



AT SEA

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Graduate College of Marine Studies
Newsletter

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Deep-Sea Research Takes CMS Scientists to New Extremes

by Claire McCabe

Diving to the darkest depths of the ocean is a scientific quest for several CMS students and scientists. During the last 12 months, they've participated in research cruises aboard the R/V *Atlantis*, tender to the deep submergence vehicle *Alvin*, to explore and collect data about the extreme environment of the deep sea.

The Extreme 1 cruise in May was the first of a three-cruise series headed by CMS marine biologist Craig Cary to explore the deep ocean. The next Extreme cruise is scheduled for January 2000, with the third cruise later that year. Cary and CMS marine chemist George Luther secured funds for the multidisciplinary cruises from the National Science Foundation's Life in Extreme Environments Program and from Delaware Sea Grant.

The CMS deep-sea research is conducted aboard the R/V *Atlantis* and *Alvin*, which are operated by the Woods Hole Oceanographic Institution. The destination of the cruises includes several sites on the eastern Pacific spreading center, where the Earth's plates separate and new oceanic crustal material is formed.

Scientific interest in these hydrothermal vent sites ranges from biological to chemical to geological. The vents were discovered in the late 1970s by geologists who had theorized that shifts in the Earth's crust would leave openings where lava and chemicals could spew forth. Scientists did discover "black smoker" chimneys spewing chemicals and were surprised to find an abundance of life nearby.

While most of the deep-sea bottom appeared like a desert, the hydrothermal vents were like oases teeming with life. Giant clams, 8-foot long tubeworms, and bizarre-looking fish populated the area.

By the early 1980s, marine scientists, including Cary, were investigating life in this extreme environment, where toxic chemicals abound, temperatures may reach more than 572°F, and pressure mounts to 3,600 pounds per square inch.

In addition to chief scientists Cary and Luther, CMS researchers on the Extreme 1 cruise included Drs. Ana Dittel and Donald Nuzzio, postdoctoral researchers Kathy Coyne and Martial Taillefert, graduate students Gina Perovich, Carol DiMeo, and Liz McCliment, and research assistant Geremeo Fioravanti.

The scientists focused on two projects. The first, led by Cary in collaboration with CMS scientists Chuck Epifanio and Ana Dittel, involves studying vent crab larvae for clues to population establishment and maintenance in hydrothermal vent communities. The other project is led by Luther and Cary in collaboration with Dr. Anna-Louise Reysenbach of Portland State University. It involves testing for chemical indicators of microbial vent life and pursuing chemical evidence to support the theory that life may have begun in environments similar to hydrothermal vents. Luther, Cary, and other scientists have theorized that under high-temperature environments, such as those found near vents, organisms can use the mineral pyrite for chemoautotrophic metabolism, thus providing the organisms with an energy source other than the sun.

Diving for New Knowledge

One reason why deep-sea research is so compelling is that it is a mix of both basic and applied science.

"The quest for new knowledge is necessary to an understanding of the biology



Cary/Luther

From left, Drs. Craig Cary, George Luther, and Donald Nuzzio stand in front of the submersible *Alvin*, housed in its hangar on the R/V *Atlantis*. The CMS scientists organized the research cruise to test equipment and collect chemical data and biological specimens from hydrothermal vents in the eastern Pacific Ocean.

of vent life," says Cary, chief scientist on Extreme 1 and a veteran of 35 deep-sea research cruises. "The root of the success of science in the United States is basic science. But deep-sea research has an underpinning of applied science. Our Extreme project for Sea Grant is dedicated to understanding the biodiversity in deep-sea hydrothermal vent systems. In an extreme environment with high temperatures and high pressure, we expect to find organisms using novel enzymes. We hope to discover and characterize enzymes that are unique to these organisms and that may have application in industrial processes.

"The Extreme 1 cruise is the most successful I have ever been on," Cary continues. "We worked for 24 hours a

(Continued on page 4)



At the Helm

These are exciting times at the Graduate College of Marine Studies! Our faculty, students, and staff continue to garner major scientific and public acclaim for their accomplishments. We've entered an almost unprecedented period of faculty and staff recruitment. And we're looking forward to an important milestone on the horizon — the college's 30th anniversary in June 2000.

CMS is blessed with exceptional personnel. Every member of our crew — students, staff, faculty, and administrators — plays an important role in advancing our voyage of excellence in research, teaching, and service.

In August, CMS marine biochemist John Boyer received the Francis Alison Award, the highest honor the University bestows on a faculty member. The award, based on Dr. Boyer's outstanding research, teaching, and advisement record, places him in an elite group on campus that includes another CMS faculty member, marine policy professor Gerard Mangone.

