

# Ariana E. Sutton-Grier

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## Research Interests

Ecosystem ecology and restoration, ecosystem services and environmental markets, biogeochemistry, biodiversity and ecosystem function, climate change

## Education

- 2008 Ph.D. in Ecology. Nicholas School of the Environment, **Duke University**, Durham, North Carolina. (Professor Curtis Richardson, adviser)
- 2000 Honors B.S. in Environmental Science, *Summa Cum Laude*. Honors B.A. in International Studies, *Summa Cum Laude*. **Oregon State University**, Corvallis, Oregon (Professors Jane Lubchenco and Bruce Menge, Honors Thesis advisers)
- 1997-1998 Direct Exchange Study Abroad Program, **Université Jean Moulin III**, Lyon, France

## Appointments

- 2010-Present AAAS Science and Technology Policy Fellow, National Oceanic and Atmospheric Administration, Office of Habitat Conservation
- 2009-2011 NSF FIRST IV (Faculty Institutes for Reforming Science Teaching) Postdoctoral Scholar
- 2008-2010 Smithsonian Fellow, Smithsonian Environmental Research Center
- 2007-2008 American Association of University Women (AAUW) Doctoral Fellow
- 2003-2006 National Science Foundation (NSF) Graduate Fellow

## Publications

\* Denotes undergraduate or post-baccalaureate mentee

**Sutton-Grier, A.E.**, J. Wright, and C. Richardson. In Press. Different plant traits affect two pathways of riparian nitrogen removal in a restored freshwater wetland. *Plant and Soil*.

Keller, J., **A.E. Sutton-Grier**, \*A. Bullock, and J.P. Megonigal. In Press. Anaerobic metabolism in tidal freshwater wetlands: I. Plant removal effects on iron reduction and methanogenesis. *Estuaries and Coasts*.

Emerson, D., W. Bellows, J. Keller, C. Moyer, **A.E. Sutton-Grier**, and J.P. Megonigal. In Press. Anaerobic metabolism in tidal freshwater wetlands: III. Effects of plant removal on Archaeal microbial communities. *Estuaries and Coasts*.

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**Sutton-Grier, A.E.**, J. Keller, \*R. Koch, C. Gilmour, and J.P. Megonigal. 2011. Electron donors and acceptors influence anaerobic soil organic matter mineralization in tidal marshes. *Soil Biology and Biochemistry*. 43: 1576-1583.

**Sutton-Grier, A.E.** and J.P. Megonigal. 2011. Plant species traits regulate methane production in freshwater wetland soils. *Soil Biology and Biochemistry*. 43: 413-420.

**Sutton-Grier, A.E.**, J. Wright, \*B. McGill, and C. Richardson. 2011. Environmental conditions influence the plant functional diversity effect on denitrification potential. *PLoS ONE* 6(2): e16584. doi:10.1371/journal.pone.0016584.

\*Unghire, J.M., **A.E. Sutton-Grier**, N. Flanagan, and C. Richardson. 2011. Spatial Impacts of Stream and Wetland Restoration on Riparian Soil Properties in the North Carolina Piedmont. *Restoration Ecology* 19 (6): 738-746. DOI: 10.1111/j.1526-100X.2010.00726.x.

Brantley, S.L., J.P. Megonigal, F.N. Scatena, Z. Balogh-Brunstad, R.T. Barnes, M.A. Bruns, P. van Cappellen, K. Dontsova, H. Harntnett, T. Hartshorn, A. Heimsath, E. Herndon, L. Jin, C. K. Keller, J.R. Leake, W.H. McDowell, F.C. Meinzer, T.J. Mozdzer, S.Petsch, J. Pett-Ridge, K.S. Pregitzer, P. Raymond, C.S. Riebe, K. Shumaker, **A. Sutton-Grier**, R. Walter, and K. Yoo. 2011. Twelve Testable Hypotheses on the Geobiology of Weathering. *Geobiology*. DOI: 10.1111/j.1472-4669.2010.00264.x.

