Great Lakes Drinking Water: A Gaps Analysis of Policy Regulation and Funding Mechanisms Supporting Safe, Affordable and Equitable Access to Drinking Water in Michigan and Wisconsin

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Abstract

The Great Lakes, the world's largest freshwater resource, provide abundant freshwater to the Midwest United States, despite record-setting drought throughout the Western United States. And yet situations like the lead poisoning crisis in Flint, Michigan, and the PFAS crisis affecting the entire country continue to threaten public health across the region. An analysis of federal, state, and local drinking water management policies focused on Michigan and Wisconsin will identify gaps and challenges that exist within the current management system that prevent all Midwesterners from enjoying safe, affordable and equitable access to drinking water. Through two case studies on either side of Lake Michigan, this analysis identifies specific opportunities for improvement in both funding and regulatory mechanisms that could be implemented to better guarantee safe drinking water in the region.

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Definitions and Acronyms

ACE: Army Corps of Engineers
AOC: Area of Concern
BAT: Best Available Technologies
BPT: Best Practicable Technologies
BIF: Bipartisan Infrastructure (Law)
CDC: Center for Disease Control
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
CWA: Clean Water Act
CWS: Community Water Supply
DNR: Department of Natural Resources
DWSRF: Drinking Water State Revolving Fund
EGLE: (Michigan Department of) Environment, Great Lakes and Energy
EPA: Environmental Protection Agency
EPDTS: Entry point of the distribution system
GLRI: Great Lakes Restoration Initiative
GLWQA: Great Lakes Water Quality Agreement
IJC: International Joint Commission
MI EGLE: Michigan Department of Environment, Great Lakes, and Energy
NRDA: Natural Resource Damage Assessment
NPL: National Priorities List
NRDC: Natural Resources Defense Council
NTCWS: Non-transient community water system/supply
NTNCWS: Non-transient non-community water system/supply
PCBs: Polychlorinated biphenyls
PFAS: Per- and polyfluoroalkyl substances
RAP: Remedial Action Plan
RF: Revolving Fund
RLF: Revolving Loan Fund
ROW: Register of Waterways
SDWA: Safe Drinking Water Act
TNCWS: Transient non-community water system/supply
WIDNR: Wisconsin Department of Natural Resources
WOTUS: Waters of the United States

Executive Summary

The Great Lakes, the world's largest freshwater resource, provide abundant freshwater to the Midwest United States. The situation in the Midwest thus stands in stark contrast to record-setting drought and historically low water levels throughout the Western United States. And yet situations like the Flint water crisis continue to highlight the need for better policy interventions to ensure the people in the Great Lakes Basin acquire and maintain access to safe, affordable, and reliable drinking water.

To better determine what is needed to ensure all have access to safe, affordable, and reliable drinking water, this report focuses on two states in the Great Lakes region – Wisconsin and Michigan – and presents case studies of failures in the water quality and delivery systems. Through analysis of the failures that led to these case studies, we highlight the opportunities at the local, state and federal level to better guarantee equitable, affordable, reliable access to drinking water. These case studies shed light on the challenges of water management in addressing health and access concerns, and provide some paths forward, both with specific takeaways from these examples, as well as systems-level considerations that need to be further explored as options for future solutions.

The conclusions are not entirely surprising. Systemic underfunding at all levels of government impacts compliance at the local level and oversight at the state and federal levels. Underfunding also means we don't have comprehensive and sufficient data on both the impacts and extent of non-compliance with regulations, and unregulated threats. While state primacy is generally not a bad thing and allows states to implement federal requirements tailored to the needs and requirements unique to each state, increased federal leadership and direction on best practices, technical assistance, and compliance, is urgently needed to ensure consistent implementation of federal regulations, and to confirm that intended outcomes are successfully achieved. And significantly, there is no guarantee at either the state or federal level for access to clean and safe drinking water, without even getting into the question of affordability.

While much of the country, and the world, will continue to face unprecedented drought and drinking water access and affordability challenges, the Great Lakes currently remains a region plentiful with drinking water resources. Yet with egregious water safety and

environmental justice concerns still surfacing in such a water-rich region, these issues must continue to be addressed to ensure that the authorities are governing our drinking water resources responsibly with an eye to the future. Under these circumstances, this analysis could provide timely and relevant solutions for others to follow in addressing threats to drinking water.

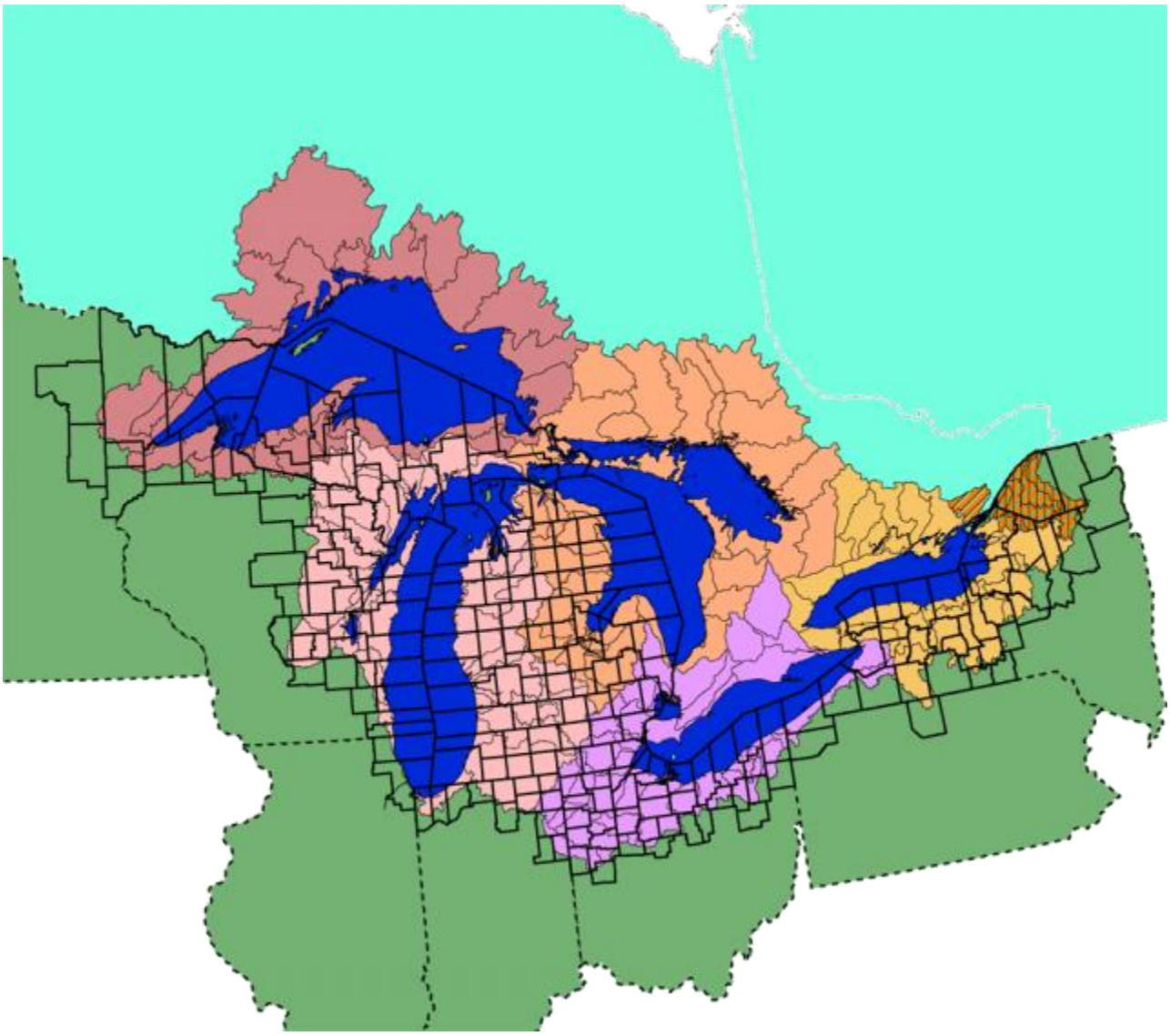

Image 1. Great Lakes Basin Watersheds, defined by 8-digit Hydrologic Unit Codes (HUC8) (EPA, 2015)

Introduction

The Great Lakes are "a dominant part of the physical and cultural heritage of North America," containing 84% of America's surface freshwater and 21% of the world's supply of freshwater. Thirty million people live in the Great Lakes Basin, depicted in Image 1, representing 30% of the Canadian population and 10% of the population of the United States, respectively (U.S. Environmental Protection Agency, n.d.). And while those born and raised in the Basin may have a strong culture and recognition of the importance of the lakes, there remain constant challenges to drinking water access. Communities such as Flint, MI and Benton Harbor, MI face lead poisoning from water delivery infrastructure and are struggling to pull together resources to remedy this toxic situation (Natural Resources Defense Council, 2021). Lake Erie and Green Bay face growing algae blooms caused by nutrient runoff that make the water toxic and unusable as drinking water (U.S. Environmental Protection Agency, n.d.). Towns across the country are facing the emerging threat of per- and polyfluoroalkyl substances (PFAS) contamination. And places like Marinette and Peshtigo in upper Wisconsin, where a long-time firefighting foam production and testing facility resides, are facing the brunt of the PFAS consequences that we are just starting to understand.

A cross-jurisdictional web of policies manage the quality, quantity, and delivery of water in and around the Great Lakes watershed. 2022 was the 50-year anniversary of the Great Lakes Water Quality Agreement, now called the Great Lakes Water Quality Protocol of 2012, a commitment between the United States and Canada to restore and protect the Great Lakes (U.S. Environmental Protection Agency, n.d.). And while regional organization is a strong model that could be replicated elsewhere, much of the regional and international focus remains on water quantity and diversions, and protection against, or removal of, invasive species (Egan, 2017). When it comes to drinking water, the burden of compliance lies on the state, and ultimately the local water system, which is responsible for its own financial viability. Importantly, the size and financial stability of these local water systems vary greatly.

Fifty years after the promise of "fishable, swimmable waters" by 1987 under the Clean Water Act, new research indicates that 51% of all rivers and streams, and 55% of lakes, remain

"impaired" by CWA definition, indicating they are too impaired for safe fishing or swimming. And the Great Lakes states are in fact far from the exception – Michigan makes the top five most impaired list regardless of whether you measure by river and stream miles (4th place) or by percent of impaired waters (3rd place) (Environmental Integrity Project, 2022). Yet the state of the Lakes isn't all bad news. According to reports released under the responsibility of the U.S. and Canada's joint Great Lakes Water Quality Agreement, the state of drinking water in all the Lakes is "good and unchanging" with good being the best category possible (Council of Great Lakes Governors, n.d.).

Yet while management of the surface waters in the Midwest may seem, at first glance, sufficient, the truth is that access to safe, affordable, reliable drinking water is not a guarantee for all those living within the boundaries of the Great Lakes Basin despite the abundance of freshwater to be found there. The recent attention brought to EPA by disasters like the public health crisis in Flint have put a necessary spotlight too on the failures of public water systems and state and federal government measures to protect health and drinking water safety, as well as opportunities for improvement. Failures at various stages throughout the infrastructure lifecycle have caused a nationwide crisis around lead contamination of drinking water, leading to rapid deployment of lead service line replacement strategies. Meanwhile, increased loads of nitrates, and groundwater contaminants like arsenic, and now the emerging PFAS crisis, which are often relics of the industrial midcentury and earlier, continue to plague our surface and groundwater reserves, threatening all sources of water for all uses.

