

Elise McKenna Myers

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Education

Columbia University & Lamont Doherty Earth Observatory

Ph.D. in Earth and Environmental Sciences (GPA 3.76/4.0)

Research Focus: Microbial Oceanography & Environmental Health

Advisor: Andrew R. Juhl

Committee: Ajit Subramaniam; Simon Levin

New York, NY

Expected August 2021

M. Phil. May 2019

Princeton University

M.A. in Ecology and Evolutionary Biology (GPA 3.24/4.0)

Research Focus: Mathematical Biology for Microbial Communities

Advisor: Simon Levin

Princeton, NJ

June 2016

Massachusetts Institute of Technology

S.M. & S.B. in Earth, Atmospheric, and Planetary Sciences (GPA 4.3/5.0)

Research Focus: Geochemistry of Microbial Mats & Stromatolites

Advisor: Roger E. Summons

Cambridge, MA

S.B. June 2014

S.M. September 2014

Selected Previous Research Experience

Sewage-Microbial Persistence in the Hudson River (Primary Doctoral Thesis Research) | Columbia Sept. '16-present

- Collaborated with a non-governmental organization and other university researchers to coordinate research efforts (minimize overlap/maximize outcome) on research cruises to collect samples to monitor water quality
- Created water quality models to minimize human health hazard during on/in water recreation due to sewage-derived bacteria contamination using mathematical models, satellite data analysis, and experiments
- Secured and managed \$135,000 grant from NASA to fund development of predictive models of water sewage-contamination, which has resulted in 1 published article and 3 upcoming research articles
- Attended and presented at periodic meetings with members of state and federal environmental agencies
- Presented water quality research (~3 times/quarter) to the general public through community groups, schools (8th grade-undergraduate), and educational organizations; also developed accessible educational videos

Racial and Socioeconomic Inequality and Implications for Covid-19 | Independent

Mar. '20- present

- Wrote a highly viewed (>1,700) review white paper for public health practitioners on increased risk for Covid-19 spread and case severity for racial and ethnic minorities and low socioeconomic status individuals
- Leading a working group examining social inequality in NYC and resultant impact on Covid-19 cases/severity

Eddy Correlation Techniques for Coral Reef Monitoring | Columbia

Jan. '16- May '17

- Fabricated and deployed a fast pH/O₂/temperature remote ocean sensor that could augment existing instrumentation for remotely monitoring high resolution variability of ambient conditions for coral reefs
- Secured internal grant funding to streamline the sensor and perform field testing

Intact Polar Lipids in Microbial Mats of Hamelin Pool, Shark Bay, AUS | MIT Summons Laboratory Sept '13-Aug '14

- Extracted and analyzed intact polar lipids, including fatty acid methyl esters, intact polar lipids, glycerol dialkyl glycerol tetraethers, and bacteriohopanepolyols, via gas and liquid chromatography mass spectrometry
- Created characteristic lipid profiles for smooth, colloform, and pustular microbial mats

Hydrogeology & Remediation Intern | Chevron Energy Technology Company

June '13-Aug '13

- Determined most effective in-situ oxidation techniques to remediate different types of soil contaminated by leaking underground oil storage tanks by analyzing data from hundreds of previous remediation projects

Biogeochemical Niche Research | MIT Parsons Laboratory

Sep '12-June '13

- Collected and analyzed samples to determine how stratified lake bacterial communities improve water quality in a traditionally industrial area; ran DNA extraction, worked on PCR library construction, and ran iron assays

Environmental Toxicology and Wastewater | Caribbean Environmental Health Institute

Jan '12-Nov '12

- Conducted audits and water quality tests (focus on potentially pathogenic bacteria) on various businesses (*e.g.* paint manufacturers, hotels, pig farmers) to determine their contribution to surface water contamination and what would need to be addressed in future policy to minimize human exposure risk
- Helped create St. Lucia's water quality National Plan of Action that restricts water contamination by businesses

