

## Alexander S. Honeyman, Ph.D.

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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

### PEER-REVIEWED PUBLICATIONS:

**Honeyman, A.**, Qiu, M., Vives-i-Bastida, J., Nguyen, N., Namayandeh, A., Southworth, E., Wager, S., Burke, M., Fendorf, S. Invisible and Far-Reaching Threat of Metal Toxins from Wildfire Smoke. *In revision.*

Smith, R., Lopez, A., **Honeyman, A.**, Carney, D., Fendorf, S., Lombard, M., Gribble, M., James, K. Anthropogenic and Geogenic Factors Affecting Groundwater Arsenic and Potential Drinking Water Exposure in the San Luis Valley, Colorado. *In revision.*

Namayandeh, A., Lamb, C., Luiz Sarabia, J., Shakouri, M., Lopes, E., Lezama Pacheco, J., **Honeyman, A.**, Coker, A., Stewart, B., Tikoo, S., Peak, D., Fendorf, S. 2025. Nonlinear Redox Transformations of Chromium in Soil during Wildfire Heating: The Critical Role of Iron Mineralogy. *Environmental Science and Technology* 59, 27623–27634.

<https://doi.org/10.1021/acs.est.5c10407>

- Honeyman, A.**, Blythe, C., Lopez, A., Vajedian, S., Carney, D., Harmon, E., James, K., Gribble, M., Smith, R., Fendorf, S. 2025. Geothermal Arsenic Threats to Intensive Groundwater Utilization in an Arid Basin. *Environmental Science and Technology* 59, 4133-4141. <https://doi.org/10.1021/acs.est.4c12125>
- Lacroix, E., Gomes, A., **Honeyman, A.**, Huy, K., Fendorf, S., Noël, V., Aeppli, M. 2025. Soil carbon concentration drives anoxic microsites across horizons, textures, and aggregate position in a California grassland. *Geoderma* 454, 117165. <https://doi.org/10.1016/j.geoderma.2025.117165>
- 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.**, Fendorf, S. SmokeCast: Developing planetary intelligence to forecast wildfire smoke chemical toxicity. Planetary Intelligence “Spotlight Case Study”, Stanford Sustainability Accelerator, Stanford, CA, 3 October 2025 (in person).
- Honeyman, A.** Data Science and Molecular (Bio)geochemical Signatures for Environmental Prediction. University of California Davis Department of Microbiology and Molecular Genetics “Selected Topics in Microbiology Work in Progress Seminars”, Davis, CA, 5 March 2025 (in person).
- 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<sub>2.5</sub> 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., Nguyen, N., Namayandeh, A., Southworth, E., Leone, M., Burke, M., Fendorf, S. 2025. Attributing and predicting metal toxin threat in wildfire smoke. Talk (in person), Association for Fire Ecology, 5 December 2025.

**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. 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. 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. American Geophysical Union 2024.

**Honeyman, A.,** Qiu, M., Burke, M., Fendorf, S. Evaluating the transport of trace metals and other inorganics in PM<sub>2.5</sub> 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<sub>2.5</sub>: 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 19<sup>th</sup>, 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 25<sup>th</sup>, 2022. <https://asm.org/Press-Releases/2022/July/New-Methodology-Helps-Predict-Soil-Recovery-After>