Rauschert, E., J. Dauer, J. Momsen, and **A.E. Sutton-Grier**. 2011. Primary literature across the undergraduate curriculum: teaching science process skills and content. *Bulletin of the Ecological Society of America*.

**Sutton-Grier, A.E.**, M.A. Kenney, C.J. Richardson. 2010. Examining the relationship between ecosystem structure and function using structural equation modeling: A case study examining denitrification potential in restored wetlands. *Ecological Modelling*. 221:761-768.

\*McGill, B.M., **A.E. Sutton-Grier**, and J. P. Wright. 2010. Plant trait diversity buffers variability in denitrification potential over changes in season and soil conditions. *PLoS One* 5(7): e11618. doi: 10.1371/journal.pone.0011618.

Smith, Z. and **A. E. Sutton-Grier**. 2010. Making the Most of Your Postdoc. *The Chronicle of Higher Education*. Published online July 16, 2010.

**Sutton-Grier, A.E.**, M. Ho, and C.J. Richardson. 2009. Organic amendments improve soil conditions and denitrification in a restored riparian wetland. *Wetlands*. 29:343-352.

Kenney, M.A., **A.E. Sutton-Grier**, R. Smith, and S. Gresens. 2009. Benthic macroinvertebrates as indicators of water quality: the intersection of science and policy. *Terrestrial Arthropod Reviews*. 2(2): 99-128.

Freidenburg, T.L., B.A. Menge, P.M. Halpin, M. Webster, and **A.E. Sutton-Grier**. 2007. Cross-scale variation in top-down and bottom-up control of algal abundance. *Journal of Experimental Marine Biology and Ecology*. 347:8-29.

**Sutton-Grier, A.E.** and M.A. Kenney. 2005. Recruiters and Academia: A Class Act. *Nature*.

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436: 886.

## **B. In Review**

Edwards, P., **A.E. Sutton-Grier**, and \*G. Coyle. Blue Infrastructure and Coastal Habitat Restoration: Green Job Creation.

\*Bullock, A., **A. E. Sutton-Grier**, and J.P. Megonigal. Anaerobic metabolism in tidal freshwater wetlands: II. Temperature regulation of iron cycling.

## **Grants Received**

- National Academies Keck Futures Initiatives (NAKFI) Ecosystem Services Symposium (2011)
- Women Evolving Biological Sciences (WEBS) Symposium Travel Grant from the National Science Foundation ADVANCE program. (2010)
- National Postdoctoral Association “National Summit on Gender and the Postdoctorate.” Conference Travel Grant from the National Science Foundation ADVANCE program. (2010)
- American Association of University Women American Fellowship. (2007-2008)
- National Science Foundation Doctoral Dissertation Improvement Grant. “The role of plant functional diversity in regulating nitrogen removal in a restored riparian wetland.” (2005-2008)
- National Science Foundation Graduate Research Fellowship. (2003-2006)
- Society of Wetland Scientists Student Research Grant. (2005)
- FORWARD to Professorship Washington, D.C. (Focus on Reaching Women for Academics, Research, and Development). Conference travel funding from the National Science Foundation ADVANCE leadership award. (2007)
- Sigma Xi Annual Conference Travel Grant Award. (2006)
- Oregon State University Research Innovation, Scholarship, Creativity Undergraduate Incentive Program Grant. (1999)

## **Professional Experience**

**AAAS Science and Technology Policy Fellow**, National Oceanic and Atmospheric Administration (NOAA) (2010-present)

*Fellow:* Exploring the role of ecosystem service valuation and environmental markets in conservation efforts. I am the use of coastal carbon services (the “blue carbon” stored in coastal ecosystems) to further habitat protection and restoration efforts and nutrient trading as a strategy for cleaning up the Chesapeake Bay.

**NSF-Sponsored Faculty Institutes for Reforming Science Teaching (FIRST IV) Postdoctoral Scholar** (2009-present)

*Scholar:* Two year program focused on how to design a course based on student learning objectives (“backwards design”) using best-practice teaching approaches.

**Smithsonian Postdoc Fellow**, Smithsonian Environmental Research Center (2008-2010)

*Fellow:* Examined competition between iron-reducing and methane-producing microbes in

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tidal freshwater marshes to understand wetland greenhouse gas emissions and nutrient cycling.

