

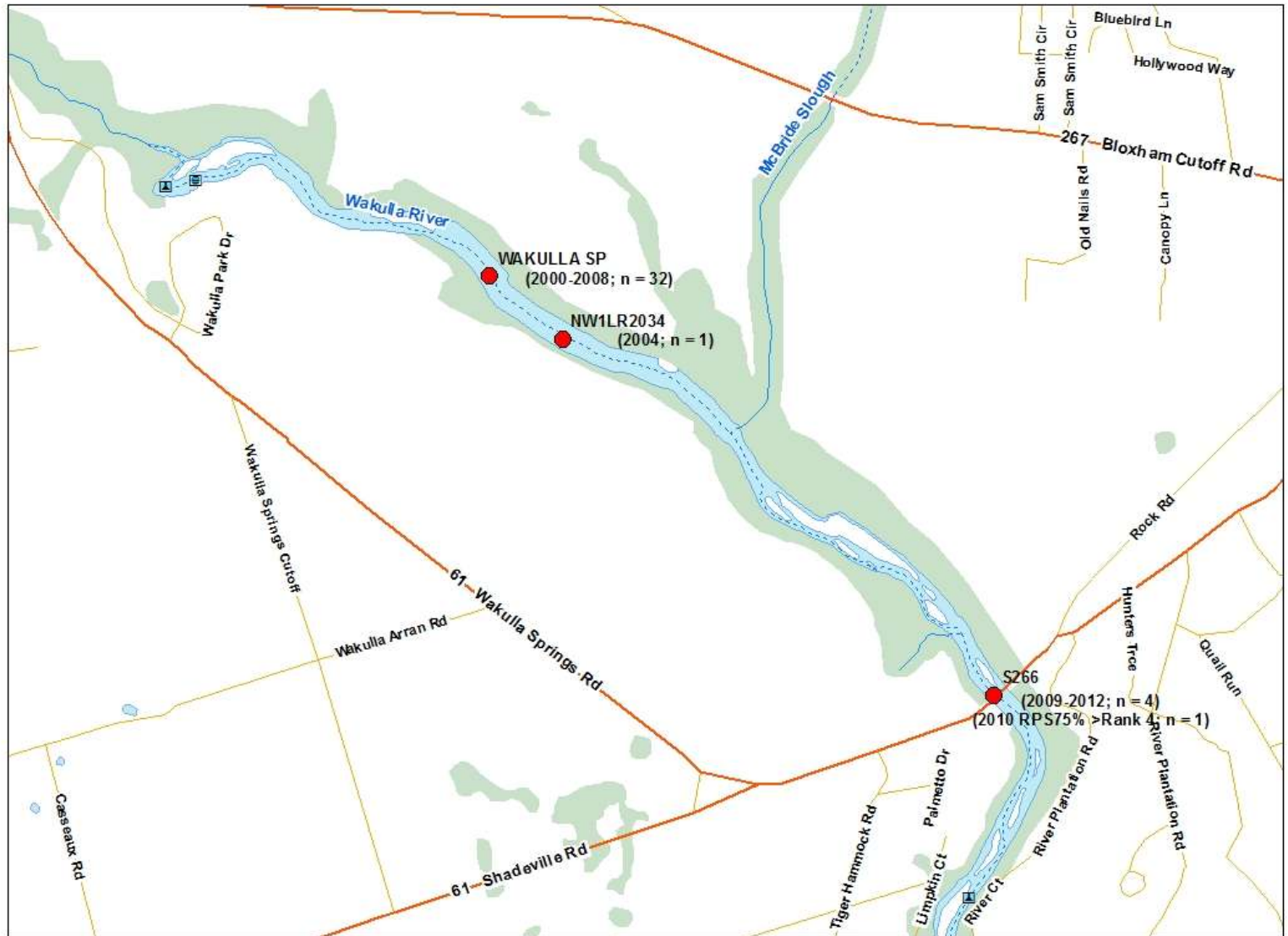


Wakulla River Biological Assessments

Joy Jackson
Standards and Assessment Section
FDEP

March 28, 2013





● Biological Stations from SBIO

Wakulla River Biological Stations

0 0.5 1 Miles





Numeric Nutrient Implementation

- Information on chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition do not indicate an imbalance in flora or fauna; AND EITHER
- The average score of at least two temporally independent SCIs is 40 or higher, with neither of the two most recent SCI scores less than 35, OR
- The Nutrient Thresholds (expressed as annual geometric means) are not exceeded more than once in a three year period





