

HOW TO!



SECTION-H

HOW TO TEST PERMEABILITY AND POROSITY

MATERIALS: tin can with both ends removed ruler
 cup or tin can with only one end removed piece of wood
 watch with a second hand water

PROCEDURE:

1. At each habitat on Sapelo, use the piece of wood to press the can that is open on both ends into to the soil about one inch.
2. Lean the ruler against the inside of the can.
3. Fill the can with only one end removed full of water and pour this into the can you pressed into the soil. At each habitat be sure to fill the can to the same height. (Use the ruler to measure.)
4. Record how long it took for the soil to absorb all the water on your Sapelo Island Field Trip Data Sheet.
5. Back in the classroom, compare the time it took the same amount of water to be absorbed in each of the habitats. Discuss the permeability and porosity of the soil in each of the habitats.

HOW TO TEST TURBIDITY

Turbidity is a measure of the dissolved particles in water. It tells you how clear the water is or how far light penetrates into the water. The amount of dissolved particles in the water determines how deep sunlight will reach and therefore affects the photosynthesis (food production) that is conducted by phytoplankton and other plants in the water. Sapelo's waters are naturally somewhat turbid because of the detritus, other nutrients and plankton it contains. When run-off from the mainland adds mud, sand, silt and pollution to the water the food production capacity of the plankton is adversely affected.

Scientists use a Secchi Disc to test turbidity (may be purchased from a scientific supply company or you may make your own). The Secchi disc is lowered into the water by a rope that is marked off in meters until it disappears. This depth is the depth to which light can penetrate.

To measure turbidity, use the turbidity index: 100 divided by the number of feet lowered before the Secchi disc disappears. If the disc disappears at 25 feet, the turbidity index is 4; if the disc disappears at 2 feet, the index is 50. There is a direct relationship between turbidity and pollution. 50 is more polluted or turbid than 2!

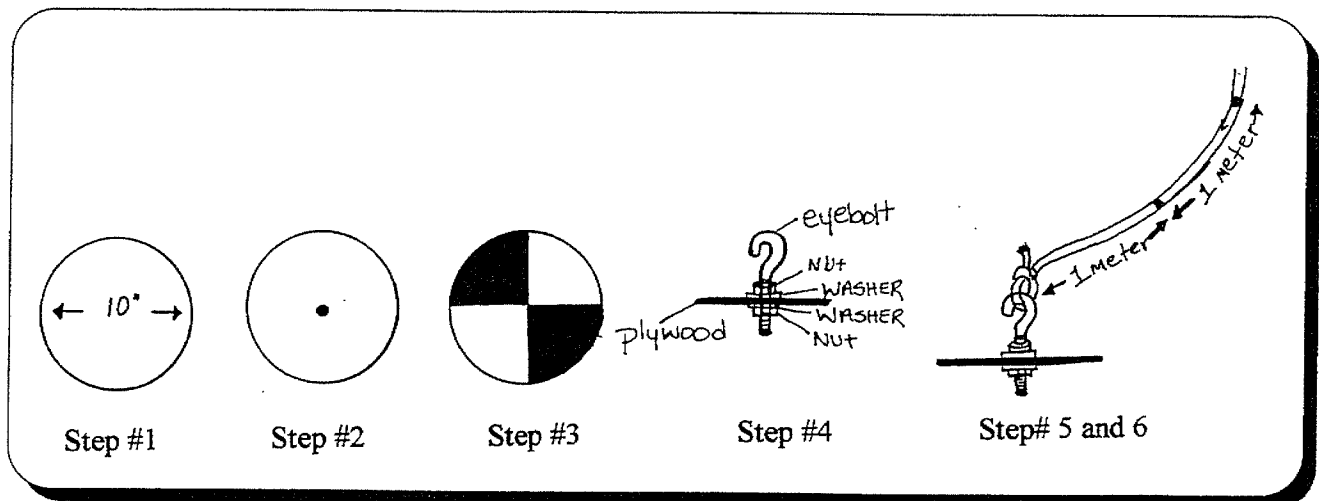
TO MAKE YOUR OWN SECCHI DISC

MATERIALS:

