



Macatawa Area
Coordinating Council
A Cooperative Effort Among Units of Government



Lowest recorded Great Lakes water levels basis for Great Lakes Levels 101 program

By Mark Breederland, MSU Extension (reprinted with permission)

Visitors and residents to the shoreline of any parts of Lakes Michigan and Huron have noticed the significantly low level of the water and the vast amount of exposed bottomland, formerly covered by water. Since the late 1800s, lake level records have been recorded for Lake Michigan and Lake Huron, and since 1918, the US Army Corps of Engineers has maintained lake level records on a number of gauging stations. Because wind and pressure can set up daily movements of the water, the gauge records are averaged to even out for such fluctuations. Each month of the year, then, has a “lake level average”. The level of 576.02 recorded during January 2013 was the lowest monthly average ever recorded on Lake Michigan—besting the previous monthly record low recorded in March 1964 of 576.05 and the previous January record low of 576.12. February 2013 levels are actually higher so far than the January levels, indicating the system may have possibly bottomed-out and may not go lower as earlier models predicted for February and March, 2013.



Little Sand Bay, Beaver Island. Photo: Jeff J. Cashman



MARCH



2013



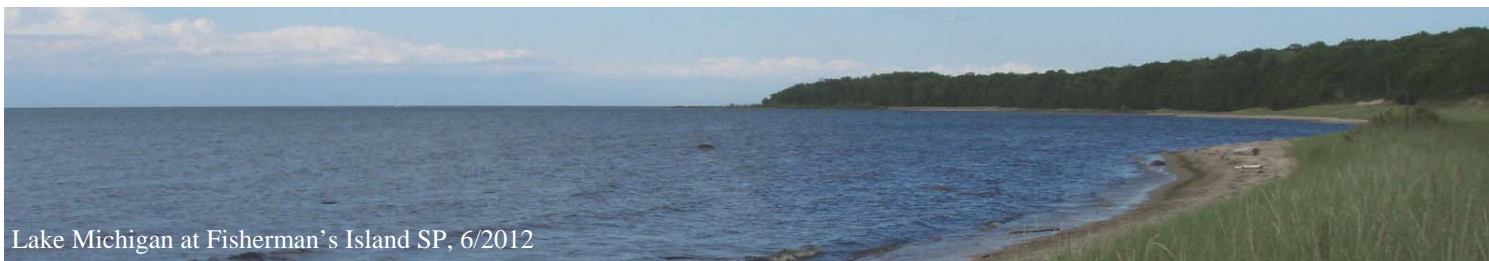
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To explain lake level variations, hydrologic system inputs and outputs, and historical lake level records, Michigan Sea Grant Extension and Michigan State University Extension are hosting a repeat of a free public seminar on **Great Lakes Levels 101 on April 8, 2013 from 6:30 p.m. – 8:30 p.m. at the Ottawa Co. Fillmore Complex Main Conference Room, 12220 Fillmore St., West Olive, MI 49460.** This program has been scheduled due to strong demand and tremendous interest from the first Great Lake Levels 101 program held in Traverse City on February 4, 2013. The Traverse City program had over 150 citizens from a multi-county region attend and had questions answered on great lakes hydrology, coastal processes and permitting issues on bottomlands of the Great Lakes. The Ottawa County program will include ample time for moderated questions and answers on similar issues from state and federal representatives. The *Levels 101* program is co-sponsored by the MACC, the US Army Corps of Engineers, and the Michigan Department of Environmental Quality (MDEQ). Facilitators and speakers for the event include:

- **Dan O’Keefe**, Educator, Michigan Sea Grant Extension/MSU Extension, Grand Haven
- **Mark Breederland**, Educator, Michigan Sea Grant Extension/MSU Extension, Traverse City
- **Keith Kompoltowicz**, Chief of Watershed Hydrology, US Army Corps of Engineers, Detroit
- **Luis Saldivia**, Michigan DEQ Water Resources Division, Grand Rapids
- **Jeff Fritsma**, US Army Corps of Engineers Regulatory, Grand Haven

(Continued on page 2)



Lake Michigan at Fisherman's Island SP, 6/2012

Great Lakes Levels 101, con't

State and federal laws and regulations apply to bottomlands below the “ordinary high water mark” and personnel who deal with these issues for the Southwestern Lower Michigan region (from both the US Army Corps of Engineers and the MDEQ) will be on hand to answer regulatory issue questions.

