COASTAL RESEARCH

A newsletter from the Coastal Ocean Institute

Issue Number 9 • February 2009

www.whoi.edu/institutes/coi

A message from Director Chris Reddy

Being an Institute director is a truly unique position at WHOI. As COI director, I have had many exciting and rewarding experiences. My responsibilities have led me to meet with students, scientists, Trustees, Corporators, elected officials, entrepreneurs, and even the media. These interactions underscore the wide interest and importance of coastal science to many parties. Such meetings often yield unexpected surprises, such as when research specialist Gene Terray told me how COI funding aided him in securing significant Federal funding (see Investigators Spotlight).

As a marine chemist specializing in coastal pollution, my experiences have provided me with a general knowledge of coastal science. As COI director, I have learned that coastal science is even broader than I ever realized. This breadth was well illustrated at *An Afternoon of Coastal Science* COI sponsored this past November with invited speakers from the five WHOI science departments and the Marine Policy Center. I found this session extremely informative and am confident it benefited the WHOI community.

Perhaps the most gratifying aspect of being the COI director is helping our coastal community with support when necessary. COI funding has provided excellent leverage for the scientific staff to gain greater support from the Federal agencies. However, there are, perhaps, even greater benefits from COI funding. And that is assisting Joint Program students. To provide you with an update, we have assembled a comprehensive list of graduate students who have been supported by the COI. It is amazing to see the range of projects these students have performed across so many disciplines, and to note where they are now.

I hope you enjoy reading this newsletter and look forward to hearing from you.

Investigators Spotlight

COI Seed Funding Makes a Difference

In 2004, Jim Ledwell and I received COI support to continue a pilot project we had been working on with Miles Sundermeyer—a Joint Program graduate, now a Professor at UMass Dartmouth—to image mixing in the upper ocean. The basic idea is to track fluorescent dye in three dimensions with meter-scale resolution using a scanning airborne laser to excite the dye. In optically clear water we can sense tracer to depths of order 50 meters, making the approach a useful tool for mixed layer studies. Although we started the work on an internal Green Technology Innovation award, COI funding was an essential bridge to producing publishable results. The effort was successful and led directly to our receiving funding last year jointly from the National Science Foundation and the Office of Naval Research to use the technique in a major field study of lateral mixing in the upper ocean. Our experience is a nice example of how the breadth of the COI call for proposals helped a high risk project succeed. It also highlights the often significant lag in time between internal seed funding and success in securing external support.

— Gene Terray,
Research Specialist, AOP&E

On the Inside

Issue Number 9 • February 2009

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COI Funded Graduate Students

Where are they now?

2001

Heather Handley Goldstone* (*Advisor, John Stegeman, BIO*) used genomic approaches to examine the global impact of marine pollution. She completed her Ph.D. in 2003 and is currently Science Editor at the local NPR station in Woods Hole.

John Tolli* (*Advisor, Craig Taylor, BIO*) examined dynamics of the microbial community responsible for carbon monoxide oxidation in marine environments. John completed his Ph.D. in 2003 and is currently Assistant Professor of Biology at Southwestern College in Chula Vista, CA.

Linda Kalnejais* (*Advisors, Bill Martin and Roger Francois, MC&G*) studied the mechanisms leading to the release of metal contaminants from coastal sediments. She received her Ph.D. in 2005 and now is an Assistant Professor of Oceanography at the University of New Hampshire.

2002

Amy Draut* (*Advisors, Peter Clift, G&G & Gail Kineke, AOP&E*) studied shoreline change along the Atchafalaya River, LA. She received her Ph.D. in 2003 and is currently a geologist at the US Geological Survey in Santa Cruz, CA.

2003

Fernanda Hoefel* (*Advisor Steve Elgar, AOP&E*) investigated coastal processes and sediment transport on beaches. She received her Ph.D. in 2004 and is currently a management consultant at McKinsey & Company in Sao Paolo, Brazil.

James Ruzicka* (*Advisor, Scott Gallager, BIO*) studied the physiological ecology of larval cod. Jim received his Ph.D. in 2004 and is currently a researcher at the Northwest Fisheries Science Center in Seattle, WA.

2004

Carlos Moffat* (*Advisor, Bob Beardsley, PO*) considered the circulation of the coastal ocean west of the Antarctic Peninsula. Carlos received his Ph.D. in 2007 and is an Assistant Professor of Oceanography at University of Concepción, Chile.

