Captain's Corner

Ahoy Mates,
Hello again!

We are going on line with SCMEA and will be building our own web page! This will allow members to log on to our web site, see pictures of past conference meetings, see "hot spots" for marine education materials, and make various announcements of marine happenings throughout our state. If you have any suggestions as to what you would like to see included at the web site, please write, email or call Leslie Sautter or Fred James (see page 2).

Leslie is our connecting link to Sea Grant and has many wonderful ideas on how we can become involved in joint opportunities. She is attempting to set up several programs to benefit the membership. Stay tuned for more!

Carmelina Livingston and Robin Stine are co-editing a column called "Classroom Currents" that is premiering in this issue. This is your opportunity to submit and share successful activities, ideas, events and students' work from your classroom so that we may all be inspired and impressed. Please continue to contribute!

We have been promised one free trip to the Galapagos Islands as a raffle ticket item ($20) for our fall conference. The trip will include round trip airfare from Miami to Ecuador and the Galapagos Islands and 7 days of food and lodging on the tourist boat appropriately called the "Darwin." Each cabin on the boat has its own bathroom and shower! I have been a passenger on this boat for the past three summers and it is great!

Rhet Wilson is so busy with the new Aquarium that she has relinquished her leadership for the NMEA Conference. Many thanks to Rhet for all she has done. We are grateful to Paula Keener-Chavis and Wendy Allen for assuming the role of co-chair for the national convention. We still need many volunteers for the 1999 National Meeting in Charleston. We have great leadership but they will need all of our input and help to make this adventure a success. We had a meeting on March 10 to do some preliminary planning and it's going to be a monumental task. We want this to be the best NMEA conference ever!

I am really excited about all that is happening to SCMEA. I think you will be impressed with all the new feature columns we will have in the newsletter and the comments concerning the conference convention in 1997. We need to take time to thank our new editors, Arla Jessen and Leslie Sautter. Please take the time to write an article or make appropriate announcements that can be used by your fellow teachers.

Please remember that this organization is only as good as the input from its members. If there is something you would like to see SCMEA do, please contact me or one of the members of the board (listed in SeaScripts). All of you have great ideas and if we work together we can make this organization a vital component of marine education in your classroom and throughout the state.

Until next time,
Captain Fred
SCMEA Board

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SEA PARTNERS

This U.S. Coast Guard’s Marine Environment Outreach Program is available to the Tri-County area (Charleston, Berkeley and Dorchester) schools, K-12. The 45 minute presentation focuses on marine pollution and trash, which endangers marine life. Also covered are the results of entanglement and ingestion of debris by marine animals. Several hands-on experiments are conducted with students and hand-outs are made available.

The U.S. Coast Guard has also placed on permanent loan at the Berkeley and Charleston Math and Science Hub the video, "Saving Inky," which is recommended for all grade levels. Another video on loan is "Troubled Waters" for high school students.

The school portion of the Sea Partners program is now being sponsored by the S.C. Sea Grant Consortium. Anyone wishing to schedule a presentation may contact YN1 Jane Quattrocchi at 884-5682 (e-mail: JaneQ@Junco.com) or call U.S. Coast Guard at 724-7612 and ask for YN2 Virginia Pearson. The current year has been extremely successful, and we request that teachers make their appointments as early as possible for the 1997-1998 school year.

SCMEA Bulletin Board

Reminder!
The deadline for the Fall issue of SeaScripts is June 15. Please send all newsletter contributions to Arla Jessen (jessena@cofc.edu).

Conference Date Set
The Fall 1997 SCMEA Conference will be held in Savannah, Georgia October 10 - 12. See the article on page 3 for more information. Sarah Mitchell is always looking for volunteers to assist with the conference. Please contact her if you can lend some time (see her address at left). Not sure how to help? We ALWAYS have a need for scavengers to convince people and businesses to donate items for the fund-raising auction!

Nominations for Marine Educator of the Year Award
We are looking for educators who are doing exciting things in the field of marine/aquatic education. Teachers in traditional school settings of any level, as well as "informal educators" working in museums, nature centers and other educational settings may be nominated. Current SCMEA Board members are ineligible for this award. A nomination form is included in this issue.