From groundwater reservoirs to the streams and rivers that feed and are fed by the vast lakes that dominate the Great Lakes watershed, it is the connectivity of these resources, and the ecosystem services they provide to people and to nature, which make this Basin so unique, and so important. And it is the actions of, but also water needs of, the people of the basin that tie these lakes, and these management mechanisms, together. This paper will review state and federal policy governing drinking water standards, and the local compliance mechanisms, related to drinking water management. It will further review the barriers and challenges that may exist across all levels, in light of some of the threats mentioned above, that prevent the equitable and affordable provision of safe drinking water to all.

To narrow the focus of this analysis, state governments, those of Michigan and Wisconsin, will be the primary focus of this research. Under the 2012 Protocol, Lake Michigan is denoted as the sole responsibility of the United States Government (International Joint Commission, 2012) thus considerations of international treaty policies will be relevant for state-wide policy considerations in MI and WI, but consideration of Canadian province law will not be detailed, though may be relevant given the connectivity of the Basin. Federal and state statutes and compliance will be analyzed for gaps and differentiations between states on a certain topic, as relevant.

Through two local case studies, one in Benton Harbor, Michigan, and one in Marinette, Wisconsin, this report will identify and highlight failures in state, local, and federal regulations and policies, whether regulatory, compliance, funding, or otherwise, and will provide reasonable policy solutions for consideration. These case studies will not only highlight policies, regulations, and/or practices that failed communities, but also highlight lessons learned, and best practices where available, for moving toward, and ultimately maintaining, safe drinking water and a healthy environment for all.

An analysis of federal and state funding mechanisms to support the challenges and solutions outlined in Benton Harbor and Green Bay will consider further the federal, regional, state, and inter-agency and inter-governmental connections and funding opportunities to address these issues. Federal regulation and funding considerations are covered first, so that references can be made throughout the case studies as appropriate.

The following research questions defined the initial scope of this report and helped to align the research and drive toward outcomes and takeaways.

Research Questions

1. How is drinking water managed at the federal and state levels? (MI and WI)
2. What barriers or gaps exist in delivering safe, affordable, and reliable drinking water to all constituents in WI and MI?
3. What other policies or regulations have impacts on availability/delivery/affordability of drinking water in MI/WI? E.g., quality and quantity regulations, funding mechanisms, etc?
4. What threats exist to quality, quantity and delivery exist in MI and WI?
5. What is currently being done? What positive example exists, and where should policy and funding priorities lead?

Methodology

The primary method for this research was a policy, literature, and media review focused on federal and state regulations and the respective case studies. This includes compliance reports and plans from both Michigan and Wisconsin, the Environmental Protection Agency (EPA), the Great Lakes Restoration Initiative (GLRI), and other relevant government agencies and entities that are responsible for drinking water or water resources in the respective states of focus. Additional peer reviewed journals were also reviewed to seek additional relevant reviews of challenges or opportunities around drinking water management, either federally or specific to the Midwest United States.

The analysis will provide a broad overview of federal and state policies governing drinking water quality, quantity, access and delivery. One case study in each state will be examined to outline the depth and complexity of the issue of affordable, equitable, reliable drinking water, and provide specific examples of both the challenges and opportunities that exist at the state level. A gaps analysis will consider possible recommendations for future policy goals at the state and local level in Michigan and Wisconsin, and through other regional, federal, or international mechanisms.

While community interviews and perspectives would be valuable components of this research, due to timing and resource constraints, that depth of research is out of the scope of this project. Thus, no IRB reviews were needed, as no human interviews or data were utilized. The overall product will attempt to synthesize the complex web of drinking water policies and regulations, recognize the cross-jurisdictional nature of the issue, and provide best practices and solutions gathered from the research that could be worth further considering in more detail.

Findings

Drinking Water 101: Who is Responsible?

The web of who is responsible for drinking water is shockingly complex. Answering the question "where do I get my drinking water" seems like it could be simple enough, but upon brief investigation, it becomes clear how disparate and convoluted the answer can be. It depends on what state or region you live in, whether you are in a rural or urban area, and can even differ depending on if you are in your home or up the road at the local elementary school. The quality of drinking water systems (DWS), the location-specific nature of source water access and protection, and the distributed responsibility of maintaining and regulating transmission infrastructure makes a simple answer to the question "who is responsible for making sure I have safe, affordable, reliable drinking water" challenging.

The vast number of drinking water systems in the country is alarming - EPA cites over 148,000 (U.S. Environmental Protection Agency, n.d.b). A drinking water system is defined as a system that, "provides water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year," (U.S. Environmental Protection Agency, n.d.b). As listed by EPA, there are three major types of public water systems: Community Water Systems (CWS) which serve the same population all year round; Non-transient, non-community water systems (NTNCWS) such as schools and hospitals where a consistent population spends time; and transient non-community water systems (TNCWS) such as a gas station that sees a more transient user base (U.S. Environmental Protection Agency, n.d.b). In addition to community water systems, EPA estimates at least 23 million households in the United States rely on private well systems, of which the responsibility for management and safety relies completely on the well owner (U.S. Environmental Protection Agency, n.d.c). Throughout this paper, some numbers may necessarily include transient and non-transient non-community water supplies, but the challenges and possible solutions to clean water access will primarily focus on the average homeowner or renter, who are primarily served through community water systems or well water, at the household level.

Beyond management of systems, responsibility further splits. The water source is another critical component and has impacts on quality and availability of water to communities.

According to USGS surface water use data, surface waters such as rivers, streams, lakes, creeks, and reservoirs, supply 74% of all water usage in the US, with the remaining 24% coming from groundwater (U.S. Geological Survey, n.d.). State breakdowns of surface to groundwater use will be provided in the state-specific sections later in this report.

Finally, distribution is also a critical component of quality and delivery of drinking water to individuals. Public water systems are responsible for maintaining and operating the transmission infrastructure from the designated entry point of the distribution system (EPDTS) to the service connection point in a home or building, but owners are solely responsible for the piping within a home or privately owned apartment complex or other dwelling (U.S. Environmental Protection Agency, n.d.d).

The responsibility for drinking water is spread out in a vast network of water systems, overlayed with a vast network of water resources, both ground and surface, some more reliable than others. The responsibilities for cleanliness of source water, safety of delivery transmission, and affordability of access are spread amongst local, state, and federal jurisdictions. It becomes immediately apparent that no one jurisdiction is fully responsible. And so, to begin to pull at the thread of responsibility, the research questions will separate federal, state, local, and even individual responsibility over components of the drinking water systems as they exist in the U.S. Image 2 provides a simple overview of the components of drinking water delivery.

Throughout this research exercise it was hypothesized that underfunding, lack of agency and cross-jurisdictional functionalities, and other systemic barriers may exist, resulting in attainable, feasible opportunities for improvement in the various systems and their connectivity.

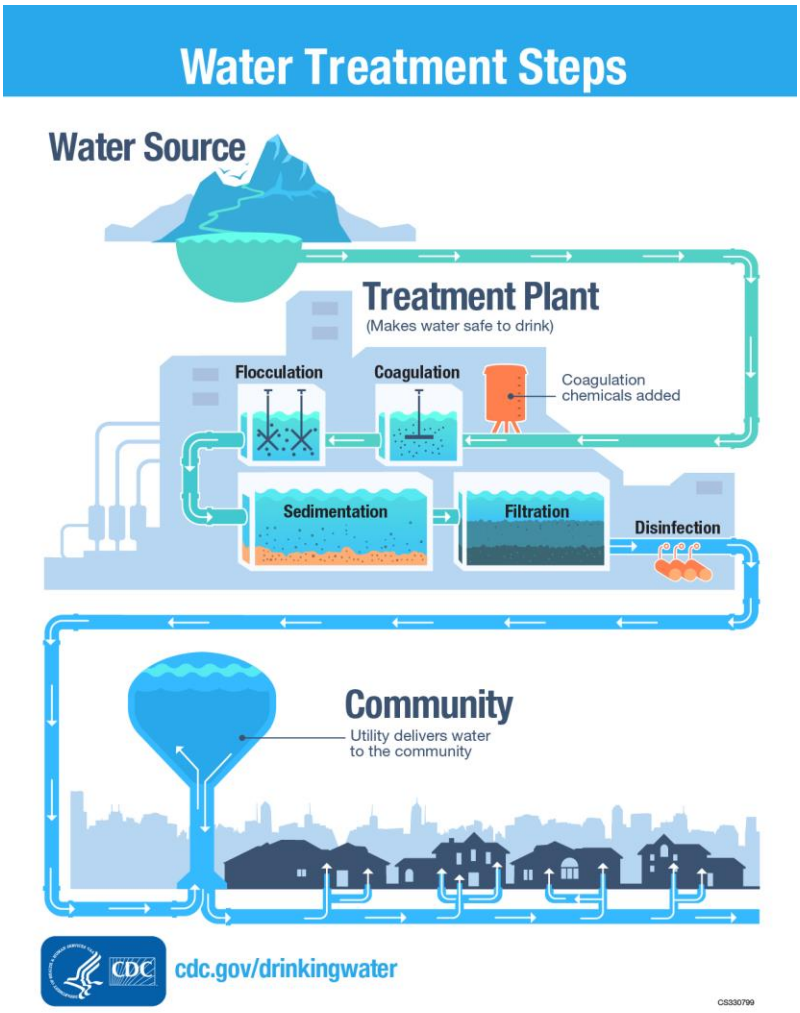

Image 2. Water Treatment Steps from Source to Household (CDC, 2022)

Federal Regulations

Various statutes and agency regulations address access and protection of safe drinking water. This section will detail a brief history of each of the primary federal laws that govern drinking water safety and related water quality issues, including some discussion around historic and current funding levels. A brief discussion will follow each mechanism description to pull out any immediate takeaways or concerns regarding regulation or funding pertaining to each federal mechanism addressed.

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) was established in 1974 and is the primary federal law governing drinking water safety in the United States. The law establishes a list of regulated

contaminants, managed by the Environmental Protection Agency (EPA), that require monitoring and regulation. EPA is required to publish a contaminant "candidate" list, and the SDWA requires their tracking during the ensuing 5-year period. This information can be found published on EPA's website (U.S. Environmental Protection Agency, n.d.e). The law also establishes primacy to the states over drinking water quality regulations, meaning that while EPA sets the contaminants list and provides federal funding, compliance and regulation mechanisms and enforcement lies primarily with state governments (Humphreys and Tiemann, 2021). In statute, states are given explicitly primary enforcement, but EPA has not only the authority but the obligation to assist with technical assistance should a state fail to uphold regulatory compliance (Safe Drinking Water Act, 1974).

Critical amendments to the Act occurred in 1986 and 1996. The 1996 amendments resulted in many notable updates that stand as the primary enforcement mechanisms concerning drinking water today. Consumer confidence reports are required, mandating that all community water systems prepare and distribute reports to consumers on source, possible contaminants, and general quality of their drinking water (Humphreys and Tiemann, 2021). Source water assessment programs were also established to identify and prevent threats to source water contamination. The 1996 amendments also set up the critical drinking water state revolving fund (DWSRF) that still functions as the primary source of funding for state drinking water system upgrades. But they also established the mandate for cost benefit analysis regarding new standards, something that could have influenced lack of any new listings on the EPA contaminants list since 1996, which will be discussed later in this section.