2005

Jon Woodruff*,** (*Advisor, Jeff Donnelly, G&G*) studied hurricane impacts on the coastal shoreline. In 2008, Jon received his Ph.D. and is now an Assistant Professor of Geosciences at the University of Massachusetts at Amherst.

2006

Jonathan Blythe** (*Advisor, Jesús Pineda, BIO*) is working on topographic influences on barnacle recruitment.

Matt Jackson** (*Advisor, Stan Hart, G&G*) studied coastal erosion due to island flank failure and resulting tsunamis. Matt defended his Ph.D. in 2008 and is an Assistant Professor of Earth Sciences at Boston University.

Christine Mingione** (*Advisor, Scott Gallager, BIO*) is exploring bivalve larval growth and conditions in Waquoit Bay, MA.

Mark Rapo** (*Advisor, Houshuo Jiang, AOP&E*) is working on predator-prey interactions using computational fluid dynamics.

James Saenz** (*Advisor, Tim Eglinton, MC&G*) is studying bacterial activity in coastal aquifers.

Tom Kleindinst, WHOI

MIT/WHOI graduate student Christine Mingione rinses a plankton sample from a collection screen into a bottle. She will take the samples back to the lab to count the larvae and image them using polarized light.

2007

Dan Rogers* (*Advisor, Karen Casciotti, MC&G*) is exploring novel techniques for accessing chemical and biological measurements in microbial ecosystems.

Jonathan Blythe** (*Advisor, Jesús Pineda, BIO*) is working on the biomechanical and adhesive properties of barnacle larvae using a laboratory flume.

Michael Brosnahan** (*Advisor, Don Anderson, BIO*) is studying the molecular characterization of life cycle transitions for the red tide dinoflagellate, *Alexandrium tamarense*.

James Sáenz** (*Advisor, Tim Eglinton, MC&G*) is working on marine cyanobacteria in coastal environments.

Ratsirin Supcharoen** (*Advisor, Matt Charette, MC&G*) is studying the interannual variability in the fate of biological production in the Bering Sea.

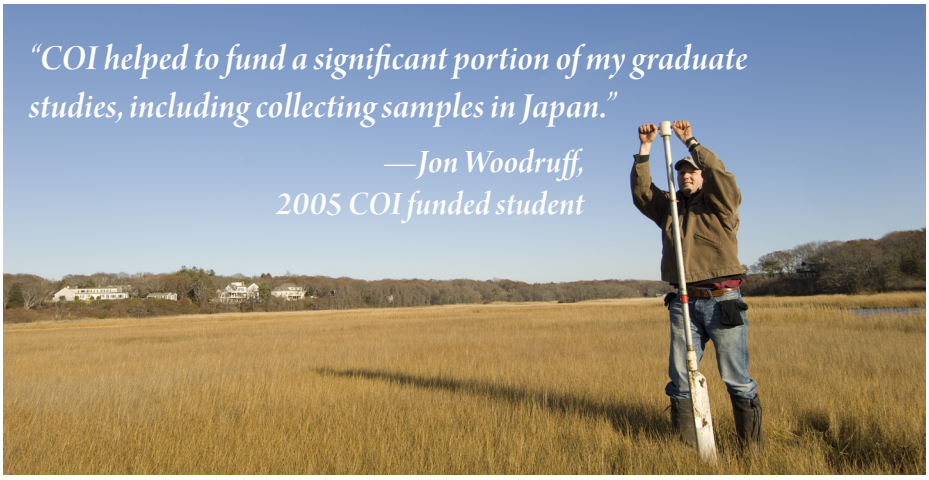
Louie Wurch** (*Advisor, Sonya Dyhrman, BIO*), is conducting work on the brown tide organism, *Aureococcus anophagefferens*, identifying the genes involved in nutrient stress responses.

2008

Erin Banning* (*Advisors, Elizabeth Kujawinski & Karen Casciotti, MC&G*) is exploring the geobiology of groundwater.

Colleen Petrik** (*Advisor, Cabell Davis, BIO*) continues modeling studies focused on larval fish.

Erin Bertrand** (*Advisor, Mak Saito, MC&G*) is working on vitamin B_{12} proteins in seawater.



Tom Kleindinst, WHOI

Michael Holcomb** (*Advisors, Anne Cohen & Dan McCorkle, G&G*) is conducting research on coral reefs and how calcification changes with a range of environmental conditions.