Creek Children

Raised on the creek
Where the tide water flows
Digging for fiddlers
With pluff between their toes

Chicken on the line
With a tug and a bend
They pull it in slowly
With a crab on the end

To the bank by the marsh
The seine makes a sweep
They pull in fish and shrimp
And squiggly things from the deep

Feet dangling on the dock
And then the flip of the bail
Reeling in quickly
The tugging spot tail

The creek so beautiful
And the noise so mild
There is no one as lucky
As the creek raised child

by Jean Seyle-Mullis
St. James-Santee
McClellanville, SC
1997 SCMEA/GAME Conference
“Coastal Connections”
Savannah, Georgia, October 10 - 12, 1997

Make plans to attend the 1997 SCMEA conference, “Coastal Connections,” in Savannah, October 10 - 12. You will have the opportunity to discover coastal treasures for yourself and for your students including spectacular field trip sites, inspiring educational opportunities, and stimulating speakers. One of the reasons that we are able to offer so much for this year’s conference is that we are joining forces with the Georgia Association of Marine Educators (GAME). SCMEA and GAME have formed an alliance just for this year’s conference. The association of two state chapters of the National Marine Educators Association (NMEA) will multiply the marine science teaching adventures, expand field trip explorations, and add to the general revelry.

The conference will begin Friday with an array of field trips and workshops. Friday evening will feature Todd Ballantine, author of the truly indispensable coastal resource Tideland Treasures, who will take us on an armchair journey featuring many of the coastal organisms that you have been wondering about for years. A wine and cheese social and a book signing session will offer a special time to meet the author.

Saturday’s concurrent sessions will be held in the new Coastal Georgia Center, located in Savannah’s beautiful Historic District. Dr. Eugene Odum, often called the “Father of Modern Ecology” will give the Keynote presentation. It is a rare treat to hear Dr. Odum and gain his clear insight on coastal ecology. This downtown center is near the foot of the Savannah River bridge, Highway 17 and I-16, which makes the conference convenient for a one-day trip. Saturday night, Fort Jackson will welcome us with cannon firings plus fife and drum music for a traditional low country dinner on the Savannah River. Sunday will offer half and full day field trips. Conference registration is a bargain at approximately $65. Lodging will range in cost from $8 (dorm room) to $57 (single or double) per night. You can also choose to stay at the beach or in the Historic District.

Field trips during the conference will offer you the finest places for coastal ecology adventures. You can take a boat cruise to a spectacular and uninhabited barrier island, relax on one of the secluded beaches, explore a pristine maritime forest, or photograph coastal birds in the vast unspoiled marshes and estuaries. Spend your day strolling along a beautiful beach collecting seashells or hunt for fossils in areas known only by a few of the locals. You may be the one to find a giant tooth from a fossilized great white shark! The adventuresome can paddle a sea kayak from one barrier island beach to another, island hopping with the dolphins.

The conference will offer the best new classroom activities for K - 12 students and a cornucopia of hands-on teaching techniques. Additionally, scientists from the Skidaway Institute of Oceanography will provide presentations on ocean research conducted off Georgia and South Carolina. Learn the latest information about the role the oceans play in global warming, barrier island formation, beach erosion, and energy cycling in salt marshes.

For more information about the conference or ways to help, please contact Sarah Mitchell (912-589-2381 or smitchell@ocean.nos.noaa.gov). Please remember that although this conference is taking place in Georgia, it should be a joint effort by all. We hope to have the best turn out ever!
**Marine Happenings**

**Swim With the Whales**
During semester break (early January) 1998, swim with porpoises and humpback whales in the Turks and Cacaos Islands. One week on a 90 foot motorized catamaran, all inclusive, for $1945. Contact Julie Cliff (803) 848-8367.

**Hawaii Trip**
This is a one week spring break trip (1998) for high school students to Kauai, Maui, and the Big Island. Costs are approximately $1345. Airfare is additional. Contact Julie Cliff (803) 848-8367.

**Barrier Island Experience**
The Loggerhead Sea Turtle Conservation Project is continuing its efforts on pristine Pritchard's Island. Spend five days and four nights in the modern barrier Island Research Facility while you witness turtles laying their eggs and then participate in nest relocation away from predators and high tides. The dates are June 16-20 and adult costs are $400 (children $200). Please contact Lynn Corliss for more information at (803) 521-4148 or lcorliss@vm.sc.edu.

