Rouge River Watershed

Welcome Packet

Friends of the Rouge

Sea Grant Michigan

michigan WATER SCHOOL

MICHIGAN STATE UNIVERSITY | Extension

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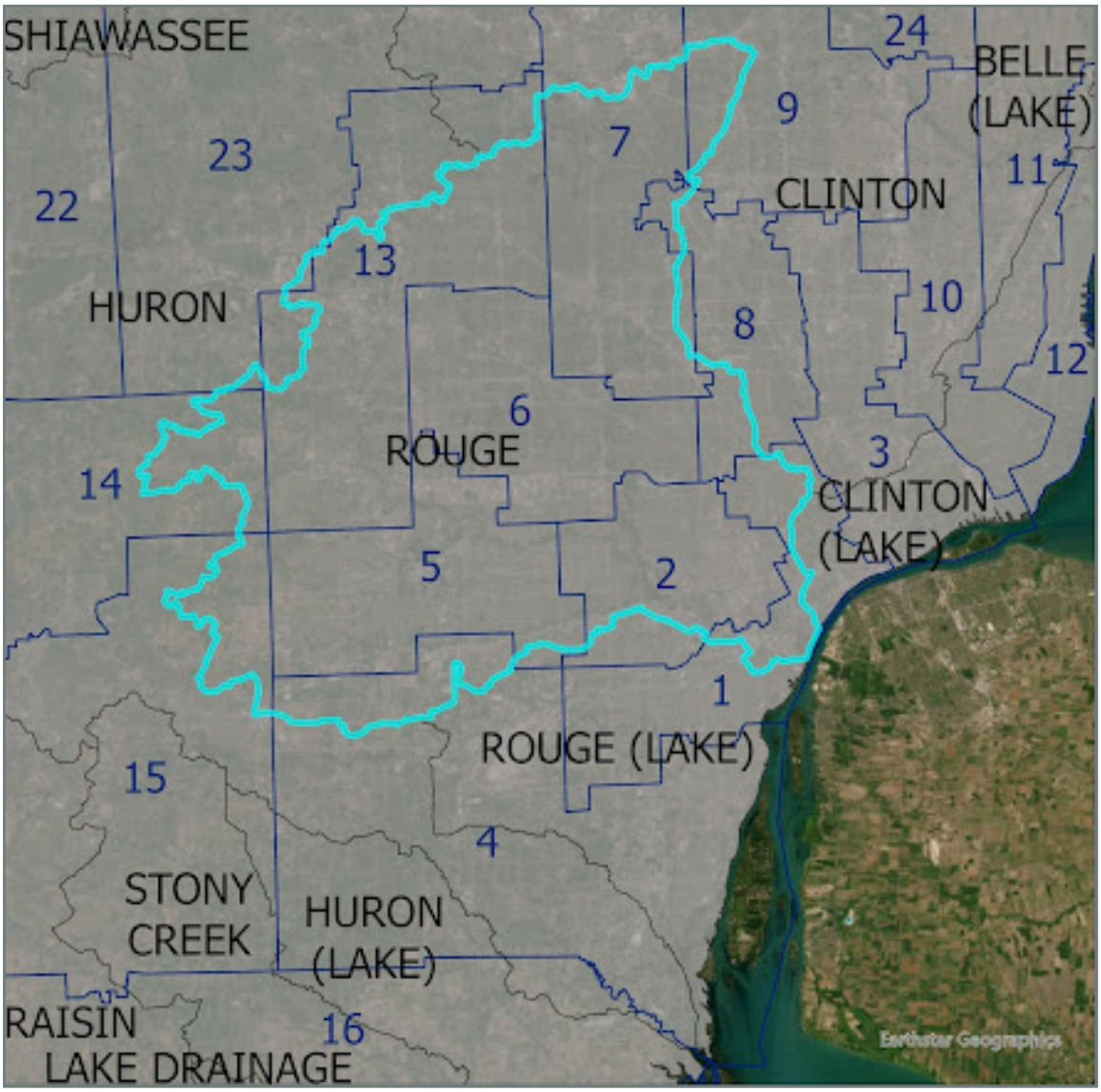
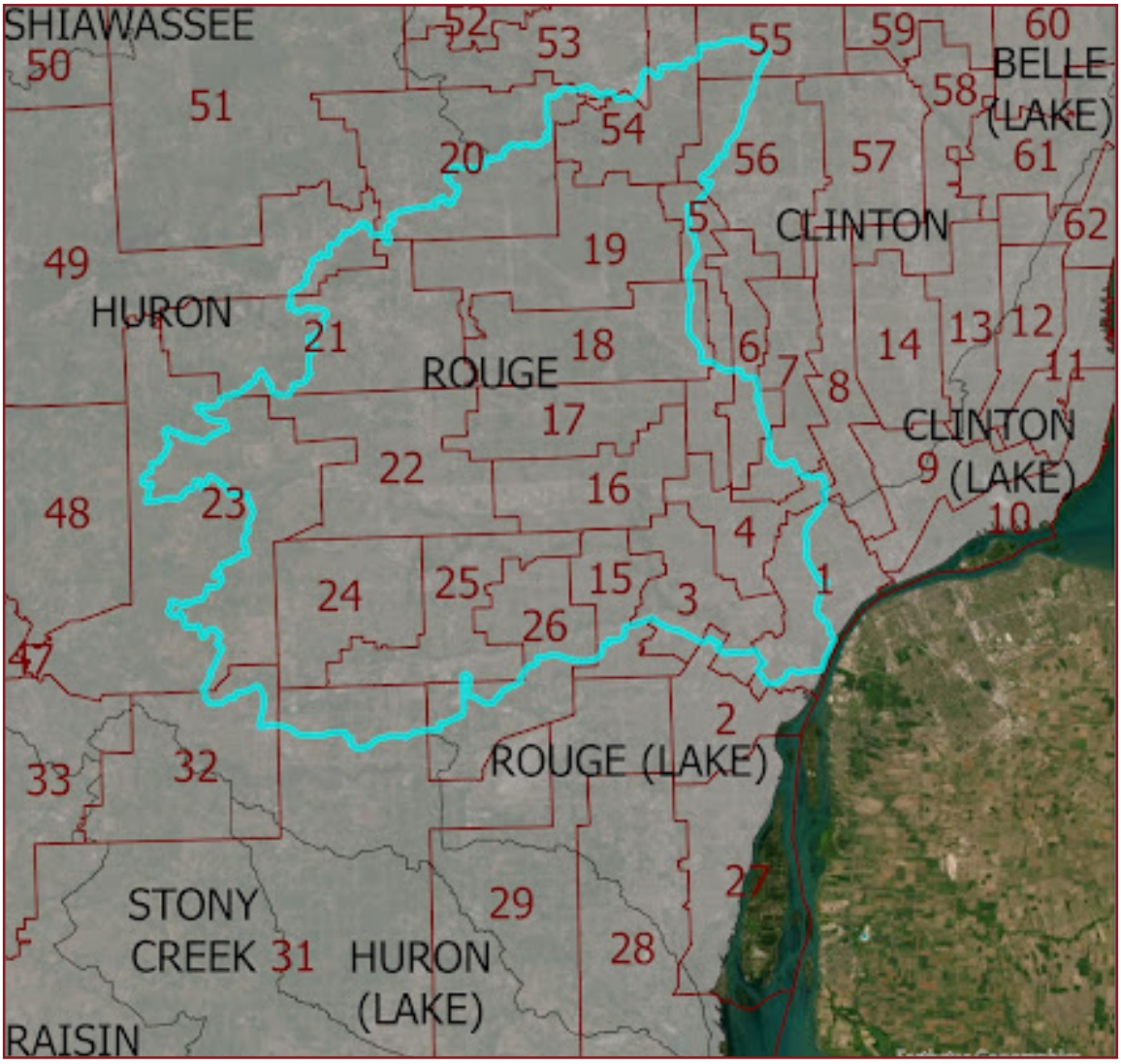
Senate District Map



2023 MICHIGAN STATE SENATORS

District 1	Erika Geiss	District 6	Mary Cavanagh	District 13	Rosemary Bayer
District 2	Sylvia Santana	District 7	Jeremy Moss	District 14	Sue Shink
District 4	Darrin Camilleri	District 8	Mallory McMorrow	District 15	Jeff Irwin
District 5	Dayna Polehanki	District 9	Michael Webber	District 23	Jim Runestad

House District Map



2023 MICHIGAN STATE REPRESENTATIVES

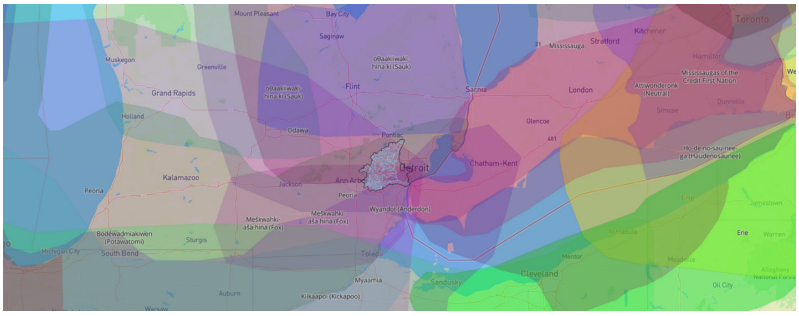
District 1	Tyrone Carter	District 17	Laurie Pohutsky	District 26	Dylan Wegela
District 2	Tullio Liberati	District 18	Jason Hoskins	District 31	Reggie Miller
District 3	Albas Farhat	District 19	Samantha Steckloff	District 32	Jimmie Wilson
District 4	Karen Whitsett	District 20	Noah Arbit	District 49	Ann M. Bollin
District 5	Natalie Price	District 21	Kelly Breen	District 53	Brenda Carter
District 6	Regina Weiss	District 22	Matt Koleszar	District 54	Donni Steele
District 7	Helena Scott	District 23	Jason Morgan	District 55	Mark Tisdel
District 15	Erin Byrnes	District 24	Ranjeev Puri	District 56	Sharon MacDonell
District 16	Stephanie Young	District 25	Kevin Coleman		

Hello, and welcome to the Watershed!

