



**NOAA
FISHERIES**

Restoration
Center-Southeast
Region

Connecting Coastal Waters: Hydrologic Restoration in the Northern Gulf of Mexico

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Galveston , Texas

Restore America's Estuaries
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Hydrologic Restoration-What, Why

Undersized
Culverts



Photo Credit: Seattle Conservation Department

Navigation
Infrastructure



Photo Credit: FWS

Outdated Flood
Infrastructure



Photo Credit: Orleans Levee District

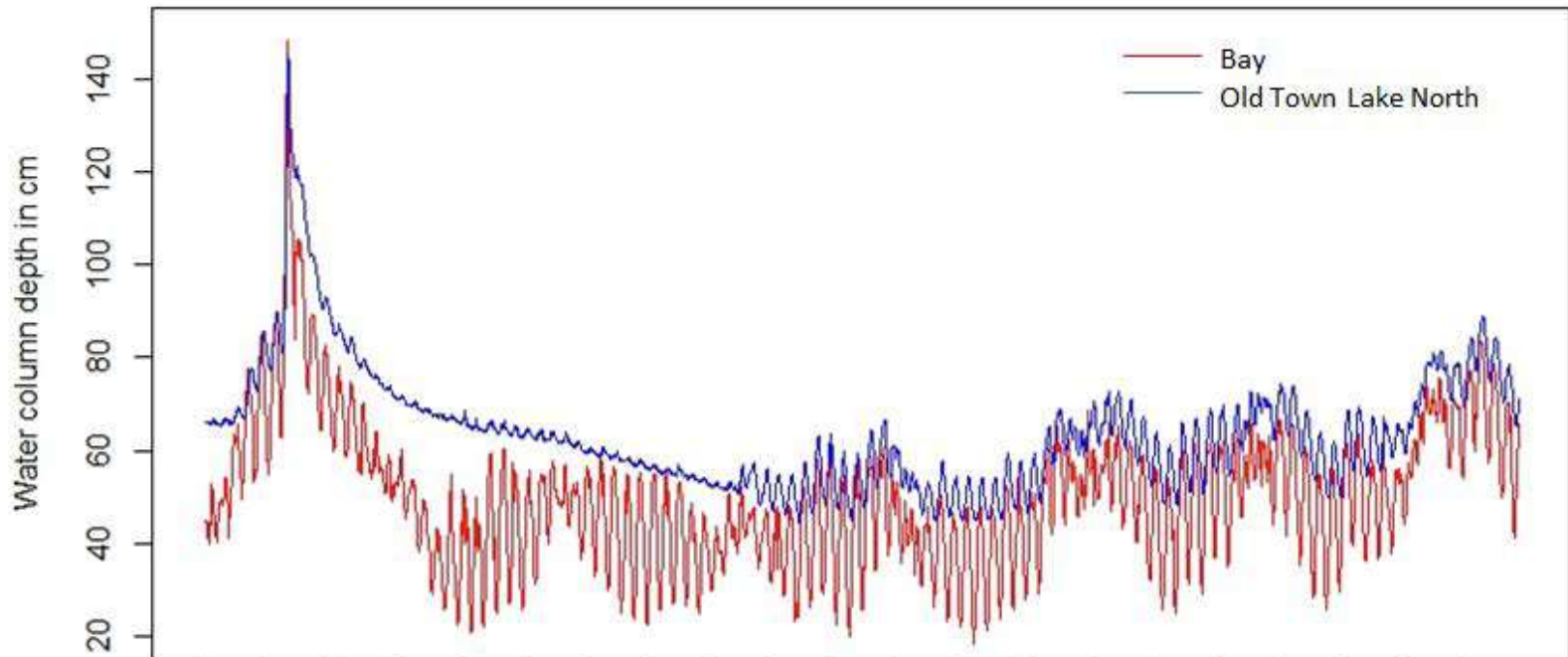


Photo Credit: Texas Sea Grant

Low Water
Crossings

Hydrologic Restoration-What, Why

Comparison between the Bay and North Old Town Lake tides



Courtesy of Rusty Feagin and Thomas Huff

Bahia Grande, Texas



Photo Credit: NOAA



Photo Credit: NOAA

NOAA-Gulf SeaGrant Partnership



Community Based Partnership
On the Ground Restoration
Hydrologic Restoration Opportunity Inventory
Monitoring Protocols
Outreach Materials



NOAA -Gulf Sea Grant Partnership

Bayou St. John, LA



Photo Credit: Albert Guade

Acres Restored: 186

Cost per Acre: \$1,110

Total Budget for the Restoration: \$206,390

NOAA -Gulf Sea Grant Partnership

Restoration of Salinity Patterns Upper Apalachicola Bay through
Reconnection of Severed Historic Watershed Drainage Pathways, FL



