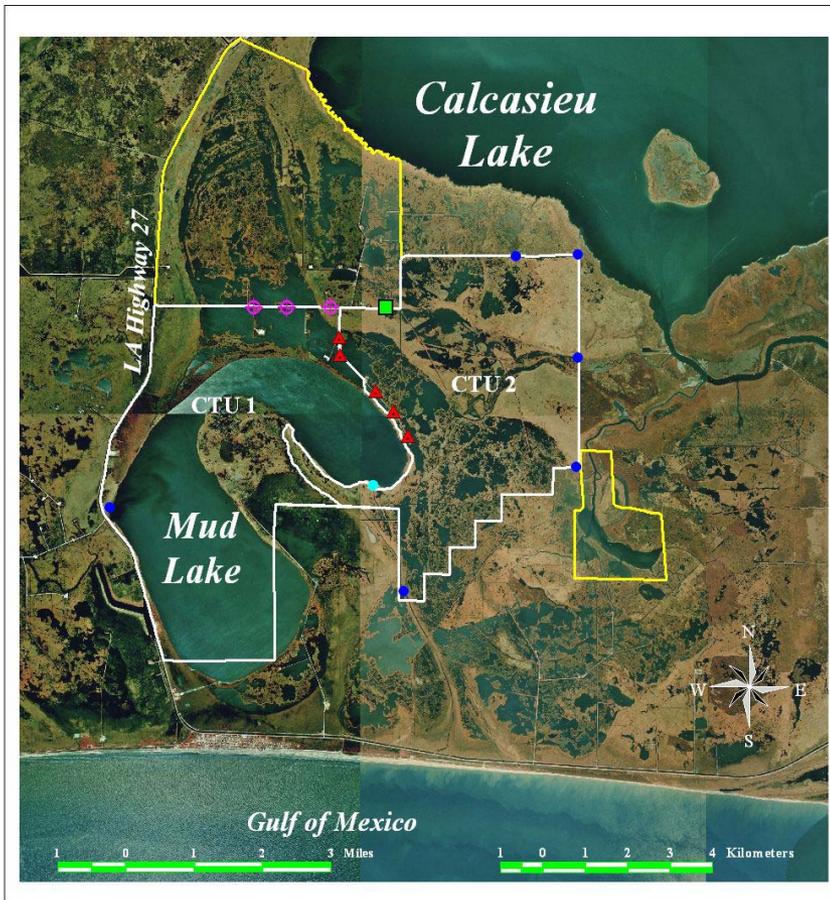


East Mud Lake Marsh Management

- Selected on PPL 2
- Construction completed June 1996
- Location: Cameron Parish, north of Holly Beach



Project Location



● Project Features

- ▲ – Culvert with flapgate
- – Gated culvert
- – Variable crest culvert with flapgate
- ⊕ – Variable crest culvert with slots
- – Variable crest box structure with boat bay
- Vegetative plantings (7,200 CTU 2, 480 Mud Lake)

Planning

- Assumed Causes of Loss
 1. Inadequate water exchange points
 2. Subsidence
 3. Unstable water conditions
 - a. Unnatural inundation of high water levels
 - b. Unnatural water level fluctuations
 - c. High salinities (salinity spikes)
 - d. Unnatural salinity fluctuations
 4. Soil erosion

Objectives

- Prevent wetland degradation by reducing vegetative stress, thereby improving abundance of emergent and submergent vegetation. Achieved through hydrologic structural management to reduce water levels and salinity.
- Stabilize the shoreline of Mud Lake through vegetative plantings.

Specific goals

- Decrease rate of marsh loss
- Increase vegetative coverage on shoreline of Mud Lake and shallow open water areas
- Increase abundance of emergent vegetation
- Reduce water level fluctuations to range from 6 in BML to 2 in AML
- Reduce salinity levels to ≤ 15 ppt
- Decrease duration and frequency of flooding
- Decrease mean salinity in CTU 2
- Increase accretion in CTU 2
- Maintain fisheries abundance*

Construction

- Final Features

- Four 36” corrugated aluminum pipes w/ 10ft variable crested weir inlets and 4” vertical slots
- Six 36” corrugated aluminum pipes w/ 10ft variable crested weir inlets and flap gates *(changes structure 1 and 13)
- One (1) 48” corrugated aluminum pipe w/ flap gate and screw gate
- Five (5) 24” corrugated aluminum pipes and flap gates
- Two (2) sheet pile variable crested weirs
- Three (3) earthen plugs
- 1,500 lf of levee construction
- 40,500 lf of levee rehabilitation *(added more lf due to levee degradation)
- Vegetative plantings *(reduced # planted for project and changed location of plantings)

