

Factory Farm Pollution Threatens the Great Lakes



The Great Lakes and their interconnected waterways make up the largest freshwater system in the world.¹ Rich with a variety of plant and animal life, the lakes contain one-fifth of the world's surface freshwater and supply one out of every ten Americans with drinking water.² But these waters are at risk from a ballooning factory farm³ industry — one which produces enormous amounts of untreated manure that pollutes waterways and encourages the growth of harmful algal blooms.

Factory Farms Exploding in Great Lakes States

Throughout the Great Lakes states — Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania and New York — factory farms have mushroomed over the past two decades.⁴ Together, these eight U.S. states confine 1.7 million dairy cows on factory farms. That is a nearly eight-fold increase over a twenty-year period (1997 to 2017).⁵ The pressure to “get big or get out”⁶ encourages factory farm growth while smaller, family-scale farms continue to disappear from the rural landscape.

In Michigan, for example, the number of dairy factory farms ballooned nearly five-fold from 1997 to 2017, and the num-

ber of cows living on these operations increased eight-fold. Likewise, the number of hogs on Michigan's factory farms increased by more than 50 percent, and data showed that individual operations are getting larger. Wisconsin confined 12.6 times as many dairy cows on factory farms in 2017 compared to 1997. Yet both states lost over half of their smaller dairies (those under 500 head) over the same time period — 15,500 farms in Wisconsin alone.⁷ The trend towards larger, factory farm operations with limited land for manure spreading is creating an enormous waste problem.

Growing Factory Farms, Growing Manure Waste

Predictably, these large farms produce a lot of manure that needs to be disposed. In 2017, the 1.7 million dairy cows living on factory farms in the Great Lakes states produced 68 billion pounds of manure. That is equal to the weight in sewage produced each year by 50 million people — or 2.5 times as much sewage as the New York City metro area. Wisconsin's share exceeded the annual sewage production of the Los Angeles metro area, and Michigan's nearly equaled that of Chicago's metro area.⁸ But unlike human waste, factory farm manure is not treated before being released into the environment. It's also increasingly polluting waterways.

Smaller, pasture-based dairies can manage manure onsite by applying it as fertilizer on their cropland at sustainable rates. However, factory farms typically produce more manure than can be used onsite. Overapplication of dairy manure can cause runoff, polluting waterways with nutrients like nitrogen and phosphorus.⁹

Excessive application results in pollutants getting picked up in stormwater runoff that finds its way to surface waters.¹⁰ One study looked at manure spreading by 13 factory farms in southeastern Michigan over a three-year period. These farms overapplied manure in 42 percent of instances, totaling 895,000 pounds of excess phosphorous compounds and 1.8 million pounds of excess nitrogen.¹¹

Digesters Are a False Solution to Factory Farm Manure

Instead of implementing real solutions, some leaders are championing anaerobic digesters as a remedy for managing factory farm waste.¹² The technology converts gas from



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factory farm manure and other wastes like sewage sludge or food waste into biogas, which is promoted for onsite electricity generation or for sale to the grid.¹³

Digestors are typically expensive and not feasible without significant public funding and incentives.¹⁴ And they produce neither clean nor safe energy, because of methane combustion emissions, leaks, accidental manure spills and explosions.¹⁵ According to data from the Environmental Protection Agency (EPA), three of the 11 digesters built in Michigan have since shut down for reasons that include “management problems” and “odor control issues.” In Ohio, odor complaints likely led to a digester closing. And a dairy digester shut down in Wisconsin following a fire.¹⁶

Indeed, biogas opens up a whole new set of environmental problems. The prefix “bio” before biogas does not make it clean — it’s still comprised of methane (the primary constituent of fracked gas) and other pollutants.¹⁷ Methane is nearly 90 times more powerful a greenhouse gas than carbon dioxide over a 20-year period.¹⁸ Plus, burning biogas releases CO₂ and other poisonous gases, including nitrogen oxides, ammonia and hydrogen sulfide.¹⁹

These digestors do not solve animal waste problems, and they do not reduce phosphorus or nitrogen levels in manure. Manure still needs to be managed through practices such as field application.²⁰

