

Dr. Robert F. Smith

Lycoming College Clean Water Institute and Department of Biology
Lycoming College
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Curriculum Vitae

RESEARCH AND TEACHING INTERESTS

I am interested in studying and teaching about ecological patterns and processes operating at small to broad spatial scales along a gradient of human influence. My research and teaching focus on freshwater systems and understanding the ecological effects of global change. I perform research to develop effective strategies for managing and restoring human-impacted systems. Actionable science to support effective management requires an understanding of the social context of remnant natural areas in human-dominated landscapes, and I also study and teach about the socio-ecology of aquatic systems. My broad interests are supported by my backgrounds in ecology, environmental science, entomology, and quantitative ecology.

EDUCATION

- Ph.D. 2012 **University of Maryland**, College Park, MD 20742-4454
Degree Program: Entomology
Dissertation title: *Local versus regional processes impacting insect diversity loss from urban headwater streams*
- M.S. 2006 **University of Maryland**, College Park, MD 20742-4454
Degree Program: Entomology
Thesis title: *Effect of urbanization on stream insect communities in adjacent headwater and downstream reaches*
- B.S. 2000 **Millersville University**, Millersville, PA 17551
Major: Biology (Concentration in Ecology)

ACADEMIC, RESEARCH, AND PROFESSIONAL POSITIONS

- 2016-Current **Assistant Professor of Biology / Clean Water Institute Research Associate**,
Lycoming College, Department of Biology, Williamsport, PA 17701
- 2015-2016 **Visiting Assistant Professor of Biology**, College of the Holy Cross, Department of
Biology, Worcester, MA 01610
- 2012-2015 **Postdoctoral Researcher / NSF Science, Engineering and Education for
Sustainability (SEES) Fellow**, University of Massachusetts, Mass Cooperative Fish
and Wildlife Research Unit, Amherst, MA 01003
- 2000-2002 **Macroinvertebrate Biologist**, Normandeau Associates, Inc., Spring City, PA 19475
(now located in Stowe, PA, 19464)

PUBLICATIONS

(Google Scholar profile: <http://scholar.google.com/citations?user=2b7khNkAAAAJ>)

Accepted / in-press

Smith, R.F., E. Neideigh, A. Rittle, and J.W. Wallace. 2019. Assessing macroinvertebrate community response to restoration of Big Spring Run: Expanded analysis of BACI sampling designs. *Submitted to River Research and Applications (Final revision submitted 29-Sep-2019).*

Published

Cheney, K.N., A.H. Roy, R.F. Smith, and R.E. DeWalt. 2019. Effects of stream temperature and substrate type on emergence patterns of Plecoptera and Trichoptera from northeastern United States headwater streams. *Environmental Entomology* XX:1-11 (*available online*). DOI 10.1093/ee/nvz106

Smith, R.F., R.J. Hawley, M.W. Neale, G.J. Vietz, E. Diaz-Pascacio, J. Herrmann, A.C. Lovell, C. Prescott, B. Rios-Touma, B. Smith, and R.M. Utz. 2016. Urban stream renovation: Incorporating societal objectives to achieve ecological improvements. *Freshwater Science* 35:364-379. DOI:10.1086/685096 (*Invited Submission*)

Spadafora, E., A.W. Leslie, L.E. Culler, R.F. Smith, K.W. Staver, and W.O. Lamp. 2016. Macroinvertebrate community convergence between natural, rehabilitated, and created wetlands. *Restoration Ecology* 24:463-470. DOI:10.1111/rec.12352

Roy, A.H., K.A. Capps, R.W. El-Sabaawi, K.L. Jones, T.B. Parr, A. Ramírez, R.F. Smith, C.J. Walsh, and S.J. Wenger. 2016. Urbanization and stream ecology: Diverse mechanisms of change. *Freshwater Science* 35: 272-277. DOI:10.1086/685097

Smith, R.F., P.D. Venugopal, M.E. Baker, and W.O. Lamp. 2015. Habitat filtering and adult dispersal determine the taxonomic composition of stream insects in an urbanizing landscape. *Freshwater Biology* 60:1740-1754. DOI:10.1111/fwb.12605

Culler, L.E., R.F. Smith, and W.O. Lamp. 2014. Weak relationships between environmental factors and invertebrate communities in constructed wetlands. *Wetlands* 34:351-361. DOI:10.1007/s13157-013-0502-1

Thompson, K.V., T.J. Cooke, W.F. Fagan, D. Gulick, D. Levy, K.C. Nelson, E.F. Redish, R.F. Smith, and J. Presson. 2013. Infusing quantitative approaches throughout the biological sciences curriculum. *International Journal of Mathematical Education in Science and Technology* 44:817-833. DOI:10.1080/0020739X.2013.812754

Leslie, A.W., R.F. Smith, D. Ruppert, K. Bejleri, J. M. McGrath, B.A. Needleman, and W.O. Lamp. 2012. Environmental factors structuring benthic invertebrate communities of agricultural ditches in Maryland. *Environmental Entomology* 41:802-812. DOI:10.1603/EN12049

Kenney, M.A., A.E. Sutton-Grier, R.F. Smith, and S.E. Gresens. 2009. Benthic macroinvertebrates as indicators of water quality: The intersection of science and policy. *Terrestrial Arthropod Reviews* 2:99-128. DOI:10.1163/187498209X12525675906077

Smith, R.F., L.C. Alexander, and W.O. Lamp. 2009. Dispersal by terrestrial stages of stream insects in urban watersheds: synthesis of current knowledge. *Journal of the North American Benthological Society* 28:1022-1037. DOI:10.1899/08-176.1 (*Invited Submission*)

Smith, R.F. and W.O. Lamp. 2008. Comparison of insect communities between adjacent headwater and main-stem streams in urban and rural watersheds. *Journal of the North American Benthological Society* 27:161-175. DOI:10.1899/07-071.1

White paper, reports, and other published products

Smith, R.F. 2019. Teaching logistic population growth and ecological modelling. Reducing Barriers to Teaching with R in Undergraduate Biology, QUBES Educational Resources.
doi:10.25334/Q4CF1M

Smith, R.F. and M.J. Raupp. 2008. Green Roofs: A new frontier. *Groundwork* (A publication of the Landscape Contractors Association MD/DC/VA). January edition.

