

SYDNEY A. MAGUIRE

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EDUCATION

Doctor of Philosophy, Earth and Environmental Science

Expected May 2028

Columbia University

PhD Thesis (In-progress, working title): “Assessing spatial and temporal variations in fault slip within the Eastern California Shear Zone and the southern East African Rift System”

Advisor: Dr. Folarin Kolawole and Dr. Sidney Hemming

Selected Coursework: Remote Sensing, Stable Isotope Geochemistry

Master of Science, Earth Science – Geology

December 2023

University of North Carolina, Chapel Hill

Master’s Thesis: “A 2-Myr History of Slip along the Garlock Fault Zone, Eastern California”

Advisor: Dr. Eric Kirby

Selected Coursework: Tectonic Geomorphology, Evolution of Earth’s Surface Environment, Data Analysis, Marine Geology, Proposal Writing, Mountain Building

Bachelor of Science, Earth Science – Geology

September 2019

University of California, Santa Barbara

Selected Coursework: Summer Field, Mineralogy, Geomorphology, Engineering and Environmental Geology, Structural Geology, Ore Deposits, Metamorphic Petrology, Physical Volcanology, Sedimentology and Stratigraphy, Groundwater, Geological Application of GIS, General Chemistry (I, II, III), Calculus (I, II), Algebra Based Physics (I, II, III), Linear Algebra, Differential Equations

PROFESSIONAL EXPERIENCE

GRADUATE

MEETING ABSTRACTS

Maguire, S.A., Kirby, E., Walker, J.D., Heizler, M., Asmerom, Y., Polyak, V., 2023, A 2-My Record of Slip Along the central Garlock Fault Zone, American Geophysical Union Fall Meeting, Abstract T31G-0267. [Poster]

Maguire, S.A., Kirby, E., Walker, J.D., Heizler, M., Asmerom, Y., Polyak, V., 2023, A 2-My History of Slip Along the Garlock Fault Zone, GSA Connects 2023 Annual Meeting, Abstract 253-7. [Talk]

Maguire, S.A., Kirby, E., Walker, J.D., 2022, New Slip Rates Along the Garlock Fault Zone During the Mid-Pleistocene and Pliocene from Provenance of Fanglomerate Deposits, American Geophysical Union Fall Meeting, Abstract T45D-0148. [Poster]

Maguire, S.A., Kirby, E., Walker, J.D., 2022, Evaluating Displacement along the Garlock Fault Zone During the Pliocene and Early Pleistocene from Provenance of Fanglomerate Deposits, GSA Connects 2022 Annual Meeting, Abstract 67-6. [Poster]

INDUSTRY

Staff Geologist, Slate Geotechnical Consultants, Inc.

Fall 2019 to June 2021

Geologic data compilation and analysis, report writing, geologic cross-section construction, figure creation, geologic reconnaissance, soil and rock core logging, seismic source characterization for probabilistic seismic hazard analysis, fault displacement hazard analysis

UNDERGRADUATE

Research Assistant, UCSB Geomorphology Research Group

Fall 2018 to Summer 2019

Weekly UAV structure-from-motion study of sea cliff erosion along Santa Barbara marine terrace from change detection analysis, spatial and temporal assessment of erosion with total water level measurements, wave run-up, beach slope

Research Assistant for Dr. Roberta Rudnick, UCSB Geochemistry Research Group

Spring 2017 to Summer 2018

Study of mantle and Earth’s surface geochemistry through work with glacial diamictites, sulfides, mid-ocean ridge basalts, and mantle xenoliths. Thin section petrographic analysis, rock crushing, and mineral separation

FIELD PROJECTS

- Fault Trench Logging of a Railroad Cut Exposure, Kern County, CA *May 2023*
Structure-from-motion photogrammetric reconstruction and trench logging of a railroad cut exposing several thrust fault traces and growth strata
- Neotectonic and Fanglomerate Provenance mapping, Garlock Fault Zone, Kern County, CA *Total of eight weeks, 2022*
Geologic mapping of displaced piles of alluvium with provenance ties across the El Paso, Garlock, and Savoy Faults for analysis of displacement through time, sample collection for $^{40}\text{Ar}/^{39}\text{Ar}$ dating of detrital sanidine and $^{10}\text{Be}/^{26}\text{Al}$ burial dating of quartzite boulders
- Soil and Rock Coring, Observation of Pile Installation for High-Rise Retrofit, San Francisco, CA *2020-2021*
Five-week drill program consisting of soil logging and rock coring for strength analyses, followed by installation of 300' piles for building retrofit and concurrent soil logging, piezometer and inclinometer data collection
- Hillslope Reconnaissance above Kaiser Permanente, San Rafael, CA *Spring 2020*
Assessment of ground slope stability for geologic hazard analysis
- Field Camp - Schell Creek Range, White Pine County, NV *Summer 2019*
Six weeks of geologic mapping. Completed four individual mapping projects in field locations with extensional and compressional tectonic structures, largely carbonate and volcanic bedrock, block slide, and hillslope failure geomorphic features.
- UAV Change Detection for Incremental Erosion Assessment of Sea Cliffs, Isla Vista, CA *2018-2019*
Structure-from-motion photogrammetric reconstruction of weekly UAV flights using a DJI Phantom III Professional Drone, GPS RTK survey for ground control points, weekly water level measurements

