



Northeast Ohio Areawide Coordinating Agency

# Water Quality Strategic Plan

December 1, 2023

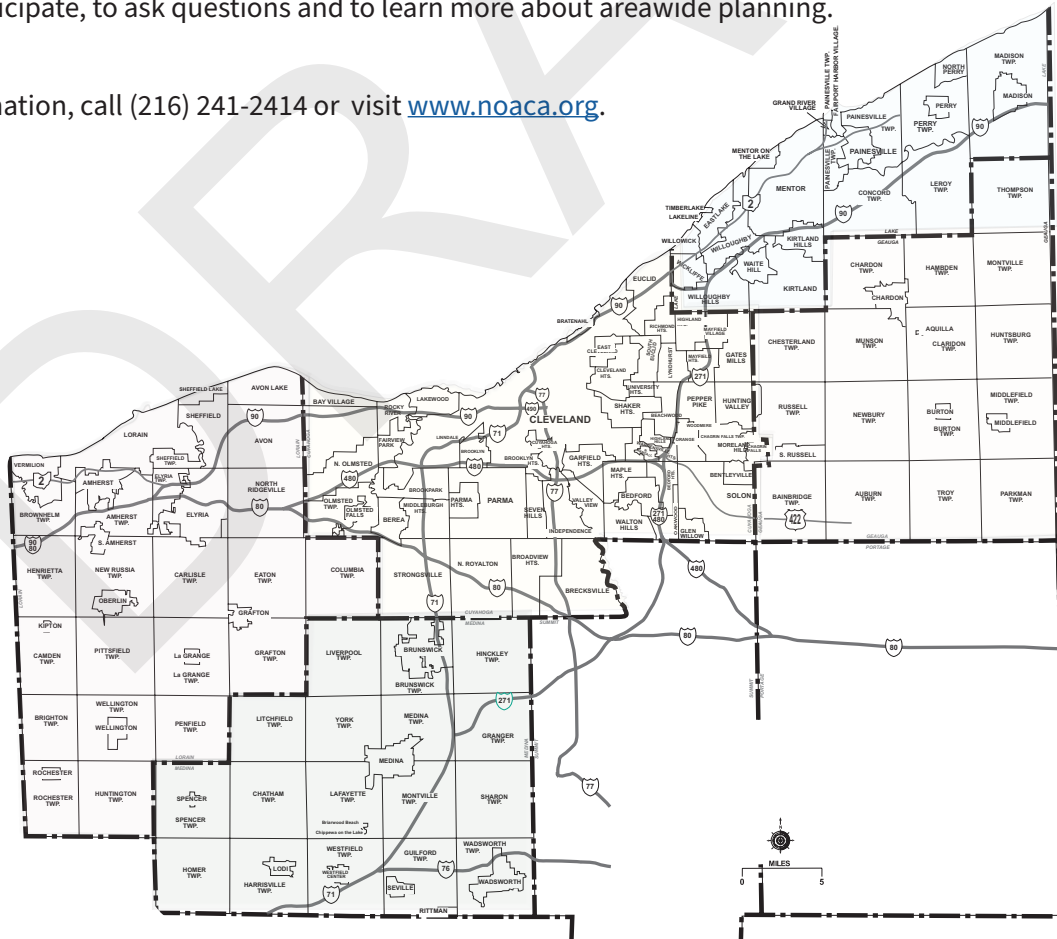


The Northeast Ohio Areawide Coordinating Agency (NOACA) is a public organization serving the counties of and municipalities and townships within Cuyahoga, Geauga, Lake, Lorain and Medina (covering an area with 2.1 million people). NOACA is the agency designated or recognized to perform the following functions:

- Serve as the Metropolitan Planning Organization (MPO), with responsibility for comprehensive, cooperative and continuous planning for highways, public transit, and bikeways, as defined in the current transportation law.
- Perform continuous water quality, transportation-related air quality and other environmental planning functions.
- Administer the area clearinghouse function, which includes providing local government with the opportunity to review a wide variety of local or state applications for federal funds.
- Conduct transportation and environmental planning and related demographic, economic and land use research.
- Serve as an information center for transportation and environmental and related planning.
- As directed by the Board, provide transportation and environmental planning assistance to the 172 units of local, general purpose government.

NOACA’s Board of Directors is composed of 48 local public officials. The Board convenes quarterly to provide a forum for members to present, discuss and develop solutions to local and areawide issues and make recommendations regarding implementation strategies. As the area clearinghouse for the region, the Board makes comments and recommendations on applications for state and federal grants, with the purpose of enhancing the region’s social, physical, environmental and land use/transportation fabric. NOACA invites you to take part in its planning process. Feel free to participate, to ask questions and to learn more about areawide planning.

For more information, call (216) 241-2414 or visit [www.noaca.org](http://www.noaca.org).



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# Water Quality Strategic Plan

December 1, 2023



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AREAWIDE COORDINATING AGENCY  
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## EXECUTIVE SUMMARY

The Northeast Ohio Areawide Coordinating Agency's (NOACA's) Water Quality Strategic Plan (WQSP) includes a mission, goals, objectives, and strategies to guide the work of water quality planning staff. The WQSP considers current land use, population and housing trends that affect water resources and infrastructure in both rural and urban communities.

The WQSP supports [NOACA's Vision](#) and [eNEO2050: An Equitable Future for Northeast Ohio](#) Long Range Plan:

***NOACA will STRENGTHEN regional cohesion, PRESERVE existing infrastructure, and BUILD a sustainable multimodal transportation system to SUPPORT economic development and ENHANCE quality of life in Northeast Ohio.***

NOACA is the designated areawide planning agency (Areawide) responsible for water quality and wastewater management planning in Northeast Ohio. The Governor of Ohio, under Section 208 of the federal Clean Water Act (CWA), designated NOACA and five other regional planning organizations to perform areawide planning in 1975. Subsequently, NOACA prepares plans, such as [Clean Water 2020 \(208 Plan\)](#) to support federal, state and local government solutions to regional water quality issues. Together with local public officials throughout the region, NOACA updates and maintains the region's 208 Plan to address both municipal wastewater treatment issues and nonpoint source pollution management and control. The first 208 Plan for Northeast Ohio, completed in 1979, focused considerable attention on public investments in wastewater treatment facilities and point sources of water pollution. These investments produced a remarkable recovery in the region's water quality; a widespread threat to water quality remains in Northeast Ohio from nonpoint source pollution generated by storm water runoff from paved surfaces, rooftops, lawns and farms.

In response to the water quality threats that persist, NOACA staff collaborated with stakeholders to develop the inaugural WQSP, [NOACA's Water Quality Strategic Plan \(WQSP\)](#), in 2017. As part of the Fiscal Year (FY) 2023 work plan, WQP staff undertook an audit of the WQSP to assess potential updates needed in response to changing regional planning and water quality issues. The audit results were presented to NOACA's Water Quality Subcommittee (WQS) for review and comment. WQP staff also used NOACA's [Census 2020 Technical Analysis Report](#), [Ohio Environmental Protection Agency's \(Ohio EPA's\) Integrated Report Water Quality Monitoring and Assessment Report](#) (Integrated Report), and NOACA's subwatershed planning efforts to update the WQSP's State of the Region summary. Census population and household data, and subwatershed water quality overview maps were presented to the Water Quality Subcommittee for review and comment. Additionally, NOACA recently completed a regional greenhouse gas (GHG) inventory that presented emissions associated with water and wastewater infrastructure and explored water-related hazards as part of an assessment to determine adaptation needs to protect vulnerable populations within Northeast Ohio (e.g., environmental justice communities).

NOACA WQP staff reviewed and proposed a streamlined, updated version of the WQSP's Mission Statement to the Water Quality Subcommittee. The 2023 WQSP Mission Statement reads as follows:

“As a designated areawide planning agency and a metropolitan planning organization, NOACA will maintain and update the region's Water Quality Management (208) Plan. NOACA will

support the restoration, protection and sustainable use of water. NOACA will provide leadership, planning and technical assistance to advance Northeast Ohio's quality of life through the management of water as a valuable resource.”

NOACA WQP staff recommended the following definitions for goals, objectives, and strategies to the NOACA Water Quality Subcommittee to create a framework for development of the proposed revisions to the WQSP:

**Goals:** Broad and long range; guides work direction

**Objectives:** Specific outcomes that support goals

**Strategies:** Plans and actions to attain objectives

NOACA WQP staff reviewed and revised the goals, objectives and strategies and presented a matrix comparison of the 2017 goals & objectives and proposed changes to the WQS for review and comment. WQP staff continued to use a matrix comparison to demonstrate the relationship between goals, objectives and proposed strategies; the Water Quality Subcommittee (WQS) was asked to review, comment and support. The following goals were agreed upon to guide the update of the WQSP:

**Goals:**

**Goal 1:** Provide planning and technical support to protect and restore Lake Erie and the region's valuable water resources.

**Goal 2:** Protect the region's water quality/quantity to support regional economic competitiveness.

**Goal 3:** Identify and inform communities and organizations about the impacts of local decisions on valuable regional water resources and infrastructure.

**Goal 4:** Advance the philosophy of “One Water” through NOACA's water planning work.

**Goal 5:** Within NOACA's internal structure, address potential water quality and quantity impacts related to climate change on the region's transportation and water infrastructure.

NOACA water quality staff presented a draft of the 2023 WQSP to the WQS on September 15, 2023. The WQS recommended that NOACA's Planning and Programming (P&P) Committee recommend adoption of the 2023 WQSP to the NOACA Board of Directors at their December 1, 2023 meeting.

## INTRODUCTION

The [Northeast Ohio Areawide Coordinating Agency \(NOACA\)](#) is the transportation and environmental planning agency that represents state, county, city, village, and township officials in Greater Cleveland. NOACA addresses the transportation, air quality, and water quality needs of Cuyahoga, Geauga, Lake, Lorain and Medina counties. The agency and its partners cooperatively develop and implement plans to ensure that travel throughout the region is safe, cost-effective, and environmentally sound.

NOACA is organized under the Ohio Revised Code pursuant to the joint powers of County Government at ORC 307.14 et seq.<sup>1</sup> NOACA was formed in 1968 for the purpose of coordinating planning and development activities in Northeast Ohio. The Demonstration Cities and Metropolitan Development Act of 1966 and the Intergovernmental Cooperation Act of 1968 provided the impetus for the creation of the agency. In 1969, NOACA merged with the Cleveland Seven County Transportation Land Use Study (SCOTS), which had been established in 1964 in response to requirements of the 1962 Federal-Aid Highway Act. At the time, that Act required a metropolitan area to prepare a comprehensive transportation/land use plan for the area to receive federal highway funds.<sup>2</sup> In 1975, the Governor of Ohio also designated NOACA as an areawide planning agency (Areawide) to perform water quality management planning (WQMP) under section 208 of the federal Clean Water Act.<sup>3</sup>

In December 2017, the NOACA Board adopted a [Water Quality Strategic Plan \(WQSP\)](#) that was intended to guide the work of NOACA's water quality planning staff over the next five years. The WQSP included a chapter summarizing the "State of the Region" and water quality issues identified at the time of adoption. Additionally, the WQSP included goals, objectives and strategies that align NOACA's water quality program with the agency's vision to address regional water quality issues.

It has been five years since the adoption of the WQSP and it is now time to revisit the "State of the Region" and update the WQSP goals, objectives and implementation strategies. Since the adoption of the 2017 WQSP, there have been several major developments. First, NOACA has prepared and adopted the [Clean Water 2020](#), 208 Areawide Wastewater Management and Water Quality Plan, and [eNEO2050: An Equitable Future for Northeast Ohio](#), NOACA's Long-Range Plan. These documents will be the foundation of NOACA's efforts over the next several years to protect and restore water resources, guide infrastructure investments, and provide a vision for the future. Second, the United States Census Bureau has released results from the [2020 Census](#) which illustrate trends in population and housing that may impact regional water quality. Third, the State of Ohio is focused on nutrient reduction efforts, and a portion of NOACA's water quality work now strives to support the development of [Nonpoint Source Implementation Strategy \(NPS-IS\) Plans](#) for regional watersheds without watershed organizations. Finally, NOACA has undertaken a [Climate Action Planning Process](#) and Climate Pollution Reduction Program to develop a [regional inventory of greenhouse gas \(GHG\) emissions, an assessment of climate risks and vulnerabilities](#) (including extreme heat, heavy precipitation, and severe storms and risks to water and wastewater infrastructure), and

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1 Northeast Ohio Areawide Coordinating Agency (NOACA), 208 Areawide Water Quality Management Plan, <https://www.noaca.org/regional-planning/water-quality-planning/areawide-water-quality-management-208-plan> (accessed May 31, 2023).

2 NOACA, Overall Work Plan FY24 (Cleveland: NOACA, April 2023), <https://www.noaca.org/home/showpublisheddocument/29675/638170656212270000> (accessed August 7, 2023).

3 NOACA, About NOACA, <https://www.noaca.org/about/about-noaca> (accessed May 31, 2023).

strategies to help people adapt to climate change.

The 2023 WQSP will coalesce water quality planning outcomes associated with *Clean Water 2020*, eNEO2050 and climate action planning/climate pollution reduction into a guide for NOACA's water quality planning staff work over the next five years.

