State of Louisiana
Department of Natural Resources
Coastal Restoration Division and
Coastal Engineering Division

2005 Operations, Maintenance, and Monitoring Report

for

Humble Canal Hydrologic Restoration

State Project Number ME-11
Priority Project List 8

June 2005
Cameron Parish

Prepared by:

Justin Price, Monitoring Section, Coastal Restoration Division (CRD)
and
Mel Guidry, Field Engineering Section, Coastal Engineering Division (CED)
Louisiana Department of Natural Resources (LDNR)/
Coastal Restoration and Management
Lafayette Field Office
635 Cajundome Boulevard
Lafayette, LA 70506

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Operations, Maintenance, and Monitoring Report
for
Humble Canal Hydrologic Restoration (ME-11)

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Preface

The Operations, Maintenance, and Monitoring (OM&M) Report format is a streamlined approach which combines the Operations and Maintenance annual project inspection information with the Monitoring data and analyses on a project-specific basis. This report includes monitoring data collected through December 2004, and annual Maintenance Inspections through June 2005.

The 2005 report is the second in a series of reports. For additional information on lessons learned, recommendations, and project effectiveness, please refer to the 2004 Operations, Maintenance, and Monitoring Report on the Louisiana Department of Natural Resources (LDNR) web site at dnr.louisiana.gov (Price and Guidry 2007).

I. Introduction

The Humble Canal Hydrologic Restoration Project (ME-11) area encompasses 4,030 acres (1,228 ha) of fresh marsh in Cameron Parish, Louisiana (figure 1). The project area is bounded by Little Chenier Ridge to the south, the Mermentau River to the east, and oilfield canals to the north and west.

The marsh is classified as fresh marsh with 74 percent of the project area being marsh and 26 percent of the project area being open water, based on the Louisiana Department of Natural Resources (LDNR) GIS data for 1988-1990. Dominant emergent vegetation in the project area includes *Spartina patens* (marsh-hay cordgrass), *Typha latifolia* (cattail), and *Sagittaria lancifolia* (bulltongue). Dominant submerged aquatic vegetation (SAV) in the project area includes *Najas guadalupensis* (southern naiad), *Alga* sp., and *Chara* sp. (muskgrass) (U.S. Department of Agriculture, Natural Resources Conservation Service [USDA/NRCS] 2000).

Soils found in the project area have been recently mapped as Allemands muck, Clovelly muck, Larose muck, Bancker muck, Aquents frequently flooded, Peveto fine sand, Hackberry loamy fine sand, and Hackberry-Mermentau complex (USDA/Soil Conservation Service [SCS] 1995). Most of the soils within the project area are classified as muck and are associated with brackish or freshwater marsh. The Aquents frequently flooded are hydraulically excavated soils that occur along the Mermentau River. The Peveto, Hackberry, and Hackberry-Mermentau are on the Little Ridge that comprises the southern boundary of the project.

Land loss data indicate that, from 1932 to 1990, approximately 826 acres (334 ha) of land were converted to open water in the Humble Canal project area (Dunbar et al. 1990). Land alteration, including the construction of Humble Canal in the 1950's and dredging of the Mermentau River to facilitate greater commercial use, has resulted in excessive water levels in some areas and saltwater intrusion from the south and east.

To aid in the removal of excess water without permitting saline water into the project area, five 48-inch (122-cm) culverts with variable crest weir inlets and flapgated outlets were constructed in an oilfield access canal north of Marseillais Bayou. Construction began in September 2002 and ended with implementation in March 2003.

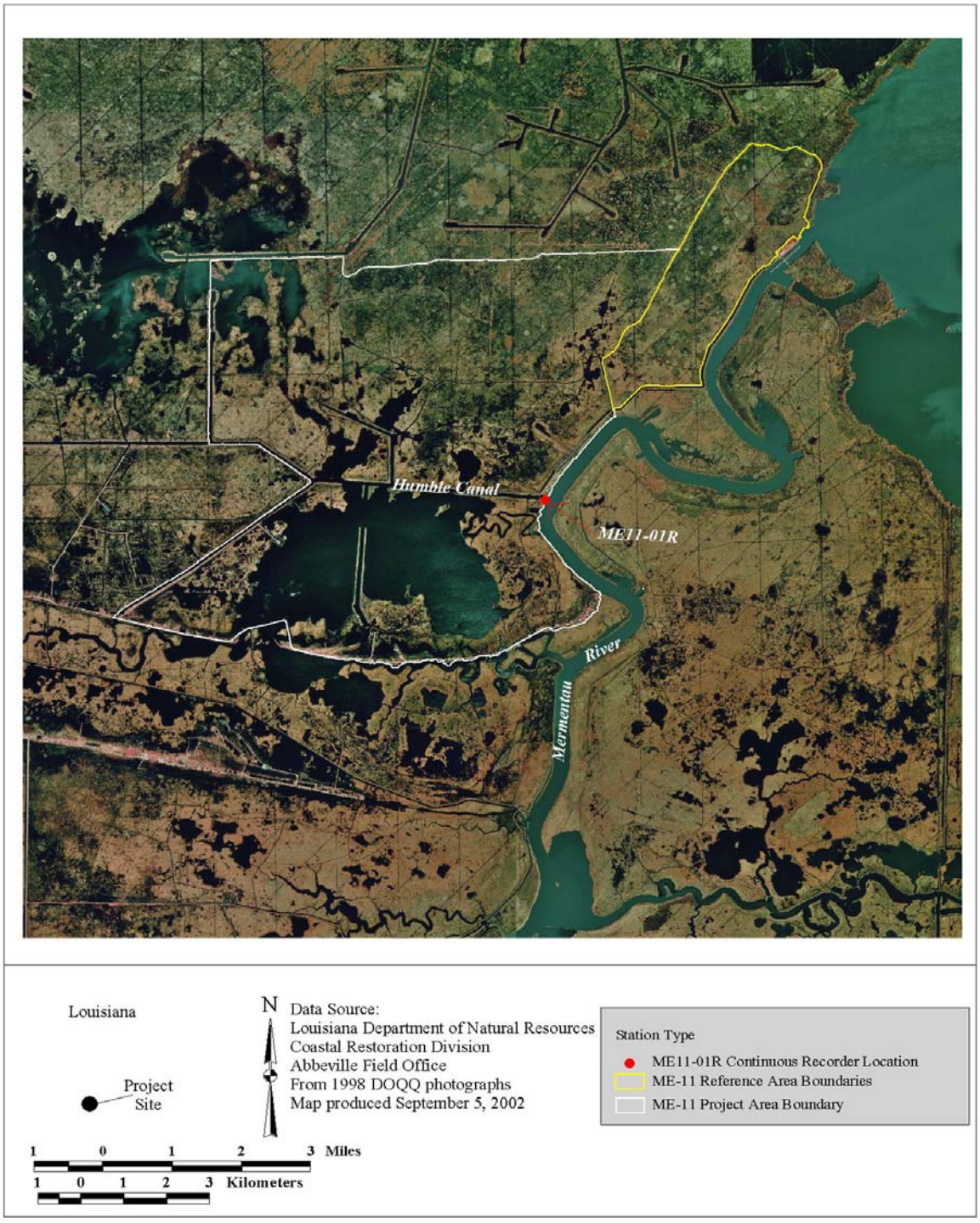


Figure 1. Humble Canal Hydrologic Restoration Project (ME-11); project and reference areas.

II. Maintenance Activity

a. Inspection Purpose and Procedures

The purpose of the annual inspection of the Humble Canal Hydrologic Restoration Project (ME-11) is to evaluate the constructed project features, identify any deficiencies, and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, LDNR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs. The annual inspection report also contains a summary of maintenance projects, if any, which were completed since completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance, and rehabilitation. Photographs taken during the annual inspection are presented in Appendix A. The three-year projected operation and maintenance budget is shown in Appendix B.

An inspection of the Humble Canal Hydrologic Restoration Project (ME-11) was held on Wednesday, March 23, 2005, under partly cloudy skies and mild temperatures with a 5-10 mph north wind. In attendance were Mel Guidry, Stan Aucoin, Darrell Pontiff, and Garrett Broussard from LDNR, along with Brad Sticker and Charles Starkovich representing NRCS. All parties met at the boat launch on the Mermentau River in Grand Chenier, and traveled north to the Humble Canal Project Site. The annual inspection began at approximately 10:00 a.m. at the marine barrier on the juncture of the Humble Canal Project Outfall Channel and the Mermentau River.

