Washtenaw County Conservation District

JULY 2019

Rainwater Harvesting By Celeste Novak, LEED

"Rainwater harvesting and conservation aims at optimum utilization of the natural resource that is Rain Water, which is the first form of water that we know in the hydrological cycle and hence is a primary source of water for us. The Rivers, Lakes, and Ground Water are the secondary sources of water. In present times, in absence of Rain Water harvesting and conservation, we depend entirely on such secondary sources of water. In the process it is forgotten that rain is the ultimate source that feeds to these secondary sources. The value of this important primary source of water must not be lost. Rainwater harvesting and conservation means to understand the value of rain and to make optimum use of Rain Water at the place where it falls."

-India: Rainwater Harvesting and Conservation Manual.

"Si quaeris peninsulam amoenam circumspice" is the state motto, and while seeking a pleasant peninsula, Michiganders know that we are a water wealthy state. With at least one-quarter of the world's freshwater supply, there are enough rivers, inland lakes, rain, and snow to fill our aquifers as well as our overflowing rain barrels.

One response to the water supply challenges is the re-creation of one of the world's oldest water supply systems: rainwater collection. Rainwater collection, or rainwater harvesting, involves the capture of water from roofs and/or impervious/pervious surfaces. The roofs of buildings, schools, offices, large data distribution centers, and agricultural buildings can serve as the contributing drainage area for a given system. New approaches in plumbing design are utilizing collected rainwater or stormwater

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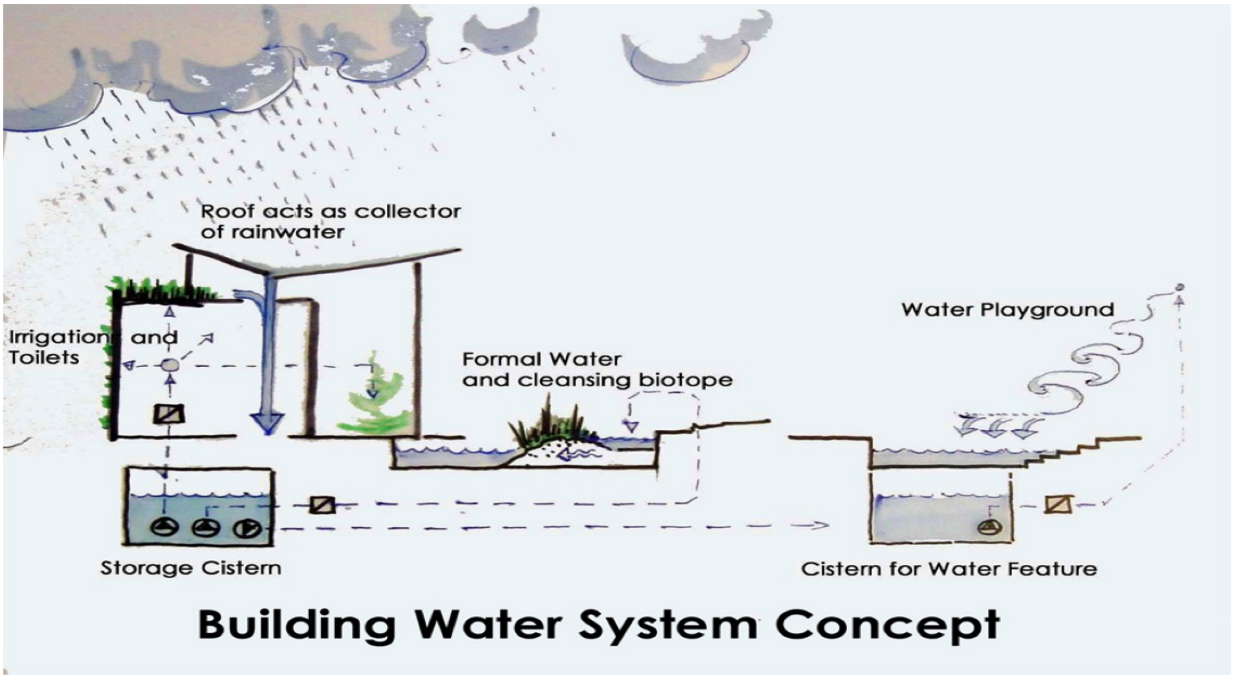

to provide all or part of the water requirements for a building. This results in a reduction in stormwater runoff volumes leaving a property, while at the same time providing a new source of water to reduce the burden on potable water supplies.