## **BACKGROUND**

### **NOACA's Coordination as an Areawide**

In 1975, the Governor of Ohio designated the Northeast Ohio Lake Erie Basin (NEOLEB) organization under provisions under Section 208 of the federal Clean Water Act (CWA) to perform the Areawide WQMP. In 1990, the NOACA Board assumed the NEOLEB Board's Areawide WQMP responsibilities for the five-county area.

NOACA's water quality management plan (WQMP) addresses both municipal waste treatment (sewage) issues and nonpoint source (NPS) pollution management and controls. The plan identifies entities (designated management agencies, or DMAs with municipal wastewater treatment or NPS pollution management responsibilities. These entities implement specific water quality management duties and recommendations detailed within the WQMP.

*Clean Water 2020* focuses on the protection and restoration of water resources in the NOACA region and is a comprehensive update of Clean Water 2000, NOACA's previous wastewater management and water quality plan from 2000. *Clean Water 2020* was approved by the NOACA Board of Directors (Board) on September 11, 2020. The *Clean Water 2020* plan was developed with the input of many Northeast Ohio stakeholders who represent government agencies, technical stakeholders and the public. Approved by the NOACA Board, certified by the Ohio Governor on September 21, 2021, and approved by the United States Environmental Protection Agency (USEPA) on February 17, 2022, *Clean Water 2020* serves as the water quality and wastewater management plan for Cuyahoga, Geauga, Lake, Lorain, and Medina counties.

### **NOACA's Coordination as a Metropolitan Planning Organization (MPO)**

NOACA was formed in 1968 for the purpose of coordinating planning and development activities in northeast Ohio. The Demonstration Cities and Metropolitan Development Act of 1966 and the Intergovernmental Cooperation Act of 1968 provided the impetus for the creation of the agency. In 1969, NOACA merged with the Cleveland Seven County Transportation Land Use Study (SCOTS), which had been established in 1964 to respond to requirements of the 1962 Federal-Aid Highway Act. This Act required a metropolitan area to prepare a comprehensive transportation/land use plan for the area to receive federal highway funds.

NOACA's current long-range regional strategic plan [\*eNEO2050: An Equitable Future for Northeast Ohio\*](#) defines the agency's mission statement, plus goals and strategies to allocate the region's resources efficiently. NOACA's Long-Range Transportation Plan (currently eNEO2050) creates a detailed vision for the region's transportation system over a 25-year period. Through its Transportation Improvement Program (TIP), that long-range vision is translated into a four-year, fiscally constrained capital budget for highway, bikeway and transit projects. Finally, NOACA's Overall Work Program (OWP) outlines a yearly work plan for staff. In addition to the above activities, NOACA is designated to coordinate and review some federally and state-funded planning and development activities for its five-county area. The agency is the region's coordinator for certain programs of the following federal and state agencies: U.S. Department of Transportation (DOT), Federal Transit Administration (FTA), and Federal Highway Administration

(FHWA), in conjunction with the Ohio Department of Transportation (ODOT), USEPA, and Ohio EPA.<sup>4</sup>

## WATER QUALITY & REGIONAL TRENDS

Nonpoint source pollution (NPS) continues to be the largest source of water quality problems. NPS pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification. Unlike pollution from industrial and sewage treatment plants, NPS pollution comes from many diffuse sources; it is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and ground waters.

### Ohio's Water Quality

Ohio is fortunate to have abundant water resources that provide healthy drinking water, agricultural irrigation, recreational opportunities, and industrial uses. As required by the CWA, Ohio EPA's Integrated Report characterizes the state's general water quality conditions and identifies waters that do not meet water quality goals.<sup>5</sup> Specifically, Ohio EPA determines a waterbody's overall quality based on how well it supports the following uses:

- Aquatic Life Use (e.g., fish and water insects)
- Recreation (e.g., fishing, swimming, boating)
- Drinking Water Human Health Impacts (watch lists for nitrates, pesticides and harmful algal blooms)
- Fish Tissue Contamination Human Health Impacts (polychlorinated biphenyls (PCBs) and mercury)

If a waterbody is impaired for one or more of these uses, Ohio EPA must develop remediation actions known as Total Maximum Daily Loads (TMDLs), water quality-based permits, and nonpoint source pollution control measures. The TMDL analysis specifies the amount of pollutant that must be reduced to meet water quality standards, allocates pollutant load reductions, and provides the basis for restorative actions.

For aquatic life use, the most common causes of impairment are organic enrichment, sedimentation/siltation, hydromodification, nutrient enrichment, and habitat modification. Many of these causes are related to landscape modifications associated with agricultural practices

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4 NOACA, Overall Work Program (OWP), (Fiscal Year FY2023), 10. <https://www.noaca.org/regional-planning/major-planning-documents/overall-work-program-owp> (accessed October 6, 2023).

5 Ohio Environmental Protection Agency (Ohio EPA), Ohio 2022 Integrated Water Quality Monitoring and Assessment Report , Executive Summary, 1 <https://epa.ohio.gov/static/Portals/35/tmdl/2022intreport/Full-2022-IR.pdf> (accessed May 31, 2023).

and urban development and often have greater impact on smaller streams and waterbodies. Large river impairments are primarily associated with impoundments that alter the river's habitat and hydrology along with retention of sediments, nutrients and organic loading within impounded sections.<sup>6</sup> In Lake Erie, harmful algal blooms (HABs) can impact aquatic life use through reduced oxygen levels for fish and other animals.<sup>7</sup>

Recreational use impairments are associated with high bacteria rates in waterbodies. Ohio's waterbodies are generally safe for swimming and wading but can become more hazardous after heavy rain events due to higher water levels along with chemicals and bacteria captured in stormwater runoff. In some areas a community's sewage system cannot handle the added water from heavy rains and can release untreated sewage into local waterways. Recreation can also be impacted at specific (local) locations due to high levels of other legacy contaminants, such as polychlorinated biphenyls (PCBs) in the waters or sediment. In the Lake Erie western basin, HABs, ranging from algal scum polluting beaches to the generation of toxins within the water, can also impact recreational opportunities.<sup>8</sup>

In Ohio, 99% of all public water supplies met all human health standards.<sup>9</sup> Public water systems treat Ohio's raw water to ensure tap water meets all safe drinking water standards. Human health impacts related to drinking water in Ohio are often related to nitrate, pesticides, and cyanotoxins from HABs. The waterbodies impacted by nitrate and pesticides are primarily located in northwest Ohio, where agricultural land uses are predominant.<sup>10</sup>

More than three million people in Ohio receive their drinking water from Lake Erie.<sup>11</sup> Ohio EPA monitors Lake Erie for HABs to mitigate impacts from cyanotoxins on drinking water supplies. The impacts of HABs on Lake Erie and other inland lakes can cause taste/odor problems in drinking water, processing problems for public water supplies, and in extreme circumstances, generate toxic chemicals that require removal prior to consumption.<sup>12</sup>

Ohio EPA tests fish tissue for the presence of contaminants that can affect human health. The most common contaminants found in Ohio's fish are PCBs and mercury. PCB is a historical contaminant used in electrical equipment and for other purposes until banned in 1979. PCBs persist in the environment, and fish can become contaminated if they live near contaminated sediment or if they eat contaminated prey. Mercury contamination is ubiquitous due to aerial depositions from coal or household trash burning. A few waterbodies are contaminated by other chemicals, including dichlorodiphenyltrichloroethane (DDT) and hexachlorobenzene. Contamination levels of fish tissue can vary among species and location.<sup>13</sup> Ohio EPA maintains

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6 Ibid., A-7 – A-8.

7 Zoe Almeida, "How is Fish Habitat Affected? Lake Erie's Dead Zone," Old Woman Creek National Estuarine Research Reserve Technical Bulletin 3 (July 2015), Ohio Department of Natural Resources Division of Wildlife, [https://ohiodnr.gov/static/documents/coastal/owc/owc\\_techbull3\\_Hypoxia.pdf](https://ohiodnr.gov/static/documents/coastal/owc/owc_techbull3_Hypoxia.pdf) (accessed May 26, 2023).

8 Ohio Environmental Protection Agency (Ohio EPA), Ohio 2022 Integrated Water Quality Monitoring and Assessment Report, A-5 – A-6, <https://epa.ohio.gov/static/Portals/35/tmdl/2022intreport/Full-2022-IR.pdf> (accessed May 31, 2023).

9 Ibid., A-6.

10 Ibid., A-6.

11 Ohio Lake Erie Commission, "Lake Erie Quality Index - 2022 Report," [https://lakeerie.ohio.gov/static/OLEC\\_Reports/LEQI+2022+FINAL+PDF.pdf](https://lakeerie.ohio.gov/static/OLEC_Reports/LEQI+2022+FINAL+PDF.pdf) (accessed May 31, 2023).

12 Ohio EPA, Ohio 2022 Integrated Water Quality Monitoring and Assessment Report, A-10.

13 Ibid., A-4 – A-5.

the comprehensive [Ohio Sport Fish Consumption Advisory](#) webpage with public information.

### **Ohio's Integrated Water Quality Monitoring and Assessment Report**

Ohio Environmental Protection Agency's (Ohio EPA) Integrated Report indicates the general condition of Ohio's waters and identifies waters that do not meet water quality goals. The report satisfies the CWA requirements for both Section 305(b), biennial reports on the condition of the state's waters, and Section 303(d), a prioritized list of impaired waters. For each impaired water, Ohio EPA typically prepares a Total Maximum Daily Loads analysis.

According to Ohio EPA's 2022 Integrated Report, the top five most common causes of Aquatic Life Use (ALU) impairments across the state's Large River Assessment Units (LRAUs) include habitat modification, nutrient enrichment, hydromodification, sedimentation/siltation and organic enrichment. The "impairments are commonly linked back to impoundments, either directly through habitat/hydromodification or with sediment/nutrient/organic loading that is exacerbated by the impounded sections."<sup>14</sup>

Ohio EPA's 2022 Integrated Report also states, "the most common causes of ALU Watershed Assessment Units (WAUs), or HUC12 watersheds, include organic enrichment, siltation/sedimentation, habitat modification, hydromodification or flow alternation, contamination by pathogens and nutrient enrichment."<sup>15</sup> The sources of impairments are primarily related to landscape modification due to agricultural land use and urban development. Hydromodification and agricultural and urban land use generally impact smaller streams. More than half of the monitored WAUs were impaired by one of these sources.<sup>16</sup>

### **USEPA's - ATTAINS "How's My Waterway"**

As of 2020, Ohio EPA is transitioning the water quality monitoring and assessment information developed as part of the Integrated Report to USEPA's Assessment and Total Maximum Daily Load Tracking and Implementation System (ATTAINS). Ohio EPA's data in ATTAINS is now available to the public through U.S. EPA's ["How's My Waterway"](#) application and through a spreadsheet posted on Ohio EPA's website.<sup>17</sup>

### **Regional Water Quality**

As an Areawide, NOACA provides watershed planning and technical assistance to protect regional water resources. USEPA defines a watershed "as the geographic area within the boundary of a drainage divide; which boundaries follow the highest ridgeline around the stream drainage area; the bottom of the watershed or the pour point is the lowest point of the land area where water flows out of the watershed."<sup>18</sup> There are five major watersheds in the NOACA region. They include the Black, Rocky, Cuyahoga, Chagrin and Grand River watersheds (see Figure 1). There are 105 HUC12 subwatersheds that ultimately flow through NOACA's planning boundaries (see Figure 2).

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14 Ibid., A-7.

15 Ibid., A-9 – A-10.

16 Ibid., A-9 – A-10.

17 Ibid., A-3.

18 USEPA, EnviroAtlas, <https://enviroatlas.epa.gov/enviroatlas/datafactUSEPA'sheets/pdf/Supplemental/HUC.pdf> (accessed August 8, 2023).

