



Smithsonian Environmental  
Research Center

Fall 2006

S | E | R | C



Bushwhacking  
Alaska's  
Kenai Peninsula

Insect Impact

New Chesapeake Invasion?

Solar Radiation

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As a part of the 2006 Science Academy  
sponsored by the National Federation of the  
Blind, students visiting SERC experience a  
hands-on approach to learning blue crab  
biology and ecology.



# Eye on Education . . .

## *Kudos*

SERC's public outreach programs have been honored with a Heritage Program Award from Four Rivers, the Heritage Area of Annapolis, Lodontowne and South County.

The award is for new public programs that offer a variety of quality environmental educational experiences to the residents and visitors of Southern Anne Arundel County. Tuck Hines and Karen McDonald accepted the award at the organization's 5<sup>th</sup> anniversary celebration on November 8. SERC was the recipient of one of the Four Rivers' first mini-grants which supported the creation of the visitor's kiosk in the Reed Education Center.

## *Smithsonian Teachers' Night*

This year's Annual Smithsonian Teachers' Night provided an opportunity for 2,500 teachers from the greater Washington, DC area to visit with SERC Education staff, participate in hands-on demonstrations, and learn about our programs. Karen McDonald ran a session titled "Teaching Plankton in the Classroom" which provided a hands-on demonstration of how to run a plankton activity. With 93 participants, McDonald's was the most highly attended session of the night.



Director Anson (Tuck) Hines and Outreach Coordinator Karen McDonald accept an award for SERC's public programs.

## *NEXGEN*

*Fostering the future of environmental science*



### **New Fellowship Coordinator**

The SERC community welcomed Daniel Gustafson as the new Fellowship Coordinator this fall. Gustafson came to SERC from the non-profit Chesapeake Research Consortium where he has served as their fellowship coordinator for the past few years. Prior to that, he spent 17 years at the University of Maryland Center for Environmental Studies, Horn Point Laboratory in

Cambridge, MD, where he was a Senior Faculty Research Technician. Gustafson has worked on microscopic flora in the world's oceans as well as harmful algal blooms in the Chesapeake Bay and tributaries. His work has included collaborations with other scientists to investigate food web dynamics, zooplankton ecology and nutrient dynamics in the Bay as well as the Baltic Sea, and sea-ice microalgae in Antarctica at McMurdo Station.

*Though the hiking was rough  
and the terrain unyielding,  
there was at least one literal  
bright side to the 19-hour days*

Deputy Director Dennis Whigham spent doing field work in Alaska this summer: the sun never set.

Whigham and his colleagues from Baylor University and the Alaska Fish and Game Department bushwhacked through the pristine wilderness of Southern Alaska's Kenai Peninsula with the goal of surveying fish and wetland species within an 810,000 acre wilderness that covers five different rivers. The researchers intend for their work to help Alaskan land managers determine what types of wetlands and headwater systems are needed to support a healthy salmon population.

Alaska's economy thrives on salmon. The commercial harvest was valued at \$305 million in 2005. Recreational fishing brings in even more revenue during salmon runs, when salmon return from the ocean to spawn in their natal streams. In 2001, Alaskan fishing trips represented \$537 million to the state's economy. While many Alaskan salmon runs are endangered, the Kenai peninsula run remains healthy. But most of the land is privately held, and a 20 percent increase in residential growth in the Peninsula over the past 10 years raises concerns that development may encroach on wetlands and streams affecting salmon populations.

Stream headwaters are known to exert a strong influence on downstream physical and chemical water properties. They are also known to provide critical habitat for young salmon, but a comprehensive survey identifying the specific wetland characteristics associated with a healthy salmon population had not been done in the Kenai Peninsula before.

Understanding what streams and wetlands are most important to preserve in such a large area, however, is not a simple matter. Whigham has experience with this



type of daunting issue as one of the lead scientists of the Atlantic Slope Consortium project (ASC). The basic premise of this six-year-long study was that everything about a piece of land draining into a body of water—its shape and size, its geology, the plant and animal communities that live there, and the land use practices of people—has potential to influence what goes on in the water.

By synthesizing information from ecological and socioeconomic surveys across small watersheds and estuary segments, the ASC team was able to identify key factors and combinations of factors that influence watershed health and the health of downstream aquatic ecosystems. From that knowledge, they developed a set of indicators to assess ecosystem health and sustainability over large scales such as the Chesapeake Bay.