A WATERSHED IS AN AREA OF LAND THAT DRAINS INTO A BODY OF WATER. WE ALL HAVE WATERFRONT PROPERTY: ANY ACTION TAKEN ON OUR LAND IMPACTS THE HEALTH OF OUR LOCAL AND REGIONAL WATERWAYS.

Land Acknowledgment

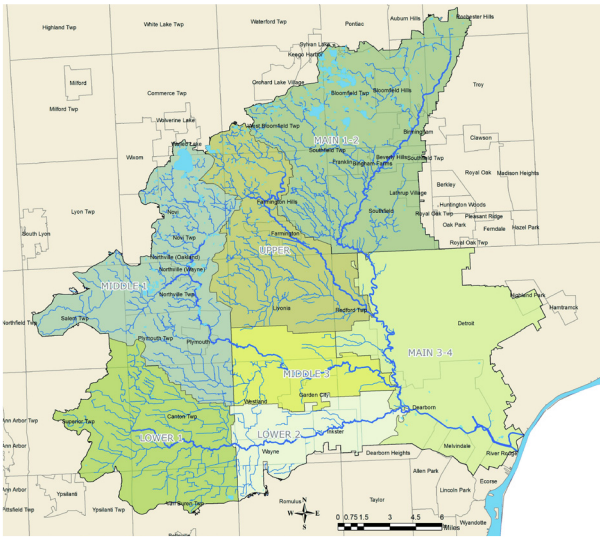
To demonstrate respect, raise awareness, and affirm the ongoing relationships between indigenous people and the land, we acknowledge the ancestral, traditional, and contemporary lands on which our watershed exists.



- Meškwahki·aša·hina (Fox)
- Peoria
- Anishinabewaki
- Bodéwadmiakiwen (Potawatomi)
- Myaamia
- Mississuaga

The Rouge River watershed, in Southeast Michigan:

- Drains 467 square miles
- Has four major branches (Main, Upper, Middle, and Lower), 127 river miles, and numerous tributaries
- Is home to more than 400 lakes, impoundments, and ponds
- Spans three counties (Oakland, Washtenaw, and Wayne) and 47 municipalities:



Allen Park
Auburn Hills
Beverly Hills
Bingham Farms
Birmingham
Bloomfield Hills
Bloomfield Township
Canton Township
Commerce Township
Dearborn
Dearborn Heights
Detroit
Farmington
Farmington Hills
Franklin
Garden City
Highland Park
Inkster
Lathrup Village
Livonia
Lyon Township
Melvindale
Northville
Northville Township
Novi
Novi Township
Oak Park
Orchard Lake Village
Plymouth
Plymouth Township
Pontiac
Redford Township
River Rouge
Rochester Hills
Romulus
Salem Township
Southfield
Southfield Township
Superior Township
Troy
Van Buren Township
Walled Lake
Wayne
West Bloomfield Township
Westland
Wixom
Ypsilanti Township

The Challenges:

URBANIZATION: Humans are reshaping the land to make their homes

SEWAGE IN THE RIVER: Aging infrastructure + big rain events allow raw sewage to enter the river

POLLUTANTS: What people do on land directly impacts the health of our waterways

INVASIVE SPECIES: Aggressive plants, animals, and insects are moving into our watershed, damaging key habitat and pushing out the diverse community of organisms that keep our ecosystem healthy

EMERGING CONTAMINANTS: Keep an eye out for these new threats to human and animal health

CLIMATE CHANGE: Think global, act local. Our changing climate is already impacting the Rouge River with more frequent high rain falls (six of the highest rainfall years have happened since 2006) and increasing temperatures.

Friends of the ROUGE

Who we are—

Friends of the Rouge is a 501(c)(3) non-profit organization whose mission is to restore, protect, and enhance the Rouge River watershed through stewardship, education, and collaboration.

What does this mean? We are your one-stop-shop for all things Rouge. We have our finger on the pulse of major environmental issues in your community. If we don't have the answer, we likely know who does. Let's talk! Please reach out to us anytime. We have open office hours Monday–Thursday from 10am–4pm. Visit us online anytime at therouge.org.

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Keep reading throughout this guidebook to learn more about each issue and what YOU can do to help!

Issues

Invasive Species

Red swamp crayfish

What are invasive species?

Invasive Species are organisms that cause economic, environmental, or human health harm when introduced to an ecosystem where they are non-native. Most introduced species are neutral or beneficial, but some have characteristics like tolerance to a wide variety of conditions and the ability to produce many offspring in a short period of time that allow them to crowd out native species.

What is the problem with invasive species?

Invasive species can decimate native species and cause economic and health damage. Sea lamprey devastated the native fish population in the Great Lakes by parasitizing and killing the fish. Zebra mussels clog water intake pipes, and concentrate E. coli bacteria, posing both economic and human health threats. Garlic mustard carpets the forest floor and releases toxins, creating an inhospitable environment for native spring ephemerals and other plants that pollinators and wildlife rely on. The effects of invasive species often echo through the system in ways that are not apparent until much later. Zebra mussels eat harmless green algae, allowing cyanobacteria to grow and potentially produce harmful algal blooms that turn swim areas into pea soup, sicken pets and swimmers, and contaminate drinking water. A 2021 study estimated that invasive species cost North American countries $2 billion in damage annually.

Invasive species are most effectively addressed by preventing them from invading in the first place. If they do invade, catching and eradicating them early can be effective. Once an invasive species is entrenched, it can be impossible to remove. Because of this, Michigan maintains a “Watch List” of invasive species that have not been identified in the wild or have limited known distribution in Michigan, to be prioritized for surveillance, reporting, and other possible responses in order to reduce the risk of impact to valued assets. These species can be found on the Michigan EGLE Watch List. Some species on this list are restricted and illegal to possess or sell.

European Frog-bit intermixed with phragmites

What species should you be concerned about in Southeast Michigan?

www.michigan.gov/invasives/id-report/prohibitedrestricted

The Michigan Invasive Species Information Network (MISIN) keeps a list of Watch List as well as non-watch list species and has a tool for reporting them. They feature information about how to identify species and map their known distribution. Any Watch List species are of utmost concern and should be reported immediately. Friends of the Rouge is currently part of a project to survey for Watch List species European Frogbit to determine the extent of its infestation in an area of the watershed where they were recently found. Early detection of the spread followed by treatment can be effective at limiting the spread and impact. Another Watch List species, Red Swamp crayfish, have invaded ponds in a portion of the watershed where the DNR has been working furiously to control them. Any sightings of these bright red crayfish should be reported to the DNR or through MISIN. They dig gigantic burrows that destabilize banks and aggressively overpopulate, wiping out most of the rest of the aquatic animals in the pond.

Non-Watch List species are also a huge concern, especially if they are not yet present in an area. Zebra mussels and round goby moved up into the Rouge River most likely through bait bucket release. Asian clams are also becoming ubiquitous in the Rouge River watershed. It is very important to clean any clothing, gear, or boats you use in another body of water before moving to another one so you do not become the vector who brought them in.

Invasive plants like garlic mustard, exotic honeysuckle, common and glossy buckthorn, phragmites, and purple loosestrife are all some of the most problematic in the Rouge River watershed. Our forest edges are quickly filling in with woody honeysuckle and buckthorn, degrading the habitat and outcompeting native plants our wildlife relies on. Phragmites have the ability to suck a wetland completely dry such that few other plants can live.

Friends of the Rouge has been at the forefront of discovering and reporting invasive species through our monitoring programs. Round goby and red swamp crayfish were first noticed and reported by members of our fish survey team. Due to our long term monitoring program, we have been able to document the migration of the round goby up the Lower branch and its effect on the native fish community.

