated evenly over the two-year grant cycle. The total cost of the proposed project is expected to be \$545,410.40.

## Project Narrative

### Relevant Background

The Mona Lake Watershed is located in the central-western portion of the Lower peninsula of Michigan that drains to Lake Michigan (see Figure 1.). The total area of the watershed is 45,570 acres, which is almost entirely embodied within Muskegon County. The major hydrographic features within the watershed are Little Black Creek and Black Creek, which empty into the drowned river mouth known as Mona Lake. The local land use is predominantly a mixture of agriculture seated in the headwaters followed by increased industrial and residential development as you reach the mouth of Black Creek. The watershed's historic and current uses have dramatically impaired the local fishery and associated habitat. According to the antidegradation policies set to protect waterbodies through the Clean Water Act, the state of Michigan's Part 4 rules highlights several designated uses within the watershed that are directly associated with impairment of the local fishery. Specifically, the watershed is recognized for having impairments to the (1) Coldwater fishery and (2) other indigenous aquatic life and wildlife. In addition, non-point source pollutants also contribute to 303d designated use impairments further degrading the fishery including sediment, nutrients, pathogens, storm water, and heavy metals (Steinman et al. 2006; Cooper et al. 2009; Johnson et al. 2011).



**Figure 1.** Project Location Map  
Reconnecting the Mona Lake Celery Flats Phase  
T9N R16W Section 9  
Norton Shores, Michigan.

The proposed project location involves two shallow lakes lying north and south of Black Creek immediately upstream of Mona Lake. In 1938 the Office of the Muskegon County Drain Commissioner was petitioned to install a dyke to separate these two shallow lakes from the main channel of Black Creek. In 1939 construction on the newly created O.H. Scott and Waters Drain was completed and these two shallow lake beds were more suitable than ever for agricultural production. For decades following construction, the area was used primarily for celery and vegetable production. In 2004 the Mona Lake Watershed Management plan was completed and scientific research associated with its assemblage was shining light on the phosphorus and sediment the “celery flats” were contributing to Mona Lake (Steinman and Ogdahl 2011). By 2013, the City of Norton Shores once again approached the Muskegon County Drain

Commissioner to install water control structures to prevent phosphorus introduction to Mona Lake, which at the time was estimated to be as high as 60 percent of the external load (Steinman and Ogdahl 2011). Today the presence of those installed water control structures provides isolation from the main channel of Black Creek. To restore the habitat of this area, it is necessary to restore the flow-through marsh that predated agricultural production, but in so doing, also protect the water quality of Mona Lake and Lake Michigan.

Today the Mona Lake Celery Flats, as they would become known locally, support very little activity. Agricultural production has ceased, the water quality is too poor to support recreation, and the fishery supports primarily common carp responsible for nutrient suspension in the water column. Interest in the restoration and reconnection of the Mona Lake Celery Flats has been gaining traction locally and several entities have entered into partnership with Muskegon County Water Resources to facilitate the restoration initiative. Reconnecting the shallow lake systems to the historic creek channel could have significant benefits pertaining to fish and wildlife habitat. Specifically, the reconnection would expand the lotic/lentic interface allowing for diverse habitat features including: high quality spawning areas for native fish, an expanded nursery for native larval fish, establishment of native flora indicative of a lacustrine estuary wetland complex, as well as increased forage and habitat for waterfowl, piscivorous birds and mammals. The pre-connection remediation of the area would also have significant impact on water quality of the downstream lacustrine ecosystem, as it would serve as a filter for nutrients and sediments (Heath 1992, Sierszen et al. 2012), further improving the fishery within Mona Lake.