Figure 1: Major Watersheds

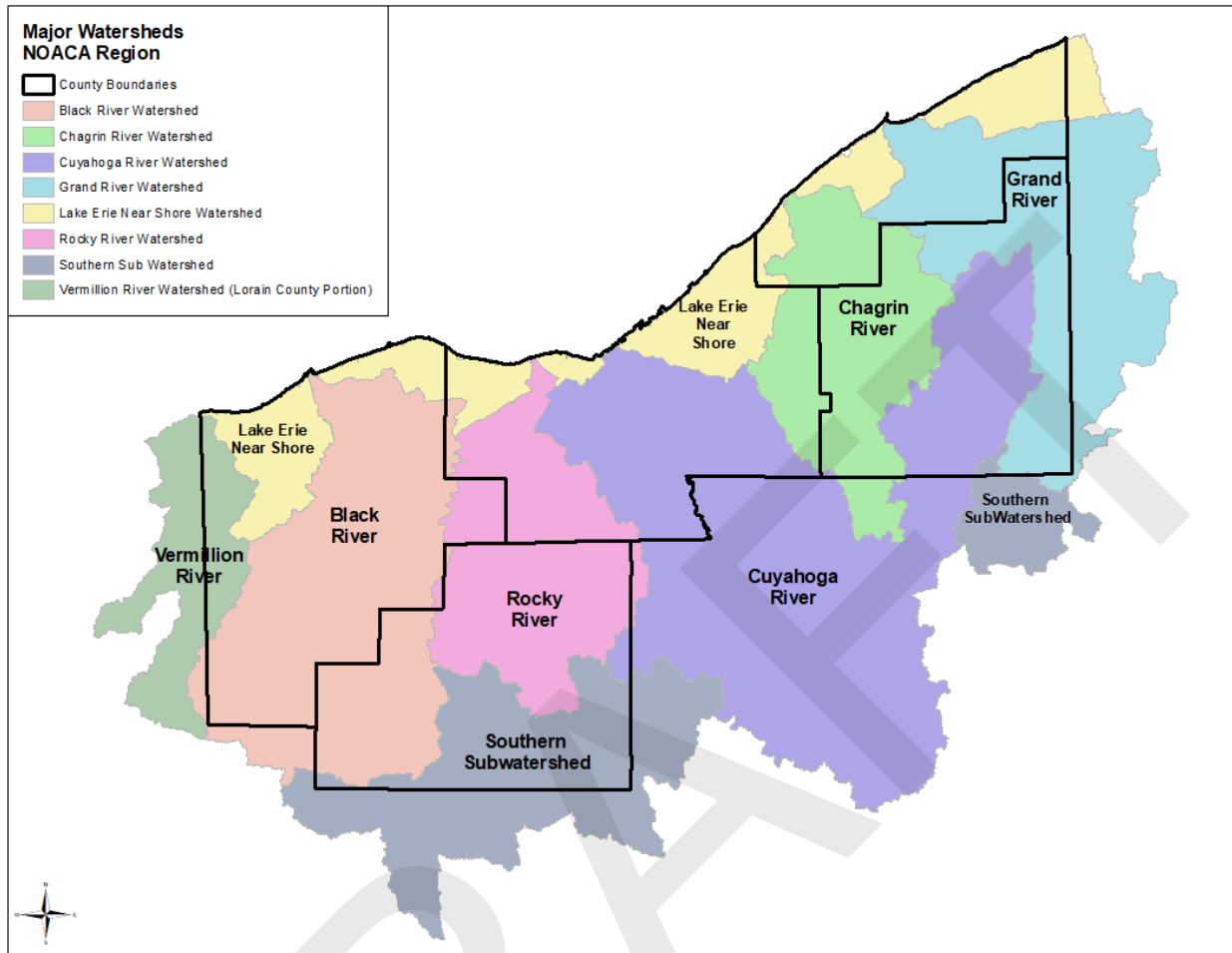
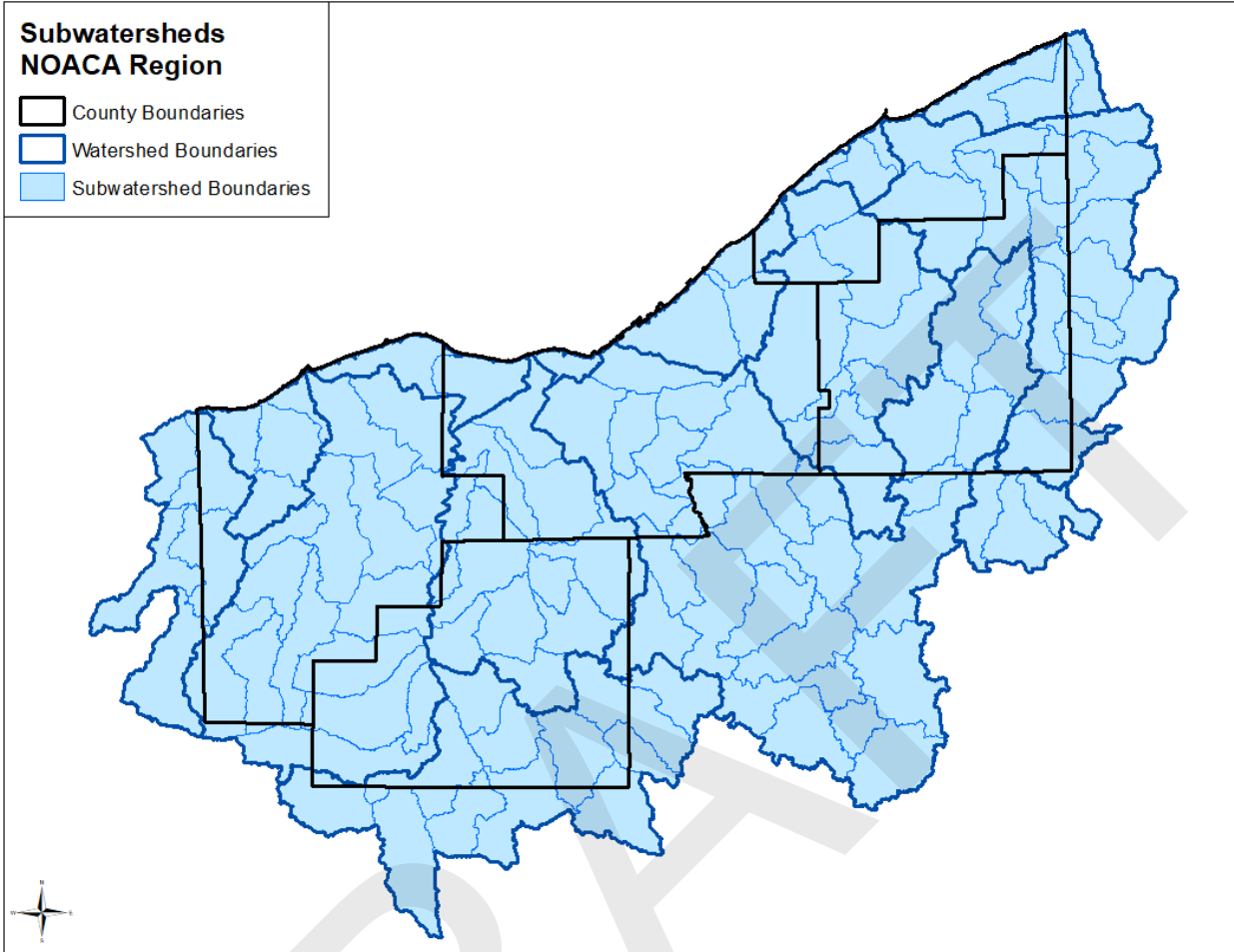


Figure 2: Subwatersheds (HUC12)



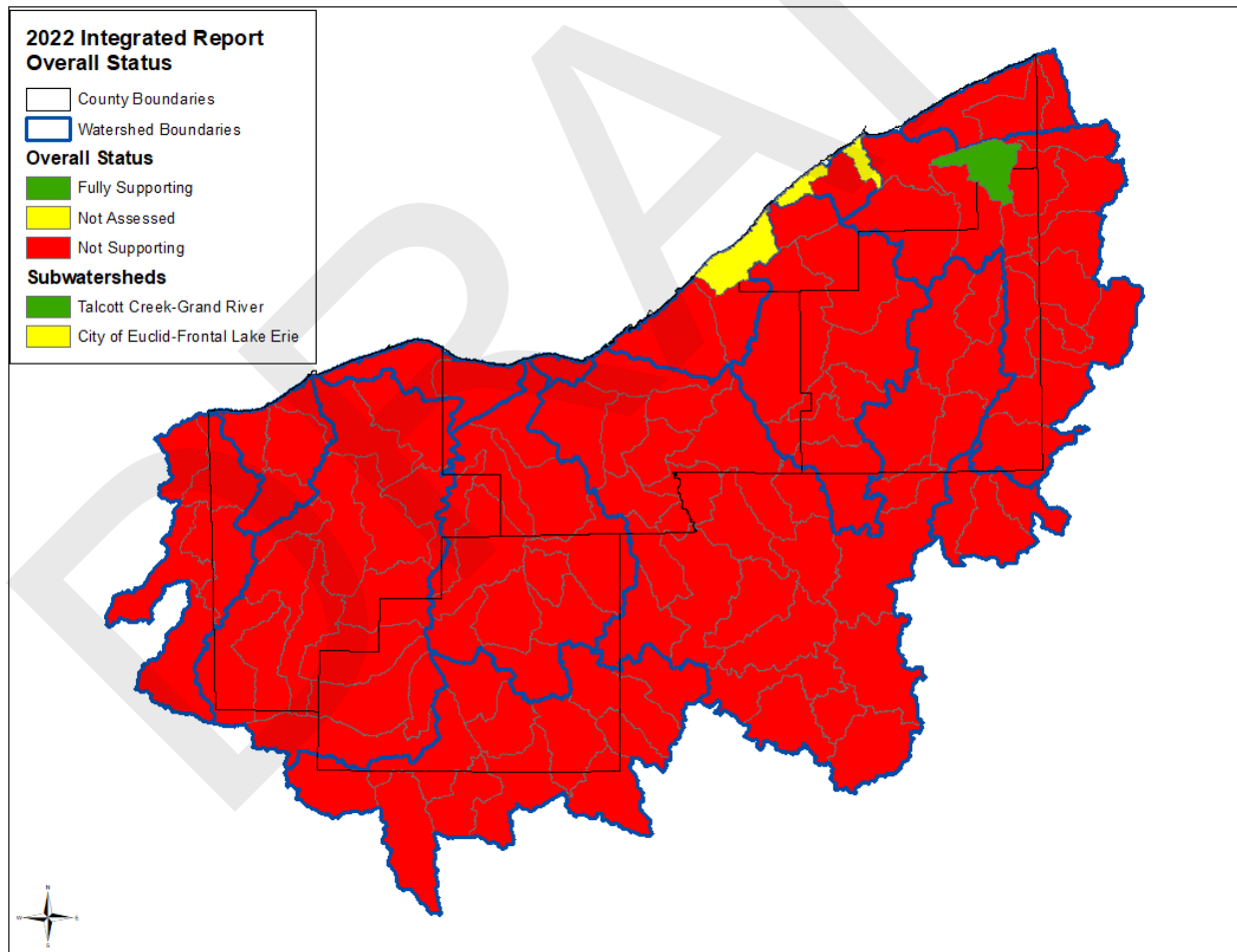
## Ohio EPA Water Quality Standards Use Designations

A goal of the Clean Water Act is to achieve fishable and swimmable conditions in water bodies, wherever attainable. The fishable and swimmable goals equate to the Warmwater Habitat (WWH) and Primary Contact Recreation (PCR) use designations. Ohio's Water Quality Standards are state regulations or rules that protect lakes, rivers, streams, and other surface water bodies from pollution.

Beneficial use designations are the water quality goals for lakes, rivers, streams, and other water bodies. Designations include such uses as aquatic life habitats (Warmwater, Coldwater, etc.), recreation (bathing waters, primary contact, and secondary contact), and water supplies (public, agricultural, industrial).

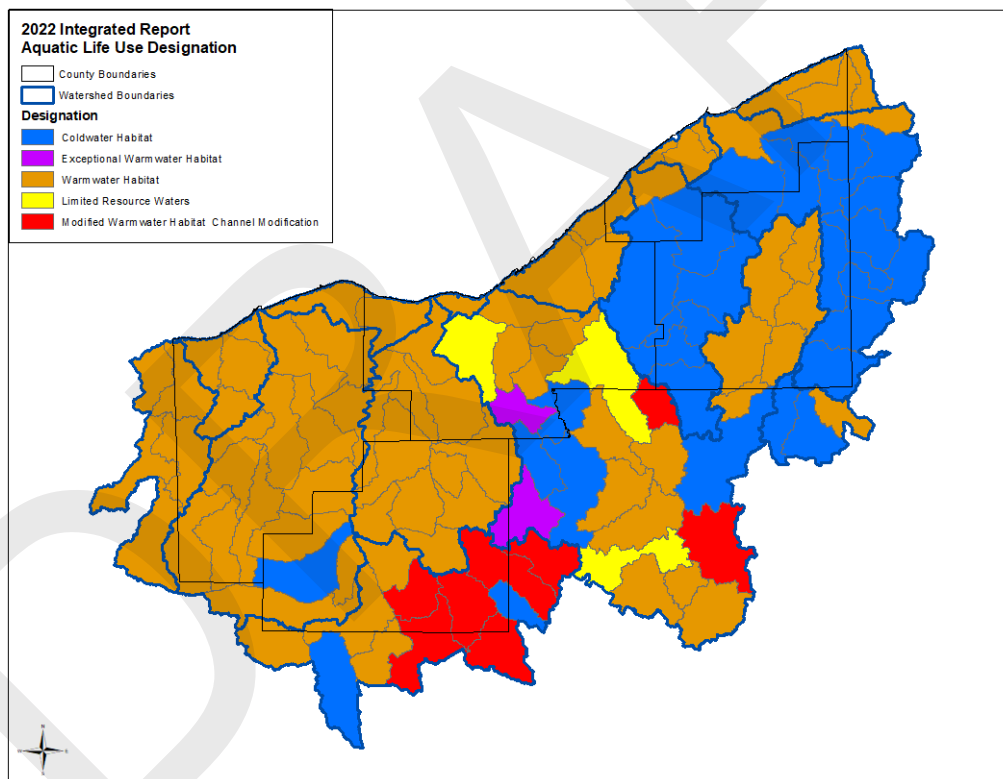
NOACA staff used data from Ohio EPA's 2020 Integrated Report to identify that 103 of the 105 HUC12 subwatersheds in the region do not support all four beneficial uses (ALUs, Recreational Uses, Drinking Water Uses and Fish Consumption). Only one subwatershed, Talcott Creek-Grand River is "fully supporting" beneficial uses, and one subwatershed, City of Euclid-Frontal Lake Erie was not assessed (see Figure 3); this subwatershed includes three separate drainage areas.

