

South Florida Water Management District – Gulf Coast Estuaries
C-43 Water Quality Treatment and Testing Facility Project (Project ID #862)

Updated, August 2017

The major ecological problems in the southwest Florida estuaries stem from altered hydrology and excess nutrient loading. Below are the District's top restoration priorities for the region.

Improve water quality: Excessive nutrient loading from anthropogenic activities has resulted in a eutrophic system leading to algal blooms and reduced light penetration to the bottom. Algal blooms can cause depressed dissolved oxygen (DO) below the state criteria, depending on the concentration of the bloom, spatial extent, and duration, and submerged aquatic vegetation need light to grow. Improving the quality of water entering the river and estuary are essential in ensuring a healthy ecosystem.

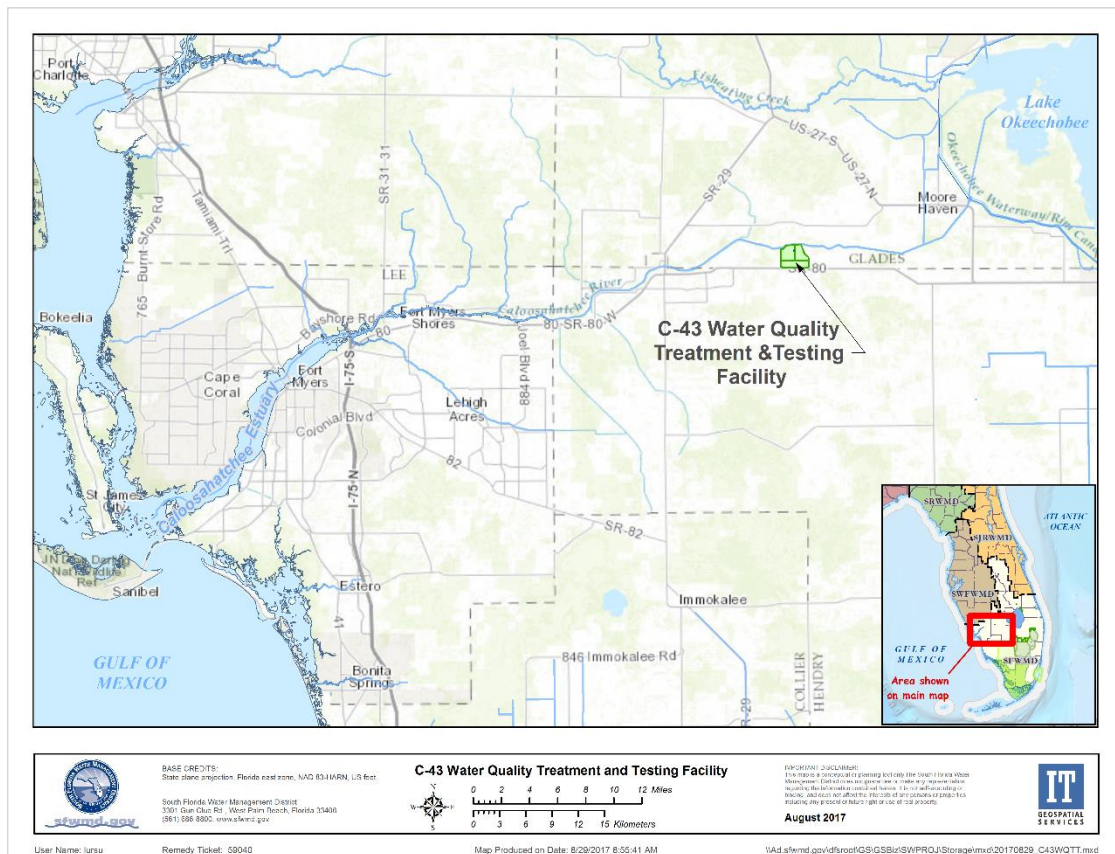
Increase water storage in the watershed: Land clearing and impervious areas have increased both the volume and timing of wet season flows from the watershed, while dry season flows have decreased due to the lack of natural storage and increased water supply demand for agricultural and urban development. Increased storage is necessary to attenuate stormwater runoff in the wet season and provide additional water in the dry season for the estuary and water supply.

Improve salinity regimes: The salinity regime in the Caloosahatchee Estuary is greatly affected by the hydrologic alterations discussed above. At times, discharge from the Caloosahatchee River to the downstream estuary ceases entirely and salt water intrudes upstream causing mortality of brackish and fresh water organisms. Conversely, during the wet season extreme discharges from the S-79 Structure have led to extreme and sudden low salinity conditions within the Caloosahatchee Estuary negatively affecting distribution and abundance marine organisms such as oysters and seagrass.

Restore and protect native habitats: Both native aquatic and upland habitats in the coastal watersheds have been lost due to urbanization, agriculture, exotic and invasive species and anthropogenic pollutants. It is important to restore and preserve these habitats when possible.

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Elevated concentrations of nutrients such as nitrogen and phosphorus in the Caloosahatchee River and Estuary (CRE) contribute to water quality impairments in this system as evidenced by excessive algae blooms and decreased water clarity and dissolved oxygen content. Through more than a decade of successful operation of Stormwater Treatment Areas (STAs), the South Florida Water Management District (SFWMD) has built an extensive expertise in phosphorus removal from stormwater runoff using managed wetland treatment systems—notably, which serve many benefits such as improving water quality, increasing water storage and restoring habitats. The mechanisms for nitrogen removal, especially in the organic forms, using wetland treatment systems have not been studied to the same extent. To investigate and demonstrate cost-effective strategies for reducing nitrogen particularly at the low levels found in the Caloosahatchee River, SFWMD and Lee County are partners on the C-43 Water Quality Treatment Area Testing Facility Project (see maps). The purpose of the project is to investigate and test new strategies for reducing nitrogen in the CRE to improve water quality in downstream estuarine ecosystems and applied to other estuaries in south Florida.



C-43 Water Quality Treatment and Testing Facility project location in Glades County.

In 2007, approximately 2,000 acres of land was acquired with funds from Lee County as well as from SFWMD and State of Florida. In 2015, the first part of the demonstration phase (Phase I) was initiated, which includes bioassays to quantify the dissolved organic nitrogen in the estuary and mesocosms (experimental tanks) to assess nitrogen removal rates of different plants and flow rates; this phase is scheduled to be completed by 2019. The next phase, Phase II, is planned to include larger demonstrations (test and field-scale cells) that will focus on scaling up the most successful treatments of the mesocosms, and is contingent on future legislative funding. If results of the demonstration testing are promising and provide a cost-effective total nitrogen treatment design to achieve the desired concentration reductions, the future proposal is to build a full-scale facility on the property, cost estimates for which are not yet developed and are also contingent on future legislative funding.

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