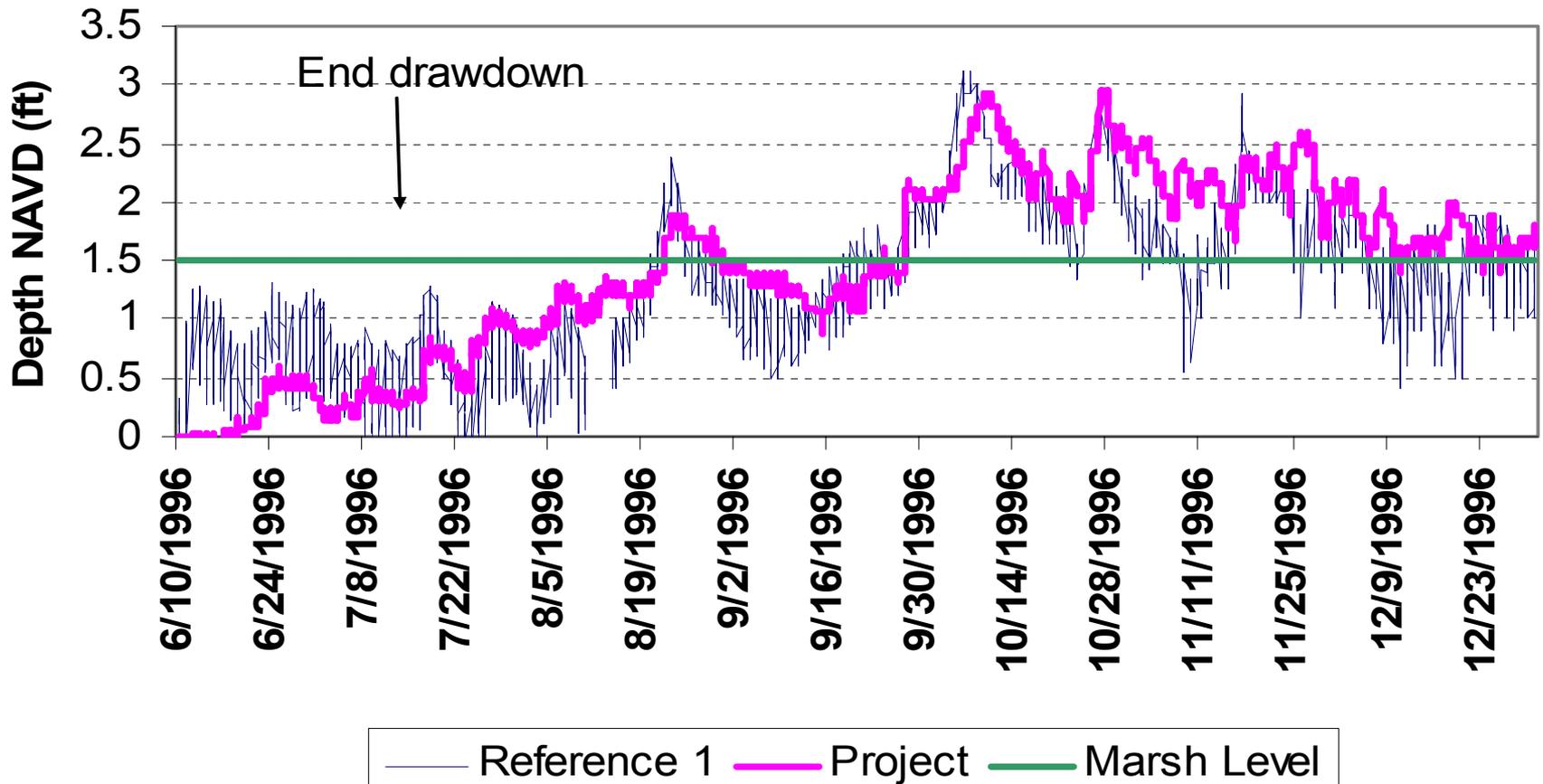
Monitoring Variables

- Aerial photography
- Planted vegetation
- Emergent vegetation
- Salinity
- Water level
- Accretion and elevation
- Fisheries abundance

