



# Explorer

Winter 2017

## 2017 Macatawa Watershed Stakeholder of the Year

The Macatawa Area Coordinating Council (MACC) announced the 2017 Watershed Stakeholder of the Year on December 7 at its Watershed Annual meeting. The award was given to the Day1 Watershed Research Community at Hope College led by Dr. Cathy Mader, Dr. Aaron Best, and Dr. Brent Krueger. The Watershed Stakeholder of the Year Award is given to an individual, organization or group that has made significant contributions to improving water quality in the Macatawa Watershed.

The Day1 Watershed Research Community engages students in local efforts to improve water quality in the Macatawa Watershed and the Great Lakes Basin. The Hope College Day1 program is designed to offer an inclusive and collaborative first-year experience to encourage students to pursue a career in a STEM field (science, technology, engineering or math). The program includes research, residential and coursework components. Students have a pre-college experience where they get to know the watershed and start learning water sampling and laboratory techniques. Day1 Watershed students collect and process weekly water samples collected at 5 lake and 6 stream locations throughout the Macatawa Watershed. They take physical and chemical measurements, and process additional chemical tests and microbial analyses in the laboratory. For microbial samples, they not only count the bacteria present but also DNA sequence samples to better understand the microbial community in the Watershed. The work being done by the students will be extremely valuable to the MACC and other partners that are working to restore Lake Macatawa. The data will help inform decisions about when, where and how to implement conservation where it is needed most to improve water quality.

Pictured below are Hope College faculty, staff and current and former Day1 Watershed students.



# About the MACC

**Steve Bulthuis**

Executive Director

**Elisa Hoekwater**

Transportation Manager

**Kelly Goward**

Watershed Project Manager

**Rob Vink**

Agricultural Technician

**Carolyn Ulstad**

Program Assistant

The Macatawa Area Coordinating Council (MACC) was formed in 1993. It is the Metropolitan Planning Organization for the Holland, Michigan, urbanized area and is required by federal legislation to provide coordinated transportation planning. The MACC's transportation program is funded by planning funds from the Federal Highway Administration, the Federal Transit Administration, the Michigan Department of Transportation, and local dues. Other programs of the MACC include the Macatawa Watershed Project that works to improve area water quality and the Clean Air Action Program that promotes voluntary actions on Clean Air Action! Days.

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## Calendar of Events

**February 1, 1:30-3:00pm—Watershed Advisory Committee Meeting**

All are welcome to attend these meetings to learn more about the watershed. The meeting will be held in Zeeland at the Howard Miller Library (14 S. Church Street, Zeeland, MI 49464). For more information contact Kelly at [kgoward@the-macc.org](mailto:kgoward@the-macc.org)

**January 6, 2:30-4pm @ Paw Paw Park East and January 20, 10-11:30am @ Riley Trails—Keep it Active Winter Walk**

Don't hibernate...activate! These winter walks aim to keep you outside and active during the long, cold months of winter. Join Ottawa County Parks naturalists for a one hour "sauntering" walk. Visit [www.miottawa.org/EventRegistration](http://www.miottawa.org/EventRegistration) for more information.

**January 9, 6:30-8pm—Economic Development: Sustainable Government @ Herrick District Library**

This Living Sustainably Along the Lakeshore program will explore various sources of local government funds and review the city and county budget process. What are the near-term and long-term needs within the community, and how should they be supported? The program will conclude with a question and answer opportunity. Visit [bit.ly/HHCSI\\_events](http://bit.ly/HHCSI_events) for more information.

**January 27, 9am-12pm—Family Ice Fishing @Hawthorn Pond**

Enjoy a time of angling on the ice. The event is free and geared for children accompanied by an adult. Equipment and refreshments will be provided. This event is hosted by the Friends of Ottawa County Parks. Registration is encouraged [www.miottawa.org/EventRegistration](http://www.miottawa.org/EventRegistration)



Looking for a New Year's Resolution? Resolve to reduce your mailbox clutter and paper waste! Sign up to receive this newsletter via email! Visit [www.the-macc.org](http://www.the-macc.org), scroll to the bottom of the page and enter your email address in the box to "Sign up for our Email newsletter." You will also receive periodic reminders about events and volunteer opportunities.

## Student Research Presented at Watershed Annual Meeting

Students from Hope College's Advanced Environmental Seminar, under the instruction of Dr. Brian Bodenbender, presented results of their semester-long research at the Macatawa Watershed Annual meeting on December 7 at Holland City Hall. Copies of their presentations are available on the MACC's website.

