



Water Quality and Health Impacts in Wisconsin

A report by the Sierra Club-John Muir Chapter

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All Wisconsinites Need Clean Water

Wisconsinites have long enjoyed the state's plentiful water resources, but the ability of future generations to enjoy them is in jeopardy. Across the state, the quality of Wisconsin's waters has taken a turn for the worse. Water contamination has begun to take a toll on the health of Wisconsin's residents, and citizens cannot afford to allow harmful practices to continue. The issues are widespread, impacting both urban and rural areas. Despite the vast impact, few citizens are aware of the water contamination in their area of the state, but are forced to bear the burden of the health risks. Everyone deserves access to clean, safe water, and this should be an underlying principle in decisions about Wisconsin's water management, especially as it pertains to contamination from phosphorus, bacteria, nitrates, radium, and pharmaceuticals.

Sources of Health Threats

The range of threats to Wisconsin's water quality is broad, both in types of contamination and in distribution across the state. Currently, bacterial contamination of the water supply is the most common, followed by nitrate pollution and the presence of radium. Additionally, phosphorus and pharmaceuticals are also impacting water across the state. While this report includes case studies, it is important to note that many of these contaminants are impacting water resources across the state and are resulting in widespread threats to the health of Wisconsin citizens. For example in 2014, 520 out of 11,420 public water supply systems in Wisconsin did not meet health standards.¹ Stakeholders from all backgrounds and fields will need to work together to remove a variety of contaminants from Wisconsin's water.



Phosphorus

Phosphorus is essential to plant growth and is a common component of fertilizers. It is also present in manure, decomposing crop waste, leaves, grass clippings, other organic matter and treated wastewater. From any of these sources it can find its way into the environment through various sources: run off from agricultural lands, land spreading of manure or discharge from sewage treatment plants.

While phosphorus occurs naturally in organic materials, an excess negatively impacts waterways and threatens human health. Unchecked, this can result in large algal bloom mats. When the

algae die and decompose, they rob the water of its oxygen and create unpleasant odors. This leads to dead zones, which are low-oxygen environments that can dramatically alter the types of plants and fish that can live in the water. The dead zone at the mouth of the Mississippi River is just one example, but dead zones can occur anywhere. In Wisconsin, a dead zone has occurred each year for about a month in Lake Michigan's Green Bay.² This presents a serious and direct threat to fishery and tourism industries.

Additionally, algal blooms from phosphorus also present health threats. Under certain conditions, the algae created by phosphorus pollution are blue - green algae called cyanobacteria. Cyanobacteria can create microcystin, a toxin. Microcystin has caused illness in humans and has even killed pets that have been exposed to it.³ Other areas of the Midwest have been impacted by microcystin including in Toledo, Ohio, where drinking water was declared unsafe for consumption in 2014. These are threats that Wisconsin residents should not have to face.

Pollution Causes Dead Zone in Bay



Source: NEW Water, University of Wisconsin-Milwaukee

Journal Sentinel

Bacteria and Cryptosporidium

Coliform bacteria are a group of species that originate in the digestive tract of animals and humans and enter the water supply through manure or human sewage contamination. Coliform bacteria contamination is an indicator that other illness-causing bacteria, parasites and viruses are present in water. Four hundred and twenty public water supply systems in Wisconsin exceeded the health standard set by the state. This should not be taken lightly because people can become ill after a single exposure to water contaminated by coliform bacteria.¹ In 2004, a six-month old infant from Kewaunee County was taken to the emergency room after bathing in manure-tainted well water. The rest of the family became sick as well.⁴

In addition to spreading coliform bacteria to Wisconsinites' water supplies, farm manure and faulty sewage systems may also contaminate the water with cryptosporidium. These parasitic protozoans reproduce inside infected animals or humans and are passed along through fecal matter, which may infiltrate the groundwater if not properly managed. Cryptosporidium may cause headaches, nausea, diarrhea, abdominal cramps, vomiting, weight loss and dehydration.⁵ Wisconsin has seen the dramatic impact of this parasite before; the 1993 cryptosporidium outbreak in Milwaukee County impacted over 400,000 people and resulted in 69 deaths.⁶ Legislators must ensure the necessary precautions are written into laws that protect Wisconsinites from manure and sewage contamination of the water supply while emphasizing the importance of storing these materials properly.