Dr. Boyer's research on water stress physiology in plants, in which he uses marine plants (algae) to help understand the biochemistry and biophysics of terrestrial plants, is internationally recognized. The vigor of his research also carries over into both his classroom teaching and the mentoring of many students who have gone on to distinguished positions in academia and industry.

Marine policy professor Robert Knecht received a national award in July. He was selected by his peers to receive the Stratton Award, which is presented to the person or group who can best be labeled as the "Champion of the Coast." Previous winners include Peter Douglas, executive director of the California Coastal Commission in 1995, and Sylvia Earle, internationally known ocean explorer, in 1997.

Associate Dean Nancy Targett, was accepted into a select group of American scientists for Aldo Leopold Leadership training. Over the next two years, as a member of the first class of Aldo Leopold Fellows, she will receive communications training to enhance her already stellar ability to relay the importance of environmental research to the news media, the public, and decision makers.

Earlier this summer, her research to develop a synthetic eel bait to be used in place of the horseshoe crab was featured in the *Baltimore Sun*. This story, along with others relating to the horseshoe crab census our Sea Grant Marine Advisory Service helps coordinate, placed CMS in major media ranging from *U.S. News & World Report* to National Public Radio.

Significant administrative changes also have occurred. Rich Tarpley, CMS executive officer and Sea Grant executive director, recently left the college to pursue other interests. During the past 11 years, he has been a tremendous asset, overseeing an important period in our growth. We wish him all the best in his new endeavors.

We also welcome his successor: David McCarren, Commander, U.S. Navy (retired). He recently completed a distinguished military career as Deputy, Technology and Integration, for the Naval Oceanographic Office at Stennis Space Center, Mississippi,



Bob Bowden

where, he managed 175 scientists and engineers in the evaluation and acquisition of new technologies to support the Navy's worldwide ocean survey mission.

Also, Dr. A.D. Kirwan, Jr., recently joined CMS as director of the Physical Ocean Science and Engineering Program, which was established last year under the leadership of Dr. Richard Garvine, who returns full-time to research after an outstanding job as the program's interim director. Dr. Kirwan is the former Samuel L. and Fay M. Slover Chair of Physical Oceanography at Old Dominion University. His accomplishments include pioneering the use of satellite technology to measure ocean currents.

You'll learn more about these new members of our crew, as well as old friends and their contributions, in this issue of *At Sea*. In the coming months, we'll be welcoming four more faculty to CMS, further expanding our academic program. To keep abreast of our progress, visit our Web site often at www.ocean.udel.edu.

Carolyn A. Thoroughgood

Dr. Carolyn A. Thoroughgood
Dean, Graduate College of Marine Studies



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Graduate College of Marine Studies
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In Memoriam

The College of Marine Studies lost a great friend on April 21 when C. Porter Schutt, 88, passed away.

Throughout his adult life, Porter felt a special kinship with the sea. His children say they often heard the story of when, on vacation, he swam the Hellespont.

He also loved sailing. He raced his five boats, all called *Egret*, throughout the United States and Europe. He was a member of 15 yacht clubs around the world and served as past Commodore of the Chesapeake Station of the Cruising Club of America. He also was one of the few Americans to be a member of The Royal Cruising Club (of England).

Porter's love for the sea also extended into his business affairs. While his primary business interest was a timber farm in Alabama, for which he was chief executive officer, he also was part owner of an oyster and clam farm in Virginia. And his friends say he had a particular fondness for catching catfish in Alabama.

A generous supporter of CMS, Porter played a key role in our acquisition of two portable clean labs for shipboard experiments on trace metals. He is survived by his son, Chip, who is a member of the Marine Associates Steering Committee, 2 daughters, 14 grandchildren, 12 great-grandchildren, and a brother.

CMS Bids Farewell to Rich Tarpley

After 11 years of service as CMS executive officer and Sea Grant executive director, Richard W. Tarpley recently bid farewell to pursue other interests. The tall, lanky Texan brought enthusiasm, expertise, and efficiency to his dual management roles along with a warm sense of humor and a strong dedication to excellence.



Rich Tarpley

Robert Cohen

“Rich’s contributions to CMS were significant and extensive,” says Dean Carolyn Thoroughgood. “He put the college at the forefront in the automation of financial accounting systems, as well as advanced our use of interactive television, the Internet, and other distance learning and electronic technologies to bring people together. He’s been a wonderful manager, and the college and Sea Grant express tremendous gratitude for a job well done.”

