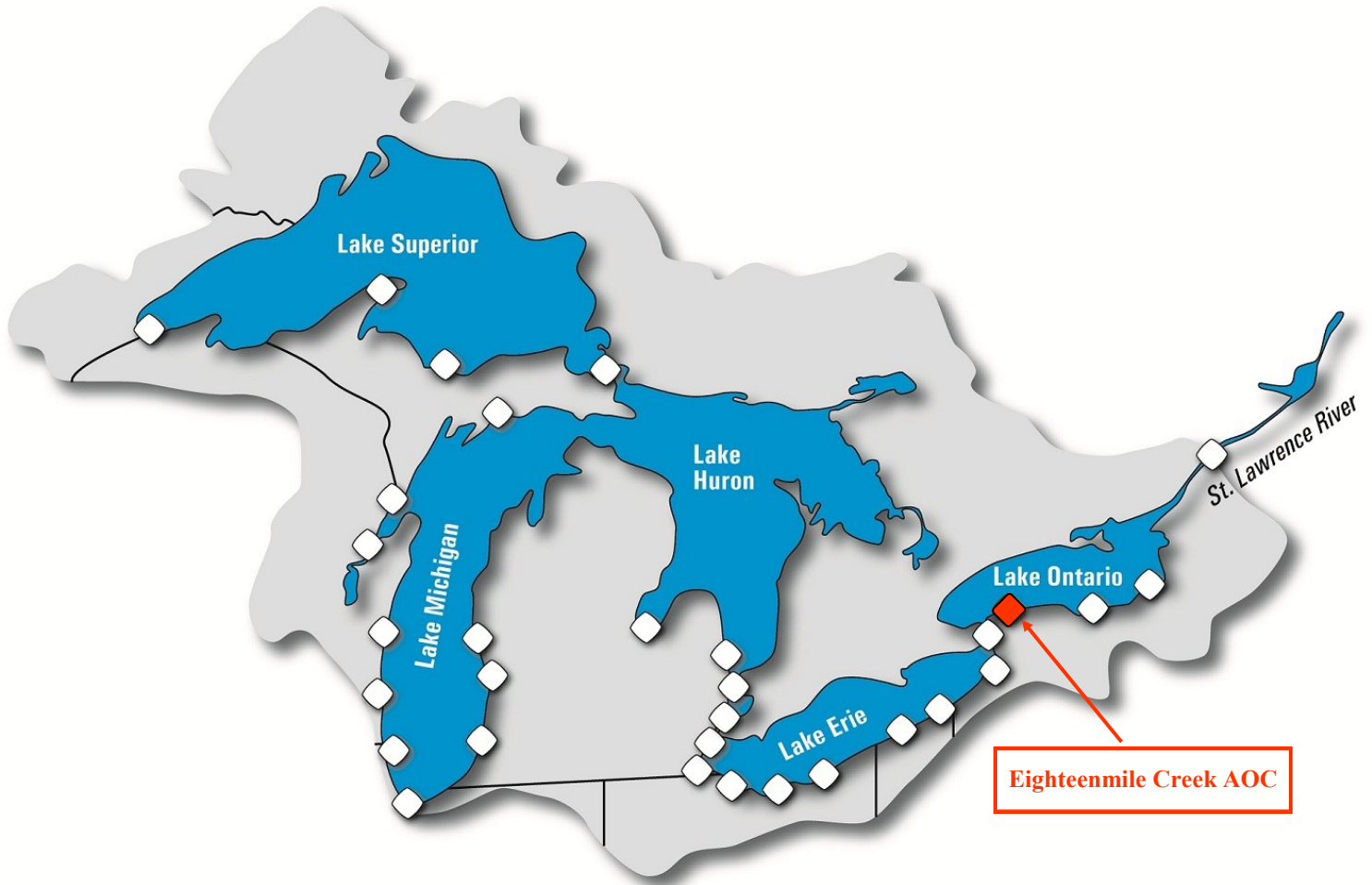
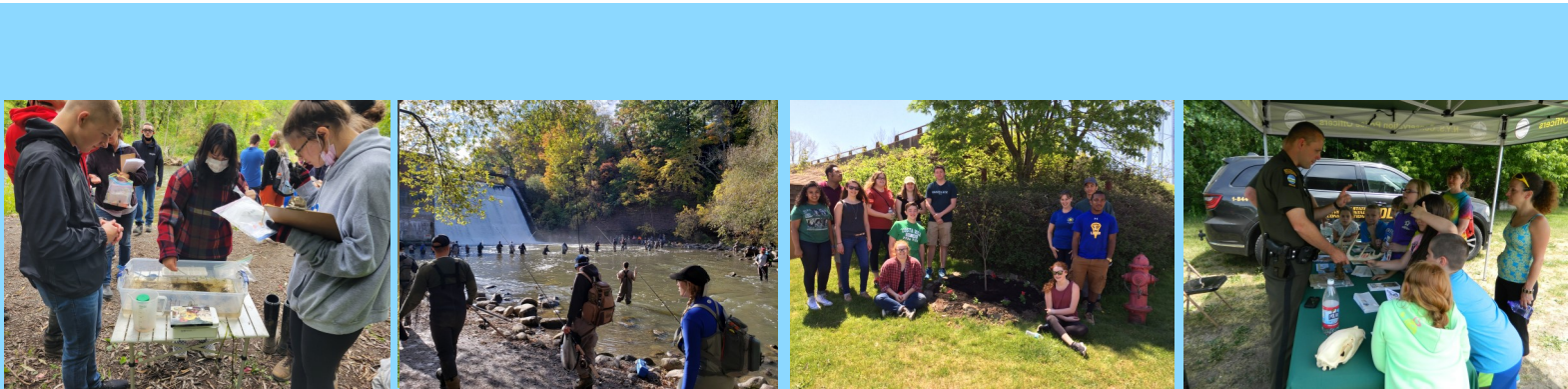


