2020

HUDSON BAYOU IN-STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS

Sarasota County

Florida Stormwater Association

Excellence Award for

Projects and Programs

February 2020

HUDSON BAYOU IN-STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS

Project Description

A. Population:

Sarasota County has a population of ~426,000 living in a coastal, urban and rural community encompassing 555 square miles. Project is in the City of Sarasota with a population of ~57,000 residents.

B. Personnel and Project Team:

The key project team and stakeholders consisted of:

- Mike Jones, Sarasota County Public Works Stormwater, Project Manager
- Paul Semenec, Sarasota County Public Works Stormwater, Manager
- Peter Peduzzi, Sarasota County Capital Projects Design, Project Manager
- John Saputo, Sarasota County Capital Projects, Construction Manager
- Rhett Butler, Sarasota County Capital Projects, Construction Inspection
- Harold Roebuck, Sarasota County Public Works Stormwater Operations & Maintenance, Manager
- Patricia Wilken, Sarasota County Financial Management, Grant Coordinator
- Paul Pitcher, Sarasota County School Board
- Grant William, Sarasota County School Board
- City of Sarasota – Planning and Engineering Department
- Adurra (former King Engineering, Inc.), Brian Skidmore, Project Manager/ Ecologist
- Adurra (former King Engineering, Inc.), Michael Peck, Engineer of Record
- DRMP, Inc. – Brian Crowl and Breonnia Pittman, Construction Engineering and Inspection
- Sarasota Bay Estuary Program – Concept plan
- Universal Engineering Sciences, Inc. – Geotechnical Investigation
- Wilson Structural, Inc. – Structural Sheet Pile Design
- Tampa Contracting Services, Inc. – General Contractor

C. Budget and Funding Sources:

Source	Amount
Sarasota County CIP #75846:	$ 600,000
SWFWMD Grant Design:	$ 75,000
SWFWMD Grant Construction:	$ 225,000
School Board JPA Construction:	$ 150,000
Total Budget Cost:	**$ 1,050,000**
Construction Contract Cost:	**$ 535,649**

This project was funded through Southwest Florida Water Management District, Sarasota County School Board, Sarasota County Stormwater Rates, and Sarasota County Surtax III General Funds. The project was constructed on schedule and within budget.

D. Project Objective and Goals:

The Hudson Bayou In-Stream Restoration and Water Quality Improvements project is a retrofit project intended to eliminate direct discharge runoff into Hudson Bayou tidal bay tributary, provide sediment abatement load reductions and improve water quality. Project feature and goals:

- **Enhanced Drainage Features and Storage**
- **Pollutant Load Reduction**
- **Tree Island Preservation**
- **Improved Environmental Habitat**

With these stormwater improvements completed, Sarasota County will begin to realize the benefits of enhanced protection of our Bays and waterways.

