

# **Prioritization Mapping for Shoreline Protection along the GIWW**





# Gulf Coast's Importance to Waterfowl

- Winters 14 million ducks and 1.5 million geese (~ 5 Million in Texas)
- 25% Continental Breeding Population
- Winters significant proportions of some duck spp. within the Central & Mississippi Flyways
  - ~ 95% of Gadwall
  - ~ 80% of Green-Winged Teal & Redhead
  - ~ 60% of Lesser Scaup
  - ~ 25% of Northern Pintail
- Important to Blue-Winged Teal, L. Snow Goose, Mottled Duck





# Coastal Marsh Pond Foraging Values

**Empirical estimate -**

- **Fresh marsh**

**272,021 kcal/ac**

Winslow (2003), Nyman (2004)

**Assumed Estimates:**

- **Intermediate marsh: 272,021 kcal/ac**
- **Brackish marsh: 136,010 kcal/ac**
- **Saline marsh: 27,020 kcal/ac**



# **REGION'S CONSERVATION CHALLENGES FOR WATERFOWL**

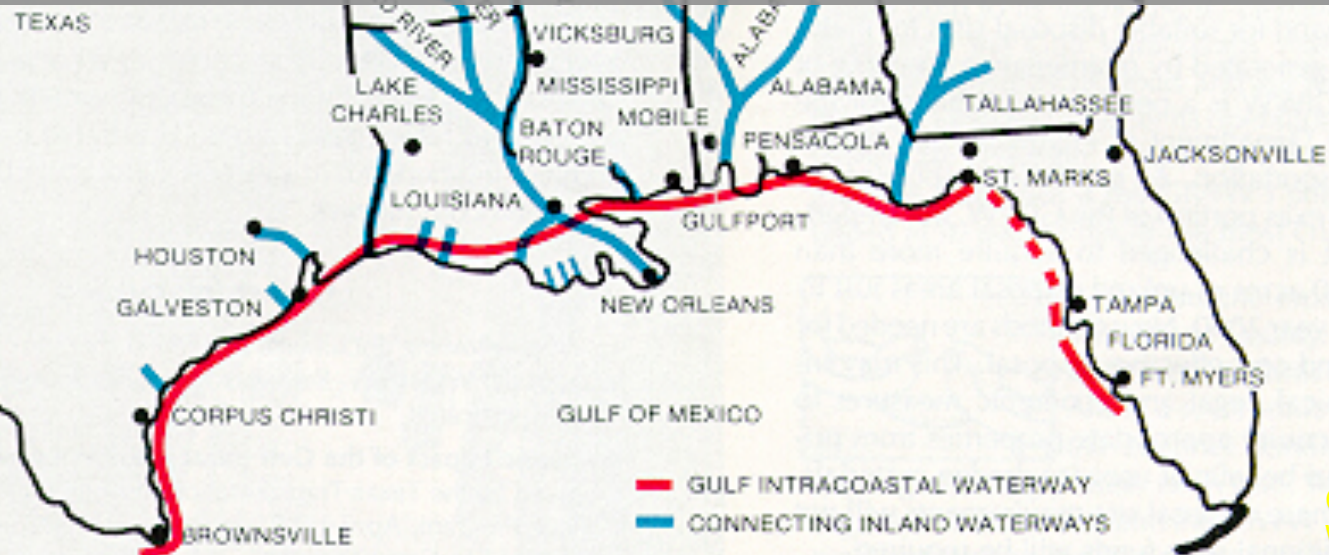
- **Degraded/Altered Hydrology**
- **Salt Water Intrusion & Subsidence**
- **Declining Rice Production**
- **Development Pressures**