The field inspection included a complete visual inspection of all project features. Staff gauge readings were used to determine approximate elevations of water, earthen embankments, water control structure, and other project features. Photographs were taken at each project feature (see Appendix A) and Field Inspection notes were completed in the field to record measurements and any notable deficiencies (see Appendix C).

b. Inspection Results

Marine Barrier Fence:

The structure is in excellent condition. Some shrinkage of the sign lettering has occurred. Bank tie-ins, pile caps, hardware, etc. are in excellent condition. No maintenance is required at this time. (Photos: Appendix B, Photos 1 & 2)

Hyacinth Guard:

The structure is in excellent condition. No maintenance is required at this time. (Photo: Appendix B, Photo 3)

Water Control Structure:

Overall, the structure is in excellent post-construction condition. Some slight sloughing of the rock-armored earthen embankment on both the weir inlet and flapgate sides of the structure has occurred. This situation was noted in the 2003/2004 Annual Inspection and will continue to be monitored. As of now, no maintenance is recommended or required. Hardware, grating, etc. associated with the structure is in excellent condition. Water levels on the inside of the project area were +2.3 ft NAVD. Stoplogs had been removed to approximately -0.5 ft NAVD88 as allowed in the permit. Although no cross-sections were performed, both the inlet and outfall channels appear to be experiencing no slope failures. Both agencies agreed to perform a structural assessment survey in 2006/2007 for comparison to previous as-built surveys.

c. Maintenance Recommendations

i. Immediate/ Emergency Repairs

See recommendations made at each project feature.

ii. Programmatic/ Routine Repairs

None.

d. Maintenance History

No maintenance has been performed on this project.

III. Operation Activity

a. Operation Plan

b. Actual Operations

2004 Structure Operations:

In accordance with the operation schedule outlined in the Operation and Maintenance Plan, structures will be manipulated as required by Miami Corporation personnel at no cost to LDNR. At present, a contract is being developed between LDNR and Miami Corporation for Miami to continue to operate the structure according to the permitted operational plan at no cost to LDNR. The earthen plug at the Humble Canal and Mermentau River was removed by the Gravity District to facilitate removal of Hurricane Rita storm surge waters.

IV. Monitoring Activity

Pursuant to a Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Task Force decision on August 14, 2003, to adopt the Coastwide Reference Monitoring System-*Wetlands* (CRMS-*Wetlands*) for CWPPRA, updates were made to the ME-11 Monitoring Plan to merge it with CRMS-*Wetlands* and provide more useful information for modeling efforts and future project planning while maintaining the monitoring mandates of the Breaux Act.

a. Monitoring Goals

The objective of the Humble Canal Hydrologic Restoration Project is to improve removal of excess water without permitting saline water into the freshwater marsh of the project area.

The following goals will contribute to the evaluation of the above objectives:

1. Increase present (year 2000) land to water ratio.

2. Maintain mean water levels in the project area between 6 in (15.2 cm) below and 2 in (5.1 cm) above marsh level.

3. Maintain mean monthly salinity (0–3 ppt) in the project area after construction and prevent salinities from exceeding 7 ppt.

4. Increase or maintain the occurrence and cover of fresh marsh vegetation species in the project area.

5. Increase frequency of occurrence of submerged aquatic vegetation (SAV) in the project area.

b. Monitoring Elements

Aerial Photography:
Near-vertical color-infrared aerial photography (1:12,000 scale) was used to measure land to open water ratios and land change rates for the project and reference areas. The photography was obtained in 2000 prior to project construction and will be obtained post-construction in 2005 and 2017. The original photography was checked for flight accuracy, color correctness, and clarity and was subsequently archived. Aerial photography was scanned, mosaicked, and geo-rectified by U.S. Geological Survey/National Wetlands Research Center (USGS/NWRC) personnel according to standard operating procedures (Steyer et al. 1995, revised 2000).

Water Level:
To monitor water levels, one continuous data recorder and staff gauge is deployed in the project area and one continuous data recorder and staff gauge is deployed in the Mermentau River (figure 2). The project area recorder was removed in April 2004, and CRMS station CRMS0624 will serve its function upon full implementation of CRMS-*Wetlands* in the

summer of 2005. Water level data are used to determine if project area water levels are being maintained within the target range. Water level will also be monitored at least monthly by two staff gauges located on the weir. The continuous data recorders will be maintained until 2017.

Salinity:

Salinities are monitored monthly at permanent discrete sampling stations within the project area (figure 2). In addition, continuous data recorders are deployed to record salinity at one location in the project area and at one location in the Mermentau River. The project area recorder was removed in April 2004, and CRMS624 will serve its function upon full implementation of CRMS-*Wetlands*. Salinity data are used to characterize the spatial variation in salinity throughout the project area, and to determine if project area salinity is being maintained within the target range. Salinity will be monitored until 2017.

Emergent Vegetation:

To document the condition of emergent vegetation in the project area over the life of the project, vegetation is monitored at sampling stations (figure 3) established systematically in the project and reference areas using a modified Braun-Blanquet sampling method as outlined in Steyer et al. (1995, revised 2000). Four north-south transects are established uniformly across the project area, and sampling stations are established uniformly along each transect line to obtain an even distribution throughout the project area. Two north-south transects are delineated across reference area # 1 to establish the sampling stations. Percent cover, dominant plant heights, and species composition are documented in 4-m^2 sampling plots marked with two corner poles to allow for revisiting the sites over time. Vegetation was evaluated at the sampling sites in the fall of 2000 (pre-construction) and in the fall of 2003 (post-construction). Future vegetation sampling will be conducted through CRMS-*Wetlands*.

Submerged Aquatic Vegetation (SAV):

The effect of the project on SAV abundance is determined by comparing SAV abundance before and after project construction. Three permanent locations are sampled in the project area, and three reference locations are sampled outside the project area (figure 4). Frequency is determined on two transects in each pond; there will be at least 20 stations per transect. Frequency is determined by methods described in Chabreck and Hoffpauir (1962) and Nyman and Chabreck (1996), except that the stations are as short as possible because the ideal area of a station is a point (Mueller-Dombois and Ellenberg 1974:69-80). When water clarity permits, cover and species abundance are estimated visually on each transect. SAV was evaluated in the fall of 2000 (pre-construction) and in the fall of 2003 (post-construction). Based on the CRMS-*Wetlands* review, future SAV sampling was discontinued.

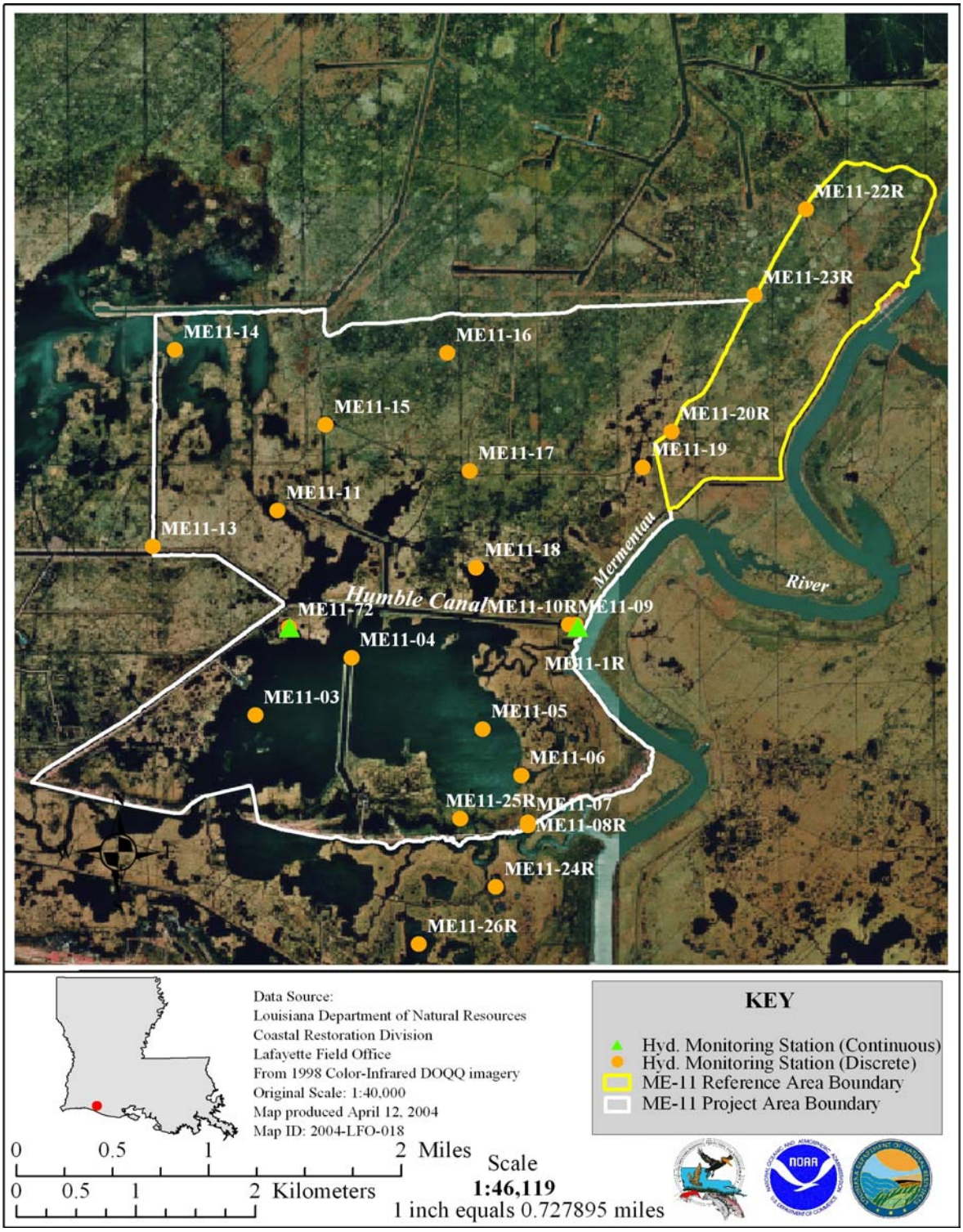


Figure 2. ME-11 project area with locations of continuous data recorders and discrete sampling stations.

