



Fostering the science and art of soil and water conservation in Michigan and the Great Lakes Region.

What does the arrival of an iron ore carrier at Duluth Harbor on Labor Day have to do with soil and water conservation on working lands? Actually, there is a connection. Serious maintenance is required to keep these ships, which are the cheapest way to move large quantities of bulk materials, making their calls to Great Lakes ports. The harbors need to be able to accommodate vessels with upwards of 50-foot draft. The harbors tend to be found at river mouths, such as the St. Louis River in Duluth, which carry sediment to the lakes.

To prevent the harbors from clogging with sediment, some of which originated on farm fields, requires regular dredging. [The U.S. Army Corps of Engineers manages a dredging program.](#) Originating from authority granted in by Congress in 1824, the dredging effort produces thousands of yards of sediment that need to be disposed of in some fashion. Due to



contamination, much of the sediment is stored in [Confined Disposal Facilities](#). Sediment considered relatively safe can be used in a variety of “beneficial uses,” including beach nourishment, habitat development, island creation/enhancement, construction, and agriculture. For example, sediments dredged from the Frankfort harbor have been used to reclaim farmland to support an orchard operation. More information is available online through the [USACE Detroit District](#).

For about six minutes of impressive videography depicting the arrival of the Arthur M Anderson on a beautiful morning on Lake Superior, there is [this video](#) provided by the Duluth Harbor Cam. (Photo credit Duluth Harbor Cam 2021).

EXECUTIVE COUNCIL HIGHLIGHTS

The Executive Council (EC) has been holding monthly teleconferences and keeping our award-winning Chapter business running smoothly and engaged in significant collaboration with other conservation groups.

- In June, Katie Droscha proposed two annual deliverables as part of our partnership with the Maple River RCCP. They are, at least one newsletter per year and at least one workshop per year.
- Dan Kesselring updated the Chapter Committee list and indicated some committee positions are open and encourages members to serve on a committee.
- The Chapter was invited to consider a letter of support to designate three new Wilderness areas and one addition to an existing Wilderness area on the Ottawa National Forest in Michigan's Upper Peninsula: (1) the Ehlco area, (2) the Trap Hills, (3) Norwich Plains, and (4) the Sturgeon River Gorge Wilderness Addition. and preserving aesthetic and historic assets. A motion to was moved by Rebecca Bender, supported by Tim Harrigan, to support this Wilderness Area designation effort, and to have President O'Neil sign and submit the letter of support. Motion passed by voice vote.
- Zach Curtis reported further progress on a webinar on Systems Based Planning.
- In July, the EC announce the 2021 scholarship will increase to \$750. Details and the application form are available on the Chapter website.
- Chapter webinars have been recorded, but, in the past, they have only been made available to registrants. The EC decided to make the recordings available only to registrants for 6 months. After that they will be available on the Chapter website but not actively promoted for open access.
- Glenn discussed the results of the Strategic Planning ad hoc Committee regarding the Leadership Survey.
- The 2022 ANR Seminar Planning Committee remains intact from last year and is proceeding with the next agenda.
- In the August EC teleconference, Glenn reported Dan Kesselring attended the International Conference State of the Union Delegates and other sessions, reporting the virtual process was much improved over 2020.
- The EC agreed to hold the Fall Annual Meeting virtually again this year,
- Katie Droscha reported an interview with NRCS was in the works with a Newsletter to be sent to the Maple River RCCP in fulfillment of one of the Chapter's commitments.
- In September, Glenn reported the Strategic Planning Committee is working on updates to the Strategic Plan.
- Glenn reported that the Nominations Committee members have now been appointed and duties assigned. The members are: Dave Lehnert representing Region 1, Steve Schaub representing Region 2, Gary Boersen representing Region 3, and Jon Bartholic representing State-Wide.
- Jerry Miller reported the Annual Fall MACD and our Chapter participation plans are progressing.
- The 2021 Michigan Chapter 2021 Annual Meeting is to be held at 10:00 AM, December 3, 2021 by Zoom meeting.

MEMBER PROFILE

This quarter we are happy to introduce Heather Varboncoeur. Thank you, Heather, for sharing this with the Chapter!

1. *Where do you work? What do you do there?*

I work for the Natural Resources Conservation Service. I am the District Conservationist for Ottawa County. I am responsible for implementing the conservation programs in the Farm Bill, assisting private landowners in addressing their resource concerns and working with partners to get as much conservation on the ground as possible.



2. *When and why did you join MI-SWCS?*

I honestly don't remember when I joined SWCS. It's been a while! I've always enjoyed reading the journal and found many of the articles relatable to my own work. I appreciate how complimentary the goals of SWCS are to the goals of NRCS. And I really enjoy the educational opportunities.