Water conservation and sustainable stormwater management are two of the most effective sustainable design practices available to architects and engineers. Rainwater collection conforms to the goals and objectives of low-impact development, which aims to mimic the predevelopment site hydrology by using site design techniques that store, infiltrate, evaporate, and detain runoff. Reducing the runoff from storm events via rainwater harvesting provides numerous benefits to property owners and contributes to the big-picture goal of reducing the impact of urbanization on receiving water bodies.

Today it is possible to design virtually all buildings and landscapes to collect, store and treat water in order to provide a resilient water resource. New policies and codes allow the creation of a new hydrologic system that restores water as it flows through the environment in a regenerating system that includes humans.

Rainwater Harvesting for ALL Buildings is a workshop designed to demystify rainwater collection for domestic, commercial and agricultural usages. Architect Celeste Allen Novak will provide an overview of the importance of rainwater systems and the benefits that can be gained by designing a complete rainwater system. She will share her passion about integrated rainwater collection systems that provide resilient, sustainable strategies for water conservation in buildings and communities.

The workshop will include a sizing exercise to determine how much rain can be gathered from your rooftop. Attendees should be prepared to use basic calculations to size a rainwater system. The panelists will be prepared to answer your questions about rainwater harvesting and discuss the optimal amount of water to store for later use.

Join us on July 25th from 6-8p.m for the Rainwater Harvesting workshop at Scio Township Hall. Cost is $10. RSVP at megan.deleeuw@macd.org

MAEAP June Update By Nicholas Machinski

Verifications

Sweetland Farms first became verified in the Spring of 2014. In June, the farm became re-verified in their systems of Cropping and Livestock. Brian Sweetland plants corn, soy and wheat and grows a cover-crop to reduce any soil erosion. In the spring, the cover-crop is plowed under to provide nutrients for the future row crop. Manure, from the cattle is added right before planting to maximize the availability of the nutrients. The farm is transitioning away from a dairy to a beef operation. Brian hopes to sell freezer beef off of the farm, so if you live near northern Lodi township, you will have some fresh local beef in your area soon!

Brett Seabury has been operating Golden Fleece Farms for decades and has achieved verification in his Cropping system. When Brett took over the farm, the land had been intensively farmed for decades. He set about turning the fields into pasture ground to improve the soil's health. Brett has both goats and chickens on his farm, but the largest animals are the cattle that roam the 152 acres of pasture. The wet spring has definitely helped the pasture grow this year and the cattle can hardly keep up. Some of it will be cut as hay, otherwise cattle are rotated through the different pastures chomping away at the grasses and legumes.

Nancy Whitelaw and Jan Benson have lived on their property since 2011. When they arrived they immediately went to work restoring the land to a prairie habitat for wildlife and have earned their MAEAP verification in the Forest, Wetland and Habitat system. After removing invasive species, planting native ones and performing prescribed burns their hard work has paid off. Wildflowers and forbs dominate the landscape. Pollinators such the Baltimore Checker-spotted Butterfly start their lives out amongst the plantains and one can see them flutter between flowers as adults. In the long-term Nancy and Jan hope to establish an oak opening and a sitting area where they can enjoy the habitat they created on The Whitelaw-Benson Property.

Figure 1: Jan Whitelaw proudly holding her MAEAP sign for the Whitelaw Benson Property

Algal Blooms and Lake Erie

A series looking at the system of factors leading to algal blooms in the Western Lake Erie Basin (WLEB)

By Nicholas Machinski

Part 2: City Life

In *Part 1: It's Complicated* we learned that not all phosphorus is created equal. Farmers have improved at controlling particulate phosphorus (PP) but dissolved reactive phosphorus (DRP) has increased and is difficult to get a handle on. This time we are going to focus on the city to look at some ways the urban areas are contributing to the algal blooms as well as some sources you might not expect.