Recognizing an opportunity to expand the tools and skills developed during the ASC project and apply them to the vastly different environment of Alaska, Whigham contacted his former post doctoral fellow Ryan King who had worked on the ASC and is now an assistant professor of biology at Baylor University in Texas. Together, they set out to conduct the Alaska project.

The scientists looked for intersections of different wetland types and streams in the area. They plotted coordi-

nates from a Geographical Information Systems map into a hand-held GPS device, and then selected potential sites to survey.

The scientists set out to survey 40 streams in settings with different geomorphic profiles. Dividing into teams, they canvassed the area on both sides of each stream to characterize the physical conditions over a distance of 250 meters. The wetland team developed a vegetation map and sampled herbs, shrubs and trees in sample plots and collected water for nutrient analyses. The fish team surveyed the fish and invertebrates within each stream. The work was intensive and the very nature of the Alaskan wilderness meant the work was almost always challenging.

Throughout the six-week survey, the group faced close encounters with black bear, a grizzly that startled at the approach of their jeep, and fiercely protective female moose and their young. But the most arduous aspect of the work was the sheer effort it took to get to their sites.

Team members report taking more than an hour sometimes to advance one mile over dense thickets of willow and fallen spruce trees. At 62, Whigham was grateful he had spent months preparing for the trip—hiking with a 35-pound backpack two or three times a week, biking four to six hours per week and climbing ten laps or more up and down SERC’s 125-foot research tower three or four times a week during his lunch break. Still, he reports losing 40 pounds on the expedition.

The group sampled 30 streams and found juvenile salmon in many of them that had never been documented before. “We’ve clearly demonstrated that the tiny streams are supporting juvenile

salmon,” Whigham said, “Why in some streams and not in others? Those are some questions that we still have to answer.”

The scientists hope to continue their work in Alaska, but for now, the summer has provided them with a vast amount of data to synthesize. Their report promises to tie key environmental features and conditions to the sustainability of one of Alaska’s most valuable resources, the salmon. “When [resource managers] have that information,” said King, “they can start identifying priority areas for conservation in developing management plans that protect these headwater streams, because right now there’s very little protection for them. It’s not uncommon to see someone clearing land right up to the edge of these streams or even pushing soil into them, which obviously has major implications for juvenile salmon.”

“Salmon is our life and economy,” said Coowe Walker, a watershed specialist with Alaska’s Kachemak Bay Research Reserve and coordinator for the research. “This project is key to developing our understanding of headwater stream habitat. Most runs of salmon [in Alaska] are endangered, but we [in the Kenai Peninsula] have a healthy run of salmon, and we want to keep it that way.”

*—Portions of this story were adapted from an article by Matthew Waller in Baylor Magazine.*



**Rough terrain and the need to carry all their supplies made arduous work for the Kenai Peninsula survey team. Scientists sample fish in a small headwater stream (far left).**



## Field Notes:

### Chinese Crab Found in Chesapeake

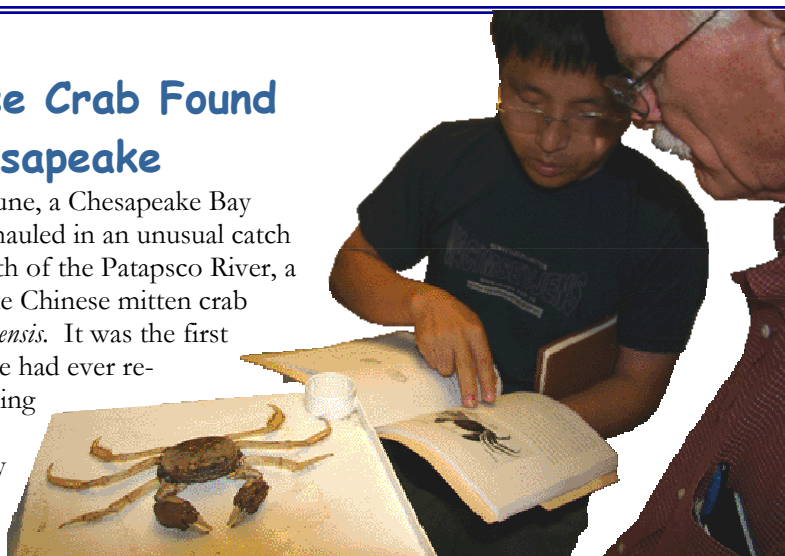
This past June, a Chesapeake Bay waterman hauled in an unusual catch at the mouth of the Patapsco River, a mature male Chinese mitten crab *Eriocheir sinensis*. It was the first time anyone had ever reported finding

a mitten Crab in Bay waters.

