Captain's Corner

I hope all of you have had a "relaxing productive" summer as the season that most of us "marine-minded" people yearn for rapidly draws to a close. I am certain that all of us, in one way or another, have had some exciting and interesting experiences over the summer. I have, as I made a decision to leave my position as marine education specialist for the South Carolina Wildlife and Marine Resources Department's Marine Resources Division and accepted a position as a project scientist with General Engineering Laboratories (GEL), a privately-owned environmental consulting and engineering firm in Charleston.

For the past three years, I have been involved in coordination and development of a marine education program with the goal of increasing the general public's awareness of and appreciation for our fragile marine environment. The program was primarily targeted to teachers and students and included many educational tours, cruises, marsh and beach walks, inservice programs and various other outreach activities. Throughout all of this, I believed that those of us who truly consider ourselves "hardcore environmentalists" were the only ones REALLY dedicated to affecting a positive change in our environment through conducting environmental education programs. In the three short weeks that I have been with GEL, my eyes have certainly been opened, WIDE!

I am beginning to see another facet of environmental education. Instead of focusing environmental awareness programs towards teachers, students and the general public, businesses like GEL focus environmental awareness and education efforts towards corporations and other industries by assisting them with coming into compliance with increasingly stringent environmental regulations. Although most of these efforts are currently directed towards clean up and remediation of environmental impact, the momentum is slowly beginning to lean towards prevention of impact by addressing pollution problems at their source.

Senator Albert Gore of Tennessee was recently quoted as saying, "1990 was a year of decision for the environment, but no decisions were made." Ah, but decisions were made on a very different level, specifically the corporate level. Some major American tuna canners quit buying seafood from fishing fleets that pose threats to populations of marine mammals, McDonalds addressed a major solid waste problem and a major oil company decided to use double-hulled tankers to ship oil. Certainly a major incentive to make these decisions towards "corporate environmentalism" was a direct result of industry wanting (needing, perhaps?) to address the general public's growing concern about environmental issues. Even though these corporate efforts toward cleaning up our environment are just a drop in the bucket, industry is addressing, or at least attempting to address, the issues. Government, too, will have to speed up its efforts towards developing a REAL environmental agenda as the general public's awareness and concern will produce demands that will have to be met.

The cast in this environmental drama consists of you and me, corporate environmentalists, environmental engineering and consulting firms and regulatory agencies. Most of us have the common goal of protecting the environment - the key lies in developing the education, awareness, technology and the lines of communication among these various groups to accomplish our task.

On the lighter side, in the past three weeks I have learned that "waste reduction" does not simply mean writing on both sides of a piece of paper and crumpling it into a smaller ball before recycling (there are in fact, volumes of published literature on waste reduction processes.) I have also learned that TCLP does not stand for "Tiny Colonial Leptogorgia Polyps" but for Toxicity Characteristic Leaching Procedure!! I'll be learning more about that next week.

I look forward to seeing all of you at our fall conference in Myrtle Beach. It certainly sounds like things are shaping for our best SCMEA conference yet. Good luck as many of you BRAVELY enter those classrooms within the next few weeks and remember - educate, educate, educate so that one day we might not have to remediate!

Paula Keener-Chavis
SCMEA President
Deadline Extended for Marine Education Grant Proposals

Interested educators can still apply to SCMEA for a marine education grant. The grant program was established to provide support for projects that will further marine education in South Carolina. Two grants of $250 each will be awarded to active SCMEA members during the 1991-1992 school year and can be used to purchase any special materials, equipment and resources, or to defray costs of a marine field study for a group of students. The project possibilities are limitless. It is not the intent of the grant program to supplement salaries, rather, to facilitate small marine education projects that can be valuable additions to a curriculum. Grant recipients will be expected to submit a summary article about their project for publication in the SCMEA newsletter.

SCMEA members interested in applying for a marine education grant should submit a one page application letter outlining the proposal. Letters should describe the planned project, how the project would benefit the intended audience, and how the grant monies would be spent. Letters should also include any efforts to match or enhance the SCMEA grant with other school and community resources and/or additional funding sources. Letters of support from fellow teachers, administrators, or SCMEA members will also be accepted and considered in the review process. Proposal letters should be submitted by September 20 to be considered for the 91-92 school year. Grant recipients will be notified shortly after this date. Letters should be sent to: SCMEA Scholarship Committee, Attn: Wendy Allen, Baruch Marine Lab, PO Box 1630, Georgetown, SC 29442, (803) 546-6219.