Hudson Bayou South Channel aerial view

Offline Filter Marsh and Native Plantings

South Channel Filter Marsh - Public Education Signage

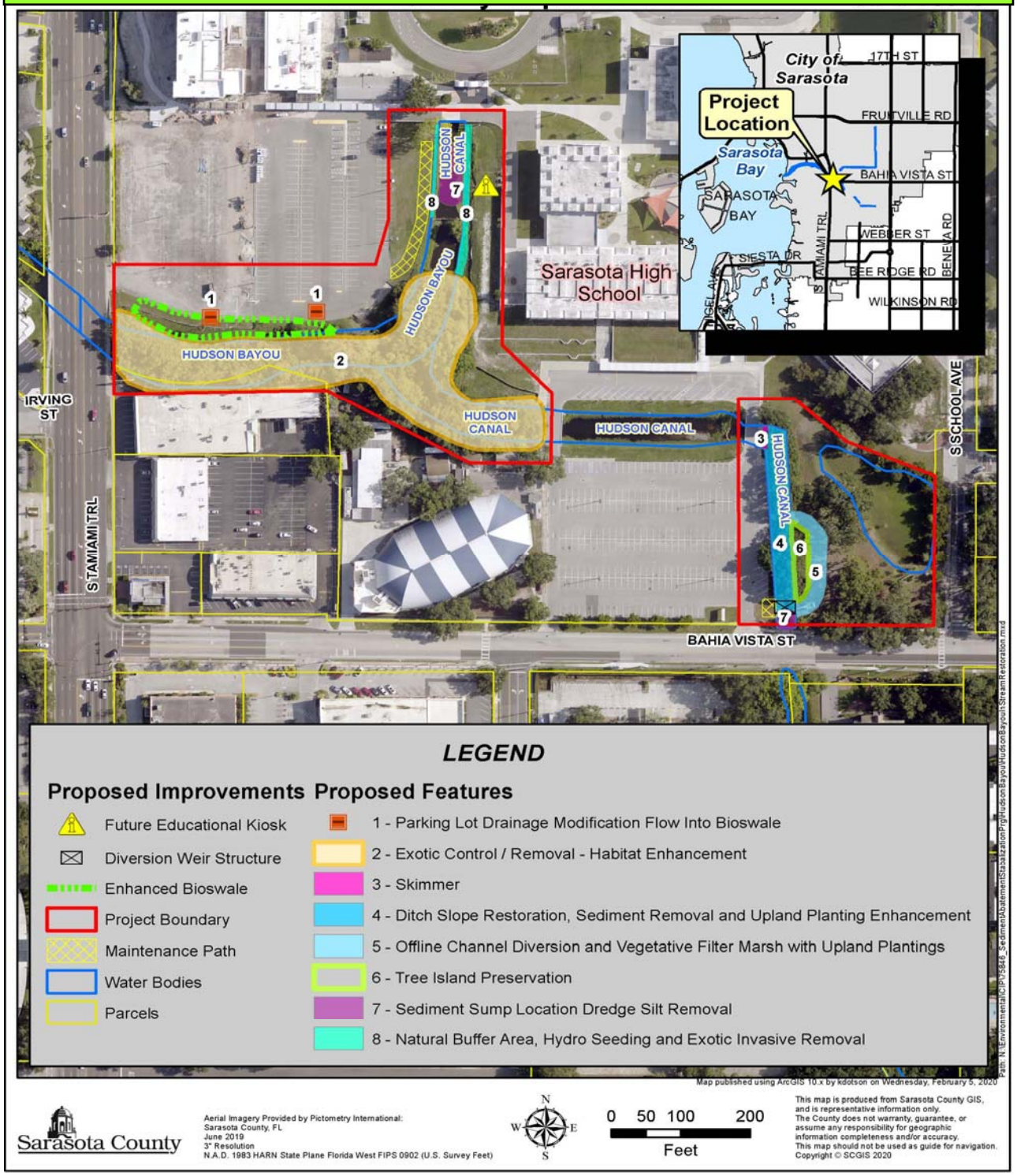
South Channel – Skimmer Structure to Hudson Bayou

Bioswale – In Operation Parking Lot Flume and Control Box

Supporting Information

Hudson Bayou In-Stream Restoration and Water Quality Improvements

Hudson Bayou Basin, Sarasota County **CIP #75846**



Hudson Bayou Project Location Map

In September 2013, Sarasota County, the Sarasota County School Board, the Sarasota Bay Estuary Program, and the City of Sarasota jointly developed the restoration project to improve the habitat and water quality along the two main branches of Hudson Bayou that converge at the Sarasota High School property located near Bahia Vista and US 41in the City of Sarasota. Project components include removing exotic vegetation, creating sediment capture areas, planting native species in wetland and upland areas to improve habitat along the bayou as well as reducing the amount of nitrogen and sediment entering Sarasota Bay.

Sarasota High School North Channel Weir

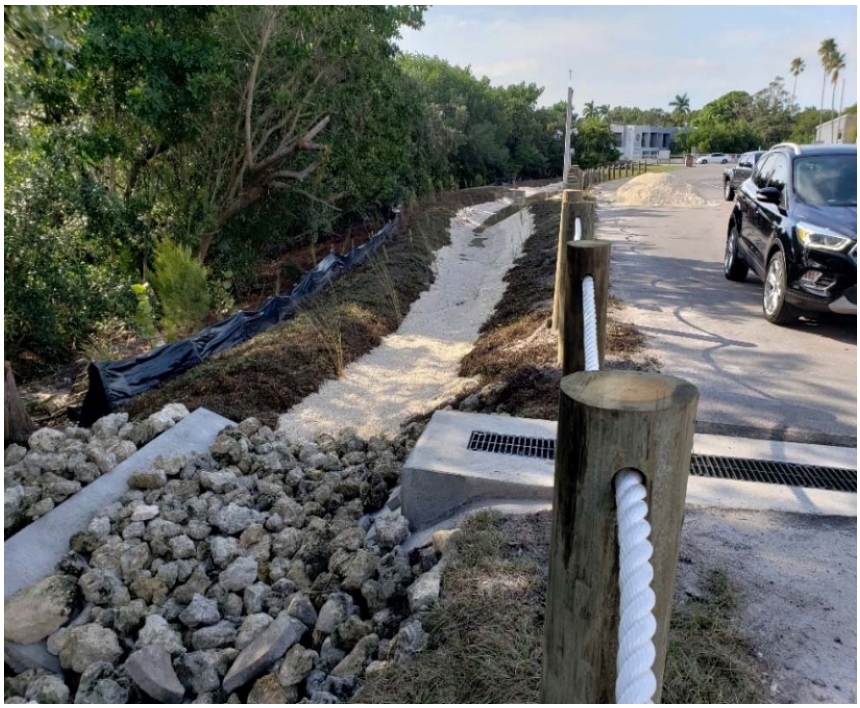
The project planning began in December 2015, construction started in May 2019 and was more than 90% substantially complete in December 2019 and final completion January 7, 2020. The project improvements included the following:

- Removed direct drainage discharge connections into Sarasota Bay. Two (2) parking lot drainage structures were modified to redirect runoff into the newly enhanced bioswale area for treatment.
- Removal of five (5) 60-inch dimeter Australian pine trees, along with Brazilian pepper, Carrotwood and other invasive vines that were choking the mangrove canopy.
- A new Skimmer structure to capture floating trash and debris at the South inflow channel that discharges into tidal waters.
- Tree Island preservation area, excavation of a new offline channel diversion rerouting stream flows through the new vegetated filer marsh and upland planting enhancements
- Ditch slope restoration, and enhanced upland plantings.
- A dedicated sump area for sediment collection and removal.
- Future planned, interpretive educational kiosk to demonstrate the project and explain the measurable water quality benefits.
- Integrate an outreach component with the high school students.

South Channel – Filter Marsh Excavation

Enhanced Drainage Features and Storage The existing school parking lot drainage structures were modified to redirect runoff directly discharging into Hudson Bayou into a new bioswale area. Stormwater facility operation:

1. Parking lot runoff drains into trench drain system and flows into the newly constructed bioswale.
2. The bioswale is designed to collect the first 1/2-inch stormwater runoff, settle out solids, provide vegetative treatment system filtering debris and remove pollutants through filter media.
3. The bioswale system has an outfall box with a skimmer to hold back oils and greases before discharge into the tidal bayou system.

