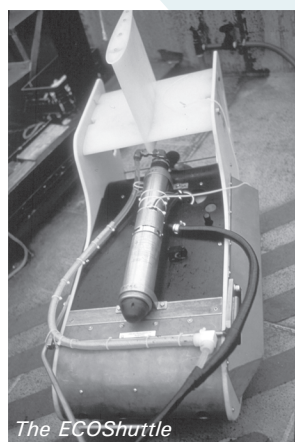


# UMASS MARINE

The University of Massachusetts Graduate School of Marine Sciences and Technology

## Research Notes

**Prof. Robert Chen** and his **UMass Boston** co-PIs have completed work, funded by the Defense University Research Instrumentation Program (Office of Naval Research), upgrading their ECOShuttle coastal observing vehicle and outfitting an instrumented mobile lab van to transport the vehicle and expand its physical, chemical and biological analysis capabilities. The integrated mobile laboratory (Integrated Coastal Observations System — ICOS) is versatile (fit for ships



The ECOShuttle

from 40-300 feet), operable in a wide range of coastal systems (from estuaries to shelf/slope regions), and capable of rapid response (hours to days) to episodic events (e.g., spills, harmful algal blooms, hurricanes). In the water, sensors on the ECOShuttle continuously measure parameters such as temperature, salinity, oxygen, organic matter, and chlorophyll, while continuous analyses of pumped seawater include particle size, total organic carbon, total nitrogen, and plankton number, size and species. Discrete

samples can be captured on demand for further analysis (<http://www.es.umb.edu/research/shuttle/index.html>) ••• The Office of Naval Research has announced an award to **Prof. Louis Goodman (UMass Dartmouth)**, IGSMST Research Director, to pursue "AUV Turbulence Measurements in the LOCO Field Experiments" for three years. The project is part of a new ONR initiative, *Layered Organization in the Coastal Ocean*, to understand the properties of densely concentrated, thin layers of planktonic biota that can occur in coastal ocean environments. A specially equipped autonomous underwater vehicle, acquired through a separate grant, will serve as the observation workhorse of the project. Goodman will be joining colleagues from institutions including the University of Rhode Island, Oregon State University, Woods Hole Oceanographic Institution, and the University of California Santa Cruz, in this interdisciplinary program ([http://www.smast.umassd.edu/Ocean\\_Physics/](http://www.smast.umassd.edu/Ocean_Physics/)) ••• A pair of new grants from Duke Energy and from the National Science Foundation Biocomplexity Program has bolstered



Prof. Mark Hines

## A message from the Dean . . .

The University of Massachusetts Graduate School of Marine Sciences and Technology is a distributed system. Our faculty and students reside on the Amherst, Boston, Dartmouth, and Lowell campuses. Yet as in any distributed system, we have pathways along which we communicate: graduate courses via distance learning technology, graduate committees, and shared research. *UMass Marine* is another essential communications link bringing together our diverse interests at our several campuses. It focuses on our biggest assets: our people—faculty, staff, students—and what they do.



In these pages and in future issues, we will introduce our people as space allows. In our "Research Notes," you'll also find highlights of their diverse research efforts. Whether working on the frontiers of theory or solving practical problems, whether in the Southern Ocean off Antarctica or in Massachusetts waters, it is these talented people and their research that drive our graduate school.

Brian J. Rothschild

the environmental mercury research of **Prof. Mark Hines (UMass Lowell)** and collaborators. For more than a decade, Hines' team has been on the trail of mercury in the environment as it moves through various chemical and biological pathways at sites from the Arctic to the Adriatic Sea. By some measures, mercury is the anthropogenic pollutant of longest standing: at one site in Slovenia where the team has been active, the source is a mercury mine that opened in the year 1492; at another in Spain, mercury is said to have been mined since the Year One. Hines and company are uncovering the role of bacteria in transforming mercury between the inorganic, oxidized form and methyl mercury, which is the most serious problem, especially for pregnant women and children ([http://faculty.uml.edu/mark\\_hines/](http://faculty.uml.edu/mark_hines/)) ••• With funding from Duke Energy, **Prof. David Ryan (UMass Lowell)** and co-investigators are working on the development of new biomarkers or indicators for use in coastal monitoring. Can certain contamination problems at a coastal site be deduced by analyzing an organism from that site? Specifically, the group is examining binding

