Making Waves
At the Darling Marine Center

Top: Paolo Mantero and Brian Bergamaschi deploying an optical profiling package off the R/V Ira C.

Bottom: Heather Uhden and Remy Luerrsen calibrating a sky radiometer against a test panel of known reflectance.

New Summer Courses are Hits

This summer the DMC added two new courses to its popular summer line-up. One was a five-week, graduate-level Optical Oceanography course, the other was a spin-off of the ever popular Developmental Biology Teaching Workshop focusing on Special Topics for college-level Developmental Biology professors.

Optical oceanography is the study of sunlight and seawater. Optical oceanographers look at how sunlight penetrates seawater, and how animate and inanimate particles in the water absorb and scatter the light. They also quantify the amount of light available to phytoplankton for primary production, the basis of the ocean food chain.

With complete funding from the Office of Naval Research (ONR) and the National Aeronautics and Space Administration (NASA), Dr. Mary Jane Perry taught one of the most in-depth and intensive Optical Oceanography courses offered in the United States. She brought together the expertise and talents of top optical oceanographers from five research institutes, and guest lectures were given by Navy representatives, oceanographic instrument manufacturers, and other prominent researchers in the field.

Dr. Eric Cole, St Olaf's College, instructor for Special Topics course. *Story on page 7.*

Participants included graduate students from every corner of the United States, Chile, Canada, Japan and Italy whose theses cover such topics as primary production estimates, ocean color, and variability of phytoplankton blooms. Two participants were professionals working for the United States Geological Society and the Navy.

In classroom, laboratory and field settings, participants studied the optical properties of water using the most current remote sensing equipment. A 22-station computer cluster allowed students to use state of the art software to examine remote sensing and optical models. Field trips on the DMC's *R/V Ira C* let students deploy a wide variety of optical instruments in and around the Damariscotta River estuary.

The various instructors all brought with them different laboratory instruments, which the students used in preparing their final research projects. These projects allowed students the opportunity to use equipment and resources for their own research which were not necessarily available at their home institutes, but some students used the opportunity to explore new facets of optical oceanography outside their current field of study.

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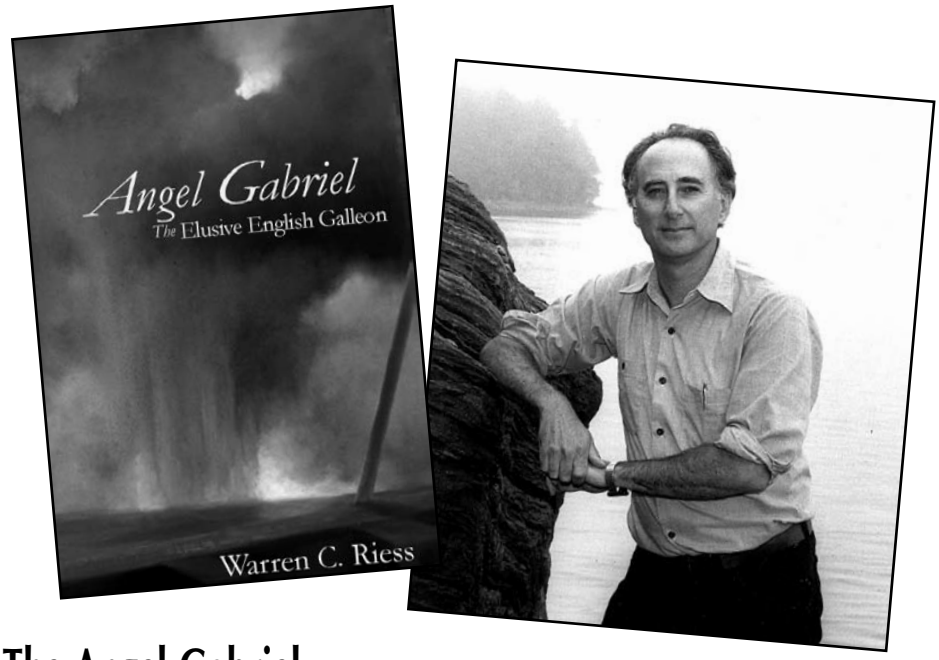

The Angel Gabriel

For 20 years Dr. Warren Riess searched the bottom of John's Bay for the wreck of the *Angel Gabriel*. Though he never found the ship, he learned much about her and her voyages.

Built in 1617 for Sir Walter Raleigh's last expedition to America, the *Angel Gabriel* met her demise in a hurricane at Pemaquid, Maine in 1635. Though almost everyone aboard made it safely ashore before the hurricane hit, the ship had not been unloaded. It was lost with a hold full of trade goods and family heirlooms. If found, these treasures would shed light on 17th-century merchant goods and the belongings early settlers brought with them to America.

Over the years, with hopes of uncovering these trade secrets, Warren enlisted the help of countless individuals—divers, graduate students, friends, and volunteers. Using University of Maine research vessels and a host of electronic equipment including side scan sonar, magnetometer, sub-bottom profiler, and hand-held metal detectors, Warren scoured every easily accessible inch of John's Bay to no avail.