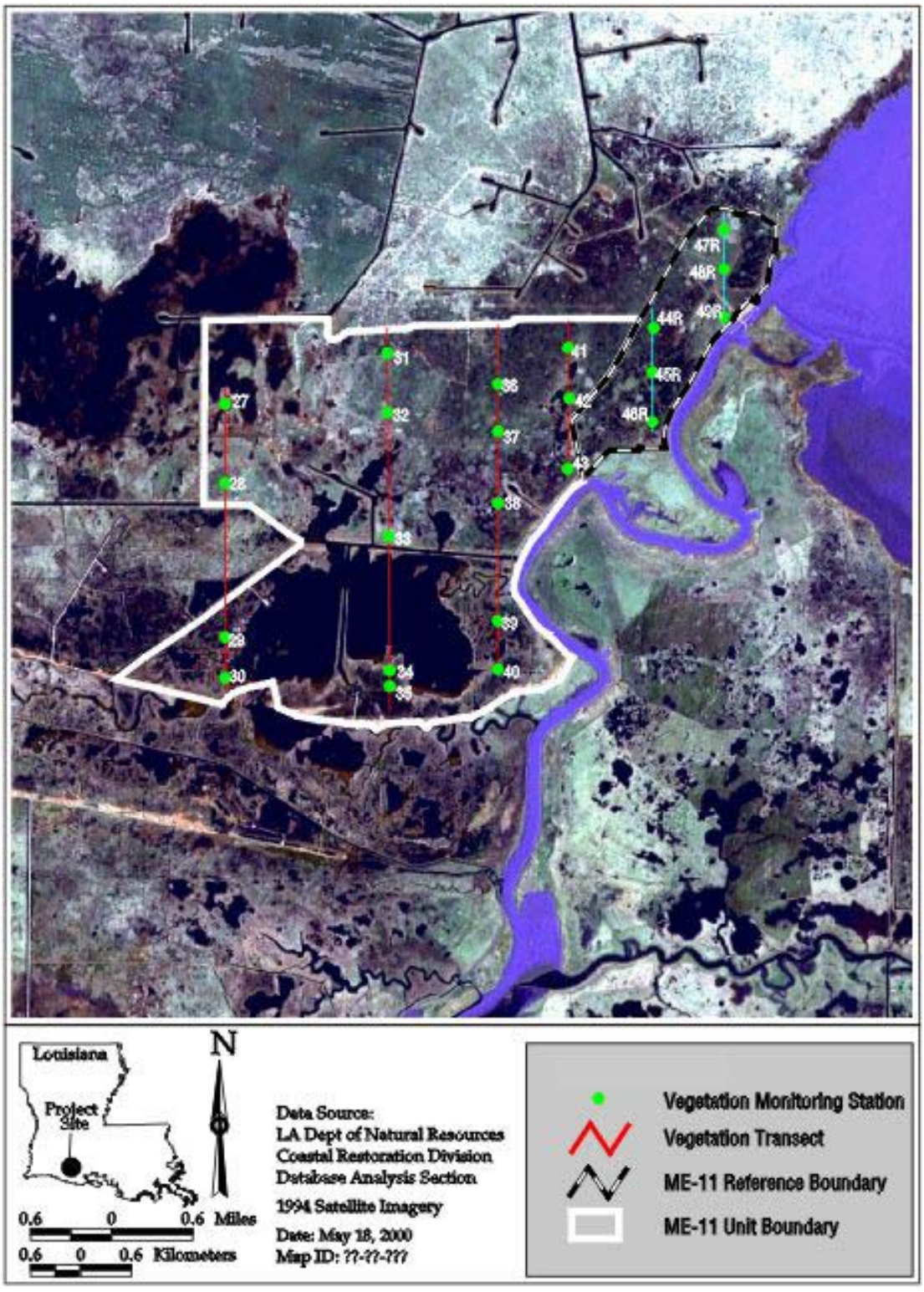


Figure 3. Location of vegetation monitoring transects and sampling points for the ME-11 project.

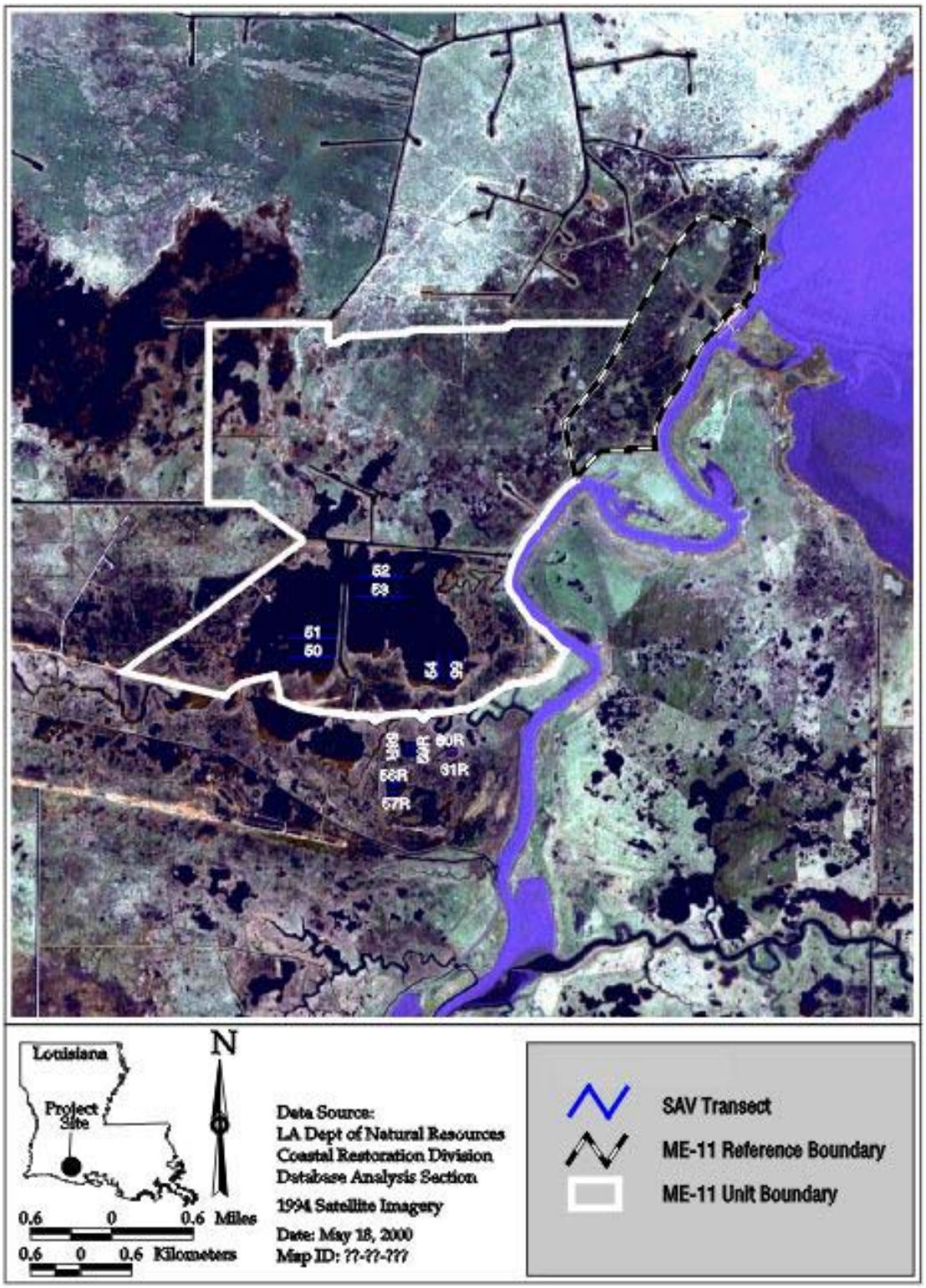


Figure 4. Location of SAV monitoring transects and sampling points for the ME-11 project.

IV. Monitoring Activity (continued)

c. Preliminary Monitoring Results and Discussion

Aerial Photography:
Land/water analysis of project and reference areas was completed for 2000 aerial photography (pre-construction) and is shown in figure 5. In the project area, 2,993 acres (1,211 hectares) were classified as land and 683 acres (276 hectares) were classified as water. Comparisons will be made to determine land loss/gain when 2005 post-construction photography becomes available.

