

# Dr. Robert F. Smith

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

### PROFESSIONAL STATEMENT

I am an interdisciplinary environmental scientist who studies global environmental change with a focus on streams in urban ecosystems. I leverage my expertise in aquatic entomology, organismal biology, and spatial ecology to work across spatial scales and levels of biological organization. I combine my knowledge of ecosystem science, biology, and social science to study links between built environments, biodiversity, ecosystem goods and services, and human wellbeing. My teaching is unified by a similar breadth of ecological knowledge and interdisciplinary approaches that highlight the ecological and social context of natural and human-dominated ecosystems. I stress that contemporary approaches to sustainability, management, and restoration require a holistic approach that addresses issues of environmental justice driven by social inequities.

### 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>*)

### **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* 48:1349-1359. DOI:10.1093/ee/nvz106
- Smith, R.F.**, E.C. Neideigh, A.M. Rittle, and J.W. Wallace. 2019. Assessing macroinvertebrate community response to restoration of Big Spring Run: Expanded analysis of before-after-control-impact sampling designs. *River Research and Applications* 36:79-90. DOI:10.1002/rra.3556
- 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.**, 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
- 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

### **In-review**

Rieck, L., C. Carson, B. Hawley, M. Paul, M. Scoggins, M. Heller, M. Zimmerman, and **R.F. Smith**. 2020. MS4 misunderstandings: Moving toward effective stormwater management for small municipalities. *Intended submission to: Urban Ecosystems (submitted as part of a special issue on urban stream ecology and the 5<sup>th</sup> Symposium on Urbanization and Stream Ecology)*.

### **White papers, 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 (submission expected within 30 days)**

**Smith, R.F.**, M. Fork, F. Acuña, R. Hawley, K. Katusin, M. Neale, R. Scarlett. 2020. A novel approach for creating transformative co-produced science through a professional meeting: the 5th Symposium on Urbanization and Stream Ecology. *Intended submission to: Frontiers in*

## **EXTERNAL COMPETITIVE RESEARCH AND CONTRACTED FUNDING**

### **In-progress or complete as PI or co-PI**

*(Career grants awarded from 7 organizations totaling \$833,496)*

- 2020-2021 **Effect of weather on activity and ecology of adult stream insects.** Washington Biologist's Field Club 2020 Research Awards Competition (*As single PI: \$2,991*)
- 2020-2021 **A novel approach for conducting transformative science through a professional meeting: the 5th Symposium on Urbanization and Stream Ecology.** National Science Foundation, Conferences and workshops (unsolicited) - Chapter II.E.7 (*As single PI with 9 senior personnel: \$25,550*)
- 2019-2022 **Developing a college-community stormwater partnership model for small urbanized watersheds.** Arthur Vining Davis Foundations Environmental Engagement, Stewardship & Solutions Grants (*As co-PI with 2 co-PI's – primary author on teaching and research technical components: \$258,000*)
- 2019 **Unassessed Waters of North-Central Pennsylvania.** Foundation for Pennsylvania Watersheds. (*As PI with single co-PI: \$11,000*)
- 2018-2019 **Assessing the coevolution of dispersal traits in adult stream insects.** Washington Biologist's Field Club 2018 Research Awards Competition (*As single PI: \$2,500*)
- 2017 **Unassessed Waters of tributaries in the Pine Creek drainage.** National Fish and Wildlife Foundation – Unassessed Waters Initiative 2017 (*As 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.** National Science Foundation, Catalyzing New International Collaborations (CNIC) program (*As 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.** National Science Foundation, Science, Engineering and Education for Sustainability (SEES) Fellowship (*As 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 (*As 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 (*As single PI: \$2,500*)
- 2005 **Effect of urbanization on the adult stage of aquatic insects: Does constrained dispersal contribute to community degradation?** Washington Biologist's Field Club 2005 Research Awards Competition (*As single PI: \$2,485.00*)

**In-progress or complete as senior or contributing personnel**

*(Grants awarded from 2 organizations totaling \$74,116)*

- 2019-2020 **Survey and assessment of the Eastern Hellbender Population in the Sinnemahoning Creek Watershed.** Pennsylvania Fish and Boat Commission (*As contributing personnel with PI P.J. Petokas: \$50,000*)
- 2018 **Unassessed Waters Application from Lycoming College Clean Water Institute 2018.** Pennsylvania Fish and Boat Commission (*As contributing personnel with PI M. Zimmerman: \$11,000*)
- 2014 **Meeting: The Third Symposium on Urbanization and Stream Ecology (SUSE3).** National Science Foundation, NSF 13-1 (*As senior personnel with PI S. Wenger and 7 additional senior personnel; \$14,116*)

