



OUR WATER, OUR FUTURE:

*A Common Agenda for Protecting Pennsylvania's
Lake Erie Watershed*



Partner Organizations



Front cover photo credits:

Left: Kids at Seven-mile Creek, Photo courtesy of Sr. Pat Lupo

Center: Sunrise from Twenty-mile Creek, Photo courtesy of J. Michael Campbell

Right: Leo's Landing at Presque Isle State Park, Photo courtesy of J. Michael Campbell

Background photo: Lake Erie viewed from Cranch Park, Photo courtesy of Sarah Bennett

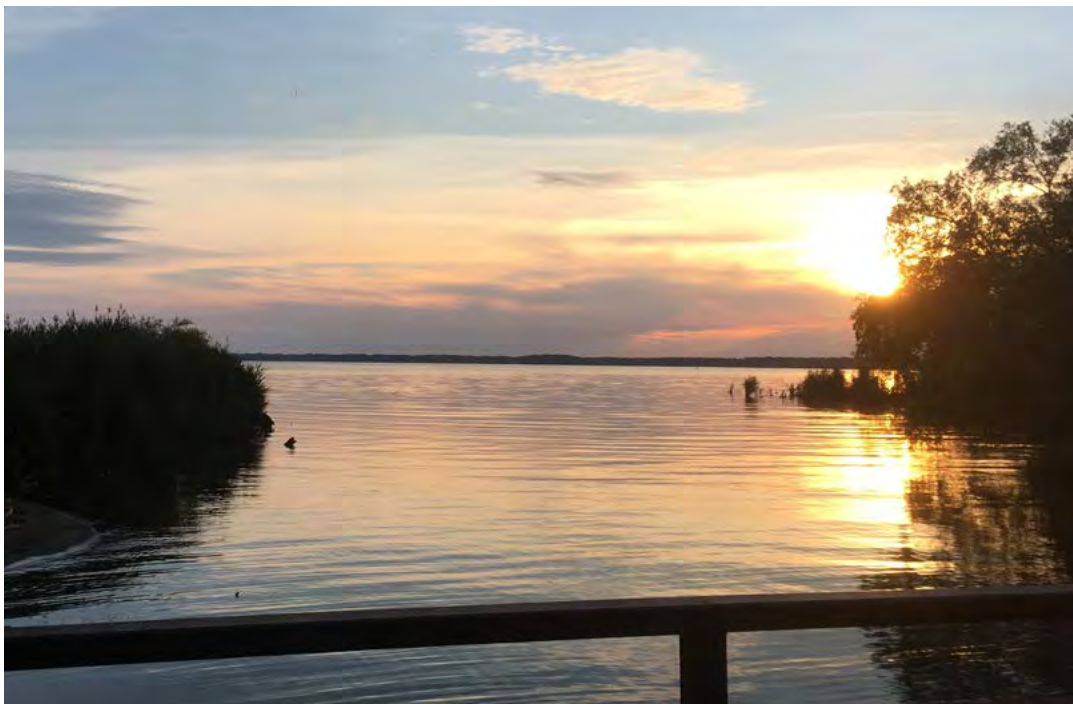
Dear Decision-Makers in Pennsylvania's Lake Erie Watershed,

We the undersigned organizations respectfully present **Our Water, Our Future: A Common Agenda for Protecting Pennsylvania's Lake Erie Watershed**. This Common Agenda is the product of several virtual meetings and multiple emails and phone conversations bringing together a diverse set of voices to identify threats to clean water in the Lake Erie watershed of Pennsylvania. Partners worked together to determine the impacts of these threats on marginalized communities and to develop solutions that protect water quality while promoting a more equitable and sustainable future for Erie County residents. Many partner organizations, several additional organizations, and a technical advisory committee developed and prioritized a list of high-priority threats. Partner organizations included local environmental, wildlife, and civic organizations, and the technical advisory committee was composed of local and regional scientists and science professionals. Prioritization was based on collective impacts to the economy, human quality of life, ecosystems, and regional sustainability.

The undersigned organizations work on a variety of issues but share the common goal of promoting sustainable development that protects our natural resources and human health. We support the Erie region's efforts to reinvent itself and we believe the recommendations herein will contribute to the region's success toward that end. Through well-informed, thoughtful, and equitable decision-making processes, the region can grow while improving the lives of all Erie residents and protecting our important water resources.

Erie County has much to be proud of. From its growing tourist industry to its vibrant wine country to its revitalization efforts, all of this success relies in some way on Lake Erie, Presque Isle Bay, and their tributaries. However, there still remains a tendency to embrace a "growth at any cost" mentality that does not serve county residents well, nor does it protect the environment. Continuing on this track might provide short-term economic gains but it will do nothing to improve quality of life for residents or develop sustainable communities. This mentality will also serve to further degrade the region's land, air, and water that were historically ravaged by our industrial past.

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AND PROTECTING
OUR IMPORTANT
WATER RESOURCES.



Sunrise from Twenty-mile Creek

Photo courtesy of J. Michael Campbell, Ph.D.

THIS COMMON
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PROVIDES A
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RACISM AS A
PUBLIC HEALTH
CRISIS AND MOVE
ERIE COUNTY
TOWARD A
HEALTHIER FUTURE.

This Common Agenda lays the foundation not only for protecting Erie County's important water resources, it provides a framework for sustainable growth and also for making decisions that will help address racism as a public health crisis and move Erie County toward a healthier future.

We recognize that there are many people, businesses, and organizations working to improve Erie's present and launch us into a vibrant future. COVID-19 and recent social unrest in response to years of racial injustice have changed the present by forcing us to reconcile with inequities. Let us build on this movement using water protection as a unifying cause to create a healthier and more inclusive future for Erie.

Let this Agenda be a catalyst for conversation. Ask us questions. Share your plans for protecting water in the Lake Erie watershed and let's brainstorm new ideas together. Let's work together with the unifying purpose of creating a vibrant, sustainable, high quality of life community where all Erie County residents thrive and our natural resources are protected for future generations.

Sincerely,

Erie County United
Green New Deal Coalition of Erie
Hold Erie Coke Accountable
Keep Erie County Beautiful
Lake Erie Arboretum at Frontier Park
Lake Erie Group of Sierra Club
Lake Erie Region Conservancy
Our Water Our Air Our Rights
PennFuture
Pennsylvania Lake Erie Watershed Association
Presque Isle Audubon Society
Save Our Native Species (SONS) of Lake Erie
Whole Foods Co-Op

Technical Advisory Committee

Community Resilience Action Network of Erie (CRANE)
Pennsylvania Sea Grant
Regional Science Consortium
Western Pennsylvania Conservancy
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Social Justice Reviewers

Erie County United
Green New Deal Coalition of Erie
U.S. Committee on Refugees and Immigrants Erie

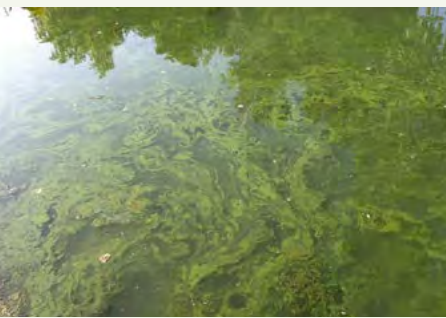
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EXECUTIVE SUMMARY



Presque Isle State Park viewed from Chautauqua Park
Photo courtesy of Sarah Bennett



Harmful algal bloom in Presque Isle Bay
Photo courtesy of J. Michael Campbell



Child fishing at Liberty Park
Photo courtesy of Sr. Pat Lupo

Lake Erie, Presque Isle Bay, and their tributaries make up Pennsylvania's Lake Erie watershed. These valuable resources provide water for drinking, brewing, manufacturing, and agriculture, and are places to swim, fish, and boat. Not only do they support Erie County's residents and businesses, but also its vibrant \$1.2 billion tourism industry which attracts people from all over the world. The lake moderates the region's climate, which supports an important fruit growing and wine industry. With such an abundance of fresh water in our backyards, it can be easy to take these resources for granted. However, without clean freshwater, Erie's future is bleak. For this reason, it is important to put protective measures in place now to ensure that these resources remain valuable well into the future.

This document is a Common Agenda for Protecting Pennsylvania's Lake Erie Watershed developed by several non-governmental organizations (NGOs) with input from a diverse group of stakeholders, as well as a technical advisory committee. Partner organizations included local environmental, wildlife, and civic organizations, and the technical advisory committee was composed of local and regional scientists and science professionals.

The Common Agenda describes several threats to maintaining water quality in Pennsylvania's Lake Erie watershed and the impacts of those threats on marginalized communities. It also identifies municipal, county, state, and federal solutions to each threat that will also promote a more equitable and sustainable future. A summary of solutions for the county, its municipalities, and state legislators can be found in Appendix A. The threats appear in prioritized order in this agenda. They were prioritized based on collective impacts to the economy, human quality of life, ecosystems, and regional sustainability.

This agenda took shape during the unprecedented COVID-19 pandemic and social unrest in response to racial injustice across the country. Erie County declared racism as a public health crisis in its response to this injustice. This agenda includes recommendations that will not only protect water quality but will also ensure a more equitable and just future for residents in the Lake Erie region.

Addressing Racism and Environmental Justice

Environmental degradation disproportionately impacts historically burdened residents, and communities of color do not often have equal seats at decision-making tables. Water protection in the Lake Erie Watershed can be used as a unifying cause that creates a more equitable decision-making process. Solutions that will help ensure more equitable and environmentally sound decision-making include:

- Develop municipal Community Advisory Committees composed of people who live in the neighborhoods they represent, and formalize their inclusion in decision-making processes.
- Establish an Erie County Council Environmental Justice Committee that studies impacts of polluting industries on environmental justice communities and monitors environmental violations by county industries.
- Establish an Environmental Advisory Council that includes environmental and community experts, as well as representation from typically underrepresented communities.

EXECUTIVE SUMMARY

Reduce Water Pollution and Flooding Due to Surface Runoff

Surface runoff was named by almost every regional stakeholder as the single greatest threat to water quality in the Lake Erie Watershed. Surface runoff contributes a wide variety of pollutants to Erie regional waterways and causes erosion of soil and streambanks. However, local, state, and federal policies that protect water quality, and community education and outreach can do much to reduce this major threat. Recommended solutions to this threat include:

- Revise zoning and development plans to conserve open space including wetlands, protect native species, and restore riparian zones along stream banks.
- Improve stormwater management through a phased implementation plan.
- Establish a state-level dedicated fund for watershed restoration and monitoring.
- Pass the Moving Forward Act that increases funding to the Great Lakes Restoration Initiative and provides funding for sewage infrastructure and PFAS contamination cleanup, among other infrastructure upgrades.

Improve Resilience to Climate Change and Extreme Weather

Climate change and extreme weather comprise the second greatest threat to clean water in the Lake Erie watershed. The City of Erie is the 8th fastest warming city in the United States (Climate Central, 2019) and a recent study found that historically redlined neighborhoods in Erie were 3.93°C warmer than non-redlined neighborhoods during the dates of analysis (Hoffman, Shandas, & Pendleton, 2019). Along with warming, the Erie region has seen increased extreme rain and snow events, increased flooding, extreme fluctuations in water levels, and increased number of summer days above 90°F (CRANE, 2019). These changes are expected to continue and become more extreme as the climate continues to change, and their impacts will be felt disproportionately by the region's most vulnerable populations (Islam & Winkel, 2017; Li et al., 2016; Plumer & Popovich, 2020). Recommended solutions to this threat include:

- Pass Complete Streets Ordinances that increase safety, comfort, and access for pedestrians, bicyclists, and people with disabilities and promote efficient public transportation systems.
- Develop an Erie County climate action plan that identifies vulnerabilities, measures progress, identifies strategies for reducing greenhouse gas emissions, and describes mitigation plans.
- Support Pennsylvania's participation in the Regional Greenhouse Gas Initiative.
- Pass state legislation that enables community solar.



Sidewalk runoff



High water levels along Dobbin's Landing
Photo courtesy of Eric Guerrein

EXECUTIVE SUMMARY

Limit the Damage Caused by Plastics and Fossil Fuels

Petrochemicals, oil and fracked gas are the third highest priority threat to water quality in the Lake Erie watershed and are tied to climate change since their extraction and use generates greenhouse gases. The specific threats to the Lake Erie watershed include 163 known abandoned oil and gas wells, pipelines running through the county, fracking waste containing a host of toxic chemicals including radioactive material, and plastic pellets, or nurdles, that easily escape during transport, transfer, and use in plants. Recommended solutions to this threat include:

- Adoption of Operation Clean Sweep practices that reduce plastic pellet pollution from plastic molding plants.
- Establish an industrial scale biowaste digester in Erie County where biodegradable plastic can be composted.
- Pass state legislation that regulates plastic pellet transportation, transfer, and use to reduce plastic pellet escape into the environment.
- Pass legislation that includes fossil fuel drilling waste in the definition of hazardous waste.
- Pass the federal Break Free from Plastic Pollution Act.

Control Invasive Species in the Lake Erie Watershed

Invasive species can have significant effects on water quality by impacting native species, aquatic food webs, and habitats. It is very difficult, time consuming, and expensive to control invasive species once they are established so preventing their introduction and spread is key in reducing their impacts. The characteristics of Pennsylvania's Lake Erie watershed that make it invaluable to the Erie region—fishing and recreation opportunities, the commercial port, and proximity to railways and highways—also increase its vulnerability to invasive species. Recommended solutions to this threat include:

- Municipalities should work with agencies and NGOs to incorporate the Lake Erie Watershed Cooperative Weed Management Area Plan into municipal public works protocols.
- Establish municipal landscaping best management practices that encourage native plant use, reduce herbicide and pesticide use, and transition municipal equipment to electric.
- Create a state watercraft inspection and decontamination program to prevent invasive species from entering waterways before they flourish.
- Pass the federal America's Water Infrastructure Act which includes provisions for fighting invasive species.



Erie Coke Corporation
Photo courtesy of J. Michael Campbell



Zebra Mussels
Photo courtesy of National Park Service
(WikiMedia Commons)

EXECUTIVE SUMMARY

Address Legacy Pollution and Promote a More Sustainable Future

Legacy pollution from Erie's industrial past has plagued the region for decades. Toxic chemicals can be found in soil, groundwater, and sediments and many can be found in fish that humans consume. Industrial sites throughout the Lake Erie watershed have received federal, state, and private funds to clean up and redevelop sites for new uses. However, many undeveloped sites remain and new sites are emerging as polluting industries, like Erie Coke Corporation, close their doors. Erie should learn from its past and prevent future polluting industries from fouling its land, air, and water and generating millions of dollars of cleanup costs for taxpayers. Recommended solutions to this threat include:

- Incentivize brownfield development through municipal and county tax incentives, while engaging impacted neighborhoods to ensure that residents' needs are met by the development.
- Develop plans to replace some brownfield sites with open spaces that include green stormwater infrastructure.
- State legislators should support SB 581 and SB 582 which call on Pennsylvania's Department of Environmental Protection (PA DEP) to establish maximum contaminant level (MCL) drinking water standards for PFAS and define them as hazardous substances.
- Expand the PA DEP's PFAS testing program in Erie County and leverage state and federal funds to address contamination cleanup.