In his recently published book, *Angel Gabriel:The Elusive English Galleon*, Warren tells the history of this ship, the people she carried across the Atlantic, and the story of a twenty-year search for the ship's remains.

The book can be purchase in many local book stores or by contacting the publisher 1797 House by e-mail at 1797hous@tidewater.net. ISBN 0-9713438-0-2

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Dr. Kevin J. Eckelbarger, Director
Tim Miller, Laboratory Manager
Linda Healy, Science Writer & Events Coordinator

Recent Publications

Adey, W.H. and **R.S. Steneck.** 2001. Thermogeography over time creates biogeographic regions: a temperature/space/time-integrated model and an abundance-weighted test for benthic marine algae. J. Phyc. 37(5):677-698.

Hardy, K.R. and **G.M. King**. 2001. Enrichment of High-Affinity CO Oxidizers in Maine Forest Soil. Appl. Environ. Microbiol. 67:3671-3676.

Jackson, J.B., M.X. Kirby, W.H. Berger, K.A. Bjorndal, L.W. Botsford, B.J. Bourque, R. Bradbury, R. Cooke, J.A. Estes, T.P. Hughes, S. Kidwell, C.B. Lange, H.S. Lenihan, J.M. Pandolfi, C.H. Peterson, **R.S. Steneck**, M.J. Tegner, R. Warner. 2001. Historical overfishing and the recent collapse of coastal ecosystems. Science 293:629-638.

Macintyre, I.G., P.W. Glynn, **R.S. Steneck**. 2001. A classic Caribbean algal ridge, Holandés Cays, Panamá: an algal coated storm deposit. Coral Reef 20:95-105.

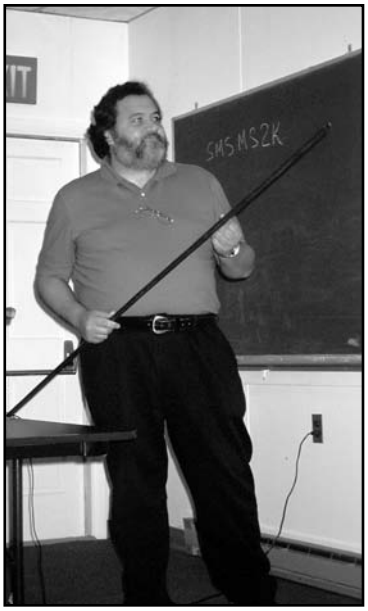
Meidel, S.K., and **P.O. Yund**. 2001. Egg longevity and time-integrated fertilization in a temperate sea urchin (*Strongylocentrotus droebachiensis*). Biol. Bull. 201:84-94.

Mayer, L.M. and B. Xing. 2001. Organic carbon-surface area-clay relationships in acid soils, Soil Science Society of America Journal, 65:250-258.

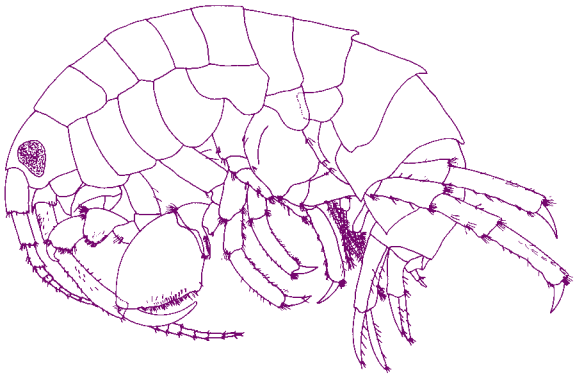
Mayer, L.M., D.P. Weston, and M.J. Bock. 2001. Benzo-a-pyrene and zinc solubilization by digestive fluids of benthic invertebrates-a cross-phyletic study. Environmental Chemistry and Toxicology 201890-1900.

Palma, A. and **R.S. Steneck**. 2001. Variable coloration in juvenile marine crabs reduces risk against visual predators. Ecology 82:296-967.

Stewart-Savage, J., **A. Phillippi,** and **P.O. Yund**. 2001. Delayed insemination results in embryo mortality in a brooding ascidian. Biol. Bull. 201:52-58.



Ph.D. Awarded



Exequiel González was awarded a Ph.D. in Marine Biology by The University of Maine for his taxonomic work on the amphipod family Hyalellidae, specifically the genera *Parhyalella* and *Hyalella*.

Working under the tutelage of Dr. Les Watling, Exequiel sorted out the taxonomy of these two genera using morphological characteristics, geographical distributions and cladistic analysis. He redescribed over 40 species and identified 10 provisionally new species.

