Jacob S. Diamond

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Research Interests

Ecosystem ecology and ecohydrology. Watershed hydrology and biogeochemistry. Feedbacks and self-organization. Analysis of environmental data.

Education

Ph.D. [Forest Ecohydrology], Virginia Tech — May 2019
M.S. [Ecohydrology], University of Florida — May 2013
Concentration in Hydrologic Science
Certificate in Wetland Science
B.S.E. [Environmental Engineering], University of Florida — May 2011

Appointments

Postdoctoral Researcher — June 2019 – present
INRAe, Lyon and University of Tours, France

- Analyzing 20-year river metabolism dataset to understand trophic shifts/management change over time
- Developing and implementing river-network metabolism study focused on confluence behavior
- Modeling spatiotemporal evolution of dissolved solutes in river networks
- Collaborating with colleagues to improve data analysis and visualization

Graduate Research Assistant — August 2015 – May 2019
Virginia Tech, Blacksburg, VA

- Conducted field- and data-science based research in both dissertation topics and additional projects
- Conducted peer review of primary ecohydrologic research
- Taught classes to undergraduates and assisted in grading

Water Resources Specialist — August 2013 – August 2015
SWCA Environmental Consultants, Salt Lake City, UT

- Managed projects for local governments with budgets of $60k–100k
- Conducted ecohydrologic and geomorphic analyses of rivers, lakes, and wetlands including statistical flow analyses, water budgets, groundwater availability analyses, hydrogeomorphic impacts of dams, water rights analyses, and impacts of irrigation on annual flow metrics
- Developed water quality monitoring programs and watershed management plans, including EPA-based Implementation Plans (IPs) based on Total Maximum Daily Loads (TMDLs)
- Modeled lake and river systems with QUAL2k, BATHTUB, R, and Excel for Environmental Assessments (EAs), Environmental Impact Statements (EIS's), TMDLs, and IPs
- Wrote, compiled, and edited technical reports including wetland 404 permits, Restoration Plans, EAs, EIS's, and sediment, nutrient, and pathogen TMDLs and IPs
- Conducted ecological and economical risk analysis for environmental disasters
- Presented TMDLs and watershed-based IPs to local stakeholders in public meetings

Wetland Field Technician — June 2013 – August 2013
Utah Department of Environmental Quality, Salt Lake City, UT

- Assisted in creation of wetland ecological index sampling routine
- Collected wetland water quality, soil, and biological data
- Conducted in-situ mesocosm nutrient uptake experiments

Graduate Teaching Assistant — August 2011 – May 2013
University of Florida, Gainesville, FL

- Conducted thesis research on ecohydrological controls of hydrochemical fluxes
- Taught classes to undergraduates and assisted in grading

Research Assistant, Ecohydrology Laboratory August 2009 – May 2011
University of Florida, Gainesville, FL

- Analyzed water chemistry with spectrophotometer
- Analyzed soil for carbon and nutrients
- Conducted stream velocity profiles and tracer experiments in streams and rivers
- Assisted in stream metabolism, wetland evapotranspiration, and paired watershed studies
- Installed and programmed high temporal resolution in-situ meters

Published Journal Articles

Diamond, J.S.*, D.L. McLaughlin, R.A. Slesak, A. Stovall. (2020). Microtopography is a fundamental organizing structure in black ash wetlands. *Biogeosciences 17*(4), 901–915. doi: 10.5194/bg-17-901-2020.

Diamond, J.S.*, D.L. McLaughlin, R.A. Slesak, A. Stovall. (2019). Pattern and structure of microtopography implies autogenic origins in forested wetlands. *Hydrol. Earth Syst. Sci., 23*, 5069–5088, doi: 10.5194/hess-23-5069-2019.

Chandesris, A., Van Looy, K. Diamond, J.S.*, and Souchon, Y. (2019). Determinants of thermal regime influence of small dams. *Hydrol. Earth Syst. Sci.*, 23, 4509–4525, doi: 10.5194/hess-23-4509-2019.

