



DEPARTMENT OF BIOLOGICAL SCIENCES NEWSLETTER
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I am the sea. In my depths all treasures dwell.

Muhammad Hafiz Ibrahim

As those of us who are getting older, it is amazing how fast time flies, and it is true that life's most precious commodity is time. It is spring already, and summer is just around the corner, with all its challenges and opportunities. Classes will end in another month or less, and REU and new graduate students will soon be here as well. Here are wishes for an enjoyable and productive spring and summer to all!

The Editor (W.O. Smith)

Student Moments: Sikai Peng

I was born as the second child in my family, in a small village near the City of Linyi, Shandong Province, China. A penalty of 400 yuan (almost 2-year salary then; today about US\$64) for my birth explained well to my parents how "precious" and "dear" this son was.

Although not wealthy, my parents tried their best to provide my brother and me happy and carefree childhoods. I was a sensible child, smart and hard-working, therefore always the top student in the school. My parents never had the idea to let us drop from school early to go to work and make money for the family. I've always been very grateful for their belief that education was the best way to change our destinies. My whole childhood was filled with happy memories, one of which was my brother teaching me riding my aunt's bike in the shady paths crossing miles and miles of golden field. I'm not sure whether I have a good memory, but I still can't remember anything unusual happening in faraway Beijing when I

was three years old [Editors note: near the end of Mao's rule and opening of China to the world].

In 2000s, my little village was gradually annexed by urbanization. My rustic fellow villagers, more willingly rather than reluctantly, received their new IDs labeled "Citizen" instead of "Peasant", found better-paid jobs in factories built in the wheat fields, moved into multi-storey buildings established when their dilapidated cottages were torn down, waving farewell to their impoverished and miserable lives as well as the fresh air in the country roads and beautiful stars in the night sky.

Maybe many students here at VIMS connected with the ocean from a very young age, but not me. In 2004, I was admitted to Ocean University of China, in Qingdao, where I first saw the sea. After my graduation with a bachelor's degree, the extraordinary beauty of the ocean in Qingdao and my growing interest in marine science drove me to get my Master's degree in 2011.

Then I came to VIMS. My first impression of Americans was they were all incredibly nice, even strangers on the road. However, when I tried to talk with them, I found their English needed to be improved. They had both difficulties in understanding me and making themselves understood. I was deeply touched by the harmony between animals and human beings here. Happy squirrels were seen everywhere. Recently people even setup a cordon for a bird hatching her eggs on the lawn in VIMS. Many mornings chattering birds woke me from a nightmare in which I screwed up my GRE test. My favorite time here was when I finished a workout on main campus, driving my third hand Focus back home on Colonial Parkway with verdant woods and the peaceful York River on the side ---- a landscape that reminded me those lost shady paths in my hometown. An important fact I learned from the Eastern Shore trip was about those respectable American girls with strong personalities of independence. I was astonished when I saw them carrying heavy boxes, reluctant to accept any masculine help. In a nutshell, VIMS is an ideal place to do

Student Moments: Solomon Chak

I grew up in Hong Kong, a densely populated city in the southern coast of China. Although Hong Kong is a coastal city, I never imagine myself studying marine science.

I came to the US in 2002 and spent 5 years in the Midwest and Central US. At Iowa State University, I quickly realized my interest in evolution and animal behavior, yet most of my work focused on conservation genetics at that time. I did undergraduate research on the population genetic of endangered freshwater mussel

research. We have good scientific atmosphere, advanced facilities, and most crucially, brilliant scientists who care about the ocean and whose research will benefit our society without harming our environment. Although there will be difficult times ahead, I will try my best to remain positive, keep my fingers crossed and wish myself a splendid future.



Sikai and a vision from the past (or future?).

Lampsilis higginsii. After that, I went to University of Wyoming for a M.S. degree and studied phylogenetic and population genetic of the threatened mountain snails *Oreohelix*. I enjoyed the snow and cold winter in the plains and mountains very much, and I did not have the slightest hint that I will be diving in subtropical waters after graduation.

