EcoSummary

Wakulla Springs

10/8/2003

Background

The Florida DEP Bureau of Laboratories has been conducting quarterly sampling of the Wakulla River within the boundaries of Wakulla Springs State Park, just below the tour boat turn-around area. Data from these efforts will be used for documenting conditions within the river and for making resource protection decisions. Wakulla Springs State Park is located in Wakulla County, Florida (see Figure 1). The Wakulla River begins in the park, flows south, and joins the St. Mark's River before flowing into the Gulf of Mexico. Wakulla Springs is a Floridan Aquifer-dominated system and is known for its recreational and aesthetic qualities.

Wakulla Springs was sampled on October 8, 2003 as part of the quarterly monitoring program and to determine the long-term results of the Aquathol® herbicide treatments. Water chemistry samples were taken for ammonia, nitrate-nitrite, total Kjeldahl nitrogen (TKN), total phosphorus, *Enterococci*, *Escherichia coli*, fecal coliform, total coliform, and other analyses. Habitat assessment, qualitative periphyton sampling, and benthic invertebrate stream condition index (SCI) sampling were also conducted. See Figure 2 for results of this testing and Figure 3 for the SCI trend.

Results

Ammonia and TKN were not detected. Total phosphorus (0.027 mg /L) was very low (just above the detection limit). The nitrate-nitrite concentration (0.78 mg/L) remained elevated, higher than the values found in approximately 90% of Florida streams. The sampling site is approximately a mile downstream from the spring boil, and nutrients are expected to be lower than those at the boil due to uptake by the copious growth of vegetation in the river.

In October 2003, Enterococci (40 CFU/100 mL) and *Escherichia coli* (30 CFU/100 mL) densities are below the EPA single-sampling guideline values for designated beach areas. Fecal coliform (48 CFU/100 mL) and total coliform (380 CFU/100 mL) levels comply with Class III water quality standards.

The stream condition index (SCI) score (11) remains in the "very poor" category. Historically, the Wakulla Springs SCI score is in the "poor" or "very poor" range. The use of Aquathol® herbicide reduces the growth of the nuisance plant *Hydrilla*, although re-growth occurs within months of application. It is hypothesized that improvements in the dissolved oxygen regime and in-stream habitat attributable to the temporary control of *Hydrilla* results conditions favorable to macroinvertebrates, yielding improved SCI scores. When *Hydrilla* growth again reaches nuisance proportions, SCI scores decline

The habitat assessment score (137) was in the "optimal" category. The periphyton community was dominated by diatoms and blue-green algae, and many of the taxa found are tolerant of nutrient enriched conditions. In addition, a few algal blooms have been noticed.

In conclusion, the nitrate-nitrite concentration remains elevated. The periphyton community also reflects nutrient enrichment.

Wakulla Springs will continue to be sampled as part of the quarterly Springs Monitoring program.

Figure 1: Overview Map

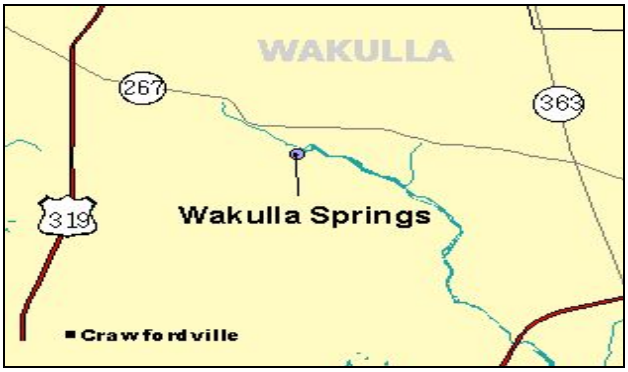


Figure 2: Data Table

Wakulla Springs			
Sampling Date		October 8, 2003	
Macroinvertebrate Parameters		Periphyton Parameters	
SCI Score	11	% Bacillariophyceae	45.98
SCI Evaluation	Very Poor	% Chlorophyceae	5.14
Number of Taxa	15	% Cyanophyceae	48.87
EPT Index	2	Dominant Taxon	Cyanobium parvum
Florida Index	6	% Contribution Dominant Taxon	39.23
% Contribution Dominant Taxon	71.3	Physical-Chemistry Parameters	
% Diptera	6.48	Habitat Assessment Score	137
Total Number Chironomidae Taxa	4	Specific Conductance (umhos/cm)	322
%Filter-Feeders	5.56	Dissolved Oxygen (mg/L)	4.2
Chemistry Data		pH (SU)	7.1
Ammonia (mg N/L)	0.01 U	Temperature (deg C)	20.9
Nitrate-Nitrite (mg N/L)	0.78	Bacteria Parameters	
TKN (mg/L)	0.06 U	Enterococci (colonies/100ml)	40
Total Phosphorus (mg P/L)	0.027 I	Eschericia coli (colonies/100ml)	30 B
Color (PCU)	5 U	Fecal Coliforms (colonies/100ml)	48
Turbidity (NTU)	0.35	Total Coliforms (colonies/100ml)	380

"I"-Below Quantitation Limit; "U"- Below Detection Limit; "B"- Based on Results Outside the Acceptable Range

Figure 3: SCI Scores Over Time



FOR MORE INFORMATION, CONTACT:
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