

**A field guide to aquatic habitats and common
fauna of the northern Gulf of Mexico:
Chandeleur Islands, Louisiana to Perdido Key,
Florida**

**Mark S. Peterson
Department of Coastal Sciences
The University of Southern Mississippi
703 East Beach Drive
Ocean Springs, Mississippi 39564**

**Gretchen L. Waggy
Department of Coastal Sciences
The University of Southern Mississippi
703 East Beach Drive
Ocean Springs, Mississippi 39564**

Table of Contents

- I. Gulf Coast Research Laboratory Information
 - a. History
 - b. Facilities
 - c. Instructional faculty
 - d. Summer courses

- II. Maps and Driving Directions
 - a. Gulf Coast Research Laboratory, Ocean Springs, MS
 - b. J. L. Scott Marine Education Center & Aquarium, Biloxi, MS
 - c. Audubon Aquarium of the Americas, New Orleans, LA
 - d. Estuarium, Dauphin Island, AL

- III. Species Lists, Habitat Descriptions and Sampling Gear
 - a. Muddy/Sandy substrate
 - b. Sea grass
 - c. Oyster reefs
 - d. Surf zone
 - e. Commonly caught recreational fish
 - f. Sampling gear

- IV. Local Places of Interest
 - a. Boat Excursions
 - b. Museums
 - c. National Seashore

- V. Scientific Collection Permit Information
 - a. Louisiana
 - b. Mississippi
 - c. Alabama
 - d. Florida

- VI. Regional Literature

- VII. Acknowledgements

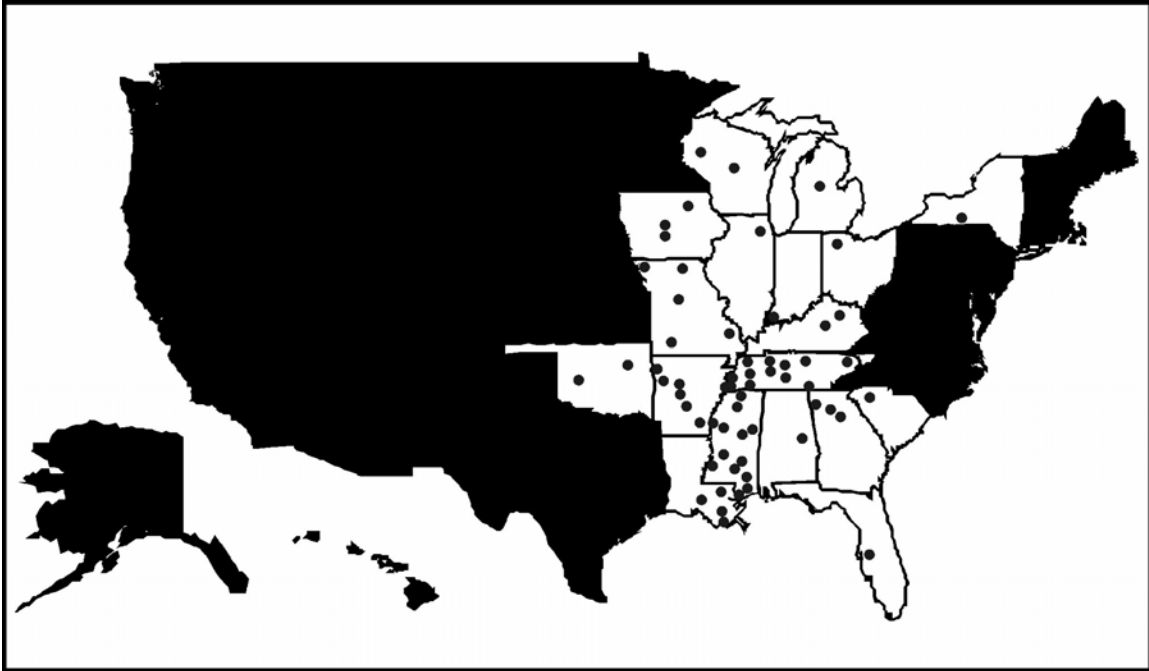
- VIII. Appendix
 - a. GCRL Affiliate Colleges and Universities
 - b. Habitat photographs
 - c. Organism photographs
 - d. Seagrass coverage images
 - e. Oyster bed coverage

I. Gulf Coast Research Laboratory Information

a) History-

The Gulf Coast Research Laboratory (GCRL) has had a unique 57-year history of research and education, and is the only state supported marine biology laboratory, as well as the main marine education and research component of The University of Southern Mississippi (USM). On August 28, 1947, the Mississippi Academy of Sciences officially dedicated the GCRL with the opening of the first official summer session at Magnolia State Park in Ocean Springs, Mississippi. The GCRL emerged from those early days with a two-fold focus: 1) scholarship, and 2) immediate impact on the economy of Mississippi. The evolution of the two-fold focus set into motion a creative environment still at work today as GCRL administrators, researchers, and educators merge sometimes contrasting missions, approaches, priorities and perspectives. GCRL faculty, their graduate students, and technical staff explore fundamental questions about the plants, animals and processes of Mississippi's coastal environments. At the same time, these professionals have a firsthand relationship with the practical realities and the concerns encountered by the people who live, work and play in those environments. The result is a unique institution that integrates scientific discovery with graduate, undergraduate and public education as well as with rapid and effective response to questions of public concern.

The Summer Field Program (SFP) is managed by the Department of Coastal Sciences of The University of Southern Mississippi. The SFP has 62 affiliate colleges and universities from 17 states, mainly in the Mississippi Valley of the United States (Map 1). The program serves about 80 undergraduate



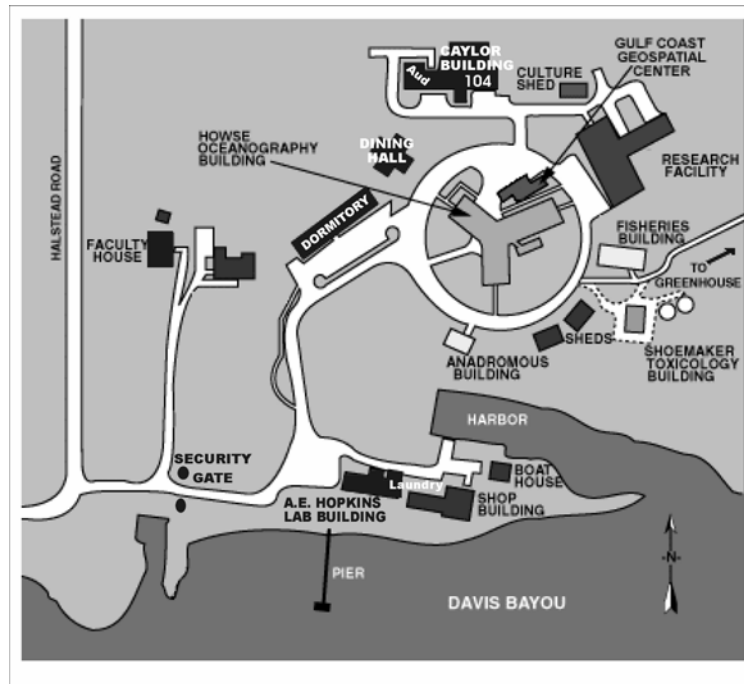
Map 1. Map of the locations of the 62 affiliate colleges and universities. Listing of colleges and universities can be found in Appendix a.

and 35-40 graduate students annually with a broadly-based selection of courses that transfer through USM back to their home college or university. The program is very cost-effective for all students who seek marine science education and research experience in a unique setting. The Mississippi Sound as a study area couples offshore barrier islands, saline and freshwater marsh ecosystems, Pine Savannas, riverine ecosystems and extensive seagrass meadows. This region is also home to the endangered Gulf sturgeon (see Appendix a), the saltmarsh topminnow (a candidate species) and the Pascagoula River (the only non-dammed river of its size in the lower 48 states). This ideal location is very attractive to visiting research faculty for enumerable research opportunities. This region, associated natural habitats, and unique species also fosters the

integration of research and education opportunities that both faculty and graduate/undergraduate students embrace.

b) Facilities-

GCRL's 22 buildings house research and teaching laboratories, classrooms and offices (Map 2) where more than 220 researchers, technical and support personnel, and graduate and undergraduate students work. The Laboratory is also home to the Gunter Library (5,306 ft²), one of the most extensive marine science libraries in the northern Gulf of Mexico region. The Laboratory's Ichthyological Research Collection includes 310,000 fish specimens from around the world. Finally, there is a 11,240 ft² dormitory for



Map 2. Layout of the buildings at the Gulf Coast Research Laboratory.

visiting students that was recently renovated and re-opened for the 2001 SFP session.

Among the Laboratory's vessels are the *R/V Tommy Munro*, a 97-foot oceanographic research vessel, the 38-foot steel *M/V Hermes*, and the 55-foot steel trawler *R/V McIlwain*. There are also small skiffs and canoes available for collecting purposes by enrolled students.



R/V Munroe



M/V Hermes



R/V McIlwain

On the Laboratory's Biloxi campus, the J.L. Scott Marine Education Center & Aquarium houses Mississippi's largest public aquarium and features marine

educational programs and firsthand experiences for Mississippi residents and visitors of all ages. More than 81,000 children and adults visit the Center each year. About 31,000 of the Center's yearly visitors are involved in the hands-on education programs that have earned the Center an international, award-winning reputation. The facility's 48 aquariums, arranged around the 42,000-gallon Gulf of Mexico tank, showcase native creatures typical of Mississippi's waters from freshwater streams to open ocean.

c) Instructional faculty-

The majority of instructors come from the Department of Coastal Sciences faculty or the GCRL scientific or education staff (*).

Resident faculty	Current visiting faculty and home institution
Patrick Biber, Ph.D.	Pat Biesiot, Ph.D., USM-Biological Sciences
Reg Blaylock, Ph.D. *	Carol Cleveland, Ph.D., Northwest Mississippi Comm. College
Marius Brouwer, Ph.D.	Walt Conley, Ph.D., State University of New York, Potsdam
Shelia Brown, Ph.D. *	Gregory Fulling, Ph.D., NOAA, NMFS
Jinx Campbell, Ph.D.	Stan Kuczaj, Ph.D., USM - Psychology
Bruce H. Comyns, Ph.D.	Michael W. Morris, Ph.D., North Georgia College & State University
D. Jay Grimes, Ph.D.	Keith Mullins, Ph.D., NOAA, NMFS
William Hawkins, Ph.D.	Stephanie Showalter, JD, University of Mississippi
Richard W. Heard, Ph.D.	James Wetzal, Ph.D., Presbyterian University
Eric Hoffmayer, Ph.D. *	Mark Woodrey, Ph.D., Mississippi State University
Jeffrey Lotz, Ph.D.	Jack Gartner, Ph.D., St. Petersburg College
Jerry McClelland, M.S. *	
Robin Overstreet, Ph.D.	
Harriet M. Perry, M.S.	
Mark S. Peterson, Ph.D.	
Chet F. Rakocinski, Ph.D.	
Sharon Walker, Ph.D.	

