Captain's Corner

It is truly an honor to serve as the 1998 president of SCMEA. This organization is exciting and dynamic because of each of you - the members who support it.

I'd like to welcome our new board members: President Elect - Rob Young, Secretary - Carmelina Livingston, and Arla Jessen, Robin Stine, Mark Madden, and Colette Dryden. Thank you to Fanya Pauris and Denise Zacherl who have recently served on the SCMEA board. We applaud all of their valuable contributions.

Rob Young, the new SCMEA President Elect, is planning the conference for 1998 and believes he will appreciate your help. This is a good time to start thinking about how you would like to get more involved with next year's conference.

If you have attended one of the annual National Marine Educators Association (NMEA) annual conferences then you already know in addition to learning a great deal, bringing back new ideas to your classrooms, meeting other marine educators, and finding new teaching resources, that it is a time of revelry and celebration. This year is particularly a good time to attend for two reasons: you can gear-up for 1999 when SCMEA will host the annual conference in Charleston, and because it is in Puerto Rico! The conference this year, An Island Journey and Ecological Diversity, looks like it will be another outstanding event held in beautiful surroundings (see article page 6). The dates for the conference are August 3-7.

Julie Cliff is putting together a list of people who are interested in getting a group rate for travel to the NMEA conference in Puerto Rico. Contact Julie for more information about excellent airfares. Also, Fred James is coordinating a trip to the US Virgin Islands that is associated with the conference. Contact Fred for more information regarding this exciting excursion.

The next board meeting is January 9, at 10:00 AM, and will be held at Leslie Sautter’s home. Please join us at this or any board meeting. We plan the dates and times of the meetings to best suit the attendees. If you are interested in attending board meetings, let us know when you would be able to participate.

Wishing all of you an exciting and prosperous 1998.

Sarah Mitchell
SCMEA President
The Jacques Cousteau Memorial Scholarship Award

Dear Mrs. Cousteau:

Let me first assure you that every member of the South Carolina Marine Educators Association and the Georgia Association of Marine Educators mourns with you the recent loss of Jacques-Yves Cousteau. Captain Cousteau was and is an education icon; he will remain so as long as there are seas and waters to be saved and Nature’s mysteries to be solved. He will be in our classrooms. He will be at our aquariums and nature centers. He will be part of any attempt to bring about a marine-literate public. His affect on the public’s understanding of the planet is too large to measure. Where would we be if he had never lived? Any yet, I know he felt we hadn’t gone near far enough.

Each year, the South Carolina Marine Educators Association offers a travel award in the amount of $500 to send an exemplary marine science teacher to the annual conference of the National Marine Educators Association. The SCMEA has decided to name the annual award “The Jacques Cousteau Memorial Scholarship” in memory of Captain Cousteau.

So, when the mourning is done, let us celebrate what Captain Cousteau gave us. I pledge to you that the South Carolina Marine Educators Association and the Georgia Association of Marine Educators and its members will carry forth his relentless passion and beautiful curiously “to make known the world of water, both fresh and salt.”

At our annual conference in Georgia, October 10-12, 1997, we read this letter and observed a moment of silence to honor Captain Cousteau. When that moment concluded, we began our work, renewed by his spirit.

Sincerely,
Paula Keener-Chavis
NMEA Chapter Representative

NMEA Conference Scholarships

Ten $250 scholarships will be available to NMEA members to attend the 1998 NMEA Annual Conference, “An Island Journey in Ecological Diversity,” set for August 3-7 in Puerto Rico. Scholarship awards are based solely on financial need of the applicant. Applicants must not be an NMEA officer, voting member of the Board of Directors, or an Institutional or Corporate member, and must not have been awarded a scholarship for the previous three NMEA Annual Conferences. Applications will be accepted from January 1 through March 31, 1998. Application forms are included in this newsletter or contact Tina Shoemaker, NMEA, PO Box 1470, Ocean Springs, MS 39566-1470; 601-374-7557; shoemak@seahorse.ims.usm.edu.

South Carolina Aquarium News

It’s been a busy year in 1997 for the Aquarium! Construction of the building at the edge of the Cooper River on the east end of Calhoun Street is reaching new heights. From all around Charleston, the tall crane on the site is visible. The crane is now being used to build the 56 high forms for the Great Ocean Tank’s walls.