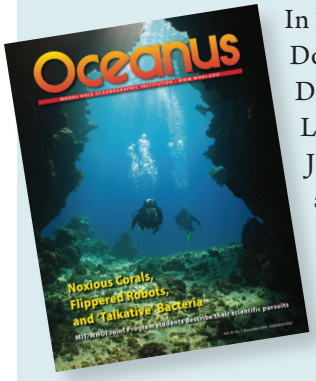
Rachel Horwitz** (*Advisor, Steve Lentz, PO*) is working on sediment dynamics on the inner shelf south of Martha's Vineyard.

Andrew McDonnell** (*Advisor, Ken Buesseler, MC&G*) is studying subsurface particle fluxes and processes in the North Atlantic.

Abigail Noble** (*Advisor, Mak Saito, MC&G*) is developing novel approaches to measure trace metals present in the coastal environment.

*This includes students who received fellowships to support them for an academic year, which began in 2001 (denoted with *). In addition, we highlight students who received support via a competitive award system for travel, supplies, and to attend short courses, etc (denoted with **). Former COI director, Don Anderson, initiated the latter program in 2006.*

Graduate Student writing



In 2008, with support from the Henry L. and Grace Doherty Professor of Oceanography fund, COI Director Chris Reddy and *Oceanus* managing editor Lonny Lippsett organized an informal course to teach Joint Program students to write for non-scientist audiences. Many of you have likely seen the resulting issue of *Oceanus*, containing 11 articles written by these students. Many of these student authors are supported—directly or indirectly—by the COI. Elizabeth Halliday is working with Becky Gast (COI Research Fellow); Christine Mingione received a COI Student Research Award; Caitlin Frame and Carly Buchwald are studying with Karen Casciotti (COI Research Fellow).

Coastal Ocean Institute

Coastal Notes

- The R/V *Tioga* celebrates her fifth birthday in March. Since launching in 2004, 492 cruises have been completed serving 2,946 scientists, students and staff. Due to the gracious generosity of David Stone, the R/V *Tioga* has just received a multicorer, a novel tool capable of collecting coastal sediments at a level previously unattainable here at WHOI.

- On November 13, COI sponsored an afternoon of coastal research presentations, bringing investigators together from diverse research areas. This session was well attended and sparked numerous cross-discipline questions and discussion. In fact, we know of at least one new scientific collaboration begun because of this session.

- On December 4th, Professor Jim Galloway (University of Virginia) presented a talk on nitrogen industrialization and impacts on the coastal environment. Jim has won numerous awards, the most recent of which is the Tyler Prize, closely equivalent to the Nobel Prize for environmental sciences. Additional distinguished speakers have been scheduled for the spring (April 23rd and May 21st).

Carl Lamborg, above, along with Chris Reddy, wrote an OpEd in the Boston Globe regarding mercury.

- COI grantee to study mercury in coastal ponds, Carl Lamborg and COI Director, Chris Reddy, wrote an OpEd article for the January 26th issue of the Boston Globe, entitled *"Piven case reinforces mercury warnings."* This piece discusses issues regarding mercury released into the atmosphere through coal combustion and the accumulation of one form of mercury, methylmercury, found in predatory fish such as tuna, swordfish and king mackerel.

- COI provided cost-share funding for a project involving cultured bay scallops at Martha's Vineyard. Invasive tunicates (also called sea squirts) attach to the scallops, smothering them so they cannot feed. Mary Carman (BIO) is using new techniques to eradicate these tunicates and aims to determine which method is most effective.

- A recent grant from a private foundation will support WHOI's Environmental Sample Processor. This unique new technology will provide improved methods for detecting red tides and other toxins in coastal waters. Our thanks to the foundation, and a member of the COI Committee affiliated with it, for making this grant possible.

- The Coastal Media Database, established in 2004, thanks to the generosity of Trustee and COI Committee Chair, Bill Kealy, continues to serve the public in its outreach to multiple media outlets across the US. Using the CMD, WHOI's Media team has reached out to print, web, radio, and television outlets in all the coastal and Great Lakes states with information about a variety of coastal issues with which WHOI is involved in its research and public policy initiatives. If you see or hear about WHOI's coastal science in any of your local newspapers, radio or television stations please let us know. Or if you wish to suggest a particular media outlet be added to our list, please contact media@whoi.edu

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