## **Wetland Ecology, Biogeochemistry, and Restoration, Duke University (2002-2008)**

*Research Assistant:* Conducted research examining how wetland restoration techniques, including organic matter amendments and plant species diversity, affect the restoration of wetland ecosystem functions. Designed and established a biodiversity experiment in Duke Forest. Performed soil and plant analyses including denitrification enzyme potential, available nitrogen, total nitrogen, and loss on ignition carbon.

## **Duke University Nicholas School of the Environment and Earth Sciences (2002/03 and 2006/07)**

*Teaching Assistant:* Wetland Ecology and Management and Wetland Restoration Responsibilities included lecturing, developing course materials including problem sets and exams, grading of assignments and exams, and assisting with field trips and classroom logistics. Received excellent student evaluations.

## **Forest Biogeochemistry, Boston University (2000-2002)**

*Laboratory Manager:* Performed nutrient analyses including Potential Net Nitrogen Mineralization, Microbial Biomass, and Total Kjeldhal Nitrogen and Phosphorous to determine element cycling in forest soil and plant samples. Assisted in the development of a  $^{15}\text{N}$  isotope dilution technique to measure gross rates of ammonium and nitrate production and consumption. Collected data on delta  $^{13}\text{C}$  values in leaves to compare water use efficiencies. Trained undergraduate workers in lab activities, maintained safe, clean lab environment.

## **Coastal Intertidal Ecology, Oregon State University (Summer 1999)**

*Research Assistant:* Implemented a research project studying herbivores and algal abundance. Gathered data at low tides, analyzed photos using Adobe Photoshop and Image Analyst.

## **Honors and Awards**

- Society of Wetland Scientists (SWS) Chair of the Global Change Section (2011-2012)
- ESA Academic Excellence Award for Young Women in Ecology, Honorable Mention (2010)
- Duke University Young Trustee Finalist (2009)
- American Association of University Women American Fellowship (2007-2008)
- 10<sup>th</sup> International Symposium on Wetland Biogeochemistry “Best Student Presentation” (2007)
- National Science Foundation Graduate Research Fellowship (2003-2006)
- Oregon State University Waldo Cummings Outstanding Senior Award (2000)
- OSU College of Science Outstanding Woman in Science Scholarship (1999)
- Oregon State University Oregon Laurels Scholar (1996-2000)

## **Teaching Experience**

**Teaching Workshop Instructor, Ecological Society of America Annual Meeting in Pittsburgh, Pennsylvania.** (Summer 2011) “101 Ways to Effectively Use Journal Articles

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as Teaching Tools.” Co-Organizers: E. Rauscher, J.L. Momsen, and J. Dauer.

**Teaching Workshop Instructor, National Postdoc Association Annual Meeting in Bethesda, Maryland.** (Spring 2011). “Scientific Teaching and Active Learning in Undergraduate Science.” Co-Organizers: D. Ebert-May and A. Roark.

**Teaching Workshop Instructor, Ecological Society of America Annual Meeting in Austin, Texas.** (Summer 2010) “In Full Bloom: Using Bloom’s Taxonomy to Align Class Learning Objectives and Assessments in Introductory Biology.” Co-Organizers: J.L. Momsen, J. Dauer, and E. Rauscher.

**Front Royal Smithsonian National Zoological Park (2010)**

*Guest Instructor:* Global Carbon Cycle, Climate Change, and Wetlands

**Adjunct Faculty, Goucher College Biology Department (Fall 2009)**

*Instructor:* Co-designed and taught BIO 240 “Ecology and Evolution.” Implemented the course with a focus on a learner-centered classroom, active learning, and alignment of learning objectives with course assignments and assessments. Received excellent student evaluations.

**Duke University Women’s Studies Department and Nicholas School of the Environment and Earth Sciences (2005)**

*Instructor:* Co-designed and co-taught a multidisciplinary course about gender and the environment entitled “Feminism and Ecology.” Implemented the course with a focus on student involvement using active learning techniques such as role-plays, discussions, and small-group activities. Received excellent student evaluations.

