

Environmental Science and Management Newsletter

Environmental Science & Management Program
Portland State University

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www.pdx.edu/esm

Congratulations 2009 ESM Grads!

The past academic year was a very productive and busy one for the ESM program. We graduated 14 undergraduates in Environmental Science and 14 in Environmental Studies. Six students completed their MS degree, nine completed the MEM, and three completed the PhD. Three students also completed their comprehensive exam for the PhD. We hired two new faculty members and three of our faculty were promoted to full professor. We have a growing research portfolio and we are teaching a record number of students.

Bachelor's in Environmental Science

Mark Correll	Galadriel Herdman
Brian Hageman	Bria Leslie
Kristopher Reidt	Tamara Linde
Rebecca Aaby	Lindsay Mayer
Samantha Barker	Caitlyn Peake
Shannon Byers	Hiroko Segawa
Lee Demick	Malcolm Staudinger

Bachelor's in Environmental Studies

Derek Abe	Christen Poynter
Henry Condron	Jaimee Reznicek
Joseph Ezell	Samuel Hall
Alexander Hutton-Tine	Laura Robinson
Ashley Kersey	Jessica Tishkoff
Amanda Lara	Jesse Treon
Micah Parsons	Jamie Valentine

Master of Science

Amanda Hillman	Ben Johnson
Kate Norton	Aricke Rouhe
Ashley Rudolph	Steve Wells

Master of Environmental Management

Brad Carter	Ashley Edwards
Sara Ennis	Anne Gire
Callie Hall	Sam Hartsfield
Vihn Mason	Justin Olexy
David Wickham	David Kennedy

PhD

Josh Caplan	Cody Jones
Fungai Mukome	



Dr. Rueter and Dr. Maser with some happy ESM graduates at the Rose Garden.

PSU Weekend ESM Alumni Event – Save the Date!

Environmental Science and Management Alumni Happy Hour! Thursday, Oct 8, 2009, 4:30 – 6:30 pm in Science Building 2, 2nd floor lounge. Come reminisce with old friends and meet new ones. No host bar. Hors d'oeuvres provided. For more info please contact Teri at 503/725-9856 or visit <http://www.pdx.edu/esm/esm-alumni>.

ALUMNUS PROFILE



GREG PRICE, BS 2006

Greg Price entered the Environmental Sciences Program in 2004 and chose the environmental studies track with a minor in business administration.

Greg chose business as the path to work on environmental problems; this spring he graduated from the PSU Graduate School of Business. In his own words, "Many of these issues, or the lack of a timely resolution to these issues, seemed in my mind to be directly related to the world of business and economics. I started to think and believe in a mantra constantly in the back of my mind; if we could bridge the gap between ecology and the economy and make environmentalism profitable then we could realize a critical mass of acceptance and implementation."

As part of his graduate education he participated in a collaborative project between Environmental Science and Management, the School of Business and Green Empowerment to examine the use of renewable energy in community development in Nicaragua.

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Catherine de Rivera Outstanding Researcher and Teacher in 2009

The Columbia River Chapter of Sigma Xi recognized Dr. Catherine de Rivera as the Outstanding Researcher in Environmental Science and Biology in 2009 at their annual dinner and awards ceremony on May 21.

Cat was recognized for the significance of her contributions to invasive species research and her development of a research program on road ecology. In a rare demonstration of the performance all faculty should strive for, Cat was also awarded the J.E. Allen

Departmental Teaching Award. The students in the department vote this award. Some of the comments from the students on here teaching were: "thinks big picture; provides input in many areas; truly interested; cultivates students; incredible mentor; can go to her for

advice even though not your advisor; great feedback; lots of effort into lectures; enthusiastic; open door; inspiring; engaging; organized; knowledgeable; creative; active; involved; brings in people from area; has time for you; engaging; great idea generator; excited; journal club advisor and it has expanded; full of great ideas, creative lessons; builds ESR community; paints big picture; displays enthusiasm; respects students. "



Pacific NW Sigma Xi Chapter President Linda Mantel (right) with Catherine deRivera.