Water Level:
From January 1, 2004, to March 14, 2004, water level variability was lower in the project area, as shown in the yearly graphs for the project and reference stations (figures 6a [reference] and 6b [project]). Water level at project area station ME11-72 remained within the target range 18% of the time during this period, while water level at reference station ME11-01R remained within the target range 41% of the time during the same period. Mean, maximum, and minimum water levels for each station's entire data range are displayed in table 1.

Analysis of pre- and post-construction water level data through December 2003 is available in the 2003 Operations, Maintenance, and Monitoring (OM&M) report (Price and Guidry 2007). Variability was lower in the project area during 2003, and post-construction results showed improvement at station ME11-72.

Water Salinity:
From January 1, 2004, to March 14, 2004, salinity variability was lower in the project area, as shown in the yearly graphs for the project and reference stations (figures 6a-b). Salinity at both stations ME11-72 and ME11-01R remained within the target range 100% of the time during this period. All salinity parameters at station ME11-72 were within target range, and salinity at station ME11-01R exceeded the target range by a large degree (table 1) when examining record for the entire year.

Analysis of pre- and post-construction salinity data through December 2003 is available in the 2004 OM&M report (Price and Guidry 2007). Variability was lower in the project area during 2003, and post-construction results were within target range at station ME11-72.

Emergent Vegetation:
Complete analysis of pre- and post-construction vegetation data, collected in 2000 and 2003, is available in the 2004 OM&M report (Price and Guidry 2007). Mean percent cover by species for year 2000 and 2003 is displayed in figure 7a (project area) and 7b (reference area). Species diversity, mean total percent cover (figures 8a-b), and mean species richness (figures 9a-b) decreased in both project and reference areas from 2000 to 2003, although these results were not significant ($P>0.05$). Dominant species found in 2000 and 2003, in both the project and reference areas, were *Spartina patens* (marsh-hay cordgrass), *Typha latifolia* (cattail), and *Sagittaria lancifolia* (bulltongue).

Submerged Aquatic Vegetation (SAV):

Complete analysis of pre- and post-construction SAV data is available in the 2004 OM&M report (Price and Guidry 2007). The presence of SAV markedly increased in the project area post-construction, while some increase was experienced in the reference area. Eight species of SAV were encountered in the project area in 2003, whereas no SAV was encountered in 2000. In 2003, the mean frequency of occurrence of SAV species in the project area approached levels encountered in the reference area (figures 10a-b).

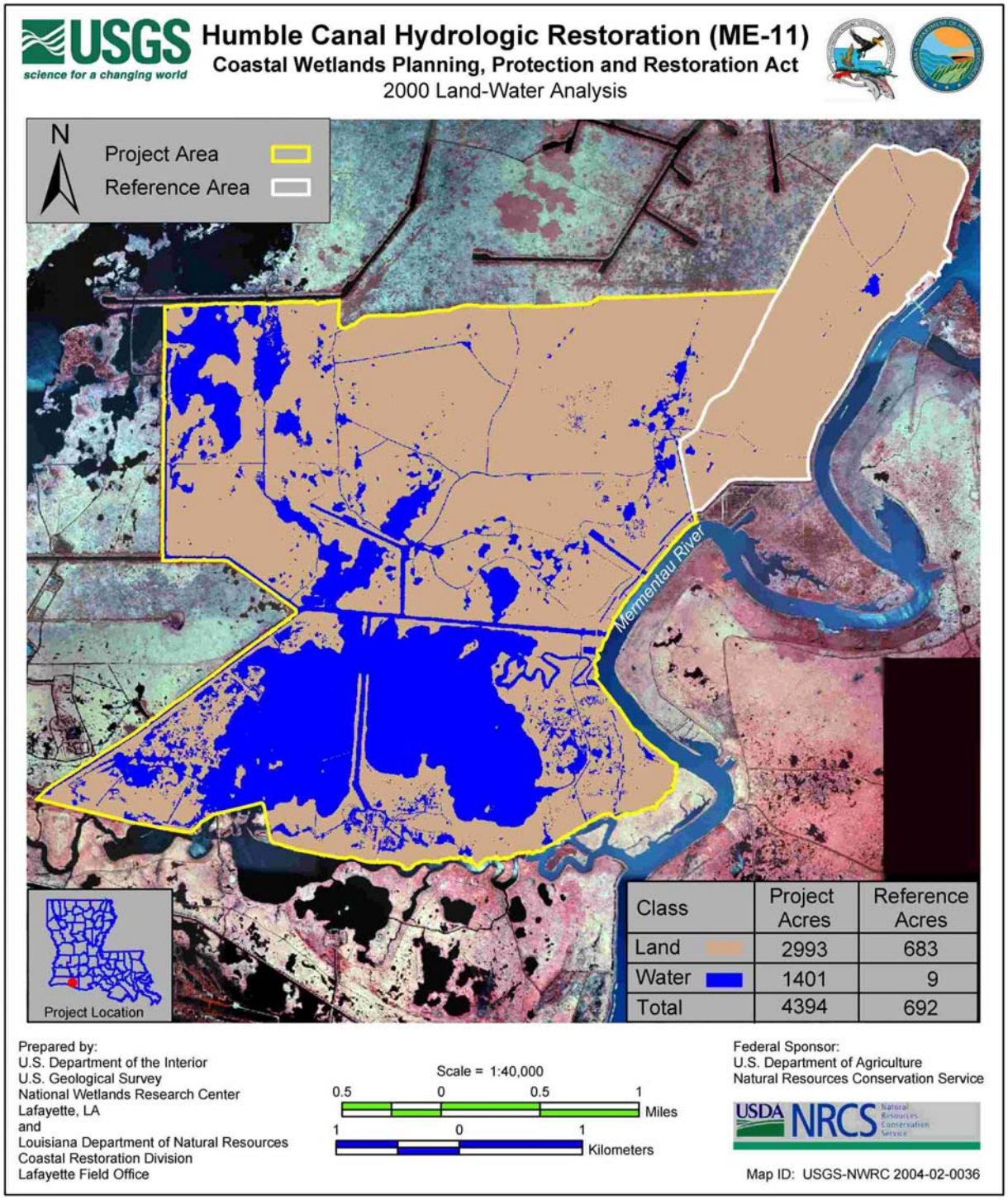
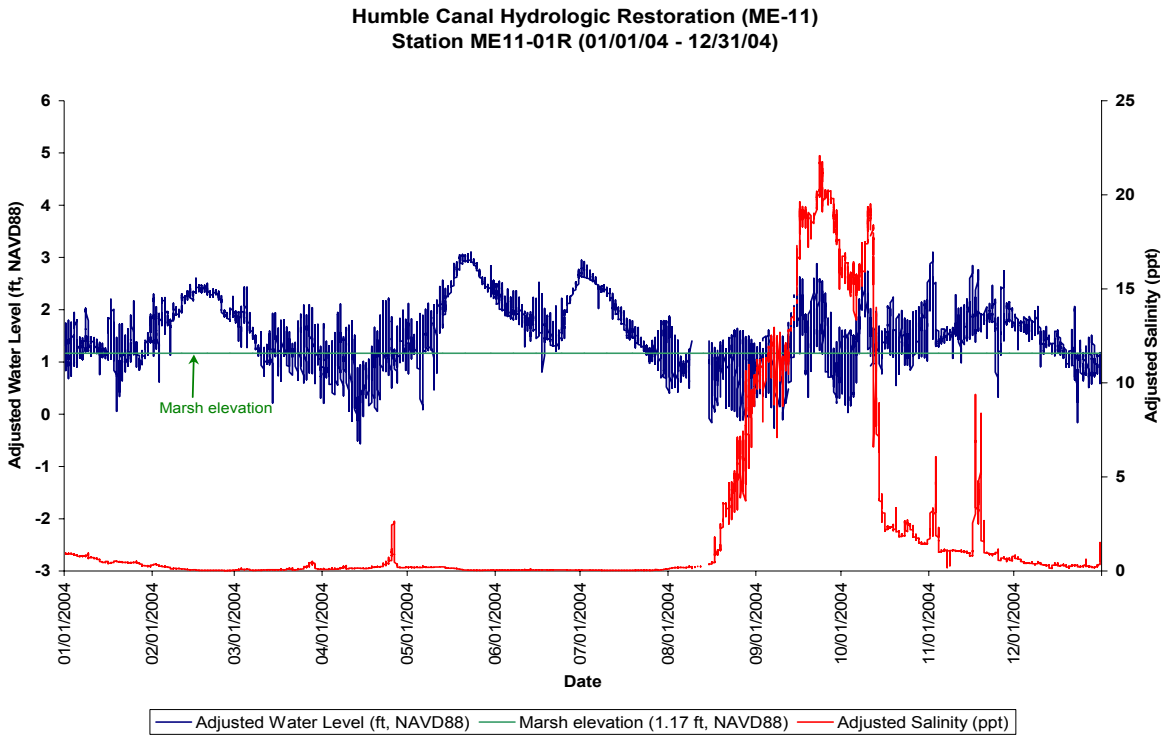
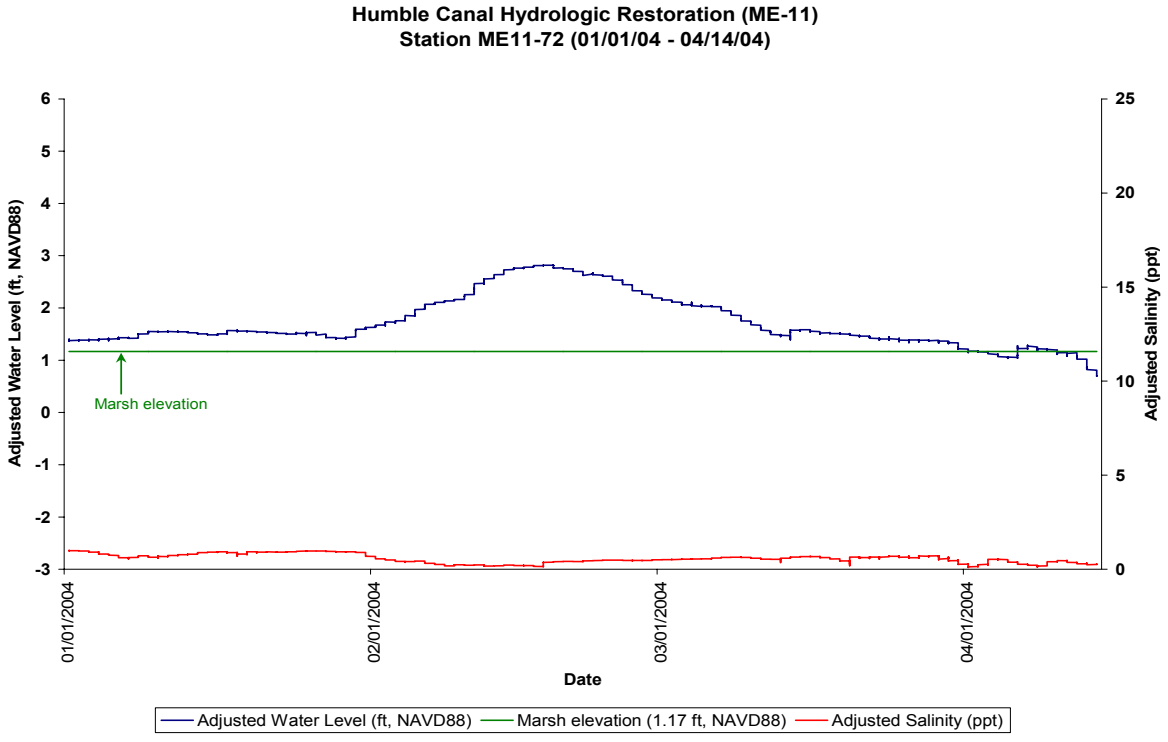