d) Summer courses-

Course #	Course Title	Credit Hours	When Offered
COA 300	Marine Science I: Oceanography	3	Every summer
COA 300L	Marine Sci. I: Oceanography Lab	2	Every summer
COA 301	Marine Science II: Marine Biology	3	Every summer
COA 301L	Marine Sci. II: Marine Biology Lab	2	Every summer
COA 409	Coastal Geology	3	Occasionally
COA 417	Marine Fish Tech	3	Occasionally
COA 421	Marine Ichthyology	3	Every 3rd summer
COA 421L	Mar Ichthyology Lab	3	Every 3rd summer
COA 424	Marine Aquaculture	3	Occasionally
COA 422	Elasmobranch Biology	3	Occasionally
COA 422L	Elasmobranch Biology Lab	2	Occasionally
COA 424L	Mar Aquaculture Lab	3	Occasionally
COA 428	Mar Invert Zoology	3	Every summer
COA 428L	Marine Invert Lab	3	Every summer
COA 433	Marine Phycology	2	Occasionally
COA 433L	Mar Phycology Lab	2	Occasionally
COA 434	Coastal Vegetation	2	Occasionally
COA 434L	Coastal Veg Lab	1	Occasionally
COA 435	Salt Marsh Plant Eco	2	Occasionally
COA 435L	Salt Marsh Eco Lab	2	Occasionally
COA 436	Marine Botany	2	Occasionally
COA 436L	Marine Botany Lab	1	Occasionally
COA 443	Marine Mammals	3	Every summer
COA 443L	Mar Mammals Lab	2	Every summer
COA 444	Cetecean Behavior	3	Every 3rd summer
COA 446	Marine Ecology	3	Every summer
COA 446L	Mar Ecology Lab	2	Every summer
COA 447	Faunistic Ecology	2	Every other summer
COA 447L	Faunistic Eco Lab	3	Every other summer
COA 465	Mar Biotechnology	3	Occasionally
COA 465L	Mar Biotech Lab	3	Occasionally
COA 486	Ecology For Teacher	3	Every summer
COA 486L	Ecology Teacher Lab	1	Every summer
COA 490	Special Topics	1-6	New Course designation
COA 491	Special Topics	1-6	New Course designation
COA 492	Special Problems	1-6	Independent studies
COA 509	Coastal Marine Geo	3	Occasionally

Course #	Course Title	Credit Hours	When Offered
COA 521	Marine Ichthyology	3	Every 3rd summer
COA 521L	Mar Ichthyology Lab	3	Every 3rd summer
COA 522	Elasmobranch Biology	3	Occasionally
COA 522L	Elasmobranch Biology Lab	2	Occasionally
COA 524	Marine Aquaculture	3	Occasionally
COA 524L	Mar Aquaculture Lab	3	Occasionally
COA 528	Mar Invert Zoology	3	Every summer
COA 528L	Mar Invert Zoo Lab	3	Every summer
COA 533	Marine Phycology	2	Occasionally
COA 533L	Mar Phycology Lab	2	Occasionally
COA 534	Coastal Vegetation	2	Occasionally
COA 534L	Coastal Veg Lab	1	Occasionally
COA 535	Salt Marsh Plant Eco	2	Occasionally
COA 535L	Salt Marsh Eco Lab	2	Occasionally
COA 536	Marine Botany	2	Occasionally
COA 536L	Marine Botany Lab	1	Occasionally
COA 543	Marine Mammals	3	Every summer
COA 543L	Marine Mammals Lab	2	Every summer
COA 544	Cetecean Behavior	3	Every other summer
COA 546	Marine Ecology	3	Every summer
COA 546L	Marine Ecology Lab	2	Every summer
COA 547	Faunistic Ecology	2	Every other summer
COA 547L	Faunistic Ecol Lab	3	Every other summer
COA 565	Mar Biotechnology	3	Occasionally
COA 565L	Mar Biotech Lab	3	Occasionally
COA 585	Marine Science/Et	3	Occasionally
COA 586	Ecology For Teacher	3	Every summer
COA 586L	Ecol For Teach Lab	1	Every summer
COA 590	Special Topics	1-6	New course designation

II. Maps and Driving Directions

a) Directions to Gulf Coast Research Laboratory-

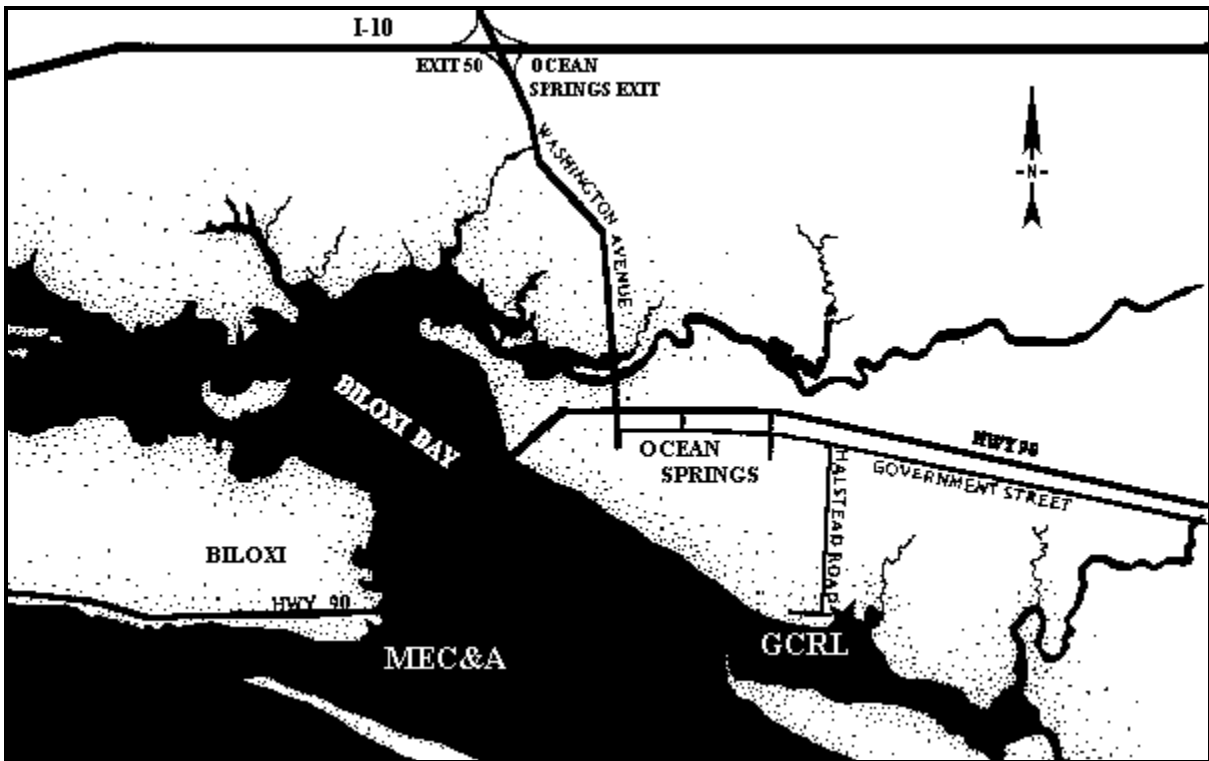
Traveling from New Orleans, LA/Gulfport, MS directions (points West):

The Gulf Coast Research Laboratory is located at 703 East Beach Road in Ocean Springs, Mississippi. If you are traveling East on I-10, take the Ocean Springs Exit #50 and follow Hwy 609 (Washington Avenue) south for about 3

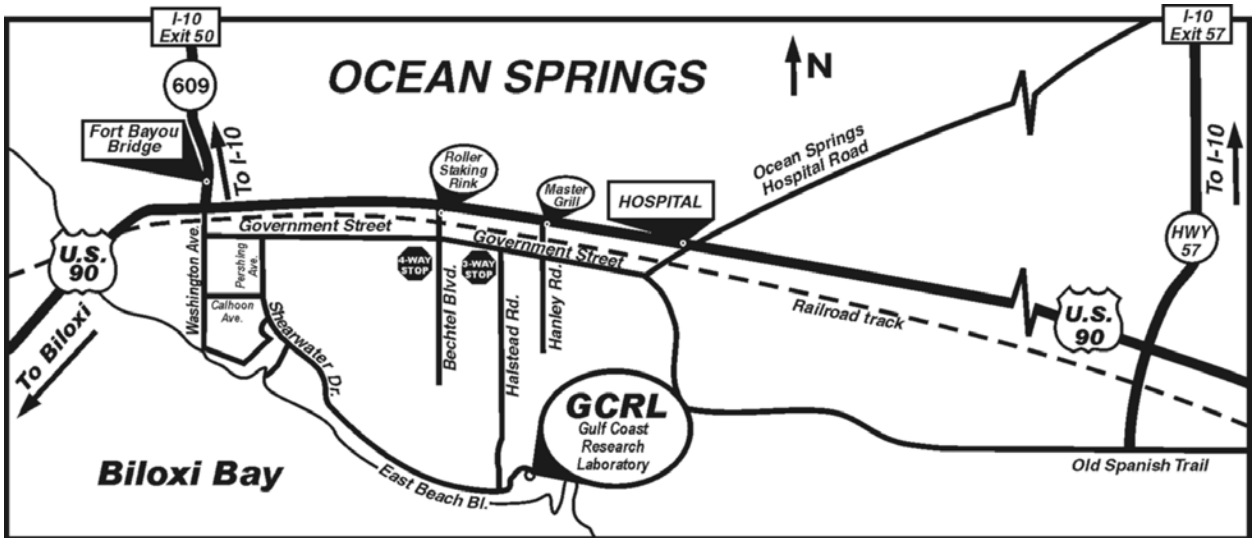
miles to U.S. 90; Turn left on U.S. 90 (Bienville Blvd.) and then turn right on Bechtel Blvd. (3rd traffic light, about 1.5 miles). Go across the railroad tracks and turn left on Government street (a 4-way stop). At the next 3 way stop, turn right on Halstead Road. Drive south to the beach and the GCRL entrance is located on the left (Maps 3 and 4).

Traveling from the Mobile, AL/Pascagoula, MS directions (points East):

The Gulf Coast Research Laboratory is located at 703 East Beach Road in Ocean Springs, Mississippi. If you are traveling West on I-10, take the Ocean Springs Exit #57 and turn left (south) on Hwy 57. Take this to U.S. 90 (Bienville Blvd.) and turn right. Go about 4.5 miles (6th traffic light) to Hanley Road. Turn left on Hanley, go cross the railroad tracks, and then turn right on Government (a 4-way stop). Take a left on Halstead (a 3-way stop) and go south to the beach. The GCRL entrance is located to the left (Maps 3 and 4).



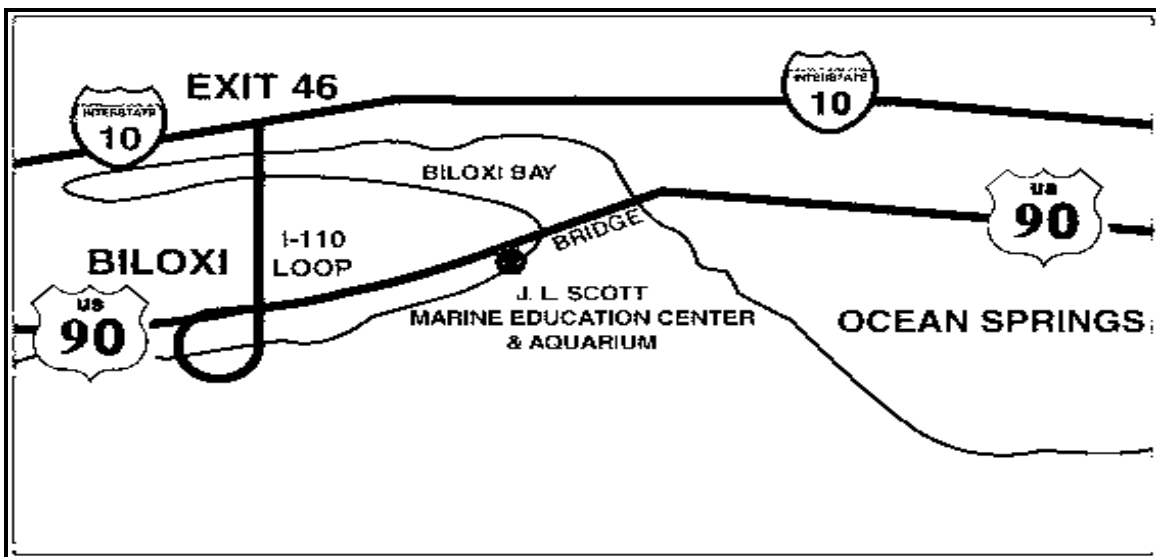
Map 3. Gulf Coast Research Laboratory, Ocean Springs in relation to I-10 and Hwy 90.



