

Curriculum Vitae

Rachel E. Schultz

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I. EDUCATION

- 2010 Ph.D., **The Ohio State University**, Environment and Natural Resources
2006 M.S., **Technische Universität München**, Ecology
2003 B.S., **Northland College**, Environmental Studies-Restoration Ecology, *summa cum laude*

II. RESEARCH EXPERIENCE

Research Scientist, College of Natural Resources, University of Wisconsin–Stevens Point (2016-)

- Co-designed an assessment of restored wetlands in the Glacial Habitat Restoration Area in Wisconsin and direct the wetland condition component.
- Lead PI on a cooperative agreement with NRCS to monitor Wetland Reserve Program easements in Wisconsin and provide guidance for future implementation and management of wetland restoration projects.

Assistant Professor, Center for Earth and Environmental Science, SUNY Plattsburgh (2011-2016)

- Directed a wetland mesocosm experiment exploring the role of plant community and diversity on greenhouse gas emissions, carbon and nitrogen storage, and invertebrate diversity.
- Investigated aquatic and terrestrial decomposition of invasive shrub litter in collaboration with researchers across the continent.

Postdoctoral Researcher, Department of Wildlife, Fisheries and Aquaculture, Mississippi State University (2010-2011)

- Synthesized scientific results on the effects of invasive aquatic plants on fish and macroinvertebrates and published the review in an international journal.
- Analyzed and published diet data from fish in lakes treated with herbicide versus control lakes.
- Designed and implemented a mesocosm study exploring how invasive water hyacinth affects zooplankton communities.

Graduate Research Associate, School of Environment and Natural Resources, The Ohio State University (2006-2010)

- Studied the effects of plant community diversity and composition on carbon cycling including emissions of greenhouse gases from natural, created, and experimental wetlands.
- Explored nitrogen partitioning as a mechanism explaining diversity effects on belowground biomass in wet meadow communities using an isotope tracer technique.

Graduate Researcher, Center for Nutrition, Land Use, and Environment, Technische Universität München (2004-2006)

- Measured and modelled carbon dioxide data from restored and degraded fens in southern Germany to determine the impacts of land use change on greenhouse gas emissions.

III. PEER-REVIEWED PUBLICATIONS

Schultz, R. and L. Pett. 2017. Plant community effects on CH₄ fluxes, root surface area, and carbon storage in experimental wetlands. *Ecological Engineering*. (*in press*)

Webb, K., **Schultz, R.** and E. Dibble. 2016. The influence of invasive aquatic plant removal on diets of bluegill in Minnesota lakes. *Journal of Aquatic Plant Management* 54, pp. 37-45.

Lenihan, W and **R. Schultz**. 2014. Carnivorous plant (*Sarracenia purpurea* L.) increases root growth in response to nitrogen addition. *Botany* 92(12): 917-921.

Maynard, G., Mihuc, T., **Schultz, R.**, Sotola, V., Reyes, A., Malchoff, M., and D. Garneau. 2013. Use of external indicators to evaluate stress of largemouth (*Micropterus salmoides*) and smallmouth (*M. dolomieu*) bass at tournaments. *Open Fish Science Journal* 6:78-86.

Andrews, S., **Schultz, R.**, Bouchard, V., and S. Frey. 2013. The role of plant community structure in mediating potential methane production and potential iron reduction in experimental wetland mesocosms. *Ecosphere* 4(4): 44. <http://dx.doi.org/10.1890/ES12-00314.1>

Schultz, R. and E. Dibble. 2012. The effects of invasive macrophytes on fish and macroinvertebrates: the role of invasive plant traits. *Hydrobiologia* 684 (1):1-14.

Schultz, R., Bouchard, V. and S. Frey. 2012. Overyielding and the role of complementary use of nitrogen in wetland plant communities. *Aquatic Botany* 97 (1):1-9.

Schultz, R., Andrews, S., O'Reilly, L., Bouchard, V. and S. Frey. 2011. Plant community composition more predictive than diversity of carbon cycling in freshwater wetlands. *Wetlands* 31 (5):965-977.

