

EVERGLADES NATIONAL PARK – WATER QUALITY STATISTICAL ANALYSIS

Client Name: South Florida Water Management District

Type of Service: *Statistical Analysis*



The South Florida Water Management District (SFWMD) currently manages large-scale monitoring programs designed to routinely assess the quality of water leaving the Southern Everglades and entering Everglades National Park (ENP). Under these programs, water quality samples are collected from autosamplers and the resulting concentration data are used to examine the nutrient levels, flow dynamics, short-term spikes, concentration gradients, and load estimates for waters entering the ENP. Key success factors for these programs include establishing that resulting data are representative of actual water quality conditions within these monitoring areas, and identifying any factor contributing to either unrepresentative samples or inconsistent quality assurance, including those associated with the Consent Decree 13 required.

Milian Swain & Associates, Inc. (MSA), in partnership with CH2M HILL, was assigned the task of evaluating the water quality, generated under the District's monitoring program, entering the ENP with the respect to sample collection methods (time-proportional autosampler vs. grab) and frequency. The study plan is based on a cooperative agreement between the ENP and District to optimize the monitoring network in the Southern Everglades.

The MSA team evaluated water quality data collected at 10 monitoring stations for a period from January 2006 to March 2007 using advanced statistical analysis. This study included:

- Evaluation of spatial variations for the quality parameters in (TPO₄, TKN, NO_x, NH₄, D.O., pH, and Conductivity); evaluation of TP and TN loads (where there were flow data) of water near Everglades National Park
- Evaluated the water quality parameters (TPO₄, TKN, NO_x, NH₄, D.O., pH, and Conductivity); TP and TN load (where there were flow data) differences between samplers from autosamplers and grab samples in wet and dry season; rain and no-rain periods and overall sampling period at each site
- Provided information characterizing monitoring networks, identifying redundancies, and increasing spatial efficiency through analysis of spatial variations
- Provided information characterizing the annual, seasonal (wet and dry seasons) and event based (rain and no-rain events) variations of datasets collected using time proportional automated sampling and manual grab sampling methods.