Alexander S. Honeyman, Ph.D.

Address: Earth System Science, Stanford University, 473 Via Ortega, Stanford, California, USA, 94305
Office: Green Earth Sciences 303. *Email:* honeyman@stanford.edu
ORCID: https://orcid.org/0000-0002-9610-9208
Google Scholar: https://scholar.google.com/citations?user=Sbi8rEgAAAAJ&hl=en&oi=ao

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PROFESSIONAL PREPARATION:

Postdoctoral Fellow. Earth System Science, Stanford University, 2022 — Present; Laboratory of Dr. Scott Fendorf

Ph.D. Civil and Environmental Engineering, Colorado School of Mines, 2022; Advisor: Dr. John R. Spear

M.S. Civil and Environmental Engineering, Colorado School of Mines, 2020

B.A. Biochemistry, Biophysics, and Molecular Biology, *cum laude*, Whitman College, 2016

PROFESSIONAL POSITIONS:

November 2022 — Present	**Postdoctoral Fellow** in Soil and Environmental Biogeochemistry, Fendorf Lab, Earth System Science, Doerr School of Sustainability, Stanford University, Stanford, California, USA
September 2019 — August 2022	**US National Science Foundation Graduate Research Fellow**, Geo-Environmental Microbiology (GEM) Lab, Civil and Environmental Engineering, Colorado School of Mines, Golden, Colorado, USA
October 2021 — December 2021	**Invited Visiting Research Ph.D. Student**: Sensors Lab, Microbiology Section, Department of Biology, Aarhus University, Aarhus, Denmark; Principal Investigator: Dr. Klaus Koren
May 2019 — August 2019	**Edna Bailey Sussman Environmental Research Fellow**, Civil and Environmental Engineering, Colorado School of Mines, Golden, Colorado, USA
2018 — 2022	**Graduate Student (M.S., Ph.D.)**, Geo-Environmental Microbiology (GEM) Lab, Civil and Environmental Engineering, Colorado School of Mines, Golden, Colorado, USA
2016 — 2018	**Research Technician**, Geo-Environmental Microbiology (GEM) Lab, Civil and Environmental Engineering, Colorado School of Mines, Golden, Colorado, USA

AWARDS / HONORS / AFFILIATIONS:

- Editor's 'Spotlight Selection' and journal cover image for *Applied and Environmental Microbiology*, July, 2022. https://journals.asm.org/doi/10.1128/aem.01091-22
- Second Place Poster: Front Range Microbiome Symposium. April 15th, 2022. Fort Collins, Colorado.
- National Microbiome Data Collaborative Champion, 2021 – Present: https://microbiomedata.org/nmdc-champions/
- US National Science Foundation Graduate Research Fellowship Awardee, 2019
- Edna Bailey Sussman Environmental Research Fellowship Awardee, 2019
- Colorado School of Mines Graduate Student Fellowship Awardee, 2018 - 2019
- Software Carpentry Teaching Assistant, 2018 – 2022: https://software-carpentry.org/
- US National Science Foundation Graduate Research Fellowship Honorable Mention, 2018
- Graduated from Whitman College *cum laude*, 2016
- Whitman College Internship Grant, Rabinovitch Lab, Stanford University, Stanford, CA, 2015

- Whitman College Internship Grant, National Jewish Health, Denver, CO, 2013
- D.K. Pearson Scholarship for exceptional contribution to academic life, Whitman College, 2012 - 2016
- Eagle Scout, Scouting America, 2012

PEER-REVIEWED PUBLICATIONS:

Honeyman, A., Blythe, C., Lopez, A., Vajedian, S., Carney, D., Harmon, E., James, K., Gribble, M., Smith, R., Fendorf, S. 2024. Geothermal Arsenic Threats to Intensive Groundwater Utilization in an Arid Basin. *Under review*.

Honeyman, A., Merl, T., Spear, J.R., Koren, K. 2023. Optode-based chemical imaging of laboratory burned soil reveals millimeter-scale heterogeneous biogeochemical responses. *Environmental Research* 224. https://www.sciencedirect.com/science/article/pii/S001393512300261X

Honeyman, A., Fegel, T., Peel, H., Masters, N., Vuono, D., Kleiber, W., Rhoades, C., Spear, J. 2022. Statistical learning and uncommon soil microbiota explain biogeochemical responses after wildfire. *Applied and Environmental Microbiology* 88. https://journals.asm.org/doi/10.1128/aem.00343-22

Thieringer, P., **Honeyman, A.**, Spear, J.R. 2021. Spatial and temporal constraints on the composition of microbial communities in subsurface boreholes of the Edgar Experimental Mine. *Microbiol Spectr* 9:e00631- 21. https://doi.org/10.1128/Spectrum.00631-21

Honeyman, A., Day, M., Spear, J.R. 2018. Regional fresh snowfall microbiology and chemistry are driven by geography in storm-tracked events, Colorado, USA. *PeerJ* 6:e5961. https://doi.org/10.7717/peerj.5961

THESES:

Honeyman, A. 2022. Explaining soil biogeochemical responses after fire. Ph.D. Dissertation, Civil and Environmental Engineering, Colorado School of Mines, Golden, Colorado. https://www.proquest.com/docview/2733118029?pq-origsite=gscholar&fromopenview=true&sourcetype=Dissertations%20&%20Theses

Honeyman, A. 2016. Developing an in vitro model to test how blood flow influences human endothelial cell phenotype in health and disease. Whitman College Senior Thesis; Dept. of Biochemistry, Biophysics, and Molecular Biology.