- Thin plywood or metal cut into circle 10 inches in diameter.
- Large eyebolt
- Two nuts and two washers
- Black and white enamel paint and paintbrush
- drill
- 50 feet of strong chord or rope
- Ruler or measuring tape

Procedure:

1. Cut the plywood or metal into a circle 10 inches in diameter.
2. Drill a hole large enough for the eyebolt to fit through.
3. Paint the circle black and white (like the pieces of a pie - one white, one black, etc.).
4. Push the eyebolt through the hole and keep it in place with a washer and nut on either side of the wood.
5. Tie the chord or rope to the eyebolt.
6. Mark the chord with a permanent marker every meter (or tie knots every meter).



HOW TO TEST DISSOLVED OXYGEN

The amount of oxygen that is dissolved in the water is a very important indicator of the water. There are several ways that oxygen can get into the water: diffusion at the surface; aeration by breaking waves and by photosynthesis occurring in aquatic plants. Three-fourths of all the world's oxygen supply is produced by oceanic algae.

Temperature controls the amount of oxygen that water can hold. Warm water holds less oxygen than cold water if everything else is the same. In addition to temperature, the amount of oxygen present is determined by the number of organisms using the oxygen, weather conditions, the time

of day, the season of the year and the amount of decomposition or chemical activity occurring in the water.

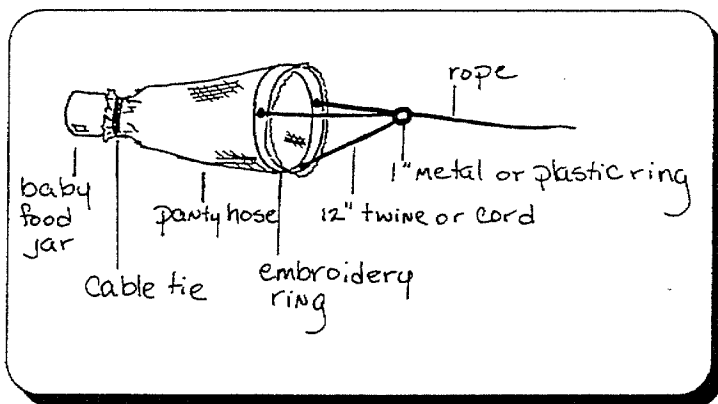
The amount of oxygen an organism requires depends upon its species, the temperature of the water and the physical state of the organism. Because of these variables it is difficult to predict an organism's specific oxygen demand. Most populations of fish require at least 4 - 5 ppm (parts per million) dissolved oxygen to live and up to 9 ppm to reproduce. When the dissolved oxygen content drops below 3 ppm, most fish die.

To test for dissolved oxygen, one needs a dissolved oxygen test kit. These are available from any science supply company. The directions on how to use the kit are different for each kit.


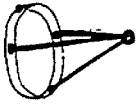
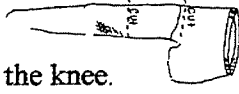
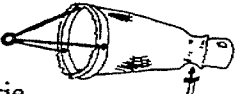
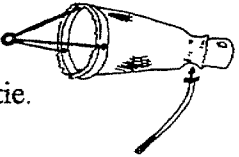
HOW TO CONSTRUCT YOUR OWN PLANKTON NET

MATERIALS:

1 pair pantyhose
baby food jar (save lid)
metal or plastic ring, 1 inch in diameter
6 inch, nylon cable tie
5 inch or 6 inch plastic embroidery clamp
36 inches of twine or heavy duty chord
scissors
electric hand drill with 3/16 inch drill bit



PROCEDURE:

1. Drill 3 holes through the embroidery ring, 120° apart. 
2. Cut the twine or chord into three equal lengths (12 inches each).
3. Thread each piece of twine through one of the holes in the outer part of the embroidery ring. 
4. Attach the other end of all three pieces of twine to the one inch metal or plastic ring (this is your tow ring)..
5. Cut one leg of the panty hose near the top of the leg and about 1/2 way to the knee. 
6. Clamp the widest part of the pantyhose in the embroidery ring. 
7. Attach the other end of the panty hose to the baby food jar with the cable tie.
8. Attach the rope to the tow ring. 