Patrick Edwards Receives Departmental Service Award

The ESM department recognized the valuable and continuing contribution of Patrick Edwards by awarding him the Departmental Service Award. Patrick teaches primarily in the University Studies curriculum at PSU and therefore few ESM

undergraduate students have the opportunity to take his classes, which is to their disadvantage. Every quarter the department chair gets unsolicited emails from students in Patrick's classes praising his teaching ability. Patrick teaches at 0.7 of a full teaching load and is also working on his PhD with Dr. Pan.



Student Awards

In recognition of exceptional performance in a number of areas, students and faculty were recognized for exceptional performance in several areas during a departmental awards celebration on June 5, 2009.

Undergraduate Student Awards

Stephanie Houser – Barry Commoner Scholarship

Rebecca Aaby – Paul Croy Environmental Scholarship

Heather Spalding – ESM Environmental Sustainability Award

Malcolm Staudinger – Undergraduate Award for Science and Research

Graduate Student Awards

Josh Caplan – President’s Award for Outstanding Community Engagement

Zoe Rodrigues del Rey and **Kate Norton** – Outstanding Graduate Student Teaching Award

Brian Fletcher and **Leslie Bliss-Ketchum** – Graduate Award for Departmental Service

Chris Parker and **Josh Caplan** – Graduate Award for Science and Research



Rebecca Aaby



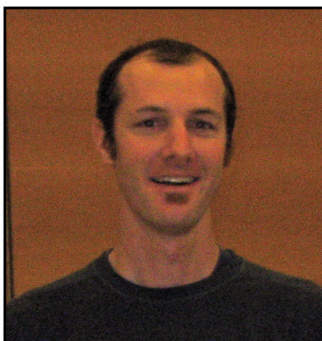
Josh Caplan



Chris Parker



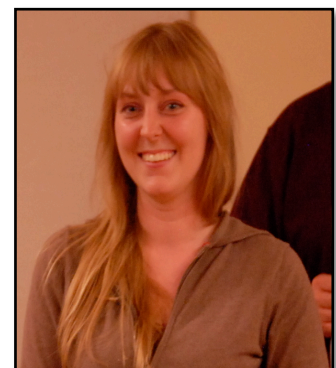
Kate Norton and Zoe Rodrigues



Brian Fletcher



Stephanie Houser



Heather Spalding



Malcolm Staudinger



Leslie Bliss-Ketchum

ESM Summer 2009 Research

Mark Sytsma and students and staff at the Center for Lakes and Reservoirs and the Aquatic Bioinvasion Research and Policy Institute will be sampling lakes, rivers, and streams in Teton National Park, California, Nevada, and the Columbia River Basin for aquatic invasive species; monitoring water quality in Diamond Lake and Waldo Lake; finishing up a year long study of the nutrient budget of Siltcoos Lake; surveying for invasive spartina on the Oregon coast; assisting the Oregon Department of Agriculture on aquatic weed management; studying impacts and developing nutria management strategies; determining quagga mussel requirements for calcium at Lake Mead; conducting a risk analysis for dreissenid mussels in the Columbia River basin, conducting a literature review of antifouling coatings to mitigate invasive mussel impacts; working on biocontrol of purple loosestrife; characterizing the role of hull fouling on commercial, fishing, and recreational vessels in transport of aquatic invasive species; looking for diseased frogs at Denali National Park; studying goose populations in the Yukon delta; completing work on a manual of aquatic plants of Alaska; and continuing to work with the Oregon Invasive Species Council.

Jeff Gerwing (new ESM faculty member) will be developing studies of the effectiveness of road closures and the implementation of plantation stand thinning protocols on the Mount Hood National Forest. He will also be working with the University Studies Program to enhance and expand the opportunities for PSU students to study sustainability as part of their general education requirements at PSU.

Alan Yeakley will have students conducting research on invasive plant ecology and management in Columbia River bottomlands (Tina Farrelly, Sarah Shewell), on stream restoration (Tess Chadil, Denisse Fisher), and on alpine tree regeneration (Adelaide Johnson).

