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UMASS MARINE

The University of Massachusetts Graduate School of Marine Sciences and Technology

A week in the life of . . .

As a new and uniquely structured program, the University of Massachusetts Graduate School of Marine Sciences and Technology offers some unusual opportunities for students. The following is a sampling of their experiences, compressed into a single composite week.

MONDAY— It's a cold Monday in March, and New Bedford Harbor is still clogged with ice. For **Chris Pease** and his classmates enrolled in Case Studies in Estuarine Dynamics at UMass Dartmouth, it's the equivalent of a "snow day," but they aren't cheering. Their sampling cruise will be postponed, but they'll still have to finish their assignment on deadline and under budget.

That assignment is to construct a nutrient budget for the Acushnet River Estuary. But unlike most class assignments, this one is funded. SMAST researcher Brian Howes took a component of his own funded research and made it the class project. Howes is principal investigator, but the students are planning and conducting the research. Under the guidance of Howes and co-instructor Miles Sundermeyer, the class is collecting and analyzing water samples, making tidal measurements, and integrating their data with information on rainfall, land use, reservoir releases, storm events, and so on, gathered from various government agencies.

"The course is unique in that it's real research with real funding," says Chris. "Working within a budget is also giving us an appreciation for how expensive research is."

At the end of the semester, the class will formally present its findings in a seminar of SMAST faculty and students, but on this frigid March morning, that day seems a long time away.

The students bring a range of backgrounds to the course. Chris himself has master's degrees in Artificial Intelligence from the University of Edinburgh (UK) and in Mathematics from the University of Warwick (UK); he's now concentrating on physical oceanography, which makes him particularly valuable in the tidal studies. Other students have more chemistry or estuarine experience, but on the project, everyone is equal. As Chris puts it, "We all take turns bringing the bagels."

Graduate student, Melanie Griffin

TUESDAY — It's 10:30 a.m. and Melanie Griffin is already leaving her office at the Massachusetts Division of Marine Fisheries in Boston. Banker's hours? No, Melanie is headed across town to UMass Boston, where she is pursuing a master's degree, part-time, through the UMass Marine Graduate School.

Melanie has never been satisfied with pure academics. She graduated with a B.A. in Biology from Cornell University in May of 2000. But before starting her current job at DMF in October 2001, she had "sown her wild seaoats," monitoring offshore turbidity in Florida, studying groundfish movement in Washington State, and conducting coral research in Mexico.

Today Melanie has a class in Environmental Law and another

A message from the Dean . . .

On May 22nd, the UMass Dartmouth Class of 2004 was honored to be addressed by one of the most influential scientific personalities of this generation—Dr. Rita Colwell.

While her audience characterized her speech with terms such as "invigorating" and "important," Dr. Colwell's extraordinary record of accomplishment is no less inspirational. She has held a number of this country's top posts in science, including President of Sigma Xi, President of the American Association for the Advancement of Science, and Director of the National Science Foundation (NSF). She has authored or co-authored 16 books and hundreds of scientific publications. She has received numerous awards and honorary degrees—the Doctor of Sciences degree bestowed on her by Chancellor MacCormack was her 36th!

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Information and submissions: f1smith@umassd.edu • 508-910-6347 Editor: Frank Smith Production: Dianne Rittmuller

Introducing ...

Faculty

Gregory Beck, Associate Professor and Graduate Program Director in the Department of Biology at UMass Boston, applies contemporary techniques of biochemistry and molecular biology to an important emerging field in biomedicine: the evolution of the immune system. His discovery of key mammalian immunoregulatory molecules in other, distantly related animals has demonstrated the antiquity of the immune system. His work promises to contribute to the possible discovery of pharmacologically important molecules and the improvement of the control of harmful insects and parasites. Beck teaches courses in Immunology and in Research Experimentation in Biology.

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Nelson Eby is Professor of Geosciences at the University of Massachusetts Lowell, where he teaches a range of courses in the geological sciences, including Geological Oceanography, an advanced undergraduate/ graduate course dealing with the geology of the ocean basins and their margins. This year, Brooks/Cole published his textbook "Principles of Environmental Geochemistry," to reviews from his peers such as: "... clearer and more student-friendly than any other book on environmental geochemistry that I am aware of ... " and " ... one of the most comprehensive treatises of environmental geochemistry available ... ." Eby's fieldwork in geochemistry, geology, geochronology and igneous petrology has taken him to field sites in various locations across North America, Asia, and Africa. Eby received his B.A. and M.S. from Lehigh University, and his Ph.D. in Geology from Boston University in 1971. §

Students

Zibiao Zhang hails from Minle, a small city in Northwest China. Zibiao graduated from Lanzhou University in 1995 with a degree in atmospheric science, and then worked as a research assistant at the Lanzhou Plateau Institute of Atmospheric Physics until 1998. He finished his master's degree in Physics at UMass Dartmouth in 2001, and nearly completed a second master's (in Computer and Information Science) there before entering the UMass Marine Graduate School last year to pursue his Ph.D. with Meng Zhou of UMass Boston.