In early December, Rhet Wilson, past president of SCMEA, was selected to serve as the Director of Education for the Aquarium. She says that in the Spring, the Aquarium will hire the School Program Specialist. Then, work will begin immediately on curriculum development.

The Aquarium will offer a graduate course in the summer of 1998 for the first Aquarium Master teachers to begin developing the curriculum.

SCMEA Bulletin Board

Reminder!
The deadline for the Spring issue of SeaScripts is March 15. Please send all newsletter contributions to Arla Jessen (jessena@cofc.edu). Articles, events, activities, artwork, trips and tidbits are all needed. Please do not hesitate to share - it takes everyone’s input to make this a great newsletter!

$250 Classroom Scholarship
Award based on innovative, marine related classroom project, program or activity. All K-16 teachers and informal educators are eligible to apply. Application form included in this newsletter.

Discounted Puerto Rico Air Travel
If interested in approximately $300 r/t airfare on Delta to NMEA ‘98 conference in Puerto Rico, contact Julie Cliff (jim@cofc.edu) at (803) 849-8367. Minimum of 10 people needed for group rate. Fare not available after Feb. 20.
Many people appreciate the sea for its beauty and for the bounty of food it offers. But did you know the sea is also a significant source of medical research? Below are some examples of medicines from the sea. These animals and their contributions to medicine and scientific research make for lively discussions with school groups.

**Lobster** - Serotonin plays a role in the temperature regulation, sensory perception and onset of sleep. Drugs, such as Prozac, that regulate levels of serotonin in the brain help control depression. The simple nervous system of New England lobsters is helping to explain and perhaps treat excessive aggression in humans. Serotonin, a chemical compound implicated in violent human behavior, is also found in lobsters.

**Horseshoe crabs** have blue blood used to detect meningitis, septic shock, and other forms of bacterially related conditions. Pharmaceutical companies routinely use the blood to screen for bacterial contamination.

From **mussel** harvests come the first marine superglues. Blue mussels produce an adhesive that provided a model for Cell-Tak. Now used to repair corneas and retinas, it may soon work to secure dentures and dental fillings.

Sea organisms make powerful poisons. Powerful nerve toxin tetrodotoxin is made by marine bacteria that inhabit **puffer fish** and can cause numbness, paralysis, coma and death. Tetrodotoxin is concentrated in the ovaries, intestines and liver. This drug is used currently in eye surgery. In Japan, puffer fish are eaten to produce a mouth-tingling sensation for which the dish is prized. People can die from this dish if they do not have a good chef. In Haiti, the puffer fish is used to induce the catatonic state that is attributed to zombism.

**Atlantic squid** - Squid nerves are 100 times bigger than humans, making them easier to study. They have a giant axon, a nerve the size of a pencil lead, connecting nerve cells. Most of what is currently known about the human nervous system has come from studies of squid over decades. These studies could eventually control nerve injuries, combat Alzheimer's and Parkinson's diseases.

**Dogfish shark** have yielded squalamine, a powerful antibiotic. Because squalamine works differently from today's antibiotics, it may also combat diseases that have become drug resistant. Squalamine is named for the shark genus *Squalus*. It is found in high levels of shark liver and in lower levels in the stomach. In addition to its use as an antibiotic, squalamine also inhibits growth of blood vessels around some tumors. Shark liver oil is also in Preparation-H which reduces the inflammation of hemorrhoids. Shark cartilage has also been implicated in future cancer research.

**Cone snails** have a piercing radula they use to kill their prey. This radula emits a paralyzing toxin, called conotoxin. The omega component of conotoxin is currently being used as a pain killer in a drug called SNX-111. This drug is 100 to 1000 times more effective than morphine and it does not have the negative side effects of the opiates. It has been tried out on terminal cancer patients and on people with nerve damage on a limited basis, and it's currently undergoing more intensive clinical trials.