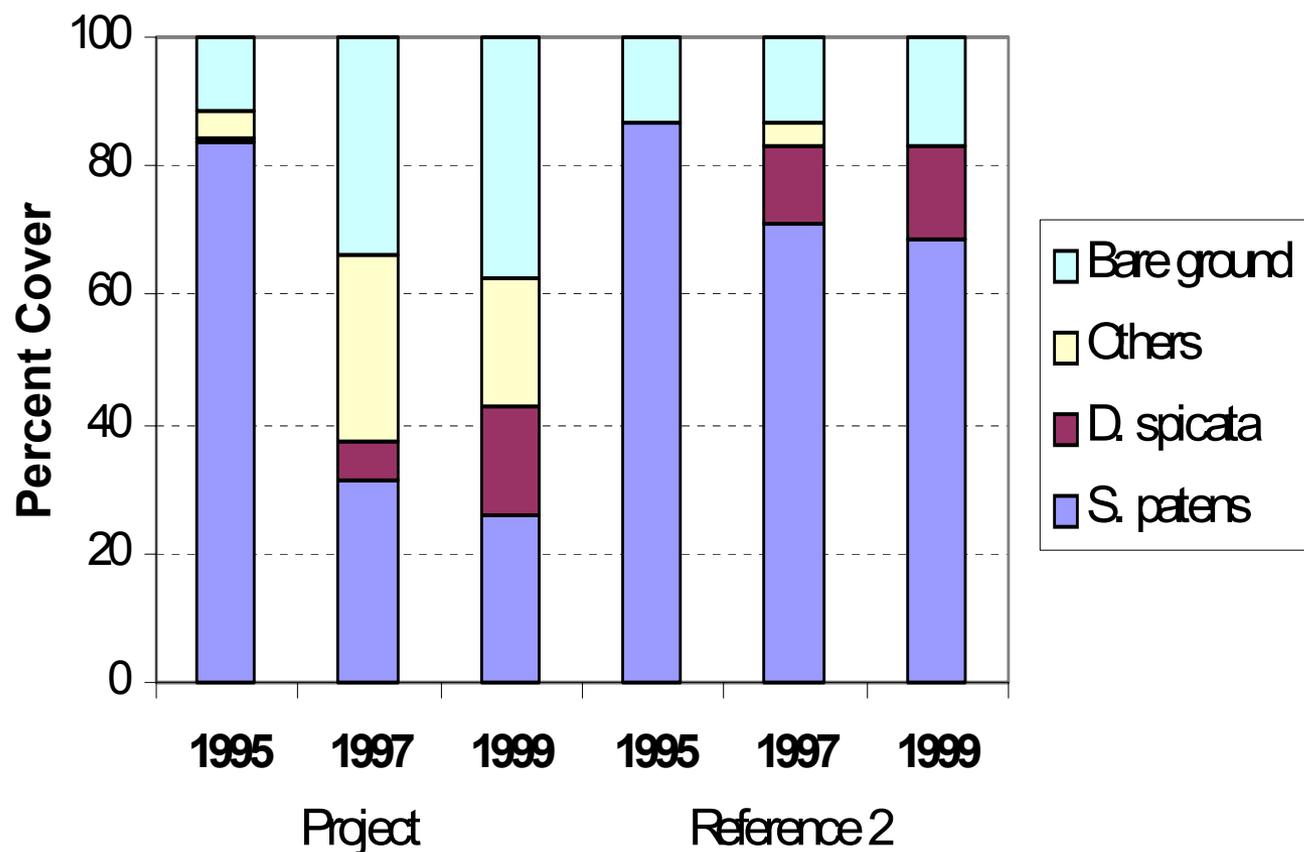
Drought 1996



Physical Response



Biological Response



- *Spartina patens* decreased in the project area
- *Distichlis spicata* increased
- Species diversity is higher in the project area
- *Paspalum vaginatum* increased along pond edges



Landscape Response

- Photography was taken in 1994 and 2000.
- Observations from the unrectified 2000 color-infrared photography suggests the landscape is not changing as rapidly post project construction as what occurred from 1983 to 1994.
- Small marsh islands within larger open water areas have been lost with larger contiguous areas fairly stable.
- The project is maintaining the landscape as brackish marsh since construction.

Project Adaptive Management

- Implemented Changes
 - Structure operations were modified in 1999 after results of a survey to determine marsh elevation indicated that marsh level in CTU 2 was 1.0 ft NAVD and not 1.4 ft NAVD as originally provided in planning documents.
 - Repeated vandalism of the Oyster Bayou structure in CTU 2 caused damage to the structure requiring maintenance in 1997. The repairs completed in 2000 failed and a new structure is in design. Oyster Bayou is a conduit of high salinity water therefore, from late 1999-end of 2000, salinities in CTU were well above target range of 15 ppt.

Project Adaptive Management

- Recommended Improvements
 - Continue intensive monitoring.
 - Oversee operation of structures.
 - Respond faster to maintenance of structures. Streamline the process that when a problem is identified by the monitoring manager or permit holder and brought to the attention of the project manager, it is addressed and repair is contracted and constructed in a timely manner. Minimize delays when possible.

Lessons Learned for Future Projects

- Incorporated in the CWPPRA process
 - Implement phases of construction over time if delays occur. Modifications in vegetation planting design negated a major objective of this project, to vegetate the shoreline of Mud Lake.
 - Obtain an elevation survey of the project area in the project planning phase.
- Recommended for incorporation
 - In a brackish marsh, operate structures to prevent ponds from drying out completely, even if salinity is considerably above target levels outside the managed area.