

## **Kate S. Boersma**

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### **EDUCATION**

- 2013, Ph.D. Zoology, Oregon State University, Corvallis, OR  
Committee: David Lytle (Adviser), Selina Heppell, Alix Gitelman, Stevan Arnold, Russ Ingham  
Dissertation title: Direct and indirect effects of drought on aquatic invertebrate communities in fragmented arid-land streams
- 2007, M.S. Fisheries Science, Oregon State University, Hatfield Marine Science Center, Newport, OR.  
Advisors: Selina Heppell and Clifford Ryer
- 2001, B.A. Environmental Science, Spanish, Northwestern University, Evanston, IL.
- 1999, Universidad Nacional Autónoma, Heredia, Costa Rica, C.A., Study Abroad

### **PEER REVIEWED PUBLICATIONS**

#### *Published or in press:*

- Boersma, K.S. and D.A. Lytle. Long distance drought escape behavior in a flightless aquatic insect, *Abedus herberti* (Hemiptera: Belostomatidae). *Southwestern Naturalist*.
- Beck, C., Middendorf, G., Tysor, C.S., and K.S. Boersma. The changing face of leadership in the Ecological Society of America: Women and minorities in ecology. *Frontiers in Ecology and the Environment*.
- Bogan, M.T., Boersma, K.S., and D.A. Lytle. Increasing drought variability generates novel aquatic invertebrate communities: Insights from long-term studies in an arid-land stream system. Invited contribution to *Freshwater Biology* Special Issue "Extreme Climatic Events: Impacts on Freshwater Ecosystems" edited by M. Ledger and A. Milner.
- Schriever T.A., Bogan M.T., Boersma K.S., Cañedo-Argüelles M., Jaeger K.L., Olden J.L. and D.A. Lytle. Hydrology shapes taxonomic and functional structure of desert stream invertebrate communities. *Freshwater Science*.
- Boersma, K. S., M. T. Bogan, B. A. Henrichs, and D. A. Lytle. 2014. Invertebrate assemblages of pools in arid-land streams have high functional redundancy and are resistant to severe drying. *Freshwater Biology* **59**:491-501.
- Boersma, K. S., M. T. Bogan, B. A. Henrichs, and D. A. Lytle. 2014. Top predator removals have consistent effects on large species despite high environmental variability. *Oikos* **123**:807-816.
- Bogan, M.T., Boersma, K.S., and D.A. Lytle. 2013. Flow intermittency alters longitudinal patterns of invertebrate diversity and assemblage composition in an arid-land stream network. *Freshwater Biology* **58**: 1016-1028.
- Bogan, M.T. and K.S. Boersma. 2012. Aquatic invertebrate aerial dispersal traits along and inland from aridland streams. *Freshwater Science* **31**: 1131-1144.
- Ryer, C.H., Boersma, K.S. and T.P. Hurst. 2012. Growth and distributional correlates of behavior in three co-occurring juvenile flatfishes. *Marine Ecology Progress Series* **460**: 183-193.
- Boersma, K.S., Ryer, C.H., Hurst, T.P., and S.S. Heppell. 2008. Influences of divergent behavioral strategies on risk allocation in three species of north Pacific flatfishes. *Behavioral Ecology and Sociobiology* **62**(12): 1959-1968.
- Ryer, C.H., Lemke, J.L, Boersma, K.S., and S.J. Levas. 2008. Adaptive coloration, behavior and predation vulnerability in three juvenile north Pacific flatfishes. *Journal of Experimental Marine Biology and Ecology* **359**(1): 62-66.

#### *In review or in revision:*

- Boersma, K.S., Dee, L.E., Miller, S.J., Bogan, M.T., Lytle, D.A., and A.I. Gitelman. Linking multidimensional functional diversity to ecological theory: A graphical hypothesis-driven framework.
- Cañedo-Argüelles M., Boersma, K.S., Bogan M.T., Olden, J.D., Phillipsen I., Schriever, T.A., and D.A. Lytle. Dispersal strength determines meta-community structure in a dendritic riverine network.
- Piacenza, S.H., Barner, A., Benkwitt, C., Boersma, K.S., Cerny-Chipman, E., Ingemann, K., Kidinger, T., Lindsley, A., Nelson, J., Reimer, J., Rowe, J., Shen, S., Thompson, K., Thurman, L. and S.S. Heppell. Complex patterns and variation of benthic biodiversity a large marine ecosystem.

#### *In prep:*

- Dee, L.E., Boersma, K.S. and S. Miller. A new metric to calculate functional resistance in natural communities.