FDEPs Biological Tools for Streams

- **Stream Condition Index (SCI)**
 - The SCI is a biological assessment procedure that measures the degree to which flowing fresh waters support a healthy, well-balanced biological community, as indicated by benthic macroinvertebrates.
- **Rapid Periphyton Survey (RPS)**
 - Used to quantify the extent (coverage) and abundance (thickness) of attached algae (periphyton) and is an effective tool to quantify abundance of nuisance or problematic algal growth.
- **Linear Vegetation Survey (LVS)**
 - Evaluates the ecological condition of streams based on vascular plants.





SCI Evolution

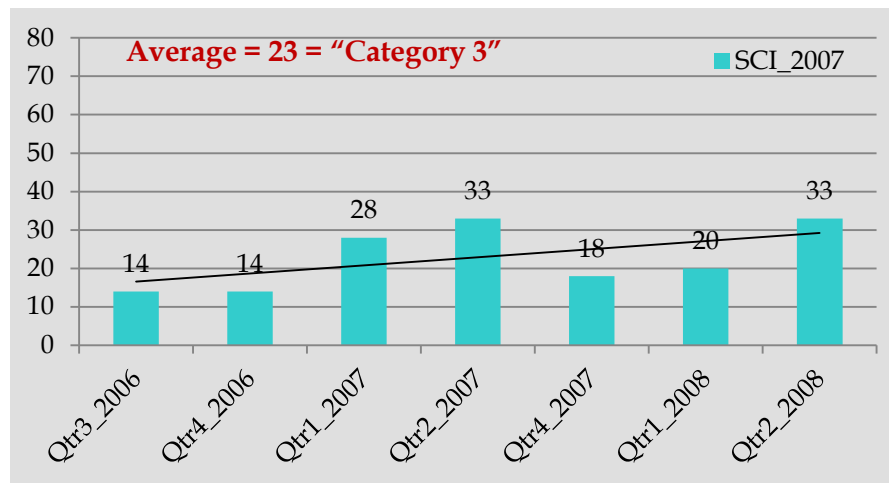
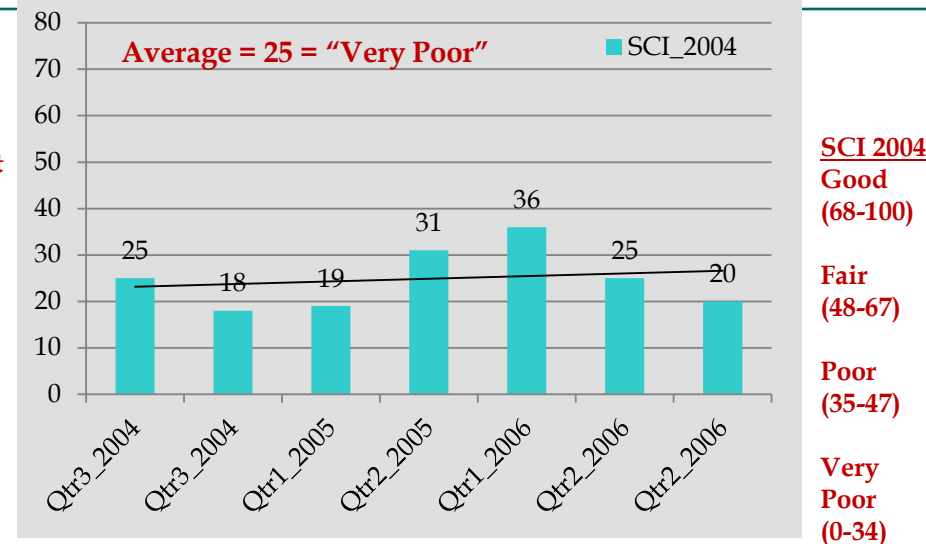
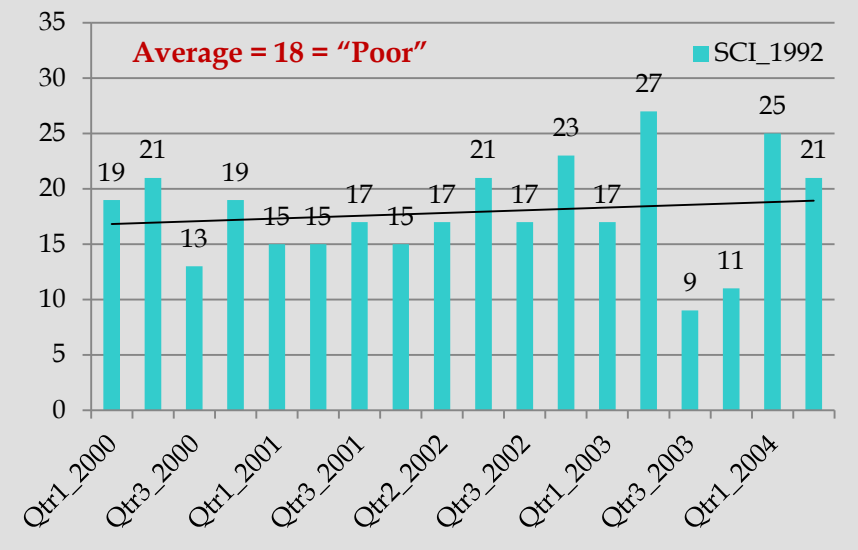
Version	Target	Calculation	# Metrics	Calibration	Word Result	Score Range
SCI_1992	100-120 Individuals	Bioregion & Season	7	Reference vs. Test Sites	Excellent Good Poor Very Poor	varied by Bioregion (never greater than 33)
SCI_2004	100-110 individuals	Bioregion	10	Human Disturbance Gradient (HDG)	Good Fair Poor Very Poor	68-100 48-67 35-47 0-34
SCI_2007	average of 2 reps x 150 individuals	Bioregion	10	HDG + Biological Condition Gradient + Reference Approach	Category 1 Category 2 Category 3	68-100 35-67 0-34