Continued on page 3

# Introducing...

*Editors Note: Over the next several issues of the UMass Marine newsletter we plan to introduce our current faculty and students. That goal accomplished, we will focus on new IGSMST faces. Send your comments to the Editor at: f1smith@umassd.edu*

## Faculty

**Julie Brigham-Grette** joined the UMass Amherst Geosciences department in 1987, where she is currently Professor and, since 1998, Associate Department Head. She received her Ph.D. in Geology at the University of Colorado-Boulder and held post-doctoral fellowships at the University of Bergen, Norway, and with the Canadian Geological Survey based at the University of Alberta. For over two decades, Julie's research interests have been focused on the stratigraphy and chronology of geologic systems (lakes,



*Prof. Julie Brigham-Grette*

rivers, oceans) that record information about past climate change. Julie teaches upper level undergraduate and graduate courses in her specialty of Glacial Geology, and regularly teaches Introductory Oceanography. She is on the editorial advisory boards of three international journals and is currently President Elect of the American Quaternary Association. In spring 2002, she was elected a Fellow of the Geological Society of America. Julie is the new Chair of the International Science Steering Committee of the IGBP Past Global Change Program.

—  
Professor in the School of Marine Science and Technology at UMass Dartmouth, **Mark Altabet** teaches Chemical Oceanography and Global Marine Biochemistry. His research specializes in nitrogen cycling in the marine environment; light stable isotope biogeochemistry; particle fluxes in the open ocean; marine productivity; and oceanic paleochemistry and paleoproductivity in relation to past climate change. Mark's work has focused

on understanding major biogeochemical cycles in the marine environment, as they operate today and in the past, using natural variations in stable isotope ratios as *in situ* tracers. The sites of his research have included the coastal environment (e.g., Long Island Sound, Pacific coast of



*Prof. Mark Altabet*

South America) as well as the open ocean (e.g., Arabian Sea, the Southern Ocean off Antarctica, and the Sargasso Sea). Mark received his Ph.D. from Harvard University in 1984. §

## Students

Graduate student **Yuko Hasegawa** (UMass Lowell, Microbial Ecology) comes to Massachusetts from Japan—by way of Wyoming, where she took her Bachelor of Science degree in Biology at the state university in Laramie. Yuko traces her interest in the life sciences to her early years growing up in a small Japanese mountain town that she witnessed gradually transform into an industrial area, a process which inspired her to, "think about the relationship between the natural environment and the human society." With Professor Juliette Rooney-Varga, Yuko is studying the bacteria that associate with the algal dinoflagellates responsible for shellfish poisoning. Some bacteria appear to stimulate the growth of the dinoflagellates; other seem to be algicidal. Ultimately, the research may lead to new controls on the infamous "red tides" that threaten shellfisheries worldwide.



*Yuko Hasegawa*

—  
An accomplished cellist, Amnesty International member, Sunday school

founder, and gospel singer, **Anne-Marie Brunner** is not your typical physical oceanography graduate student. Hailing from the German city of Neustadt, close to the French border, Anne-Marie lists almost as many human languages as computer languages on her resume, including—in addition to her native German—English, French, Swedish, Latin, and Ancient Greek. Anne-Marie received her M.S. in Physics at UMass Dartmouth in 2002, and is currently a Ph.D. candidate advised by Dr. James Bisagni, SMAST/Physics. She is examining the interaction between the North Atlantic Oscillation within the atmosphere and large-scale circulation variability in the western North Atlantic. Variations in the Gulf Stream and Labrador Current may influence the western North Atlantic's ecosystem, including both plankton and fish. §



*Anne-Marie Brunner*

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

## Seminar Schedules

Seminar schedules are posted on the UMass Intercampus Graduate School of Marine Sciences and Technology web site at:

<http://www.umassmarine.net/news/>

or visit these campus web sites:

Department of Natural Resources Conservation (UMass Amherst)

<http://forest.fnr.umass.edu/seminar.htm>

The Biology Department (UMass Boston): [www.bio.umb.edu](http://www.bio.umb.edu)