**FELLOWSHIPS AND RESEARCH GRANTS**

- Boersma, K.S., Oregon State University Zoology Research Fund, 2009-2013, Top predator extinctions affect community structure and ecosystem functioning, \$2800
- Ganio, L.M., Lachenbruch, B., Boersma, K.S., and Kavanaugh, M.T., NSF ADVANCE Subaward, Women in Science FORWARD to Professorship, 2011, \$9,995. This grant financed a three-day career advancement workshop for women postdocs and early faculty in biology, ecology and earth sciences disciplines in April 2012. Fellow student Maria Kavanaugh and I wrote the proposal, and Drs. Lisa Ganio and Barbara Lachenbruch provided revisions and logistical support
- Boersma, K.S., National Park Service George Melendez Wright Climate Change Fellowship, 2010, Climate-induced top predator extinctions affect aquatic community structure in arid headwater streams, \$8,693
- Boersma, K.S., World Wildlife Fund Fuller Doctoral Fellowship, 2010, Arid headwater stream community ecology, \$15,000
- Boersma, K.S., American Museum of Natural History Theodore Roosevelt Memorial Fund, 2009, Interactive effects of habitat fragmentation and top predator removal on community structure in arid headwater streams, \$1,500
- Boersma, K.S., Sigma Xi, 2009, Interactive effects of habitat fragmentation and top predator removal on community structure in desert streams, \$400
- Boersma, K.S. and Ryer, C.H., Markham First Year Student Award, 2005, Foraging and predation risk in flatfishes, \$10,000

**AWARDS***Best presentations:*

- Murray F. Buell Award for Excellence in Ecology, Ecological Society of America, 2012, \$1200
- Best Student Presentation, Ecological Society of America, Aquatic Section, 2012, \$300
- Best Student Presentation, Desert Fishes Council Meeting, 2010
- Best Presentation, Biology Graduate Student Symposium, 2009

*Merit-based awards:*

- Oregon State University Zoology *Castor canadensis* award for Outstanding Departmental Service, 2013, \$200
- Herbert F. Frolander Award for Outstanding Graduate Teaching Assistant, 2012, \$1000
- Oregon Lottery Scholarship, 2012, \$5000

*Competitive travel awards:*

- Ecological Society of America, Aquatic Ecology Section, Student Travel Award, 2013, \$300
- Ecological Society of America, Southwest Chapter, Student Travel Award, 2013, \$350
- OSU Graduate School Travel Award, 2013, \$500
- OSU College of Science Student Travel Award, 2011, \$500
- Biodiversity and Management of the Madrean Archipelago III Meeting Travel Award, 2012, \$500
- Student Travel Award, Desert Fishes Council Meeting, 2010, \$200
- Ecological Society of America, Aquatic Ecology Student Travel Award, 2008, \$200
- Desert Fishes Council, Student Travel Award, 2008, \$200
- Ecological Society of America, Student Travel Award, 2008, \$200

**SELECTED CONFERENCE PRESENTATIONS (a total of 21 during graduate studies)**

- Boersma, K.S., Bogan, M.T., Dee, L.E., Miller, S. and D.A. Lytle. *Ecological Society of America*, August 5-9, 2013, Minneapolis, MN
- Boersma, K.S., Bogan, M.T., and Lytle, D.A. *Society for Freshwater Science*, May 20-24, Jacksonville, FL
- Boersma, K.S., Bogan, M.T., Henrichs, B.A., and D.A. Lytle. *Ecological Society of America*, August 5-10, 2012, Portland, OR
- Boersma, K.S., Bogan, M.T., and Lytle, D.A. *Society for Freshwater Science*, May 20-24, Louisville, KY
- Boersma, K.S., Bogan, M.T., and Lytle, D.A. *Biodiversity and Management of the Madrean Archipelago III Meeting*, May 1-5, 2012, Tucson, AZ
- Boersma, K.S., Bogan, M.T., and Lytle, D.A. Invited presentation, *Pacific Branch of the Entomological Society of America*, March 27, 2012
- Boersma, K.S., Bogan, M.T., and Lytle, D.A. *Desert Fishes Council Meeting*, November 9-11, 2011, Hermosillo, Sonora, Mexico

Boersma, K.S., Lytle, D.A., and Bogan, M. T. *Ecological Society of America*, August 7-12, 2011, Austin, TX  
 Boersma, K.S., Lytle, D.A., and Bogan, M. T. *North American Benthological Society*, May 22-27, 2011, Providence, RI  
 Boersma, K.S. and Lytle, D.A. *The 2011 George Wright Society Biennial Conference on Parks, Protected Areas, and Cultural Sites: Rethinking Protected Areas in a Changing World*, March 14-18, 2011, New Orleans, LA  
 Boersma, K.S. and Bogan, M. T. *Desert Fishes Council Meeting*, November 18-21, 2010, Moab, UT  
 Boersma, K.S. and Lytle, D.A. *North American Benthological Society*, June 6-10, 2010, Santa Fe, NM  
 Boersma, K.S. and Lytle, D.A. *Ecological Society of America*, August 3-7, 2009, Albuquerque, NM  
 Boersma, K.S., Ryer, C.H., Hurst, T.P., and Heppell, S.S. *Ecological Society of America*, August 3-8, 2008, Milwaukee, WI