I went back to Hong Kong on 2007 and worked in the Swire Institute of Marine Science at the University of Hong Kong for 4 years. This is when I

started working in marine science and realized its beauty. With my experience with genetics, I started working with Dr. Gray Williams on limpet and sea urchin population genetics. I also spent more than a year to do underwater surveys on the diversity and distribution of sea urchins in Hong Kong. In fact, I learned scuba diving because I wanted to do this project. After that, I continued to work on the coexistence of two sea urchins species in the rocky subtidal zone, investigating their difference in diet, movement, and predation pressure. On the side, I also worked on behavior of dancing shrimp *Rhynchocinetes* and coral bioerosion in Hong Kong and the crown-of-throne sea star in a Malaysian MPA.

I got married at the end of 2010, and with the support of my wife Belinda, returned to the US to pursue my original interest in evolution and behavior. At VIMS, I am very happy to work with Dr. Emmett Duffy on the evolution ecology of social snapping shrimps *Synalpheus*. My plan is to

understand the evolution of diversity and eusocial system in these sponge-dwelling snapping shrimps. This January, I collected my first *Synalpheus* during our field trip to Jamaica. It is amazing to work in the Caribbean, and I look forward to more opportunities in the future.



Solomon and friends

The Talking Head: Department Chair Comments

This spring follows what for eastern Virginia was a very mild winter. While many observations have already been made relative to the effects of the mild conditions on everything from the pollen count and early flowering of plants to the early emergence of ticks and mosquitoes, it is usually just the watermen, fishermen and ourselves who can readily observe what is happening below the water surface. Those of us conducting studies in this region may have some interesting things to observe this year. And we should all be reminded to put whatever we observe into a longer term context. The results of one year studies, while valuable, certainly should never really be considered “normal”.

This past August and September two storms which passed us, “Hurricane Irene” and “Tropical Storm Lee”, provided a one-two punch to the east coast as high tides, storm winds and perhaps more importantly heavy rains and flooding scoured the waters and watersheds of our estuary. Certainly a number of scientists and researchers throughout the Chesapeake Bay will be closely watching to see if there are any lasting effects. What is just as interesting, perhaps, is the immediate response of the media to what was characterized as an impending “huge sediment plume” that was “enveloping” the bay. Certainly the ability of satellites to provide dramatic, synoptic pictures of the sediment input,

much of it scoured from behind the Conowingo Dam at the head of the Bay, fueled this drama. However, it brings to mind what we as scientists, teachers or environmental managers have to balance throughout our careers. Our current 24-hour world “ news” is largely fueled by drama and conflict, and we, who may know something about whatever is currently being highlighted at the time, be it the “dead” zones, fish kills, or mud waves, need to be able to concisely respond if called upon. Sometimes we may be asked about things that we have little firsthand knowledge. For example, as “marine biologists” our neighbors may expect us to know, “when are the oysters coming back” or “what is up with the whale strandings”? No one wants to respond, “I have no idea!” So maybe we should try and broaden our knowledge base for these informal exchanges, especially while we are at a place such as VIMS, where there is so much diversity of science. When it is a call from a newspaper or other news outlet that may quote or misquote us, our best bet is to say “I have no idea!”

Ken

[Selected Recent National and International Presentations by Biological Sciences' Personnel](#)