EIGHTEENMILE CREEK AREA OF CONCERN



2021 REPORT CARD



A COMPILATION OF SUCCESSSES, IMPROVEMENTS & CURRENT CONDITIONS



2021 AOC Newsletter Update

Progress has continued at Eighteenmile Creek Area of Concern (AOC) throughout 2021. The mink study was completed by SUNY Brockport, the US Army Corps of Engineers are nearly complete with surface water monitoring and outreach opportunities have restarted. The status of each project will be discussed in the following sections:

Are the results from the mink contaminant study ready yet?

This is the same question/topic as last year! A topic wouldn't normally be repeated, but there's good news— a final report was released in December 2021! Started in 2017 the study assessed impairment status of Beneficial Use Impairments (BUI) #3 (“Degradation of Fish and Wildlife Populations”) and BUI #5 (“Bird or Animal Deformities/Reproductive Problems”). Mink are the most sensitive species to PCBs, so they became a focal point to determine if contaminants caused deformities or reproductive problems. Given the small size and poor habitat of the AOC, live mink weren't able to be captured forcing a modeled approach. Mink dietary and bioaccumulation models have been used across other NYS AOCs by SUNY Brockport. Those models were refined and optimized for Eighteenmile Creek. Brockport's model captures mink prey (fish, crayfish and amphibians) as well as water samples to calculate an amount of PCBs that would bioaccumulate. Additional support for this project was provided by US Army Corps of Engineers and NYS DEC.



Above: Brockport grad student searches for frogs to be used in the study.



Above: Brockport's staff electrofishing in Eighteenmile Creek.

There are two different results that this type of modeling can determine. Chronic (health) would indicate reproductive failure or other deformities. Acute endpoints would show if mink accumulate PCBs that would result in death. Final modeling of this study suggests any mink permanently residing at Eighteenmile Creek AOC would likely suffer deformities and reproductive impairment. While chronic toxicity has been reached at Eighteenmile Creek AOC, acute toxicity is not probable.