# Gulf Intracoastal Waterway

- 426 Miles in TX
- Completed thru Texas in 1949
  - 125' wide and 12' Feet Deep



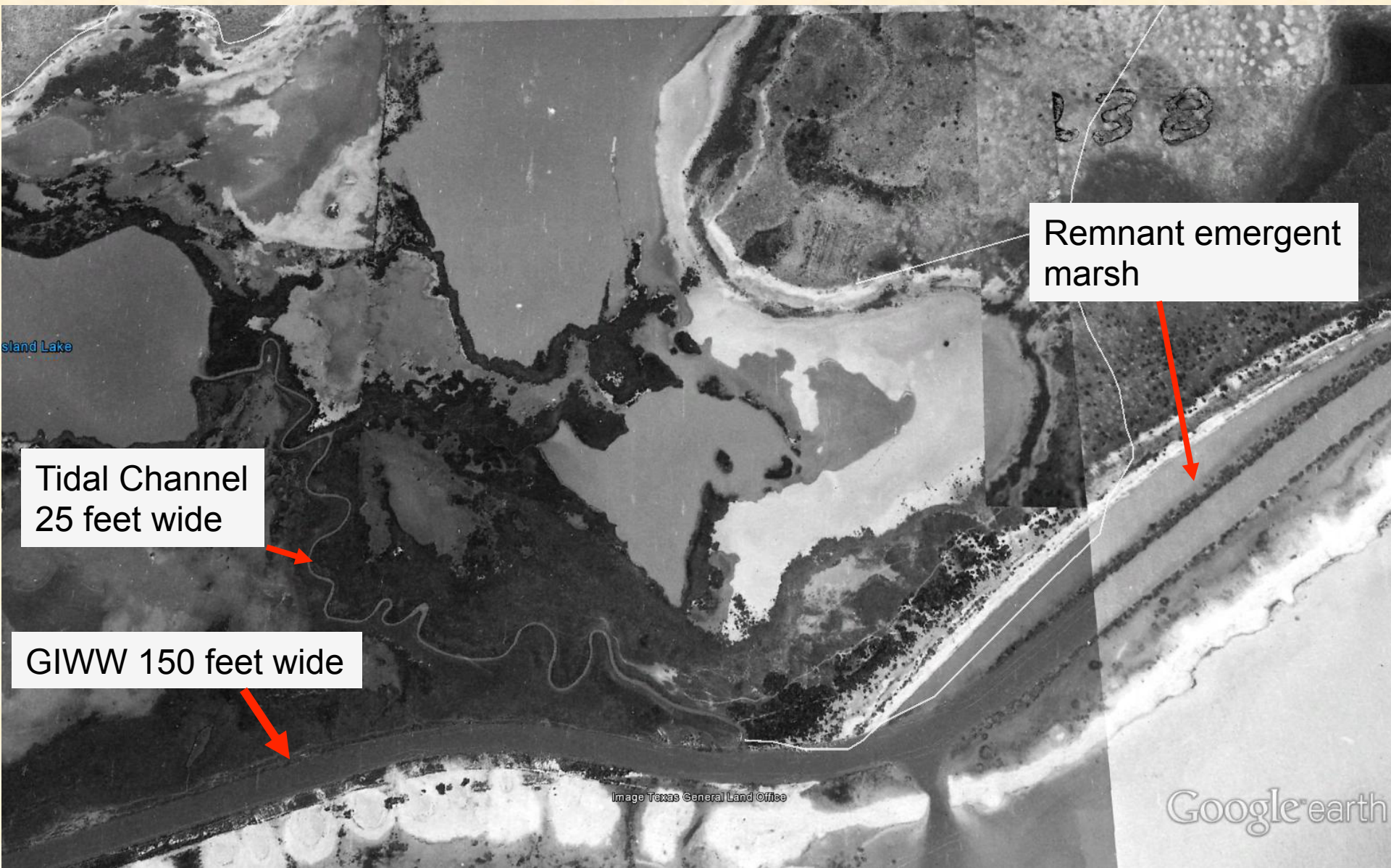


A satellite view of a wide river flowing through a green, rural landscape. A dam is visible in the middle of the river, with a bridge crossing it. The river is significantly wider than the bridge. A road labeled 'Glam Lake Rd' runs along the right bank. Two white text boxes with black borders provide measurements: one above the dam and one below the bridge. A red line is drawn across the river at the bridge's location.

624 feet currently

185 feet wide in 1938





L33

Remnant emergent marsh

Tidal Channel  
25 feet wide

GIWW 150 feet wide

Island Lake

Image Texas General Land Office

Google earth





Island Lake

Tidal bayou  
95 feet wide

GIWW 450  
Feet wide

Remnant emergent  
marsh

Google earth



# Motivation for a DST

- Already know that we're short on habitat.
- Continued Erosion along GIWW poses an increased threat to marsh degradation and waterfowl food deficits.
- Where?    How much?    How long?
- Breakwaters are expensive \$1 million/mile



# Goals of Decision Support Tool

- Quantify & Locate habitats in jeopardy
- Establish priorities
- Develop a cost estimate
- Give perspective to Agency, Regulatory and Legislative Interests