Increase Collaboration Between Community Organizations, Businesses, and Government

The Erie region is home to many non-governmental organizations that work intimately with environmental issues or social justice issues. Government, NGOs, businesses, and residents working together will result in the best decisions for the region. When included, NGOs can act as liaisons between government and residents as needed, which will improve efficiency in planning and decision-making and increase trust by residents. Recommendations for increasing collaboration include:

- Work with community organizations to promote best management practices and other water protection initiatives with residents and businesses.
- Work with community organizations to more fully engage residents in addressing blight in their neighborhoods.



Introduction – Why Erie, Why Now?

Water is Northwest Pennsylvania's most valuable natural resource. Waterways in the Pennsylvania Lake Erie watershed provide drinking water to over 240,000 residents and visitors; attract people to swim, fish, and boat, and support Erie's vibrant \$1.2 billion tourism industry. Lake Erie also moderates the region's climate to support an important fruit growing region and wine country along its shores. It is easy for people living near the shores of Lake Erie to take this important resource for granted. However, the future of the Erie region depends on its water resources so policy decisions should include water protection.



A map of municipalities and streams in the Lake Erie watershed in Erie County, Pennsylvania. The Lake Erie watershed is outlined in red, major tributaries are blue, and their subwatersheds are outlined in yellow.

Among the waterways in the Lake Erie watershed are Presque Isle Bay and many tributary streams that flow into the bay and Lake Erie. Many of these streams are classified as impaired by the Pennsylvania Department of Environmental Protection. Progress has been made in several streams—Cascade Creek in Frontier Park for example—however, much more needs to be done to ensure that these waters are restored and protected. The Lake Erie Region Conservancy (2008) previously published a Pennsylvania Lake Erie Watershed Conservation Plan that highlights many of the same threats to water quality that this agenda does. That plan led to several restoration projects but many of the recommendations (i.e., multi-municipal cooperation and developing brownfields first) have not yet been broadly adopted.



The top map shows Erie County streams that are impaired at the level of recreation use. This means that those streams are not safe for human recreation. The bottom map shows Erie County streams that are impaired at the level of aquatic life. This means that stream quality does not support a wide diversity of organisms. An additional portion of Conneaut Creek (not shown) in western Erie County is impaired for fish consumption due to elevated mercury levels in smallmouth bass.

Erie is Working to Transition from Its Industrial Past

Erie County has a strong industrial history and its fortunes have risen and fallen with industrial success. Past industries have left their marks on the region in many ways, including legacy pollution that hinders development. More recently, Erie has suffered due to decades of manufacturing job losses and currently has an unemployment rate 1% higher than the state rate and a median household income almost \$11,000 lower than the state average (PA Dept. of Labor and Industry, Sept. 2020). Those numbers are even more dire for Erie County's communities of color (Erie County, 2020b). This economic downturn has led the region to develop a "growth at any cost" mentality that contributes to environmental deterioration and inequitable health risks to its most vulnerable populations.

Over the past decade Erie has begun a renaissance that has accelerated within the last few years. Investments by current businesses and non-profit organizations, formation of several new development partnerships, and initiatives by municipalities and Erie County governments to draw people to the region have begun this revitalization. The City of Erie has also committed to *Erie Refocused: A Comprehensive Plan and Community Decision-Making Guide* which calls on Erie to create "places that build confidence, that signal high standards, and that attract and retain households and businesses" (Buki et al., 2016). However, this plan does not sufficiently address racial inequity in the county (Erie County United, personal communication, Oct. 2, 2020). As revitalization continues, it is important that decision-makers deliberately address racial inequities and avoid mistakes of the past that will undermine the excellent progress that continues to be made.

Erie County Has Declared Racism as a Public Health Crisis

This Common Agenda took shape during the unprecedented COVID-19 pandemic, and in the midst of social unrest incited by recent tragedies that were the result of racial injustice across the country. As PennFuture convened several environmental, wildlife, and civic organizations to identify threats to clean water in the Lake Erie watershed and effective ways to address them, many other organizations were joining together to fight injustice for Black Americans. This has brought to light ongoing and systemic inequities experienced by marginalized populations across the country, including Erie County. Erie County Council declared racism as a public health crisis in September 2020 (Erie County Resolution 43, 2020). The resolution identified dramatic disparities in health and social conditions between the county's Black and White residents including higher rates of infant mortality, cancer, heart attacks, and respiratory disease, among many others. Discriminatory policies and practices are to blame for these disparities and the county has committed to addressing them.

Threats to the environment disproportionately impact the health of people of color. For example, in Erie there are many immigrant and refugee families who rely on fishing for food. This means that decreased water quality or increased contaminants in fish will disproportionately impact those families. Another example is that legacy pollution from lead-containing service lines and household pipes is more likely to impact renters and low-income people due to lack of resources to test for lead in their drinking water or address the problem. The facts that people of color in Erie County are more likely to live in rental or subsidized housing and there is a greater percentage of people of color living below the poverty level (Erie County, 2020b) mean that lead contamination in drinking water has the potential to disproportionately impact these communities.

Climate change is guaranteed to exacerbate existing inequities. Among the impacts of climate change that have already been experienced are increased frequency and duration of heat waves. Extreme heat is especially deadly to people with pre-existing conditions and the elderly (Poumadere et al., 2005). A study by Hoffman, Shandas, & Pendleton (2019) found that redlining¹ has relegated underserved

¹ Redlining is a process that began in the 1930s where lenders refused loans or insurance to people living in specific areas because they are deemed too risky. Neighborhoods dominated by people of color were historically considered too financially risky for loans so this practice segregated people of color to less desirable and unhealthy neighborhoods. These practices legally ended in 1968 but their impacts on communities of color have continued to this day (Gross, 2017).

populations to neighborhoods that are hotter than non-redlined neighborhoods in 94% of urban areas analyzed. In the analysis, the temperature in Erie's redlined neighborhoods was 3.93°C higher than non-redlined neighborhoods during summer analysis dates. Erie County's resolution on racism identified that Black county residents have much higher rates of pre-existing conditions than White residents, which further complicates this issue (Erie County, 2020b). This agenda will specifically identify recommendations that will help address the issue of racism in Erie County.

Erie Must Create a Future that is Equitable

Our conversations during the development of this Common Agenda revealed inequities in access to the region's water resources. People living in Erie's east side neighborhoods are geographically close to Lake Erie, but getting to the lake can be difficult. Traveling by foot can require many to cross the busy Bayfront Connector or Bayfront Parkway and the one accessible beach (East Avenue Boat Launch) is covered in litter, including hypodermic needles. Traveling by bus to Presque Isle State Park (PISP) requires at least three transfers and a significant amount of time. Taking the water taxi to PISP would be the fastest route; however, the \$10 per person round trip price tag can be prohibitively expensive. Perhaps for these reasons, many kids living in the City of Erie either do not know that there are beaches they can visit at PISP, or are unaware that the beaches are free (ServErie, personal communication, July 16, 2020). This inequity creates segregation in the community and reinforces the sense that PISP is only a place for people of privilege, including tourists. It also prevents people living in east side city neighborhoods from fully experiencing this valuable regional asset, which can have far reaching impacts on their understanding and appreciation for wildlife and natural resources.

It was mentioned above that the Erie region has a growing population of refugees and immigrants who rely on fishing to feed their families. The language barrier may prevent Erie residents from understanding fish consumption advisories, which will further add to disproportionate negative effects of fish contaminants. Government entities should increase efforts and work with community organizations to translate communications for these populations.

The *Erie Refocused* plan (2016) calls on Erie leaders to establish "places that build confidence, that signal high standards, and that attract and retain households and businesses" (p. 26). The objectives of the City of Erie's Five Year Consolidated Plan are to provide affordable housing, create suitable living environments, and create economic opportunities (City of Erie, 2018). Neither of these plans will be realized until Erie moves away from its top down decision-making processes and more meaningfully engages the communities most in need. This requires inclusive decision-making processes to ensure that *all* residents experience improved quality of life and all impacts are considered. Unfortunately, policy decisions are often made with only short term economic gains or savings in mind. This results in short sighted and often unjust policies that are disproportionately detrimental to people in poverty and people of color, especially since these populations are not often represented when policy decisions are being made. A collaborative vision, such as that presented in this Common Agenda, that incorporates protection of Erie's important water resources and rejects a "growth at any cost" mentality will ensure the most equitable and sustainable future for the region, while also providing triple bottom line benefits (economic, environmental, and social)² for the region over the long term.

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² Policies that protect natural resources are inherently triple bottom line because they tend to reduce costs in the long run (including environmental clean up and health care costs), promote healthy communities for all Pennsylvanians, and protect the environment and natural resources for future generations.

PART 1: Addressing Racism and Environmental Justice



The current social and environmental landscape clearly demonstrates that Erie County needs a more forward-thinking and equitable approach to policy making around infrastructure and the economy. The situation between the City of Erie and the Erie Coke Corporation is a perfect example. For decades, the City of Erie and its residents accepted Erie Coke Corporation's repeated environmental violations fouling its air and water in the name of tax revenue and jobs. This plant was located near Erie's East Bayfront neighborhood, which is a Pennsylvania Department of Environmental Protection (PA DEP) Environmental Justice Area³ because its population is 54% minority and has a 49% poverty rate (PA DEP, 2015a). These residents were in direct proximity to the illegal emissions levels from Erie Coke, which were known to contain the carcinogen benzene and high levels of particulate matter, among other harmful pollutants (Pa. Ct. Com. Pl. July 1, 2019, pp. 2-3). When the Erie Coke plant applied for its permit renewal with PA DEP, Erie residents had had enough. They organized to form Hold Erie Coke Accountable (HECA) to provide a platform for residents' voices to be heard. Group members met with residents in the neighborhood to listen to their stories and encourage them to submit their experiences through public comments. Both City and County Councils adopted resolutions proclaiming that Erie Coke needed to come into perpetual compliance or shut down. This process empowered residents and contributed to Erie Coke Corporation's closure in 2019. This neighborhood is just one of many Environmental Justice Areas within the Lake Erie watershed including areas in northwest Crawford County, Albion, Girard, Lake City, City of Erie, Wesleyville, Lawrence Park, Millcreek, and North East.

³ PA DEP Environmental justice areas are census block groups with 20% of residents or more living in poverty and/or 30% of residents or more who are minorities.

Municipal Community Advisory Committees and Other Recommendations for Inclusion

In order to improve quality of life throughout Erie County and in keeping with the mission of the PA DEP Office of Environmental Justice, there needs to be equal representation of all residents at the table when decisions are being made, as well as more meaningful outreach to residents. For this reason, municipalities should establish Community Advisory Committees (CACs) that play an integral role in municipal decision making. These could be standing committees or ad hoc committees, established when decisions with broad community impacts need to be made. Municipalities should establish formal methods for electing members who live in the neighborhoods they represent to CACs to ensure that municipal residents are well-represented. For example⁴, the City of Erie should work with civic organizations like the Multicultural Community Resource Center, Eastside Grassroots Coalition, Booker T. Washington Center, ServErie, and the U.S. Committee for Refugees and Immigrants, among others, to develop a process for electing representatives from neighborhoods across the city. The planning areas identified in the Erie Refocused plan (pp. 6-7) could be used as initial guidelines; however, these areas may be too large. These organizations already work closely with city residents and would be able to facilitate this planning process. The CAC then would meet regularly with City Council and municipal departments and would act as liaisons between city residents and government entities. CAC members should canvas door to door or by phone to connect with the residents they represent. A process for formally and transparently allowing the CAC to weigh in on policy and development decisions should be established. This would create a better and more inclusive process of communication between government and city residents and would result in more well-informed decisions at the city level. This would also provide opportunities for marginalized voices to be heard and will ultimately result in higher quality of life for all Erie residents. In turn, a sustainable, equitable, healthy community will build confidence, signal high standards, and attract and retain households and businesses, just as Erie Refocused proposed.

More inclusive decision-making processes can also be fostered by establishing standard methods for informing and being informed by residents that are more meaningful than public meetings that require residents to come to them⁵. Each municipality will be different but a few ideas in addition to CACs include:

- Neighborhood meetings that are widely publicized to the impacted neighborhoods including fliers and social media, not just notification in a newspaper or on a website.
- Mailings, tabling in the neighborhood, phone/texting trees, or door to door information sharing. Municipalities should work with community organizations to find volunteers for this.

Establish an Environmental Justice Committee on Erie County Council

Declaring racism as a public health crisis was a good first step for the county to begin addressing systemic racism. A productive next step is to establish an Environmental Justice Committee on the Erie County Council. This committee should include the county sustainability coordinator and water resources coordinator, as well as council members. In coordination with the Environmental Advisory Council recommended below, the committee should:

- Review existing companies with environmental permits in the county to ensure compliance with environmental regulations.

IN ORDER TO
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⁴ The City of Erie is used only as an example. Different municipalities should choose a democratic process that works best for them and their residents.

⁵ See Advancing Equity and Inclusion: A Guide for Municipalities for sample policy language and more ideas on improving equity and inclusion: https://www.cawi-ivtf.org/sites/default/files/publications/advancing-equity-inclusion-web_o.pdf.

- Examine the minority and income statuses of neighborhoods surrounding those companies to gauge impacts to vulnerable communities.
- Monitor environmental violations by companies in the county and consider adding county-level penalties for repeat violators.
- Explore the development of a county environmental impact fee for more environmentally impactful⁶ companies and use these funds to establish a county sustainability fund. Among ideas that this fund could be used for are supporting/expanding the Erie County Sustainability Office, providing grants to local entities to help them reduce environmental impacts, and investing in communities that have historically been wronged by polluting industries. Funds generated from county pollution penalties could also be added to this fund.
- Conduct analyses of proposed economic development opportunities, focused on protecting water resources, air quality, and impacts on environmental justice areas identified by the PA DEP, to ensure that marginalized people do not continue to be disproportionately impacted by polluting industries. The region's industrial history (e.g. Erie Coke Corporation) provides clear evidence that welcoming harmful industries to the region will eventually cost residents and the environment in terms of health and tax dollars when forced to clean up contaminated sites. People living in impacted communities should be included in the analysis process through public hearings.

Establish a County Environmental Advisory Council

An Environmental Advisory Council (EAC) that advises Erie County Council would allow the county to take advantage of the wealth of scientific and social knowledge that exists in the county to provide a formalized method for protecting residents and natural resources by overseeing potential impacts of companies and county decisions to human and environmental health. Erie County Council should pass ordinances that determine the scope and composition of the EAC following recommendations in this agenda and from the EAC Network⁷. Once the EAC is established, the County Council should work with them to establish specific standards for assessing environmental impacts. Given the intricate relationships between the environment and human health, and the fact that environmental degradation impacts marginalized populations more directly, it is also important to incorporate council members who represent these populations. Better oversight of the environmental impacts in the watershed will help ensure responsible economic development and require higher standards for new companies being established.