These findings directly impact removal criteria in BUIs 3 and 5. BUI 3 may be removed when three separate criteria are met. The criteria addressed by the mink study states “PCB concentrations in fish tissue and other prey are below thresholds likely to result in acute toxicity to fish or piscivorous wildlife (birds and mammals).” The mink study fully addressed this criteria and will be discussed with a Remedial Advisory Committee to determine if the rest of the criteria are adequately

met. BUI 5 removal criteria has two parts, only one of them has to be met. The criteria addressed by the mink study states “PCB concentrations in fish and other prey are below tissue concentrations known to cause deformities or reproductive impairment in piscivorous wildlife.”. Based on SUNY Brockport's results this criteria will remain impaired and may be monitored though the AOC program while remedial activities through the federal Superfund program continue. A full report can be found at eighteenmilerap.com data repository.

US Army Corps of Engineers SPMD Monitoring

In 2020, the US Army Corps of Engineers (USACE) reviewed data available from the AOC, Superfund and other programs to determine the causes of BUI impairments. Their conclusion was that most BUIs are driven by high amounts of PCBs suspended in the water column. The source of PCBs will be determined by Superfund, but passive water monitoring of PCBs was completed by USACE throughout 2020 and 2021. Results of this sampling will estimate the amount of PCB loading from above Burt Dam as well as confirm their findings from the 2020 report.

Semipermeable membrane devices (SPMDs) were used because the devices can be left in a stream for weeks. By leaving SPMDs out for long periods of time, hundreds or thousands of gallons of water pass through the samplers and a long term average of contaminants for that period can be determined. This saves time and money when compared to surface grab samples, that would require multiple field personal, many trips to Eighteenmile Creek/reference site and multiple sampling events to build similar types of long term data.



Above: SPMDs collected from Eighteenmile Creek September 2020.

Below: Burt Dam power station September 2020



In Eighteenmile Creek, SPMDs were deployed at two sites in the AOC and one in Lake Ontario at the west pier in Olcott. Oak Orchard Creek had one sampling location below Waterport Dam and another sample at Lake Ontario. The first set of samples were installed in fall 2020. A second round was deployed at the same sites during spring 2021. Results of this study will be available in early 2022.

Where are we at with the BUIs?

BUIs are still impaired under the new removal criteria. It's easiest to discuss these as their own separate topics.

