WATER: OUR MOST ESSENTIAL RESOURCE

A Brief Review of Current Literature

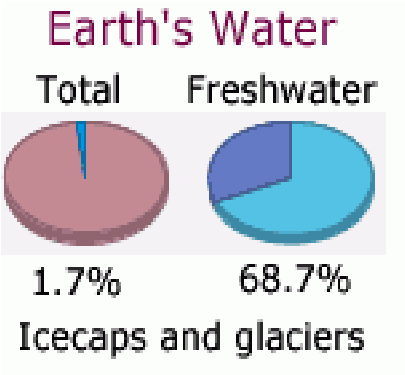
Sources: EPA, Greater Cincinnati Water Works, American Rivers, Ohio River Foundation, Sierra Club, Army Corps of Engineers, Lessons on The Habitable Planet, Environmental Law & Policy Center, Inside Climate News

The Earth's water resources are under major stress around the world. Rivers, lakes, and underground aquifers supply fresh water for drinking, irrigation, sanitation, agriculture, and industry while the oceans provide habitat for a large share of the planet's food supply. Today, however, expansion of agriculture, damming, diversion, over-use, and pollution threaten these irreplaceable resources in many parts of the globe. Contaminated water can spread illnesses and disease vectors, so the availability of clean water is both an environmental and a public health issue.

How much fresh water do we really have on Earth?

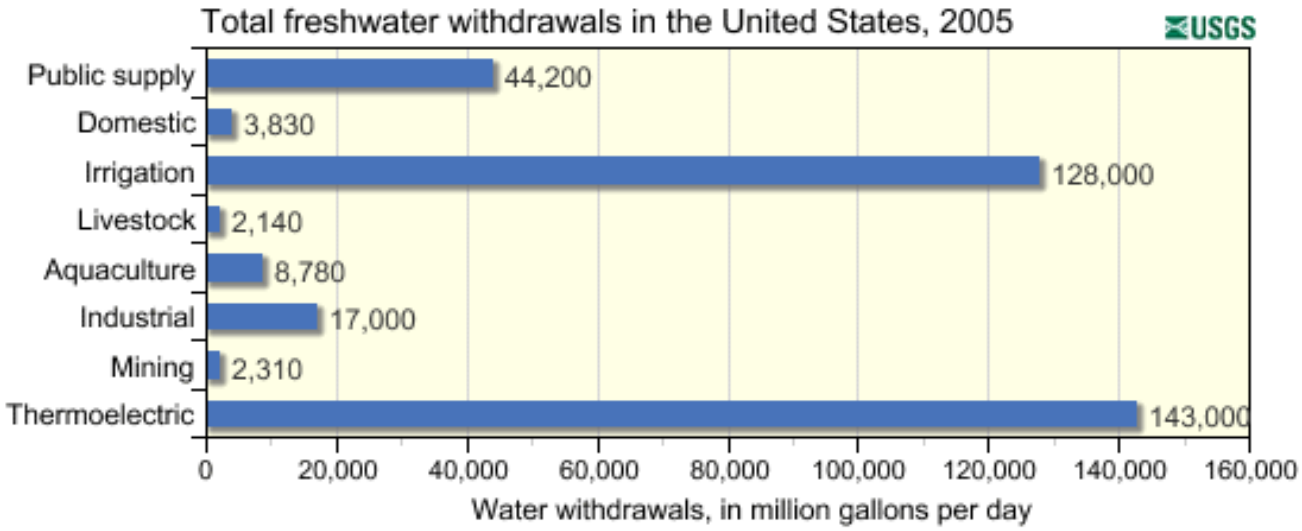
The Earth is a watery place. But just how much water exists on, in, and above our planet? About 71 percent of the Earth's surface is water-covered, and the oceans hold about 96.5 percent of all Earth's water. Water also exists in the air as water vapor, in rivers and lakes, in icecaps and glaciers, in the ground as soil moisture and in aquifers, and even in you and your dog.