Born and raised in Texas, Rich Tarpley carried that heritage with him to CMS. In addition to paintings by his late wife, Emily, and family pictures, his office was decorated with the top of a cowboy boot converted to a pencil pot on his desk. During the football season, his casual conversation would turn to the progress of his favorite teams — the Cowboys, the Blue Hens, and the Army.

A patriot to the core, he earned a bachelor’s degree in engineering from the United States Military Academy at West Point in 1966, formalizing his personal commitment to duty, honor, and country, and a lifetime of selfless service to the nation.

While few may know it, Rich graduated with the West Point class that was the subject of the book *The Long Gray Line*, which tells the story of the generation of Army officers who fought in Vietnam, where dozens of their classmates died. Rich served as a lieutenant and captain with airborne and ranger units in Vietnam and Cambodia and sustained and recovered from serious wounds during the war. The dedicated soldier also served in Korea, Europe, and South America. After achieving the rank of lieutenant colonel, he worked in the Pentagon in the Office of the Chief of Staff.

During the course of his military career, Rich earned a master’s degree in political science from the University of Delaware

and an MBA from the Florida Institute of Technology. Toward the end of his 20 years in the service, he, Emily, and their four children settled in Newark, Delaware, where he worked at UD as a professor of military science and director of the ROTC program until he joined CMS in 1988.

Rich served as the college’s chief financial officer, leading the development of the CMS general accounting system that made real-time research accounting for faculty possible. This system influenced accounting systems University-wide.

Carol Rylee, director of the University Budget Office, knew she could depend on Rich’s accuracy and efficiency.

“He did a wonderful job,” Rylee says. “When we worked with projections, he was always right on target with the college’s finances. He was exceptional in the amount of information he had at his fingertips and in his ability to get the information we needed.”

Rich says his most satisfying impact on CMS has been the people he’s hired and helped develop into a professional staff.

“We have an excellent support team that is conscientious,” he says. “The people who work here care deeply about the college and the quality of their work.”

As Rich grew as an administrator, so did his responsibilities. He added the title of Delaware Sea Grant executive director and assumed oversight of the research and outreach program’s day-to-day management.

Yet his sphere of influence extended far beyond campus. Besides meeting with legislators and industry partners, Sea Grant Advisory Council members and national staff, Rich rarely missed a Marine Associates’ function. His friendships with the group will follow him throughout his life.

“The Marine Associates are very special people,” he says. “Many have been supporters of the college since its beginning. They are interested in what they can do to help. This group was responsible for the R/V *Cape Henlopen* and its advancements. You don’t always find people who are interested in science and service.”

Rich Tarpley is one of those people whose interest in science and service has greatly benefited the college. As he pursues personal interests, his positive influence will remain at CMS. Although three of his four children are now living in Texas, he has no immediate plans to join them. A few years ago, he bought a Harley-Davidson motorcycle. He hopes to spend next year taking road trips across North America.

Marine Associates’ Corner



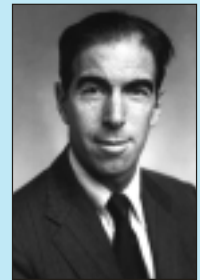
From the Chairman

Building public awareness about ocean issues is an important goal of the Graduate College of Marine Studies. Several upcoming events offer a great opportunity for your family, friends, and associates to discover the fascinating world of marine science.

CMS’s 23rd annual Coast Day festival, on Sunday, October 3, at the Lewes campus, features the college’s latest research in lectures, research demonstrations, and special exhibits. You can take part in dozens of activities at Coast Day, from sampling seafood chowder and other delicious seafood, to touching a dogfish shark. The day begins at 11 a.m. and ends at 5 p.m. Call the Marine Communications Office at (302) 831-8083 for more information.

Also, many of you have attended the popular CMS lectures in Wilmington and Lewes that bring the latest developments in ocean science to the public. The next lecture series will begin on November 17 at the Hotel du Pont in Wilmington. Mark your calendars now. Details will follow soon!

Share your enthusiasm for marine science by inviting a friend or two to Coast Day, to the next public lecture, or to a Marine Associates meeting. If you are not a member of the Marine Associates, but would like to join, contact the college at (302) 831-2841. Or you can find more information about the Marine Associates at our Web site: www.ocean.udel.edu/associates.html.



Robert Cohen

William M. W. Sharp
William M. W. Sharp



Nearly 2 miles under the ocean, a wand extended from the submersible Alvin houses a thermometer, electrodes for chemical measurements, and a biosipper to collect water samples for in situ analysis. The in situ data help scientists understand the chemical and biological processes as they occur near deep-sea hydrothermal vents.