Map 4. Enlargment of Ocean Springs and the proximity of GCRL to Hwy 57.

b) Directions to the J.L. Scott Marine Education Center and Aquarium-

The J.L Scott Marine Education Center and Aquarium is located at 115 Beach Blvd. (US Hwy 90) in Biloxi, Mississippi at the western end of the Biloxi Bay Bridge. From I-10 take the I-110 Exit (#46). From I-110, take the Ocean Springs exit to US Hwy 90 and travel east 2 miles. Use the Isle of Capri entrance and go east at the traffic circle (Map 5).



Map 5: Location of J.L. Scott Marine Education Center & Aquarium in relation to I-10, I-110, and Hwy 90.

Hours of Operation:

Open daily from 9:00 am to 4:00 pm (Closed Sundays)

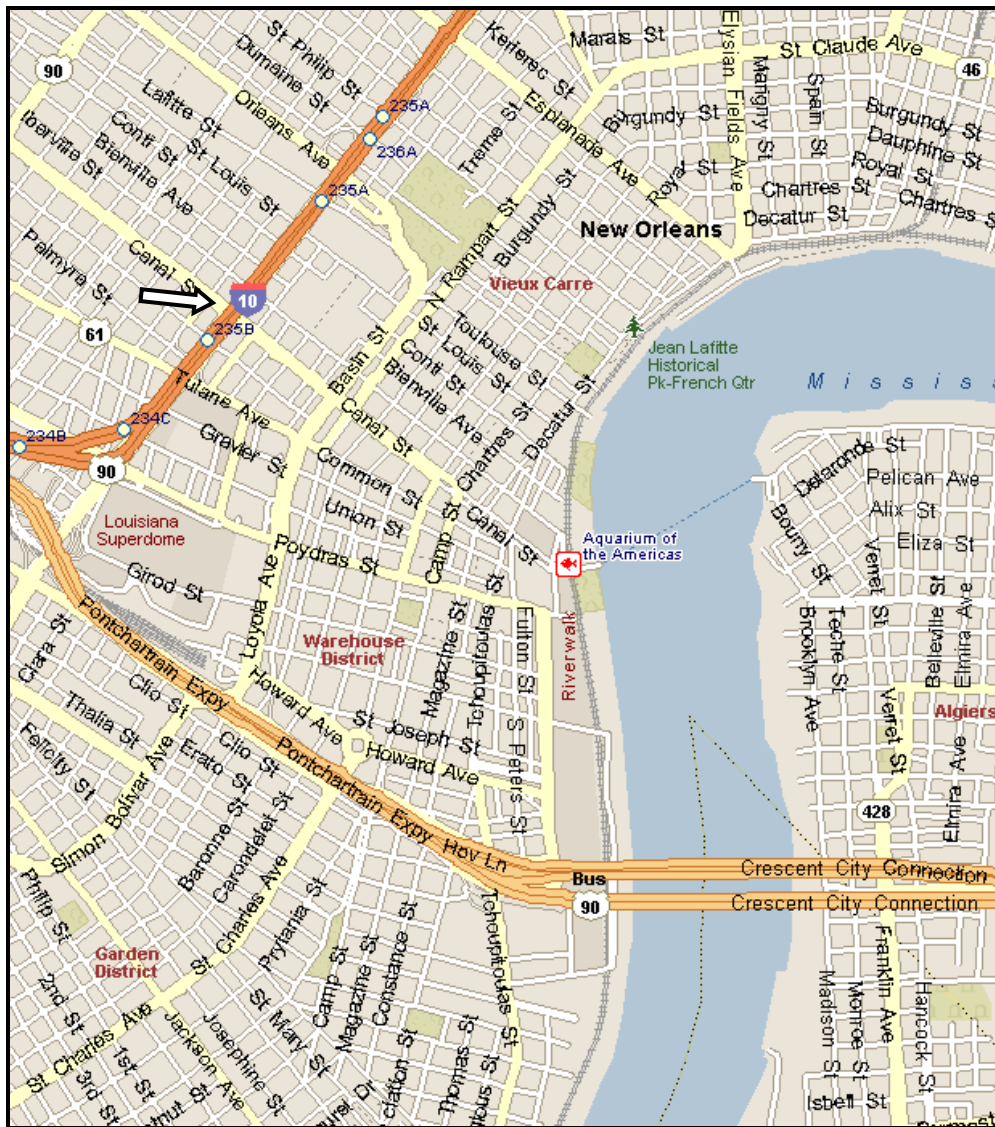
Admission

Group rates available

For Group Scheduling call (228) 374-5550

c) Directions to the Audubon Aquarium of the Americas, New Orleans-

Via Interstate 10 West: Take I-10 west to New Orleans. Exit at Canal/ Superdome (exit 235B), turning right onto Canal. The Aquarium/IMAX® is located at the foot of Canal Street at the Mississippi River (Maps 6 and 7).



Map 6: Route to Aquarium of the Americas from I-10 (exit 235B) in New Orleans.



Map 7: Enlargement of Canal Street, Aquarium and surrounding area.

Hours:

9:30 a.m. to 6 p.m. – Sunday through Thursday

9:30 a.m. to 7 p.m. – Friday and Saturday

Ticket Prices:

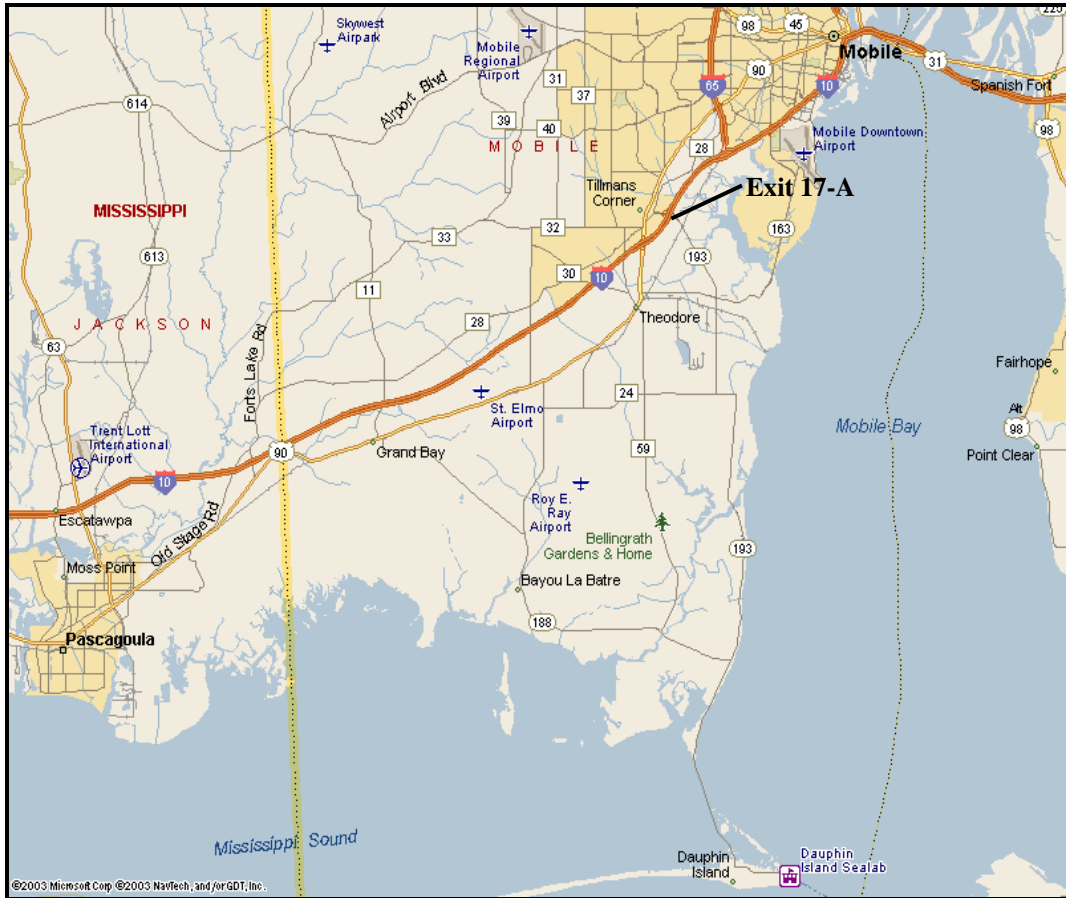
Group reservations at (504) 581-4629 or 1-800-774-7394

50% non refundable deposit is due 2 weeks before visit

d) Directions to Dauphin Island Sea Lab Estuarium-

The DISL Estuarium is located 35 miles from Mobile. From I-10, take the Dauphin Island/Tillman's Corner exit (Exit 17-A). Travel south down Rangeline Road (HWY 193) to Dauphin Island. Take a left at the water tower onto Bienville

Boulevard. Go 2.2 miles and you will see the Estuarium on the left. Parking facilities are available (Maps 8 and 9).



Map 8: Location of Hwy 193 and Dauphin Island Sea Lab in relation to I-10.



Map 9. Enlargement of east portion of Dauphin Island.

Hours of Operation: The Estuarium is open 7 days a week

Summer hours

March 1 - August 31

Monday to Saturday 9:00 am to 6:00 pm

Sunday 12:00 pm to 6:00 pm

Winter hours

September 1 - February 28/29

Monday to Saturday 9:00 am to 5:00 pm

Sunday 1:00 pm to 5:00 p.m

Admission

Group rates available

For Group Scheduling contact Denise Keaton (dkeaton@disl.org)

III) Species lists, habitat descriptions, sampling gear, and species images (appendices b and c)-

a) **Muddy/sandy bottoms-** Unvegetated bottoms of sounds, lagoons, estuaries, river mouths, and offshore subtidal bottoms. Inshore bottoms exposed at low tide, usually submerged at high tide. Sometimes associated with tide pools.

Inshore

Fish

Atlantic stingray

bay anchovy

inland silverside

Gulf menhaden

threadfin shad

scaled sardine

sand seatrout

spotted seatrout

Atlantic croaker

silver perch

southern kingfish (ground mullet)

southern flounder

bay whiff

fringed flounder

hogchoker

lined sole

blackcheek tonguefish

offshore tonguefish

Atlantic cutlass fish

pinfish

sheepshead

Dasyatis sabina

Anchoa mitchilli

Menidia beryllina

Brevoortia patronus

Dorosoma petenense

Harengula jaguana

Cynoscion arenarius

Cynoscion nebulosus

Micropogonias undulatus

Bairdiella chrysoura

Menticirrhus americanus

Paralichthys lethostigma

Citharichthys spilopterus

Etropus crossotus

Trinectes maculatus

Achirus lineatus

Symphurus plagiusa

Symphurus civitatus

Trichiurus lepturus

Lagodon rhomboides

Archosargus probatocephalus

pigfish
inshore lizard fish
longnose killifish
gulf killifish
sheepshead minnow
sailfin molly
hardhead catfish
Atlantic needlefish
planehead filefish (juvenile)
lookdown (juvenile)
leatherjacket
Spanish mackerel (juvenile)
northern sennet (juvenile)
white mullet
striped mullet
Atlantic cutlassfish
Gulf butterfish
harvestfish
striped burrfish

Invertebrates

mantis shrimp
white shrimp
brown shrimp
grass shrimp
ghost shrimp
Louisiana ghost shrimp
brief squid
blue crab
horseshoe crab
striped hermit crab
long-wristed hermit crab
grey sea star

Offshore

Fish

southern kingfish
silver seatrout
white seatrout
Atlantic croaker
spot
pinfish
dwarf sand perch
rock sea bass
Gulf menhaden
scaled sardine

Orthopristis chrysoptera
Synodus foetens
Fundulus majalis-similis
Fundulus grandis
Cyprinidon variegatus
Poecilia latipinna
Arius felis
Strongylura marina
Monochanthus hispidus
Selene vomer
Oligoplites saurus
Scomberomorus maculatus
Sphyraena borealis
Mugil curema
Mugil cephalus
Trichiurus lepturus
Peprilus burti
Peprilus alepidotus
Chilomycterus schoepfi

Squilla empusa
Litopenaeus setiferus
Farfantepenaeus aztecus
Palaemonetes spp.
Biffaria (=Callianassa) biformis
Lepidophthalmus louisianensis
Lolliguncula brevis
Callinectes sapidus
Limulus polyphemus
Clibanarius vittatus
Pagurus longicarpus
Luidia clathrata