### **Relevance to Program Priorities**

The Great Lakes Restoration Initiative, Action Plan III (Fiscal Year 2020-Fiscal Year 2024) describes long term goals for the Great Lakes Ecosystem in addition to the honed objectives set forth within the five restoration focus areas. The proposed project would make significant contributions to several of these long-term goals including: fish safe to eat, water safe for recreation, harmful/nuisance algal blooms eliminated, and habitat protected and restored to sustain healthy ecosystem function and native species. The proposed project would advance efforts to reconnect and restore two shallow lakes to the historic river channel (see attached 1938 aerial photo). Once designed and permitted, the proposed grantee will remediate nutrient-laden bottomlands and reconnect the wetland complexes to expand and enhance aquatic habitat. These efforts will increase water quality by removing excessive nutrients (primarily phosphorus) making the waters more useful for recreation and decreasing the presence of harmful/nuisance algal blooms while increasing ecosystem health and functionality crucial to the fishery.

In addition to the long-term goals for the Great Lakes ecosystem, the Action Plan III also includes specific focus area objectives that are relevant to the proposed project. The proposed project by nature revolves around aquatic habitat restoration for Great Lakes native species thereby increasing ecosystem structural and functional resiliency which aligns with objectives 4.1 and 4.2 as they pertain to Focus Area 4. The commitment of objective 4.1 is to identify habitat that supports Great lakes species and to take action to restore, enhance, and provide connectivity of these habitats, which is the sole purpose of this proposal. The proposed project also fulfills the commitment, outlined in objective 4.2, to support enhancements and re-

introduction of Great Lakes native species of importance. The proposed project location is thought to be critical in advancing the Great Lakes Spotted Muskellunge Initiative by expanding spawning and nursery habitat. Mona Lake is one of the stocking locations used annually by Michigan's Department of Natural Resources Fisheries Division for releasing Great Lakes Spotted Muskellunge. The project would also have significant impacts on other species of common concern across the Lake Michigan Basin including yellow perch, northern pike, sunfishes, and bass by addressing a priority of the Lake Michigan Committee to reconnect coastal wetlands in the Southern Basin of Lake Michigan. The proposed project would allow for the introduction, growth, and expansion of submerged aquatic vegetation, wetland reconnection, and in-stream habitat which are outlined within this program's request for proposals (RFP) as a subset of the Lake Michigan Committee's environmental priorities.

### **Habitat Issues Addressed:**

The Michigan Natural Features' MI Vegetation circa 1800 Viewer indicates the proposed project location was historically a Black Ash Swamp and Shrub Swamp/Emergent Marsh complex. The area would have been greatly influenced by Great Lakes water levels and would have contained large areas of peat and muck with several braided river channels dominated by emergent vegetation and shrub wetlands. The pre-settlement habitat would have supported a diverse set of native flora and fauna.

Historically, the proposed location's habitat was degraded through local resource extraction, agricultural conversion, and eventually fragmentation. In the early to mid-1800's Muskegon, Michigan experienced a logging boom and many drowned river mouth lakes and associated waterbodies were modified to transport timber. In the early 1900's the project location was converted to farmland because of its rich soil. In 1938 local farmers petitioned the Office of the Muskegon County Drain Commissioner to "improve" the drainage by installing six-foot-high dykes along Black Creek to further develop the area for farming and segregate tillable bottomland from the main channel. The project location was intensely farmed for decades for vegetable production, most commonly celery. Over the course of the last 200 years the project location has been isolated hydraulically, stripped of its native flora, and degraded severely. The area has lost its ability to support many of the native plant, avian, fish, and mammal communities.

Today, the proposed project location is no longer suitable or financially sustainable to farm and due to its degraded state is unsuitable for development, recreation, and is dramatically impaired in terms of its ecological functionality. The Mona Lake celery flats have elevated phosphorus content in bottomland sediment which led local government to "seal" off the flats in 2013 when mounting concerns were validated that the flats were exacerbating Mona Lakes algal problem. The area was to remain "sealed" until the area could be remediated and reconnected at a later date. The proposed project location has the potential to offer high quality habitat for native fish including this program's species of common concern including: yellow perch, esocids, and centrarchids. The location also has the potential to exhibit diverse habitat features for a variety of fish including those that are migratory and predatory, as well as piscivorous and migratory birds, and wetland dependent mammals.