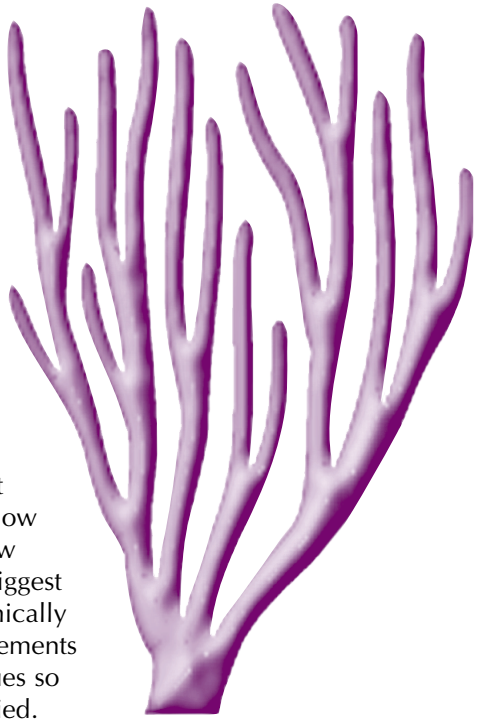
Exequiel and his family have returned to Chile where he teaches Marine Invertebrate Zoology and Evolution at the Universidad Catolica del Norte in Coquimbo and continues his research on *Hyalella*.

Congratulations Dr. González!

Deep-sea Corals **Continued from the back page**

The dive in Hydrographer Canyon began at 1400m and ended at 800m. Hydrographer Canyon did not have steep rocky walls as seen in Oceanographer, rather it was made of steep sloping mud banks. These banks were heavily burrowed by young deep-sea red crabs. Back at the DMC, Semester-by-the-Sea student Mary Ann Morin is reviewing the video from Hydrographer Canyon and collecting data on the sizes and numbers of the red crab burrows to learn more about this soft-bottom community.

Dr. Kevin Eckelbarger, another principal investigator on the deep sea coral project, is a specialist in the reproductive biology of deep-sea invertebrates. Over the next few months, he will be using the transmission electron microscope to describe the reproductive organs of the corals and the process by which gametes (egg and sperm) develop.



It is expected that a lot of new basic information will be uncovered about coral reproduction, but the ultimate goal is to determine how fast gametes are produced and how often the animals breed. Kevin's biggest immediate challenge will be chemically removing the hardened skeletal elements that protect the delicate coral tissues so the underlying tissues can be studied.

Library Expansion

Thanks to a $200,000 facility award from the National Science Foundation and matching funds from The University of Maine, the DMC library will undergo an expansion and renovation in 2002.

The project will ultimately more than double the amount of floor space available to the library. A 1,500 sq. ft. addition to the main floor will allow for the consolidation of all journal/book holdings. Existing space will be renovated to create a student Computer Center and ITV-equipped conference room, a Special Collections Room to house rare holdings, and a large reprint collection covering ecology/taxonomy of organisms from the Gulf of Maine.

The Center's Library is arguably its most important asset and the planned improvements will immediately benefit students, faculty, and visitors by providing more study space and access to modern technology to support their research and course work.

Dr. Kevin Eckelbarger
Director, Darling Marine Center

Honorable Mention

For Eons of Service

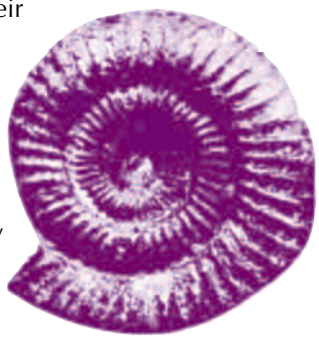
It's a New England tradition dating back to 1909 to honor the eldest member of a community with a exquisite cane. Now it is a DMC tradition thanks to Dr. Gary King, resident DMC microbial ecologist. Though The University of Maine commemorates years of service with milestone gifts of key chains, clocks and rockers, Gary thought it was time we recognized our own — in a fashion unique and fitting to the DMC.

Unlike the Boston Post Canes which were made of ebony and graced with a gilded knob of 14 carat gold, the Darling Staff is a sturdy pine limb, stained a beautiful shade of mahogany with a hand rubbed finish. It is adorned by a thin section of a fossil ammonite (courtesy of Dr. Bob Steneck) and a dog tag inscribed with *For Eons of Service*.

The Staff was presented to Dr. Detmar Schnitker, not because he was the oldest member of the Darling Center community, but because he has the longest personal history with the Center.

Detmar has been with The University of Maine and based at the Darling Center since 1969. He arrived in Damariscotta on a Greyhound bus at 3 a.m., having been told in Boston that there were lots of hotels in this coastal resort town. His informant had obviously never been to Damariscotta! At 4:30 a.m. he was picked up by a local policeman in a warm cruiser. Later that morning he met the DMC's first Director, Dr. David Dean.

Detmar has seen the DMC go through many changes and has helped many graduate students complete their degrees. Upon his retirement, the Darling Staff will be passed on to another unsuspecting person with a long history at the DMC.



At first I did not catch on to what this was all about; then I thought that it could not possibly be me. Then reality set in - yes I am the 'oldest' here, but I hope that I am not fossilized yet... even though sometimes I feel that a staff to lean on comes in handy.

Dr. Detmar Schnitker, recipient of the Darling Staff

25 Years of Teaching & Research at DMC

Dr. Les Watling has been with The University of Maine for 25 years. He was hired in 1976 as an Assistant Professor, was Director of the DMC for five years in the late 1980's, and became a full Professor in 1991.

