Toxic algae is invading our lakes and lack of transparency makes it difficult to track

Tom Wilber, Binghamton Press & Sun-Bulletin Published 6:00 a.m. ET Sept. 13, 2018 | **Updated 1:00 p.m. ET Sept. 26, 2018**

In 2017, a farm injected 3 million gallons of liquefied manure into fields. Days later, the manure seeped into Cayuga Lake tributaries. Was this the cause of the toxic algae affecting the lake?

(Photo: Kate Collins / Staff photo)

With 4,300 cows filing into an automated rotating milking parlor — one every few seconds around the clock — Sunnyside Farms is one of the most technologically advanced dairies in New York state.

Many in the industry consider the farm on a hill rising from the east shore of Cayuga Lake one of the most well-run.

But in February 2017, the farm staff emptied about 3 million gallons of liquefied manure — enough to fill nearly five Olympic-sized pools — from a leaking lagoon and injected it into the fields.

In subsequent days, the manure sloughed off and ran down the hill with melting snow, darkening tributaries on its way to Cayuga Lake. That summer, as water temperatures warmed, a pea-green slime, toxic algae, covered parts of the lake. Beaches were closed. Warnings were posted.

Was the Sunnyside manure spill a factor?

Toxic algae and water quality: Here are the findings to our story

- The pace of toxic algal blooms continues to accelerate in New York with more than 100 water bodies already affected this year and more than 80 blooms currently active.
- More extreme weather makes it harder for farmers to control manure run-off. The problem also applies to outdated sewage treatment plants.
- Lack of regulations makes it difficult to track manure spills that can fuel toxic blooms.

"If this makes people aware, and prevents people and pets from getting sick, then it's a good thing. If dogs get sick, what about children?"

Kim Pearson, owner of a dog who died after being exposed to

toxic algae.

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An explosion of toxic algal blooms is degrading lakes across the state and country — more than 150 were reported in New York state in 2017. Although some reports point to agriculture as a leading cause, answers are elusive because of a lack of public records, and reluctance by regulatory officials to specify sources of pollution.

State regulations requiring toxic spills to be logged into a database, for example, do not apply to manure. Rich in phosphorous and nitrogen, manure is perfect toxic algae food. When it washes into water bodies, it supercharges the ecosystem for algae blooms when temperatures rise.

Cayuga Lake had suffered algae before. But the bloom in the summer of 2017 was far worse and more toxic than previous blooms.

Cayuga Lake, with Cass Park, left, Newman Golf Course, lower right, in May of 2014. Phosphorus is a concern in the lake because it promotes algal growth, and it has impaired part of the lake for swimming. The impairment led to the southern end being listed in 2002 for violating the U.S. Clean Water Act. *(Photo: The Ithaca Journal / file photo)*

Exposure to this blue-green algae, called cyanobacteria, can cause a range of symptoms and diseases, from stomach cramps to permanent neurological damage and possible death. Water-loving pets are especially vulnerable.

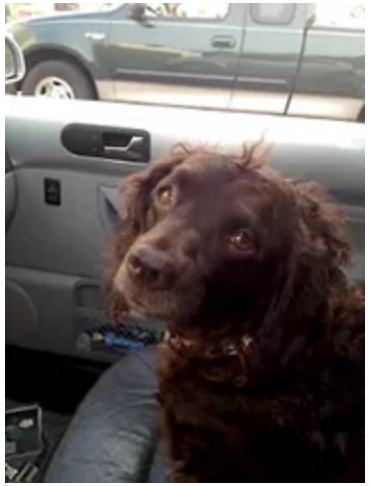
The problem is urgent.

Documentation of harmful algal blooms — HABs — has risen steadily since 2012, when blooms were reported in 50 water bodies in New York. Last year, more than 150 water bodies suffered the menace, with durations, concentrations and toxicity increasing across the board.

Since 2016, the state Department of Health has received reports of 65 people becoming sick from exposure to toxic algae. Last year, more than 100 New York beaches were closed, and some lakes that provide drinking water for nearby communities — notably Skaneateles, Owasco, and Cayuga and Seneca — were threatened, some for the first time.