Outside of the obvious habitat and reconnection benefits, the project would have additional ecosystem benefits as well. The Mona Lake Celery Flats were estimated to be contributing as much as 60% of the external phosphorus load to Mona lake (Steinman and Ogdahl 2011), which exhibits extreme algal blooms (Gillett et al. 2015). Remediating the celery flats would not only improve the fishery but have lasting benefits on local water quality. Contextually, the area is comprised of 150+ acres of suitable lands for restoration based on desktop assessment.

### **Community Benefits:**

Upon reaching the implementation phase, the proposed project will boast a myriad of community benefits including: increased/enhanced fishery, increased recreational and fishing tourism, enhanced water quality, increased public access for outdoor recreation, increased floodplain/wetland retention capability, and a suite of ancillary ecological benefits. The impending restoration will enhance water quality of Mona Lake substantially by reducing nutrient and sediment loads, and as a result, an anticipated reduction in harmful algal blooms while providing for the establishment of beneficial macrophyte communities. The project site itself will provide recreational opportunities for fishing, kayaking, and other aquatic activities within an underserved socio-economic community (36.1% poverty rate in 2019; <https://datausa.io/profile/geo/muskegon-heights-mi/>). Recreational and sustenance fishing is expected to be positively impacted as a result of project implementation as well. Implementing the proposed project will provide a nature-based solution not only to local nutrient problems, but it will also expand the system's ability to store and retain/detain water that continues to be problematic with an everchanging climate and an increase in area development.

### **Technical/Scientific Merit (Feasibility and Design Project):**

The need for remediation and reconnection of the Mona Lake Celery Flats is well known locally and regionally. The Muskegon area has a long history of environmental abuse; a number of large-scale restoration initiatives and clean ups have taken place on several aquatic ecosystems, most notably the White Lake and Muskegon Lake Areas of Concern (AOCs). White Lake has been delisted as an AOC and Muskegon Lake is nearing its delisting. Now, local environmental groups are starting to analyze the needs of Mona Lake more thoroughly. The Mona Lake Celery Flat "issue" has been recognized for decades; however, the project scope, scale, and complexity require a substantial financial commitment and a dedicated group of resource professionals. The Office of the Muskegon County Drain Commissioner has assembled a technical advisory committee comprised of: Annis Water Resources Institute (AWRI) of Grand Valley State University, USFWS, MDNR Fisheries Division, Muskegon Conservation District, and the Mona Lake Watershed Council, just to mention a few of the active project partners. Funding for designs, baseline condition surveys, permit applications, and feasibility is the missing piece of the puzzle to catalyze the restoration initiative.

Several techniques have been proposed to mitigate the nutrient impact and allow for reconnection of the shallow lakes to the river channel. To date, capping, dredging, and dewatering and excavating nutrient rich sediment have all been posed as viable options. **Our goal is to fully assess the most financially and ecologically sound alternative for restoration.**

This includes soil sampling to determine the volume of material that needs to be addressed. In addition to addressing the nutrient-laden sediment, baseline ecological studies and monitoring need to be conducted, as well as physical surveying and designing.

### Timeline and Milestones

Because this application is being submitted under the feasibility and planning category there are two major milestones: 1) completion of data collection/baseline documentation; and 2) completion of final design/permit submission. Outlined below is a tentative timeline for the proposed project. In essence the first year will be used for baseline documentation and data collection and the second year will be utilized for design and permitting. Implementation of the proposed project will require two permit applications, a Muskegon county SESC permit and a USACE/EGLE joint permit. At this time neither permit has been submitted and or approved.

