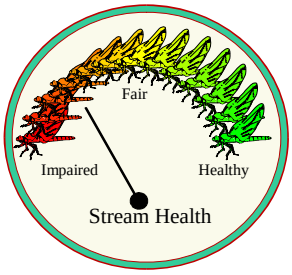


EcoSummary

Wakulla Springs
5/16/2005

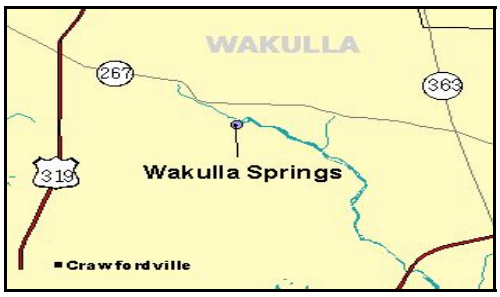


Background

The Florida DEP Bureau of Laboratories conducts quarterly sampling of the Wakulla River within the boundaries of Wakulla Springs State Park, at a site located just below the tour boat turn-around area. Data from these efforts are 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 Floridian Aquifer-dominated system and is known for its recreational and aesthetic qualities.

Wakulla Springs was sampled on May 16, 2005, as part of the quarterly monitoring program and to determine the long-term results of Aquathol® herbicide treatments. Water chemistry samples were collected for ammonia, nitrate-nitrite, total Kjeldahl nitrogen (TKN), total phosphorus, *Enterococci*, *Escherichia coli*, fecal coliform, total coliform, and other analyses; see Figure 2. Habitat assessment and benthic invertebrate stream condition index (SCI) sampling were also conducted.

Figure 1: Overview Map of the Wakulla Springs Area



Results

The nitrate-nitrite concentration in Wakulla Springs (0.58 mg/L) was slightly decreased from the previous sampling, but remained higher than values found in 80% of Florida streams. The ammonia concentration was below the detection limit; TKN and total phosphorus were below practical quantitation limits. Since the sampling site is about a mile downstream from the spring boil, nutrients are expected to be lower than those at the boil due to uptake by the heavy growth of vegetation in the river.

Enterococci concentration (200 col/100 ml) was above the EPA single-sample guideline of 61 CFU/100 mL for "designated beach areas," although the applicability of this guideline in warm Florida waters is questionable. *Escherichia coli* concentration (56 col/100 ml) was below the EPA single-sample guideline of 235 CFU/100 mL for "designated beach areas." Fecal and total coliform levels complied with Class III water quality standards.

The SCI was recently recalibrated in order to make it a more effective tool for evaluating ecological health of streams. The sampling method remained the same; only the index calculation was changed. The recalibrated SCI tends to produce a more stringent evaluation, since two poorly performing metrics from the old SCI were discarded (% Diptera and number of chironomid taxa). Five additional metrics correlated with human disturbance were added, for a new total of ten metrics. The ten metrics are: total taxa, Ephemeroptera taxa, Trichoptera taxa, percent filterers, long-lived taxa, clinger taxa, percent dominance, percent Tanytarsini, sensitive taxa, and percent very tolerant taxa. More details can be found in the FDEP Standard Operating Procedures, LT 7200. The recalibrated SCI went into effect June 8, 2004, when the FDEP Quality Assurance Rule was finalized. SCI samples collected after that time may yield different results from prior evaluations.

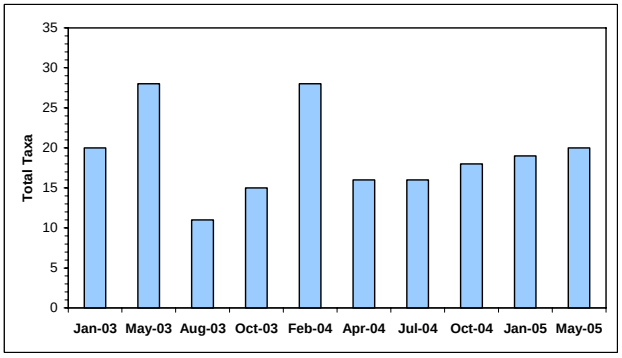
The habitat assessment score (129) was in the "optimal" range. The SCI score (31) was in the "poor" range but was better than the previous score of 19. The SCI scores at Wakulla Springs are potentially related to *Hydrilla* density (and the associated low dissolved oxygen from *Hydrilla* respiration and decomposition), with better SCI scores possibly associated with times when the *Hydrilla* density is reduced. In conclusion, elevated nitrate-nitrite concentrations and *Hydrilla* control continue to be the issues of concern in Wakulla Springs.

Figure 2: Data Table

WAKULLA SPRINGS			
Sampling Date	5/16/2005	**Physical-Chemical Data**	
Macroinvertebrate Data		Habitat Assessment Score	129
SCI Score	31	Temperature (deg. C)	21.0
SCI Evaluation	Poor	pH	7.5
Chemistry Data		Dissolved Oxygen (mg/L)	4.3
Turbidity (NTU)	0.45	Specific Conductance (umhos/cm)	294
Color (PCU)	15	**Bacteria Data**	
Ammonia (mg/L)	0.01 U	*Escherichia coli* (col/100 mL)	56 Q
Nitrate-Nitrite (mg/L)	0.58	*Enterococci* (col/100 mL)	200 Q
TKN (mg/L)	0.10 I	Fecal Coliforms (col/100 mL)	42 Q
Total Phosphorus (mg/L)	0.031 I	Total Coliforms (col/100 mL)	230 Q

"U"=Below detection limit; "I"=Below practical quantitation limit; "Q"=Outside of holding time

Figure 3: Total Number of Macroinvertebrate Taxa Over Time



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