Menticirrhus americanus
Cynoscion nothus
Cynoscion arenarius
Micropogonias undulatus
Leiostomus xanthurus
Lagodon rhomboides
Diplectrum bivittatum
Centropristis philadelphica
Brevoortia patronus
Harengula jaguana

striped anchovy
dusky anchovy
bay anchovy
Gulf butterflyfish
harvestfish
inshore lizardfish
offshore lizardfish
longspined porgy
bigeye searobin
bigheaded searobin
shoal flounder
fringed flounder
southern flounder
bay whiff
blackcheek tonguefish
offshore tonguefish
lookdown (juvenile)
Atlantic moonfish
blue runner (hardtail)
Atlantic bumper
hardhead catfish
gafftopsail catfish
blackedged cusk-eel
shrimp eel
least puffer
planehead filefish

Invertebrates

lesser blue crab
blue crab
spider crab
purse crab
Gulf purse crab
flat-clawed hermit crab
box crab
white shrimp
brown shrimp
leanback shrimp
common rock shrimp
rock shrimp
slender inshore squid
longfined squid
spiny-beaded sea star
grey sea star

Anchoa hepsetus
Anchoa lyolepis
Anchoa mitchilli
Peprilus burti
Peprilus alepidotus
Synodus foetens
Saurida brasiliensis
Stenotomus caprinus
Prinotus longispinosus
Prinotus tribulus
Syacium gunteri
Etropus crossotus
Paralichthys lethostigma
Citharichthys spilopterus
Symphurus plagiusa
Symphurus civitatus
Selene vomer
Selene setapinnis
Caranx crysos
Chloroscombrus chrysurus
Arius felis
Bagre marinus
Lepophidium brevibarbe
Ophichthus gomesi
Sphoeroides parvus
Monochanthus hispidus

Callinectes similis
Callinectes sapidus
Libinia dubia
Persephona mediterranea
Persephona crinita
Pagurus pollicaris
Calappa spp.
Litopenaeus setiferus
Farfantepenaeus aztecus
Rimipenaeus similis
Sicyonia brevis
Sicyonia dorsalis
Loligo plei
Loligo pealeii
Astropecten duplicatus
Luidia clathrata

b) **Sea grass**-- submerged aquatic vegetation on shallow, quiet nearshore bottoms. Species dependant on salinity. High faunal abundance and diversity. *Thalassia testudinum*, *Halodule wrightii* and *Ruppia maritima* predominate. *Vallisneria americana* is also abundant in low salinity/tidal freshwater habitats (Appendix d: 1992 seagrass coverage from Chandeleur Islands, Louisiana through Pensacola bay, Florida).

Fish

silver perch	<i>Bairdiella chrysoura</i>
bay anchovy	<i>Anchoa mitchilli</i>
least puffer	<i>Sphoeroides parvus</i>
inland silverside	<i>Menidia beryllina</i>
pinfish	<i>Lagodon rhomboides</i>
pipefish	<i>Syngnathus</i> spp.
seahorse	<i>Hippocampus</i> spp.
southern kingfish (ground mullet)	<i>Menticirrhus americanus</i>
Atlantic croaker	<i>Micropogonias undulatus</i>
pigfish	<i>Orthopristis chrysoptera</i>
speckled seatrout	<i>Cynoscion nebulosus</i>
inshore lizard fish	<i>Synodus foetens</i>
spot	<i>Leiostomus xanthurus</i>
bighead searobin	<i>Prinotus tribulus</i>
silver jenny	<i>Eucinostomus gula</i>
striped burrfish	<i>Chilomycterus schoepfi</i>
Gulf toadfish	<i>Opsanus beta</i>
white mullet	<i>Mugil curema</i>
striped mullet	<i>Mugil cephalus</i>
code goby	<i>Gobiosoma robustum</i>
naked goby	<i>Gobiosoma bosc</i>
darter goby	<i>Ctenogobius boleosoma</i>
clown goby	<i>Microgobius gulosus</i>
frillfin goby	<i>Bathygobius soporator</i>

Invertebrates

blue crab	<i>Callinectes sapidus</i>
striped hermit crab	<i>Clibanarius vittatus</i>
long-wristed hermit crab	<i>Pagurus longicarpus</i>
grass shrimp	<i>Palaemonetes</i> spp.
arrow shrimp	<i>Tozeuma carolinense</i>
brown shrimp	<i>Farfantepenaeus aztecus</i>
white shrimp	<i>Litopenaeus setiferus</i>
snapping shrimp	<i>Alpheus normanni</i>
common grass bed shrimp	<i>Hippolyte zostericola</i>
pen shells	<i>Atrina</i> spp.
quahog (hard clam)	<i>Mercenaria campechiensis</i>

c) **Oyster Reefs**-- intertidal and subtidal structures composed of live oysters, oyster shell and distinct invertebrate communities. The only naturally occurring hard substrate in coastal Mississippi (Appendix e: 1998-1999 oyster coverage from the area south of St. Louis Bay, Mississippi).

Fish

Gulf toadfish	<i>Opsanus beta</i>
skilletfish	<i>Gobiesox strumosus</i>
naked goby	<i>Gobiosoma bosc</i>
code goby	<i>Gobiosoma robustum</i>
darter goby	<i>Ctenogobius boleosoma</i>
striped blenny	<i>Chasmodes bosquianus</i>
spadefish	<i>Chaetodipterus faber</i>
bighead searobin	<i>Prinotus tribulus</i>
pinfish	<i>Lagodon rhomboides</i>
sheepshead	<i>Archosargus probatocephalus</i>
black drum	<i>Pogonias cromis</i>
red drum	<i>Sciaenops ocellatus</i>

Invertebrates

grass shrimp	<i>Palaemonetes</i> spp.
snapping shrimp	<i>Alpheus heterochaelis</i>
striped hermit crab	<i>Clibanarius vittatus</i>
blue crab	<i>Callinectes sapidus</i>
flat-backed mud crab	<i>Eurypanopeus depressus</i>
Atlantic mud crab	<i>Panopeus herbstii</i>
stone crab	<i>Menippe adinia</i>
oysters	<i>Crassostrea virginica</i>
oyster drill	<i>Stramonita haemastoma</i>

d) **Salt marsh** - regularly flooded, low-energy shoreline vegetated by salt-tolerant herbaceous plants. Zonation due to influence of tidal patterns. *Juncus roemerianus*, *Spartina alterniflora* and *Distichlis spicata*.

Fish

naked goby	<i>Gobiosoma bosc</i>
code goby	<i>Gobiosoma robustum</i>
darter goby	<i>Ctenogobius boleosoma</i>
striped blenny	<i>Chasmodes bosquianus</i>
pinfish	<i>Lagodon rhomboides</i>
killifish	<i>Fundulus</i> spp.
sheepshead minnow	<i>Cyprinidon variegatus</i>
sailfin molly	<i>Poecilia latipinna</i>
spot	<i>Leiostomus xanthurus</i>
silversides	<i>Menidia</i> spp.
mullet	<i>Mugil</i> spp.

Invertebrates

fiddler crabs
grass shrimp
snapping shrimp
white shrimp
striped hermit crab
blue crab
flat-backed mud crab
Atlantic mud crab
stone crab
oysters
oyster drill
ribbed mussel
marsh periwinkle
olive nerite
mud snail

Uca spp.
Palaemonetes spp.
Alpheus heterochaelis
Litopenaeus setiferus
Clibanarius vittatus
Callinectes sapidus
Eurypanopeus depressus
Panopeus herbstii
Menippe adinia
Crassostrea virginica
Stramonita haemastoma
Geukensia demissa
Littoraria irrorata
Neritina virginea
Nassarius vibex

e) **Surf Zone**- beaches where wave and current action produce erosion patterns (high energy); beaches within estuaries where fine sediment is deposited (low energy).

Fish

striped anchovy
dusky anchovy
bay anchovy
inland silverside
scaled sardine
Gulf menhaden
permit (juvenile)
Florida pompano (juvenile)
spot
Gulf kingfish
southern kingfish
striped mullet
white mullet
Atlantic stingray
spotted whiff

Anchoa hepsetus
Anchoa lyolepis
Anchoa mitchilli
Menidia beryllina
Harengula jaguana
Brevoortia patronus
Trachinotus falcatus
Trachinotus carolinus
Leiostomus xanthurus
Menticirrhus saxatilis
Menticirrhus americanus
Mugil cephalus
Mugil curema
Dasyatis Sabina
Citharichthys macrops

Invertebrates

common mole crab
square-eyed mole crab
long-wristed hermit crab
lady crab
blue crab
sand dollar
coquina clam

Emerita talpoida
Lepidopa websteri
Pagurus longicarpus
Ovalipes ocellatus
Callinectes sapidus
Mellita quinquesperforata
Donax variabilis

giant cockle
 knobbed whelk
 lightning whelk
 Gulf beach callianassid
 beach mantis shrimp

Dinocardium robustum
Busycon carica
Busycon contrarium
Callichirus islagrande
Coronis scolopendra

f) List of commonly caught recreational fish species in Mississippi waters-

Inshore Species		Offshore Species	
White seatrout	<i>Cynoscion arenarius</i>	Cobia	<i>Rachycentron canadum</i>
Spotted seatrout	<i>Cynoscion nebulosus</i>	Spanish mackerel	<i>Scomberomorus maculatus</i>
Atlantic croaker	<i>Micropogonias undulatus</i>	Red snapper	<i>Lutjanus campechanus</i>
Spot	<i>Leiostomus xanthurus</i>	Dolphinfish	<i>Coryphaena hippurus</i>
Black drum	<i>Pogonias cromis</i>	Gag grouper	<i>Mycteroperca microlepis</i>
Red drum	<i>Sciaenops ocellatus</i>	Blue runner (hardtail)	<i>Caranx crysos</i>
Southern flounder	<i>Paralichthys lethostigma</i>	Black tip shark	<i>Carcharhinus limbatus</i>
Sheepshead	<i>Archosargus probatocephalus</i>	Spinner shark	<i>Carcharhinus brevipinna</i>
Hardhead catfish	<i>Arius felis</i>	Tripletail	<i>Lobotes surinamensis</i>

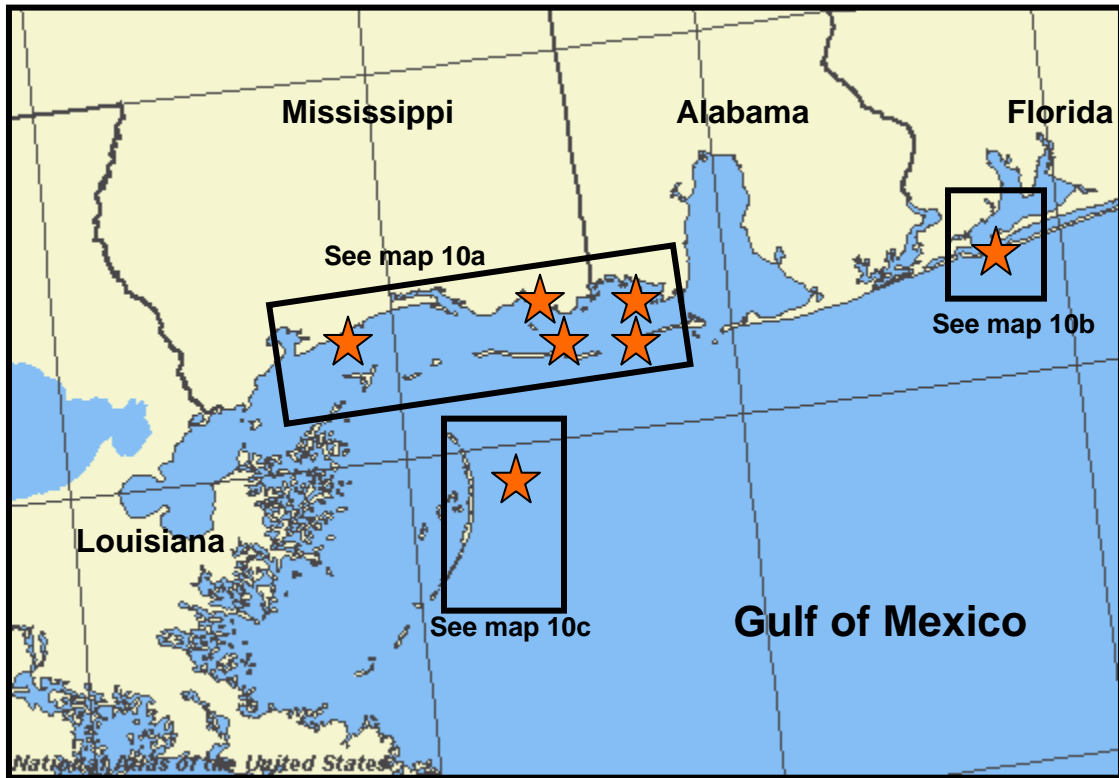
g) Sampling gear in various habitat types-