In-prep (in final stages of development for submission or review)

Smith, R.F., R.O. Bowman, B.L. Lenze, and R.E. DeWalt. 2019. Vertical migration of adult Plecoptera (Stoneflies) above forested headwater streams. *Intended submission to Hydrobiologia*

Armstrong, D.S, M.E. Baker, C.N. Bentsen, S.B. Levin, L.J. Ostiguy, A.H. Roy, R.F. Smith, and J.T. Stolarski. 2020. Unpacking biotic responses to impervious cover in Massachusetts. USGS Scientific Investigations Report, 2020-####, ##p.

EXTERNAL COMPETITIVE RESEARCH AND CONTRACTED FUNDING

(Grants awarded from 7 organizations totaling \$804,955)

In-progress or complete

- 2019-2021 **Developing a college-community stormwater partnership model for small urbanized watersheds.** Arthur Vining Davis Foundations Environmental Engagement, Stewardship & Solutions Grants (3 Co-PI's – primary author on teaching and research technical components: \$258,000)
- 2019 **Unassessed Waters of North-Central Pennsylvania.** Foundation for Pennsylvania Watersheds. (PI with single co-PI: \$11,000)
- 2018 **Assessing the coevolution of dispersal traits in adult stream insects.** Washington Biologist's Field Club 2018 Research Awards Competition (Single PI: \$2,500)
- 2017 **Unassessed Waters of tributaries in the Pine Creek drainage.** National Fish and Wildlife Foundation – Unassessed Waters Initiative 2017 (PI with single co-PI: \$8,037)
- 2014-2016 **Supplement to: A heads up view of aquatic ecosystem sustainability: Understanding the terrestrial landscape scale impacts of urbanization on aquatic biota.** NSF, Catalyzing New International Collaborations (CNIC) program (Single PI: \$42,771)
- 2012-2016 **A heads up view of aquatic ecosystem sustainability: Understanding the terrestrial landscape scale impacts of urbanization on aquatic biota.** NSF, Science, Engineering and Education for Sustainability (SEES) Fellowship (Single PI: \$476,162)
- 2006 **Connecting terrestrial adult activity to in-stream community structure in urban and rural watersheds.** Cosmos Club Foundation, Grants-In-Aid to Young Scholars Program (Single PI: \$1,500)
- 2005 **Effect of urbanization on the adult stage of aquatic insects: Does constrained dispersal contribute to community degradation?** Maryland/DC Chapter of the Nature Conservancy: Biodiversity Conservation Research Fund (Single PI: \$2,500)

2005 **Effect of urbanization on the adult stage of aquatic insects: Does constrained dispersal contribute to community degradation?** Washington Biologists' Field Club Research Award (Single PI: \$2,485.00)

TEACHING AND RESEARCH AWARDS

2019 **Mid-Atlantic Chapter, Society for Freshwater Science Travel Grant to attend the Association of Mid-Atlantic Aquatic Biologists annual meeting.** Mid-Atlantic Chapter, Society for Freshwater Science (\$100)

2010 **North American Benthological Society General Research Endowment Award.** North American Benthological Society (\$900)

2009 **Entomological Society of America Student and Young Professional Participation Award.** Entomological Society of America (\$100)

2009 **Teaching Achievement Award.** Dept. of Entomology, Univ. of Maryland

2008 **Entomology Student Organization Extension / Outreach Award.** Dept. of Entomology, Univ. of Maryland (\$250)

2006 **Entomological Society of America President's Prize Runner-Up (Oral Presentations).** Entomological Society of America, Annual Meeting: Section Cd5 Behavior and Ecology

2006 **HHMI Teaching and Learning Fellow (Summer).** College of Life Sciences, Univ. of Maryland

2006 **Allen L. Steinhauer Award for Excellence in Teaching.** Dept. of Entomology, Univ. of Maryland

2006 **North American Benthological Society Endowment, President's Award.** North American Benthological Society (\$600)

2005 **HHMI Teaching and Learning Fellow (Summer).** College of Life Sciences, Univ. of Maryland

2005 **Teaching Achievement Award.** Dept. of Entomology, Univ. of Maryland

2004 **Special Distinction in Teaching.** Dept. of Entomology, Univ. of Maryland

2000 **Henry Franklin Bitner Memorial Fund Prize (Top graduating student in Biology).** Millersville Univ.

TEACHING AND RESEARCH INSTITUTIONAL SUPPORT

(All grants total \$74,702)

2019 **Curriculum Enrichment Grant (Course instruction).** Lycoming College (\$1300)

2019 **Curriculum Enrichment Grant (Student travel).** Lycoming College (\$895; *for undergraduate researcher to attend the Society for Freshwater Science annual meeting*)

2019 **Faculty Travel Grant.** Lycoming College (\$1,500; *to attend the Society for Freshwater Science annual meeting*)

