

Submerged Aquatic Vegetation Mapping in Alabama Coastal Waters in 2008 and 2009



Funding provided by the Mobile Bay National Estuary Program, the Alabama Department of Conservation and Natural Resources State Lands Division and the National Oceanic and Atmospheric Administration

NOAA Coastal Change Analysis Program (C-CAP) ---

Digital feature mapping using aerial photography and complementary surface-level verification

- Remote sensing using ortho imagery produced from aerial photographs
- SAV signatures digitized in GIS to create ESRI polygon coverage
- Field surveys for database development and accuracy assessments

Aerial Imagery Acquisition → *Environmental conditions must be suitable for detecting submerged features*

- Minimal cloud cover, wind and waves
- Low turbidity
- Sun angles between 30 and 45°
- Low tides
- Peak SAV biomass



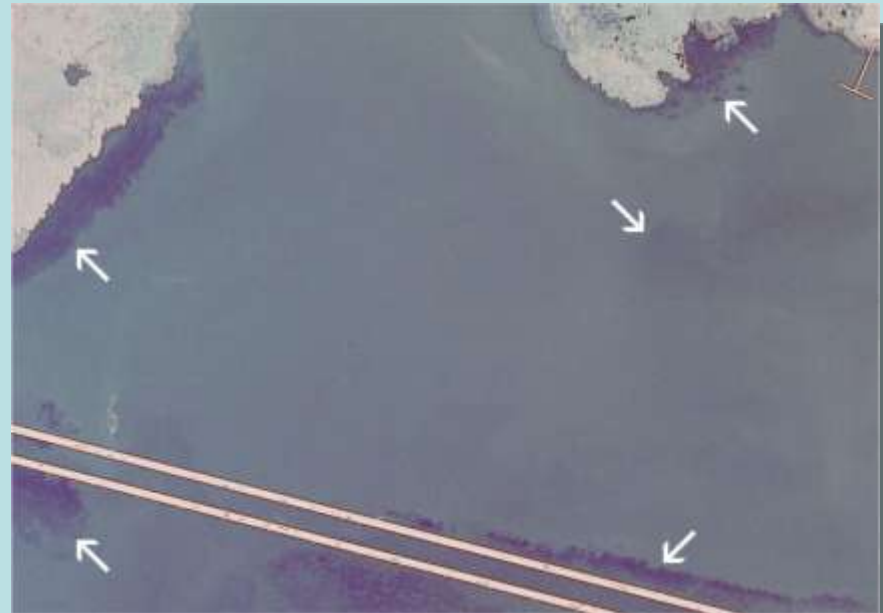
Field surveys

- Data was collected at 182 field locations in 2008 and 1,326 locations in 2009
- Visual assessment of dominant species and bed density

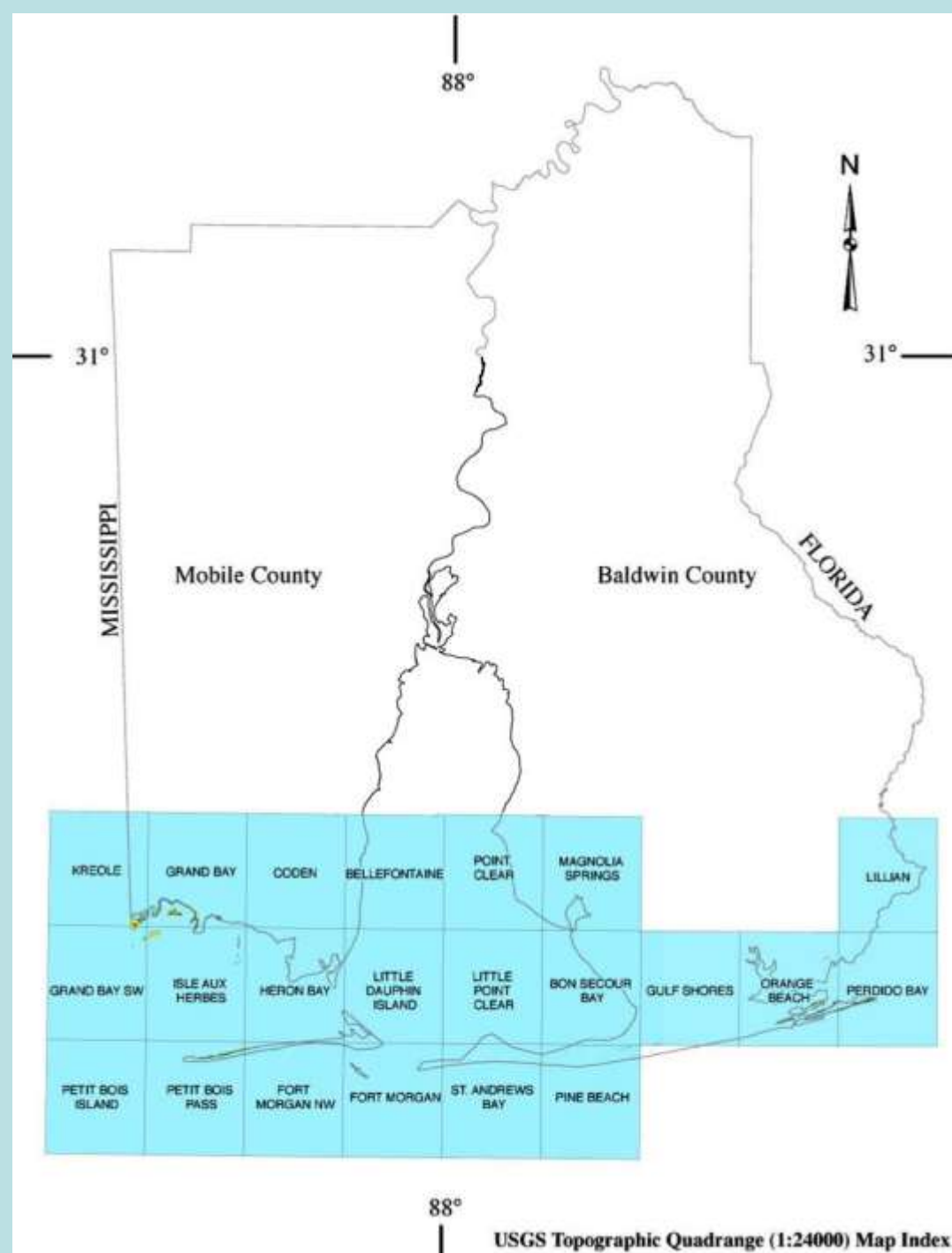
Accuracy testing of the completed delineation