**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)
- 2017 **Association for Biology Laboratory Education Charlie Drewes Waiver of Registration Grant.** Association for Biology Laboratory Education (\$390)
- 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**

*(Last 5 years; all grants total \$74,702)*

- 2019 **Curriculum Enrichment Funds (Course instruction).** Lycoming College (\$1,300)
- 2019 **Curriculum Enrichment Funds (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 Funds (Course instruction).** Lycoming College (\$300)
- 2018 **Faculty Conference Travel Grant.** Lycoming College (\$1,500; *to attend the Society for Freshwater Science annual meeting*)
- 2018 **Faculty Conference Travel Grant.** Lycoming College (\$700; *to attend the Association for Biology Laboratory Education annual meeting*)
- 2017 **Curriculum Enrichment Funds (Course instruction).** Lycoming College (\$425)
- 2017 **LITT grant.** Lycoming College (\$1,000 stipend)
- 2017 **Faculty Conference Travel Grant.** Lycoming College (\$1,500; *to attend the Society for Freshwater Science annual meeting*)
- 2017 **Faculty Conference Travel Grant.** Lycoming College (\$1,182; *to attend the Association for Biology Laboratory Education annual meeting*)

- 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 Funds.** Lycoming College (\$880)
- 2016      **Faculty Conference Travel Grant.** College of the Holy Cross (\$1,427)

## PROFESSIONAL PRESENTATIONS

### Invited and symposium presentations and workshops (23 as primary author)

(\* indicates mentored undergraduate student presentation)

- Rieck, L., C. Carson, B. Hawley, M. Scoggins, and R.F. Smith. 2020. Challenges, barriers, and misunderstandings for implementing small-municipality MS4 programs. *Symposium oral presentation: Association for the Science of Limnology and Oceanography and Society of Freshwater Science joint annual meeting (Accepted but cancelled due to COVID-19).*
- Scoggins, M., A. Gonzalez, R. Hawley, R.F. Smith, E. Bilger, R. Hale, M. Fork, K. Hopkins, M. Neale, and A.H. Roy. 2020. Moving the bar on multi-disciplinary solutions to wicked urban stream problems: A summary of SUSE5. *Symposium oral presentation: Association for the Science of Limnology and Oceanography and Society of Freshwater Science joint annual meeting (Accepted but cancelled due to COVID-19).*
- Smith, R.F. 2020. Natural history and ecology of streams in a human-dominated world. *Invited oral presentation: Illinois Natural History Survey, Prairie Research Institute.*
- Smith, R.F., Schwenk, B., and L. Rieck. 2020. GIS-based prioritization system for small municipality MS4 compliance projects. *Symposium poster presentation: 5<sup>th</sup> Symposium on Urbanization and Stream Ecology.*
- Rieck, L., C. Carson, M. Paul, M. Scoggins, and R.F. Smith. 2020. MS4 Misunderstandings and Myths: Moving toward effective stormwater management for small municipalities. *Symposium poster presentation: 5<sup>th</sup> Symposium on Urbanization and Stream Ecology.*
- Smith, R.F. 2019. MS Excel for teaching quantitative concepts in biology: An introduction and case study examining climate data. *Workshop presented at the Regional ABLE conference, Allegany College of Maryland.*
- Smith, R.F. 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. 2019. The pedagogy of a college stormwater management curriculum. *Invited oral presentation: PA-DEP sponsored symposium, Weathering the Storm: MWEE and Stormwater BMP Workshop.*
- 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. *Symposium 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. *Symposium oral presentation: US Regional Association of the International Association for Landscape Ecology.*
- 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. *Symposium oral presentation: 3<sup>rd</sup> 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. 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., 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. *Symposium 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. *Symposium 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. *Symposium oral presentation: 2<sup>nd</sup> Symposium on Urbanization and Stream Ecology.*
- Smith, R.F. 2007. Connecting terrestrial adult activity to in-stream community structure in urban and rural watersheds. *Invited oral presentation: Cosmos Club 2007 Reception for Recipients of the Young Scholars Award.*

**Regular conference presentations last 5 years (26 not shown)**

(\* indicates mentored undergraduate student presentation)