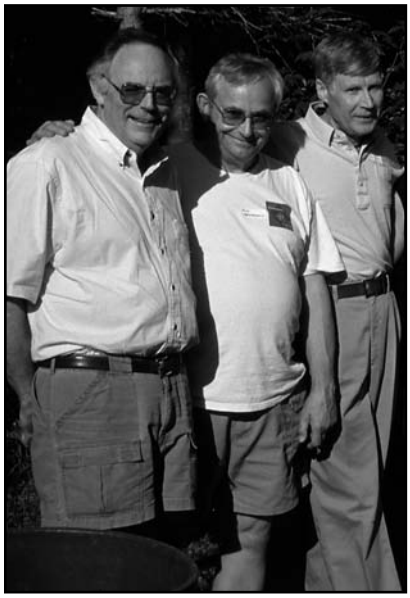
Les's research has taken off in two directions. He is an expert in crustacean taxonomy and phylogeny, specializing in cumaceans and amphipods. His other area of research is benthic oceanography, specifically human impact on the benthos. He is particularly concerned with the effects of mobile fishing gear on benthic communities including the loss of biodiversity associated with fishing activities.

In the past 25 years he has taught a myriad of courses including: Biological Oceanography, Marine Invertebrate Zoology, Anatomy and Phylogeny of Crustacea, Biology of Decapods, Ecology of Marine Sediment Dwellers, and many more. He has advised over 20 graduate students and is now active in the School of Marine Sciences undergraduate *Semester by the Sea* program.

Congratulations Les!

Dr. Gary King (right) congratulates Dr. Les Watling (left) on 25 years with the UMaine while Dr. Larry Mayer (center) looks on.

Alumni Gathering



A great time was had by all at the DMC Alumni Gathering, July 21, 2001. Alumni representing every era of DMC history gathered on the familiar banks of the Damariscotta River to rekindle old friendships and enjoy a traditional Maine lobster bake. Afternoon activities included tours of the "new" waterfront facilities and boat rides. The festivities were capped-off with a spectacular evening slide show — four carousels worth of slides borrowed from alumni and narrated by DMC's current Director, Dr. Kevin Eckelbarger.

Top left: Linda Plunket, Warren Riess, Dick Clime, Reg Gillmor.

Top right: Gordon Bilyard, Bob Crippen, Lynne Noyes, Nan Dean, Bernie McAlice.

Middle left: Jim Blake, Mike Mazurkiewicz and Detmar Schnitker.

Above: Mark Wells and daughter Lindsay.

Left: David and Mieko Shull (foreground), Don and Ellen Miller. Don was the first interim Director of the DMC in 1965.

Marine Education for K-12 Students

Exposing students to the scientific method, exploring the marine and coastal environments, and practicing stewardship are the cornerstones of the Gulf of Maine Foundation's K-12 education program which really got a running start this summer.

GMF's summer Education Coordinator, Maya Crosby, and summer intern, Pearl Ly, pulled together a variety of programs geared toward students, parents and teachers. Together they hosted visits from summer camps, schools, and youth groups. Maya held a half-day teacher workshop for local elementary school teachers on science skills.

Marine Mania was a popular weekly summer program for kids in grades K-4. Each week children and their parents explored a different marine biology theme such as *Fun with Seaweed*, *Crazy Crustaceans*, *Fish Fiasco*, and *Marine Pollution Stinks!*

Scenes from Marine Mania...

In Fish Fiasco, young marine biologists learn why fish swim in schools and how they use bioluminescence to find each other in the dark depths of the ocean. They then painted fish for printing on pillowcases and t-shirts.

During the Crazy Crustacean class kids learned about the hard shell of crabs and lobsters, how they grew, where they lived and what they ate. Hermit crab races proved to be a fun way to learn about crustacean locomotion. Human crab races show that crab walking isn't easy if you only have two arms and two legs!

GMF has a web site! Check it out:

www.gulfofmainefoundation.org

Above: Home schoolers quantify critters in a quadrant. Right: South Bristol 3rd and 4th graders observe seaweeds and invertebrates under dissecting microscopes.

Jan Faulkner is back this fall as the GMF Education Coordinator for the academic year. She organized 23 group visits (over 300 students) to the DMC this fall. Most were from local schools and home school programs.

Working directly with teachers, Jan designs grade-appropriate lessons that meet the State of Maine Learning Results and integrate with the school's curriculum. Since many elementary school teachers are not well-versed in science, this is win-win situation: students get a fun hands-on program and teachers get help incorporating Maine's strict learning standards into their class's curriculum.

In general, younger students study plankton, marine critters and seaweeds. They explore feeding behaviors and food webs, and learn observational skills and microscope use.

Middle school students look quantitatively at ecosystems—who lives where and why. They study the adaptations various animals have for living in their ecological niche.

Population dynamics, human impacts, and marine science careers are all hot topics for high school programs.

The Gulf of Maine Foundation (GMF) is a non-profit organization founded in 1986 to foster the growth and development of marine studies at the Darling Marine Center.