## LEADERSHIP AND SERVICE:

- 2025 (November 18<sup>th</sup>): Primary workshop convener for “*SmokeCast*” hosted at Stanford University. Developed framework for forecasting smoke chemical toxicity with collaborators in academia, government, the fire service, and the Stanford Sustainability Accelerator.
- 2025 (August 20<sup>th</sup>): Department of Energy AI4ESS virtual roundtable: Opportunities and Advances in the Application of AI in Environmental System Science (ESS).
- 2025 – Present: LA Fire Health Environmental Exposures Team. <https://lafirehealth.org/>
- 2025: Briefing panelist for California Legislature and Congressional staff: “Legislating after Wildfires: Health and Preparedness”. 14 February 2025. Stanford Woods Institute for the Environment.
- 2024 & 2025: Application review committee: Sustainability Undergraduate Research in Geoscience and Engineering Program (SURGE, Stanford’s Earth Science NSF REU program).
- 2024: Goldschmidt conference session co-convener: Novel Computational, Data-driven and multiscale approaches for advancing geochemistry.
- 2024 – Present: Reviewer for *Applied and Environmental Microbiology*
- 2023: Planet Labs – Stanford Doerr School of Sustainability Faculty and Staff workshop. Satellite imagery and artificial intelligence opportunities and collaborations.

## AWARDS / HONORS:

- Editor’s ‘Spotlight Selection’ and journal cover image for *Applied and Environmental Microbiology*, July, 2022. <https://journals.asm.org/doi/10.1128/aem.00343-22>
- Second Place Poster: Front Range Microbiome Symposium. April 15<sup>th</sup>, 2022. Fort Collins, Colorado.
- National Microbiome Data Collaborative Champion, 2021 – 2025: <https://microbiomedata.org/nmdc-champions/>
- US National Science Foundation Graduate Research Fellowship Awardee, 2019
- Edna Bailey Sussman Environmental Research Fellowship Awardee, 2019
- 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

## MENTORSHIP:

- *As postdoctoral fellow:*
  - 2026: Supervisor for two Stanford Engineering undergraduates (electrical engineering and mechanical engineering) working on environmental sampling systems (students are direct reports to M.S. student, below).
  - 2025 – 2026: Primary mentor and supervisor for Stanford Mechanical Engineering M.S. student developing novel environmental sampling systems.
  - 2025 – 2026: Supervisor for undergraduate water chemistry technician.
  - 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 M.S. (thesis) student.
- As doctoral student:
  - Mentor for one M.S. student and several undergraduate students: field, laboratory, software, and manuscripts, 2018 – 2022.
  - Mentor for High school STEM student: 1<sup>st</sup> Place Earth and Environmental Sciences at the Denver Metro Regional Science and Engineering Fair, 2021.

#### TEACHING:

- 2024 & 2025 **Soil and Water Chemistry (graduate and undergraduate)—Co-instructor,**  
Department of Earth System Science, Stanford University
- 2024 **Microbial Diversity Summer Course—Instructor in Computation, Data Science, and Bioinformatics,** Marine Biological Lab, Woods Hole, MA
- 2019 & 2021 **Microbial Diversity Summer Course—Molecular Biology Teaching Assistant,** Marine Biological Lab, Woods Hole, MA
- 2018 **Software Carpentry Program—Teaching Assistant,** Colorado School of Mines:  
<https://software-carpentry.org/>

#### 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:

- **Stanford Sustainability Accelerator** ([website](#)), 2025-2027
  - “**SmokeCast**: Developing planetary intelligence to forecast wildfire smoke chemical toxicity”. **Honeyman, A.**, Fendorf, S. (PI).
    - \$150,000 for 1 year (“Scoping” funding), 2025-2026
    - \$150,000 for 1 year (continuation funding), 2026-2027
- **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. (Co-PI), **Honeyman, A.**, Zieger, S., and Koren, K. (Co-PI)
  - \$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

#### SYNERGISTIC LEADERSHIP AND FIELD EXPERIENCE:

- Maintained / current wildland firefighter certification (FFT2 “red card”)
- 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)
- Remote and rugged scientific field work
  - Yellowstone National Park (MT, WY and ID)
  - Edgar Experimental Mine (Idaho Springs, Colorado)
  - Wildland fire burn areas (Colorado)

- Prescribed fire smoke sampling (California)
  - Direct wildfire smoke plume sampling (Western United States)
  - Groundwater for drinking supply and agriculture (Colorado)
- Technical Mountaineering
  - Alpine climbing & snow / glacier travel