



**Reach E Water Control Structure Construction**



# FALGOUT CANAL FRESHWATER ENHANCEMENT



**Pre-Project**



**Spray Dredging**



**Structure Wall**



**Freshwater Introduction**

*Reducing salinity and increasing freshwater flow to restore our coast and safeguard our community.*

**CHALLENGE:** Falgout Canal was hydrologically cut off from freshwater, causing catastrophic forested and marsh area loss.

**SOLUTION:** Reintroduce freshwater inflows that carry nutrient rich sediments to decaying marsh through spray dredging and water control structures.

**INNOVATION:** Develop and calibrate a 2D, finite element, hydrodynamic model to simulate water and salinity transport; spray dredge as a cost effective method to deposit nutrient rich sediments; design water control structures to allow freshwater to flow through, prevent saltwater intrusion, and allow vehicular traffic to flow on top of the structures.

**COMPLEXITY:** Construction in environmentally sensitive areas, including forested wetlands, vegetated marsh areas, and bald eagle site.

**UNIQUE ASPECT:** Hydrodynamic model utilized to simulate water and salinity levels.

**RESULT:** Freshwater flows reintroduced to a hydrologically isolated estuary.

**Location:** Terrebonne Parish, LA

**Client:** Terrebonne Parish Consolidated Government and Terrebonne Levee & Conservation District (Houma, LA)

**Entering Firm:** T. Baker Smith, LLC (Houma, LA)



The Falgout Canal Freshwater Enhancement project area consists of approximately 7,400 acres of cypress/tupelo swamp; fresh, intermediate, and brackish marsh and open water. It is bounded by Falgout Canal to the south, the Houma Navigation Canal (HNC) to the east, the spoil bank of Bayou Dularge to the west, and a natural ridge to the north. The marshes located in the project area have been hydrologically isolated from historical flow patterns by construction of various pipeline and navigation canals, including the HNC and Falgout Canal. Due to these barriers, the prevailing hydrologic influence is confined to southern tidal flows, which resulted in elevated salinity and land loss in the historically fresh and intermediate marshes. The southern project area consists of uninhabited wetland areas bounded by Falgout Canal Road to the north, the HNC to the east, and the East Lower Dularge Levee to the west. Since the construction of Falgout Canal Road approximately 60 years ago, the southern marshes and estuary have been deprived of the benefits of the positive freshwater flow of the HNC and Falgout Canal. Because the regular exchange of freshwater between the northern basin and the areas adjacent was severed, substantial deterioration of the fresh, intermediate, and brackish marsh caused large open areas of water to form. Prior to this project, the Falgout Canal marsh area had no source of freshwater input other than rainfall.

To enhance freshwater flow to the northern marsh areas, T. Baker Smith, LLC (TBS) collected salinity, meteorological, water surface elevation, and topographic and hydrographic survey data. Using this data, TBS and FTN Associates, Ltd. developed a 2D, finite element, hydrodynamic model (RMA-2/RMA-11) to simulate water and salinity transport in the Falgout Canal estuary. Based on the model, TBS designed a dredging project that allowed freshwater to flow through a water control structure that connected the northern estuary to the HNC. To mimic the sediment deposition that should have naturally occurred, TBS utilized spray dredging to spray dredge sediment on the adjacent swamp and marsh areas to replenish it with nutrient rich soils and open the channels to freshwater flow. TBS also designed the reconfiguration and reconstruction of six additional timber water control structures to control the flow of freshwater through the northern estuary.

To reestablish freshwater flow to the southern estuary, TBS was challenged with introducing freshwater flows through Falgout Canal Road while maintaining vehicular traffic and providing hurricane and storm risk reduction to the residents of Terrebonne Parish. TBS designed two identical water control structures spaced approximately 1.25 miles apart. Each structure consists of seven concrete culverts laid across a pile-supported concrete pad. On the northern side of the structure, cast iron sluice gates were installed on the ends of the culverts to provide a means to control the flow of water through the structures. A braced flood wall (consisting of steel sheetpiles braced by 30-inch diameter steel batter piles) was built to +18.0 EL on the southside of the structure to provide flood protection. Heavy flap gates were attached to the floodwall to allow water to flow south but prevent salt/flood waters from flowing north. The southern basin was dredged for a few hundred feet to allow water exchange through the structure. Finally, Falgout Canal Road was reconstructed across the top of the structures to allow the continued flow of vehicular traffic between the two communities of Dularge and Dulac.