For more information or to become a member, contact:

The Gulf of Maine Foundation
P.O. Box 185
Damariscotta, ME 04543
gmf@maine.edu

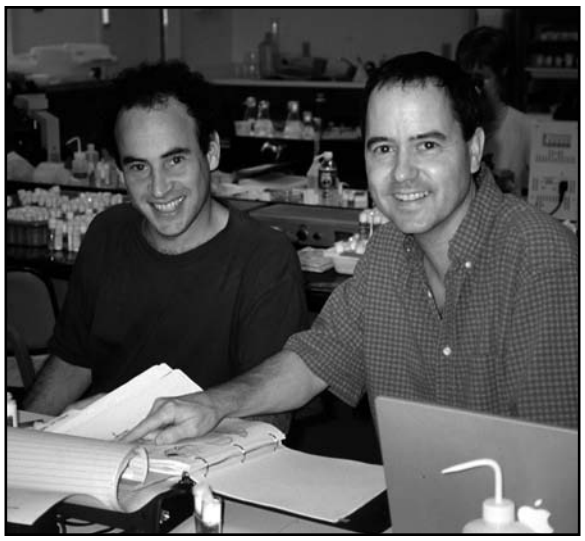
New Summer Courses Continued from page 1

Developmental Biology is the study of how oganisms grow from a single, fertilized cell into highly specialized plants and animals. For decades, college students studied this phenomena using sea urchins, chick embryos and worms. Today, molecular techniques and genetic experiments are becoming the norm.

The *Developmental Biology Special Topics Workshop: lacZ and GFP Reporter Genes, Ectopic Eyes & Drosophila Development* was developed by Dr. Eric Cole, St. Olaf's College and Dr. Kevin Cook, Indiana University. The goal of this course was to expose professors to more advanced, specialized and current techniques that they can use in their Developmental Biology laboratory classes.

The course delved into the latest molecular genetic tricks in the field of Drosophila Developmental Genetics. Participants learned how to splice fluorescent reported genes into Drosophila embryos and use fluorescence microscopy to see the resulting patterns of gene expression.

Eric hopes to offer different *Special Topics* workshops highlighting various organisms and techniques at the DMC every couple of years.



Dr. Mark Spiro, Bucknell University, and course instructor Dr. Kevin Cook, Indiana University, review lab procedures in the Dev. Bio. Special Topics course.

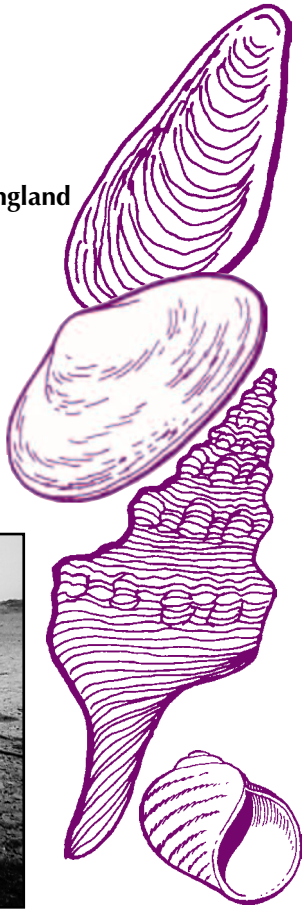
Semester By the Sea

Semester By the Sea is a unique residential program offered by the University of Maine's School of Marine Sciences at the DMC for juniors and seniors in college. Most courses are taught by DMC resident faculty and take full advantage of the DMC's research vessels, flowing seawater laboratories and classrooms. Extensive field trips to marine habitats of the midcoast Maine area are part of every course.

Choose from such courses as:

Invertebrates of the Maine Coast
Marine Ecology
Coastal Marine Geology
Maritime History & Archaeology of New England
Design of Marine Organisms
Introduction to Biological Modeling

Plan your course work now for the SBS 2002!
For academic information contact:
Dr. Sara Lindsay
Undergraduate Coordinator
School of Marine Sciences
207-581-4381 • slindsay@maine.edu