⁶ The term "environmentally impactful" should be defined by the committee in coordination with the EAC.

⁷ Pennsylvania Act 148 gave PA municipalities authority to enact EACs by ordinance. See <https://eacnetwork.org/getting-started/> for guidance on creating an EAC.

PART 2: Adequately Fund Water Protection and Avoid State Budget Cuts that Impact the Lake Erie Watershed



Kids playing at Presque Isle State Park

Photo courtesy of Sr. Pat Lupo

The Lake Erie watershed is unique. Local threats to water quality also threaten water resources shared by Michigan, Ohio, and New York as well as Canada's province of Ontario. Though Pennsylvania contains only a fraction of Lake Erie's coastline, it is important that the state does its part to protect this resource for the hundreds of thousands of Pennsylvanians who rely on it as a source of clean water for residential and commercial use, and the millions of people who visit these shores each year and contribute significantly to the local and state economies. State level budget decisions should reflect the importance of water to its residents and economy by providing funds to address the major threats to water quality identified in this agenda.

Establish a Dedicated Fund for Watershed Protection and Restoration

A dedicated fund for clean water projects is needed in order to address stormwater runoff and implement best management practices while upgrading water infrastructure. The state faces an \$18.6 billion gap in funding for needed water infrastructure upgrades and the current levels of funding are not adequate to address these (PA DEP, 2015b). For example, Erie County relies on grants from the Environmental Stewardship Fund (Growing Greener) through the PA DEP to help residents repair and replace failing

septic systems. When this funding is received it is used up rapidly due to the number of failing systems in the county. Additionally, it can take up to a year for Erie County to receive a decision from PA DEP on whether or not their grant has been funded. A dedicated clean water fund would help Erie County implement stormwater best management practices, upgrade and monitor septic systems and small flow treatment facilities, and protect water resources that are so vital to success in the region. In addition, planning, implementing, and maintaining these projects would provide many family-sustaining jobs⁸ that are desperately needed in the Erie region. The current state funding options are simply not adequate for addressing water issues statewide.

Restore Funding to State Resource Agencies

The Erie region's economy relies heavily on tourism and recreation activities tied to its water resources and state parks and this reliance continues to increase each year. These valuable resources are monitored, protected, maintained, and restored where necessary by government agencies in the region and the non-governmental organizations they rely upon. Funding to the Department of Conservation and Natural Resources (DCNR), which manages Presque Isle and Erie Bluffs State Parks, has been cut dramatically from its 2003 level of \$108.8 million. These cuts undermine DCNR's ability to manage state parks and offer educational opportunities to residents and visitors across the county. Funding to the Department of Environmental Protection (PA DEP), whose mission is to protect Pennsylvania's water, air, and land, has been cut 40% since 2002. These cuts limit the department's ability to monitor, identify and respond to threats to the environment, which are ultimately detrimental to human health. The PA Department of Agriculture (PDA) provides financial assistance to farms to preserve their lands, implement water protections like riparian zones, provides education to farmers so they can continuously improve efficiency and environmental protections, and address issues with invasive species. Increased funding to this department is necessary to tackle the threat that agricultural runoff poses to clean water while still providing farmers with the resources they need. Locally, funding from PA DEP and PDA contribute to the Erie County Conservation District (ECCD). ECCD works with local farmers to implement best management practices that limit the fertilizers and pesticides that runoff from farms. For example, their PA Vested in Environmental Sustainability (PA VinES) program is funded through the state Growing Greener fund.

Maintain Support for the Great Lakes Commission and International Joint Commission

State, provincial and federal governments that border the Great Lakes have all committed to protecting these waters through the Boundary Waters Treaty and the Great Lakes Water Quality Agreement (GLWQA). These agreements are meant to protect water quality and regulate shared water resources. Pennsylvania has a good history of paying its fair share toward the International Joint Commission and the Great Lakes Commission. It is important that this financial commitment continue to ensure that pollution standards and other initiatives are continuously updated to protect water quality. GLWQA's most recent Lake Erie Lakewide Action & Management Plan draft identified the five priority threats to Lake Erie that align well with the threats identified by this agenda's partners including nutrients and bacterial pollution, chemical contaminant pollution, loss of habitat and native species, invasive species, and climate change impacts (ECCC & US EPA, 2019).



⁸ Ez's *Clean Jobs, Better Jobs* report shows that clean energy jobs pay an average wage that is 25% higher than the U.S. median and these jobs are more likely to have health insurance and retirement benefits than other private sector jobs (Ez, ACORE, & CELI, 2020). In *The Economic Benefits of Investing in Water Infrastructure* (Value of Water Campaign, 2017) it was reported that for every \$1 million invested in clean water and wastewater projects, between 15 and 18 jobs are created.

PART 3: Reduce Water Pollution and Flooding Due to Surface Runoff



Harmful algal bloom in Presque Isle Bay

Photo courtesy of J. Michael Campbell

The single greatest threat to clean water in Pennsylvania’s Lake Erie watershed is surface runoff, including stormwater and agricultural runoff. Surface runoff is the combination of water and pollutants that are carried into waterways via storm sewers⁹ or over land. Runoff increases when it rains or when snow melts. Once in the water, pollutants impact aquatic organisms and reduce water quality for human use. The major pollutants are listed below and their impacts to the environment and human health are further described in Appendix B.

- Fertilizers from agricultural, residential, and business applications. Fertilizer is a type of nutrient pollution that contributes to algal blooms and hypoxic¹⁰ zones in bodies of water.
- Pesticides from agricultural, residential, and business applications.
- Salt, especially from sidewalk and road de-icers in the winter.
- Litter, especially plastics that break down into microplastics in waterways.
- Sewage from sewer system overflows and failing septic systems. Sewage and animal waste are sources of bacterial and nutrient pollution.
- Vehicle pollution due to exhaust, leaks, and metal loss from wear and tear.

These are mostly non-point source pollutants—pollution that originates from many places rather than one specific source—which are difficult to regulate but cause direct and rapid impacts on water quality. It is important that all stakeholders understand their impacts on water quality in order to reduce the impacts of runoff.

⁹ Most storm sewers/drains in Erie County are separate stormwater systems that collect stormwater and drain directly into nearby bodies of water. The water is not filtered nor is it treated at the wastewater treatment plant before it flows into waterways.

¹⁰ Hypoxic zones are locations in bodies of water where dissolved oxygen is too low to support aquatic life. These zones can sometimes become anoxic zones, where no dissolved oxygen exists.

One of the reasons that runoff is so detrimental to waterways is that conventional “gray” stormwater systems are designed to convey water away from the built environment and into nearby waterways as quickly as possible and without being treated. This results in rapid conveyance of pollutants (described in Appendix B) into waterways. The abundance of impervious surfaces like roads, parking lots, and other built structures causes runoff to move even faster into stormwater systems. When water moves rapidly into these systems and into waterways both can become overwhelmed with the amount of water, resulting in overflow of sewage, flooding, erosion of streambanks, and increased sedimentation downstream¹¹. Gray systems are also expensive to implement and upgrade, which has resulted in a backlog of upgrades across the country. In Erie County, there are still water mains in use that were installed in the 1800s.

In rural areas, agricultural and residential runoff of fertilizers and pesticides is significant and rapid runoff also erodes fertile topsoil. Additionally, septic systems and small flow treatment facilities (SFTFs) are methods of human waste disposal in these locations. Septic systems in Erie County are more prone to fail early due to the soil properties in the region (J. Fronzoli, personal communication, August 11, 2020). This has led to an increase in SFTFs and the county now has over 500 of these facilities, which is the highest of any other Pennsylvania county (Erie County Department of Health, personal communication, Sept. 14, 2020). Best management practices (BMPs) suggest that property owners have their septic systems inspected every 3-5 years and Erie County Department of Health (ECDH) currently inspects SFTFs once per year. However, funding for ECDH inspections currently comes from a federal Great Lakes Restoration Initiative grant and will run out in 2022. Regular inspection is important to ensure that these systems are functioning properly and to prevent human and environmental health hazards. If funding for an inspector is not secured, the ECDH will be forced to reduce their inspection schedule which would increase the threat of water contamination.

For residents, the need to maintain, repair, and replace septic systems and SFTFs is expensive and can create financial hardship for rural residents in a county that has the 10th highest poverty rate in Pennsylvania (US Census Bureau, 2019). State funding options to help landowners are lacking. One option, PENNVEST, which is a low interest loan program, requires that homes have foundations. This excludes (often low-income) people living in mobile homes on rural properties. Growing Greener grant funds are also available. The Erie County government recently applied for one of these grants to help residents fund septic system repairs and replacement. Ten months after the application was submitted the county had still not learned whether they would receive the funds. This extended timeline slows down county residents’ ability to respond to septic system issues, which increases bacterial and nutrient pollution in Lake Erie’s waterways.

Modern best management practices for stormwater management suggest installation of green stormwater infrastructure (GSI) in conjunction with conventional gray infrastructure. GSI is a soil-plant-water system that intercepts runoff and allows it to evaporate, percolate into soil, or slowly release into surface waterways. It includes elements like rain gardens, green roofs, soil cells with native trees, stormwater planter boxes, bioswales, and stormwater wetlands, as well as existing natural wetlands. The added benefits of GSI compared to gray stormwater infrastructure are that it costs much less to implement and maintain¹², reduces the amount of infrastructure that can be damaged by flooding which leads to additional cost savings, increases greenspaces in communities, improves air quality, lowers urban heat island effects, and helps municipalities implement the best management practices (BMPs) required for municipal separate storm sewer system (MS4) permits.

¹² Philadelphia implemented their Green City, Clean Waters Program in 2009 to address a growing sewer system overflow problem. The conventional grey system approach was estimated to cost \$10 billion for a tunnel under the Delaware River (Luntz, 2009). The city chose instead to commit to implementing green systems throughout the city at a cost of \$2.4 billion over 25 years (PWD, 2011).

Communities need to act now to reduce runoff and water pollution. Extreme weather events, like torrential rain, are expected to increase as the climate continues to change (Climate Central, 2019). This will exacerbate the issues with stormwater runoff and will likely lead to increased stress on stormwater infrastructure as well as increased operating costs and subsequent rate increases, property destruction, displacement of residents from shoreline and riverine locations, injury, and possibly death. Additionally, City of Erie revitalization provides a good opportunity to develop in a sustainable way but could also pose increased threats to water quality if not done responsibly. For example, increased development in Erie's Bayfront Corridor is likely to increase impervious surfaces along Presque Isle Bay, which will result in more runoff. Forward-thinking plans for development can incorporate GSI to ensure that development is not detrimental to the water that makes this location so valuable.

Upgrading water infrastructure and incorporating GSI in Erie County will provide triple bottom line benefits. A study by Green for All found that investing in water infrastructure would create between 80,500 and 167,800 family-sustaining jobs in Pennsylvania (Gordon, et al., 2011). Promoting good-paying jobs is one of the most impactful things that Erie County can do to address county-wide poverty and racism as a public health crisis. In order to do so, plans to upgrade must include mandates that Erie County residents be hired to complete these jobs, that residents of the cities and townships be hired by their local public works to maintain infrastructure, and require a certain percentage of employees be hired from environmental justice areas.

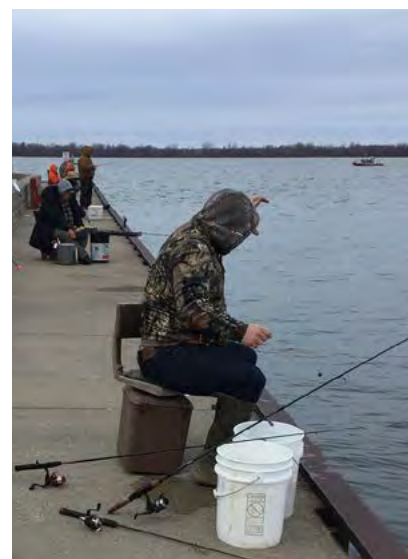
Municipal and County Level Solutions

Water is the most important resource to communities in the Lake Erie watershed and it is important that municipal and county policies reflect this. County and municipal governments must be proactive with forward thinking policies and planning to address current threats and prevent future threats to clean water. Erie County developed the Municipal Stormwater Assistance Program to help municipalities with Municipal Separate Storm Sewer System (MS4) permits¹³ and any others who want to participate meet permit requirements. They also recently hired a Water Resources Coordinator to further aid municipalities. Implementation of BMPs and Pollution Reduction Plans (PRPs) required for MS4 permits are steps in the right direction to protect water resources; however, municipalities must fully commit to their implementation and utilize the resources available.

- **Revise zoning and development plans to conserve open space and decrease impervious surfaces.** Protecting existing open spaces is the simplest and least costly solution to runoff management that can also save municipalities in the long run¹⁴. Open space with native species, especially trees, are pervious surfaces that slow runoff and allow it to percolate into soil. Vegetation also filters water before it enters waterways, filters air, removes carbon dioxide from the atmosphere, and generates oxygen. Municipalities should develop forward thinking zoning plans that include the following:
 - Protection for existing wetlands
 - Protection for native species and eradication of invasive species
 - Protection and restoration of riparian zones along stream banks

¹³ MS4 permits require municipalities to develop stormwater management programs that implement BMPs and utilize six minimum control measures to reduce pollutants entering waterways. More information about Erie County's Municipal Stormwater Assistance Program can be found here: <https://eriecountypa.gov/departments/planning-and-community-development/programs/municipal-stormwater-assistance/>

¹⁴ Lake Erie Region Conservancy (LERC) found that the existing open spaces in Erie County provide \$149.6 million in ecosystem services including reducing air and water pollution and flood control. This is in addition to increased property values due to nearby open spaces (LERC, 2012). Return on expenditure studies conducted in several Pennsylvania counties have determined that counties receive at least \$1 billion in services from natural systems each year (Wilt, 2018). Berks County found specifically that for every \$1 invested in wetland restoration, \$13 of benefits were realized and every acre of riparian and headwaters area provided \$3,000 of ecosystem services to municipalities (Berks Conservancy, 2015). The University of Illinois Extension (2020) states that the economic benefits to municipalities utilizing natural solutions will outweigh the tax revenue generated by housing developments.



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- Prevent urban and suburban sprawl by adhering to zoning plans and avoiding variances and subsidies that allow septic systems and wells in open spaces
- Ordinances that require increased pervious surfaces in and around parking lots. An example is Millcreek Township's Ordinance 2016-3 that requires 7% of the parking lot surface include pervious surfaces. Parking lots and sidewalks can also incorporate pervious pavers to improve water permeability.
- Ordinances that encourage residents and businesses to incorporate alternative landscaping rather than conventional lawns, which have low stormwater management capabilities. Alternative landscapes that have larger root systems will help municipalities reduce stormwater volume. The City of Erie's § 1503.21 Uniform Construction Code Section 302.4 is one example ordinance, though implementation has been difficult due to lack of education about the issue.