NOTE: If your plankton net is too bouyant and will not sink below the surface, attach a fishing weight.

APPENDIX



SECTION-I-J-K

INTERDISCIPLINARY ACTIVITIES

SOCIAL STUDIES:

1. Use the information in the History section to make a time line.
2. Prepare migration reports and a migration map of the birds seen on Sapelo.
3. Research the "Gullah" history.
4. Research some of the previous owners of Sapelo and their contributions to the history of Georgia.
5. Study historical uses of salt marshes by the Indians and the colonists.
6. Study the history of the fishing and/or shrimping industry in Georgia.
7. Invite one of the local residents of Sapelo to speak to your class about life on the island.
8. Research the early inhabitants of Sapelo and Georgia's other barrier islands. Make a video using drawings or creative dramatics.
9. Research what life would have been like on Sapelo during any particular period of its history. (research dress, family life, transportation, food, etc.)
10. Conduct an interview with the oldest members of the Hog Hammock Community. Find out what life was like during their youth. Interview a young Hog Hammock resident. What is their life like today?
11. Investigate the history of shipbuilding and Georgia's contribution.
12. Investigate the import/export industry of Georgia's coastal regions.
13. Investigate the kinds of boats.
14. Learn to read navigational charts and maps.
15. Students who have relatives that live on Sapelo could prepare a family tree.

LANGUAGE ARTS:

1. Write a "Biography of a Beach" (Island, Marsh, Maritime Forest, etc). Describe events that may have happened from the beach's (island, marsh, maritime forest, etc) point of view. The biography can be factual or imaginative.
2. Write "Island Poems."
3. Sit quietly for about 5 minutes listening to the sounds of the "Maritime Forest" (or any other habitat). What sounds do you hear? Write a poem or a story entitled "The Sounds of Sapelo's Forest."
4. Mystery Bird Descriptions: Have students write a description of a bird they saw on Sapelo. Exchange papers and using field guides or pictures from this manual, have other students try to identify the "Mystery Bird."
5. Have students write legends, fables, or songs about their experiences on Sapelo.

6. Have the students write a story about an ocean creature, marsh or ocean food web, history of Sapelo, etc. Then have them change their story into a play. The students could perform the play or create a stage and puppets to present their play.
7. Creative writing: Finish the sentence by writing a short story.
 "If I were a crab and tide went out, I would"
 "If I were a fiddler crab and the tide came in, I would"
 "If I were a barnacle attached to a horseshoe crab, I would"
8. Write a story about the travels of a sand grain.
9. Use the history of the island to write a historical fiction story that would take place on Sapelo.

ART:

1. "Shapes of Sapelo." Find as many different shapes as possible and make a collage of island shapes.
2. Paint a picture using different items found on the island. Use pigments from plants, leaves, stems, sand, etc.
3. Make clay models of favorite animal seen on Sapelo. (Dolphin, heron, egret, crabs, various shells, etc.)
4. Shell casts: in damp sand, press in your favorite shell. Pull it up and fill the depression with plaster of Paris; let dry.
5. Leaf prints: Collect leaves from the maritime forest floor to take back to the classroom. Place leaf on newspaper. Using a sponge or brush, add paint to the leaf. Put leaf with paint side down onto cloth, construction paper, etc., cover with newspaper and press or use a rolling pin. Be creative: the students can make wall hangings, note paper, placemats, etc.
6. Leaf rubbings: place leaf under paper. Using crayon or pencil, rub over the leaf.
7. Splatter prints: Use leaves, shells, sand dollars, seaweed, etc., thinned paint, old toothbrush, small piece of wire screening or thin stick. Arrange object to be painted on the paper. Dip toothbrush into the paint and let any drips fall back into the paint container. Hold toothbrush several inches above the paper and rub the bristles against the screening or stick, spattering paint onto the paper around your object.
8. "Sapelo Island Mural": Divide the class into groups. Each group draws a different habitat on a strip of butcher paper. Tape all habitats together.
9. Driftwood or shell mobiles.
10. "Sapelo Diorama": Have students build a diorama of Sapelo inside a shoe box.
11. Make "Sand Clay": Mix one cup sand and one-half cup corn starch, pour in boiling water and mix well. Cook briefly until mixture thickens. Wait a minute or so for the mixture to cool. Use imagination and model into your favorite island shape. Place on a flat cooking sheet and bake at 275° until dry (can dry without oven).
12. Create a Sapelo bulletin board. (You may want to choose a particular habitat or the entire island.)