Additional changes in 2015 are also relevant to address current threats to drinking water. The 2015 Drinking Water Protection Act (P.L. 114-45) addressed algal blooms specifically, requiring EPA to develop a strategic plan to assess and manage the risks posed by such blooms. Also passed in 2015, the Grassroots Rural and Small Community Water Systems Assistance Act (P.L. 114-98) recognized the complex challenges faced by small rural water systems struggling to financially survive, and revised, reauthorized, and most importantly funded a technical assistance program aimed at supporting small rural systems (Humphries and Tiemann, 2021).

Most importantly, the SDWA authorizes appropriations toward federal programs aimed at achieving the goals and regulations stated by the act. Table 1 highlights the most recent funding levels as of FY2021 for the various programs within the SDWA, and though supplemental funding has been made available through one-time federal investments under the Biden Administration, this table presents a relevant snapshot of year-over-year funding levels, which are more indicative of general funding availability for drinking water quality.

42 U.S.C.	**Purpose**	**Last Authorized Amount**	**Last Fiscal Year of Authorization**	**SDWA, as amended**
300g-I(b)(3)(C)	EPA studies, assessments, and analyses in support of regulations or the development of methods	$35,000,000	FY2003	§1412(b)(3)(C)
300g-8(d)	Small public water system operator training and certification	$30,000,000	FY2003	§1419(d)
300g-9(f)	Small public water systems technology assistance centers	$5,000,000	FY2003	§1420(f)
300g-9(g)	Environment finance centers	$1,500,000	FY2003	§1420(g)
300h-6(m)	Sole source aquifer demonstration program	$15,000,000	FY2003	§1427(m)
300h-7(k)	State programs to establish wellhead protection areas	$30,000,000	FY2003	§1428(k)
300h-8(f)	State groundwater protection grants	$15,000,000	FY2003	§1429(f)
300i-2(g)	Community water system risk and resiliency grants	$25,000,000	FY2021	§1433(g)
300i-4(e)	Review of methods by which terrorists/others may disrupt or contaminate water supplies and methods to prevent, detect, and respond to such actions	Such sums as may be necessary	FY2005	§1435(e)
300j-1(d)	Emergency grants and technical assistance	Such sums as may be necessary	Indefinite	§1442(d)
300j-1(e)	Technical assistance for small system compliance	$15,000,000	FY2020	§1442(e)

300j-1(f)	Technical assistance for innovative water technologies	$10,000,000	FY2021	§1442(f)
300j-2(a)	State Public Water System Supervision program grants	$125,000,000	FY2021	§1443(a)
300j-2(b)	State Underground Injection Control program grants	$15,000,000	FY2003	§1443(b)
300j-2(d)	New York City watershed protection grants	$15,000,000	FY2010	§1443(d)
300j-3(c)	Special demonstration projects grants	$10,000,000	FY1977	§1444©
300j-4(a)	Monitoring program for unregulated contaminants	$10,000,000	FY2021	§1445(a)
300j-4(j)	Monitoring program for unregulated contaminants for certain systems	$15,000,000	for reach fiscal year for which monitoring is required	§1445(j)
300j-12(m)	State Revolving Loan Fund program grants	$1,950,000,000	FY2021	§1452(m)
300j-12(t)	Grants to address emerging contaminants	$100,000,000	FY2024	§1452(t)
300j-14(e)	State Source Water Petition program grants	$5,000,000	FY2021	§1454(e)
300j-16(e)	Grants to colonias for safe drinking water	$25,000,000	FY1999	§1456(e)
300j-18(c)	Studies on harmful contaminants in drinking water	$12,500,000	FY2003	§1458©
300j-18(d)	Waterborne disease occurrence study	$3,000,000	FY2001	§1458(d)
300j-19a(k)	Assistance for small and disadvantaged communities	$60,000,000	FY2021	§1449A(k)
300j-19a(l)	Drinking Water Infrastructure Resilience and Sustainability Program	$4,000,000	FY2020	§1459A(l)
300j-19b	Reducing lead in drinking water	$60,000,000	FY2021	§1449B(d)
300j-19d	Review of technologies	$10,000,000	FY2019	§1459D
300j-24(d)	Voluntary school and child care program lead testing grant program	$25,000,000	FY2021	§1464(d)
300j-25	Drinking Water Fountain Replacement for Schools Grant Program	$5,000,000	FY2021	§1465

Table 1. FY2021 SDWA Funding Levels and Date of Most Recent Appropriation (data from Humpheys and Tiemann, 2021)

Shortfalls of SDWA

Of most immediate concern are the documented violations of the SDWA recorded in recent years. According to a report by the Natural Resources Defense Council (NRDC), in a three-year period between June 2016 and May 2019, 24,133 community water systems faced at least 170,959 recorded violations of the SDWA, impacting 129,907,275 people who use these almost 200,000 drinking water systems (Powers, Shaffer, & Poston, 2022). This report also emphasizes that the violation rates are highest in small systems serving under 3,300 people each, emphasizing what are expected to be barriers to access later: system viability for small systems (p9). As of 2018, EPA recorded at least 40% of CWS reported violations of at least one drinking water standard, and another 30% reported monitoring or reporting violations, (U.S. Environmental Protection Agency, n.d.f) Beyond measured violations, almost one third of all systems may not be sufficiently monitoring and reporting violations, which also causes obvious concern (U.S. Environmental Protection Agency, n.d.f).

While EPA publishes and regulates named contaminants (U.S. Environmental Protection Agency, n.d.g) the most recent additions to the contaminants list were in 1996, meaning there is also likely a huge gap in what we are measuring for, and what is or could be impacting our human health (Powers, Shaffer, & Poston, 2022, p9). As noted previously, the requirement of a cost-benefit analysis for new listed contaminants also began in 1996, and very well could have affected the 20+ year gap in any new listed contaminants between then and now. Under recent scrutiny to regulate PFAS, the EPA has recently named 29 known PFAS under the fifth Unregulated Contaminant Monitoring Rule, meaning those 29 substances will be monitored and studied for a five-year period beginning in 2023 for consideration for addition to the regulated contaminants list (U.S. Environmental Protection Agency, 2022). PFAS are an emerging challenge, being addressed in multiple ways through the complex systems established to address threats to drinking water posed by such substances.

Finally, while new federal rulemaking processes around issues like PFAS, and increased funding for contaminants like lead and copper, tell a story of increased focus and prioritization of drinking water provision, they are newfound, and have been long-awaited by the affected

communities on the ground. We will more fully address funding mechanisms and shortfalls through the localized lens of the two case studies in later sections of this report.

CERCLA/Superfund

In 1980, after recognizing the necessary involvement of the federal government in cleaning up the nation's most contaminated sites to ensure public health and safety, Congress passed the Comprehensive Environmental Response, Compensation and Liability Act, more commonly known as CERCLA, or simply as "Superfund" for short. Without getting too into the details of financial liability webs, this section will specify the pieces of CERCLA that have a direct and immediate impact on water quality as it pertains to drinking water sources.

Of particular note is the responsibility of EPA to maintain a National Priorities List (NPL), which names sites most hazardous to human health, and is used to prioritize cleanup of these sites. Cleanup for these sites is very site-specific, and EPA does not have common regulations mandating the levels of acceptable remaining contaminants, nor any details on how cleanups must proceed (Ramseur, 2012). Again, for simplicity, this report will not cover detailed liability as covered by CERCLA, except to note that the taxing authority originally authorized under CERCLA to tax corporate entities in order to maintain a Superfund trust expired in 1995 and has not been reauthorized. However private funds also supplement the Superfund Trust, and over $4 billion has been added to the Trust through private settlements over time (Ramseur, 2021). These monies are not subject to discretionary Congressional appropriations and are at the sole disposal of EPA for Superfund cleanup purposes (Ramseur, 2021).

The current CERCLA Superfund site lists contains 1177 NPL sites, 436 deleted sites, and 35 proposed sites, all listed on EPAs public webpage (US EPAO, 2015). EPA also provides a general overview of the expectations around timelines and actions related to Superfund sites. It should be noted that CERCLA and Superfund authorities do not extend to petroleum. Much research and analysis has been and can be done specific to petroleum and natural gas, and their potential impacts on water and the environment, but this paper will not go into detail on those topics.

Begun in 1993, and codified in 2002 as its own program, CERCLA also houses the Brownfields program, initially as a part of, and then once codified outside of, the Superfund trust program. The Brownfields program provides supplemental funding opportunities through

federal appropriations and the ensuing grant programs, for communities in need of funds to cleanup sites for purposes outside of the explicit Superfund NPL.

Shortfalls of CERCLA/Superfund

As noted above, the taxing authority originally offered under CERCLA expired in 1995 and has not been reauthorized, leaving the Superfund trust to depend on annual appropriations as passed under the discretion of Congress on an annual basis. Congressional appropriations have also decreased over time, with the Superfund Trust reaching its peak balance of $4.7 billion in FY1997 (U.S. Public Interest Research Group Education Fund, 2021). The current balance, according to EPA, is $3.5 billion (US Environmental Protection Agency, n.d.(i)).

In addition, CERCLA authority is limited to locations on the NPL or that are declared Brownfields. There exists both a barrier to accessing funds and also possible stigmas against these declarations, which specify the unsellable and unusable state of otherwise potentially valuable areas, which would prevent local authorities or entities from desiring NPL or Brownfield designations (U.S. Public Interest Research Group Education Fund, 2021).

Clean Water Act

While the SDWA amendments of 1996 began the formal connectivity at the federal level between safe drinking water and clean source water in establishing required source water assessments, the federal law most relevant to maintaining clean water in the United States is the Clean Water Act (CWA). The CWA as we know it today is actually a set of amendments, passed in 1972, that build upon the 1948 Federal Water Pollution Control Act. The 1972 amendments, known from here forward simply as the CWA, make it "unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained" as their most notable responsibility (U.S. Environmental Protection Agency, 2022b).

Broadly, the CWA covers two things: first, titles II and VI authorize federal financial assistance for municipal sewage treatment construction; and second, it sets various regulatory requirements pertaining to industrial and municipal discharges (U.S. Environmental Protection Agency, 2022b). It uses both water quality standards and technology-based effluent limitations throughout these regulatory requirements. Title II construction grants evolved into what is now the State Water Pollution Control Revolving Funds, reflecting a standing debate on "the balance between assisting municipal funding needs, which remain large, and the impact of assistance

programs such as the Clean Water Act's on federal spending and budget deficits," (Copeland, 2021).

At its core, the CWA is broad and ambitious, declaring that "To achieve its objectives, the CWA embodies the concept that all discharges into the nation's waters are unlawful, unless specifically authorized by a permit" (Copeland, 2021). Effluent limitations on discharges are governed by a permit process managed by EPA, in which technology standards are set for polluters. These are often referenced as best practicable technologies (BPT) or best available technologies (BAT). Section 404 governs dredge and fill allowances for wetlands, and delegates authority to the US Army Corps of Engineers (ACE), which authorizes permits under EPA established standards.

Section 319, passed with the 1987 amendments, governs nonpoint source solution, ceding management of runoff to states, and leaving nonpoint source pollution unregulated by other CWA permitting schemes. In practice, most of the CWA enforcement is undertaken by states (Copeland, 2021). References will be made in the state overview sections from the respective CWA 319 reports required from states to the EPA.