- Anderson, I.C., M.J. Brush, C.A. Currin, M.F. Piehler, and J.W. Stanhope. 2011. The role of natural and anthropogenic disturbances in regulating the benthic nutrient filter. 21st biennial conference of the Coastal and Estuarine Research Federation, Daytona Beach, FL.
- Bernard, K. S., Steinberg, D. K., Fraser, W. R. “Krill distribution and Adelie penguin diet at Anvers and Avian islands, Western Antarctic Peninsula”. AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Bever, A., M.A.M. Friedrichs, and C.T. Friedrichs 2011. Using Chesapeake Bay models to develop informed observational sampling strategies. Gordon Conference on Coastal Ocean Modeling, South Hadley, MA.
- Bever, A.J., M.A.M. Friedrichs, C.T. Friedrichs, 2011. Is there any air down there? Using multiple 3D numerical models to investigate hypoxic volumes within the Chesapeake Bay. Coastal and Estuarine Research Federation, 21st Biennial Conference, Daytona Beach, FL.
- Bickel, S.L., K.W. Tang, H.-P. Grossart. 2012. zooplankton-associated bacterial abundance and community composition in the York River tributary of Chesapeake Bay. AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Blackburn, N. and R. J. Orth. Bioturbation’s green thumb: The role of infauna in *Zostera marina* seed burial. Coastal and Estuarine Research Federation 21st Biennial Conference. Daytona Beach, FL. Nov. 6-10. 2011.
- Brush, M.J., I.C. Anderson, M.F. Piehler, C.A. Currin, and H.W. Paerl. 2011. Modeling response to climatic and anthropogenic stressors in a shallow, photic coastal system. 21st biennial conference of the Coastal and Estuarine Research Federation, Daytona Beach, FL.
- Brush, M.J., J.W. Stanhope, and I.C. Anderson. 2011. High resolution monitoring of climatically-driven variations in photic area and potential benthic productivity in a shallow, blackwater estuary. Workshop presentation, 21st biennial conference of the Coastal and Estuarine Research Federation, Daytona Beach, FL.

- Coles, V., Yager, P., Berelson, W., Capone, E., Carpenter, E., Goes, J., Hood, R., Montoya, J., Steinberg, D. K., and others. "Amazon influence on the Atlantic: Carbon export from Nitrogen fixation by DiAtom Symbioses (ANACONDAS)". Ocean Carbon and Biogeochemistry (OCB) Meeting, Woods Hole, MA. July, 2011.
- Conroy, B. J., Steinberg, D. K.: Zooplankton community composition in the Amazon River plume and western tropical North Atlantic". AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Dinniman, M.S., J.M. Klinck and W.O. Smith, Jr. Sensitivity of Modified Circumpolar Deep Water in the Ross Sea to Changes in the Surface Winds. AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Dziallas, C., H.-P. Grossart, T.G. Nielsen, K.W. Tang. 2012. Composition and functional diversity of copepod-associated prokaryote communities in a Greenlandic fjord. AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Fall, K.A., C.T. Friedrichs, M.A.M. Friedrichs, 2011. Observations and best-fit modeling of settling and suspension of multiple sediment particle types: York River, Virginia. Coastal and Estuarine Research Federation, 21st Biennial Conference, Daytona Beach, FL.
- Feng, Y., G.A. Jackson, S.F. DiMarco, R. Hetland, K. Fennel, M.A.M. Friedrichs, 2012. Understanding hypoxic area variability from a three-dimensional coupled physical-biogeochemical model. AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Friedrichs, C.T., M.A.M. Friedrichs, A. Bever, W. Long, M. Scully, 2012. Results of the US IOOS Testbed for comparison of hydrodynamic and dissolved oxygen models of the Chesapeake Bay. AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Friedrichs, M.A.M. and the USECoS team, 2011. The U.S. Eastern Continental Shelf Carbon Cycling Project (U.S. ECoS). NASA Carbon Cycle and Ecosystems Joint Science Workshop, Alexandria, VA.
- Friedrichs, M.A.M. and the USECoS Team, 2012. Coastal carbon fluxes along the U.S. eastern continental shelf derived from a coupled biogeochemical-circulation model. AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Friedrichs, M.A.M., 2011. Impacts of changing climate and land use on carbon cycling and budgets of the coastal ocean margin: observations, analysis and modeling. NASA Ocean Color Research Team Meeting, Alexandria, VA.
- Gleiber, M. R., Steinberg, D. K., Ducklow, H. W. "Time series of vertical flux of zooplankton fecal pellets on the continental shelf of the Western Antarctic Peninsula". TOS/AGU/ASLO Ocean Sciences Meeting, Salt Lake City, UT, Feb., 2012.
- Grossart, H.-P., C. Dziallas, K.W. Tang. 2012. Bacteria-zooplankton interactions: a key to understanding bacterial dynamics and biogeochemical processes in lakes? Annual Conference of the Association for General and Applied Microbiology, Tübingen, Germany. March 18-21.
- Hudson, J. M., Steinberg, D. K., Sutton, T. T., Graves, J. E. "Feeding ecology and carbon transport of diel vertically migrating myctophids from the northern Mid-Atlantic Ridge". AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Kaufman, D.E., D.J. O'Connell, M.A.M. Friedrichs, W. O. Smith, K.J. Heywood, B. Y. Queste, 2012. An investigation of Modified Circumpolar Deep Water trough autonomous glider measurements in the Ross Sea. AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Kendrick, G, M. Waycott, R. Hovey, S. Krauss, E. Sinclair, R. Lowe, K. Van Dijk, P. Lavery, J. Verduin, R. Orth. The central role of dispersal in the maintenance and persistence of seagrass populations. Ecological Society of Australia. Hobart, November. 2011