- Only 3% of Earth's water is fresh water. 97% of the water on Earth is salt water.
- The water found at the Earth's surface in lakes, rivers, streams, ponds, and swamps makes up only 0.3% of the world's fresh water.
- The amount of water locked up in ice and snow is **only about 1.7 percent** of all water on Earth, but the majority of total freshwater on Earth, about **68.7 percent**, is held in ice caps and glaciers.
- 30% of fresh water is in the ground.
- 1.7% of the world's water is frozen and therefore unusable



https://water.usgs.gov/edu/earthhowmuch.html

What is most of the freshwater in the U.S. used for?



https://water.usgs.gov/edu/qa-usage-freshwater.html

How does climate change impact our water resources?

Climate change has had a major impact on water resources everywhere. In the Midwest, precipitation is expected become more intense, leading to increased flood damage, strained drainage systems, and reduced drinking water availability. Midwestern cities with impervious infrastructure may result in surface runoff entering combined storm and sewage drainage systems. Sediment runoff and erosion may clog reservoirs and reduce storage capacity. When these systems are overloaded during intense rainstorms, raw sewage overflow can result, impacting clean water availability and human health. Local governments may need to invest in new infrastructure to prevent contamination and protect water resources. https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-water-resources_.html,

Is our Ohio River Basin vulnerable to climate change?

The Army Corps of Engineers, in a study conducted in 2017, warn of a brutal future for Ohio River region from climate change. Climate change will push the Ohio River and its tributaries into uncharted waters, setting off economic and environmental crises like never before across a 13-state region.

Among the findings:

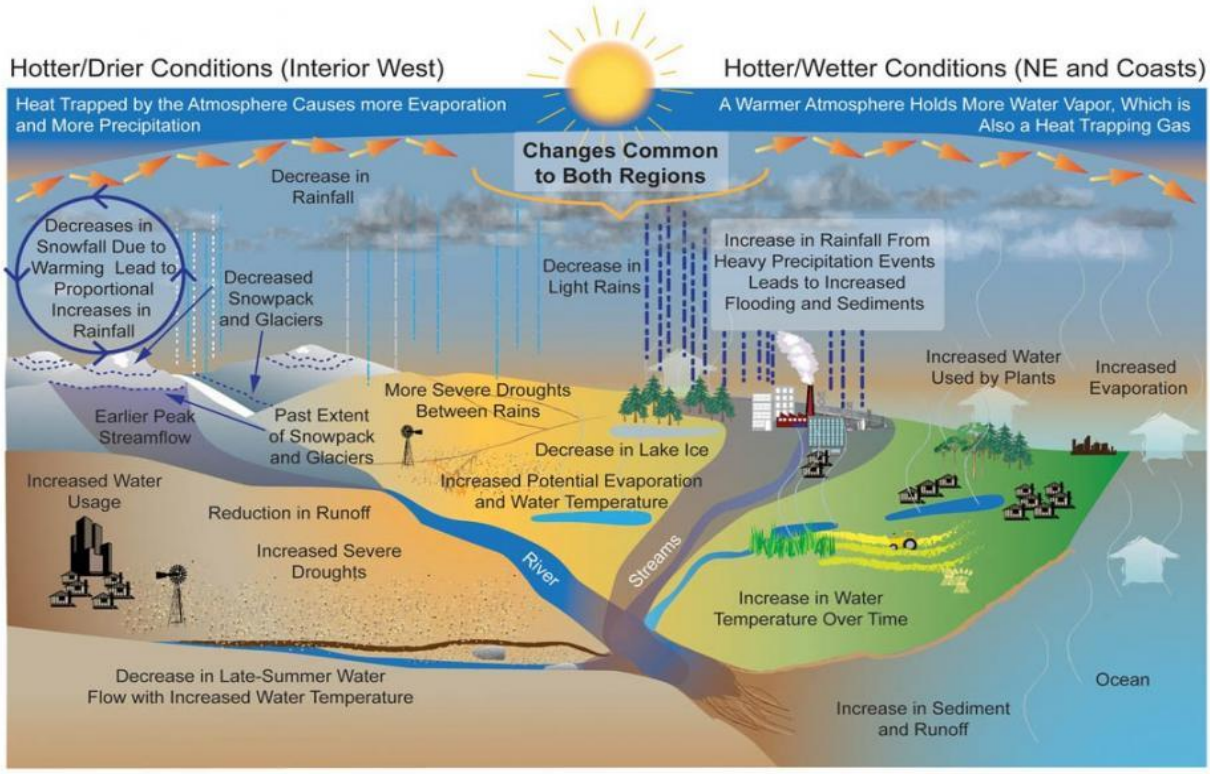
► Increasingly potent storms will cause river levels to surge, risking major floods in low-lying cities like Louisville.