Shortfalls of the Clean Water Act

As most anyone critiquing water policy would agree, the primary and major shortfall of the CWA is any authority or attempt to regulate nonpoint source pollution. Section 319 regulations are not stringent and put much of the burden on states for enforcement, highlighting both a common shortfall between federal regulation and state primacy, but also more importantly the glaring exclusion of nonpoint source runoff from command-and-control regulations in the CWA (Environmental Integrity Project, 2022)

EPA has also been unable to comply with its own five-year cycle requiring updates in BPT and BAT standards. Failure to implement BPT/BAT standards has left those standards untouched for decades (Kelderman et al, 2022) Perpetual Congressional underfunding of the EPA is a likely contributor to this deficit.

In addition, the definition of Waters of the United States (WOTUS) has long been litigated (*Waters Lawsuits Will Roll on Even as High Court Weighs in*. (n.d.).) and has recently been re-established and thus re-defined to pre-2015 terms (US EPA. (n.d.).), which is a return to a more comprehensive definition allowing for broader CWA authority. This definition was

narrowed under President Trump (*Waters Lawsuits Will Roll on Even as High Court Weighs in*. (n.d.).) but recently re-established under President Biden. The lack of clarity and thus continuing debate both in the courts and at the administrative level over the definition of WOTUS creates further uncertainty over the reach of the CWA authority and thus has significant implications on the outcomes of the CWA regulations.

As with other federal legislation, state primacy can be a challenge, in that each state implements its CWA authority differently. This can lead to conflicting contaminants lists, different standards across state lines, and confusing and often inequitable funding of state priorities across the U.S. While not a topic covered in depth in this report, a clear example is the variation from state to state regarding Outstanding National Resource Waters (ONRW). ONRW policy, authorized by the CWA but established and managed at the state level, is not found in all states, and even in states that have established these ambient freshwater standards, usage at large, and specific designation levels vary (Cordan, 2021). While Wisconsin DNR makes information easily available on ONRW designations and the tool in general (Wisconsin DNR. (n.d.), this information is much less accessible in Michigan, with only a link to the regulatory code available, containing no clear descriptions or guidance on usage or prominence of ONRW in the state (Michigan.gov, n.d.).

Regional Governance: The Great Lakes Water Quality Agreement (GLWQA) and the Great Lakes Restoration Initiative (GRLI)

In addition to the standard federal legislation governing various components of drinking water access, delivery, affordability, as well as state primacy, which will be discussed in the following sections, it is worth a brief overview of various components of regional organizations focused on the Great Lakes, namely the Great Lakes Water Quality Agreement (GLWQA) and the Great Lakes Restoration Initiative (GLRI).

The GLWQA is an agreement between the governments of Canada and the United States to restore and protect the water resources of the Great Lakes. Originally signed in 1972, the Agreement was amended multiple times, and creates a framework for protection and restoration initiatives, shared between the two governments, to ensure the future availability of the Great Lakes water resources (US EPA, 2015). Of note, the GLWQA establishes Areas of

Concern, or AOCs, a special designation of locations where the GLWQA agrees that special restoration attention is needed.

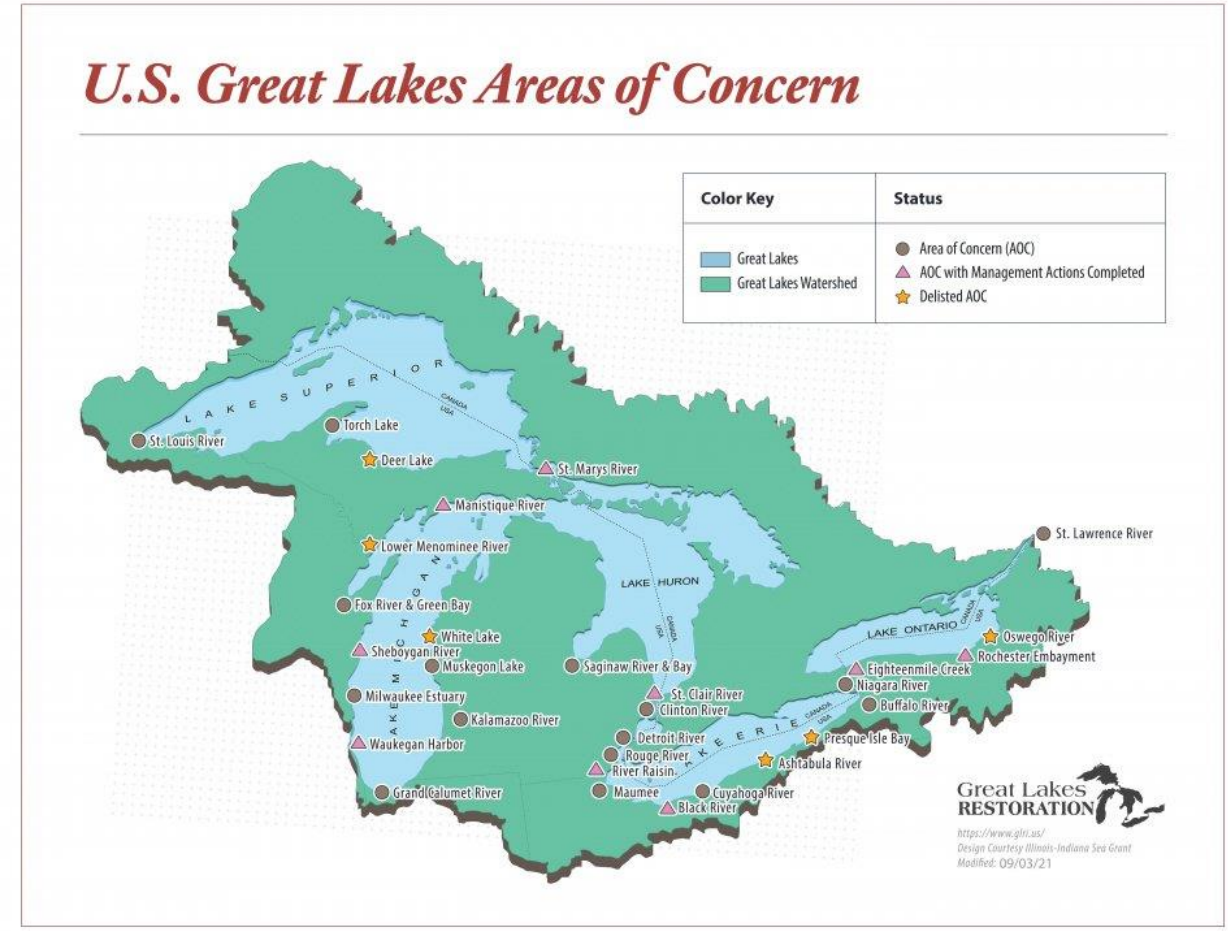

Image 3: Map of Great Lakes AOCs (US EPA *(n.d.)(b)*)

GLRI was developed to build upon previous efforts to organize regional, federal and state efforts to restore and protect the Great Lakes and charges the Interagency Task Force to coordinate efforts across the various jurisdictions working to protect the water resources of the Great Lakes (Great Lakes Restoration Initiative, 2010).

Both GLRI and specific AOCs designated by the GLWQA have received supplemental funding recently as part of President Biden's Bipartisan Infrastructure Law (BIF) which aims to address 22 of the remaining 25 AOCs by 2030 (Great Lakes Restoration Initiative. (n.d.).).

Recent Federal Funding Increases

Since his Inauguration, President Biden has signed multiple large spending bills that have included extensive attention to and funding for drinking water issues, namely $1.2 billion

for lead issues such as service line replacement (The White House, January 2023) and $10 billion for addressing emerging contaminants such as PFAS (The White House, March 2023).

Table 2 provides updated funding to the Revolving Loan Fund (RLF) programs under the bi-partisan infrastructure law (BIF) signed into law by President Biden on November 15, 2021 (U.S. Environmental Protection Agency, 2022c). These are significant investments in the program, and these will provide extensive resources to states. However, this funding has long been needed, and this cannot be the last significant investment to ensure all community water systems across the country are able to address issues like lead pipes and PFAS.

Appropriation	FY 2022 - 2026 (five-year funding)
CWSRF General Supplemental	$11,713,000,000
CWSRF Emerging Contaminants	$1,000,000,000
DWSRF General Supplemental	$11,713,000,000
DWSRF Emerging Contaminants	$4,000,000,000
DWSRF Lead Service Line Replacement	$15,000,000,000

Table 2. FY2022-2026 BIF Spending Totals, Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) (U.S. Environmental Protection Agency, 2022c).

Table 3 provides state-specific RLF allocations of the new FY2022-2026 funding per state, focusing solely on the case study states of MI and WI (U.S. Environmental Protection Agency, 2022c). Given Michigan's population, it is not unexpected that amounts to the state are more than those awarded to Wisconsin. However, we will see in further sections how the actual costs to implement many of the policies already reviewed require much more funding than is available to any given state, leaving a lot of necessary work on the table for communities that need it.

State	DWSRF General	DWSRF Lead Service Line Replacement	DWSRF Emerging Contaminants	CWSRF General	CWSRF Emerging Contaminants

Michigan	$44,168,000	$69,593,000	$18,546,000	$76,528,000	$4,020,000
Wisconsin	$30,666,000	$48,319,000	$12,877,000	$48,116,000	$2,527,000
Tribes	$38,040,000	$60,000,000	$16,000,000	$38,040,000	$2,000,000
Total	$1,902,000,000	$3,000,000,000	$800,000,000	$1,902,000,000	$100,000,000

Table 3. FY2022 BIF Spending Breakdown by State, Relevant Drinking Water Funding Opportunities (annual funding) (U.S. Environmental Protection Agency, 2022c)

Table 4 provides additional funding mechanisms relevant to drinking water appropriated through BIF, including non-regular supplemental revolving fund (RF) dollars, and non-RF appropriations. Again, these supplemental dollars are much needed and very welcome. However, consistent annual appropriations are also necessary to maintain infrastructure needs and continue to address emerging contaminants, and this must be the beginning of more sufficient investment, not a one-time plus up of funds.

State	2022 CWA 604(b)	604(b) Emerging Contaminants	604(b) total	DWSRF *	DWSRF Lead Service Line *	DWSRF Emerging Contaminants *	CWSRF General *	CWSRF Emerging Contaminants *
MI	$773,000	$41,000	$814,000	$21,642,320	$34,100,570	$18,546,000	$37,498,720	$4,020,000
WI	$486,000	$26,000	$512,000	$15,026,340	$23,676,310	$12,877,000	$23,576,840	$2,527,000
Total	$17,984,000	$950,000	$18,934,000	$859,588,380	$1,354,421,250	$736,612,000	$854,727,580	$91,635,000

Table 4. Other FY2022 BIF Funding *Denotes additional subsidy amount. Many of these additional amounts are subject to specific state matching quotas outlined in statute (annual funding) (U.S. Environmental Protection Agency, 2022c)

PFAS

A final issue that must be covered in this policy review is the emerging concern and resulting focus on addressing harmful per- and poly-fluoroalkyl substances (PFAS). PFAS are sometimes called "forever chemicals" (The White House, March 2023) used commonly in industrial production, and are being found in soil, in drinking water across the country, in fish and other animal food compounds. According to the Center for Disease Control (CDC), PFAS are man-made chemicals used in industrial production during the previous century, primarily since the 1940s (CDC, n.d.). Under the current Administration, EPA Administrator Regan has given increased focus to the emerging issue of PFAS, putting together an EPA Council on PFAS, who as their first action have put together a PFAS Strategic Roadmap that provides direction for

various agencies, and the states, to begin addressing the concern of toxic PFAS levels in soil, water, fish, and more. In the funding table above, funding for emerging contaminants can be found throughout, which is meant primarily to address PFAS and other chemicals that are not yet on other permanent listings for tracking, containment, and funding. In addition, since the onset of this research, new action has been taken by EPA to update SDWA regulations to include PFAS as regulated contaminants (The White House, March 2023), and the rulemaking is currently ongoing.