**Classroom Currents**

**Mini-Aquariums**
by Julie Cliff
The next time you go on a field trip with your class to the beach take along a large ziplock bag. During low tide you can find many aquatic things. Place the animal or plant in the ziplock bag with some salt water for viewing. Don't forget to gently return the animal or plant back to the water. Try using a large shell, such as a cockle to gently scoop up the animal with water. This makes a quick aquarium that all children (especially the very young) can do on their own.

**Pangea**
by Carmelina Livingston
The next time you discuss Plate Tectonics with your early primary students and they are fascinated by the "super continent, PANGEA," teach them this simple song -- they'll sing it every time they hear the word!:

(tune to "Mary Had A Little Lamb")

Pangea was a super continent,
Super continent, super continent.
Pangea was a super continent, Many long years ago.

**Looking for Sand Gems**
by Karey M. Santos
Can't get your class to the shore? Bring the shore to your class by examining the organic and inorganic components of beach sand. With only a tennis ball container of beach sand, a sieve, hand lens and pocket microscopes, students can observe, classify, infer, predict and interpret a variety of areas through hands-on explorations. Introduce the lesson by giving each pair of students a small cup of sand. Have them identify the material, its probably origin and components through observation. Use the sieve to sort out larger organic materials (spartina, litter, shell fragments, etc.) and allow students to use first the hands lens, then pocket microscopes to examine the smaller inorganic materials (sand gems), inferring how the grains became part of the shoreline sand through weathering and erosion.

Don't be surprised if some students identify "rainbow jewels" in their samples. Since the silica cleaves to form prisms, a few grains may lie in a position to diffract the light rays of the pocket microscopes, creating rainbows, but that is another lesson...

**Marine Ecology at Brittlebank Park**
by Robin Stine
What does a nursery, a pillow, a box of laundry detergent, and a sieve have in common with a marsh? Many fourth grade students from Ashley River Elementary will tell you, "plenty" (see "Wetland Metaphors," Aquatic Project Wild). In early March, about 80 fourth grade students traveled to Brittlebank Park to attend a marine ecology program sponsored by the City of Charleston Department of Recreation (803-724-7327). The students learned interesting facts about local marine life with a hands-on approach. They learned about the fascinating life of the sea turtle. They engaged in a follow-up game of "Turtle Hurdles," a game of turtle survival from the nest to the ocean (Aquatic Project Wild). The students became acutely more aware of the eminent dangers that sea turtles face. Other marsh experiences answered questions such as, "Why does the marsh smell?" and "Why is the water salty?" Overall, the experience provided students with an appreciation of the intricately diverse world of the saltmarsh community. One student, Lindsay Funderburk, commented, "It was fun to be out in nature and actually see the things we were learning about."
Aquatic Habitat Center
by Carmelina Livingston, Jennie Moore Elementary
SC Marine Educator of the Year, 1996

I'd like to take the time to thank SCMEA and the scholarship committee for giving me the opportunity to pursue the "Aquatic Habitat Center" in my classroom. It continues to be a daily learning experience!

As a teacher of young children (Kindergarteners), I feel that it is of the utmost importance for children to develop a sense of awareness and appreciation for their local environment. My primary goal in this project is to help children become knowledgeable of the many living things which inhabit both salt and fresh water. An additional goal of the project is to help children investigate, research, record data, and compare two aquatic environments. The Aquatic Habitat Center consists of a salt water aquarium and a fresh water pond aquarium. The grant helped me to purchase filters, filter cartridges, sea salt, thermometers, pH kits, aquarium hoods, and food for the animals. I was fortunate to have a 35 gallon tank available for the saltwater tank and a 15 gallon tank for the freshwater tank from a previous SCMEA grant.

The children first helped prepare the salt water tank. We did not have a hose to put water into the tank, so imagine 24 five year old children with small buckets of water. What a sight! What a mess! Boy, it was fun! The children took an active role in setting up the rest of the aquarium. After several weeks, our class took a walking field trip down the road from our school to the marsh. The children encountered many live animals. We took a cast net to catch minnows. We also found hermit crabs, blue crabs, stone crabs, fiddler crabs, and lots of snails. We took some of animals back to the classroom and placed them into the salt water aquarium to observe their behavior.