Publications

- Myers, Elise M.**; Juhl, Andrew R. Particle association of *Enterococcus* sp. increases growth rates and simulated persistence in water columns of varying light attenuation and turbulent diffusivity. *Water Research* 2020.
- Myers, Elise M.** Compounding Health Risks and Increased Vulnerability to SARS-CoV-2 for Racial and Ethnic Minorities and Low Socioeconomic Status Individuals in the United States. Preprints 2020. **Note: not peer-reviewed**
- Arora-Williams, Keith, Olesen, Scott W., Scandell, Benjamin P., Delwiche, Kyle, Spencer, Sarah, **Myers, Elise M.**, Abraham, Sonali, Sookal, Alyssa, Preheim, Sarah P. "Dynamics of microbial populations mediating biogeochemical cycling in a freshwater lake." *Microbiome* 6.1 (2018): 165.
- Myers, Elise M.** *Complex Lipids in Microbial Mats and Stromatolites of Hamelin Pool, Shark Bay, Australia*. Thesis. Massachusetts Institute of Technology, 2014. Cambridge: MIT Technology Licensing Office, 2014.
- *Manuscripts in preparation**
- Myers, Elise M.**; Suter, Elizabeth; Juhl, Andrew R. Particle-Associated and Free-Living Seasonal Microbial Community Dynamics in an Urbanized Estuarine System.
- Myers, Elise M.**; Juhl, Andrew R. Differential Loss Rates and Persistence of Sewage-Derived and Naturally-Occurring Potential Pathogens
- Myers, Elise M.**; Subramaniam, Ajit. Seasonal and Spatial Dynamics of Dissolved and Particulate Components of Water Transparency in an Urbanized Estuary.
- Morgan, Ashlea A., et al (other 11 author order undecided). How Science Succeeds: Methods to make academia a healthy, inclusive environment for underrepresented groups.

Invited Presentations & Colloquia

- River Turbidity and Enterococcus*. Hudson River Watershed Alliance breakfast lecture series (New Paltz, NY – online). [Video Link](#). February 2021
- Predicting Sewage Pollution: Using Models & Experiments to Protect the Hudson River*. GenSpace and Planet Microbes public lecture series (New York, NY – online). [Video Link](#). February 2021.
- Everybody Poops: The Impact of Particle Association on the Persistence of Sewage-Derived Microbes*. Earth Day Assembly for Greenwich Academy Middle School (Greenwich, CT – online). April 2020.
- The Impact of Microbial Particle Association on Pathogen Persistence in the Hudson River Estuary*. Bard College Environmental and Urban Studies Departmental Seminar. March 2019.

Conference Presentations

- Myers E.**, Juhl, AR. (2020, April- cancelled due to Covid-19). *Variability in water column transparency and optical properties of the Hudson River Estuary*. **Presentation for** NASA Biodiversity & Ecological Forecasting Team. (Washington, DC).
- Myers E.**, Juhl, AR. (2020, May- cancelled due to Covid-19). *Particle Association Increases the Persistence of Sewage-Derived Microbial Contaminants: A Combined Empirical and Modeling Study*. **Presentation for** Gordon Research Conference: Marine Microbes (Les Diablerets, Switzerland).
- Myers E.**, Juhl, AR. (2019, February) *Comparison of the effect of particle association on the persistence of exogenous fecal indicator bacteria and sewage-derived pathogens*. **Presented at** ASLO Aquatic Sciences Meeting. (San Juan, PR).
- Figueredo, NB, **Myers, EM**, Juhl, AR. (2018, October). *The Impact of Particle Association on Temperature-Dependent Growth and Light-Induced Mortality of *Vibrio* sp. in the Hudson River Estuary*. **Poster Presented at** SACNAS That National Diversity in STEM Conference. (San Antonio, TX)
- Myers E.**, Juhl, A. (2018, June). *Quantifying the effect of particle association on the persistence and transport of exogenous fecal indicator bacteria*. **Presented at** Association for the Sciences of Limnology & Oceanography, Victoria, BC.
- Myers, E.**, Juhl, A., Levin, S. (2017, September). *Modeling the fate of particle-associated fecal indicator bacteria and pathogens in the Hudson River Estuary*. **Poster Presented at** Coastal Estuarine Research Federation, Providence, RI.
- Medina, A., **Myers, E.**, Juhl, A. (2017, October). *Comparison of Particle Association of Different Bacteria in the Hudson River Estuary*. **Poster Presented at** Society for the Advancement of Chicanos & Native Americans – The National Diversity in STEM Conference Salt Lake City, UT.