---

**South Carolina Water Watch Program Initiative**

Over 1,500 students and other volunteers from throughout South Carolina are participating in the South Carolina Water Watch Program, a new Nonpoint Source water pollution reduction program in the Outreach Education Section of the South Carolina Department of Health and Environmental Control's Bureau of Water. The Water Watch program encourages South Carolina's citizens to become stewards of the state's lakes, rivers, streams, estuaries and wetlands. Classroom students and other volunteers select a water resource on which to focus and perform one or more activities aimed at protecting water quality. The activities range from storm drain stenciling to shore line surveys, litter cleanups to habitat preservation, educating the public through articles in newspapers and newsletters, and conducting research. Speakers are invited to discuss water quality issues. For additional information on the program, contact Heather Lindsay, DHEC, 2600 Bull St., Columbia, South Carolina, 29201 or call (803)734-5177, or e-mail lindsayh@dhec.state.sc.us.
Marine Happenings

Australia Trip June 1999
A 19 day student and adult trip to Australia for approximately $3500 (all inclusive). Contact Julie Cliff (803 849-8367) for more information.

Ecotour to the Galapagos Islands and the Ecuadorian Highlands July 6 - 21
This is a unique opportunity to see the Galapagos Islands and visit areas that most tours do not include. Educators and marine enthusiasts are encouraged to come. $2995 includes airfare. Deposit of $500 required by February 1. Call Beth Day for more information (803) 777-3938 or day@biol.sc.edu.

Environmental Science for Teachers
An activity-based environmental science course for teachers January 29 - May 7 at USC Aiken and January 27 - May 5 at SC State University. Includes 3 hours of graduate credit and participants receive a CD-ROM with course content, slides and diagrams. No Fee. For elementary and middle school teachers. Contact Phil Astwood (803) 777-6920 or astwood@psc.sc.edu.

DNR Marine Resources Division Offers Classroom Activities
Activities are used as a supplement to the tour program to increase participants’ understanding of marine biology and the activities taking place at Ft. Johnson. These include: Fish Lab - “What makes a fish a fish?” general anatomy, body shape, bone structure, scales, and senses are covered. Preserved and live specimens are examined, along with specially prepared specimens that are inspected with a microscope. Grades K - 4 Fish Trading Cards, Build a Fish, Touch Tank; Grades 5 - 8 Build a Fish, Touch Tank, fish Anatomy; Grades 9 - Adult Fish Banke, Fish Taxonomy, Fish Morphology. Call (803) 762-5110 for more information.

Environmental Education Symposium will be held by Charleston County Park and Recreation January 20, 9:30 - 3:00. A gathering of agencies from across the state that are dedicated to enhancing our children’s education with hands-on programming. The symposium will be both interactive learning and a time to visit each booth to gather information for your classroom. Contact Karen McKenzie at (803) 762-2172.

IMAX Discovery Theater
Myrtle Beach, SC. All IMAX films are accompanied by complimentary educational resource guides available to educators. Now showing at the IMAX Discovery Theater: The Living Sea, Whales, and the Grand Canyon. Contact Connie Martin or Byran Marlone at 1-800-380-IMAX.

Coral Reef Courses University of South Carolina Tropical Courses June 1 - July 2, 1999, Old Providence Island in the Caribbean. Two courses will be held, beginning on campus in Columbia and continuing with a 21-day field experience. Costs: $2400 plus USC tuition. Contact: Dr. Bjorn Kjerfve (803-777-2572 or bjorn@sc.edu) or Dr. Richard Zingmark (803-777-4873 or zingmark@biol.sc.edu).

1998 Marine Resources Fair & Open House is scheduled for May 2 - 3. Admission to the fair, sponsored by the SC Department of Natural Resources, is free. Many marine management, law enforcement and research projects will display educational exhibits including a touch tank for youngsters. Biologists and scientists will be on hand to answer questions. Hours are 11 - 5 on Saturday and 1 - 5 on Sunday at the Marine Resources Center at the end of Ft. Johnson Rd on James Island. For more information call (803) 762-5000.

Grante & Awards for Teachers: A Guide to Federal and Private Funding, Second Edition lists more than 270 funding opportunities for innovative projects and professional development. You can receive assistance to study abroad, continue graduate studies, conduct research, or attend a professional development seminar. This book includes advice on how to identify the most appropriate funding sources and how to develop proposals, as well as insights on federal funding agencies and understanding the types of support offered by foundations and corporations. Order for $58 from Capitol Publications, 1101 King St., Suite 444, Alexandria, VA 22314; 1-800-655-5597.