For the purpose of this article we are going to look at Detroit and the Detroit River in particular, though we will touch on Toledo, Ohio as well (*Figure 1*). One of the largest contributors, in terms of Phosphorus, to the Detroit River are the regional sewage treatment plants.[1] These plants are handling the waste of millions of people and have gotten better in recent years. Any further improvements to plants have been deemed too costly to even implement at this stage.

Another source are the combined sewer overflow systems. Rain drains directly into the sewer lines in Detroit and with heavy rain events (like the ones we got this spring), these systems are often stretched to their max. The result is sewage being dumped directly into the river instead of being treated, leading to not only nutrient loading but an increased risk of E. coli contamination. Fortunately, it was just announced that the City of Detroit will be investing $500 million into their water and sewer systems. The plan calls for greener infrastructure to manage storm water and will mitigate the amount of sewage entering the Detroit River.[2]

1- https://news.umich.edu/u-m-report-details-phosphorus-sources-both-urban-and-agricultural-in-detroit-riverwatershed/

2- https:// www.michiganradio.org/post/detroit-plans-5-year-500-million-investment-water-infrastructure

Don't think that this is just an infrastructure problem either. There are a lot of items that people can do individually that add to the nutrient loading of Lake Erie. Pet waste has been deemed an issue and contributor to the problem.[3] Of course, my pet peeve are individuals that think it is necessary to fertilize their lawn every month. One, it's not, lawncare companies are just trying to sell you their products. Grass can survive just fine without it. Two, the grass we have on our lawns is typically non-native anyway. Three, if you have your fertilizer applied by a third party I find that they also apply it to the sidewalk, a nice impermeable surface where it gets washed right into the storm drain and out into the lake. So now, not only is your lawn green but so is Lake Erie.

Something many of us don't think about are septic tanks. It is important to not only have the tank emptied regularly but to have it inspected as well. There are 1.3 to 1.4 million septic tanks in the state of Michigan and it is estimated that about 10% of them are failing.[4] That means nutrients and bacteria is leaching from these septic systems and into the groundwater. That is a huge threat to many people's drinking supply as a large number of Michiganders get their drinking water from a well. There aren't any laws at the state level about getting your septic tank inspected, though perhaps there should be. In Washtenaw County, it is required to have the system inspected at the time of sale only.[5] That could still mean that there are hundreds, if not thousands, of septic systems in the county that are failing because they are not inspected regularly.

All of the factors above can be housed under the category of "urban runoff." Though that term isn't technically accurate, it will work for our purpose. However, the major contributor of phosphorus to the Detroit River isn't the urban runoff or even the agricultural runoff from the Thames River (Ontario). It is actually due to lack of ice. Wait. Ice? Really?

A recent study shows that a decrease in ice cover of Lake Huron and an increase in storms has led more shoreline erosion and suspended lake sediment. Basically, the phosphorus locked into the soil along the shore of Lake Huron is being washed away because of the lack of ice. If ice was present for a longer period on the lake, this would decrease the erosion of the shoreline and the churning of the lake bottom. It may not sound like a lot, but researchers have "calculated that 54% of the Detroit River's total phosphorus load comes from Lake Huron – a proportion three to four times higher than previous estimates."[6] When I talk to farmers, some claim that it isn't all them contributing to the algal blooms in Lake Erie; and they're right, its not all them. However, , they shouldn't be quick to celebrate. Though the Detroit River supplies Lake Erie with 80% of its water, it only supplies 25% of its total phosphorus.7 That means 75% of the phosphorus entering Lake Erie is from other sources.

