

ALICIA M PURCELL

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Post-doctoral Research Associate
Department of Biological Sciences
Texas Tech University
Lubbock, TX
Website: aliciapurcell.com

RESEARCH INTERESTS: Soil microbial ecology, quantitative ecosystem microbial ecology, in situ growth and activity of soil microorganisms, scaling in situ microbial activity to ecosystem function, influence of microbes on global biogeochemical cycling and their response to climate warming, biogeography of microorganisms, Antarctic microbiology

EDUCATION

- 2021 Ph.D., Biological Sciences
Northern Arizona University, Flagstaff, Arizona
Dissertation Title: Quantifying wild soil microbes: warming effects on
taxon growth in the field
Advisor: Dr. Bruce Hungate
- 2014 M.S. Microbiology
University of Tennessee, Knoxville, Tennessee
Thesis Title: Diversity and Function of sulfur cycling microorganisms in
sediments from Subglacial Lake Whillans, Antarctica
Advisor: Dr. Jill Mikucki
- 2012 B.S. Biological Sciences
Concentration in Biochemistry, Cellular, and Molecular Biology
University of Tennessee, Knoxville, Tennessee

APPOINTMENTS

- Jan 2022-current Post-doctoral Research Associate
Advisor: Dr. Natasja van Gestel
Department of Biological Sciences
Texas Tech University
Lubbock, Texas
- Jan 2022 - current Affiliate Post-doctoral Research Associate
Center for Ecosystem Science and Society
Northern Arizona University
Flagstaff, Arizona

- Aug 2016 – Graduate Research Assistant
Dec 2021 Northern Arizona University
Department of Biological Sciences
Center for Ecosystem Science and Society
Advisor: Dr. Bruce Hungate
Project: field measurements of taxon-specific microbial growth in soil in response to warming in Northern Arizona and along a deglaciated sere of the Marr Ice Piedmont Glacier, West Antarctic Peninsula. This is conducted using intact core field incubations with isotopically heavy water and the technique quantitative stable isotope probing.
- March 2016 – Laboratory Tech at Aviagen Veterinary Laboratory
July 2016 Crossville, TN
- Jan. 2015 – Field Research Assistant/Post-Masters Research Assistant
Aug. 2015 University of Tennessee, Knoxville, Tennessee
Department of Microbiology
Advisor: Dr. Jill Mikucki
Tasks: Plan, organize, and execute sample collection and experiments measuring microbial activity of samples collected from the grounding zone of the Whillans Ice Stream, West Antarctica; sample organization, inventory, and shipment; isolating microbes from sub-ice samples
- Jan. 2013 – Graduate Research Assistant
Dec. 2014 University of Tennessee, Knoxville, Tennessee
Department of Microbiology
Advisor: Dr. Jill Mikucki
Project: Diversity and function of sulfur cycling microorganisms in sediments from Subglacial Lake Whillans, West Antarctica as part of the WISSARD project (www.wissard.org).
- May 2012 – Post-Baccalaureate Research Assistant
Dec. 2012 University of Tennessee, Knoxville, Tennessee
Department of Microbiology
Advisor: Dr. Jill Mikucki
Project: Optimization of microscopy techniques to visualize and quantify microorganisms in Antarctic sediments
- Jan. 2011 - Undergraduate Researcher
May 2012 University of Tennessee, Knoxville, Tennessee
Department of Biochemistry, Cellular, and Molecular Biology
Advisor: Dr. Gladys Alexandre
Project: Genetic and phenotypic characterization of transposon mutants of the rhizosphere associated bacterial species *Azospirillum Brasilense* on the basis of flocculation

PUBLICATIONS IN PREP OR UNDER REVIEW

Foley MM, Tristan Caro, Noah W. Sokol, Steven J. Blazewicz, Paul Dijkstra, Michaela Hayer, Kirsten Hofmockel, Brianna K. Finley, Benjamin J. Koch, Michelle Mack, Jane Marks, Rebecca Mau, Victoria Monsaint-Queeney, Ember Morrissey, Jeffrey Propster, **Alicia Purcell**, Egbert Schwartz, Bram W.G. Stone, Jennifer Pett-Ridge, Noah Fierer, Bruce A. Hungate. *Microbial Growth in Soil*. *Nat. Eco. Evo.* (In review)

Purcell, AM., Dijkstra P, Hayer M, Koch BJ, Mau RL, Schwartz E, and Hungate BA. Laboratory measures of soil microbial taxon-specific growth fail to predict field growth. Submitted.