► More frequent and heavy droughts will likely dramatically reduce river volumes in some spots, putting in jeopardy drinking water supplies, barge traffic and power generation that relies on abundant water.

► Rising temperatures and wild swings in river flows threaten to wipe out fish and other aquatic life.

► Economic losses could be ten times or more greater than from any other resource-based threats from the past.

The study concludes that the most dramatic effects are likely two decades away. But changes are happening more quickly than previously thought, and the time to start bracing for "a new normal" and making plans to adapt is now.
https://www.courierjournal.com/story/tech/science/environment/2017/11/30/ohio-river-valley-climate-change-report/831135001



What is the quality of drinking water in the Greater Cincinnati area?

The Ohio River provides drinking water for approximately 3 million Americans and recreation and fisheries for millions more. The 981-mile Ohio River begins in Pittsburgh, PA, and winds through West Virginia, Ohio, Kentucky, Indiana and Illinois before converging with the Mississippi River near Cairo, IL.

According to the Environmental Law & Policy Center (ELPC), the Ohio River is also one of the most polluted rivers in the U.S., according to the U.S. EPA. Mercury pollution — a potent neurotoxin that impairs fetal brain development — in the Ohio River increased by more than 40% between 2007 and 2013, according to EPA data. High levels of nitrates and other pollutants also plague the river. Additionally, coal plants, factories and water treatment facilities dot the riverbanks, discharging byproducts that contribute to pollution and health hazards in the river.
http://elpc.org/issues/clean-water/ohio-river/