Native to East Asia,

the crab is significant as a potentially harmful invasive species that has caused economic damage in Europe and on the West Coast of the United States.

Recognizing his catch as unusual, the waterman presented it to Maryland Department of Natural Resources (DNR) who brought it to the Smithsonian for confirmation. Since the finding was announced, another specimen has been confirmed from the same area, and SERC's Invasive Species Lab is working with DNR to determine if these are isolated inci-



dents or if the crab is established in the area.

The researchers have been surveying the area in which the crabs were found, and have been using special techniques relayed to them by SERC visiting scientist Yongxu Cheng who is an expert in Mitten Crab ecology from Shanghai, China.

There are many ways the crabs could have ended up in Bay waters, including accidental releases from an illegal seafood trade. However, if surveys reveal an established population,

Mitten crab expert Yongxu Cheng and SERC Director Tuck Hines compare the specimen caught in Chesapeake waters with a text describing the species. Below, Greg Ruiz examines the crab. Hair-like setae on its claws makes it appear to be wearing mittens and gives the crab its name.

the culprit is most likely to be untreated ballast water from commercial shipping in nearby Baltimore Harbor.

In a bit of prescient science, SERC researcher Greg Ruiz had written a paper for *Ecological Applications* this summer predicting the likelihood of an introduction of the Mitten Crab into the Chesapeake Bay area. The paper will be in print in the near future.



### Attenuating Circumstances

Catching some rays in Greece with SERC Research Associate Maria Tzortziou is no day at the beach. This summer, Tzortziou spent the better part of July on the roof of the Physics Department of the Aristotle University of Thessaloniki analyzing solar radiation.

She was participating in a multinational research effort by NASA and the University to learn how aerosols and trace gases modulate ultraviolet (UV) radiation from the sun, and pro-

viding ground measurements of ozone, trace gases and aerosol columns to compare with and validate satellite readings.

Ozone and aerosols such as smog and soot from pollution absorb and scatter UV rays and can reduce UV-radiation reaching the Earth. Estimates suggest that sulfate aerosols (primarily from burning fossil fuels) have decreased surface UV-B irradiances by five to 18 percent in some heavily industrialized regions of the northern hemisphere. However, not all aerosols

scatter and absorb UV in the same way. While scattering by aerosols always decreases the total amount of surface UV irradiance, it can actually increase the UV exposure on non-horizontal surfaces, such as your face.

The summer field research is part of a larger effort called the SCOUT-03 program (Stratospheric-Climate Links with Emphasis on the Upper Troposphere and Lower Stratosphere) which aims to inform policy-makers about the connections between air chemistry, changes in ozone and UV radiation and climate impacts.

## Small Bites Add Up

Many of us don't think much about the impacts of plant-eating insects on the world until aphids invade our gardens or the emerald ash borer threatens the health of a national forest. But recent studies by post doctoral fellow Samantha Chapman give us a reason to look further. In a paper published in the journal *Oikos*, Chapman and her colleagues showed that the effect herbivores have on the type of leaf litter on the forest floor can significantly influence nutrient availability. They also showed that the impacts are distinctly different between forest types.

The study revealed that the response of evergreens and deciduous trees to herbivores may have opposite effects on the availability of nutrients in leaf litter on the forest floor. Evergreens tend to drop their leaves as a defense mechanism when they're being munched on. So, in the presence of



Comparing leaf litter, Chapman evaluates the impacts of herbivory in different forest types.

herbivores, leaves fall earlier than normal, before the plant has time to resorb (or “take back”) nitrogen. Not only is there more leaf litter falling to the forest floor, but it is higher in nutrients, resulting in a pulse of nutrient availability.