Myers, E., Schubotz, F., Matys, E., Summons, R. (2015, December). *Complex Lipids in Microbial Mats and Stromatolites of Hamelin Pool, Shark Bay, Australia. Poster Presented at* American Geophysical Union, San Francisco, CA.

Teaching Experience

Instructor & Course Designer: Field Geosciences in Peru | Columbia Earth & Environmental Sciences (2018-2019)

- Designed and co-led a summer course on geosciences in Peru, with a special focus on Peruvian history and culture and pressing issues in the country related to climate change
- Coordinated topics, travel logistics, and finances (\$14k budget) for a 12-day field course from Lima to Cuzco with geoscience stops along the road trip, visits to earth scientists, and culture/history and environment stops

Instructor & Course Designer: Summer Research Program | Columbia Graduate School Arts & Sciences (2018-2020)

- Taught 3-hours/week course designed to prepare undergraduate researchers for a career in scientific research and/or graduate school; advised each cohort (5-6 students/year) on their research projects from creation to dissemination (via talks and articles)

Senior Thesis Advisor | Student at Barnard College Class of 2019

- Regularly met with thesis advisee, coordinated lab and field work, fundraised to support both research costs and conference costs for student, and advised on writing, analysis, and presentation

Graduate Level Teaching Assistant (2011-2019)

Columbia: Biological Oceanography (x2 – wrote 50% of exams, ran 2 activity-based lecture sessions, graded assignments, held weekly office hours), Science for Sustainable Development (held office hours, graded assignments and exams)

Princeton: Animal Behavior (led 3, 1-hour recitation groups per week for ~85 students, graded exams and assignments, hosted additional review sessions, held weekly office hours)

MIT: Principles of Chemistry (x2), Biology (held weekly office hours, ran monthly review & problem-solving strategy sessions for students, graded exams)

Research Advisor | National Science Foundation Research Experience for Undergraduates (2018 & 2019)

Head Chemistry Facilitator & Course Designer | MIT Office of Minority Education (2011-2012)

- Created lectures and problem-solving materials for 2, 1.5 hour classes per/week; disseminated base lecture plans to other facilitators and coordinated multiple Chemistry sections

Undergraduates Supervised

Natalia Figueredo Botello (Barnard College) – 2018-2019, REU & Senior Thesis (now at University of Maryland Baltimore County in the Interdisciplinary Consortium for Applied Research in the Environment MA program)

Ariana Medina (Dominican College) – REU 2017

Summer Research Program/Leadership Alliance Cohorts

2020 - Daniela Martinez, Lior Zweig, Noah Silver-Beck, Chayanne Solorzano Villegas, Jalen Grayson, Taysha Jimenez Rivera

2019 - Andres Martinez-Muniz, Brittany Bistis, Aida Murati, Carol Delgarno, Antonio Gil de Rubio Cruz, Jahru McCulley

2018 - Alexia Johnson, Andrew Palacios, Hannamariam Mekbib, Astrid Candelaria, Sergio Acevedo

Selected Service & Leadership Experience

Students of Color Alliance (SoCA) | Co-Chair '18-'21 | Communications Director '16-'18

- Co-lead a 10-person team and manage a \$27,000 budget to support 32 social and/or educational annual events up to 200 attendees (*e.g.* Welcome BBQ, Winter Reception, SoCA Graduation, Future Faculty Workshops)
- Secured a 29% budget increase after creating and documenting success of a popular weekly co-working event
- Fundraised ~\$7,000 annually for the now flagship SoCA Graduation Ceremony
- Managed operational activities and budget reports with senior administrators, including Deans of the Graduate School, and offices of University Life and Academic Diversity & Inclusion
- Advocate for students of color to university administrators, communicate with membership, maintain website

Local Outreach Events | Activity/Workshop Designer & Presenter '16-'21

- Designed and/or led science outreach activities at Lamont Doherty Earth Observatory Open House, AMNH Sun Earth Day, Earth Day Fair, World Science Day, Girls Advancing in STEM, Youth Climate Summit

Princeton Diversity Initiative | '15- '16

- Helped create an initiative to address issues graduate students of various underrepresented identities face on campus; compiled responses from students and wrote a report to the Princeton administration