## GUEST LECTURES AND INVITED PRESENTATIONS

Departmental seminar, Department of Zoology, OSU, "Top predator extinctions in arid-land streams: Do classic ecological principles hold under extreme environmental conditions?", March 2013  
 Departmental seminar, Department of Fish and Wildlife, OSU, "Top predator extinctions in arid-land streams: Do classic ecological principles hold under extreme environmental conditions?", January 2013  
 Z477/577 Aquatic entomology, OSU, "Drought in aquatic systems," February 2012  
 FW107 Introduction to Fisheries and Wildlife, OSU, "Tales of an aquatic ecologist," November 22, 2011  
 BI370 Ecology, Department of Biology, University of Puget Sound, "Species interactions and trophic cascades," August 2011  
 Departmental seminar, University of Puget Sound, "Predicting the consequences of top predator loss in fragmented aridland streams", August 2011  
 Stream Team, OSU, "Predicting the consequences of top predator loss in fragmented arid-land streams," January 2011  
 Public Presentation, "Toe-biters in the Chiricahuas: cannibalism, dispersal and climate change," Southwestern Research Station, Portal, AZ, June 2010  
 Z477/577 Aquatic entomology, OSU, "Dispersal in aquatic organisms," January 2011  
 Z477/577 Aquatic entomology, OSU, "Trophic ecology," February 2011  
 AHE599 GTA Training and Development, OSU, "Engaging students using iClicker," October 2010

## SERVICE AND OUTREACH ACTIVITIES

### *Professional service:*

Organizer, Ecological Society of America Organized Oral Session, "Community-structuring Processes in Fragmented Freshwater Habitats: A Synthesis Across Scales and Systems", August 7, 2013, <http://bit.ly/19p0LTV>.  
 Awards committee member, American Naturalist Student Research Award, 2011-2013.  
 Advancing Toward Professorship in Biology, Ecology and Earth System Sciences (ATPinBEES) Committee Chair, 2011-present: I led a committee of 6 women in administering a NSF subaward to develop a 2-day professional development workshop for postdocs and early faculty. Our workshop took place April 9-11, 2011, and welcomed 33 women from around the country for a program that included skills development sessions and a mock tenure panel. This extremely rewarding task entailed a commitment of ~10h/wk for 8 months and culminated in a poster presentation at a national meeting and a manuscript in preparation. The complete program can be found at: <http://atpinbeess.forestry.oregonstate.edu/>.  
 Reviewer for: *The American Naturalist, Ecological Applications, Limnology and Oceanography, Journal of Applied Ichthyology, Biodiversity and Conservation, Marine Biology, Freshwater Science*  
 Book proposal review: *What Editors Want: An Author's Guide to Journal Publishing*, University of Chicago Press, 2010  
 Student liaison, American Society of Naturalists, 2010-2012

### *University service:*

Member, NSF Dimensions in Biodiversity Distributed Graduate Seminar, 2011-present  
 Committee member, Curriculum Committee, 2011-2012  
 Committee chair, Graduate Student Invited Speaker Committee, 2010  
 Committee member, Graduate Student Invited Speaker Committee, 2007-2009  
 Participant, Oregon Women in Higher Education Conference, 2009  
 Volunteer, Ecological Society of America Meeting, 2008  
 Founder, Oregon State University's Women in Science organization, 2007. OSU WIS provides support and professional development for students, staff and faculty working in diverse scientific disciplines at the university. After 5 years, the organization boasts a membership of over 200, and is coordinated by an elected executive board.

Moderator, Oregon Branch American Fisheries Society Meeting, 2006

*Outreach:*

Science and Nature in Tandem for Youth (SANITY), Tucson High Magnet School, 2008-Present. I mentor students participating in a 10-day internship program held every summer at the Southwest Research Station, Portal, AZ.

Students learn basic field study techniques and protocols, develop a research question, design and execute a field study, and present their results to an audience of peers and scientists.