In contrast, herbivory in deciduous forests does not often cause trees to drop their leaves, but causes them to produce compounds in their leaves that reduce the rate of decomposition, resulting in a

slower release of nutrients.

“This work presents a new way of thinking about how herbivores can control processes much larger than themselves,” Chapman said. The researchers suggest that more attention should be placed on the role of herbivores in nutrient cycling and that this information may help managers understand their forests better. Chapman is continuing to explore the dynamic role of herbivores in a project with Candy Feller looking at how crab herbivory impacts mangrove forests.

## Strength in Numbers

Mark Haddon received **\$171,450** from the U.S. Department of Commerce for Student Training in Aquatic Research.

Gregory Ruiz received **\$352,645** and **\$179,639** from the U.S. Department of Homeland Security for “Technical and Documentation Support Services for the Office of Operating and Environmental Standards” and “Ballast Water Management and Delivery Patterns for the United States” respectively. He also received **\$22,883** from Portland State University for “Survey of the Vessels Point Loma and Florence upon Arrival at the Port of Brownsville, TX” and **\$14,000** from the U.S. Department of Interior for “Advancing NISbase: A Distributed Database System for Non-Native Species Information.”

Wayne Coats received **\$52,000** from the University of Delaware for “Interannual Diversity and Dynamics of Chesapeake Bay Virioplankton.”

Cynthia Gilmour received **\$238,063** from the National Science Foundation for the third year of “METAALICUS: A whole-watershed, stable isotope study of the mechanisms of net microbial methylmercury production.”

Denise Breitburg received **\$99,953** from the U.S. Department of Commerce for “Will Predatory Mortality Differ for Larvae of Native and Non-Native Oysters?”

## SIGHTINGS

The discovery of a Chinese mitten crab in Chesapeake Bay waters has drawn a lot of attention to SERC invasions studies. Greg Ruiz was featured in multiple media outlets including the Washington Post, the Washington Times, Channel 13, Channel 2, Baltimore Sun, NPR's morning edition and others.

Denise Breitburg was interviewed for a national NPR story on Jellyfish that ran on the program "the World."

Rick Osman was quoted in Long Island Newsday as a participant in a research cruise investigating an invasive tunicate. The article was titled "Long Island's Invaders from the Deep," Sept. 27, 2006.

Invasive Species Lab personnel in San Francisco were featured in the Marin Times story "Invasive snail imperils ecology near marina in San Rafael." The Invasive Species Weblog at

<http://invasivespecies.blogspot.com/> subsequently picked up the story.

In August, the Baltimore Sun ran a full-page spread on SERC's canoe tours, and in a separate article, featured the opening of SERC's dock for dinghy tie-up and the availability of the property for hiking and picnicing. In October, The Sun also featured an article on SERC titled "Environmental

Center's Lessons Focus on Chesapeake Bay Ecosystem."

SERC's website was the featured site of the week on the Chesapeake Bay Gateways Network site [www.baygateways.net](http://www.baygateways.net).

Check us out at: [www.serc.si.edu](http://www.serc.si.edu).

## Civil Science

SERC hosted the Short Course in Wetlands for Congressional Staffers sponsored by the International Society of Wetland Scientists (SWS) and the American Society of Limnology and Oceanography (ASLO). Eighteen congressional staffers and two ESA organizers participated. SERC scientists Tom Jordan, Pat Magonigal and Dennis Whigham led the course and tours of SERC.

SERC hosted the 2006 Chesapeake Bay Congressional Staff Briefing and Tour on Friday, August 25. The day's events involved presentations by NOAA, EPA, NPS and SERC as well as tours of the SERC research sites including a boat trip and trail walk.

## Minutes: scientific and professional meetings and presentations by SERC staff

**Cindy Gilmour** has been elected to membership in the Chesapeake Bay Program's Scientific and Technical Advisory Committee and will serve for a four-year term.

**Patrick Neale** has been appointed chair of the technical committee within the International Commission on Illumination (CIE) to "Develop Generalized Action Spectra for Plant Responses to Wavebands from 280 to 1100 nm." The CIE is devoted to international cooperation and exchange of information relating to the science and art of lighting, and is recognized by ISO as an international standardization body. The committee will produce a report containing recommendations on using action spectra to describe plant responses such as UV effects, photosynthesis and photomorphogenesis.