- Lake, S.J., M.J. Brush, I.C. Anderson, H.I. Kator, and L.W. Haas. 2011. Contribution of internal and external organic matter sources and sinks to the formation of periodic hypoxia in a tributary estuary: the York River, VA. Invited presentation, 21st biennial conference of the Coastal and Estuarine Research Federation, Daytona Beach, FL.
- Marion, S., R. J. Orth, A. Malhotra, and M. Fonseca. The role of seed burial in reducing wave-based constraints on *Zostera marina* (eelgrass) recruitment success. Coastal and Estuarine Research Federation 21st Biennial Conference. Daytona Beach, FL. Nov. 6-10. 2011
- Maxey, J.D., I.C. Anderson, M.J. Brush, C.A. Currin, M.F. Piehler, and J.W. Stanhope. 2011. Estimating system-wide sources and sinks of nitrogen in a shallow mid-Atlantic estuary: the role of light availability. 21st biennial conference of the Coastal and Estuarine Research Federation, Daytona Beach, FL.
- McGlathery, K. J., L. K. Reynolds, L. W. Cole, R. J. Orth, S. R. Marion, and A. Schwarzschild. Recovery trends in an eelgrass system restored by seeding: State changes and tipping points. Coastal and Estuarine Research Federation 21st Biennial Conference. Daytona Beach, FL. Nov. 6-10. 2011.
- O'Connell, D.J., D.E. Kaufman, M.A.M. Friedrichs, and W.O. Smith, 2011. Glider observations of the biological response to Modified Circumpolar Deep Water Variability in the Ross Sea. Fall AGU, San Francisco, CA.
- Orth, R. J., K. A. Moore, S. R. Marion, D. Wilcox, M. Luckenbach, D. Parrish, B. Truitt, B. Lusk, and K. McGlathery.. Seed addition facilitates *Zostera marina* L. (eelgrass) recovery in a coastal bay system (USA). Coastal and Estuarine Research Federation 21th Biennial Conference. Daytona Beach, FL. Nov. 6-10. 2011.
- Owens, S. A., Buesseler, K. O., Lamborg, C. H., Valdes, J., Lomas, M.W., Johnson, R. J., Steinberg, D. K., Siegel, D. A. "A new record of particle flux at the Bermuda Atlantic Time-series site from neutrally buoyant sediment traps". AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Paerl, H.W., N. Hall, K. Rossignol, B. Peierls, A. Joyner, I.C. Anderson, M.J. Brush, and J. Stanhope. 2011. The role of hydrologic variability in determining microalgal biomass, community structure and water quality in the New River Estuary, Marine Corps Base Camp Lejeune, North Carolina. SERDP-ESTCP Symposium, Washington, DC. (poster)
- Price, L. M., Steinberg, D. K., Ducklow, H. W. "Microzooplankton community structure and grazing impact along the Western Antarctic Peninsula". AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Queste, B. Y., W. O. Smith Jr., V. L. Asper, C. M. Lee, M. S. Dinniman, J. I. Gobat, and K. J. Heywood. Physical and biological observations of the Ross Sea polynya using Seagliders during the 2010 austral spring. European Geophysical Union, March, 2012.
- Queste, B., W. Smith Jr., V. Asper, C. Lee, M. Dinniman, J. Gobat, and K. Heywood.
- Reynolds, L. K., K. J. McGlathery, M. Waycott, R. J. Orth, J. C. Zieman. Ecosystem service recovery trajectories in a restored eelgrass system. Marine Benthic Ecology Meetings. Norfolk, VA. March, 2012.
- Reynolds, L. K., K. J. McGlathery, M. Waycott, R. J. Orth, J. C. Zieman. High Eelgrass Genetic Diversity in Virginia is a Result of Disturbance and Restoration Using Seed. Coastal and Estuarine Research Federation 21th Biennial Conference. Daytona Beach, FL. Nov. 6-10. 2011
- Ruck, K. E., Steinberg, D. K.; Canuel, E. A. "Krill lipid dynamics along the Western Antarctic Peninsula". AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Seaglider deployment in the Ross Sea: advantages of glider platforms and preliminary results. European Glider Organization, Las Palmas, March, 2011.