SOFTWARE EXPERIENCE

- Esri ArcMap/GIS *5.0 Years*
Geologic mapping, geostatistical analysis, figure creation
- Adobe Illustrator *4.5 Years*
Geologic cross-section creation, general figure creation
- R (Programming Software) *4.5 Years*
Data cleaning, calculation, manipulation
- Agisoft Photoscan/Metashape *2.5 Years*
Structure-from-motion dense cloud and orthomosaic construction
- StraboSpot2 *1.0 Years*
Geologic mapping on tablets in field
- Cloud Compare *3 Months*
Dense cloud comparison for volumetric change
- MATLAB *2 Months*
Programming and numeric computing platform used for data analysis and modeling

TEACHING AND MENTORSHIP

SUBSTITUTE LECTURER

- GEOL 201 - Earth's Surface: Processes, Landforms, and History *Fall 2022*
Lectured six classes when professor was absent. Lectures focused on glacial landscapes and geomorphology, atmospheric and oceanic circulation, the Greenhouse Effect, present-day climate change, and climate oscillations. The course emphasizes biological, chemical, and physical processes that shape the surface of the earth, including climate change, the global water cycle, geomorphic processes, and depositional environments.

TEACHING ASSISTANTSHIPS

- GEOL 303 – Sedimentology and Stratigraphy *Spring 2023*
Assisted teaching in labs for three hours a week to 25 students. Course introduces principles involved in description, classification, and interpretation of sedimentary rocks and stratigraphic units including stratigraphic correlation. Emphasis on relationships between processes and sedimentary facies depositional environments and stacking patterns.

- GEOL 201 - Earth's Surface: Processes, Landforms, and History *Fall 2022*
Served as a lecture assistant and grader for 59 students. Designed and implemented final course project. Lectured six classes when professor was absent. Course emphasis on biological, chemical, and physical processes that shape the surface of the earth, including climate change, the global water cycle, geomorphic processes, and depositional environments.
- GEOL 425 - Introduction of Field Geology *Spring 2022*
Taught six hours per week to 25 students. Course introduces geologic field methods, making observations, mapping, identification of structures and features, taking structural data, interpretation to solve basic geologic problems.
- GEOL 101L - Planet Earth Laboratory *Fall 2021*
Taught seven hours a week to 90 students. Course focuses on the study of common minerals and rocks, use of topographic and geologic maps to illustrate processes.

MENTORSHIP ROLES

- Graduate Research Mentor – Columbia University, Crustal Deformation Lab *September 2023 - Present*
Mentored a single undergraduate student project with dual goals of assessing fault slip in high-resolution LiDAR and fault damage zone deformation of sampled fault rocks along the Black Mountain fault zone in Death Valley National Park.
- Graduate Research Mentor – UNC Chapel Hill, Tectonics and Geomorphology Lab *2022 - 2023*
Mentored and managed a year-long research project for one undergraduate student focusing on a structure-from-motion photogrammetric reconstruction and trench logging of a railroad cut exposing several thrust fault traces and growth strata.
- Tutor - UNC Chapel Hill Academic Support Program for Student Athletes (ASPSA) *Fall 2022*
Taught geologic principles and review lecture material for introductory geoscience courses to 15 student athletes for six hours a week.
- Undergraduate Student Field Training *Summer and Fall 2022*
Geologic mapping and sampling training of one female undergraduate student for four weeks (summer) and one week (fall) in the Mojave Desert.
- UCSB GEMSS (Geoscience Enrichment and Mentoring for Students by Students) *Fall 2020*
Mentoring of two undergraduate earth science students, aiding in development of academic, professional, and personal goals.

CERTIFICATIONS

- Geologist in Training (G.I.T.) *March 2021*
Fundamentals of Geology Exam, ASBOG

GRANTS AND AWARDS

- GSA Student Research Grant (\$2200) *May 2023*
- Perkins Elmer Research Symposium Presentation Award – Honorable Mention (\$500) *April 2023*
- Martin Supplemental Research Fellowship (\$5000) *February 2023*
- AWG Takken Student Research Presentation Travel Award (\$500) *September 2022*
- GSA Cordilleran Section Student Travel Grant (\$350) *September 2022*
- GSA Student Research Grant (\$2500) *June 2022*
- UCSB Earth Science Outstanding Academic Achievement *June 2019*
- UCSB Earth Science Department Field Award (\$2000) *June 2019*
- UCSB Coastal Fund Minor Grant (\$975) *March 2019*

PROFESSIONAL ORGANIZATIONS

- Association for Women Geoscientists *July 2022 to Present*
- Geological Society of America *January 2022 to Present*
- American Geophysical Union *January 2022 to Present*
- Association of Environmental and Engineering Geologists *Fall 2019 to June 2021*