	2022	2023				2024				
Tasks	Q4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Final Product
Quality Assurance Project Plan										1 QAPP
Topographic/Bathymetric/L and Surveys										3 Data Sets
Soil/Sediment Sampling										Lab Results/Data Sets
Water Quality Sampling										Lab Results/Data Sets
Marsh Monitoring Bird and Amphibian Surveys										1 Monitoring Report
Threatened and Endangered Species Surveys										1 Report
Wetland Delineation										Digital Data Set
Vegetation Surveys										1 Report
Phase 1 and 2 Environmental Assessments										2 Reports
Hydrologic/hydraulic modeling										electronic Data Sets
Compile Conceptual Design and Alternatives										1 Conceptual 30% Design
Develop final Project Design										1 Final Design and Specs
Apply for SESC Permit										Permit Application
Apply for EGLE Joint Permit Application										Permit Application

### Project Assessment

The proposed project is requesting funding for feasibility and planning and as such is proposing to conduct pre-restoration monitoring that complements and exceeds expectations from the NOAA RC Implementation Monitoring (Tier 1) Guidance. The proposed surveying, monitoring,

and ecological assessments are crucial for future implementation efforts, permitting requirements, and baseline documentation. Implementation of the proposed project would require Tier 1 Monitoring Under 3.3 Hydrologic reconnection because the future project would be removing fill, removing portions of an existing dyke, and would be reconnecting floodplain and off-channel habitat. The metrics that are used under this type of project include: land elevations, water levels, annual operating and maintenance cost, public safety, and community enhancement. To monitor land elevations, we propose to conduct bathymetric and land surveys, which will ultimately be compiled into a construction design. Post- implementation these construction designs can be compared to the as-builts to ensure target elevations have been met. To monitor water levels, we are proposing to conduct hydrologic/hydraulic modeling to incorporate appropriate water levels into our conceptual and final designs. Comparing pre- and post-restoration hydrographs can show change indicative of assessing progress toward project objectives. In addition, water levels will be documented thoroughly through land-based photography. Operating and maintenance cost, community enhancement, and public safety will not be monitored in any capacity until a restoration direction and method have been selected.

In addition to the aforementioned surveys, designs, and assessments additional work will help to gauge the effectiveness of the proposed project and assist in acquiring the necessary permits and approvals. Our proposal includes fish surveys to assess the current fish community. We are also planning to conduct Phase 1 and Phase 2 environmental assessments, vegetation surveys, wetland delineations, soil/sediment sampling, and water quality sampling.

### **Sustainability**

The Office of the Muskegon County Drain Commissioner understands how important long-term project sustainability, maintenance, and protection can be on large scale initiatives. Although the proposed funding request is for feasibility, design, and permitting, post construction sustainability is also at the forefront of our minds. During the planning and design phase, consideration will be given to anticipated changes in ecosystem structural and functional resiliency, water levels, and flora and fauna as it relates to potential climate change impacts. In addition, post construction sustainability has been evaluated in terms of: the sustainability of the fishery, water quality, and future maintenance funding mechanisms. Successfully reconnecting the Mona Lake Celery Flats to Black Creek will provide critical habitat and spawning grounds for several Great Lakes native fish species of common concern including yellow perch, esocids and centrarchids. Mona lake has been used as a stocking location for the Michigan Department of Natural Resources (MDNR) for the Great Lake Spotted Muskellunge since the program started in 2012. With increased quality spawning habitat and an abundance of large woody debris, the reconnected shallow water areas may improve stocking success of the spotted muskellunge and mitigate the need for expanded stocking efforts in the future. To successfully reconnect the shallow water areas of the Mona Lake Celery Flats to Black Creek, phosphorus laden soils would have to be removed to prevent the introduction of excessive nutrients into Mona Lake. AWRI concluded that the Mona Lake Celery Flats were contributing a “significant source of phosphorus to the creek” (Steinman and Ogdahl 2011) and eventually Mona Lake. Reduction of external phosphorus loading to the Mona Lake system could help reduce

cyanobacteria growth and blooms, thereby allowing for additional native macrophytes, better water quality, and ultimately a healthier lake and fishery. Lastly, the recent redefinition of the O.H. Scott and Waters Drainage district would allow for maintenance to fall under the jurisdiction of the Drain Commissioner and be funded by drainage assessments placed on the district as a whole.