Questions regarding the grant program can be addressed to any of the Scholarship Committee members: Wendy Allen, Chair; Julie Cliff; Beth Day; Stan Rachelson; or Rhet Wilson.

Former SCMEA President Elected to NMEA Board

Rhet Wilson, Past-President of SCMEA, was recently elected to serve a three-year term on the Board of Directors of the National Marine Educators Association.

SCMEA is a chapter of this prestigious national organization which holds great annual conferences and publishes a well-respected marine education journal. It is truly an honor to be elected to this Board. We are all proud of you, Rhet, and know that you will do a great job furthering marine education on the national as well as state level!

Earth Science Videos in the Making

As part of the South Carolina Earth Science Resources Project, Phil Astwood and Larry Cameron at the Center for Science Education at USC are working on a series of short videos designed to introduce selected earth science topics to eighth graders. Guided by a team of eighth grade teachers, they decided to produce five videos, between fifteen and twenty minutes in length, which would provide introductions to: Coastal Processes, Mountain Building, Erosion, Conservation of Resources, and The Disposal of Solid Waste.

The videos are being shot at a variety of sites around the country. They are designed to show significant national features and processes and relate these to similar ones in South Carolina. Shooting for the first three videos began last summer in the mountains and along the beaches of Hawaii and the Pacific Northwest. These contain pictures of active and recently active volcanos and lava flows, as well as a collection of shots showing a variety of different types of coastlines. Work continued this summer with pictures of earthquake and fault features in California, mountains in Colorado, and spectacular sedimentary deposits in Zion and Bryce Canyons in Utah.

With local shooting in the Appalachians and along the South Carolina coast to be completed this summer, it is expected that the first two videos will be complete and available in 1992. The others should be ready about a year later. For more information, contact Phil Astwood at the Center for Science Education, University of South Carolina, Columbia, SC 29208.
Program Feature: The World of Wonders (WOW) Family Science Program

Would you enjoy spending your Saturdays or Sundays with your children dissecting sharks, participating in an archaeological dig, building and soldering components to create a photosensitive "lunch box burglar alarm" or self-lighted kaleidoscope, making citric-acid powered batteries and "silver bottles," or catching, studying and releasing marsh and marine life? All these activities and more have been part of the programs offered through the World of Wonders (WOW) Family Science Program.

Charleston, South Carolina is the home of this unique community science education program for elementary age children and their parents, sponsored by the Charleston County Park and Recreation Commission. A series of six hands-on science programs are offered every other weekend during the fall and spring series. The WOW Program has two basic goals: to stimulate an enthusiasm for science by providing manipulative exposure to a diversity of science subjects, and, to provide a lasting vehicle for parent-child bonding and communication. Parents are required to attend and participate in all programs along with their children. Siblings are allowed to attend if accompanied by another adult. Parent-child interaction thus becomes both the means and the purpose of science education. Children acquire an affection for science not only because the activities are engaging but also because of the parents' attention and involvement.

Professional scientists and leading science educators are instructors for all programs. Physics, chemistry, nature study, marine science, and machine technology are program "staples." Additional program subjects include genetics, astronomy, anatomy, physiology, archeology, police science, ornithology, aeronautics, and meteorology. Programs take place in a nonjudgmental, recreational, and informal atmosphere without tests, grades, or evaluations. Program locations include a variety of area indoor and outdoor locations. College and university laboratories, marine science laboratories, police laboratories, marshes, beaches, islands, docks, parks, and forests provide varied program settings.

Participants may enroll in Saturday morning, Saturday afternoon, or Sunday afternoon sessions. Programs are offered in two series: Series I is for children in grades 1-3, Series II is for children in grades 4-6. Only twelve children and their parents are enrolled in each session in order to maintain an informal, small group atmosphere and maximize learning opportunities. The fee for the entire series of six programs for both parent and child, including all materials, is $40.