Environmental Coastal and Ocean Sciences (ECOS, UMass Boston)  
[http://www.ecos.umb.edu/seminars/curr\\_seminars\\_sched.html](http://www.ecos.umb.edu/seminars/curr_seminars_sched.html)

The Center for Complex Environmental Systems (CCES, UMass Lowell):  
[www.uml.edu/centers/ces/sem\\_eve.htm](http://www.uml.edu/centers/ces/sem_eve.htm)

The School for Marine Science and Technology (SMAST, UMass Dartmouth):  
[www.smast.umassd.edu/seminars\\_spring2004.htm](http://www.smast.umassd.edu/seminars_spring2004.htm)

## Research Notes...continued

relationships between metals and blood plasma proteins found in mussels. Studies are being conducted by graduate student Matthew Woodcock (UMass Lowell), with



Prof. David Ryan (left) and Matthew Woodcock

the help of Dr. Lenny Pitts (Woods Hole Group) and Dr. William E.

Robinson (ECOS, UMass Boston) ([http://faculty.uml.edu/david\\_ryan/index.htm](http://faculty.uml.edu/david_ryan/index.htm)) • • •

• In conjunction with Prof. Martha Mather (UMass Amherst), Unit Scientist of Massachusetts Cooperative Fish and Wildlife Research Unit, graduate student Kristen Ferry recently completed a study of factors driving distribution of migratory striped bass across Massachusetts estuaries. In collaboration with the Massachusetts Division of Marine Fisheries, this study quantified estimates of striped bass distribution, diet, consumption, habitat selection, and growth implications of habitat selection. The estimates generated from this study could help identify strata for effective predator monitoring, improve estimates of growth and size at age, pinpoint time

Graduate Student Kristen Ferry



periods of prey vulnerability, and improve single species models or provide the basis for a multi-species community

approach • • • "Climate-Related Interannual Variability of Potential New Production over the Western North Atlantic Ocean" is the title of a project recently funded for three years by the National Aeronautics and Space Administration. Using a blend of satellite and *in-situ* data and fine-scale numerical modeling, Prof. James Bisagni (UMass Dartmouth), along with co-investigators Avijit Gangopadhyay (UMass Dartmouth) and Joaquim Goes (Bigelow Laboratory) are seeking to understand the role of climate variability and the North Atlantic Oscillation in regulating oceanic circulation

and biology and their effect on the carbon cycle over the western North Atlantic (<http://celtic.cmast.umassd.edu/>) • • • Prof. Meng Zhou (UMass Boston), Research Associate Yiwu Zhu and Ph.D. student Ryan Dorland spent most of February and March aboard the *R/V Gould* in the Southern Ocean off Antarctica. Their research is funded by the Office of Polar Programs, National Science Foundation. Zhou, Zhu and Dorland are part of a scientific group seeking to understand mesoscale physical circulation patterns associated with bottom topography, and to understand the off-shelf transport of nutrients and iron, enhanced primary productivity and krill populations in the Shackleton Fracture zone, southern Drake Passage. In the

Researchers from the R/V Gould working off Antarctica.



highly productive Antarctic waters, krill is the key link in the food chain that extends to seals, penguins, and whales (<http://www.es.umb.edu/faculty/mzh/files/sfz/sfz.htm>) • • • Prof. Miles Sundermeyer (UMass Dartmouth) has been notified that the National Science Foundation has funded his proposal, "Collaborative Proposal: Laboratory Studies of Stirring by Small-Scale Geostrophic Motions." The long-term goal of this research is to provide a quantitative description of ocean stirring on scales of 1-10 km, which is particularly important to understanding global ocean circulation and heat balances. The studies will be conducted in collaboration with the University of Rhode Island's Graduate School of Oceanography (<http://www.smast.umassd.edu/msundermeyer/>) • • • When considering the effect of a policy change on the ecology, environmental planners have often left one animal out of the equation: *Homo sapiens*. But 21st century policy planners are now folding human ecology into their planning process. Prof. David K. Loomis (UMass Amherst), Human Dimensions Research Unit and Department of Natural Resources Conservation, has been funded to gather the leading human dimensions

experts and restoration practitioners available into an *ad hoc* think tank for four days in April. Sponsored by the National Oceanic and Atmospheric Administration and the University, the Workshop for Monitoring the Human Dimensions Aspects of Coastal Restoration proposes to develop a state of the art perspective on monitoring the human dimensions of coastal restoration, in particular for the Estuary Restoration Act of 2000, which seeks to restore one million acres of coastal habitat in 30 states by the year 2010 (<http://www.umass.edu/hd/index.html>). §

