



Tackling Florida's Blue-Green Algae Crisis

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Florida summers are typically marked by bustling theme parks and crowded beaches, but the COVID-19 pandemic has largely shut down the state's tourism industry this year. While the pandemic will eventually subside, another crisis—toxic blue-green algae blooms—poses a longer-term threat to the state's tourism economy. Blooms in 2016 and 2018 were severe enough to cause states of emergency to be declared, generating negative headlines

across the country. Tackling Florida's algae crisis is essential for a strong recovery and will help ensure continued growth for years to come.

Toxic cyanobacteria, or blue-green algae, kill wildlife and present serious health hazards to humans.¹ Contact with or accidental ingestion of the algae can cause irritation to the gastrointestinal tract, liver, nervous system and skin. Some research even links long-term exposure

to the development of neurodegenerative disorders like Amyotrophic Lateral Sclerosis (ALS) and Alzheimer's disease.²

The algae thrive in warm freshwater and brackish habitats like the lakes, rivers, and estuaries found throughout Florida. Combined with sunlight and an influx of nutrients from urban and agricultural sources, the algae "bloom" and form a thick layer of green slime on the water's surface. While algae blooms occur in waterbodies all around the state, Lake Okeechobee and the wider Everglades region are at the heart of Florida's water quality crisis.

How We Got Here

Prior to human settlement, the Everglades was more than twice the size it is today. Water originating in central Florida flowed into Lake Okeechobee through the Kissimmee River, carrying nutrients along the way. In the rainy months, water spilled over the lake's southern shore and into a vast "river of grass" stretching to the Gulf and Florida Bay. The Everglades acted as a sort of natural filter, taking up nutrients as water slowly moved through the system.

Beginning in the 1850s, large-scale drainage projects cleared the way for development. A series of hurricanes in the early 1900s prompted the construction of the Herbert Hoover Dike around Lake Okeechobee and a network of canals and levees to provide flood protection to south Florida's growing population. These measures enabled tremendous growth and agricultural productivity in the region, but at significant cost to the environment.

Today, much of the water-flow north of Lake Okeechobee remains intact, but

urban and agricultural development have increased the amount of nutrients reaching the lake, leading to frequent algae blooms. Moreover, the Herbert Hoover Dike and other flood control measures block the natural flow south of the lake. Instead, much of the water in Lake Okeechobee is released to the east and west coasts through the St. Lucie and Caloosahatchee rivers. This altered flow spreads blooms down the rivers and to the coastal estuaries while drying out grasslands to the south.

Ongoing Restoration Efforts

In 2000, Congress authorized the Comprehensive Everglades Restoration Plan (CERP)—a joint effort between the state of Florida and the U.S. Army Corps of Engineers. Widely considered the largest environmental restoration program in the world, the plan encompasses over 50 projects with timelines spanning multiple decades.³ Collectively, the projects will provide water treatment, storage, and conveyance to reduce nutrient pollution, avoid large discharges to the coasts, and send more water south to the Everglades.

There has been little progress in the two decades since CERP was authorized. Political conflicts and bureaucratic delays have led to extended timelines and increased costs. Notably, the federal government is more than \$1 billion dollars behind the state in fulfilling its funding obligations under the equal funding agreement for CERP projects.⁴ Fortunately, Governor DeSantis has prioritized Everglades restoration since taking office. An executive order issued in January 2019 called on state agencies to expedite the planning and construction of

several key infrastructure projects included under CERP.

Despite this renewed momentum, the storage and treatment capacity included in current CERP plans is likely insufficient to meet the scale of the problem. It is also far more cost effective to address sources of nutrient pollution directly than to provide treatment after the fact. Consequently, restoration must take a more comprehensive approach than large-scale infrastructure projects alone.

Addressing Sources of Nutrient Pollution

Florida lawmakers recently passed the Clean Waterways Act during the 2020 legislative session. The sweeping legislation addresses many of the largest sources of nutrient pollution including agricultural runoff, failing septic systems, and wastewater spills.

The largest source of nutrient pollution in the Okeechobee watershed is agricultural runoff. The primary tool for reducing nutrient pollution from agricultural producers is the adoption of “Best Management Practices” (BMPs) developed by the Florida Department of Agriculture and Consumer Services. Producers in the watersheds are required to either

implement BMPs or conduct monitoring to demonstrate compliance with water quality standards. The Clean Waterways Act strengthens the BMP program by requiring onsite inspections every two years to ensure that producers are properly implementing BMPs and meeting nutrient reduction goals.