The team of Karey Frink, Max Huffman and Erin Brophy studied microplastics in Lake Macatawa sediments. They were curious if plastics were present in Lake Macatawa sediment, how abundant are they, where are they located, and any relationship to the surrounding landuse. They collected sediment from 10 locations in the lake and sorted the plastics into 3 types: fibers, films and pellets.

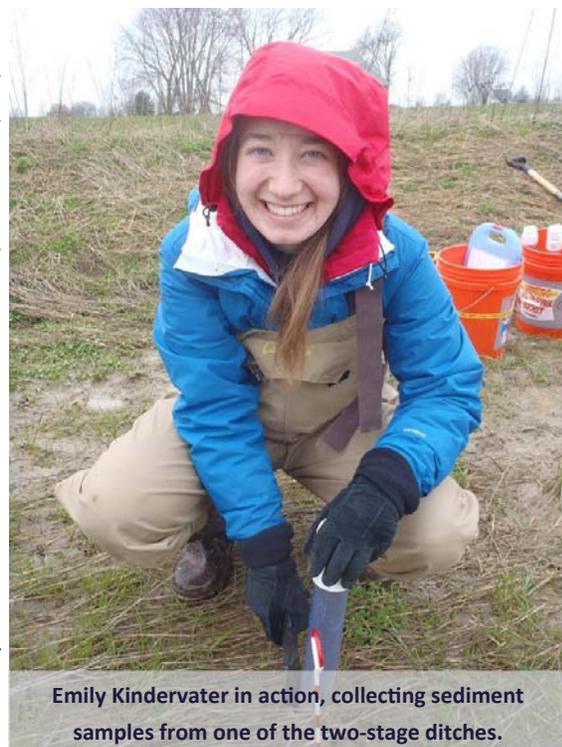
Plastics were found in every sediment sample and fibers were the most common, making up almost 85% of the total plastics found across all sites. There were peaks in plastic counts near Holland State Park and the area closest to downtown Holland. The landuses in these areas are primarily recreational and non-residential uses.

The team of Amber Bosch, Kathleen Fast and Brooke Mattson studied mushrooms as bioindicators of heavy metals in sites affected by industrial activity. They were curious if analyzing heavy metal content of mushrooms would be a cost and time-efficient way to gauge whether or not heavy metals were present in a soil. They collected and analyzed mushrooms from 2 clean sites and 3 sites that were likely to have heavy metals contamination. They looked for iron, cadmium, nickel, and lead. Concentrations were fairly uniform for all metals at all sites except one site that had a spike in iron. All concentrations were below what is considered safe for human contact. There was some concern about sources of error and detection limits of the equipment that was available to them. More investigation is needed to determine if this in an effective way to gauge heavy metal contamination of soils.

Emily Kindervater, A Grand Valley State University Graduate Student, also presented the results of her research investigating phosphorus retention in two-stage ditches in the Macatawa Watershed. Previous work has shown that two-stage ditches are effective at removing sediment and nitrogen, but not much is known about their effects on phosphorus. Emily investigated phosphorus retention by both biotic (taken up by plants) and abiotic (physically bound by sediment) processes. She looked at concentrations of total phosphorus and soluble reactive phosphorus (the type available for plants) in sediment and water samples and locations within and upstream of 2 two-stage ditches in the southern portion of the watershed. While there were physical differences in the 2 sites, both showed a preference for phosphorus retention in the soil (96-97%) as opposed to in the water or in plants. Water quality results were variable between the 2 sites. Overall, her results showed that the two-stage ditches had a limited affect on phosphorus retention as evidenced by water quality data. However, stables reaches of two-stage ditches will hold phosphorus in their sediments. Emily's presentation is available on the MACC website and once her research is published, it will be posted there also.



From left to right: Karey Frink, Erin Brophy, Max Huffman, Brooke Mattson, Amber Bosch, and Kathleen Fast