Habitat Type	Gear Type	Availability
Sea grass	Seine net, Dip net, Snorkel & mask, Cast net, Hook and line	All are available for summer classes
Muddy/sandy bottom Inshore and Offshore	Trawl, Seine net, Dip net, Yabby pump, Hook and line, Cast net	All are available for summer classes
Oyster reefs	Trawl, Hook and line, Cast net	All are available for summer classes
Salt marsh	Seine, quadrats, Breder traps, dip nets.	All but Breder traps are available for summer classes

Surf zone	Seine net, Dip net, Cast net, Hook and line, Yabby pump	All are available for summer classes
-----------	---	---

h) Study sites for various habitat types-

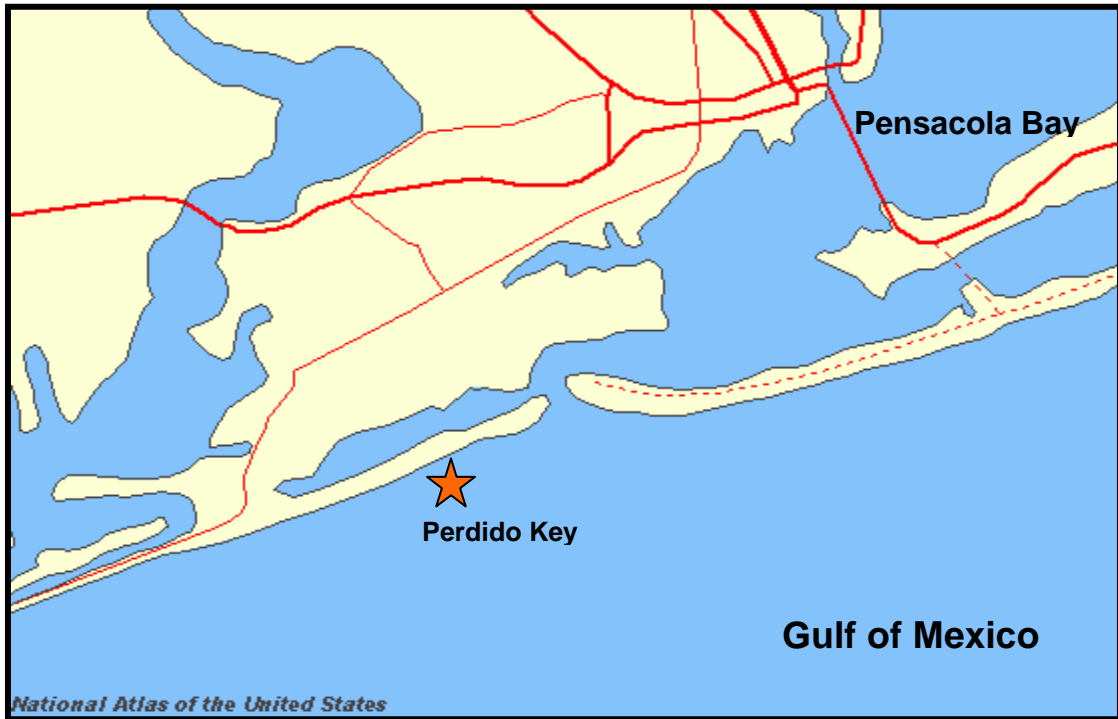
Habitat Type	Study Site
Seagrass or SAV	Chandeleur Islands – <i>Thalassia testudinum</i> ; <i>Halodule wrightii</i> ; <i>Syringodium filiforme</i> Grand Bay – <i>Ruppia maritima</i> ; <i>Vallisneria</i> <i>americana</i> Horn Island & Ship Island – <i>Halodule wrightii</i>
Muddy/sandy bottom Inshore and Offshore	Mississippi Sound Chandeleur Islands
Oyster Reefs	Bay St. Louis (subtidal)
Salt Marsh	Davis Bayou (Ocean Springs) – <i>Spartina</i> <i>alterniflora</i> ; <i>Juncus roemerianus</i> Mississippi Sound (along coastline)
Surf Zone	Horn Island & Ship Island – south side of the barrier islands Marsh Point (Ocean Springs) Chandeleur Islands (east side) Perdido Key



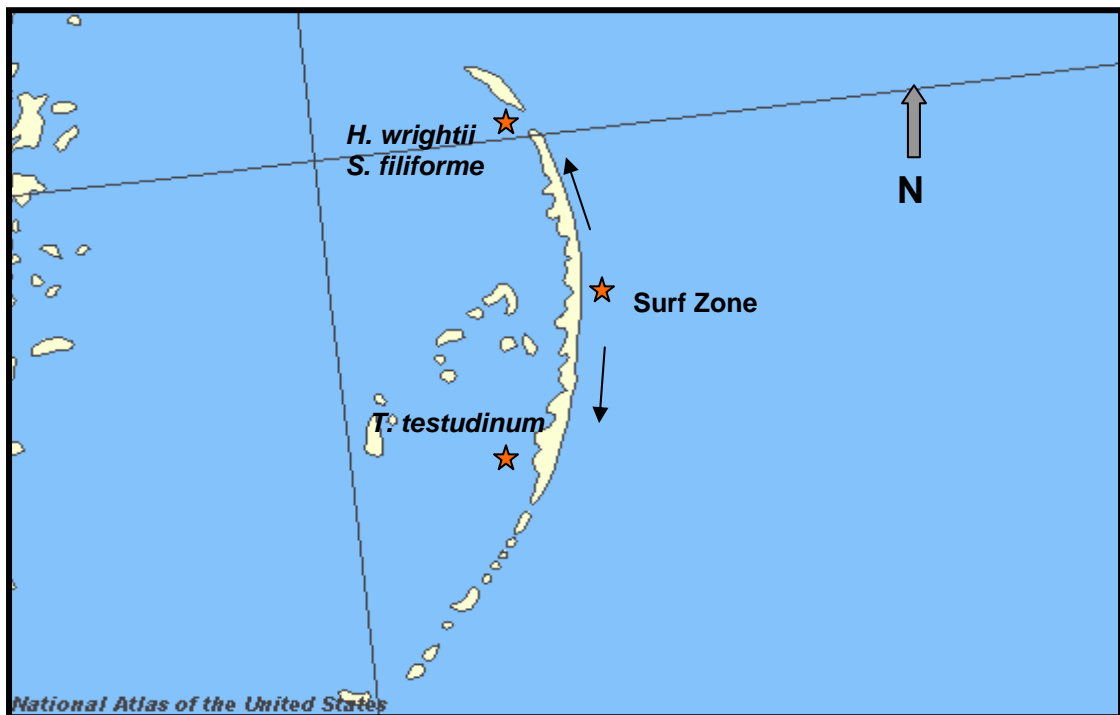
Map 10: Location of potential sampling sites.



Map 10a: Detailed map of Mississippi Sound and surrounding area.



Map 10b: Detailed map of Perdido Key sampling site.



Map 10c: Detailed map of the Chandeleur Islands.

IV. Local places of interest

a) Boat excursions-

SHIP ISLAND EXCURSIONS – (228) 864 – 1014

Summer Schedule Starting 2nd Saturday in May
7 Days a Week – Depart 9:00 A.M. & 12 Noon daily
Arrive Gulfport 3:40 P.M. & 6:15 P.M.

- Call for group discount rates (20+).
- Regular rate of \$16.00 per adult.
- If the group is doing sampling, they must have a permit from the National Park Service.

BILOXI SHRIMPING TRIP

Virginia Eleuterius – (228) 385 – 1182

- Approximately 1.5 hour “marine adventure cruise” – Morning and afternoon excursions
- If requested they will give a narrative as they go. Cruise in waters between Deer Island and Biloxi shore.
- 42 ft boat, hold 40 people
- Will trawl and students can keep what they catch
- Departs from small craft harbor in Biloxi
- Call for reservations as soon as possible – at least 1 – 2 days in advance

Rates: \$6.00 per person with instructor free

b) Museums-

MARITIME & SEAFOOD INDUSTRY MUSEUM

Rodin Kron – (228) 435 – 6320

- Owners of the Glenn L. Swetman and Mike Sekul Schooners
- Located on the eastern tip of the historic Point Cadet peninsula in Biloxi, MS
- Groups of 10 or more: \$1.00 / person
- Regular rate: \$2.50 per adult
-

WALTER ANDERSON MUSEUM OF ART - (228) 872-3164

The Walter Anderson Museum of Art (WAMA) is dedicated to the celebration of the works of Walter Inglis Anderson (1903-1965), American master, whose depictions of the plants, animals, and people of the Gulf Coast have placed him among the forefront of American painters of the Twentieth Century; and to his brothers, Peter Anderson (1901-1984), master potter and founder of Shearwater

Pottery; and James McConnell Anderson (1907-1998), noted painter and ceramist.

Museum Hours:

October-April: Mon-Sat 9:30 a.m. to 4:30 p.m.
Sunday 12:30-4:30 p.m.

May-September: Mon-Sat 9:30 a.m. to 5:00 p.m.
Sunday 12:30-5:00 p.m.

* Call for group rates 2 weeks in advance of tour

c) National seashore-

GULF ISLANDS NATIONAL SEASHORE—WILLIAM M COLMER VISITOR CENTER, OCEAN SPRINGS, MS

For more information: (228) 875-0074

The William M. Colmer Visitor Center, named for a veteran Mississippi congressman, is located at the end of Park Road. Presentations covering all aspects of the Gulf Islands National Seashore in Mississippi are available. A wonderful exhibit area that incorporates the art of local artist Walter Anderson explains the different ecosystems and features local plants and wildlife. An exhibition of work by other local artists changes on a quarterly basis. The twelve minute film "Tides, Winds, and Waves" is shown daily in the auditorium. Administrative Offices, restrooms, water fountains, and the Eastern National Bookstore are housed in the building. Park Rangers are available at the information desk to answer questions.

V. Scientific collection permit information-

LOUISIANA

Ms. Janet Abbott
State of Louisiana
Department of Wildlife and Fisheries
2000 Quail Drive
Baton Rouge, LA 70898

MISSISSIPPI

Traci Floyd
Department of Marine Resources
1141 Bayview Ave. Suite 101
Biloxi, MS 39530
(228) 374-5000 (x 5142)

ALABAMA

Vernon Minton
Alabama Marine Resources
P.O. Box Drawer 458
Gulf Shores, AL 36547

FLORIDA

Lisa Gregg
Division of Marine Fisheries
620 South Meridian Street
Tallahassee, FL 32399-1600
850-488-6058
lisa.gregg@fwc.state.fl.us

NATIONAL PARK SERVICE

Gulf Islands National Seashore

Riley Hoggard, Coordinator

1801 Gulf Breeze Parkway

Gulf Breeze, FL 32561

850-934-2617

riley_hoggard@nps.gov

VI. Regional literature-

Classics-

- Boesch, D.F and R.E. Turner. 1984. Dependence of fishery species on salt marshes: the role of food and refuge. *Estuaries* 7(4A): 460-468.
- Carr, W.E.S. and C.A. Adams. 1973. Food habits of juvenile marine fishes occupying seagrass beds in the estuarine zone near Crystal River, Florida. *Transactions of the American Fisheries Society* 102(3):511-540.
- Franks, J.S. 1970. An investigation of the fish population within the inland waters of Horn Island, Mississippi, a barrier island in the northern Gulf of Mexico. *Gulf Research Reports* 3(1):3-104.
- Galtsoff, P.S. 1954. Gulf of Mexico: Its Origin, Waters, and Marine Life. *Fishery Bulletin, U.S.* 55:1-604.
- Gunter,G. 1938. Seasonal variations in abundance of certain estuarine and marine fishes in Louisiana, with particular reference to life histories. *Ecological Monographs* 8(3):313-346.
- Gunter,G. 1945. Studies of Marine Fishes of Texas. *Publication of the Institute of Marine Science, University of Texas* 1:1-190.
- Gunter,G. 1950. Seasonal population changes and distributions as related to salinity, of certain invertebrates of the Texas coast, including the commercial shrimp. *Publication of the Institute of Marine Science, University of Texas* 1(2):7-51.
- Gunter,G. 1956. Some relations of faunal distributions to salinity in estuarine waters. *Ecology* 37(3):616-619.
- Gunter,G. 1957. Predominance of the young among marine fishes found in fresh water. *Copeia* 1957(1):13-16.
- Gunter,G. 1961. Some relations of estuarine organisms to salinity. *Limnology and Oceanography* 6:182-190.