Kim and Jay Pearson have a cottage on Owasco Lake, which is east of Cayuga Lake and also plagued by toxic algal blooms.

Last summer, her dog Coco, an American water spaniel in robust health, was fetching sticks from the lake. The Pearsons had heard toxic algae had been reported in the area, but at that moment, the water appeared to have cleared.



Coco, a dog who died after exposure to algal blooms on Owasco Lake. *(Photo: Courtesy photo)*

Soon after Coco had been joyfully romping in and out of the water with sticks, she became ill.

In the following days, the Pearsons watched their frisky dog suffer a cascade of symptoms. Coco became listless, vomited green bile and developed diarrhea. Tests at the vet showed Coco's liver was suddenly failing — a symptom of poisoning. The symptoms grew worse, she suffered more, and the Pearsons had to have her euthanized.

There is no way to conclusively prove the dog's death was from the toxic algae, Pearson notes. But it fits all the warnings.

"If this makes people aware, and prevents people and pets from getting sick, then it's a good thing," Kim Pearson said. "If dogs get sick, what about children?"

A sign cautioning visitors about blue-green algae blooms greets cars as they enter Taughannock Falls State Park. *(Photo: Matt Weinstein / staff photo)*

Illness due to toxic algae “is likely to be very underreported,” said state health department spokesman Jeffrey Hammond. That’s because symptoms of exposed people and pets do not always show up immediately; they vary widely, and victims may not associate them with exposure.

The state has addressed the problem by closing beaches, posting warnings and raising awareness, Hammond added. Many more dogs have suffered (https://www.dec.ny.gov/docs/water_pdf/habspets.pdf) — some terminally — although the number is undocumented.

So far in 2018, the number of toxic algal blooms has topped 100, with the late summer and early fall months, which have conditions conducive to blooms, still to come.

The state Department of Environmental Conservation updates a list of active algal blooms on a notification page (https://www.dec.ny.gov/chemical/83310.html) weekly.

Meanwhile, toxic algae has become so commonplace that some county health departments, including Cayuga, have stopped issuing health bulletins and advised the public to instead call beaches to learn their status before visiting.

'No finger pointing'

What else could be leading to the increase in toxic algae blooms? Some experts say septic systems in cottages, sub-standard sewage treatment plants, storm water run off or invasive species could all play a role.

State officials say runoff from many non-specified points, exacerbated by warming temperatures and more intense rains, are contributors to an explosion in harmful algal blooms across the state. The process is called nutrient loading.

But officials are reluctant to single out specific sources for the Cayuga Lake bloom or, for that matter, hundreds of other blooms overtaking New York state waters in recent years.

Besides agriculture, sources of the problem can include septic systems designed for seasonal cottages that have been turned into year-round homes; sub-standard sewage treatment plants; and stormwater runoff, said Julie Tighe, chief of staff for the DEC.

Invasive species also may play a role in keeping ecosystems off-kilter.

“We’re still trying to understand all the contributing factors,” Tighe said. Although the problem of the blooms is becoming universal, each water body is unique in respect to tolerance and triggers, she added.

This apparent blue-green algae bloom was spotted in 2014 at Seneca Lake State Park in Geneva. *(Photo: Press & Sun-Bulletin file photo)*

Jacqueline Lendrum, director of the DEC's Bureau of Water Assessment Management, summed it up with a talking point often heard at state-sponsored conferences on the issue: "We are charged not with pointing fingers but taking a holistic approach to addressing all nutrients."

The centerpiece of the state's approach is a $65 million program announced by Gov. Andrew Cuomo earlier this year to fight harmful blooms.

That includes $6 million split among 12 watersheds to identify problems. The remainder would be used to execute plans to fix them, mostly in the forms of grants to upgrade farming practices, septic systems and sewer treatment.

Finger pointing, especially in the direction of farms, is a touchy subject for the state's dairy industry — one of the largest milk producers in the country behind only California, Wisconsin and Idaho.

With 4,300 cows, Sunnyside Farms in Scipio Center is one of the most technologically advanced dairies in New York state. *(Photo: Kate Collins / Staff photo)*

But research documents tell a story not generally incorporated into the DEC's talking points. A preliminary analysis for Cayuga Lake (https://www.dec.ny.gov/docs/water_pdf/cayugahabplan.pdf), for example, shows 92 percent of nutrients that feed algae come from runoff, with 80 percent of that coming from farmland and 1 percent from septic tanks.