- Shields, E.C., K.A. Moore, D.B. Parrish, R.J. Orth. Eelgrass survival within two contrasting systems in the mid-Atlantic: the critical role of summer temperature. Coastal and Estuarine Research Federation 21st Biennial Conference. Daytona Beach, FL. Nov. 6-10. 2011.
- Signorini, S.R., A. Mannino, M.A.M. Friedrichs, B. Cahill, 2011. Seasonal Variability of Surface Ocean pCO₂ and Air-Sea CO₂ flux in the Continental Shelf of the US East Coast. NASA Carbon Cycle and Ecosystems Joint Science Workshop, Alexandria, VA.
- Stanhope, J.W., I.C. Anderson, and M.J. Brush. 2011. Variation in photic area with climatic changes in a shallow estuary. 21st biennial conference of the Coastal and Estuarine Research Federation, Daytona Beach, FL.
- Steinberg D.K. "Long-term changes in the role of zooplankton in ocean biogeochemical processes" Sverdrup Award Lecture, AGU/ASLO Ocean Sciences, Salt Lake City, UT.
- Sumoski, S. and R. J. Orth. Through the belly of the beats: Can vertebrates do it? Coastal and Estuarine Research Federation 21st Biennial Conference. Daytona Beach, FL. Nov. 6-10. 2011.
- Tian, H., M. Liu, Q. Yang, M.A.M. Friedrichs, E. Hofmann, 2011. Exports of Water, Carbon and Nutrients to the U.S. East Coast during 1901-2008 as simulated by DLEM: Results from a NASA IDS Project. NASA Carbon Cycle and Ecosystems Joint Science Workshop, Alexandria, VA.
- Wilcox, D. J., R. J. Orth, K. A. Moore, J. R. Whiting, A. K. Kenne, A. L. Owens, L. S. Nagey, and D. Parrish. Monitoring submersed aquatic vegetation: techniques and applications in management in Chesapeake Bay, USA. Coastal and Estuarine Research Federation 21th Biennial Conference. Daytona Beach, FL. Nov. 6-10. 2011.

Recent BioSci Peer-reviewed Publications

- Bernard, K.S., **D.K. Steinberg**, O.M. Schofield, 2012. Summertime grazing impact of the dominant macrozooplankton off the Western Antarctic Peninsula. Deep-Sea Research I, 62: 111-122.
- Condon, R.H., **D.K. Steinberg**, P.A. del Giorgio, T.C. Bouvier, D.A. Bronk, H.W. Ducklow. 2011. Jellyfish blooms result in a major microbial respiratory sink of carbon in marine systems. Proceedings of the National Academy of Sciences. doi: 10.1073/pnas.1015782108.
- Dinniman, M.S., J.M. Klinck, and **W.O. Smith, Jr.** 2011. A model study of Circumpolar Deep Water on the West Antarctic Peninsula and Ross Sea continental shelves. Deep-Sea Research II 58: 1508-1523.
- Doney, S.C., M. Ruckelshaus, **J.E. Duffy**, J.P. Barry, F. Chan, C.A. English, H.M. Galindo, J.M. Grebmeier, A.B. Hollowed, N. Knowlton, J. Polovina, N.N. Rabalais, W.J. Sydeman, L.D. Talley. 2011. Climate change impacts on marine ecosystems. Annual Review of Marine Science 4:11-37.
- Ducklow, H. W., A. Clarke, R. Dickhut, S. C. Doney, H. Geisz, K. Huang, D. G. Martinson, M. P. Meredith, H. V. Moeller, M. Montes-Hugo, O. M. E. Schofield, S. E. Stammerjohn, **D. K. Steinberg**, and W. Fraser (2012). The Marine Ecosystem of the West Antarctic Peninsula. In: A. Rogers, N. Johnston, A. Clarke and E. Murphy (Editors), Antarctica: An Extreme Environment in a Changing World. Blackwell, London.
- Fragoso, G.M. and **W.O. Smith, Jr.** 2012. Influence of hydrography on phytoplankton distribution in the Amundsen and Ross Seas, Antarctica. Journal of Marine Systems 89: 19-29.

