Jacob S. Diamond

4 Rue des Pierres Plantées, Lyon, France, 69001
diamondjacob@gmail.com
+33 06 36 13 42 04
+1 850 264 1871
https://jakediamond.science
https://orcid.org/0000-0002-5392-5707

RESEARCH INTERESTS

Environmental data science to support public policy. Watershed science and ecohydrology. Ecosystem ecology and biogeochemistry. Model-data fusion across scales.

EDUCATION

Ph.D. [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

Research Engineer — June 2019 – present
INRAe, CNRS, and University of Tours, France

- Co-led and managed team coordination of 3 research projects spanning 3 departments and 15 people
- Obtained external funding for research projects on river hypoxia (200k€) and carbon cycling (30k€)
- Developed neural net and random forest models to predict river oxygen and temperature regimes
- Developed workflow for classifying riverine autotophs with Landsat satellite data
- Mentored 3 graduate students and conducted regional and international scientific outreach
- Led 7 lead-author publications of peer-reviewed research in top subject-area journals

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

- Obtained independent funding for research to support conservation and ecosystem management
- Developed open-science, novel classification tools for wetland microtopgraphy
- Led graduate student workshops on open and reproducible data science in R
- Led grad./undergrad. team to 1st place NYU Policy Case Competition for Climate Change
- Led 6 lead-author publications of peer-reviewed research in top subject-area journals

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

- Won 4 external contracts ($200k) and managed 2 projects for state & local governments
- Conducted hydro-bio-geo-chemical, geomorphic, and risk-based analyses of rivers, lakes, and wetlands
- Developed, published, and presented to stakeholders: EPA-based Implementation Plans, Total Maximum Daily Loads, Environmental Assessments, and Environmental Impact Statements

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

- Developed novel, standardized wetland ecological index sampling routine for state-wide use
- Quantified large wetland ecosystem services using in-situ nutrient uptake experiments

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

- Conducted independent research and programmed novel statistical analyses for
- Designed web scraping tool and reproducible workflow in R to mine water quality data from US databases

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

- Led 10-person team to 1st Place National Water Env. Fed. Design Competition ($2,500)
- Managed laboratory water chemistry and soil analyses for isotopes and nutrients
- Led field campaigns for groups of 2-5 in difficult terrain and conditions

PUBLISHED JOURNAL ARTICLES

*indicates mentee Citations = 217; h-index = 9; i10-index = 8

1. **Diamond, J.S.**, G. Pinay, S. Bernal, M.J. Cohen, D. Lewis, A. Lupon, J. Zarnetske, and F. Moatar. Light and hydrologic connectivity drive dissolved oxygen synchrony in stream networks. *L&O*. doi: 10.1002/lno.12271
2. Seyedhashemi, H.*, J. Vidal, **J.S. Diamond**, D. ThiÃľry, C. MontÃľil, FrÃľdÃľric Hendrickx, A. Maire, and F. Moatar. (2022). Regional, multi-decadal analysis reveals that stream temperatures increase faster than air temperature. *Hydrol. Earth Sys. Sci., 26(9), 2583-2603.* doi:10.5194/hess-26-2583-2022
3. Beaufort, A., **J.S. Diamond**, et al. (2022). Spatial extrapolation of stream thermal peaks using heterogeneous time series. *Hydrol. Earth Sys. Sci., 26(13), 3477-3495.* doi:10.5194/hess-26-3477-2022
4. **Diamond, J.S.**, S. Bernal, A. Boukra, M.J. Cohen, D. Lewis, M. Masson, F. Moatar, and G. Pinay. (2021). Stream network variation in dissolved oxygen: metabolism proxies and biogeochemical controls *Ecological Indicators 131.* doi: 10.1016/j.ecolind.2021.108233
5. Ledford, S.H., **J.S. Diamond**, and L. Toran. (2021). Large spatiotemporal variability in metabolic regimes for an urban stream draining four wastewater treatment plants with implications for dissolved oxygen monitoring. *PLoS ONE 16(8).* e0256292. doi: 10.1371/journal.pone.0256292
6. **Diamond, J.S.**, F. Moatar, M.J. Cohen, A. Poirel, C. Martinet, A. Maire, and G. Pinay. (2021). Metabolic regime shifts and ecosystem state changes are decoupled in a large river. *Limnology and Oceanography.* doi: 10.1002/lno.11789
7. **Diamond, J.S.**, J. Epstein, M.J. Cohen, D.L. McLaughlin, J. Duberstein, Y. Hsueh, and R. Keim. (2021). A little relief: Autogenesis and ecological functions of wetland microtopography. *Wiley Interdisciplinary Reviews: Water, 8*(1) e1493. doi: 10.1002/wat2.1493
8. Ciancolo, T., **J.S. Diamond**, D.L. McLaughlin, R.A. Slesak, A. D'Amato, and B. Palik. (2020). Hydrologic variability in black ash wetlands: implications for vulnerability to emerald ash borer. *Hydrological Processes.* doi: 10.1002/hyp.14014
9. Seyedhashemi, H.*, F.Moatar, J. Vidal, **J.S. Diamond**, A. Beaufort, A. Chandesris, and L. Valette. (2020). Thermal signatures identify the influence of dams and ponds on stream temperature at the regional scale. *Science of the Total Environment.* doi: 10.1016/j.scitotenv.2020.142667
10. **Diamond, J.S.**, D.L. McLaughlin, R.A. Slesak, and 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.
11. **Diamond, J.S.**, D.L. McLaughlin, R.A. Slesak, and 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.
12. Chandesris, A., K. Van Looy, **J.S. Diamond**, and Y. Souchon. (2019). Small dams alter thermal regimes of downstream water. *Hydrol. Earth Syst. Sci.*, 23, 4509–4525, doi: 10.5194/hess-23-4509-2019.
13. 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.
14. 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.