Andrews, S., **Schultz, R.**, Frey, S. and V. Bouchard. 2009. The effects of plant community composition and richness on methane production and iron reduction in experimental mesocosms. *Journal of Nematology* 41(4):302-303.

Drösler, M., Bergmann, L., Freibauer, A., Jungkunst, H.F., **Schultz, R.**, Höll, B.S., Fielder, S., 2006. Long-term effect of fen-restoration on the C-balance and the GWP-balance. *Verh. Ges. Ökol* 36, 26.

IV. OTHER RELEVANT PUBLICATIONS

Madsen, J.D., P. Amburn, R. Brown, E. Dibble, G. Ervin, C. Abbott, C. Brooks, D. Irby, S. Lee, V. Maddox, **R. Schultz**, L. Wasson, R. Wersal, T. Woolf, D. McBride, and N. Madsen. 2012. Research to support integrated management systems of aquatic and terrestrial invasive species: annual report, 2011. Geosystems Research Institute GRI#5051, Mississippi State University, Mississippi State, MS.

Madsen, J.D., P. Amburn, R. Brown, E. Dibble, G. Ervin, D. Shaw, C. Abbott, G. Baker, K. Bloem, C. Brooks, D. Irby, S. Lee, V. Maddox, R. Rose, **R. Schultz**, L. Wallace, L. Wasson, M. Welch, R. Wersal, D. McBride, and N. Madsen. 2011. Research to support integrated management systems of aquatic and terrestrial invasive species: annual report, 2010. Geosystems Research Institute GRI#5047, Mississippi State University, Mississippi State, MS.

Schultz, R. 2010. Plant diversity and community composition effects on carbon cycling and nitrogen partitioning in freshwater wetlands. Dissertation. Ohio State University.
http://rave.ohiolink.edu/etdc/view?acc_num=osu1275400132

Schultz, R. 2006. Ecosystem respiration of degraded and restored fen ecosystems in Southern Bavaria. Thesis. Technische Universität München.

V. INVITED PRESENTATIONS

Schultz, R. Wetland and waterfowl assessment project – GHRA. Private Lands Coordination Meeting, June 13-15 2017, Saron, WI.

Schultz, R. and L. Pett. 2016. Plant community effects on biomass production and methane emissions from experimental wetlands: Applications for restoration. 5th International EcoSummit, August 29-Sept. 2 2016, Montpellier, France.

Schultz, R. 2014. Effect of invasive macrophytes on macroinvertebrates and fish: the role of traits. Joint Aquatic Sciences Meeting, May 18th-24th 2014, Portland, OR

Schultz, R. 2013. Green teams and armies of one: plant community effects on wetland and aquatic systems. Biology Department Seminar Series at Binghamton University.

Schultz, R. 2011. Green teams: plant community effects on wetland and aquatic systems. Graduate Seminar Series at the Rubenstein School of Environment and Natural Resources - University of Vermont.

Schultz, R. 2009. Biodiversity and ecosystem functioning research: implications for wetland ecosystems. OSU School of Environment and Natural Resources Fall Seminar Series, Columbus, OH.

Bouchard, V., Hossler, K. and R. Schultz. 2008. Shoots, roots and microbes in wetlands: how they interact and why we care. OSU School of Earth Sciences, Division of Global and Environmental Change Seminar Series, Columbus, OH.

Schultz, R. 2008. Centers for Ocean Science and Education Excellence (COSEE) Great Lakes Educators House Call Workshop for NSF GK-12 program at OSU, Columbus, OH.

VI. OTHER ACADEMIC PRESENTATIONS (selected presentations since 2013)

Pett, L. and Schultz, R. 2017. Effects of functional group richness of plants on invertebrate diversity in wetland mesocosms. Northeastern Natural History Conference, April 21-23, Cromwell, CT

Schultz, R. and Pett, L. 2017. Do plant community composition and diversity affect belowground carbon dynamics in experimental wetlands? Wisconsin Wetlands Association's 22nd Annual Wetland Science Conference, February 28 – March 2, Stevens Point, WI.