What are steps to eradicate already established invasive species?

Cooperative Invasive Species Management Areas (CISMAs) are partnerships of groups and individuals that work to address invasive species impacts on the environment, economy and human health within a defined region. By collaborating across jurisdictional boundaries, CISMAs work to leverage resources and overcome challenges associated with the prevention, early detection, response, and control of invasive species.

Contact your local CISMA if you have questions about invasive species or if you are interested in becoming involved in efforts to prevent and control invasive species in your community.

www.michigan.gov/invasives/take-action/local-resources

How does Friends of the Rouge help?

Friends of the Rouge provides information about invasive species on the website and through email posts, newsletters, and social media. We regularly share alerts about new invaders like the spotted lantern fly as well as informational webinars and identification training sessions. At our restoration and cleanup days, we often engage volunteers in invasive species removal on public and private lands. Participants learn to identify and remove them and therefore become educated about how to address this on their own property.

Friends of the Rouge encourages the planting of native plant species and eradication of invasive species. Our rain garden education promotes planting a diverse mix of plants/trees/shrubs that will help the ecosystem become more resilient in the face of new invasive species. We offer sales of native plants so that homeowners and businesses can plant them. We favor native plants in all of our green infrastructure projects and train maintenance staff on the identification of invasives.

Our monitoring practices minimize the spread of invasive species by assigning teams to sample within the same branch or providing disinfection supplies and instruction. Paddlers are instructed to wash/dry their water crafts following a padding event and we provide written and verbal information about this at all group paddling events.

What can you do to mitigate the effects of invasive species on our ecosystem?

Elected officials can help develop legislation to ban the sale and distribution of invasive species and encourage the use of all native plants in any sponsored projects. Both terrestrial and aquatic invasive species are still being sold at garden centers, aquariums, and pet stores, as well as online. Developing laws that ban the sale of invasive species in our region will go a long way in reducing the spread. Favoring native plants in projects can help to develop a stronger market for the plants that should be there rather than planting Kentucky bluegrass, Japanese barberry, and day lilies in every landscape.

Addressing potential invasion points like ballast water and the aquarium industry will reduce current and future invasions. As many as 100 invasive species arrived in the Great Lakes when a ship dumped its ballast water. Stricter protocols for how ships dispose of ballast water when they enter the Great Lakes from the sea would have helped to prevent this.

Ensuring funding remains for invasive species program efforts, such as through the Great Lakes Restoration Initiative, are crucial for this fight against these invaders. Efforts throughout the Great Lakes region to stop the spread of invasive species should be supported.

Emerging Contaminates

What are emerging contaminants?

Emerging contaminants, or contaminants of emerging concern, can refer to many different kinds of chemicals, including medicines, personal care or household cleaning products, lawn care and agricultural products, among others. One of the ways they end up in our waterways is through wastewater treatment plant discharges. These facilities were not designed to remove them.

What is the problem with emerging contaminants?

These chemicals make it into our nation's lakes and rivers and have a detrimental effect on fish and other aquatic species. They have also been shown to bioaccumulate up the food web - putting even non-aquatic species at risk when they eat contaminated fish. The USGS monitors and assesses these dangerous chemicals from their source all the way through the food web (USGS).

A recent study found PFAS in all fish tested in both the Rouge and Huron rivers

Examples of emerging contaminants:

PER AND POLYFLUOROALKYL SUBSTANCES (PFAS) are a group of manufactured chemicals that have been used in consumer products since the 1940s. Known as "forever" chemicals because they do not break down in nature, they are widely used in firefighting equipment, non-stick pans, food wrappers, raincoats, carpet and industrial uses due to their ability to dissolve in both oil and water. There are over 4,700 PFAS compounds. PFAs are highly toxic to humans and some forms bioaccumulate in our bodies. PFAS exposure may increase the incidence of thyroid disease, decrease fertility in women, cause developmental issues in infants and older children, and increase blood pressure and cholesterol levels. They have also been linked to increased risks of kidney and testicular cancer. (EPA)

MICROPLASTICS are small plastic pieces less than five millimeters long which can be harmful to our ocean and aquatic life. Microplastics come from a variety of sources, including from larger plastic debris that degrades into smaller and smaller pieces, to lentil sized primary microplastics known as "nurdles" that are produced by the petrochemical industry to be used in the production of bags and other single-use plastic packaging. In addition, microbeads, a type of microplastic, are very tiny pieces of manufactured polyethylene plastic that are added as exfoliants to health and beauty products, such as some cleansers and toothpastes. These tiny particles easily pass-through water filtration systems and end up in the ocean and Great Lakes, posing a threat to aquatic life and drinking water sources. (NOAA)

POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) are a class of chemicals that occur naturally in coal, crude oil, and gasoline. They also are produced when coal, oil, gas, wood, garbage, and tobacco are burned. PAHs generated from these sources can bind to or form small particles in the air. Several of the PAHs and some specific mixtures of PAHs are considered to be cancer-causing chemicals (EPA).

1,4-DIOXANE is a synthetic industrial chemical that mixes completely in water. It persists for a very long time in the environment and is associated with many health risks. Manufacturers often use it as a solvent to create other chemicals like those found in cosmetics, detergents, shampoos, paint strippers, glues, pesticides, medicines and foods. It is also used in the manufacturing of pharmaceuticals and is a byproduct in the production of certain plastic containers. The EPA suspects 1,4-dioxane may cause cancer when people are exposed to it through air, water, or by skin contact over time. Short-term exposure effects include eye and nose irritation. Other long-term exposure effects may include liver and kidney damage (HRWC).

How does Friends of the Rouge help?

Friends of the Rouge seeks to stay informed on the most up-to-date research on emerging contaminants so that we can protect our program participants from potential exposure, educate the general public about the issue, and examine the effect on aquatic life and the watershed. Wayne State University published a report in 2021 showing a multitude of synthetic sweeteners, pharmaceuticals, stimulants, pesticides, and chemicals such as PFAS at the mouth of the Rouge River. The likely source is the Detroit wastewater treatment plant. Since no drinking water is obtained from the Rouge River, exposure to emerging contaminants for humans is mainly through recreation—paddling and fishing.

PFAS is of particular concern as recent testing in Michigan has found hotspots around the state and in the Rouge River. Paddlers and anglers are at risk for PFAS exposure if they come into contact with PFAS foam or consume contaminated fish. Testing by Michigan's Department of Environment, Great Lakes, and Energy (EGLE) has found contaminated fish in the Lower branch and Main stem, leading to a fish consumption advisory in the summer of 2022 for sunfish in the Lower branch and downstream all the way to the Detroit River. Friends of the Rouge has partnered with the Ecology Center and Wayne State University's Healthy Urban Waters to collect and test more fish for PFAS in the Rouge River. The results will be used to guide the development and distribution of educational information and materials. We are working with the Department of Health and Human Services on the distribution of pamphlets and posting of signage at locations frequented by anglers.

What can you do to mitigate problems caused by emerging contaminants?

Michigan has been a national leader in response to PFAS, setting limits for PFAS in drinking water in 2014 for two PFAS compounds and expanding that to seven PFAS compounds in 2020. A map of contaminated sites can be found here: MPART.

Officials can mitigate problems with emerging contaminants like PFAS by focusing on preventing new production and spread of these products and allocating funding to identify and treat areas of contamination. Legislation is needed to ban the production and use of any PFAS. Guidelines for new state and municipal purchases should prohibit PFAS containing products. Funding is needed for contaminated sites and for upgrades to water treatment plants to adequately remove these chemicals as well as for research on contamination and remediation. And industry needs to be made accountable for cleaning up contaminated sites they are responsible for causing.

Examples of plastic pollution reduction efforts include installing water fountains for reusable bottle refills and banning single-use plastics such as plastic grocery bags, styrofoam, and drinking straws.

In addition, regulators are taking the first step towards quantifying the risk to people's health—measuring exposure. In July 2022, the California State Water Resources Control Board, a branch of the state's environmental protection agency, will become the world's first regulatory authority to announce standard methods for quantifying microplastic concentrations in drinking water, with the aim of monitoring water over the next four years and publicly reporting the results.

Support for state regulations against these contaminants and/or polluter-pay legislation should be considered. Funneling funding towards clean-up efforts and source detection will organize efforts around this growing problem. Stringent drinking water regulations will ensure the health of your constituents that call our state home.

Any standards should be cumulative and be re-evaluated periodically (for example, every two years) since there are so many different compounds and this is a compounding issue threatening human health.

Climate Change

Flooding in Dearborn Heights

What is climate change?