Figure 5. Land/water analysis of 2000 aerial photography showing the acreage of land and water in the project and reference areas of Humble Canal Hydrologic Restoration.

a



b

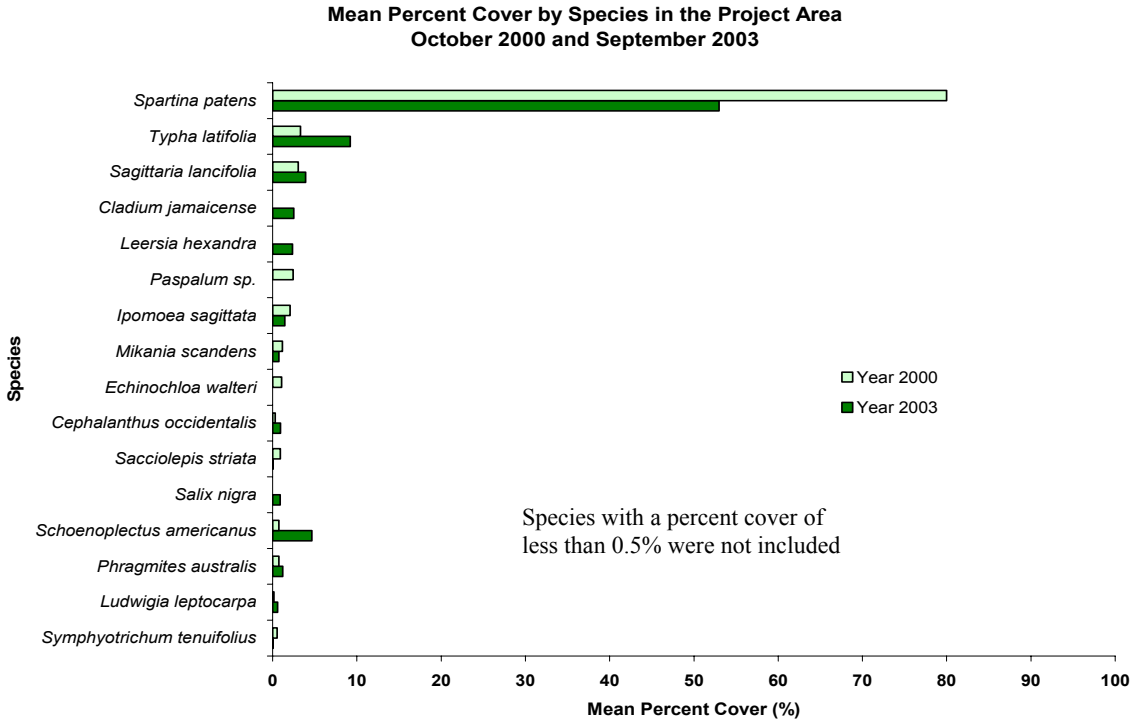


Figures 6a-b. Water level and salinity data from stations a) reference station ME11-01R and b) project area station ME11-72, shown in feet.

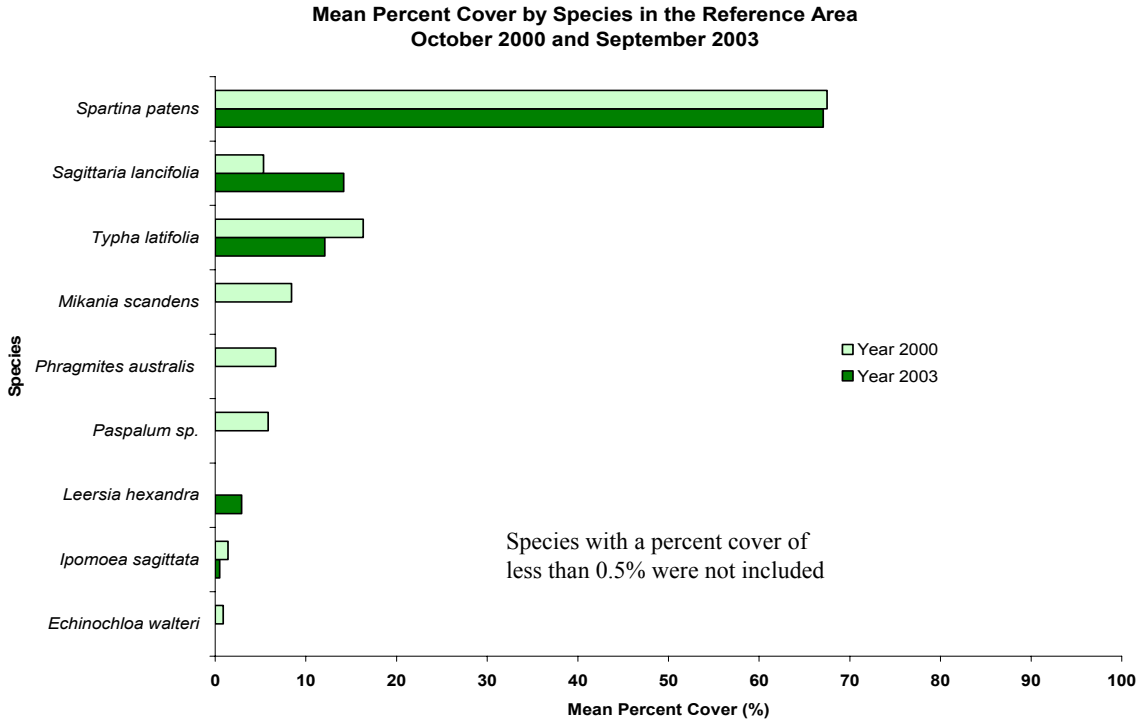
Table 1. Mean, maximum, and minimum values of water level and salinity during 2004 for stations ME11-01R and ME11-72. Station 72 was removed in April.

