NONPOINT SOURCE SUCCESS STORY

Florida

Wetland Restoration Project Increases Dissolved Oxygen Levels in Alligator Creek

Waterbody Improved

Water quality impacts from nutrient loading and polluted runoff from both point and nonpoint sources led the Florida Department of Environmental Protection (DEP) to add Alligator Creek to Florida's 1998 Clean Water Act (CWA) section 303(d) list of impaired waters for exceedances of the historical minimum dissolved oxygen (DO) impairment threshold. In response, project partners implemented numerous nonpoint source pollution management strategies, including the construction of Kapok Park, a local neighborhood park that provides habitat for a variety of wildlife and enhances water quality, flood control and channel stabilization. Improved DO measurements in Alligator Creek show that the project has had a positive impact on water quality.

Problem

Alligator Creek is in the Group 1 Tampa Bay watershed in central Pinellas County in Clearwater, Florida. Alligator Creek flows into Alligator Lake and then into Tampa Bay (Figure 1). The entire reach of Alligator Creek is roughly 4 miles long and falls within WBID 1574. Alligator Creek is a Class III fresh waterbody designated for recreation and the propagation and maintenance of healthy, well-balanced fish and wildlife populations. The predominant land uses in the Alligator Creek watershed are 83 percent urban/built up (of which 48 percent is residential and 52 percent is commercial), as well as transportation, communication and utilities (6 percent).

Portions of the creek are highly modified and engineered, which has altered the natural flow of water within the creek and caused the DO concentrations to fall below the state's applicable water quality standard for Class III waterbodies. As a result, in 1998, DEP placed Alligator Creek on the state's CWA section 303(d) list for DO impairment. Point sources in the Alligator Creek watershed include one domestic wastewater treatment facility; nonpoint sources of pollution include septic systems and surface water runoff.

Story Highlights

In 2003, the City of Clearwater's Kapok Wetland and Floodplain Restoration Project received CWA section 319(h) funding. Kapok Park was designed and

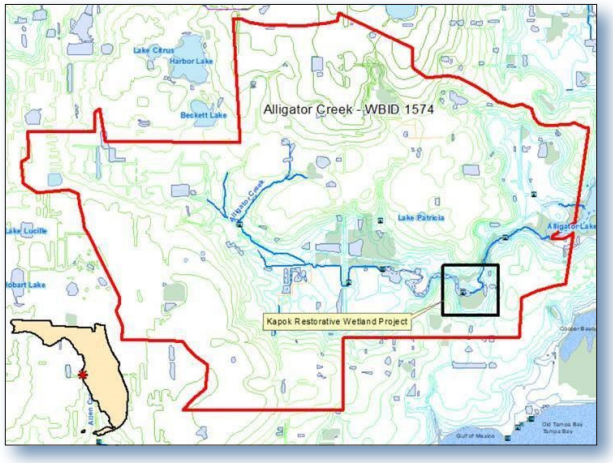

Figure 1. Alligator Creek is on Florida's Gulf Coast.

constructed to address nonpoint source pollution impacting Alligator Creek and provide benefits such as wetland restoration, flood control, water quality improvement and recreational opportunities. Project work was conducted in 2005–2009 and restored the floodplain function to a 37-acre urbanized tract of land. The pollutant load reductions included 23,850.7 pounds per year (lbs/yr) of total suspended solids, 291.8 lbs/yr of total phosphorus, 644.3 lbs/yr of total nitrogen and 10,622.3 lbs/yr of biological oxygen demand.

The project included construction of 19.4 acres of herbaceous and forested wetlands to absorb nutrients, enhance water quality and reduce pollutant loading downstream to Alligator Lake and Old Tampa

Bay. Reducing these pollutants contributed to the improvement of the DO levels in Alligator Lake. The project is located in what was previously the Kapok Mobile Home Park, where most homes were within the 25-year floodplain and approximately one-third of the 200 structures were within the 10-year floodplain. The restored wetland and upland areas also provide essential habitat for wildlife, including many threatened and endangered species (Figure 2). Interpretive signs were installed at the site to educate the public about the benefits of the project.

Results

Thanks to the efforts of many stakeholders and the completion of the Kapok project, the DO concentrations in Alligator Creek have increased (Figure 3). Data were collected at two long-term monitoring stations (21FLPDEM14-10 and 21FLPDEM14-11). The exceedance ratio decreased from 48/90 before and during the project (1999–2009) to 13/59 in the post-project timeframe (2009–2013). DO values also show improvement: minimum values increased from 0.8833 milligrams per liter (mg/L) to 2.2 mg/L, while maximum values increased from 8.9 mg/L to 9.59 mg/L. It is important to note that the mean DO value increased from 4.898 mg/L in 1999–2009 (below the 5.0 mg/L state DO standard threshold) to 6.136 mg/L in 2009–2013 (above the DO standard threshold). These changes in the DO measurements demonstrate that the project has had a positive impact on water quality in Alligator Creek. The increase in DO concentrations can be attributed to the removal of immediately adjacent structures and the restoration of a natural wetland area that established a more natural flow regime.

Figure 2. Kapok Wetland and Floodplain Restoration Project area in 2004 (left: pre-project) and in 2009 (right: post-project).

Partners and Funding

The Kapok Wetland and Floodplain Restoration Project was funded through the City of Clearwater ($5,150,541), Southwest Florida Water Management District–SWIM Trust Fund ($1,089,082), Pinellas-Anclote River Basin Board of the Southwest Florida Water Management District ($726,064) and CWA section 319(h) funding ($490,625). Pinellas County has also implemented multiple environmental education campaigns, including Be Floridian, and has partnered with University of Florida's IFAS Extension offices.

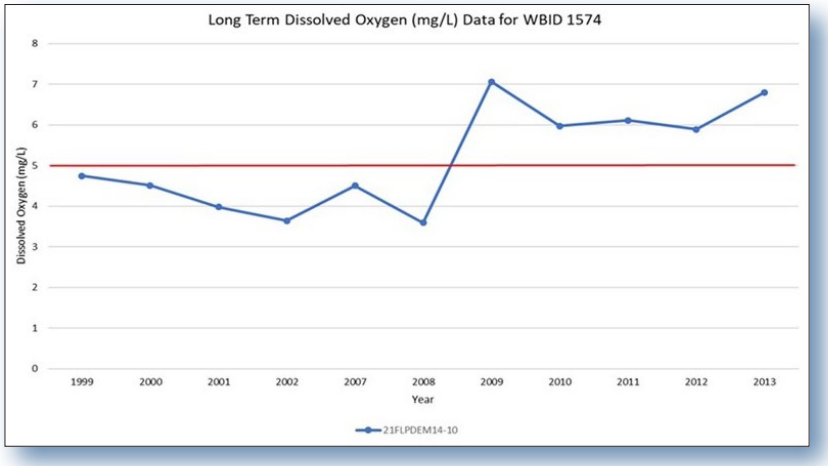

Figure 3. Long-term dissolved oxygen data for Alligator Creek (1999–2013).

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