13. Make "Camouflage Tubes." Have students choose an animal from the marsh, maritime forest, dunes, or beach and decorate a toilet paper tube with twigs, grasses, sand etc. to depict the camouflage adaptations of that animal for survival in its habitat.
14. Make shell sand candles: Press a shell into a container of lightly dampened sand. Pull the shell out so that it leaves an depression. Melt old candles or paraffin and pour into the shell depression. Quickly place a length of wick into the wax before it hardens. When the wax is dry, pull your candle out of the sand.
15. Sapelo is an excellent location for photography. Take pictures of lines, trunks of trees, patterns of palmetto, etc.
16. Gytaku: *Japanese Fish Printing*. You could substitute treasures found on the beach. The print could be designed to tell a story or reflect the different seasons of the beach. To make a print, cover the work area with newspaper. Wash and dry the fish or whatever object is to be printed. Place the fish or other object on a piece of cardboard; brush a thin coat of paint or ink onto the object; lay a piece of newsprint, white paper, muslin, t-shirt, sheet (what ever you want) on top of the painted surface and press lightly. Carefully remove your print from the painted surface.
17. Make colored sand by adding colored powdered tempera in an empty container. Add sand purchased from a hardware store and shake. You can make several different colors, then have students draw designs or "Sapelo" scenes on a piece of heavy cardboard or poster board. Fill in each section with a thin coat of elmers glue (one color at the time). Sprinkle the colored sand over the glue and let dry. When one color is dry, proceed to the next color, etc.
18. Make kites or wind socks: Use fish, clams, dolphins, waves, Live Oak tree, etc. as the main theme for the kite or wind sock.
19. Take slides and sound recordings of the various areas visited and prepare a multi-media presentation of the day using slides, sound tapes and specimen collections.

MATH:

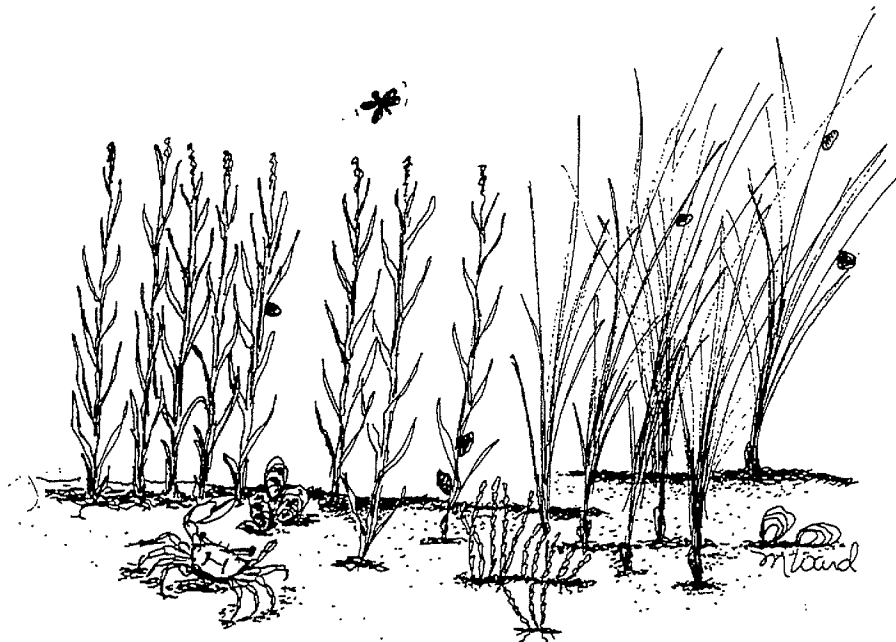
1. Visit the various "Tabby Ruins." Calculate the area of the buildings. If history can tell us the average number of people that inhabited the buildings, calculate the space in square feet per person.
2. Make graphs of the information collected in various activities: compare salinity of the water at Meridian Dock, Marsh Landing Dock, Long Tabby, Dean Creek along the nature trail, the ocean, the duck pond, etc. Make air temperature comparisons at the places mentioned above and/or at various locations along the nature trail.
3. Find the surface area of various shells collected from the beach. Find the average size for each, mean, median, mode, etc. Graph results and compare the different shells.
4. Prepare graphs of the plant and/or animal life found in each of the various habitats. Find the percentages of each animal/plant found.

SCIENCE:

1. Go on a "Bird Behavior Hunt." Observe the behavior and movement of the birds of Sapelo. Record your observations and discuss why they behaved or moved as they did.
2. Measure the velocity of the salt marsh creek. Measure about 5 yards downstream along the creek (mark the beginning and ending of the measurement). Drop a piece of wood or grass into the creek at the beginning. Time how long it takes for the wood or grass to float the 5 yards. Divide this time by 5 or whatever distance you measured. This is the speed the creek was flowing. It would be interesting to compare the speed of the creek during incoming and outgoing tides.
3. Make an underwater viewing can. Cut both ends out of a coffee can. Attach a strip of clear plastic or plastic wrap over one end with a large rubber band.
4. Using paper and tape only, have students create a creature that can withstand the crashing power of a wave. Make a wave using 5 pounds of bird seed in a pillow case. Drop the wave onto each creature to see if they survive.
5. Discover how sand dunes are made. On a day when the wind is blowing, place a pile of wrack or shells, or even an old shoe, on the dry sand. Watch what happens over a period of several minutes (you may want to do something else and come back in 30 minutes or so). Observe what has happened. Discuss how this happened, and the importance of plants and other objects that slow the speed of the wind.
6. Establish the "ESTUARY TRAVEL AGENCY." Students should prepare travel itineraries for migratory residents of the estuary. These itineraries may be written as travel tickets, and then plotted on world maps.
7. Play "Estuary Quest" or "Marsh Quest" or "Beach Quest," etc. Divide the class into teams. Each team is competing against the other teams. Pin or tape the name of an estuary (marsh or beach) resident (use fact sheets for this information) on the back of each student. Each member of each team gets one turn to ask teammates 4 questions. These questions can only be answered by yes or no. If the student guesses his identity on the first question he/she earns 4 points for his team, 3 points if guessed on second question, 2 points if guessed on third question and 1 point if guessed on fourth question. After each team member has had a turn, tally the total points earned by each team. The winning team is the team with the most points.
8. Have each student create a food chain for each Sapelo Island habitat. Then take these food chains and create food webs. Be sure to discuss how loss of one member of a food chain in one habitat can affect the food chains and webs in other habitats.
9. Demonstrate the concept of the energy transfer in a wave rather than water movement by using the idea of a "stadium wave." Have students sit or stand in a straight line. Begin at one side and have the first student raise his hands above his head and then lower them. As soon as one student has his hands raised, the next student raises his and so on. Tell the students that if everyone participating in the "stadium wave" moved, they would all pile up at one end of the stadium. (The concept of energy transfer in a wave is much the same as the "stadium wave.")
10. Beach scavenger hunt. Before visiting Sapelo, prepare a list of items that the students should look for on the beach. Be as creative as possible; some items might include: a bird track, bird feather, Styrofoam, an old shoe, a bone, plastic, algae, snail shell, milk carton, aluminum can,

tin can, fishing line, rope, etc. Divide the class into teams of 4-6 students, give each team a section of the beach in which they can search and a time limit. All teams must bring their items to teacher for verification. (Be sure to save any trash and remove it from the beach) The team with the most items wins.