Extreme 1

(Continued from page 1)

day, for 21 days. Extreme 1 is inherently interdisciplinary. It was a challenge to coordinate all the different tasks for a diverse group that included geochemists, geophysicists, and biologists. The crew of the *Atlantis* and the *Alvin* bent over backwards to help. Success on a cruise is always the result of a group effort."

One of the most notable successes of the dive series was the testing of an electrochemical device called a voltammetric analyzer. Marine chemists, led by Luther, used the analyzer to detect dissolved hydrogen sulfide, iron, and soluble iron monosulfide emanating from and near the hydrothermal vents. The presence of hydrogen sulfide

and iron monosulfide in the same water is an important indicator of microbial life at the vents. The analyzer, built by Nuzzio, who is a CMS adjunct professor and scientist with Analytical Instruments Systems, Inc., performed correctly on its first deep dive — a feat that is virtually unheard of — and performed perfectly on the 10 subsequent dives on which it was deployed.

"The voltammetric analyzer now gives us the *in situ* capability of measuring many of the chemical ions and compounds that are deemed essential to life," Luther says. "This will allow us to study in more detail a variety of organisms that live at and near vents."

"I was very excited that the instrument worked the first time and allowed us to be the first to perform voltammetry, a type of electrochemical analysis, 2,500 meters below the ocean," Nuzzio adds.

Collecting biological and geological specimens also proved successful and required great expertise on the part of *Alvin*'s pilots. Using *Alvin*'s long, clawed arms called manipulators, the pilots collected specimens, placing them in a large plexiglass basket attached to the sub. A typical collection from a dive included fragile pieces of a black smoker chimney, traps that had been set to collect vent crabs, and other biological specimens such as deep-sea clams.

Sharing the Wonder of the Deep

Not every student can go on a deep-sea dive, but Cary brought the wonder of the deep into a University of Delaware ocean science class he co-taught with CMS oceanographer Doug Miller last October. While Cary and his colleagues were on a cruise more than a mile under the ocean, he made a real-time connection to the class in Newark. The scientists' voices were transmitted acoustically from *Alvin* to *Atlantis* and patched through live by phone to the class in Gore Hall for a lively question-and-answer session.

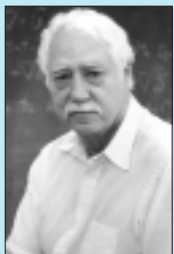
Another way the Extreme 1 cruise was made available to those on land was through the establishment of a Web site at www.ocean.udel.edu/extreme1/extreme1_intro.html. This site became the main form of communication for the Extreme 1 researchers and crew members to their fellow scientists as well as family on land.

The Web site will remain active through the duration of the Extreme project. It includes research abstracts, dive plans, daily cruise journals and dive logs, and pictures taken on the cruise. Cary encourages the curious to "travel along" on next year's cruises, via the Web, starting January 14, 2000.

CMS Welcomes Aboard New Administrators

Two administrators recently joined CMS. Professor A.D. Kirwan, Jr., will direct the college's new academic program in Physical Ocean Science and Engineering, and David McCarren, Commander, U.S. Navy (retired), is the new executive officer of the college and executive director of the Sea Grant College Program.

Jack Buxbaum



Dr. A. D. Kirwan, Jr.

Kirwan has a diversity of experience in research, teaching, and administration. His career has included director of the Physical and Chemical Oceanography Program at the U.S. Office of Naval Research, research specialist in geotechnical hazards for Exxon Production Research, and professorships at New York University, Texas A&M University, University of South Florida, and Old Dominion University.

Kirwan pioneered the use of satellite technology to measure ocean currents. Today, this technology is widely used in weather forecasting and the global positioning system (GPS). He's now working to improve computer models of ocean circulation by merging data from a variety of sources, such as moored and drifting buoys and radar. A major goal of the research is to assist in the rapid environmental assessment phase in emergency response to oil spills and other environmental crises.

He earned his bachelor's degree from Princeton University and his doctorate from Texas A&M University. He is editor of the journal *Nonlinear Processes in Geophysics*, and has received numerous awards including a Fulbright Research Fellowship.

As CMS's new executive officer, Dave McCarren will oversee an annual budget in excess of \$13 million and be responsible for day-to-day management of the college, including personnel, purchasing, ship operations, outreach, and contract-and-grant negotiations. He also will manage the Sea Grant College Program, which recently received \$2.8 million in federal, state, and University funds to pursue research and outreach projects.

McCarren has 20 years of administrative experience in the U.S. Navy. Prior to his recent retirement from the military, he served as Deputy, Technology and Integration, for the Naval Oceanographic Office at Stennis Space Center, Mississippi. There, he managed 175 scientists and engineers in the acquisition of new technologies to support the office's global ocean survey mission. He oversaw a budget of more than \$11 million and was regularly called upon to brief Cabinet-level visitors about the office's mission.

