**Sarah M. Giles** sgiles@ldeo.columbia.edu

Lamont-Doherty Earth Observatory

Seismology, Geology, and Tectonophysics Division

Office 201B, 61 Route 9W, Palisades, NY, 10964

Education

2018-Present Ph.D. Geology, **Columbia University**, Department of Earth and Environmental Sciences

Advisor: Dr. Nicholas Christie-Blick

Expected: May 2023

2014-2018 B.S. Geology, **Texas A&M University-College Station**, *Magna Cum Laude*

Relevant Experience

1. **Ph.D. Research, Sedimentology, Stratigraphy, and Geochemistry, South Australia-August 2018-Present**

* Integrated sedimentology, stratigraphy, geochemistry, and structure project incorporating field mapping, high-resolution sequence stratigraphy, petrography, and isotopic analyses to evaluate the character, source, and timing of the Neoproterozoic (1,000-541 Ma) Shuram carbon-13 isotope anomaly in the Flinders Ranges, South Australia.
* Associated expertise: Petrographic analysis on siliciclastic/carbonate rocks, carbon and oxygen isotope analyses, Scanning Electron Microscope (SEM) applications, U-Pb geochronology on calcite and detrital zircons, K-Ar geochronology on glaucony grains, field geology, sequence stratigraphy, cement stratigraphy, Neoproterozoic geoscience.
* Supervising 1 undergraduate research project in South Australia investigating the variations in pyrite sulfur content inside paleovalley fill to determine if the valleys were incised in a submarine or subaerial environment. Expected completion December 2020.

1. **Research Assistant, Geochemistry & Stratigraphy, Utah-October 2019-Present**

* Formulated a collaborative research project investigating the characteristics of salt-sediment-fluid interactions at the Onion Creek salt diapir in Fisher Valley, Utah through the application of cement stratigraphy. This project will supplement the Ph.D. research of a student at the University of Texas at El Paso who is evaluating halokinetic deformation at the Onion Creek Salt Wall.
* Co-supervising 2 undergraduate research projects investigating salt-sediment-fluid interactions and associated structural complexities through multifaceted analyses on the Onion Creek Diapir. Expected completion by May, 2020.

1. **Research Assistant, Salt Sediment Interactions Research Consortium (SSIRC), University of Texas at El Paso-January 2016-July 2018**

* Conducted research evaluating the sedimentology and stratigraphy of the Patawarta supra-salt minibasin in the Flinders Ranges, South Australia.
* Utilized field mapping, carbon and oxygen isotope analyses, vein-fill fluid inclusion analysis, cathodoluminescence imaging analysis, petrographical analysis on siliciclastic/carbonate rocks. Conducted vein-fill fluid inclusion analysis and cathodoluminescence analysis to investigate the fluid flow characteristics of Patawarta diapir in the Flinders Ranges, South Australia

1. **Research Assistant, Climate-Tectonic Interactions, Texas A&M University- July 2017-May, 2018**

* Conducted a research project investigating pluton exhumation pathways in the Oregon Cascades Range. Utilized U-Pb zircon geochronology, Ar/Ar feldspar geochronology, (U-Th)/He apatite thermochronology, and HeFTy thermal-pathway modelling.

1. **Intern, Texas A&M Energy Institute-June-August 2017**

* Conducted a project performing core preparation, sampling, description, and interpretation. Well: Texaco #1 Navajo J, Aneth Field, Utah, USA.

1. **Research Assistant, Soil Moisture Influence on Land-Atmosphere Interactions-August 2015-May 2017**

* Evaluated land-atmosphere interactions in Oklahoma using in-situ soil measurement data and clustering statistical analysis. Utilized, ArcGIS, Matlab, and Excel.

1. **Intern, Environmental Protection Agency-May-August 2015**

* Worked as a geology intern in the EPA Region 6 Management of Contaminated Sites Task Force. Conducted water geochemistry analyses, filter description for air pollution monitoring, site mapping, and contributed to the EPA Region 6 environmental blog.