11. Use sand to time sedimentation rates using a capped long plastic tube (make pie or bar graphs of the results). Compare sand from different parts of the beach taken at different times or seasons of the year.
12. Microbial study: collect samples of mud or sand from the salt marsh, a freshwater area, and the intertidal beach. Prepare a culture of each for bacteria. Make slides and examine the bacteria. Compare the different bacteria found in each environment.
13. Prior to making a trip to Sapelo, give each student a copy of a map of the island and have them predict where they think a dock should be or where would be a good location for a fort, or houses. Where would be the best location for the UGa. Marine Institute, the Big House, etc.? They can then compare their predictions with where development actually occurs.
14. Have students create a food web or an energy pyramid for the various habitats of a barrier island. Discuss how, even though they are separate habitats, they all are interdependent on each other. Many of the same organisms are members of the food web or pyramid of one or more habitats.
15. Make an adaptation card game: Draw pictures of various island organisms (both plant and animal) on one side of an index card. Use the pictures and make a list of as many adaptations of each organism as possible. Write the adaptations on separate cards. Use the cards to play a game of concentration. Place all the cards face down on the table in a big square. Turn over two cards; if the picture matches the adaptations, you may keep the pair and turn over two more cards. A turn ends when the two cards do not match up. The number of players will depend on the number of cards available for the game.



SOURCES OF MARINE RELATED INFORMATION

DIRECTIONS: When writing to the following addresses: ask for a teacher's packet, to be put on their mailing list, and a list of free or inexpensive educational materials they have available. Also ask for information on any particular topic that you are interested in. Those that have information listed are things that I found very good.

Atlantic Coast Conservation Association, P.O. Box 15034, Savannah, Ga., 31416, (913) 355-7323. Attention: Paul Glenn.

Coastal Division of Georgia Conservancy, 711 Sandtown Rd., Savannah, Ga. 31410, (912) 987-6462. Attention Becky Shortland.

College of Marine Studies, University of Delaware 19958-1298. Ask for MAS Bulletin Series and MAS Note Series. (Have excellent publications on a variety of marine related topics.)

College of William and Mary, School of Marine Science, Virginia Institute of Marine Science, P.O. Box 1346, Gloucester Point, VA 23062-1346. (Excellent Marine Science Methods For The Classroom Series. It includes 12 facts sheets on observing, inferring, classifying, investigating, hypothesizing, identifying variables, measuring, etc.)

Cooperative Extension Service, U.S. Department of Agriculture, Virginia State University, Petersburg, VA. 23806. (Ask for 4-H Marine Project Units 1-4 and leaders guide, A Planning Guide For Field Study Programs/A Guide for Aquatic Field Study Programs. There is a small charge but they are worth it.)

Cooperative Extension Service, University of Florida, United States of Agriculture, Gainesville, FL 32611-0210. Ask for Florida Sea Grant Publication Catalog-1995).

Department of Environmental Protection, Florida Marine Research Institute, 100 Eighth Ave., S.E., St. Petersburg, FL 33701-5095. Ask for information on marine related topics. They have excellent pamphlets on salt marshes, coral reefs, mangroves, sea grasses, estuaries, turtles, manatee, and endangered species. Also ask for a publications list.

EPA Coastal Programs Division, 345 Courtland St. NE, Atlanta, Ga. 30365. (404) 347-1740. Ask for information on public outreach programs.

Florida Sea Grant College, P.O. Box 110409, University of Florida, Gainesville, FL 32611-0409.