15. **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.
16. **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

1. **Diamond, J.S.**, L. Valette, R. Recoura-Massaquant, A. Charnaud, G. Pinay, J. Zarnetske, and F. Moatar. Hypoxia is common in temperate headwaters and driven by hydrological extremes. *Submitted to Ecological Indicators*
2. Cohen, M.J., M. Gooseff, **J.S. Diamond**, P.H. Decker, L.H. Devito, and R.T. Hensley. Oxygen Signals and Metabolism in Spatially Heterogeneous Rivers. *In prep for Geophysical Research Letters*
3. **Diamond, J.S.**, M.R. Ross, J. Gardner, F. Moatar, M.J. Cohen, and G. Pinay. Directional autotrophic regime shifts in a large river. *In prep for PNAS*
4. Song, C., J. Zarnetske, **J.S. Diamond**, and F. Moatar. Watershed controls on dissolved organic carbon transport. *In prep for Limnology and Oceanography Letters*
5. **Diamond, J.S.**, D.L. McLaughlin, R.A. Slesak, J.H. Kim, K. Schafer, B. Ebel, M. Forrest, and K. McGuire. Ecohydrological effects and resilience to forest pests. *In prep. for Frontiers in Ecology and the Environment*

SKILLS

- Data analysis and visualization
- Geospatial and multivariate statistics
- Time series analysis and forecasting with uncertainty propagation
- Complex systems analysis (e.g., causality, convergent cross mapping)
- Machine learning (ANN, RF, multi-model, clustering)
- Outlier detection
- Environmental systems monitoring and associated in-situ and laboratory methods
- Surface and groundwater hydrology
- Terrestrial laser scanning
- Out-of-box hydrology and biogeochemistry models (e.g., HYDRUS, QUAL2k)
- Model development for 1-,2-,3D hydrology and biogeochemistry (Stochastic and deterministic)
- Environmental systems modeling
- Project management
- Grant and proposal preparation
- Public outreach and presentation
- Study design and implementation
- Leadership and networking
- Functional programming in R and Python
- Google Earth Engine
- French: B2

RESEARCH GRANTS

Total granted = $245,000 (230,000€)

1. Project "RHpoxie" (200,000€) – developed for the Loire-Bretagne and Rhone-Med.-Corse Water Agencies. PI: Florentina Moatar
2. Project "METACALC" (30,000€) – developed for the Electricity of France (EDF). PI: Florentina Moatar

AWARDS AND HONORS

Total awarded = $215,550

Joint Aquatic Sciences Meeting Early Career Grant ($750)	May 2022
Elected as 2019 Gordon Research Seminar Chair	June 2017
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	*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

PROFESSIONAL ORGANIZATIONS

European Geophyiscal Union	May 2020–Present
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