Federal Policy Overview and Discussion

Much of the federal policy governing and funding the regulations pertaining to drinking water and water resources consists of broad mandates with discrete state funding allocations that are left to the discretion of annual Congressional appropriations. This provides funding challenges at large, but also presents planning challenges. In particular, the lack of security and certainty of funding, at transparent and sufficient levels, makes it difficult to achieve the goals of the various policies.

Further, the mechanisms put in place by these policies address various components of drinking water safety, cleanliness, and availability, but none of them explicitly guarantee a right to clean drinking water. With this goal remaining unnamed, the policies instead reflect a desire to limit pollution by industry, so as to reduce harm to human consumption and use needs.

And, as we will begin to explore in the next section, federal mandates, often under-funded, with oversight and implementation left to the state, provide several practical challenges. First, the separation of the regulating body, EPA, and the implementing body, the state or local government, as dictated by the state, immediately opens up the opportunity for gaps in the system. Reporting itself, as we will soon see, is a challenge for the states, and often reporting is insufficient, let alone the quality of the reporting or the potential state actions to address potential safety issues. In addition, if each state is setting up its own reporting and compliance mechanisms, it becomes more difficult for federal funding bodies, either EPA or Congress, to determine needs and prioritization, when it cannot necessarily trust that the reporting and compliance are an apples-to-apples comparison. This discussion will continue after the forthcoming state case-studies.

Primacy and the States

While federal statutes cover the broad country-wide regulations, much of the enforcement and implementation dictated by legislation such as the CWA, SDWA, and CERCLA are implemented by the states. State primacy often gives states the flexibility to build and fund their own state-specific plans to achieve federal regulation, allowing for more local control. However, federal regulation coupled with state agency involvement over enforcement and implementation also creates disconnects between federal regulation and state management. States have much liberty in how they track and prioritize needs and funding within their own borders, creating a web of state-specific policies that vary in effectiveness and sufficiency. And while statute requires EPA intervention if states prove uncapable of upholding SDWA responsibilities the primary responsibility is given to states (Safe Drinking Water Act, 1974), and perpetual underfunding at all levels of government creates a complex web of responsibilities scattered across disparate regulatory authorities.

Considering the regulations and compliance of federal water laws in Michigan and Wisconsin, neighbors who share the borders of Lake Michigan, the only Great Lake fully within the U.S. border, allows us to examine the variations between states in their implementation of the federal regulations. From there we can further analyze what supplemental actions either state may be undertaking to improve or advance water resource quality. Recognizing the previously detailed complexity of the water systems, a direct comparison is not practical or useful. Instead, two localized case studies, one from each state, will be used to identify and explore challenges and shortcomings in both federal and state policy, and identify specific opportunities for improvement. This format reflects, and will further articulate the depth and challenge of, the complexity of the drinking water delivery and regulation systems. Some best and worst practices emerge at the state level, and provide discussion points for improvement opportunities for local, state and federal agencies, and their private and nonprofit partners.

Wisconsin

As of the 2020 census, the population of Wisconsin was 5,893,718 (U.S. Census Bureau, 2020)). Fiscal year 2021 (FY 2021) spending in the state was 59.4 billion. FY 2020 per capita spending was listed as $9,791, with the largest spending areas per capita being public welfare

at $2,416 per capital, and elementary and second education spending at $2,135 per capita (Urban Institute, 2022).

Wisconsin is also home to 84,000 miles of rivers and streams, 15,000 lakes making up over 1.2 million acres of lakes and reservoirs (Kelderman et al, 2022), and millions of acres of wetlands (Wisconsin Department of Natural Resources, n.d.). Wisconsin's Department of Natural Resources website provides open access data to the states' Register of Waterways (ROW) and provides other extensive mapping of their various water resources throughout their public website.

Lay of the Land: Drinking Water in Wisconsin

In the state of Wisconsin, there are 11,228 public water systems, the largest number of any state (Wisconsin Department of Natural Resources 2022), despite WI being only the 20th most populous state (Nations Online, n.d.). Wisconsin has four types of public water systems that similarly mirror federal water system definitions: municipal community water systems; other-than-municipal community water systems; non-transient, non-community water systems; and transient-community water systems (Wisconsin Department of Natural Resources, 2022). While only 1,038 of these systems are community water systems compared to 10,190 non-community water systems, the community-water systems serve 4,026,471 Wisconsinites, a large majority of the population. Private wells, which fall under none of the above public water systems, serve an additional 1,808,035 individuals, making it the second largest source of drinking water by far.

Despite proximity to the Great Lakes, 69% of Wisconsin residents get their drinking water from ground water, which serves 11,172 of the total public water systems, leaving 31% of the population and only 56 public water systems sourcing surface water (Wisconsin Department of Natural Resources, n.d.b) (Wisconsin Department of Natural Resources, 2022).

According to their 2021 report to EPA, in 2021 98% of Wisconsin's public water systems met all health standards (Wisconsin Department of Natural Resources, 2022). However, digging deeper into the numbers, only 88% of public water systems in the same year met all reporting requirements (p12). So, while those who are reporting are 98% compliant with requirements, assuming testing is 100% accurate, but 12% remain without accurate or reliable reporting data.

After 50 years of the CWA, Wisconsin still only classifies 29% of their 88,000 river miles as assessed for use, and of those 29%, 36% are considered impaired for either: water contact recreation; aquatic life; or fish consumption. Again, of the measured 29% of rivers and streams, 49% are impaired for water recreation, and 73% are impaired for fish consumption. Of the 1.2 million acres of lakes and reservoirs within the state, 76% have been assessed, and of that, 52% are impaired, with 70% of those lakes and reservoirs measured registering impaired for water contact recreation. (Environmental Integrity Project, 2022).

Wisconsin's most recent CWA 319 Plan covers the time period from 2021 – 2026 and acknowledges the challenge of nonpoint source pollution in achieving both CWA and SDWA standards and goals (WI 319 report). WI DNR recognizes that up to 70% of water resources in WI are impaired by nonpoint source pollution. In addition, WI DNR recognizes both the importance and critical need to measure wetlands for pollution levels, but also names the funding and staffing realities that have prevented sufficient research and monitoring of the over 5.3 million acres of wetlands in Wisconsin (Wisconsin's Nonpoint Source Program Management Plan FFY 2021-2025, 2021).). Wisconsin also names in this plan the specific sources of state legislative authority to address water quality concerns pertaining to nonpoint source pollution (p 61) and also highlights the cross-jurisdictional nature, and thus the necessary inter-agency and cross-jurisdictional collaboration and coordination that takes place to support water quality needs (p75).

Overall, Wisconsin DNR data are easily available, and the policy and compliance reports reflect a reverence toward the water resources of the state.

Drinking Water Funding in the Badger State

According to state reports, in 2021, $45 million was awarded to 21 communities through the Safe Water Drinking Loan Program, and another $33 million was distributed to 60 communities through the Private Lead Service Line Replacement Program (Wisconsin Department of Natural Resources, 2021).

Funding Source	Funding year	Amount	Notes/other
Safe Water Drinking Loan Program	FY2021	$45,000,000	Spent, as reported by state

Private Lead Service Line Replacement Program	FY2021	$33,000,000	Spent, as reported by state

Table 5. Snapshot of WI state funding (Wisconsin Department of Natural Resources, 2021).

Case Study: Marinette and Peshtigo, Wisconsin

Throughout preliminary research in the state, Green Bay, a large freshwater bay at the Northwest end of Lake Michigan, emerged as a recurring body of water plagued by a trifecta of threats worth examining further. Toxic algal blooms from nitrate runoff upstream of the Fox river are caused largely by nonpoint source runoff from the agriculture industry. Industrial runoff from the widespread industrial factories of the Midwest, placed along rivers like the Fox and Menominee, spill into Green Bay. And finally, there have been recent widespread findings of PFAS throughout the Bay, both in ground and surface water, in towns like Marinette and Peshtigo (McCracken, 2021). This section will outline a brief history of mis-managed water resources in the area, then focus on the PFAS crisis occurring in Marinette and Peshtigo, two neighboring towns currently dealing with toxic PFAS levels in drinking water.

A History of Pollution in the Region

Despite being a state with a strong public trust doctrine that incentivizes strong water regulation and monitoring compared to other states (Walls, 2020), prolific challenges to human health still exist in the Green Bay region of Wisconsin, and the area can be viewed as a case study to highlight the challenges that exist in ensuring safe, affordable and reliable drinking water to constituents.

Green Bay and the rivers that feed it have a long history with pollution regulation. Even before Green Bay became the first Great Lakes AOC listed by the International Joint Commission (IJC) in 1985, there were decades of highly toxic sediment and nutrient loads, including reports as early as 1939 citing unhealthy levels of green/blue algae (Harris et al, 2018). While records indicate that pollution, primarily caused by paper mills along the rivers and nutrient runoff from rural areas likely heavy in agriculture have plagued the region for over a century, it wasn't until the environmental movement and the noted passage of federal policies like the CWA and SDWA that control regulations began to be introduced (Harris et al, 2018).

Once designated an AOC, the Green Bay and Fox River areas were able to implement planning and research through a Remedial Action Plan (RAP), which provides further insight into the challenges and barriers to solutions that exist regarding drinking water quality in the state. Consistent with other state documentation of plans and compliance with regulations regarding water resources in the state, the Green Bay AOC RAP directly mentions the lack of regulation covering nonpoint source pollution as a barrier to comprehensive planning, research, and remediation efforts (Wisconsin Department of Natural Resources, 2022b).

The Lower Fox River Watershed, which houses the Fox River as it flows into Green Bay, has been named one of four GLRI priority watersheds (Wisconsin Department of Natural Resources, 2022b).). These watersheds are identified for their need for phosphorous load reductions in order to prevent increased toxic algae blooms in the Great Lakes.

There also exists a recently completed NPL Superfund site along the Fox River and into Green Bay. (U.S. Environmental Protection Agency Region 5, 2019). The Fox River NRDA/PCB Releases Superfund Site, or Lower Fox River and Green Bay Superfund Site, contains a 39-mile stretch of the Lower Fox River and the bay of Green Bay. The NPL is managed primarily due to PCB contamination in the river and bay as a result of discharge from various paper mills from the 1950s to the 1970s, though also includes other various contaminants of concern (COC). According to a 2019 five-year remedial action update report by EPA, the third five-year review for this NPL, just under $100,000,000 has been spent thus far on remediation as planned in the Lower Fox River Green Bay NPL site, and yet surface water and fish contamination level goals have not been achieved (U.S. Environmental Protection Agency Region 5, 2019). While certified as complete in 2022 by EPA, sediment caps will continue to be monitored and water testing will continue every five years under the discretion of EPA and WIDNR (Wisconsin DNR, 2023).

