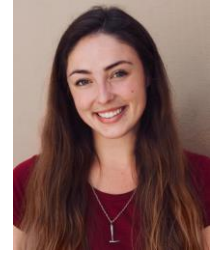


Curriculum Vitae

Rachel Phillips

School of Earth, Ocean and Environment
University of South Carolina
Rp66@mailbox.sc.edu
469-422-0556



BIOGRAPHICAL SUMMARY

Rachel Phillips is a National Science Foundation STEM Education Postdoctoral Research Fellow at the University of South Carolina. She received her PhD in geological sciences from the University of Texas at El Paso, where her research aimed to improve reconstructions of Earth's ancient atmospheric and oceanic conditions by strengthening the reliability and precision of palaeoceanographic proxies. Her postdoctoral research aims to increase geoscience enrollment and engagement through identifying and transforming misperceptions of geoscience. Alongside her research, Rachel works to promote global geoscience communication and engagement through her YouTube channel, GEO GIRL, on which she shares educational geoscience videos. Through her interdisciplinary research and communication endeavors, Rachel has developed expertise in biogeochemistry, geomicrobiology, paleoceanography, paleoclimatology, and geoscience education.

EDUCATION

2023, PhD Geological Sciences, University of Texas at El Paso (UTEP), GPA 4.0
2019, BS Geology (Chemistry minor), University of Texas at Arlington (UTA), Cum Laude, GPA 3.6
2016, AS General Science, McLennan Community College, Waco, TX, High Honors, GPA 3.9

RESEARCH & EXPERIENCE

- 1/2024 – Present National Science Foundation STEM Education Postdoctoral Research Fellow at the University of South Carolina (U of SC) School of the Earth, Ocean & Environment working with Dr. Katherine Ryker to increase geoscience enrollment and engagement by identifying and transforming misperceptions of geoscience.
- 1/2024 – Present Teaching Faculty at the University of South Carolina (U of SC) School of the Earth, Ocean & Environment, teaching the upper level elective: *Processes of Global Environmental Change*.
- 5/2020 – 12/2023 Research Associate in summer 2020 and fall 2021 to 2023, conducting PhD research in Dr. Jie Xu's NanoGeoBio laboratory previously at UTEP, currently at ASU, investigating the behavior of molybdenum under various geochemical conditions to enhance reconstructions of ancient oceanic and atmospheric chemistry.
- 5/2022 – 8/2022 Mission Design Intern as part of NASA's Jet Propulsion Laboratory Planetary Science Summer School (PSSS). This work involved designing a mission to Jupiter's moon, Io, as part of a team of scientists and engineers.
- 6/2021 – 8/2021 Guest Researcher at Woods Hole Oceanographic Institution (WHOI), conducting lab work under Drs. Yi Wang, Sune Nielsen, and Colleen Hansel to measure thallium

isotope fractionation upon sorption to manganese oxides to develop a novel paleoceanographic proxy.

- 8/2019 – 5/2021 Teaching Assistant at UTEP, teaching students that represent diverse cultural backgrounds with varied academic trajectories, motivating me to adjust my approach to individuals and implement new methods of communicating scientific concepts.
- 5/2019 – 8/2019 USGS Intern with the Geologic Hazards group at the US Geological Survey Earthquake Center in Colorado, conducting structural and stratigraphic mapping, paleoseismic trenching, and optically stimulated luminescence geochemistry.
- 6/2018 – 5/2019 Undergraduate Research Assistant, working with Dr. Majie Fan at UTA on reconstructing ancient elevations of the northern Cordilleran orogenic front using oxygen isotope geochemistry.

TEACHING EXPERIENCE

- GEOL/MSCI 355 Processes of Global Environmental Change (U of SC); Instructor 2024
- GEOL 1313 Physical Geology (UTEP); Lecture Substitute 2022 and 2023
- GEOL 1314 Historical Geology (UTEP); Lecture Substitute 2022 and 2023, Co-Instructor 2021, Teaching Assistant 2019 and 2020
- GEOL 1212 Principles of Earth Science (UTEP); Teaching Assistant 2021
- GEOL 1104 Historical Geology Lab (UTEP); Teaching Assistant 2019 and 2020
- ESCI 1301 Introduction to Environmental Science (UTEP); Teaching Assistant 2019