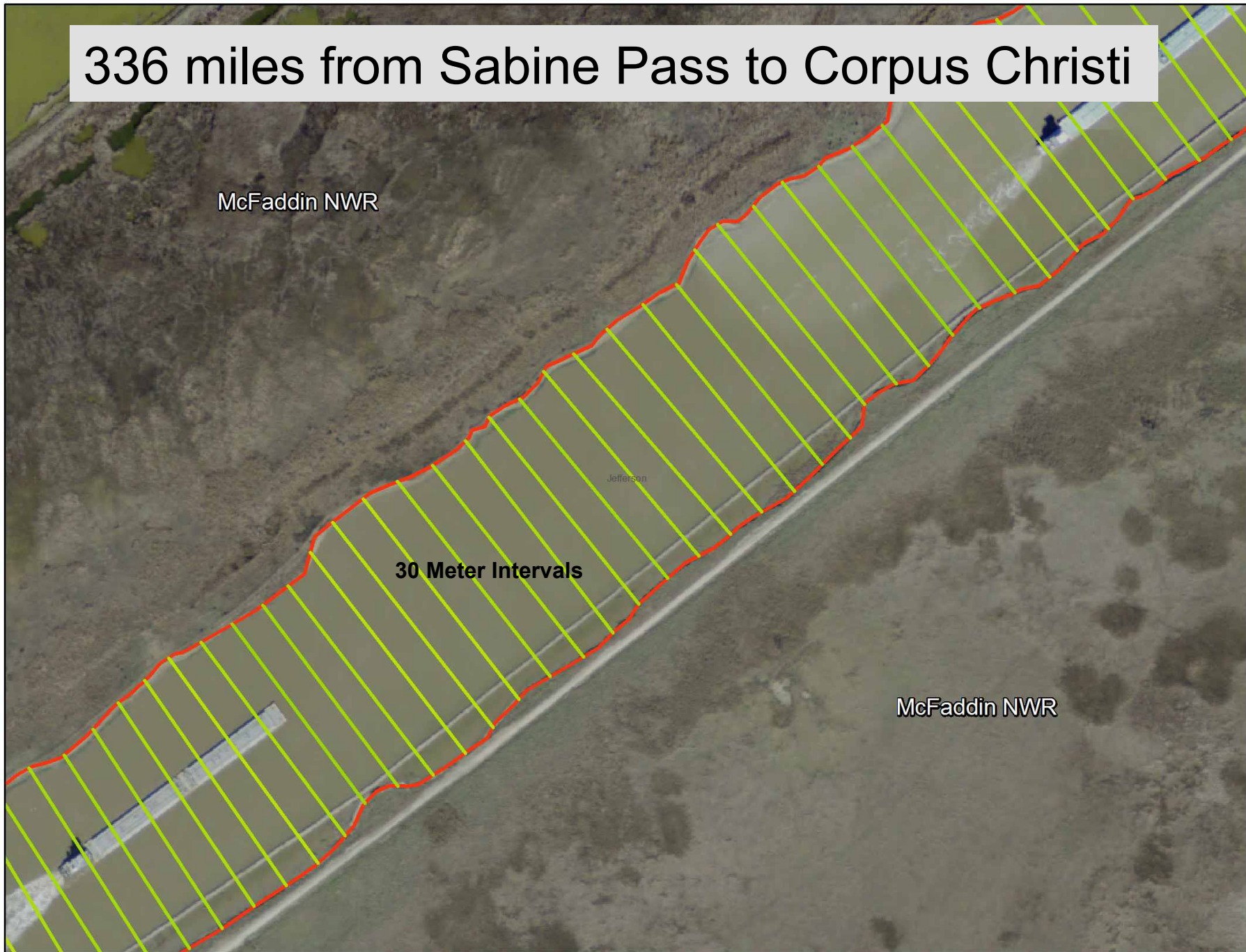
# 336 miles from Sabine Pass to Corpus Christi