He received his bachelor's degree in geological sciences from Pennsylvania State University and his master's degree in physical oceanography and meteorology from the Naval Postgraduate School.



David McCarren

Jack Buxbaum

Gerard J. Mangone Lecture Established

The first annual Gerard J. Mangone Lecture was held May 6 at Clayton Hall in Newark. The annual lecture was established in honor of the distinguished CMS marine policy professor whose industry, dedication, and intelligence have greatly benefited the college over the years.

The speaker at the inaugural lecture was Admiral James D. Watkins, U.S. Navy (retired), and president of the Joint Oceanographic Institutions (JOI) and the Consortium for Oceanographic Research and Education (CORE). Watkins emphasized the importance of continuing ocean-related research and praised Mangone for his impressive career.



Duane Perry

Professor Gerard J. Mangone (left) and Admiral James D. Watkins confer at the first annual Gerard J. Mangone Lecture in May.

“This lecture series is one of the more important components in our ongoing national effort to raise public awareness of the importance of the oceans,” Watkins said. “Dr. Mangone, the fact that you continue to teach and advise students in ocean affairs, continuing your long tradition of service to the University of Delaware and your field, deserves special mention. You’re not only a great credit to your institution and the ocean community, but more importantly, you’re an inspiration to all of us.”

Gerard J. Mangone, founder and first director of the Center for the Study of Marine Policy at CMS, research professor, and professor emeritus at the University of Delaware, keeps a rigorous schedule.

On most mornings, he can be found in UD’s Morris Library, a center of intellectual sustenance and scholarship. In the afternoons, he is in Robinson Hall advising his students and promoting alliances between other institutions and CMS. He also is secretary for UD’s Francis Alison Society. Mangone organized the society for professors who have received the Alison Award, UD’s highest recognition of faculty research and scholarship. Its

members contribute to a University fund, which supplies a Young Scholars Award to an outstanding assistant professor.

The breadth of Mangone’s activity is remarkable, especially considering that he reached official retirement age more than 10 years ago. But rather than retire, Mangone continues to do what he does best — teach, research, and establish programs. His titles of University Research Professor of International and Maritime Law, and H. Rodney Sharp Professor Emeritus are less important than his duties: teaching a course each semester, advising students, and lecturing locally and internationally. Most recently, he was instrumental in establishing a cooperative program that provides students with the option of obtaining both a master’s degree in marine policy from CMS and a law degree from Widener University School of Law. (See sidebar.)

Mangone’s genius has been in creating successful programs and influencing successful persons. Peppered throughout his career are names including Richard Nixon, John Kennedy, Robert Kennedy, Patrick Moynihan, Michael Dukakis, and William Buckley. Some were students, others political figures who sought his advice and expertise. He has served as counsel to the White House, the Department of State, and the United Nations, as well as the Ford Foundation and the Carnegie Endowment for International Peace.

Mangone’s academic career began impressively. As a graduating Ph.D. in international law, he received the prestigious Charles Sumner Award from Harvard University, given for the dissertation that makes the most significant contribution to international peace. Mangone proceeded to hold faculty and administrative posts at Wesleyan, Swarthmore, Syracuse, and Temple universities. In 1972, he was invited to organize a marine policy program at UD’s Graduate College of Marine Studies.

“The Master of Marine Policy program is a broad introduction to marine policy studies using the disciplines of politics, economics, law, and human behavior,” he explains. “Students follow a rigorous but interdisciplinary curriculum including completion of a thesis of original research.”

In 1973, Mangone established UD’s Center for the Study of Marine Policy — the first of its kind in the United States. He secured a grant from the Rockefeller Foundation to develop a series of books on straits around the world. Mangone directed the Center until 1989, receiving

Joint Degree Program in Marine Policy/Law Now Available

This fall, the University of Delaware Graduate College of Marine Studies and Widener University’s School of Law are embarking on a cooperative program that will enable students to earn both a master’s degree in marine policy from the University of Delaware and a law degree from Widener University. Students who enroll in the combined program will shave about a semester’s worth of study from the time it would take if the degrees were pursued separately.

Widener waived nine credit hours to be filled in with marine policy courses, and the CMS Marine Policy Program waived nine of its elective credits to be replaced by Widener law courses.

Students must qualify for admission to both CMS and to Widener’s School of Law.

For information, please contact Gerard J. Mangone at (302) 831-8087 or gmangone@udel.edu; or James May at (302) 477-2182 or James.R.May@law.Widener.edu.

many honors along the way including the Tagore Law Professorship at the University of Calcutta in 1979, and the Francis Alison Award in 1983.