- 2019 **Summer Student Research Grant.** Lycoming College (\$2,900 student salary, \$390 materials, & \$1,000 faculty stipend)
- 2018 **Curriculum Enrichment Grant (Course instruction).** Lycoming College (\$300)
- 2018 **Faculty Conference Travel Grant.** Lycoming College (\$2,200; *to attend the Society for Freshwater Science and Association for Biology Laboratory Education annual meetings*)
- 2017 **Curriculum Enrichment Grant (Course instruction).** Lycoming College (\$425)
- 2017 **LITT grant.** Lycoming College (\$1,000 stipend)
- 2017 **Faculty Conference Travel Grant.** Lycoming College (\$2,682; *to attend the Society for Freshwater Science and Association for Biology Laboratory Education annual meetings*)
- 2017 **Summer Student Research Grant.** Lycoming College (\$2,320 student salary, \$430 materials, & \$1,000 faculty stipend)
- 2016 **Center for Energy and the Future (CEF) Pilot Grant Program.** Lycoming College (\$1,400)
- 2016 **Curriculum Enrichment Grant.** Lycoming College (\$880)
- 2016 **Faculty Conference Travel Grant.** College of the Holy Cross (\$1,427)
- 2011 **International Conference Student Support Award.** Univ. of Maryland (\$500)
- 2010-2011 **Gahan Fellowship.** Dept. of Entomology, Univ. of Maryland, 2010-2011 (\$24,212 stipend)
- 2010 **Graduate Student Summer Research Fellowship.** College of Chemical and Life Sciences, Univ. of Maryland (\$5000 stipend)
- 2009-2010 **Gahan Fellowship.** Dept. of Entomology, Univ. of Maryland (\$19,686 stipend)
- 2009 **College of Chemical and Life Sciences Travel Grant.** Univ. of Maryland (\$300)
- 2009 **Entomology Student Organization Travel Grant.** Dept. of Entomology, Univ. of Maryland (\$250)
- 2006 **Jacob K. Goldhaber Travel Grant Award.** College of Chemical and Life Sciences, Univ. of Maryland (\$350)
- 2005 **Chesapeake Bay Fund.** Biology Department, Univ. of Maryland (\$2,000 stipend)
- 2000 **Neimeyer-Hodgson Research Grant** (\$355)

PROFESSIONAL PRESENTATIONS

Invited and symposium presentations (18 as primary author)

(* indicates mentored student presentation)

Smith, RF and *R. Bowman (*co-presenters*). 2019. From nymphs to spinners: Aquatic research incorporating the entire lifecycle of stream insects. *Invited oral presentation: Susquehanna Chapter of Trout Unlimited.*

Smith, R.F. 2018. The stream, the network, and the landscape: A story about dispersal by stream organisms. *Invited oral presentation: Department of Biology, Bloomsburg University.*

- Smith, R.F., J. Blaszczyk, B. Bledsoe, T. Parr, A. Roy, M. Scoggins, R. Utz, and S. Wenger. 2017. A summary of SUSE4: making urban stream rehabilitation a co-evolutionary process. *Invited oral presentation: Rehabilitating urban streams: perspectives from science and management – Society of Freshwater Science annual meeting.*
- Smith, R.F. and A.H. Roy. 2017. Exploring the importance of catchment land use and dispersal barriers for fish and insect assemblage composition in human-dominated landscapes. *Invited oral presentation: US Regional Association of the International Association for Landscape Ecology.*
- Smith, R.F. 2016. More than just a job talk: Current and future research in the Smith Ecology lab at Lycoming College. *Invited oral presentation: Biology Department seminar series – Lycoming College.*
- Smith, R.F. 2015. A heads up view of stream ecology: Effect of dispersal on stream communities along a rural to urban gradient. *Invited international oral presentation: Department of Environment and Primary Industries, Arthur Rylah Institute for Environmental Research, Heidelberg, Victoria 3084, Australia.*
- *Cheney, K.N., A.H. Roy, and R.F. Smith. 2015. Spatial and temporal variation in Plecoptera and Trichoptera emergence from headwater streams. *Symposium poster presentation: Emergent Insects as Focal Taxa for Bridging Ecological Understanding Across Ecosystems: A Synthesis of Current Knowledge and Novel Applications (Integrative session) – Joint Aquatic Sciences Meeting*
- Roy, A.H., K.A. Capps, K.L. Jones, T.B. Parr, A. Ramirez, R.F. Smith, C.J. Walsh, and S.J. Wenger. 2014. Global differences in urbanization and stream ecology: A synthesis. *Symposium oral presentation: A City Is A City Is A City? Comparative Analyses in Urban Aquatic Ecosystems (Integrative session) – Joint Aquatic Sciences Meeting.*
- Smith, R.F. and A.H. Roy. 2014. Thinking outside the shed: Examining landscape characteristics as part of management strategies for sustaining stream ecosystems. *Symposium oral presentation: Water Resource Sustainability and Resilience: Assessments, Approaches, and Communication (Integrative session) – Joint Aquatic Sciences Meeting.*
- Smith, R.F. and A.H. Roy. 2014. Considerations for examining the effects of watershed and landscape land use/cover on stream biota in urbanizing streams. *Invited oral presentation: 3rd Symposium on Urbanization and Stream Ecology.*
- Smith, R.F. 2014. A heads up view of urban stream ecology: Local and regional processes controlling insect biodiversity. *Invited oral presentation: The Cambridge Entomological Club – Harvard University, Cambridge, MA.*
- Smith, R.F. 2013. A heads up view of urban stream ecology: How human land-use impacts local and regional processes controlling biodiversity of stream fauna. *Invited oral presentation: Biology Dept. seminar series – SUNY College at Oneonta, Oneonta, NY.*
- Smith, R.F. and A.H. Roy. 2013. Comparing insect and fish assemblage responses to urbanization for sustainable management of stream ecosystems. *Symposium oral presentation: Aquatic Entomology for the Protection of Water Resources (Member Symposium) – Entomological Society of America.*