The next step in the project was to create a fresh water habitat. My goal was to show children what a pond looks like from a bird's eye view as well as an underwater view. The children actively participated in setting up the aquarium. Oh yeah, we again had 24 children with small buckets of water. After several days, I went to a local pond and obtained some water to pour into the tank. By doing this, I would increase the chance of having micro-organisms in the water. The children got dip nets and containers and went to the school's small pond/ditch and caught some minnows, snails, crayfish, and various plants. We put the animals into the pond tank to observe their behavior.

On a daily basis, the children observe and compare both aquaria. Children are intrigued by the behavior of the animals and are constantly asking questions. Children are using new vocabulary terms, such as, vertebrate, invertebrate, radula, buoyant, salinity, acidic, alkaline, neutral, and so on. From the pond water, we view the micro-organisms under a microscope and then use field guides to identify them. The children are fascinated when they see these "monster" looking creatures. On a biweekly basis, the children take turns recording the water temperature and pH levels of both tanks. The children are also responsible for the maintenance of both tanks which include feeding the animals and cleaning the equipment. At the end of each month, the children compare the two aquaria by writing and illustrating. The writing serves as an evaluation of the project. Environmental stewardship is stressed on a daily basis. Each week, children are appointed as the "wildlife patrol." The responsibility of a "wildlife patrol" is to make sure that all people at school and home are handling the animals with care. Another responsibility of the patrol is to assist the teacher in returning the animals to their natural habitats.

This project has turned out to be the highlight of each day. The children now have some idea of what goes on under the ocean and in a pond. I feel that this project has stimulated enthusiasm, curiosity, and stewardship for the environment among the children in my class. When children see fish swim together to form a "school of fish" or see a snail use its radula to eat, the excitement is worth more than a million bucks! Thank you SCMEA for giving me and the children in my class this opportunity.
Reproductive Biology of the Seahorse

by Jim Wetzel, Presbyterian College

Seahorses (Genus: Hippocampus) and Pipefishes (52 genera) comprise a family of fishes (Syngnathidae) that is characterized by a broodpouch on the male. This unique and highly specialized structure provides parental care (paternal care) of the young without the need for a nest. Other peculiarities found in these fishes include an external skeleton (body armor) made of interlocking calcified plates in the skin, 'rosette-like' gills, independent eye muscles (which allow the eyes to focus independently), and the absence of teeth, tongue, ribs, and stomach. The prehensile, grasping tail of Hippocampus separates Seahorses from the Pipefishes. However, it is the broodpouch of the male that distinguishes Seahorses from other live bearing fishes.

Seahorses and Pipefishes do not exhibit sexual differences in size or in coloration, yet males and females are easily distinguished by comparing their abdomens. The abdomen of the female is rounded at the top of the tail while that of the male forms a tapered line to the base of the tail. Sexual characteristics are not evident for five to eight months after hatching and the male broodpouch first appears as a pigmented area on the underside of the tail. Both sexes engage in courtship, swimming together horizontally (pipefishes) or vertically (seahorses), at which time eggs are transferred through a muscular tube that extends from the ovary, into the broodpouch of the male. The broodpouch then serves as the site of fertilization, supplies oxygen to the eggs, and provides a stable environment for the developing embryos. As development proceeds, iron is removed from the broodpouch lining, then used by the enclosed embryos to manufacture hemoglobin in the blood. Calcium is concentrated from sea water inside the broodpouch and used by the embryos to form their body armor plates.

Before mating, the broodpouch looks wrinkled and has a slot-like opening in the middle. This muscular opening closes after eggs are deposited into the male and the broodpouch appears greatly swollen.

Species dependent, the full broodpouch will contain between 15 and 300 eggs. Females may deposit their ova into the pouches of several different males.

Accordingly, the male broodpouch may simultaneously contain embryos at several different developmental stages. The broodpouch is lined with tissues that become spongy after oviposition and it is heavily supplied by blood vessels. As such, the Seahorse broodpouch resembles the structure of a human placenta. Each egg becomes enveloped by this 'placental' tissue that lines the broodpouch; the resulting brood resembles eggs nestled within an egg carton. Eggs that do not become wrapped in this tissue eventually degenerate.