Mau R, Hayer M, **Purcell AM**, Geisen S, Hungate B, Schwartz E. Measurements of soil protist richness and community composition are influenced by primer pair, annealing temperature, and bioinformatics choices. Submitted.

PUBLICATIONS

Purcell AM, Dijkstra P, Hungate BA, McMillen K, Schwartz E, van Gestel N. Rapid growth rate responses of terrestrial bacteria to field warming on the Antarctic Peninsula. *The ISME Journal*. 2023 Oct 23:1-3. <https://doi.org/10.1038/s41396-023-01536-4>

Walkup J, Dang C, Mau RL, Hayer M, Schwartz E, Stone BW, Hofmockel KS, Koch BJ, **Purcell AM**, Pett-Ridge J, Wang C, Hungate, BA, Morrissey, E. The predictive power of phylogeny on growth rates in soil bacterial communities. *ISME communications*. 2023 Jul 15;3(1):73. <https://doi.org/10.1038/s43705-023-00281-1>

Stone BW, Dijkstra P, Finley BK, Fitzpatrick R, Foley MM, Hayer M, Hofmockel KS, Koch BJ, Li J, Liu XJ, Martinez A, Mau RL, Marks J, Monsaint-Queeney V, Morrissey EM, Propster J, Pett-Ridge J, **Purcell AM**, Schwartz E, Hungate BA. Life history strategies among soil bacteria—dichotomy for few, continuum for many. *The ISME Journal*. 2023 Apr;17(4):611-9. <https://doi.org/10.1038/s41396-022-01354-0>

Mikucki JA, Schuler CG, Digel I, Kowalski J, Tuttle MJ, Chua M, Davis R, **Purcell AM**, Ghosh D, Francke G, Feldmann M, Espe C, Heinen D, Dachwald B, Clemens J, Lyons WB, Tulaczyk S, and the MIDGE Science Team. Field-Based Planetary Protection Operations for Melt Probes: Validation of Clean Access into the Blood Falls, Antarctica, Englacial Ecosystem. *Astrobiology*. 2023 Nov 1;23(11):1165-78.

Purcell AM, Hayer M, Koch BJ, Mau RL, Blazewicz SJ, Dijkstra P, Mack MC, Marks JC, Morrissey EM, Pett-Ridge J, Rubin RL, and Hungate BA. Decreased growth of wild soil microbes after fifteen years of transplant-induced warming in a montane meadow. *Global Change Biology*. 2021 Sep 29. <https://doi.org/10.1111/gcb.15911>

Hungate BA, Marks JC, Power ME, Schwartz E, van Groenigen KJ, Blazewicz SJ, Chuckran P, Dijkstra P, Finley BK, Firestone MK, Foley M, Greenlon A, Hayer M, Hofmockel K,