- Fransson, A., M. Chierici, P.L.Yager and **W.O. Smith, Jr.** 2011. Antarctic sea ice carbon dioxide system and controls. *Journal of Geophysical Research* 116, C10029, doi:10.1029/2009JC005954.
- Giordano, JP, **Brush, MJ**, Anderson, IC (2011). Quantifying annual nitrogen loads to Virginia's coastal lagoons: sources and water quality response. *Estuaries and Coasts* 34:297-309.
- Grossart, H.-P., K. Frindte, C. Dziallas, W. Eckert, and **K.W. Tang.** 2011. Microbial methane production in oxygenated water column of an oligotrophic lake. *Proceedings of the National Academy of Sciences* 108:19657-19661.
- Hardison, A, Tobias, C, Stanhope, J., Canuel, E., **Anderson, I.** (2011). An experimental apparatus for laboratory and field-based perfusion of sediment porewater with dissolved tracers. *Estuaries and Coasts* 34:243-255.
- Hardison, AK, **Anderson, IC**, Canuel, EA, Tobias, CR, and Veuger, B. (2011). Carbon and nitrogen dynamics in shallow photic systems: Interactions between macroalgae, microalgae, and bacteria. *Limnol. Oceanogr.* 56(4):1489-1503.
- Kendrick, G.A., M. Waycott, T.J. Carruthers, M.L. Cambridge, R. Hovey, S.L. Krauss, P.S. Lavery, D.H. Les, R.J. Lowe, O.M. Vidal, J.L. Ooi, **R.J. Orth**, D.O. Rivers, L. Ruiz-Montoya, E.A. Sinclair, J. Statton, J.K. van Dijk and J.J. Verduin. 2012. The central role of dispersal in the maintenance and persistence of seagrass populations. *BioScience* 62:56-65.
- Lake, S.J. and **M.J. Brush.** 2011. The contribution of microphytobenthos to total productivity in Narragansett Bay, Rhode Island. *Estuarine, Coastal and Shelf Science* 95:289-297.
- Liu, X. and **W.O. Smith, Jr.** 2012. A statistical analysis of the controls on phytoplankton distribution in the Ross Sea, Antarctica. *Journal of Marine Systems* 94: 135-144.
- Long, M.C., R.B. Dunbar, P.D. Tortell, **W.O. Smith, Jr.**, D.A. Mucciarone and G.R. DiTullio. 2011. Vertical structure, seasonal drawdown, and net community production in the Ross Sea, Antarctica. *Journal of Geophysical Research* 116, C10029, doi:10.1029/2009JC005954.
- Marion, S.R. and **R.J. Orth.** 2012. Seedling establishment in the eelgrass: seed burial effects on winter losses of developing seedlings. *Marine Ecology Progress Series* 448:197-207.
- McGlathery, K. J., L.K. Reynolds, L. W. Cole, **R.J. Orth**, S.R. Marion, and A. Schwarzschild. 2012. Recovery trajectories during state changes from bare sediment to eelgrass dominance. *Marine Ecology Progress Series* 448:209-221.
- Moore, K.A.**, E.C. Shields, D.B. Parrish, and **R.J. Orth.** 2012. Eelgrass survival in two contrasting systems: role of turbidity and summer water temperatures. *Marine Ecology Progress Series* 448:247-258.
- Orth, R.J.** and K.J. McGlathery. 2012. Eelgrass recovery in the coastal bays of the Virginia Coast Reserve, USA. *Marine Ecology Progress Series* 448:173-176.
- Orth, R.J.**, **K.A. Moore**, S.R. Marion, D.J. Wilcox, and D.B. Parrish. 2012. Seed addition facilitates eelgrass recovery in a coastal bay system. *Marine Ecology Progress Series* 448:177-195.
- Reynolds, L.K., M. Waycott, K. J. McGlathery, **R. J. Orth**, and J. C. Zieman. 2012. Eelgrass restoration by seed maintains genetic diversity: case study from a coastal bay system. *Marine Ecology Progress Series* 448:223-233.
- Saba, G.K., **D.K. Steinberg**, and D.A. Bronk (2011). The relative importance of sloppy feeding, excretion, and fecal pellet leaching in the release of dissolved carbon and