	Adjusted Water Level (ft. NAVD88)		Adjusted Salinity (ppt)	
	ME11-01R	**ME11-72**	**ME11-01R**	**ME11-72**
Mean ± S.D.	1.56 ± 0.60	1.73 ± 0.50	2.41 ± 5.10	0.57 ± 0.24
Maximum	3.10	2.82	22.07	0.99
Minimum	-0.56	0.69	0.03	0.10

a

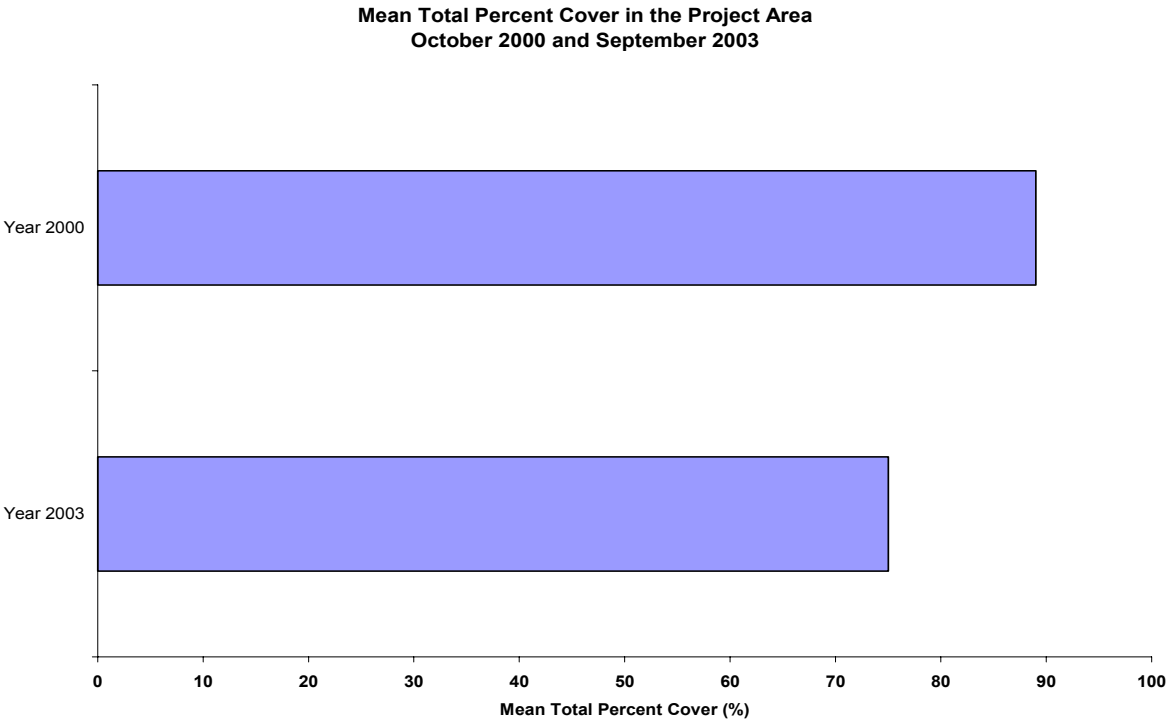

Mean Percent Cover by Species in the Project Area
October 2000 and September 2003
Spartina patens
Typha latifolia
Sagittaria lancifolia
Cladium jamaicense
Leersia hexandra
Paspalum sp.
Ipomoea sagittata
Mikania scandens
Echinochloa walteri
Cephalanthus occidentalis
Sacciolepis striata
Salix nigra
Schoenoplectus americanus
Phragmites australis
Ludwigia leptocarpa
Symphyotrichum tenuifolius
Species
Year 2000
Year 2003
Species with a percent cover of
less than 0.5% were not included
0
10
20
30
40
50
60
70
80
90
100
Mean Percent Cover (%)

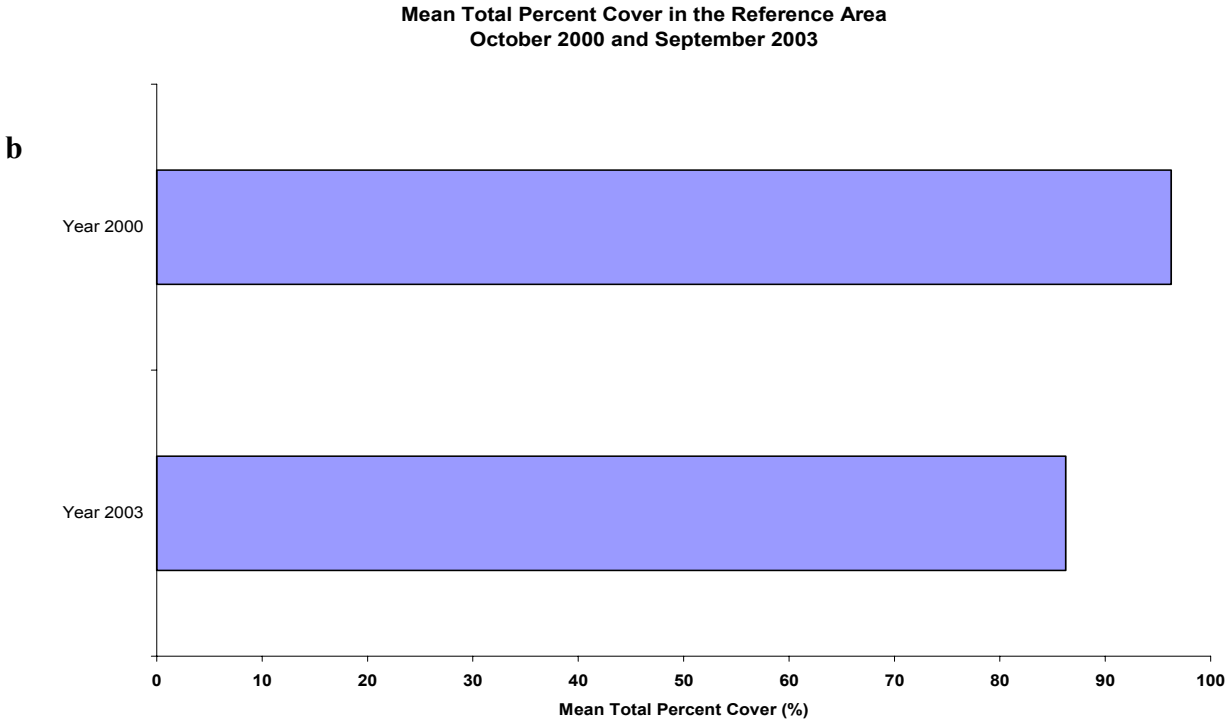
b



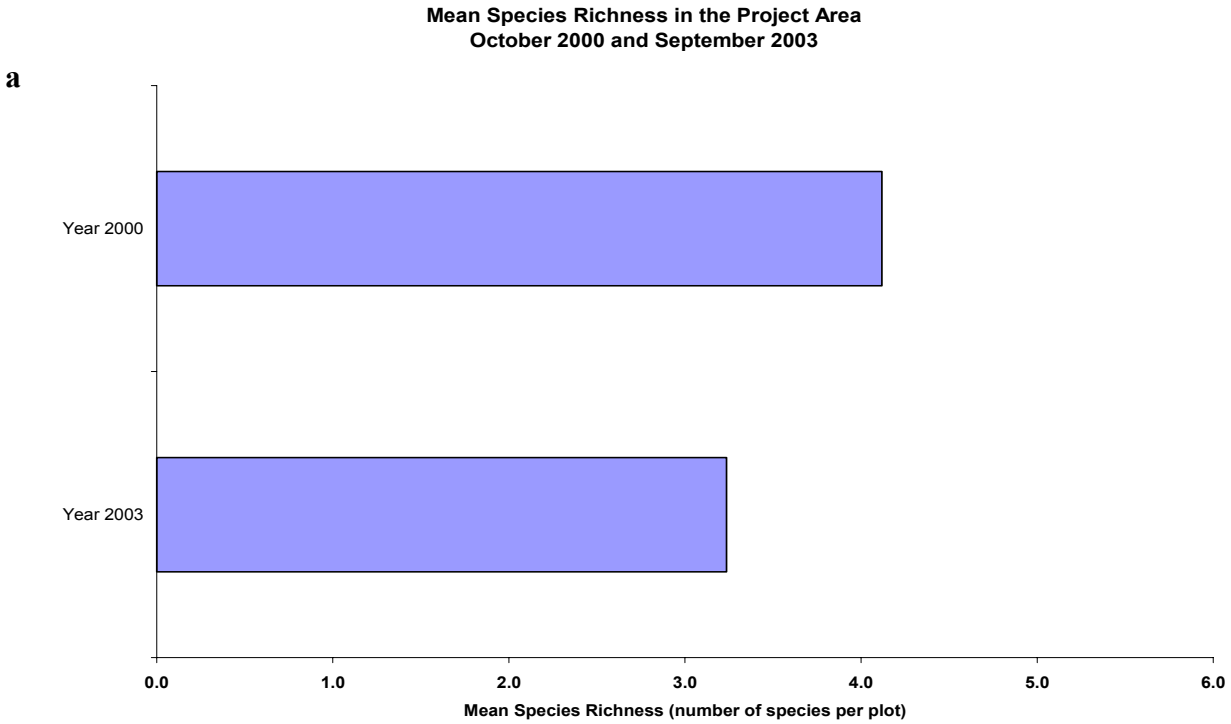
Figures 7a-b. Mean percent cover of selected species across all project ME-11 plots within the a) project area (N=17 plots) and b) reference area (N=6 plots) during October 2000 and September 2003.

