

Annie Klyce

aklyce@seoe.sc.edu – (404) 966 0267

ORCID: [0000-0002-4497-8831](https://orcid.org/0000-0002-4497-8831)

Education

University of South Carolina - Columbia, South Carolina

May 2023

PhD in Geological Sciences, Geoscience Education

Advisor: Dr. Katherine Ryker

Exploring the current training of undergraduate geology students and teaching spatial skills to improve student outcomes

Appalachian State University - Boone, North Carolina

August 2019

BS in Geology, Geography minor

Teaching Experience

Senior Lecturer — Vanderbilt University

August 2023 - Present

Instructor — University of South Carolina

August 2021 - December 2021

Environment of the Earth - Lecturer for general education science course focused on environmental geology, climate change, and human-Earth interactions. Lecture was offered in a hybrid format, and integrated both active and place-based learning. Utilized free polling software to engage students with one another regardless of their attendance location, and provided immediate feedback on practice questions as well as discussion of course concepts.

Teaching Assistant — University of South Carolina

January 2020 - May 2021

Introduction to the Earth - Prepared materials (lecture and lab) for a student who is blind, rapidly developed new materials and converted others to online format for over 400 students during COVID-19 pandemic. Experience creating, adapting and implementing lecture and lab materials for a physical geology class offered both in person and online. Utilized dynamic teaching approaches (jigsaw, think-pair-share, class discussion) to engage students.

August 2019 - December 2020

Structural Geology and Tectonics - Developed and instructed laboratory classes, served as guest lecturer, mentored students through field work.

Laboratory Coordinator — University of South Carolina

January 2020 - May 2021

Introduction to the Earth - Developed new and improved existing laboratory assignments, secured and organized materials for approximately 20 laboratory sections each semester, purchased lab equipment, facilitated regular communication and weekly meetings with eight instructional assistants. Supported instructional assistants and students with the rapid transition online in Spring 2020, and prepared completely digital laboratory assignments for intentionally remote courses following the onset of COVID-19.

Guest Lecturer - Appalachian State University

Evolution of the Earth (2021) - Interpreting geologic maps, drawing corresponding cross sections and sea level curves, calculating relative and numeric ages and using fossil assemblages to better understand geologic history.

Museum Intern and K-12 Education — Appalachian State University

August 2017 - May 2019

Organized the museum and classrooms for undergraduate students and the public. Organized outreach events. Coordinated with other museums to identify specimens for future use. Worked with professors to expand the curriculum out of the classroom, and update current museum displays.

Tutored students taking upper and introductory level geology or environmental science courses during “Answerspherian” hours each evening in the museum.

Teaching Assistant — Appalachian State University

August 2018 - May 2019

Historical Geology - Co-taught introductory lab, facilitated field trips, worked with students to develop and test hypotheses, answered student questions, proctored exams. See also, lab manual research at Appalachian State University.

Research Experience

NSF Graduate Research Fellow and Research Assistant— University of South Carolina

August 2019 - current

Conducting research on interventions to train spatial skills in early career undergraduate students and measuring if interventions have an effect on students’ efficacy, value, and success.

Reviewing US-based institutions to create a cumulative list of what courses are most commonly required of students earning a Bachelor of Science in geology.

Undergraduate Research Assistant — Appalachian State University

Fred Webb Jr Outdoor Geology Laboratory: May 2018 - May 2019

Conducted a petrographic analysis on several Southern-Appalachian specimens, created a comprehensive data sheet for use in both the undergraduate classroom and in public outreach conducted by the department, made thin sections, drilled cores in “rock garden” specimens, and used various editing softwares to create intriguing and educational signs for the Fred Webb Jr. Outdoor Geology Laboratory.

Improving lab manuals using teacher and student input: January 2019 - May 2019

Revised introductory geology lab manuals to be more accessible to students and conducted a quantitative analysis on question styles to determine how students learn best.

Structure of Toxaway Dome: March 2016 - December 2017

Drew cross sections of the Toxaway Dome to determine tectonic evolution and the implications of the dome’s presence in the known geologic history of the Southern Appalachians.

Merit-Based Grants

Graduate Research Fellowship, 2020 - \$138,000 National Science Foundation

Graduate Research Grant, 2021 - \$2,100 Geological Society of America

Teaching Resource Development Grant, 2020 - \$500 Center for Teaching Excellence, University of South Carolina

Graduate Student Leadership Team, 2020 - \$750 Incubator for Teaching Innovation, University of South Carolina

Awards

Geoscience Education Research Emerging Scholars Award, 2022 - \$500 National Association of Geoscience Teachers

Outstanding Teaching Assistant Award, 2022 - National Association of Geoscience Teachers

Meritorious Service Award, 2022 - Center for Teaching Excellence, University of South Carolina

Inclusive Geoscience Education and Research Award, 2021 - \$250, International Association for Geoscience Diversity

Outstanding Graduate Student Teaching Assistant Award, 2021 - Graduate Student Association, University of South Carolina