The documents — 12 harmful bloom action plans, (https://www.dec.ny.gov/chemical/113733.html)each more than 100 pages — cite similar assessments for Owasco and Skaneateles watersheds.

The assessments are crude, the documents caution. More detailed inventory and modeling is needed for "precise quantification … from all suspected sectors" to guide policy.

More waste, less space

While the number of small farms is decreasing, operations with more than 500 cows doubled in New York State from 1997 to 2012. A 500-head dairy can produce as much waste as a small city.

New York's dairy industry, featuring stars like Dannon, Chobani and Crowley, is integral to upstate New York economic development efforts. At its foundation are cows managed by fewer farmers, who are aided by more mechanized systems to increase yields.

Sometimes called "factory farms," they are Concentrated Animal Feed Operations, or CAFOs. By definition, the operations include at least 300 cows confined for more than 44 days a year, and typically much longer, in an area with no natural vegetation.

Whether the huge dairy operations are more or less contributors to nutrient pollution than small farms is a lively point of debate in the industry. Farms with fewer than 300 cows are not subject to the permitting requirements of larger farms.

Good farming practices or bad farming practices are independent of a farm's size, of course. Smaller farms, however, are more likely to get away with practices a larger farm can't.

One operator at a large farm noted horses can poop in the road without attracting much notice. But CAFO operators become targets if their equipment tracks even small amounts of manure onto the road. The operator asked to remain anonymous because of competitive tensions between small and large farms.

Fullscreen

Upstate NY farms and algal blooms

Few would argue, however, that the large farm operations are the overriding trend statewide and nationally. And when things go wrong, they can go wrong on a spectacular scale.

Operations with 500 head or more of dairy cows more than doubled in New York state from 1997 to 2012 to more 240, according to the most recent figures from the USDA Census of Agriculture, while the total number of farms continued to fall.

More recent data will be available after the next agricultural census is released in 2019. But an analysis by USA Today Network New York suggests the trend toward large operators is continuing strong. Since 2012, the state granted more than 500 permits for large operators, compared with 269 during the previous five years.

Unlike traditional farms with livestock grazing over hill and dale, the large operators confine large herds to small areas for long periods.

In short, keeping automated milking parlors working 'round the clock produces more dairy at less cost, with "efficiency" being a favored word in the industry. That's easier to do with the cows close at hand rather than spread over the countryside.

But it presents a unique problem.

One dairy cow produces up to 120 pounds of waste each day. A 500-head dairy can produce as much waste as a small city. Unlike sewage treatment plants with sophisticated measures to process and discharge treated effluent at strategically placed points on water bodies, farm lagoons holding manure dot the countryside.

Unlike sewage, raw manure is an essential resource to managing crops that feed the cows that feed us. For it to have value, the manure has to go into the ground.

Concentrated animal waste on a scale produced by the large operators creates logistical challenges involving storage, hauling, transferring, pumping, distributing and spreading in a way so the land can absorb it. Accidents happen, ranging from leaks to manure truck turnovers.

Even the best farming practices are ambushed by extreme and unpredictable weather.

'Zero tolerance'

Extreme weather — and possibly climate change — is frustrating farming experts and others. In 2017, more than 6 billion gallons of untreated sewage and stormwater polluted more than 200 waterways in New York due to extreme weather.

At Sunnyside Farms, Greg and Neil Rejman, each with an animal science degree from Cornell University, are well-known figures in the upstate community. Neil Rejman has served in positions on the Farm Bureau, Cornell College of Veterinary Medicine Dean’s advisory committee, and his local church and food pantry.

When the brothers faced a critical decision on that day in February 2017 to remove manure from the leaking lagoon or risk a complete break in the system, they were counting on a forecast that predicted dry weather, Greg recalled. At the time, the decision to inject it into fields, where they had some measure of control, appeared sound.

If the forecast held, the outcome would likely have been different.

But the forecast failed: A heavy snow was followed by an extreme thaw.