- \*Tasker, J., R.O. Bowman, B. Schwenk, and R.F. Smith. 2020. Examining temporal and spatial patterns of adult stream insect activity to improve conservation and management of stream ecosystems. *Poster presentation: Undergraduate Research at the Capitol, Harrisburg Pennsylvania (Accepted but cancelled due to COVID-19).*
- \*Bowman, R.O., B. Lenze, and R.F. Smith. 2020. Vertical migration of adult Plecoptera (stoneflies) above forested headwater streams. *Oral presentation: Pennsylvania Academy of Science annual meeting (Accepted but cancelled due to COVID-19).*

- \*Gonzales, B., L. Rieck, M. Zimmerman, and R.F. Smith. 2020. Novel pollutants in tributaries to the West Branch of the Susquehanna River. *Poster presentation: Pennsylvania Academy of Science annual meeting (Accepted but cancelled due to COVID-19)*.
- \*Schappert, M. and R.F. Smith. 2020. Geographic assessment of landscape vulnerability to climate change. *Poster presentation: Pennsylvania Academy of Science annual meeting (Accepted but cancelled due to COVID-19)*.
- \*Schwenk, B., L. Rieck, and R.F. Smith. 2020. GIS-based prioritization system for MS4 compliance projects. *Poster presentation: Pennsylvania Academy of Science annual meeting (Accepted but cancelled due to COVID-19)*.
- \*Tasker, J., B. Schwenk, R.O. Bowman, and R.F. Smith. 2020. Effect of climate on adult stonefly and caddisfly activity and abundance. *Poster presentation: Pennsylvania Academy of Science annual meeting (Accepted but cancelled due to COVID-19)*.
- \*Bowman, R.O., B. Lenze, and R.F. Smith. 2020. Vertical migration of adult Plecoptera (stoneflies) above forested headwater streams. *Poster presentation: Association of Mid-Atlantic Aquatic Biologists annual meeting (Accepted but cancelled due to COVID-19)*.
- \*Gonzales, B., L. Rieck, M. Zimmerman, and R.F. Smith. 2020. Novel pollutants in tributaries to the West Branch of the Susquehanna River. *Poster presentation: Association of Mid-Atlantic Aquatic Biologists annual meeting (Accepted but cancelled due to COVID-19)*.
- Rieck, L., M. Zimmerman, and R.F. Smith. 2020. Misunderstandings hamper effective, efficient actions for small-municipality MS4's. *Oral presentation: Association of Mid-Atlantic Aquatic Biologists annual meeting (Accepted but cancelled due to COVID-19)*.
- Smith, R.F., L. Rieck, and M. Zimmerman. 2020. Tools, teaching, and lessons learned (so far) developing a college-community stormwater partnership. *Oral presentation: Association of Mid-Atlantic Aquatic Biologists annual meeting (Accepted but cancelled due to COVID-19)*.
- \*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: 14<sup>th</sup> Susquehanna River Symposium*.
- \*Bowman, R.O., B.L. Lenze, and R.F. Smith. 2019. Vertical migration of adult Plecoptera (stoneflies) above forested headwater streams. *Oral presentation: 14<sup>th</sup> Susquehanna River Symposium*.
- \*Schwenk, B.A. and R.F. Smith. 2019. GIS-based prioritization system for MS4 compliance projects. *Poster presentation: 14<sup>th</sup> Susquehanna River Symposium*.
- 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: 11<sup>th</sup> 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.*

## TEACHING EXPERIENCE

### Instructor

BIO215 Introduction to GIS, Lycoming College (SP 2018, '19, '20, FA 2019)  
BIO220 Environmental Biology, Lycoming College (SP 2017, '18, '19, '20)  
BIO224 Ecology, Lycoming College (FA 2016, '17, '18, '20)  
BIO253 Urban Ecology, Lycoming College (FA 2020)  
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 and postdoctoral 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 last 5 years (6 not shown)

*Current* **Brooke Millisock.** Lycoming College, Undergraduate in Biology. Faculty mentor for informal research project: *Urban stormwater extension and outreach for a college-community stormwater partnership*

*Current* **Bailey Schwenk.** Lycoming College, Undergraduate in Biology. Faculty chair for departmental honors project: *(Topic) Decision support tool for urban stormwater BMP's in small municipalities*

*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*

- 2020 **Ruric Bowman.** Lycoming College, Undergraduate in Biology. Faculty chair for Departmental Honors in Biology: *Vertical migration of adult Plecoptera (stoneflies) above forested headwater streams*
- 2020 **Mikayla Schappert.** Lycoming College, Undergraduate in Biology. Faculty mentor for independent study: *Geographic assessment of landscape vulnerability to climate change*
- 2020 **Braeden Gonzales.** Lycoming College, Undergraduate in Chemistry. Faculty mentor for Chemistry Department Capstone project: *Novel pollutants in tributaries to the West Branch of the Susquehanna River.*
- 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*