Photo Credit: Linda Chaisson

Acres Restored: 2,374

Cost per Acre: \$137

Total Budget for the Restoration: \$324,306

NOAA -Gulf Sea Grant Partnership

Salinity Barrier Removal Feasibility & Restoration in Tampa Bay Tidal Tributaries, FL

Acres Restored: 58

Cost per Acre: \$8,600 (based on total restoration footprint and all partner contributions)

Total Budget for the Restoration: \$496,500



Photo Credit: Brad Young

NOAA -Gulf Sea Grant Partnership Magnolia Inlet, TX

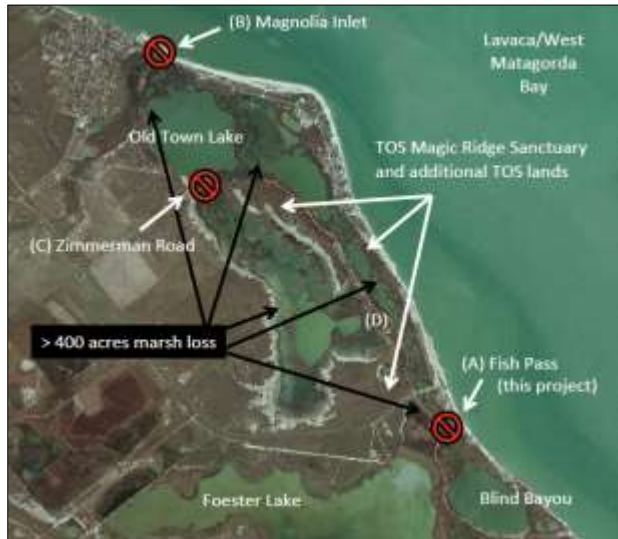


Photo Credit: Rusty Feagin



Photo Credit: Texas Sea Grant



Photo Credit: Thomas Huff

Acres Restored: 770
Cost per Acre: About \$530
Total Budget for the Restoration:
\$408,831

NOAA -Gulf Sea Grant Partnership

Hydrologic Restoration Inventory GOM



<http://masgc.org/hydrorestoration>

NOAA -Gulf Sea Grant Partnership



HYDROLOGIC Restoration

The NOAA Restoration Center collaborated with the four Sea Grant programs in the Gulf of Mexico through a community-based partnership. The partnership addressed hydrological restoration and included identifying hydrological restoration projects throughout the region. The partnership also funded four on-the-ground restoration projects. This guide includes some of the information learned while implementing the partnership.



This document was developed to share best practices to identify coastal wetlands impacted by hydrological modifications. More detailed guidance and additional resources are available at: ["Determining the Tidal & Tidal Hydrology Restoration Guidance Manual for the Southern United States."](#) See references for full text.

A SHORT GUIDE TO IDENTIFYING AND IMPLEMENTING HYDROLOGIC RESTORATION PROJECTS IN THE GULF OF MEXICO

Karla Danker*, Jessica Berner*, Laurie Round*, Jamie Schubert*, Stephen Genser* and Eric Spoker†
 *Independent Contractor, formerly with Texas Sea Grant, NOAA Restoration Center
 †Mississippi-Alabama Sea Grant Consortium

Coastal and estuarine wetland habitats are a vital part of our ecosystem. They provide habitat for varieties of fish, shellfish, birds and other wildlife. They improve water quality and buffer our coastlines against storm damage and sea level rise. Changing the hydrology the way water flows in an area can reduce the ability of wetlands to provide these important ecological services.



Coastal wetlands in Louisiana. Credit: Anthony Sebilo

Background

Magnitude of Wetland Loss: Gulf of Mexico coastal watersheds contain 15.6 million acres of a diverse array of tidal and nontidal wetlands and abundant riparian habitats along their rivers and streams. Between 1996 and 2004, the

U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) reported wetland trends in the Gulf of Mexico. The study found that watersheds along the Gulf of Mexico had a net wetland loss of



HYDROLOGIC Restoration

A QUICK GUIDE TO IDENTIFYING HYDROLOGIC RESTORATION PROJECTS AND THEIR BENEFITS IN THE GULF OF MEXICO

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Coastal and estuarine wetlands provide habitat for many species of fish, shellfish, and other wildlife. Credit: NOAA

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MAGNITUDE OF WETLAND LOSS

The U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) completed a study from 2004 to 2009 and found that during that time the wetlands in the Gulf of Mexico showed losses of an estimated 257,150 acres. The wetland loss was equivalent to 462 square miles or 197,806 football fields. Losses occurred in estuaries, inland tidal and freshwater wetlands and were especially high in forested wetlands. Gulf Coast wetlands also suffered damage during the Deepwater Horizon oil spill. Hydrological restoration is a critical component to reversing these losses in many watersheds. For example, activities to ditch and drain wetlands and to impound, dredge, fill or channelize estuaries were common in the mid-1900s. However, removing hydrological barriers or artificial drainage to enhance tidal and freshwater flows can restore large wetland areas and their vital ecosystem services.