Greg Rejman of Sunnyside Farms said they monitored the weather in advance of releasing about 3 million gallons of liquefied manure into the fields. "We did everything right. ... Climate change is throwing everything for a loop. Practices that have worked for 50 years aren't working anymore." *(Photo: Kate Collins / Staff photo)*

“We did everything right,” Greg said. “The weather pattern we have been seeing is absolutely unheard of. Climate change is throwing everything for a loop. Practices that have worked for 50 years aren’t working anymore.”

"It's not something we're proud of," Neil said. "We don't have the attitude that 'accidents happen, so that's okay.' We have to have zero tolerance for them."

Farmers are not the only ones facing limits on managing nutrient runoff in the face of flooding and erosion.

In 2017, 6.5 billion gallons of untreated sewage and stormwater polluted more than 200 waterways in New York because of systems overwhelmed by extreme weather, according to a recent report (https://www.osc.state.ny.us/localgov/pubs/research/infrastructure-series/combined-sewers.pdf) by State Comptroller Thomas P. DiNapoli.

The report noted regulations now requiring sewer system owners to report all discharges in real time is "both a challenge and an opportunity for local officials." While "negative press" may hinder waterfront recreation, the report states, "increased awareness might cause residents and businesses to be more inclined to support the cost of fixing the problem."

Lack of records

> While agriculture is known as common cause of water impairment, the DEC's permits for large farm operators don't comply with the federal Clean Water Act. Much of the farm runoff is from hard-to-track "non-point" sources, making it hard to pin-point problems.

Pollution has typically had an outsized impact on smaller water bodies with lower capacity to absorb nutrients and greater vulnerability to temperature spikes.

More recently, however, “high toxic blooms,” a particularly dangerous kind, have begun showing up in some of the deepest and coldest lakes previously thought to be resistant to the nutrient and temperature spikes that trigger blooms.

In 2016, algal toxins were detected for the first time in treated drinking water from Owasco Lake, serving the city of Auburn. Although concentrations were below thresholds for heath risks, according to officials, their presence was a sign of a serious issue in the watershed.

More recently, toxin outbreaks hit Skaneateles and Cayuga lakes, not far from drinking-water intakes.

The problem is becoming rampant in water bodies nationwide.

“Agriculture is the main driver of water quality impairment in the country,” said Peter Lehner, an attorney for Earthjustice, an environmental law firm.

Lehner cites data from the EPA's most recent Water Quality Assessment (https://ofmpub.epa.gov/waters10/attains_nation_cy.control#LAKE/RESERVOIR/POND)showing agriculture as the single largest known source of pollution to the nation's lakes, rivers and ponds, with nutrients being the second-most common contaminant behind mercury and in front of PCBs.

BE AWARE: Officials advise people to stay out of the water if they see algae spots like this. *(Photo: Department of Environmental Cons, Department of Environmental Cons)*

A lack of transparency necessary to hold farms and regulators accountable compounds the problem, Lehner added.

Earthjustice, representing Riverkeeper and a host of other environmental groups, recently argued before the state Supreme Court that the DEC's permits for large farm operators fail to comply with the federal Clean Water Act's mandate for oversight and public participation in the permitting process.

Specifically, the DEC did not require proper public or internal vetting of the large operators' plans to manage nutrient pollution.

The court ruled in the environmental groups' favor.

"The permit … fails to require prior DEC review and approval for most changes … and also fails to meet federal regulatory requirements for public disclosure, notice and comment" for amendments to plans, Judge David A. Weinstein ruled in April.

Environmental lawyer Lehner put it this way: "The DEC permit allowed a lot of information to be kept secret."

The DEC is developing a new permit rather than appeal, said DEC spokesman Kevin Frazier. The court is allowing farms to continue to operate under the current permit until July 23, 2019.

While the ruling advances the cause of disclosure, other transparency issues remain at large.

The ruling applies only to 21 farms with permits for discharges under the federal Clean Water Act. Most of the state's CAFO farms switched to a state permit for non-discharging operations prior to the judgment.

Much of agricultural runoff for many of these farms is from hard-to-track "non-point" sources, meaning it runs off land to water with no particular discharge point.

This is different from "point source" pollution from manure spills and sewage treatment overflows.

