

# Jade Bowers

*Curriculum Vitae*

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## Education

- Ph.D.** (Geosciences), Boise State University (BSU) *Present*  
Dissertation: Petrogenesis of the Curacautín ignimbrite, a large-volume mafic ignimbrite at Llaima volcano, Chile  
*Co-Advisors: V. Dorsey Wanless and Brittany Brand*
- M.S.** (Geology), Oregon State University (OSU) *2019*  
Thesis: Deciphering magma dynamics prior to the May 2016 eruption at Sinabung Volcano  
*Advisor: Shan L. de Silva*
- B.S.** (Geology – *Geophysics Emphasis*), University of Arizona (UA) *2016*  
*Advisor: Christopher Hamilton*

## Professional Experience

### **Linn-Benton Community College, Department of Physical Science, Albany, OR**

2019, 15+ hrs/wk

*Title: Part-time Geoscience Faculty | Supervisor: Deron Carter, MS*

- Responsible for implementing curriculum, lectures, labs, in-class activities, and grading assignments and exams pertaining to Geology 203: Historical Geology
- Setup up laboratory and lecture materials, submit end of course grades
- Updated instructional materials to include various forms of active learning techniques (e.g., muddiest point, think-pair-share, jigsaw, flipped classroom)

### **Oregon State University, College of Earth, Ocean, and Atmospheric Sciences, Corvallis, OR**

2017 – 2019, 10+ hrs/wk

*Title: Mineral Separation Lab Manager | Supervisor: Shan de Silva, Ph.D.*

- Skilled preparer of zircon samples for U-Th/He analysis
- Utilized manual, mechanical, and chemical mineral separation (e.g., hand picking, Frantz magnetic separator, heavy liquid separation)
- Coordinated and performed hands-on training of safety and equipment operation for both university faculty/staff and visiting external users (e.g., Frantz magnetic separator, heavy liquid separation)
- Monitored usage and maintenance of the equipment and lab, diagnosis and repair of malfunctioning equipment, ordered lab consumables, and liaised with OSU Health and Environmental Safety department to maintain code requirements.
- Constrained crystallization ages of zircons from Sinabung volcano and post-caldera lava domes of Toba Caldera using SIMS
- Conducted SIMS U-Th zircon analyses on zircons from the Qixiangzhan eruption, Changbaishan-Tianchi volcano, China/DPRK (Pan et al., 2022)
- Trained and supervised undergraduate researchers

## Research Experience

### **Boise State University, Department of Geosciences, Boise, ID**

July 2019 – Present, 40+ hrs/wk

*Title: Ph.D. Graduate Research Assistant | Supervisor: Dorsey Wanless, Ph.D.*

Igneous petrologist who is conducting petrologic, geochemical, and interdisciplinary research on an active continental arc system in southern Chile with a record of producing large-volume, highly explosive mafic eruptions. Fingerprint mantle wedge sources and processes through contemporaneous evaluation of the trace element and isotopic compositions to gain insight into the “subduction factory”. Utilize a variety of petrologic and geochemical tools to constrain configuration of underlying magmatic system prior to the explosive eruption of a large volume of mafic magma.

- Fingerprinting subduction contributions during melt generation and processes during magma evolution
- Constraining pre-eruptive magmatic storage conditions and volatile contents for the mafic ignimbrite-forming eruption of Llaima volcano, Chile using crystal-scale techniques (mineral and melt inclusion major and trace element chemistry, thermobarometers, melt inclusion H<sub>2</sub>O-CO<sub>2</sub> concentrations)
- Developed new understanding of chemical heterogeneity of individual pyroclasts and its connection to fingerprinting the tapping of multiple magma bodies simultaneously or consecutively during an eruption (individual pyroclast trace element chemistry, statistical validation of variability, petrologic modeling; Bowers et al., 202X)
- Instrumentation utilized: XRF+ICPMS, TIMS, FTIR, EMP, LA-ICPMS
- Skilled preparer of whole rock samples for solution ICPMS and radiogenic isotope TIMS analysis
- Utilized manual separation (hand picking) and chemical preparation (HF dissolution, chemical separation and purification of Pb, Sr, and Nd)

### **Oregon State University, College of Earth, Ocean, and Atmospheric Sciences, Corvallis, OR**

2016 – 2019, 40+ hrs/wk

*Title: M.S. Graduate Research Assistant | Supervisor: Shan de Silva, Ph.D.*

- Determined pre-eruptive magmatic storage conditions for the May 2016 Sinabung volcano eruption, Sumatra, Indonesia using crystal-scale techniques (mineral chemistry, thermobarometers)
- Used heterogeneity in enclave textures and glomerocrysts to determine cryptic evidence for lower crustal mush storage and mafic replenishment and worked with seismologists to link petrologic constraints on storage locations with seismic signals to provide insight into the 2016-2019 prolonged explosive eruptive period of Sinabung volcano (Bowers et al., 202X)
- Utilized field work, sample collection, petrographic characterization, XRF+ICPMS, EMP