### **Qualifications of Applicant**

The office of the Muskegon County Drain (Water Resources) Commissioner is staffed by two individuals with a suite of ancillary county staffing departments (e.g. accounting, budget, public works, GIS etc.). Namely, they are elected commissioner Brenda M. Moore and appointed Deputy Dallas B. Goldberg.

Ms. Moore has been seated as the Drain Commissioner since 2013. In that time Ms. Moore has overseen and implemented dozens of large-scale drain construction projects which are commonly executed simultaneously. Moore is familiar with managing multi-million-dollar construction projects as demonstrated by the Ribe (\$3.0 million), Kuis (\$2.2 million), and Pierson Swamp (\$3.2 million) Drainage improvement projects in Muskegon County, as well as geographically large projects as demonstrated by the Black Creek Consolidated Drain (over 49 miles long-upstream from Mona Lake Celery Flats). Recently, Ms. Moore and the Muskegon County Drain Commissioner's office have been acknowledged for innovation and excellence by the Michigan Association of Drain Commissioners. The office takes great pride in implementing in-stream Best Management Practices (BMP's) and is sensitive to enhancing and creating habitat and improving water quality, traditionally unheard of within drain offices. Before her appointment to the Drain office, Ms. Moore was employed as the Director of the Mona Lake Watershed Council where she helped implement the Mona Lake Watershed Management Plan.

Mr. Goldberg has worked in the Muskegon County Drain Office for just under a year. Before his appointment to the Drain Office, Mr. Goldberg was the Executive Director of the Muskegon Conservation District. During his tenure at the Conservation District Mr. Goldberg managed, implemented, and conceptualized many local and regionally significant projects impacting natural resources. Many of the projects Mr. Goldberg worked on were federally funded grant initiatives which provided for enhanced wildlife or fisheries habitat. Notably one of the largest projects was the Area of Concern (AOC) delisting of White Lake which concluded in 2014. Mr. Goldberg has had the opportunity to work with a diverse set of partners through his career including local, state, and federal governmental organizations (BLM, FS, EGLE, USACE, USFWS, MDNR...), interest groups (Trout Unlimited, Ducks Unlimited, Wild Turkey Federation, Ruffed Grouse Society...), and the public. Through interactions with these organizations and individuals Mr. Goldberg has recognized the value and importance of partnerships. Throughout Mr. Goldberg's career his involvement in natural resource projects has provided him with ample experience in habitat restoration, construction, ongoing monitoring initiatives, and local, state, and federal environmental compliance.

As a team, the office of the Muskegon County Drain Commissioner has the relevant experience to assemble a technical advisory committee, to design, and to carry out a federal grant to improve the Mona Lake Celery Flats and enhance the local fishery.

### **Outreach and Education**

In anticipation of submitting the proposed project to NOAA, the office of the Muskegon County Drain Commissioner has been developing a technical support advisory committee and an education and outreach network to encourage collaboration, long term stewardship, inclusion, and assurance that the holistic needs of our diverse community are met. To date our invested technical support committee includes: nationally recognized Grand Valley State University's Robert B. Annis Water Resources Institute and its director, Dr. Alan Steinman; United States Fish and Wildlife Service biologist Gib King; Michigan Department of Natural Resources Fisheries Division and Lake Michigan Basin Coordinator Jay Wesley; The Mona Lake Watershed Council; The Muskegon Conservation District, the Cities of Norton Shores and Muskegon Heights, the Michigan Angler's Association, the Michigan Muskie Alliance, and local engineering and consulting firms (hydrogeologist/engineers).