**Figure 3: Subwatersheds (HUC12)**



According to Ohio EPA's 2020 Integrated Report, 60% of the subwatersheds that flow through the NOACA region are designated Warmwater Habitat (WWH). WWHs are waters capable of supporting and maintaining a balanced, integrated, adaptive community of warmwater aquatic organisms.<sup>19</sup> This is the most commonly applied use designation assigned to rivers and streams in Ohio. There are 26 subwatersheds designated as Coldwater Habitat (CWH), which are waters capable of supporting populations of native coldwater fish and associated vertebrate and invertebrate organisms and plants on an annual basis.<sup>20</sup> There are two subwatersheds that are designated as Exceptional Warmwater Habitat (EWH), which are waters capable of supporting and maintaining an exceptional or unusual community of warmwater aquatic organisms having a species composition and diversity.<sup>21</sup> Eight subwatersheds are designated as Modified Warmwater Habitat (MWH) due to Channel Modification, while three are designated Limited Resource Waters (LRW). MWHs are "waters that have been the subject of a use attainability analysis and have been found to be incapable of supporting and maintaining a balanced, integrated, adaptive community of warmwater organisms due to irretrievable modifications of the physical habitat."<sup>22</sup> LRWs are waters that have been the subject of a use attainability analysis and have been found to lack the potential for any resemblance of any other aquatic life habitat<sup>23</sup> (see Figure 4).

**Figure 4: Aquatic Life Use (ALU) Designation**

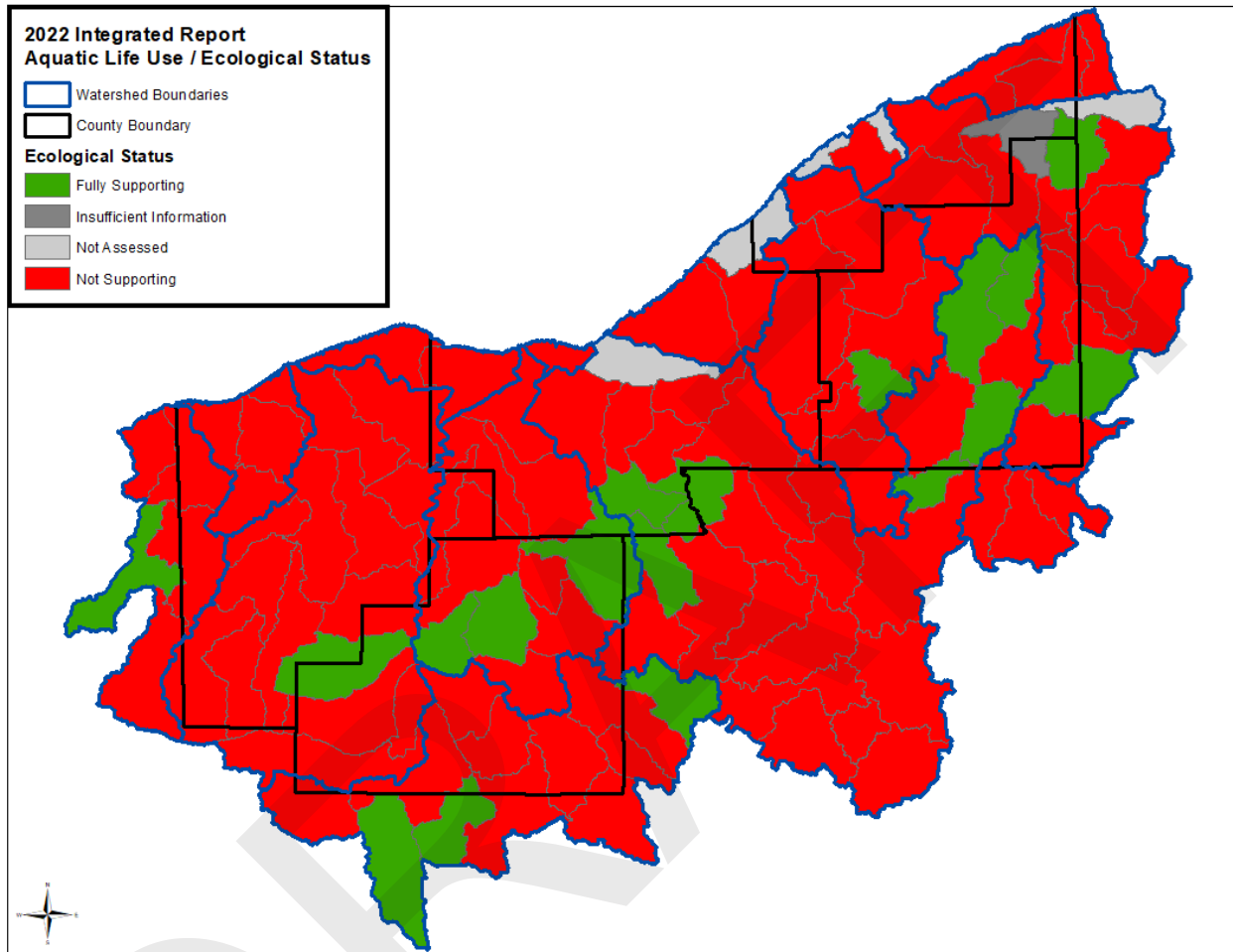


19 Ohio Administrative Code, Rule 3745-1-07 | Beneficial Use Designations and Biological Criteria, <https://codes.ohio.gov/ohio-administrative-code/rule-3745-1-07> (accessed May 31, 2023).

20 Ibid.  
21 Ibid.  
22 Ibid.  
23 Ibid.

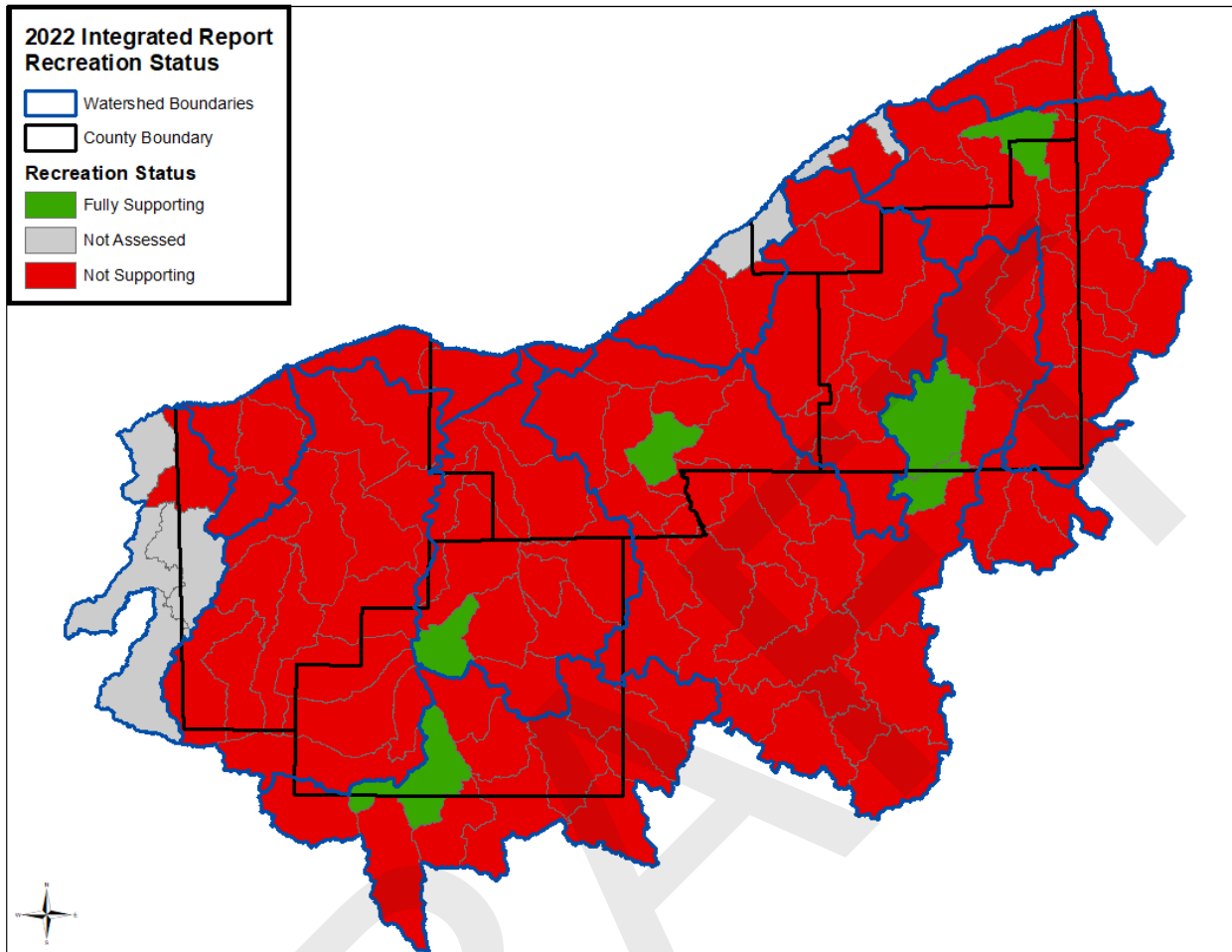
According to Ohio EPA sampling data submitted to USEPA's "How's My Waterway," 83 of the subwatersheds are "not supporting" Aquatic Life Uses/Ecological Status, while 18 subwatersheds are "fully supporting." Three subwatersheds have not been assessed, and one watershed does not have sufficient reporting data (See Figure 5).

**Figure 5: 2022 Integrated Report Aquatic Life Use / Ecological Status**



All of the 105 subwatersheds in the NOACA region are designated as primary contact uses; only six are fully supporting recreational primary contact uses. There are 94 subwatersheds that do not support Recreational Uses, while five subwatersheds have not been assessed (see Figure 6).

Figure 6: 2022 Integrated Report Recreational Status



Most subwatersheds (96) in the NOACA region are not used as a drinking water source. Of the nine subwatersheds that are used for drinking water, only four are fully supporting of drinking water, three are not supporting, and two have insufficient information (see Figure 7).

Finally, there are 57 subwatersheds that are not supporting Fish Consumption, while only 14 are fully supporting. There are 33 subwatersheds that have not been assessed, while one has insufficient data (see Figure 8).

