



Excessive Nutrients Threaten Health of Lake Okeechobee Ecosystem

Introduction

Lake Okeechobee, the largest freshwater lake in the Southeastern United States, is the liquid heart of the Greater Everglades. It is critical habitat for Everglades wildlife, including the endangered Everglade Snail Kite and numerous wading birds. The Lake is also a vital stopover for a host of migratory birds. It receives flows from the Northern Everglades watershed. The Lake connects to the St. Lucie and Caloosahatchee estuaries on the east and west, and flows to the Water Conservation Areas and Everglades National Park to the south.

Prior to the 1900's, Lake Okeechobee's water quality was clear and low in nutrients. Okeechobee's bottom sediments were historically described as "clean sand." Over the last century, large amounts of phosphorus and nitrogen from human sources, mostly from fertilizer, animal feed, and human waste, accumulated in the watershed. This resulted in the degradation of the Lake's water quality.



Problem: Too Much Nutrient Pollution in the Lake

The Florida Department of Environmental Protection (DEP) traced the high levels of phosphorus in the Lake to harmful effects on the ecosystem. Too much phosphorus in the Lake leads to the increased frequency of algal blooms and the dominance of blue-green algae. High levels of phosphorus can also contribute to the accelerated growth of vegetation like cattails and water hyacinth that block navigation and damage wildlife habitat.

In 2001, DEP established the Total Maximum Daily Load (TMDL) for phosphorus to support a healthy Lake system. A TMDL is a calculation of the maximum amount of a pollutant a waterbody can receive and safely meet water quality standards. The TMDL proposes a water quality goal for the Lake based on a five year rolling average, (the average amount of phosphorus entering the Lake for each month for last five years) of 140 metric tons (mt) of phosphorus to Lake Okeechobee. The goal is to achieve an in-Lake target phosphorus concentration of 40 parts per billion in the pelagic (open water) zone of the Lake.

Although the State of Florida has tried several plans to achieve the Lake's TMDL, phosphorus continues to enter the Lake in excessive amounts. Recent phosphorus loads flowing into the Lake have been three to five times higher than the TMDL goal. Over 4,000 metric tons of phosphorus are added to the Okeechobee watershed annually from agricultural and urban sources. The more this pollution accumulates in the watershed and enters the Lake, the harder it is to fix the problem.

Where is the Pollution Coming From?

According to the State of Florida's 2011 *Lake Okeechobee Protection Plan (LOPP)* report, over 70% of the phosphorus entering the Okeechobee watershed comes from agricultural sources, including cow-calf operations, citrus farming, dairies, sugarcane and row crops through the addition of fertilizer and/or animal feed. Pollution from urban stormwater and wastewater contributes around 29% of the phosphorus entering the watershed.

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Forested areas, rangeland, and wetlands now are overwhelmed with phosphorus in their systems. Some of this pollution is shedding to the Lake. Audubon scientists report no significant improvement in phosphorus concentrations in the time period between the 2000 and 2011 LOPP updates.

The State of Florida's deadline to comply with Lake Okeechobee's water quality goals is approaching in 2015. It is urgent to take bold steps now to reduce the continuing flow of pollution into the Everglades' liquid heart.

Improving Lake Okeechobee's Water Quality through Source Control

The first step to restoring Lake Okeechobee's water quality is to stop the continuing influx of pollution entering the watershed. Today, DEP is developing a new plan, known as a Basin Management Action Plan (BMAP) for Lake Okeechobee. The Plan will set limits for phosphorus pollution throughout the Okeechobee watershed. It will appropriate funding for projects and programs to meet the Lake's water quality goals with benchmarks on a timeline. The Plan authorizes DEP and other agencies to develop new and more protective rules for source control.

Audubon Recommends Three Steps to Improve the Lake's Water Quality:

- 1. Reduce agricultural pollution entering the watershed.** The State should maximize the effectiveness of incentive programs for agriculture in the Okeechobee watershed, *known as best management practices (BMPs)*, to significantly reduce the amount of phosphorus from fertilizer and animal feed added to the watershed. While many acres are enrolled in the program, we are not seeing results. This must be improved.
 - Florida Law requires the DEP to verify the effectiveness of BMPs at representative sites. The Plan should clarify exactly how many acres of agricultural lands are implementing BMPs, and the amount of the phosphorus reductions achieved. DEP should create a monitoring framework at the subbasin level to verify performance.
 - Right now BMPs focus on what is good for the crop, not how to meet the water quality goal of the Lake. Florida Department of Agriculture and Consumer Services and South Florida Water Management District should update BMP programs to achieve higher reductions of phosphorus.
 - The most effective BMP practices should be prioritized for implementation and funding. DEP should articulate a budget and timeline for implementation.
- 2. Clean up phosphorus hotspots in the watershed.** There are several hotspots within the 3.4 million acre Okeechobee watershed. The State of Florida should fund and implement the following solutions in these problem areas:
 - On-farm water retention prior to downstream treatment.
 - Advanced BMPs for phosphorus hotspots, such as edge-of-farm treatment, expanded waste storage ponds, filter strips, conservation buffers, or berms and diversions to treat discharges, and spreader swales to encourage sheetflow through the wetland buffer.
 - Hybrid (chemical) treatment in hotspot tributaries.
- 3. Prevent pollution from urban areas from entering the natural system.** DEP and the South Florida Water Management District (SFWMD) should restart efforts to craft stormwater regulations for urban discharges statewide and in the Northern Everglades. These rules will limit the amount of nutrients coming off new development in the watershed. The Florida Legislature should close the loophole in Florida law that allows dried-out residuals from human waste to be used as fertilizer. They should stop the expansion of wastewater deliveries to Lake Okeechobee, including reclaimed wastewater.

The Plan will include a variety of large and expensive infrastructure projects to clean the already polluted water, of which a timeline for funding and implementation must be developed. While these are important, stopping the continued influx of phosphorus from agricultural and urban sources is a crucial step that must be done.