To date the most relevant local expertise has been assembled as part of the advisory committee to assess the feasibility, create restoration and construction designs, and obtain permits required for the proposed project. As the proposed project develops we will rely on input from additional user groups and take the opportunity to evaluate the incorporation of a broader suite of holistic benefits. Our strategy includes planning and designing with an emphasis on the natural resources and local fishery, first and foremost. We will host a series of public engagement meetings to receive feedback throughout the design and scoping process. Once a solid strategy has been devised to remediate resource concerns the Office of the Muskegon County Drain Commissioner will rely on the local networking ability of the Muskegon Conservation District and the Mona Lake Watershed Council to assist with connecting and disseminating materials to relevant interest groups. These agencies are better suited and well versed in community outreach and public involvement. All outreach materials will recognize grants awarded including NOAA if accepted for funding.

### **Data Management**

The proposed project entitled: Reconnecting the Mona Lake Celery Flats Phase I: Engineering & Feasibility, implemented by the Office of the Muskegon County Drain Commissioner will generate environmental information including: property surveys, bathymetric surveys, soil/sediment sampling analysis, water sampling analysis, engineering designs, aquatic macrophyte surveys, benthic macroinvertebrate surveys, fish sampling (species, length) surveys, and document environmental conditions (water temperature, dissolved oxygen concentrations, pH, specific conductivity, turbidity, water depth) to develop preliminary designs and document pre-construction conditions.

Data collection will be supervised by the consulting engineering firm that is selected by bid as well as Annis Water Resources Institute staff. Our data collection and quality control processes will be fully described in a Quality Assurance Project Plan (QAPP) upon successful award. All

environmental data collected during the course of grant implementation will be made available within 2 years of collection and uploaded to the Muskegon County Water Resources Commissioner website: [www.co.muskegon.mi.us/492/Water-Resources-Commissioner](http://www.co.muskegon.mi.us/492/Water-Resources-Commissioner). Data upload will be overseen by Deputy Dallas Goldberg ([goldbergda@co.muskegon.mi.us](mailto:goldbergda@co.muskegon.mi.us)) and Thomas Van Bruggen, Muskegon County GIS Administrator ([VanBruggenTh@co.muskegon.mi.us](mailto:VanBruggenTh@co.muskegon.mi.us)). Mr. Van Bruggen is well versed in data sharing and archiving for public viewing. Mr. Van Bruggen manages all of Muskegon County GIS Data platforms including the Muskegon County Property Viewer, the Muskegon Area Municipal Stormwater Data, the Muskegon County Water Resources Viewer, County Election Data, and most recently Covid-19 spatial data for Muskegon County. Mr. Van Bruggen can be contacted at 231.724.4458.

### **Work Cited**

Steinman, A., Rediske, R., Denning, R., Nemeth, L. Chu, X., Uzarski, D., Diddanda, B. and Luttenton, M. 2006. An environmental assessment of an impacted, urbanized watershed: the Mona Lake Watershed, Michigan. *Archiv Fur Hydrobiologie* 166: 117-144.

Cooper, M.J., Rediske, R.R., Uzarski, D.G. and Burton, T.M. 2009. Sediment contamination and faunal communities in two subwatersheds of Mona Lake, Michigan. *Journal of Environmental Quality* 38: 1255-1265.

Johnson, K.A., Steinman, A.D., Keiper, W.D. and Ruetz III, C.R. 2011. Biotic responses to low-concentration urban road runoff. *Journal of the North American Benthological Society* 30: 710-727.

Steinman, A.D., and M.E. Ogdahl. 2011. Does converting agricultural fields to wetlands retain or release phosphorus? *Journal of the North American Benthological Society* 30: 820-830.

Heath, R.T. 1992. Nutrient Dynamics in Great Lakes coastal wetlands: future directions. *Journal of Great Lakes Research* 18: 590-602.

Siersen, M.E., Morrice, J.A., Trebitz, A.S. and Hoffman, J.C. 2012. A review of selected ecosystem services provided by coastal wetlands of the Laurentian Great Lakes. *Aquatic Ecosystem Health & Management* 15: 92-106.

Gillett, N.D., M.R. Luttenton and A. D. Steinman. 2015. Spatial and temporal dynamics of phytoplankton communities in a Great Lake's drowned river-mouth (Mona Lake, USA). *Journal of Limnology* 74: 453-466.