De La Mater, D., Hammer, C., Malanchuk, J., Schultz, R., Straub, J. 2015. Vegetation characteristics of two uncommon floodplain forest types in the northeastern U.S. New York Waterfowl & Wetlands Network 2015, July 28-29, Oswego, NY.

Schultz, R., Wilson, R., Christian, N. 2015. Ferns, rushes, and tussocks: plant community effects on biomass in experimental wetlands. Society of Wetland Scientists Annual Meeting, May 31 – June 4, Providence, RI.

DaBreo, K., Moseman, E., Rosedale, A. and Schultz, R. 2015. Invasive Species Impact on Leaf Litter Decomposition in an Aquatic System. Northeastern Natural History Conference, April 19-20, Springfield, MA.

Moseman, E., Rosendale, A. and Schultz, R. 2014. Aquatic decomposition of native and invasive leaf litter in Rugar Woods, Plattsburgh, New York. Northeastern Natural History Conference, April 7-9, Springfield, MA.

Straub, J., Garneau, D., and Schultz, R. 2014. From local to continental scales: training undergraduates to think big through the Ecological Research as Education Network. Northeastern Natural History Conference, April 7-9, Springfield, MA.

Gartner, T., Thomas, C., Anderson, L., Dosch, J., Geedey, K., Hornback, D., Lyons, K., Machado, J.L., Mankiewicz, C., Schultz, R., and Zimmerman, C. 2013. Decomposition in aquatic and terrestrial invaded systems (DATIS): a collaboration among ecologists at primarily undergraduate institutions. Ecological Society of America Annual Meeting, August 5-9, Minneapolis, MN.

Schultz, R., Bouchard, V. and Frey, S. 2013. Functional diversity and composition: which is more important in determining methane cycling in freshwater wetlands? Society of Wetland Scientists Annual Meeting, June 2-6, Duluth, MN.

VII. GRANTS SUBMITTED

Project Director “Monitoring Wetland Reserve Program easements in Wisconsin” Natural Resources Conservation Service, \$95,040 awarded 2017.

Co-principle Investigator “Effectiveness of wetland conservation programs in the Glacial Habitat Restoration Area of Wisconsin” US Fish and Wildlife Service, \$82,838 awarded 2017.

Principle Investigator “Influence of groundwater level declines on plant communities of Wisconsin Central Sands kettle lakes and wetlands” State of Wisconsin Groundwater Coordinating Council, \$77,975 requested.

Project Director “Coastal wetland restoration and enhancement of Oconto Marsh” Sustain Our Great Lakes RFP, National Fish and Wildlife Foundation, \$155,116 requested.

Co-Principal Investigator “Developing a New York Waterfowl & Wetlands Collaborative Network.” SUNY 4E Grant Program. \$9,581 awarded 2015.

Co-Principal Investigator “An ecological integrity comparison of protected and managed forestlands in the Adirondacks” Northern States Research Consortium, \$133,408 requested.

Participating Scientist “Collaborative Research: Invasives as drivers, passengers, or both: Examining the roles of macrosystem processes on the impact and spread of invasive shrub species” National Science Foundation, MacroSystems Biology Program, \$120,000 requested (SUNY Plattsburgh portion only).

NYS/UUP Individual Development Awards Program, \$400 awarded 2014.

Principal Investigator “Forest management and greenhouse gas fluxes: wetland dynamics in peatlands vulnerable to climate change” Northern States Research Consortium, \$124,348 requested.

Co-Principal Investigator “Economic value of surface water resources: ecological services at multiple scales in the Lake Champlain basin of New York and Vermont” Lake Champlain Basin Program, \$70,000 requested.

Participating Scientist “Collaborative research: research network and training model at primarily undergraduate institutions for macrosystems projects: stream metabolism and impacts of non-native shrubs” National Science Foundation, MacroSystems Biology Program, \$100,540 requested (SUNY Plattsburgh portion only).

Principal Investigator “Effects of disturbance on methane dynamics in temperate wetlands integrated into the biogeochemistry model CLM4Me” US DOE Terrestrial Ecosystem Science Program, \$356,000 requested.