HONORS AND AWARDS

- 2024-2026 NSF Postdoctoral Fellowship
- 2024-2025 GSA Science Communication Fellowship
- 2023 American Dissertation Fellowship
- 2023 Selected UTEP's 3-Minute Thesis Regional Representative
- 2022 UTEP Graduate School Travel Grant
- 2022 GSA Travel Grant
- 2022 AIPG Shoemaker Graduate Student Scholarship
- 2022 UTEP McBride Graduate Research Fellowship
- 2022 Selected for NASA Planetary Science Summer School (PSSS)
- 2022 Award for Outstanding Oral Presentation at UTEP Department Colloquium
- 2021 Selected to Present to UTEP College of Science Advisory Board
- 2021 AGU Sharing Science Grant
- 2021 John and Vida White Endowment Award
- 2021 Appointed Guest Researcher at Woods Hole Oceanographic Institution
- 2021 NSF/GSA Graduate Student Geoscience Grant
- 2021 UTEP Dodson Research Grant
- 2021 Award for Outstanding Poster Presentation at UTEP Department Colloquium
- 2020 - 2022 President of the El Paso Geological Society
- 2020 - 2022 Vernon G. and Joy Hunt Scholarship for Excellence in Geological Sciences
- 2019 - 2023 UTEP Doctoral Excellence Fellowship for Academic Performance

2019	UTA Maverick Advantage Award for Distinction in Leadership, Career Development, and Research
2018 - 2019	UTA Undergraduate Research Assistant Program
2018	Nominated for USGS Internship for Ranking First at Geology Field Camp
2016 - 2018	Outstanding Transfer Scholarship for Academic Performance
2016 - 2017	Phi Theta Kappa Scholarship for Academic Performance
2016	Academic All-American in Women's Golf
2016	All-Conference Academic Team in Women's Golf
2015	Phi Theta Kappa Honor Society

OTHER ACTIVITIES

Science Communication: To promote global inclusivity and engagement in geosciences, I create and share educational videos on my YouTube channel, GEO GIRL. Having posted nearly 300 videos, which have accrued over 3.5 million views, I received an AGU sharing science grant in 2021, have been invited to guest lecture at other universities, give seminar talks, and conduct professional webinars, and was recently named a GSA Science Communication Fellow for 2024-2025.

Science Outreach: I engage in numerous outreach activities, such as speaking at local high schools, organizing departmental public events, providing radio interviews, and conducting field trips. I am a mentor for both the AGU mentoring 360 and the PROGRESS (PROmoting Geoscience Research, Education and Success) programs, and a community partner with the UTEP Community-Driven Inclusive Excellence and Leadership Opportunities in the Geosciences (CIELO-G) program, which aims to transform the culture of the geosciences toward a more diverse, equitable, inclusive community.

Memberships: Former president of the El Paso Geological Society (EPGS). Member of the Geological Society of America (GSA), American Geophysical Union (AGU), National Association of Geoscience Teachers (NAGT), American Association of Petroleum Geologists (AAPG), American Institute of Professional Geologists (AIPG), and Association of Women Geoscientists (AWG).

Athletics: Before science, I was a competitive athlete. I competed nationally as a gymnast while training at the World Olympic Gymnastics Academy (WOGA) with Olympic coaches, Cecile and Laurent Landi, until injuries ended my gymnastics career. Determined to still earn an athletic scholarship to college, I began playing golf. After little more than a year, I earned a full athletic scholarship. I was a member of the women's golf teams at UT Arlington and McLennan, playing a leadership role as the only upperclassman on UTA's team and serving on NCAA's Student Athlete Advisory Committee.

PAPERS

Phillips, R.F., and Ryker, K. Informing future outreach strategies based on current misperceptions of geoscience among students and the public. *In preparation for submission to Journal of Geoscience Education.*

Phillips, R.F., Insights from four years of geoscience outreach on YouTube. *In preparation for submission to Geoscience Communication.*

Wang, Y., **Phillips, R.F.**, Farfan, G., Ostrander, C.M., Gadol, H., Hansel, C.M., and Nielsen, S.G. Dual kinetic and equilibrium thallium isotope fractionation upon sorption to hydrogenetic manganese oxides. *In preparation (journal TBD).*