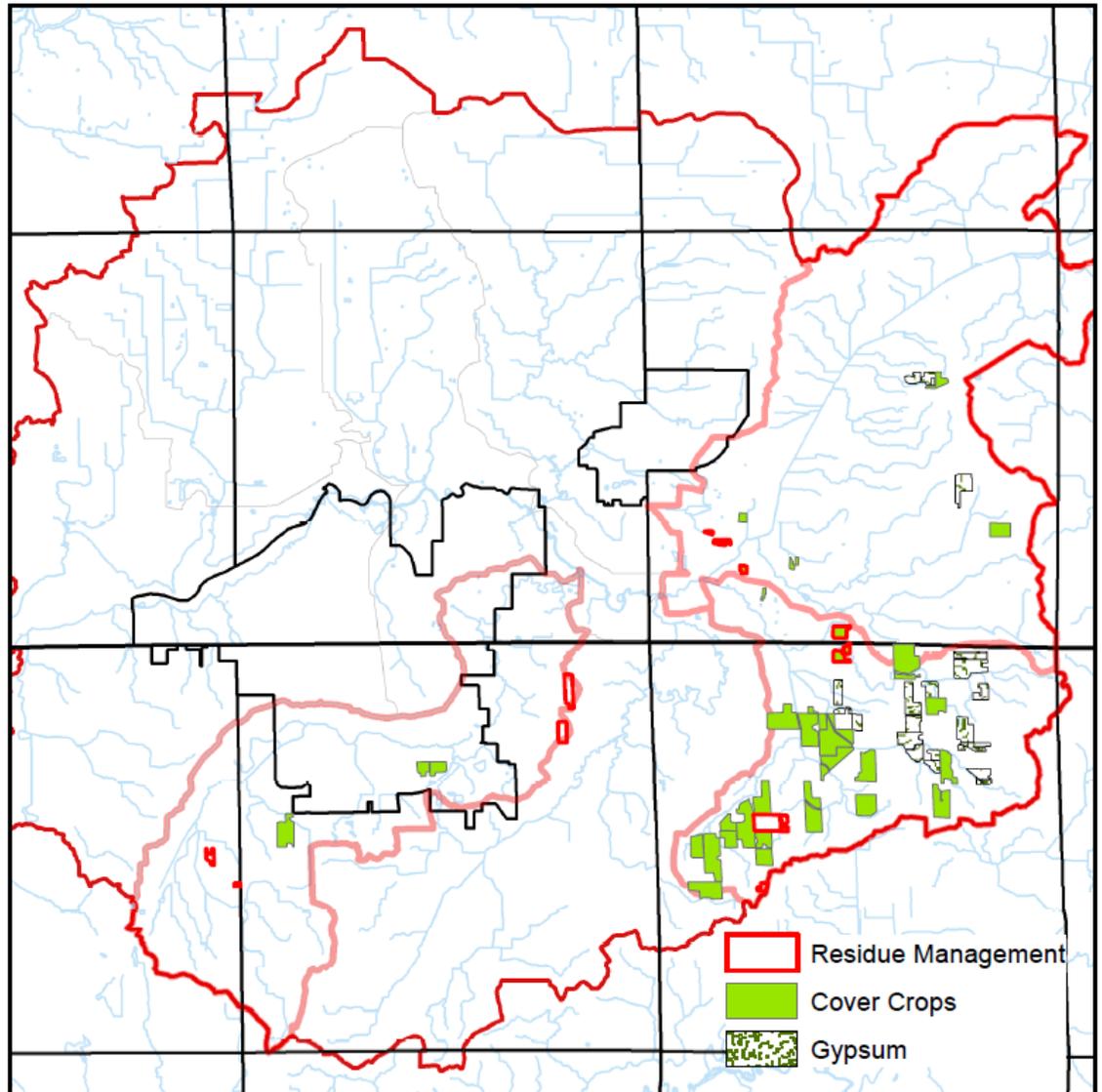
Emily Kindervater in action, collecting sediment samples from one of the two-stage ditches.

# Agricultural Best Management Practices 2017 Review

*T'was the months before Christmas, the office lights glowed; The watershed stakeholder award would soon be bestowed;  
Numbers and figures were reported with care, in anticipation that auditors soon would be there;  
Staff worked quietly, some dreaming of their beds, while visions of finished reports danced in their heads.*

September brings us the end of our fiscal year and a time for us to draft and complete reports of all the things that have been accomplished throughout the year. The numbers reported in the MACC's annual report for agricultural practices do not necessarily reflect all of the best management practices (BMPs) that farmers have implemented this cropping season. Much of what is being done to improve water quality happens during the fall months. October was a month of unseasonably warm temperatures and relatively dry weather. Farmers harvested soybeans in record time. Many got a good jump on the corn harvest but wet weather would soon slow that progress. Because soybeans were off early many growers were able to apply gypsum and plant cover crops in these fields before wet weather set in. When the harvest dust settled, farmers in the Macatawa Watershed receiving cost share from the Great Lakes Restoration Initiative (GLRI) had applied gypsum to slightly over 600 acres of cropland and planted more than 1,460 acres of cover crops. Several growers participated by managing crop residue this past spring on over 400 acres of land. In total, agricultural BMPs were implemented on over 2,400 acres this year. The map below shows the BMPs that were installed under the GLRI grant in 2017.