- **Examine existing stormwater ordinances and BMPs to ensure they are being followed.** There are likely several water protection ordinances in municipal codes for protecting water resources or implementing BMPs. However, these ordinances may no longer be enforced for a variety of reasons. The same holds true for previously implemented BMPs. For example, several snouts have been installed throughout the region to trap floatable materials in outlet pipes. These snouts require yearly cleaning or they will not work. Municipalities should check these snouts to see if they are being cleaned and if not, develop plans or amend ordinances to make responsibilities clear to property owners. Ordinances should also be amended to stop property owners from paving large portions of their yards to reduce maintenance.
- **Improve stormwater management through a phased implementation plan.** Stormwater runoff is known to be a large and growing threat to water quality and requirements for managing stormwater have become and will continue to grow more stringent, accordingly. The BMPs described above will require a long term strategy of implementation. It is recommended that municipalities and Erie County work together on each of the following phases of implementation:
 - **Phase 1 - Determine municipal stormwater needs, develop pollution reduction plans, and identify funding sources¹⁵** for design and implementation by working with the county Municipal Stormwater Assistance Program. Incorporating GSI will improve the efficiency and cost-effectiveness of regional stormwater systems and help MS4 municipalities establish PRPs and implement BMPs.
 - **Phase 2 - Establish a multi-municipal stormwater authority.** This is a *long term* solution that will make implementation easier, more efficient, and more cost effective. Such an authority can develop and implement stormwater plans throughout the county and work directly with municipalities, the Erie County Municipal Stormwater Assistance Program, Erie County Conservation District, and PA DEP, reducing the onus on municipalities that do not have the capacity for this level of development.
 - **Phase 3 - Establish a county-wide stormwater fee** by using the findings from the Millcreek and City of Erie feasibility studies. Implementation of BMPs, as required for MS4 permits, requires stable, sustained sources of funding. General funds, which rely on property taxes, do not provide the level of funding required for stormwater management and do not reflect properties' actual stormwater impacts. Additionally, there are many properties in Erie County that do not pay property taxes due to their non-taxable status. A stormwater fee that requires all property owners, regardless of taxable status, to pay for the runoff that they generate will be most fair and equitable¹⁶. The City of

¹⁵ Upgrading stormwater systems to include GSI can require large upfront investments; however, the cost is typically less than major "gray" infrastructure projects. Funding opportunities include Coastal Zone Management grants, Great Lakes Restoration Initiative grants, and PENNVEST loans. Efforts are also underway to develop a statewide dedicated fund for watershed restoration projects.

¹⁶ Municipalities can refer to PennFuture's manual Funding Stormwater Management in Pennsylvania Municipalities found here: https://www.pennfuture.org/Files/Admin/PennFuture_StormwaterManual_web_3.20.17.pdf

Meadville, PA has implemented such a fee and should be consulted in the process of developing one in Erie County.

- **Phase 4 - Pass ordinances protecting water quality and resident health from future polluting development along waterways¹⁷.** Ordinances that require strict anti-pollution requirements for businesses operating along waterways will ensure that water quality is protected without stifling economic growth. Examples of ordinances include requirements for GSI to be implemented with new development, erosion and sediment control ordinances, or ordinances controlling escaped plastics.
- Consider “daylighting” portions of streams running under municipalities or through tunnels. Cities across the nation are opening up streams that were historically buried by development (Thompson, 2014). Meadville, PA has plans to daylight a portion of Mill Run as part of a community green space initiative (Crowly, M., 2020). The benefits of well-planned daylighting are improved stream quality, increased property values, improved flood control, and increased green space for residents to enjoy (Trice, 2016).

State Level Solutions

The Lake Erie watershed of Pennsylvania is the only state watershed within the Great Lakes, and the only watershed in Pennsylvania that is shared with another country. Though Pennsylvania contains only a fraction of Lake Erie’s coastline, it is important that the state does its part to protect this resource for the hundreds of thousands of Pennsylvanians who rely on it as a source of clean water for residential and commercial use, and the millions of people who visit these shores each year and contribute significantly to the local and state economies. The Pennsylvania state legislators who represent the Lake Erie watershed should introduce and support bills that reduce pollution from runoff, aid municipalities in planning and implementing BMPs, including green stormwater infrastructure, and increase capacity of state agencies to administer programs and grants¹⁸. Upgrades to stormwater infrastructure will also better prepare Pennsylvania stormwater systems for future pressures due to climate change.

- Establish requirements for fertilizer application. SB 915 establishes limits on nitrogen and phosphorus application and creates education programs that will help reduce nutrient pollution that reaches waterways in the Lake Erie watershed. Agricultural, residential, and commercial applications of fertilizers contribute to algae blooms (Appendix B).
- Increase funding to Erie County Conservation District (ECCD) by \$75,000. ECCD helps land owners implement BMPs to reduce pollutants in Erie County waterways. Increased funding would increase ECCD’s capacity to work with land owners, which would result in more nutrient pollution reduction. This \$75,000 increase includes \$60,000 from the Growing Greener fund for the PA VinES program, which is a 25% increase over current levels. It also includes a \$15,000 increase from the State Conservation Commission Nutrient Management Program. ECCD was previously funded at \$28,000 but those funds were cut in 2017.
- Establish a dedicated fund for watershed restoration and monitoring with sufficient levels dedicated to Lake Erie watershed testing. A dedicated fund would provide funding for BMP implementation (including GSI), water quality testing (including HABs testing which would ideally receive at least \$112,000 per year), and many other regional activities that would protect water quality and reduce flooding in the watershed and throughout the state. The Pennsylvania Water Resource Act (HB 20, 2017-2018 legislative session) establishes a plan for such a fund.



¹⁷ Several model ordinances from the US EPA, which also address urban runoff, can be found here: <https://www.epa.gov/nps/urban-runoff-model-ordinances-prevent-and-control-nonpoint-source-pollution>

¹⁸ Legislation to reduce runoff and runoff pollution will have the added benefit of addressing the Chesapeake Bay TMDL and will benefit municipalities across the Commonwealth.

PART 4: Improve Resilience to Climate Change and Extreme Weather

The Erie region has already begun to see the impacts of climate change and extreme weather and these impacts are expected to increase as global temperatures continue to rise. Researchers at Climate Central (2019) ranked Erie as the 8th fastest warming city in the United States with an average temperature increase of 4°F since 1970. A recent study found that historically redlined neighborhoods in Erie were 3.93°C warmer than non-redlined neighborhoods during the study period so increased temperatures are likely to disproportionately impact historically disadvantaged communities (Hoffman, Shandas, & Pendleton, 2019). Along with warming, the Erie region has seen increased extreme rain and snow events, increased flooding, extreme fluctuations in water levels, and increased number of summer days above 90°F (CRANE, 2020). As these changes continue and become more extreme, the impacts to residents, businesses, and the regional economy will also increase. Erie County is especially vulnerable to these growing impacts because of the discrepancies that already exist along racial lines, percentage of people in poverty, and elderly people living here. Research shows that these populations are the most vulnerable to climate change impacts like heat waves (Islam & Winkel, 2017; Li et al., 2016; Plumer & Popovich, 2020). People living in the City of Erie will experience the additional threat of higher heat indices due to heat island effects of buildings and paved surfaces. Thus, climate change should be viewed by Erie County as a threat to public health that will exacerbate the existing public health crisis of racism.

One concrete example of a climate change threat to the region can be seen along Lake Erie's shores. For the past couple of years, the Great Lakes have seen record high water levels due to increased precipitation across the basin and the local impacts are known throughout the region¹⁹. Presque Isle State Park had to close completely several times over the past three years due to these levels that



High water levels near a house on Lake Erie

Photo courtesy of Eric Guerrein

¹⁹ Recent high water levels cannot be directly attributed to climate change but extreme water levels are expected to occur more frequently as the climate continues to change.

can be dangerous to visitors²⁰. The park also experienced extreme beach erosion and increased wave action, which is exacerbated by the lack of ice on Lake Erie over the winter. Responding to high water effects has caused a dramatic increase in park expenses. For fiscal year 2018, the park spent \$18,567 due to high water. That number was almost 7 times greater for fiscal year 2019, when \$126,927 was spent (DCNR, personal communication, July 7, 2020).

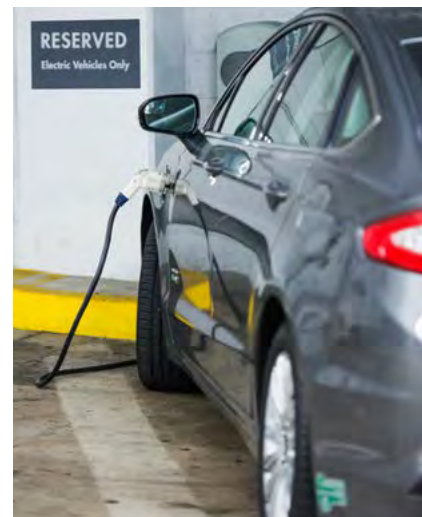
Along the Bayfront Corridor in the City of Erie, high water levels and waves have led to property damage and loss, increased litter, and infrastructure damage. For example, high water levels and waves caused one resident's entire storage shed to be washed into Presque Isle Bay, taking paint cans and other chemical pollutants with it. In order to mitigate these impacts with a higher break wall and generally improve the Erie Bayfront, \$1.6 million in taxpayer funds and at least \$1 million in other funds will be spent. Another \$17 million is projected to be needed in the area for additional upgrades (Flowers, 2020).

Transportation is the third largest contributor to greenhouse gas emissions in Pennsylvania (PA DEPa, 2019) so it is a critical target sector for reducing the state's overall emissions. Improving public transportation and electric vehicle infrastructure will have dramatic impacts on reducing greenhouse gas emissions. Erie County has a public transportation system that suffers from the same issues that other systems have: funding and revenue for the system are inadequate to allow efficient transportation, which leads to reduced usage and further reduced revenue. Public transportation needs to be viewed as a viable alternative to personal vehicles in order to increase usage and reduce emissions.

Municipal and County Level Solutions

There have been notable efforts in Erie County and its municipalities to address emissions and plan for a changing climate. These efforts include the development of the Community Resilience Action Network of Erie (CRANE), the energy and water audit and conservation program conducted by Erie County, creation of the Erie 2030 District by Green Building Alliance²¹, and many efforts by non-governmental organizations aimed at public education, tree planting, and increasing infrastructure for electric vehicles, among other initiatives. The City of Erie has demonstrated a willingness to begin addressing climate change by joining the Erie 2030 District and signing on with Climate Mayors and Mayors for Solar Energy. The city also recently created a Planning Department dedicated to implementing the city's comprehensive plan, Erie Refocused, and its 5 Year Action Plan. Common themes among these plans and climate action plans are the need to develop in a sustainable, equitable fashion that reduces energy use and provides opportunities for all residents. The aforementioned Environmental Advisory Council and Community Advisory Committees should be engaged in these plans to ensure that they are sustainable and equitable.

- **Pass an ordinance to establish a C-PACE district in Erie County.** C-PACE is the Pennsylvania Commercial Property Assessed Clean Energy Program that provides long-term, low-interest financing to commercial, industrial, or agricultural property owners for clean energy and clean water projects. Erie County must establish a C-PACE district before county businesses are eligible. Efforts are already underway to do this in Erie County so county officials should work to remove barriers that are preventing its implementation.



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²⁰ The park closed once in 2018, twice in 2019, and three times so far in 2020. Several individual locations at the park have also experienced closures.

²¹ The City of Erie and DCNR at Presque Isle State Park are among the Erie2030 District partners.



THE COUNTY
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- **Pass Municipal Complete Streets Ordinances.** The Complete Streets concept accommodates travelers in all modes of transportation by increasing safety, comfort, and access for pedestrians, bicyclists, and people with disabilities. Public transportation is also promoted by Complete Streets. Given the number of Erie city residents who do not own vehicles, this concept would be especially useful there. The City of Philadelphia has a detailed Complete Streets Design Handbook (2017) that can be used to develop language in Erie County municipalities. These ordinances would have additional positive impacts on people who do not own vehicles.
- **Establish a county-wide tree management program** that includes BMPs for planting, maintaining, and removing trees, and allows the county to develop tall, mature, long-lived native trees. Trees have myriad benefits including air pollution and greenhouse gas reduction, reduction of urban heat island effects, slowing and filtering runoff, and beautifying neighborhoods. The county can leverage community tree planting initiatives already underway including ReLEAF, a collaborative tree planting effort aimed at planting 275,000 trees in Erie County, the Plant it Forward project, ongoing tree-planting programs at the Housing Authority of the City of Erie, Sisters of St. Joseph Neighborhood Network, and Bayfront East Side Taskforce, just to name a few. There are many arborists, including the City of Erie's, who could be contracted to develop this plan and the City of Cleveland has a comprehensive tree plan, including planting in vacant lots and brownfields, that would be an excellent resource (Davey Resource Group, 2015).
- **Develop a county climate action plan.** Work with CRANE and PA DEP Energy Programs Office to participate in their Local Climate Action Program (LCAP). If LCAP cohorts are full, participate for free until a space opens up. CRANE should increase its membership to include civic organizations working with vulnerable communities and/or Community Advisory Committee members to ensure that the plan is inclusive of all county residents. The climate action plan should identify vulnerabilities, include continuous measurement of progress, identify strategies for reducing greenhouse gas emissions, and describe mitigation plans to prepare for future climate change. Once a climate action plan is developed for the county, it will provide new direction for municipalities to improve their resilience and mitigate impacts. Many mitigation efforts will increase jobs in the region. For example, jobs implementing building weatherization to improve heating and cooling efficiency and installing renewable energy infrastructure will increase.
- **Establish municipal and county sustainability offices.** Several municipalities and Erie County have sustainability coordinators. However, these positions are underutilized²² and have limited capacity due to lack of resources. Erie County and municipalities should establish sustainability offices rather than employing single sustainability coordinators. Offices with adequate capacity can conduct municipal energy and water use audits, develop reduction plans, manage the tree planting program (described above), and coordinate with community organizations to develop public education programs. Energy and water use reduction will eventually lower municipal costs, which can help offset the cost of expanded sustainability offices²³. Erie County government and the City of Erie have begun auditing their buildings and are encouraged to share their experiences and resources with other municipalities through the Erie County Council of Governments (ECCOG). Other municipalities are encouraged to start their own audits and develop reduction plans. Municipalities can apply for grants through the Met-Ed / Penelec Sustainable Energy Fund to help conduct audits and implement energy reduction projects. One easy project is to upgrade street lights to LED lighting that uses much less energy and costs less. Residents who pay for street lighting would also appreciate these upgrades.

²² Most sustainability coordinators in the Erie region are required to focus their energy on recycling efforts. A broader view of these positions will provide much greater value to the Erie region and its efforts in reducing environmental impacts.