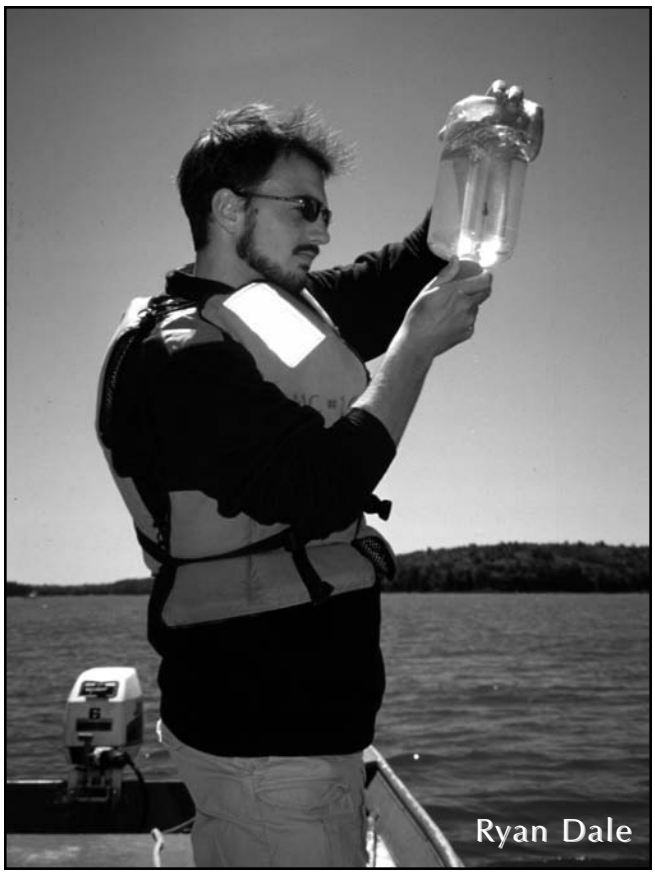


Interns at Work

Renee Meredith

Renee worked in Dr. Gary King's microbial ecology laboratory. Her independent research project involved looking at how different aluminum species affect the consumption of carbon monoxide gas by an isolated soil bacterium. Renee found that aluminum nitrate, aluminum sulfate, and aluminum chloride did have significant environmental affects on the bacteria's ability to use carbon monoxide as its carbon source. Renee is a senior a the University of Evansville, Evansville, IN. She held an REU (Research Experience for Undergraduates) Fellowship supported by the National Science Foundation.


Renee Meredith


Ryan Dale

Ryan Dale

Working in Dr. Pete Jumars' laboratory, Ryan used acoustic profiling and emergence traps to study the nightly migration of invertebrates, primarily mysid shrimp, from the bottom sediments up into the water column, in the Damariscotta River. Acoustic techniques were used to determine the size of the emergers, and when and how far they emerged. Traps were used to catch the emergers. Ryan correlated the sizes of the organisms caught in the traps with the sizes shown by the acoustics to get an accurate picture of the nightly emergence. Ryan held an REU Fellowship. He is a senior at The College of New Jersey.

Danielle Rioux

Danielle Rioux is a senior at The University of Maine, Orono. Working with Dr. Kevin Eckelbarger this summer, she surveyed the extent off shipworm (*Teredo navalis*) damage along Maine's coast; finding it to be spotty, but significant. She also prepared worm samples for electron microscopy to learn more about its reproductive cycle. She hoped to find the mechanism that triggers the population explosions that cause so much damage to dock, pilings and aquaculture equipment, but more work still needs to be done. Danielle held an REU Fellowship.


Danielle Rioux


Nick Sosin

Nick Sosin

Nick worked for Dr. Rick Wahle, a visiting investigator from the Bigelow Laboratory of Ocean Sciences, on lobster population studies. To track lobster populations, individuals need to be tagged in a way that does not cause undo harm to the animal and that stays with the animal for a period of time. Nick conducted tag retention and tag mortality experiments on young lobsters to determine the use and effectiveness of "streamer tags" in lobster population studies.

Nick is a senior at the University of California, San Diego. He held a SURE internship supported by the Gulf of Maine Foundation and Maine Sea Grant.

Melissia Baird

Melissa was one of the divers in Dr. Bob Steneck's summer crew. She worked on green sea urchin recruitment studies with graduate student John Vavrinec. The project involved retrieving settlement plates from four locations along the Maine coast: York, Pemaquid, Bar Harbor and Stonington. The plates had sat at a depth of 10m for four months. Here, Melissa is rinsing a settlement plate to catch all the organisms that settled on it. Then, using a microscope, she counted the number of urchins, and other organisms, in each sample. She describes them as "really cute, they look just like a regular urchin but they're microscopic". Preliminary results suggest that urchin recruitment is on the rise in the York and Pemaquid areas. Melissa is a graduate of the University of Missouri.