**Mario Sengco** and **Kevin Sellner** organized "HABs and clay flocculation: some species, some places, but not a silver bullet" at the 12th International Conference on Harmful Algae.

**Wayne Coats** attended the 12th International Conference on Harmful Algal, Copenhagen, and was co-author of the presentation-Gribble, K. E., Coats, D. W. and Anderson, D. M. Asexual and sexual reproduction in *Protoperdinium steidingeriae* (Dinophyceae).

In the Netherlands, **Dennis Whigham** presented "Landscape interactions—linking the effects of human activities to aquatic resources in coastal streams and shallow estuaries" at an invited seminar at Nijmegen University, Nijmegen, and "Restoration and assessment of wetlands" at an invited seminar

at Utrecht University.

**Whitman Miller** and **Paul Fonoff** presented a poster on Web-based nonindigenous species databases at Interagency Meeting Mid-Atlantic Regional Panel, Annapolis, MD. Miller also attended the First Annual Meeting of the Global Invasion Network Conference in Fort Collins, CO, and represented SI at the Aquatic Nuisance Species Task Force meeting which occurs twice annually for the purpose of coordinating federal, regional, and state activities on invasion research, policy and management.

**Greg Ruiz**, **Kathleen Murphy**, **Jennifer Boehme**, **George Smith**, **Chris Brown**, and **Monaca Noble** presented the talk "Ballast water exchange verification: discrimination using chemical characteristics of oceanic water" at the California

state lands commission Prevention First 2006, an onshore and offshore pollution prevention symposium and technology exhibition in Long Beach, CA. At that same symposium, **Ian Davidson**, **Greg Ruiz**, and **Mark Sytsma** presented "Shipping traffic, hull fouling and invasion risk to west coast ports."

**Thomas Jordan** attended the National Fish and Wildlife Foundation Expert Panel on evaluation of Chesapeake Bay Small Watershed Grants Program in Washington, DC.

**Xuyong Li** attended the Annual ESA meeting in Memphis and presented a poster "Effects of watershed and estuary characteristics on the abundance of submerged aquatic vegetation in Chesapeake Bay subestuaries" by Li, **Donald Weller**, **Charles Gallegos**, and **Thomas Jordan**.

**Maria Tzortziou** participated in the SCOUT-O3 field campaign for measurements of ozone, trace gas amounts, and aerosol properties in the atmosphere.

**Melissa McCormick** presented a poster titled "Abundance of *Coralorhiza odontorhiza* (Orchidaceae) within an established population reflects abundance of ectomycorrhizal root tips and fungal community composition" at the International Conference on Mycorrhizas in Granada, Spain.

**Cristina Sobrino** attended the Ocean Carbon Biogeochemistry Workshop at Woods Hole Oceanographic Institution, and presented the poster "Elevated Atmospheric CO<sub>2</sub> Increases Growth Rates in the Diatom *Thalassiosira pseudonana* but Decreases Resistance to UVR Exposure."

**Patrick Megonigal** gave an invited presentation at the Annual Meeting of the International Society of Wetland Scientists in Cairns, Australia. The title was "Rising CO<sub>2</sub>, rising sea level and rising (or sinking?) coastal wetlands."

**Greg Ruiz** presented the talk "Spatial variation in invasion magnitude and propagule supply in coastal marine ecosystems" at an EPA sponsored workshop in Washington, DC, titled "The link between propagule pressure and aquatic nonnative invasion success and impacts."

At the Ecological Society of America's annual meeting, **Amy Freestone** presented the talk "Facilitation influences local abundance and regional distribution of a rare plant in a harsh environment" and **Yong Li** presented the poster "Effects of watershed and estuary characteristics on the abundance of submerged aquatic vegetation in Chesapeake Bay subestuaries."

**Patrick Neale** chaired a symposium at the American Society of Photobiology meeting in Rio Grande, Puerto Rico, on "UV Effects in Aquatic and Terrestrial Environments." The symposium included the following presentations:

"UV effects across multiple trophic levels in freshwater ecosystems: comparative spectroscopy of biological weighting functions." **P. Neale**, R. Moeller, G. Grad, C. Williamson, W. Jeffrey, R. Sanders, and M. Olson.

"Photochemical degradation of colored dissolved organic matter in a brackish tidal marsh-estuarine system of the Chesapeake Bay."