²³ Erie County Sustainability Offices should consider working toward Sustainable Pennsylvania Community Certification through the Pennsylvania Municipal League. More information can be found here: <https://www.pml.org/training-development/programs/sustainable-pa-communities/>

- **Revise municipal zoning and development plans to promote multi-use neighborhoods** that are developed only on previously developed land. Development plans that promote mixed use neighborhoods where residents can work, grocery shop, eat, and recreate within walking distance to their homes will reduce vehicle emissions, improve lives for city and borough residents who do not have vehicles, and generate more property tax for municipalities due to higher use densities. Municipalities and development companies should consult with urban designers²⁴, the Community Advisory Committee, and community organizations to create equitable development plans that reduce carbon emissions and pollution, promote urban agriculture, improve public transit, and encourage more pedestrian activity²⁵.
- **Implement community level renewable energy and electric vehicle infrastructure.** It can be difficult for individual landowners to implement renewable energy sources on their property for a variety of reasons. For example, there may be too much tree cover on a property or not enough wind. Community renewable energy allows everyone to subscribe to community-generated energy and earn a credit on their electric bills. Current PA laws do not allow community solar but Pennsylvania HB 531 and SB 705 currently have bipartisan support and can allow community solar to exist. Likewise, establishing local electric vehicle infrastructure will reduce emissions in the region and prepare it for the future. Electric vehicle infrastructure would also increase jobs for installing and maintaining the infrastructure, and Erie's proximity to three major cities could attract electric vehicle or infrastructure manufacturing companies to the area.

State Level Solutions

The most impactful climate solutions will come from state and federal level policies that lead to large scale emissions reductions and carbon sequestration. Governor Wolf signed an executive order in 2019 directing the PA DEP to begin the rulemaking process for Pennsylvania to join the Regional Greenhouse Gas Initiative (RGGI) with ten other Northeastern and Mid-Atlantic states. This is a market-based cap and invest program aimed at reducing carbon dioxide emissions in the power sector by 80% by 2050. It allows power companies to buy and sell excess carbon dioxide credits from the state and, therefore, generate capital that can then be reinvested into energy efficiency projects, clean and renewable energy, and greenhouse gas reduction programs²⁶. Reduction in emissions from power companies will have the added benefit of reducing nitrous oxide and sulfur dioxide emissions, which will result in cleaner air with less ozone²⁷ and better water quality. In other words, this program has triple bottom line benefits.

Pennsylvania also needs to wean itself from a fossil fuel-based economy that has continuously polluted its air, water, and land and contributes to climate change. Hydraulic fracturing, or fracking, and the petrochemical industry that depends on it, has been embraced by many Pennsylvania residents and lawmakers as the economic future. However, these industries are experiencing high rates of bankruptcy (Wethe & Crowley, 2020), continue to contribute to air, water, and land pollution, and are guaranteed to leave Pennsylvania with even more legacy pollution if the industries collapse as we move closer to a carbon-minimal energy future. State representatives from the Lake Erie watershed should demonstrate their commitment to current and future Pennsylvanians and the Pennsylvania Constitution Environmental Rights Amendment (Article I, Section 27) by halting further subsidies for fracking, petrochemical facilities, and oil and gas infrastructure. They should oppose legislation that provides subsidies to fossil fuel companies, as well as legislation that reduces the

DEVELOPMENT PLANS THAT PROMOTE MIXED USE NEIGHBORHOODS WHERE RESIDENTS CAN WORK, GROCERY SHOP, EAT, AND RECREATE WITHIN WALKING DISTANCE TO THEIR HOMES WILL REDUCE VEHICLE EMISSIONS, IMPROVE LIVES FOR CITY AND BOROUGH RESIDENTS WHO DO NOT HAVE VEHICLES

²⁴ A good resource for urban design can be found here: <http://www.urbandesign.org/>

²⁵ A good resource for developing communities with lower carbon footprints is *The Land Use Stabilization Wedge Strategy: Shifting Ground To Mitigate Climate Change* by John R. Nolan (2009).

²⁶ PA DEP (2020a) modeling projects the RGGI program will generate \$300 million per year and 30,000 jobs.

²⁷ The Erie-Meadville region has consistently been given a C rating in the American Lung Association's State of the Air Report (ALA, 2020).

regulatory abilities of agencies that protect Pennsylvanians from polluting companies. Pennsylvania lawmakers should support legislation that moves Pennsylvania to a cleaner, more carbon-neutral future while also providing for a just transition for workers in the fossil fuel industry.

- **Pass Community Solar Legislation (HB 531/SB 705).** This legislation allows electric customers to purchase, lease or subscribe to a portion of a community solar facility, which increases the chances for Lake Erie watershed municipalities to install community solar facilities. The bill also calls for the PA Public Utility Commission to identify and eliminate barriers to participation by low- and moderate-income customers.
- **Pass the Modernizing Pennsylvania's Renewable Energy Standards (SB 600/HB 1195).** Municipalities in the Lake Erie watershed have already expressed interest in community solar and other renewable projects. This bill increases the renewable energy target to 30% by 2030 in the Alternative Energy Portfolio Standards, increases the in-state grid-scale solar requirement to 7.5%, and will make Pennsylvania's solar industry more competitive which will create family-sustaining jobs, including solar installation jobs in Erie County. This program should be leveraged to improve local solar industry wages by including tax breaks for companies who employ residents who have resided locally for a minimum of 3 years and additional tax breaks if employers pay higher than the state's median salary.
- **Support PA's participation in RGGI.** RGGI provides a market-based cap and invest program aimed at reducing carbon dioxide emissions in the power sector by 80% by 2050. This program will help address climate change, and generate revenue that can be used by municipalities in the Lake Erie watershed for renewable energy projects. In addition to millions of dollars worth of public health benefits, this could result in a cumulative increase of over \$70 million in disposable income by 2050 in Erie County alone.
- **Pass the Energy Transition and Recovery Act (SB 15).** This legislation creates the Energy Transition Fund that directs RGGI funds to environmental justice communities, supports workers and communities transitioning away from coal mining, and provides bill assistance to low-income ratepayers. Many EJ communities and low-income ratepayers in the Lake Erie watershed will benefit from these funds.
- **Pass the Pennsylvania Clean Transportation Infrastructure Act (SB 596).** This legislation establishes a plan for developing statewide electric vehicle infrastructure across all transportation sectors. Electric vehicles will reduce air pollution and emissions in the Lake Erie watershed and infrastructure could attract electric vehicle or infrastructure manufacturing companies to the area.
- **Pass the Lake Erie Wind Energy Development Act (HB 685).** This legislation establishes a competitive process for leasing 25 acres within the bed of Lake Erie for evaluation and development of wind, solar, or kinetic energy generation facilities. A 2% royalty on gross revenues will be distributed 20% to Erie County, 20% to the PA Fish & Boat Commission for activities directly related to Lake Erie, 40% to PA DEP for dam removal, restoration, and repair projects, and 20% to the Erie County Conservation District. It is strongly recommended that the lessee be required to hire 80% of employees from Erie County.



PART 5: Limit the Damage Caused by Plastics and Fossil Fuels



Photo courtesy of J. Michael Campbell, Ph.D.

Pennsylvania has a long history with fossil fuel industries and Erie County is no exception. The connection between gases released when extracting and burning fossil fuels and increased global temperatures has long been established²⁸ and global infrastructure needs to transition to renewable energy sources. Pennsylvania's stubborn adherence to fossil fuels as a source of economic development does nothing to help the country or the world pivot to a more sustainable future. As long as Pennsylvania clings to the fuels of the past, it will be unable to create an economy for the future. The good news is that many of the solutions to climate change discussed above will also address the threats caused by petrochemicals, oil, and gas and vice versa. Specific threats to the Lake Erie watershed are abandoned and orphaned wells, pipelines, petrochemicals including plastics, and fracking waste.

Erie County has 163 known abandoned and orphaned conventional oil and gas wells from Pennsylvania's oil and gas boom in the late 19th and early 20th centuries. Of those wells, only 30 have been plugged (PA DEP, 2020b). Unplugged wells can release combinations of oil, gas, and brine into soil and groundwater, all of which can irreversibly contaminate the water and cause other detrimental effects to human health and the environment. These wells are also sources of methane and volatile organic compound air pollution (Fractracker Alliance, 2019). Methane is a powerful greenhouse gas and volatile organic compounds are known to cause a variety of human health issues including asthma and cancer (ToxTown, 2017).

Erie County has several oil and gas pipelines running through it, including the recently completed Risberg pipeline, and there is potential for more pipelines given the current proliferation of oil and gas infrastructure in Pennsylvania. Pipelines always have the potential for leaking and contaminating surface and groundwater. Erie County has been fortunate in its lack of pipeline incidents, but collectively, U.S. pipelines have been found to leak an average of 300 times per year (Stover, n.d.). There have been a number of highly detrimental pipeline incidents in Pennsylvania including an ethylene glycol leak in

²⁸ Oil and gas wells leak methane, a powerful greenhouse gas. Production of plastic generates greenhouse gases, and burning of all fossil fuels (oil, gas, and coal) generates carbon dioxide among other pollutants.

Potter County that caused resident well water to become unusable and is credited with a fish kill in a local pond (Troutman, 2020), and the Revolution pipeline exploding in Beaver County that completely destroyed one home while damaging several others. Energy Transfer, the company that owns the Revolution pipeline, has racked up millions of dollars of fines and hundreds of environmental violations in just the past several years (Stonesifer, 2019).

A growing threat to the Lake Erie watershed is its connection to the petrochemical buildout occurring throughout Pennsylvania. Erie has a thriving plastic industry that relies on preproduction plastics (also called plastic pellets or nurdles). The pellets are very small and easily escape into the environment during transport and manufacturing. In Erie, piles of pellets are regularly seen littering the ground below transport railcars and ongoing studies are finding that these pellets are escaping into Erie County streams, washing into Lake Erie, and depositing on beaches (S. Mason, personal communication, April 7, 2020). When pellets are in the water, aquatic organisms mistake them for food and fill up on them instead of the food they should be eating. To make matters worse, pellets attract bacteria (Rodrigues et al., 2019) and persistent organic pollutants (Driedger et al., 2015) so they may serve as vectors for pathogens and toxins to animals. The Shell ethane cracker plant currently being built in Beaver County, PA is likely to increase the number of plastic pellets entering Erie County and its waterways.



Plastic pellets below a railcar

Photo courtesy of Sherri A. Mason

In addition to the direct threats to clean water that preproduction pellets pose, manufactured plastics are a well known and potent threat to water quality across the globe. When these plastics enter waterways, they break down into microplastics which have the same impacts on waterways as plastic pellets described above. This problem is receiving more and more attention worldwide, with single-use plastic bans occurring in several countries and in municipalities across the United States. This wave of single-use plastic bans will eventually reduce the demand for plastics that are produced in Erie County, so local leaders should be leary of placing all of their future hopes upon a plastic industry buildout.

Pennsylvania has increasingly relied on the fracked gas industry to provide a thriving economic future for the state and this poses a serious threat to water quality in Pennsylvania's Lake Erie watershed. While

fracking is unlikely to occur in the watershed, fracking waste from other parts of the state has been disposed of in the region and could increase in the future. Fracking waste injection wells and waste deposited in the Lakeview Landfill are potential threats, and fracking brine has been applied to Erie County roads in the past. Fracking waste and brine are known to contain heavy metals and naturally occurring radioactive material (NORM) (Frazier, 2018). When these products are deposited in landfills (because they are not considered hazardous material under current law) they can combine with other landfill leachate and be sent to the Erie Wastewater Treatment plant then eventually released into Lake Erie. Such leachate containing fracking wastes has caused violations of state discharge permits and pollution of waters in other parts of PA (Hopey, 2020). Brine is of particular concern in Erie County because it is directly applied to unpaved roads and can easily run off into waterways. Additionally, unpaved roads are found in rural parts of Erie County where residents often rely on untreated wells for drinking water. There is also a significant population of rural people living in poverty in Erie County (Jefferson Education Society, 2019), including several environmental justice communities (PA DEP, 2015a).

Municipal and County Level Solutions

Many of the solutions offered in the sections above on reducing runoff pollution and improving resilience to climate change will help limit damage caused by petrochemicals and fossil fuels. Anti-pollution ordinances will reduce plastic and industrial pollution, and improving public transportation and increasing electric vehicle infrastructure will also reduce pollution and fossil fuel use. Creating an Environmental Justice Committee on the County Council and establishing an EAC will help the county avoid welcoming new polluting industries. There are some additional steps that municipalities and counties can do to limit damage but many of the solutions to this threat are at the state level.

- **Pass new or revise existing litter ordinances to increase penalties for littering.** Litter is a major source of plastic pollution entering waterways. Once it enters the water, plastics are broken down into microplastics which are detrimental to aquatic life and can get into drinking water (See Appendix B for further explanation).
- **Establish an industrial scale biowaste digester in Erie County.** Currently, there are many municipal and privately owned composting facilities in the county but none are equipped to break down biodegradable plastics or fat-containing food waste. Establishing a biodigester in Erie County would reduce reliance on traditional single-use plastics, provide an end use for biodegradable plastics and restaurant waste that require high temperatures to break down, provide fertilizer for Erie County farms, reduce methane generated by food decomposition in landfills, and help move the county to becoming a zero waste community (CAG, 2020). Biogas can also be harvested to generate energy, which could reduce energy costs for the county²⁹.

State Level Solutions

The dangers of petrochemicals, oil and gas to human and environmental health are well known and communities across the commonwealth are in legal battles to protect themselves and their families. A recent grand jury report of energy companies by Pennsylvania Attorney General Josh Shapiro highlighted the damage that this industry has already caused to Pennsylvanians (Hopey and Legere, 2020). Pennsylvania residents need state legislators and agencies to protect their rights to clean water and pure air. To do this, legislators need to increase funding to state agencies that protect water resources and stop proposing legislation that undermines their regulatory authorities. Legislators also need to hold polluting industries accountable for threats to current and future



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²⁹ Ohio State University's Ohio Agricultural Research and Development Center currently generates 30% of its electricity through biogas (Espinoza, 2013).



Erie Coke Corporation

Image courtesy of Tom Hiegel

Pennsylvanians and be more forward thinking to prepare Pennsylvania for a future with limited fossil fuel use. Recommendations above that promote renewable energy will have the added benefit of limiting Pennsylvania's reliance on fossil fuels and help pave a cleaner, healthier path forward.