Climate change is a long-term shift in the average weather patterns that have come to define Earth's local, regional and global climates. These changes have a broad range of observed effects that are synonymous with the term. Changes observed in Earth's climate since the early 20th century are primarily driven by human activities, particularly fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere, raising Earth's average surface temperature. (NASA)

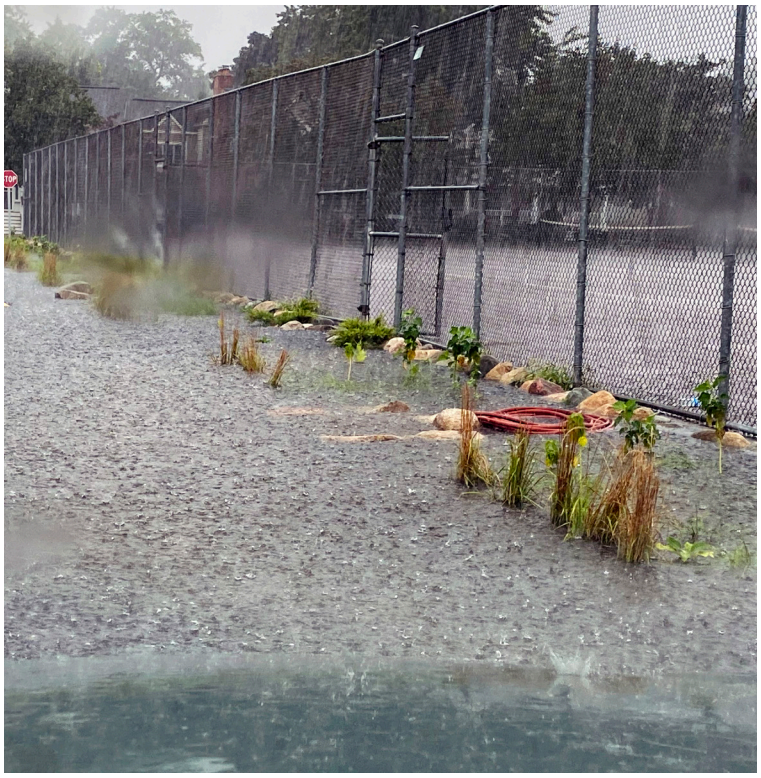
What is the problem with climate change?

The answers lie in defining what are climate disruptions and how they are caused:

FLOODING— Climate change may cause river floods to become larger or more frequent than they used to be in some places yet become smaller and less frequent in other places. As warmer temperatures cause more water to evaporate from the land and oceans, changes in the size and frequency of heavy precipitation events may in turn affect the size and frequency of river flooding. Changes in streamflow, the timing of snowmelt, and the amount of snowpack that accumulates in the winter can also affect flood patterns. (EPA)

"HEAVY PRECIPITATION" refers to instances during which the amount of rain or snow experienced in a location substantially exceeds what is normal, especially when it happens in a very short period of time. What constitutes a period of heavy precipitation varies according to location and season. Climate change can affect the intensity and frequency of precipitation. Warmer oceans increase the amount of water that evaporates into the air. When more moisture-laden air moves over land or converges into a storm system, it can produce more intense precipitation. The potential impacts of heavy precipitation include an increase in flood risk, soil erosion, and crop damage due to heavy rains—which in turn can lead to injuries, drownings, and other flooding-related effects on health. In addition, runoff from precipitation can impair water quality as pollutants deposited on land wash into water bodies.

WATER LEVELS— In recent years, warmer surface water temperatures in the Great Lakes have contributed to lower water levels by increasing rates of evaporation and causing lake ice to form later than usual, which extends the season for evaporation. Lower water levels in the Great Lakes forced ships to reduce their cargo



Heavy rain fills rain gardens and floods a tennis court and parking lot

tonnage by 5 to 8 percent between 1997 and 2000, which increased shipping costs. Lower water levels can also affect water supplies, the usability of infrastructure such as docks and piers, and shoreline ecosystems. These types of disruptions from low water levels are expected to continue as the climate changes. Another possible effect of warmer water, reduced ice cover, and increased evaporation is a corresponding increase in precipitation over nearby land, especially "lake effect" snow. Rising water temperatures are also expected to expand the ranges of and give new advantages to some invasive species such as the zebra mussel, and to encourage the growth of certain waterborne bacteria that can make people ill.

DAM FAILURE— The Rouge River watershed has several operating dams that are aging and at risk of failure with the increase in severe weather events and heavy precipitation.

How does Friends of the Rouge help?

Friends of the Rouge acknowledges that the impacts of climate change affect everyone, but especially our underserved communities and communities of color. Severe floods in 2014 and 2021 affected Detroit and south and east Dearborn residents more than other areas. Residents here have few resources to deal with flooded cars and basements and loss of furnaces and appliances. The older urban areas of the watershed are at the downstream end and are forced to contend with water coming in from all of the communities upstream. Development in upstream communities adds more stormwater to the system by increasing the number of impervious surfaces such as roads, driveways, and roofs, and often reducing tree canopy coverage to clear the way for new developments. Our underserved communities often lack access to green spaces such as parks that would assist with flood control, and are on combined sewer systems that discharge raw sewage into the river each time it rains.

Friends of the Rouge offers workshops, training programs and opportunities for residents, municipalities and other institutions like churches to design and install rain gardens and other green infrastructure to mitigate flooding. We also are working to plant trees, especially in underserved communities which tend to have fewer parks, trees, and green space.

What can you do to mitigate the effects of climate change on communities?

Officials can work to develop land protection policies to preserve undeveloped land in headwater areas, prohibit building in floodplains, and plan development based on projections of an increasing number of heavy precipitation events. They can also encourage ordinances or support initiatives that create or preserve "green infrastructure" such as native plantings (rain or pollinator gardens) and trees, and work to support pollution input reductions by separating combined sewers in our underserved communities. Our underserved communities do not have a wealthy tax base to pull from, and additional resources are necessary to assist in providing these crucial, and very expensive, infrastructure updates.

Nonpoint Source Pollution

Trash accumulates in a logjam

What is nonpoint source pollution?

Nonpoint source (NPS) pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and ground waters.

NON-POINT SOURCE POLLUTION CAN INCLUDE:

- Excess fertilizers, herbicides and insecticides from residential areas, golf courses, and agricultural lands
- Oil, grease, and toxic chemicals from urban runoff and energy production
- Sediment from improperly managed construction sites, eroding stream banks, and crop and forest lands
- Bacteria and nutrients from pet wastes, excessive numbers of waterfowl (namely Canada geese), faulty septic systems, and livestock
- Road salt
- Litter

What is the problem with nonpoint source pollution?

States report that NPS pollution is the leading remaining cause of water quality problems. The effects of NPS pollutants on specific waters vary and may not always be fully assessed. However, we know that these pollutants have harmful effects on drinking water supplies, recreation, fisheries, and wildlife. (EPA)

How does Friends of the Rouge help?

Education on pollution prevention should start in your community at a young age. Our Rouge Education Project works with teachers to get their students to the banks of the river for water quality testing where they assess the physical, chemical, and biological health and are encouraged to take action to improve the river based on their results. The State of Michigan does not do frequent monitoring or sampling of the river for non-point

source pollution. Our monitoring programs such as the Rouge Education Project, bug hunts, and SaltWatch and NitrateWatch through the Izaak Walton League provide the most recent snapshots as to what non-point source pollutants are entering our waterways and the impact they have.

FOTR citizen scientists who collect data for Friends of the Rouge undergo training in the Illicit Discharge Elimination Program, learning how to identify signs and sources of illegal and illicit discharges and how and where to report them. These volunteers, interns, and staff are often in river or wetland locations that are seldom visited or checked. As a result of this training, our monitors have discovered and reported discharges ranging from sewage, oil, and antifreeze and severe erosion issues that would likely never have been noticed or addressed. The awareness the training provides has led many participants to report spills they see outside of their work for Friends of the Rouge. One of our volunteers was the first to report the river turning bright green behind his house, leading to a quick response, cleanup, and identification of the source.

Restoration Programs inform and engage watershed residents and corporate citizens in activities that directly reduce nonpoint source pollution in our Rouge River. This is achieved through our Rain Gardens to the Rescue and Master Rain Gardener training courses, rain garden installations, tree plantings, rain garden maintenance work days, and informational seminars.

Residents can get involved by participating in river clean-up events, learning about restoration practices such as the installation of rain gardens, native plantings, safe fertilizer use, and rethinking the standard “mowed lawn” practice in their community. Residents can also help by picking up pet waste before it rains and washing vehicles on the lawn or at a car wash rather than on driveways.

What can you do to reduce and mitigate the effects of nonpoint source pollution in our communities?

SHARE AT HOME REMEDIES FOR RESIDENTS:

- Properly dispose of oils and chemicals at Household Hazardous Waste Days or return them to manufacturers who will take them back
- Repair leaky vehicles as soon as you notice the leak
- Pick up pet waste
- Use lawn and garden fertilizers sparingly and with care
- Replace mowed grass with native trees, shrubs, and flower (or rain) gardens
- Ensure detention ponds and streams have a native plant buffer
- Reduce use of road salt or explore alternatives and reduction practices such as the use of brine (a salt/water mix), or only salting roads at the most effective temperatures
- Participation in river clean-up events

You can also help by promoting and/or organizing household hazardous waste collections, encouraging the use of storm drain covers that say No Dumping/Drains to River or Waterbody, sharing our programming in local schools and to municipalities, attending our events, or inviting a speaker to come to one of your events. Please always listen to concerns from residents of all ages.

