



Neely L. Law, Ph.D.

Senior Research Analyst

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Ellicott City, MD 21043

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nll@cwpp.org

Neely L. Law, PhD, is a Senior Research Analyst at the Center for Watershed Protection with over 15 years of experience in the water resources field. Neely has extensive project management experience with multi-year federal, state and local agencies that includes coordination of inter-disciplinary teams, data management and facilitation. Her technical area of expertise is applied research and development of stormwater and watershed management strategies based on existing data, or new information generated from watershed and stream assessments or monitoring efforts. Neely's recent work at the Center has focused on facilitating stakeholder panels to define crediting protocols for urban BMPs at the State and Federal levels, advancing education and training programs in local communities, and development of monitoring plans and QAPPs.

Representative Projects

Urban Tree Planting Expert Panel. Project Manager. February 2015- September 2016

The Center assembled and led an Expert Panel for the Chesapeake Bay Program to quantify the nutrient and sediment removal effectiveness of urban tree planting. The panel reviewed the available literature, discussed and made recommendations for efficiencies that can be used to credit urban tree planting in the Chesapeake Bay Watershed Model. Neely was the panel coordinator, facilitated the meetings and was lead on developing the final report detailing the panel recommendations.

Making Urban Trees Count. Team Member. October 2014- Present.

The Center was funded by the US Forest Service to develop a model design specification for urban tree planting that addresses crediting, verification, cost-effectiveness, and tree health. The project involves a comprehensive literature review, pilot testing of a tree planting credit and verification system, collaboration with a panel of experts to make recommendations to inform the model design specification and national dissemination of the results. Neely is leading the development of a national water quality credit for tree planting.

The Self-Recovery of Stream Channel Stability in Urban Watersheds due to BMP Implementation. Project Manager. 2016 to present

The Center is working with Carroll County, MD to evaluate the effectiveness of BMP implementation on the changes in stream channel stability. The monitoring project uses a paired-watershed study design to address three research hypotheses that will evaluate hydrologic, hydraulic and geomorphic conditions of streams in Carroll County, MD and the potential sediment reductions for Chesapeake Bay TMDL credit.

Upper Neuse River Basin Nutrient Credits Project, Upper Neuse River Basin Association, NC. February 2014 to present.

The Center in partnership with Cardno is under contract to develop a more comprehensive nutrient credits toolbox for the Association that includes appropriate practices and measures for use in the Falls Lake watershed and to assist in the development of a more flexible nutrient reduction management program for the basin. The development practice standards for a set of priority BMPs and model development are the focus of the Center's efforts.

Maryland State Highway Administration Inlet Cleaning Pollutant Characterization Study for TMDL Compliance. Project Manager. 2016 to present

The Center is working with Morgan State University to provide MD SHA with recommendations to optimize their inlet cleaning program for TMDL compliance and provide information that can enhance the crediting protocols allowed by MDE. The program assessment will include surveys, GIS analysis and implementation of a study design to collect and analyze material collected in inlets.

Sediment Reduction and Stream Restoration Corridor Coordinator. Project Manager. 2012 to 2015

To advance the implementation of the most cost-effective, efficient, and targeted nutrient and sediment reduction actions for the protection and restoration of the Chesapeake Bay. This work included technical assistance to integrate sediment reduction strategies into the Bay modeling tools, coordination of expert panels and programmatic support to Goal Implementations Teams and Work Groups.

Performance Enhancing Devices for BMPs. Team Member. October 2014 – December 2017

Recent buzz around additives to stormwater BMPs to enhance nitrogen and phosphorous removal efficiency led the Center to pursue funding to monitor BMPs modified with additives. Monitoring includes bioretention with a biochar additive as well as a sand filter with biochar. These enhanced BMPs will be compared against control versions to determine added benefits.

Related Experience

Adjunct Faculty; University of Maryland University College; 2009-2011

Research Assistant, University of North Carolina at Chapel Hill; Department of Geography; 1998-2002

Instructor; Geography of Environmental Systems; North Carolina at Chapel Hill; Spring 2002

Planner; City of Windsor; Department of Planning; 1994-1996

Research Associate; Wayne State University; Detroit, MI; 1993-1994

Education

PhD in Geography; University of North Carolina at Chapel Hill, Chapel Hill, NC, 2004

Masters Geography, University of Toronto, Toronto, Ontario, 1996

Bachelors in Environmental Studies, Urban Planning, University of Waterloo, Waterloo, Ontario, 1992

Selected Publications

- Fraley-McNeal, L., N. L. Law and J. Tassilo. 2011. Estimating forest loss with urbanization: an important step towards using trees and forests to protect and restore watersheds. *Watershed Science Bulletin*, 2 (2):
- Drescher, S.R., N. L. Law, D. S. Caraco, K. M. Cappiella, J. A. Schneider and D. J. Hirshman. 2011. Research and policy implications for watershed management in the Atlantic Coastal Plain. *Coastal Management*, 39: 242-258.
- Shields, C., L.E. Band, N. Law, P. Groffman, S. Kaushal, K. Savvas, G. Fisher, K. Belt, 2008. Streamflow distribution of non-point source nitrogen export from urban-rural catchments in the Chesapeake Bay Watershed. *Water Resources Research*, 44, W09416, doi:10.1029/2007WR006360.
- Law, N. L., K. Cappiella and M. E. Novotney. 2009. The need for improved pervious land cover characterization in urban watersheds. *Journal of Hydrologic Engineering*, 14(4):305-308.
- Pickett, S. T. A., M. L. Cadenasso, J. M. Grove, P. M. Groffman, L. E. Band, C. G. Boone, G. S. Brush, W. R. Burch, Jr., C. S. B. Grimmond, J. Hom, J. C. Jenkins, N. L. Law, C. H. Nilon, R. V. Pouyat, K. Szlavecz, P. S. Warren, M. A. Wilson. Beyond Urban Legends: An Emerging Framework of Urban Ecology as Illustrated by the Baltimore Ecosystem Study, *Bioscience*, 58(2): 141-152.
- N. Law, L. E. Band, and J. M. Grove. 2004. Nitrogen input from residential lawn care practices in suburban watersheds in Baltimore, County, MD, *Journal of Environmental Planning and Management*, 47, (5): 737-755.
- Groffman, P., N. L. Law, K. Belt, L. E. Band, and G. Fisher. 2004. Nitrogen and phosphorus fluxes in urban watershed ecosystems. Nitrogen fluxes and retention in urban watershed ecosystems. *Ecosystems*, 7:393-403.