- Spatial – Bed boundary locations in the field compared with GIS polygon boundaries → Average horizontal error was 3.17 meters
- Thematic – Verification of cover type → Accuracy determined to be 90%

Timing is critical!



- Project was originally intended for 2007 but was postponed due to poor water clarity.
- Suboptimal conditions persisted through the Summer 2008.
- Aerial imagery was acquired October 2008 for the southern portion of the study area. →



SW
Mobile
County
2008



SE Baldwin County 2008

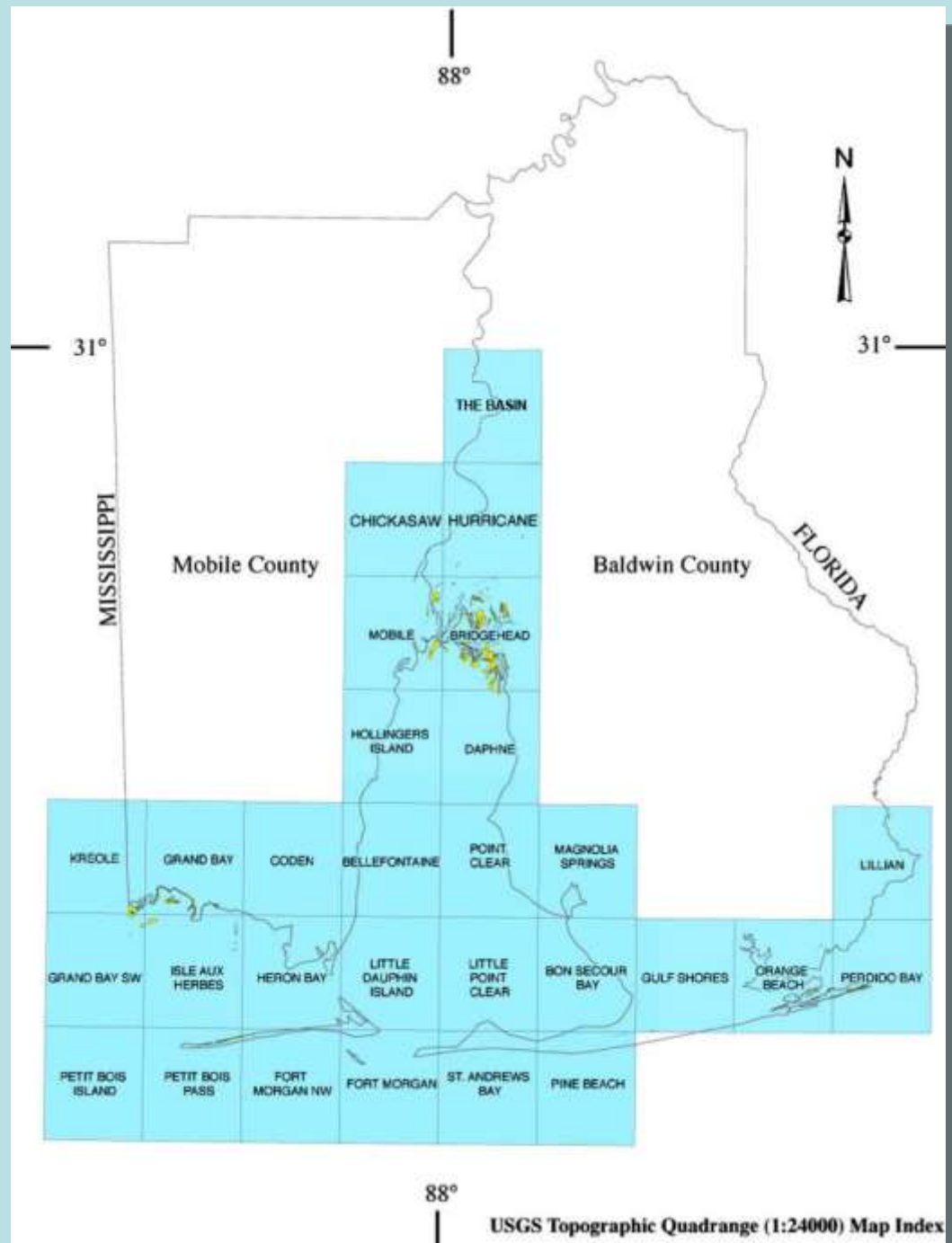


Halodule wrightii

GULF OF MEXICO

ALABAMA
FLORIDA

Full Area Survey
Aerial imagery
acquired July 2009



Comparison of 2008 and 2009 Acreage

USGS QUADRANGLE	OCT 2008 ACREAGE	JULY 2009 ACREAGE	DIFFERENCE
Fort Morgan	6.8	0.0	- 6.8
Fort Morgan NW	31.4	25.2	- 6.2
Grand Bay	548.1	364.2	- 183.9
Grand Bay SW	86.8	61.8	- 25.0
Gulf Shores	1.4	1.5	+ 0.1
Isle aux Herbes	355.7	129.2	- 226.5
Kreole	230.1	218.8	- 11.3
Orange Beach	147.0	150.8	+ 3.8
Perdido Bay	135.1	135.4	+ 0.3
Petit Bois Pass	142.1	142.3	- 0.2
Pine Beach	1.2	1.2	--
TOTAL	1,685.7	1,230.4	- 455.3

Mobile County; Baldwin County

Less widgeon grass (*Ruppia maritima*) in Mississippi Sound in 2009 compared to 2008.



2009 acreage by species (habitat) category.	
HABITAT	ACREAGE
Eurasian watermilfoil, southern naiad, wild celery	1005.9
Wild celery	978.6
Eurasian watermilfoil	804.3
Shoal grass	467.3
Shoal grass, widgeon grass	436.6
Eurasian watermilfoil, southern naiad	365.9