nitrogen by *Acartia tonsa* copepods. *Journal of Experimental Marine Biology and Ecology* 404: 47-56.

- Saba, G.K., **D.K. Steinberg**, D.A. Bronk, and A.R. Pace (2011). The effects of harmful algal species and food concentration on zooplankton grazer production of dissolved organic matter and inorganic nutrients. *Harmful Algae* 10(3): 291-303.
- Saba, V.S., **M.A.M. Friedrichs**, D. Antoine, R.A. Armstrong, I. Asanuma, M.J. Behrenfeld, A.M. Ciotti, M. Dowell, N. Hoepffner, K.J. W. Hyde, J. Ishizaka, T. Kameda, J. Marra, F. Mélin, A. Morel, J. O'Reilly, M. Scardi, **W.O. Smith Jr.**, T.J. Smyth, S. Tang, J. Uitz, K. Waters and T.K. Westberry. 2011. Estimating marine primary productivity in coastal and pelagic regions across the globe: An evaluation of satellite-based ocean color models. *Biogeosciences* 8: 489-503.
- Sedwick, P.N., C.M. Marsay, A.M. Aguilar-Islas, M.C. Lohan, B.M. Sohst, M.C. Long, K.R. Arrigo, R.B. Dunbar, M.A. Saito, **W.O. Smith** and G.R. DiTullio. 2011. Early-season depletion of dissolved iron in the Ross Sea polynya: Implications for iron dynamics on the Antarctic continental shelf. *Journal of Geophysical Research* 116, C12019, doi:10.1029/2010JC006553.
- Shields, E.C., **K.A. Moore** and D.B. Parrish. 2012. Influences of salinity and light availability on abundance and distribution of tidal freshwater and oligohaline submersed aquatic vegetation. *Estuaries and Coasts* 35: 515-526.
- Smith, W.O. Jr.**, D.G. Ainley, R. Cattaneo-Vietti and E.E. Hofmann. 2012. The Ross Sea continental shelf: Regional biogeochemical cycles, trophic interactions, and potential future changes. In: *Antarctic Ecosystems: An Extreme Environment in a Changing World* (A.D. Rogers, N.M. Johnston, E.J. Murphy and A. Clarke, Eds.). Chapter 7, Blackwell Publishing, London, pp. 213-242.
- Smith, W.O. Jr.**, E.E. Hofmann, and A. Mosby. 2012. Aquatic biogeochemistry - marine. In: *Encyclopedia of Sustainability Science and Technology* (R.A. Meyers, Ed.), Springer, doi:10.1007/978-1-4419-0851-3.
- Steinberg, D.K.**, M.W. Lomas, and J.S. Cope (2012). Long-term increase in mesozooplankton biomass in the Sargasso Sea: Linkage to climate and implications for food web dynamics and biogeochemical cycling. *Global Biogeochemical Cycles*. 26, GB1004, doi:10.1029/2010GB004026
- Wang, X., Y. Wang and **W.O. Smith, Jr.** 2011. The role of nitrogen on the growth and colony development of *Phaeocystis globosa* (Prymnesiophyceae). *European Journal of Phycology* 46: 305-314.