Kathleen Bailey Boomer

Post Office Box 55, Queenstown, MD 21658

e-mail: kboomer@tnc.org

phone: 607-280-3720

SUMMARY OF PROFESSIONAL INTERESTS AND EXPERIENCE: Developed broad, interdisciplinary background in wetland eco-hydrology and ecosystem services, watershed modeling, and landscape ecology to reduce human impacts on the environment by promoting targeted management and collaborative research for decision-support.

EDUCATION: Cornell University, Ithaca, NY:

Ph.D. 2006 (Biogeochemistry). Effects of ground-water flow on soil chemistry, nutrient availability, and plant species distribution in four New York State fens. Advisor: Dr. Barbara Bedford

M.S. 1998 (Natural Resources, wetland ecology). Hydrology and water chemistry patterns driven by short-term geomorphic processes in a freshwater coastal peatland.

B.S. 1991 (Natural Resources).

PROFESSIONAL EXPERIENCE:

Watershed Scientist, The Nature Conservancy

June 2011 – present.

MD/DC Chapter, Bethesda, MD 20814

Provide technical support to advance resource management. Currently, work with stakeholders to target on-the-ground wetland conservation practices; manage field monitoring programs with external partners to evaluate wetland function in relation to landscape position; facilitate external collaborations to secure grant funds and advance applied research; and co-lead workshops and webex seminars to communicate complex scientific issues to a broad range of audiences. Serve as a technical expert of integrated modeling and monitoring strategies to the USEPA Chesapeake Bay Program's Science Technical Advisory Committee (STAC), Mississippi River Basin project team, CBP Wetlands Expert Panel, and The World Bank's Zhejiang Qiandao Lake Project in China.

Research Ecologist, Smithsonian Environmental Research Center

February 2004 – 2011.

Ecological Modeling and Spatial Analyses Laboratory, Edgewater, MD 21037

Coordinated two multi-institutional efforts to evaluate impacts from agriculture, land use/land cover conditions, and climate change by comparing advanced watershed model applications. Developed geospatial tools to identify nutrient and sediment retention "hotspots" and highly erosive hillslopes and stream banks affecting stream water quality and habitat conditions using high resolution LiDAR-derived topography and other remote sensing data.

Research Assistant, Cornell University,

January 1998 – 2006.

Department of Natural Resources, Ithaca, NY 14853

Surveyed 24 coastal wetlands and anthropogenic impacts for the USEPA's Great Lakes Environmental Indicators (GLEI) project. Adopted methods in contaminant hydrogeology to characterize wetland water budgets and to compare habitat condition and nutrient fluxes in 18 isolated, riparian, and coastal wetland systems. Developed and managed large database including plant, soils, and water data contributed by researchers at multiple institutions. Secured more than \$50K in grant research funds and supervised staff of ten field technicians.

Software Application Developer, Cornell University

June 1995 – 2006.

Department of Applied Economics and Management, Ithaca, NY 14853

Wetland Hydrobiologist, The Nature Conservancy

May 1996 – December 2001.

Tug Hill/Eastern Lake Ontario Office, Pulaski, NY 13142

Conducted hydrological studies of Lake Ontario coastal wetlands and to evaluate potential impacts of adjacent development and alternative land management strategies. Provided technical review of environmental impact studies and expert opinion to New York State regulatory agencies.

Environmental Scientist, Malcolm Pirnie, Inc.

November 1991 – August 1994.

White Plains, NY 10602-0751

Prepared human and ecological health risk assessments for Remedial Investigation/Feasibility Study reports, wetland delineation reports, and habitat assessments.

KATHLEEN BAILEY BOOMER

PUBLICATIONS:

- Sharifi, A., H. Yen, **K.B. Boomer**, L. Kalin, X. Li, D.E. Weller. 2017. Using multiple watershed models to assess the water quality impacts of alternate land development scenarios for a small community. *Catena* 150:87-99.
- Tomer, M.D., S.A. Porter, **K.B. Boomer**, D.E. James, J.A. Kostel, M.J. Helmers, T.M. Isenhardt, and E. McLellan. 2015. Agricultural conservation planning framework: 1. Developing multi-practice watershed planning scenarios and assessing nutrient reduction potential. *Journal of Environmental Quality* 44(3):754-767.
- Tomer, M.D., **K.B. Boomer**, S.A. Porter, B. Gelder, D.E. James, and E. McLellan. 2015. Agricultural conservation planning framework: 2. Classification of riparian buffer design-types. *Journal of Environmental Quality* 44(3):768-779.
- Selected as the 2014 Editor's Choice Award:*** Tomer, M.D., S. Porter, D.E. James, **K.B. Boomer**, J.A. Kostel, and E. McLellan. 2013. Combining precision conservation technologies into a flexible framework to facilitate agricultural watershed planning. *Journal of Soil and Water Conservation* 68:113A-120A.
- Selected for the 2014 Boggess Award, for best paper:*** Boomer, K.B., D. Weller, T. Jordan, L. Linker, J. Reilly, G. Schenk, and A. Voinov, 2013. Using Multiple Watershed Models to Predict Nitrogen and Phosphorus Discharges to the Patuxent Estuary. *Journal of American Water Resources Association* DOI: 10.111:1-25.
- Osmond, D.L., R. Brooks, S. Yetter, R. Carline, **K.B. Boomer**, A. Armstrong, R. Stedman, D. W. Meals, and G.D. Jennings. 2012. Spring Creek Watershed, Pennsylvania: National Institute of Food and Agriculture–Conservation Effects Assessment Pr. In: Osmond, D. L., and others. *How to Build Better Agricultural Conservation Programs to Protect Water Quality: The NIFA–CEAP Experience*. Ankeny, IA: Soil and Water Conservation Society, pp.342-357.
- Kröger, R., E.J. Dunne, J. Novak, K.W. King, E. McLellan, D.R. Smith, J. Strock, **K.B. Boomer**, M. Tomer, and G.B. Noe, 2012. Downstream Approaches to P Management in Agricultural Landscapes. *Science of the Environment* 442:263–274.
- Boomer, K.B.** and B.L. Bedford. 2008. Groundwater-induced redox-gradients control soil properties and phosphorus availability across four headwater wetlands, New York, USA. *Biogeochemistry* DOI 10.1007/s10533-008-9251-2.
- Boomer, K.B.** and B.L. Bedford. 2008. Influence of nested groundwater systems on reduction-oxidation and alkalinity gradients with implications for plant nutrient availability in four New York fens. *Journal of Hydrology* 351: 107-125.
- Boomer, K.B.**, D.E. Weller, T.E. Jordan. 2008. USLE-based models fail to predict sediment discharges. *JEQ* 37: 7-89.
- Liu Z.J., D.E. Weller, T.E. Jordan, D.L. Correll, and **K.B. Boomer**. 2008 Integrated modular modeling of water and nutrients in the Patuxent River watershed. *Journal of the American Water Resources Association* 44: 700-723.
- Gusewell S., **K. Bailey**, W. Roem and B. Bedford. 2005. Nutrient limitation and botanical diversity in wetlands: can fertilization raise species richness? *Oikos* 109:71-80.
- Bailey, K.M.** and B.L. Bedford. 2003. Transient geomorphic control of water table and hydraulic head reversals in a coastal freshwater peatland. *Wetlands* 23: 969-978.

