
Pollution Loading and Abatement Analysis in the C-43 Basin Hendry County, FL



Client/Owner: Florida Dept. of Environmental Protection

Project Location: Hendry County, FL

The Comprehensive Everglades Restoration Plan includes a project to design and construct an above-ground reservoir(s) with a total storage capacity of approximately 160,000 acre-ft in the C-43 Basin in Hendry County. The purpose of this feature is to capture runoff from the C-43 basin and releases from Lake Okeechobee. The reservoir(s) will be designed to provide water supply benefits, some flood attenuation, and water quality benefits to reduce salinity and nutrient impacts in the Caloosahatchee River and estuary due to excessive runoff.

GPI is a part of a team led by Tetra Tech that is providing input to the Florida Department of Environmental Protection by performing modeling and analysis of the C-43 Basin. The overall project goals were to develop a water quality assessment tool and associated quantitative water quality targets for the C-43 Basin. This assessment tool and quantitative water quality targets will allow planners, regulators, and local stakeholders to evaluate various alternatives for protecting and enhancing stream flow and water quality within the basin and related impacts on the downstream Caloosahatchee River estuary.

Our role in the project was to identify and compile the data and information needed to develop the water quality assessment tool and identify specific quantitative water quality targets. These products were based on observed water quantity and quality data, land use, soils and topographic information, and agricultural practices information. GPI utilized the water quality data to develop statistical approaches to define appropriate water quality targets for both the freshwater and estuarine portions of the C-43 Basin and Caloosahatchee River. GPI has identified several alternative approaches to define the water quality targets and have developed a decision-making framework to facilitate the application of the targets. The water quality targets were developed based on four independent lines of reasoning: a standards based approach that applied the Florida Impaired Waters Rule, a reference system based approach that statistically compared conditions in the C-43 Basin to a pristine reference system, a historical based approach that statistically compared pre-anthropogenic impact conditions to post-anthropogenic impact conditions, and a living resource based approach that modeled the water quality responses in the estuary to discharge and nutrient loading from the C-43 canal. For the living resource based approach, GPI developed an empirical model to predict chlorophyll-a concentrations based on freshwater discharge (i.e., residence time) and nutrient loading using a Vollenweider type approach.