Marinette Water Supply

Marinette and Peshtigo are neighboring communities in the northeastern most part of Wisconsin that sit just a few miles away from the shores of Green Bay. And while it is less than a 15- minute drive from one town to the other, the two communities do not share a drinking water source. Marinette obtains its drinking water from the nearby Green Bay off of Lake Michigan, a surface water source filtered through the Marinette Public Water System (Marinette Consumer Confidence Report, 2021). Peshtigo, just a couple miles further away

from Green Bay, uses multiple groundwater sources (Peshtigo Waterworks (2021)). For the purpose of simplicity, this paper will largely focus on the city of Marinette, a community of just over 11,000 people (US Census Bureau, 2020) who primarily obtain their water from Green Bay, but the primary health concern under debate is for those roughly 170 potable wells that serve individual homes in the Marinette area impacted by groundwater contamination of PFAS.

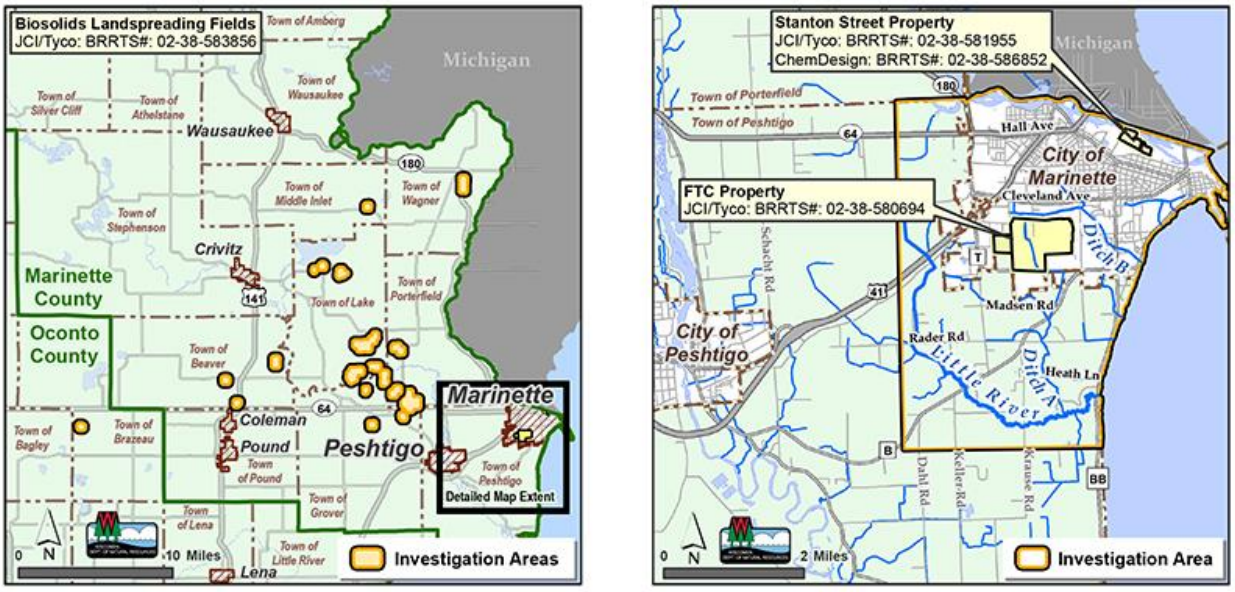

Image 4. Marinette and Peshtigo, WI PFAS Investigation Areas and JCI/Tyco location (Wisconsin DNR. (n.d.)(b))

PFAS in Marinette

Of more recent concern nationally, PFAS are also prolific across all Wisconsin water resources, and have been seeping into surface waters, groundwaters, and rivers/streams that lead into Green Bay. The towns of Marinette and Peshtigo have likely been subject to PFAS contamination since at least the 1960s, when a firefighting foam production and testing facility was first opened and began testing their product on site. The company, now Johnson Controls Inc and Tyco Fire Products (JCI/Tyco), was first contacted by the WI Department of Natural Resources (WIDNR) in 2018 after sewage intakes in the area showed elevated levels of PFAS in their sewage intake (Fox, M. and Kaeding, D., 2022). And while JCI/Tyco may have known as early as 2013 about the toxic chemicals leaching into the ground and water from their tests, it did not report concerns to the WI DNR until 2017 (McCracken, 2021). Further investigation was

done and ultimately WIDNR referred JCI/Tyco to the WI Department of Justice (DOJ) for failing to report testing results indicating PFAS levels at elevated levels as far back as 2013 (Fox, M. and Kaeding, D., 2022). While not formally regulated in 2017 at the time that JCI/Tyco recognized the contamination and began taking action to reduce PFAS runoff, the highest concentrations of PFAS found in groundwater on the company property site were as high as 100,000 parts per trillion (ppt) (Wisconsin DNR. (n.d.)(b)). While not regulated formally at the time, EPA had released a 2016 health advisory, which while non-regulatory and thus not enforceable, advised that states, water providers, tribes and other relevant entities managing water supplies consider the recommended rate of 70 ppt of PFAS (US EPA, 2016).

While the impacts and dispersion rates/occurrence of PFAS are just now being actively studied (Balgooyen, S. and Remucal, C. 2022; Pfotenhauer et al, 2022), these compounds are now understood to have negative health impacts on humans and animals at concentrated levels. According to news reports, the community in Marinette and Peshtigo have seen above average rates of testicular cancer in young populations (McCracken, 2021). A class action lawsuit was filed by residents of the two communities, and ultimately $17.5 million was rewarded to roughly 270 households (Fox and Kaeding, 2022). However, in reviewing the claim settlement web page, the maximum payment to an individual available is $65,000 (FAQs, n.d.) which may or may not be sufficient to cover the damages caused by the health impacts of PFAS, still largely unknown but in some cases potentially connected to cancer, let alone the costs to acquire or relocate to a place with access to safe drinking water.

Wisconsin State Response

Wisconsin has recently formally recognized and addressed the PFAS issue through Executive Action under Governor Evers, which mandates action and coordination in response to PFAS contamination by 20 state agencies (Wisconsin Department of Natural Resources, 2022). This document is extensive and thorough and provides an action plan that is cross-agency, calls for various specific legislative and rulemaking recommendations, and outlines technical and financial needs for local governments in order to implement the strategies outlined in the plan. Wisconsin is now in the process of developing rules under the SDWA that regulate four PFAS classifications, with public comment periods of proposed rules, and ultimately finalization and codification of the rules, still forthcoming (Wisconsin DNR, n.d.(d)). The PFAS Action Plan also

calls for action and sets up a preliminary state strategy to ban PFAS contamination through various statutes regulating runoff and waste disposal, as well as surface water contaminant levels, and other actions that direct funding and strategic prioritization to addressing PFAS in a comprehensive and inter-agency way (Wisconsin Department of Natural Resources, 2022).

Meanwhile, technologies are still being developed to properly filter PFAS from water to meet the moving target of actionable levels as mandated by states and the federal government, as PFAS regulation is truly still an emerging issue. As discussed in the previous federal section, recent actions by EPA and the Biden Administration are large and critical steps in the right direction, but the size and scope of the problem, and cost and details of a comprehensive solution, still remain to be determined.

Despite all of the positive state action, the groundwater and wells in the Marinette area impacted by PFAS remain contaminated. In 2022 the Wisconsin Department of Justice (WI DOJ) filed litigation against JCI/Tyco claiming they violated the state hazardous chemical spills law by not notifying the state DNR of the spill in 2013, but a separate lawsuit filed by lobby group Wisconsin Manufacturers and Commerce (WMC) at the county level is fighting use of spill laws to cover PFAS damages (Gunn, 2022). If successful, the DOJ lawsuit would hold JCI/Tyco responsible for fully cleaning up the PFAS contamination. Until litigation is resolved, the mess remains, and the water remains undrinkable, for those in the region.

Michigan

As of the 2020 Census, the Michigan population was 10,077,331 (U.S. Census Bureau, 2020). The FY 2020 per capita spending was $9,506, with the largest areas of per capita spending being on public welfare at $1,940 per capita and elementary and second education at $1,901 per capita (Urban Institute, 2022b). Michigan has 76,439 miles of rivers and streams, 46,000 inland lakes (MI 319 Report) and 872,109 acres of lakes and reservoirs (Environmental Integrity Project, 2022) and over 275,000 acres of Great Lakes coastal wetlands (MI EGLE wetlands numbers).

Lay of the Land: Drinking Water in Michigan

Michigan, like the federal government, has three types of public water systems; community, serving year-round residential customers in their homes; nontransient noncommunity, such as schools and daycares; and transient noncommunity, serving new

customers daily, such as rest stops and motels. 1,380 community water systems serve 7,450,000 Michiganders, while 1,305 nontransient noncommunity systems serve only 310,000 people in the state. (Michigan Department of the Environment, Great Lakes and Energy 2021). In addition, another 7,796 transient noncommunity water supplies serve over 1 million people daily, and while a total of over 10,000 varied water supplies may be referenced in the state of Michigan, this report will largely focus on the nontransient systems that are primary residence for Michiganders. An additional 1.12 million households are served by private wells which are also regulated by the Department of Environment, Great Lakes, and Energy (EGLE) (Michigan Department of the Environment, Great Lakes and Energy, n.d.).

Michigan is unique in its position to the Great Lakes, being almost completely surrounded by the surface freshwater of the Great Lakes on all sides. As such it isn't a surprise that 75% of Michigan residents served by public water systems get their drinking water from surface water, which accounts for drinking water supply to about 50% of the population of the state (1999 source water assessment; 2004 assessment). This 75% of the population is served by 70 community water systems, 60 of which source from the Great Lakes (p. 5 1999 source water assessment). The remainder source from groundwater or private wells. As is a common theme found throughout the literature review, and is notably a subjective takeaway, these data were found in a decades old report from 1999, hidden fairly deep within the EGLE website space, where equivalent information was more readily accessible and public facing.

Unlike the Wisconsin 2021 report to EPA on violations of water supplies, the Michigan report does not provide clean percentages of violations across the various types of systems. In fact, rather than stating general toplines, the overview states, "The number of CWS violations and the population impacted are relatively low considering the total number of monitoring events and that approximately 7.45 million people are served by approximately 1,380 CWSs in Michigan. There are 9,101 noncommunity PWSs in Michigan at facilities such as schools, industries, restaurants, motels, campgrounds, churches, and roadside parks. The majority of noncommunity systems are very small privately-owned businesses that provide water to fewer than 100 people per day. It is estimated that 10 percent of the owner/operators change each year at these facilities," (MI EGLE, 2021). While presumably true, this feels more like a

statement of excuse for what is to come, rather than a sufficient takeaway of the data, which one would expect in such a report, and as is provided in Wisconsin. This overview instead highlights a few numbers, such as "24 chemical MCL violations in 2021," and "31 supplies that incurred arsenic MCL violations, 12 had nitrate MCL violations, and seven were issued PFAS MCL violations," (p.9, MI EGLE, 2021). Meanwhile, the appendices containing the actual data tell a different story, with tables indicating that for even just one specific type of PFAS (Hexafluoropropylene oxide dimer acid (HFPO-DA)), the Number of Systems with Violations is listed at 56 (p2, MI EGLE 2021(b)). Most importantly though, the overview indicates a major gap in compliance in that "Most violations reported in the NCWS Program are for failure to collect water samples at the prescribed frequency (monitoring/reporting violations)," citing a rate as high as 18% of noncompliance, a reduction from the 20% reported in 2016 and 2020 (p.9, MI EGLE, 2021).