New Grant Activity within the Department

- Friedrichs, M. 2011-2012. Carbon budget calculations for the U.S. eastern continental shelf, in support of the new NASA Carbon Monitoring System. NASA. \$25,000
- Friedrichs, M. and C. Friedrichs, 2011-2012. U.S. IOOS Coastal Modeling Testbed: A Super-Regional Testbed to Improve Models of Environmental Processes on the U.S. Coasts. NOAA. \$55,000.
- Duffy, J.E. Effects of invasive macrofauna on marine biodiversity and ecosystem function. Australian Research Council: A\$180,000.
- Smith, W.O. Jr. 2011-2014. Collaborative Research: Impact of Mesoscale Processes on Iron Supply and Phytoplankton Dynamics in the Ross Sea. NSF; \$365,203.
- Anderson, I., M. Brush and M. Luckenbach. 2012 - 2014. Developing strategies to sustain hard clam aquaculture while minimizing impacts. VA SeaGrant. \$140,000.

- **Brush, M. and I. Anderson. 2012 - 2014. Forecasting watershed loading and lagoon response along the Delmarva Peninsula due to changing land use and climate. Virginia-Maryland-Delaware Regional Sea Grant Research. \$139,000.**
- **Moore, K. 2012-13. Study of Water quality conditions in Lower James River. VA Department of Environmental Quality, \$85,000.**
- **Moore, K. 2012-13. Evaluating estuarine condition in the NE Coastal and Barrier Network. National Park Service, \$125,000.**

Departmental Tidbits

- **Debbie Steinberg presented the American Geophysical Union's Sverdrup Award Lecture at the Ocean Sciences Meeting in Salt Lake City, Utah this February.**
- **Yongjin Xiao won two awards at the Marine Ecosystem Evolution in a Changing Environment (MEECE) Summer School in Ankara Turkey: the Best Student Presentation Award and the Best Group Presentation Award.**
- **Cathy Feng joined the Biological Sciences department in October 2011 as a post-doctoral investigator working with Marjy Friedrichs.**
- **J.J. Orth co-edited a special theme Section of MEPS on "Eelgrass recovery induces state changes in a coastal bay system" Volume 448, February, 2012.**
- **In January Marjy Friedrichs was invited to give a presentation to the Management Board of the Chesapeake Bay Program describing the Chesapeake Bay Hydrodynamical Modeling Workshop and the benefits of using multiple models in the Bay Program.**
- **Kam Tang was named Outstanding Limnology & Oceanography Reviewer in the February issue of ASLO Bulletin.**
- **Bob Diaz was appointed to the Outer Continental Shelf Scientific Committee of the Bureau of Ocean Energy Management and elected Vice-Chair.**
- **J.J. Orth was elected to the Gloucester County Board of Supervisors in November.**
- **Kam Tang is appointed co-chair of ASLO 2013 Aquatic Sciences Meeting in New Orleans, LA.**
- **Marjy Friedrichs organized the U.S. East Coast Carbon Cycle Synthesis Workshop at VIMS on January 19-20, 2012. Roughly 35 participants came together at VIMS to develop a carbon budget for the east coast of the U.S.**
- **Emmett Duffy co-led (with Brad Cardinale and Dave Hooper) the recent working group on "Biodiversity and the Functioning of Ecosystems: Translating Results from Model Experiments into Functional Reality" at the National Center for Ecological Analysis and Synthesis.**
- **Dr. Kim Bernard finished her post-doc with Debbie Steinberg's lab and has returned to South Africa.**
- **Debbie Steinberg was elected to the Council of The Oceanography Society (TOS), the governing body responsible for directing the affairs and determining the future of the Society.**
- **Emmett Duffy contributed to the National Climate Assessment's Technical Input Teams on (1) Oceans and Marine Resources (the first time oceans are being considered in the NCA), and (2) Biodiversity, Ecosystems, and Services.**
- **Walker Smith taught a course in Nha Trang, Viet Nam titled "Fluorescence in Oceanography".**
- **Emmett Duffy is leading the VIMS node of an NSF-funded collaborative "Distributed Biodiversity Graduate Seminar" involving several universities around the world.**



Stresses of graduate school can contribute to male pattern baldness.