**Duke University Nicholas School of the Environment and Earth Sciences (2006-2008)**

*Guest Instructor:*

- Wetland Ecology and Management
- Wetland Restoration

**Duke University Graduate School (2008)**

*The College Teaching Practicum:* Developed four teaching demonstrations using different visual aids and active learning techniques that were recorded followed by a critical self-evaluation of each demonstration. Also observed and evaluated teaching presentations by peers.

**Duke University Graduate School (2005-2006)**

*Preparing Future Faculty:* Worked with two mentors, Professors Janice Swab and Elizabeth Wolfinger, at Meredith College to learn more about faculty life, responsibilities, and teaching. Guest lectured in the senior research seminar class.

## **Presentations**

### **A. Invited Seminars**

**Sutton-Grier, A.E.,** J. Wright, and C.J. Richardson. 2007. “Plant Functional Diversity and the restoration of riparian wetland ecosystem function.” Participant in the Biodiversity

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and Ecosystem Restoration Symposium at the annual Ecological Society of America conference. San Jose, California.

**Sutton-Grier, A.E.**, C.J. Richardson, and G.L. Bruland. 2007. "The Importance of Soil Processes for Effective Wetland Restoration." Keynote Address at Radford University's 2<sup>nd</sup> Annual Wetland Symposium. Radford, Virginia.

**Sutton-Grier, A.E.**, C.J. Richardson, and G.L. Bruland. 2006. "Understanding Soil Processes: The Next Frontier of Wetland Restoration." World Congress of Soil Science conference. Philadelphia, Pennsylvania.

**Sutton-Grier, A.E.**, M. Ho, J. Pahl, and C.J. Richardson. 2005. "Compost Use in Urban Restored Wetlands." BioCycle Southeast Conference meeting. Charlotte, North Carolina.

**Sutton-Grier, A.E.** 2006, 2007. "TA Survival Skills: Getting the most out of your Teaching Assistantship." Invited panelist for Duke University Teaching IDEAS workshop.

### **B. Presentations**

**Sutton-Grier, A.E.**, Kellee James and Peter Edwards. 2011. "Environmental Markets: A tool to help conserve wetlands?" Society of Wetland Scientists, Prague, Czech Republic.

**Sutton-Grier, A.E.** and J. Patrick Megonigal. 2010. "The power of "Green" Energy: Plant trait influences on microbial competition and greenhouse gas production." Ecological Society of America Conference, Pittsburgh, Pennsylvania.

**Sutton-Grier, A.E.** and J. Patrick Megonigal. 2010. "Plants rule, Microbes Drool: Plant trait effects on greenhouse gas production." Society of Wetland Scientists conference, Salt Lake City, Utah.

**Sutton-Grier, A.E.**, A. Bullock, J. Keller, C. Gilmour, and J.P. Megonigal. 2009. "Plant impacts on competition between tidal marsh microbes." Ecological Society of America conference, Albuquerque, New Mexico.

**Sutton-Grier, A.E.**, A. Bullock, J. Keller, C. Gilmour, and J.P. Megonigal. 2009. "Tidal marsh metabolism: 'C' how they run." Society of Wetland Scientists conference, Madison, Wisconsin.

**Sutton-Grier, A.E.**, J.Wright, S. Qian and C.J. Richardson. 2008. "Plant functional diversity and nitrogen removal in a restored riparian wetland." Society of Wetland Scientists meeting, Washington, D.C.

**Sutton-Grier, A.E.**, J.Wright, S. Qian and C.J. Richardson. 2007. "Plant Functional Diversity: A good Predictor of Denitrification and Plant Biomass Nitrogen?" 10<sup>th</sup> International Symposium on Wetland Biogeochemistry. Annapolis, Maryland.

**Sutton-Grier, A.E.**, J.Wright, S. Qian and C.J. Richardson. 2006. "The role of plant species and functional diversity in the restoration of riparian wetland ecosystem functions." Ecological Society of America conference. Memphis, Tennessee.