After 50 years of the CWA, Michigan has, contrary to Wisconsin, managed to assess 97% of its 76,439 river and stream miles for impairment. However, the results are not worth bragging over. Of the 97% assessed, 74% are impaired for at least one use: water contact recreation; public drinking water, aquatic life, and fish consumption. In fact, water contact recreation and fish consumption are both found to be 95% impaired. Similarly, Michigan has assessed 93% of the 872,109 lake and reservoir acres within the state, with 43% of those assessed registering as impaired. In lakes and reservoirs, 91% of each were found impaired for water contact recreation and fish consumption. Though surrounded by the Great Lakes, the waters within the state boundaries have much room for improvement.

While sections of the Wisconsin CWA 319 plan stood out for recognizing the connectivity of water systems and the need for increased focus on nonpoint source pollution, Michigan's most recent 319 plan and update has a different tone completely. While the state has made state matching loan funds available through the CMI funds (p.50, Michigan Department of the Environment, Great Lakes and Energy, 2019) the report itself is quite technical, missing the overarching narrative of water resources found in the Wisconsin report. The plan names partnerships with the agriculture industry in developing technology and standards for runoff, which is not uncommon in agriculture-heavy states, but also sets a tone of

practicing compliance as a necessary part of industry, rather than through the lens of protection of water resources (Michigan Department of the Environment, Great Lakes and Energy, 2019).

While no direct comparison was ultimately made between state laws and compliance mechanisms outside of the case study examples, it was noticeable that within the Michigan agency websites, merely reporting compliance was the priority, where Wisconsin materials, even simply annual drinking water reports, provided more narrative context, and ultimately a more comprehensive overview of state actions toward providing clean drinking water to all. An example is the "2021 Annual Report on Michigan Public Water System Violations (Michigan Department of the Environment, Great Lakes and Energy 2021). This document is an overview and introduction to tables of noncompliance data but acts largely as a reprint of EPA requirements that the State Agency is required to carry through and is certainly not written in a way that would encourage or welcome a non-technical audience. Another instance of Michigan defaulting to federal materials was found upon digging into the case study around Lead, as the EGLE website relied upon federally-produced and publicly-available images for published lead information notifications, rather than producing any Michigan-specific materials (MI EGLE (n.d.). While there is no violation or technical problem with this, it begins to point to a pattern of least possible effort toward compliance with federal statutes, which is not the proactive or responsible stance one might prefer from their state when it comes to protecting drinking water.

Drinking Water Funding in the Wolverine State

According to EGLE numbers, Michigan awarded 29 loans in 2021 through SDWA authorized appropriations, totaling $352 million in spending. This spending included over $190 million in Drinking Water State Revolving Fund (SRF) dollars on 16 projects: $684,725 for principal forgiveness for lead service line removal to nine projects and $1,726,650 for principal forgiveness to five disadvantaged communities. The other $161,880,000 was spent on loan financing for 13 projects through the Clean Water SRF (cite: *MI EGLE 2021 SDWA Fund)*.

Source/Purpose	Most recent funding year	Amount
DWSRF	FY2021	$190,000,000

CWSRF	FY2021	$161,880,000
Lead Service Line Removal	FY2021	$684,725
Disadvantaged communities	FY2021	$1,726,650

Table X: Snapshot of FY2021 MI Spending (MI EGLE 2021 SDWA Fund)

Case Study: More Environmental Injustice in Benton Harbor

While Green Bay was chosen for its multi-faceted challenges, and multi-faceted opportunities, around a large/shared Estuary/body of water, Benton Harbor was chosen due to its similarities with the Flint drinking water crisis. Just five years after the news cycle was taken over by toxic levels of lead in Flint, another case popped up on the West coast of the state in Benton Harbor. Benton Harbor is a town of roughly 9,700 people, located in Southwest Michigan on the shore of Lake Michigan. The population is 85% black and 5% Hispanic, and 45% of the population lives below the poverty line (United States Environmental Protection Agency Region 5, 2021).

A History of Pollution in the Region

Similar to the history that plagues the waters of Green Bay, so too does the area surrounding Benton Harbor have a history of toxins and pollution. Benton Harbor houses one of 65 EPA listed NPL Superfund sites in Michigan, Aircraft Components (D&L Sales), which consists of 17 acres of land in Benton Harbor (U.S. Environmental Protection Agency, n.d.h) The location is bounded on four sides by the Paw Paw River, a commuter road, and a residential neighborhood, and Lake Michigan. According to NPL progress documents, an estimated 4,000 people, and several schools, are located within one mile of the Aircraft Components site (U.S. Environmental Protection Agency Region 5, 2008). And while well records are incomplete, with no records being required pre-1967 for private well drilling, at least 30 known private wells exist within a half mile radius of the Aircraft Components site (U.S. Environmental Protection Agency Region 5, 2008). An industrial site since 1917, the Aircraft Components location was identified as a concern in the 1990s due to both measured hazardous levels of radium in the soil and measured hazardous levels of non-radionuclide hazardous substances in groundwater. And while the concerns to human populations did not specify connectivity to surface water, it was specifically noted in the report regarding ecological risk to local terrestrial and aquatic

species, "The primary ecological exposure pathway of concern was found to be groundwater discharge to surface water" (U.S. Environmental Protection Agency Region 5, 2008, p17).

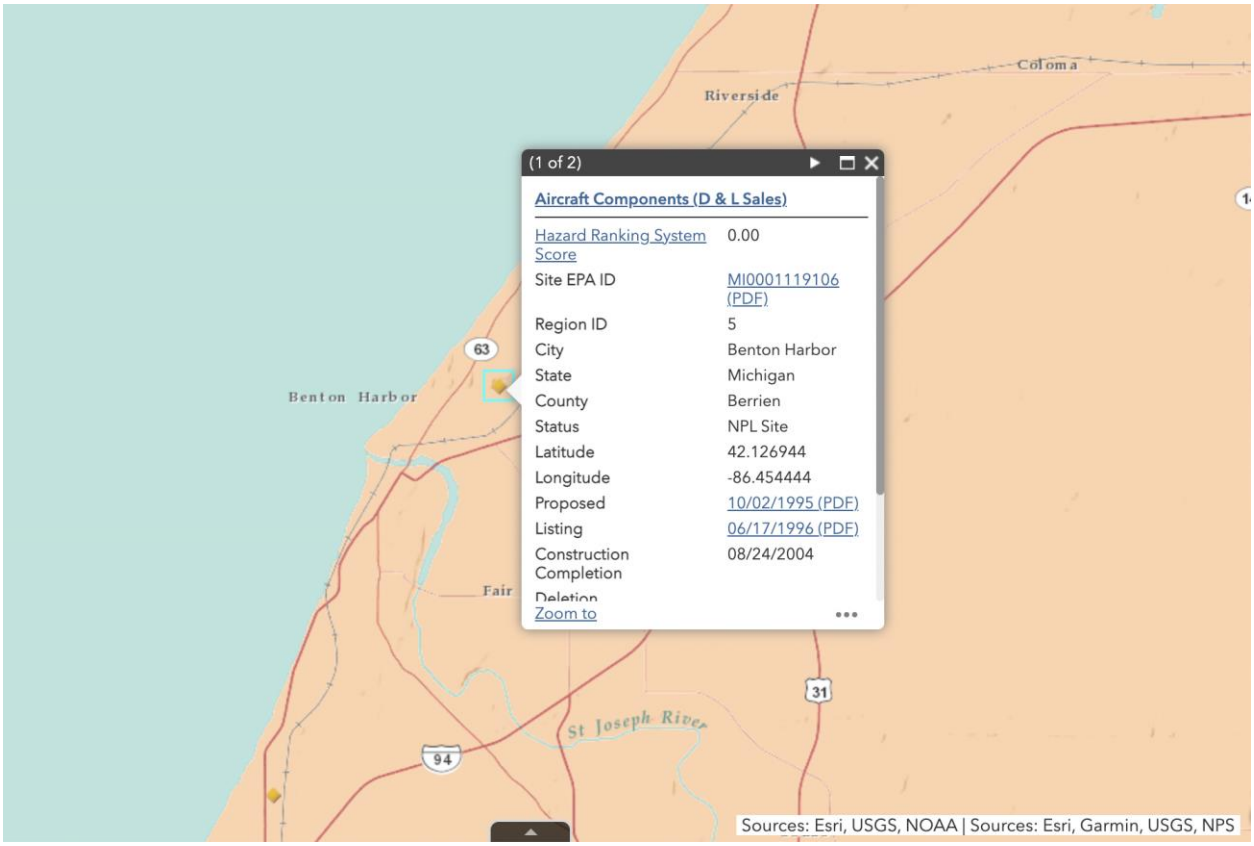

Image 4. Aircraft Components NPL Location: EPA GIS Screen Grab

Lead in Benton Harbor's Water Infrastructure

The Superfund designation, however, is not the only environmental concern facing the residents of Benton Harbor and is in fact barely mentioned in recent news of the town. In September 2021, a group of petitioners on behalf of the community of Benton Harbor submitted an emergency petition to EPA regarding an ongoing lead poisoning crisis, only half a decade after the Flint crisis occupied the headlines of the country week after week (United States Environmental Protection Region 5, 2021). While the new Michigan lead and copper rules, established in 2018 after the Flint crisis, prompted additional testing requirements, it remains unclear how testing in years prior showed no indication of actionable lead levels in the community. Notable, though, and unique to the state of Michigan, is public act 436, passed in 2012 under Governor Rick Snyder, which expanded the emergency management authority of the state to take over local governments that were suffering under unbalanced budgets (Public

Law 436), and Benton Harbor was one of those communities. And while in Flint, emergency management meant a transition of water supplies from the Detroit water system to the Flint River, it is notable that Benton Harbor did not at any point change its water supply, indicating that lead may have been present and undetected previous to 2018.

According to the Reverend Edward Pinkney, a local minister and president of the Benton Harbor Community Water Council, while formal testing didn't begin to show unhealthy lead levels until 2018, residents in Benton Harbor began noticing irregularities in their drinking water coming from the tap as early as 2017 (Facundo, 2022). When the Reverend and his community were unable to garner state attention, they sent water to be tested with the University of Michigan labs, and this resulted in preliminary warnings of toxic lead levels. In 2017 consumer confidence reports produced by the City of Benton Harbor's water utility, only two instances of lead above federal regulation rates were found in the last round of testing in 2015 (City of Benton Harbor, 2017). Both official state documents (City of Benton Harbor (2022) and the legal petition calling for EPA intervention (Benton Harbor Community Water Council et al, 2021) indicate that the 2018 testing, the first testing since 2015 in compliance with federal regulation, was the first formal instance of recurring toxic lead levels. This lead exceedance violation did trigger more frequent testing of every six months, and erosion control measures (NRDC). However, the petition to EPA to intervene puts into question the proper process around and testing of corrosion controls and points out that lead levels continued to exceed federal limits at every testing occurrence done by the city from 2018 through 2021 (Benton Harbor Community Water Council et al, 2021).

Lead levels first came to light in 2018 testing by Benton Harbor that took place as part of the routine 3-year testing cycle mandated by EPA. Levels were recorded at 22 parts per billion for the 90th percentile, which is above the actionable level of 15 parts per billion for the 90th percentile (Benton Harbor Community Water Council et al, 2021). State documents cited in the Petition show that as of 2020, 51% of lead service lines in Benton Harbor were known to be made of or connected to, or likely contain, lead, while another 47% were made of unknown materials, with only 2% known to be containing no lead or no galvanized connection to lead (Benton Harbor Community Water Council et al, 2021). According to the petition, these levels

trigger actions by the state lead and copper rule, including more frequent testing at six-month increments, and replacement of lead service lines (Benton Harbor Community Water Council et al, 2021). The ensuing June 2019 sampling period found levels further increased at the 90th percentile to 27 parts per billion, and by November 2019 sampling the 90th percentile had increased to 32 parts per billion (Benton Harbor Community Water Council et al, 2021).