The Princess America Project Sails On! This is a educational program centered around the Princess America yacht. The initial voyage through the Gulf of Mexico is a teaching tool to excite students about math, science, history, ecology, current events, art and geography. Students have direct email contact with Princess America and scientists, explorers, teachers and citizens of the world that bring education to life. You can see issues of the Princess America Newsletter at: www.neosoft.com/~tallship

Internet Resources
National Oceanic and Atmospheric Administration (NOAA)
http://www.noaa.gov/

The Coastal Ocean Program, NOAA http://hpc.noaa.gov/cop/cop-home.html


The WWW Virtual Library: Fish http://www.actwin.com/WWWVL-Fish.html

International Ocean Foundation http://www.rsmas.miami.edu/iof.html

Oceanography Resources http://www.edsim.noaa.gov/ocean_page.html

Classroom Currents

Making the Most of Mollusks
by Karey Santos, Millbrook Elementary
If, like most of us, you have a wonderful collection of shells sitting in your classroom, dust them off and plan now to use them this year to teach attributes and set theory. Begin by giving each student a shell and a hand lens so they can list describing words regarding their shells. Then, compile a class list which sorts these terms into attribute categories: size, shape, color, texture, etc.

Now you are ready to build sets! Lay a hula hoop (or string loop) on the floor and put several shells which share a common attribute into the set (center of circle). Ask students to define the ‘rule’ for belonging to the set. Allow students to place their shells into the set if they fit the ‘rule’. Repeat the set building process several times, varying the attribute ‘rule’ for belonging. Once the set building concept is clear, you can add an intersecting set by overlapping a second circle and introducing a different attribute (e.g.: size and color). Finally, allow students to design original 2 or 3 cell Venn Diagrams to sort and classify shells. As you will discover, mollusks have a place in math as well as science class!
Regional Ocean Sciences Bowl Hosted by USC

The University of South Carolina is assisting with the first ever National Ocean Sciences Bowl, a challenging academic tournament that focuses on our planet’s primary feature: the ocean. The National Ocean Sciences Bowl, organized by the Consortium for Oceanographic Research and Education (CORE) and the National Marine Educators Association (NMEA), is sponsored by the Oceanographer of the Navy, Office of Naval Research, National Science Foundation, National Aeronautics and Space Administration and the National Oceanic and Atmospheric Administration. The University of South Carolina is an associate member of CORE and was selected as one of only 16 sites around the country to host a regional competition.

The University of South Carolina will host a Regional Ocean Sciences Bowl for 16 high school teams from South Carolina and Georgia on its Columbia campus, February 28, 1998. The winning team will receive, among other prizes, an all expenses paid trip to Washington, DC to compete against 15 other regional winners in the National Ocean Sciences Bowl competition, April 25-27, 1998. The winners of the National competition will receive an all expenses paid trip to EXPO ’98 in Lisbon.

The competition format is a round-robin followed by a double-elimination tournament. Teams consist of 6 people from one high school: five students, one of whom is an alternate; and a coach, usually a science or math teacher. Sixteen teams from South Carolina and Georgia have already been selected to compete in the regional competition and are have begun to prepare for this rigorous competition.

The University of South Carolina is excited to be hosting this new event that will stimulate greater understanding of our ocean environment at both regional and National levels. The Marine Science Department and Baruch Institute are working very hard to make this a very successful event which coincides with the International Year of the Oceans and the 25th Anniversary of the Marine Science Program at the University. For more information about the Regional Ocean Sciences Bowl, visit the web site at: http://marine-science.sc.edu/bowl/ or contact Wendy Allen, Regional Ocean Sciences Bowl Coordinator, Baruch Marine Lab, (803) 546-6219.

Florida’s Flintheads Make a Move to South Carolina for Recovery

by Mark Madden

During the early part of this century, the Everglades system was under siege. Relentlessly, people manipulated water regimes through canals and levees as well as logged the seemingly inexhaustible wetland. One of the results was that thousands of wood storks were deprived of traditional hunting grounds. Predictably, the stork’s population dramatically declined. By 1984, with only five thousand breeding pairs left in the United States, the ill-fated wading bird was put on the endangered species list. The protection that this step afforded the stork helped its numbers slowly climb. However, the feisty “flintheads” helped themselves out tremendously by beginning to breed in Georgia and South Carolina swamps.