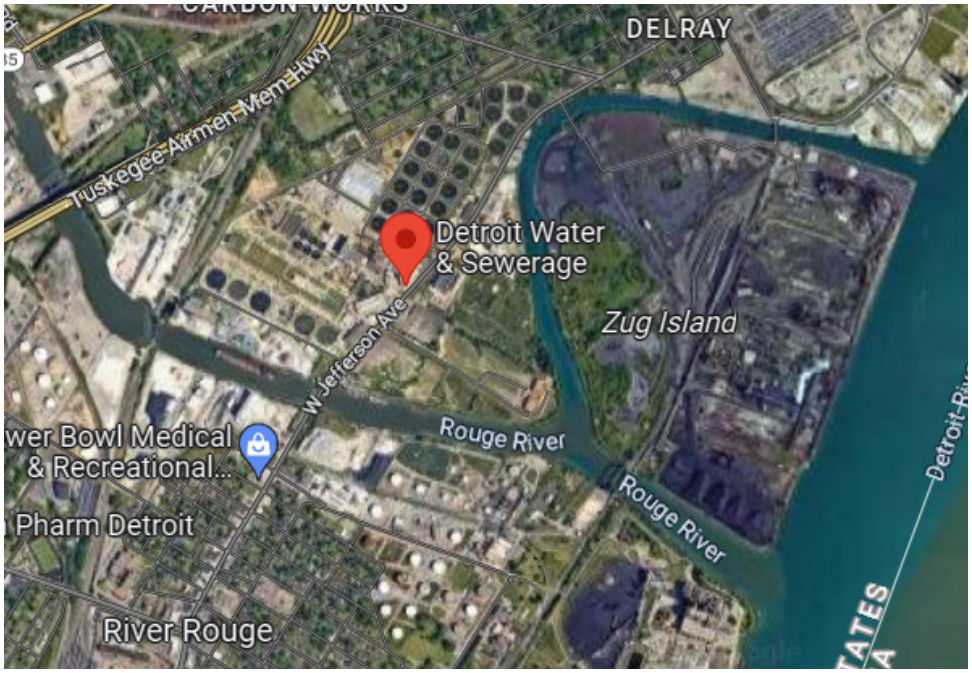
Non-point source pollution education helps communities fulfill the public education component of state municipal and school district stormwater permit requirements. There are also gaps in legislation regulating the maintenance of septic systems.

Sanitary Sewer Overflows (SSOs) and Combined Sewer Overflows (CSOs)

What are Sanitary Sewer Systems?

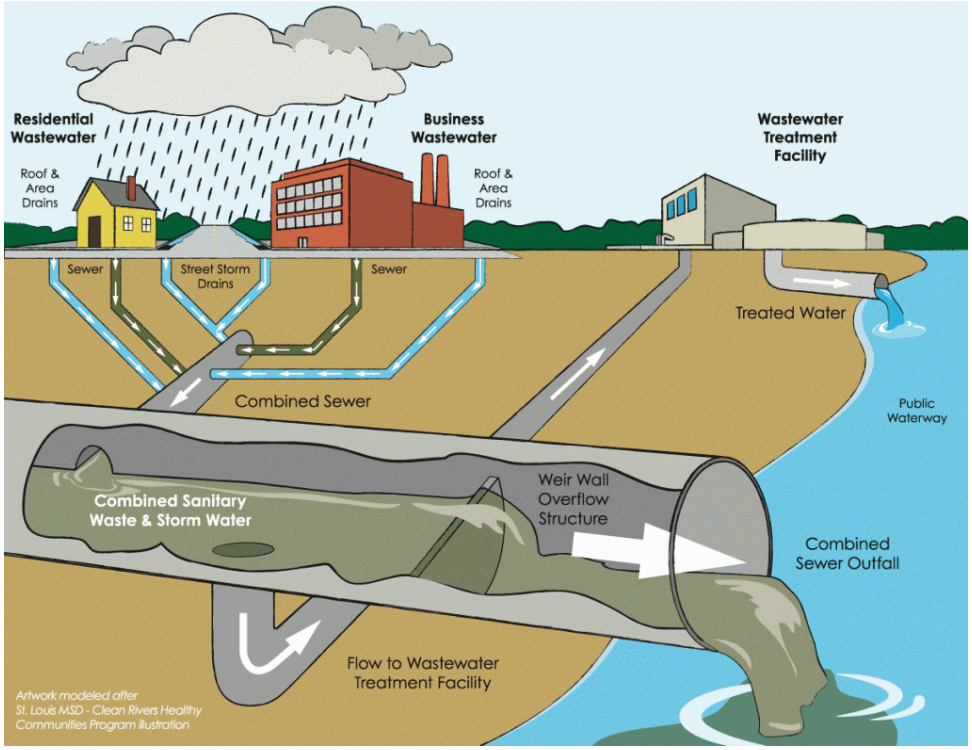
Sanitary sewer systems collect and transport domestic, commercial, and industrial wastewater and limited amounts of stormwater and infiltrated ground water to treatment facilities for appropriate treatment.

Map via Google



What are Combined Sewer Systems?

A combined sewer system (CSS) collects rainwater runoff, domestic sewage, and industrial wastewater into one pipe. Combined sewer overflows (CSOs) happen when too much rain overwhelms the system and is diverted to the river. CSOs contain untreated or partially treated human and industrial waste, toxic materials, and debris as well as stormwater.



What is the problem with SSOs and CSOs?

Combined sewer overflows (CSOs) are one of the biggest threats to the health of the river. Aging infrastructure allows for discharges of raw sewage which have a major impact on human and animal health.

Occasionally sanitary sewers will release raw sewage. These types of releases are called sanitary sewer overflows (SSOs). SSOs can contaminate our waters, causing serious water quality problems, and back up into homes, causing property damage and threatening public health. Possible causes of SSOs can be blockages, line breaks, power failures, and sewer defects (EPA).

Under normal conditions, a CSO transports all of the wastewater it collects to a sewage treatment plant and then discharges the treatment byproduct to a water body. The volume of wastewater can sometimes exceed the capacity of the CSS or treatment plant (e.g., during heavy rainfall events or snowmelt). When this occurs, untreated stormwater and wastewater discharge directly to nearby streams, rivers, and other water bodies (EPA).

Volunteer standing next to a combined sewer overflow outfall

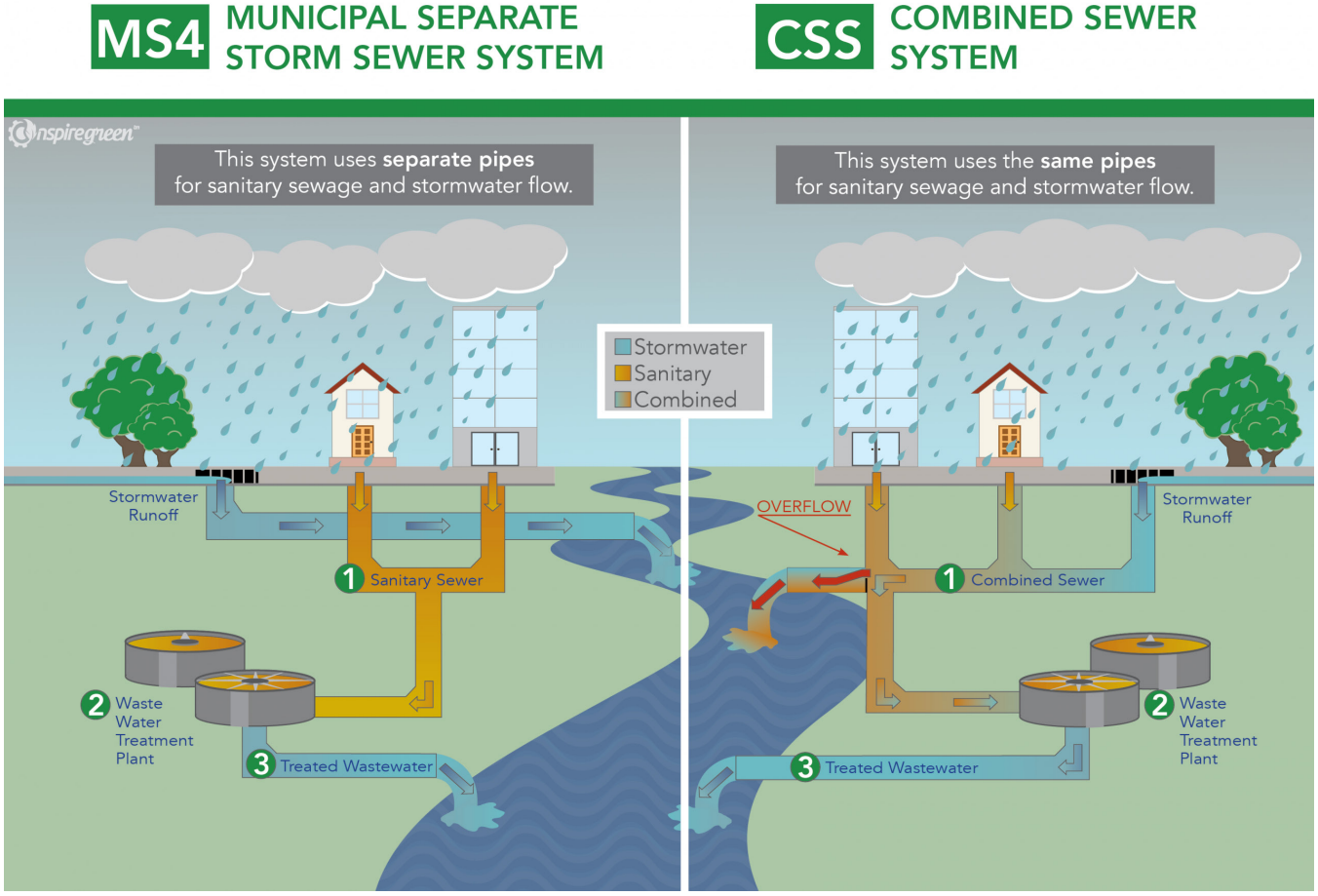
How does Friends of the Rouge help?