Dave Ervin is conducting research on ecosystem services and sustainability, university-industry research relationships, and business environmental management. Recent journal articles include "Research Choice and Finance in University Bioscience," *Southern Economic Journal*, and "Motivations for Voluntary Environmental Management" in the *Policy Studies Journal*. He is project director of a Miller Foundation award entitled "Ecosystem Services and Sustainability: Analyzing Changes from the Marmot Dam Removal," collaborating with Elise Granek, Alan Yeakley and several other PSU faculty. He also leads a National Science Foundation proposal with Elise, Alan and other PSU faculty entitled "Sustaining Ecosystem Services to Support Rapidly Urbanizing Areas." He is preparing two book manuscripts: "University-Industry Research Relationships in Agricultural Biotechnology" for the MIT Press, and "The New Economics of Green Business" for Earthscan.

Yangdong Pan and his students will be examining benthic diatom assemblages to determine if they can be used to assess environmental conditions in large rivers in Oregon. They will also test the effects of fine sediments and nutrients on several biological metrics using artificial streams in the *Columbia River Research Laboratory*, Cook, Washington.

Marion Dresner will be starting a new study about the value of doing fieldwork on pre-college students' stewardship attitudes, understanding about ecological interactions, and interest in ecological science. She is also starting a new project, working with a colleague at OSU and teacher partners, to analyze data from Forest Park about litter decomposition, forest fragmentation and tree and moth

phenology and comparing this to parallel studies from the Cascades (H.J. Andrews LTER).



Pat Edwards setting up artificial streams at Columbia River Research Lab.

ESM 2009 Research Continued

Linda George and her research group will be conducting field studies in the Columbia River Gorge and in the I-205 corridor and laboratory studies on NO₂ microsensor optimization and NO₂ flux measurements from urban surfaces. Her field studies will be conducted in collaboration with Dr. Vivek Shandas (UPA) and Dr. Julie Fry (Reed).

Elise Granek and her students' lab will be busy this summer working on four different projects (on 4 continents!). Here in Oregon Zoe Rodriguez del Rey will be continuing with caffeine sampling in the freshwater and at the mouths of five coastal rivers to examine caffeine contamination in Oregon's rocky intertidal habitat and Charissa Stair will be sampling of mussels and algae to quantify pesticide contamination in these intertidal foundation species. Granek will be mentoring two Murdock Partners in Science teachers on Oregon Coast projects: Brian Fain will be sampling mussels, macroalgae, and sediments to examine whether pharmaceutical contamination is affecting Oregon's rocky shores and Meg Griffith will be collecting sediment to examine deposition of pesticides in coastal marine sediments. In Belize, Heather Hayden will continue sampling mangrove seedlings at Turneffe Atoll to examine differences in growth rates between seedlings in cleared and intact areas- and to identify factors limiting seedling growth in clearings. In the Comoros Islands, Sarah Freed will be tagging coral recruits, surveying coral reefs exposed to varying levels of human use, and interviewing community members on their perceptions and uses of coral reef resources. Finally, Choo Chee Kuang will be starting his field research in Malaysia, examining ecological characteristics of potential marine areas for inclusion in a Special Conservation Area in the Pulai River Estuary.

Catherine de Rivera and her students will be assessing control methods of invasive green crabs in Bodega Harbor, California; beginning a new citizen science project engaging residents of Bolinas, California, in a project removing invasive green crabs from their lagoons; assessing the effectiveness of under-road passage structures for a variety of vertebrates on the Boeckman Road extension in Wilsonville, OR; mentoring REU fellow Anne Phillip and involving her in field and lab work for several marine ecology research projects including research on the impacts of the invasive isopod *Sphaeroma quoianum* on styrofoam floats and recipient ecosystems; starting to develop methods and tools to assess how viable under-road structures in Portland are for animal passage and how they could be modified to improve habitat connectivity; studying the biotic resistance to, and impacts by, invasive green crabs; planning and conducting research describing how the interactive effects of environmental factors and butterfly behavior affect road mortality of the federally listed Oregon Silverspot Butterfly and using this information to identify the best mitigation measures for reducing vehicle-caused mortality on US 101; developing procedures for identifying which planned Oregon's State Transportation Improvement Projects should be targeted for improvements for habitat connectivity; and presenting and co-leading a workshop on crab control at the International Marine Bioinvasions Conference at PSU in August.