Looking forward to 2018 we hope to build on the momentum of this past year to increase those numbers and bring in new farmers. The MACC has been successful in securing funds for a number of years. Because of this success, many of the larger growers in our watershed are nearing the end of their allowable number of years for which they may receive funding. Success in 2018 will not be measured solely on the number of acres with BMPs implemented, but also by the number of new growers participating the GLRI grant program. Questions on agricultural best management practices can be directed to MACC Agricultural Technician, Rob Vink.



# Macatawa Watershed Project Annual Report Highlights

The 2017 Macatawa Watershed Annual Report was recently published to summarize program accomplishments over the past year. The full report is available on the MACC's website ([www.the-macc.org/watershed/overview/](http://www.the-macc.org/watershed/overview/)). Hard copies are also available in the MACC office. Here are a few of the highlights:

## Outreach and Education

The Macatawa Watershed Project participated in 15 community events, interacting with people of all ages and engaging them in hands-on learning about water quality and the Macatawa Watershed. Our largest event of the year was the Macatawa Water Festival, held on July 15 at Windmill Island. Over 3,000 people attended and were able to experience over 20 different activities and learning experiences, including bike riding, kayaking and fishing. Another way that the MACC engages the public in the watershed project is through volunteer events. 120 volunteers participated in our river cleanups, water bug monitoring, habitat assessments, and road-stream crossing inventories in 2017.



New for 2017 was a fishing game to learn about nonpoint source pollution. Kids Day at the Farmers Market, June 28

## Stormwater Management

The MACC completed work on a Stormwater Management Plan in May 2017. This plan included working with local communities to update components of their stormwater permits. In December 2016, the MACC received a grant from the Community Foundation of the Holland/Zeeland Area to support the development of a Green Stormwater Vision for the Macatawa Watershed. This included a mapping exercise, stakeholder engagement, and community conversations with residents. More information about the vision is on the next page. On August 22, the MACC hosted a seminar about green stormwater infrastructure at the Haworth Inn and Conference Center. Over 50 people attended to hear from 8 speakers and visit with 9 exhibitors to learn more about green stormwater infrastructure.



A group from the green infrastructure seminar exploring a permeable parking lot at Hope College, August 22

## Agriculture

The MACC completed work on a Great Lakes Commission grant in September 2017. In total, this grant paid for the installation of 1,608 acres of cover crop, 1,178 acres of reduced tillage and 1,348 acres of gypsum. The grant provided \$190,240 in funding and helped keep 740 tons of sediment and 4,836 pounds of phosphorus out of Lake Macatawa. The MACC also continued to implement a Great Lakes Restoration Initiative grant with the support of Project Clarity. In 2017, 200 acres of cover crops, 444 acres of reduced tillage, 169 acres of gypsum, and one water and sediment control basin were implemented. These practices kept 1,552 tons of sediment and 2,094 pounds of phosphorus out of Lake Macatawa. The MACC also continues to work with the Outdoor Discovery Center Macatawa Greenway to implement agricultural BMPs under the guidance of the Project Clarity Agricultural Committee. In 2016, the committee approved funding for 424 acres of cover crops, 2,158 acres of gypsum, 1,400 feet of two-stage ditches, and 3,750 feet of grassed waterways.



Water and sediment control basin funded by the GLRI grant soon after construction, June 1

# Macatawa Watershed Green Stormwater Vision

The MACC received a grant in December 2016 from the Community Foundation of the Holland/Zeeland Area (CFHZ) to support the development of a green stormwater vision for the Macatawa Watershed. A draft of the vision was submitted to the CFHZ on December 1 with the final grant report. The document includes information about the various types of green stormwater infrastructure, relationships to water quality and transportation, a brief discussion of economics, and a strategy to implement the vision. The document will likely be updated after review and input from community stakeholders, but this version of the vision is available on the MACC's website. Some highlights are provided below.

*To increase community understanding and acceptance of green stormwater infrastructure so that its adoption will be increased throughout the watershed*

## Green Stormwater Infrastructure Suitability and Prioritization

MACC staff, with the input from various community partners, developed maps to guide where green stormwater infrastructure could and should be implemented in the watershed. Various data was evaluated related to the suitability of placing green stormwater infrastructure on the ground, primarily soil and landscape features. We were able to calculate suitability scores for each parcel of land within the urban area of the watershed. Once suitability was determined, then prioritization mapping looked for publically-owned parcels of land with medium to high suitability scores. Publically-owned land was determined to be high priority for several reasons including the fact that the MACC has well-established relationships with those landowners, they tend to be larger parcels of property and they can also serve as site to demonstrate green stormwater infrastructure to the public. The mapping results were provided to a consultant the developed conceptual designs for installations at 14 locations in the watershed.