Other Contributions to Educational Commons (not in Service section)

- Columbia Diversity Alliance member and author on upcoming publication reviewing graduate STEM program efforts to recruit and retain diverse graduate students
- Black History Month celebration and educational event at Lamont, designed educational materials [hosted on Lamont's website](#) (also shared via Twitter February 2021). February 2020.
- Girls Advancing in STEM high school program mentor
- Developed and led workshop on modern/paleoclimate in NY region at the Youth Climate Summit. January 2020.
- Led laboratory tours and activities and served as regular panelist for high school and undergraduate student groups visiting Lamont Doherty Earth Observatory (2017-2020)
- Created accessible research related media content (e.g. [Youtube video](#))
- Mentor Secondary School Field Research Program, high school students in earth science research (2018 & 2019)
- Lamont Doherty Colloquium Steering Committee (2017-2019)
- Princeton University Theoretical Ecology Lab Tea Coordinator (2015-2016)
- Princeton University Graduate Housing Committee (2015-2016), resulted in 500 new graduate housing units

Awards and Honors

- Campbell Award from Columbia Alumni Association (2021) – 1 student for Graduate School of Arts & Sciences
- 2nd Place & Audience Choice at Black Alumni of MIT Virtual Research Slam (lightning research talks)
- NASA Future Investigator in Earth & Space Science & Technology (2019-2021)
- Chinweike Okegbe Service Award from the Arts & Science Graduate Council at Columbia (2020)
- Ciriacks Graduate Fellowship in Earth & Environmental Sciences (2018-2019)
- Chevron Student Initiative Grant (2016-2017) – for ocean sensor development/testing
- Columbia University Dean's Fellow & Provost's Diversity Fellowship (2016-2021)
- Princeton University Centennial Fellowship in Natural Sciences & Engineering (2014-2016)
- MIT Presidential Advisory Cabinet (2013-2014) - comprised of 6 undergraduate & graduate student leaders
- MIT Institute Award - Ronald E. McNair Scholarship Fund (2013) – awarded to 3 undergraduate students
- MIT Office of Minority Education's Distinguished Peer for Public Service (2013)
- Tau Beta Pi Service & Engineering Fellowship (2012)

Media Coverage

- Featured research for CBS This Morning's Earth Day Special (2021- *to be released April 22, 2021*)
- Featured in Fox Broadcasting's Women in Science Special (2021 – *to be released mid 2021*)
- Featured profile by MIT Alumni Association (2021) "Safe to Swim? Scientist's Study of River Bacteria Motivated by Environmental Justice" <https://alum.mit.edu/slice/safe-swim-scientists-study-river-bacteria-motivated-environmental-justice>
- Featured profile by Earth Institute's State of the Planet (2021) "At the Intersection of Hudson River Microbiology and Environmental Justice with Elise Myers" <https://www.ldeo.columbia.edu/news-events/intersection-hudson-river-microbiology-and-environmental-justice-elise-myers>
- Featured in LoHud Newspaper "Covid-19 and race: Elise Myers gauges risk of racial disparity" (2020) <https://www.lohud.com/story/news/coronavirus/2020/09/03/covid-19-race-elise-myers/5654628002/>
- Featured profile in New Yorker (2020) <https://www.newyorker.com/culture/culture-desk/as-the-world-turns>

Other Skills

Technical Software: R, Python, MATLAB, Trello, GitHub, Microsoft Office (incl. Powerpoint), QGIS, Adobe Illustrator, SQL, SeaDas, ACOLITE, Inkscape

Laboratory/Field Skills: Microbiology (culturing, bacterial plating, filtration, perturbation experiments, live cell staining, microscopy), Molecular Biology (Gel electrophoresis, DNA extraction, 16S sequencing and data analysis), Imaging (for biology), Mass Spectrometry (Liquid & Gas Chromatography Mass Spectrometry, High-Performance Liquid Chromatography), Water Chemistry (nutrients, alkalinity), Lipid Geochemistry (column packing, derivatization, extraction), Monitoring Instrument Fabrication and Deployment, Water Optics, Sample Collection, Aquatic Field Work Planning and Coordination

Languages: English (fluent); Spanish (advanced); Portuguese (conversational)