Cannot directly compare SCI_1992 scores to SCI_2004 or SCI_2007 scores!



Upper Wakulla (WAKULLA SP) - SCI Over Time



New Criteria
Average >40 &
no score <35





Evaluating Algal Mats with the RPS

- DEP compared RPS results from a population of minimally disturbed sites. These sites had a mean value of 6% and a 90th percentile of 25% (Rank 4-6 represent epiphyte lengths of > 6 mm).
- If a stream segment exceeds an RPS 4-6 coverage of >25% during two consecutive, temporally independent samplings (> 3 months apart), the Department considers this as evidence that the NNC is not achieved.





Upper Wakulla RPS Results

- Only one RPS sample from the Upper Wakulla at station S266 (4/12/2012)
 - 75% of the points assessed had a Rank ≥ 4 algae coverage
 - Need an additional sample to confirm
- One RPS sample from ~ 0.5 mi below Hwy 98 where 40% of points assessed had Rank 4 or greater





Upper Wakulla RPS Results

1. Were environmental conditions associated with the RPS samples representative of the typical conditions of the system? (*e.g.*, flow between 10th and 90th percentile of long term discharge, light penetration characteristic of system, sampling location representative of waterbody segment, etc).
 - 1a. Yes, proceed to couplet 2.
 - 1b. No. Collect additional RPS samples at representative locations and during representative conditions, and return to couplet 1.





Upper Wakulla RPS Results

2. Results of two temporally independent RPS samplings show that RPS rank 4-6 is 25% or less?
 - 2a. Yes. Evidence that the waterbody *achieves the algal mat component of floral measures* (other components must still be evaluated). If RPS rank 4-6 results are between 20% to 25%, then algal species composition will also be evaluated (see algal species composition decision key).
 - 2b. No, evidence that the *nutrient standard at 62-302.531(2)(c) is not achieved*.