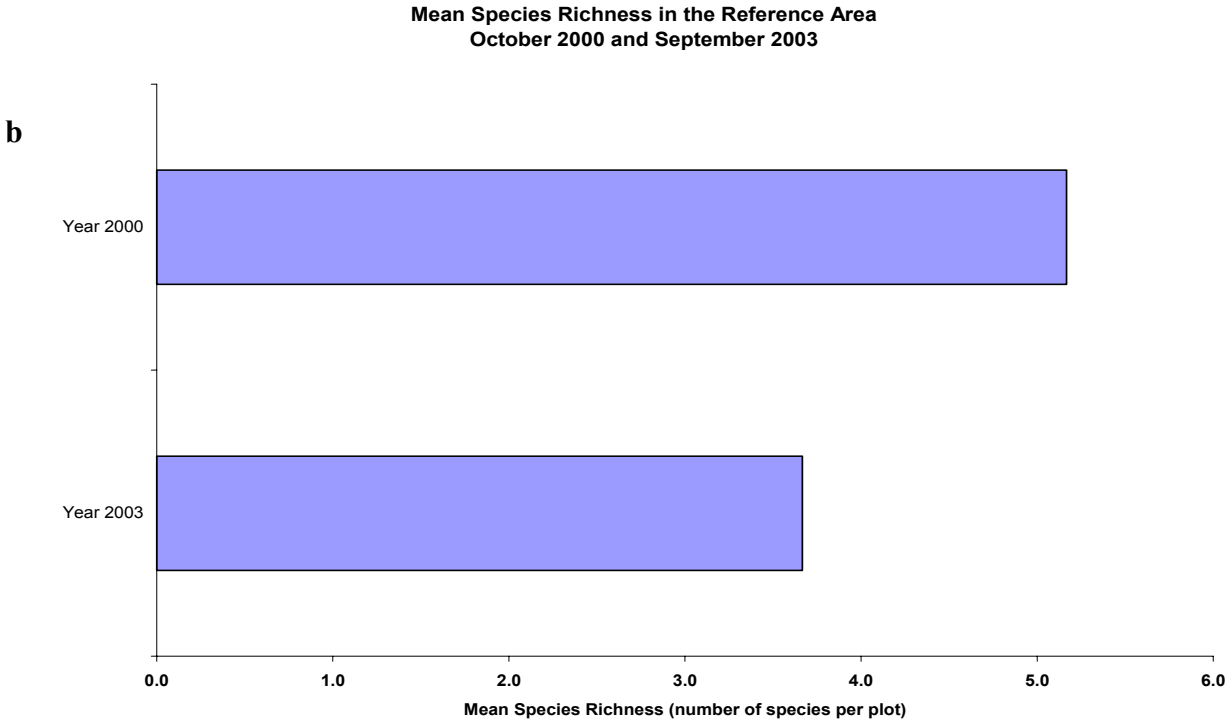
a





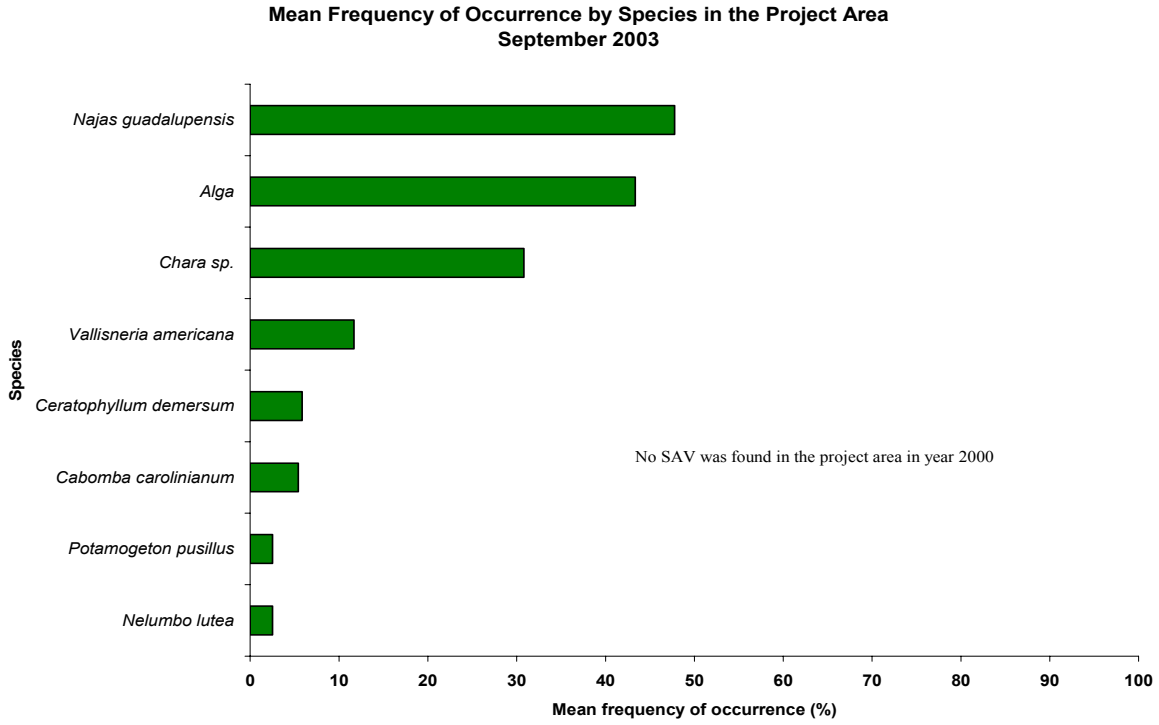
Figures 8a-b. Mean total percent cover in the a) ME-11 project area (N=17) and b) reference area (N=6) during October 2000 and September 2003.



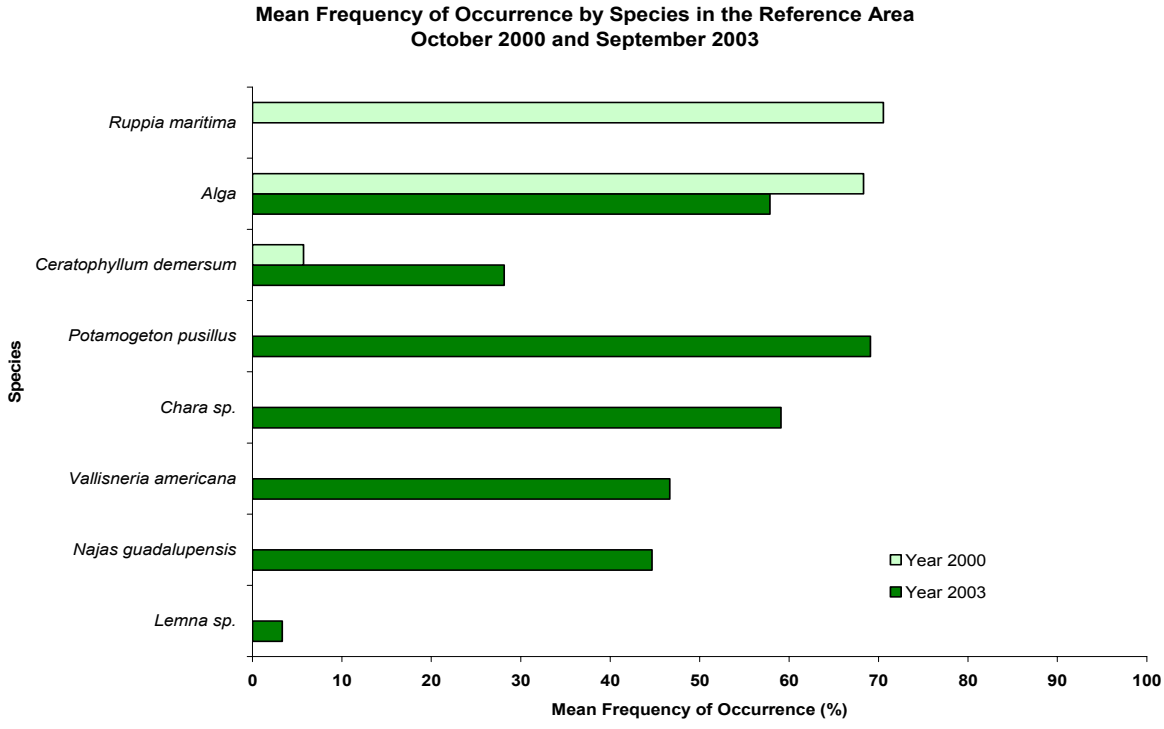


Figures 9a-b. Mean species richness in the a) ME-11 project area (N=17) and b) reference area (N=6) during October 2000 and September 2003.

a



b



Figures 10a-b. Mean frequency of occurrence across all ME-11 project transects in the a) project area (N=6) and b) reference area (N=6) during October 2000 and September 2003.