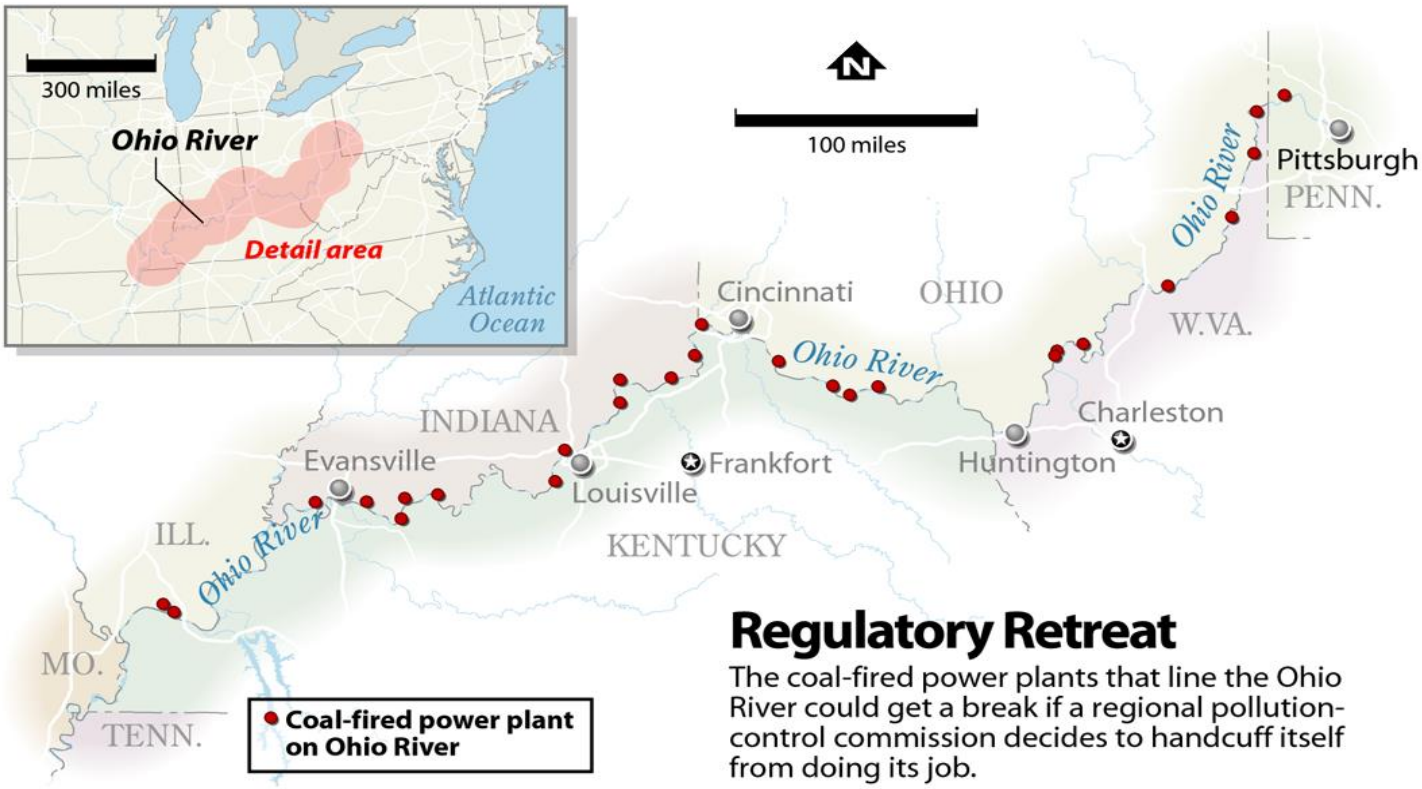
What is Happening to the Ohio River?

- During rainstorms, raw sewage is discharged directly into the river at hundreds of points along the river. A result is that health department warnings occur at certain stretches of the Ohio River near many major cities when water quality conditions are not safe for recreational contact.
- Non-point source pollution from urban runoff and agricultural activities contributes significant amounts of contaminants to the river.
- Acid mine drainage (AMD) is a major source of water quality problems for the upper Ohio River and its tributaries. (As water runs through old mines, it becomes contaminated with sulfur and high concentrations of metals.)
- Many sections of the Ohio River do not meet water quality standards for bacteria and pathogens, PCBs, lead, mercury, metals, organics and other pollutants.
- Approximately 164 species of fish have been found in the Ohio River. However, the dams have drastically altered the habitat for river organisms, as they prevent fish and other organisms from moving up and down the river in their natural cycles.
- At the turn of the century, the Ohio River basin was home to 127 of the 297 freshwater mussel species native to North America. Since that time, however, human changes in the environment have taken their toll; 11 mussel species are extinct, and 46 others are classified as endangered or species of concern.
- There are fish consumption advisories in place for the most of the river. The primary fish to avoid is catfish, that should be eaten no more than 6 meals/yr., and limited consumption advisories are in place for other types of fish including smallmouth buffalo (1 meal/month) white bass, drum, sauger, black bass (1 meal/week). Updated information can be found at www.orsanco.org/fca

What is being done to protect our drinking water?

The Ohio River Valley Water Sanitation Commission, known as ORSANCO, is supposed to ensure that the river is safe for drinking, fishing and recreation.

Since 1948, ORSANCO and its eight-member states have cooperated to improve water quality in the Ohio River Basin, ensuring the river can be used for drinking, industrial supplies, and recreational purposes: and can support a healthy and diverse aquatic community. However, in October of 2010, ORSANCO commissioners voted to adopt a variance rule that will allow states to permit more toxic pollution of the Ohio River. It will be up to the watershed states (Ohio, Kentucky, Illinois, Indiana, West Virginia, and Pennsylvania) to decide whether they will adopt the ORSANCO rule. The rule allows polluters to obtain variances (a/k/a waivers) from having to comply with requirements for biological chemicals of concern (i.e., mercury and other toxins). Thus, polluters could be given a pass and there will no



longer be an incentive to seek alternative products or processes. ORSANCO has reported that in a given year there are 180 days where wastewater standards are violated. If adopted these proposals will make it legal to allow sewage into the Ohio River.