**Maria Tzortziou**, **Patrick J. Neale**, Christopher L. Osburn, **Charles L. Gallegos**, **J. Patrick Megonigal** and Jay R. Herman.

"Interaction of ultraviolet radiation and vertical mixing effects on photosynthesis in the Ross Sea Polynya." **Patrick J. Neale**, **Cristina Sobrino**, **Ann E. Gargett**, **Hae-Cheol Kim**, **Linda A. Franklin** and **Jesse Phillips-Kress**.

"Dissimilar effects of increased CO<sub>2</sub> on growth and carbon fixation of two phytoplankton species under par and UVR exposure." **Cristina**

**Sobrino**, **Patrick J. Neale** and Mary L. Ward.

**Cindy Gilmour**, Tyler Bell, Georgia Riedel and Elizabeth Kerin attended the 8<sup>th</sup> International Conference on Mercury as a Global Pollutant, Madison, WI, where they gave the following presentations:

"Stable mercury isotope dose-response studies in Florida Everglades mesocosms: The relationship between load and bioaccumulation, and the influence of sulfate and organic carbon." **Gilmour, C.C.**, D.P. Krabbenhoft, W. Orem and G. Aiken.

"METAALICUS: Methylmercury production in lake sediments from ecosystem mercury isotope amendments to Lake 658 and its watershed." **Gilmour, C.C.**, **J.T. Bell**, C. Miller, M. Rearick, **G.S. Riedel**, and K. Sandilands.

"An Update on the Phylogeny of Mercury Methylation Among the Sulfate-Reducing Bacteria." **Gilmour, C.C.**, **E. Kerin**, **S. Werner**, M. T. Suzuki, R. P. Mason.

"Sulfate vs. sulfide controls on Hg methylation: A compilation of field and experimental data from multiple ecosystems." **Gilmour, C.C.**, A. Heyes, C. Mitchell and B. Branfireun.

"How does atmospheric mercury deposition affect fish mercury concentrations: Results from the first four years of METAALICUS."

"The influence of dissolved organic matter on the abundance of neutral mercury sulfide complexes under sulfidic condition." Miller, Carrie, Robert Mason, **Cynthia Gilmour** and Andrew Heyes.

"Factors controlling net mercury methylation in estuarine and coastal waters." Mason, R.P., C.C. Gilmour, A. Heyes, T. Hollweg, Kim, and C. Miller.

"Mercury methylation in the Chesapeake Bay and Mid-Atlantic continental shelf." **Hollweg, T.A.**, **R. P. Mason**, **C. Gilmour**, **G. Riedel**, and **J.T. Bell**.