Figure 7: 2022 Integrated Report Drinking Water Status

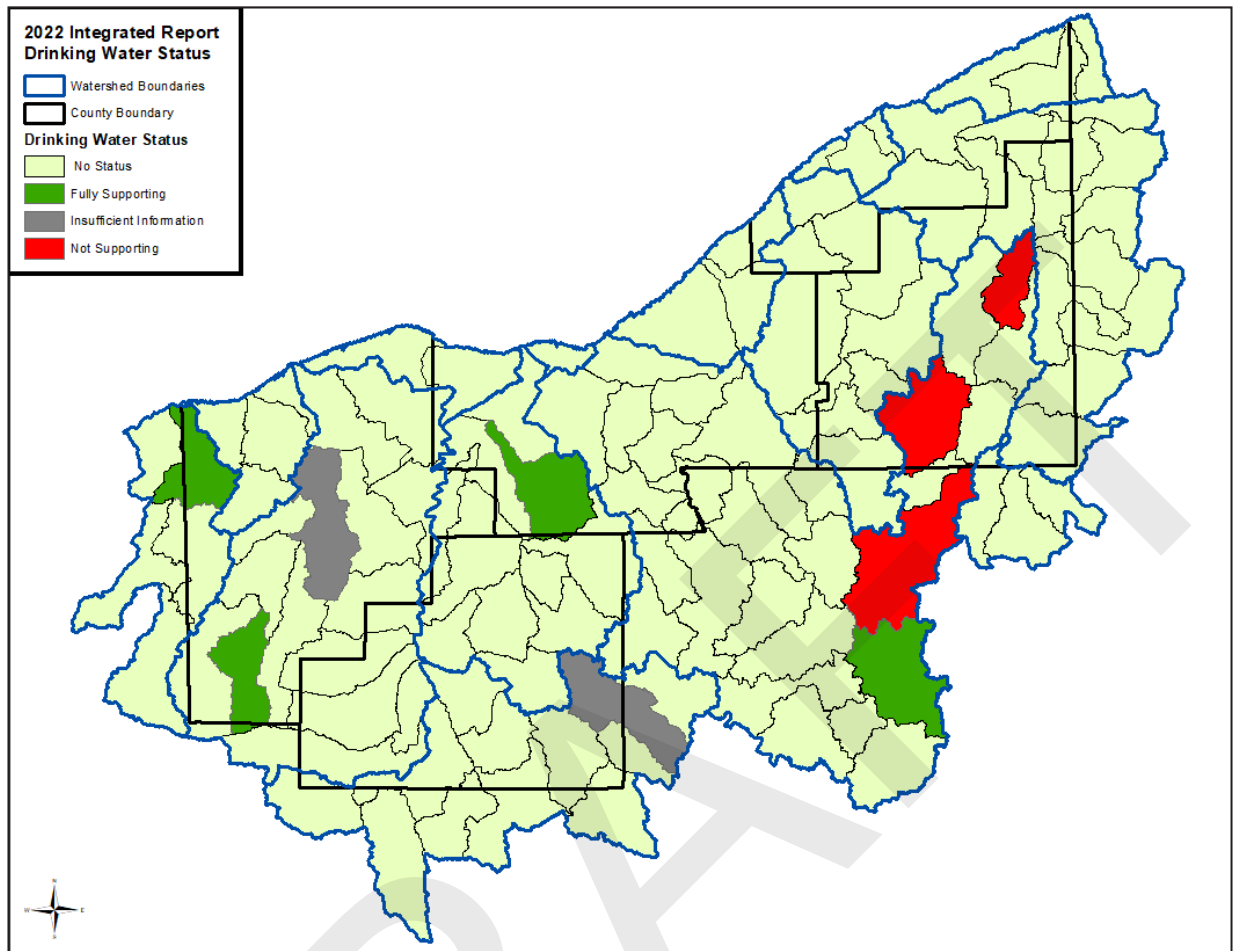
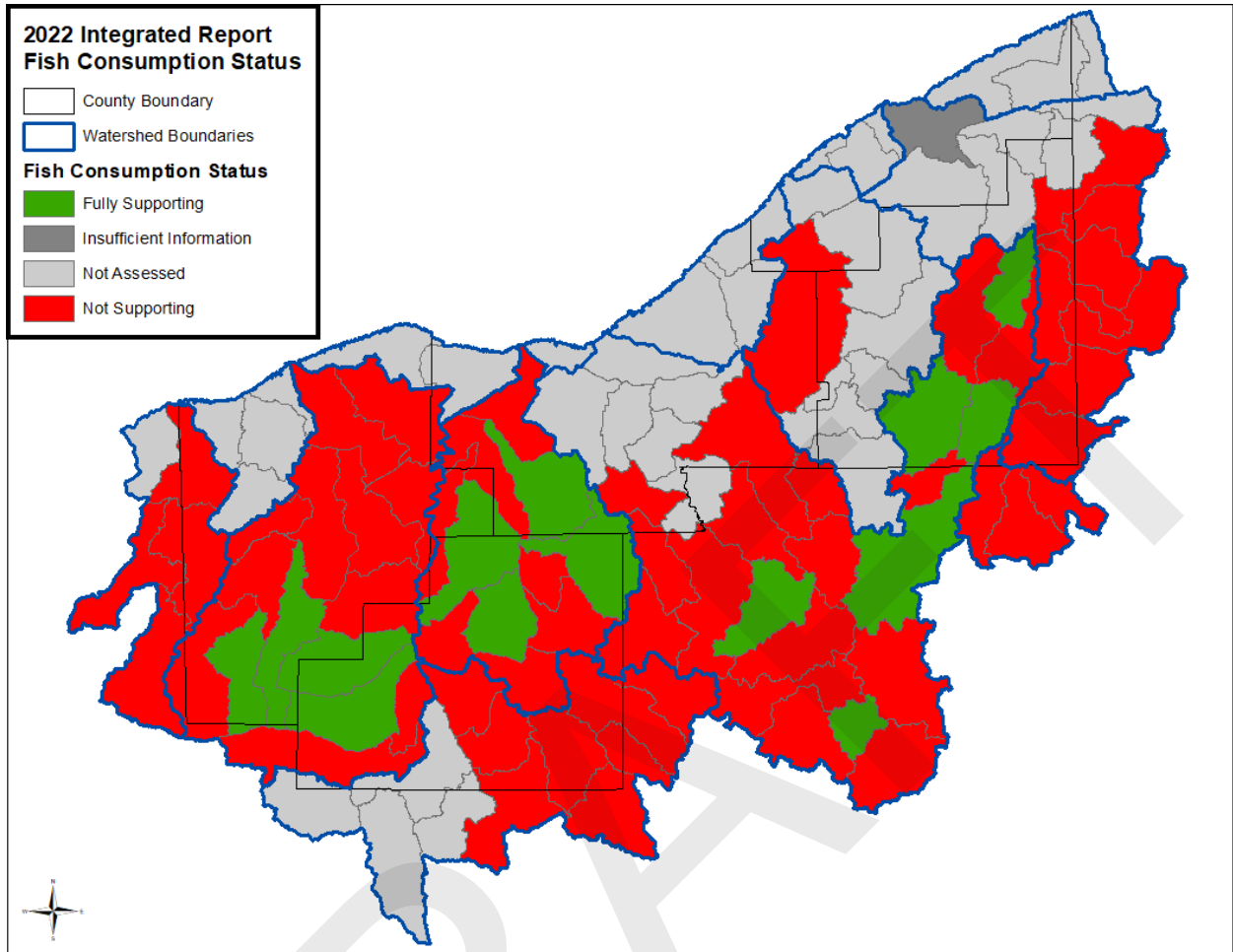


Figure 8: 2022 Integrated Report Fish Consumption Status



## Population & Household Trends

Changes in population and households can lead to changes in land cover, land use and impervious surfaces that ultimately affect water quality.

### Population Trends

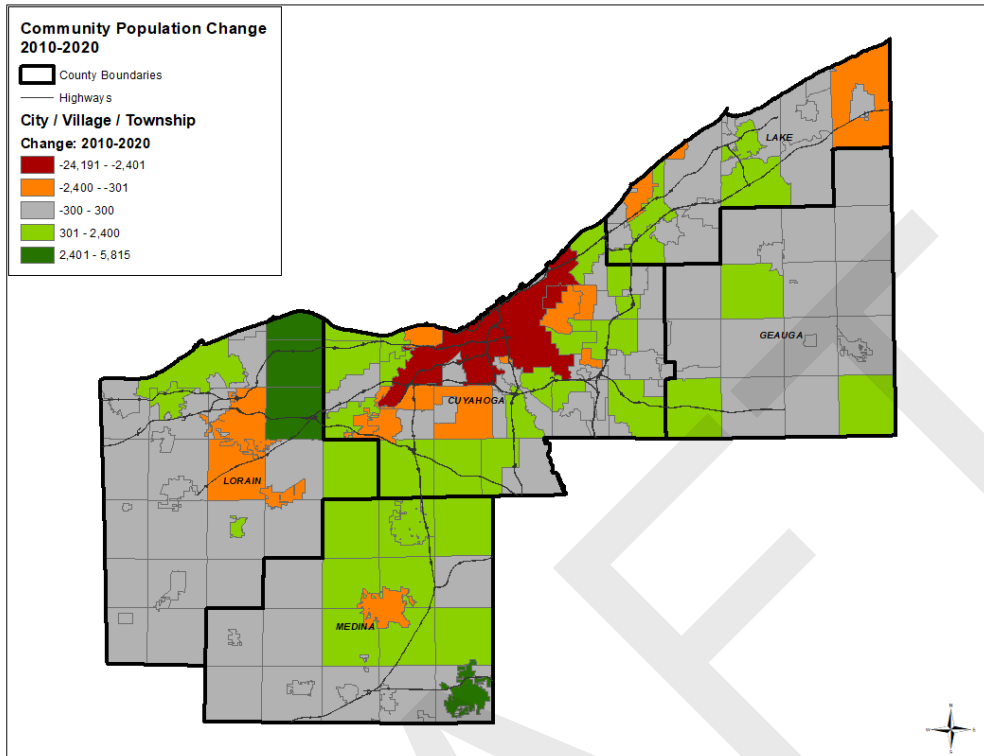
According to [NOACA's Census 2020 Technical Analysis Report](#), the region continued to experience very little population growth from 2010 to 2020 (half percent), while outward migration still occurred, albeit at a slower pace than past decades (see Table 1 and Figure 9).<sup>24</sup> Counties and jurisdictions that historically experienced decreases in population continued to decrease, but some census tracts in suburban and exurban communities, such as Grafton, Madison Township and Olmsted Falls are also experiencing decreases (see Table 2 and Figure 10).

Geography	2010	2020	Change (2010-2020)	% Change (2010-2020)
<b>Cuyahoga</b>	1,280,122	1,264,817	<b>-15,305</b>	<b>-1.2%</b>
<b>Cleveland</b>	396,815	372,624	<b>-24,191</b>	<b>-6.1%</b>
<b>Rest of Cuyahoga</b>	883,307	892,193	8,886	1.0%
<b>Lorain</b>	301,356	312,964	<b>11,608</b>	<b>3.9%</b>
<b>Lake</b>	230,041	232,603	<b>2,562</b>	<b>1.1%</b>
<b>Medina</b>	172,332	182,470	<b>10,138</b>	<b>5.9%</b>
<b>Geauga</b>	93,389	95,397	<b>2,008</b>	<b>2.2%</b>
<b>NOACA Region</b>	2,077,240	2,088,251	<b>11,011</b>	<b>0.5%</b>

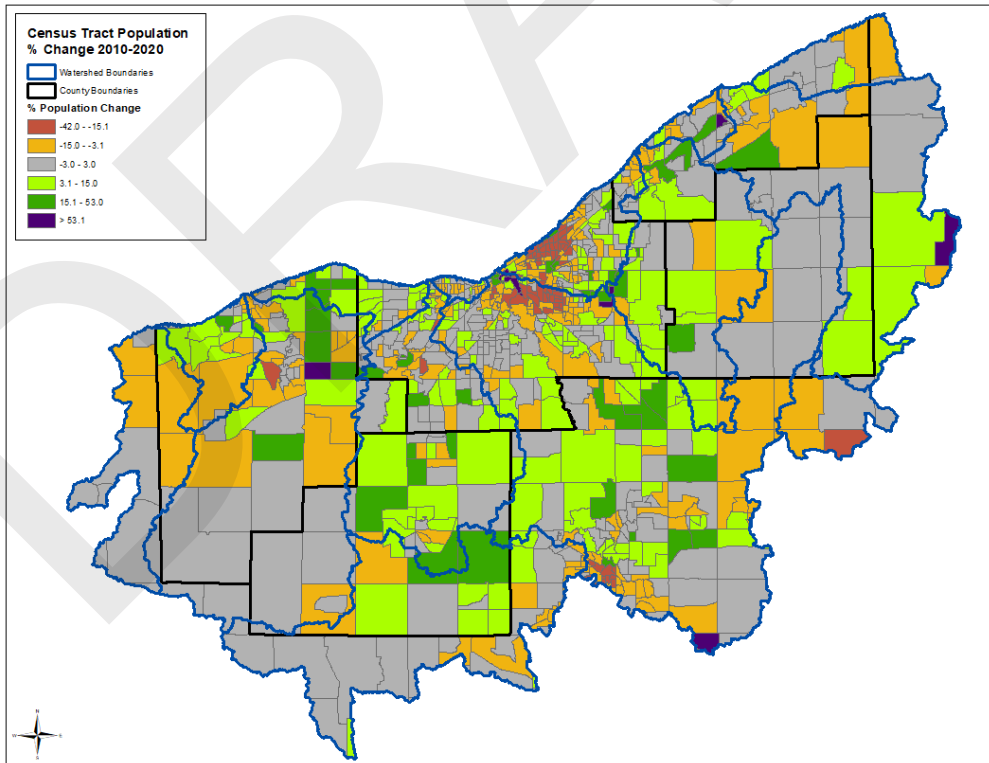
Jurisdiction	County	2010	2020	Decrease	% Increase	Peak Year
Cleveland	CUY	396,815	372,624	<b>-24,191</b>	<b>-6.1%</b>	1950
East Cleveland	CUY	17,843	13,792	<b>-4,051</b>	<b>-22.7%</b>	1950
Elyria	LOR	54,533	52,656	<b>-1,877</b>	<b>-3.4%</b>	1980
Lakewood	CUY	52,131	50,942	<b>-1,189</b>	<b>-2.3%</b>	1970
Eastlake	CUY	18,577	17,670	<b>-907</b>	<b>-4.9%</b>	1980
Cleveland Heights	CUY	46,121	45,312	<b>-809</b>	<b>-1.8%</b>	1960
Grafton	LOR	6,636	5,895	<b>-741</b>	<b>-11.2</b>	2010
Madison Twp	LAK	15,699	15,053	<b>-642</b>	<b>-4.1%</b>	2010
Brook Park	CUY	19,212	18,595	<b>-617</b>	<b>-3.2%</b>	1970
Medina	MED	26,678	26,094	<b>-584</b>	<b>-2.2%</b>	2010
Berea	CUY	19,093	18,545	<b>-548</b>	<b>-2.9%</b>	1970
Highland Heights	CUY	1,130	662	<b>-468</b>	<b>-41.4%</b>	1990
Parma	CUY	81,601	81,146	<b>-455</b>	<b>-0.6%</b>	1970
Olmsted Falls	CUY	9,024	8,582	<b>-422</b>	<b>-4.9%</b>	2010
South Euclid	CUY	22,295	21,883	<b>-412</b>	<b>-1.8%</b>	1970

<sup>24</sup> NOACA, Census 2020 Technical Analysis Report Year, (Cleveland: NOACA, February 14, 2022), <https://www.noaca.org/tools-resources/recent-studies/census-2020-technical-analysis-report> (accessed August 8, 2023).