More recently, ORSANCO appears ready to strip itself of the power to set pollution-control standards for the 981-mile waterway. An industry-supported plan would end the 8-state commission's decade-long role in setting river pollution standards. A preliminary vote in February 2019 suggests it may succeed. The debate has mirrored Trump administration efforts to roll back pollution controls and yield more authority to states on environmental matters.

> "The Clean Water Act has all the vigor you need," said Toby Frevert, an Illinois representative on the commission who chaired the committee that recommended the plan. "It has all the protections," he said, adding that "competing regulatory bodies confuse the public."
>
> Climate advocates **worry the plan will lead to weakened water standards** that will allow coal-burning power plants along the river to continue operating longer than they otherwise would. The river has 26 coal-fired power plants, roughly one every 38 miles.
>
> https://insideclimatenews.org/news/07062018/ohio-river-pollution-control-standards-orsanco-vote-clean-water-act-coal-fired-power-plants-epa

If ORSANCO abandons it water quality standards, how will this impact the 5 million people who get their drinking water from the Ohio River?

Read blog from *Kentuckians for the Commonwealth* posted by Robin Ghee.

http://www.kftc.org/blog/ohio-river-pollution-control-agency-wants-abandon-its-water-quality-standards

"Protect our water" was the strong and clear message of close to 100 people who attended a July 26 public forum on a proposal to abandon regional water standards for the Ohio River by the multistate Ohio River Valley Sanitation Commission (ORSANCO).

How does fracking, or hydraulic fracturing, impact our freshwater supply?

Water is the key ingredient in the hydraulic fracturing process, and its usage – in total and per well – is increasing at an exponential rate. The fracking industry in Ohio uses roughly 10-14 million gallons per well, up from 4-5 million gallon demands in 2010, which means that freshwater demand for this industry is increasing 15% per year. (This rate is more than double the volumes cited in a recent publication by the American Chemical Society.)
https://www.eurekalert.org/pub_releases/2018-01/acs-tpi012618.php

If such exponential growth in hydraulic fracturing's freshwater demand in Appalachia continues, by 2022 each well in Ohio and West Virginia will likely require at least 43 million gallons of freshwater. Water quantity and associated watershed security issues are both acute and chronic concerns at the local level, where fracking's freshwater demands equal 14% of residential demands across Ohio. To date the fracking industry has taken on an average of 90 million gallons of freshwater per county out of Ohio's underlying watersheds, resulting in the production of 9.6 million gallons of brine waste that cannot be reintroduced into waterways. This massive waste stream is destined for one of Ohio's Class II injection wells, but the industry spends less than 1.25% of available capital on water demand(s) and waste disposal.

Acute pressures are being put upon watersheds and public water supplies in the name of "energy independence." Yet, Ohio regulators and county officials aren't putting any pressure on the high volume hydraulic fracturing (HVHF) industry to use less water and produce less waste. We can't determine exactly how water demand will change in the future. The problem is not going away, however, especially as climate change results in more volatile year-to-year fluctuations in temperature and precipitation. This means that freshwater that was/is viewed as a surplus "commodity" will become more valuable and hopefully priced accordingly.
https://www.fractracker.org/2018/02/freshwater-supply-demand-eastern-ohio/

Could a proposed fracking "hub" harm our water?

In November of 2018, the U.S. Department of Energy published a report to Congress on "the feasibility of establishing an ethane storage and distribution hub in the

United States.” The proposed "hub," referred to by its acronym ASTH (Appalachian Storage and Trading Hub), would include "hundreds of miles of pipelines, fracked gas processing facilities, and underground storage of petrochemicals and fracked gas liquids stretching along the Ohio-West Virginia border from Pennsylvania to Kentucky along the Ohio River." The report has been accepted, and Congress has given the go-ahead to begin work on this massive infrastructure project.