Speakers will also discuss observations from the long-term data set that exists for lake levels information on the Great Lakes. For instance, just four years after the lowest monthly record low in March 1964 and the lowest yearly low in 1964, the lake levels bounced above the long-term yearly average in 1968. Currently, however, the yearly average of Michigan-Huron has not been above the long-term average since 1998, making this a string of 14 consecutive years below average.

For more information about the *Great Lakes Level 101* program or lake levels, contact Mark Breederland at 231-922-4628, Dan O Keefe at 616-994-4572, or Kelly Goward, MACC, at 616-395-2688.

Sediment Fingerprinting Final Report

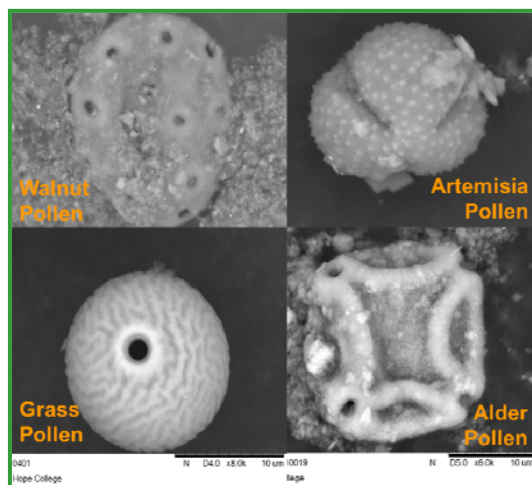
By Dan Callam, Outdoor Discovery Center Macatawa Greenway and Dr. Graham Peaslee, Hope College

Over the past three years, the partnership of Hope College, the Outdoor Discovery Center Macatawa Greenway (ODCMG), and the MACC has worked to identify areas in our watershed that contribute the greatest amount of sediment and nutrients to Lake Macatawa. You may have seen our sampling tubes set up in area waterways (see header photo on page 5), where they were arranged to collect sediment over a broad area when it rained. These measurements help us to determine which streams contain the highest levels of these pollutants and to prioritize waterways in which we should focus our restoration efforts.

But what if we could go one step further in tracking the sediment? Instead of simply focusing on a large tributary entering Lake Macatawa, what if we could focus on one drain, one ditch, even one field as a source of sediment? Or if we sampled the sediment that was downstream of several different streams, could we tell how much sediment came from each stream based on the sample itself? These questions are the idea behind a collection of techniques that are collectively known as sediment fingerprinting. This process involves developing a unique “fingerprint” that can be used to identify a sediment sample and distinguish it from others. Research students from Hope College employed a number of different forensic techniques to see if they could better distinguish sediment collected from different sites around the Macatawa Watershed. These analyses included looking at physical and chemical characteristics, such as color or chemical composition. While this concept has been developed before, it is still such a novel concept that there are no already-developed procedures that could be used in the Macatawa Watershed. Instead, the research is designed to look at several potential methods to “fingerprint” the sediment locally to determine which specific techniques will work for us.

This sediment fingerprinting work was conducted using funding from the Michigan Department of Environmental Quality and private donors. The specific techniques included:

Pollen Content: Wind-borne pollen grains that fall on local waterways wind up being left behind in sediment, which can be separated and examined using Hope's scanning electron microscope. Since each type of plant has unique pollen, the pollen (and sediment) have to come from an area with that type of plant, potentially distinguishing between streams.



Examples of pollen grains viewed using Hope's scanning electron microscope



No Till 101: Why Less is More for Soil Conservation

By Mark Ludwig, Allegan Conservation District

Tillage of the soil is credited by many anthropologists as an important step in the development of civilization. It has also been blamed for the fall of many civilizations as intense tillage led to the erosion of topsoil, which resulted in decreased crop production and subsequent starvation. While on modern farms the loss of soil due to intense tillage does not automatically lead to dramatic crop failure, it does have environmental and financial costs as fertilizer is purchased to make up for the loss of natural fertility. For these and other reasons, some farmers have chosen to eliminate tillage all together.