- **Pass legislation that includes fossil fuel drilling waste in the definition of hazardous waste.** This bill will help prevent fracking waste from threatening water quality in the Lake Erie watershed. Municipalities across PA have had to fight to prevent fracking injection wells³⁰ and the evidence that drilling waste is hazardous continues to grow.
- **Make the moratorium on application of brine from oil and gas drilling permanent** and reject legislation that proposes to allow brine application. This will prevent heavy metals and radioactive elements from entering Lake Erie waterways, especially in rural and environmental justice communities.
- **Propose legislation regulating plastic pellet transportation, transfer, and use to reduce plastic pellet pollution.** Legislation that reduces plastic pellet pollution is important to water quality and long term economic viability of Erie County. The water resources of Erie County, in addition to providing drinking water to over 240,000 residents, are integral to its fishing, tourism, agriculture industries, which contribute \$40.6 million, \$1.2 billion, and \$23 million to Erie County's economy, respectively.
- **Support the investment of \$453 million over 4 years in DEP's Abandoned & Orphan Well Program and ensure that Erie County gets its fair share of those funds.** It is estimated that each well will cost approximately \$50,000 to plug (PennFuture, 2020) so Erie County should receive \$8,150,000 of this state investment to plug its 163 known wells. These funds will have the added benefit of generating family-sustaining jobs.



³⁰ There is an ongoing legal battle between Grant Township and PA DEP as the township fights to prevent fracking waste from being injected into wells in the township (Hopey, 2019)

PART 6: Control Invasive Species in the Lake Erie Watershed

Invasive species can have significant effects on water quality in all waterways by impacting native species, aquatic food webs, and habitats. It is very difficult, time consuming, and expensive to control invasive species once they are established, so preventing their introduction and spread is key in reducing their impacts. The characteristics of Pennsylvania's Lake Erie watershed that make it invaluable to the Erie region—fishing and recreation opportunities, the commercial port, and proximity to railways and highways—also increase its vulnerability to invasive species. This issue is exacerbated by the fact that Pennsylvania lags behind many other Great Lakes states in terms of policies and programs addressing invasive species. An analysis of the number of invasive aquatic plants and animals regulated by the state places Pennsylvania second to last in terms of number of species regulated (Great Lakes Regulation Species List, 2019). There are several species, like the alewife, Japanese knotweed, and *Phragmites*, that have caused dramatic changes in the Lake Erie watershed that are not regulated by the state.

Aquatic invasive species (AIS) are often referred to as “aquatic hitchhikers” as they can be transferred to new locations on recreational equipment such as boats, trailers, or fishing gear. For example, invasive mussels such as zebra and quagga mussels can survive out of water for more than five days attached to boating or fishing equipment. These mussels can filter large quantities of water (up to 1.5 liters per day) removing plankton and detritus from the food web. This filtering behavior can also facilitate the accumulation of cyanobacteria, which are responsible for harmful algal blooms. Mussels also accumulate in and clog water intake pipes and can injure swimmers when they are stepped on.

Terrestrial invasive species also impact water quality. For example, invasive Norway maples can shade stream banks, preventing native shrubs and other plants from growing. The lack of ground cover along the banks makes them less stable, and more vulnerable to erosion. Erosion can then result in increased flooding, increased sedimentation, and decreased habitat for aquatic organisms. Multiflora rose and *Phragmites* (also known as the common reed) are very problematic because they take over large areas and prevent native plants from growing. Like Norway maples, these plants can prevent healthy riparian zones from growing along streambanks, which will destabilize them, reduce water quality in streams, and increase sedimentation and pollution downstream in Lake Erie.

Terrestrial invasive species are introduced in a variety of ways, and often people introduce them by planting them in yards without knowing that they are invasive or that they will have negative impacts on the environment. For example, Norway maples have been planted extensively throughout the United States, including the Erie region, due to their hardiness and ease of cultivation (Nowak & Rowntree, 1990).

Municipal and County Level Solutions

In Pennsylvania's Lake Erie Watershed, the tendency has been to rely completely on government and non-government agencies to manage the problems caused by invasive species. However, if municipalities and the county take a more hands-on approach and aid these agencies in their efforts, the region will be much more successful in addressing the threats posed to our ecosystems, waterways, and economy.

- **Municipalities should follow the Lake Erie Watershed Cooperative Weed Management Area Plan.** State agencies and NGOs have put together a Lake Erie Watershed Cooperative Weed Management Area (CWMA) Plan (PA SeaGrant, 2013), which identifies target invasive species for the region and describes a plan for addressing them by working with landowners. Engagement by municipalities in the following ways will increase its impact.
 - Train public works crews to identify and eliminate invasive species.



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TO INVASIVE SPECIES.

- Educate residents about invasive species to improve collective efforts to reduce this threat. Municipalities should add pictures and descriptions of common invasive species to their websites. This is especially important for municipalities like Lake City Borough, Harborcreek Township, and North East Township, among others, that have several streams traveling through residential areas before draining directly into Lake Erie.
- Work with state agencies and NGOs that are already working on the CWMA plan to host municipal training through ECCOG to facilitate this education.
- **Establish municipal landscaping best management practices** that encourage native plants and limit the use of pesticides and herbicides to only when necessary. Proper landscape planning and maintenance can reduce the need for chemical applications dramatically, will reduce pollution getting into waterways, and improve water quality for aquatic organisms and humans (See Appendix B for explanation of the impacts of pesticides and fertilizers). Municipalities should work with state agencies, Erie County Conservation District, PA SeaGrant, Tom Ridge Environmental Center, Penn State Extension Master Gardener Program, and community organizations to implement native landscaping around municipal buildings and highlight these efforts in their outreach to residents³¹. The municipal grounds could then serve as educational spaces for residents and businesses to encourage more native landscapes across municipalities and elevate residents' understanding of their impact on water resources. It would also increase the demand for native plants at local nurseries. Municipalities should also begin transitioning to electric landscaping equipment³².

State Level Solutions

Given the difficulty of managing invasive species, it is important to take an “all hands on deck” approach to preventing their establishment and spread, and controlling them if they have established. Collaborative efforts between state agencies, NGOs, municipalities, residents, and businesses will have far reaching impacts on invasive species control in the Lake Erie watershed. In Pennsylvania, aquatic invasive species are regulated by Pennsylvania Fish and Boat Commission while terrestrial invasive species are regulated by PDA and DCNR, depending on their location. These three agencies and four others are represented on the Governor's Invasive Species Council (GISC). One initiative by GISC is to establish Partnerships for Regional Invasive Species Management (PRISM) to provide greater capacity and funding to address invasive species regionally. In their June 2020 meeting, the council discussed the need for an economic analysis on the impacts of invasive species and a PRISM draft budget. It was anticipated that the economic harm due to invasive species would be much greater than the \$6 million budget a PRISM would cost the state (GISC, 2020).

- **Introduce and pass legislation establishing a state watercraft inspection and decontamination (WID) program** using model legislative provisions from National Sea Grant Law Center (Otts & Nanjappa, 2014). A WID program would increase Pennsylvania state agencies' abilities to prevent the introduction of invasive species and educate the public about the importance of proper watercraft management. Pennsylvania should also consider establishing reciprocity with other states to improve efficiency of WID programs across the country and address repeat offenders, people who regularly endanger waterways by not properly managing their watercraft.
- **Support PRISM when proposed by GISC and fully fund the program** in order to better protect Pennsylvania's natural resources and economy from the devastation invasive species can cause. This program would increase capacity for Pennsylvania to address the threats of invasive species regionally and provide the increased funding needed to better address these threats.



³¹ The PA DCNR offers technical assistance for conversion to alternative lawns and some landowners may be eligible for funding. More information can be found at: <https://www.dcnr.pa.gov/Conservation/Water/LawnConversion/Pages/default.aspx>

³² Mercyhurst University began this process and could provide advice on the process.

PART 7: Address Legacy Pollution and Promote a More Sustainable Future



Erie Coke Corporation

Photo courtesy of J. Michael Campbell

Legacy pollution from Erie's industrial past has plagued the region for decades and existing companies continue to pollute the region's air, land, and water. Industrial sites throughout the Lake Erie watershed have received federal, state, and private funds to clean up and redevelop sites for new uses. For example, one site where the Hammermill Paper and later International Paper mills sat was heavily polluted with byproducts of paper pulping and bleaching. The site was cleaned up through the Pennsylvania Act 2 Land Recycling Program and is now home to Hero BX, a biodiesel fuel company. The story of Hero BX has a happy ending, but there are many sites across the region that continue to lie vacant. There are also sites, like the former GAF shingle plant site along Erie's bayfront, that continue to have issues even after being cleaned up. The site underwent a \$7 million cleanup by its current owner, Erie Events, beginning in 2013. The cleanup addressed tar along the foundations of the site, built a sea wall to contain pollutants, and several other measures were taken to improve the site and make it safe for future development. However in 2019, tar bubbles began to surface at this site. They were quickly cleaned up by site owners but they demonstrate the long term effects that these sites and their pollution can have on the Erie region. In addition, high water levels in Presque Isle Bay, which have already been described in this document, are believed to be the culprit in bringing tar to the surface (Erie News Now, 2019). This highlights the need for site cleanups to consider long term changes, like climate change, to ensure that cleanup is sufficient in the long term.

A more recent example of a polluted site is the Erie Coke Corporation³³, also located along Erie's Bayfront, which closed in 2019. During its operation, the plant had frequent environmental violations including illegal emissions levels of benzene and high levels of particulate matter, among other harmful pollutants (Pa. Ct. Com. Pl. July 1, 2019, pp. 2-3). As discussed previously, these violations most directly impacted

³³ Erie Coke Corp. produced high energy coke by burning coal at high temperatures. Coke is used in many industrial processes that require very high heat.



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JUSTICE AREAS.

low-income and minority residents. Land and water pollution from this plant's decades of operation will be yet another legacy pollution issue for the Erie region and cleanup will require taxpayer dollars for years to come. Erie should learn from its past and prevent future polluting industries from fouling its land, air, and water and generating millions of dollars of cleanup for taxpayers. It is especially important to prevent industries that use or produce hazardous wastes from developing near waterways or in environmental justice areas.

The Erie region faces another legacy water quality challenge that many other U.S. cities face, and that is the potential for lead contamination in drinking water due to corrosion of old water supply lines or lead piping and fixtures in homes. People with lower incomes are more likely to be affected by this issue because they tend to be renters rather than homeowners. As renters, they must rely on their landlords to upgrade piping, and they may also lack the resources to have their drinking water tested. Water quality reports from Erie region water authorities demonstrate that lead is rarely found in drinking water (Erie Water Works, 2019; Girard Borough Water Dept., 2019; North East Township Water Dept., 2019), although service lines containing lead are slowly being replaced as time and funding allows. In many cases this occurs in coordination with road construction projects when paving and restoration costs can be minimized. Pressure to ramp up supply line replacement is likely to increase with more attention being paid to water infrastructure issues (Erie Water Works, personal communication, Sept. 8, 2020).

Among the many legacy pollution concerns that plague the region are several toxic chemicals that have been identified by the Great Lakes Water Quality Agreement as chemicals of mutual concern to both the United States and Canada. This list includes many chemical classes used as flame retardants or plastic additives, as well as mercury and polychlorinated biphenyls (PCBs). A description of the currently adopted chemicals of mutual concern can be found in Appendix C. All of the chemicals have human sources, accumulate in tissues of organisms (bioaccumulate), increase in concentration in tissues as they move up the food chain (biomagnify), and are persistent organic pollutants, which are chemicals that stick around in the environment long after their use stops. The full scope of their impacts are not fully known, but there are known harmful impacts on wildlife, biodiversity, and humans (GLWQA, 2016). Mercury and PCBs are among the chemicals of concern that cause issues in the Lake Erie watershed. This is most apparent with fish consumption advisories for mercury and PCBs (PA Fish and Boat Commission, 2020). Radionuclides, lead, PAHs and sulphates are currently being considered for addition to the chemicals of mutual concern list (Jackson, 2020).

The standard method of addressing this pollution is to let it be buried by natural sedimentation processes. However, sediment buildup at the mouth of the bay currently requires dredging every few years to maintain connectivity between the bay and Lake Erie. Dredging can cause these chemicals to be redistributed into the water. Therefore, efforts to reduce sedimentation (as described previously in this document) may also reduce the need for dredging and help reduce the threat from chemicals of mutual concern.

Chemicals of mutual concern have potentially greater impact on marginalized people in the Lake Erie watershed. There is a growing population of immigrants and New Americans³⁴ in Erie who often rely on fishing to feed their families. Fish consumption advisories may not be known to these populations and the information may not be easily accessible due to language barriers. Therefore, contaminated fish may pose a greater threat to these already marginalized populations.

³⁴ New Americans are people living in the Erie region who recently became American citizens.

One class of chemicals of mutual concern, PFAS, has received increased attention recently due to increased knowledge of their impacts on organisms and humans, the film *Dark Waters*³⁵, and the discovery of some PFAS chemicals in human bodies. PA DEP conducted limited testing for PFAS in Erie County in 2019. No PFAS were detected at three of the four sites tested; however, PFAS was detected at Freligh's Whispering Pines Mobile Home Park in Girard (PA DEP, 2019b). PFAS-containing products can include clothing, home furnishings, non-stick cookware, food packaging, and personal care products. These products usually end up in landfills when consumers are finished with them. In this way, PFAS can become part of landfill leachate (Murray and Salim, 2019). In Erie, this leachate is sent to the City of Erie Wastewater Treatment Plant and then released into Lake Erie; however, wastewater treatment does not specifically remove PFAS or any other chemicals of mutual concern from the water. Additionally, PFAS-containing foams are still being used at airports across the United States (Stermann & Brauer, 2020), and the EPA listed them as a major source of groundwater contamination at airports (EPA, 2016); therefore, it is necessary to determine whether or not PFAS contamination exists at the Erie International Airport.

Municipal and County Level Solutions

Erie County and its municipalities should be mindful of the legacy pollution present in its soil, sediment, and water. Steps should be taken to clean up pollution that already exists and to prevent any new pollution from adding to the legacy. Incorporating GSI, the Erie County Environmental Justice Committee and EAC, and engaging Community Advisory Committees are solutions to several other threats described above that will also be effective in managing legacy pollution and preventing new polluting industries. Specifically, incorporating GSI can improve neighborhoods while making brownfield sites more functional and can reduce sedimentation by slowing the water entering streams. By doing so, this could reduce the amount of dredging that takes place in Presque Isle Bay, which can also prevent disruption of chemicals of mutual concern sequestered in the sediment.

- **Incentivize brownfield development by modifying the LERTA tax credit program and exploring countywide tax incentives.** Municipalities and Erie County can address legacy pollution by incentivizing brownfield development and discouraging development on undeveloped land. Brownfield development can utilize Pennsylvania Act 2 funds and federal superfunds to clean up sites and develop them for new uses. The Local Economic Revitalization Tax Assistance (LERTA) tax abatement program in the City of Erie is an example of a current program that could be modified to include increased incentives for developing brownfield sites. Opportunity Zones could also be expanded to include brownfield site development. The City of Erie also added a fee to LERTA to establish a fund to help the most vulnerable neighborhoods. This was an excellent idea to ensure that programs like this “raise all boats” but the fee should be increased so the fund is sufficient. Redevelopment authorities in municipalities throughout the county have done a good job of identifying blighted and vacant properties and should increase their incentives for development on brownfield sites to promote additional cleanup, which would reduce long term soil and water pollution. It must be reiterated, however, that residents in impacted neighborhoods should be included in development plans to ensure that their needs are met. The Community Advisory Committee would be well utilized in this situation.
- **Develop plans to replace some brownfield sites with open spaces that include GSI.** Erie County Department of Planning and Community Development has established a map of locations across the county that would benefit the most from more green spaces³⁶. Municipalities should work with the

³⁵ *Dark Waters* is a film that tells the story of a West Virginia lawyer who exposed the impacts of PFAS in drinking water.