Zibiao finished his coursework in December and is currently working on Zhou's Massachusetts Bay modeling project. Of his work, he says "I hope [it] will help people to have a better understanding of the physical and biological properties of the coastal ocean and provide scientific support to policy makers so that our coastal environment will be protected more efficiently."

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Fiona Hogan grew up in New York State, and moved to Ireland with her family at the age of 13. She graduated from Trinity College, University of Dublin, in 2003, with a major in zoology and a specialization in marine biology. After one semester as an intern in the laboratory of Dr. Alan Kuzirian at the Marine Biological Laboratory in Woods Hole, Fiona entered the UMass Marine Graduate School on the Amherst campus in January. This summer, Fiona will stay in Amherst, pursuing her research into salmon ecology under the guidance of Kevin Friedland. Specifically, she is investigating changes, on decadal scales, in the growth patterns of Atlantic salmon. §

CMER: 15 Years of Marine Research and Education

Fifteen years ago, the National Oceanic and Atmospheric Administration (NOAA) and the University of Massachusetts signed a cooperative agreement "for active university/agency cooperation in the advancement, organization, and operation of marine research, education, in-service training, and demonstration programs."

The UMass/NOAA Cooperative Marine Education and Research (CMER) Program was established in early 1989 to address marine issues affecting the Commonwealth, region, and nation. Similar CMER programs are now active at Rutgers University, the University of Rhode Island, and the Virginia Institute of Marine Science.

CMER was inspired in part by the successful COOP program of the U.S. Fish and Wildlife Service, which co-located research units on college campuses. CMER took the next logical step, providing for greater university involvement in addressing agency research needs while simultaneously tackling the problem of training future professionals in the marine sciences.

CMER's Program Director is a NOAA employee who is on the UMass Amherst graduate faculty. Through CMER, UMass and NOAA scientists collaborate on research projects; NOAA researchers serve as principal investigators, academic instructors, and chairs and members of thesis and dissertation committees; and graduate and undergraduate students serve as summer interns, working side-by-side with agency scientists at NOAA marine laboratories.

Over the past 15 years, the UMass CMER program has involved faculty members and graduate students from 11 departments on the Amherst campus as well as departments on the UMass Boston, Dartmouth, and Lowell campuses. As of last year's annual report, UMass/NOAA CMER projects had totaled nearly $2.8 million, involved 39 UMass faculty and staff, and supported 108 undergraduate and graduate students. Projects have addressed a wide range of issues important in the Northeast, such as winter flounder ecology, seafood shelf life, sampling designs, subsistence fishing, and cod maturation. §

A week in the life . . . *continued*

in Environmental Policy. In between, she attends a weekly seminar series that exposes her to research across the spectrum of the marine fields. Then it's back to DMF, where work is piling up in her absence.

A physically exhausting schedule? Not for a New York State All-Star rugby player!

WEDNESDAY — It's 6:00 a.m. and the *F/V Liberty* is due at the docks. Graduate student Mike Marino and his colleagues from the SMAST Fisheries Research Lab have to be there early to meet the boat, but they still take the time to stop by Dunkin' Donuts. The trip to the docks is to pick up scientific

Graduate student Mike Marino

samples of live sea scallops that the *Liberty* has brought back from Georges Bank; the doughnuts are for the captain and crew.

Within the hour, Mike and company are back at SMAST, transferring the scallops to tanks of running seawater, and setting up for the dissections. The purpose of this ongoing work is to determine the ratio of shell size to meat weight in sea scallops, a crucial relationship in assessing the biomass of the stocks. SMAST researchers have developed video techniques to improve estimates of the number and size of scallops across vast areas of ocean floor, but fisheries management needs to know how much meat is out there. Unfortunately, shell size is not yet a reliable indicator of biomass because the ratio between the two varies from place to place. The samples provided by the scallop fleet are steadily filling in the missing information.

The dissections and measurements complete, Mike sheds his lab coat. He's in a hurry – he's late for class. Fortunately, class is just upstairs. One last question, Mike: would you still get the scallops if you didn't bring the donuts?

"Can't say," he winks. "We've never forgotten the donuts."

THURSDAY — Jake Nogueira is in his Biostatistics course at UMass Dartmouth's School for Marine Science and Technology. The course is taught via distance-learning technology, which allows students on multiple UMass campuses to see, hear, and interact with a lecturer in a remote location. The course is being taught live on the Boston campus, but Jake and four other graduate students are participating from SMAST, some 50 miles away.

Is the experience really just like being physically present in the class? "Well," Jake muses, "you can't throw spitballs at the teacher."