Called continuous no-till farming, this system relies on herbicides to control weeds and seeding tools capable of planting through heavy crop residues. Not only do these farms experience much less erosion, they frequently build a more resilient soil over time. When soil is tilled, air rushes into the root zone and oxidizes (burns) some of the organic matter that is present. Unless measures are taken to balance these losses, organic matter content tends to decline over time. Organic matter is a wonderful material: it makes soils more productive by increasing water and nutrient holding capacity.

Populations of soil micro organisms and earth worms substantially increase under no-till systems. These creatures help process residues, cycle critical plant nutrients and excrete natural glues that help soils hold together during rain events. Some specialized fungi even assist plant roots in extracting water and nutrients from the soil. When the soil is undisturbed, these fungi form large networks of hyphae (fungal roots) that can quickly colonize crop roots and boost yield.

Undisturbed soils also form more pores. Pores are critical for soil health as they allow water to drain through the soil profile and allow some air into the root zone. A healthy soil has a balance of mineral soil, organic matter, water, and air. Tillage temporarily adds more air, but also breaks the macro pore spaces built by worms and insects. It also shatters micro pores that develop due to chemistry, freeze and thaw cycles and the decomposition of small roots. Micro pores take significant time to develop, especially in soils with substantial clay content (the smallest type of soil particles), but can be broken down with one pass of a tillage tool or compacted away by heavy equipment traversing a wet field.

No-till soil takes several seasons to fully develop these pores, build micro organism populations and increase organic matter. This lag time can make for a difficult transition for farmers, as can difficulties setting up equipment and dealing with ruts and other issues typically handled with tillage. However the elimination of high horsepower tillage trips through fields and a healthier soil generally make no till farms more profitable in the long run.

RECOMMENDED READING

No Till Farmer Magazine

For 40 years No Till Farmer Magazine has been providing farmers real world information on how to get no till farming done. Many of their articles can be found online at www.no-tillfarmer.com

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No-till corn planter in Iowa. Photo credit: Gene Alexander, USDA.

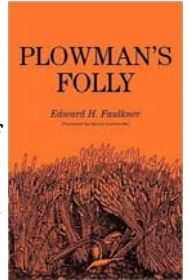




No Till 101, con't

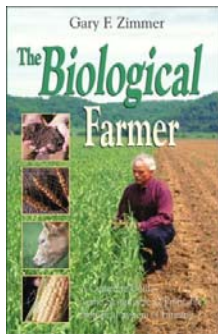
Faulkner, E. (1943). *Plowman's Folly*. University of Oklahoma Press.

The breakthrough work that shook the agricultural world by challenging the supremacy of the moldboard plow. From the introduction, "We have equipped our farmers with a greater tonnage of machinery per man than any other nation. Our agricultural population has proceeded to use that machinery to the end of destroying the soil in less time than any other people has been known to do it in recorded history."



Crovetto, C.C. (2006). *No Tillage – The relationship between no tillage, crop residues, plants and soil nutrition*.

South America has a very high rate of no till adoption, and a lot of the credit for that goes to Sr. Crovetto. This is his second book, written with great passion and a firm grounding in science and practical agronomic practices. From the introduction, "I believe that my soil, enriched year after year by the way I tend it, is my wealth and legitimate inheritance for those who follow me." Available from the Conservation Technology Information Center, find them on line at www.ctic.purdue.edu



Zimmer, G.F. (2000). *The Biological Farmer –A Complete Guide to the Sustainable and Profitable Biological System of Farming*. Acres USA.