Friends of the Rouge has a map on our website showing all of the controlled and uncontrolled combined sewer overflows in the Rouge River Watershed. Mitigating combined sewer systems by separating them into sanitary and stormwater networks or building basins to screen, disinfect and hold the overflows to be released after a storm is extremely costly.

The Clean Water Act requires communities to stop discharging sewage into rivers. Rouge communities with the resources and personnel to obtain funding have addressed most cases, leaving approximately 3.6% remaining (see map). According to a Combined Sewer Overflow Informational Study commissioned by the Erb Family Foundation, “this will require an estimated capital investment of $2.29 billion, not considering long-term operation and maintenance costs and the impacts of climate change.” The problem is that the remaining uncontrolled CSOs are in older urban areas that do not have access to the same resources. This includes the city of Detroit, which is home to the largest and oldest infrastructure in southeast Michigan, yet has lost most of its tax base as two-thirds of residents have left the city. Detroit has 40 uncontrolled sewer overflows into the Detroit and Rouge Rivers. In historically under-resourced and under-represented communities, the population’s basic needs are not prioritized. Leaders need to advocate for this.

The American Rescue Plan of 2021 and the 2022 Bipartisan Infrastructure Law both provide federal funding for sewer infrastructure, but the community must have the staff and experience to take advantage of these programs and design proper solutions. The communities must also understand the priority of sewer infrastructure, as well as the connection with basement backups and personal health. Friends of the Rouge can help provide the support to advocate for these projects and funding, and connect stakeholders with partners that can help offer solutions.

In addition to gray infrastructure projects that separate sewers or provide overflow basins, sewer overflows can be reduced by minimizing rainwater runoff. If less water goes into the system, the scope of projects can be smaller and therefore less costly. Municipalities, residents, and businesses can install rain gardens and bioswales to hold rainwater on site and let it slowly filter back into the ground instead of running off into storm drains. FOTR has programs that teach residents how to install rain gardens and work with communities, residents and



institutions to install rain gardens when funding can be found. Planting trees, replacing turf grass with native plants, disconnecting downspouts and using pervious pavement are additional measures that can help. FOTR has several programs to plant trees and also works in partnership with the Alliance of Rouge Communities to increase the tree canopy.

What can you do to reduce and mitigate the effects of sanitary and combined sewer overflows?

Although the Clean Water Act requires communities to stop discharging sewage into our waterways, it continues to occur in Metro Detroit. In the Rouge River watershed, sewer overflows are mainly happening in low income communities of color that disproportionately bear the cost of aging infrastructure. With a projected $2.29 million cost, municipalities throughout the region must work together to solve this problem.

The Detroit Water and Sewerage Department (DWSD) is currently working to minimize flow into the combined system through separation and green infrastructure projects, but will not control all CSOs until 2037. DWSD will be updating its plan to identify priority outfalls and control measures in 2023. Redford Township, Dearborn, Dearborn Heights, and Inkster are also working to control their CSOs. The Bipartisan Infrastructure Law and the American Rescue Plan have dollars available for projects to control CSOs, but economically distressed communities need help in navigating their access to these funds and designing and implementing solutions.

In 2016 a regional authority was created and leases operation of DWSD treatment plants, major water transmission mains, sewage interceptors and related facilities for $50 million annually. Called the Great Lakes Water Authority, the lease funds are designated for capital improvement for the City of Detroit retail water system and to repair Detroit's aging water infrastructure.

Removing stormwater from the system through green stormwater infrastructure (GSI) can reduce untreated discharge events depending on the extent of its deployment, location, and capacity. The Erb-commissioned study found that GSI located in upstream areas are more effective than those at the downstream end of the "sewershed." As water travels downstream, flows from upstream areas increase such that downstream areas are beyond their capacity from local and upstream flows. Therefore, green infrastructure projects in the "headwaters" of the Rouge are more effective than downstream. These headwater areas include the townships of Superior, Salem, Canton, Northville, Plymouth, West Bloomfield and Bloomfield, as well as the cities of Troy and Novi. These communities also contain some of the area's last remaining undeveloped land. Developing this land will increase the capacity needed for downstream stormwater storage, so stormwater mitigation of any development is critical. Setting aside undeveloped land for watershed protection will also help minimize flooding and overflows.

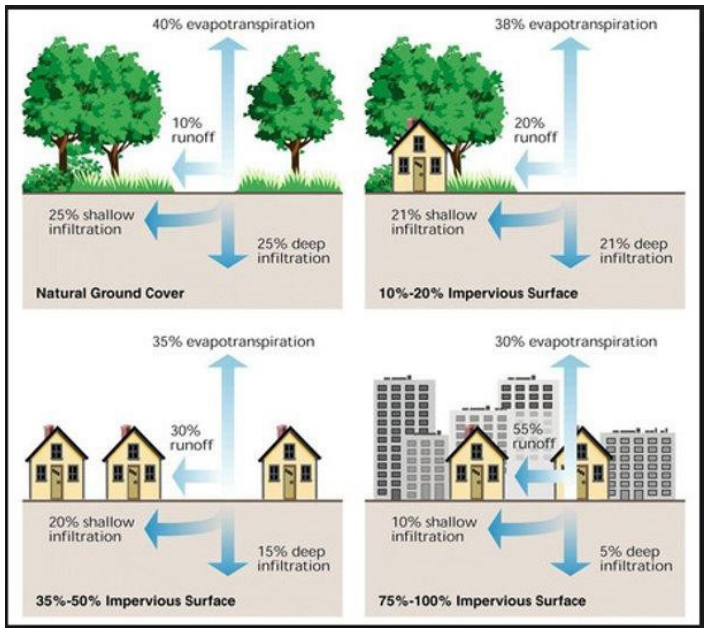
The region must work together to address CSOs with creativity and cooperation so that the funds and expertise can be leveraged to address this huge problem. Friends of the Rouge can help provide the support to advocate for these projects and funding, and connect stakeholders with partners that can help offer solutions.

Urbanization and Development

What is urbanization?

Urbanization refers to the concentration of human populations into discrete areas as people move away from rural areas into cities. This concentration leads to the transformation of land for residential, commercial, industrial, and transportation purposes. Urban development has increased dramatically in the recent decades, and this leads to altered streamside areas, increased wastewater inputs, and increased surface runoff. Urbanization increases regional impervious surface area, which generally reduces the ecosystem's ability to quickly respond to rain events and therefore increases flood risk. (EPA)

What is the problem with urbanization?