3. *What do you see as a major challenge to conservation efforts in Michigan?*

Education is always a challenge. Convincing farmers that there might be a new, better way to do things has been the biggest barrier. I also find that it's difficult to get farmers in the same space to teach them about new programs or technologies. Urban development has been a worsening issue. Ottawa County is the fastest growing county in the state and land prices have gotten so high that farmers can't compete, which means we can't help them get more conservation on the ground.

4. *How have you engaged in the MI SWCS chapter?*

I have sat on several committees, including most recently the nominations committee. I have also attended several workshops and look forward to ANR week every year at MSU.

5. *How do you feel your membership to the MI SWCS is valuable?*

Even if I go a while without participating in anything, I know my contribution through dues helps SWCS continue to offer opportunities for other members. And the more educated our members are, the better they can help get conservation on the ground.

6. *What advice do you have for aspiring or early career natural resource professionals?*

Get out there and discover all of the diverse careers that are available in this field. It continues to surprise me where a natural resources related degree can take you. And find someone who has the job you want and ask them how they got it. Having a good mentor can completely change your chances of ending up where you want to be.

7. *Where were you born? Where did you grow up?*

I was born and raised on the east side of Detroit. Not a lot of conservation or nature around where I lived but my mother is Hawaiian and honoring nature has always been a big part of who she is. She made sure we respected it and did her best to take us places that were open and natural for us to experience. I credit her a lot with my love of nature and my desire to do the work that I'm doing.

8. *What is your favorite place in Michigan to visit?*

My favorite place to visit in Michigan is probably Marquette. It's so beautiful up there and the city has a lot of unique places to visit. Plus you're in the U.P. which is full of adventure and beauty.



9. *What do you like to do in your free time?*

I love the beach! I'm lucky enough to live in Muskegon where there is an abundance of gorgeous beaches and I make sure to take full advantage of them. I like gardening but only if it's for fun. As soon as I try to be serious about it I kill everything.

10. *Best place to eat in your area? What to order?*

My current favorite restaurant in Muskegon is El Tapatío. They make their own tortillas and everything is made from scratch. The tacos are AMAZING but honestly I've never had anything bad there. I highly recommend it.

11. *Favorite dessert?*

I'm going to have to go with Key Lime Pie. But anything with hot fudge is a close second.

SOIL HEALTH: WHAT IS IT?

We've all heard the term many times, but how would each of us define it? According to MSU Extension(ref), the definition of soil health depends on what one's use of the soil. For a rural homeowner, their biggest concern might be a working septic system, which they want to absorb and filter water. For someone building a structure such as a building or a road, the mechanical properties of the soil are most important. For farmers, the ability of the soil to support crops for a financially viable business is what counts.

The NRCS(ref) defines soil health as the:

“capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.”

Further, a healthy soil *“gives us clean air and water, bountiful crops and forests, productive grazing lands, diverse wildlife, and beautiful landscapes. Soil does all this by performing five essential functions:*

- *Regulating water - Soil helps control where rain, snowmelt, and irrigation water goes. Water and dissolved solutes flow over the land or into and through the soil.*
- *Sustaining plant and animal life - The diversity and productivity of living things depends on soil.*
- *Filtering and buffering potential pollutants - The minerals and microbes in soil are responsible for filtering, buffering, degrading, immobilizing, and detoxifying organic and inorganic materials, including industrial and municipal by-products and atmospheric deposits.*
- *Cycling nutrients - Carbon, nitrogen, phosphorus, and many other nutrients are stored, transformed, and cycled in the soil.*
- *Physical stability and support - Soil structure provides a medium for plant roots. Soils also provide support for human structures and protection for archeological treasures.”*

A similar definition with more emphasis on soil biology and symbiotic relationships, implying integrated pest management, was offered by the United Nations Food and Agriculture Organization¹, as follows:

"Soil health is the capacity of soil to function as a living system, with ecosystem and land use boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and promote plant and animal health. Healthy soils maintain a diverse community of soil organisms that help to control plant disease, insect and weed pests, form beneficial symbiotic associations with plant roots; recycle essential plant nutrients; improve soil structure with positive repercussions for soil water and nutrient holding capacity, and ultimately improve crop production" (FAO, 2008).

FAO currently extends this definition to include “*A healthy soil does not pollute its environment and does contribute to mitigating climate change by maintaining or increasing its carbon content.*”

¹FAO 2008. An international technical workshop Investing in sustainable crop intensification The case for improving soil health. Integrated Crop Management Vol.6-2008. FAO, Rome: 22-24 July 2008.

“Living roots, in the soil, as long as possible.”