**Figure 9: 2010-2020 Community Population Change**



**Figure 10: 2010-2020 Census Tract Population Percent Change**



## Household Trends

According to [NOACA's Census 2020 Technical Analysis Report](#), "households" include one or more persons. Understanding changes in households over time is just as important as tracking population changes. If and when people migrate, they still need structures to live in, which results in changes to residential development patterns, that in turn may result in the creation of additional impervious surfaces and impact water quality. All five of NOACA's counties, as well as many communities, experienced an increase in the number of households (see Table 3 and Figure 11). Cuyahoga County experienced only a 2% growth, while Medina and Lorain saw larger percentage increases (10% and 7.7%, respectively).<sup>25</sup>

Geography	2010	2020	Change (2010-2020)	% Change (2010-2020)
<b>Cuyahoga</b>	545,056	555,988	<b>10,932</b>	<b>2.0%</b>
<i>Cleveland</i>	167,490	167,681	191	0.1%
<b>Rest of Cuyahoga</b>	377,566	388,307	10,741	2.8%
<b>Lorain</b>	116,274	125,239	<b>8,965</b>	<b>7.7%</b>
<b>Lake</b>	94,156	99,590	<b>5,434</b>	<b>5.8%</b>
<b>Medina</b>	65,143	71,647	<b>6,504</b>	<b>10.0%</b>
<b>Geauga</b>	34,264	35,460	<b>1,196</b>	<b>3.5%</b>
<b>NOACA Region</b>	854,893	887,924	<b>33,031</b>	<b>3.9%</b>

[NOACA's Census 2020 Technical Analysis Report](#) also compared population and household changes at the county and regional level (see Table 4). All five of NOACA's counties experienced greater growth rates in households than population.

Geography	Population % Change (2010-2020)	Households % Change (2010-2020)
<b>Cuyahoga</b>	<b>-1.2%</b>	2.0%
<i>Cleveland</i>	<b>-6.1%</b>	0.1%
<b>Rest of Cuyahoga</b>	1.0%	2.8%
<b>Lorain</b>	3.9%	7.7%
<b>Lake</b>	1.1%	5.8%
<b>Medina</b>	5.9%	10.0%
<b>Geauga</b>	2.2%	3.5%
<b>NOACA Region</b>	0.5%	3.9%

The "differences between the change in population and households throughout the region can be attributed to the change in the number of people per household" (see Table 5).<sup>26</sup> Populations per household have been consistently decreasing over the past few decades due to aging populations ("empty nesters"), families with fewer children, and more households with only one or two persons. Population increases, coupled with fewer people per household, results in additional development of housing units, which can potentially result in additional impervious surfaces, stormwater runoff, and additional water/wastewater infrastructure to maintain in

<sup>25</sup> NOACA, Census 2020 Technical Analysis Report, 6-7.

<sup>26</sup> Ibid., 8.

perpetuity.

<b>Geography</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>Change 1990-2020</b>
<b>Cuyahoga</b>	2.51	2.44	2.35	2.27	<b>-0.23</b>
<b>Cleveland</b>	2.53	2.51	2.37	2.22	<b>-0.31</b>
<b>Rest of Cuyahoga</b>	2.49	2.4	2.34	2.30	<b>-0.20</b>
<b>Lorain</b>	2.82	2.69	2.59	2.50	<b>-0.32</b>
<b>Lake</b>	2.68	2.54	2.44	2.34	<b>-0.34</b>
<b>Medina</b>	2.93	2.77	2.65	2.55	<b>-0.38</b>
<b>Geauga</b>	3.02	2.87	2.73	2.69	<b>-0.33</b>
<b>NOACA Region</b>	2.60	2.52	2.43	2.35	<b>-0.25</b>

Cleveland continues to be largest jurisdiction in the region, even though it has had a 6% decrease in population from 2010-2020 (see Table 6). Many of the 15 largest cities in the region had low-to-moderate levels of population change, with change rates ranging between -4% and +5%. North Ridgeville is one exception; the city experienced an increase in population of nearly 20%. A third of the largest cities in the region reached their peak population in 2020, which indicates that these cities or portions of these cities (census tracts) are potentially still growing (see Figure 11). Development impacts will follow where population grows by community and/or is redistributed throughout the region. As development occurs, so will impervious surfaces and stormwater runoff of nonpoint source pollution.<sup>27</sup>

<b>Population Rank (2020)</b>	<b>City</b>	<b>County</b>	<b>Population % Change (2010-2020)</b>	<b>Households % Change (2010-2020)</b>
1	Cleveland	CUY	<b>-6.1%</b>	0.1%
2	Parma	CUY	<b>-0.6%</b>	1.8%
3	Lorain	LOR	1.7%	4.2%
4	Elyria	LOR	<b>-3.4%</b>	2.5%
5	Lakewood	CUY	<b>-2.3%</b>	4.6%
6	Euclid	CUY	1.6%	2.9%
7	Mentor	LAK	0.6%	5.7%
8	Strongsville	CUY	3.9%	5.6%
9	Cleveland Heights	CUY	<b>-1.8%</b>	0.5%
10	Brunswick	MED	3.4%	9.4%
11	North Ridgeville	LOR	19.7%	23.0%
12	Westlake	CUY	4.6%	5.4%
13	North Olmsted	CUY	<b>-0.8%</b>	1.2%
14	North Royalton	CUY	2.9%	4.3%
15	Garfield Heights	CUY	3.2%	2.5%
16	Shaker Heights	CUY	3.5%	4.9%

<sup>27</sup> Ibid., 16.

Figure 11: 2010-2020 Community Household Change

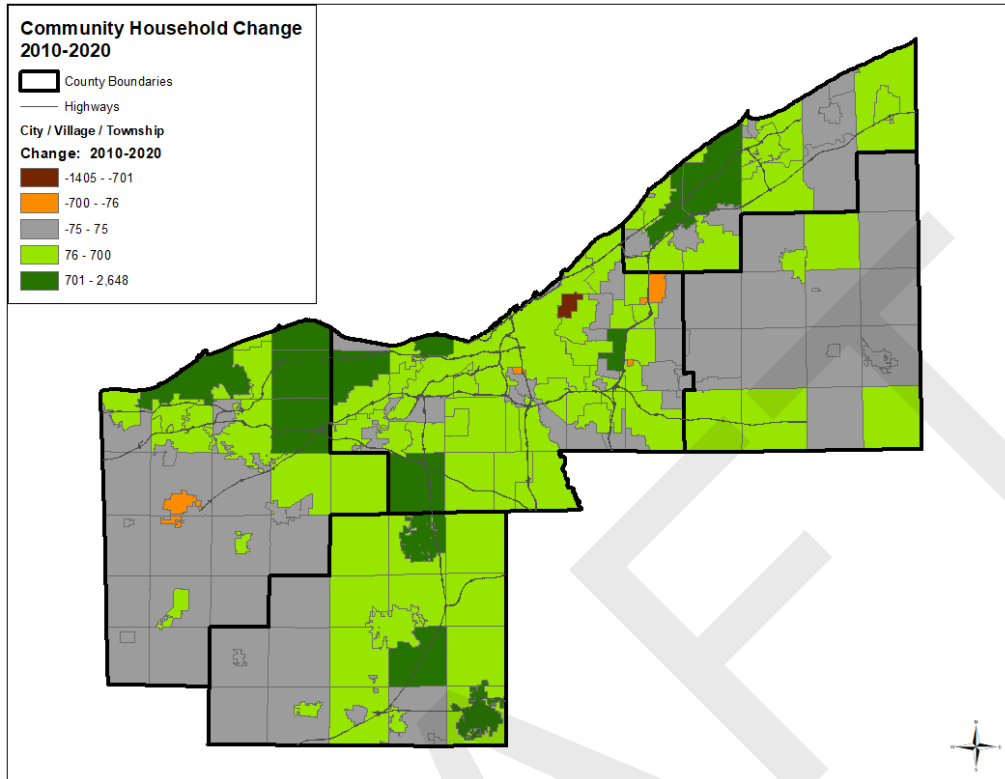
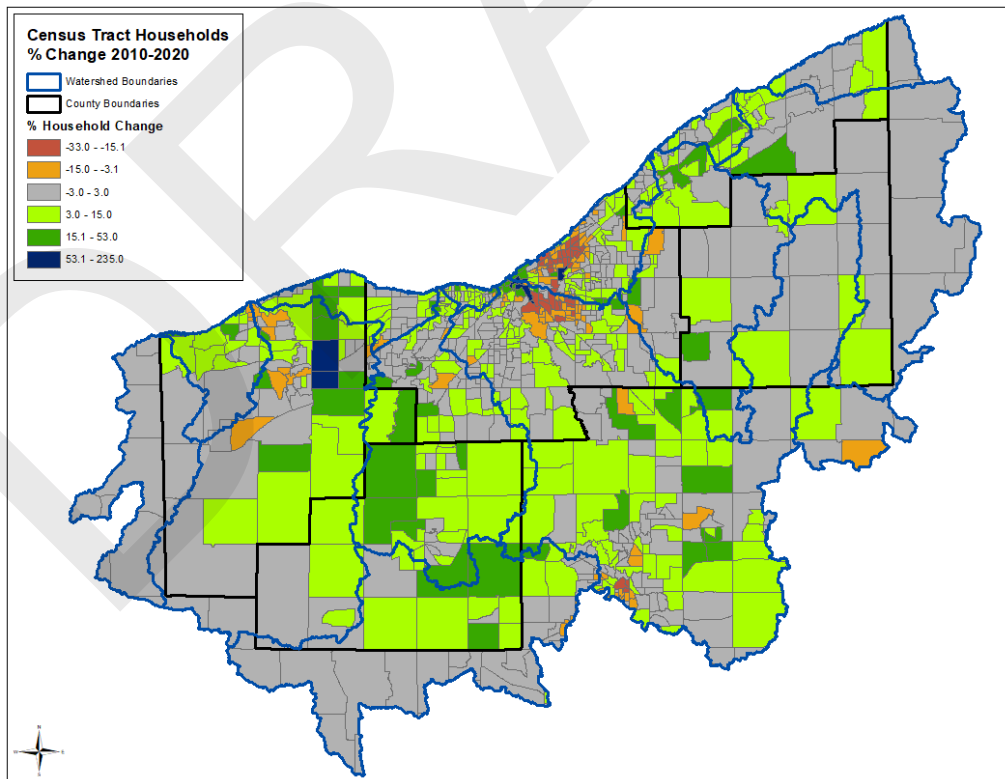


Figure 12: 2010-2020 Census Tract Household Percent Change



## Water Quality, Land Cover, & Impervious Surfaces

Land uses or land cover are often the source of water quality impairments (e.g., channelization and channel modification, riparian area encroachment, wetland drainage/filling, etc.). Changes in population, households and land use can lead to changes in land cover and impervious surfaces. Land use and land cover changes influence runoff within a drainage basin, which affects the quality of surface and groundwater resources.<sup>28</sup> Land cover indicates the physical land type, such as forest or open water, whereas land use describes human use of the landscape.<sup>29</sup> The Multi-Resolution Land Characteristics (MRLC) Consortium updates the National Land Cover Database (NLCD) every four years. The MRLC Consortium is a group of federal agencies that “coordinate and generate land cover information at the national scale.”<sup>30</sup> The MRLC Consortium’s National Land Cover Data (NLCD) is defined by classification categories, such as Developed (Open Space, Low Intensity, Medium Intensity, High Intensity), Forests, Wetlands, Grasslands, Pasture/Hay, Cultivated Crops, etc.

### Land Cover Changes 2001-2019

A comparison of the 2001 and 2019 NLCD shows increased developed (11.7%) and shrub/scrub (73.87%) land cover. Additionally, the comparison shows some loss of forested, grasslands and pasture/hay land cover (see Table 7 and Figures 13 and 14). As development occurs, open spaces (e.g., forests, grasslands, etc.) are lost and the percentage of impervious surfaces increases, which result in increases in stormwater and the increase in nonpoint source pollution runoff that directly impacts water quality. Increased development typically leads to more water and wastewater (e.g., sewers) infrastructure that must be maintained by a regional population with very little growth creating an increasing burden on rate payers.

<b>Land Cover Types</b>	<b>2001 SQMI</b>	<b>2019 SQMI</b>	<b>% Change 2001-2019</b>
Barren Land	5.36	4.77	<b>-10.92</b>
Cultivated Crops	412.15	420.75	<b>2.09</b>
Developed	969.19	1082.59	<b>11.70</b>
Forested	994.25	927.97	<b>-6.67</b>
Wetlands	129.01	139.16	<b>7.87</b>
Grassland/Herbaceous	24.78	22.00	<b>-11.24</b>
Pasture/Hay	509.10	444.20	<b>-12.75</b>
Shrub/Scrub	3.83	6.66	<b>73.87</b>
Water	30.14	29.70	<b>-1.45</b>

28 N. Sajikumar and R.S. Remya, R.S., “Impact of Land Cover and Land Use Change on Runoff Characteristics,” PubMed. DOI: 10.1016/j.jenvman.2014.12.041 (accessed August 8, 2023).