Stovall, A., J.S. Diamond*, D.L. McLaughlin, and H. Shugart. (2019). Quantifying Wetland Microtopography with Terrestrial Laser Scanning. *Remote Sensing of Environment, 232*, 111271. doi: 10.1016/j.rse.2019.111271.

McLaughlin D.L., J.S. Diamond*, C. Quintero, and M. J. Cohen. (2019). Wetland connectivity thresholds and flow dynamics from stage measurements. *Water Resources Research* doi: 10.1029/2018WR024652.

Diamond, J.S.* and M.J. Cohen. (2018). Complex patterns of catchment solute-discharge relationships for coastal plain rivers. *Hydrological Processes, 32*(3), 388–401. doi: 10.1002/hyp.11424.

Diamond, J.S.*, D.L. McLaughlin, R.A. Slesak, A.W. D'Amato, and B.J. Palik. (2018). Forested *versus* herbaceous wetlands: Can management mitigate ecohydrologic regime shifts from invasive emerald ash borer? *Journal of Environmental Management, 222*(15), 436–446. doi: 10.1016/j.jenvman.2018.05.082.

Manuscripts Submitted for Publication or in Preparation

Diamond, J.S.*, J. Epstein, M.J. Cohen, D.L. McLaughlin, J. Duberstein, Y. Hsueh, and R. Keim. A little relief: Autogenesis and ecological functions of wetland microtopography. *In review at Bioscience*

Diamond, J.S.*, D.L. McLaughlin, R.A. Slesak, J.H. Kim, K. Schafer, B. Ebel, M. Forrest, and K. McGuire. Pest hydrology: A review. *In prep. for Frontiers in Ecology and the Environment*

Diamond, J.S.*, F. Moatar, M.J. Cohen, and G. Pinay. Decadal lags in large river metabolic regime shifts following ecosystem state changes. *In prep. for Nature Geoscience*

Skills

- Environmental data analysis and visualization
- Geospatial and multivariate statistics
- Environmental systems and hydrologic modeling
- Project management
- Grant and proposal preparation
- Public outreach and presentation
- Study design and implementation
- Leadership and networking
- Coding for analysis, modeling, visualization in R
- Spanish (conversational)
- French (beginner)

Professional Organizations

Society for Freshwater Science May 2018–Present

Association for the Sciences of Limnology and Oceanography	February 2018–Present
American Association for the Advancement of Science	January 2016–Present
Society of Wetland Scientists	June 2012–Present
American Geophysical Union	June 2012–Present

Academic Awards

A.B. Massey Outstanding Doctoral Award	April 2019
ICTAS Doctoral Scholar Experiential Learning Grant ($500)	October 2017
São Paulo School of Advanced Science on Climate Change ($4,000)	July 2017
William R. Walker Fellowship Award ($2,300)	July 2017
1st Place in Category, 2nd Overall NYU Policy Case Competition, *Team Leader*	April 2017
William J. Dann Fellowship ($12,000)	August 2015
Virginia Tech ICTAS Doctoral Scholar Award ($160,000)	August 2015
Virginia Tech Cunningham Doctoral Scholar Award ($138,000)	*not accepted*
Outstanding Presentation at the American Geophysical Union Conference	December 2012
1st Place National Water Env. Fed. Design Competition, *Team Leader* ($2,500)	December 2011
Graduate Assistantship to Master's Program at UF ($32,000)	August 2011
Gareth Kerr Environmental Engineering Memorial Scholarship ($1,000)	May 2010
Charles Poekert Environmental Engineering Alumni Scholarship ($500)	May 2009
UF-HHMI GATOR Undergraduate Research Program ($2,500)	May 2008