From the “Soil Health Nexus”

The North Central Region Soil Health Nexus (SHN) is a collaboration among academics and researchers from Land Grant Universities across 12 states, including Michigan State University. It’s mission seeks to increase access to and implementation of soil health research and knowledge. The SHN posts video presentations on its [Digital Cafe Webinar](#) series.

Those interested in soil health may find this webinar interesting: [Solar Corridors for Soil Health](#) presented by [Joel Gruver](#) of Western Illinois University. It doesn’t. Solar corridors are simply opening up wider spaces, for example, 60-inches wide, for cover crops between corn rows. The wider strip receives far more light than what is typically available in rows spaced 30 inches wide, increasing cover crop productivity. Why do this? Briefly, some justification for this approach, as well as results of field trials is presented in the webinar. A few key points:

- Increasing soil organic matter is (SOM) good for soil health.
- All farms can benefit from higher SOM because it favors higher productivity with lower inputs.
- Cover crops add carbon to soils with benefits to soil health and water quality.
- Cover crops in solar corridors offer opportunities in full season manure application, secondary cash crops, livestock forage, and carbon farming.
- Yield increases in recent years have not been uniformly distributed, geographically (interesting national map showing variability in corn yield increases). Why?
- **Rooting depth** and **plant available water** correlate strongly to yield increases.
- Pasture and perennial crops are the only cropping systems that increase or maintain SOM.
- Solar corridors can essentially “perennialize” a cropping system by keeping living roots in the soil for extended periods of time.
- Cover crops are currently under-utilized (national map). Only about 8 percent of Michigan farm land is put into cover crops. Maryland leads the nation at 29 percent, due to financial incentives.
- Cover crops are usually planted late and killed early, limiting their benefits.

The webinar lacks a detailed financial accounting of solar corridor farming. Their studies showed a decrease in yield, but there may have been cost-saving offsets to help make up for the smaller harvests. They also found evidence of more efficient use of nitrogen banding and increased nitrification using this system.



MODIS October 1, 2021 image of Lake Erie and Lake St. Claire following heavy rains the previous week. The Thames and Chatham rivers in Ontario contribute sediment to Lake St. Claire and the Maumee and Sandusky rivers deliver sediment to western Lake Erie. (NOAA Coast Watch Great Lakes https://coastwatch.glerl.noaa.gov/modis/region_map.html)

MICHIGAN CONSUMPTIVE WATER USE – A BRIEF REVIEW

Water use is divided into two categories: consumptive and non-consumptive use. Nonconsumptive use is water that is collected from a water source, used for some purpose, and returned to the water source. For example water is collected from a river by a water treatment facility, used by a community, then (mostly) returned to the river after release from a sewage treatment plant. Thermoelectric power plants use large amounts of water for cooling but return most of the water to its source. Consumptive use, however is water lost from the watershed. Water turned to steam in an industrial boiler may rise out of a stack and be carried away as water vapor. Groundwater used for irrigation is lost by evapotranspiration, enters the atmosphere and is carried away by the wind. The [State of Michigan keeps tabs](#) on consumptive use by some of its biggest users. Below is a list of the top 20 water users. The list may surprise some. For example, three of the top 20 are farms and a pharmaceutical company is ranked eighth. Nestle, for all the criticism they receive, is ranked 85th. Farm names are kept confidential. The pie chart below the table shows water use by sector with agricultural irrigation the largest “slice.” (Source: [Michigan.gov](#))