Florida Marine Education Resources Bibliography - \$3.00. Florida's Estuaries - \$2.00.

Marine Education and Research Organizations in FL. - \$8.00. Man Meets Coast - free.

Florida Keys-Lower Region, 216 Ann Street, Key West, FL. 33040.

Florida Keys National Marine Sanctuary, P.O. Box 500368, Marathon, FL 33037.

Georgia Department of Natural Resources, Coastal Resources Division, One Conservation Way, Brunswick, Ga. 31523-8600. Request map of Georgia's barrier islands and a list of materials available to teachers.

Georgia Sea Grant College, University of Georgia, Ecology Building, Athens, Ga. 30602-2206. Attention: Mac Rawson. (706) 542-7671, FAX: 706-542-5880. "Ga. Clipper" a collection of all coastal and environmental newspaper articles from Georgia and neighboring states published quarterly- \$12.00.

Gray's Reef National Marine Sanctuary, 10 Ocean Science Circle, Savannah, Ga. 31411.
 Attention: Sarah Mitchell. (912) 598-2345. Ask for copy of Guide to Georgia, Florida, N. and S. Carolina Coastal Resources Centers and information on the topic you need information.

Gulf Coast Research Laboratory, J.L. Scott Marine Ed. Center and Aquarium, P.O. Box 7000, Ocean Springs, MS 39564-7000. Excellent teacher's packet. Ask for reprints of "The Water Column," the gift shop gift catalog, and a copy of Marine Education: A Bibliography of Educational Materials from the Nations Sea Grant Programs - \$4.00, but well worth it.

Jekyll Island Authority, 375 Riverview Dr., Jekyll Island, Ga. 31527.

Key Largo National Marine Sanctuary, P.O. Box 1083, Key Largo, FL 33037.

Louisiana Nature and Science Center, Inc., P.O. Box 870610, New Orleans, LA 70187-0610.
 "Welcome to the Wetlands: An Activity Book for Teachers" - \$15.00.

Louisiana Sea Grant, Communications Office, Louisiana State University, Baton Rouge, LA 70803-7507. "Common Vascular Plants of the Louisiana Marsh" \$8.00.

The Marine Mammal Center, Marine Headlands, Golden Gate National Recreation Area, Sausalito, CA, 94965-2697.

Minnesota Extension Service, U. S. Department of Agriculture, University of Minnesota, St. Paul, Minnesota 55108. "Lake Game for Youth;" an excellent game involving decision making skills - free.

Modern Curriculum, 4200 N Industrial Blvd., Indianapolis, IN 46254. Ask for information on the Superific Science Series: Books VI, Marine Biology and Book VII: Oceanography.

Monterey Bay Aquarium, 886 Cannery Row, Monterey, CA 93940-1085. Ask for information on a particular topic in addition to materials list.

National Aquarium in Baltimore, Education Department, Pier 3, 501 East Pratt St., Baltimore, Maryland 21202-3194. Ask for "Ask the Aquarium Fact Sheets" series (\$2.00), in addition to the teacher's packet.

National Audubon Society, 613 Riverside Rd., Greenwich, CT 06830, (203) 364-0520.

National Coalition for Marine Conservation, 5105 Paulsen St., Suite 243, Savannah, Ga. 31405.

National Marine Fisheries Services, 9721 Executive Center Dr., N., St. Petersburg, FL 33702, (813) 570-5325. Free posters on Sea Turtles, Fishes of the Gulf and S. Atlantic, Crustaceans, Marine Mammals, and information on recreational fishing. For nine poster series: call 1-800-228-5006 (\$5.00 each)

National Marine Fisheries Service Hot-line: (813) 570-5554. Ask for information on a particular topic.

New Jersey Department of Environmental Protection, Office of Communications and Public Education, 401 East State Street, 7th Floor, Trenton, NJ 08625. Ask for educational materials on marine topics — EXCELLENT!