- Smith, R.F., M.E. Baker, P.D. Venugopal, and W.O. Lamp. 2013. Regional and local processes structure a stream insect metacommunity in a partially urbanized landscape. *Symposium Oral presentation: Mechanisms of urban impacts on stream ecosystems: a global perspective (Special session) – Society for Freshwater Science annual meeting.*
- Smith, R.F. 2012. Local and regional processes controlling insect diversity in urban headwater streams (...and other ramblings of a Millersville grad). *Invited oral presentation: Dept. of Biology Colloquium – Millersville Univ., Millersville, PA.*
- Smith, R.F., E.M. Pilgrim, and W.O. Lamp. 2012. By land or by stream? Contribution of constrained dispersal by adult caddisflies to diversity loss from urban headwaters. *Symposium oral presentation: Completing the life cycle – Dispersal, fitness and behaviour of adult aquatic insects (Special session/symposium) – Society of Freshwater Science annual meeting.*
- Smith, R.F. 2011. A heads up view of urban stream ecology: Potential impacts to adult stream insects in the terrestrial, urban landscape. *Invited international oral presentation: Graduate Student seminar – Monash Univ., Melbourne, Australia.*
- Lamp, W.O. and R.F. Smith (presenting author). 2011. Aquatic insects are terrestrial: Life history constraints and opportunities. *Symposium oral presentation: Conservation challenges for organisms with complex life-cycles (Special session/symposium) – North American Benthological Society annual meeting.*
- Smith, R.F. 2011. The life of an entomology teaching assistant: motivating students to learn in nontraditional subject areas. *Invited oral presentation: Teaching Entomology at Various Educational Levels: Perspectives, Techniques, and Challenges (Education Symposium) – Entomological Society of America, Eastern Branch annual meeting.*
- Smith, R.F. and W.O. Lamp. 2009. Incorporating the entire life cycle of aquatic insects into urban stream ecology. *Invited oral presentation: Advances in Aquatic Entomology: Celebrating the Role of Aquatic Insects in Scientific Research (Section Symposium) – Entomological Society of America annual meeting.*
- Smith, R.F. and W.O. Lamp. 2008. The adult assemblage of aquatic insects indicates recruitment limitation in urban headwater streams. *Invited oral presentation: 2nd Symposium on Urbanization and Stream Ecology.*

Regular conference presentations (25 as primary author)

(* indicates mentored undergraduate student presentation)

- *Tasker, J.N., B.A. Schwenk, R.O. Bowman, and R.F. Smith. 2019. Effect of climate on adult stonefly and caddisfly activity. *Poster presentation: 14th Susquehanna River Symposium (Submitted).*
- *Bowman, R.O., B.L. Lenze, and R.F. Smith. 2019. Vertical migration of adult Plecoptera (stoneflies) above forested headwater streams. *Oral presentation: 14th Susquehanna River Symposium (Submitted).*
- *Schwenk, B.A. and R.F. Smith. 2019. GIS-based prioritization system for MS4 compliance projects. *Poster presentation: 14th Susquehanna River Symposium (Submitted).*

- Smith, R.F., E. Neideigh, A. Rittle, and J.R. Wallace. 2019. Assessing macroinvertebrate community response to restoration of Big Spring Run: Expanded analysis of BACI sampling designs. *Oral presentation: Society for Freshwater Science annual meeting.*
- *Bowman, R.O., B.L. Lenze, and R.F. Smith. 2019. Vertical migration of adult Plecoptera (Stoneflies) above forested headwater streams. *Poster presentation: Society for Freshwater Science annual meeting.*
- *Bowman, R.O., B.L. Lenze, and R.F. Smith. 2019. Vertical migration of adult Plecoptera (Stoneflies) above forested headwater streams. *Poster presentation: Pennsylvania Academy of Science annual meeting.*
- Smith, R.F. and R. Bowman. 2019. Vertical migration of adult stream insects into forest canopies. *Oral presentation: Association of Mid-Atlantic Aquatic Biologists annual meeting.*
- Smith, R.F., E. Neideigh, A. Rittle, and J.R. Wallace. 2018. Assessing macroinvertebrate community response to restoration of Big Spring Run: Expanded analysis of BACI sampling designs. *Oral presentation: 13th Susquehanna River Symposium.*
- *Lenze, B.L., R.O. Bowman, and R.F. Smith. 2018. Field and lab experiments examining the effects of elevated soil temperature on the growth of *Cirsium arvense* (Canada thistle). *Poster presentation: 13th Susquehanna River Symposium.*
- *Bowman, R.O., B.L. Lenze, and R.F. Smith. 2018. Vertical migration of adult stream insects above forested headwater stream environments. *Poster presentation: 13th Susquehanna River Symposium.*
- Smith, R.F. 2018. Basic Data Summary and Analysis Module for an Ecology Laboratory Course. *Poster presentation: Association of Biology Laboratory Educators annual meeting.*
- Smith, R.F., R. Lucas, J. Ortiz, K.G. Rosas, P. Zaidel, J. Miller, and J. Ward. 2018. Social and institutional barriers to urban stream rehabilitation: Insights, challenges, and opportunities. *Poster presentation: Society of Freshwater Science annual meeting.*
- *Lenze, B.L. and R.F. Smith. 2017. Effects of elevated soil temperature on the growth of *Cirsium arvense* (Canada Thistle). *Poster presentation: 12th Susquehanna River Symposium.*
- *Musheno, S.A. and R.F. Smith. 2017. Longitudinal changes in stream macroinvertebrate communities along a gradient of stormwater inputs. *Poster presentation: 12th Susquehanna River Symposium.*
- *Treaster, C.J. and R.F. Smith. 2017. Evolution of dispersal traits of adult stream insects. *Poster presentation: 12th Susquehanna River Symposium.*
- Smith, R.F. 2017. Using Harvard Forest Signature Datasets to Teach ‘Big-Data’ Organization, Summary, and Analysis in Undergraduate Ecology. *Poster presentation: Association of Biology Laboratory Educators annual meeting.*
- Smith, R.F. 2016. Being a social caddisfly: Making the case for incorporating societal objectives to help achieve ecological improvements for urban streams. *Oral presentation: 11th Annual Susquehanna River Symposium.*
- *Yeates H. and R.F. Smith. 2016. The Effects of Impervious Cover on the Functional Diversity of Benthic Stream Invertebrate Communities in Massachusetts Streams. *Poster presentation: College of the Holy Cross undergraduate research symposium.*