The nest of a wood stork is a frail affair, perched so precariously on the upper reaches of a cypress. The occasional egg or chick that falls from the nests is eaten by water moccasins and alligators. In return, the reptiles incessant patrolling among the bases of the colony’s trees keeps most predators a bay. The three to five eggs are watched over by both parents for the thirty two days it takes them to hatch. Then, the real work begins. Young storks are scraggly, loud, ravenous begging machines! The tiny storks are stuffed with regurgitated fish and crustaceans daily until they are about four months old and able to fend for themselves. By the time they are hunting with their parents, these juvenile storks are very easy to tell apart from their parents. Although they are nearly as large, the juveniles’ heads are covered with a brown fuzz and they have a yellow bill. Adults have the familiar scaly, featherless heads with a dark curved bill and black trailing edges on the wings. This combination of features makes the 34” to 47” wader hard to mistake for the egrets which are all white with dagger like beaks or the white ibis which has black wing tips and a reddish curved bill.

Walking purposefully through impoundments and swamps, the wood storks swing their huge beaks half-open, ready to snap shut on any fish and invertebrates they might dislodge from the shallows. The decurved bill may be the stork’s most prominent feature and is possibly the reason that early bird books called him a “wood ibis.” Apart from a tendency to soar and feed in the same habitats with ibises, the stork shares little in common with them. In fact, the wood stork is the only representative of the “true stork” family in all of North America!

The wood storks fate is tied to the fate of the wetlands. Their behavior patterns including reproduction are intricately interwoven, not with the calendar year or solar year, but with local rainy seasons and drainage patters. While storks in southern Florida might nest during the dry winter so that there is plenty of food available for the chicks in the wet spring, storks in South Carolina might nest in the summer when water levels are low and hunting is easier! The storks are finding that they need in South Carolina wetlands to start to recover and remain a special part of the Lowcountry experience.
I have had the opportunity to visit Puerto Rico on many occasions. I'd like to describe some of the great aspects of the Island and encourage you to attend the National Convention in 1998. I suggest you begin your trip several days early and fly to St. Thomas, and then quickly take a ferry boat ride to St. John (my Garden of Eden).

When you arrive in Puerto Rico, you will land at the San Juan Airport, definitely not my favorite airport! The crowds will be great and the traffic in San Juan will be worse than Atlanta at noon on Saturdays! But don't despair - there are many beautiful sites to visit. The Island of Puerto Rico is shaped like a brick. It is approximately 100 miles long and 35 miles wide but the roads and traffic will not let you make good time going from city to city. The population of Puerto Rico is over 3 million with 850 people per square mile! Puerto Rico is a commonwealth of the United States. The people have voted against statehood several times. With commonwealth status they have the same privileges we have but they can't vote for the President and don't have to pay federal income tax.

Approximately 25 miles east of San Juan is the Luquillo Experimental Forest. The forest in known by the tourist and local people as "El Yunque" in honor of the second highest peak in the forest some 3,493 ft. high. This is the only tropical forest of the 155 national forests owned by the United States. A trip to this tropical paradise is a must for everyone visiting Puerto Rico. You should park your car about half way up the forest and then walk the remainder to get a feel for what it is like to be in a tropical rainforest. Obviously, be prepared for rain since it is not unusual to have 250 inches of rain per year in this forest. Your ideas of ferns will change drastically. The epiphytes grow in great profusion on the trunks of trees. We counted over 250 different species of plants on one tree! As you travel up the mountain you will reach the mosey, dwarf (elfin) or cloud forest. It is called the mosey forest because it looks like moss hanging from the trees but most of these plants are actually leafy liverworts. The term dwarf forest is given because in some areas the trees are less than 8 ft. tall and one foot in diameter yet they are thought to be approximately 1,000 years old! How is this possible? The other name for this forest gives us a clue. The cloud forest is so named because it sits in the clouds. It has been hypothesized that the moisture in the clouds prevents the loss of moisture from the trees. This reduction in the flow of water reduces the minerals that the new growing regions of the plant needs. Thus they grow very slowly. You can't count the rings since these tropical plants do not produce rings with a constant temperature environment!