GRADUATE STUDENT MENTORING

Hanieh Seyedhashemi, PhD student	June 2019-present
Alan Toczydlowski, MS Student	Summer 2018
Hannah Friesen, MS Student	Summer 2017

UNDERGRADUATE STUDENT MENTORING

Breanna Anderson, Undergraduate research	Spring 2018
James Maze, Undergraduate Climate Change Policy Competition	Spring 2017
Charlotte Grandjean, Undergraduate research	July 2021

OTHER MENTORING

Elrick Ducuing, Highschool internship	August 2022
Melissa von Mayrhauser, JASM Mentor-Mentee program	Summer 2022
Highschool Crew athletes, Utah Crew Coach	2013-2014
Maria Gaffud, G.A.T.O.R. Mentor-Mentee program	2008-2009
FGCB highschool students, Gadsen County Upward Bound	Summer 2007

TEACHING EXPERIENCE

Video Lecturer - Instrumentation and analysis of dissolved oxygen in flowing waters	Spring 2021
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

Joint Aquatic Sciences Meeting – *Spatial patterns of light and hydrological connectivity control dissolved oxygen synchrony across fluvial networks*	May 2022
First OZCAR TERENO International Conference – *Three years of stream network hourly dissolved oxygen: scaling, hot spots, hot moments, and synchrony*	October 2021
EGU Spring Meeting – *Metabolic regime shifts and ecosystem state changes are decoupled in a large river*	May 2021
SFS Annual Meeting – *Metabolic regime shifts and ecosystem state changes are decoupled in a large river*	May 2021

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

[invited] Earth and Life Institute Seminar, UCLouvain – *Ecosystem regime shifts, stream metabolism, biogeochemical synchrony, and confluence behavior in river networks* — September 2022

CASTOR development of a carbon budget for the Loire River basin, Universite d'Angers – *Carbon fluxes due to to biota in the Loire River* — November 2021

LEHNA Lab, Universite de Lyon 1 – *Ecosystem regime shifts, stream metabolism, biogeochemical synchrony, and confluence behavior in river networks* — October 2021

H20'Lyon, Universite de Lyon 1– *Patterns, proxies, and mysteries of dissolved oxygen in river networks* — April 2021

[invited] Environmental Engineering Seminar, Ecole Polytechnique Federale de Lausanne – *Dissolved oxygen provides insights into regime shifts and headwater network behavior* — February 2021

[invited] Department of Integrative Biology Seminar, University of South Florida – *Dissolved oxygen, regime shifts, and scaling the metabolism of flowing waters* — November 2020

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 SERVICE

Session Organizer JASM 2022: Carbon fluxes across ecosystem interfaces May 2022
H20'Lyon, Universite de Lyon Tutorial on dissolved oxygen measurement April 2021
[invited] University of South Florida Nitrogen S-STEM Roundtable November 2020
International School of Lyon Lesson on Environmental Assessments May 2020
Co-Chair Gordon Research Seminar on Catchment Science June 2019
R Data Wrangling and Graphics Workshop for Grad Students October 2018
Tazewell County 4-H Students Virginia Tech Visit April 2018
Southeastern Friends of the Pleistocene February 2018
Blacksburg High School Science Outreach December 2017
William Fleming High School Science Outreach November 2017
President Department Graduate Student Association August 2016–May 2017
Series Organizer Departmental Spring Seminar November 2016–April 2017
Christiansburg Middle School Stormwater Day April 2017
Tazewell County 4-H Students Virginia Tech Visit April 2017

PEER REVIEW

- Biogeosciences
- Ecology
- Frontiers in Water
- Geoderma
- Hydrological Processes
- Hydrology and Earth System Sciences
- JGR – Biogeosciences
- Journal of Hydrology
- Remote Sensing of the Environment
- Science of the Total Environment
- Water Resources Research
- Wetlands

REFERENCES

Dr. Daniel McLaughlin
mclaugd@vt.edu
(540) 231-6616

Dr. Matthew Cohen
mjc@ufl.edu
(352) 846.3490

Dr. Kevin McGuire
kevin.mcguire@vt.edu
(540) 231-6017

Dr. Florentina Moatar
florentina.moatar@inrae.fr
+33 (0)6 26 20 60 39

Dr. Gilles Pinay
gilles.pinay@ens-lyon.fr
+33 (0)4 37 37 63 41