- *Jambora, C.J.F. and R.F. Smith. 2016. The effects of land use on eastern brook trout and associated fish species in several Massachusetts streams. *Poster presentation: New England Association of Environmental Biologists annual meeting.*
- Smith, R.F. 2016. Introducing Urban Stream Renovation: A method to incorporate societal objectives to achieve ecological improvements. *Oral presentation: New England Association of Environmental Biologists annual meeting.*
- Smith, R.F., G.C. Gundersen, and A.H. Roy. 2015. Catchment land use and dispersal barriers affect fish and insect assemblage composition in urban streams. *Oral presentation: Ecological Society of America annual meeting.*
- Smith, R.F. and A.H. Roy. 2015. The effect of dispersal barriers on stream fish and insect assemblages in urban landscapes. *Oral presentation: Society for Freshwater Science annual meeting.*
- Smith, R.F., A.H. Roy, and R.L. Ryan. 2015. Are conservation lands good for streams? Assessing the spatial relationships of conservation lands. *Oral presentation: New England Association of Environmental Biologists annual meeting.*
- *Gundersen, G., and R.F. Smith. 2015. How Big is Big Enough? Using Empirical Evidence to Determine Spatial Extent for Examining. *Poster presentation: New England Association of Environmental Biologists annual meeting.*
- *Neideigh, E., R. Smith, A.M. Rittle, and J.R. Wallace. 2014. Impacts of stream restoration on macroinvertebrate community structure and adult stream insect colonization on Big Spring Run, Lancaster County, PA. *Poster presentation: Entomological Society of America annual meeting.*
- Roy, A. and R. Smith. 2014. Investigating impacts of landscape development on stream fish and insect dispersal. *Oral presentation: American Fisheries Society annual meeting.*
- *Cheney, K., R.F. Smith, and A.H. Roy. 2014. Spatial and temporal variation in aquatic insect emergence from headwater streams in New England. *Poster presentation: New England Association of Environmental Biologists annual meeting.*
- *McCanty, S.T., R.F. Smith, and W.O. Lamp. 2014. Morphological and phenological differences in adult *Dolophilodes distinctus* (Trichoptera) at urban and rural headwater streams. *Oral presentation: The Northeast Natural History Conference annual meeting.*
- *McPherson, L. and R.F. Smith. 2014. Predicting artificial light pollution around The University of Massachusetts campus. *Poster presentation: New England Association of Environmental Biologists annual meeting.*
- Smith, R.F. and A.H. Roy. 2014. Landscape and watershed predictors of insect and fish assemblages in Massachusetts streams. *Oral presentation: New England Association of Environmental Biologists annual meeting.*
- *Tenhulzen, A., A. Black, and R.F. Smith. 2014. The potential for restoration of Tan Brook, an urban headwater stream in Amherst, Massachusetts. *Poster presentation: New England Association of Environmental Biologists annual meeting.*
- Smith, R.F. and W.O. Lamp. 2013. Multi-scale processes controlling the composition of insects in urban streams and the application to sustainable land-use management. *Oral presentation: New England Association of Environmental Biologists annual meeting.*

- *McCanty S.T., R.F. Smith, and W.O. Lamp. 2012. Spatial and temporal differences in the activity of adult *Dolophilodes distinctus* (Trichoptera) at urban and rural headwater streams. *Poster presentation: Society for Freshwater Science annual meeting.*
- Smith, R.F. and W.O. Lamp. 2011. Comparison of adult and larval caddisfly (Trichoptera) assemblages indicates both regional and local processes decrease larval richness in urban streams. *International oral presentation: Australian Society for Limnology and the New Zealand Freshwater Sciences Society joint Congress.*
- Smith, R.F. and W.O. Lamp. 2011. Urbanization impacts adult caddisflies (Trichoptera) to reduce richness of in-stream, larval assemblages. *Oral presentation: North American Benthological Society annual meeting.*
- Smith, R.F. and W.O. Lamp. 2011. Urbanization impacts aquatic and terrestrial stages of caddisflies (Trichoptera) to reduce richness of larval assemblages in headwater streams. *Oral presentation: Entomological Society of America annual meeting.*
- Smith, R.F., L.E. Culler, and W.O. Lamp. 2010. Multivariate analysis of arthropod community development in constructed wetlands. *Oral presentation: Entomological Society of America annual meeting.*
- Smith, R.F. and W.O. Lamp. 2010. Applying metacommunity concepts to urban stream ecology: A preliminary evaluation of species sorting in a caddisfly (Trichoptera) assemblage at an urban headwater stream. *Oral presentation: Entomological Society of America, Eastern Branch annual meeting.*
- Smith, R.F. and W.O. Lamp. 2009. Adult versus larval assemblage of Trichoptera at an urban headwater stream. *Poster presentation: North American Benthological Society annual meeting.*
- Smith, R.F. and W.O. Lamp. 2008. Colonization potential of caddisflies (Trichoptera) in an urban headwater stream. *Oral presentation: Entomological Society of America annual meeting.*
- Smith, R.F. and W.O. Lamp. 2007. Does the lack of dispersing adults limit richness of aquatic insect communities in urban headwater streams? *Poster presentation: Entomological Society of America annual meeting.*
- Smith, R.F. and W.O. Lamp. 2007. Comparison of aquatic insect communities between adjacent headwater and main-stem streams in urban and rural watersheds. *Oral presentation: Entomological Society of America, Eastern Branch annual meeting.*
- Smith, R.F. 2006. Patterns among aquatic insect communities in headwater and main-stem streams: A comparison of urban and rural watersheds. *Oral presentation: Entomological Society of America annual meeting.*
- Smith, R.F., M.A. Palmer, W.O. Lamp, and L.E. Culler. 2006. Relationships of aquatic insect communities between headwater and main-stem streams in urban and rural watersheds. *Poster presentation: North American Benthological Society annual meeting.*
- Smith, R.F., W.O. Lamp, M.A. Palmer. 2006. Links between aquatic insect adult flight and larval assemblage structure in urban and rural headwater streams. *Poster presentation: Entomological Society of America, Eastern Branch annual meeting.*

Smith, R., J. Eckenrode, A. Gaul, D. Masemer, S. Poerstel, H. Rodriguez, M. Stough, J. Ambler. 2000. Stream Macroinvertebrates, the Riparian Forest, and Stream Habitat as Indicators of Human Disturbance. *Poster presentation: Pennsylvania Academy of Science annual meeting.*

Other academic presentations (4 as primary author)