Teaching Experience

Guest Lecturer - Surface water modeling	Spring 2020
Guest Lecturer - Wetland Hydrology and Biogeochemistry	Spring 2018
Teaching Assistant/Guest Lecturer - Forestry Field Methods	Spring 2017
Teaching Assistant/Guest Lecturer - Watersheds and Water Quality Monitoring	Fall 2016
Teaching Assistant - Forest Soil and Watershed Mgmt	Fall 2015
Teaching Assistant/Guest Lecturer - Forest Water Resources	Spring 2013
Teaching Assistant/Guest Lecturer - Environmental Science	Fall 2011
Upward Bound Summer School Teacher - Physics, Chemistry, Earth/Space Science, and Biology	Summer 2007

Conference Presentations

CUAHSI Master Class: Advanced Techniques in Watershed Science – *Synchronous surface water connectivity implies landscape scale mass export*	January 2019
AGU Fall Meeting – *Small changes create big differences: A study on the importance of microtopography in wetlands*	December 2018
SFS Annual Meeting – *Self-organized microtopography in black ash wetlands is driven by hydrology*	May 2018
AGU Fall Meeting– *Wetland microtopographic structure and function revealed with terrestrial laser scanning*	December 2017
Workshop on the Future of Ash Forests – *Six year effects of simulated EAB mortality and harvesting on black ash ecohydrology*	July 2017
São Paulo School of Advanced Science on Climate Change – *Emerald ash borer simulation reveals ecohydrologic feedbacks in black ash wetlands*	July 2017
Gordon Research Conference: Catchment Science – *Emerald ash borer simulation reveals ecohydrologic feedbacks in black ash wetlands*	June 2017
ICTAS Doctoral Scholar Poster Session – *The black ash tree is a foundational species and ecosystem engineer*	April 2017
AGU Fall Meeting – *Emerald Ash Borer Threat Reveals Ecohydrologic Feedbacks in Northern U.S. Black Ash Wetlands*	December 2016
SWS Annual Meeting – *Vegetation controls hydrology in northern black ash wetlands*	May 2015

AGU Fall Meeting – *Concentration-discharge relationships for variably sized streams in Florida: Patterns and drivers in long-term catchment studies* — December 2012

Southeastern Ecology and Evolution Conference – *Use of $\delta^{15}N$ to Trace Sources of Nutrient Enrichment on Tree Islands in the Everglades, Fl* — May 2009

Seminars and Talks

Intermittent Rivers and Streams Workshop, Irstea Lyon – *River network metabolism in the Loire River Headwaters* — October 2019

Cross-Boundaries Biogeochemistry Flash Talk – *Thresholds of connection* — November 2018

Cross-Boundaries Biogeochemistry Flash Talk – *An ecology of mind* — April 2018

Forest Resources and Environmental Conservation Spring Seminar – *Terrestrial laser scanning reveals wetland microtopographic structure and function* — March 2018

Science on Tap Flash Talk – *Why do so many forested wetlands organize around a single primary producer?* — March 2017

Cross-Boundaries Biogeochemistry Flash Talk – *What are the rules of life?* — March 2017

Cross-Boundaries Biogeochemistry Flash Talk – *How do forested wetlands self-organize?* — November 2016

Forest Resources and Environmental Conservation Spring Seminar – *How do Hydrologic Feedbacks Drive Ecosystem Structure and Process in Forested Wetlands?* — April 2016

School of Natural Resources and Environment Spring Seminar – *Concentration-discharge relationships for streams and rivers in Florida: Patterns and drivers* — May 2013

Outreach and Volunteering

Gordon Research Seminar on Catchment Science Co-Chair — June 2019
R Data Wrangling and Graphics Workshop for Grad Students — October 2018
Tazewell County 4-H Students Virginia Tech Visit — April 2018
Blacksburg High School Science Outreach — December 2017
William Fleming High School Science Outreach — November 2017
Department Graduate Student Association President — August 2016–May 2017
Departmental Spring Seminar Series Organizer — November 2016–April 2017
Christiansburg Middle School Stormwater Day — April 2017
Tazewell County 4-H Students Virginia Tech Visit — April 2017

Peer Review

Ecology
Journal of Geophysical Research – Biogeosciences
Water Resources Research
Wetlands
Journal of Hydrology
Hydrological Processes
Hydrology and Earth System Sciences