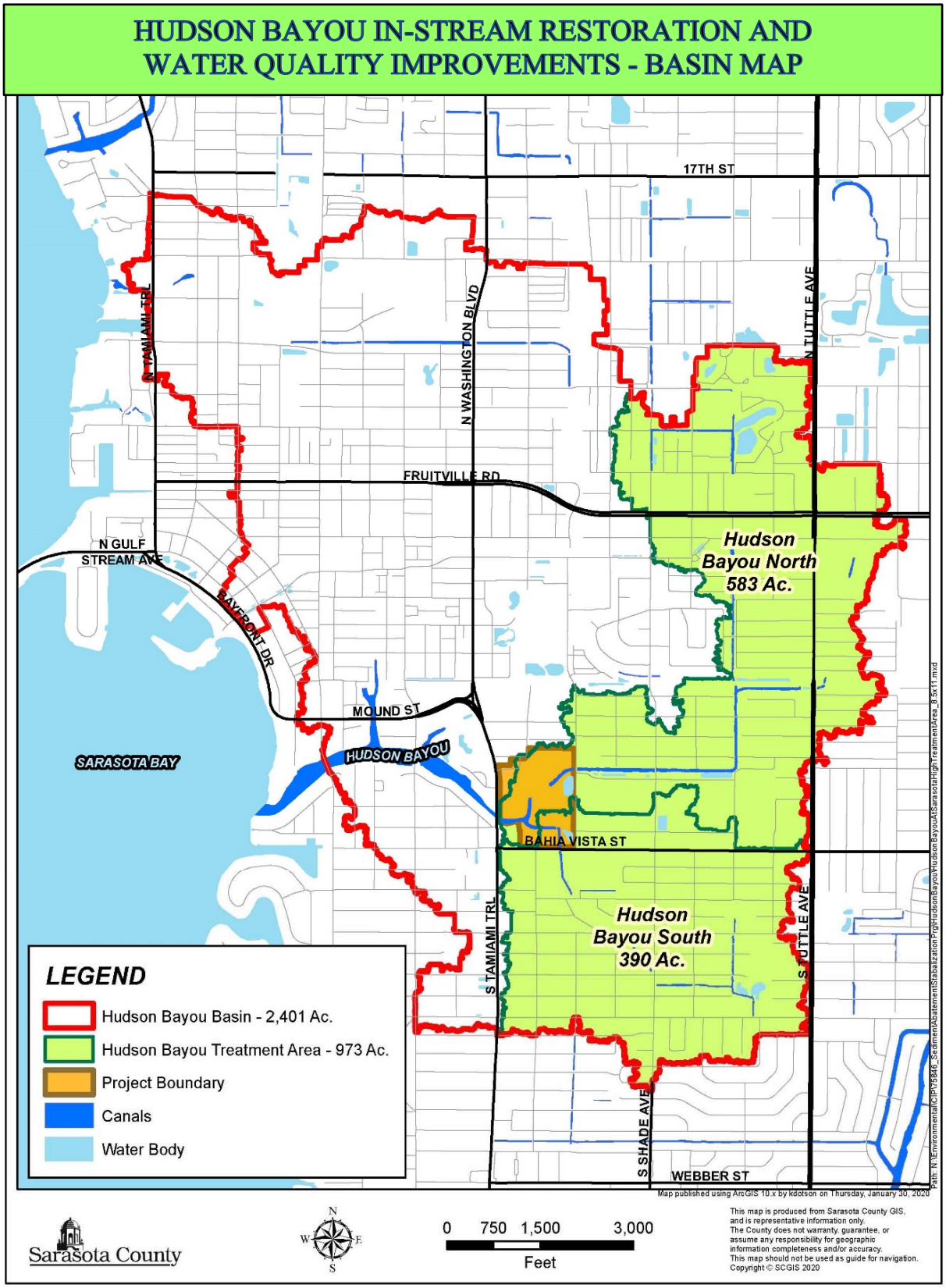


Bioswale Treatment Area and Parking Lot Trench Drainage Box

Pollutant Load Reduction and Sediment Abatement

The target goal to reduce the Nitrogen pollutant load to Hudson Bayou and subsequently Sarasota Bay were achieved through a combination of different design features and BMPs. These include vegetative treatment and uptake, dry detention and infiltration, wet detention, removal of floating trash and debris and mechanical removal of sediments. There are two main contributing drainage basins: North (583 acres) and South (390 acres) basin areas, plus the onsite parking treatment area of 3.5 acres. Total land area treated was 973 acres that drains through the school site of ~1.0-acre size. The net resource benefit statement removal efficiencies were achieved with calculated removal rates of 25% for total nitrogen (TN) and 67% total suspended solids (TSS). The pollutant load reductions meet the goals of the project.

North Channel – Sediment Sump Excavation



Hudson Bayou Treatment Area Map – 973 acres

POLLUTANT LOAD REMOVAL TABLE		
Resource Benefit Parameters	**Load Reduction Mean Annual Removal (lbs/yr)**	**Combined Annual Mean Removal Efficiency (percent)**
Total Nitrogen (TN)	152	25%
Total Suspended Solids (TSS)	71,031	67%

Source: Hudson Bayou In-Stream Restoration Resource Benefit and Cost-Benefit Summary Report 100%, dated 10/27/2016

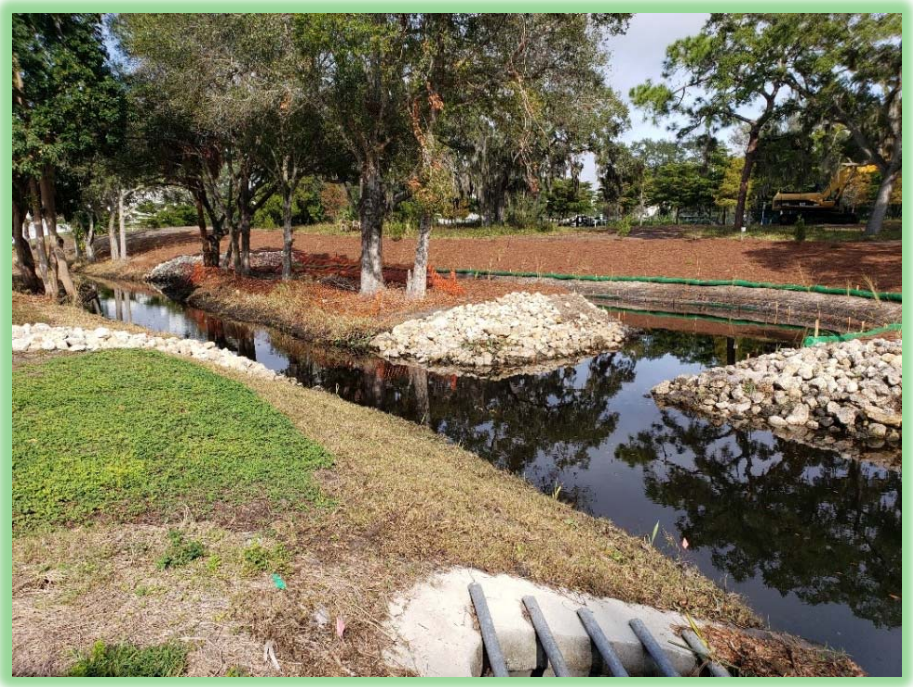
Enhance Environmental Habitat

The removal of exotic vegetation and litter control to enhance the existing tidal mangrove habit within the Hudson Bayou creek system.

Tidal Mangrove Area, Exotic Removals and Native Vegetation Enhancements

Summary

Overall, the project's outcome was a collaborative effort to enhance natural habitat, deliver protection to Sarasota Bay; and provides an educational opportunity to the school and students.



Channel Diversion Vegetative Filter Marsh Treatment