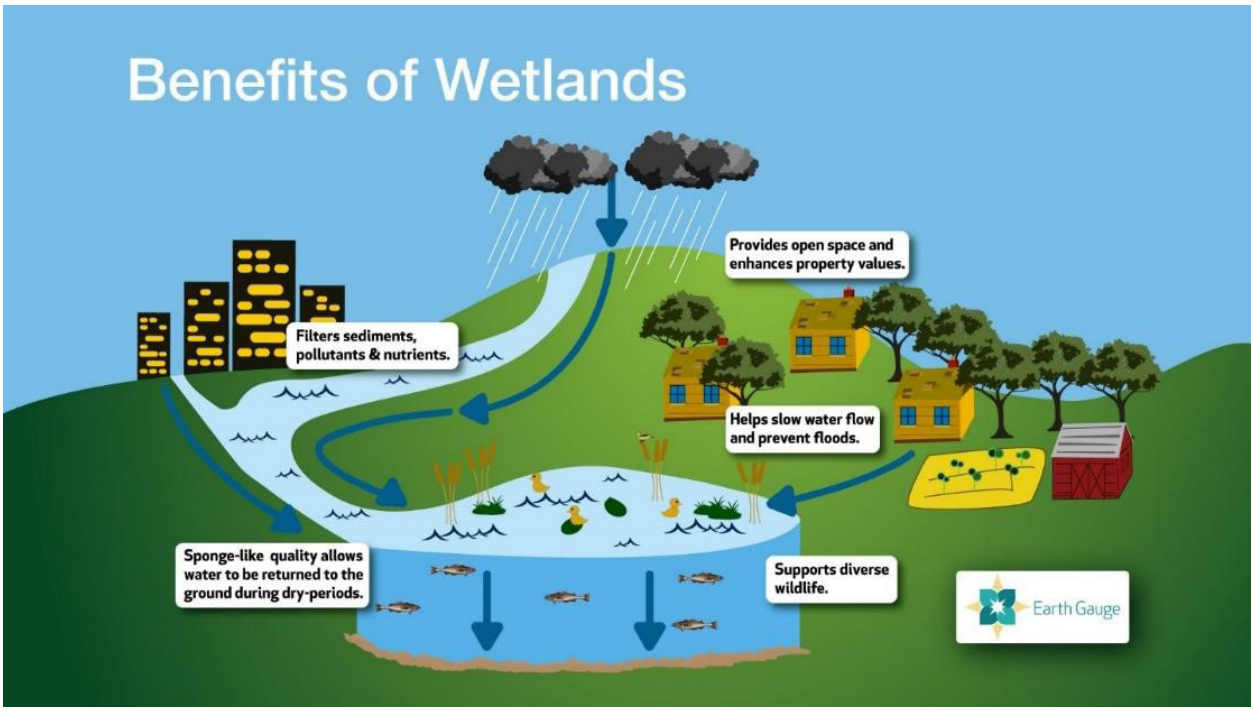


URBAN HEAT ISLANDS occur when cities replace natural land cover with dense concentrations of pavements, buildings, and other surfaces that absorb heat. This in turn causes increased energy costs, higher air pollution levels, and heat related illness and mortality. According to the U.S. Environmental Protection Agency, cities of a million or more people can be 1–3°C (1.8–5.4°F) warmer on average—and as much as 12°C (22°F) warmer in the evening—than the surrounding area.

FLOODING— Land development and increases in impervious surfaces can affect the risk of flooding in several ways. First, development tends to replace soil and vegetation with impervious surfaces such as roof tops and asphalt. This means that rainfall that used to soak into the ground will flow directly into rivers and streams, increasing both the amount of flow and speed. These developments can obstruct the natural course of flood plains. The potential for flood damage is greatly increased when, through lack of awareness or disregard for the potential danger, unsuitable development takes place in areas that are already subject to flooding.

WETLAND LOSS— Wetlands provide critical habitat for many species, but also operate as a buffer for flooding and erosion. Because of their sponge-like ability to absorb water, wetlands can slow the momentum of flood waters. Wetland plants' highly developed root systems hold the soil in place and filter pollutants, naturally improving water quality (including water that is eventually used for drinking). (EPA) Increased flooding, erosion, and pollutants are caused by the increase in development over necessary wetland areas.

According to a state of Michigan 2014 report entitled "Status and Trends of Michigan's Wetlands Pre-European Settlement to 2005," southeast Michigan has had some of the biggest wetland losses with Monroe County leading at 93% loss, Wayne at 90%, and Macomb at 86%. Michigan's 1979 wetland protection law has led to a reduction in loss but the current development bloom is likely to increase the loss.



How does Friends of the Rouge help?

Friends of the Rouge has water quality monitoring programs that give us data to show how development is impacting our local waterways. The Frog & Toad Survey trains volunteers to listen for the presence or absence of frogs & toads throughout the watershed, which lets us know how healthy our wetlands are - or if there isn't enough wetland habitat in an area to support a healthy mix of amphibians. Our "Bug Hunts" send teams of volunteers to the river to search for the bugs that live on the bottom because they are long-term indicators of how healthy our rivers are based on the types and number of bugs we find. Participants in these programs learn the value of these ecosystems first-hand and become advocates for protecting them.

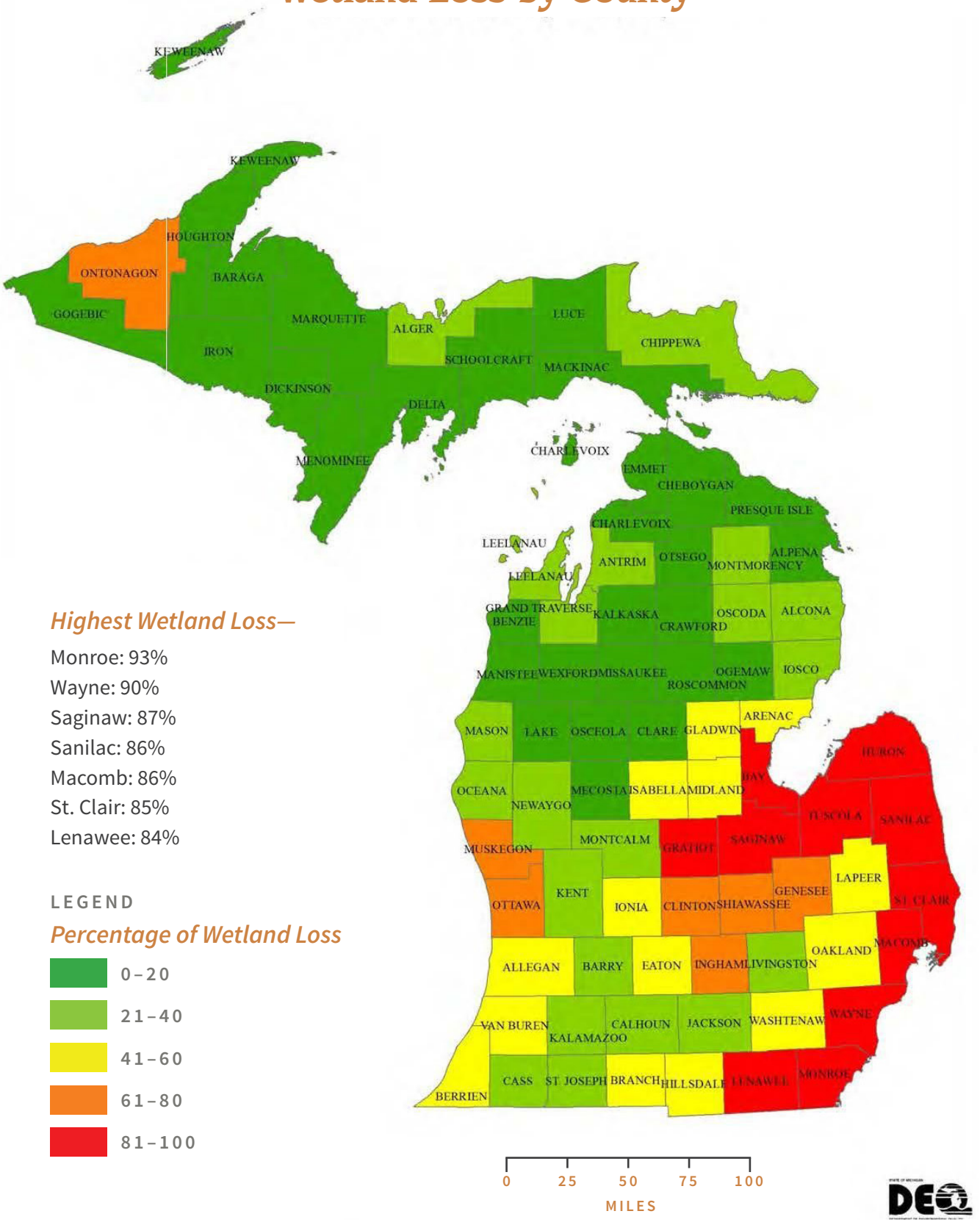
Ways to minimize the impact of urbanization include promoting "green infrastructure": measures such as rain gardens or bioswales along roadways to take runoff and allow it to slowly filter back into the ground instead of being directed immediately to storm drains. Green infrastructure also includes planting trees and native vegetation, incorporating green roofs, and encouraging residents to have rain barrels to capture rainwater for use on their property. These alternatives are a relatively low-cost way to have a major impact on the health of our streams. We have several opportunities through our Restoration programming to learn more about rain gardens, and offer sales of native plants and rain barrels.

What can you do to reduce and mitigate the effects of urbanization?

Ensuring that wetland protection laws are up-to-date and enforced, promoting the value of greenspace to quality-of-life as well as property values, and prioritizing conservation would improve the health of our ecosystem. Laws that promote low-impact development, and rezoning floodplains to prevent development altogether, will go a long way in mitigating rainwater to avoid future flooding disasters that have become common in southeast Michigan. One southeast community is even purchasing and demolishing homes in the floodplain.