McFaddin NWR

Jefferson

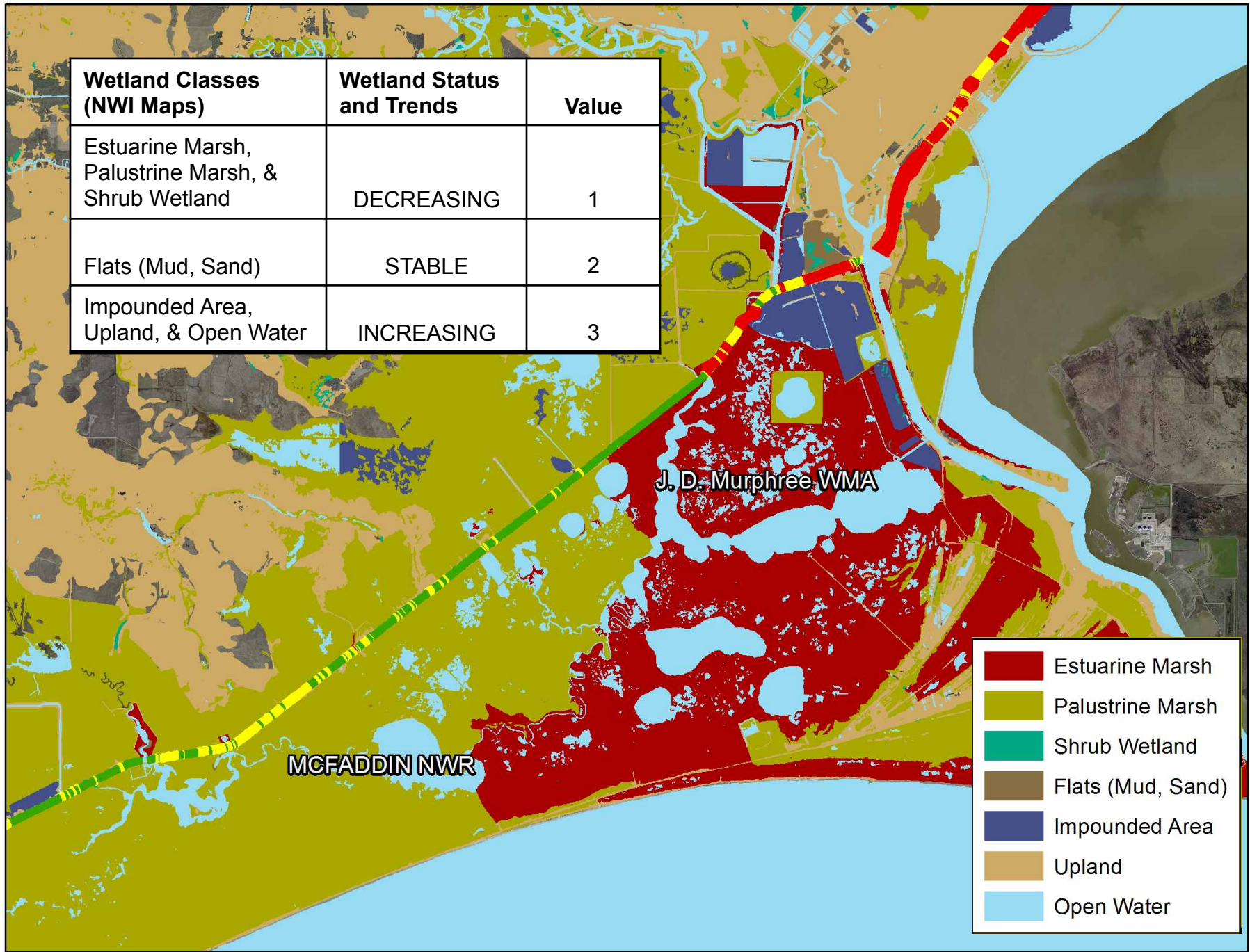
**30 Meter Intervals**

McFaddin NWR





Wetland Classes (NWI Maps)	Wetland Status and Trends	Value
Estuarine Marsh, Palustrine Marsh, & Shrub Wetland	DECREASING	1
Flats (Mud, Sand)	STABLE	2
Impounded Area, Upland, & Open Water	INCREASING	3



- Estuarine Marsh
- Palustrine Marsh
- Shrub Wetland
- Flats (Mud, Sand)
- Impounded Area
- Upland
- Open Water