Factory Farm Manure is Polluting the Great Lakes

Animal agriculture manure contains nitrogen and phosphorus compounds that are detrimental to waterbodies and feed algae blooms. Research shows that manure from confined animal agriculture is a leading source of phosphorus in the Great Lakes, contributing roughly one-quarter

of all input to Lakes Ontario and Michigan.²¹ Manure runoff can also cause massive fish kills, such as the 2009 disaster in the Black River that left 218,000 fish dead.²²

Algae occur naturally in surface waters, but under the right conditions — warm water, adequate sunlight, and high nitrogen and phosphorous levels — algae can swiftly proliferate and form blooms.²³ Blooms that impair ecosystems or pose hazards to human health are known as harmful algae blooms.²⁴ The growing trend toward the increasing size, frequency and duration of harmful algae blooms in the United States will only worsen as global temperatures continue to rise.²⁵

International efforts in the 1970s and ‘80s virtually eliminated harmful algae blooms, but these resurged in the 1990s, coinciding with the growth of factory farms.²⁶ Since 2011, Lake Erie has experienced the five worst blooms on record.²⁷ Manure pipeline spills and runoff also continue to foul local rivers and streams.²⁸ Additionally, animal waste contains other pollutants like human pathogens, pesticides, hormones and antibiotics.²⁹

Manure Pollution Compounds Drinking Water Woes

Algal blooms from agricultural pollution threaten safe drinking water and are exacerbated by climate change.³⁰ In 2013, microcystin toxins (a harmful byproduct of blue-green algae called cyanobacteria) exceeded World Health Organization guidelines in Carroll Township, Ohio’s drinking water and the municipal supply had to be closed off for two days.³¹ A year later the city of Toledo issued a two-day “do not drink” order that affected nearly 500,000 people after microcystin pollution overwhelmed a water treatment plant.³² And in 2015, Lake Erie struggled with large harmful



The wake of a National Oceanic and Atmospheric Administration research boat highlights a harmful algae bloom in Lake Erie, July 2011.

algal blooms that were comparable to the record-setting blooms in 2011.³³

Unfortunately, costly infrastructure is required to address contamination. Carroll Township spent \$125,000 to upgrade the water system's ozone treatment after its 2013 incident.³⁴ Meanwhile, in Toledo, the Capital Improvement Program is funneling \$500 million into drinking water infrastructure with \$80 million designated for harmful algal bloom-related improvements.³⁵

Factory farm manure pollution will force Great Lakes states to spend significant money on costly water infrastructure to address growing contamination problems. These costs unfortunately fall on the backs of municipalities and rate-payers — not factory farms. Already, the North American Great Lakes region is in dire need of water infrastructure upgrades. From aging infrastructure, to lead-contaminated drinking water in Flint, to the threat of harmful algal blooms, an estimated *minimum* of \$7.5 billion annually over the next two decades must be invested in upgrading, replacing and maintaining water infrastructure.³⁶

Many vulnerable Great Lakes communities in Cleveland, Detroit, Buffalo and Chicago already face high water costs, affordability challenges and water shutoffs.³⁷ Increased financial burdens will disproportionately fall on lower-income communities.

Conclusion & Recommendations

Simply put, we need a complete overhaul of our federal farm policies so that they work for farmers and consumers — not agribusiness giants — all while reducing livestock's dirty footprint. The current agricultural system is highly



NASA Earth Observatory satellite imagery captures a harmful algae bloom in Lake Erie in October 2011. Possible high levels of microcystin toxins in these blooms can threaten drinking water safety for millions of residents in the Great Lakes region.

polluting to the climate and our waterways. We must implement an immediate, national ban on new factory farms and on the expansion of existing ones. One example of legislation that could achieve this is the Farm System Reform Act in Congress.

We also need all levels of government to work together to tackle the water and infrastructure crisis. It is urgent that Congress create a dedicated source of federal support for our crumbling public water and sewer systems. One model is the Water Affordability, Transparency, Equity and Reliability (WATER) Act in Congress. Without delay, we must fully fund our water infrastructure to make water safe, affordable and accessible for all.

Endnotes

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