Throughout the forest their are 18 species of frogs belonging to the genus Eleutherodactylus. The most famous is the coqui frog (E. coqui). The frog is only an inch long and is one of many species in the forest. The people in Puerto Rico call all the frogs coqui. Coqui have been found to number 10,000 per acre in the tropical rainforest - the largest concentration of frogs anywhere in the world! During the night, many of these frogs will be found in the canopy eating the abundance of insects, but when morning arrives they literally jump from the trees to the forest floor below. This allows them to escape predation by birds. As night arrives the frogs make their way up the stems toward the canopy. At approximately 7:30 p.m. the scorpions and other frog predators become active, but most of the coquis are already having supper in the canopy.

When you are in the forest at night the call of all the frogs is unbelievable. The male frog typically calls the female. Interestingly the males call at different frequencies so they do not hear the call of the other frogs! The coqui frog has two parts to his call. The "co" is male to male interaction. The male frog is telling the other male frogs this is my territory and "stay out." We actually placed a microphone in the forest and played the call of a coqui and had males come out and "attack" our microphones! The "qui" is a male to female call. He is saying "here I am you lucky female - come jump on my back and I will take you to my nearest pad." This pad is typically a bromeliad, a member of the pineapple family that is sold in most grocery stores. The leaves of these plants make a little pitcher in which a whole ecosystem of organisms lives. The male frog grabs the female and while she releases eggs he releases sperm. Obviously this type of environment is not conducive to a swimming tadpole, so this stage has been eliminated. Thus, the story we give students that there are eggs, tadpoles, and then adults certainly does not hold for many species of tropical frogs. I remember taping the call of the coqui frog at three different elevations. One was at sea level, one was half way up El Yunque and the other was at the peak of El Yunque. The frogs living at sea level had a high pitch to their call, whereas those living at the middle elevation had lower-pitched calls, and the frogs living at the mountain peak had the lowest calls. If you ask a student to explain this drop in voice they will say it is due to the "lack of air" at 3,493 feet. We know that the altitude is not high enough to change the pitch of the frog's voice. As it turns out there are more species of frogs at sea level, thus the competition for food is greater and the frogs are smaller. As one goes up into the cloud forest there are fewer species of frogs and more food - thus fatter frogs and deeper voices!!

In the next article I will discuss the Karst topography where the largest radio telescope in the world is situated and run by Cornell University. It was featured in the film "Contact" (with Jodie Foster). We will then explore the mangroves and the beautiful Bay of Fire on the South Coast. Certainly you do not want to miss one of the most spectacular sites in the world! (see July 1960 National Geographic pages 120-129 - "Sailing a Sea of Fire"). Of course, what article would be complete without diving into the coral reefs!
Exploring Our Coastal Heritage:  
A Voyage Through Cultures, Lands and Seas  
National Marine Educators Association  
23rd Annual Conference, Charleston, SC August 5 - 11, 1999

Explore your coastal heritage with southern style in this historic city by the sea! Wendy Allen and Paula Keener-Chavis, conference co-chairs, have been working with '99 Conference Steering Committee to plan a fabulous conference in Charleston. Extensive salt marshes, meandering tidal creeks, remote barrier islands with abandoned lighthouses, old cobblestone streets, and gullah-speaking sweetgrass basket weavers create a magnificent backdrop to a NMEA conference that will long be remembered. Hosted at the College of Charleston (established 1770), the conference promises exciting concurrent sessions and guest speakers focusing on our coastal heritage, field trips, dinner cruises, tall ships, SCUBA diving, the opportunity to get involved in research, and of course, the brand new South Carolina Aquarium!

The Conference Steering Committee has held several planning meetings in Charleston and it will need as much assistance as possible from the SCMEA membership to successfully pull the '99 Conference together. Subcommittees include the following: Program, Exhibits, Hospitality, Publicity, Field Trips, Audiovisual, Evaluation, Registration, Fundraising, Auction, Special Events, Finance, Transportation, Conference Research Connection.

