

ARE WE IN DENIAL?

Some tie septic, sewer pollution to harmful algae blooms

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What happens after flushing the toilet is not something people can see.

Or is it?

An expert on algae from Florida Atlantic University, Brian Lapointe, thinks people can see what often happens next. They just don't realize it.

Toxic algae blooms that started last year have hurt Southwest Florida beaches, killing marine life along with tourism and grabbing headlines.

According to Lapointe, septic systems located in the wrong landscapes, as well as aging or unstable sewer infrastructures, are largely to blame. "Sewage nitrogen in growing populations is the single factor causing blooms to worsen," Lapointe told the *Sun*.

Lapointe has researched impacts of landbased pollution on water quality for various local governments, such as Charlotte and Lee counties, as well as Monroe County. In Monroe, his work led to a phosphate ban and new state regulations requiring greater nutrient removal from sewage effluent.

With an estimated 2.6 million septic systems in Florida, according to state figures, Florida's population is also swelling. Some estimates are at around 900 people moving into the state daily with many going on septic systems, Lapointe said.

"I think it's the ultimate denial," Lapointe said about those who don't believe human waste pollution is largely to blame. "People don't want to believe they are part of this problem."

Lapointe was contracted a few years ago by Charlotte County to study area waterways and he discovered local conditions are just not conducive for functioning septic tanks.

He discovered that 71 percent of the area he studied in Charlotte County does not have adequate soil depth between drain fields and the seasonally high water tables. That means Charlotte County needs to aggressively move forward with its septic-to-sewer conversion program,

"What we haven't been dealing with is our own sewage coming from our backyards."

2-PART SERIES

This is the first part of a Sun series examining the relationship between harmful algae blooms and local waste systems.



In recent months dead fish have been a common sight on Southwest Florida beaches.

SUN FILE PHOTO



— **Brian Lapointe, Ph.D.**, Florida Atlantic University Professor

according to Lapointe.

Similar efforts are also continuing in parts of northern Sarasota County. And, local municipalities like Punta Gorda and North Port, have begun to plan, or at least discuss, septic-to-sewer conversion in their futures. Residents of Rotonda West and customers of the Englewood Water District, which encompasses most of Englewood — excluding Englewood East — are hooked up to a vacuum sewer system that began construction in the mid-1990s.

But not everyone believes the science behind the conversions — or approves of the cost.

At least some residents who live in El Jobean, where septic systems are slated to arrive next, have said they also wonder if expanding public sewer systems can really handle all the additional waste.

And Lapointe agrees that getting them on sewers isn't necessarily enough.

“We need to make sure the infrastructure isn't leaking,” Lapointe said.

For example, some of Charlotte County's sewer infrastructure — which goes back to the 1960s in some areas — failed during Hurricane Irma in September 2017, when 17 lift stations overflowed following power outages and flooding. Lift stations are positioned around gravity-based sewer systems to “lift” waste with a pump and keep it flowing through pipes toward the wastewater treatment plant.

That sent 122,000 gallons of untreated wastewater and 500,000 gallons of reuse quality water into surface waters and prompted a “consent order” of repairs and upgrades required by the Florida Department of Environmental Protection.

It was the largest discharge in at least 10 years for the county, which is how long its utility department discharge records have been kept. The county is still working on state-required repairs, but is on track to complete them all by December 2019 as mandated by the state.

And it wasn't just Charlotte County that had wastewater overflows during Irma that were so bad the DEP intervened.

“Hurricane Irma was an unprecedented storm, with facilities impacted throughout the state,” said DEP spokesperson Dee Ann Miller. “DEP has executed 42 Consent Order Enforcement Actions covering 84 permitted wastewater facilities for spills resulting from Hurricane Irma.”

Those also included other facilities in the region, such as the cities of Sarasota, Fort Myers, Tampa, Naples, Cape Coral, Clewiston and Arcadia, along with county-run facilities in Collier, Lee, Sarasota, Hillsborough, Manatee and Polk, according to documents from the DEP.

Lapointe confirmed he thinks these large discharges resulting from Irma, along with flooding and runoff from septic systems, could have fed the red tide bloom that started last year and has continued into this year with heavy rainfalls, warming temperatures, lots of sunlight and additional nutrient run-off.

Wastewater from failing infrastructure as well as thousands of septic tanks went into the waterways, Lapointe said. “That was the nutrient source that began that bloom.”

But the DEP and Florida Fish and Wildlife Conservation Commission would not directly respond to whether sewer discharges tied to Irma and ongoing septic system pollution are the main culprit in local algae blooms, such as red tide.

And Charlotte County Utilities Department spokesperson Caroline Wannall said: “There is no way to determine whether the Irma overflows directly impacted subsequent red tide blooms.”

As for the septic pollution, Charlotte County and Punta Gorda officials have stated in writing it is at least a contributor of harmful algae blooms like red tide. They also cite it as a reason for why moving forward with sewer conversions is so important.

Disagreement

Key state agencies are not pointing fingers about what causes red tide blooms to reach high levels, and stress that the algae is natural in the Gulf of Mexico and blooms that grow to kill fish and other marine life have recurred over the centuries.

When asked what's more to blame for red tide affecting Southwest Florida, an FWC spokesperson declined to say. "Red tide is a naturally-occurring microscopic alga that has been documented along Florida's Gulf Coast since the 1840s," said FWC spokesperson Katie Purcell. "Blooms, or higher- than-normal concentrations, of the Florida red tide alga, *Karenia brevis*, occur nearly every year in the Gulf of Mexico."