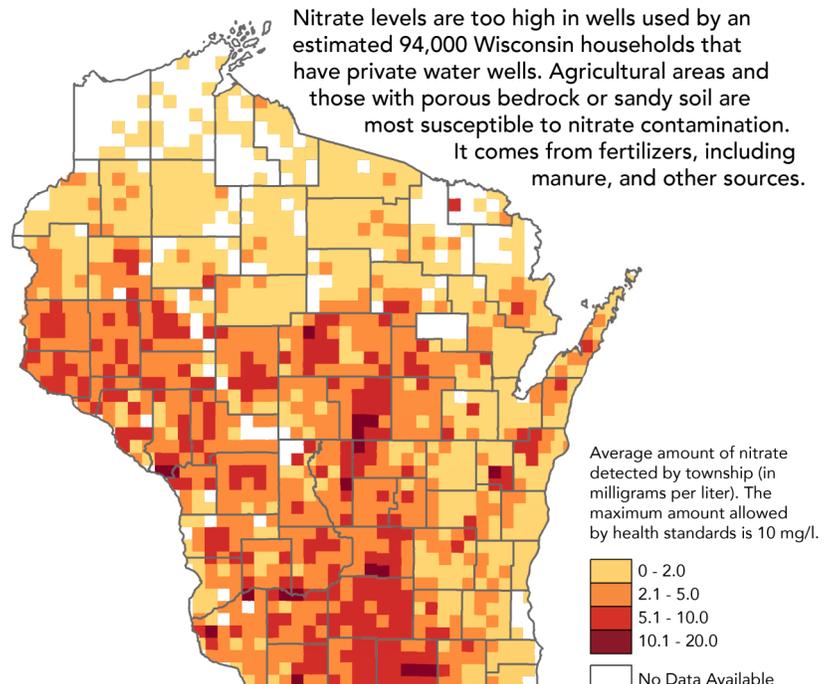
Nitrate

Nitrate-contaminated water is harmful to all, but poses an extreme threat to pregnant mothers and infants, as it may cause birth defects or infant methemoglobinemia, also known as blue baby syndrome.⁷ Studies have found nitrate exposure to be a possible risk factor associated with gastric cancer, birth defects, hypertension, thyroid disorder and lymphoma.⁸

Stemming from inadequate safety and environmental precautions or careless farming practices, 90 percent of nitrate in Wisconsin comes from manure or excess fertilizer runoff.⁹ Nitrate easily infiltrates groundwater and other waterways, contaminating Wisconsin residents' sources of drinking water and posing a risk to all. Recent DNR-funded testing by UW-Oshkosh found that 110 wells out of 320 tested contained water unsafe for consumption due to contamination from nitrate, coliform bacteria or *E. coli*.⁴

Even if Wisconsinites do not live in an agricultural area, there is still concern for nitrate contamination in the local water supply, whether they are serviced by a private well or municipal water system. Areas with sandy soils or porous bedrock may host dangerous levels of nitrate. Ninety-four thousand households in Wisconsin have unsafe levels of nitrate in their drinking water.¹⁰ Kewaunee County, an area of Wisconsin with fractured bedrock, is especially prone to manure contamination. The sources of this contamination, manure and sewage, vary across the state.¹¹

Nitrate in drinking water around Wisconsin



CREDIT: Katie Kowalsky/Wisconsin Center for Investigative Journalism

SOURCE: Well Water Quality Viewer, University of Wisconsin-Stevens Point's Center for Watershed Science and Education. Private Drinking Water Quality in Rural Wisconsin, Journal of Environmental Health, 2013.

Radium

Although radium, a radioactive metal, is found naturally in bedrock throughout Wisconsin, most notably along Lake Michigan, there has been an increase in radium contamination of water supplies due to overpumping of groundwater. As this occurs, radium is drawn into the water supplies. Typically, radium concentrations increase the further the water table drops.

This issue is exacerbated by a lack of regulation of high-capacity wells, which are wells that draw 100,000 gallons of water or more each day. Radium in the water supply creates a public health crisis, and some communities have even decided to draw clean water from Lake Michigan, which sets a dangerous precedent for the Great Lakes. Radium is a known carcinogen and may cause breast, liver and bone cancer; cataracts; anemia and fractured teeth.¹² Over the past two years, 25 Wisconsin municipal water systems have exceeded maximum contaminant levels for radium.¹³

Pharmaceuticals

Pharmaceuticals are a frequently overlooked contaminant of Wisconsin's water resources. Pharmaceuticals can impact ecosystem and human health even in small quantities. While it is still unknown whether their presence in the water supply is harming the health of Wisconsin families, fish sex ratios have been shown to change due to birth-control substances in waterways.¹⁴

The Wisconsin Department of Health Services has confirmed that trace amounts of pharmaceuticals have shown up in multiple community water supplies throughout the state, and water treatment plants are not capable of removing such substances from drinking water.¹⁵ A UW-Milwaukee School of Freshwater Sciences study revealed high levels of pharmaceuticals in Lake Michigan, from which millions of Wisconsinites get their drinking water.¹⁶

Wisconsin legislators must protect water and health

Clean water is necessary for the health and well-being of all people, yet there is much to be done to ensure that all Wisconsinites have access to clean water. All aspects of water quality should be considered and managed appropriately. Solutions to water quality concerns must be sustainable, as resources will only become more stressed.