Applications are accepted on a first-come, first-served basis and sessions fill up very rapidly. Schedules and applications for the fall series are mailed in mid-August; the spring series information is mailed in mid-January. For more information about this unique family science program, contact Cindy Renkas, WOW Program Coordinator, Charleston County Park and Recreation Commission, 861 Riverland Drive, Charleston, SC 29412, (803)762-2172.

What's Up with the SC Aquarium?

Experiences from the South Carolina Aquarium: Flash! Silver! Fish turn in the sunlight - Hurly Burly! Otters tumble - Quiet swamp resonance - Marsh grass rustles - Our sea's surprises and solemnity.

What links these experiences? Yes, each is part of the presentation of the South Carolina aquatic environment from the mountains to the sea. Each holds an opportunity for wonder and discovery. Each is but a glimpse of the possibilities.

As visitors go through the South Carolina Aquarium, their senses, wonder, and intellectual curiosity will enable them to choose the depth of their experience. The choice of exhibit types, habitats, animals, art, and text all support visitors' observation and exploration of the ecosystem. From writing style to print style, the text and graphics are planned to allow visitors to adapt the information they find to their level of inquiry. "Interpretive planning" is what creates the Aquarium's story line to reinforce learning.

As outlined, the South Carolina Aquarium interpretive plan provides visitors with the context in which they may think about the exhibits. The plan reinforces the recognition of the biological richness of South Carolina, the uniqueness of each habitat and niche and factors that determine them, the concept of change as a natural process and the need to understand how humans catalyze changes in the environment. Fundamental to these concepts is simply helping visitors observe their world by showing them close-ups in the exhibits and teaching them skills of observation.

The interpretive plan is available for review and your comments are solicited. Going into the final design of the building and exhibits, it will help make South Carolina's Aquarium the best in the nation to have marine educators reviewing the interpretive and programmatic plans. This time next year, construction will be underway on the building with opening targeted for 1994-1995. While the building is underway, plans for the exhibits, text, graphics, and programs will be developed to full scale. If you would like to comment on the concepts and goals for the Aquarium's interpretive plan, now is the time. Please write or call Rhett Wilson, South Carolina Aquarium, 116 Meeting St., Charleston, SC 29401 or (803) 724-3784 for more information.

Put Beach Sweep/River Sweep on Your Calendar

Beach Sweep/River Sweep, scheduled for Saturday, September 21 this year, provides an opportunity for people to assist in a statewide clean-up of beaches and waterways. Educators are encouraged to involve their students in this clean-up effort which brings home the need for recycling, trash reduction, and the elimination of waste disposal at sea. A network of area coordinators has been established. For more information on how you can get involved with Beach Sweep, contact Leigh Handal at the SC Sea Grant Consortium, (803) 727-2078. For River Sweep information, contact Karen Smith with the Water Resources Commission, (803) 737-0800.
Spineless Wonders: Lights in the Sea
by Fred James

Numerous organisms produce light (bioluminescence) in the sea including bacteria, invertebrates, and fish. In the deep areas of the sea, 400 meters and below, 70-80% of the jellyfish, squids, shrimps, and fishes are bioluminescent. While some light-producing organisms are found on land and a few freshwater environments, bioluminescence is much more common in the marine environment. Why organisms produce light is often not known but to observe this light production on a moonless night will leave you with a sense of wonder! One of the major functions of light is thought to be communication, such as seen in courtship and mating. This is well researched in fireflies but has also been shown for some polychaete annelids, ostracods (a bivalved crustacean), and fishes. Perhaps the most common function is predator avoidance. The predator is often startled by the light after touching or coming close to the prey organism. Squids and fishes form a silhouette when seen by a deep swimming predator against the light filtering down from the surface. Organisms with glowing lights on their ventral surface tend to obliterate their outline and may confuse the predator.