Immediately after class, Jake will leave for Woods Hole to attend a Stock Assessment Research Committee meeting, where scientists who are sizing up the state of the scallop fishery will report directly to the decision-makers on the New England Fishery Management Council.

"It's less of a transition than you might think," he points out. "Prof. Gallagher (Eugene Gallagher, UMass Boston) discusses statistical techniques in biology with lots of examples from the news and from his own research. The assessment committee uses some of the same techniques in their work, which ultimately will affect the future of our fisheries."

Could Jake sneak out of class undetected if he had a mind to? "Nah," he grins, "Prof. Gallagher has a camera on us, too."

FRIDAY — Yuko Hasegawa is in the laboratory of her advisor, Juliette Rooney-Varga, preparing to run what she calls her "big gel." Yuko, who was the first IGS student at UMass Lowell, is using molecular techniques to study the bacteria associated with the toxic phytoplankton that threatens shellfisheries, and thereby human health, along our coasts. For over a month, she has been amplifying tiny fragments of genetic material extracted from the microorganisms she is studying. Finally, she has accumulated enough DNA to run the gel, which will measure the genetic diversity in her sample. Then she will begin the cycle again as she has for several months past--and will for many months to come.

The complexity of the gel procedure requires that it be run overnight, and Yuko is nervous. Her luck has held so far, but if anything does goes wrong, she could lose a month's worth of work.

What could go wrong? A blackout, for instance. "We've had energy failures here before," she points out, "so I worry. Sometimes I stay in the lab until the middle of the night to make sure everything's OK."

"The student that worked here before me slept overnight in the laboratory."

Yuko draws the line at that. Still, she won't sleep peacefully tonight. §

IGSMST faculty contact information is available at:
http://www.umassmarine.net

UMASS MARINE

A message from the Dean . . . *continued*

It is characteristic of Dr. Colwell that her commencement address stressed the importance of service. In her own career, she attained the highest levels in her field while integrating her values into her professional mission. During her tenure at NSF, for example, the foundation achieved significant budget increases and launched new initiatives in such areas as nanotechnology, biocomplexity, and information technology. Over the same period, she spearheaded the foundation's advances in socially progressive areas such as the participation of women and minorities in science, and programs for a more scientifically literate society.

We in the UMass Marine Graduate School may feel a particular professional kinship to Dr. Colwell because of her background in the ocean sciences, but she is an equal inspiration to all students, professors, and administrators, having excelled in all three roles. Most of all, perhaps, her remarkable personal example inspires optimism that high professional achievement and a keen sense of social responsibility can go hand-in-hand.

Brian J. Rothschild

Graduate Assistantships

For information visit the IGS web site:
http://www.umassmarine.net

UMASS MARINE

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Events

June 8, NEW BRUNSWICK, NJ, Seafood: Assessing the Benefits and Risks, Cook College. See www.rutgers.edu/kiosk/directions/CCC.html. Call Gef Flimlin at 732-349-1152 or email flimlin@aesop.rutgers.edu.

June 9, KINGSTON, RI, Coastal Institute of the University of Rhode Island. Call Lesa Meng at (401) 782-9618.

June 13-18, SAVANNAH, GA, American Society of Limnology and Oceanography 2004 Summer Meeting: The Changing Landscapes of Oceans and Freshwater. See www.aslo.org/meetings/savannah2004/. Contact Helen Schneider, helens@sgmeet.com, 254/776-3550.

June 15-18, NEW BEDFORD, MA, FVCOM Modelers Workshop 2004, UMass Dartmouth School for Marine Science and Technology. For details, visit http://codfish.smast.umassd.edu/fvcom_workshop.html.

June 17-18, SEBASCO ESTATES, ME, IEEE/OES AUV2004: Multiple automonous underwater vehicles operations workshop. See www.oceanicengineering.org.

June 25, WOODS HOLE, MA, Workshop for Educators: Monitoring Beach & Dune Dynamics, Woods Hole Oceanographic Institution. Contact Stephanie Murphy, samurphy@whoi.edu, 508-289-2271, or Kate Madin, kmadin@whoi.edu, 508-289-3639.

June 30-July 5, BOSTON, MA, Boston Harborfest, with Inner Harbor and Charles River fireworks, chowderfest, and Living History Presentations aboard USS Constitution. Call (617) 227-1528.

July 19-23, LONDON, UK, Fisheries Society of the British Isles International Symposium: Comparative Biology and Interactions of Wild and Farmed Fish. See http://fp.paceprojects.f9.co.uk/FSBI2004home.htm. Tricia Ellis-Evans, tricia@paceprojects.co.uk.

July 21-23, PLYMOUTH, UK, Climate Change and Aquatic Systems: Past, Present, and Future, See www.biology.plymouth.ac.uk/climate/climate.htm. Contact Martin Attrill, matrill@plymouth.ac.uk.