Why should Cincinnatians care about this? The Ohio River, which constitutes one of the "spokes" of the proposed hub, provides the region with 88 percent of its drinking water. Fracking produces massive quantities of radioactive waste water which may well make its way into our river. And legal protections that have prevented companies from dumping waste into the river for over four decades have recently been repealed.

That means Cincinnati drinking water may soon be subject to pollutants leftover from natural gas extraction.

Other people have reported on the Ohio River Valley Water Sanitation Commission's (ORSANCO) decreasing standards for Ohio River water quality. The Ohio River is a notoriously polluted body of water and has been for a long time. But the Appalachian Storage and Trading Hub poses a new threat in its scale.

https://www.cincinnati.com/story/opinion/2018/12/31/opinion-fracking-hub-could-harm-our-water/2342112002/

How does the Greater Cincinnati Waterworks protect our drinking water?

Greater Cincinnati Water Works (GCWW) has been a municipally owned and operated utility since it was purchased by the City of Cincinnati in 1839. Its mission is to provide its customers with a plentiful supply of the highest quality water and outstanding services in a financially responsible manner.

The quality of drinking water is continually monitored as the Greater Cincinnati Water Works uses the latest treatment techniques in its state-of-the-art facilities to remove harmful contaminants. Cincinnati has been recognized nationally for its excellent drinking water. GCWW has always met or exceeded all state and federal health standards for drinking water. https://www.cincinnati-oh.gov/water/water-quality-and-treatment/

***** An average American family uses about 552 gallons of water per day. Residential Europeans use about half of the water that residential Americans use. Residents of an African family use only 5 gallons of water per day. https://www.awf.org/blog/how-does-water-use-united-states-compare-africa

*****In fact, Americans use twice the amount of water they think they do, and appear to be particularly oblivious about how much H2O they flush down the toilet on a daily basis, according to new research. https://www.latimes.com/science/sciencenow/la-americans-underestimate-personal-water-usage-study-says-20140227-story.html

Where is the Metropolitan Sewer District in complying with consent decree?

MSD is under a federal mandate, known as a Consent Decree, to reduce sewer overflows into local streams and rivers. with the Since 2009, MSD has invested more than $1 billion toward complying with a federal Consent Decree (mandate) to reduce sewer overflows into local streams and rivers. This is about a third of the work necessary to achieve full compliance. This initiative is anticipated to take decades to complete.

MSD has reduced combined sewer overflow (CSO) volume by 6 billion gallons sanitary sewers.

The Wet Weather Improvement Plan was rebranded as Project Groundwork in 2009, with a separate website and logo. Project Groundwork is being conducted in two phases: Phase 1 (2009-2018) and Phase 2 (after 2018).

MSD is working to complete Phase 1. About 84% of the projects have been completed, or 112 of 133 total projects. Phase 1 includes the Lower Mill Creek Partial Remedy, which is designed to reduce overflows into the Mill Creek by 1.78 billion gallons a year, primarily through the Lick Run Project.

Phase 2 of Project Groundwork, which is expected to start in 2020, will be implemented in phases over multiple years, starting with Phase 2A. MSD submitted a proposed Phase 2A schedule to the U.S. EPA on June 28, 2018 on behalf of the City of Cincinnati.
http://www.projectgroundwork.org/projects/reporting.htm

Is the Environmental Protection Agency solving water pollution?

There is concern by many over the past 2 years about changes in the U.S. EPA. When the Clean Water Act was passed in 1972 these laws served as a national guarantee of environmental quality regardless of the state where you reside. An October 30, 2018 memo issued by Acting Administrator Andrew Wheeler directs EPA regional offices to exhibit "general deference to the states" in order "to provide certainty in oversight." What does this mean? This appears to result in not permitting federal EPA employees to set any direction and oversight in state issues. https://www.peer.org/publications/read-peermail/at-epa-oversight-means-overlook.html

The Ohio EPA took comments on a proposed program to train and permit industry consultants, instead of EPA biologists, to approve EPA permits for projects affecting streams and wetlands. If they approve the proposal, it means that only industry is monitoring industry. https://www.dispatch.com/news/20190223/ohio-epa-program-could-turn-over-water-quality-certification-to-developers

How is Climate Change Affecting Great Lakes Water?