- Phillips, R.F.**, Singerling S., Leng, W., Desmau, M., Chernikov, R., and Xu, J. Comparison of Abiotic and Biologically Induced Molybdenum Speciation and Sequestration under Sulfidic Conditions. *Under review at Geo-Bio Interfaces*.
- Hanley, K.G., McKown, Q., Cangi, E.M., Sands, C., North, N., Miklavcic, P., Bramble, M., Bretzfelder, J.M., Byron, B.D., Caggiano, J., Haber, J.T., Laham, S., Morrison-Fogle, D., Napier, K.A., **Phillips, R.F.**, Ray, S., Sandford, M., Sinha, P., Hudson, T., Scully, J.E.C., and Lowes, L., 2024. The Vulcan Mission to Io: Lessons Learned during the 2022 JPL Planetary Science Summer School. *Planetary Science Journal*. 5:164, 20pp.
- Phillips, R.F.**, Singerling, S., Leng, W., Xu, J., 2023. Significance of pH and iron-sulfur chemistry for molybdenum sequestration under sulfidic conditions. *Chemical Geology* 638, 121702.
- Phillips, R.F.**, Wang, Y., Frieder, K., Farfan, G., Ostrander, C.M., Gadol, H., Hansel, C.M., Nielsen, S.G., 2023. The role of manganese oxide mineralogy in thallium isotopic fractionation upon sorption. *Geochim. Cosmochim. Acta* 356, 83-92.
- Thompson Jobe, J., Briggs, R., Gold, R., DeLong, S., Hille, M., Delano, J., Johnstone, S.A., Pickering, A., **Phillips, R.F.**, Calvert, A., 2022. The Pondsosa fault zone: A distributed dextral-normal-oblique fault system in northeastern California, USA. *Geosphere* 19 (1): 179–205.
- Phillips, R.F.** and Xu, J., 2021. A Critical Review of Molybdenum Sequestration Mechanisms under Euxinic Conditions: Implications for the Precision of Molybdenum Paleoredox Proxies. *Earth Science Reviews*. 221, 103799.
- Phillips, R.F.** and Xu, J., 2021. Biological Sequestration of Molybdenum under Sulfidic Conditions: The Role of Sulfate Reducing Bacteria. *Abstract*, ACS Geochemistry Symposium, Atlanta, GA. [Poster]
- Xu, J., **Phillips, R.F.**, Alarcon, H.V., and Kumar, S., 2021. Current and Emergent Methods for Monitoring the Efficacy and Environmental Impacts of Agricultural Nanoparticle Uses: A Review and Perspective. *Current Opinion in Chemical Engineering*. 33, 100706.
- Fan, M., Constenius, K.N., **Phillips, R.F.**, and Dettman, D.L., 2021. Late Paleogene Paleotopographic Evolution of the Northern Cordilleran Orogenic Front: Implications for Demise of the Orogen. *GSA Bulletin*. 133 (11-12): 2549-2566.
- DuRoss, C.B., Gold, R.D., Thackray, G.D., Briggs, R.W., Zellman, M.S., Delano, J.E., **Phillips, R.F.**, Wittke, S.J., and Mahan, S.A. Reconstruction and interpretation of paleoseismic activity along the southern Teton Fault in Wyoming, USA. Manuscript *in preparation*.

CONFERENCE PRESENTATIONS

- Phillips, R.F.**, and Ryker, K., 2024. Identifying common misperceptions of geoscience to inform future outreach strategies. *Abstract*, AGU Fall Meeting. [Talk]
- Phillips, R.F.**, 2024. Insights from four years of geoscience education and community engagement on YouTube. *Abstract*, AGU Fall Meeting. [Talk]
- Phillips, R.F.**, and Ryker, K., 2024. Enhancing outreach strategies based on current misperceptions of geoscience among students and the public. *Abstract*, GSA Annual Meeting. [Talk]
- Phillips, R.F.**, 2024. Power of YouTube as an accessible geoscience communication, outreach, and recruitment tool. *Abstract*, GSA Annual Meeting. [Talk]
- Phillips, R.F.**, and Ryker, K., 2024. Increasing geoscience enrollment and engagement by transforming perceptions of geoscience- Insights from YouTube and surveys. *Abstract*, Earth Educators' Rendezvous 2024. [Talk]