**TEACHING EXPERIENCE**

Instructor, GRAD599 Special Topics in Teaching and Learning, Fall Term 2013

Teaching Assistant, Z477/577 Aquatic Entomology, Winter Term, 2011, 2012, 2013

Co-Instructor, Z599 Scientific Teaching and Laboratory Design, Winter Term, 2011

Instructor, Z341 Human Anatomy and Physiology, Fall Term, 2010, 2012

Mentor Teaching Assistant, BI21X Introduction to Biology, Fall and Winter Terms, 2009, 2010

Teaching Assistant, BI21X Introduction to Biology, Fall 2007, Winter 2008

Lead Instructor, Pacific Marine Science Camps, Oregon Museum of Science and Industry, 2002-2005

**ADDITIONAL TEACHING COURSEWORK AND ACCOMPLISHMENTS**

Winter 2013-present, Graduate Teaching Assistant, Oregon State University Graduate School appointment, working with the Dean of the Graduate School to develop a new Graduate Certificate in College and University Teaching, including constructing application materials, publicizing the certificate to current graduate students, reviewing applications, designing orientation materials, and welcoming the inaugural cohort Fall 2013.

Fall 2011, In conjunction with Dr. Devon Quick and graduate student Lindsay Biga, I redesigned the electromyography curricula for the Z341 Human Anatomy and Physiology course. The new material allows students to learn a procedure and then apply their learning to create and test hypotheses on the relationship between muscle function, force and electromyogram output.

April 15, 2011, OSU Center for Teaching and Learning Workshop, Bill Robertson, "Engaging Students to Promote Critical Thinking", Corvallis, OR

April 2, 2011, Willamette Valley Biological Education Network Workshop, "New Biology: From Courses to Competencies", Gresham, OR

Fall 2009, Along with another graduate student, I developed a new inquiry-based Scientific Methods Laboratory for the Biology 212 series. In this teaching unit, students learn about the scientific method by inventing, designing and carrying out an experiment during the laboratory period. It includes activities directed at multiple learning styles and involves both self-assessment and peer evaluation. The lab was tested with a subset of students during summer 2010 and was implemented program-wide in January 2011 for a total enrollment of 1200 undergraduates.

Fall 2009-Winter 2010, Mentor Teaching Assistant for the Introductory Biology 200 series. In this invited role, I helped new teaching assistants gain skills for engaging students, creating a welcoming classroom environment, and developing curricula to foster diversity in the classroom.

Fall 2009, Z599 Scientific Teaching and Laboratory Design

Winter 2009, AHE507 GTA Training and Development

Winter 2008, MB699 Success in the College Classroom

October 17, 2008, Center for Teaching and Learning Workshop, "Learning Styles and Learning Perspectives"

March 14-15, 2004, Participant, "Workshop for Coordinating and Advancing Field-Based Marine Science Education in Puget Sound: Creating a vision for the future." Seattle, WA

November 2003, Designed new high school science programming for the Oregon Museum of Science and Industry, including a week-long field course, Island Biogeography

**ADDITIONAL RESEARCH EXPERIENCE**

*Coordinator, San Juan Island Research Team, San Juan Island, Washington, 2004.* Planned and supervised high school marine invertebrate research teams, guided student research projects including instruction on equipment preparation, species identification and tracking, and data collection, interpretation, and presentation

*Thistle Monitoring Project, San Juan Island National Historical Park, 2001-2004.* Planned and executed monitoring and removal of Canada and bull thistles (*Cirsium arvense*, *Cirsium vulgare*) in the National Park in accordance with research protocols; trained students in data collection techniques, species identification, and invasive removal; compiled, submitted and presented data to the National Park Service and the Oregon Museum of Science and Industry

*Bat Population Study, San Juan Island National Historical Park, 2004.* Monitored population of *Myotis lugifugus*, *Eptesicus fuscus*, and *Myotis yumanensis* in maternal roosts at the San Juan Island National Historic Park using mist netting and ultrasonic detection equipment, coordinated with National Park Service staff to review data and discuss options for the future of bat roosts in the park

## **ADDITIONAL SKILLS**

Advanced multivariate community analyses

Advanced aquatic macroinvertebrate identification

Basic programming in R

Spanish language fluency

Wilderness First Responder, CPR, Basic First Aid, and Lifeguard certified

Oregon Class B Commercial Drivers License

Experience with fresh- and salt-water aquaria, including plumbing and husbandry

## **REFERENCES**

Dr. David Lytle  
Associate Professor, Zoology  
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1 541 737 1068

Dr. Stan Gregory  
Professor, Fisheries and Wildlife  
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Dr. Selina Heppell  
Associate Professor, Fisheries and Wildlife  
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Dr. Alix Gitelman  
Associate Professor, Statistics  
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Dr. Jessica White  
Director, Graduate Certificate in College and University Teaching  
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