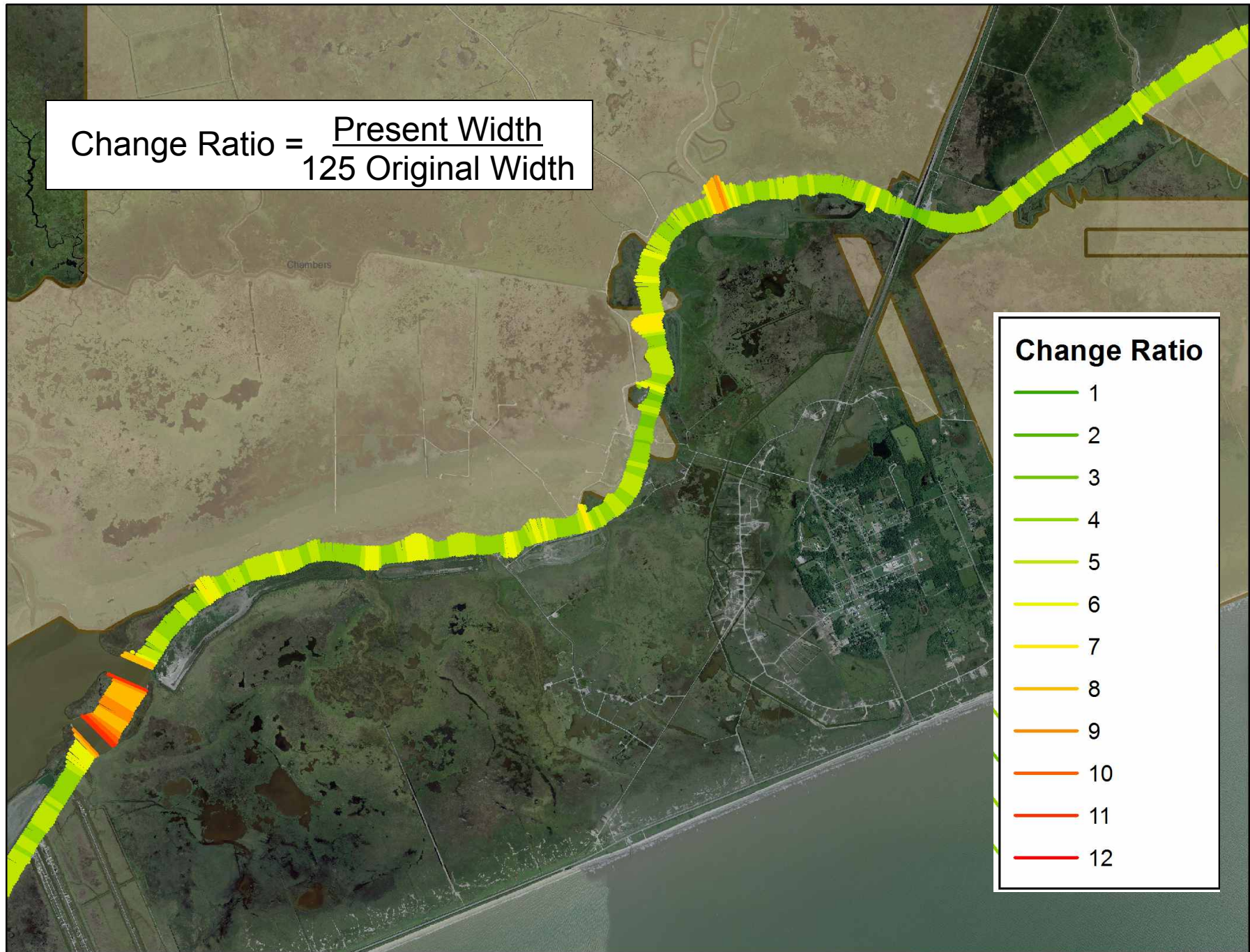


<u>Dataset</u>	<u>Value</u>	<u>Definition</u>
Wetland Type	1	Estuarine Marsh, Palustrine Marsh, & Shrub Wetland
	2	Flats (Mud, Sand)
	3	Impounded Area, Upland, & Open Water
Change Ratio	1	between 5.632734 & 13.08168 ( $\geq 5.632734$ )
	2	between 4.393893 & 5.632734
	3	between 0.564883 & 4.393589 ( $\leq 4.393589$ )