Gary is a leader in the organic and biological farming movement. His theme of "tillage with a purpose" fits well with organic and conservation tillage systems. This book is a comprehensive look at soil management from a biological viewpoint. From the introduction, "Biological Farming improves the environment, reduces erosion, reduces disease and insect pressure, alters weed pressure, and it accomplishes this while working in harmony with nature." The book is available at www.midwesternbioag.com

Urban Tree Canopy Assessment Project

The GVSU Annis Water Resources Institute, in partnership with the MACC, was recently awarded a Michigan DNR Urban and Community Forestry Program Grant to complete an evaluation of the urban tree canopy within the Cities of Holland and Zeeland. The objectives of this project are to determine the current extent of the urban tree canopy; estimate the potential full tree canopy; model the value of the ecosystem services, such as shade, carbon sequestration, storm water interception, and wildlife habitat, that are being provided by the canopy; and encourage the adoption of public policies and other mechanisms that will increase and protect the urban tree canopy and other green infrastructure in our cities. This project meets some of the urban objectives that are found in the Macatawa Watershed Management Plan, including the recommendation that an urban tree canopy analysis be completed in order to better evaluate its contributions to protecting and improving our watershed. The results of the tree canopy analysis will be presented to both cities in the form of an atlas that will provide a summary of the results in maps and tables. The results will also be made available to the public through brochures and flyers. Results will be discussed at public presentations in both cities. The assessment has already begun, and it is anticipated that results will be available and presented in mid to late summer. The project will be completed by the end of September 2013. If you have any questions about this project, please contact Kelly Goward at 616-395-2688.



Downtown Holland. Photo credit: L.M. Nielsen



Sediment sampler in the Upper Macatawa River near 84th Ave

Sediment Fingerprinting, con't

Reflected Light Color: Photographic images of filtered sediment taken with a microscope-mounted camera can be analyzed for the unique digital red, green, and blue pixel count, to measure the degree of color difference between samples. Sediment rich in darker organic content can be readily distinguished from the lighter, sandy soils.

Elemental Composition: Using Hope's particle accelerator, small amounts of sediment can be analyzed rapidly to quantify the different amounts of 12 common elements, like iron and calcium, which made up the typical soil sample.

Particle Size and Shape: Using scanning electron microscopy, digital images of individual sediment grains can be taken and analyzed by automatic digital image processing software to measure the size and shape of the individual sediment samples collected to see if there are significant differences between sites.



Four examples showing the variety of sediment color

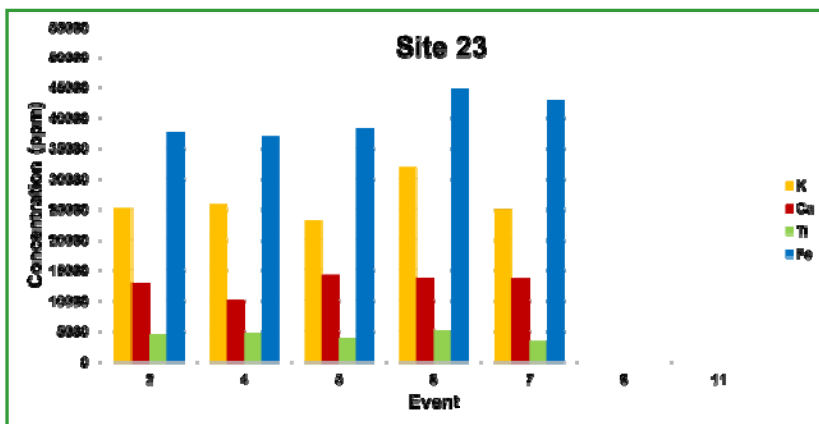
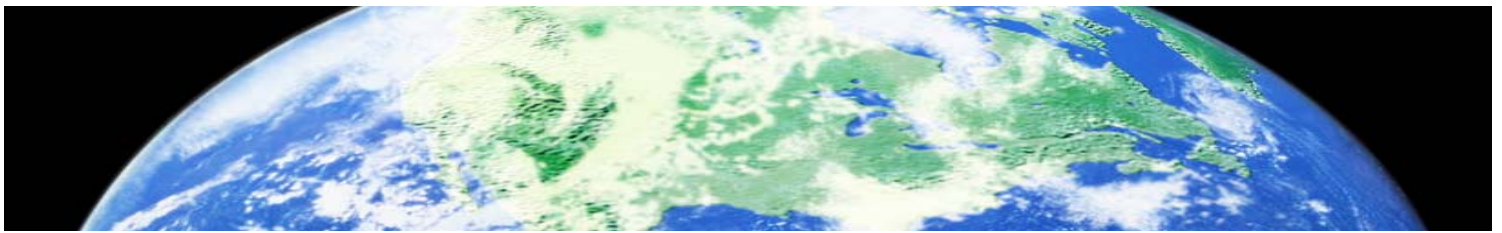


Chart showing the consistent ratios between elements at a sampling site on Noordeloos Creek

Phosphate Analysis: We also measured the amount of phosphorus attached to the sediment samples collected, which is the main nutrient of concern in the Macatawa Watershed. The amount and type of phosphorus observed allows us to see the variations in how it is distributed across the watershed soils.