Squids are known to throw out black ink from their intestine when they are disturbed. One species of deep dwelling squids has adapted to this dark environment by spurting out bioluminescent ink. How ingenuous! Deep ocean predators also have luminous lures to attract prey. Many organisms at deep depths can detect meals of dead organic matter covered by bioluminescent decomposer bacteria. This could be one reason why many deep dwelling fish have extremely large eyes in an environment where eyes don’t seem to be of paramount importance. If you keep a squid or soft bodied invertebrate overnight in a warm place, it will usually become covered by bioluminescent bacteria. You need to view this in a dark room and let your eyes adjust. If you culture these bacteria on nutrient "saline" agar plates, you can have your students write their names in lights!

During World War II, the Japanese soldiers produced a powder from dried Cypridina (an ostracod) to which they added water to produce enough light to read maps without being detected by the enemy. The organism itself is not bioluminescent but it squirts out bioluminescent substances as it swims up from the bottom sediments at night to feed. On a 90 foot dive in Jamaica, we turned off our dive lights and were able to see these ostracods by the thousands squiring out rows of bioluminescent substances that slowly faded and looked like strings of golden lamps at a camp site!

One of the most interesting of the bioluminescent organisms are the marine polychaete worms. Columbus recorded seeing lights in the water, resembling moving candles as he approached the Bahamas, an obvious reference to these worms. The Bermuda fireworm begins to swarm two to three days after the full moon each month, emitting a green light which reaches its maximum intensity 55 minutes after sunset. Several smaller bioluminescent males circle the females and release their sperm. The female worms glow strongly and almost continuously while they release their eggs.

One of the most exciting experiences I have ever had was while snorkeling in Puerto Rico's Bay of Fire on the southern coast near the small town of La Parguera. When snorkeling under water, your face mask lights up with a thousand points of light (perhaps President Bush has been here!) If you dump a bucket of water on your head or slap your wet tee shirt with your hand, the entire area lights up. When the boat moves through the water, the fish shoot out from the front of the boat like Roman Candles and the back of the boat lights up in an eerie blue color! We had a porpoise lead our boat into the bay on one trip and his entire body was lit up. On a rainy night, every drop that hits the water glows and the bay shimmers with light from shore to shore. I always thought that this would be a great place for a baptism (Yes sir, I saw the light!)

There are many common invertebrates that are bioluminescent on our coast. A few of these are the parchment worm which lives in a U-shaped tube that is opaque, sea pantries (Phylum Cnidaria), and Pelagia noctiluca, the oceanic jellyfish off our coast (as its name implies pelagic= ocean and noctiluca= night light.) Most of the bioluminescence along our coast, however, is due to comb jellies and dinoflagellates. Comb jellies (Phylum Ctenophore = "combs to bear," referring to eight rows of combs of cilia) are typically two inches long and look like small oval globs of jelly. They often wash up on the beach and are easy to spot if you use a lantern and walk the beach at night near the ocean's edge. You can carefully pick them up with your hand and place them in a jar with water. They have no tentacles and won't hurt you. When you stroke them, they produce streaks of light along the eight comb rows.

Dinoflagellates (Dino=whirling; these creatures have a whip-like flagella around their middle which causes them to spin like a
top) are one celled "animals" (Phylum Protozoa) that give off light when they are disturbed. Botanists often put them in the algal Division Pyrophyta ("Fire Plants"-how appropriate.) It is interesting to note that Dinoflagellates have a biological clock which stops producing light at dawn and starts producing it again at dusk. If the organism is kept indoors under constant dim light, the cycle continues for weeks. Not only are dinoflagellates bioluminescent but some species are the cause of the red tide which results in giant fish kills and poisoning of shellfish beds. The toxin produced by these organisms was once kept by the C.I.A. for possible use in assassin weapons. Dinoflagellates are always present in the marine environment and are best observed on moonless nights. If you put your shadow on the water and move your hand back and forth in the water or wet sand, you will see these shining jewels of light. For the best results try to get on a dock away from lights and move a crab net back and forth in the water to observe these intriguing lights in the sea.

Dr. Fred James is a professor of Biology at Presbyterian College, Clinton, SC 29325. Suggestions for future "Spineless Wonders" columns can be made by writing Fred at the address above or by calling him at (803) 833-8402.

"Spineless Wonders" illustrated by Lee Nisbet

Don't Miss SCMEA's Fall Conference!