Michigan State Response

Multiple components of the initial state response to the 2018 test results were alarming. First, while state Lead and Copper rules required notification to the community by the city and water system, instead a citizen reported receiving a letter from MI EGLE advising that after initial flush, the water was safe for consumption (Benton Harbor Community Water Council et al, 2021). Second, actual action taken by the state primarily focused around an untested, and according to records internally debated, corrosion control series containing chemical additives, without any attempt to replace the lead service lines (Benton Harbor Community Water Council et al, 2021). EGLE defended this choice in a letter to the city, and when lead levels continued to show no decrease in 2020, required Benton Harbor to switch corrosion control chemical blends, but ultimately the new blends continued to be debated, and show no success. It is ultimately noted that the city budget of $50,000 for the corrosion control studies mandated by the federal Lead and Copper Rule was likely insufficient for the testing needed to find the right corrosion control mixture, and with no study action by 2021, the expected actual timeframe for a sufficient corrosion control strategy, after testing and implementation, should the budget be sufficient, would likely be 2024 or later (Benton Harbor Community Water Council et al, 2021).

The petition outlines multiple specific components of both state and federal Lead and Copper Rules that the city and state did not comply with, including specific timeframes for corrosion control study requirements and action, as well as the mandated federal 7% per year replacement of lead service lines upon discovery (Benton Harbor Community Water Council et al, 2021). The back and forth between the state and the city, as well as Region 5 EPA and the state, as narrated through the petition, is also concerning. The lack of responsibility and accountability is clear, with the state and the city negating legal responsibilities, and neither taking full responsibility for ownership of a proactive solution. Insufficient notification to the

community was rampant throughout the process, and even Region 5 EPA, once contacted by the Benton Harbor Community Water Council and residents, did not disclose in meetings the consecutive lead exceedance levels (Benton Harbor Community Water Council et al, 2021). The petition ends with an extensive list of immediate actions that EPA must take, including sufficient notification to residents of the issue and safety concerns with their drinking water, comprehensive availability and support for installation of additional filtration measures at the household level, and actions as mandated by both state and federal Lead and Copper rules. These would also include sufficient and comprehensive corrosion control testing and options, as well as grants and funding for service line replacement (Benton Harbor Community Water Council et al, 2021).

Finally, in October 2021, with Biden's signature on the Infrastructure, Investment and Jobs Act all but guaranteed, Governor Whitmer signed an Executive Director (Governor Whitmer signs directive, 2021) speeding up implementation of the state lead and copper rule lead service line replacement requirement, and the Michigan Department of Health and Human Services (DHHS) and EGLE issued a joint advisory calling on citizens of Benton Harbor to switch fully to bottled water usage until lead levels were reduced (MI EGLE, 2021). This came in turn before a formal response from EPA to the September 2021 petition from the Benton Harbor Community Water Council et al, and as a result the response from EPA both echoed and supported the state Executive Directive and specified some of the actions that must be taken according to state and federal Lead and Copper Rules. Those Rules require detailed organization and provision of bottled water to the entire community, sufficient corrosion control testing and implementation, and ultimately grant monies to support the expedited replacement of the lead service lines (U.S. Environmental Protection Agency Region 5, 2022).

Ultimately this came three years after the first formal indication of the lead problem in Benton Harbor, meaning the community was left exposed to toxic levels of lead for over three years, and possibly longer. The federal investment gave Governor Whitmer the resources she needed to act on the issue, but the delay in substantive action was nonetheless unacceptable. It was likely the cause of multiple factors such as perpetual underfunding at the federal and thus

state level, but also failure of federal oversight and leadership on compliance best practices, lack of technical assistance with regulation and compliance, and more.

The good news is that as of early 2023, 99% of the lead service lines in Benton Harbor have been replaced, all within the 18 months since the EPA intervention called for by the community and nonprofit partners (Ellison, 2023). This is a huge feat, and a more appropriate response, but would not have been possible without the influx of federal funding coming from IIJA and other measures and did not come without extensive pressure from the community, the nonprofit community, and ultimately EPA.

Discussion and Conclusions

Some broad takeaways can immediately be drawn from the policy overviews and local case studies above. The complexity of the topic is immediately evident. Many challenges exist across the water supply and delivery system, from the existence of tens of thousands of water systems, to fifty states with distinct personalities and budgets, to varied communities of different size and wealth within those, the web of jurisdiction and oversight for various components of the law is complex and convoluted. Emerging contaminants such as PFAS are critical to address, and more research attention, funding, and planning needs to be done to understand and address the problem.

First, drinking water policy is complicated. Water resources are not only managed for public consumption but are also managed for many other uses. And beyond the waters, the adjacent lands have long been home to corporate polluters. We are just in the past fifty years more clearly recognizing the harm to our land and water resources caused by industry and are still in the discovery phase when it comes to understanding the impacts.

Primacy and federalism have proved to be barriers to successful implementation of federal policies, especially when funding and guidance are not accessible or sufficient to support state and local compliance. States can and should go beyond the requirements outlined by federal agencies such as EPA. Some, like Wisconsin, have shown more connectivity of resources, investment in data, communication and transparency, where others such as Michigan have a recent history trending toward focusing more on monitoring technical compliance rather than leadership and responsibility. And beyond a cultural lean toward

compliance over leadership, states like Michigan have also failed to successfully obtain and track the data necessary to check the box of compliance. Dollars for, and an emphasis and focus from agencies in states on, obtaining, maintaining, and sharing transparently public data as required in current language would be a big step in the right direction. Meanwhile, federal leadership, and funding for, all components of data collection and regulation compliance would also be beneficial to ensure states are not doing the bare minimum and are taking an active role in the delivery of safe drinking water to their constituents. And while federal statute requires federal intervention upon failure of states to take primary responsibility for sufficient water testing and compliance with federal regulation (Safe Drinking Water Act, 1974), in practice the EPA has not taken on this responsibility, letting states and water systems continue without sufficient oversight and intervention.

State response makes a huge difference, and we saw this in our two case studies. In Marinette, Wisconsin, when PFAS contamination and potential community health concerns were discovered, the state jumped into action. The governor expedited an action plan and put into place various agency actions that ultimately resulted in JCI-mandated well and groundwater testing, and continuing DOJ engagement has created a thread of liability that is still being litigated, but it is working toward a funding solution for contamination cleanup. Further, the PFAS Action Plan has since identified and is working to address proactive testing in possible contamination locations and has extensive interagency action, funding, and testing strategies (Wisconsin Department of Natural Resources, 2020). Meanwhile, all indicators show that Michigan responded to the Benton Harbor lead crisis with the minimum regulatory requirements, lacked comprehensive interagency action or response, and even the Governor's Executive Directive, which ultimately has supported rapid replacement of service lines since 2021, focused exclusively on the Benton Harbor location, without consideration of potential additional lead replacement needs across the state.

At the root of state responses, though, is the necessary consideration of the challenge of varying budgets and operational health of community water systems at large. What was clear in Michigan, at least, was the expectation of the state that compliance with federal regulations and provision of safe drinking water was the responsibility of Benton Harbor. Either federal

direction to states to play a more proactive regulatory role is necessary, or more support is needed at the community level, both in technical assistance, and in funding, to ensure the water systems are set up for success.

Funding is a critical component of the challenges, and a necessary part of the solutions, toward guaranteed clean drinking water for all. As highlighted in a joint Nicholas School Aspen Institute Policy Report on water affordability "provision of drinking water in the United States historically prioritized liberty and efficiency," rather than a guarantee of the provision of safe drinking water, resulting in a multitude of independent water systems with wide variation in the safety of the water provided (Duke Aspen 2020). The quality of regulation compliance managed by water utilities, as seen throughout this report, varies drastically, and is heavily reliant on the financial solvency of the water utility, and thus the community, which it serves. More funding for data and research is needed to better define the problems that exist, such as lead service lines in unknown quantities and locations, and the extent of the emerging PFAS threat. More funding is also needed for day to day and year to year compliance, both at the local and state level, so that the bare minimum is no longer the norm when it comes to meeting federal requirements.

Regarding lead service lines specifically, rapid and extensive funding and direction is needed from the federal level to enable states to address the problem. We know lead is unsafe, and we know it is a prolific component of aging infrastructure. We can see our crumbling roads and bridges, but often infrastructure components like drinking water pipes are out of sight, out of mind. The Biden Administration has taken notice of the issue and is making significant progress in advancing a federal action plan to address lead in service lines and paint across the country (The White House, 2023, Jan). However, much of the IIJA and American Rescue Act dollars are short-term investments, and sustainable funding is necessary to ensure the ability to address other issues that may arise as the challenges of drinking water infrastructure and provision become known in the future.

PFAS contamination requires comprehensive state action, as we saw in Marinette and Peshtigo, Wisconsin. But similar to addressing lead, federal funding and leadership is also critical. Again, the Biden administration is listening to communities on the ground and

beginning to take extensive action. New actions were taken during the research of this paper, and as recently as March 2023, the Administration announced actions such as new federal water standards under the SDWA, which are currently in drafting and will ultimately move through the public comment process (The White House, 2023, March).

However, these case studies and this federal and state overview still barely scratch the surface of the extent of the problem, and the complexity of possible solutions. How we built things is not necessarily how we should fix things. Like the electric grid, the transmission infrastructure for drinking water was built over time, with old technologies. Lead pipes cannot be fixed, they need to be replaced. And unlike our mostly visible electric grid, more often than not we do not even know where lead pipes are. They deliver our water, but we don't have a record of their specific location. And the pipes, once they go into individual homes, must also be addressed as part of the solution. There must be shared resources to deal with the problem from source to tap, not piecemeal. Beyond funding, the water grid, like the electrical grid, needs to be updated and modernized for a more sustainable future, with more protection mechanisms for contaminants, more tracking of infrastructure resources and testing data, and alternative reliable water filtering technologies at accessible costs for rural communities and individuals as ground and well water resources become less reliable and harder to maintain.

Much of the community outreach and environmental justice components of drinking water safety can and should be addressed under the Administration's new Environmental Justice Initiative (The White House, 2023 April). But drinking water is a complex problem, and as the Safe Drinking Water Act states, "safe drinking water is essential to the protection of public health," (Safe Drinking Water Act, 1974). Perhaps a dedicated agency department should be committed to drinking water – from regulation to compliance to outreach and education and technical assistance. It could live under EPA and better connect the overlap in authority and compliance between SDWA and the other statutes connected to the provision and safety of drinking water.

Overall, it is apparent that a systemic shift is needed, one that centers on the access to and delivery of healthy, affordable water to all, rather than on compliance with now 50-year-old federal regulations developed at a time when the impacts of the regulated industries were

largely unknown. This is a cultural shift toward science. But it is also a shift back toward providing, rather than simply regulating access to, basic human rights like clean drinking water. Perhaps naming values and priorities like this can and should be an explicit government exercise, to center and align workplans, moving forward. This new approach could lead to faster action, more comprehensive funding plans, and more communication and transparency between government and citizens.

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