

ERRONEOUS TOTAL SUSPENDED SOLIDS AS A RESULT OF NO TO LOW FLOW CONDITIONS AND FLOCCULENT SUBSTRATE

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Abstract Substrate from tributaries that discharge into Lake Okeechobee consists of organic flocculent material that adsorbs organic phosphorus and nitrogen. In suspension, this material forms colloidal particles that enrich the eutrophic waters of Lake Okeechobee with these nutrients. Accurately measuring total suspended solids (TSS) in these tributaries can provide needed insight into this important mechanism for nutrient transport.

Measuring TSS in these tributaries is performed by boat or by wading across the tributary following a tag line. The equal-width-increment method is used to divide the tributary into 8-10 sections for sampling. A weighted bottle sampler is used to collect samples because the stream velocity, less than 2 ft/s, is too slow to effectively collect an isokinetic sample. The weighted bottle sampler is lowered close to the bottom of the tributary and raised to the surface at a constant rate. Sub - samples are composited into a churn splitter for processing.

Plumes of TSS are common when sampling streams that contain unconsolidated mud (in the riverbed/in suspension). These plumes complicate the sampling process because they can remain in suspension for extended periods in low to no flow conditions. At times, low to no flow conditions are observed in the tributaries around Lake Okeechobee, especially the dry season. The TSS samples taken during these periods can be biased high due to the loose sediment that is put in suspension by launching the canoe, setting up the tag line, or by hitting the substrate with the sampler.

The maximum TSS measured at Otter Creek was 651 mg/L with an associated discharge of 266 ft³/s. To contrast, a TSS of 10 mg/L was observed along Fisheating Creek, the tributary with the maximum discharge often above 5,000 ft³/s. The TSS measured in each of the tributaries was typically associated with lower discharges. Additional research is needed to determine the appropriate method to sample these streams during no to low flow conditions so TSS are representative and valid.