Widgeon grass	313.1
Eurasian watermilfoil, southern naiad, widgeon grass, wild celery	201.7
Eurasian watermilfoil, water stargrass	187.6
Eurasian watermilfoil, wild celery	155.8
Sago pondweed	78.7
Coon's tail, Eurasian watermilfoil, southern naiad, wild celery	76.9
Sago pondweed, wild celery	63.6
Coon's tail, Eurasian watermilfoil, water stargrass, wild celery	35.1
Eurasian watermilfoil, water stargrass, wild celery	13.7
Southern naiad	12.8
Brittle water nymph, southern naiad	10.5
Coon's tail, small pondweed, southern naiad	3.3
Water stargrass	3.1
Eurasian watermilfoil, leafy bladderwort	1.7
Twoleaf watermilfoil	1.1
Turtle grass	0.04

Northern portion of study area; Southern portion of study area

The lower Mobile-Tensaw Delta contained 77% of the total 2009 SAV acreage.





Comparison of 2009 Acreage with the 2002 Baseline Survey

USGS QUADRANGLE	2002 ACREAGE	2009 ACREAGE	DIFFERENCE
Bridgehead	3,641.0	3,450.3	- 190.7
Chickasaw	26.9	21.2	- 5.7
Daphne	9.5	35.1	+ 25.6
Fort Morgan NW	0.0	25.2	+ 25.2
Grand Bay	296.4	364.2	+ 67.8
Grand Bay SW	79.9	61.8	- 18.1
Gulf Shores	1.2	1.5	+ 0.3
Hollinger's Island	126.7	0.0	-126.7
Hurricane	517.3	1.9	- 515.4
Isle aux Herbes	87.6	129.2	+ 41.6
Kreole	295.9	218.8	- 77.1
Mobile	1,007.0	509.8	- 497.2
Orange Beach	60.0	150.8	+ 90.8
Perdido Bay	114.6	135.4	+ 20.8
Petit Bois Pass	59.6	142.3	+ 82.7
Pine Beach	0.1	1.2	+ 1.1
The Basin	265.2	0.0	- 265.2
TOTAL	6,588.9	5,248.7	-1,340.2

Northern portion of the study area; Southern portion of the study area