Governor DeWine has promised "real money" in his upcoming budget preparation to fight the annual algal growth problem in Lake Erie as well as the quality of the Ohio River and other waterways.
https://www.toledoblade.com/local/politics/2019/02/20/governor-promises-real-money-for-lake-erie-algae/stories/20190220116

Each summer, as the weather warms, "Lake Erie algal blooms threaten the health and drinking water of 11 million people, harm the region's tourist economy, and prevent residents and visitors from enjoying lake activities such as swimming, boating, and fishing." Blooms now also occur in other Ohio lakes and along the Ohio River.

"Lake Erie's algae blooms are caused by runoff pollution. This type of pollution occurs when rainfall washes fertilizer and manure spread on large farm fields into streams that flow into Lake Erie. This runoff fuels a bumper crop of algae each year that can make water toxic to fish, wildlife, and people.

“Algae blooms are preventable. Scientists report that reducing the amount of runoff pollution will significantly reduce Lake Erie algae blooms and improve the lake’s health.

“Unfortunately, very few rules are in place to limit runoff pollution from big farms. It is time for mandatory regulations to reduce the amount of runoff pollution allowed to flow into Lake Erie. New regulations will reduce Lake Erie algae blooms, restore the lake, and ensure safe, clean drinking water for our families.”

https://greatlakes.org/campaigns/lake-erie-algae-blooms/

Rights of Lake Erie Recognized in Historic Vote, Feb 27, 2019

Toledo, Ohio, voters made history, adopting a charter amendment that recognizes the rights of Lake Erie! This is the first rights-based law in the United States that specifically acknowledges the rights of a distinct ecosystem, securing the Lake’s rights to exist, flourish, and naturally evolve. https://celdf.org/2019/02/rights-of-lake-erie-recognized-in-historic-vote/

Citizens decided that industry and government were not taking seriously the effects of pollution of the Lake on their lives. The question they voted on was, “Should Lake Erie be granted the legal rights normally reserved for a person?”

“The measure passed easily, which means citizens will be able to sue on behalf of the lake whenever its right to flourish is being contravened — that is, whenever it’s in danger of major environmental harm.” https://www.vox.com/future-perfect/2019/2/26/18241904/lake-erie-legal-rights-personhood-nature-environment-toledo-ohio?fbclid=IwAR3wHx1sGvvU1SjB3eDo5TKr-7A5sJzagCnstWWwy17c1ewNk3-4ImT3yZI

What is the most recent LWVUS position on Climate Change and Natural Resources?

The League believes that climate change is a serious threat facing our nation and planet. The League believes that an interrelated approach to combating climate change—including through energy conservation, air pollution controls, building

resilience, and promotion of renewable resources—is necessary to protect public health and defend the overall integrity of the global ecosystem. The League supports climate goals and policies that are consistent with the best available climate science and that will ensure a stable climate system for future generations. Individuals, communities, and governments must continue to address this issue, while considering the ramifications of their decision, at all levels—local, state, regional, national, and global.

This position will be included in the next version of Impact on Issues when it is published later this Spring.

Discussion Questions on Climate Change and Water

- What more should be done to protect our drinking water and mediate climate change? What do YOU do?
- Do you have confidence in our regulating agencies (USEPA, Ohio EPA, MSD, ORSANCO, GCWW)?
- As compared with communities with little water, ours has flooding threats. Are we responding?
- What can we do to make sure the Clean Water Act is enforced?
- How do we get over the bickering between County and City to fix basement backups?
- What does MSD do to incentivize the conservation of water?
- Why are Cincinnatians concerned about water in the Great Lakes?