Development is attractive to local municipalities because it helps to fuel tax increases, but the hidden costs of new sewer lines, streets, power, etc. are not often considered. Setting aside and protecting green space improves the quality of a community. Local land conservancies like Six Rivers Land Conservancy and the Southeast Michigan Land Conservancy can broker conservation easements and purchase of land for protection.

Wetland Trends in Michigan from 1800-2005
Wetland Loss by County



Highest Wetland Loss—

Monroe: 93%
Wayne: 90%
Saginaw: 87%
Sanilac: 86%
Macomb: 86%
St. Clair: 85%
Lenawee: 84%

LEGEND

Percentage of Wetland Loss

- 0–20
- 21–40
- 41–60
- 61–80
- 81–100

Michigan Water School and Resources

MSU Extension Water School is a policy-neutral, fact-based program. The objective of this program is to provide local decision-makers, appointed and elected officials, and municipal staff with critical, relevant information needed to understand Michigan's water resources, including the fundamentals of water science, in order to support sound water management decisions and increase awareness of current and future local and state water issues.

As an elected or appointed official, you are a valued leader with a unique opportunity to make important decisions regarding the future of our water resources.

The program will include sessions on water quantity; water quality; water finance and planning; and water policy issues. Topics to be covered include:

- The Blue Economy
- Fiscal benefits of water management
- Incorporating water into local planning and placemaking
- Resources to help address water problems
- Water policy at the federal, tribal, state, and local levels

If you're interested in learning more about these topics, view the webinars below or visit the Michigan Water School website

SESSION 1: WATER QUANTITY

Presenter Ruth Kline-Robach, Academic Specialist; Institute for Water Research
Water School Water Quantity

SESSION 2: WATER QUALITY

Presenter Erick Elgin, Water Resource Extension educator
Water School Water Quality

SESSION 3: WATER ECONOMICS, FINANCE, AND PLANNING

Presenter Steve Safferman, MSU Department of Biosystems and Agriculture Engineering; and Brad Neumann, Land Use Planning Extension educator
Water School Water Economics, Finance, & Planning

SESSION 4:

Presenter Terry Gibb, Water Resource Management and Public Policy Extension educator; Harmony Fierke-Gmazel, Government and Community Vitality Extension educator; and Emily Proctor, Tribal Extension educator
Water School Water Policy

HOW TO USE YOUR POLICY TOOLBOX

Presenter Dr. Pat Norris, former MSU Community Sustainability Department professor
Water Policy Toolbox Explanation

The Water Policy Toolbox is a detailed explanation of water policy laws in Michigan.

Solutions Summary

So... what can YOU do?!

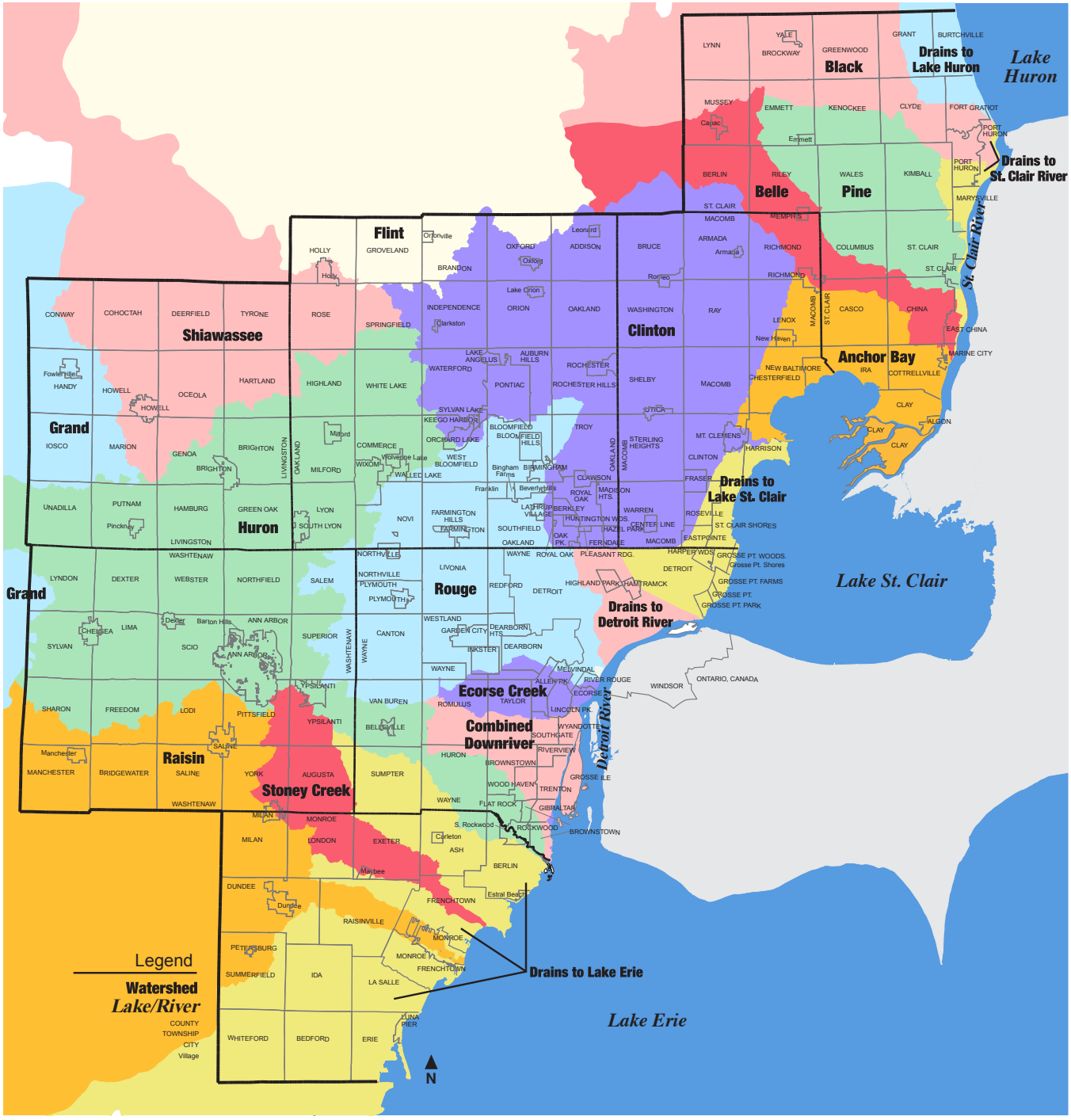
As takeaways, please consider the following:

Residents planting a rain garden in Detroit

- Develop land and streamside protection policies
- Prohibit building in floodplains
- Plan new developments to be resilient against frequent heavy precipitation events
- Ordinances or support initiatives that create or preserve green infrastructure (native plantings and trees)
- Prevent new production and spread/purchasing of products containing harmful emerging contaminants like PFAS
- Support funding initiatives that allow upgrades to water treatment plants and clean-up of contaminated sites to adequately remove harmful chemicals (like PFAS), including research into remediation efforts
- Hold industries accountable for their role in pollution and contamination
- Support plastic pollution reduction efforts
- Support state regulations against emerging contaminants and/or polluter-pay legislation
- Support legislation to ban the sale and distribution of invasive species and encourage use of all native plants in any sponsored projects
- Address potential invasion points like ballast water from freighters
- Ensure funding remains for invasive species program efforts, such as through the Great Lakes Restoration Initiative
- Share at-home remedies to reduce pollution (such as properly disposing of chemicals, repairing leaky vehicles, picking up after pets, using fertilizers with care, planting native plants and trees, reducing the use of road salt, etc)
- Share opportunities for residents to get involved with river clean-up events, our school-based river education program, and rain garden education
- Encourage the use of storm drain covers that say “No Dumping/Drains to River” (or similar)
- Promote legislation addressing the maintenance of septic systems
- Work regionally to address the serious issue of raw-sewage discharges into the river so that funding and expertise can be leveraged to address this huge problem of combined sewer overflows, and help our underserved communities access additional resources to do so
- Ensure wetland protection laws are up-to-date and enforced
- Promote the value of greenspace to quality of life and property values
- Encourage recreation opportunities along our new Water Trail

We can work together to combat and prevent pollution in our beautiful state. Please consider including opportunities for your residents to get involved with our numerous initiatives in your newsletters, and reach out to us anytime.

Watersheds of Southeast Michigan



SEMCOG

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Detroit, MI 48226-3602
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www.semcog.org

Southeast Michigan Watershed Groups

We are just one of numerous watershed groups working to protect and restore the health of our waterways. Please contact us or our immediate neighbors for more information at any time!

Friends of the Rouge

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Alliance of Downriver Watersheds

OURS TO PROTECT

Alliance of Downriver Watersheds
(includes Ecorse Creek)
allianceofdownriverwatersheds.com

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