



Southeast District
Surface Water Ambient Monitoring
Ecosummary

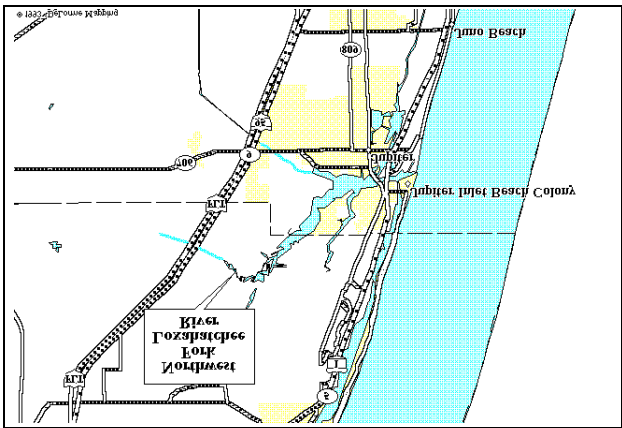
Northwest Fork of the Loxahatchee River

National "Wild and Scenic" River
Martin and Palm Beach Counties
September, 1996



"Within a few minutes, we are immersed in the quiet, gliding over a dark mirror of water into the secluded grotto of the surrounding forest... In the water's blurred reflection are the images of the ancient cypress tress that still line the river - some nearly five centuries old. The forest is a dark and tangled thicket of red maple, dahoon holly, slash pine and oak." from A Canoe Adventure Down Florida's Wild and Scenic River, Florida Wildlife, Vol. 50, No. 5.

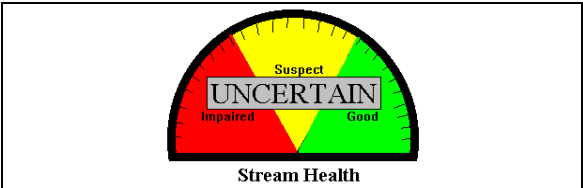
A Site Worth Watching



The Northwest Fork of the Loxahatchee River is the only Florida stream federally recognized as "Wild and Scenic". It is located within Jonathan Dickinson State Park. Although biological sampling indicates an extremely healthy aquatic invertebrate community, long-term trends indicate a decline in dissolved oxygen levels. If this downward trend continues, adverse changes in the biological community are likely to occur despite the presence of superb habitat.

The area is used for bird watching, canoeing and fishing for tarpon, snook, bass and bowfin. The stream is also home to wild boar, mountain mullet, barred owl, alligator, wild turkey, indigo snake and merlin.

Biological Stream Condition Index (SCI)



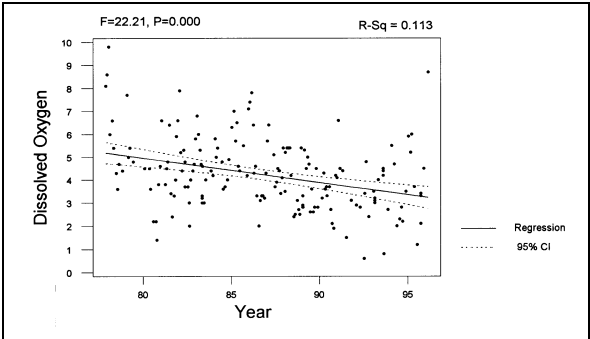
The Northwest Fork macroinvertebrate community has been sampled twice per year since 1992. The biota-based Stream Condition Index (SCI) has consistently rated the water quality as "Excellent". This is not surprising due to the strong flows and the expanse of natural habitat and structure the Wild and Scenic section of the river affords.

Physical and Chemical Status

There are no detectable trends in nitrogen (long-term mean »1.0 mg/l), pH (mean »7.4) or conductivity (mean »540TS). These values do not indicate a water quality problem. Average total phosphate is currently about 0.06 mg/l, an acceptable level; however, there have been recorded spikes above 0.2 mg/l particularly during 1984-86. Traces of the pesticide endosulfan were detected in a sediment collected in 1993 by FDEP. There was also a large copper-induced agrochemical fish kill in 1992.