SCMEA's 1991 conference, scheduled for the weekend of October 11-13 in Myrtle Beach, should be one of the best ever. The theme for the conference is "Marine Educators, Scientists and Managers Making a Difference Together." An unprecedented number of scientists and managers from colleges and universities, agencies, and organizations, as well as educators, will come together to present field trips and workshops during this conference aimed at improving lines of communication so that we can all do a better job informing people about the coastal environment and its resources.

A brochure describing the conference is attached. As you look it over, you will see that a variety of exciting field trips are planned for Friday afternoon and Sunday morning and a tremendous selection of hands-on workshops and contributed papers will be presented on Saturday. We will renew and form new friendships during a wine and cheese social Friday evening, followed by a keynote address presented by Dr. John Mark Dean, Professor of Marine Science at the University of South Carolina. John will address the importance of communication between educators, scientists and managers and the vital role educators play in this process. Eating is always one of our conference highlights and a Surf and Turf Buffet is planned for Saturday evening, followed by a short SCMEA business meeting. Last year's fund-raising auction was such a success that another is planned for this year. Fred James and John Carpenter have agreed to team up as the auctioneers which should make for a fast-paced, humorous exchange of words and booty! Don't forget to bring some money so that you can bid on and take home some of the items!

The conference will be held at the Sands Ocean Club Resort Hotel which is located in one of the more scenic areas of Myrtle Beach. This location is ideally suited for a fall getaway with family and friends. The hotel has indoor and outdoor swimming pools, nightly entertainment and is right on the beach. All rooms are efficiency suites equipped with kitchens.

Registration is limited to 150 people and will be treated on a first-come, first-served basis. SCMEA members are receiving the conference brochure in this newsletter first before it is mailed to others who might be interested in attending. Be sure to register early to ensure your participation in this fun educational event!

Any questions regarding the fall conference can be addressed to the Conference Chair, Beth Day, at (803) 837-4848.

Call for Auction Items

The auction at last year's conference in Hilton Head proved to be a wonderfully entertaining way to raise money for the SCMEA. Over $1,300 was raised and enabled SCMEA to initiate teacher scholarship and marine education grant programs. Another auction is planned for the 1991 conference in Myrtle Beach. Donated items, especially those that relate to a marine theme, are needed for the auction. Such items might include tee shirts, sweat shirts, curriculum materials, books, posters, sampling equipment, etc. A table will be set aside at registration to accept donated items. Please contact Debbie Maddaloni, auction committee chair, concerning items you plan to bring for the auction. She can be reached at (803) 626-7217. Thanks!
Resource News

A Citizen's Guide to the Regulation and Management of Coastal Resources in South Carolina by Melvin H. Goodwin and Elizabeth Prioleau contains a comprehensive listing and description of agencies that have regulatory authority along the coast. Major legislation governing coastal concerns is also briefly described and suggestions for how private citizens can make a difference are offered. This publication is produced by the Charleston Harbor Estuary Committee and can be obtained by writing or calling the SC Sea Grant Consortium, 287 Meeting St., Charleston, SC 29401, (803) 727-2078.

A Guide to Aquatic Field Study Sites in South Carolina by Wendy Allen and Patricia McLaren contains a listing of 60 study sites along with information on available resources at each site including study leaders, interpretive buildings, restrooms, etc. Copies are available for a cost-covering fee of $6.00/copy from the SC Sea Grant Consortium, address above.

The South Carolina Public Beach and Coastal Access Guide, produced by the SC Dept. of Parks, Recreation and Tourism, covers all coastal counties and contains maps and a checklist of facilities at each public access site. For more information contact: SC Dept. of Parks, Recreation and Tourism, 1205 Pendleton St., Suite 110 - Edgar Brown Bldg. Center, Columbia, SC 29201 (803) 734-0156.

Continuing Education Opportunities

Beach Sweep/River Sweep 1991 - Sept. 21 - Team up with friends, families, colleagues and students to help clean up the state's beaches and waterways and contribute to a data base that is adding to our understanding of the problems of waste disposal and marine debris. For information on Beach Sweep, contact Leigh Handal at the SC Sea Grant Consortium: (803) 727-2078. Information on River Sweep can be obtained from Karen Smith at the Water Resources Commission: (803) 737-0800.