As development proceeds, each egg hatches inside the pouch, but the embryos remain nestled within the 'placental tissue' until all yolk is absorbed. In most Seahorse species, infant seahorses ('seapony') are not born individually. After a normal gestation of 30 days, about 30 'ponies' are simultaneously released from the male after a series of muscular contractions of the broodpouch walls. Upon release from the broodpouch the young immediately attach to the substrate using their prehensile tail, and begin feeding on zooplankton and small crustaceans. After the final release of the young, the slot of the broodpouch closes and the internal tissues return to their normal pre-egg condition.

Fred James has underwater footage of a seahorse giving birth. If you are interested in this footage send Fred a short blank tape and he will mail it back to you for use in your class (see address on page 2).

Dr. Wetzel was the keynote speaker at the 1996 SCMEA Conference.
AN OCEANOGRAPHIC OPPORTUNITY YOU SHOULD NOT MISS!

I've acquired another 2 days of ship time aboard the NOAA Ship Ferrol on June 9 and 10, and am offering a 5 to 6 hour day-trip on this 133 foot research vessel each day to SCMEA Members. While on board, you'll actively participate in using a variety of oceanographic instruments (water sampler, coring devices, plankton nets, etc.). We'll sail from the Charleston Navy Base, through the harbor and offshore (briefly!) beyond the Charleston jetties. The cost is $5.00 (to pay for a delicious lunch). Sailing time will be 9:00 a.m. to 3:00 p.m. I can practically guarantee that it will be an awesome experience!

Up to 20 people can participate on each cruise, so return the application ASAP if you want to reserve a spot (first come first serve)! Please do not invite friends or family unless they are SCMEA members. May 15 is the deadline. Photocopy the application below and send it with a check for $5 (written to me) to: Dr. Leslie Sautter, Dept. of Geology, College of Charleston, Charleston, SC 29424. Confirmation and directions will be mailed upon receipt of your application.

Hope to see you on board!  Leslie Sautter

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Check which dates you can participate: ___June 9 ___June 10

Circle your preference date

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**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!

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____ One year - $10  ____ Three years - $25  ____ Five years - $40

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.

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**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!

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**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).*

| ____ 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 Spring '97
Species Spotlight: The Loggerhead Sea Turtle

by Beth Kostka, Gray’s Reef National Marine Sanctuary

A reddish-brown, 300 pound reptile, with a jaw more powerful than an alligator's for its size, is commonly found in the coastal waters of South Carolina and Georgia. It is not a monster from the deep, but a graceful and often serene federally threatened loggerhead sea turtle.

Modified to live in the ocean, loggerheads have adapted powerful flippers instead of legs and a fused, aerodynamic body and shell which enables them to move quickly and elegantly through the sea. Due to gravity and their large size, sea turtles are unable to retract their extremities into their shell. Instead loggerheads must rely on strong swimming ability, size, and a protective outer shell to escape predation. Loggerheads normally weigh 170 to 315 pounds and attain a length of 31 to 49 inches. These immense proportions predictably deter most predators, leaving only large carnivorous animals, such as sharks and humans, with the ability to catch and eat these well adapted sea turtles.

Like all reptiles, a sea turtle's body temperature depends on the temperature of its surrounding environment. This dependence on external heat can inhibit the animal's activity in colder waters and its ability to live outside tropical environments. The loggerhead has adapted to the southern temperate region along the southeastern coast of the United States and is commonly seen resting, feeding, swimming, and nesting in this area.

Aptly named for their broad, massive skulls, loggerheads have powerful jaw muscles and strong beak-like jaws which they use to eat hard, shelled animals such as crabs and clams. Although loggerhead sea turtles are primarily bottom feeders, they also eat planktonic sea jellies obtained while swimming and resting near the sea surface.

Little is known about swimming and foraging behaviors or habitat utilization of the loggerhead sea turtle, with even less information available on the relatively small Georgia/South Carolina nesting population. Current efforts exist to increase the knowledge base concerning these majestic and federally protected turtles.

SCMEA
c/o Center for Science Education
University of South Carolina
Columbia, SC 29208