Post doctoral research associate Ian Davidson collecting fouling organisms from the propeller in Ketchikan Harbor, Alaska, in a study of the role of fishing and recreational vessels in the transport of invasive species.



New Faculty Join ESM

Jeff Gerwing



Dr. Jeffrey Gerwing has been studying forest management and restoration in the Brazilian Amazon and the Pacific Northwest for the past 15 years. For the past three years he has been working with the Clackamas Stewardship Partners (<http://www.clackamasstewardshippartners.org/>) to develop and plan ecosystem restoration projects on the Mt Hood National Forest.

He is currently chair of the Monitoring and Research Committee whose charge is to provide information on restoration project implementation and effectiveness. He is particularly interested in using an adaptive management approach to resolve controversies over ongoing restoration projects and to improve the implementation and effectiveness of future projects. His current work includes studies of the effectiveness of different approaches to road closure, the effectiveness of created forest openings to provide wildlife forage, and a comparison of the economic benefits of ecosystem restoration projects and traditional timber sales.

Dr. Gerwing is also working with PSU faculty to develop sustainability learning outcomes for PSU's general education program and to increase the offerings of sustainability available to PSU students.

Robert Scheller



Dr. Robert Scheller grew up in Minnesota, near Minneapolis. He received a B.S. at the University of Minnesota and work then worked at the US EPA in Duluth, MN as a fish biologist. He subsequently received his M.S. and Ph.D. in Forest Ecology at the University of Wisconsin-Madison. He has worked at the Conservation Biology Institute in Corvallis, OR for the past two years.

The principle focus of Rob's research is forest landscape change due to climate change, development and fragmentation, forest management, wildfire, and insect outbreaks. He explores how these multiple interacting drivers affect species composition and forest carbon and nitrogen cycles. Rob develops and applies forest landscape models to examine such broad-scale interactions and project future landscape change. Ultimately, his research informs how landscapes can be managed to sustain ecosystem services. He has studied forest landscape dynamics across North America and Asia.

Outside of research and teaching, Rob and his partner enjoy exploring the Pacific Northwest, camping, skiing, hiking, etc. They have lived in downtown Portland for the past year and are budding enthusiasts of the Portland lifestyle.

Aquatic Bioinvasion Research and Policy Institute Hosts International Conference

Over 150 scientists from around the world will converge at PSU on August 24-27, 2009 to discuss the latest research and management of invasive marine species at the 6th International Marine Bioinvasions Conference. The conference is held every two years; the previous conference was at MIT. There will be oral and poster presentations, special sessions on green crabs, shipping as a vector of introduction, and invasive spartina and seaweeds. Following the conference there will be a joint meeting of the invasive species working groups of the International Council for the Exploration of the Seas and the North Pacific Marine Science Organization. A social evening is also planned at the Chinese Garden. See www.clr.pdx.edu/mbic for further information.



Alumnus Profile Continued

Greg has been working in the wind industry for about seven years. He recently started an independent venture with several partners from the graduate school of business called New Roots (www.newrootsenergy.com). New Roots provides renewable energy consulting services to professionals in the renewable energy industry. They have just released an energy production and financial forecasting model called WindCast, which is unique to the market and is becoming a valuable tool for dealers/installers, state incentive and energy programs, as well as end users.



ESM alumnus Greg Price (front) installing a wind turbine.

Support ESM by donating now

In this time of tightening budgets we are increasingly dependent upon alumni giving for student support and recognition, mailings, etc.

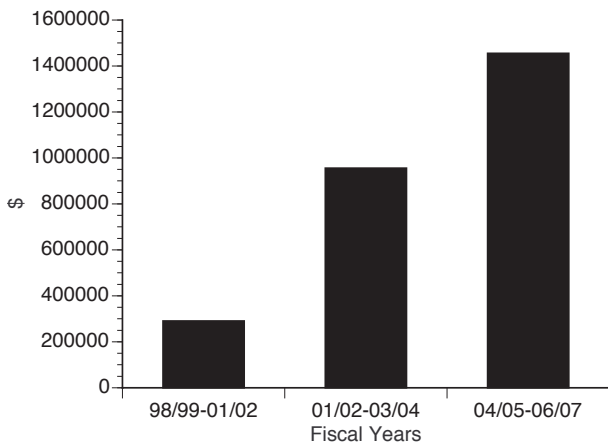
You can make a donation by clicking on this



on the ESM webpage (www.pdx.edu/esm). **Be sure to designate Environmental Science and Management as the designation for your donation – and thanks from all of us in ESM at PSU.** Thank you for your support!