V. Conclusions

a. Project Effectiveness

The 2004 data collected from January to April indicate that project area water level was above the target range most of that time. Post-construction in 2003, water level within the project area decreased compared to the reference area, although project area mean water level was slightly above the target range. Observations made during site visits indicate that large rain events will raise water levels temporarily within the project area, and this water is slower to recede than at adjacent marsh area.

The 2004 data indicate that project area salinity was consistently within target range. Since salinity has remained below 3 ppt in the project area 100% of the time post-construction while salinity has frequently risen well above 3 ppt at the reference station, saltwater is effectively restricted. However, since salinity at the project station remained within the target range 99% of the time pre-construction, results cannot be attributed to project implementation.

No additional emergent vegetation or SAV data were collected in 2004. Emergent vegetation data will be collected through CRMS-*Wetlands* stations after the summer of 2005.

b. Recommended Improvements

Modifications to the land rights agreement with Miami Corp. are currently being made in an effort to designate Miami as structure operator for the project.

c. Lessons Learned

The ME-11 structure design incorporated the use of aluminum stoplogs and removable lifting devices. This type of structure design is recommended on future projects, providing for easier and safer operations of the structure.

The structure design was modified during construction to add five small platforms above the flapgates of each barrel. This allowed for safer operator access to manipulate the opening handles that are used to lift the flapgates, and is recommended to be incorporated in future designs.

The structure design was modified during construction to replace the ¼"-thick (0.6 cm) aluminum channel system supporting the stoplogs with an extruded ½" (1.3 cm) channel system. The thicker ½" extruded channel system is free of any warps to which the ¼" system would be subjected. This allows the stoplogs to move more freely and is recommended to be incorporated in future designs.

VI. REFERENCES

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Appendix A
(Inspection Photographs)

Photo 1—marine barrier

Photo 2—sloughing rock around structure

Photo 3—exposed cloth around structure

Photo 4—inlet side of structure and hyacinth guard

Appendix B
(Three-Year Budget Projection)

HUMBLE CANAL / ME11 / PPL8
Three-Year Operations & Maintenance Budgets 07/01/2005 - 06/30/08

Project Manager	O & M Manager	Federal Sponsor	Prepared By
		NRCS	

	2005/2006	2006/2007	2007/2008
Maintenance Inspection	$ 4,995.00	$ 5,119.00	$ 5,288.00
Structure Operation			$ -
Administration			$ -
Maintenance/Rehabilitation			

05/06 Description:

E&D	$ -	
Construction	$ -	
Construction Oversight	$ -	
Sub Total - Maint. And Rehab.	$ -	

06/07 Description: Structural Assessment

E&D		$ 15,000.00
Construction		
Construction Oversight		$ -
Sub Total - Maint. And Rehab.		$ 15,000.00

07/08 Description:

E&D			$ -
Construction			$ -
Construction Oversight			$ -
Sub Total - Maint. And Rehab.			$ -

	2005/2006	2006/2007	2007/2008
Total O&M Budgets	**$ 4,995.00**	**$ 20,119.00**	**$ 5,288.00**

OPERATION AND MAINTENANCE BUDGET 07/01/2005-06/30/2006

HUMBLE CANAL/ME-11/PPL8

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$4,955.00	**$4,955.00**
General Structure Maintenance	LUMP	1	$0.00	**$0.00**
Engineering and Design	LUMP	1	$0.00	**$0.00**
Operations Contract	LUMP	1	$0.00	**$0.00**
Construction Oversight	LUMP	1	$0.00	**$0.00**
ADMINISTRATION				
LDNR / CRD Admin.	LUMP	0	$0.00	$0.00
FEDERAL SPONSER Admin.	LUMP	0	$0.00	$0.00
SURVEY Admin.	LUMP	0	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$0.00**
MAINTENANCE / CONSTRUCTION				
SURVEY				
SURVEY DESCRIPTION:				
Secondary Monument	EACH	0	$0.00	$0.00
Staff Gauge / Recorders	EACH	0	$0.00	$0.00
Marsh Elevation / Topography	LUMP	0	$0.00	$0.00
TBM Installation	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL SURVEY COSTS:	**$0.00**
GEOTECHNICAL				
GEOTECH DESCRIPTION:				
Borings	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL GEOTECHNICAL COSTS:	**$0.00**
CONSTRUCTION				
CONSTRUCTION DESCRIPTION:				
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE
	0	0.0	0	$0.00
	0	0.0	0	$0.00
	0	0.0	0	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00
Navagation Aid		EACH	0	$0.00
Signage		EACH	0	$0.00
General Excavation / Fill		CU YD	0	$0.00
Dredging		CU YD	0	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00
Timber Piles (each or lump sum)			0	$0.00
Timber Members (each or lump sum)			0	$0.00
Hardware		LUMP	1	$0.00
Materials		LUMP	1	$0.00
Mob / Demob		LUMP	1	$0.00
Contingency		LUMP	1	$0.00
General Structure Maintenance		LUMP	1	$0.00
OTHER				$0.00
OTHER				$0.00
OTHER				$0.00
			TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$4,955.00**

OPERATION AND MAINTENANCE BUDGET 07/01/2006-06/30/2007

HUMBLE CANAL/ME-11/PPL8

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$5,119.00	**$5,119.00**
General Structure Maintenance	LUMP	1	$0.00	**$0.00**
Engineering and Design	LUMP	1	$15,000.00	**$15,000.00**
Operations Contract	LUMP	1	$0.00	**$0.00**
Construction Oversight	LUMP	1	$0.00	**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	$0.00	$0.00
FEDERAL SPONSER Admin.	LUMP	0	$0.00	$0.00
SURVEY Admin.	LUMP	0	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$0.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	$0.00	$0.00
Staff Gauge / Recorders	EACH	0	$0.00	$0.00
Marsh Elevation / Topography	LUMP	0	$0.00	$0.00
TBM Installation	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	1	$0.00	$0.00
Materials		LUMP	1	$0.00	$0.00
Mob / Demob		LUMP	1	$0.00	$0.00
Contingency		LUMP	1	$0.00	$0.00
General Structure Maintenance		LUMP	1	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$20,119.00**

OPERATION AND MAINTENANCE BUDGET 07/01/2007-06/30/2008

HUMBLE CANAL/ME-11/PPL8

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$5,288.00	**$5,288.00**
General Structure Maintenance	LUMP	1	$0.00	**$0.00**
Engineering and Design	LUMP	1	$0.00	**$0.00**
Operations Contract	LUMP	1	$0.00	**$0.00**
Construction Oversight	LUMP	1	$0.00	**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	1	$0.00	$0.00
FEDERAL SPONSER Admin.	LUMP	1	$0.00	$0.00
SURVEY Admin.	LUMP	1	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$0.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	$0.00	$0.00
Staff Gauge / Recorders	EACH	0	$0.00	$0.00
Marsh Elevation / Topography	LUMP	0	$0.00	$0.00
TBM Installation	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	1	$0.00	$0.00
Materials		LUMP	1	$0.00	$0.00
Mob / Demob		LUMP	1	$0.00	$0.00
Contingency		LUMP	1	$0.00	$0.00
General Structure Maintenance		LUMP	1	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$5,288.00**

Appendix C
(Field Inspection Notes)

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: ME-11 Humble Canal

Date of Inspection: March 23, 2005 Time: 11:00am

Structure No. N/A photos 4-9

Inspector(s): LDNR- Stan Aucoin , Mel Guidry, Garrett Broussard, Darrell
NRCS- Brad Sticker, Charles Starkovich

Structure Description: 5 - 48" x 50' corrugated aluminum pipe with weir type drop inlets and flap gated outlets/ 1 1 - 18" x 50' corrugated aluminum pipe with screw gate

Water Level +2.2 NAVD Inside

Type of Inspection: Annual

Weater Conditions: Clear, 10-15 mph N. wind, 50 deg.

Item	Condition	Pysical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	good				
Steel Grating	good				
Stop Logs	good				Stoplogs on this structure are made of aluminum and should last practically forever.
Hardware	good				
Timber Piles	good				
Timber Wales	good				
Galv. Pile Caps	good				
Cables/ lifting device	good				The lifting apparatus was not on site.
Signage /Supports	good				
Rip Rap (fill) (foreshore dike)	good				
Eathern Embankment	fair				Some slight sluffing near the structure has occurred, and geo-textile is exposed. It doesn't appear to have been caused by water scour, but possibly just because of the steep slope involved. This situation will be monitored to see if it worsens.

What are the conditions of the existing levees?	Stable on both the inlet and outlet channels. Assessment survey to be performed in '05-'06. Exposed cloth near the structure as noted.
Are there any noticable breaches?	No
Settlement of rock plugs and rock weirs?	N/A
Position of stoplogs at the time of the inspection?	Approximately -0.5 NAVD
Are there any signs of vandalism?	No