AUDREY DUNHAM

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EDUCATION

PhD University of Arizona
Department of Geosciences — May 2022
Dissertation: *"From western North America to the Himalaya: Using region shallow earth structure and ground motion models to better understand seismic hazard"*

BS Pennsylvania State University — August 2017
College of Earth and Mineral Sciences
Schreyer Honors College
Major in geoscience, Minor in geophysics
Thesis: *"Earthquake processes in the Lesser Antilles subduction zone"*

RESEARCH EXPERIENCE

Global Seismology and Tectonics Laboratory — Tucson, AZ
Graduate Research Assistant, PhD Candidate — *August 2017-Present*
Advisor: Dr. Eric Kiser

- Simulate strong ground motions from earthquakes using the spectral element method (implemented in SPECFEM3D). Investigate landslide distribution related to simulated seismic shaking of 2015 M7.8 Gorkha earthquake in Nepal, future work includes the 2005 M7.6 Kashmir earthquake.
- Process seismic data sets from regions of high seismic hazard to investigate relationships between shallow crustal structure and earthquake processes. Current datasets include nodal arrays in the Cascadia Subduction Zone, the Teton Fault in Northwestern Wyoming, and induced seismicity in Raton, NM.

Earthquake Seismology Laboratory — University Park, PA
Undergraduate Researcher — *January 2016-May 2017*
Advisor: Dr. Charles Ammon

- Analyzed surface waveforms for the 2 March 2016 Wharton Basin MW 7.8 earthquake and aftershocks to relatively relocate events and evaluate the earthquake rupture.
- Synthesized a topic and wrote an undergraduate thesis on the seismicity of the Less Antilles Arc.
- Evaluated surface waveforms to relatively relocate earthquakes along the arc and analyze stress patterns.

WORK EXPERIENCE

Chevron — Covington, LA
Summer Intern, GOMBU AD Technical Geophysics Team — *June – August 2020*

- Collaborated with geophysics and geologists to generate rock property maps of a reservoir using inversion techniques as inputs to an earth model rebuild.
- Gained technical skills used in geophysical inversion and processing of seismic reflection data.
- Synthesized my results in a final presentation to a broad audience of Chevron Earth Scientists.

Los Alamos National Lab — Los Alamos, NM
Graduate Researcher, Geophysics (EES-17) — *June – September 2019*
Mentor: Dr. Joshua Carmichael

- Simulated the wavefield from small explosions using SPECFEM3D in the Bighorn Mountains in Wyoming to investigate anomalous surface wave propagation.
- Collaborated with members of the geophysics team to synthesize results in a final report and paper (*in review*).

COMPUTATIONAL SKILLS

Python, Obspy, SAC, UNIX/Linux/bash, Generic Mapping Tool (GMT), SPECFEM2D/3D, QGIS, MATLAB

PUBLICATIONS

Dunham, **A**., Kiser, E., Kargel, J., Haritashya, U., Watson, S., Shugar, D., Hughes, A., DeCelles, P., 2020. Topographic control of ground motions and landslides from the 2015 Gorkha earthquake. (*in review*).

Kintner, J., Cleveland, M., Modrak, R., **Dunham, A.,** 2021. Rayleigh Wave Propagation in the Bighorn Mountains Region, Wyoming. *BSSA*. (*in review).*

Dunham, A., Kiser, E., 2020. Local earthquake tomography of the Central Oregon forearc using a large-N, short duration, nodal array. Earth Planet. Sci. Lett. 551. https://doi.org/10.1016/j.epsl.2020.116559.

Lay T, Ye L, Ammon CJ, **Dunham A**, Koper KD. 2016. The 2 March 2016 Wharton Basin Mw 7.8 earthquake: High stress drop north-south strike-slip rupture in the diffuse oceanic deformation zone between the Indian and Australian Plates, *Geophys. Res. Lett.* 43(15):2016GL069931.

SELECTED PRESENTATIONS

Dunham, **A**., Kiser, E., Kargel, J., Shugar, D., Haritashya, U., Watson, S., "Uncovering relationships between ground shaking and coseismic landsliding during the April 25, 2015 Gorkha Earthquake through full wavefield simulations using SPECFEM3D", poster presented at the American Geophysical Union Fall Meeting 2019 in San Francisco, California.

Dunham, A., Kiser, E., "Seismic investigation of the Cascadia forearc in Central Oregon through the deployment of nodal seismometers", poster presented at the American Geophysical Union Fall Meeting 2018 in Washington D.C.

Dunham, A., "Complex Channel Avulsion in the Meghna River Floodplain During the Mid to Late Holocene: The Potential Effect of Tectonic and Co-Seismic Uplift", poster presented at the American Geophysical Union Fall Meeting 2016 in San Francisco, California.

LEADERSHIP EXPERIENCE

President, Founder Association for Women Geoscientists, Southern Arizona Chapter *May 2018-Present*
Geoscience Representative Earthweek planning committee *August 2019-Present*
Program Coordinator Women in Science and Engineering (WISE) *August 2020 - Present*
Graduate Student Representative Gemology faculty search committee *September 2019 – May 2020*

FUNDING

Chernoff Family Field Experience scholarship ($2000) *May 2018*
GSA Graduate Student Research Grant ($1900) *April 2018*
GSA Geophysics and Geodynamics Student Research Grant Award ($750) *April 2018*

HONORS AND AWARDS

M. Lee Allison Scholarship Arizona Geological Society *November 2020*
Outstanding Service Award UA College of Science *April 2020*
Best Geophysics Talk UA Geoscience Symposium *April 2020*
Galileo Circle Award UA College of Science *April 2019*