Research Grows in ESM

Research in ESM has increased 500% in the past decade. The figure below shows 3-year average annual research expenditures by faculty in Environmental Science and Management at PSU. Research expenditures increased from an average of about \$300,000/year in the 98/99 - 01/02 period to nearly \$1.5 million in the 04/05 - 06/07 academic year period. The increase in research activity translates into more opportunities for students, increased publication rates, and an enhanced profile for the program.



John Rueter Named Interim Director of School of the Environment

John Rueter was named the interim director of the new School of the Environment at PSU. The School includes the Environmental Science and Management Program, Geology and Geography, as well as affiliated faculty from across campus. The School will coordinate joint, departmental undergraduate degree offerings and house the Environmental Science and Resources PhD program. It will also facilitate collaboration on research to address complex environmental problems that require multidisciplinary, multi-investigator teams to develop solutions.

Rueter is currently developing operating by-laws for the School. The by-laws will describe how the School operates, how faculty outside the three participating departments can be affiliated with the School, and how the ESR PhD degree program will be administered.



Diamond Lake in winter

Recent Publications by ESM Faculty and Students

- Gillett, N. Y. Pan, C. Parker. 2009. Should only live diatoms be used in the bioassessment of small mountain streams? *Hydrobiologia* 620:135-147.
- Stevenson, R. J., Y. Pan, K. Manoylov, C. Parker, D. Larsen, and A. Herlihy. 2008. Development of diatom indicators of ecological condition for streams of the Western United States. *Journal of North American Benthological Society* 27:1000-1016.
- Weilhoefer, C. L. and Y. Pan. 2008. Using change-point analysis and weighted averaging approaches to explore the relationships between common benthic diatoms and in-stream environmental variables in Mid-Atlantic Highlands streams, USA. *Hydrobiologia* 614:259-274.
- Weilhoefer, C. L., Y. Pan, and S. Eppard. 2008. The effects of river floodwaters on floodplain wetland water quality and diatom assemblages. *Wetlands* 28:473-486.
- Parra, J. and L. George. 2009. Atmospheric pressure laser-induced fluorescence determination of ambient levels of NO₂. *Applied Optics* 48 (18), 3355-3361.
- George, L. and J. Brenner. In Press. Increasing scientific literacy about global climate change through a laboratory-based feminist science course. *Journal of College Science Teaching*.
- Shandas, Vivek and Linda George. 2009. Neighborhood, Neighborhood, Neighborhood: Spatial Patterns of Air Toxins and Implications for Metrocape Residents and Urban Planners. *Metrocape*, Winter, 2009.
- Meka, D., L. George, and S. Prasad. 2009. Polymer nanocomposite based electrical nitrogen dioxide gas sensor. *Journal of the Association of Laboratory Automation*, No. 4, 69-75.
- Granek, E.F*, J.E. Compton, and D. Phillips. 2009. Mangrove-exported nutrient incorporation by sessile invertebrates on adjacent coral reefs. *Ecosystems* 12: 462-472.
- Koch, E.W., E.D. Barbier, B.R. Silliman, D.J. Reed, G.M.E. Perillo, S.D. Hacker, E.F. Granek, J.H. Primavera, N. Muthiga, S. Polasky, B.S. Halpern, C.J. Kennedy, E. Wolanski, C.V. Kappel. 2009. Non-linearity in ecosystem services: temporal and spatial variability in coastal protection. *Frontiers in Ecology and the Environment* 7: 29-37.
- Granek, E.F., E.M.P. Madin, M.A. Brown, W. Figueira, D.S. Cameron, Z. Hogan, G. Kristianson, P. de Villiers, J. E. Williams, J. Post, S. Zahn and R. Arlinghaus. 2008. Engaging recreational fishers in management and conservation: global case studies. *Conservation Biology* 22 (5): 1125-1134.
- Granek, E.F. and B.I. Ruttenberg. 2008. Changes in biotic and abiotic processes following mangrove removal. *Estuarine, Coastal & Shelf Science* 80: 555-562.
- Jenkins, N.J., Yeakley, J.A. and Stewart, E.M. 2008. First-year responses to managed flooding of lower Columbia River bottomland vegetation dominated by *Phalaris arundinacea*. *Wetlands*. 4: 1018-1027.
- Yeakley, J.A. 2008. An expanding ribbon of native green? [Book review] *Ecology* 89: 594-595.
- Beckage, B., Kloeppel, B. D., Yeakley, J. A., Taylor, S. F., Coleman, D. C. 2008. Differential effects of understory and overstory gaps on tree regeneration. *The Journal of the Torrey Botanical Society* 135: 1-11.
- Pennington, T. and M.D. Sytsma. 2009. Seasonal changes in carbohydrate and nitrogen content of *Egeria densa* from populations in Oregon and California. *Invasive Plant Science and Management*. 2:120-129.
- Simkanin, C., I. Davidson, M. Falkner, G. Ruiz, and M. Sytsma. 2009. Intra-coastal ballast water flux and the potential for secondary spread of non-native species on the U.S. West Coast. *Marine Pollution Bulletin* 58: 366-374.