INVITED TALKS:

Honeyman, A., Lopez, A., Smith, R., James, K., Fendorf, S. Deducing and projecting arsenic threats to groundwater: a data science approach exemplified for the San Luis Valley, Colorado, USA. Geological Society of America Connects 2024, Anaheim, CA, 22 September 2024 (in person).

Honeyman, A. Do wildfire smoke particles transport an inorganic toxic threat across the United States? Stanford Synchrotron Radiation Light Source Hydro-biogeochemical Group, SLAC National Accelerator Laboratory, Menlo Park, CA, 15 May 2024 (in person).

Honeyman, A. Data science to examine the toxic threat of wildfire smoke. United States Military Academy West Point, Environmental Biological Systems course, Department of Geography and Environmental Engineering, 6 May 2024 (remote).

Honeyman, A. Inorganic (metals) toxic threat in $PM_{2.5}$ from wildfire smoke. Wildland Fire Science Lab (Stephens Lab), University of California Berkeley, 24 April 2024 (in person).

Honeyman, A. Data science to characterize geogenic arsenic contamination in groundwater of the San Luis Valley, Colorado. Stanford Hydrology Seminar Series, 21 February 2024 (in person).

Honeyman, A. Fire in the American West: Genetic sensing of soil biogeochemistry after wildfire in Colorado, USA. Microbiology Section, Department of Biology, Aarhus University, Aarhus, Denmark, 8 November 2021 (in person).

OTHER PRESENTATIONS & ABSTRACTS (*Indicates mentee w/ Honeyman as primary mentor):

Honeyman, A., Qiu, M., Burke, M., Fendorf, S. Quantifying the effect of wildfire-specific soil characteristics on the transport of metals and other inorganics in smoke. Accepted eLightning talk (in person), American Geophysical Union 2024.

*Savoie, C., **Honeyman, A.**, Fendorf, S. Creating a geospatial dataset linking CONUS wildfire footprints with soil characteristics to enable potential inferences about the origin of wildfire smoke chemistry. Accepted poster, American Geophysical Union 2024.

Smith, R., Lopez, M., **Honeyman, A.**, Fendorf, S., Vajedian, S., Carney, D., James, K., Gribble, M. Leveraging Satellite and Geological Data to Estimate 3-Dimensional Arsenic Concentrations and Human Exposure in the San Luis Valley, Colorado. Accepted abstract, American Geophysical Union 2024.

Honeyman, A., Qiu, M., Burke, M., Fendorf, S. Evaluating the transport of trace metals and other inorganics in $PM_{2.5}$ attributed to specific fires in the United States. Oral presentation, Goldschmidt 2024.

Fendorf, S., Lopez, A., **Honeyman, A.**, Namayandeh, A., Avila, C. (Invited). Beyond $PM_{2.5}$: Wildfire production and dispersion of toxic metal soil particulates. Goldschmidt 2024.

James, K., Stoll, N., **Honeyman, A.**, Gribble, M., Smith, R. Assessing Drought Impacts on Water Resources and Metal Exposure in a Rural Community: A Community-Based Participatory Research Approach. International Society of Environmental Epidemiology 2024.

Honeyman, A. Can we predict the composition of smoke? Poster, Stanford Big Earth Hackathon Wildland Fire Challenge 2024.

Honeyman, A. Does smoke from specific wildfires transport toxic metals? Poster, Stanford Data Science Symposium 2024.

*Blythe, C., Lopez, A., **Honeyman, A.**, Vajedian, S., James, K., Smith, R., Fendorf, S. 2023. Interpolating Groundwater Arsenic Contamination in the San Luis Valley, Colorado, USA. Poster, American Geophysical Union 2023.

*Southern, J., Lopez, A., **Honeyman, A.**, Carney, D., James, K., Smith, R., Fendorf, S. 2023. Deciphering the Role of Redox Conditions on Groundwater Arsenic Contamination in the San Luis Valley, Colorado. Poster, American Geophysical Union 2023.

*Liebson, R., Lopez, A., **Honeyman, A.**, James, K., Smith, R., Fendorf, S. 2023. Geothermal Contributions to Groundwater Arsenic Contamination in the San Luis Valley, CO, USA. Poster, American Geophysical Union 2023.