The Presidential Research Award Program, SUNY Plattsburgh, \$4,962 awarded 2012.

Principal Investigator “Chazy community wetland and wildlife enhancement program” National Fish and Wildlife Foundation Five Star Restoration Program, \$39,856 requested.

NYS/UUP Professional Development Individual Awards Program, \$200 awarded 2011.

Co-Principal Investigator “Low-grade weirs for nutrient and sediment retention: effects on aquatic and wetland biodiversity.” USDA AFRI Foundational Program, \$322,958 requested.

Principal Investigator “Determining the role of plant community composition and hydrology in the greenhouse gas mitigation potential of Wetland Reserve Program land.” USDA AFRI Fellowship Program, \$110,000 requested.

VIII. TEACHING EXPERIENCE

Courses taught as Instructor (2009-2017):

Advanced Studies in Wildlife: Restoration Ecology Theory and Practice (graduate level course), Design of Constructed Wetlands, Ecological Basis of Natural Resource Management, Ecological Data Analysis (graduate level course), Environmental Science Seminar, General Ecology, Limnology,

Restoration Ecology, Statistical Analysis in R (graduate level course), Water Quality Management, and Wetland Ecology and Management.

IX. ADVISING

Undergraduate students:

2017 Independent Study Research Mentor for Loken, Z., UWSP
 2011-2016 Independent Study Research Mentor for 12 students, SUNY Plattsburgh
 Honors Thesis Committee member, The Ohio State University (Apolinar, E. 2009)

Graduate students:

Master's Thesis adviser, SUNY Plattsburgh (L. Pett 2015- 2017)
 Master's Thesis Committee member, SUNY Plattsburgh (Zajac, J. 2014- 2016)
 Master's Thesis Committee member, SUNY Plattsburgh (LaMay, M. 2013- 2015)
 Master's Thesis Committee member, SUNY Plattsburgh (Hayes-Pontius, E. 2011-2013)

X. SOCIETY MEMBERSHIP

Botanical Club of Wisconsin Native Plant Society, Ducks Unlimited, Society of Wetland Scientists, and Wisconsin Wetlands Association

XI. PEER REVIEW

Aquatic Invasions, Aquatic Sciences, Austral Ecology, Ecography, Ecological Engineering, Freshwater Biology, Freshwater Science, Hydrobiologia, Journal of Natural History, Journal of Plant Ecology, Landscape Ecology, Limnologica, Neotropical Ichthyology, Oikos, Plant and Soil, Soil Biology and Biochemistry, and Wetlands

XII. OTHER PROFESSIONAL ACTIVITIES

2017- Member of the Wisconsin Joint Venture Steering Committee
 2016 Peer-reviewer for the National Science Foundation Collaborative Research in Ecosystem Studies program
 2014 Co-editor of the undergraduate e-journal, Scientia Discipulorum
 2013 Peer-review Panelist for the NASA 2013 Research Opportunities in Space and Earth Sciences solicitation
 2012- Expert Review Panelist for EPA grant, "Building a monitoring framework for detecting wetland response to climate change in the Adirondacks"
 2012-16 Affiliate of the Lake Champlain Research Institute
 2011-13 Junior Faculty Learning Community, Center for Teaching Excellence, SUNY Plattsburgh
 2010-11 Mississippi Women in Natural Resources Mentoring Group, Mississippi State University, Department of Wildlife, Fisheries and Aquaculture
 2010-11 Biogeochemistry Reading Group, Mississippi State University, College of Forest

Resources and Department of Geosciences

XIII. AWARDS & FELLOWSHIPS

- 2011, 13, &14 Academic Advisor Appreciation Recognition, SUNY Plattsburgh
2008 Ray Travel Award for Scholarship and Service, The Ohio State University,
Council of Graduate Students
2008 GradRoots MiniGrant Award, The Ohio State University, School of Environment
and Natural Resources
2006-2007 University Fellowship, The Ohio State University
2002-2003 Sigurd Olson Environmental Leadership Scholar, Northland College

XIV. LANGUAGES

Native language - English, proficient in German and working knowledge of Spanish