

Florida Newsletter items for SWPBA 2014

Microbial Source Tracking

Over the past year and a half, the Florida Department of Environmental Protection has developed the in-house capability to perform Quantitative Polymerase Chain Reaction (qPCR) analyses. The qPCR analyses are being used in Microbial Source Tracking (MST) investigations to try to identify whether human fecal waste sources are contributing to fecal coliform impaired waterbodies. A molecular marker for a particular strain of *Bacteroidales spp.* bacteria (HF183) that is common in the human gut and is quantified using a qPCR molecular method. These results are compared to a couple of chemical markers of human fecal waste, sucralose (Splenda®) and acetaminophen (Tylenol®). Sucralose and acetaminophen enter wastewater treatment plants in similar concentrations; however sucralose passes through the plant at nearly the same concentration as the influent, whereas acetaminophen is nearly or completely removed. The presence of the HF183 human source marker with sucralose and acetaminophen present in similar concentrations is an indication that untreated human wastewater is likely present in the waterbody.

Low Water Study

FDEP uses a Stream Condition Index (SCI) score derived from macroinvertebrate community metrics to help assess the health of stream segments. Macroinvertebrates are collected from a composite of 20 standardized dipnet sweeps partitioned among the major habitat types present (snags, root, leaf, plant, or rock) with the remaining sweeps sampling the bottom substrate, usually sand in Florida. FDEP methods specify that the use of the SCI tool is appropriate on samples collected only under specific hydrologic conditions, which can restrict data collection during abnormal hydrologic periods. To better understand the changes that occur to the invertebrate community and the SCI score during fluctuations in stream water levels, the FDEP-Tallahassee Biology lab has been monitoring 6 stream sites in tributaries of Telogia Creek in the NW Florida Panhandle. Each of the 6 sites is visited once a month. During each visit, flow is measured with a Sontek FlowTracker Handheld-ADV® (Acoustic Doppler Velocimeter) and discharge is calculated, physical-chemical parameters are measured with a YSI 650 MDS data logger and 600XL sonde, habitat assessment and macroinvertebrate SCI samples are collected. Water chemistry is collected every other site visit. Flow data from a nearby gauge in Telogia Creek is downloaded from USGS 02330100 Telogia Creek near Bristol, Florida, to use for comparison to the site flow data. The original study design was to monitor the effects of water levels on SCI scores and to determine the recovery times necessary for the re-establishment of the macroinvertebrate community. During the two years of the study which began shortly after the end of the 2012 drought, the streams have undergone a typical fall dry season, with stream flows nearing zero, and typical high stream flows during the spring and early summer, which have on several occasions resulted in the inundation of the surrounding flood plain. In the past few months, the streams have begun to return to year 1 low water levels. Therefore, the study is being extended into a third year to obtain more low water data for comparison. We look forward to reporting the findings at the end of the study.