Elizabeth Johnston, Ph.D.

Earth and Geospatial Scientist with over 10 years of research experience. Recent Stanford University graduate with a Ph.D. in Earth System Science. Previously served as an Energy Policy Analyst. Diverse technical skillset, including geospatial analysis, multivariate statistics, and causal inference.

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Education

Ph.D. Earth System Science | Stanford University | 2024

M.S. Marine Science | University of San Diego | 2016

B.S. Earth & Environmental Science | Furman University | 2013

Research experience

Climate Change Impacts | Stanford University | June 2018 - April 2024

- Designed reproducible workflows for data modeling and visualization using high performance computing to improve efficiency
- Applied principles of econometrics to infer causality
- Analyzed complex datasets to understand patterns and trends
- Presented at international conferences and published peer-reviewed journal article that was selected for press release

Isotope Geochemistry | Stanford University | August 2017 - June 2018

- Conducted literature review of isotopic signatures of landscape evolution (e.g., triple oxygen, carbon-13)
- Planned and conducted fieldwork of Idaho Batholith
- Conducted lab work to process and analyze rock samples by mass spectrometry and presented initial results to research group

Physical Science Lab Assistant | Univ. of San Diego | May 2015 - Aug. 2016

- Ensured proper safety protocol and data collection techniques, including quality assurance/quality control (i.e., QA/QC) for physical science lab courses (e.g., Environmental and Ocean Geochemistry)
- Resolved technical concerns with laboratory instrumentation (e.g., XRF)

Trace Metal Geochemistry | University of San Diego | Aug. 2014 - May 2017

- Researched the trace metal geochemistry of an ancient volcanic system
- Planned fieldwork in coordination with Parks and Recreation Department; collected rock, soil, and water samples; analyzed samples for trace metal concentration (e.g., XRF, FAAS); assessed mineral composition (e.g., SEM, XRD, thin section microscopy)
- Mentored high school, undergraduate, and graduate students; published master's thesis; presented at international conferences

Energy Policy Analyst | University of San Diego | December 2013 - May 2015

- Developed greenhouse gas inventories to estimate emissions among the electricity, transportation, waste, water, and agricultural sectors
- Co-authored climate action plans that quantified potential emissions reductions and made recommendations for climate policies

Climate Education | University of San Diego | October 2013 - March 2014

- Assisted with data and literature analysis assessing effects of climate change on extreme events, water resources, and public health
- Conducted interviews with community leaders about knowledge of local climate impacts

Engineering Communications | Vanderbilt University | May - August 2013

- Wrote articles (e.g., about Young Scientist publication) and prepared other digital promotional materials for School of Engineering

Landslide Hazard Modeling | Furman University | Aug. 2012 - May 2013

- Senior thesis research supported by Furman Advantage Fellowship leveraged ArcGIS and remotely sensed imagery to delineate landslide hazard in North and South Carolina
- Presented at international conference and was covered in local news

Incentivizing Carbon Offsets | Upstate Forever | May - Aug. 2011

- Supported by Shi Sustainability Fellowship, analyzed and reported the feasibility of a local carbon offsets program by conducting literature reviews, holding focus groups with local businesses, and deploying an online survey which received over 500 responses

Fluvial Carbon Transport | Furman University | Aug. 2009 - Aug. 2010

- With support from the Howard Hughes Medical Institute (HHMI), researched particulate organic carbon transport by headwater streams
- Collected sediment and storm water samples (e.g., ISCO); processed and analyzed samples (e.g., LOI); analyzed data; presented at conferences

Computational skills

- **Programming Languages**: proficient in R; experience with Unix, C, Java, MATLAB, Python
- **Data Visualization**: Adobe Creative Suite (e.g., Illustrator); Microsoft Office Suite (e.g., Excel, PowerPoint); Google Suite (e.g., Sheets, Slides)
- **Geospatial Analysis**: experience with ArcGIS, QGIS, Google Earth Engine
- **Version Control & Data Repositories:** experience with Github, Zenodo

Selected publications

Johnston, E.C. (2024) Impact of climate variability on landslide hazard in the western United States. Doctoral Dissertation. Stanford University. https://searchworks.stanford.edu/view/in00000069376

Johnston, E.C., et al. (2021) Quantifying the effect of precipitation on landslide hazard in urbanized and non-urbanized areas. Geophysical Research Letters, 48, https://doi.org/10.1029/2021GL094038

Teaching experience

Academic Skills Educator | Stanford University | June - October 2022

- Developed and led workshops for undergraduate students centering academic planning, growth mindset, and resilience

Teaching Assistant | Stanford University | September 2017

- Assisted with field-based Sophomore College (SOCO) course, Geological History of the Rocky Mountains (ESS 101)

Instructor | University of San Diego | August 2015 - May 2017

- Taught lab sections for Natural Hazards (EOSC 104L; 4 semesters) and Environmental Geology (EOSC 485L; 1 semester)
- Assisted with curriculum development by creating and leading lectures, practical exercises, and field trips

Teaching Assistant | University of San Diego | Jan. - May 2015

- Assisted with practical exercises and local field trips for the Dynamic Earth (EOSC 110L)

Consultant | FU Center for Teaching & Learning | Aug. 2010 - May 2013

- Provided individualized writing and multimedia consultations

Professional societies

American Association for the Advancement of Science (AAAS); Geological Society of America (GSA); American Geophysical Union (AGU)

Conference presentations
(first-authored)

AGU Fall Meeting 2021 | “Effect of wildfire severity on the longevity of precipitation-triggered Landslide Hazard” | Poster

AGU Fall Meeting 2020 | “Impact of urbanization on the relationship between antecedent precipitation and landslides: evidence from the San Francisco Bay” | Talk

AGU Fall Meeting 2019 | “The combined influence of antecedent rainfall and urbanization on landslides: an empirical approach based on data for the Pacific Coast of the United States” | Talk

AGU Fall Meeting 2018 | “Multi-scale signatures of climate change on landslide susceptibility: a case study for the Pacific Coast of the United States” | Poster

AGU Fall Meeting 2016 | “Investigations of the geochemical controls on anomalous arsenic enrichment in the Santiago Peak Volcanics of Southern California” | Poster

GSA Annual Cordilleran Meeting 2015 | “Arsenic Enrichment Associated with Historic Gold Mining in Julian, CA: a case study for ecosystem and public health impacts related to artisanal mining” | Poster

Climate Change Impacts and Responses 2015 | “Urban Climate Action Planning: Demonstration of Greenhouse Gas (GHG) Mitigation Tool for Analysis of Local Energy and Climate Policies” | Talk

GSA Annual Southeastern Meeting 2013 | “Landslide Hazard Zonation in the Mountain Bridge Wilderness Area Using GIS-Based Modeling” | Poster

GSA Annual Southeastern Meeting 2011 | “Particulate organic carbon transport by headwater streams in the piedmont of South Carolina” | Poster

Outreach & service

2023 | PhD Pathways Advisory Committee | Stanford Career Education

2022 | Mentor | Girls in STEM

2021 | Service Award for Diversity, Equity, and Inclusion | Stanford University

2019 | Organizing Committee | Women in Data Science @ Stanford Earth

2018 – 2019 | Executive Board | Stanford University Women in Earth Science

2016 | Instructor | National Ocean Sciences Bowl

2015 & 2016 | Instructor | STEM Mission Camp @ University of San Diego