**Rebecca (Becky) Forgrave**

ORISE / Environmental Protection Agency

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**RESEARCH INTERESTS**

Aquatic biogeochemistry, urban hydrology, nitrogen isotopes, green stormwater infrastructure

**EDUCATION**

2022 **Ph.D. University of Pittsburgh,** Geology and Environmental Science, GPA 3.92

Dissertation: Timing, Transport and Impacts of Sewer Subsides to Pittsburgh’s Nine Mile Run (Advisor: Emily M. Elliott)

2014 **B.A. Colby College.** Environmental Science with a Chemistry focus. GPA 3.57

Undergraduate Honors Thesis: The Impact of Dams on Nitrogen Cycling in the Messalonksee Stream (Advisor: Denise Bruesewitz)

**RESEARCH EXPERIENCE**

2023 – present Postdoctoral Research with Minneapolis-St. Paul LTER, College of Biological Sciences, University of Minnesota

2022 – 2023 Postdoctoral Research Fellow with the Oak Ridge Institute for Science Education (ORISE), hosted by the EPA Office of Research and Development

2016 – 2022 Graduate Research Assistant, Pitt Isotope Tracers Lab, Department of Geology and Environmental Science, University of Pittsburgh

2014 – 2015 Research Assistant, Louisiana Universities Marine Consortium (LUMCON)

2013 – 2014 Research Assistant, Aquatic Ecology Lab, Environmental Science Department, Colby College

2012 Summer Research Fellowship in Environmental Chemistry, Chemistry Department, Colby College / Maine Lakes Society

**PEER-REVIEWED PUBLICATIONS**

**Forgrave, R.,** Evenson, G.R., Golden, H.E., Christensen. J.R., Lane, C.R., Wu,Q., D’Amico,E., andPrenger, J. (2023). *Downstream attenuation of wetland-mediated nitrate reductions*. Journal of Environmental Management(in preparation)

**Forgrave, R.,** Bain, D.J., and Elliott, E.M. (2023). *Sewer subsidies from overflows and pipe leaks dominate urban stream solute fluxes in all storm events.* Frontiers in Environmental Science Special Issue on Urban Biogeochemistry. <https://doi.org/10.3389/fenvs.2023.1117809>

**Forgrave, R.,** Elliott, E. M., & Bain, D. J. (2022). *Event scale hydrograph responses highlight impacts of widespread stream burial and urban infrastructure failures*. Hydrological Processes, 36(5), e14584. [https://doi.org/10. 1002/hyp.14584](https://doi.org/10.%201002/hyp.14584)

**PRESENTATIONS**

**Forgrave, R.**, Evenson, G.R., Golden, H.E., Christensen. J.R., Lane, C.R., Wu,Q., D’Amico,E., andPrenger, J. 2023. *Downstream propagation of wetland-mediated nitrate reductions.* Gordon Research Conference: Catchment Science: Interactions of Hydrology, Biology & Geochemistry, Andover, NH.

**Forgrave, R.** Bain, D.J., and Elliott, E.M., 2022. *Storm Event Solute Dynamics Reveal Hydrologic Interactions Between Buried Streams and Sewer Infrastructure*. American Geophysical Union, Chicago, IL (Abstract H22U-1114).

**Forgrave, R.** and Elliott, E.M., 2021. *Beyond flashy: assessing rapid chemical and flow event responses in a buried urban stream network in Pittsburgh, PA*. American Geophysical Union, Virtual & New Orleans, LA (Invited) (Abstract H11F-01).

**Forgrave, R.K,** and Elliott, E.M., 2021. *The impact of sewage leak subsidies on baseflow diel nitrate fluctuations in Pittsburgh’s Nine Mile Run*. Society for Freshwater Science Annual Meeting, Virtual.

**Forgrave, R.K.**, Elliott, E.M., 2020. *Combined sewer overflows create novel concentration-discharge hysteresis patterns in urban streams.* Symposium on Urban Stream Ecology, Austin, TX.