- Phillips, R.F.**, 2024. The Carbon Cycle and 6th Mass Extinction Board Games: Gamified Labs for Increased Student Engagement and Learning. Earth Educators' Rendezvous 2024. [Teaching Demonstration]
- Phillips, R.F.**, Singerling S., Leng, W., and Xu, J., 2023. Formation and Structure Altering Processes of Iron-Molybdenum-Sulfide Clusters Under Abiotic vs Biotic Conditions- Implications for Molybdenum Paleoredox Proxies. *Abstract*. Goldschmidt Meeting, online. [Talk]
- Phillips, R.F.**, 2023. Promoting Global Inclusivity and Engagement in Geoscience Through YouTube. *Abstract*, Goldschmidt Meeting, online. [Poster]
- Hanley, K.G., McKown, Q., Cangi, E.M., Sands, C., North, N., Miklavcic, P., Bramble, M., Bretzfelder, J.M., Byron, B.D., Caggiano, J., Haber, J.T., Laham, S., Morrison-Fogle, D., Napier, K.A., **Phillips, R.F.**, Ray, S., Sandford, M., Sinha, P., Scully, J.E.C., and Hudson, T., 2022. Vulcan: Exploring Tidal Heating & Extreme Volcanism at Io. *Abstract*. AGU Fall Meeting, Chicago, IL. [Poster]
- Phillips, R.F.**, Xu, J., Singerling, S., and Leng, W., 2022. Refining Reconstructions of Ancient Ocean Biogeochemistry Using Molybdenum. AIPG TX Webinar Series. [Talk]
- Phillips, R.F.**, 2022. Global Geoscience Outreach through Online Video. *Abstract*, GSA Annual Meeting. [Poster]
- Phillips, R.F.**, Singerling, S., Leng, W., and Xu, J., 2022. Formation and Reaction Pathways of Iron Molybdenum Sulfur Clusters under Abiotic and Biotic Euxinic Conditions. *Abstract*. ACS Meeting. [Talk]
- Pendleton, M., Nichol, C., Kubicki, J., and **Phillips, R.F.** Preparing Students for Careers, Licensure, Industry. *Workshop*. Earth Educators' Rendezvous 2022.
- Phillips, R.F.**, Singerling S., Leng, W., and Xu, J., 2022. Formation of Iron Molybdenum Sulfur Clusters under Abiotic and Biotic Euxinic Conditions. *Abstract*. Goldschmidt Meeting, online. [Talk]
- Phillips, R.F.**, Wang, Y., Nielsen, S., Hansel, C., Ostrander, C., and Gadol, H., 2022. Effect of Mineralogy on Thallium Isotope Fractionation during Sorption to Manganese Oxides. *Abstract*, Ocean Sciences Meeting, online. [Talk]
- Phillips, R.F.** and Xu, J., 2021. Biological Sequestration of Molybdenum under Sulfidic Conditions: The Role of Sulfate Reducing Bacteria. *Abstract*, ACS Geochemistry Symposium, Atlanta, GA. [Poster]
- Phillips, R.F.** and Xu, J., 2020. Molybdenum Sequestration Mechanisms under Euxinic Conditions: Implications for the Utility of Molybdenum as a Paleoredox Proxy. *Abstract*, GSA Annual Meeting and AGU Fall Meeting, online. [Poster]
- Phillips, R.F.**, Fan, M., and Constenius, K., 2019. Late Paleogene Paleoelevation of the Northern Cordilleran Orogenic Front Based on Carbonate Oxygen Isotopes. *Abstract*, GSA Annual Meeting, Phoenix, AZ. [Poster]

GUEST LECTURES / SEMINARS

- Phillips, R.F.**, 2024. How studying Earth helps us search for extraterrestrial life. *Itelescope Seminar* [Talk]
- Phillips, R.F.**, 2023. Promoting Global Inclusivity and Engagement in Geoscience Through YouTube. *Earth, Planetary, and Space Science Seminar at Michigan Technical University*. [Talk]
- Phillips, R.F.**, 2023. Evolution of Earth. *Learning Geology Facebook Live Outreach Event*. [Talk]

- Phillips, R.F.**, 2023. Bioremediation and Biorecovery: Using life to transform/recover metals in the environment. *Guest Lecture at University of Arizona*. [Talk]
- Phillips, R.F.**, 2023. Global Geoscience Engagement Through YouTube! *STEAM Region 19 event, El Paso, TX*. [Talk]
- Phillips, R.F.**, 2022. Why Geology Rocks! And How it Applies to Astrobiology. *Leicester University Natural Science Society Seminar* [Talk]
- Phillips, R.F.**, Xu, J., Singerling, S., and Leng, W., 2022. Refining Reconstructions of Ancient Ocean Biogeochemistry Using Molybdenum. *AIPG TX Webinar Series*. [Talk]

REFERENCES

- | | |
|----------------------------|--|
| Dr. Katherine Ryker | Associate Professor (Postdoctoral Supervisor)
School of Earth, Ocean and Environment
University of South Carolina
kryker@seoe.sc.edu |
| Dr. Jie Xu | Associate Professor (PhD Advisor)
School of Molecular Sciences
Arizona State University
jie.xu.gail@asu.edu |
| Dr. Benjamin Brunner | Associate Professor (PhD Co-advisor)
Department of Earth, Environmental, and Resource Sciences
University of Texas at El Paso
bbrunner@utep.edu |
| Dr. Katherine Giles | Endowed Professor
Department of Earth, Environmental, and Resource Sciences
University of Texas at El Paso
kagiles@utep.edu |
| Dr. Jorge Gardea-Torresdey | Endowed Professor
Department of Chemistry and Biochemistry
University of Texas at El Paso
jgardea@utep.edu |
| Dr. Majie Fan | Associate Professor, Associate Chair
Department of Earth and Environmental Science
University of Texas at Arlington
mfan@uta.edu |