Melissa Baird

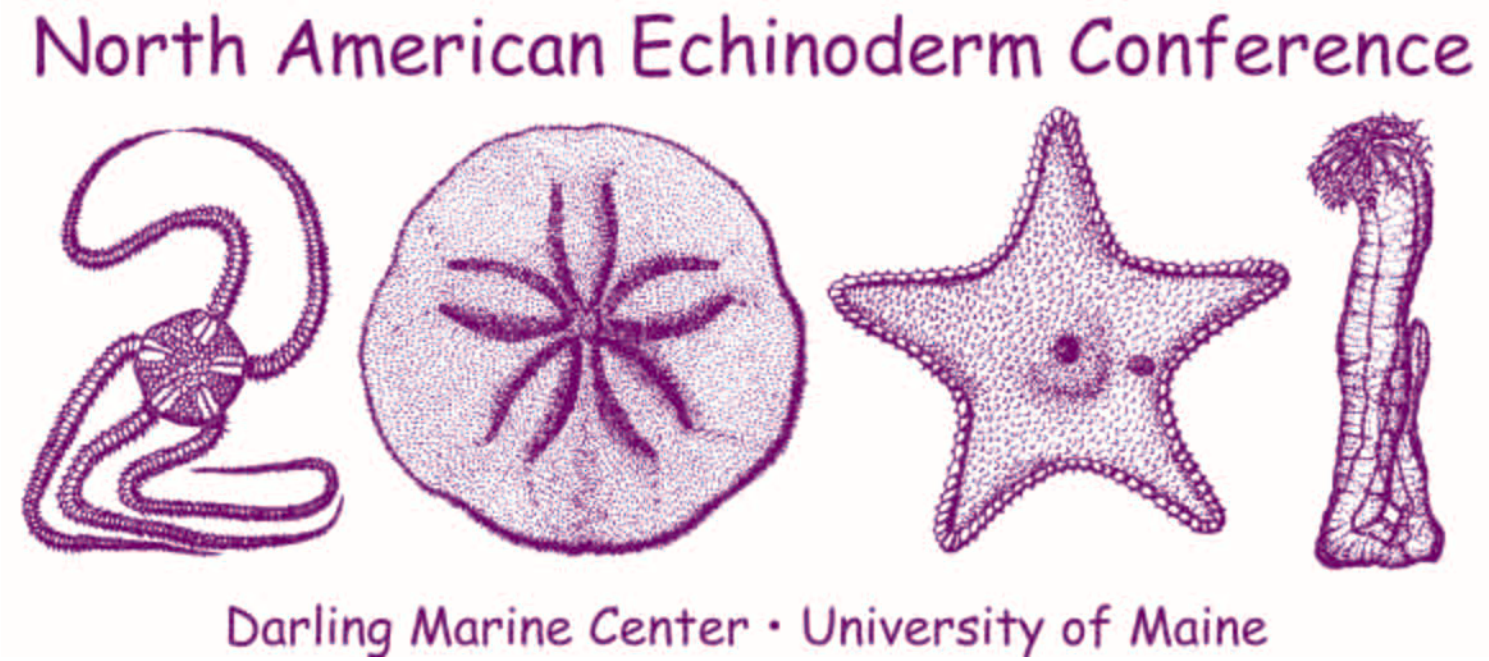

Matt Dickens

Rachel Macnamee

Rachel Macnamee & Matt Dickens

Rachel and Matt worked in the Flowing Seawater Lab for Dr. Paul Rawson this summer. They helped maintain and spawn adult *Mytilus trossulus* and *M. edulis* for studies investigating gametic incompatibility between the two species.

Matt is a senior at Lincoln Academy, Newcastle, Maine. Rachel is a senior Honors Program student at The University of Maine who will be finishing her B.S. in Biology, and Honors Thesis on barnacle population genetics this semester, Fall 2001.

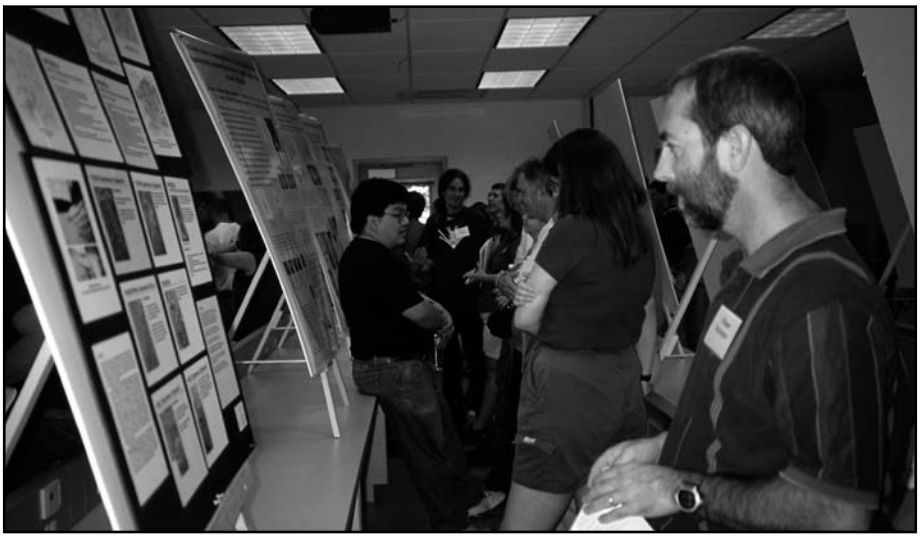


Dr. Les Watling and conference attendee Deanna Pinkard enjoy a picnic lunch. Deanna is a graduate student at the Florida Institute of Technology. She was an intern in the Watling lab during the summer of 1997.

Starfish, Urchins and Brittlestars Are Hot Topics at DMC Summer Conference

Starfish, brittle stars, sand dollars, sea urchins and sea cucumbers, all commonly found in Maine waters, are members of a group of marine organisms called echinoderms. Echinoderms are abundant in the world's oceans and are the most common large-bodied marine organisms in the deep sea. Some, like the green sea urchin, are harvested as gourmet food items.

Marine biologists and oceanographers study the ecology and biology of echinoderms to better understand how marine animals live and breed in extreme environments like the deep sea or the Antarctic, and to assess resource management issues.



Left: Dr. Isidro Bosch (SUNY, Geneseo) and Adam Reitzel (University of Florida) prepare for talks.

Above: Shawn Robinson (Department of Fisheries and Oceans, St. Andrews, NB) and others at the poster session.

University of Alabama crew get ready to eat lobster!
Scott Hoffer, Katie Gibbs, Brenda Wallace and Dr. Steve Watts

Dr. David L. Pawson, Smithsonian Institution, and Dr. Charles Walker, University of New Hampshire.