TECHNICAL REPORTS:

- Scavia, D, Easton, Z, R. Alexander, L. Band, K. Boomer, P. Kleinman, A. Miller, D. Smith, C. Welty. *In Review*. STAC Review of the CBP Phase 6 Watershed Model.
- Mason, P., **K. Boomer**, J.M. Denver, E. McLaughlin, K. Staver, S. Strano and others. 2016. Wetlands and Wetland Restoration Recommendations for the Incorporation of Non-Tidal Wetland Best Management Practices (BMPs) and Land Uses in the Phase 6 Chesapeake Bay Watershed Model. Chesapeake Bay Program Report CBP/TRS-314-16.
- Linker, L., R. Hirsch, W. Ball, J. Testa, **K. Boomer**, C. Cerco, L. Sanford, J. Cornwell, L. Currey, C. Friedrichs, R. Dixon. 2016. Conowingo Reservoir Infill and Its Influence on Chesapeake Bay. STAC Pub #16-004, Edgewater, MD. 51 pp.
- Schneider R.L. and **K.B. Boomer**. 2016. Re-plumbing the Chesapeake Watershed: Improving Roadside Ditch Management to Meet TMDL Water Quality Goals. STAC Publ. 16-001. Edgewater, MD 43 pp.
- Porter, S.A., M.D. Tomer, D. James and **K.B. Boomer**. 2014. Agricultural Conservation Planning Toolbox and User's Manual. USDA, ARS, Midwest Area Agroecosystems Management Research Unit. Ames, IA
- Chesapeake Bay Program Scientific and Technical Advisory Committee. 2013. Incorporating Lag-Times into the Chesapeake Bay Program. STAC Publ. #13-004, Edgewater, MD. 66 pp.
- Boomer, K.B.** 2012. Flow alterations in the Susquehanna River and Effects on the Ecology of the Susquehanna Flats and Upper Chesapeake Bay. Peer-reviewed report for The Nature Conservancy.
- Aldous, A., **K.B. Boomer**, B. Bedford, A. Jacobs, M. Fisher, and J. Marty. 2012. Making the Case for Hydrologic and Biogeochemical Connections of Headwater Wetlands to Traditional Navigable Waters of the United States. 21 pp. Submitted to the US Environmental Protection Agency, April 30, 2012.
- Boomer, K.B.** 2011. Simulation of Nutrient Transport in Groundwater, submitted to the CBP STAC. May 31, 2011.
- Boomer, K.B.** 2010. Water Resource Element of the Queenstown Comprehensive Plan (reviewed by MDP).

Denice Heller Wardrop

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Email: dhw110@psu.edu

education and licenses:

- Pennsylvania State University - Ph.D. Ecology
- University of Virginia - M.S. Wildlife Environmental Sciences
- University of Virginia - B.S. Systems Engineering
- Licensed Professional Engineer, Commonwealths of Pennsylvania and Virginia

professional employment:

- **2005–Present:** Senior Research Associate, Penn State University
- **2003–Present:** Associate Director, Riparian (formerly the Cooperative Wetlands Center), Penn State University
- **2000–2003:** Assistant Director, Cooperative Wetlands Center
- **1997–2005:** Research Associate, Penn State University
- **1993–1997:** Research Assistant, Penn State University
- **1991–1993:** Risk Assessment Specialist, Environmental Standards Inc. Valley Forge, PA
- **1988–1991:** Project Manager, Nittany Geosciences, State College, PA
- **1985–1988:** Senior Project Manager, Environmental Resources Management, Inc., Exton, PA
- **1982–1984:** Research/Teaching Assistant, University of Virginia
- **1979–1980:** Systems Engineer, Satellite Business Systems, McLean, Virginia

selected service

- Associate Director, Penn State Cooperative Wetlands Center
- Pennsylvania Governor's Representative, Chesapeake Bay Program Scientific and Technical Advisory Committee
- Director, Mid-Atlantic Regional Wetland Working Group, USEPA/Pennsylvania Department of Environmental Protection
- Member, National Biological Assessment of Wetlands Working Group, US EPA Office of Wetlands, Oceans, and Watersheds
- Member, National Tiered Aquatic Life Use Working Group, US EPA Office of Wetlands, Oceans, and Watersheds

- Chair and/or Geography Representative, Fixed Term and Research Faculty Advisory Committee, College of Earth and Mineral Sciences
- Appointed Member, Commission for Women, 2003-2006

selected publications:

Wardrop, D. H., M. E. Kentula, D. L. Stevens, S. F. Jensen, and R. P. Brooks. 2007. Assessment of Wetland Condition: An Example from the Upper Juniata Watershed in Pennsylvania, USA. *Wetlands* 27: 416-431.