**Forgrave, R.K.**, Elliott, E.M, Bain, D.J. and Thomas, B.F., 2019. *Combined sewer overflows lead to complex concentration-discharge patterns and mid-storm changes in nitrate delivery.* Gordon Research Conference: Catchment Science: Interactions of Hydrology, Biology & Geochemistry, Andover, NH.

**Forgrave, R.K.**, Elliott, E.M, Bain, D.J. and Thomas, B.F*.,* 2018. *Linking Hydrology and Nitrogen Biogeochemistry in an Urban Stream with Continuous Sensing and Stable Isotopes.* American Geophysical Union, Washington D.C. (Abstract B53K-2206).

**Forgrave, R**.**K**, Groszewski, K.L., Boyer, E.W and Elliott, E.M., 2017. *Assessing Sources and Fluxes of Reactive Nitrogen Deposition to Urban Landscapes Using Ion Exchange Resins,* National Atmospheric Deposition Program (NADP) Fall Meeting, San Diego, CA.

**Forgrave, R**.**K**, Groszewski, K.L, and Elliott, E.M. 2017. *Assessing Sources and Fluxes of Reactive Nitrogen Deposition to Urban Landscapes Using Ion Exchange Resins,* Gordon Research Conference: Catchment Science: Interactions of Hydrology, Biology & Geochemistry, Lewiston, ME.

**Forgrave, R**. and Bruesewitz, D.A. 2014. *The Impact of Dams on Nitrogen Cycling in the Messalonskee Stream*, Joint Aquatic Sciences Meeting, Portland, OR.

Petzoldt, T.L, **Forgrave**, **R.K** and Bruesewitz, D.A., 2014. *Patterns of Nutrient Limitation in the Belgrade Lakes of Central Maine*, Joint Aquatic Sciences Meeting, Portland, OR.

King, D.W., **Forgrave, R**., Thiele, J., Murray, K., and Kallin, P., 2012."Google LakeView”: *Creating public-domain shoreline images for research, public policy, and education*, North American Lake Management Society (NALMS) Symposium, Madison, WI.

**INVITED TALKS**

Forgrave, R. *Buried Biogeochemistry: Investigating Subsurface Connectivity Between Urban Streams and Sewer Infrastructure.* February 10, 2023. Colby College Chemistry Department Seminar. Waterville, ME.

Forgrave, R. *Timing, Transport, and Impacts of Sewer Subsidies to Pittsburgh's Nine Mile Run.* February 4, 2021. University of Pittsburgh Geology and Environmental Science Department Seminar. Pittsburgh, PA.

**TEACHING, COMMUNITY OUTREACH & SCIENCE COMMUNICATION**

**Voices for Science Program,** 2023 – 2024.

* Participated in a year-long cohort of science advocates as part of AGU’s Voices for Science Program in the media/communications track (<https://www.agu.org/Share-and-Advocate/Share/Sharing-science-network/Voices-for-science>).
* Activities included launching an Instagram account to highlight buried streams, and hosting a film screening for Let’s Talk About Water.

**Skype A Scientist***,* 2020-present.

* Participate in outreach to K-12 classrooms through the Skype-A-Scientist Network. I meet with a classroom for a one-hour session coordinated by the teacher and answer student questions about environmental science, water quality, and what it is like to be a scientist.

**Teaching Assistant,** University of Pittsburgh, 2016-2019

* Developed all labs and activities for the Ecosystem Ecology Lab for the first time it was ever taught and implemented the curriculum three times.
* Assisted students and graded student work for Environmental Geochemistry and Groundwater Geology lab courses.

**Community Liaison**, Maine Lakes Society, 2011-2012

* Edited an informational booklet for shoreline property owners focusing on best management practices to limit surface runoff.
* Completed the “Google LakeView” project, a compilation of shoreline imagery aimed at creating community awareness of shoreline development, riparian buffers, and water quality impacts.
* Captained a pontoon boat as a mobile classroom to teach 7th and 8thgraders about local lake ecosystems.

**Science Interpreter II,** Pacific Science Center*, Seattle, WA, 2008-2010*

* Interpreted museum exhibits and taught science activities to visitors of all ages.