## Community Conversations

Beyond completing a desktop mapping exercise, the MACC also sought to engage community residents in a conversation about stormwater in their neighborhoods. Maps can only tell us so much, and no one knows stormwater in a neighborhood better than the people that live there. There was only time enough to complete one of these conversations in Holland Heights before the end of the project. However, the MACC intends to hold more of these conversations in other neighborhoods and work with residents to find solutions to address stormwater issues.



## Implementing the Vision

There are numerous existing efforts in the watershed related to improving water quality. These efforts will not be replaced by the green stormwater vision, but they will be evaluated for opportunities to include conversation or installation of green stormwater infrastructure. Three key activities that will help realize the green stormwater vision are implementing policy recommendations, public education and marketing and on-the-ground implementation.

The MACC intends to begin implementing the vision immediately while simultaneously engaging new stakeholders in conversations about stormwater. Contact the MACC if you would like to have a conversation in your neighborhood or would like to provide individual comments or suggestions that will enhance our vision for green stormwater.

# Project Clarity Update: An Overview of 2017 Activities

*Contributed by Dan Callam, Greenway Manager, Outdoor Discovery Center Macatawa Greenway*

Project Clarity's goal is to reduce phosphorus in Lake Macatawa by 70%. According to the 2016 monitoring conducted by Grand Valley State University's Annis Water Resources Institute (GVSU-AWRI), we are currently showing a 40% reduction. These levels will naturally fluctuate based on lake and weather conditions, but long-term trends are encouraging. 2017 monitoring results will be finalized and published in early 2018.

## 2017 Project Highlights

The Kuipers Drain Project, completed in October 2017, includes 15 acres of land along the North Branch of the Macatawa River. The wetland restoration will provide 42 acre-feet of water storage. The project was in partnership with MDOT, who invested over \$500,000, and the Allegan County Drain Office. Project Clarity provided the land, which was acquired from the Lumir Corporation, allowing the leveraging of state dollars to create this new water quality asset. The project will be monitored by the Allegan County Drain Office and Project Clarity. It will have important flood-relieving impacts along the US-31 corridor in Laketown Township and the south side of Holland.



The wetland restoration near the Haworth Corporate Headquarters continues to mature. Nineteen (19) credits have been released by the state for sale in the wetland mitigation bank that was established as part of this project. The Middle Mac Wetland restoration also continues to mature. Both wetlands are functioning as intended to capture rising floodwaters from the adjacent streams and allow sediment to settle out. GVSU-AWRI is monitoring the effectiveness of these wetlands at improving downstream water quality.

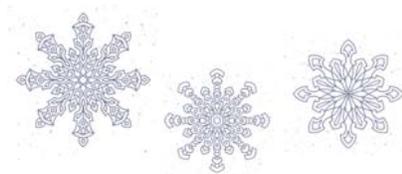
Agricultural practices were implemented on over 2,500 acres under the guidance and approval of the Agricultural Committee. This is in addition to the agricultural BMPs installed by the MACC under their Great Lakes Commission and Great Lakes Restoration Initiative grants.

## Education

- Over 70 farmers and agriculture businesses attended the annual agriculture lunch on February 21.
- Seven Project Clarity information kiosks (example pictured at right) were constructed throughout the Macatawa Watershed. Kiosks will be updated annually with monitoring results and information about the watershed.
- The 2017 Macatawa Water Festival, held on July 15, was a great success with well over 3,000 people in attendance. The 2018 Macatawa Water Festival will be held on July 14 at Windmill Island.
- The Outdoor Discovery Center continues to educate 1,000s of local school children at their facility each year



## Winter Water Quality Tips



- Just like in the fall with leaves, snow should not be piled on top of storm drains. As you are plowing your driveway this winter, try to keep the storm drains on your street clear too. As a general rule, if you can't see the storm drain, then melting snow or rain can't find it either!
- Salt pollutes! When snowmelt or rain dissolves and washes salt off your driveway, it isn't gone. Dissolved salt, in particular the chloride portion, is toxic to plants on land and to aquatic life in water. Minimize your winter salt use to only what is necessary, or use alternatives to keep salt (chloride) out of Lake Macatawa.
- Use electric or mechanical methods to remove snow instead of gas-powered ones. Not only can gasoline easily spill and pollute our water, but it also emits greenhouse gases that are harmful to air quality.

### Contact Us

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