Florida’s 2.6 million septic systems

are perhaps the second largest source of nutrient pollution.⁵ Septic systems are well-suited for low-density areas with sufficient separation between the drainfield and groundwater. However, they can be a major problem in high-density areas, in close proximity to waterways, or in areas with higher water tables—especially when they are improperly maintained. The Clean Waterways Act transfers oversight of septic systems from the Department of Health to the Department of Environmental Protection. In areas where septic systems are responsible for at least 20 percent of nutrient pollution, the law also requires local governments to develop septic remediation plans.

Florida’s aging sewage infrastructure is another major source of nutrient pollution addressed by the Clean Waterways Act. Between 2009 and 2019, nearly 23,000 sewage spills across the state released 1.6 billion gallons of wastewater into the environment—over 370 million gallons of which were completely untreated.⁶ The Clean Waterways Act creates a wastewater grant program that will help fund local projects to upgrade sewer infrastructure and convert existing septic systems. Similar to septic remediation plans, local governments will also be required to develop wastewater treatment plans in areas where wastewater is responsible for at least 20 percent of nutrient pollution.

Further Policy Recommendations

The Clean Waterways Act is a strong first step but tackling Florida’s algae crisis will require additional actions at the private,

municipal, state, and federal levels.

Private actors can take simple, voluntary steps to reduce their contributions to nutrient pollution. While a large number of septic systems will be converted to sewer over the coming years, many households will continue to rely on septic systems. Proper routine maintenance and inspection of septic systems can go a long way toward reducing the risk of system failure. For those who rely on sewer systems, responsible disposal of greases and fats can help avoid pipe bursts that cause sewage spills. Households can also voluntarily reduce fertilizer use and avoid excessive landscaping. While these measures may appear insignificant at the individual level, they could have a real impact if adopted by the millions of households that call Florida home.

Municipal governments also have an important role to play. While the Clean Waterways Act includes some funding and requirements for wastewater improvements, local governments are ultimately responsible for wastewater management. It is vital that aging sewer infrastructure be replaced and upgraded over time to keep up with population growth. Public-private partnerships could help offset some of the costs associated with construction, operation, and maintenance.

Local governments can also limit the spread of septic systems by requiring sewer connections for new development. In areas near vulnerable waterbodies, fertilizer-use ordinances may be appropriate to reduce runoff.

State and federal authorities should primarily focus on completing CERP projects on time and on budget. Getting the appropriate storage and treatment infrastructure in place will significantly reduce the risk of algal blooms over the next few years as the state's economy recovers. Improved water quality monitoring systems and data will also be useful for assessing the effectiveness of ongoing projects and guiding further restoration efforts. Finally, the federal government should eliminate the system of tariffs and subsidies that prop up the sugar industry south of Lake Okeechobee.

Florida's water quality crisis is among the state's most complex challenges and getting our response right is critical. Lawmakers have made significant progress in recent years, but there is plenty more to be done. Maintaining the current momentum for restoration is all the more important as the economy begins to recover.

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REFERENCES

- 1 “HABs: Harmful Algae Blooms.” Florida Department of Health. <http://www.floridahealth.gov/environmental-health/aquatic-toxins/harmful-algae-blooms/index.html#bluegreen>
- 2 Kiniry, Mike and Julie Glenn. “Researchers Explore Possible Connections Between BMAA and Neurodegenerative Disorders.” WGCU Public Media. 19 July 2019. <https://news.wgcu.org/show/gulf-coast-life/2019-07-09/researchers-explore-possible-connections-between-bmaa-and-neurodegenerative-disorders>
- 3 “Ecosystem Restoration.” U.S. Army Corps of Engineers, Jacksonville District. <https://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/>
- 4 “Federal Support Needed to Fully Implement CERP.” South Florida Water Management District. <https://www.sfwmd.gov/our-work/ceerp-project-planning/ceerp-implementation#:~:text=State%20vs.,Federal%20Spending,project%20costs%20continue%20to%20rise>
- 5 Lapointe, Brian, Laura Herren, Armelle Paule, Anne Sleeman and Rachel Brewton. “Charlotte County Water Quality Assessment Phase I: Data Analysis and Recommendations for Long-Term Monitoring.” Harbor Branch Oceanographic Institute, Florida Atlantic University, 2016. <https://www.charlottecountyfl.gov/dept/utilities/Site%20Documents/Charlotte%20County%20HBOI.FAU.PhaseI.Final%20Report.12.12.2016.pdf>
- 6 Salman, Josh, Jennifer Borresen, Daphne Chen and Dak Le. “Sewer Crisis in the State of Florida: Aging Infrastructure and Storms Contribute to Massive Spills.” Gannett. <https://stories.usatodaynetwork.com/sewers/>