Radioisotopes: This technique measures the ratio of two different radioisotopes (^7Be and ^{210}Pb) that can tell us how long it has been since a sample has been exposed to the atmosphere. Both occur from atmospheric deposition onto topsoil, but ^7Be is very short-lived, high levels of ^7Be relative to ^{210}Pb tells us that the sample is from surface runoff instead of streambank erosion.

All of these techniques have been explored with the sediment samples collected in the Macatawa Watershed over the past two summers, and some of these techniques proved to be more useful than others in helping to “fingerprint” the sediment. Radioisotope measurements show that a majority of the sediment that is washing downstream is coming from surface erosion, for example. Particle size and shape is fairly uniform across the watershed, thus not very distinguishing, and the pollen analysis is very time-consuming and will need further work. The combination of color, elemental, and phosphate analyses proved to be reliable and repeatable techniques for many of the sites studied. Further statistical analyses of the data obtained from these techniques are ongoing, with the eventual goal of being able to describe which parameters are most useful for differentiating sediment from one side of the watershed to the other. While these analyses will occasionally work on a finer scale, some areas are too similar to have a unique fingerprint at this time. More data will continue to be collected and compared to existing analyses in order to develop a practical sediment fingerprinting approach. While we may not be able to identify where a scoop of mud from the bed of Lake Macatawa came from yet, the fingerprinting work has given us another tool to help pinpoint the sources of the troublesome sediment and it promises to continue to develop into a practical tool that can be used to clean up the Macatawa Watershed and others. Contact Dan Callam at the ODCMG for more information: dan@outdoordiscovery.org or 616-393-9453.



Local Leader Honored with Outstanding Earth Steward Award

Michigan Interfaith Power and Light has announced the selection of Peter Boogaart as this year's recipient of the Outstanding Earth Steward Award. The award will be presented at the organization's 10th Anniversary Awards Dinner in Ann Arbor on March 7th.

In announcing the award, Michigan IPL Executive Director Julie Lyons Bricker said that Peter's "commitment to sustainability has not wavered throughout the years... [his] Creation Care activities have shown people the beauty of and their connection to nature." Lyons Bricker stated that Peter's involvement within the Church, environmental organizations, and with the city of Holland is "truly visionary."

Peter is employed by Ottawa County's Community Action Agency as a weatherization inspector. He is the Caring for Creation Coordinator at Hope Church, Holland, chairperson for West Michigan Creation Care, a past board member of West Michigan Environmental Action Council, and an advocate for the city of Holland's Community Energy Plan.



Peter Boogaart

Conservation District Spring Tree Seedling Sales



While the past two winters have been mild by the standards of any true Michigander, March still finds us looking forward to springtime. As you begin dreaming about working outside in your short sleeves, your local Conservation District invites you to start thinking about your spring planting. The annual tree seedling sales features many native species sold bare root and ready to find new homes in your yard or on your property. Other items are also available, such as shrubs, beach grass and accessories for your planting projects – educational books, marking flags, animal repellent, planting gel, and more. See below for more detail about the Ottawa and Allegan sales or visit www.macd.org to find your local Conservation District.