### **University of Arizona, Lunar and Planetary Laboratory, Tucson, AZ**

2015-2016, 15 hrs/wk

*Title: Arizona NASA Space Grant Intern, Planetary Volcanology | Supervisor: Dr. Christopher Hamilton*

- Query NASA digital satellite imagery database for high-resolution images of Mars mapping area

- Built mosaics of high-resolution satellite imagery for geologic mapping of Medusae Fossae Formation (MFF) and the Athabasca Valles Flood Lava (AVFL)
- Manually outlined volcanic rootless cones (VRCs) in mapping area for training convolutional neural networks and used for extensive identification of VRCs in the rest of the mapping area
- Used terrestrial analogues and interpretation of geologic structures to investigate the role ground ice on Mars based on presence of VRCs in the AVFL along contacts with yardangs in the MFF
- Oral presentation at Arizona Space Grant Symposium

**University of Arizona, Department of Geosciences, Tucson, AZ**

2013-2014, 10 hrs/wk

*Title: Undergraduate Research Assistant, Structural Geology | Supervisor: Dr. Paul Kapp*

- Used GoogleEarth to map geologic structures (folds) and geomorphological structures (yardangs) in the Qaidam Basin, China and Ocotillo Wells, California
- Documented geometries based on wind and bedrock structures
- Investigated feedback between wind erosion and tectonic uplift
- Poster presentation at University of Arizona GeoDaze Symposium

**University of Arizona, Department of Geosciences, Tucson, AZ**

2012, 5 hrs/wk

*Title: Undergraduate Research Assistant, Geochronology | Supervisor: Dr. George Gehrels*

- Separated detrital zircons from sediment collected from the Connecticut River
- Manual (pan separated), chemical (heavy liquid), and magnetic (Frantz) separation
- Created and polished epoxy mounts of zircon crystals for imaging and U-Pb analysis via LA-ICPMS
- Poster presentation at University of Arizona GeoDaze Symposium

## Workshops

**SZ4D Community Meeting, Houston, TX**

November 2022

A three-day interdisciplinary workshop discussing ongoing planning efforts associated with Subduction Zones in Four Dimensions (SZ4D) initiative. Keynote and breakout sessions discussing recent advancements in subduction zone science, update the community on SZ4D, and solicit community feedback on next steps, particularly near-future opportunities to seek funding for SZ4D needs.

- Organizers: Mark Behn, Donna Shillington, Kasey Aderhold, **Jade Bowers**, Behrooz Ferdowsi, Anais Ferot, Melodie French, Krystin Poitra, Diana Roman, David Sandwell, Justin Sweet
- Poster presentation: “*How important is small-scale geochemical variability to constraining sources and processes?*”
- Pre-meeting Early Career Event
  - Organizers: **Jade Bowers**, Behrooz Ferdowsi, Melodie French

**Community Network for Eruption Response (CONVERSE), Albuquerque, NM**

Aug 2022

A three-day interdisciplinary workshop discussing various topics including lessons learned from CONVERSE eruption scenario exercises and responses, engagement of Early Career Researchers, open-data approaches, intellectual property protection, the role of Scientific Advisory Committees (SAC), and the future of CONVERSE.

- Organizers: Tobias Fischer, Kari Cooper, Yolanda Lin

**GeoPRISMS: Volatiles from source to surface**, Montana State University May 2022

A four-day interdisciplinary workshop to identify outstanding questions in the field of magmatic volatiles and develop research initiatives and collaborative solutions. Keynote sessions and breakout discussions surrounding volatile cycling, volatiles and magmatic processes, and volcanic degassing. Workshop fieldtrip to Yellowstone National Park to discuss monitoring and measurement techniques.

- Poster presentation: “*Volatiles And The Curacautín Magma: Excess volatiles influence on explosive mafic eruption*”
- Organizers: Madison Myers, Megan Newcombe, Daniel Rasmussen, Taryn Lopez, Mike Hudak, Behnaz Hosseini

**Diffusion Modeling**, Goldschmidt 2020 (virtual) June 2020

A two-day workshop covering the underlying principles, analytical and numerical techniques, and uncertainties in applying diffusion modeling to magmatic and metamorphic systems. Covered basic background through a series of short talks, but mostly, emphasized gaining practical coding skills to start own diffusion models using Excel® and trying out more sophisticated programming tools like Matlab®. Several exercises encompassing analytical solutions and numerical finite differencing in 1D (and potentially 2D), all grounded in real case studies. Discussion of uncertainties, potential pitfalls, unsolved diffusion mysteries, and areas that we as a community can help improve in the years to come.