- Gunter,G. 1961. Salinity and size in marine fishes. *Copeia* 1961(2):234-235.
- Gunter,G. 1963. The fertile fisheries crescent. *Journal of Mississippi Academy of Science* 9:286-290.
- Gunter,G. 1967. Some relationships of estuaries to the fisheries of the Gulf of Mexico. *In: Estuaries*. (Publication No. 83) (Ed: Lauff, G.H.) American Association for the Advancement of Science, Washington, D.C., 621-638.
- Kilby, J.D. 1955. The fishes of two Gulf coastal marsh areas of Florida. *Tulane Studies Zoology and Botany* 2(8):175-247.
- Hedgepeth, J.W. 1953. An introduction to the zoogeography of the northwestern Gulf of Mexico with reference to the invertebrate fauna. *PIMS* 3: 110-224.
- Reid, G.K. 1954. An ecological study of the Gulf of Mexico fishes, in the vicinity of Cedar Key, Florida. *Bulletin of Marine Science and Gulf and Caribbean* 4(1):1-94.
- Subrahmanyam,C.B. and S.H. Drake. 1975. Studies on the animal communities in two north Florida salt marshes Part I. Fish communities. *Bulletin of Marine Science* 25(4):445-465.
- Subrahmanyam,C.B., W.L. Kruczynski, and S.H. Drake. 1976. Studies on the animal communities in two north Florida salt marshes Part II. Macroinvertebrate communities. *Bulletin of Marine Science* 26(2): 172-195.
- Subrahmanyam,C.B. and C.L. Coultas. 1980. Studies on the animal communities in two north Florida salt marshes Part III. Seasonal fluctuations of fish and macroinvertebrates. *Bulletin of Marine Science* 30(4):790-818.
- Sullivan, M.J. and C.A. Moncreiff. 1990. Edaphic algae are an important component of salt marsh food webs: evidence from multiple stable isotope analyses. *Marine Ecology Progress Series* 62: 149-159.
- Swingle, H.A. and D.G. Bland. 1974. A study of the fishes of the coastal watercourses of Alabama. *Alabama Marine Resources Bulletin* 10:17-102.
- Livingston, R.J. 1976. Diurnal and seasonal fluctuations of organisms in a North Florida estuary. *Estuarine, Coastal Marine Science* 4:373-400.
- Livingston, R.J., G.J. Kobylinski, F.G. Lewis III and P.F. Sheridan. 1976. Long-term fluctuations of epibenthic fish and invertebrate populations in Apalachicola Bay, Florida. *Fishery Bulletin, U.S.* 74(2): 311-321.

- Livingston, R.J. 1980. Ontogenetic trophic relationships and stress in a coastal seagrass system in Florida. *In: Estuarine Perspectives*. (Ed: Kennedy, VS) Academic Press, New York, 423-435.
- Livingston, R.J. 1982. Trophic organization of fishes in a coastal seagrass system. *Marine Ecology Progress Series* 7:1-12.
- Livingston, R.J. 1984. Trophic response of fishes to habitat variability in coastal seagrass systems. *Ecology* 65(4):1258-1275.
- Livingston, R.J. 1984. The relationship of physical factors and biological response in coastal seagrass meadows. *Estuaries* 7(4A): 377-390.
- Loesch, H. 1960. Sporadic mass shoreward migrations of demersal fish and crustaceans in Mobile Bay, Alabama. *Ecology* 41:292-298.
- Loesch, H. 1965. Distribution and growth of penaeid shrimp in Mobile Bay, Alabama. *Publication of the Institute of Marine Science, University of Texas* 10:41-58.
- Odum, W.T. 1970. Insidious alteration of the estuarine environment. *Transactions of the American Fisheries Society* 99:836-847.
- Odum, W.E. and E.J. Heald. 1972. Trophic analyses of an estuarine mangrove community. *Bulletin of Marine Science* 22:671-738.
- Odum, W.E., J.C. Zieman and E.J. Heald. 1973. The importance of vascular plant detritus to estuaries. *In: Coastal Marsh and Estuary Management*. (Ed: Chabreck, R.H.) La. State Univ. Press, Baton Rouge, 91-114.
- Odum, W.E. and E.J. Heald. 1975. The detritus-based food web of an estuarine mangrove community. *In: Estuarine Research*. Vol. 1. (Ed: Wiley, M) Academic Press, New York, 265-286.
- Parker, R.H. 1960. Ecology and distributional patterns of marine macro-invertebrates, northern Gulf of Mexico. pp.302-381, in *Recent Sediments, Northwestern Gulf of Mexico, 1951-1958*. Am.Assoc, Petrol. Geol., Tulsa, OK.
- Richmond, E.A. 1962. The fauna and flora of Horn Island, Mississippi. *Gulf Research Reports* 1(2):59-106.
- Richmond, E.A. 1968. A supplement to the fauna and flora of Horn Island, Mississippi. *Gulf Research Reports* 2(3):213-256.

- Turner, R.E 1977. Intertidal vegetation and commercial yields of penaeid shrimp. *Transactions of the American Fisheries Society* 106:411-416.
- Wood, E.J.F., W.E. Odum, J.C. Zieman. 1967. Influence of sea grasses on the productivity of coastal lagoons. Symposium on Coastal Lagoons, UNAM-UNESCO, Mexico City, Mexico. pp. 495-502.
- Review/summary -*
- Day, J.W. Jr., G.P. Shaffer, L.D. Britsch, D.J. Reed, S.R. Hawes, and D.R. Cahoon. 2000. Pattern and process of land loss in the Mississippi delta: a spatial and temporal analysis of wetland habitat change. *Estuaries* 23:425-438.
- Day, J.W. Jr., G.P. Shaffer, D.J. Reed, D.R. Cahoon, L.D. Britsch and S.R. Hawes. 2001. Patterns and processes of wetland loss in coastal Louisiana are complex: a reply to Turner 2001. Estimating the indirect effects of hydrologic change on wetland loss: if the earth is curved, then how would we know it? *Estuaries* 24:647-651.
- Deegan, L.A., J.W. Day, Jr., J.G. Gosslink, A. Yanez-Arancibia, G.S. Chavez and P. Sanchez-Gil. 1986. Relationships among physical characteristics, vegetation distribution, and fisheries yield in Gulf of Mexico estuaries. *In: Estuarine Variability*, pp. 83-100 (D.A. Wolfe, ed.). Academic Press, New York.
- Heck K.L Jr., D.A. Nadeau and R. Thomas. 1997. The nursery role of seagrass beds. *Gulf of Mexico Science* 15:50-54.
- Minello, T.J. 1999. Nekton densities in shallow estuarine habitats of Texas and Louisiana and the identification of essential fish habitat. *American Fisheries Society Symposium* 22:43-75.
- Peterson, M.S. and M.R. Meador. 1994. Effects of salinity on freshwater fishes in coastal plain drainages in the southeastern U.S. *Reviews in Fisheries Science* 2:95-121.
- Peterson, M.S. 2003. A conceptual view of environment-habitat-production linkages in tidal-river estuaries. *Reviews in Fisheries Science* 11(4):291-313.
- Rabalais, N.N., R.E. Turner and D. Scavia. 2002. Beyond science into policy: Gulf of Mexico hypoxia and the Mississippi River. *BioScience* 52:129-142.
- Turner, R.E. 1997. Wetland loss in the northern Gulf of Mexico: multiple working hypotheses. *Estuaries* 20:1-13.

Turner, R.E. 2001. Estimating the indirect effects of hydrologic change on wetland loss: if the earth is curved, then how would we know it? *Estuaries* 24:639-646.

Recent-

Baltz, D.M., C.F. Rakocinski and J.W. Fleeger. 1993. Microhabitat use by marsh-edge fishes in a Louisiana estuary. *Environmental Biology of Fishes* 36:109-126.

Baltz, D.M., J.W. Fleeger, C.F. Rakocinski and J.N. McCall. 1998. Food, density, and microhabitat: factors affecting growth and recruitment potential of juvenile saltmarsh fishes. *Environmental Biology of Fishes* 53:89-103.

Chesney, E.J. and D.M. Baltz. 2000. Louisiana estuarine and coastal fisheries and habitats: perspectives from a fish's eye view. *Ecological Applications* 10:350-366.

Childers, D.L., J.W. Day, Jr. and R.A. Muller. 1990. Relating climatological forcing to coastal water levels in Louisiana estuaries and the potential importance of El-Niño-Southern Oscillation events. *Climate Research* 1:31-42.

Livingston, R.J. 1997. Trophic response of estuarine fishes to long-term changes of river runoff. *Bulletin of Marine Science* 60:984-1004.

Livingston, R.J., X. Niu, F.G. Lewis III and G.C. Woodsum. 1997. Freshwater input to a Gulf estuary: long-term control of trophic organization. *Ecological Applications* 7:277-299.

Modde, T. and S.T. Ross. 1981. Seasonality of fishes occupying a surf zone habitat in the northern Gulf of Mexico. *Fishery Bulletin, U.S.* 78(4):911-922.

Modde, T. and S.T. Ross. 1983. Trophic relationships of fishes occurring within a surf zone habitat in the northern Gulf of Mexico. *Northeast Gulf Science* 6(2):109-120.

Onuf, C.P. 1996. Seagrass responses to long-term light reduction by brown tide in upper Laguna Madre, Texas: distribution and biomass patterns. *Marine Ecology Progress Series* 138:219-231.

Peterson, G.W. and R.E. Turner. 1994. The value of salt marsh edge vs interior as a habitat for fish and decapod crustaceans in a Louisiana tidal marsh. *Estuaries* 17:235-262.

Peterson, M.S. and S.T. Ross. 1991. Dynamics of littoral fishes and decapods along a coastal river-estuarine gradient. *Estuarine, Coastal Shelf Science* 33:467-483.

Quammen, M.L. and C.P. Onuf. 1993. Laguna Madre: seagrass changes continue decades after salinity reduction. *Estuaries* 16:302-310.

Rakocinski, C.F., Baltz, D.M. and Fleeger, J.W. 1992. Correspondence between environmental gradients and the community structure of marsh-edge fishes in a Louisiana estuary. *Marine Ecology Progress Series* 80:135-148.

Rozas, L.P. 1995. Hydroperiod and its influence on nekton use of the salt marsh: a pulsing ecosystem. *Estuaries* 18:579-590.

Regional Keys-

Abele, L.G. and W. Kim. 1986. An Illustrated Guide to the Marine Decapod Crustaceans of Florida, Parts 1-2. Florida Department of Environmental Regulation Technical Series 8(1), 760 pp.

Camp, D.K. 1973. Stomatopod Crustacea. Mem. Hourglass Cruises 3(2), 100 pp.

Cook, H.L. 1964. A generic key to the protozoa, mysis, and postlarval stages of the littoral Penaeidae of the Northwestern Gulf of Mexico. *Fishery Bulletin, U.S.* 64(2): 437-447.