North Carolina Aquarium-Roanoke Island, P.O. Box 967, Airport Road, Manteo, NC 27954.

Director of Education, New England Aquarium, Central Wharf, Boston, Mass. 02110-3399. Ask for materials list from teacher resource center. They will loan kits, filmstrips, videos, books, etc. A GREAT RESOURCE!

NOAA'S Marine Debris Information Office, 1725 DeSales St, NW, Washington, DC 20036. In addition to teacher's packet, ask for Marine Debris Educational Materials Directory.

NOAA National Marine Fisheries Service, 75 Virginia Beach Drive, Miami, FL 33149-1099.

Rookery Bay National Estuarine Research Reserve, 10 Shell Island Road, Naples, FL 33962.

- Sea World of California, 1720 South Shores Road, San Diego, CA.
- Sea World of Florida, 7007 Sea World Drive, Orlando, FL 3281-8097.
- Sea World of Texas, Education Department, 10500 Sea World Drive, San Antonio, TX 78251-3002. In addition to teacher's packet, ask for *Marine Mathematics for the Secondary Classroom*. \$8.00.
- Texas A&M University at Galveston, P.O. Box 1675, Galveston, Texas 77553-1675. *Marine Organisms in Science Teaching*, 192 pages of activities (\$4.00).
- U. S. Department of Commerce/NOAA, PA/Correspondence Unit, 1305 E. West Highway, #8624, Silversprings, MD 20910. Ask for *Coastal Awareness Guide* and internet instructions.
- University of Illinois at Urbana-Champaign, 124 Mumford Hall, 1301 West Gregory Dr., Urbana, IL 61801. *Wetlands are Wonderlands: Teacher guide*, \$3.50; youth guide, \$3.00.
- University of Georgia Marine Extension Service, 30 Ocean Science Circle, Savannah, Ga. 31411, (912) 598-2496.
- University of Maryland, Sea Grant College Program, 0112 Skinner Hall, College Park, MD 20742. Marine Science Education Workbooks: *Tides and Marshes* UM-ES-79-01 (\$2.00) and *Food Webs in an Estuary* UM-SG-ES-79-02 (\$2.00)
- University of Hawaii, Sea Grant Communications, 1000 Pope Rd., MSB 200, Honolulu, Hawaii, *How to Use the Library to Find Marine-Related Information* UNHI-Sea Grant-AB-84-02 (free).
- University of North Carolina Sea Grant College Program, Box 8605, North Carolina State University, Raleigh, NC 27695-8605. Excellent Manuals: Unit One: Coastal Geology UNC-SG-78-14-A (\$3.50); Unit Two: Sea Water UNC-SG-78-14-B (\$2.00); Unit Three: Coastal Ecology UNC-SG-78-14-C (\$2.00); Unit Four: Coastal Beginnings UNC-SG-78-14-D (\$2.00).
- University Press of Mississippi, 3825 Ridgewood Rd., Jackson, Mississippi 39211-6492. Ask for *Man and The Gulf of Mexico Series: Marine Habitats, Diversity of Marine Plants, Marine and Estuarine Ecology*.
- U. S. Fish and Wildlife Services, 4270 Norwich St., Brunswick, Ga. 31520-2523, (912) 265-9336. Attention: Deborah Harris.
- The Whale Museum, 62 First St. N, P.O. Box 945, Friday Harbor, WA 98250.
- Wheelock College, 200 The Riverway, Boston, Mass. 02215-4176. Ask for *Field Study in Marine Science Bibliography, Marine Science Activities on a Budget, and Introduction to Whalenet*.
- Woods Hole Information Office, Woods Hole Oceanographic Institution, Woods Hole, Mass., 02543. In addition to teacher's packet, ask for list of publications and *Oceanography Reading Lists for Students/Adults*. Also ask for: *Field Guide Sheet for Eastern Shore Marine Environments*. 11 x 17 sheets with poster on one side and written description on the other for the sandy shore and dunes, marshes, tidal flats, and salt ponds.

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