- Koch B, Mack M, Mau R, Miller S, Morrissey E, Propster J, **Purcell AM**, Sieradzki E, Starr E, Stone B, Terrer C, Pett-Ridge J. The functional significance of bacterial predators. *Mbio*. 2021 Apr 27;12(2):10-128. <https://doi.org/10.1128/mbio.00466-21>
- Wang C, Morrissey EM, Mau RL, Hayer M, Piñeiro J, Mack MC, Marks JC, Bell SL, Miller SN, Schwartz E, Dijkstra P, Koch B, Stone BW, **Purcell AM**, Blazewicz SJ, Hofmockel KS, Pett-Ridge J, Hungate B. The temperature sensitivity of soil: microbial biodiversity, growth, and carbon mineralization. *The ISME Journal*. 2021 Sep;15(9):2738-47. <https://doi.org/10.1038/s41396-021-00959-1>
- Purcell AM**, Dijkstra P, Finley B, Hayer M, Koch BJ, Mau RL, Morrissey E, Papp K, Schwartz E, Stone BW, Hungate BA. Quantitative stable isotope probing with H₂¹⁸O to measure taxon-specific microbial growth. *Soil Science Society of America Journal*. 2020 Sep;84(5):1503-18. <https://doi.org/10.1002/saj2.20159>
- Finley BK, Hayer M, Mau RL, **Purcell AM**, Koch BJ, van Gestel NC, Schwartz E, Hungate BA. Microbial taxon-specific isotope incorporation with DNA quantitative stable isotope probing. *Stable isotope probing: methods and protocols*. 2019:137-49.
- Vick-Majors TJ, Mitchell AC, Achberger AM, Christner BC, Dore JE, Michaud AB, Mikucki JA, **Purcell AM**, Skidmore ML, Priscu JC, Team TW (2016). Physiological ecology of microorganisms in Subglacial Lake Whillans. *Front. Microbiol*. 7.
- Mikucki JA, Lee PA, Ghosh D, **Purcell AM**, Mitchell AC, Mankoff KD, Fisher AT, Tulaczyk S, Carter S, Siegfried MR, Fricker HA. Subglacial Lake Whillans microbial biogeochemistry: a synthesis of current knowledge. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*. 2016 Jan 28;374(2059):20140290. <https://doi.org/10.1098/rsta.2014.0290>
- Bible AN, Khalsa-Moyers GK, Mukherjee T, Green CS, Mishra P, **Purcell AM**, Aksenova A, Hurst GB, Alexandre G. Metabolic adaptations of *Azospirillum brasilense* to oxygen stress by cell-to-cell clumping and flocculation. *Applied and environmental microbiology*. 2015 Dec 15;81(24):8346-57. <https://doi.org/10.1128/AEM.02782-15>
- Purcell AM**, Mikucki JA, Achberger AM, Alekhina IA, Barbante C, Christner BC, Ghosh D, Michaud AB, Mitchell AC, Priscu JC, Scherer R, Skidmore ML, Vick-Majors TJ, and the WISSARD Science Team. Microbial sulfur transformations in sediments from Subglacial Lake Whillans. *Frontiers in Microbiology*. 2014 Nov 19;5:594. doi: 10.3389/fmicb.2014.00594

TEACHING

- Aug. 2019- Graduate Teaching Assistantship
Dec. 2019 Northern Arizona University
BIO305W instructor for one section

“Writing in Biology”. This is a junior level science writing course where the goal is to help students learn how to write technically, read and understand peer reviewed publications, and improve writing over the semester.

- Aug. 2017-
Dec. 2017 Graduate Teaching Assistantship
Northern Arizona University
BIO305W instructor for one section
“Writing in Biology for Microbiology Students”. This is a junior level science writing course where the goal is to help students learn how to write technically, read and understand peer reviewed publications, and improve writing over the semester.
- Aug. 2016-
Dec. 2016 Graduate Teaching Assistantship
Northern Arizona University
BIO305W instructor for one section
“Writing in Biology for Microbiology Students”. This is a junior level science writing course where the goal is to help students learn how to write technically, read and understand peer reviewed publications, and improve writing over the semester.
- Aug. 2014-
Dec. 2014 Graduate Teaching Assistantship
University of Tennessee, Knoxville
General Biology 140 laboratory instructor for two sections
“Organization and Function of Cells” – This is a course for biology majoring undergraduates.
- Jan. 2013 -
Apr. 2013 Graduate Teaching Assistantship
University of Tennessee, Knoxville
General Biology 102 laboratory instructor for three sections. This is a general biology course for non-biology majoring undergraduates.
- Aug. 2013 -
Dec. 2013 Graduate Teaching Assistantship
University of Tennessee, Knoxville
General Biology 101 laboratory instructor for three sections
This is a course for general education course for non-biology majoring undergraduates.

GRANTS AND AWARDS

- Sept. 2021 The U.S. Department of Energy Joint Genome Institute (JGI) community science project FY22, Monitoring Inter-Organism Interactions Within Ecosystems: <https://jgi.doe.gov/monitoring-inter-organism-interactions-within-ecosystems/>
Proposal Accepted. Proposal title: “Quantifying the ecophysiology of growing

microbes responding to warming along a productivity gradient of the Marr Ice Piedmont Glacier, West Antarctic Peninsula”

- Nov. 2019 NAU Ecosystem TRAP award
\$900 awarded to Alicia Purcell to fund travel to the American Geophysical Conference Fall 2019 meeting in San Francisco, CA Dec. 9-13, 2019.
- August 2019 NAU Graduate Student Government Travel Award
\$235 awarded to Alicia Purcell to fund travel to the American Geophysical Conference Fall 2019 meeting in San Francisco, CA Dec. 9-13, 2019.
- April 2018 NAU Ecosystem TRAP Award
\$900 awarded to Alicia Purcell to fund travel to an international conference, ISME17 in Leipzig, Germany, August 2018.
- Oct. 2013 Impact Big Ideas Fundraiser:
\$525 awarded to Alicia Purcell from a crowd sourcing initiative via the University of Tennessee Office of Alumni Affairs aiming to fund student projects and their next “Big Ideas”. This award was utilized to purchase supplies for field work in Antarctica.

