



## INDIAN RIVER COUNTY, FLORIDA DEPARTMENT OF UTILITY SERVICES

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**Date:** June 26, 2018  
**To:** Jason E. Brown, County Administrator  
**From:** Vincent Burke, P.E., Director of Utility Services  
**Prepared By:** Eric Charest, Environmental Compliance Specialist, Utility Services  
**Subject:** Blue Cypress Lake Testing Update

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### **BACKGROUND/ ANALYSIS:**

On June 19, 2018, the Indian River County Board of County Commissioners (BCC) directed staff with compiling existing data on monitoring activities that are being, or have been, performed on and around the Blue Cypress Lake in western Indian River County. This request was a result of recent publications in which regulatory agencies have been quoted as saying the water quality of the lake has degraded, possibly linked to the land application of biosolids that takes place near the lake. Blue Cypress Lake is classified under Florida Department of Environmental Protection's (FDEP) Surface Water Quality Standards Classes as a Class I waterbody (Potable Water Supply), forming the headwaters of the St. Johns River.

Blue Cypress Lake, with a surface area of nearly 11 square miles, has been identified by many as maintaining a relatively unspoiled ecosystem. Data supporting this claim has been collected and analyzed by many agencies for nearly 40 years, with historical results dating back to 1979. Many of the monitoring sites and programs have been retired over this timeframe, but several sites remain active, with routine monitoring, sampling collection and analyses currently being performed.

Review of the monitoring sites in and around the lake using the FDEP's [STORET](#) (Water Quality Data STOrage and RETrieval system) identified several state and local agencies as participating in data collection and analyses activities. These agencies include (but may not be limited to):

Florida Department of Environmental Protection, Central District  
Florida Department of Environmental Protection, Southeast District  
Florida Department of Environmental Protection, Water Quality Standards Special Projects  
St Johns River Water Management District (SJRWMD)  
Florida Lakewatch  
Ocean Research & Conservation Association (ORCA)

A query of FDEP's STORET and SJRWMD's Environmental Data Retrieval Tool systems yielded more than 37,700 individual test results associated with monitoring performed on and around the lake by the various organizations supplying data from 1979 to present. A summary of the testing performed from 1979 through 2018 with the respective monitoring agency is below:

	FDEP Central District	FDEP Southeast District	FDEP Water Quality Standards	SJRWMD	Florida Lakewatch	ORCA
Algal Growth Potential	X					
Alkalinity (various forms)	X	X		X		
Bacteria (Enterococcus/Fecal Coliform)	X					
Biochemical Oxygen Demand (BOD)	X	X		X		
Chloride	X	X		X		
Chlorophyll (various forms)	X	X	X	X	X	
Color	X	X	X	X		
Dissolved Oxygen	X	X	X	X		
Fluoride	X	X		X		
Hardness				X		
Light, Photosynthetic Active Radiation at Depth (PAR)				X		
Metals *	X	X	X	X		
Microcystin	X			X		X
Nitrate + Nitrite (Nox)	X	X	X	X		
Nitrogen, Ammonia	X	X	X	X		
Nitrogen, Total Kjeldahl	X	X	X	X		
Orthophosphate	X	X		X		
PCBs	X					
Pesticides	X					
pH	X	X	X	X		
Phosphorus (Total)	X	X	X	X	X	
Secchi disk depth	X	X		X	X	
Semi-Volatile Organic Compounds	X					
Silica				X		
Silicon				X		
Solar irradiation, local				X		
Specific Conductivity	X	X	X	X		
Sucralose		X				
Sulfate	X	X		X		
Temperature	X	X	X	X		
Total Dissolved Solids	X		X	X		
Total Nitrogen					X	
Total Organic Carbon	X	X	X	X		
Total Suspended Solids	X	X		X		
Turbidity	X	X	X	X		
Volatile Solids				X		

\* Metals data includes results for Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Vanadium and Zinc

Attachment 1 (Blue Cypress Lake STORET Monitoring Sites) shows where samples were collected in the 1979 to present timeframe and were used to populate the table above. Many of these sites only saw a single collection, while some sites can provide a longer history.

Attachment 2 (Water-CAT Active Monitoring Location Map) identifies the 'active monitoring sites' in and around Blue Cypress Lake. This map was created through the University of South Florida's Water-CAT [database](#) (The Florida Water Resource Monitoring Catalog) and defines 'active monitoring sites' as sites that have had monitoring activity within the past four years. This map does show a significant reduction in the monitored sites when compared to the STORET map of sites, although the 'active' sites do reflect targeted coverage of the Blue Cypress Lake and immediate surroundings.

Site monitoring requirements on the FDEP-permitted Biosolids Land Application sites are minimal and self-reported. Soil fertility testing is to be performed in accordance with the site's Nutrient Management Plan at a frequency of at least once every five years, and site pH testing to be conducted annually. No site-specific data was located at the time of this report.

The occurrences of algae blooms in water bodies has a strong correlation to elevated levels of nutrients found in those water bodies. The FDEP has created and maintains an Algal Bloom Sampling Results interactive [webpage](#) (Attachment 3) in which results from algae sampling activities are stored. Between the FDEP and SJRWMD, results from recent algal monitoring activities on and around Blue Cypress Lake are made available to the public.

With the various regulatory agencies having vast amounts of historical data, and with some of those same agencies still having active monitoring plans in place in and/or around Blue Cypress Lake, evaluations by their experts on the data may be used to drive future monitoring programs. Advances in testing techniques have brought forth analytes that can be used to track anthropogenic influences. When the regulatory agencies review their sampling plans and results, perhaps they can include tests such as Sucralose, Caffeine, Acetaminophen or Nitrogen isotopes in an attempt to identify sources of any elevated results that they may find.

#### **RECOMMENDATION:**

Staff recommends that we continue to observe the monitoring programs in place from the Florida Department of Environmental Protection and the St Johns River Water Management District and inquire about them adding anthropogenic marker tests to their routine sampling should the data point to an increased nutrient loading in the area.

#### **ATTACHMENTS:**

1. Blue Cypress Lake STORET Monitoring Sites
2. Water-CAT Active Monitoring Location Map
3. Florida Algal Bloom Sample Collection View Map and Results
4. Various Sampling Location Results