Wardrop, D. H., M. E. Kentula, S. F. Jensen, D. L. Stevens, K. C. Hychka, and R. P. Brooks. 2007. Assessment of Wetlands in the Upper Juniata Watershed in Pennsylvania, USA, Using the Hydrogeomorphic Approach. *Wetlands* 27: 432-445.

Wardrop, D. H., C. Herschner, K. Havens, K. Thornton, and D. Bilkovic. 2007. Developing and Communicating a Taxonomy of Ecological Indicators: A Case Study from the Mid-Atlantic. *Ecohealth* 4:179-186.

Miller, S. J., D. H. Wardrop, W. M. Mahaney, and R. P. Brooks. 2006. A plant-based index of biological integrity (IBI) for headwater wetlands in central Pennsylvania. *Ecological Indicators* 6:290-312.

Wardrop, D. H., J. A. Bishop, M. Easterling, K. Hychka, W. L. Myers, G. P. Patil, and C. Taille. 2005. Use of landscape and land use parameters for classification and characterization of watersheds in the Mid-Atlantic across five physiographic provinces. *Environmental and Ecological Statistics* 12:209-223.

Brooks, R. P., D. H. Wardrop, and J. A. Bishop. 2004. Assessing wetland condition on a watershed basis in the mid-Atlantic region using synoptic land cover maps. *Environmental Monitoring and Assessment*, Vol 94(1):9-22.

Mahaney, W. M., D. H. Wardrop, and R. P. Brooks. 2004. Impacts of stressors on the emergence and growth of wetland plant species in Pennsylvania, USA. *Wetlands*, Vol 24 No. 3, pp. 538-549.

Cole, C. A., R. P. Brooks, and D. H. Wardrop. 1998. Wetland hydrology and water quality as a function of hydrogeomorphic subclass. *Wetlands* 17(4):456-467.

Methods for Evaluating Wetland Condition: Module #10, Using Vegetation to Assess Environmental Conditions in Wetlands. EPA 822-R-01-007j. December 2001. Major Contributors: S. Fennessey, M. Gernes, J. Mack, and D. H. Wardrop.

Wardrop, D.H., and R.P. Brooks. 1998. The Occurrence and impact of sedimentation in central Pennsylvania wetlands. *Environmental Monitoring and Restoration* 51(1-2), 119-130.

Erin N. McLaughlin

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Annapolis, MD 21401

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Education

M.S., Biology, 2003

Syracuse University, Syracuse, New York

Research Advisor: Dr. Charles Driscoll

B.S., Biology, minor in Chemistry, 1999

Salisbury University, Salisbury, Maryland

Professional Experience

Maryland Department of Natural Resources

Annapolis, Maryland

Habitat Restoration Section Chief

June 2014 – Present

- Manage, coordinate, and implement stream and wetland restoration projects to improve water quality and habitat
- Identify obstacles and develop solutions to ensure restoration success
- Co-Chair of Wetland Workgroup, Chesapeake Bay Foundation
- Supervise two Natural Resource Biologists/Planners

Restoration Ecologist

October 2006 – June 2014

- Project management from first site visit through final inspection; provided technical assistance to stakeholders, engaged and coordinated partners, wrote grant proposals, prepared permit applications, managed construction crews and budgets, produced final reports
- Assisted Land Acquisition and Planning Unit; identified natural resources in need of conservation or restoration on potential acquisitions; provided resource information and recommendations to support acquisition and easement decisions as well as conservation plans
- Actively participated in community and watershed planning initiatives; provided technical assistance and outreach to private landowners, community associations, and partner agencies

Delaware Department of Natural Resources and Environmental Control

Dover, Delaware

Wetland Research Assistant

May 2005 - October 2006

- Wetland assessment and monitoring; collected, analyzed and interpreted data; supervised and lead interns; regularly interacted with private landowners

Acadia National Park, Volunteers-In-Parks Program

Bar Harbor, Maine

Volunteer

October 2004 - March 2005

- Assisted with trail and carriage road maintenance, museum specimen inventory, and Microsoft Access and Outlook database maintenance and population

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United States Geological Survey

Wetland Research Team Leader

Bar Harbor, Maine

June - September 2004

- Lead crew of four research assistants; contacted and interacted with private landowners and local government personnel; became well-acquainted with the communities, trails, plants, and animals on Mount Desert Island

Appalachian Conservation Biology

Field Assistant

Frostburg, Maryland

April - May 2004

University of Maryland Appalachian Laboratory

Laboratory Technician

Frostburg, Maryland

January - April 2004

Syracuse University

Graduate Research Assistant

Syracuse, New York

August 2001 - August 2003

University of Maryland Appalachian Laboratory

Lab Assistant

Frostburg, Maryland

January 2000 - June 2001

Professional Memberships

- Mid-Atlantic Wetland Workgroup (MAWWG)
- Association of State Wetland Managers (ASWM)

Scott D. Jackson
Extension Associate Professor
Dept. of Environmental Conservation, University of Massachusetts, Amherst
(413) 545-4743, sjackson@umass.edu

DEGREES

M.S. 1990. University of Massachusetts, Amherst, Dept. Forestry & Wildlife Management.
B.S. 1980. Allegheny College, Bachelor of Science in Biology, Minor in Chemistry; Alden Scholar

UMASS EMPLOYMENT

Extension Associate Professor. University of Massachusetts Extension, Department of Environmental Conservation, Amherst, MA. January 2012 to present.

Extension Educator/Conservation Specialist, UMass Extension's Natural Resources and Environmental Conservation Program, Department of Forestry and Wildlife Management, Amherst, MA. November 1992 to January 2012.
Program Director, October 1995 to January 2012.

UMASS TEACHING

ECO 768: Wetlands Ecology and Conservation, 3 credits
NRC 563: Wetlands Wildlife Ecology and Management, 3 credits
NRC 565: Wildlife Population Dynamics and Management, 4 credits
NRC 597Wetlands Assessment and Field Techniques, 3 credits

RESEARCH & EXTENSION

As an Extension faculty member my responsibility is to develop and implement integrated research and extension projects in collaboration with other faculty and outside stakeholders. My research interests include: wildlife ecology and conservation, wetland assessment and monitoring, impacts of roads and highways on wildlife, and landscape-based ecological assessment. Significant integrated research/extension projects include the Conservation Assessment and Prioritization System (CAPS), North Atlantic Aquatic Connectivity Collaborative (NAACC), Ecological and Transportation Vulnerability of Road Stream Crossings, MA Wetlands Assessment and Monitoring Program, and the Massachusetts Wildlife Climate Action Tool.