Defenbaugh, R.E. and S.H. Hopkins. 1973. The occurrence and distribution of the hydroids of the Galveston Bay, Texas area. Texas A&M Seagrant publication. TAMU-SG-73-210. 202p.

Fotheringham, N. 1980. Beachcomber's Guide to Gulf Coast Marine Life. Gulf Publishing Company, Houston, TX, 124 pp.

Heard, R.W. 1982. Guide to Common Tidal Marsh Invertebrates of the Northeastern Gulf of Mexico. Mississippi Alabama Sea Grant Consortium, MASGC-79-004. 82p.

Heard, R.W., R.M. Overstreet and J.M. Foster. 2002. Hydrobiid snails (Mollusca:Gastropoda:Rissooidea) from St. Andrews Bay, Florida. *Gulf and Caribbean Research* 14:13-34.

Hoese, H.D. and R.H. Moore. 1998. Fishes of the Gulf of Mexico. 2nd Edition, Texas A&M University Press, College Station. 422p.

- LeCroy, S.E. 2000. An Illustrated Identification Guide to the Nearshore Marine and Estuarine Gammaridean Amphipoda of Florida. Volume 1: Families Gammaridae, Hadziidae, Isaeidae, Melitidae, and Oedicerotidae. Florida Department of Environmental Protection, Tallahassee, Florida. 1-195pp.
- LeCroy, S.E. 2002. An Illustrated Identification Guide to the Nearshore Marine and Estuarine Gammaridean Amphipoda of Florida. Volume 2: Families Ampeliscidae, Amphilochidae, Ampithoidae, Aoridae, Argissidae, and Haustoriidae. Florida Department of Environmental Protection, Tallahassee, Florida. 197-410pp.
- LeCroy, S.E. 2004. An Illustrated Identification Guide to the Nearshore Marine and Estuarine Gammaridean Amphipoda of Florida. Volume 3: Families Bateidae, Biancolinidae, Cheluridae, Colomastigidae, Corophiidae, Cyproideidae and Dexaminidae. Florida Department of Environmental Protection, Tallahassee, Florida. 411-498 pp.
- Maturo, F.J.S. Jr. 1957. A study of the Bryozoa of Beaufort, North Carolina, and vicinity. *Journal of the Elisha Mitchell Scientific Society* 73(1):11-68.
- McLelland, J.A. 1989. An illustrated key to the Chaetognatha of the northern Gulf of Mexico with notes on their distribution. *Gulf Research Reports* 8(2):145-172.
- McEachran, J.D. and J.D. Fechhelm. 1998. Fishes of the Gulf of Mexico. Volume 1, University of Texas Press, Austin. 1112p.
- Polychaetes of Chesapeake Bay and Coastal Virginia.
<http://www.vims.edu/bio/benthic/polychaete.html>
- Provenzano, A.J. 1959. The shallow-water hermit crabs of Florida. *Bull. Mar. Sci. Gulf Carib.* 9(4):349-420.
- Robins, C.R. and G.C. Ray. 1986. Atlantic Coast Fishes. Peterson Field Guides, Houghton Mifflin Company, Boston. 354p.
- Robins, C.R., R.M. Bailey, C.E. Bond, J.R. Brooker, E.A. Lachner, R.N. Lea and W.B. Scott. 1991. Common and Scientific Names of Fishes from the United States and Canada. American Fisheries Society, Special Publication 20, Bethesda, Maryland. 183p.
- Ross, S.T. 2001. Inland Fishes of Mississippi. University Press of Mississippi, Jackson. 624p.
- Ruppert, E.E. and R.S. Fox. 1988. Seashore Animals of the Southeast. University of South Carolina Press, Columbia. 429p.

- Sebens, K.P. 1998. Marine Flora and Fauna of the Eastern United States. Anthozoa: Actinaria, Corallimorpharia, Cerinantharia, and Zooanthidea. NOAA Tech. Repts., NMFS 141. 68p.
- Stuck, K.C., H.M. Perry and R.W. Heard. 1979. An annotated key to the mysidacea of the north Gulf of Mexico. *Gulf Research Reports* 6(3):225-238.
- Stutzenbaker, C.D. 1999. Aquatic and Wetland Plants of the Western Gulf coast. University of Texas Press, Austin. 465p.
- Tiner, R.W. 1993. Field Guide to Coastal Wetland Plants of the southeastern United States. The University of Massachusetts Press, Amherst. 328p.
- Ubelacker, J.M. and P.G. Johnson (eds.). 1984. Taxonomic Guide to the Polychaetes of the Northern Gulf of Mexico. Final Report to the Minerals Management Service, contract 14-12-001-29091. Barry A. Vittor & Assoc., Mobile, AL, 7 vols.
- Winston, J.E. 1982. Marine Bryozoans (Ectoprocta) of the Indian River area (Florida). *Bulletin of the American Museum of Natural History* 173(2):99-1756.
- Zullo, V.A. 1979. Marine Flora and Fauna of the Northeastern United States. Arthropoda: Cirripedia. NOAA Tech Repts., NMFS 425. 27p.

VII. Acknowledgements

We would like to thank the Mississippi-Alabama Sea Grant Consortium for funding this project to MSP and KLH of DISL. Richard Heard, Sara LeCroy, and Jerry McClelland edited certain sections of the document, provided citations for regional literature, or made many helpful comments. Jim Franks, Read Hendon, and Chet Rakocinski provided images. Tut Warren and Bradley Randall provided the georeferenced oyster data set. Data for the 1992 seagrass coverage maps were provided by the National Wetlands Center in Lafayette, Louisiana. Marc Foster constructed the GIS maps of the seagrass and oyster data coverage.

Patricia M. Spitzer and Ken L. Heck Jr. of DISL also made important contributions to this study.

VIII. Appendices-

Appendix a. GCRL Summer Field program affiliate listing.

MISSISSIPPI

Alcorn State University, Lorman
Belhaven College, Jackson
Delta State University, Cleveland
Jackson State University, Jackson
Millsaps College, Jackson
Mississippi College, Clinton
Mississippi State University, Miss. State
Mississippi University for Women, Columbus
Mississippi Valley State University, Itta Bena
Rust College, Holly Springs
University of Mississippi, University
University of Southern Mississippi, Hattiesburg
William Carey College, Hattiesburg
William Carey College at the Coast

ALABAMA

Auburn University, Auburn

ARKANSAS

Arkansas Tech University, Russellville
Hendrix College, Conway
University of Arkansas at Little Rock
University of Arkansas at Monticello
University of Central Arkansas, Conway
University of the Ozarks, Clarksville

FLORIDA

University of Tampa

GEORGIA

Berry College, Mt. Berry
Shorter College, Rome

ILLINOIS

North Central College, Naperville

INDIANA

University of Evansville

IOWA

Drake University, Des Moines
Iowa State University, Ames
Wartburg College, Waverly

KENTUCKY

Eastern Kentucky University, Richmond
Morehead State University, Morehead

LOUISIANA

Louisiana State University, Baton Rouge
Our Lady of Holy Cross College, New Orleans
Southeastern Louisiana University, Hammond
Xavier University of Louisiana, New Orleans

MICHIGAN

Central Michigan University, Mount Pleasant

MISSOURI

Central Methodist University, Fayette
Northwest Missouri State University, Maryville
Southeast Missouri State University, Cape Girardeau
Southwest Missouri State University, Springfield
Truman State University, Kirksville

NEW YORK

Cornell University, Ithaca

OHIO

Bowling Green State University, Bowling Green

OKLAHOMA

Northeastern State University, Tahlequah
Southwestern Oklahoma State University, Weatherford

SOUTH CAROLINA

Presbyterian College, Clinton

TENNESSEE

Belmont University, Nashville
Carson-Newman College, Jefferson City
Christian Brother University, Memphis
Lambuth University, Jackson
Middle Tennessee State University, Murfreesboro
Rhodes College, Memphis
Tennessee State University, Nashville
Tennessee Technological University, Cookeville
Tennessee Wesleyan College, Athens
Trevecca-Nazarene University, Nashville
Union University, Jackson
University of Memphis, Memphis
University of Tennessee at Chattanooga
University of Tennessee at Martin