Red tide begins in the Gulf of Mexico 10 to 40 miles offshore and can be transported inshore by winds and currents. And according to FWC, there is no direct link between nutrient pollution and the frequency or initiation of red tides caused by *K. brevis*. But once red tides are transported inshore, "they are capable of using man-made nutrients for their growth."

University of Florida Professor and Director of Florida Sea Grant Karl Havens wrote on the university's website that "blooms occur where lakes, rivers or near-shore waters have high concentrations of nutrients — in particular nitrogen and phosphorous. ... In Lake Okeechobee and the St. Lucie and Caloosahatchee estuaries, man-made nutrient pollution from their watersheds is causing the blooms. Very high levels of nitrogen and phosphorous are washing into the water from agricultural lands, leaky septic systems and fertilizer runoff."

Some residents faced with sewer conversion also aren't blaming themselves, or their septic systems for water quality problems.

And disagreeing with Lapointe's view is Suncoast Waterkeeper Andy Mele, an environmental activist. Mele said converting to sewer "is always a good thing." But, he said he doubts malfunctioning septic systems are the main culprit in algae blooms, though it may be part of the problem.

"The real problem is the undue influence of big business," said Mele. "Agricultural influences are most responsible."

According to Mele, improving the situation involves not voting for "anyone who is in office currently" and for stricter standards for water quality in Florida.

Lapointe noted fertilizer runoff can contribute to the problem, but he said his research involving groundwater in Indian River Lagoon and St. Lucie Estuary on Florida's eastern coast indicates septic tanks are putting off nitrogen the most to support past blooms there.

His studies identified an artificial sweetener called sucralose, which is a tracer of human waste pollution.

Lapointe co-authored a scientific paper published in the journal "Harmful Algae" earlier this year, which according to FAU, shows the cause of algae blooms in St. Lucie Estuary in 2016 stinks.

"Contrary to the widespread misconception that periodic discharges from Lake Okeechobee alone produced these harmful algal blooms, FAU Harbor Branch's study provides multiple lines of evidence that nutrient sources in the local basins, including



Street flooding Sept. 12, 2017, was caused by Hurricane Irma along Chasteen Street in Punta Gorda.

SUN FILE PHOTO



This is a screenshot of a recent septic-to-sewer conversion in Charlotte County from a video the county produced detailing its Sewer Master Plan.

PHOTO PROVIDED

on-site sewage and septic systems, contaminated the St. Lucie Estuary, in particular, its urbanized sections as well as its watershed.”

The paper notes that “there is a need to reduce (nitrogen) and and (phosphorous) loading, from the (St. Lucie Estuary) watershed via septic-to-sewer conversion projects and to minimize the frequency and intensity of the releases from Lake Okeechobee to the (estuary) via additional water storage north of the lake.”

And Charlotte County’s Water Quality Assessment Report prepared by Lapointe notes there is an opportunity to moderate pollution from septic tank effluent before Charlotte Harbor experiences higher levels of fecal contamination and harmful algae blooms similar to those in the Indian River Lagoon.

Lapointe’s research in Charlotte County “indicates that inadequately treated septic waste is a major source of nitrogen to this system, and that improved wastewater treatment, which currently removes an average of 90 percent of sewage nitrogen, would reduce nutrient loads from septic systems and help mitigate environmental impacts associated with current and future population growth.”

Meanwhile, Lapointe’s research in Lee County, more than a decade ago, drew similar conclusions about harmful algae blooms and sewage.

According to a report for Lee County by Lapointe and his team, high values of nitrogen in blooms in the Caloosahatchee estuary in Fort Myers were “typical of sewage effluent,” and dense red tide sampled off Sanibel Island in 2004 was “also within range of sewage nitrogen.”

And like this year with Hurricane Irma, the report noted high nitrogen tied to sewage found in earlier blooms tested in Lee County “provide strong evidence that these blooms were supported by land-based nitrogen discharges, particularly the massive releases from Lake Okeechobee and the Caloosahatchee River that occurred in 2004-2005 following hurricanes Charley, Frances and Jean.”

As far as this year, though, Havens from University of Florida wrote that “after heavy spring rains and because of discharges of water from Lake Okeechobee, river runoff in southwest Florida brought a large amount of nutrients into near-shore waters of the Gulf of Mexico, which fueled the large red tide.”

And nutrient pollution sources, Havens described, include decaying organic material, fertilizers applied to lawns, and golf courses, manure from fields or feedlots, atmospheric deposition, groundwater discharge, and municipal wastewater discharge.

There has been picketing with some blaming “big sugar” and polluted Lake Okeechobee releases into area waterways as the main driver of algae blooms.

But according to recent paid advertisements placed by U.S. Sugar, water from Lake Okeechobee discharges “come from the north, not from our farms.”

“Lake Okeechobee discharges, other rivers, local nutrient runoff from development and man-made sources are fueling red tide,” according to U.S. Sugar. “Water from sugarcane farms is cleaned by on-farm soil.” And they use “best management practices” paid for by farmers.

U.S. Sugar said its water is stored and cleaned to the point of being cleaner than rainfall, and then conveyed to Everglades National Park farther south.

But Mele said past legislation, namely Senate Bill 552, allowed many agri-businesses in Florida to use best management practices for nutrient releases. He said those practices don’t go far enough and that is largely why the year’s algae blooms have been so widespread and lasting.

Lapointe said he doesn’t think it’s farmers who are most to blame.

“What we haven’t been dealing with is our own sewage coming from our backyards,” Lapointe said. “It’s the pot calling the kettle black.”

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