## Graduate Teaching Assistantships

Four teaching assistantships are available at the UMass Lowell campus. The areas of interest include:

**Chemical Oceanography,**  
**Biological Oceanography,**  
**Ocean-Atmosphere Interaction (meteorology),**  
and **Ocean Engineering.**

For more information please contact the Associate Dean of the Graduate School,

**Robert\_Gamache@uml.edu**  
or see the contact page of the IGS web site, <http://www.umassmarine.net>

## Graduate Research Assistantships

Two research assistantships are available at the UMass Dartmouth campus.

**Ocean Mixing and Stirring:** to assist with laboratory studies of horizontal dispersion by eddies resulting from patchy mixing. For more information visit:

<http://www.umassmarine.net>

Contact:

Prof. Miles A. Sundermeyer  
[msundermeyer@umassd.edu](mailto:msundermeyer@umassd.edu)

**Layered Organization in the Coastal Ocean:** a multidisciplinary program aimed at understanding how ocean turbulence affects the formation and breakdown of thin biological layers of plankton. For more information visit:

<http://www.umassmarine.net>

Contact:

Prof. Louis Goodman  
[lgoodman@umassd.edu](mailto:lgoodman@umassd.edu)



Office of the Dean  
 Intercampus Graduate School of Marine Sciences  
 and Technology  
 University of Massachusetts Dartmouth  
 706 South Rodney French Blvd.  
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## Events

**March 26 – May 28 (Fridays), BOSTON**, Class offered - Fundamentals in Marina Management and Planning (EGS 478) - 1-3:30 p.m., McCormack Hall, Marine Operations Boat Shop, UMass Boston. Management techniques, storm preparation, government and environmental regulations, electrical and mechanical systems, and "hands-on" basic boating operations. 3 credits. For more information, call Moni at 617-287-5404 or email opctr@umb.edu.

**April 25-28, OCEAN CITY, MD**, The Northeastern Association of Fish and Wildlife Agencies 60th Annual Conference - Ocean City, MD. See <http://northeastconference.fws.gov/>. Fisheries session contact, Alan Heft, aheft@dnr.state.md.us.

**April 30, SCITUATE**, Marine Art Contest - Deadline for the 2003-2004 Marine Art Contest, sponsored by the Massachusetts Marine Educators, Stellwagen Bank National Marine Sanctuary, and the New England Aquarium. This year's theme is "Marine Protected Areas," and artwork will be judged in five categories: K-2, 3-5, 6-8, 9-12 and scientific illustration. Details: <http://stellwagen.noaa.gov/PDF/2004postercontest.pdf>.

**May 6-7, BOSTON**, The Massachusetts Bays Symposium - venue TBA. Details to be posted at the Massachusetts Bays Program website <http://www.state.ma.us/envir/massbays/conference.htm>.



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- Marine Biogeochemical Cycles and Environmental Change
- Marine Observation Technologies
- The Ocean and Human Health

<http://www.umassmarine.net>

**May 10-11, HALIFAX, NS, CANADA**, Ocean Zoning Workshop – "Ocean Zoning: Can it Work in the Northwest Atlantic?" Saint Mary's University, Halifax, Nova Scotia, Canada. For information, call 902-429-1335 or email [oceanzon@dal.ca](mailto:oceanzon@dal.ca).

**May 23-26, NEWPORT, RI**, Measure for Measure: How Do We Gauge Coastal Stewardship? The Coastal Society, 19th International Conference. See [www.thecoastalsociety.org/conference/tcs19/](http://www.thecoastalsociety.org/conference/tcs19/). Contact Judy Tucker, [coastalsoc@aol.com](mailto:coastalsoc@aol.com), 703/768-1599.