**SERVICE**

**DEI Committee,** Department of Geology and Environmental Science, 2020-2022

* Worked with other committee members to create a department climate survey to understand perceptions and experiences of bias and discrimination.
* Created a personalized mentoring code of conduct to ensure that students are getting the individual support they need from their advisors.
* Formalized a grievance reporting procedure for graduate students to report individual and/or systemic issues of bias, discrimination, harassment, and abuse of power.

**Nine Mile Run Watershed Association Monitoring Committee**, 2016-2022

* Attended quarterly meetings focused on monitoring watershed water quality and restoration projects the Nine Mile Run watershed.

**Elizabeth Baranger Teaching Award Review Committee,** 2019, 2021.

* Reviewed applications for the University of Pittsburgh Graduate Student Organization’s teaching award.

**Teaching Assistant Mentor,** Department of Geology and Environmental Science, 2018-2020

* Created a repository of teaching materials to facilitate passing down information year-to-year and ensure nothing was lost as senior TAs graduate.
* Held a mid-semester lunch discussion with current and former TAs to discuss teaching challenges and brainstorm solutions.
* Worked with department faculty to implement at TA peer-evaluation system.

**Graduate Student Helper Committee,** Department of Geology and Environmental Science,2018-2019

* Coordinated the annual department student research fair
* Fostered and inclusive department climate through facilitating social events for graduate students, post-docs and faculty to interact in casual settings.

**AWARDS AND HONORS­­­­­­­­­­­­­­­­­­­­­­­­­­­**

2019 Geological Society of America Student Research Grant ($2,200)

2018 Andrew Mellon Predoctoral Fellowship ($23,628)

Dr. J. Frederick and Ann Sarg Research Award ($1,500)

Elizabeth Baranger Excellence in Teaching Award ($300)

1. Best Student Talk, National Atmospheric Deposition Program Fall Meeting ($300)

Henry Leighton Memorial Graduate Award ($600)

1. Student Special Projects Scholarship from the Colby College Dean of Faculty ($500)

**PROFESIONAL DEVELOPMENT (RESEARCH)**

**Interactive Maps with R**, Physalia (online) November 21-22, 2022. Two-day workshop focused on working with spatial data in R and making interactive maps.

**Open-Source Electronic Hardware for Water Research and Real-Time, Online Water Monitoring Workshop,** CUAHSI and Stroud Water Research Center, November 9-11, 2020.

Learned to program in the Arduino development environment to collect data with EviroDIY Mayfly Data Loggers.

**Stable Isotope Biogeochemistry and Ecology,** SIRFER at University of Utah, June 11-22, 2018.

Completed a two-week intensive lecture and laboratory course focused on the fundamentals of isotope fractionation processes and their environmental and ecological applications.

**Lagrangian and Eulerian Applications of In-Situ Water Quality Sensors Workshop,** CUAHSI, November 7-9, 2017.

Completed a week-long workshop on deploying, maintaining and managing the data from various in-situ sensors (SUNA, YSI, Hydrosphere, Cycle-P) as well as an introduction of the Lagrangian and Eulerian reference frames for spatially and temporally variable data.

**PROFESIONAL DEVELOPMENT (TEACHING)**

**Pitt-CIRTL Practitioner Certification in STEM Teaching,** 2020.  
Completed and presented a Teaching as Research Project entitled “Improving Scientific Writing Through Student Grading of Example Lab Reports.” For this project, I implemented a new strategy to help undergraduate ecology students develop their writing skills and monitored its effectiveness in term of lab report grades and student self-assessment surveys.

**University of Pittsburgh Center for Teaching and Learning Workshops**, 2016-2019.

Completed a total of ten workshops across three categories (Pedagogy, Diversity, and Educational Technology) with the University of Pittsburgh Teaching and Learning Center’s Graduate Student Teaching Initiative.

**Pitt-CIRTL Associate Certification in STEM Teaching,** 2017.  
Completed a nationally recognized teaching certification program focused on strategies to implement evidence-based best practices in different learning environments and increase overall student learning outcomes in undergraduate STEM course.