**Sutton, A. E.**, D. Bradbury and A. C. Finzi. 2001. "Landscape-scale Variation in Soil Resources: Implications for Forest Composition." Ecological Society of America meeting, Madison,

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Wisconsin.

## **Professional Development and Service**

### **A. Mentoring Activities**

- Public Leadership Education Network (PLEN) Women & Science/Technology Policy Program Speaker, 2010, 2011.
- Mentor for three NSF-sponsored REU students as they designed, analyzed and presented the results of independent research projects. 2008-2010.
- Girl Scouts of America “STEM Career Day” at the Smithsonian. I was interviewed by twenty middle school girls (in groups of 2-3) sharing my experiences as an ecologist. 2010.
- Durham Women and Math Mentor for two 8th grade girls. We participated in multiple field trips to explore how science and math influence our daily lives and career opportunities (including sewage treatment to basketball games). 2008.
- Duke University Graduate and Professional Women’s Network Advisory Board. I organized events for professional development for graduate students including events about how to run a scientific laboratory and tips to improve negotiating skills. 2006-2008.
- Mentor for two independent research projects (one Master’s student). Both mentees have papers in press (see Unghire et al. 2010 and McGill et al. 2010 above). 2007-present.
- Duke University Women in Science and Engineering Event Organizer. I planned events for graduate students including how to network and how to have productive professional relationships. 2007-2008.
- PBS Dragonfly TV “SciGirls” Mentor. I was the wetlands expert and mentor for three middle school girls on a kids’ science TV show while they performed wetland biodiversity surveys and explored what it was like to be an ecologist. (see my mentor profile at <http://pbskids.org/dragonflytv/scientists/scientist56.html>). 2006.
- Group Leader for N.C. State “Expanding Your Horizons” Math and Science Conference for 8th grade girls. I mentored middle school girls as they explored career options in math, science, and engineering, including running an interactive, hands-on workshop about how wetland soils improve water quality. 2004, 2005, 2007.

### **B. Other Service Activities**

- Co-organizer and participant in the NSF-Sponsored workshop “Frontiers in Exploration of the Critical Zone II: The Geobiology of Weathering and Erosion.” Washington, D.C., 2009
- Symposium Organizer. Biodiversity and Restoration in a Changing World. Ecological Society of America Annual Meeting, San Jose, 2007. Co-Organizers: Justin Wright and Roberto Lindig-Cisneros
- Events Committee Chair of the Duke Chapter of Sigma Xi (2005-2008)
- Duke Representative at the National Conference on Graduate Student Leadership, 2007
- Duke University Commencement Committee (2006)
- Wetland Educator for the North Carolina Museum of Life and Science. I taught kids and adults what makes wetlands unique habitats and ecosystems using interactive

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activities. (2005-2006)

- Duke University, Nicholas School of the Environment and Earth Sciences, New Building Committee (2004-2006)

## **C. Reviews for Scientific Journals**

Examples include: Ecological Applications, Biogeochemistry, BioScience, Journal of the North American Benthological Society, Wetlands, Journal of the Soil Science Society of America, Nutrient Cycling in Agroecosystems, Aquatic Botany, Chemosphere, Science of the Total Environment

## **D. Professional Organizations and Affiliations**

- American Association for the Advancement of Science
- Ecological Society of America
- Society of Wetland Scientists (SWS)  
SWS Chair-Elect of the Global Change Ecology Section

## **Articles and T.V. Specials featuring my work**

- Baker, B. 2011. "Having a Life in Science." *BioScience* 61: 429-433.
- Johns-Hopkins University Global Water Magazine, October 2010. "Four Lessons from Restoration Research." (see <http://globalwater.jhu.edu/magazine/article/193/>)
- Public Broadcasting (PBS) Dragonfly TV "Wetlands of North Carolina" Kids' science show, Spring 2007 ( see <http://pbskids.org/dragonflytv/show/wetlands.html>)
- Duke Magazine "Plant Manager," July-August 2006
- News and Observer, Raleigh, NC. "Duke scholars work to restore wetlands-on campus" Aug. 22, 2005