³⁶ Erie County Parks, Trails, and Recreation Plan (2020).

<https://eriecountypa.gov/departments/planning-and-community-development/programs/parks-trails-and-recreation-plan/>

department to implement their parks, trails, and recreation plan while utilizing brownfields. Converting brownfields to functional green spaces would increase property values surrounding those spaces, reduce blight, increase the ability of sites to manage and filter stormwater, improve air quality, and improve the mental health of residents living near the green spaces (Erie County, 2020a). Planting riparian zones along waterways in brownfields would be especially beneficial in preventing rapid conveyance of pollutants to local streams. Again, it is important for municipal and county governments to include residents near the sites in the planning process to ensure that it meets the needs of the community it is meant to serve. This would be a good role for a Community Advisory Committee.

- **Revise development plans along the waterfront to include open spaces and water protections.** The value of open spaces has already been discussed throughout this document, but the need for these spaces along the waterfront, especially in more urban areas, is even stronger. Open spaces with trees and GSI will protect water resources while drawing people to the area. One example of water-friendly development plans are Erie Events' plans for Bayfront Place. These plans call for 40% of the space to be open space (Erie Events, 2016). These plans could be revised further to incorporate GSI, native trees and vegetation, and water-friendly site maintenance.
- **Revise municipal zoning to exclude new industries that use or produce hazardous chemicals from sites near waterways and groundwater recharge areas.** This rezoning will provide long term protection to water resources. A good place to start this rezoning is with future development of the Erie Coke site. The site is currently zoned as waterfront manufacturing. The City of Erie has an opportunity to signal to its current and potential residents and businesses that it values its abundant natural resources with redevelopment of the Erie Coke site. For years the coke plant polluted Erie's air, land and water, and had disproportionate impacts on people of color and people in poverty. Any new development at that site should include careful protection for water resources, but a mixed-use space that provides abundant open space with local community access is strongly recommended.

State Level Solutions

Pennsylvania government officials can take important steps to aid municipalities and counties in efforts to identify and address legacy pollution. There are already important state programs like the Act 2 Land Recycling Program and the Redevelopment Assistance Capital Program. However, funding levels continue to be an issue as more is known about emerging chemicals of concern. Steps legislators can take now to address existing and emerging issues are:

- **PA DEP should establish maximum contaminant level (MCL) drinking water standards for PFAS and define them as hazardous substances³⁷ (SB 581/SB 582).** This will allow PA DEP to regulate PFAS in drinking water and reduce threats to PA residents.
- **Expand the PA DEP's PFAS testing program in Erie County and leverage state and federal funds to address contamination cleanup** where sources of PFAS contamination are found. Increased testing in Erie County will give a clearer picture of the extent of PFAS contamination which will better allow site cleanup to reduce threats to human health.
- **Establish a state lead service line replacement grant program.** Increased funding for lead service line replacement will allow municipalities, including those in the Lake Erie watershed, to replace these lines faster and limit lead exposure to residents³⁸.



³⁷ New Jersey recently adopted new rules establishing drinking water standards for PFAS (NJ DEP, 2020).

³⁸ New York established a Lead Service Line replacement grant program in 2017 that could be used as a template (EDF, 2020).

PART 8: Increase Collaboration Between Community Organizations, Businesses, and Government



Children fishing in Presque Isle Bay

Photo courtesy of Sr. Pat Lupo

Erie's history tells an all too common story: decisions are made by a select few, excluding the communities most often impacted and organizations working most closely with those communities. When included, community organizations can act as liaisons between government and residents, improve efficiency in planning and decision-making, and increase trust between neighborhoods and government. Below are examples of ways that community groups and other non-governmental organizations (NGOs) can help address the threats to water quality included in this agenda.

- **Promote best management practices and other water protection initiatives with residents and businesses.** Community organizations and NGOs like Pennsylvania Lake Erie Watershed Association (PLEWA), Lake Erie Region Conservancy (LERC), Erie County Conservation District, PA SeaGrant, Asbury Woods, Regional Science Consortium, Tom Ridge Environmental Center and many others are well positioned to communicate with residents and businesses. By including residents and business owners and ensuring that they understand the goals of the plans, they become partners in implementing BMPs. Examples of community outreach include:
 - PLEWA should establish a website and social media sites to communicate water issues to the public. Municipalities and Erie County Department of Planning should regularly communicate with PLEWA to share information with the public.

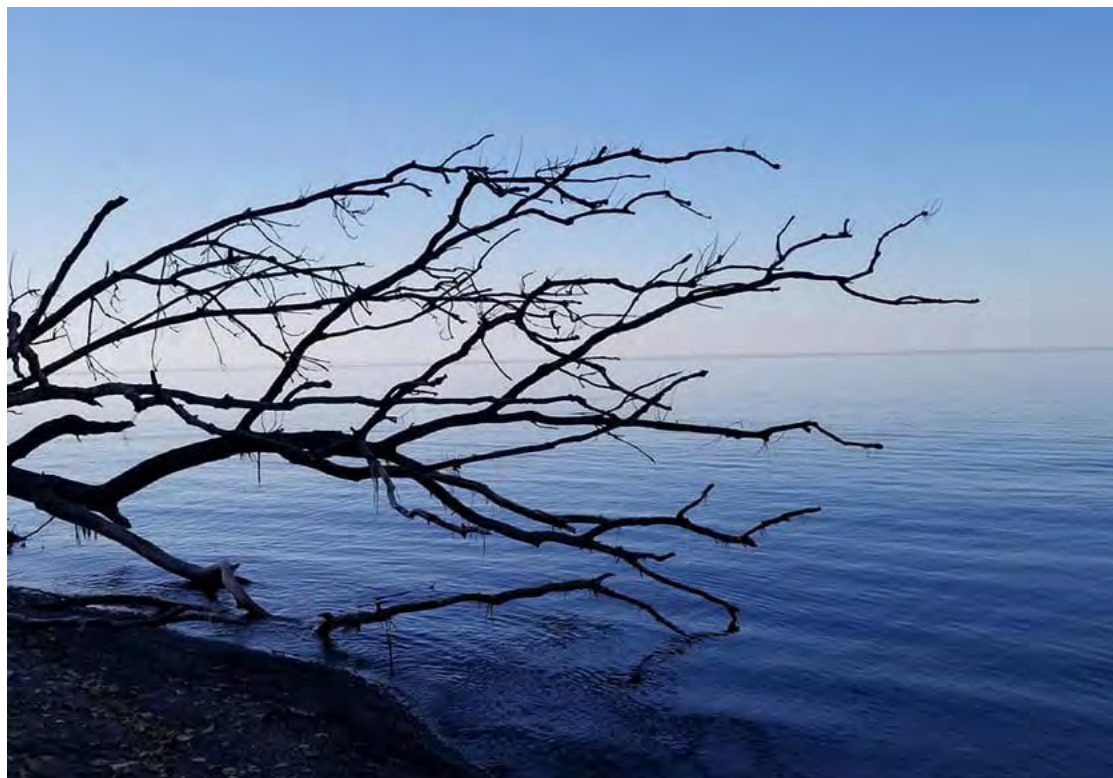


ENGAGE RESIDENTS
IN HEAVILY BLIGHTED
NEIGHBORHOODS TO
ENSURE THAT PLANS
FOR ADDRESSING
BLIGHT MEET THEIR
NEEDS AND IMPROVE
CONDITIONS.

- Developing and distributing information about BMPs for salt use during the winter to reduce salt runoff into waterways, reduce salt costs, and custodial costs.
- Developing and distributing information about alternative landscaping and working with local nurseries to highlight plants that work well.
- Conducting campaigns like “All Drains Lead to Lake Erie” or “Ditch the Straw” which could eventually lead to bans on single use plastic in the region.
- Promoting water management alternatives like rain barrels, household greywater systems, and compostable toilets and sharing information about funding.
- Installing signage for waterways, including tubed waterways, in the Lake Erie watershed to encourage awareness of these waterways and their protection.
- **Utilize Erie County Council of Governments** to provide a space for collaboration with NGOs. NGOs should develop workshops or lectures to educate municipalities on issues impacting water quality (and many other possible topics). There should also be listening sessions where NGOs hear from municipal representatives about barriers to implementing programs.
- **Establish a Sustainable Business Network in Erie County** by convening area business and sustainability leaders to develop plans, goals, workshops, and rewards for participating businesses. Rewards could be as simple as free PR for companies that meet their goals. These efforts would also contribute to Erie2030 District goals and signal to companies seeking to move to Erie County that we value sustainable development and business practices.
- **Collaborate with Climate Resiliency Action Network of Erie (CRANE)** to ensure that municipalities are prepared for extreme weather events, especially regarding vulnerable populations. Additional collaboration should be made with the region’s immigrant and refugee communities who may have experience dealing with these events.
- **Educate plastic companies in Erie County to get them to adopt Operation Clean Sweep** practices that reduce plastic pellet pollution from their plants. Community organizations should introduce companies to the Operation Clean Sweep (OCS) manual (PLASTICS & ACC, 2017), request that their company pledge to abide by the practices therein, and request that they ask their employees to pledge to the practices, as well. If the companies are interested, they could also be connected with students in environmental programs at local universities to hire as interns to conduct site audits of pellets (as described in OCS manual) and develop initial pellet reduction plans. Community organizations could also facilitate conversations between plastics companies in the region and engineering departments at Gannon University and Penn State Behrend to discuss engineered solutions to reduce plastic pellet pollution.
- **Work with local nurseries to promote native plants to residents.** If the choice between native and non-native plants is more apparent, and the benefits of native plants is explained, this may help prevent the introduction of terrestrial invasive species that can be so detrimental to water quality. It would also increase residents’ exposure to the idea of native landscaping.
- **Engage residents in heavily blighted neighborhoods** to ensure that plans for addressing blight meet their needs and improve conditions. There are many organizations like Erie County United, Green New Deal Coalition, Connect Urban Erie, Equity Coalition of Erie and Erie Equal that are well informed about these issues and potential solutions and could help with efforts to engage residents.



PART 9: Federal Level Solutions to Great Lakes Threats



Lake Erie in the fall as seen from Erie Bluffs State Park

Photo courtesy of Bryan Bentz

This agenda provides extensive refocus on local, county, and state level solutions to water quality threats. However, Lake Erie's connection to other states and to Canada requires protection at the federal level, as well. Lake Erie provides drinking water to more people than any other Great Lake (Briscoe, 2019). This places a heavy burden on this resource that also has the most agricultural land draining into it of any of the Great Lakes. Increasing harmful algal blooms and hypoxia are signs that the lake is under threat from human activities. Infrastructure improvements and increased runoff protections are needed to ensure that Lake Erie is able to continue providing quality drinking water to over 12.5 million people, clean water for recreation and economic development, and healthy ecosystems for aquatic organisms well into the future. As a Great Lake state, Pennsylvania is a party to the Great Lakes Water Quality Agreement (GLWQA), an international agreement between the United States and Canada, which commits parties to protecting the water resources of the Great Lakes. The GLWQA has identified nutrients, bacterial pollution, and chemical contaminant pollution as priority threats to Great Lakes water quality. In order to restore and protect Lake Erie from these threats, federal legislators representing the Lake Erie watershed should do the following.

- **Pass the Moving Forward Act (HR 2 2020).** This is a major infrastructure bill that will address many of the threats to clean water in this document including transportation, carbon-reduction, stormwater BMPs, and water infrastructure improvements. It includes increasing funding for the Great Lakes Restoration Initiative (GLRI) to \$475 million per year. GLRI funds used in Erie County to fund a small flow treatment facilities program with Erie County Department of Health, PA VinES Plus program, HAB testing, and several other projects including habitat restoration. The bill also provides \$40 billion over five years for sewage infrastructure improvements, \$22 billion over five years for lead service line replacement, and \$1 billion over five years for PFAS contamination management.

- **Pass the Water Resources Development Act (HR 7575 2020)** which provides funds for studying and addressing harmful algal blooms, nature-based flood control projects like wetlands, parks, and rain gardens, and technical assistance for climate change mitigation planning.
- **Pass America's Water Infrastructure Act (S 3591)** which reauthorizes and increases funding for the Clean Water State Revolving Fund which would increase Pennsylvania's PENNVEST fund. This act also includes provisions to fight invasive species, requires increased energy efficiency at ports and wastewater treatment facilities, and reauthorizes the Water Infrastructure Finance and Innovation Act that provides funding for shovel ready water infrastructure projects. PENNVEST funds can be leveraged as matching funds.
- **Pass legislation to regulate persistent organic pollutants.** The U.S. has signed several international agreements to address persistent organic pollutants but has not ratified them. Legislation should include avoiding substitution of one toxic chemical e.g., flame retardants, with new substances that are likely to become persistent pollutants in the future. Candidates for replacement chemicals should be assessed to determine whether there is a safer way to provide the service or function.
- **Pass the HR 7617 spending package (HR 7617)** which increases funding to GLRI, the small and disadvantaged communities grant program, reducing lead in drinking water program, Sewer Overflow and Stormwater Reuse Municipal Grants, NOAA harmful algal blooms and SeaGrant. The bill also maintains funding for the Clean Water State Revolving, Drinking Water State Revolving, and Lead Testing in Schools Funds.
- **Pass the Climate Action Now Act (HR 9 2019)** which promotes renewable energy and technology development, incentivizes carbon reduction and recapture, improves energy efficiency, and promotes community resilience.
- **Pass the Break Free from Plastic Pollution Act (HR 5845 2020).** This act increases responsibility of packaging producers to create products made from recycled goods and that are more recyclable or compostable. It will also help reduce plastic pollution from cradle (plastic pellets) to grave by holding plastic producers accountable for the life of their products.



Conclusion



Kids fishing with SONS of Lake Erie

Photo courtesy of Sr. Pat Lupo

The Lake Erie Watershed is an invaluable asset to Erie County residents and all Pennsylvanians. However, our federal, state, and local policymakers are not doing enough to protect and conserve this important water legacy. The threats described in this report reflect issues that have been building for decades, yet each has been largely neglected by elected officials.

By bringing together organization leaders, academic resources, and community voices, this agenda aims to change this historical inertia at a critical inflection point. After decades of industrial decline in the City of Erie and its surrounding communities, significant civic, business, and governmental energy is flowing into rebuilding, reenvisioning, and reinvigorating its economy and community. This important moment in the region's history could be transformative, but it cannot make the same mistakes of the previous century and ignore the natural infrastructure that underpins Erie. If it is ignored, Erie's civic momentum will lead to short-term changes and not the long-term transformation it seeks.