Refereed and Peer-reviewed papers and Publications (since 2011):

- Jackson, S. D.**, T. A. Langen, D. M. Marsh, and K. M. Andrews. 2015. Natural History and Physiological Characteristics of Small Animals in Relation to Roads. Pp. 21-41 *In* Andrews, K. M., P. Nanjappa, and S. P. D. Riley (eds). 2015. *Roads and Ecological Infrastructure: Concepts and Applications for Small Animals*. Johns Hopkins University Press, Baltimore, MD.
- Jackson, S. D.**, D. J. Smith, and K. E. Gunson. 2015. Mitigating Road Effects on Small Animals. Pp. 177-207 *In* Andrews, K. M., P. Nanjappa, and S. P. D. Riley (eds). *Roads and Ecological Infrastructure: Concepts and Applications for Small Animals*. Johns Hopkins University Press, Baltimore, MD.
- Langen, Tom A., K. E. Gunson, **S. D. Jackson**, D. J. Smith, and W. Ruediger. 2015. Planning and Designing Mitigation of Road Effects on Small Animals. Pp. 146-176. *In* Andrews, K. M., P. Nanjappa, and S. P. D. Riley (eds). 2015. *Roads and Ecological Infrastructure: Concepts and Applications for Small Animals*. Johns Hopkins University Press, Baltimore, MD.
- Siddig, A. A., A. M. Ellison, and **S. D. Jackson**. 2015. Calibrating abundance indices with population size estimators of red back salamanders (*Plethodon cinereus*) in a New England forest. PeerJ, DOI 10.7717/peerj.952. 15 pp.
- Homa, E.S., C. Brown, K. McGarigal, B.W. Compton and **S.D. Jackson**. 2013. Estimating hydrologic alteration from basin characteristics in Massachusetts. J. Hydrol. 503(2013):196-208.

Bellis, M.A., C.R. Griffin, P. Warren, and **S. Jackson**. 2013. Utilizing a multi-technique, multi-taxa approach to monitoring wildlife passageways in Southern Vermont. *Oecologia Australis* 17(1):111-128.

Non-refereed Articles (since 2011)

Jackson, S. D., E. Plunkett, B. W. Compton, and K. McGarigal. 2017. Empirically derived indices of biotic integrity for wetlands in Massachusetts and an evaluation of their utility for assigning Coefficient of Conservatism scores for FQA. University of Massachusetts, Amherst. 45 pp.

Jackson, S. D., L. Rhodes and M. McHugh. 2016. Wetland Replacement in Massachusetts. MassDEP Report. 106 pp.

Jackson, S. D. 2014. Integrating landscape-based ecological assessment with intensive field methodologies to monitor wetland condition in Massachusetts. AMWS (Association of Massachusetts Wetlands Scientists) Newsletter No. 89. Pp 10-12.

McGarigal, K., E. Plunkett, J. Grant, B. W. Compton, T. Portante, K. Rolih and **S. D. Jackson**. 2017. Empirically derived indices of biotic integrity for forested wetlands, coastal salt marshes and wadable freshwater stream in Massachusetts. University of Massachusetts, Amherst. 249 pp.

Jackson, S. D., B. W. Compton, and K. McGarigal. 2012. Critical linkages: Assessing connectivity restoration potential for culvert replacement, dam removal and construction of wildlife passage structures in Massachusetts. Pp. 143-156 In P. J. Wagner, D. Nelson and E. Murray (eds) Proceedings of the 2011 International Conference on Ecology and Transportation. Center for Transportation and the Environment, North Carolina State University, Raleigh, NC.

Jackson, S. D., L. Rhodes and L. Langley. 2011. Development and use of aquatic life use standards for wetlands in Massachusetts. University of Massachusetts, Amherst. 15 pp.

Cenderelli, D.A., R.A. Gubernick, M.R. Weinhold, D.K. Johansen, K.K. Bates, **S.D. Jackson**, and G. Napper. 2011. Stream Simulation: Designing Road-Stream Crossings for Aquatic Organism Passage, An e-Learning Training Course. USDA Forest Service 7700-Transportation 1177 1401 – SdTDC, January 2011.

GRANTS AND CONTRACTS RECEIVED (SINCE 2011)

Role	Sponsor	Title	Amount
PI	North Atlantic LCC via the Wildlife Management Institute	Development of a Rapid Assessment Protocol for Aquatic Passability of Tidally Influenced Road-Stream Crossings	\$75,000
PI	MA Division of Fisheries and Wildlife	Promoting Climate Adaptation Through the Use of a Web-Based Tool: Phase 2	\$150,000
PI	US EPA	Making CAPS-Based Tools for Wetlands Assessment Available Throughout New England	\$357,635
PI	Vanasse Hangen Brustlin and National Grid	Evaluation of Road-Stream Crossings in Tewksbury Massachusetts	\$16,644
PI	MA Division of Fisheries and Wildlife	Promoting Climate Adaptation Through the Use of a Web-Based Tool	\$184,500
PI	U.S. Fish and Wildlife Service	Road-Stream Crossing Assessment for Climate Resilience and Aquatic Connectivity in the Sandy-Impacted Northeastern US	\$574,375
Co-PI	MA Department of Transportation	Development Of Aquatic Connectivity and Extreme Flood Vulnerability Assessment Protocols Under Present And Future Climatic Conditions For Roadway Stream Crossing Structures Within The Deerfield River Watershed, Massachusetts	\$1,030,349
PI	MA Department of Environmental Protection and US EPA	Wetland Monitoring & Assessment: Vegetation Sampling in Forested Wetlands	\$105,000
PI	North Atlantic LCC via the Wildlife Management Institute	Increasing Resiliency for Culverts, Road and Riverine Ecosystems via Collaborative Culvert Assessment in the North Atlantic Region	\$150,000
PI	US EPA	Forested and Shrub Wetland Vegetation Sampling, IBI Development, and Revision of IBI and Scenario Software	\$211,615
PI	MA Department of Environmental Protection and US EPA	Wetland Monitoring & Assessment (M&A): Development of IBI Software and a Lacustrine Wetlands Nutrient Model	\$100,000
PI	Housatonic Valley Association	Housatonic Continuity Project	\$31,121
PI	Vanasse Hangen Brustlin and National Grid	Road-Stream Crossings: Auburn & Millbury	\$22,600
PI	MA Department of Environmental Protection and US EPA	Massachusetts Wetland Monitoring and Assessment: 2011 Wetlands Program Development Grant	\$139,000