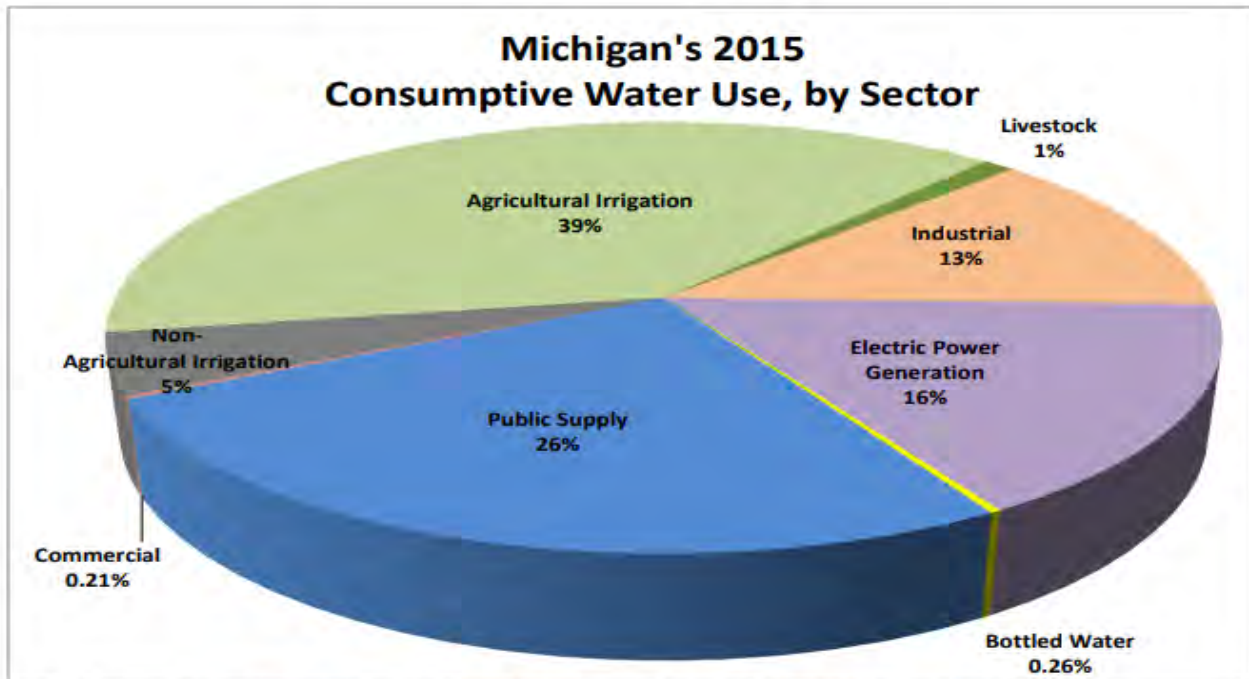
Top 20 Michigan Water Users

In millions of gallons per day, excluding power and public water supply sectors.

1	United States Steel	146.4
2	Praxair Inc.	70.7
3	Escanaba Paper Company	37.7
4	Farm A*	33.1
5	LaFargeHolcim Presque Isle Quarry	24.6
6	Occidental Chemical Corporation Ludington	24.2
7	Verso Paper Quinnesec Mill	21.4
8	Pharmacia and Upjohn Company LLC	19.0
9	Packaging Corp. of America	16.8
10	DTE Gas Company W.C. Taggart Station	13.4
11	Empire Iron Mining Partnership	11.9
12	St. Marys Cement Charlevoix Plant	11.7
13	DTE Northwind LLC	9.3
14	Sylvania Minerals	9.2
15	Farm B*	8.9
16	Farm C*	8.6
47	Carmeuse Line and Stone Cedarville Operation	7.7
18	Cargill Incorporated	7.7
19	Morton Salt Inc.	7.1
20	Tilden Mining Operation	6.7

85	Nestle Waters North America (4 locations)	1.1

**Large quantity agriculture withdrawals are reported to the Michigan Department of Agriculture and Rural Development. Individual farm names are confidential.*



***Consumptive water use is the portion of a water withdrawal that is not returned locally due to evaporation, incorporation into products, or transport out of the Great Lakes Basin.

PICTURES FOR THE NEWSLETTER

Have some interesting pictures to share with a Michigan Soil & Water theme? If you would like to share them with the Chapter, please send them to John Freeland, Newsletter editor at freeland.nrc@gmail.com

NATIONAL AND STATE DROUGHT CONDITIONS

Weather and climate conditions across the nation can have an impact on farm production and markets. The drought situation out west may ultimately affect farming decisions in Michigan, which, in turn, may have influence on soil and water conservation practices. The latest **United States Drought Monitor** map indicates most of the nation east of the Mississippi River is drought-free with large areas west of Wisconsin badly needing water. The Drought Monitor is updated weekly.

MEMBERSHIP

If you are not currently a member of the Soil & Water Conservation Society, membership has many benefits. By joining the national Society, members are automatically affiliated with their state chapters. This is an opportunity to network with professionals in the conservation field and support the Society's critical mission. Information about how to join is available through the link: <https://www.swcs.org/get-involved/join/>

LINKS OF INTEREST

[Michigan Soil and Water Conservation Society - YouTube](#)

[North Central Region | Soil and Water Conservation Society \(swcs.org\)](#)

[Great Lakes Echo - Environmental news across the basin](#)

[Michigan Farmers Union | United to Grow Family Agriculture](#)

[American Farm Bureau Federation - The Voice of Agriculture | Homepage \(fb.org\)](#)

[W.K. Kellogg Biological Station • Michigan State University \(msu.edu\)](#)

[Great Lakes Restoration Initiative | Great Lakes Restoration Initiative \(glri.us\)](#)

[Home | Hoosier Chapter of the Soil and Water Conservation Society \(hoosierchapterswcs.org\)](#)

[GLIN: Great Lakes Information Network - Great Lakes Commission \(glc.org\)](#)

[Executive Council.](#)

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