While farm regulations do not require all manure spills to be logged on the publicly accessible statewide spills database (https://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=2), large farm operators are required to report spills to regional DEC offices.

Theoretically, these records can be obtained through a Freedom of Information Law request if the person making the request has enough general knowledge of the spill to know what to ask for.

But manure spill files, to the extent they publicly exist, tend to be decentralized, fragmented and difficult to access in any comprehensive way.

A response is still pending for a USA Today Network New York comprehensive FOIL request filed in May seeking records on all large farm operator permit violations — including spills — since 2007.

The records, according to the DEC's response, are "subject to review to ascertain if any legal privileges may apply."

Since 2012, the state granted more than 500 permits for large farm operators, compared with 269 during the previous five years. *(Photo: Kate Collins / Staff photo)*

Meanwhile, various parties have attempted to track manure spills statewide, with mixed results, by piecing together records that randomly and incompletely show up on the spills database. The spills sometimes are called into the state hotline outside of normal business hours, when regional offices are closed, but there is no regulatory requirement for them to be logged there.

Walter Hang, an environmental database specialist from Ithaca, mapped some 200 manure spills (http://www.toxicstargeting.com/hab/documents/new-york-state-reported-agricultural-manure-spills) in a recent analysis of the spills data set. Many are reports of manure leaching into ditches and streams from excessive spreading, saturated conditions or outright spills.

What is missing, however, raises more questions than what's accounted for. The public database has no record of the Sunnyside Farms spill, for example, and an unknown number of others. However, records obtained be USA Today Network New York show a $4,500 penalty and other details of the Sunnyside Farm spill.

Rather than a regulatory crackdown that would likely bring financial stress for the dairy industry and political stress for the governor, Cuomo announced the incentive-based $65 million program earlier in 2018.

Hang, head of Toxics Targeting in Ithaca and a longtime critic of the DEC, faults the approach as “pay to play.”

"What we need are regulations," said Hang, who is heading a campaign to push for stronger oversight.

The head of the DEC, on the other hand, says the governor's program to study the problem and subsidize better practices and upgrades is the most effective response.

In a recent email, DEC Commissioner Basil Seggos characterized as "unprecedented" the state's response, including the $65 million for toxic algae and $2.5 billion earmarked for septic and sewage upgrades in local communities. He promised to "devote any resource needed to help communities protect our water."

‘The F word’

Sunnyside Farm adds cover crops to lesson erosion and is looking to eliminate phosphorous and nitrogen from the cows' diets. "Don't use the F word on us," one official says. "We're a family farm," not a factory farm.

Greg Rejman, of Sunnyside Farms, participated in the DEC's conference in Syracuse seeking solutions to toxic algae.

Solutions include “best practices” to plant “cover crops” including tillage radishes, barley and crimson clover. These help the ground absorb nutrients and hold back erosion in fallow fields especially vulnerable to offseason erosion.

Buffer strips or greenways between fields and streams and ditches also serve as runoff barriers.

“We have a lot of responsibility because we farm 6,000 acres," Neil Rejman said. "When talking water quality, we expect to be part of the discussion."

Sitting in their grandparents' renovated farmhouse that now serves as the Sunnyside Farms office, the brothers reviewed nutrition charts that eliminate unnecessary intake of phosphorous and nitrogen from cows' diets.

The chemistry is complicated, but the underlying concept is simple: less into the cow, less out in the manure.

It's a topic that excites the brothers. Yet public relations, they admit, is not their strength.

“Farmers want to farm,” said Steve Ammerman, public affairs manager for the New York Farm Bureau. “They are not used to talking about things that are routine to them, but not to the general public.”

Greg Rejman, who reluctantly granted an interview for this article with Ammerman's encouragement, winces when the term "factory farm" enters the conversation.

"Don't use the F word on us," he chides. "We're a family farm. But people don't see that."

He talks about how his grandfather started the farm with 14 cows, and subsequent generations built it into what it is today — with more than 70 employees, tens of millions of dollars in equipment and a key supplier to processors and plants worldwide.

Where does the toxic algae problem, complicated by weather events beyond his control, leave him?

"In the public crosshairs," he said. "We'll keep doing our best. That's how we do it."

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