29 NOACA, *Clean Water 2020* (Cleveland: NOACA, September 11, 2020).

30 Multi-Resolution Land Characteristics Consortium, About <https://www.mrlc.gov/about> (accessed August 8, 2023).

Figure 13: 2001 National Land Cover Data

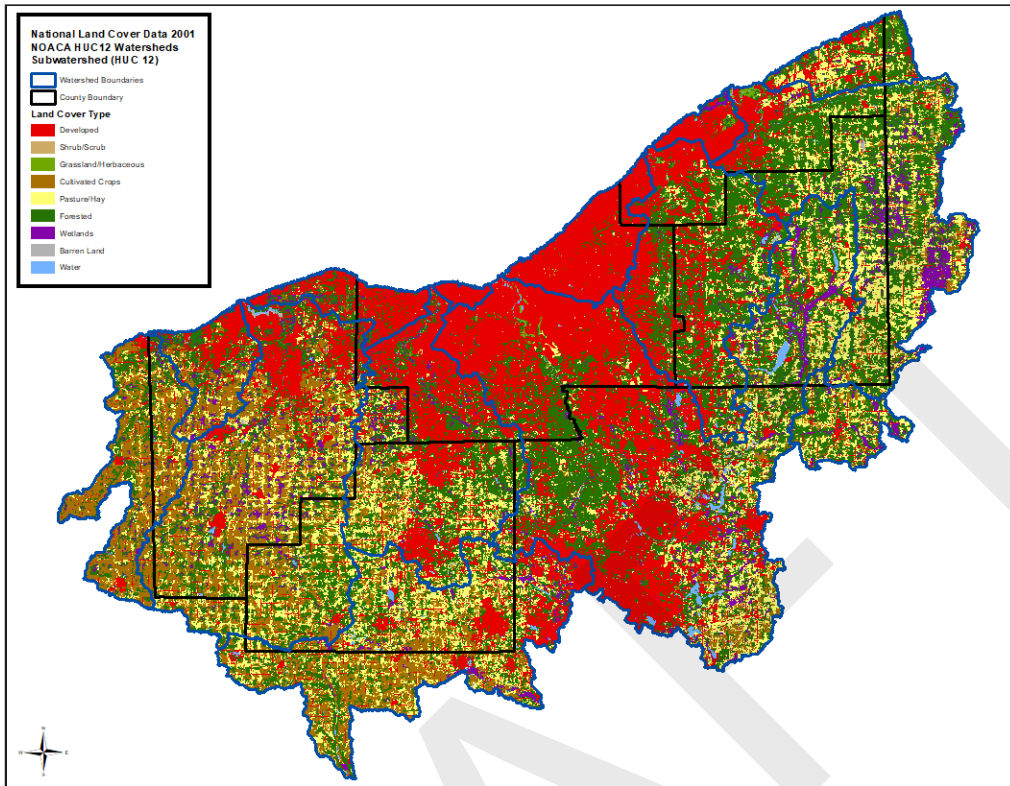
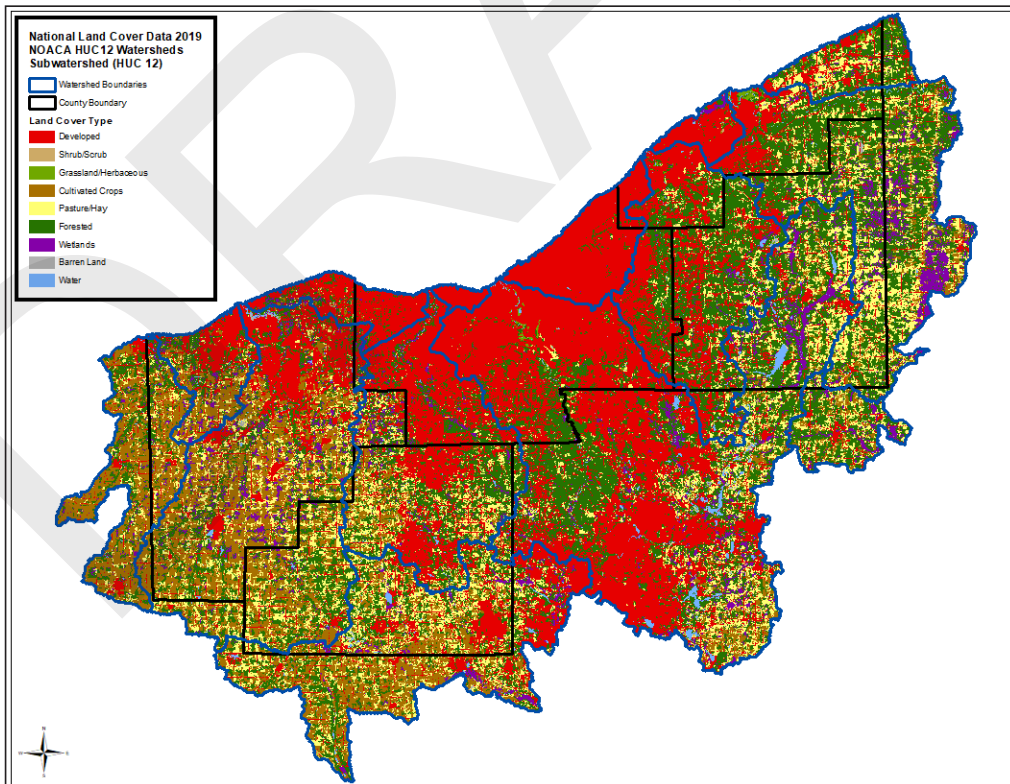


Figure 14: 2019 National Land Cover Data



## Impervious Surfaces Impacts on Water Resources

According to the United State Geological Survey (USGS), as “watersheds are urbanized, much of the vegetation is replaced by impervious surfaces, thus reducing the area where infiltration to groundwater can occur.” As the vegetation is replaced with impervious surfaces, stormwater volume and velocity increase, often blowing out streams, eroding streambanks and resulting in siltation and sedimentation. Traditional storm sewer infrastructure replaces natural systems and results in extensive drainage collection systems that also contribute to increased volume and velocity that affect waterways and contribute to more frequent and severe flooding and impacts to water quality.<sup>31</sup>

## Impervious Surfaces Changes 2001-2019

NOACA staff used a methodology developed by the Central Lake Erie Basin and Chagrin River Watershed Partners to derive impervious surface percentages for the subwatersheds from the National Land Cover Data. According to the Center for Watershed Protection, streams that have 10% to 25% impervious cover will be impacted; streams with greater than 25% to 60% impervious cover will not be able to support aquatic and biological uses, also known as aquatic life uses.<sup>32</sup> Streams with more than 60% impervious cover are essentially conduits for stormwater. Stormwater can carry the E.coli bacteria, which can result in concentration levels that warrant contact advisories that limit recreational uses. Additionally, runoff can convey excess nutrients to local waterways and Lake Erie that can result in harmful algal blooms that may impact drinking water. Stormwater can also carry heavy metals and other pollutants that can be bioaccumulated by fish resulting in consumption advisories.

In 2001, only one subwatershed, the City of Cleveland-Cuyahoga River mainstem, was more than 60% impervious, and only five were considered 40-59.9% impervious (see Figure 15). In 2019, three subwatersheds (City of Cleveland-Cuyahoga River, Big Creek, and Doan Brook-Frontal Lake Erie) were considered 60% impervious, while nine were 40-59.9% impervious (see Figure 16). As expected, many of the subwatersheds with high impervious percentages also are in non-attainment of ALU (Figure 5) and Recreational Status (Figure 6).

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31 United States Geological Society, Impervious Surfaces and Flooding, <https://www.usgs.gov/special-topics/water-science-school/science/impervious-surfaces-and-flooding> May 31, 2023 (accessed May 31, 2023).

32 Prince William Conservation Alliance, “Impervious Surfaces & Water Quality,” from <http://www.pwconserve.org/issues/watersheds/stormwater/impervious.htm#:~:text=Impervious%20Surfaces%20%26%20Water%20Quality&text=According%20to%20research%20from%20the,area%20cannot%20support%20aquatic%20life> accessed August 30, 2023).

Figure 15: 2001 Impervious Surfaces Percentage

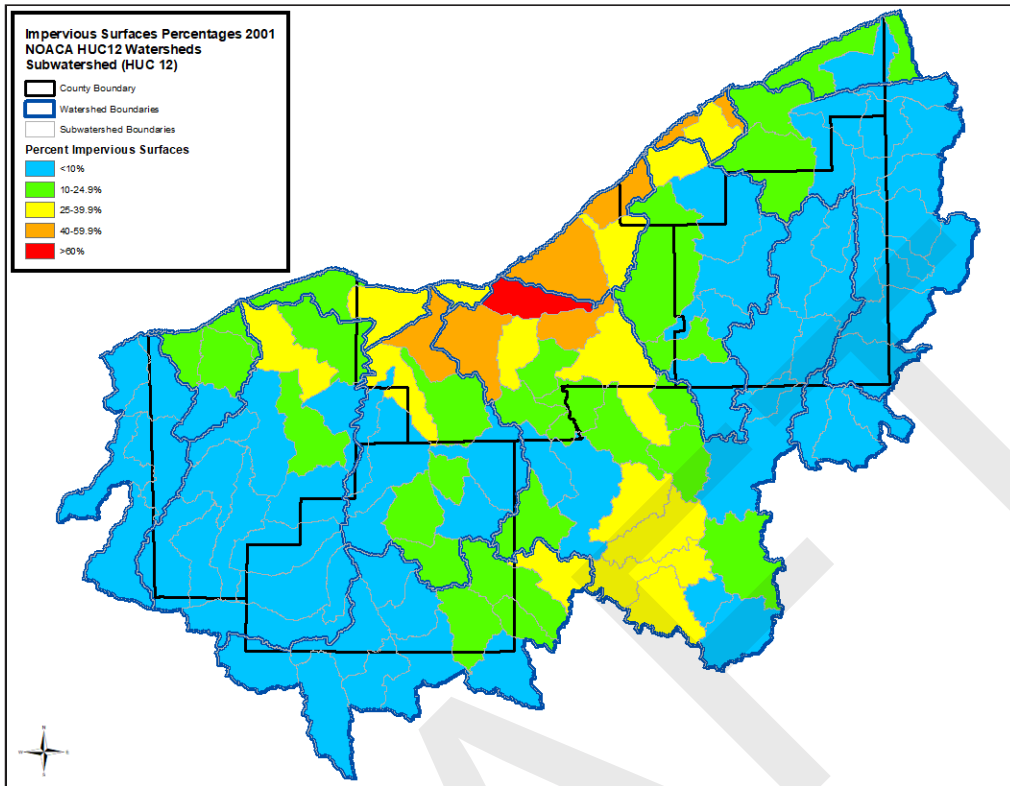
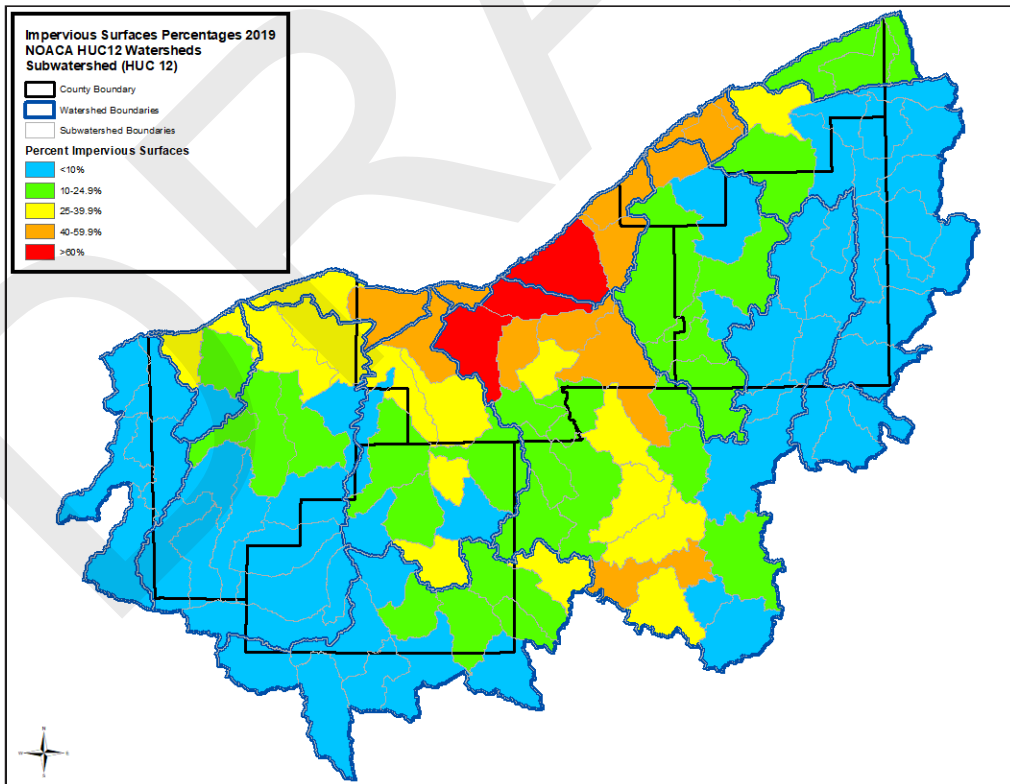


Figure 16: 2019 Impervious Surfaces Percentage



## Climate Change Impacts on Water Resources, Infrastructure & People

According to USEPA's Climate Change Adaptation Center, "climate changes, including more frequent and intense storms and more extreme flooding events, can increase stormwater runoff."<sup>33</sup> Stormwater increases with increased imperviousness, which often exacerbates existing or new water quality conditions (e.g., increases in flooding and increases in causes of water quality impairment). Storm magnitude and frequency are expected to change related to anticipated increases in temperature. Current storm sewer systems may not have the capacity to handle the increase in volume and velocity associated with storms of increasing magnitude. Increasing stormwater volume and velocity will impact water quality by washing pollutants (e.g., sediment, nutrients, chemicals) into local waterways. These pollutants can impact aquatic life uses, recreational uses, drinking water, and fish consumption. Climate change-related weather patterns can also result in droughts that lower stream flows that provide habitat for aquatic life and flow for recreational uses. Droughts can also impact the recharge and quality of groundwater; less recharge can concentrate pollution and limits the role of dilution to reduce impacts from pollution. Finally, warmer weather, droughts and nutrient pollution can result in harmful algal blooms (HABs) that can impact inland and Lake Erie drinking water sources.