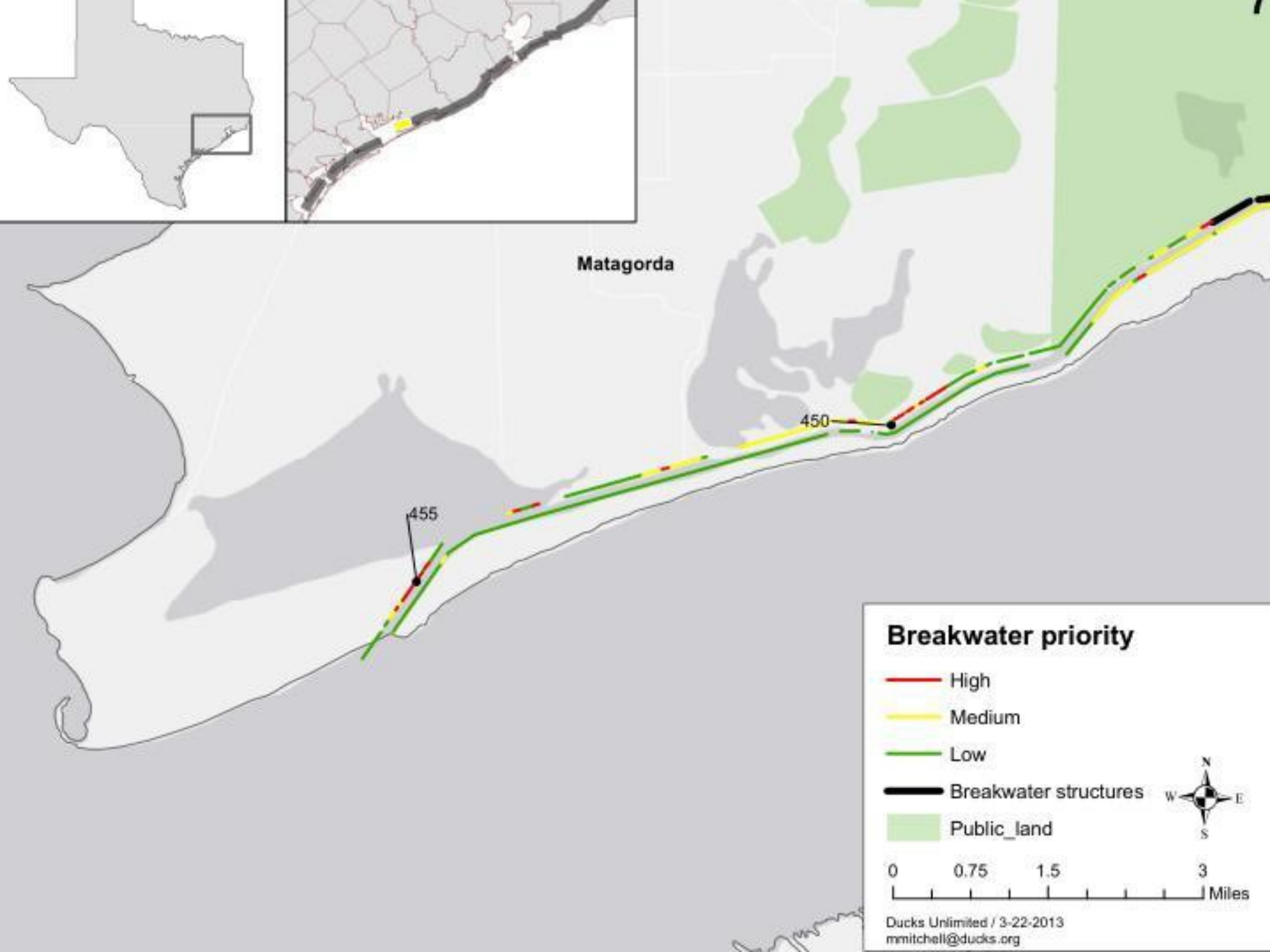
<b>Wetland Type</b>	<b>Change Ratio</b>	<b>Priority</b>
Very Important (1)	High (1)	High
Very Important (1)	Medium (2)	Medium
Very Important (1)	Low (3)	Low
Important (2)	High (1)	Medium
Important (2)	Medium (2)	Low



Change Ratio =  $\frac{\text{Present Width}}{125 \text{ Original Width}}$









50 miles of the Texas GIWW are currently protected by breakwater or revetment structures.

294 miles of unprotected marsh shoreline on the landward and bayward sides of the GIWW.

Approximately 28.6 miles of shoreline deemed high priority for protection, with nearly 45.2 miles in need of protection to maintain significant coastal marsh habitats for waterfowl.



Breakwater projects that DU has implemented within the past 3 years range between \$800,000 - \$1,000,000 per mile.

With approximately 45 miles of high priority areas delineated, roughly \$45 million is needed to protect these marsh habitats from immediate or further degradation.