Taber Teaching Award, University of South Carolina, 2020 - \$500, School of Earth Ocean and Environment, University of South Carolina

Professional Pathways Development Program, 2020 - \$500, Geological Society of America

Sustainable Societies Workshop, 2020 - \$100, Earth Education for Sustainable Societies Workshop

GES Outstanding Leadership Award, 2019 - Geological and Environmental Sciences Department, Appalachian State University

Graduate Scholar Award, 2019 - \$500 School of Earth, Ocean and Environment, University of South Carolina

GES Distinguished Senior Award, 2019 - Geological and Environmental Sciences Department, Appalachian State University

Travel Grants

NAGT Early Career Workshop - \$2100, NAGT membership

On To The Future Scholars Award - \$700, membership, registration, Geological Society of America

Travel Grant, 2022 - \$400, Geoscience Education Division of the Geological Society of America to attend GSA Connects

Travel Grant, 2022 - \$500, School of Earth, Ocean and Environment to attend GSA Connects

Travel Grant, 2022 - \$100, Southeastern section of GSA to attend GSA Connects

Travel Grant, 2022 - \$500, University of South Carolina Graduate School to attend GSA Connects

Travel Grant, 2022 - \$250, National Association of Geoscience Teachers to attend the Earth Educators' Rendezvous

Travel Grant, 2021 - \$500, School of Earth, Ocean and Environment to attend GSA Connects

Travel Grant, 2021 - \$500, University of South Carolina Graduate School to attend GSA Connects

Travel Grant, 2021 - \$198, Southeastern section of GSA to attend GSA Connects

On To The Future, 2020 - \$755, Geological Society of America
Scholarships for Field Study, 2019 - \$750, National Association of Geoscience Teachers
Fred Webb Jr. & Barbara Haynes Webb Endowed Scholar. for Geology Summer Field Course, 2019 - \$500
2019 Southeastern GSA Travel Grant - \$250, Geological Society of America
Research Support Grant, 2019 - \$250, Office of Student Research, Appalachian State University
Kephart International Program Scholar, 2019 - \$500, Appalachian State University
Research Support Grant 2017 - \$250, Office of Student Research, Appalachian State University

Publications

Klyce, A., & Ryker, K. (2022). What does a degree in geology actually mean? A systematic evaluation of courses required to earn a bachelor of science in geology in the United States. Journal of Geoscience Education, 1-16.

Klyce, A., & Ryker, K. (in review for Geosphere). Training spatial skills in undergraduates to increase efficacy, value and success in introductory geology courses

L. Lukes, Ryker, K., Klyce, A., Cheek, K., LaDue, N., McNeal, P., St. John, K. (in review for the Journal of Geoscience Education). Advancing the Geoscience Education Research Community

Publications in Prep

Klyce, A., & Ryker, K. (in prep for the Journal of Geoscience Education). Do pre-existing spatial skills predict student success in introductory geology courses?

Conference Presentations

Klyce, A., & Ryker, K. (2023). Lessons from the Field: Best Practices for Collecting and Analyzing Longitudinal Data from Human Subjects. Earth Educators Rendezvous.

Klyce, A., Ryker, K., L. Lukes, Cheek, K., LaDue, N., McNeal, P., St. John, K.. (2022) Results of the 2021/2022 GER Needs Assessment Survey: A Snapshot of the Community. Earth Educators Rendezvous.

Smith, J. Eley, E. Gilchrist, M., Hamelin, C., Klyce, A., Mendoza, K., Prince, J., Tereszkiwicz, P., Veenma, Y. Field notes from the geoscience classroom by the January 2022 NAGT Outstanding Teaching Assistants (2022). Earth Educators' Rendezvous.

Klyce, A., Ryker, K., 2021. Looking through the lens of expectancy value theory: how training spatial skills affects the student experience. Geological Society of America, Annual Meeting.

Klyce, A., Ryker, K., 2021. The effects of training spatial skills on student success, efficacy and value in introductory geology students. Earth Educators' Rendezvous.

Ryker, K., Jackson, D.O., Klyce, A., Hurler, K., & High, J. (2021, March). Developing a Survey to Understand Beliefs of Introductory STEM Students: A Case Study from Geology. In X-DBER online, USA-2021.

Klyce, A., Ryker K., 2020. Using an inductive content analysis to determine commonly required courses in U.S. geology programs. Geological Society of America.

Ryker, K., Jackson, D., Hurler, K., High, J., Klyce, A., 2020. Beliefs about enrolling in introductory geology course: An application of the theory of planned behavior. Geological Society of America.

Klyce, A., Ryker, K., 2020. So what does a degree in geology actually mean? An analysis of commonly required courses. Earth Educators' Rendezvous.

Klyce, A., Ryker, K., 2020. Communicating beyond visuals: materials to support blind and visually-impaired students in an introductory geology course. Earth Educators' Rendezvous

Klyce, A., Toran, M., Heckert, A. B., Strengthening earth science education and outreach programs through teacher and student preparation with continuous support through Appalachian State University. Southeast GSA.