Ottawa Conservation District
16731 Ferris St, Grand Haven
616-846-8770 x5

Becky Huttenga: becky.huttenga@macd.org
www.ottawacd.org (download order form plus view pictures and descriptions)

Orders due: March 22 (with full payment)

Pick up: April 13, 9am-1pm @ Reenders Blueberry Farm



Allegan Conservation District
1668 Lincoln Rd, Allegan
269-673-8965 x4

Christine Groen: chris.groen@mi.nacdnet.net
alleganacd.org (download order form or order online, view pictures and descriptions)

Orders due: March 22 (with full payment)

Pick up: April 13, 9am-2pm @ Allegan Tech Center

Calendar of Events

April 8, 6:30-8:30 PM: Great Lakes Levels 101* (see page 1 for more information)

April 20: Grand River GreenUp* (www.grandrivergreenup.com)

April 22: Ottawa Conservation District Rain Barrel Workshop* (www.ottawacd.org or 616-846-8770 x5)

May 11, 9AM-12PM: Macatawa River Spring Cleanup* (www.outdoordiscovery.org or 616-393-9453)

May 13-17: Green Commute Week* (www.the-macc.org or 616-395-2688)

May 25, 9AM-12PM: ODCMG River Encounter (www.outdoordiscovery.org or 616-393-9453)

Visit the websites or call the numbers above for more information.

*Free event





2013 Lawn Care Seal of Approval

2013 Lawn Care & Landscaping Companies Awarded the Macatawa Watershed Seal of Approval

- AAA Lawn Care Inc.
- Advantage Landscape & Lawncare LLC
- Aesthetic Gardener LLC
- Blue Ridge Landscaping Inc.
- Carefree Lawn Service
- Dale's Mowing Service
- Evergreen Landscaping
- Four Seasons Cottage & Home Services
- Hollandia Gardens
- Integrity Landscape Management LLC
- Landscape Design Services, Inc.
- Perma Green Lawn Care, Inc.
- Specialized Turf Services
- Top Cut Lawn Care Services
- TruGreen (Grand Haven location)

Visit the MACC website or call our office for company contact information.



Would you like your lawn care/landscaping business added to the Seal of Approval list?

Please contact Kelly Goward at 616-395-2688 to learn how to become an approved member of the program.

To receive the Seal of Approval, a lawn care or landscaping company must agree to the following:

1. The company makes every attempt to use no phosphorus fertilizer, limiting the use of phosphorus fertilizer to cases of (1) starting a new lawn from seed, (2) patching/repairing a lawn with seed, or (3) after a soil test has shown a phosphorus deficiency and it is required for the health of the lawn.
2. Prior to applying fertilizer, the size of the lawn is measured and the resident or property owner is given a diagram of the lawn to ensure the correct amount of fertilizer is applied.
3. Grass is cut no shorter than three inches.
4. On property near bodies of water a three-foot buffer strip adjacent to the body of water is designated to receive no fertilizer.
5. All grass clippings and fertilizer are swept or blown off impervious surfaces back onto lawns to prevent runoff into storm drains.
6. If grass clippings are taken off site, they are stored properly in an area that is not susceptible to runoff.
7. The company makes customer aware of best management practices for water quality (native plants, waterfront landscaping, rain barrels, etc.).
8. In the case that the resident participates in the maintenance of their lawn, a schedule for watering and mowing is provided by the company.
9. If the company is required to be licensed by the Michigan Department of Agriculture, they are in good standing with them.





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301 Douglas Avenue
Holland, Michigan 49424



Spring Lawn Care Tips

1. **Fertilize Fairly.** Test your soil first and only apply the nutrients that your lawn or garden needs and apply at the proper time. Fertilizer not used by plants pollutes our waterways!
2. **Mow Masterfully.** Mow high to encourage strong root growth and discourage weeds. Return clippings to the lawn as fertilizer. Clippings left on sidewalks and driveways pollute our waterways!
3. **Watch Watering.** Water deep and infrequent. Water in the morning or evening to avoid evaporation. Excess water can runoff your lawn and carry pollutants that end up in our waterways!
4. **Garden Sustainably.** Consider using integrated pest management to reduce pesticides, compost to reduce fertilizers, rain barrels to conserve water, and native plants to enhance your backyard habitat.

For more information, please visit the Macatawa Watershed Project at www.the-macc.org

Contact MACC Staff

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Phone: 616-395-2688 www.the-macc.org



We're on Facebook!

Interested in staying up to date with the Macatawa Watershed Project? Then just become a fan of our Facebook page! The easiest way to find our page is to visit our website www.the-macc.org and click on the "Find Us on Facebook" icon on our homepage.