Jeanne Marie Christie

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Phone: (207) 892-3399
e-mail: jeanne.christie@aswm.org

2001-Present Executive Director, Association of State Wetland Managers

- Responsible for developing overall strategic directions and programs for ASWM—national policy and science priorities as well as activities related to leading a nonprofit organization including; fundraising, program development and implementation, information technology, training, web design and content, and other activities associated with directing a nonprofit organization.
- Serves as liaison with individual state wetland managers and other state nonprofit organizations, federal agencies, academics, scientists, local government and other wetland and water resources management professionals.
- Provides tailored assistance to individual states on state wetland dredge and fill programs, wetland mapping, wetland water quality standard development, state wetland restoration programs, integration of state and federal Farm Bill programs, Clean Water Act jurisdiction policy issues and other technical assistance topics.
- Develops and advises on training and capacity building programs for wetland professionals.
- Steering committee member of Wetland Mapping Consortium and Natural Floodplain Function Alliance.
- Provided leadership for state program summary project, state wetland mapping project, state wetland climate change project, 401 certification project, state assumption project, nationwide permitting project, In Lieu Fee program project, state water quality standards for wetlands project, state strategic planning project, wetland restoration permitting project, stream identification delineation and mitigation project, project. Provided direction and support for water quality standards for wetlands, state programmatic permits project, state wetland program plan project, improving wetland restoration success project and state status and trends project.
- Planned and facilitated ASWM's Federal/State Cooperation Meeting annually 2001-2017
- Planned and Facilitated ASWM's National Annual Meeting 2001-2008
- A monthly blogger for The Compleat Wetlander

1999-2000 Associate Director, Association of State Wetland Managers

- Planned and facilitated Wetlands Outreach Meeting, September 1999
- Organized and facilitated ASWM's Federal/State Wetlands Meeting, February 2000
- Directed development of 3-year plan
- Editor for Quarterly Newsletter, Wetland News

Jeanne Christie Resume', Continued (p 2/2)

- 1995-1999 Resource Conservationist, U.S. Department of Agriculture Natural Resources Conservation Service Wetlands and Watersheds Division
- National Program Leader for Wildlife Habitat Incentives Program created in the 1996 Farm Bill—facilitated development of regulations, environmental assessment, cost benefit analysis, public outreach, training, program handbook, annual OMB budget requests, allocation of funding , policy revisions/clarification and overall implementation nationally.
 - Other work as assigned including endangered species policy, conferences, correspondence, software, GPS and GIS development, briefing materials, various policy issues and initiatives related to NRCS programs including Wetlands Reserve Program, Small Watershed Program, National Resources Inventory Program, etc.
- 1993-1994 Acting Branch Chief, Wetland Strategies and State Programs Branch, Wetlands Division, U. S. Environmental Protection Agency
- Charged with development of national strategies, programs, regulations and policies to promote development of State, Tribal, and local programs to protect wetlands.
 - Supervised 19 staff (12 permanent and 7 on various types of internships).
- 1992-1993 Chief, Outreach and State Program Section, Wetlands Division, USEPA
- Responsible for influencing development of Agency policies/programs, developing State, Indian, local and private sector programs; directing public information initiatives; international activities; analysis of authorizing statutes, legislative histories, judicial interpretations, and regulations of federal agencies that impact wetlands.
 - Supervised 6 full time employees.
- 1988-1992 Environmental Protection Specialist, USEPA
- Worked extensively with federal agencies to provide national direction to integrate wetlands protection into natural resource/natural hazards management, agriculture, floodplains, multi-objective river corridor management, and management of federal lands. Facilitated meetings, workshop and conferences on wetlands, floodplain management and multi-objective river corridor management
- 1986-1988 Associate Editor, J.T.& A. Associates
- 1985-1988 Program and Planning Analyst, Bureau of Water Resources Management, Wisconsin Department of Natural Resources

Education

- 1983 Bachelor of Arts, Political Science, University of Maine at Presque Isle
Bachelor of Science, Environmental Science, University of Maine at Presque Isle

Gregory B. Noe

a. Professional Preparation

Virginia Tech	Blacksburg, VA	Biology	B.S. Honors 1994
University of California, Davis and San Diego State University			
	San Diego and Davis, CA	Ecology	Ph.D. 1999
Florida International University	Miami, FL	Biogeochemistry	1999-2002

b. Appointments

Current Position:

Research Ecologist and Lead Scientist, National Research Program, U.S.
Geological Survey, Reston, VA

Previous positions:

2000-2002	LTER Scientist, Florida Coastal Everglades LTER, Florida International University, Miami, FL
1999-2001	Postdoctoral Research Scientist, Southeast Environmental Research Center, Florida International University, Miami, FL
1994-1999	Research Assistant, Pacific Estuarine Research Laboratory, San Diego State University, San Diego, CA
1990-1994	Research Assistant, Department of Biology, Virginia Tech, Blacksburg, VA

c. Products

PRODUCTS MOST CLOSELY RELATED

1. McMillan, S.K., and G.B. Noe. In press. Increasing floodplain connectivity through urban stream restoration increases nutrient and sediment retention. *Ecological Engineering*.
2. Korol, A.R, C. Ahn, and G.B. Noe. 2016. Richness, biomass, and nutrient content of wetland macrophyte community affect soil nitrogen cycling in a diversity-ecosystem functioning experiment. *Ecological Engineering* 95: 252-265.
3. Kroes, D., E.R. Schenk, G.B. Noe, and A.J. Benthem. 2015. Sediment and nutrient trapping as a result of a Mississippi River diversion: the Morganza Spillway during the 2011 Mississippi River Flood. *Ecological Engineering* 82: 91-102.
4. Kröger, R., E.J. Dunne, J. Novak, K.W. King, E. McLellan, D.R. Smith, J. Strock, K. Boomer, M. Tomer, and G.B. Noe. 2013. Downstream approaches to P management in agricultural landscapes: regional applicability and use. *Science of the Total Environment* 442: 263–274.
5. Wolf, K.L., G.B. Noe, and C. Ahn. 2013. Hydrologic connectivity to streams increases nitrogen and phosphorus inputs and cycling in soils of created and natural floodplain wetlands. *Journal of Environmental Quality* 42: 1245–1255.