Honeyman, A., Lopez, A., Blythe, C., James, K., Smith, R., Fendorf, S. 2023. Using statistical and machine learning to explain the threat of arsenic in groundwater in the San Luis Valley, Colorado, USA. Oral presentation, Goldschmidt 2023.

Honeyman, A. July 19th, 2022. Explaining soil biogeochemical responses after fire. Public Ph.D. Dissertation Defense, Colorado School of Mines, Golden, Colorado.

Honeyman, A., Moonen, J.R., Rabinovitch, M. 2015. Developing an in vitro model to test how blood flow influences endothelial cell phenotype in health and disease. Murdock College Science Research Program Annual Conference, Whitman College Biology Keynote Talk.

Honeyman, A., Browning, J., Hertzberg, J., Schroeder, J., Stalder, A., Fenster, B. 2014. Vorticity for the Assessment of Pulmonary Vascular Hemodynamics in Pulmonary Arterial Hypertension. *J. Cardiovascular Magnetic Resonance* 16 (Suppl 1): P15. Poster: Society for Cardiac Magnetic Resonance National Conference, New Orleans, LA.

PRESS:

- American Society for Microbiology Press Release: "New Methodology Helps Predict Soil Recovery After Wildfires". July 25th, 2022. https://asm.org/Press-Releases/2022/July/New-Methodology-Helps-Predict-Soil-Recovery-After

LEADERSHIP AND SERVICE:

- Session co-convener: Novel Computational, Data-driven and multiscale approaches for advancing geochemistry. Goldschmidt 2024.
- Application review committee: Sustainability Undergraduate Research in Geoscience and Engineering Program (SURGE, Stanford's 2024 Earth Science NSF REU program).
- Workshop Participant: Planet Labs – Stanford Doerr School of Sustainability Faculty and Staff. Satellite imagery and artificial intelligence opportunities and collaborations. 2023.
- Academic Journal Reviewer: *Applied and Environmental Microbiology*

MENTORHSIP:

- *As postdoctoral fellow:*
    - 2024: Mentor for student in the Stanford Sustainability Undergraduate Research in Geoscience and Engineering Program (SURGE), an NSF REU.
    - 2024: Mentor for community college summer intern (College of Marin).
    - 2023 – 2024: Mentor for two Stanford Sustainability, Engineering and Science – Undergraduate Research (SESUR) students.
    - 2023 – 2024: Project mentor for Stanford masters (thesis) student.
- *As doctoral student:*
    - Mentor for one masters student and several undergraduate students: field, laboratory, software, and manuscripts, 2018 – 2022.
    - Mentor for High school STEM student: 1st Place Earth and Environmental Sciences at the Denver Metro Regional Science and Engineering Fair, 2021.

TEACHING:

2024	**Microbial Diversity Summer Course—Instructor in Computation, Data Science, and Bioinformatics,** Marine Biological Lab, Woods Hole, MA
2024	**Co-instructor—Soil and Water Chemistry (graduate and undergraduate)**, Department of Earth System Science, Stanford University
2019 & 2021	**Microbial Diversity Summer Course—Molecular Biology Teaching Assistant**, Marine Biological Lab, Woods Hole, MA

SYNERGISTIC FORMAL TRAINING AT THE GRADUATE LEVEL:

- Statistical Learning (Applied Math, University of Colorado Boulder)
- Machine Learning (Computer Science, Colorado School of Mines)

RESEARCH FUNDING:

- **Danish Ministry of Higher Education and Science International Network Programme**, 2022 – 2023
    - "Initiating an International Network to Study Soils Post-Wildfires – From Chemistry to Microbial Ecology", Spear, J., **Honeyman, A.**, Zieger, S., and Koren, K.
    - $45,000 over 18 months
- **National Science Foundation Graduate Research Fellowship in Environmental Engineering**, 2019-2022
    - $138,000 over three years
- **Edna Bailey Sussman Environmental Research Fellowship**, Summer 2019
    - $9,000 total
- **Colorado School of Mines Graduate Student Fellowship**, 2018 – 2019
    - $55,000 total

SYNERGISTIC LEADERSHIP AND FIELD EXPERIENCE:

- 10 years' experience as a Volunteer Firefighter, Boulder County 911 System, Colorado, USA, 2012 – 2022
    - Fire (FFT2 "red card"), Engineer (Types I, III, and VI engines), Rescue, EMS (Nationally Registered EMT with IV endorsement), Qualified for Incident Command
- Remote and rugged scientific field work
    - Yellowstone National Park (MT, WY and ID)
    - Edgar Experimental Mine (Idaho Springs, Colorado)
    - Wildland fire burn areas (Colorado)
    - Direct wildfire smoke plume sampling (Western United States)
    - Groundwater for drinking supply and agriculture (Colorado)