CONFERENCE ABSTRACTS AND PRESENTATIONS (presenting author in italics)

Bram W. G. Stone, Sheryl L. Bell, Steven J. Blazewicz, Paul Dijkstra, Michaela Hayer, Ben J. Koch, Michelle Mack, Jane C. Marks, Samantha N. Miller, Ember M. Morrissey, Juan Pineiro, Jeffrey S. Propster, **Alicia M. Purcell**, Egbert Schwartz, Chao Wang, Kirsten S. Hofmockel, Jennifer Pett-Ridge, Bruce A. Hungate. “Sensitivity of bacterial networks from high-latitude soils to high temperatures”. Poster Presentation. Department of Energy Genomic Sciences Annual PI Meeting (Feb. 2022).

Purcell A.M., Jeffrey Propster, Sheryl Bell, Bram W. Stone, Chao Wang, Juan Piñeiro Nevado, Natasja van Gestel, Kelly McMillan, Michaela Hayer, Rebecca L. Mau, Samantha Miller, Steven J. Blazewicz, Paul Dijkstra, Kirsten Hofmockel, Benjamin J. Koch, Michelle C. Mack, Xavier Mayali, Ember M. Morrissey, Jennifer Pett-Ridge, Egbert Schwartz, Peter Weber, and Bruce A. Hungate. “Quantifying microbes: warming effects, field responses, and element transformations” Oral presentation. Department of Energy Genomic Sciences Annual PI Meeting (Feb. 2021)

McMillen, K., Natasja van Gestel, Bruce A. Hungate, **Alicia Purcell**, and Paul Dijkstra. “Terrestrial carbon flux responses to a warming experiment along a primary productivity gradient in a glacier forefield on the western Antarctic Peninsula” American Geophysical Union Annual Fall Meeting (Dec. 2019)

Purcell A.M., Paul Dijkstra, Bruce A. Hungate, Kelly McMillen, Egbert Schwartz, and Natasja van Gestel. “Field in situ microbial growth response to warming using H₂¹⁸O qSIP in

deglaciated soils of the Marr Ice Piedmont Glacier, Anvers Island, Antarctica” American Geophysical Union Annual Fall Meeting (Dec. 2019)

Purcell A.M., Michaela Hayer, Benjamin J. Koch, Rebecca L. Mau, Egbert Schwartz, and Bruce A. Hungate. “Field Measurements of Taxon Specific Microbial Growth in Soil at Two Elevation Gradient Sites Using H₂¹⁸O Quantitative Stable Isotope Probing (qSIP)” The 17th International Society for Microbial Ecology Symposium, Leipzig, Germany (Aug. 2018)

Purcell A.M., Michaela Hayer, Benjamin J. Koch, Rebecca L. Mau, Egbert Schwartz, and Bruce A. Hungate. “Field Measurements of Taxon Specific Microbial Growth in Soil at Two Elevation Gradient Sites Using Quantitative Stable Isotope Probing (qSIP)” Department of Energy 2018 Annual Genomic Sciences PI Meeting (Feb. 2018)

Purcell A. M., A. Achberger, B.C. Christner, A.B. Michaud, J. Mikucki, A. C. Mitchell, J. C. Priscu, M. L. Skidmore, T. Vick-Majors, and WISSARD Science Team. “The Biogeochemistry beneath the Whillans Ice Stream, West Antarctica: Evidence for a Chemoautotrophically Driven Ecosystem”. American Geophysical Union, Fall Meeting (Dec. 2015)

Mikucki, J. A., Lee, P., Ghosh, D., **A. Purcell**, et al. “Investigating the hydrological origins of Blood Falls – geomicrobiological insights into a briny subglacial Antarctic aquifer” American Geophysical Union, Fall Meeting (Dec. 2015)

Mikucki, J.A., Tulaczyk, S., Esben, A., Dachwald, B., Lyons, W., Chua, M., and **Purcell, A.** “Geomicrobiology, Engineering and Geophysics: Enabling the exploration of the subglacial microbial community in Antarctica’s Blood Falls”. SICB Extremophile Symposium. Portland, OR [submitted] (Jan. 2016)

Purcell A., J. Mikucki, D. Ghosh, and the WISSARD Science Team. Microbial Sulfur and Carbon Cycling in Antarctic Sub-Ice Environments. Southeastern Geobiochemistry Symposium, (Mar. 2015); Atlanta, GA.