OTHER SIGNIFICANT PRODUCTS

1. Noe, G.B. 2013. Interactions among hydrogeomorphology, vegetation, and nutrient biogeochemistry in floodplain ecosystems. In: Shroder, J.F. (Editor in Chief), Butler, D.R., Hupp, C.R. (Volume Eds.), *Treatise on Geomorphology*, Vol. 12, Ecogeomorphology. Academic Press, San Diego, CA. pp. 307–321.
2. Atkinson, R.B., J.E. Perry, G.B. Noe, W.L. Daniels, and J. Cairns Jr. 2010. Primary productivity in 20-year old created wetlands in southwestern Virginia. *Wetlands* 30: 200–210.
3. Moser, K., C. Ahn, and G. Noe. 2009. The influence of microtopography on soil nutrients in created mitigation wetlands. *Restoration Ecology* 17: 641–651.
4. Noe, G.B., and C.R. Hupp. 2009. Retention of riverine sediment and nutrient loads by coastal plain floodplains. *Ecosystems* 12: 728–746.
5. Noe, G.B., D.L. Childers, and R.D. Jones. 2001. Phosphorus biogeochemistry and the impacts of phosphorus enrichment: Why is the Everglades so unique? *Ecosystems* 4: 603–624.

d. Synergistic Activities

1. Development and delivery of predictive model of floodplain trapping and bank loss of sediment, nitrogen, phosphorus, and carbon for every stream reach of the 64,000 mi² watershed of the Chesapeake Bay. Partner: Chesapeake Bay Program.
2. Generating principles, targeting tool, and estimates of pollutant mass balance for optimizing water quality benefits of levee breaching to restore floodplain connectivity in an agricultural watershed. Partners: The Nature Conservancy, USDA, USFWS.
3. Expert Scientist to the Chesapeake Bay Program, The Nature Conservancy, and the Environmental Defense Fund for translating science into actionable information on restoring wetlands, floodplains, and rivers for resource management practitioners. **Member of CBP Riparian Forest Buffer Expert Panel (2012-2014), Wetlands Working Group, and presenter at numerous STAC workshops.**
4. Editorial Board, *Wetlands Ecology and Management* (2005 – 2015) and *Wetlands* (2009 – present); manuscript reviewer for over 20 journals; panel member for NSF Ecosystems proposals, EPA STAR fellowships, and NAS Gulf Research Program proposals; proposal reviewer for NSF Ecosystems, Geography, Geomorphology and Land Use Dynamics, and Biological Oceanography, Austria Science Fund, and National Geographic Society.
5. Principal Investigator for water quality restoration and wetland ecosystem ecology in USGS Chesapeake, Everglades, and Climate and Landuse Change R&D Programs; member of USGS Wetland C Working Group; Research Advisor for Ecology, USGS, 2013 – 2017, Lead Research Advisor, USGS, 2016.

CHESAPEAKE BIOLOGICAL LABORATORY

SOLANGE FILOSO

AREAS OF EXPERTISE: Biogeochemistry, ecosystem ecology, inland aquatic ecosystems, stream restoration.

PROFESSIONAL PREPARATION

1996	Ph.D.	Aquatic Biology, University of California Santa Barbara
1985	B.S.	Biological Sciences, São Paulo State University, Brazil
1990	M.A.	Aquatic Biology, University of California Santa Barbara

APPOINTMENTS

2017-	Research Associate Professor, CBL, UMCES
2011-2016	Research Assistant Professor, CBL, UMCES
2007-2011	Associate Research Scientist, CBL, UMCES
2003-2005	Postdoctoral Fellow, Cornell University, Ithaca, NY
2001-2003	Postdoctoral Scientist, Ecosystems Center, MBL, Woods Hole, MA
1998-2000	Research Scientist, CENA, University of São Paulo, Brazil
1994-1995	Research Assistant, Institute for Computational Earth Systems Sciences, UCSB, Santa Barbara, CA

FIVE RELEVANT PUBLICATIONS

Williams, M.R., Bhatt, G., **Filoso, S.** and Yactayo, G. 2017. Stream Restoration Performance and its Contribution to the Chesapeake Bay TMDL: Challenges Posed by Climate Change in Urban Areas. *Estuaries and Coasts*, DOI: 10.1007/s12237-017-0226-1.

Filoso, S., Smith, S.M., Williams, M.R. and Palmer, M.A. 2015. The efficacy of constructed stream-wetland complexes at reducing the flux of suspended solids to Chesapeake Bay. *Environmental science & technology* 49(15):8986-8994.

Palmer, M.A., **Filoso, S.** and Fanelli, R. 2014. From ecosystems to ecosystem services: Stream restoration as ecological engineering. *Ecological Engineering* 65:62-70.

Filoso, S. and M.A. Palmer. 2011. Assessing the effectiveness of stream restoration at reducing fluxes of nitrogen to downstream waters. *Ecological Applications*.

Palmer, M.A. and **Filoso, S.** 2009. Restoration of ecosystem services for environmental markets. *Science* 325(5940):575-576.

FIVE OTHER SIGNIFICANT PUBLICATIONS

Williams, M.R., Wessel, B.M. and **Filoso, S.** 2016. Sources of iron (Fe) and factors regulating the development of flocculate from Fe-oxidizing bacteria in regenerative streamwater conveyance structures. *Ecological Engineering* 95:723-737.

Koch, B.J., Febria, C.M., Cooke, R.M., Hosen, J.D., Baker, M.E., Colson, A.R., **Filoso, S.** and others. 2015. Suburban watershed nitrogen retention: Estimating the effectiveness of

stormwater management structures. *Elementa: Science of the Anthropocene*, 3(1): 000063. doi: 10.12952/journal.elementa.000063.