### **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 last 5 years (8 not shown)**

- Smith, R.F. 2019. Population genetics (*fill-in for cancelled seminar*). For Lycoming College Biology Department Colloquium (BIO 349/449), Dr. Bob Smith supervising professor
- Smith, R.F. 2019. Intelligence in insects. For Lycoming College Scholars Seminar (SCHOL 301), Dr. Michelle Briggs supervising professor

- Smith, R.F. 2019. A brief introduction to MS4 regulated regions and the current state of urban stream ecology. *For Lycoming College Biology Department Colloquium (BIO 349/449), Dr. Kat Bartlow supervising professor*
- Smith, R.F. and M. Bilger. 2019. Methods for electrofishing streams and rivers. *Bloomsburg Univ, Bloomsburg, PA. For Freshwater Biology (BIOLOGY 253), Dr. Steve Rier supervising professor*
- Smith, R.F. 2018. 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. 2016. More than just a job talk: Current and future research in the Smith Ecology lab at Lycoming College. *For Lycoming College Biology Department Colloquium (BIO 349/449), Dr. Bob Smith 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 ([www.urbanstreamecology.org](http://www.urbanstreamecology.org))

- 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 associate editor for special issue in *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; committee secretary (Fa 2018 - *current*)
- Faculty advisor for the Lycoming Environmental Awareness Foundation (Sp 2018 - *current*)
- Lycoming College field station committee (Sp 2018 - *current*)
- COVID-19 remote instruction demonstration (in collaboration with ITS): *Using Microsoft TEAMS for video conferencing and recording voice-over lectures* (2020)
- Biology dept. faculty instructor for Biology Colloquium, BIO349/449 (Fa 2016, 2017, 2019)
- 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; updated 2020)
- Presentation to ITS on CWI technology needs (2019)
- Direct or support outreach and environmental education events at the Waterdale Environmental Education Center (2016-current)

## **Adjunct faculty – University of Massachusetts-Amherst**

Fall 2015 – Spring 2019

### **University and department service: University of Massachusetts**

- Leader, Biogeography graduate student research group (Fa 2013 and Sp 2014)
- Mapping Sustainability Education at UMass, task force participant (*Series of faculty/post-doc meetings about improving sustainability education at UMass-Amherst*; 2012)

### **Proposal and manuscript reviews**

- Wetlands (1 manuscript review): 2020
- City and Environment Interactions (1 manuscript review): 2020
- Hydrobiologia (4 manuscript reviews): 2016, 2018, 2019, 2019
- 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 (2016-2019)
- 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 co-organizer: *Finding solutions to wicked problems in urban stream management and rehabilitation* (2020; Organizer: Leslie Rieck – Lycoming College; Co-organizers: Mateo Scoggins – City of Austin, Megan Fork – Umeå University; Accepted but cancelled due to COVID-19)
- 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; Organizer: Alan Leslie – Univ. of Maryland; Co-organizers Dessie Underwood – Cal State, Long Beach, Wendy Willis – Aquatic Bioassay & Consulting Laboratories)
- Symposium co-organizer: *Getting wet and making friends: Aquatic entomology's role outside academia* (2011; Organizer: Jennifer Henke; Co-organizers: Eric Benbow – Univ. of Dayton, Chris Patrick – Univ. of Notre Dame, Jen Lang – Univ. of Dayton)

- Symposium organizer: *Across systems and biomes: ecology and evolution of insects in aquatic habitats* (2010; Co-organizers: Lauren Culler – Univ. of MD, Chris Patrick – Univ. of Notre Dame, Nathan Baker – Ohio State Univ., Jennifer Milligan – Cleveland State Univ.)
- Linnaean Games Participant (2010)
- Symposium co-organizer: *Change in the Life of Aquatic Insects: Individuals to Ecosystems* (2008; Organizer: Jennifer Henke – UC Riverside; Co-organizers: Lauren Culler – Univ. of Maryland, Peter Jensen – Integral Consulting Inc., Ely Kosnicki – Univ. of Missouri)
- 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**

2017-2019 **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

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.

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)?*)

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 (Oct 2016, Oct 2017, Oct 2018)
- 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*; Instructor: 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