In August, the DMC hosted the 2001 North American Echinoderm Conference (NAEC). The event brought 80 echinoderm researchers from around the world (South Africa, Great Britain, Israel, Belgium Austria, and Canada) and across the country (Alaska, Washington, California, Florida, Georgia, Louisiana, and New Hampshire) to midcoast Maine for four days.

Present at the event were senior scientists in the fields of oceanography and marine biology, including several leading authorities on deep-sea biology. They hailed from such well-known marine labs as Friday Harbor Laboratories, WA; Harbor Branch Oceanographic Institution, FL; and University of Southampton Oceanography Center, United Kingdom.

Through oral presentations and posters, researchers at the NAEC shared their latest scientific discoveries. Some scientists reported on the factors that control echinoderm breeding cycles, others showed evidence of a biochemical process that protects marine animals from harmful ultraviolet (UV) radiation. This is especially important with a decline in the protective ozone layer over the Earth's surface. Several researchers discussed the future of Maine's sea urchin fishery based on biological analyses of sea urchin populations.

While at the DMC many researchers took part in a collecting trip aboard the DMC's research vessel. Several passes were made with a small drag through the deeper sections of the Damariscotta River and revealed echinoderm specimens new to our visitors from away.

Drs. John and Vicki Pearse, University of California, Santa Cruz.

By the way, the conference was fantastic... I had a wonderful time and enjoyed it thoroughly.

Chris Pearce
Ross Island Salmon Ltd.,
New Brunswick, Canada

I had one of the most enjoyable meetings for some considerable time. I look forward to visiting the Darling Center in the future.

Dr. Paul Tyler
Professor of Deep-Sea Biology,
University of Southampton, UK

Have Your Conference or Workshop at the DMC!

The Darling Marine Center is the perfect venue for your next scientific conference, educational workshop, or staff retreat.

We have comfortable meeting space as well as flowing seawater classrooms and laboratories suitable for hands-on workshops. In the immediate vicinity we have a wide variety of marine ecosystems, everything from calm mudflats to exposed rocky headlands. To top it off, we offer a variety of housing options, great food and beautiful scenery.

For more information contact our Conference Coordinator at 207-563-3146, ext. 200 or by e-mail at lhealy@maine.edu

Making Waves
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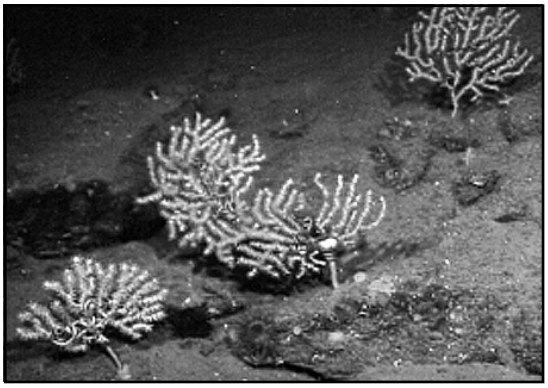

Coral from the genus Paramuricea *and the brittle star of the genus* Astroschema *(identification thanks to Dr. John Dearborn) were common finds in Oceanographer Canyon.*

In Search of Ancient Deep-sea Corals

Dr. Les Watling and graduate student Anne Simpson are interested in deep-sea octocoral communities. In hopes of finding undisturbed colonies of these corals in the Gulf of Maine, they went to sea aboard the R/V *Atlantis*. Using the video camera and special sampling devices of the *Alvin*, the Navy's deepest-diving manned research submersible, they scoured the depths of the Gulf of Maine, collected hours of video footage and many specimens.

Octocorals are the relatives of sea fans and sea whips. These colonial organisms are often brightly colored and their calcified tree-like skeleton may reach 1-3 meters in height. Radiometric dating has shown some samples to be over 400 years old.

Dr. Watling, Chief Scientist for the cruise, believes octocorals were once common in the Gulf of Maine, but now have reduced numbers due to the effects of mobile fishing gear like trawls. Assuming their best chance for finding these corals would be in relatively unfished areas, five dives were planned for the canyons and rugged seamounts on the southern edge of Georges Bank. Unfortunately, Hurricane Erin and a northeaster off the Nova Scotia coast kicked up 20' seas and only two dives, one to Oceanographer Canyon and one to Hydrographer Canyon, were possible.

Octocorals were found in several locations on the steep rocky walls of Oceanographer Canyon between 1100 and 840m depth. All the coral colonies had associated invertebrates with them, most notably a deep-sea brittle star in the genus *Astroschema*. One coral species was found to have been over-run by a colonial sea anemone. And another, with strong affinities to similar Antarctic species, had a commensal scale-worm, just as do the Antarctic colonies.

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Deep East Expedition

This voyage was the first leg of a three week cruise aboard the *R/V Atlantis* called the *Deep East Expedition* which explored the Atlantic Ocean from the Gulf of Maine to the northern coast of Florida as part of the Ocean Explorers for the Classroom Program.

The Ocean Explorers program brings the excitement of underwater exploration and research into the classroom through a Web Forum and live Webcasts of the research. It is supported by NOAA and NASA.

A running log of the *Deep East Expedition* and interviews with the scientists are posted on the Ocean Explorer web site at: http://www.oceanexplorer.noaa.gov, click on *Deep East Expedition*.