Protecting the Lake Erie Watershed is not an either/or proposition. The region can achieve economic prosperity as well as equitable and sustainable growth. So many of the recommendations made in this agenda aim to ensure that clean water—and those that use, rely, and benefit from it no matter where they live—have a seat at the table. Equitable decisions are not made in a boardroom by the select few, but after intentional community engagement.

It has been shown across the state and the country that clean water is an ultimate unifier that ignores political boundaries and affiliations. We all rely on it for life, but often take it for granted until it's too late. Erie elected officials have an opportunity to lead and provide forward-thinking policies that sketch a vision for a regional economy that thrives on its clean water rather than polluting it. We call on Erie's leaders to take responsibility for Lake Erie and its watershed and make its protection and conservation a centerpiece of any renewed vision for the region. Bold leadership at all levels of Erie's government is needed to push back against the "way we've always done it." This Common Agenda provides a path to do so.

Appendix A – Summary of Recommended Solutions for Municipalities and State Legislators

Municipal and County Solutions to Address Racism as a Public Health Crisis

- Develop municipal Community Advisory Committees and formalize their inclusion in decision-making processes.
- Establish an Erie County Council Environmental Justice Committee.
- Establish an Environmental Advisory Council that includes representation from typically underrepresented communities.

Municipal and County Solutions to Reduce Pollution and Flooding due to Surface Runoff

- Revise zoning and development plans to conserve open space and decrease impervious surfaces.
- Examine existing stormwater ordinances and BMPs to ensure they are being enforced
- Improve stormwater management through a phased implementation plan that includes a multi-municipal stormwater authority and county-wide stormwater fee.
- Consider “daylighting” portions of streams running under municipalities or through tunnels.

Municipal and County Solutions to Improve Resilience to Climate Change and Extreme Weather

- Pass an ordinance to establish a C-PACE district in Erie County.
- Pass municipal Complete Streets ordinances.
- Establish a county-wide tree management program.
- Develop a county climate action plan.
- Establish municipal and county sustainability offices.
- Revise municipal zoning and development plans to promote multi-use neighborhoods.
- Implement community level renewable energy and electric vehicle infrastructure.

Municipal and County Solutions to Limit the Damage Caused by Plastics and Fossil Fuels

- Pass new or revise existing litter ordinances to increase penalties for littering.
- Establish an industrial scale biowaste digester in Erie County.

Municipal and County Solutions to Control Invasive Species in the Lake Erie Watershed

- Municipalities should follow the Lake Erie Watershed Cooperative Weed Management Area Plan.
- Establish municipal landscaping best management practices.

Municipal and County Solutions to Address Legacy Pollution and Promote a More Sustainable Future

- Incentivize brownfield development by modifying the LERTA tax credit program and exploring countywide tax incentives.
- Develop plans to replace some brownfield sites with open spaces that include GSI.
- Revise development plans along the waterfront to include open spaces and water protections.
- Revise municipal zoning to exclude new industries that use or produce hazardous chemicals from sites near waterways and groundwater recharge areas.

State Legislative Solutions to Reduce Pollution and Flooding due to Surface Runoff

- Establish requirements for fertilizer application (SB 915).
- Increase funding to Erie County Conservation District (ECCD) by \$75,000.
- Establish a dedicated fund for watershed restoration and monitoring with at least \$112,000 dedicated to Lake Erie watershed HAB testing.

State Level Solutions to Improve Resilience to Climate Change and Extreme Weather

- Pass Community Solar Legislation (HB 531/SB 705).
- Pass the Modernizing Pennsylvania’s Renewable Energy Standards (SB 600/HB 1195).
- Support PA’s participation in RGGI.
- Pass the Energy Transition and Recovery Act (SB 15).
- Pass the Pennsylvania Clean Transportation Infrastructure Act (SB 596).
- Pass the Lake Erie Wind Energy Development Act (HB 685).

State Level Solutions to Limit the Damage Caused by Plastics and Fossil Fuels

- Pass legislation that includes fossil fuel drilling waste in the definition of hazardous waste.
- Make the moratorium on application of brine from oil and gas drilling permanent
- Propose legislation regulating plastic pellet transportation, transfer, and use to reduce plastic pellet pollution.
- Support the investment of \$453 million over 4 years in DEP’s Abandoned & Orphan Well Program and ensure that Erie County gets \$8,150,000 of those funds.

State Level Solutions to Control Invasive Species in the Lake Erie Watershed

- Introduce and pass legislation establishing a state watercraft inspection and decontamination (WID) program
- Support PRISM when proposed by GISC and fully fund the program

State Level Solutions to Address Legacy Pollution and Promote a More Sustainable Future

- PA DEP should establish maximum contaminant level (MCL) drinking water standards for PFAS and define them as hazardous substances (SB 581/SB 582).
- Expand the PA DEP’s PFAS testing program in Erie County and leverage state and federal funds to address contamination cleanup.
- Establish a state lead service line replacement grant program.

Appendix B – Common Pollutants Found in Runoff

Pesticides

Pesticides are chemical compounds used to kill unwanted living organisms. These include herbicides, insecticides, fungicides, and others. Although most pesticides are applied to terrestrial environments (croplands, vineyards, households), there is often significant risk for runoff into local waterbodies or leaching into groundwater. For example, herbicides such as atrazine and glyphosate are commonly detected in surface waters locally and abroad (Brannan, 2009; USGS, 2019). The majority of pesticide use occurs in commercial agriculture, but this use is heavily regulated and farmers continuously strive to use BMPs to localize application and reduce operating costs. Despite most attention being directed toward regulating pesticide use in agricultural operations, it can be argued that residential pesticide use (consumer or commercial) has a more detrimental effect on stream quality. Studies have found that the agricultural contribution of pesticides to some streams is lower in concentration than urban contributions (Weston et al., 2009) and that the pesticides found in urban streams are often more toxic than those near agricultural fields (Ding et al., 2009).

In Erie, residential and commercial application of pesticides results in pesticide runoff into creeks. Due to the geology of the Erie region, pesticides are unlikely to remain in the rocky sediments of most streambeds; unfortunately, this means that these contaminants will transport downstream and drain into Presque Isle Bay and Lake Erie, where they can cause toxicity to aquatic organisms. Although most current-use pesticides are not acutely toxic to aquatic vertebrates (fish, birds, mammals), the loss of sensitive invertebrate species can indirectly impact these animals, as invertebrates occupy a vital level of the food web (Groner & Relyea 2011). Insect larvae (midges, amphipods, dragonflies) are prey for smaller fish like yellow perch, which is subsequently prey for larger game fish like smallmouth bass and walleye. Thus, the application of pesticides in Erie County municipalities have a detrimental effect on the fish communities that contribute \$40.6 million each year to the region's economy (Graefe, 2016).

Sewage and Septic Systems

Human and animal waste are sources of nitrogen and microbial contamination in bodies of water throughout Pennsylvania (American Rivers, 2019). Nitrogen waste contributes to harmful algal blooms, which were discussed previously in this document. Animal waste, for example dog feces that is left on the ground, can runoff into storm drains and directly into surface waters. However, human waste enters waterways more often via

wastewater treatment plant overflows, overflows of combined stormwater and wastewater systems, and on-lot septic systems. Studies have found that water contamination due to septic systems (Murphy et al., 2020) and overflows (Cha et al., 2010) increases after rain events. Given that precipitation has increased in the Erie region by 10-15% over the past several decades (Scott, 2019) and this trend is expected to continue (Climate Central, 2019), the issue of sewage contamination is likely to increase in severity over time, threatening fisheries, other aquatic organisms, and human health.

Litter

Litter is the most visible pollutant in Lake Erie waterways given its size and our ability to recognize items in the water. It typically reaches waterways through storm drains, wind, and wave action along shorelines. Thousands of pounds of litter are picked up along Erie County waterways during yearly International Coastal and Adopt-a-Beach cleanups. The most abundant litter items picked up by Adopt-a-Beach and International Coastal Cleanup volunteers in the region are cigarette butts, plastic bottle caps, straws, other small plastic pieces, food wrappers and containers, and cigar tips (Laskos, J., personal communication, October 2020; Ocean Conservancy, 2020). Vaping cartridges are an emerging litter item.

Litter has several impacts when it enters waterways. Large pieces of litter can directly harm mammals, birds, and fish if they become entangled (Bletler and Wantzen, 2019). Organisms may mistake pieces of litter for food and are unable to digest this material. Chemicals from litter items can leach into water and imperil aquatic organisms (Lohmann, 2017; Teuten et al., 2009), and plastic items break down into microplastics, which harm aquatic species. Litter, especially plastic, poses threats to human health as well as wildlife. Microplastics have recently been found in drinking water and beer, including samples originating from Lake Erie (Pivokonsky et al., 2018; Kosuth et al., 2018). It is not yet known what the impacts of those microplastics are on humans but the potential for harm is certainly there. Kosuth and colleagues (2018) extrapolated their findings to estimate that people consume 5800 synthetic particles per year. Other studies have found that man-made chemical additives to plastic can mimic human hormones. These chemicals include bisphenol A (BPA), many phthalates, and some per- and polyfluoroalkyl substances (PFAS) (NIEHS, 2020). It is difficult to study the impacts of these chemicals and microplastics on human health, especially considering that humans are exposed to them at low concentrations but over long periods of time. However, given

how widespread these pollutants are and that animal studies have demonstrated negative effects, it is imperative that communities, especially those along waterways, take steps to prevent plastics from entering the water.

There are also several economic impacts of litter. A recently published study of the costs of Pennsylvania litter found that Erie spent over \$1.2 million cleaning up litter and illegal dumpsites during the 2018 fiscal year (Burns & McDonnell, 2020). The study also acknowledged the importance of litter prevention and cleanup in Erie in that it helps contribute to an environment more attractive to tourists, who contribute greatly to the region's economy. Despite ample efforts to prevent litter, it is still a big issue in Erie, especially in locations frequented by tourists like the Bayfront Corridor and Presque Isle State Park.

Salt

Salt levels are increasing in lakes, streams, groundwater, and soil throughout Pennsylvania (Olson, 2018). Sources of salt pollution include road and sidewalk de-icers, oil and gas brine applied to dirt roads, fertilizers, and several industrial processes. Increased salt levels have detrimental effects on aquatic life, result in

water that is less potable to humans, contaminate croplands, and create water that is more corrosive to human vehicles and infrastructure. If old lead or copper pipes corrode, this can cause dramatic impacts on water quality entering homes and businesses, and will make people sick. High profile instances of this have been demonstrated in Flint, Michigan and Washington, D.C. Lake Erie supplies drinking water to over 240,000 people in Pennsylvania so it is imperative that steps to prevent salinization of the lake are taken.

Vehicle Pollution

Motor oil, transmission fluid, brake fluid, and several other components used to keep vehicles running smoothly as well as metals from vehicle wear and tear accumulate on roadways every day. When it rains, the runoff picks up these pollutants and carries them to nearby waterways. Research has shown that bodies of water near roadways have metal contamination up to 100 times higher than average levels (Hwang et al., 2016). These chemicals are toxic to organisms, including humans, and are incredibly difficult to remove from water (Nixon and Saphores, 2007).

Appendix C – Great Lakes Water Quality Agreement Toxic Chemicals of Mutual Concern

The 2012 Great Lakes Water Quality Agreement (GLWQA) between the United States and Canada designated 8 Chemicals of Mutual Concern that have harmful impacts on aquatic organisms, biodiversity, and humans who consume contaminated fish (GLWQA, 2016). The 8 chemicals are described below. All of these chemicals can be found in air, water, soil, sediment, and living organisms. They are persistent organic pollutants, which means they persist in the environment for long periods of time, even after they are banned from use. They also accumulate in living tissues (bioaccumulation), and most can increase in concentration as they move up natural food chains (biomagnification). Additional research is needed for all of these chemicals in order to understand the full scope of their impacts. A new draft of this list that will include additional chemicals is expected to be published by GLWQA soon.

- Hexabromocyclododecane (HBCD) – a man-made flame retardant used in a variety of products including electronics and construction insulation. Use in the U.S. is declining, however, due to its persistent nature, HBCD can still be found throughout the environment and in living organisms. HBCD is toxic to a wide variety of organisms, including reproductive, developmental, and neurological effects and has been found in human tissues (GLWQA, 2016).
- Per- and polyfluoroalkyl substances (PFAS) – a large group of man-made chemicals used in products like non-stick pans, water repellent textiles, food packaging, and many other products. Most of these chemicals are no longer produced in the U.S. but can be imported for use in U.S. products. Several of these chemicals have been found to be toxic to wildlife and laboratory animals. They have also been found in human tissues and several have been linked to human health effects like cancer, thyroid disruption, and effects on the immune system (US EPA, 2018). Three PFAS chemicals specifically listed as toxic chemicals of mutual concern are:
 - Long-Chain Perfluorinated carboxylic acids (LC-PFCAs)
 - Perfluorooctanoic acid (PFOA)
 - Perfluorooctane sulfonate (PFOS)
- Mercury – a chemical that exists in several forms (e.g. inorganic mercury and methylmercury) and can be found naturally and from human sources. Human sources of mercury include municipal and medical waste incineration, fossil fuel burning, and other industrial sources. Methylmercury is the most harmful form of mercury to living organisms, including humans, because it binds to their muscle tissues. Mercury in the Great Lakes has declined over the past several decades but has recently increased in fish like Lake Erie's walleye (Evers et al., 2018). In the Lake Erie watershed, people who catch smallmouth bass from Conneaut Creek should not consume it more than 2 times per month due to mercury levels in their tissues.
- Polybrominated Diphenyl Ethers (PBDEs) – a group of man-made chemicals used as flame retardants in many products. The U.S. has ceased production of most but not all of these chemicals and they are still imported into the country. PBDEs are known to be toxic to laboratory animals, have been found in human tissues, and have been linked to endocrine disruption in humans (GLWQA, 2016).
- Polychlorinated Biphenyls (PCBs) – a group of synthetic chemicals used for a wide variety of applications in the U.S. until 1978 when their production was banned. The chemicals are highly resistant to degradation so they can still be found in several places in the U.S. despite being banned. PCBs are known to be toxic to humans and animals. In humans, they are a probable carcinogen and have also been linked to neurological and endocrine issues (GLWQA, 2016).
- Short-Chain Chlorinated Paraffins (SCCPs) – a group of synthetic chemicals used as lubricants and coolants, plasticizers, and flame retardants. These are still manufactured in the U.S. and are imported from other countries. Studies have shown that SCCPs are highly toxic to aquatic organisms and are carcinogenic to laboratory animals. They are eye and skin irritants in humans but other health effects to humans have not been demonstrated (US EPA, 2009).

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Monarch butterfly near Lake Erie
Photo courtesy of Freda Tepfer



View of Erie's Bicentennial Tower from downtown Erie
Photo courtesy of Sarah Bennett



Lake Erie
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