

South Florida Water Management District
Gulf Coast Estuaries

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 a reduction 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.

C-43 West Basin Reservoir Storage Phase 1 Project

The Caloosahatchee River and Estuary is at the head of a vast estuarine and marine ecosystem that includes aquatic preserves (Matlacha Pass Aquatic Preserve, Estero Bay Aquatic Preserve, Pine Island Sound Aquatic Preserve, Charlotte Harbor National Estuary, and the Caloosahatchee, Matlacha Pass and Ding Darling National Wildlife Refuges), along with numerous other Federal, state, and local parks and recreation areas. Restoration of a healthy, productive aquatic ecosystem in the Caloosahatchee River is essential to maintaining the ecological integrity and associated economic activity in these publicly owned and managed areas.

The C-43 West Basin Reservoir Storage Phase 1 Project contributes to the ecosystem function in the Caloosahatchee Estuary by reducing the number and severity of events where harmful amounts of freshwater from basin runoff and Lake Okeechobee releases are discharged into the estuary system. This primary functions help to moderate unnatural changes in salinity which is extremely detrimental to estuarine communities. The project provides on-site foraging and nursery habitat for aquatic animals

and wading birds. Reservoir operations will also incidentally improve water quality in the Caloosahatchee Estuary, since some of the nutrient-laden runoff and lake water will be stored in the reservoir, allowing for the settling of nutrients and other pollutants within the reservoir prior to delivery to the estuary.

Major features of the C-43 West Basin Reservoir Storage Phase 1 Project include embankments, canals, pump stations, internal control and outflow water control structures, and environmentally responsible design features. The total initial estimated construction cost of the project is \$21,489,000. Once constructed and operational, the C-43 West Basin Reservoir Storage Phase 1 Project will contribute to the improved abundance and spatial distribution of primary organisms such as submerged vegetation, invertebrates, small fish, and other prey organisms including threatened and endangered species.

Lake Hicpochee North Hydrologic Enhancement Project

Historically, Lake Hicpochee was one of three lakes located within ephemeral marshes and swamp forests that Lake Okeechobee flooded during times of high water during the dry season. The western most of these lakes, Lake Flirt, was the headwaters for the Caloosahatchee River. Channelization of the existing river and expansion of the channel connecting the river to Lake Okeechobee greatly altered this natural system. The channel expansion, now known as the C-43 Canal, drained Lake Hicpochee and bisected it into what is now known as Lake Hicpochee North and Lake Hicpochee South (north and south of the C-43 Canal respectively). The primary purpose of this project is to re-hydrate the northern portion of the historic lake bed to a more natural state while providing ancillary water quality improvements and water storage.

Lake Hicpochee North involves hydrologic enhancement by capturing and diverting basin run-off to Lake Hicpochee North and delivering it to the lake. There are two phases to this project. The first phase involves diverting water from the C-19 canal, which discharges directly into the Caloosahatchee River, and diverting it as sheet flow through spreader canals into the lake. The second phase involves capturing and attenuating excess water and peak flows from the C-19 basin in a shallow storage feature and re-distributing that water to the lake. This project will improve ecological functioning of Lake Hicpochee North, aid in controlling salinity levels in CRE, provides dry season benefits to Lake Hicpochee and reduces nutrient loading to the Caloosahatchee River.

Approximately 3,127 acres of land acquisition is needed to complete the second phase of this project. The land purchase agreement involves an initial land purchase (638 acres) with an option to purchase additional lands (2,489 acres). Phase I of this project and the initial land purchase is funded. The District is proposing to request RECOVER funding for the acquisition of the additional 2,489 acres of land to complete phase II which will cost approximately \$16.9M so the project benefits can be fully realized.

C-43 Water Quality Treatment and Testing Project

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 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 storm water runoff using wetland treatment systems. The mechanisms for nitrogen removal, especially in the organic forms, using wetland treatment systems have not been studied to the same extent. In order to investigate and demonstrate cost effective strategies for reducing nitrogen and other nutrients in the Caloosahatchee River, SFWMD and Lee County have been partnering on the C-43 Water Quality Treatment Area Testing Facility Project.

The purpose of the project is to investigate and test new strategies for reducing nitrogen in the Caloosahatchee River to improve water quality in downstream estuarine ecosystems and applied to other estuaries in south Florida. To date, project lands adjacent to the River have been acquired, initial data collection have been completed, wetland based technologies have been assessed, and the testing facility has been conceptually designed. The conceptual design for the testing facility is comprised of mesocosms, which are small experimental water enclosures in which environmental factors are easily manipulated, small impoundments or test cells, and full size test cells that can be replicated to create a fully functional treatment area. The estimated cost to design, construct, and operate the testing facility including laboratory sampling is between \$8 Million to \$9.8 Million. Assuming that funding is in place, actual design of the testing facility may begin as soon as April 2013. If results of the testing are promising, the proposal is to build a full scale facility on the property, cost estimates for which are not yet developed.

Henderson Creek-Belle Meade Project

The Henderson Creek- Belle Meade (HCBM) Basin is the primary hinterland of Rookery Bay estuary, and currently undergoing rapid urban growth. Historic flowways have been disturbed by roads and channelization. Alterations have resulted in drastic changes in timing and distribution of sheet flow runoff, including disproportionate sharing of flows with Naples Bay. Channelized flow also severely restricted ability of wetlands to filter pollutants.

The purpose of this project is to restore historic sheetflow to the Rookery Bay Estuary and, treat basin stormwater, improve water quality in the basin and thus increase habitat values & wetland functions.

The project elements include: 10-acre stormwater marsh filtering system; four culverts under CR 951; hydrologic restoration in Manatee Basin (culverts, ditching & roadbed removal); swales and spreader systems; invasive and exotic plant removal; and road removal.

Contact:

Ernie Barnett, Director of Everglades Policy and Coordination
ebarnett@sfwmd.gov
561-951-2840