## Current DU breakwater efforts:

- Existing permits for approx. 5 miles of breakwater in Galveston and Matagorda counties
- GLO funding for approx. 1 mile in Galveston County
- Seeking grants and leveraging opportunities; NAWCA, RESTORE, etc.
  - Conducting survey work for TPWD to design / permit future breakwaters at Mad Island WMA and Justin Hurst WMA



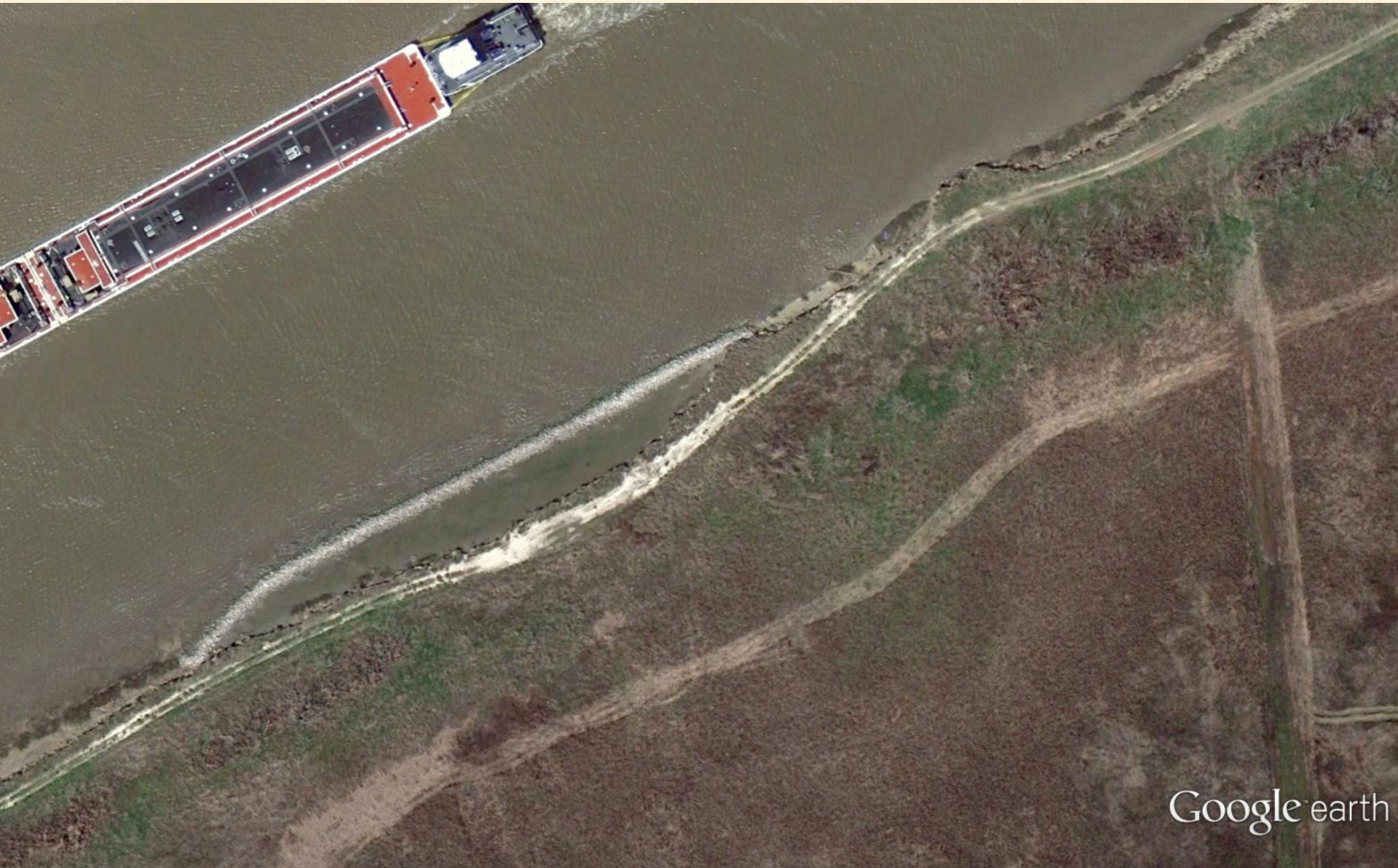
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Imagery Date: 11/21/2015 28°48'18.04" N 95°33'14.99" W elev 1 ft eye alt 2073 ft









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