BENEFITS OF HYDROLOGICAL RESTORATION

The restoration of coastal wetland hydrology is cost-effective and sustainable. Relatively small physical modifications and barriers to tidal or freshwater flow can negatively affect large areas of habitat. Consequently, the large-scale restoration of these habitats can be achieved with a relatively inexpensive (on a cost/acre basis) and small footprint of work. Wetland hydrology restoration can also improve water quality and create physical conditions (salinity, dissolved oxygen, nutrients) necessary for large-scale coastal wetland habitat restoration.

- Benefits of hydrological restoration projects:
- Save money and reduce risk. The Community Rating System (CRS) rates communities on actions that may benefit from hydrological restoration. The more points a community receives,

<http://masgc.org/hydrorestoration>

Connecting Coastal Waters

On the Ground Restoration
Watershed Based Inventory



Connecting Coastal Waters



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Bahia Grande Wetland System Restoration



600 acres restored by reconnecting freshwater hydrology blocked by highway

Connecting Coastal Waters

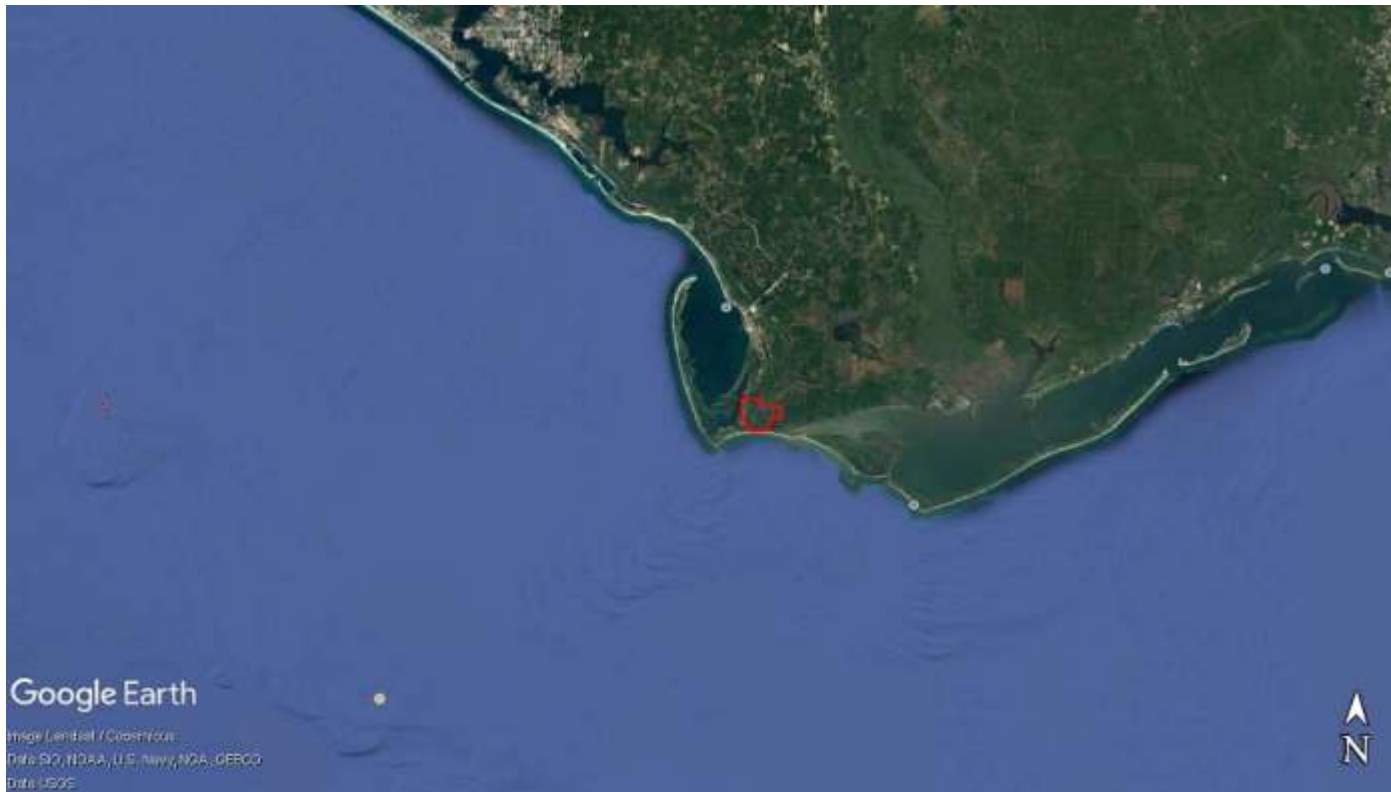
Marsh Restoration in Fish River, Weeks Bay, Oyster Bay & Meadows Tract



Restore 470 acres at three sites via culvert replacement, reconnection of dead end canals and restoration of tidal exchange.