There appears to be a downward trend in dissolved oxygen. This same trend has also been reported by Loxahatchee Environmental Control District (LOXENCON) water quality monitoring (Riverkeepers, Summer 1996). LOXENCON reports that average DO at their station "69", sampled monthly about one mile upstream of the FDEP monitoring site, was 3.3 mg/l during the period 1990-93.

The following graphs depict the downward trend in dissolved oxygen using all available data (FDEP, SFWMD and LOXENCON). The mean DO for 1994-95 was 3.8 mg/l, a violation of the minimum 5 mg/l state standard for fresh waters.



Cold water absorbs more oxygen than warm. Seasonal bias may be removed by evaluating "percent saturation". The downward trend is still clear.

The technique of Buell and Grams¹ was employed to insure that the observed trend is not an artifact of changing flow patterns². Using USGS flow data, this statistical method reveals that the apparent trend in DO is very significant ($P<0.001$).

Summary

This stream supports a diverse and well-balanced population of organisms, most likely a result of excellent habitat conditions. Stormwater from the large-scale Jupiter Farms development, water drawn from the C-18 canal and the fact that the Loxahatchee has been severed from its historical slough headwaters may all be factors contributing to the negative trends in dissolved oxygen. If the observed trends continue unabated, adverse changes in the biological community can be expected.

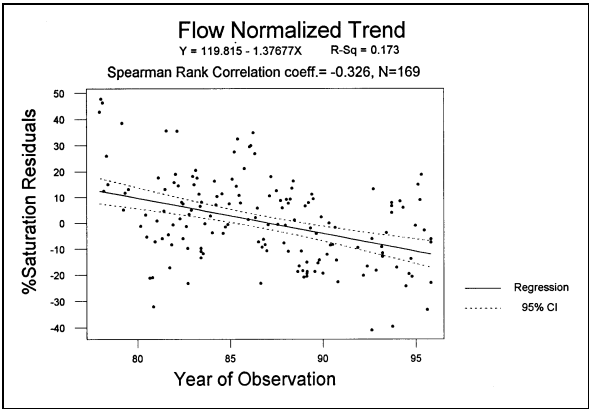
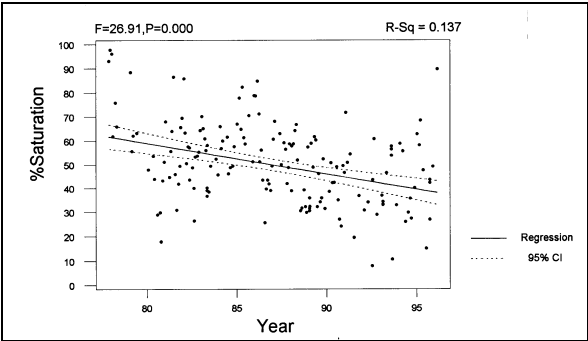
Recommendations

A cooperative effort by LOXENCON, SFWMD and/or FDEP should be undertaken to determine the cause of and find solutions for the worrisome trend in dissolved oxygen. SED SWAMP has been in contact with LOXENCON, which is actively pursuing this matter.

For Further Information

Contact Greg Graves or Doug Strom of the Southeast District of the Florida Department of Environmental Protection, Surface Water Ambient

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Monitoring Program, at 407/871-7662.

Direct Internet email to:
GRAVES_G@WPB1.DEP.STATE.FL.US
STROM_D@WPB1.DEP.STATE.FL.US

¹ Buell, G.R. and S.C. Grams. 1985. "The Hyrdologic Bench-Mark Program: A Standard to Evaluate Time-Series Trends in Selected Water Quality Constituents", USGS 84-4318.

² R-squared values for all flow-dependence models were less