Mangone has developed a number of programs in partnership with the University of Delaware such as the Joint Diploma Program in Singapore for Shipping and Port Management. Mangone also has been assisting a second institute in Hong Kong to educate professionals in transportation logistics management.

During Mangone’s career at CMS as a scholar, teacher, and author, he has written 12 books (some of which can be found on the Web site *Amazon.com*) and has edited more than 20. Mangone recently published *United States Admiralty Law* and is working on *United States Coastal Law*.

As CMS approaches its 30th anniversary celebration in June 2000, people like Gerard J. Mangone stand as a tribute to the founding forces that shaped the college’s reputation and as an inspiration to future generations of scholars.

Boyer Receives University's Highest Faculty Honor

Robert Cohen



By discovering how marine algae have solved the problem of periodic dehydration, Dr. John Boyer hopes to make it possible to modify terrestrial crops to better withstand drought.

"To be counted among those who have received this award is a great honor," Boyer says. "I am really pleased to be considered a professor like Reverend Alison was. As a professor, he was dedicated not only to the subject but to the whole person who was his student."

Boyer believes that at the core of science is a quest and desire for knowledge by teacher and student. "Scientists work hard because they want to know," he says. "I lay out options within a framework and let the student choose. That way, the student feels comfortable and is able to achieve success."

Boyer has advised undergraduate interns, graduate students, and postdoctoral researchers. Among his former advisees and students are a vice-president of the technology sector of Pioneer Hybrid International, a named fellow in the Society of Crop Scientists, and several professors at American and international universities.

Boyer earned a bachelor's degree in biology from Swarthmore College, a master's in plant physiology with a minor in soils from the University of Wisconsin, and a doctorate in plant physiology with a minor in biochemistry from Duke University. He joined the University of Delaware in 1987 after working at the University of Illinois and Texas A&M University.

He currently has two postdoctoral researchers and a research assistant working in his laboratory in Lewes examining marine and land plants at the molecular level to investigate the environmental effects of water on plant growth and reproduction.

"Working with marine plants has enabled me to further my research," he explains. "Marine plants have large structures which make for easier examination. The information on how cells grow can then be applied to land plants."

Boyer is currently a joint principal investigator on a \$2.2 million grant from the National Science Foundation (NSF) for its genomics program that is investigating and cataloging genes of plant species.

"We are focusing on maize," he explains. "High oil content is desirable for some corn crops and can be manipulated by genetic means. My role in the project is to study how deposition of oil in the developing maize grain is affected by environmental variables, especially drought."

Over the years, Boyer has received funding from the National Science Foundation, the Department of Energy, and the U.S. Department of Agriculture. He has written two books and published more than 160 journal articles. He's a member of the National Academy of Sciences and several other honorary and professional societies.

Dr. John S. Boyer, E. I. du Pont Professor of Marine Biochemistry/Biophysics at CMS, is "delighted and overwhelmed" to receive the prestigious Francis Alison Award, the University's highest faculty recognition.

Named for Francis Alison, founder of the Academy of Newark that was the forerunner of the University of Delaware, the award consists of a \$6,000 honorarium and medal and recognizes scholarship, professional achievements, and dedication.

Student Scholars Recognized at Honors Day

Dozens of students received awards at CMS Honors Day held May 7 in Lewes. Associate dean Nancy Targett presided over the ceremonies. Guest speaker was CMS alumnus Dr. David M. Einolf, manager of Pacific Northwest Compliance and Operations Services, Dames and Moore, Inc., in Portland, Oregon.

The E. Sam Fitz Award, recognizing the student who has displayed the greatest aptitude for professional development in the field of marine studies, was awarded to **Thomas Arnold**, Ph.D. graduate in marine biology-biochemistry.

The following students were recognized for outstanding theses and dissertations: **Thomas Arnold**, Ph.D. graduate in marine biology-biochemistry, and **Guebuem Kim**, Ph.D. graduate in oceanography, received the Frances Severance Award for best student thesis or dissertation within CMS. **Rosemarie Hinkel**, master's student in marine policy, received the Center for the Study of Marine Policy Award for the best research paper. **Brian Glazer**, master's student in marine biology-biochemistry, received the Thomas H. Hinkle Award in recognition of his research on Delaware's Inland Bays.

Academic Council Awards for the best dissertation within a program area were awarded to **Thomas Arnold**, marine biology-biochemistry; **Ampai Harakunarak**, marine policy; **Yun He**, applied ocean science; and **Guebuem Kim**, oceanography. Kim also received the University's Theodore Wolf Prize in Physical and Life Sciences for his dissertation.