Northeast Ohio already experiences impact from climate change, and projections of future conditions include a wetter, windier, and warmer future.<sup>34</sup> The protection of surface water from extreme weather events and shifting precipitation patterns will be increasingly important to avoid the negative impacts of excessive runoff that contributes to soil erosion, flooding, and nutrient transport. Climate resiliency and adaptation planning are necessary to ensure storage and conveyance capacities of existing stormwater systems. Continued efforts to separate sewer infrastructure from stormwater infrastructure and the expanded use of nature-based solutions are also necessary.

The health and water quality of Lake Erie is a regional concern. Beach closures and water quality advisories affect drinking water systems and impact tourism and recreation. Fluctuations in lake levels can impair the functions of water and wastewater systems and limit access to shoreline amenities due to the increased potential for erosion and flooding. Reduced winter ice cover and higher summer temperatures mean the potential for larger and more persistent algal blooms as well as changes in the magnitude and frequency of storms.

Future impacts of climate change may result in the interruption or loss of wastewater, stormwater and drinking water resources. Planning is key to prepare the region to ensure resiliency and adaptation considering climate change. Water infrastructure systems need to identify and implement adaptation strategies to minimize negative impacts from climate change. Strategies may focus on infrastructure maintenance and capital projects that build system redundancy and increase storage capacity or enhance treatment processes. Additional strategies may focus programs and policies that will be necessary to preserve water quality and minimize the negative effects of warmer air and heavier rainfall. Communities should adopt nature-based solutions (e.g., adopt or increase riparian setback requirements and expand stormwater management best management practices, such as imperviousness reduction or limits).

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33 United States Environmental Protection Agency (USEPA), Climate Change Adaptation Resource Center (ARC-X) <https://www.epa.gov/arc-x/climate-adaptation-and-stormwater-runoff> (accessed May 31, 2023).

34 United States Global Change Research Program, Fourth National Climate Assessment, Chapter 21 Midwest, <https://nca2018.globalchange.gov/chapter/21/>. (accessed May 31, 2023).

## **NOACA's Climate Pollution Reduction Program**

NOACA's Climate Pollution Reduction Program supports efforts toward the development, implementation and maintenance of a framework and plan for climate action to reduce emissions pollution that cause climate impacts and harm human health, mitigate the effects of extreme weather, adapt to changes that may occur (particularly relative to infrastructure), and build resilience. These efforts will prepare the region to reduce overall greenhouse gas emissions and develop projects and activities to increase resilience in the face of challenging climate conditions. NOACA staff will support member communities as they develop local plans and projects and enact local regulation and policy consistent with regional goals.

A primary objective of a regional framework and plan for climate action (climate pollution reduction) is to create a foundation for transformative solutions that will enhance equity across the region, especially as defined by geographic and demographic disparities in exposure to climate pollutants and hazards, and particularly as it relates to clean air and clean water as well as sound and reliable infrastructure. When completed and adopted, NOACA will coordinate the programming and implementation of its approved framework and plan that will integrate local initiatives and identify opportunities to develop additional programs and policies at the regional scale.

Work completed, principally mitigation and adaptation strategies identified within this program, will result in significant health, economic and quality-of-life benefits to residents, businesses and workers. It could also have national and global co-benefits with regional goals aligned with federal requirements related to climate action. Moreover, alignment with federal requirements will be necessary to be eligible for significant funding available through recent congressional action approving the "Climate Pollution Reduction Program."

Coordinated planning at the regional scale resulting in a framework and plan for climate action (climate pollution reduction) will enable Northeast Ohio to compete for and receive future funding allocated for projects to adapt infrastructure and systems to meet future needs. A guiding principle for this effort is the creation of a structure that enables coordination and collaboration within the region that lessens the burden on local communities. NOACA is undertaking this work as part of the implementation of eNEO2050, the long-range plan that the NOACA Board adopted in 2021.

## WATER QUALITY STRATEGIC PLAN

The Northeast Ohio Areawide Coordinating Agency's (NOACA's) Water Quality Strategic Plan (WQSP) includes a mission, goals, objectives, and strategies to guide staff planning and technical work that supports water infrastructure systems and the protection and improvement of regional water quality.

[NOACA's Vision](#) and [eNEO2050: An Equitable Future for Northeast Ohio](#) Long-Range Plan have the following vision statement:

***NOACA will STRENGTHEN regional cohesion, PRESERVE existing infrastructure, and BUILD a sustainable multimodal transportation system to SUPPORT economic development and ENHANCE quality of life in Northeast Ohio.***

In 2023, staff worked with NOACA's Water Quality Subcommittee to update and revise the Water Quality Strategic Plan. Key updates include a streamlined mission and updated and revised goals, objectives and strategies.

### Revised Water Quality Strategic Plan Mission Statement

"As a designated areawide planning agency and a metropolitan planning organization, NOACA will maintain and update the region's Water Quality Management (208) Plan. NOACA will support the restoration, protection, and sustainable use of water. NOACA will provide leadership, planning and technical assistance to advance Northeast Ohio's quality of life through the management of water as a valuable resource."

### Revised Water Quality Strategic Plan Goals

The WQSP goals are intended to be broad and long range, and guide NOACA's water planning work.

#### Goals:

**Goal 1:** Provide planning and technical support to protect and restore Lake Erie and the region's valuable water resources.

**Goal 2:** Protect the region's water quality/quantity to support regional economic competitiveness.

**Goal 3:** Identify and inform communities & organizations about the impacts of local decisions on valuable regional water resources and infrastructure.

**Goal 4:** Advance the philosophy of "One Water" through NOACA's water planning work.

**Goal 5:** Within NOACA's internal structure, address potential water quality and quantity impacts related to climate change on the region's transportation and water infrastructure.

## Water Quality Strategic Plan Objectives & Strategies

The WQSP objectives were developed as specific outcomes that help further define goals through strategic (strategies) work reflected in NOACA's contracts with Ohio EPA and with NOACA's Overall Work Program. The strategies were also revised to reflect input from NOACA's Water Quality Subcommittee.

### **Goal 1: Provide planning and technical support to protect and restore Lake Erie and the region's valuable water resources**

#### **Objectives & Strategies**

Engage and provide updates to the Water Quality Subcommittee

- Provide quarterly updates

Collaborate and coordinate with stakeholders to promote the sustainable use of water to improve quality of life

- Continue to support the Cleveland Water Alliance and the Lake Erie Volunteer Science Network

Engage and provide updates to wastewater Designated Management Agencies (DMAs)

- Host bi-annual wastewater DMA meetings that include regional updates and provide speakers for continuing education credits

Engage and assist watershed organizations by providing planning and technical assistance to develop nonpoint source implementation strategies (NPS-IS) plans

- Continue to support and assist Black River and Cuyahoga River Area of Concern Advisory Committees
- Continue to coordinate with Ohio EPA and Central Lake Erie Basin to identify priority watersheds

Integrate NOACA's water-related climate change mitigation and adaption priorities into NOACA's water quality work programs

- Identify environmental justice (EJ) communities for consideration in *Clean Water 2020* plan
- Prioritize NPS-IS planning for communities that maybe disproportionately vulnerable to climate change

Maintain and update NOACA's *Clean Water 2020* (208) Plan

- Update Chapter 2 update – State of the Region – 2020 census
- Update Chapters 6, 7 and 8
- Continue Ohio EPA consistency reviews
- Continue wastewater mediation/dispute resolution
- Continue mapping priority unsewered areas
- Continue providing wastewater technical assistance
- Continue five-year county specific update planning with wastewater DMAs

## **Goal 2: Protect the region's water quality/quantity to support regional economic competitiveness**

### **Objectives & Strategies**

Collaborate and coordinate with stakeholders to promote the sustainable use of water to improve quality of life

- Continue to support the Cleveland Water Alliance and the Lake Erie Volunteer Science Network

Coordinate with regional stakeholders to assess the resiliency of water infrastructure

- Provide assistance to communities on wastewater treatment regionalization

Support Urban Core and Environmental Justice (EJ) community efforts to plan for potential water-related impacts of extreme weather events

- Identify (map) subwatersheds that include Urban Core and EJ communities
- Work to advance the adoption of mitigation and adaptation strategies to address extreme weather events

## **Goal 3: Identify and inform communities & organizations about the impacts of local decisions on valuable regional water resources and infrastructure**

### **Objectives & Strategies**

Engage and provide updates to wastewater Designated Management Agencies (DMAs)

- Host biannual DMA meetings that include regional updates and provide speakers for continuing education credits

Maintain and update NOACA's *Clean Water 2020* (208) Plan

- Continue to implement and evaluate NOACA's Water Quality Management Plan (208 Plan) Development Impact Policy for Proposed Wastewater FPA Modification Requests
- Support Municipal Separate Storm Sewer System (MS4) planning through the implementation and update of Chapter 6

Provide planning and technical assistance to MS4 communities to update their Storm Water Management Plans (SWMPs)

- Work with Ohio EPA NEDO to educate MS4 communities regarding MS4 Permit requirements to address TMDL pollutants of concern
- Coordinate with Ohio EPA to identify planning and technical needs of MS4 communities
- Identify, track and share storm design best management practices with MS4 communities

## **Goal 4: Advance the philosophy of "One Water" through NOACA's water planning work**

### **Objectives & Strategies**

Engage and provide updates to wastewater DMAs

- Host biannual DMA workshops

Maintain and update NOACA's *Clean Water 2020* (208) Plan

- Encourage holistic water infrastructure planning and engage regional stakeholders about current water quality issues

- Support drinking water system resiliency and redundancy planning

Support Lake Erie Volunteer Science Network (LEVSN) and Cleveland Water Alliance

- Continue to participate in the LEVSN Standards Working Group to develop reporting standards for water quality sampling parameters
- Provide planning and technical assistance to the development of a Lake Erie-scale reporting tool that presents the volunteer sampling results

Manage, maintain and implement NOACA's NetZero Cool green infrastructure project for stormwater management

- Conduct annual/routine inspection of NOACA's green infrastructure components and perform ongoing maintenance
- Explore the development of a building mural on NOACA's east facing exterior that illustrates the "One Water" philosophy
- Support NOACA's NetZero Cool project public education and outreach efforts

Support the advancement of trees as natural stormwater management measures

- Participate in and support the City of Cleveland's Tree Coalition, Cuyahoga County's Healthy Urban Tree Canopy Grant Program, et al.

**Goal 5: Within NOACA's internal structure, address potential water quality and quantity impacts related to climate change on the region's transportation and water infrastructure**

#### **Objectives & Strategies**

Support NOACA's mission as an MPO to ensure that funded transportation projects consider potential impacts to regional water resources

- Incorporate water quality issues associated with transportation into NOACA's annual Overall Work Program (OWP)
- Present potential water resource impacts of transportation projects to NOACA Board, Committee, Subcommittee, and Advisory Council members
- Evaluate water quality impacts of transportation projects through Project Plan Review (PPR), Transportation for Livable Communities Initiative (TLCI), Long-Range Transportation Plan (LRTP), etc.
- Update and expand all of NOACA's transportation project application processes to include water resource impacts, water infrastructure considerations and the role trees can play

Enhance NOACA's water quality staff review processes of transportation projects to consider extreme weather impacts to regional water resources

- Identify Best Management Practices (BMPs) Program for transportation projects (e.g., stream crossing, complete and green streets, etc.)
- Update existing policies to include consideration of climate change and infrastructure resiliency
- Identify potential applications for trees as stormwater management infrastructure