Connecting Coastal Waters

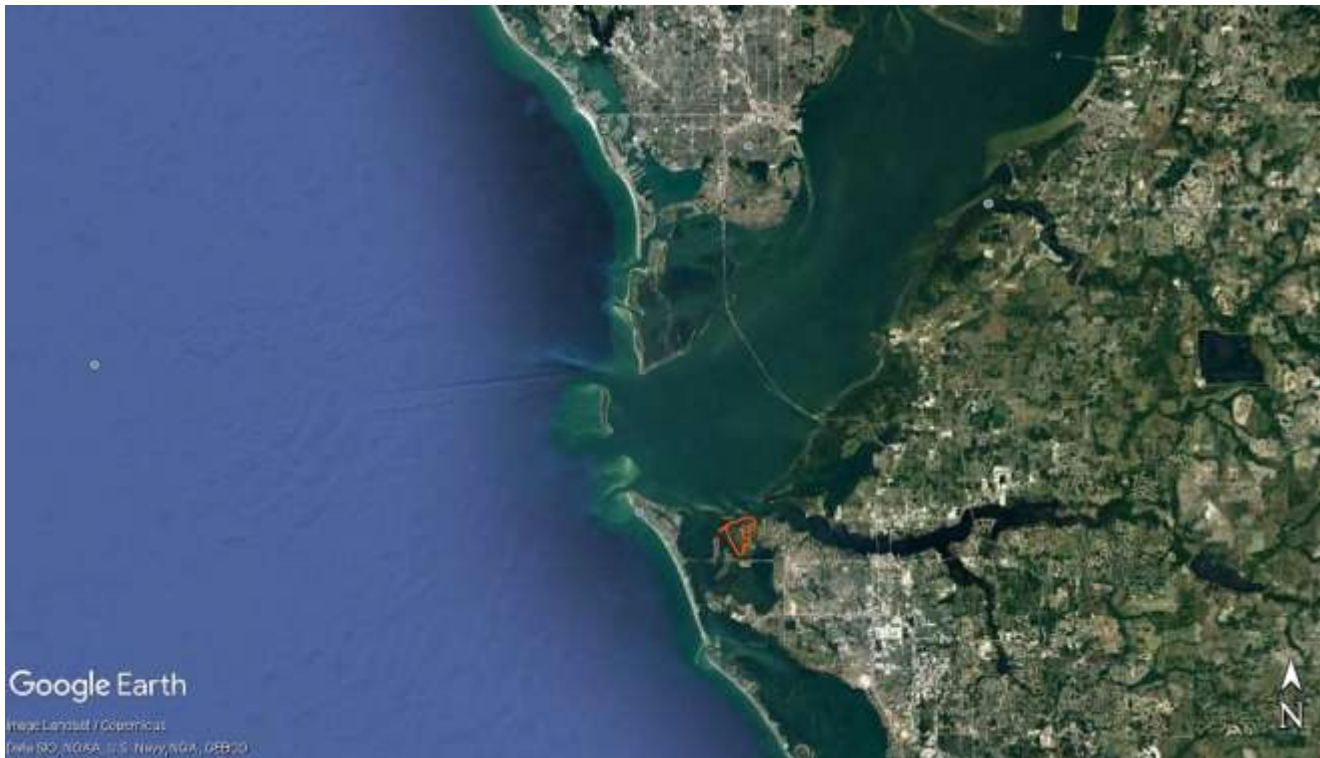
Money Bayou Wetlands Restoration



Restore at least 1,000 acres of estuarine habitat by re-establishing sheet flow, culvert replacement, low water crossings and road grading

Connecting Coastal Waters

Robinson Preserve Wetland Restoration



Restore 140 acres by re-establishing tidal flows. Will expand existing preserve.



- Northwest Florida Water Management District
- Florida Forest Service
- Tampa Bay Estuary Program
- Ecosphere Restoration Institute
- MacDill Air Force Base
- Southwest Florida Water Maintenance District
- State of Florida
- Alabama Department of Conservation and Natural Resources
- U.S. Fish and Wildlife Service
- Texas Parks and Wildlife Department
- Ducks Unlimited
- Calhoun County, Texas
- Texas A&M AgriLife Research
- Louisiana Department of Wildlife and Fisheries
- Louisiana Sea Grant
- Orleans Levee District
- Lake Pontchartrain Basin Foundation
- United States Geological Survey (USGS)
- New Orleans City Council
- Louisiana Sea Grant
- Faubourg St. John Neighborhood Association
- University of New Orleans,
- New Orleans City Park
- Texas A&M University
- Texas General Land Office
- Gulf SeaGrant Programs

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