Williams, M.R., **Filoso, S.**, Longstaff, B. and Dennison, W. 2010. Long-Term Trends of Water Quality and Biotic Metrics in the Chesapeake Bay: 1986 to 2008. *Estuaries and Coasts* 33(6):1279-1299.

Wenger, S., Roy, A.H, Jackson, C.R., Bernhardt, E.S., Carter, T.L., **Filoso, S.**, and others. 2009. Twenty-six key research questions in urban stream ecology: an assessment of the state of the science. *Journal of North America Benthological Society* 28(4):1080–1098.

Craig, L.S., Palmer, M.A., Richardson, D.C., **Filoso, S.**, Bernhardt, E.S. and others. 2008. Stream restoration strategies for reducing river nitrogen loads. *Frontiers in Ecology and the Environment* 6, doi:10.1890/070080.

SYNERGISTIC ACTIVITIES

- Scientific Outreach: Presentations at Maryland Department of the Environment, Baltimore, MD (2017); Scientific and Technical Advisory Committee (STAC), Annapolis, MD (2017); Chesapeake Bay Trust Forum, MD (2016); Maryland Department of Natural Resources Stream Exchange, Anne Arundel County (2014); Maryland Water Monitoring Council 20th Annual Meeting, Lythicum, MD (2014); Urban Stream Restoration Expert Panel (Chesapeake Bay Program), Annapolis, MD (2012); Tidal Monitoring and Analysis Group (TMAW), Baltimore, MD (2011); Maryland Water Monitoring Council Annual Conference, Lythicum, MD (2010);, South River Federation, Annapolis, MD (2009); Anne Arundel County Dept. of Public Works, MD (2008); Center for Watershed Protection, Ellicott City, MD (2010).
- Member/affiliate: Urban Stream Restoration Expert Panel; MD DNR Maryland Water Monitoring Council Stream Restoration Monitoring Subcommittee; EPA Stream Health Work Group.
- Ad-hoc adviser: Anne Arundel County Watershed Protection and Restoration Program; American Chestnut Land Trust; South River Federation, Severn Riverkeeper.
- Peer Journal Reviewer: Applied Ecology and Environmental Research, Biogeochemistry, Biomass and Bioenergy, Environmental Management, Journal of American Water Resources Association, Journal of Environmental Management, Journal of North American Benthological Society/Freshwater Science, Limnology and Oceanography, Oecologia, Philosophical Transactions of the Royal Society B, Water.

COLLABORATIONS AND OTHER AFFILIATIONS:

- Recent collaborators: S. Smith (U of Maine); M. Palmer (UMD); M.R. Williams (UMD); R. Fanelli (USGS); Kate Weiss (SESYNC-UMD); R. Tanawaki (USP, Brazil); L.A. Martinelli (USP, Brazil), Silvio Ferraz (USP, Brazil).
- Advisors (4): J.M. Melack (UCSB), L.A. Martinelli (USP, Brazil), J. Vallino (MBL, Woods Hole); R.W. Howarth (Cornell U).
- Graduate co-advisor (1): Maira Ometto Bezerra (MEES program Ph.D. candidate) (with Margaret Palmer).

Stephen V. Strano
Short Curriculum Vitae

Education

B.S. Environmental Studies, Richard Stockton College of NJ, 1995

M.S. Biological Resources Engineering, University of Maryland – College Park, 2009. Thesis: *Evaluation of the Effects of Wetland Restoration Design on Hydraulic Residence Time and Nutrient Retention.*

Relevant Work Experience

State Biologist, U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), Annapolis, Maryland, 2006 – Present

- Technical leader for Farm Bill wetland restoration programs in Maryland, including the Conservation Reserve Enhancement Program (CREP) and the Wetlands Reserve Program (WRP).
- Technical leader in Maryland for Farm Bill wildlife programs, including bog turtle habitat restoration, golden-winged warbler initiative, and early successional habitat restoration and management.
- Implemented, coordinated, and provided oversight on thousands of acres of wetland restoration projects in Maryland. Currently coordinating and/or managing wetland and floodplain restoration projects on 5,000+ acres, including effort to restore floodplain along 9 miles of the channelized Pocomoke River.
- Contracting Officer's Technical Representative (COTR) for five countywide LiDAR collections in Maryland
- Co-lead for National Environmental Protection Act (NEPA) for Farm Bill conservation programs in Maryland, and coordinated development of a programmatic consultation for federal-listed species and conservation practices.
- Developed oyster bar restoration program in cooperation with University of Maryland Extension.
- Revise and maintain NRCS conservation practice standards and job sheets for Maryland for wetland and wildlife practices, including Wetland Restoration (Code 657), Shallow Water Area Development and Management (Code 646), and Early Successional Habitat Development and Management (Code 647).

Soil Conservationist, U.S. Department of Agriculture, Natural Resources Conservation Service, Charles County, Maryland, 2002 – 2006

Soil Conservationist, U.S. Department of Agriculture, Natural Resources Conservation Service, Worcester County, Maryland, 1998 – 2002

Scientific and Technical Collaborations and Workgroups

- Member of Wetlands Expert Panel (2014 - 2016)
- Provided support and guidance for *Mid-Atlantic Wetland Conservation Effects Assessment Project* (CEAP).

- Member of the *Blackwater Climate Adaptation Project Technical Advisory Board*, which is developing a strategic assessment and comprehensive implementation strategy for salt marsh migration and sea-level rise in the Blackwater National Wildlife Refuge area.
- Member of the Chesapeake Bay Program Habitat Goal Implementation Team, Wetland Workgroup (2007 – Present).
- Member of Maryland Wetlands Monitoring Strategy Work Group (2009 – 2010)
- Collaborating with The Nature Conservancy, US Geological Survey, Maryland Dept. of Natural Resources, and US Fish and Wildlife Service on evaluation of the effects of floodplain restoration on surface water quality.
- Member of Advisory Committee for NOAA Coastal Management Fellow developing natural filters GIS targeting model.
- Member of the Maryland Conservation Reserve Enhancement Program (CREP) Advisory Committee.

Professional Associations

Lifetime Member *Society of Wetland Scientists*