Recent Publications Continued

- Davidson, I., L. McCann, M. Sytsma, and G. Ruiz. 2008. Interrupting the vector stage of a multi-species transfer: the efficacy of in-water cleaning for removing biofouling on obsolete vessels. *Marine Pollution Bulletin* 56: 1538-1544.
- Sytsma, M.D. 2008. Introduction: workshop on submersed aquatic plant research priorities. *Journal of Aquatic Plant Management* 46: 1-7.
- Cordell, J.R., S.M. Bollens, R. Draheim, M. Sytsma. 2008. Asian copepods on the move: recent invasions in the Columbia–Snake River system, USA. *ICES Journal of Marine Science* DOI: 10.1093/icesjms/fsm195.
- Bersine, K., V.E. Brenneis, R.C. Draheim, A.M.W. Rub, J.E. Zamon, R.K. Litton, S.A. Hinton, M.D. Sytsma, J.R. Cordell, and J.W. Chapman. 2008. Distribution of the invasive New Zealand mudsnail (*Potamopyrgus antipodarum*) in the Columbia River Estuary and its first recorded occurrence in the diet of juvenile Chinook salmon (*Oncorhynchus tshawytscha*). *Biological Invasions*, DOI 10.1007/s10530-007-9213-y.
- Davidson, I.C., L.D. McCann, P.W. Fofonoff, M.D. Sytsma, and G. Ruiz. 2008. Assessing the potential for hull-mediated species transfers by obsolete ships on their final voyage. *Diversity and Distributions* 14(3):518-525.
- Hanson, E. and M.D. Sytsma. 2008. The potential for mitten crab, *Eriocheir sinensis* H. Milne Edwards, 1853 (Crustacea: Brachyura), invasion of Pacific Northwest and Alaskan estuaries. *Biological Invasions* 10: 603-614.

New Stream Insect Book Available

In 2008, Patrick Edwards published "*Stream Insects of the Pacific Northwest*", a field guide to insects commonly found in small, wadeable streams and rivers. The 43-page guide, published by Freshwater Illustrated, contains over 250 color images and descriptions of 7 orders and 31 families of insects and 3 non-insect groups.

The guide is intended for educators, citizen monitoring groups or students interested in field-identification of live stream insects. To facilitate this, each insect is shown at scale with accompanying images and descriptions of key identification features that can be easily seen with the naked eye or with a magnifying lens. Also included is a description of each insects' ecological characteristics and tolerance to water pollution.

All proceeds from the guide are used to support teaching, community education and the development of non-lethal techniques for bio-assessment. Contact Patrick at Patrick.edwards@pdx.edu or 503-725-8303 if you would like to purchase a copy (\$25).