Toran, M., Klyce, A. Yokeley, B. Heckert, A. B., 2019. The geobago: how we turned an old RV into a mobile classroom to maximize our outreach potential. Southeast GSA.

Invited Presentations

Invited Panelist, Directorate of STEM Education Advisory Committee 2022 - Highlighting the importance of spatial cognition in student development and learning in STEM

Facilitator, 2021: Engaging Your Students with Visual Representations: Why, What, and How. Earth Educators' Rendezvous.

Klyce, A., Dolan, W., 2021. Managing Stress in Graduate School. Earth Educators' Rendezvous.

Workshop leader, Center for Teaching Excellence, University of South Carolina - Time and stress management in graduate school

Invited speaker, AGU Bridge Fellows, 2021 - Stress and time management in graduate school

Invited speaker, Graduate Teaching Assistant Training, Center for Teaching Excellence 2021, 2022 - Stress and time management in graduate school

Broader Impacts Activities

Teaching Tactics: Daily Practices to Make Classrooms More Welcoming, 2020 - Writing featured on the Incubator for Teaching Innovation blog

K-12 Outreach - Created activities and answered questions on the fly from teachers and students alike; found new ways to present ideas and showed students that science can be fun and a valuable learning experience. Planned visits to schools and classes coming to the University.

2018 Teacher Workshops - Partnered with Vulcan Materials to create teaching kits that met state and national standards for elementary and middle school teachers to take back to their schools and use as permanent installments in their lesson plans.

STEAM Expo, 2018 and 2019 - Coordinated hands-on activities for hundreds of middle school students to teach real life implications of scientific research.

Appalachian State Homecoming Parade, 2018 - Premiered the departmental mobile classroom, created several hands-on activities for kids and adults to understand the work that the Appalachian Geological and Environmental Sciences department does.

Schiele Museum of Gastonia Rock Identification Party, 2018 - Hosted rock samples from the Schiele Museum to be identified by Appalachian Geological and Environmental Sciences students and faculty. Specimens belonging to the Museum were being identified for use in future outreach and their newest exhibit on geology. Event was sponsored by local businesses.

Carolina Geological Society Visit, 2018 - Hosted a Carolina Geological Society visit to Boone, NC by organizing and hosting two activities (one in the field and one on the campus of Appalachian State University).

Featured in Appalachian Today, 2019- for my efforts in science education, and my accomplishments during undergraduate career.

Spoke at 2019 Appalachian Earth and Environmental Sciences Commencement Ceremony

National Service

GSA Geoscience Education Division Student representative, 2020-2022 - served as voting member on the board of the Geoscience Education Division of the Geological Society of America board representing graduate and undergraduate student needs and perspectives.

Association for Women Geoscientists, 2021 - served on the award committee for *Outstanding Educator Award*.

Geoscience Education Research Division of the NAGT, 2020 - served on the award committee for Covid-19 relief grants.

Local Service

Fellowship Peer Mentor, University of South Carolina 2021 - 2023 - mentored undergraduate and graduate students applying for national and regional fellowships, awards and travel grants. Also worked with undergraduate students applying for graduate school

Geology Graduate Student - Faculty Representative, 2020-2022 - Served as a voice for apx. 40 graduate students actively working with faculty to address student needs through improved graduate student mentorship, academic development, and classroom support during the COVID-19 pandemic. Supported students through Title IX reporting, and worked with faculty in the department to create and add an in-department reporting structure to the graduate student handbook.

Center for Teaching Excellence, University of South Carolina 2020, 2021, 2022 - Invited panelist on Veteran TA Panel, helped new graduate students at the University of South Carolina prepare for upcoming roles as teaching and instructional assistants

Selected Professional Development

Certificates

Preparing Future Faculty Certificate – Successful PFF candidates have completed activities designed to prepare participants in the critical areas of faculty competence: teaching, research and service. This accomplishment is an indicator of the participant's initiative and a measure of experience toward becoming future faculty.

Workshops

Preparing Students for Careers, Licensure and Industry

Mentoring Undergraduates: Techniques and Best Practices for Guiding the Next Generation of Scientists

Field Trip Accessibility

Applying the ICAP Theory of Cognitive Engagement to Active Geoscience Learning

Taking a Scientific Approach to Teaching Science

Teaching the Anthropocene: Reframing Geoscience Education for the Critical 2020s Decade

Preparing for Student Creation of Virtual Contexts for Exploring Geoscience Environments

3 Tips for Communicating with Students in Online Courses
Ways to Improve the Engagement in Your Live Stream Course
Active Learning Techniques for Any Discipline
Using Student Work for Instructional Decisions

Other

Collaborative Institutional Training Initiative (CITI) certification
Reformed Teaching Observation Protocol (RTOP) Training
Envisioning the Future of STEM Education: The National Academies' Roundtable on Systemic
Change in Undergraduate STEM Education