BUI 1. Restrictions on Fish and Wildlife Consumption	
Removal Criteria:	There are no AOC-specific fish and wildlife consumption advisories issued by New York State
Discussion:	Fish above and below Burt Dam continue to have elevated levels of PCBs. After a discussion with NYS Department of Health (DOH), an AOC specific consumption advisory is expected to remain in place until remedial work is complete and there has been a declining trend in contaminant levels in fish. Knowing Superfund remedial work will take years to complete, this is a BUI that is unlikely to be removed in the near future.
BUI 3. Degradation of Fish and Wildlife Populations	
Removal Criteria:	Fish community metrics (e.g., diversity, abundance, biomass, and condition) are similar to reference site(s); AND Benthic macroinvertebrate community composition is within the range expected and similar to reference site condition; AND PCB concentrations in fish tissue and other prey are below thresholds likely to result in acute toxicity to fish or piscivorous wildlife (birds and mammals).
Discussion:	The first part of this removal criterion was addressed in the fish community study by USGS in 2019. In general, there are no major differences in fish community metrics between Eighteenmile Creek and Oak Orchard Creek. Since the fish communities are similar, this part of the criteria is considered to be met. Benthic macroinvertebrate communities were addressed in reports from 2013 and 2017. Minor differences in macroinvertebrate communities were found between Eighteenmile Creek and Oak Orchard Creek, but not at a level that would impact fish and wildlife population levels. Since macroinvertebrate communities are similar to Oak Orchard Creek, this part of the criteria is also considered met. The third part of this criteria was addressed with the mink study from SUNY Brockport. Brockport modeled acute (lethal) toxicity to mink and results suggest no impairment. Since all three criteria are met, this data will be reviewed by the Remedial Advisory Committee to determine if BUI removal is appropriate.
BUI 5. Bird or Animal Deformities/Reproductive Problems	
Removal Criteria:	PCB concentrations in fish tissue from comparable functional feeding groups are similar to reference site(s); OR PCB concentrations in fish and other prey are below tissue concentrations known to cause deformities or reproductive impairment in piscivorous wildlife.
Discussion:	It's well known that resident fish in the AOC have elevated levels of PCBs. Therefore, this part of the BUI will not likely be met until after remediation is complete. The second criteria for deformities or reproductive impairment is also still impaired based on the SUNY Brockport mink study.
BUI 6. Degradation of Benthos	
Removal Criteria:	Benthic macroinvertebrate communities are “non-impacted” or “slightly impacted” according to NYSDEC indices; OR Benthic macroinvertebrate community condition is similar to unimpacted control sites of comparable physical and chemical characteristics; AND Toxicity of sediment-associated contaminants is similar to unimpacted control sites of comparable physical and chemical characteristics.
Discussion:	The first criteria uses DEC guidelines as a measuring stick, which is a good starting point for assessment. Previous studies have shown that both Eighteenmile Creek and a suitable reference site are slightly to moderately impacted by DEC guidelines, causing us to use the second and third criteria. Analysis of benthic macroinvertebrate community structure and sediment toxicity were generally similar between Eighteenmile and Oak Orchard Creek, although one site in the AOC ranked more poorly than other sites. A recent data review suggests that other factors such as seasonal eutrophication or poor habitat could be the cause of impairment. USGS started an assessment in 2021 to confirm impairment status. This study will assess community structure, toxicity and habitat to characterize Eighteenmile Creek and a reference site. Results of this study are expected in late 2022.

WHAT IS THE EIGHTEENMILE CREEK AREA OF CONCERN (AOC) ?

Local, state and federal officials identified a section of Eighteenmile Creek as one of 42 “Areas of Concern” (AOC) in the Great Lakes Basin. Eighteenmile Creek received this designation because of poor water quality and contaminated sediments present throughout the watershed. Eighteenmile Creek’s long history of use by major industries in the area, especially near the City of Lockport and Town of Newfane, has played a large role in the present condition of the creek.

WHAT IS THE EIGHTEENMILE CREEK REMEDIAL ACTION PLAN (RAP) ?

A RAP is an integrated, whole ecosystem approach to remediating impaired water bodies. The RAP first identifies use impairments, their causes, and contaminant sources, using existing studies and data. Next, existing cleanup and regulatory programs which apply to the water body are identified. A coordinated cleanup strategy is then developed to eliminate the use impairments. The NYS Department of Environmental Conservation produced the Stage 1/2 RAP in 1997 in an effort to restore the integrity of the creek’s ecosystem.

WHAT IS THE EIGHTEENMILE CREEK REMEDIAL ADVISORY COMMITTEE (RAC) ?

The Eighteenmile Creek RAC is comprised of a group of local, state and federal stakeholders, representing industries, organizations and local communities with a vested interest in the health of Eighteenmile Creek. The RAC is responsible for implementing the RAP, monitoring restoration efforts, and assessing ongoing needs and conditions. After a brief hiatus, the RAC reconvened in 2005 and is currently making progress in moving the RAP forward.

If you have a vested interest in Eighteenmile Creek and are want to help advance the RAP, contact our office and we would be happy to speak with you!

GREEN Outreach

Through the Global Rivers Environmental Education Network (GREEN) we’ve teamed with our local General Motors plant in Lockport to explore the Eighteenmile Creek watershed. The program allows students from Lockport, Newfane and Niagara BOCES to visit streams within the Eighteenmile Creek watershed and other areas in the county to investigate water quality issues through observations or nutrient testing (photos below). Throughout the school year classes will discuss solutions to the issues found in the fall field trip. These discussions will lead to the class implementing one of their solutions in spring 2022.



FOR MORE INFORMATION
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