Skidmore, M.L., A.B. Michaud, A. Achberger, C. Barbante, B.C. Christner, J. Mikucki, A.C. Mitchell, J. C. Priscu, **A. M. Purcell**, W. van Gelder, T. Vick-Majors, and WISSARD Science Team. American Geophysical Union, Fall Meeting (Dec. 2014)

Mikucki, J., S. Tulaczyk, B. Dachwald, D. Gosh, **A. Purcell**, M. Chua, J. Priscu, R. Powell, A. Mitchell, R. Scherer, B. Christner, and the WISSARD Science Team. Antarctic Subglacial Exploration – highlights from recent investigations of Subglacial Lake Whillans and Blood Falls. Scientific Committee on Antarctic Research Open Science Conference (Aug. 2014)

Mikucki, J., D. Ghosh, **A. Purcell**, A. C. Mitchell, and the WISSARD Science Team. Evidence for Iron and Sulfur-driven Chemosynthesis below Antarctic Ice. Goldschmidt (June 2014)

Purcell A., D. Ghosh, A.C. Mitchell, A. Achberger, B.C. Christner, R. Scherer, J.C. Priscu, and J. Mikucki. Microorganisms in Sediments from an Antarctic Subglacial Lake Mediate S-cycling. Poster session, Southeastern Geobiochemistry Symposium, (Apr. 2014); Atlanta, GA.

Purcell, A., H.F. Castro, K. Prater, J. Biggerstaff and J. Mikucki, “Antarctic Subglacial Sediment Visualization Techniques and its application to the Whillans Ice Stream Subglacial Access Research Drilling (WISSARD) Project”. Poster session, KY-TN American Society for Microbiology Branch Meeting, (Oct. 2012); Maryville, TN.

OUTREACH

- Sept. 2019 Participant in Flagstaff, Arizona’s “Science in the Park”, part of Flagstaff’s Science Week. We set up a booth to educate the general public about the research conducted by the Center for Ecosystem Science and Society at Northern Arizona University. This included seed necklace sprouting, moss rehydration, invertebrate observation, and climate change education.
- July 2019 Participant in group presentation to a group of students part of local Navajo college Diné College summer camp titled “Arctic vs. Antarctic” where we discussed key differences in these polar regions, climate change, and current research in both regions.
- Jan. 2019 Participant on a panel from Palmer Station, Antarctica answering questions about importance of Antarctic science and climate change to ~500 tourists on an Antarctic cruise ship.
- Dec. 2016 - Dec. 2019 Participant in a program called “Science in the Classroom” where the Center for Ecosystem Science and Society at Northern Arizona University visits a local 6th grade classroom of students to teach them science including topics in soil stability, carbon cycling, microbiology, etc. <http://ecoss.nau.edu/outreach/science-in-the-classroom/>. I have participated in this event over 6 times, twice were day long field trips of the classes to our laboratories where we set up educational booths to teach many topics including DNA extraction, leaf litter decomposition, and the carbon cycle.
- Sept. 2017 Participant in Flagstaff, Arizona’s “Science in the Park”, part of Flagstaff’s Science Week. We set up a booth to educate the general public about the research conducted by the Center for Ecosystem Science and Society at Northern Arizona University. This included seed necklace sprouting, education about dating trees, and soil respiration measurements of CO₂ from decomposition.
- March 2017 Participant in Flagstaff, Arizona’s “4th Annual Flagstaff STEM Celebration” where we set up a booth to educate primary school students about the research

conducted by the Center for Ecosystem Science and Society at Northern Arizona University. This included trivia, seed necklace sprouting, and a soil filter activity.

April 2015 Invited to present research results to a research seminar class for undergraduates at Lincoln Memorial University in Harrogate, TN. This was a model presentation for how to present data and a discussion with the class regarding what it is like to attend a scientific meeting.

May 2013 Assisted presentations with Dr. Mikucki at Gibbs Elementary School in Knoxville, TN as part of their Earth Science day. Presentation topic: extreme microorganisms with focus of polar environments. This was a one day event including 6 classrooms of third through fifth graders.