Publications Awards went to **Milen Dyoulgerov**, doctoral student in marine policy, for "Navigating the Bosphorus and the Dardanelles: A Test for the International Community," published in *The International Journal of Marine and Coastal Law*; **Jinglan Wu**, Ph.D. graduate in marine biology-biochemistry for "Salinity Adaptation of Plasma Membrane H⁺-ATPase in the Salt Marsh Plant *Spartina patens*: ATP Hydrolysis and Enzyme Kinetics," co-authored with Dr. Denise M. Seliskar, and published in the *Journal of Experimental Botany*; and **Jianhua Ye**, Ph.D. graduate in oceanography, for "A Model Study of Estuary and Shelf Tidally Driven Circulation," co-authored with Dr. Richard W. Garvine, and published in *Continental Shelf Research*.

The following internal fellowships and scholarships were presented: **Cecelia Linder**, master's student in marine biology-biochemistry, and **Emiko Maruyama**, master's student in marine policy, received Marian R. Okie Fellowships granted on the basis of academic and research excellence and demonstrated leadership abilities. **Cecily C. Natunewicz**, doctoral student in oceanography, and **Arun Chawla**, doctoral student in civil engineering, received Delaware Sea Grant student awards in recognition of excellence in student research in the Delaware Sea Grant College Program. **Gina Perovich**, master's student in marine biology-biochemistry, received the Dr. Paul R. Austin Sea Grant Student Fellowship, granted on the basis of academic and research excellence in the field of biochemistry. The University Tuition Scholarship was presented to **Robin Tyler**, doctoral student in marine biology-biochemistry.

President's Fellowships for academic and research accomplishments were awarded to **Michael Jones**, doctoral student in marine biology-biochemistry, and **Richard Wong**, master's student in marine biology-biochemistry.

CMS Program Fellowships were awarded to a student in each CMS program on the basis of academic accomplishments. Recipients included **Allison Beauregard**, master's student in oceanography; **Susan Bunsick**, master's student in marine policy; **Carrie Kopin**, master's student in marine biology-biochemistry; **Wenkai Qin**, doctoral student in applied ocean science, and **Edward Stewart**, doctoral student in physical ocean science and engineering.

Ten oceanography students received National Science Foundation Graduate Research Traineeships/Fellowships in Coastal Oceanography: doctoral students

Cecily Natunewicz, Carol Janzen, Maria Honeycutt, and Susan Park; and master's students **Olivia Hauser, Michael Whitney, Allison Beauregard, Alexander Parker, Linda Popels, and Frances Pustizzi**.

Several students received regional and national recognition. **Thomas Arnold**, doctoral graduate in marine biology-biochemistry, and **Carol Janzen**, doctoral candidate in oceanography, received the National Science Foundation Ocean Science Board Travel Award. **Katherine Bunting-Howarth**, doctoral student in marine policy, received a Student Travel Award from UD's Commission on the Status of Women. **Bunting-Howarth** and **Carrie Kopin**, master's student in marine biology-biochemistry, were named NOAA graduate research fellows in the National Estuarine Research Reserve System Fellowship Program.

Additionally, two students received research scholarships from Delaware Mobile Surf Fishermen, Inc. — **Olivia Hauser**, master's student in oceanography, for her project related to the "coral beds" of Delaware Bay, and **Richard Wong**, master's student in marine biology-biochemistry, for his project related to tautog. **Ursula Howson**, doctoral student in marine biology-biochemistry, received the Philanthropic Education Organization Scholar Award. **Dosoo Jang**, doctoral candidate in marine policy, and **Alison Sipe**, master's graduate in marine biology-biochemistry, received Dean John A. Knauss Marine Policy Fellowships in the National Sea Grant Federal Fellows Program. **Matthew Schwartz**, doctoral student in oceanography, received the Environmental Protection Agency Science to Achieve Results (STAR) Fellowship for 1998–2001.

Knecht Receives National "Coastal Champion" Award

Robert W. Knecht, professor and co-director of the Center for the Study of Marine Policy at CMS, has won the 1999 Julius A. Stratton Award for Leadership. The national award is bestowed biennially to the person or group who has made the greatest difference in leading the cause for the coast and who can best be labeled as the "Champion of the Coast."



Robert Knecht

Robert Cohen

The Stratton award is named for the former president of the Massachusetts Institute of Technology who chaired the national Commission on Marine Science, Engineering and Resources — the "Stratton Commission" — in 1969. It laid the foundation for the Coastal Zone Management Act and Program.

Previous winners include Peter Douglas, executive director of the California Coastal Commission in 1995, and Sylvia Earle, renowned ocean explorer, in 1997.