Smith, R.F. 2012. Local and regional factors controlling insect diversity loss from urban headwater streams. *Invited oral presentation: Dept. of Environmental Conservation seminar series – Univ. of Massachusetts, Amherst, MA.*

Smith, R.F. 2012. Local versus regional processes impacting insect diversity loss from urban headwater streams. *Oral presentation: Exit seminar for Univ. of Maryland, Dept. of Entomology, Spring 2012 Colloquium.*

Smith, R.F. 2007. Connecting terrestrial adult activity to in-stream community structure in urban and rural watersheds. *Oral presentation: Cosmos Club 2007 Reception for Recipients of the Young Scholars Award.*

Smith, R.F. 2006. Relationships of aquatic insect communities between headwater and main-stem streams in urban and rural watersheds. *Oral presentation: Exit seminar for Univ. of Maryland, Dept. of Entomology, Fall 2006 Colloquium.*

TEACHING EXPERIENCE

Instructor

BIO215 Introduction to GIS, Lycoming College (SP 2018, '19, FA 2019)

BIO220 Environmental Biology, Lycoming College (SP 2017, '18, '19)

BIO224 Ecology, Lycoming College (FA 2016, '17, '18)

BIO328 Aquatic Biology, Lycoming College (FA 2016, '17, '18)

BIO334 Invertebrate Zoology, Lycoming College (SP 2017, FA 2019)

BIO401 Environmental Practicum, Lycoming College (SP 2018, FA 2018)

BIOL117 Environmental Science, College of the Holy Cross (FA 2015, SP 2016)

BIOL280 General Ecology, College of the Holy Cross (FA 2015)

BIOL299 Urban Ecology, College of the Holy Cross (SP 2016)

Graduate teaching assistant

BSCI105 Principles of Biology I (Lab instruction), Univ. of Maryland (FA 2002)

BSCI105 Principles of Biology I (Lab preparation), Univ. of Maryland (FA 2003, '04)

BSCI106 Principles of Biology II (Lab instruction), Univ. of Maryland (FA 2004, SP 2005, '09)

BSCI106 Honors Principles of Biology II (Lab instruction), Univ. of Maryland (FA 2005, '06, '07)

BSCI120 Insects (Lab instruction), Univ. of Maryland (SP 2006, '07)

BSCI337 Biology of Insects (Lab instruction), Univ. of Maryland (SP 2008)

BSCI393 Biology of Extinct Animals (Lab instruction), Univ. of Maryland (FA 2008)

BSCI441 Mammalian Physiology (Lab instruction), Univ. of Maryland (SP 2003)

BSCI467 Freshwater Biology (Lab instruction), Univ. of Maryland (SP 2006, '07, FA 2008)

MEES698S Ecological and Geomorphic Principles of Stream Restoration (Lab and lecture on aquatic insect sampling and taxonomy), Univ. of Maryland (SU 2005)

Special instruction

EXST016 YD41 Science Detectives: An Introduction to Forensic Science (Lecture and lab), Univ. of Maryland (Middle school program; SU 2012)

Professional mentoring

Current **Leslie Rieck.** Lycoming College, Postdoctoral Scholar in the Department of Biology and Research Associate with the Clean Water Institute: *(Project) Developing a college-community stormwater partnership model for small urbanized watersheds.*

Student research mentoring

Current **Ruric Bowman.** Lycoming College, Undergraduate in Biology. Faculty Chair for departmental honors project: *(Topic) Climate change effects on predator-prey dynamics*

Current **Bailey Schwenk.** Lycoming College, Undergraduate in Biology. Faculty Chair for departmental honors project: *(Topic) Sediment transport and channel dynamics along a gradient of urbanization*

Current **Jenna Tasker.** Lycoming College, Undergraduate in Biology. Faculty mentor for Gaul Fellowship research grant: *Relationships among environmental conditions and vertical migrations of adult stream insects into forest canopies*

2019 **Brittany Lenze.** Lycoming College, Undergraduate in Biology. Faculty mentor for multi-year independent research project: *Effects of elevated soil temperature on the growth of *Cirsium arvense* (Canada thistle)*

2017 **Sarah Musheno.** Lycoming College, Undergraduate in Biology. Faculty mentor for independent summer research project: *Longitudinal changes in stream macroinvertebrate communities along a gradient of stormwater inputs*

2017 **Cayla Treaster.** Lycoming College, Undergraduate in Biology. Faculty mentor for independent summer research project: *Evolution of dispersal traits of adult stream insects*

2016 **Hannah Yeates.** College of the Holy Cross, Undergraduate in Biology. Faculty mentor for independent study project: *The Effects of impervious cover on the functional diversity of benthic stream invertebrate communities in Massachusetts streams*

2014 **Students of Campus Green Infrastructure LANDARCH 695F.** Univ. of Massachusetts. Faculty advisor for graduate student project for EPA Campus RainWorks Challenge

2015 **Emily Neideigh.** Millersville University, Undergraduate in Environmental Biology. Committee member for University honors project: *Impacts of stream restoration on macroinvertebrate community structure and adult stream insect colonization on Big Spring Run (BSR), Lancaster County, PA*

2014 **Kristin Cheney.** Univ. of Massachusetts, Undergraduate in Biology. Co-mentor for University honors project for Capstone II program: *Spatial and temporal variation in stream insect emergence from headwater streams of New England*

2013 **Chris Hewes.** Univ. of Massachusetts, Undergraduate in Environmental Science and Earth Systems. Co-mentor for University honors project for Capstone II program: *Modeling effectiveness of low impact development in small urbanized watershed for decreasing runoff*

2013 **Sean McCanty.** Univ. of Maryland, Undergraduate in Environmental Science and Technology. Mentor for independent project assessing caddisfly assemblages in urban and rural streams and & co-mentor for Entomology departmental honors thesis: *Morphological differences in collected females of *Dolophilodes distinctus* (Trichoptera) at urban and rural headwater streams*