If you are interested in serving on the Conference Steering Committee or one of these Subcommittees, please contact Wendy Allen, Baruch Marine Lab, PO Box 1630, Georgetown, South Carolina, 29442, 803-546-3623 or wendy@belle.baruch.sc.edu; or Paula Keener-Chavis, Charleston Math & Science Hub, College of Charleston, 66 George Street, Charleston, South Carolina 29424-0001, (803)-953-5812 or chavisp@cofsc.edu for more information.

Become a Member of the South Carolina Marine Educators Association

Join a group of dedicated teachers, naturalists, scientists and others interested in studying and teaching about the world of water, both fresh and salt. SCMEA provides a communication network for members to share information and ideas through newsletters and an annual statewide conference. Membership dues are $10.00 a year and include three newsletters, a discount on the registration fee for the annual conference, and an opportunity to interact with some of the most dynamic educators in the state!

Name: __________________________ Place of Employment: __________________________

Address: __________________________ City: __________ State: __________ Zip __________

Home Number __________ Work Number __________ Email __________________________

____ One year - $10 ______ Three years - $25 ______ Five years - $40 ______ Are you currently a NMEA member?

Please send completed form with payment (make checks payable to SCMEA) to:
Phil Astwood, Treasurer, SCMEA, Center for Science Education, University of South Carolina, Columbia, SC 29208.

Join the National Marine Educators Association

Begin to network with educators around the country sharing a common love and concern for our water world. Membership benefits include a subscription to Current: The Journal of Marine Education, the newsletter, NMEA News; and registration discounts for some of the best annual conferences you will ever attend.

Name: __________________________ Occupation: __________________________

Address: __________________________ City: __________ State: __________ Zip __________

Individual Memberships

Active membership: Any person who supports the goals of NMEA.

____ Active, 1 yr - $40 ______ Active, 2 yrs - $78 ______ Active, 3 yrs - $118

Chapter Affiliate: Any person who belongs to a regional chapter (i.e., SCMEA). Chapter:

____ Affiliate, 1 yr - $35 ______ Affiliate, 2 yrs - $68 ______ Affiliate, 3 yrs - $103

Please make check payable to NMEA and mail to: National Marine Educators Association PO Box 1470, Ocean Springs, MS 39566-1470 SCMEA Winter '98
Species Spotlight: Coral Reefs
by Beth Kostka, Gray’s Reef National Marine Sanctuary

Like an overturned box of crayons, coral reefs explode with vibrant hues of orange, green, yellow, and purple, creating the mystical world beloved by snorkelers and scuba divers. The abundant mixture of sea life which makes up a reef community is species-rich and complex, as well as exquisitely fragile. In response to the natural and man made threats encroaching upon these beautiful and valuable resources, 1997 has been declared the International Year of the Coral Reef.

Tropical reefs are usually distinguished by a diverse assemblage of stony corals which secrete limestone skeletons to support the soft-body of the coral. As the coral grows more layers of limestone are laid down, forming a foundation for future generations. A second characteristic of stony corals is their relationship with microscopic plant cells called zooxanthellae. The zooxanthellae live within the tissue of the coral, using the coral’s waste products to produce sugars and oxygen which in turn are utilized by the coral. This mutually beneficial relationship, or symbiosis, is critical for growth and general limestone secretion by the coral.

Although different in structure and formation, the hard bottom reefs characteristic of offshore South Carolina and Georgia are as important, valuable, and at risk as their tropical counterparts, the coral reefs. Live bottom reefs are characterized by sessile, non-reef building corals which attach to available hard bottom space rather than creating it. Only two genera of stony corals (Oculina and Astrangia) exhibit tolerance to the low light conditions, and fluctuating temperatures common to temperate, nearshore live bottom reefs. Both species occur infrequently in small, isolated colonies and may appear reddish due to symbiotic associations. The amazing adaptation of these stony corals is not without limitations since their ability to grow and act as reef-builders is significantly reduced.

Thus, coral reefs are 1) highly productive and constantly growing in three dimensions, 2) built on a foundation of limestone left by preceding generations of reef-building corals, and 3) highly intolerant of environmental changes in temperature, light, and water clarity. Live bottom reefs, on the other hand, are 1) extremely tolerant of environmental changes, 2) built on existing geologic, rocky outcroppings, and 3) grow only with the shifting of sea floor sand.