## NEW PUBLICATIONS

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- Zhang, J., 2006, Development of a structurally dynamic model for forecasting the effects of restoration of Lake Fure, Denmark, *Ecological Modeling*, Volume 197, Issue 1-2 pp 89-102.
- deRivera C, N Hitchcock, S Teck, B Steves, A Hines, & G Ruiz, 2006, Larval development rate predicts range expansion of an introduced crab, *Marine Biology*. DOI 10.1007/s00227-006-0451-9.
- Kudoh, H., Shimamura, R., Takayama, K, Whigham, D. 2006. Consequences of hydrochory in Hibiscus. *Plant Species Biology*. 21:00. 127-133.
- Tzortziou, M., Subramaniam, A., Herman, J.R., Gallegos, C.L., Neale, P.J., Harding, L.W.Jr.2007. Remote sensing reflectance and inherent optical properties in the mid Chesapeake Bay Estuarine, *Coastal and Shelf Science*, Accepted 21 Sept. 2006. In press.
- Place, A. R., Harvey, H. R., Bai, X. and Coats, D. W.2006. Sneaking under the toxin surveillance radar: Parasitism and sterol content. *African Journal of Marine Science*. 28:347-351.
- Ruiz G, Fegley L, Fofonoff P, Cheng Y and Lemaitre R. 2006. First records of *Eriocheir sinensis* H. Milne Edwards, 1853 (Crustacea: Brachyura: Varunidae) for Chesapeake Bay and the mid-Atlantic coast of North America. *Aquatic Invasions*. In press.
- Herborg L-M, CL Jerde, DM Lodge, GM Ruiz, & HJ MacIsaac. 2006. Predicting the North American distribution of Chinese mitten crabs (*Eriocheir sinensis*) using measures of propagule pressure and environmental niche models. *Ecological Applications*. In press.
- Miller AW, GM Ruiz, MS Minton, & RF Ambrose. 2006. Differentiating successful from failed molluscan invaders in estuarine ecosystems. *Marine Ecol. Progr. Ser* In press.
- McGee S, R Piorkowski, & G Ruiz. 2006. Analysis of recent vessel arrivals and ballast water discharge in Alaska: toward assessing ship-mediated invasion risk. *Mar. Poll. Bull.* In press.
- Murphy KR, GM Ruiz, WTM Dunsmuir, & TD Waite. 2006. Optimized parameters for fluorescence-based verification of ballast water exchange by ships. *Environmental Science and Technology* 40: 2357-2362.
- Chapman, S.K., J.A. Schweitzer, and T.G. Whitham. 2006. Herbivory differentially alters plant litter dynamics of evergreen and deciduous trees. *Oikos* 114: 566-574.
- Keller, J.K., Bauers, A.K., Bridgham, S.D., Kellogg, L.E., Iversen, C.M., 2006, Nutrient control of microbial carbon cycling along an ombrotrophic-minerotrophic peatland gradient, *Journal of Geophysical Research* 111: G03006, doi:10.1029/2005JG000152.
- Russell, M. J. and P. A. Montagna. In press. Spatial and temporal variability and drivers of net ecosystem metabolism in Western Gulf of Mexico estuaries. *Estuaries and Coasts*. Accepted August 16, 2006.
- Bi-State Blue Crab Technical Advisory Committee (J. Greer, A.P. Swanson, A.H. Hines, E.G. Johnson and 25 co-members). 2006. Blue crab 2005. Status of the Chesapeake population and its fisheries. Chesapeake Bay Commission, Annapolis, Maryland. 12 p.

## NEW PUBLICATIONS cont'd

Paterson, Michael J., Paul Blanchfield, Cheryl Podemski, Holger H. Hintelmann, Cynthia C. Gilmour, Reed Harris, N. Ogrinc, John W.M. Rudd, and Ken A. Sandilands. Bioaccumulation of newly-deposited mercury by fish and invertebrates: an enclosure study using stable mercury isotopes. In Press Can. J. Fish. Aquat Sci. June 2006.

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Miller AW, Ruiz GM, Minton MS, and RF Ambrose 2006. Differentiating successful and failed molluscan invaders in estuarine ecosystems. *Marine Ecology Progress Series*. In press.

Place, A. R., Harvey H. R., Bai, X & Coats, D. W. (in press) Sneaking under the toxin surveillance radar: Parasitism and sterol content. *Proceedings of the XI International Conference on Harmful Algae, 15-19 November 2004*. CapeTown, South Africa.

Ma, H., Overstreet, R. M., Sniezek, J. H., Solangi, M. & Coats, D. W. (in press) Two new species of symbiotic ciliates from the respiratory tract of cetaceans with establishment of a new genus *Planilamina* n. gen. (Dysteriida, Karyoikeidae). *J. Euk. Microbiol.*

Orihel, D.M., Michael J. Paterson, Cynthia C. Gilmour, R.A (Drew) Bodaly, Paul J. Blanchfield, , Holger Hintelmann, Reed C. Harris, John W. Rudd. Effect of loading rate on the fate of mercury in littoral mesocosms. 2006. *Environ. Sci. Tech.* In press.

### **Books:**

Verhoeven, J.T.A., Beltman, B., Bobbink, R., and Whigham D.F. 2006. (eds.) *Wetlands and natural resource management*. Springer-Verlag. Amsterdam, The Netherlands 316 p.

Bobbink, R., Beltman, B., Verhoeven, J.T.A., and Whigham, D.F. (eds.) 2006. *Wetlands: Functioning, biodiversity, conservation, and restoration*. Springer-Verlag. Amsterdam, The Netherlands. 316 p.

### **Book Chapters**

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On a foggy October morning, fishermen off of Fox Point work the waters near the SERC flux station. The station was used for monitoring movement of nutrients into and out of the mudflats in Muddy Creek.—Charles Gallegos

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