Coastweeks - Sept. 21-Oct. 14 - All along the coast there will be celebrations and explorations of our coastal zone during Coastweeks, Contact Donna Gress at the SC Coastal Council, (803) 744-5838, for a brochure describing planned events.

SCMEA's Annual Conference - Oct. 11-13 - "Marine Educators, Scientists and Managers Making a Difference Together" is the theme of this year's conference to be held in Myrtle Beach. Don't miss this annual happening! For extra conference brochures, contact the Conference Chair, Beth Day, at (803) 837-4848.

Bayfest - Oct. 19 - This annual celebration of Georgetown County's coastal heritage includes free narrated boat tours of Winyah Bay and the port of Georgetown, arts and crafts, live music, and lots of fun participatory activities for the entire family. For more information, contact the Georgetown Co. Parks and Recreation Dept. at 546-2481.

The Charleston Harbor Classroom Oct.-Nov.- Mini-courses geared for teens on the environment of Charleston Harbor are being offered by the Charleston Harbor Citizens Estuary Committee. Call the SC Sea Grant Consortium for more information (803) 727-2078.

All Aboard the Mimi! - Nov.-Nationally sponsored by institutions including the US Dept. of Education, the Mimi is a research vessel and associated curriculum that teaches about the marine environment. The program is for teachers and their students. Call the SC Wildlife and Marine Resources Dept. at 762-5012 for more information about this program and the dates that the ship will be in Charleston.

"Coastal Drinking Water: Good to the Last Drop?" - Dec. 6 - SC Sea Grant Consortium's winter conference featuring coastal drinking water is open to the public free of charge. Contact John Tibbetts with the Consortium for more details: 727-2078.

Charleston County Park and Recreation Commission is offering a great selection of marine related activities that educators can enjoy including: a Teachers' Nature Activity Workshop, Culinary Crabbing, Shorebirding, several kayak and canoe trips, and a World of Wonders Family Science Program. Advance registration is required for all programs. Call the Commission, 762-2172, for a complete listing of events.

Project Aquatic WILD workshops are offered upon request. To learn how to use this great resource, contact Don Winslow at the SC Wildlife and Marine Resources Dept. in Columbia, (803) 734-3888.

Editors Note: If you know of any resources and educational opportunities that should be featured in future issues of Seascripts, please send them to the editor. Thanks!
SCMEA 1991 Conference Brochure Inside
Be sure to register soon!

Are your dues current?
Check the one digit number above your zipcode on the label. It's not a 1 (standing for 1991) it's past time to renew! Send your renewal check of $5.00 to SCMEA Secretary-Treasurer, Phil Astwood, Center for Science Education, USC, Columbia, SC 29208. 1992 dues are payable at the time of the Annual Fall Conference.

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

South Carolina Marine Educators Association

and join a group of dedicated teachers, naturalists, scientists and others interested in studying and teaching about the world of water, both fresh and salt. The Association provides a communication network for members to share information and ideas through newsletters and an annual statewide conference. Membership dues are $5.00 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!

Date:

Name

Occupation

Home Address

Place of Employment

Home Phone Number

Work Address

Work Phone Number

Are you currently a member of the National Marine Educators Association (NMEA)?

Please send completed form with the $5.00 membership fee (make checks payable to SCMEA) to:

Phil Astwood, Secretary-Treasurer, SCMEA

Center for Science Education, University of South Carolina, Columbia, SC 29208

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Join NMEA . . .

... and 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 the best annual conferences you'll ever attend!

Name:

Occupation or Title:

Address:

(Street or PO Box)

(City)

(State)

(Zip)

Individual Memberships

____ Student - $15
____ Active, 1 year - $25
____ Active, 2 years - $48
____ Active, 3 years - $68

____ Associate - $40
____ Sustaining - $100 or more
____ Life - $300 or more
____ Patron - $500 or more

Institutional Memberships

____ Affiliate (includes libraries) - $35
____ Corporate - $250 or more

Are you currently a member of a regional chapter?

____ yes  ____ no. If yes, which one?

Please make check payable to NMEA and mail to:

National Marine Educators Association,

PO Box 51215, Pacific Grove, CA 93950

SCMEA Su 91