WISCONSIN

University of Wisconsin at Eau Claire
University of Wisconsin at Stevens Point

Appendix b. Photographs of common habitat



Marsh edge at the Grand Bay NERR site



Phragmites australis in the Pascagoula River ecosystem



Eastern distributary of the Pascagoula River estuary



Cat Island



Ship Island



Chandeleur Islands

Appendix c. Common organism photographs



Grey Snapper, *Lutjanus griseus*



Red grouper, *Epinephalus morio*



Tripletail, *Lobotes surinamensis*



Red snapper, *Lutjanus campechanus*



Silver perch, *Bairdiella chrysoura*



Dolphinfish, *Coryphaena hippurus*



Cobia, *Rachycentron canadum*



Greater amberjack, *Seriola dumerilli*



Red drum, *Sciaenops ocellatus*



Gulf sturgeon, *Acipenser oxyrinchus desoti*



Southern flounder, *Paralichthys lethostigma*



Gulf butterfish, *Peprilus burti*



Atlantic spadefish, *Chaetodipterus faber*



Sheephead, *Archosargus probatocephalus*



Atlantic croaker, *Micropogonias undulatus*



Spot, *Leiostomus xanthurus*



Southern kingfish, *Menticirrhus americanus*



Spotted seatrout, *Cynoscion nebulosus*



Striped burrfish, *Chilomycterus schoepfii*



Atlantic cutlassfish, *Trichiurus lepturus*



White shrimp, *Litopenaeus setiferus*



Brown shrimp, *Farfantepenaeus aztecus*



Pink shrimp, *Farfantepenaeus duorarum*



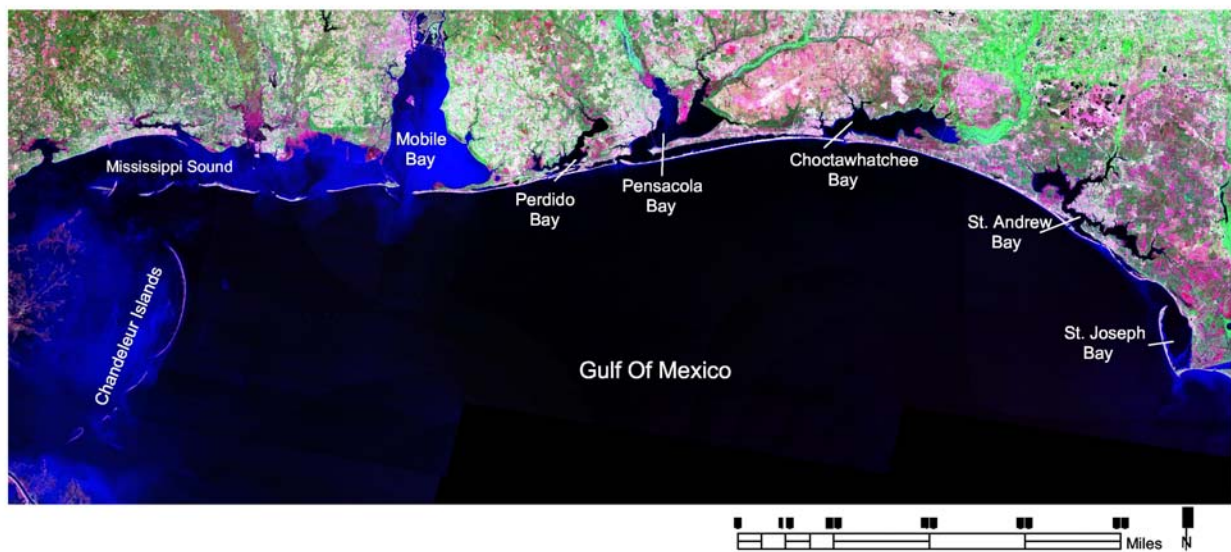
Blue crab, *Callinectes sapidus*



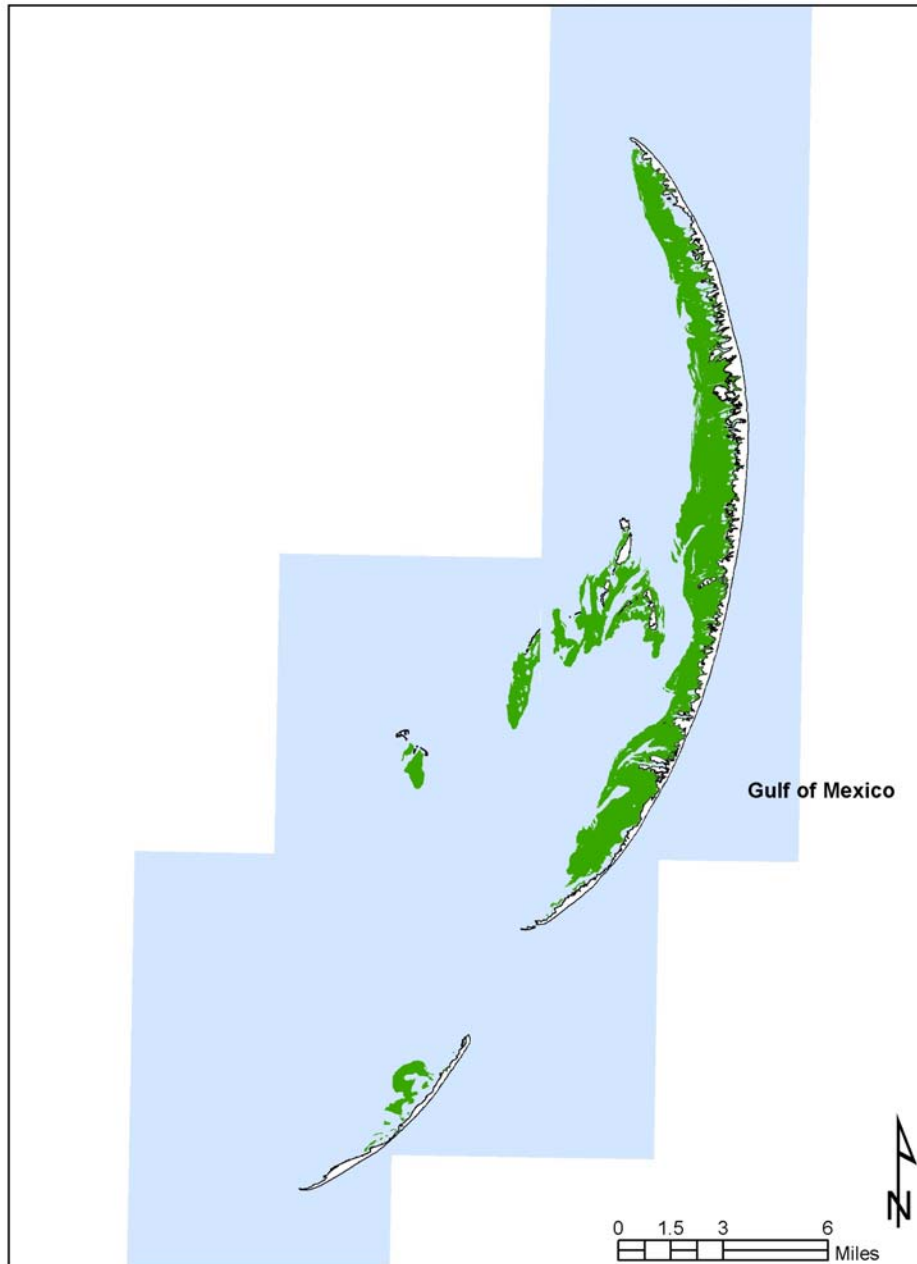
Box crab, *Calappa* sp.

Appendix d. Seagrass coverage maps based on 1992 data from the Chandeleur Islands, Louisiana through Pensacola Bay, Florida. Image 1 is a large-scale view from Chandeleur Islands, Louisiana through St. Andrews bay, Florida. Image 2 is a detailed view of the Chandeleur Islands. Image 3 is a detailed view of much of Mississippi Sound from Gulfport through the Alabama state line. Image 4 is a detailed view of Mobile bay, Alabama and associated islands. Image 5 is a detailed view of Perdido Bay and Pensacola Bay, Florida.

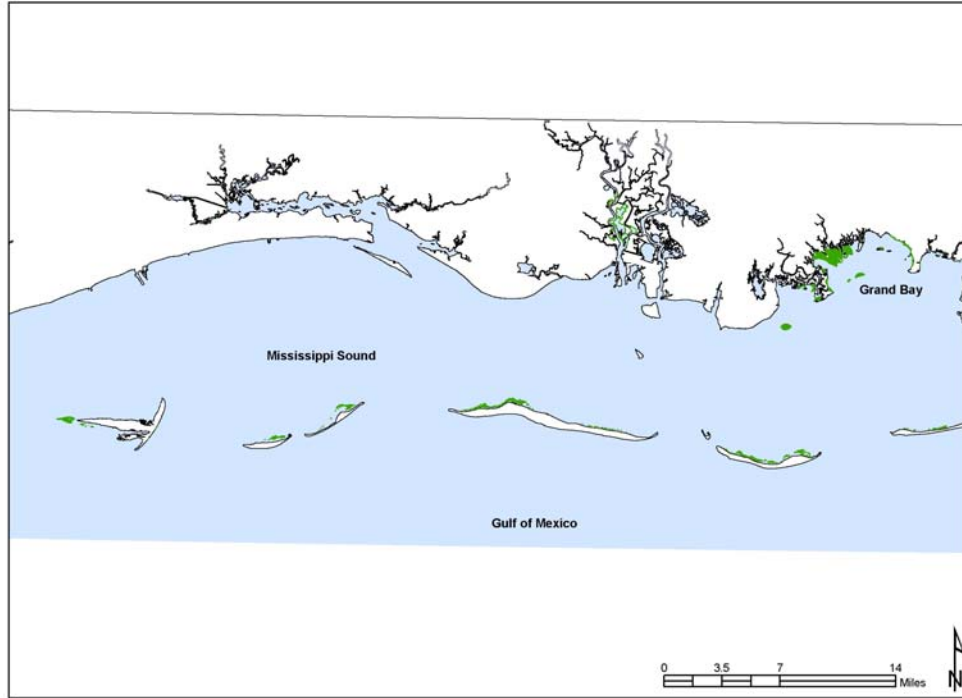
1.



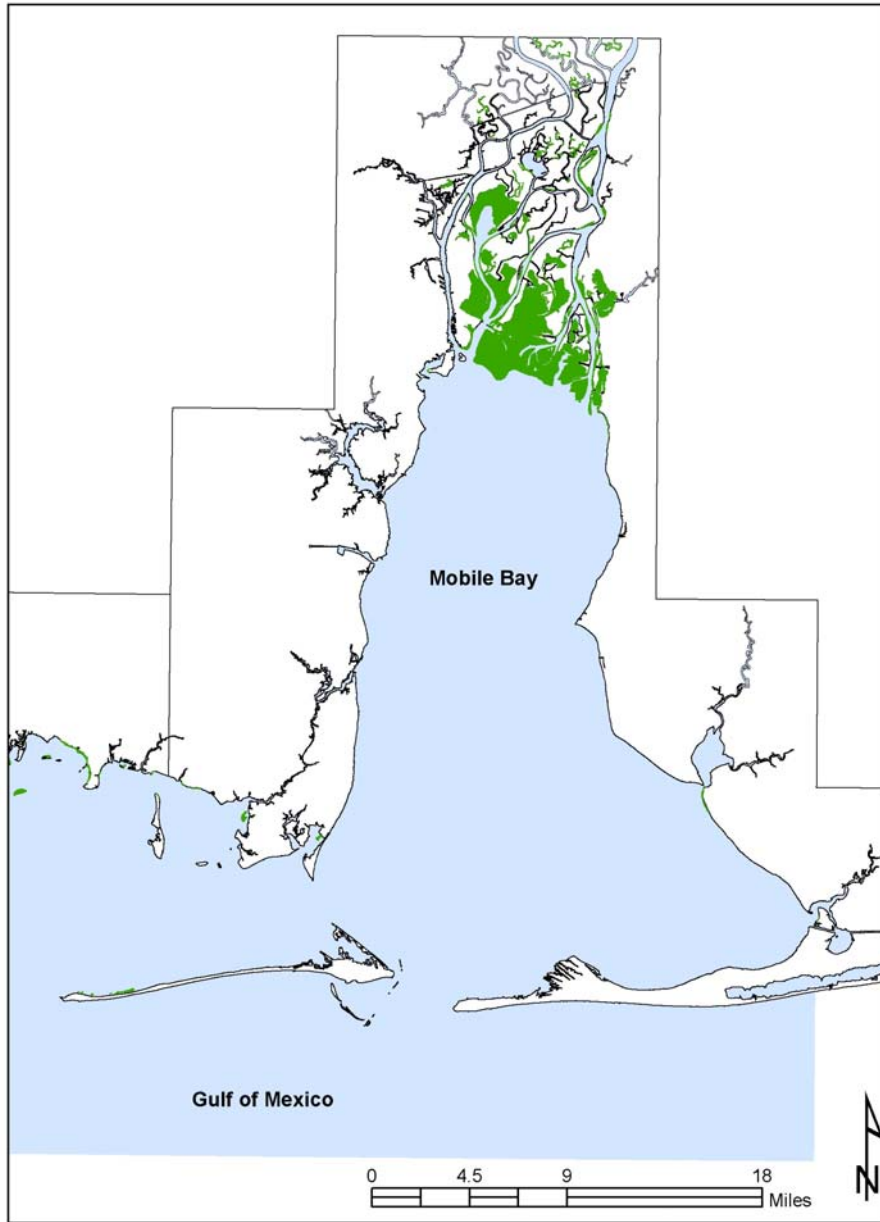
2.



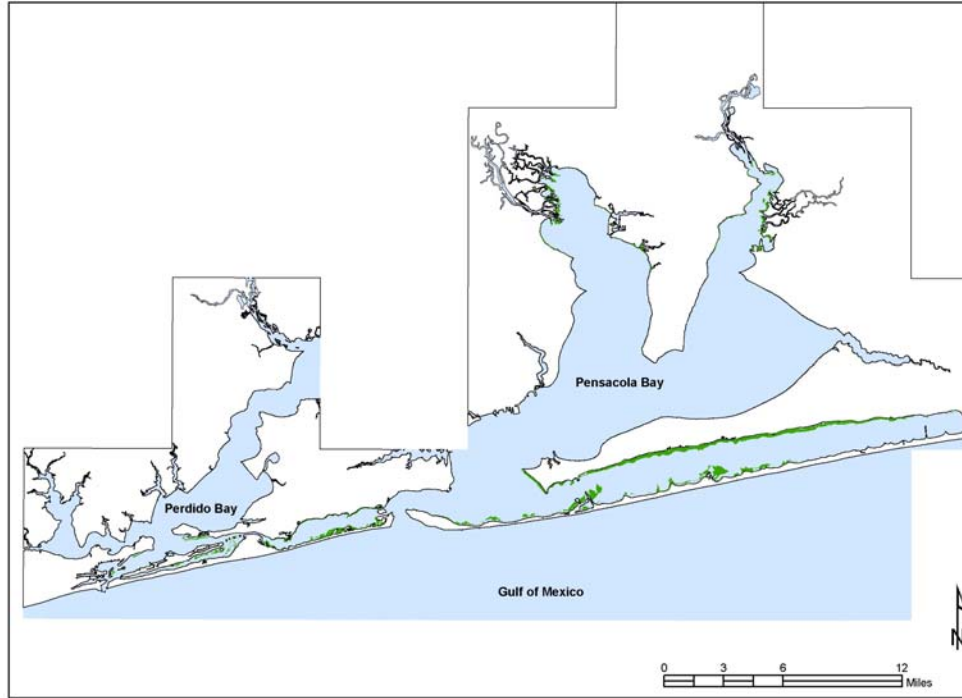
3.



4.



5.



Appendix e. Oyster bed coverage based on 1998-1999 data from areas south of St. Louis Bay, Mississippi.