3- https://binational.net/wp-content/uploads/2019/06/Draft-Lake-Erie-LAMP-061819-English.pdf

4- https://www.bridgemi.com/michigan-environment-watch/lack-oversight-allows-leaky-septic-systems-befoul-michigan-waters

5- https://www.mymlsa.org/septic-system-ordinances/

6- https://news.umich.edu/u-m-report-details-phosphorus-sources-both-urban-and-agricultural-in-detroit-river-watershed/

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Well what about Toledo? Toledo, a much smaller city than Detroit, is responsible for an estimated 15% of the phosphorus to the Maumee River.[8] Again, could improvements within the city of Toledo be made? Certainly. However, the fact is that 85-88% of the total phosphorus found in the Maumee River is from agriculture.[9, 10]

So, to summarize, there are many urban sources of nutrient pollution that contribute to the algal blooms in Lake Erie. However, in terms of scale, they are smaller contributors when compared to agriculture. That does not mean that we should ignore those areas. There are improvements that could be made at from the city level to the individual. If this whole system makes you question where to begin, I would look in the mirror.

But of course, the system only gets more complicated when we reach the lake itself. Did you actually think that we were done covering all the factors that contribute to the algal bloom? I hope not. Next time, we look at the most productive lake of all the Great Lakes: Lake Erie.

P.S. Something you should all take a look at is the draft Lakewide Action Management Plan (LAMP) for Lake Erie. It is created by the Lake Erie Partnership which is binational organization between the U.S. and Canada. I have read it and plan on submitting my comments in the coming days. They are taking public comments until August 26th.

7- https://news.umich.edu/u-m-report-details-phosphorus-sources-both-urban-and-agricultural-in-detroit-river-watershed/

8- http://www.glc.org/wp-content/uploads/HABS-Sources-of-Nutrients-20171009.pdf

9- http://www.glc.org/wp-content/uploads/HABS-Sources-of-Nutrients-20171009.pdf

10- https://www.lakeerie.ohio.gov/Portals/0/Ohio%20DAP/DAP%201-1%20FINAL%202018-08-27.pdf

Seeking Nominations for our 2019 Conservation Awards!

Please consider nominating someone who you think is deserving of one of the following: 2019 Small or Beginning Farmer of the Year (celebrating the efforts of small farmers with ten acres or less and/or beginning farmers in their first ten years of farming), 2019 Tree Conservationist of the Year (recognizing excellent tree planting efforts over many years), or 2019 Conservation Farmer of the Year (recognizing farmers that have prioritized conservation practices). Nominations are due by August 30th.

UPCOMING EVENTS

Rain Barrel Pre-Order

Looking for a rain barrel? We have rain barrels in five different colors available for pre-order on our website.https://www.washtenawcd.org/. Order by July 19th to pick up at Scio Township Hall (827 N Zeeb Rd, Ann Arbor, MI 48103) from 3-5:30 p.m on July 25th. Our rain barrels are of a 55 gallon capacity and feature a mesh top screen to keep out dust and debris. We also have tumbling composters, downspout diverters, linking hoses, and pedestal risers.

Water Catchment Workshop

When: Thursday, July 25th from 6pm-8pm

Where: Scio Township Hall, 827 N Zeeb Rd, Ann Arbor, MI 48103

We will be hosting a water catchment workshop called *Rainwater Harvesting System Design for ALL Buildings* with Celeste Allen Novak FAIA, LEED, AP BD+C, and George Edward Van Giesen III, authors of Designing Rainwater Harvesting Systems: Integrating Rainwater Into Building Systems. The workshop is designed to introduce gardeners to rain water harvesting systems at all scales. Cost is $10 per person. RSVP.

Conservation Ag Field Day

When: Tuesday August 13th, 8a.m.-3p.m.

Where: Green Things Farm, (3825 Nixon Rd, Ann Arbor, MI 48105)

Join us for a say of learning about various conservation practices that can be incorporated into your farming system! Local farmers and presenters will cover topics related to soil health, grazing, and woodlot management as well as MAEAP verifications on the farm. A free farm-grown lunch will be provided! Please RSVP by calling (734) 761-6721 ext.5 or by emailing megan.deleeuw@macd.org.

Fall Tree Sale - October 11th

Orders can be placed on our website or in the office. Forms available August 1st. Pick-up is at the Washtenaw Farm Council Grounds from 2-6pm.