Fellowships

**2019-Present NSF Graduate Student Research Fellowship**

**2018-2019 Columbia University Dean’s Fellowship**

Grants and Awards

2020 AGeS2 Grant

2020 GSA Graduate Student Research Grant

2020 AAPG General Fund Graduate Research Grant

2020 SEPM-NSF Travel Grant

2020 ISGC Travel Grant

2020 Chevron Student Initiative Fund Grant

2019 Explorer’s Club Mamont Research Grant

2019 GSA Graduate Student Research Grant

2018 Chevron Student Initiative Fund Grant

2018 College of Geosciences Outstanding Senior Award, Texas A&M University

2018 Geoscience Silver Medallion Scholar Award

2017 George Bush Presidential Library Research Travel Grant

2017 TAMU Geology & Geophysics Research Travel Grant

2017 AIPG-TX Foss Scholarship

2017 ConocoPhillips Field Camp Scholarship

2017 Chevron Field Camp Scholarship

2017 Distinguished Student in Geosciences Award, Texas A&M College of Geosciences

2017 GSA South-Central Conference Best Poster Presentation-Honorable Mention

2017 TAMU Geology & Geophysics Research Symposium 2nd Place Poster Presentation

2017 Student Ambassador Nomination for Texas A&M Institute of Advanced Research Study

Abstracts, Presentations, and Publications

* **Giles, S.M.,** Cantine, M., Understanding Interactions of Life, Tectonism, Climate, and Sedimentary Systems at the Neoproterozoic-Early Cambrian Transition, 2020 GSA Topical Session Proposal, Montreal, Canada, *Accepted*
* **Giles, S.M.,** Christie-Blick, N., Lankford-Bravo, D., Discerning the submarine from the subaerial: New insights from the mid-Ediacaran Wonoka canyons, South Australia, SEPM IGC 2019, Abstract, *Accepted.*
* Christie-Blick, N., **Giles, S.M.,** Lankford-Bravo, D., New insights on the origin of the Wonoka canyons (mid-Ediacaran), South Australia, 36th International Geological Congress, Delhi, India, Oral presentation, *Accepted.*
* **Giles, S.M.,** Christie-Blick, N., Character, Timing, and Significance of the Shuram-Wonoka Carbon-13 Isotope Anomaly, Flinders Ranges, South Australia, 2019 Columbia First-Year Colloquium, Oral Presentation
* Pesek, M. E., Perez, N. D., Meigs, A., Rowden, C., **Giles, S. M.,** Exhumation timing the Oregon Cascade Range decoupled from deformation, magmatic, and climate patterns, Lithosphere 2019 publication, *In review.*
* Kernen, R.A., Giles, K.A., Fischer, M.P., **Giles, S.M.,** Lehrmann, A., Rowan, M.G., Evaluating Exploration Potential of Suture Zones or Encased Minibasins Using an Outcrop Example from the Neoproterozoic Patawarta Salt Canopy, Central Flinders Ranges, South Australia, AAPG 2017 Conference Paper
* **Giles, S.M.,** Kernen, R.A., Lehrmann, A., Giles, K.A., Evolution of a suprasalt minibasin: Neoproterozoic (Ediacaran) Patawarta salt sheet, Flinders Ranges, South Australia, South-Central GSA 2016 Conference Paper, Best Poster Presentation Honorable Mention
* **Giles, S.M.,** Pesek, M.E., Perez, N.D., Analysis of the Exhumation Pathways Experienced in the Cascades Range, American Geophysical Union Conference 2017 Poster Presentation
* **Giles, S.M.,** Pesek, M.E., Perez, N.D., Analysis of the Exhumation Pathways Experienced in the Cascades Range, 2017 TAMU Geology & Geophysics Symposium, Poster Presentation
* **Giles, S.M.,** Kernen, R.A., Lehrmann, A., Giles, K.A., Evolution of a suprasalt minibasin: Neoproterozoic (Ediacaran) Patawarta salt sheet, Flinders Ranges, South Australia, 2016 TAMU Geology & Geophysics Research Symposium, 2nd Best Poster Presentation Award
* Lehrmann, A., Kernen, K.A., **Giles, S.M.,** Giles, K.A., Timing of allochthonous salt emplacement of the Neoproterozoic (Ediacaran) Patawarta salt sheet, Flinders Ranges, South Australia: Evidence from the subsalt minibasin, South-Central GSA 2016 Conference Paper
* **Giles, S.M.,** McRoberts, B., Quiring, S., Investigating the Local Forcing Effect of Soil Moisture on Temperature and Precipitation in Oklahoma, 2016 TAMU GIS Day, Poster Presentation
* **Giles, S.M.,** McRoberts, B., Quiring, S., Investigating the Local Forcing Effect of Soil Moisture on Temperature and Precipitation in Oklahoma, American Geophysical Union Conference 2015 & 2016 Poster Presentation

Teaching Experience

Spring 2020 **Kindergarten Earth Science Tutor, Columbia Volunteer Tutor Program**

* Designed and led virtual (Zoom) mini-lessons and interactive demonstrations for kindergarten level children of Columbia University Medical Staff workers. Topics focused on a wide range of Earth Science subjects, including lessons geology, climatology, and paleontology.
* This tutoring group was formed in response to the 2020 COVID-19 pandemic, and was created to support essential staff workers who could not be present at home to aid in their children’s learning.