Although individual citizens can contribute to water protection, large-scale solutions require policy changes. Water contamination due to animal waste, fertilizer, pharmaceuticals, or other industries must be addressed in a systemic way. Wisconsinites should not have to worry about water from private wells or municipal water supplies impacting their health. Protecting human health and avoiding the financial burden of healthcare needs, supporting industry innovation towards sustainable practices and protecting Wisconsin's tourism, water recreation and fishing industries all present powerful reasons to support these policy changes. Water contamination, instead of showing up at a kitchen tap or faucet and forcing individuals to address the problem, should be dealt with in the state capitol by those elected to represent the residents of Wisconsin.



2017 Legislative Session

Several important bills related to water quality in Wisconsin are being considered in the 2017 legislative session. Bills that would better protect Wisconsin's water include Senate Bill 22 and Senate Bill 48. On the other hand, Senate Bill 76 would have a devastating impact on Wisconsin water resources.

Senate Bill 22, known as the "Water Sustainability Act," would establish standards for designating areas as "groundwater management areas", depending on the type of aquifer and numerous other scientific factors, such as pumping levels and reductions in stream flows. After the groundwater management areas have been designated, the DNR must come up with a scientific management plan so that the area can recover to the point where it is no longer considered a management area by the target date set in the plan. These plans must contain measurable goals, reporting requirements, and water conservation measures. The bill also establishes a groundwater area review subcommittee of the existing Groundwater Coordinating Council, which will handle the recommendations to the DNR for establishing groundwater management areas, as well as rescinding them. Finally, the bill also amends the high-capacity well permitting process to make it more public and stringent, and to increase fees for overpumping.

Senate Bill 48 will allow local public water utilities to provide financial assistance for the removal of lead service lines. By providing resources that will allow the lines to be removed, this bill ensures that the threat of lead contamination from water pipes is permanently removed.

Senate Bill 76, on the other hand, would have a dangerous impact on water quality. Senate Bill 76 degrades the ability of the Department of Natural Resources to review water use by a high capacity well in a particular area and make adjustments if necessary. Instead of requiring well owners to prove that their well will not cause harm to neighbors or natural resources, this bill would put the burden of challenging the actions of a well owner on those who are harmed by the well. If this portion of the bill is not changed, lengthy and expensive litigation would be forced on those who will have to suffer from the damage done by the well owner's actions.

Water and the Wisconsin State Budget

In addition to sound legislation that protects Wisconsin's waters, proper funding must be available in the state budget to continue programs that improve and maintain healthy water quality. The biennial state budget is of critical importance in determining how well Wisconsin's waters may be managed. The health of Wisconsin's residents depends on allocations in the budget that adequately staff and support the departments and agencies that act as stewards for the state's water.

Financial resources are required for the upkeep of the water supply and water treatment systems including the monitoring of private and public water wells, groundwater, rivers, lakes, industry, and farming operations. Staff must be available to analyze data and disseminate helpful information and to continue research related to water quality and human health.

Conclusion

The health of Wisconsinites everywhere is being seriously threatened due to the lack of protection for water resources. Bacteria, nitrate, radium and pharmaceuticals are several common and serious contaminants throughout the state. Despite the severity of contaminated water, several important issues relating to health impacts and water quality in Wisconsin being woefully unattended to, and this creates significant need for legislative protection. Wisconsinites are relying on lawmakers to do the right thing and to serve their constituents. Beyond the bills that have already been introduced, the Sierra Club recommends the following water protections:

- Enforcement of existing laws and regulations, particularly regarding phosphorus
- Proper manure storage and management to mitigate health risks from contamination
- Increased sewage and septic system monitoring, maintenance and replacement
- Testing for pharmaceuticals, continued study on the impact of pharmaceuticals in waterways and appropriate removal of pharmaceuticals at water treatment plants

Commonsense water protections are necessary to best serve the residents of Wisconsin, their water, and their health.

What Residents of Wisconsin Can Do

Residents play an important role in holding elected officials accountable and encouraging sound water protections. Here are some ways to take action:

- Remain up-to-date on legislation. Subscribe to a newsletter that offers legislative updates and check the Sierra Club legislative tracker at sierraclub.org/wisconsin.
- There are many ways to communicate support or opposition to legislative action. Write a letter to decision-makers and let them know that clean water for everyone is a priority in Wisconsin.
- Share information with other Wisconsin residents. Write letters to the editor, host local forums or find a creative way to spread the word about water concerns in the state.
- Become a water advocate. Sierra Club's water campaign creates a way for concerned residents to connect with like-minded individuals and to take action to protect Wisconsin's waters.

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