Curriculum development

- Quantitative Undergraduate Biology Education and Synthesis (QUBES). 2018. *PARTICIPANT: Reducing Barriers to Teaching with R in Undergraduate Biology Faculty Mentoring Network (FMN)*.
- Lamp, W., B. DeLay, A. Leslie, E. Sancomb, R. Smith, and E. Stevens. 2012. Freshwater Biology Lab Manual: A guide to invertebrate life under and on the water's surface. Dept. of Entomology, Univ. of Maryland (*Helped develop lab manual including a taxonomic key to aquatic invertebrate identifications*)
- Smith, R.F. 2012. Assessing the correlation of exam scores with overall student performance in introductory biology courses (supported through a graduate research assistantship). *College of Computer, Mathematical, & Natural Sciences, Univ. of Maryland, College Park, MD (See manuscript: Infusing quantitative approaches throughout the biological sciences curriculum)*.
- Smith, R.F., L.C. Cloud, and K.V. Thompson. 2012. Science Detectives: An introduction to forensic sciences (Lab manual – EXST 016). College of Computer, Mathematical, and Natural Sciences. Univ. of Maryland (*Helped develop lab manual including instructor notes and lesson plans for junior high level course in forensic sciences*)

Guest lectures

- Smith, R.F. 2019. Genetics as a unifying concept across micro- and macro-systems biology.
- Smith, R.F. 2019. Intelligence in insects. *For Lycoming Scholars (SCHOL 301), Dr. Michelle Briggs supervising professor.*
- Smith, R.F. 2019. Natural history of stream insects as a focus of undergraduate research. *For Lycoming College Biology Department Colloquium (BIO 349/449), Dr. Kat Bartlow supervising professor.*
- Smith, R.F. 2015. Understanding ecosystem structure and function. Univ of Massachusetts, Amherst, MA. *For Current Research in Environmental Conservation (seminar) ECO 691A (Graduate level), Dr. Brett Butler supervising professor*
- Smith, R.F. 2015. An ecological perspective on human interactions with stream ecosystems: The Tan Brook as a case study. Univ of Massachusetts, Amherst, MA. *For Sustainable Green Infrastructure Planning and Design LA591I/RP591I (Graduate and undergraduate level), Dr. Robert Ryan and Dr. Michelle Wick supervising professors*
- Smith, R.F. 2014. A completely biased opinion about the management of urban landscapes (to preserve healthy streams). Univ. of Massachusetts, Amherst, MA. *For Campus Green Infrastructure (seminar) LANDARCH 695F (Graduate and undergraduate), Dr. Mark Lindhult supervising professor*
- Smith, R.F. 2013, 2014 & 2015. Stream macroinvertebrate ecology and sampling. Univ. of Massachusetts, Amherst, MA. *For Watershed Science & Management NRC597R/NRC578, Dr. Tim Randhir supervising professor*
- Smith, R.F. 2012. Streams and rivers in the human environment. *Univ. of Massachusetts, Amherst, MA. For Environment and Society NRC100, Luisa Galindo supervising teaching assistant*
- Smith, R.F. 2012. Aquatic macroinvertebrate ecology and sampling. *Holyoke Community College, Holyoke, MA. For General Ecology Lab BIOL261, Dr. Reena Randhir supervising professor*

Smith, R.F. 2008 & 2009. Aquatic macroinvertebrate sampling and identification. *Univ. of Maryland, College Park, MD. For students of: Ecological and Geomorphic Principles of Stream Restoration (Office of Professional Studies and Dept. of Entomology short course), Dr. Margaret Palmer supervising professor*

Smith, R.F. 2000. Chironomid identification techniques. *Workshop: Millersville Univ., August 2000, Millersville Univ., for the students of: Aquatic Insect Ecology BIOL 471 (Topics), Dr. John Wallace supervising professor*

PROFESSIONAL AND ACADEMIC ACTIVITIES

Symposium on Urbanization and Stream Ecology (SUSE)

SUSE is an international meeting held every 3-6 years to discuss research on stream ecosystems in urbanized landscapes that averages about 125 meeting participants (<https://urbanstreams.wordpress.com>)

- SUSE advisory board (Founding member; 2018-current)
- 2020 (SUSE5) program committee: Austin, TX, February, 2020 (*Moving the bar on multidisciplinary solutions to wicked urban stream problems*)
- 2017 (SUSE4) symposium chair: Browns Summit, NC, May 31-June 3 (*Making urban stream rehabilitation a co-evolutionary process*)
- 2014 (SUSE3) organizing committee and guest editor for special issue in the *Freshwater Science*: Portland Oregon, May 15-17 (*Mechanisms of biotic responses to urbanization*)

College and department service: Lycoming College

- Campus sustainability committee (*current*)
- Campus information technology committee (*current*)
- Faculty advisor for the Lycoming Environmental Awareness Foundation (LEAF; *current*)
- Lycoming College field station committee (*current*)
- Search chair for Biology Postdoctoral Scholar (2019)
- Search committee for Coordinator of Instructional Technology (2016)

College and department service: Lycoming College Clean Water Institute

- Research associate for the Clean Water Institute (*current*)
- Lead author on application (accepted) for CWI to serve as a National Fish and Wildlife Foundation technical provider (2017)
- Direct or support outreach, public event, and research initiatives

Adjunct faculty – University of Massachusetts-Amherst

Fall 2015 – Spring 2019

University and department service: University of Massachusetts

- Leader, Biogeography graduate student research group
- Mapping Sustainability Education at UMass, task force participant 2012 (Series of faculty/post-doc meetings about improving sustainability education at UMass-Amherst)

University and department service – University of Maryland

- Search Committee for Director of the Biological Sciences Graduate Program, College of Life Sciences, Univ. of Maryland, May 2009
- Chair, Graduate Student Council, College of Chemical and Life Sciences, Univ. of Maryland, 2009
- Entomology Student Organization, Social Chair, Dept. of Entomology, Univ. of Maryland, 2003-2004 (*Coordinated department-wide activities for staff, professors, and students*)