Spring 2020 **Solid Earth Systems-Teaching Assistant**

* Designed lab assignments/exams and taught the lab section

Spring 2019 **Undergraduate Field Geology in Death Valley- Teaching Assistant**

* Instructed students on field mapping and techniques while in the field

Spring 2019 **High-school Earth Science Instructor-Volunteer at Manhattan International High School**

* Prepared class assignments, handouts, and projects for 9th graders taking an introductory Earth science course
* Students primarily spoke English as their second language, so material needed to be clearly and effectively communicated for a diverse classroom of students

Science Communication and Outreach

2020 **GSA Annual Meeting Session Chair**

* Session title: “Interactions between Life, Tectonics, Climate, and Sedimentary Systems at the Neoproterozoic-Early Cambrian Transition”

2020-Present **Geology Consultant for Iga Warta Aboriginal Site, South Australia, Volunteer**

* I will geologically map the Mt. Serle area in the Iga Warta Aboriginal Reserve and create a guided geology-focused walking tour for tourist who visit the reserve. Deliverables will include a geologic map, information pamphlet, and the design of informational plaques for along the walkway. The purpose of this geology walking tour is to promote geotourism at the aboriginal reserves. I will be working in conjunction with the aboriginal leader of the reserve, Terrence Coulthard.

2020 **Graduate Student Symposium Chair, Women in Science at Columbia**

* Co-organized a student-led research symposium where graduate students can practice preparing and presenting their research.
* Hosted a networking session following the symposium to create career exposure for students.

2020 **Energy Solutions Mentee Program, World Petroleum Council**

* Participated as a group mentee in global energy discussions.
* Facilitated group discussion with energy professionals about energy education for K-12 students.

2020 **Co-organized the Columbia Undergraduate Earth Science Mentee Program**

* Helped create a matching program to pair undergraduate Earth science students with an Earth science graduate student and facilitate mentoring on topics such as how to get into graduate school, job searching, and class guidance.
* Co-organized semesterly “How to get involved in undergraduate research” panels that discussed how to arrange undergraduate research opportunities, with panels of graduate students and professors discussing their own experiences and opportunities. This panel was advertised to all Earth science undergraduates.

2019-Present **Colloquium Committee Geology Chair, Lamont-Doherty Earth Observatory**

* Served as the geology representative on the search committee for engaging scientific speakers that can lecture on multidisciplinary geoscience subjects.
* Host a round table discussion with the speaker where Columbia graduate students can ask the speaker questions related to science, career, and work-life balance.

Fall 2018-2020 **Experiment Instructor-Volunteer, Girl’s Science Day Event, Women in Science at Columbia**

Fall 2018 & 2019 **Instructor,** **Lamont-Doherty Earth Observatory Open House**

* Hosted a booth with rock specimens and diagrams discussing how we use sedimentology and stratigraphy to evaluate depositional environments
* This was an event open to the public to come participate in scientific lectures and experiments

Fall 2018-2019 **Mentor, National Academy of Sciences 1000 Girls 1000 Futures Program**

* Mentored a female 10th grade student on STEM modules and college preparation

Spring 2019 **High-school science instructor-Volunteer at Manhattan International High School**

* Prepared class assignments, handouts, and projects for 9th graders taking an introductory Earth science course
* Students primarily spoke English as their second language, so material needed to be clearly and effectively communicated for a diverse classroom of students

Students Supervised

2019-Present **Mia Ramirez, UTEP Undergraduate, Class of Fall 2020**

* Project title: “Paleoenvironmental implications of variations in pyrite sulfur isotopes from the Neoproterozoic Wonoka canyons, Flinders Ranges, South Australia”
* Created research project idea and methodology, helped student write research grants to support travel and laboratory analyses. Student will have 1 field work experience, 1 laboratory experience, and 1 presentation experience at AGU 2020.

2019-May 2020 **Rachael Hill, UTEP Undergraduate, Class of 2020**

* Project title: “Interactions between deformation and fluid alteration at the salt-sediment interface: Insights from the Onion Creek Diapir, Utah”
* Co-created project idea, methodology, and helped student write research grants to support field work travel and laboratory expenses. Student will have 1 field work experience, 1 laboratory experience, and 1 presentation experience at the 2020 UTEP Colloquium.

2019-Present **Hao Pham, UTEP Undergraduate, Class of 2020**

* Project title: “Integration of 3D drone modeling and cement stratigraphy on the Permian Cutler Formation, Utah”
* Co-created project idea and methodology, helped student write research grants to support travel. Student will have 1 field work experience and 1 presentation experience at the 2020 UTEP Colloquium.