Knecht has a distinguished record of leadership in coastal management. In 1972, he was named the first director of the nation's Coastal Zone Management (CZM) Program and led its implementation for nine years. After serving on the U.S. Law of the Sea delegation, he directed programs for the licensing of deep-sea mining and ocean thermal energy conversion systems.

During his government service, Knecht twice was awarded the U.S. Department of Commerce's Gold Medal, for a satellite experiment to explore the upper side of the ionosphere, and for his leadership of the CZM Program.

A prolific author, he recently co-wrote, with Dr. Biliiana Cicin-Sain, the books *Integrated Coastal and Ocean Management: Concepts and Practices* (1998) and *The Future of U.S. Ocean Policy: Choices for the New Century* (1999).

Alumni Update

Editor's Note: Alumni Update, a periodic feature of *At Sea*, helps our graduates stay in touch and illustrates the exciting careers built on a CMS education.

David M. Einolf

M.S. Marine Biology-Biochemistry, 1984

David M. Einolf is manager of Pacific Northwest Compliance and Operations Services, Dames and Moore, Inc., in Portland, Oregon. As a consulting engineer, Einolf's goal is to move technology into business application. He has consulted for forest products, microelectronics, and food processors, among others. Einolf was invited back to CMS as the keynote speaker for Honors Day 1999.

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David M. Einolf

Robert Cohen

Faculty Tidings

During the summer, professors **Biliana Cicin-Sain** and **Robert Knecht**, co-directors of the UD Center for the Study of Marine Policy, conducted courses in integrated coastal management at the University of Sevilla in Spain and the University of Genoa in Italy through the U.S./European Consortium, which they helped organize.



Biliana Cicin-Sain

Robert Cohen



Robert Knecht

Robert Cohen

The consortium involves an international team of six universities and seven other partners from government, non-governmental organizations, and the private sector. Consortium activities focus on three major themes: integrated management of coastal areas, U.S./Europe relations on regional fisheries issues, and implementation of recent international environmental agreements.

Robert Dalrymple, professor of civil engineering and director of the UD Center for Applied Coastal Research, has received the 1999 International Coastal Engineering Award from the American Society of Civil Engineers. He was lauded for his “outstanding and continuing achievements and contributions to the advancement of coastal engineering through research, teaching, and professional leadership.”

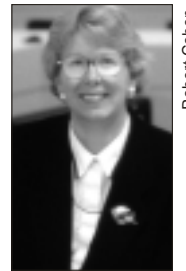


Robert Dalrymple

Robert Cohen

Dalrymple develops computer models to predict shoreline changes and advance the science of coastal protection. He has produced more than 175 research publications and advised 30 students, many of whom have gone on to leadership positions at universities and coastal institutions. He also has developed educational resources on the Internet for the coastal engineering profession and the public at www.coastal.udel.edu. He holds a joint faculty appointment with CMS.

Associate dean **Nancy Targett** is a member of the first class of fellows in the Aldo Leopold Leadership Program, an innovative communications training program sponsored by the Ecological Society of America. The new program’s goal is to bridge the gap between public perception and scientific fact regarding environmental issues by training scientists to communicate with the public.



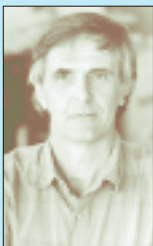
Nancy Targett

Robert Cohen

The program is organized into five areas: providing leadership within the scientific community, providing scientific input to the policy process, communicating with the media, interacting with the corporate sector, and working with nongovernmental organizations. A strong proponent of marine education and outreach, Targett initiated the Ocean Currents Lecture Series at the Lewes campus and has been a driving force behind development of the CMS Web site at www.ocean.udel.edu.

Interns Gain Experience in Marine Research

Robert Cohen



Jonathan Sharp

Nine undergraduates took on the challenge of the Marine Sciences Summer Internship at CMS this summer. During the 10-week program, the students immersed themselves in graduate-level marine research under the guidance of CMS faculty at the Hugh R. Sharp Campus in Lewes. The program, now in its 13th year, is supported by a grant from the National Science Foundation and is coordinated by CMS oceanography professor Jonathan Sharp.

The interns came from universities across the nation. They included (photo, front row, from left) Jude Szczerba (Notre Dame University), Lisa Webster (Princeton University), Rebekah Walker (St. Mary’s College); (second row, from left) Andrea LePard (University of Rhode Island), Heather Patterson (University of New Hampshire), Emily Chandler (Smith College); (third row, from left) Kara Sedwick (Grove City College), Stacy DeRuiter (St. Olaf College), and Tracy Phelps (Brevard College).



Bob Bowden



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