Proposal and manuscript reviews

- Hydrobiologia (4 manuscript reviews): 2016, 2018, 2019 (2)
- Rhodera (1 manuscript review): 2018
- Aquatic Sciences (1 manuscript review): 2016
- Journal of Urban Ecology (1 manuscript review): 2016
- Restoration Ecology (1 manuscript review): 2016
- Guest associate editor for Freshwater Science (2 manuscripts): 2015
- Freshwater Science (1 manuscript review): 2014
- NSF proposal review panel (remote): 2013
- Ecological Applications (1 manuscript review): 2012
- Ecosphere (1 manuscript review): 2011
- Ambio (1 manuscript review with follow-up review): 2010-2011

Professional society memberships and activities

2000-Present Society for Freshwater Science / North American Benthological Society

- Chair of the Mid-Atlantic Chapter (2018-*current*)
- Primarily Undergraduate Institutions (PUI) ad hoc committee (2016-*current*)
- Mentor for Student/Mentor mixer, SFS annual meeting (2014, 2015, 2017, 2019)
- Session chair (C10 Hydroecology), SFS annual meeting (2016)
- Judge for student poster competition, SFS annual meeting (2013, 2015)
- Symposium organizer: Mechanisms of urban impacts on stream ecosystems: a global perspective (2013: Co-organizer: Allison Roy - Univ. of Massachusetts)
- Symposium organizer: Completing the life cycle – Dispersal, fitness and behaviour of adult aquatic insects. (2012: Co-organizer: Jill Lancaster - Monash Univ.)

2003-Present Entomological Society of America

- Symposium co-organizer: *Aquatic entomology for the protection of water resources* (2013)
- Symposium co-organizer: *Getting wet and making friends: Aquatic entomology's role outside academia* (2011)
- Symposium co-organizer: *Across systems and biomes: ecology and evolution of insects in aquatic habitats* (2010)
- Linnaean Games Participant (2010)
- Symposia co-organizer: *Change in the Life of Aquatic Insects: Individuals to Ecosystems* (2008)
- Co-organizer of the Aquatic Entomology Network (2007; no longer managing)

2003-Present Ecological Society of America

2017-Present Association for Biology Laboratory Education

2017-Present Pennsylvania Academy of Science

- 2017-Present **Pennsylvania Chapter of the American Fisheries Society**
- 2013-2015 **American Association for the Advancement of Science**
- 2003-2012 **Eastern Branch of the Entomological Society of America**
- Eastern Branch Student Representative to the Univ. of Maryland (2009-2012)
 - Linnaean Games Participant (2010)

OUTREACH

Major initiatives

- 2019 **Co-coordinator: Frontiers For Young Minds.** Extended STEM activity for gifted/enrichment students from two local elementary schools to experience natural science and archeology research demonstrations and review an article from an open-access journal written by a scientist to be read and reviewed by kids and teens (*M.W. Glessmer. 2019. When water swims in water, will it float or will it sink (and does it even matter)?*)
- 2016-current **Instructor: Waterdale Environmental Education Center.** Environmental education events for local primary schools (elementary and junior high) in partnership with Lycoming College Clean Water Institute environmental education initiatives.
- 2013-2016 **Co-organizer: Tan Brooke Freshwater Sustainability Project.** Multidisciplinary curriculum development effort in freshwater sustainability (included co-mentoring undergraduate independent research projects).
- 2013 **Volunteered at Peoples Academy in Morristown, VT.** Assist with their VT-EPSCoR RACC High School Program.
- 2012 **Sierra Club conservation project consultant.** QA/QC for identifications of stream macroinvertebrate samples and basic ecological community analysis as it pertained to policy governing management decisions.
- 2003-2011 **Maryland Day: “Discover the Swamp”.** University of Maryland, Department of Entomology (several occasions throughout range of years listed)

Other outreach presentations or activities

- Insect collection judge: St. John Neumann Regional Academy, Williamsport, PA (2016, 2017, 2018, 2019)
- Aquatic entomology presentation: Susquehanna Chapter of Trout Unlimited, Williamsport, PA (2016)
- Stream critters presentation: Four Corners Elementary School, Greenfield, MA (2016)
- Stream critters presentation: Deefield Brownie (Girl Scouts) Troops: Deerfield, MA (2015)

TRAINING AND SPECIAL ATTENDED COURSES

GIS training

- May 2018 Technical workshop: Fundamentals of spatial data access and analysis in R, Society for Freshwater Science annual meeting (instructors: Marcus Beck and Ryan Hill)
- July 2013 Web course: Python for everyone using ArcGIS 10.1, ESRI
- Dec. 2011 Web course: Learning ArcGIS Desktop (for ArcGIS 10), ESRI

Sep. 2011 Technical workshop: Digital elevation model based watershed and stream network delineation, Matt Baker, Univ. of Maryland, Baltimore County

Taxonomy training

June 2007 Technical workshop: Crayfish ecology and taxonomy, North American Benthological Society annual meeting

June 2006 Technical workshop: Coleoptera ecology and taxonomy, North American Benthological Society annual meeting

July 2002 Fish identification workshop III: Cyprinids and Catostomids of the Atlantic slope drainage, PA Chapter American Fisheries Society

June 2001 Technical workshop: Taxonomy and systematics of the freshwater Molluscs of North America, North American Benthological Society annual meeting

Oct. 2001 Fish identification workshop II: Catfish and suckers, PA Chapter American Fisheries Society

July 2000 Fish identification workshop I: Darters, perch, and sculpins, PA Chapter American Fisheries Society

Other training

Fall 2019 Introduction to Structured Decision Making and Adaptive Management (*Online course through Department of Fisheries and Wildlife Quantitative Fisheries Center*; Instructure: Michael Jones, Michigan State University)

Mar. 2019 Technical workshop: WikiWatershed: A web toolkit for modeling stormwater runoff and water quality and for sharing and exploring monitoring data (instructor: Dave Arscott, Stroud Water Research Center)

Jan. 2011 Technical workshop: Model selection and multimodel inference, Applied Information Company, David R. Anderson

Jan. 2003 Fundamentals in ecosystem ecology, Course at Cary Institute of Ecosystem Studies, NY