**Funding**, Goldschmidt 2020 (virtual) June 2020

Funding is what makes the research world work, yet many of us frequently fail to get it. Heard from and met with members of the world's leading science funding agencies, such as NSF, GNS, and JST. Learned what makes or breaks a proposal and got the inside scoop on the selection process. A panel-based discussion and followed up by interaction directly with each of the panelists in small groups.

**Student Engagement in Higher Education**, Goldschmidt 2020 (virtual) June 2020

Student engagement is what a student brings to Higher Education in terms of goals, aspirations, and values and how these are shaped by their experience as students. This workshop is designed to provide guidance and strategies for students and academic staff wishing to initiate, sustain, or extend student-staff partnerships. The aims of the workshop are threefold, i) explore the ways in which students act as partners in learning and teaching, ii) identify strategic and sustainable practices of engaging students as partners, iii) discuss the risks and challenges inherent to partnership and find suggestions for addressing them.

**Earth Science Meets Data Science**, Goldschmidt 2020 (virtual) June 2020

Focused on the increasing need for globally standardized geochemical data due to the escalating volume of data and advanced capabilities in data processing. The workshop aims to discuss scientific challenges in geochemistry, presenting existing solutions, and propose best practices for a standardized geochemical data framework, with the intention of drafting a white paper detailing essential features.

**alphaMELTS**, AGU pre-meeting workshop, Washington, DC Dec 2018

Introduction to underlying thermodynamics, an illustration of the capabilities and potential applications of individual MELTS-type models and firsthand experience running different MELTS programs and tools.

**Magma Chamber Simulator (MCS)**, GSA pre-meeting workshop, Seattle, WA Oct 2017

Hands on experience and familiarization of running the MCS (inputs, steps to run code) and effective utilization of the output. Gained an understanding of how to utilize recharge assimilation fractional crystallization (RAFC) model by modeling various scenarios (e.g., assimilation fractional crystallization (AFC) and recharge fractional crystallization (RFC)).

**Navigating the Publication Process as an ECR**, IAVCEI, Portland, OR Aug 2017

Exploration of the publishing process. Special topics covered include how to put ideas into a coherent form, make your science “pop”, and being a constructive reviewer.

**Secondary Ion Mass Spectrometry (SIMS)**, University of California, Los Angeles March 2017

Introduced to practical applications of the SIMS analytical technique while receiving hands-on experience preparing samples, using the SEM, SIMS 1270 and 1290, and performing data reduction.

**Secondary Ion Mass Spectrometry (SIMS)**, Arizona State University Jan 2017

Introduced to the theory, both physics, and mechanics, behind the SIMS technique (e.g., transportation of ions and fundamentals of sputtering), as well as data reduction and analysis. Gained hands-on experience preparing samples and using the Cameca 6f and nanoSIMS.

## Service

AGU 2023 Session Convener: “*Advancing Subduction Zone Science: Collaborating Across Borders and Cultures*”, San Francisco, CA, *December 2023*

GSA 2023 Session Convener: “*New Voices in Subduction Zone Science*”, Pittsburg, PA, *October 2023*

Organizing committee member of SZ4D Community Meeting, Houston, TX, *November 2022*

Co-convener of SZ4D Community Meeting: Early Career Workshop, Houston, TX, *November 2022*

Founding member and Executive Committee Member of Subduction Zones for Grad-Students and Graduates (SZ4Grads – SZ4D), *2022 – present*

Vice-president and Awards Chair, Geoscience Graduate Organization (BSU), *2021 – 2022*

Student Travel Awards Co-chair, Graduate Student Committee (OSU), *2016 – 2019*

Faculty and Staff Awards Chair, Graduate Student Committee (OSU), *2016 – 2019*

Web Admin, VolcanoWorld (OSU), *2016 – 2019*

Graduate Mentor, Academic Mentoring Program (OSU), *2017 – 2018*

Outreach Coordinator, Society of Earth Science Students (UA), *2012 – 2016*

## Analytical and technical skills

*Computational:* R, Shiny Apps ([Isotope Mixing Array in 3D](#) & [Data Exploration](#)), MatLab, Python, data visualization, factor analysis, supervised and unsupervised machine learning, data querying/cleansing/manipulation, data management

*Analytical:* Running Isotopx Phoenix X62 multicollector thermal ionization mass spectrometer, Thermo Scientific iCAP-RQ single quadrupole mass spectrometer with ESI SC 4DX FAST

solution autosampler, Cameca SX-100 Electron Microprobe+WDS+EDS, CAMECA ims 1280-HR ion microprobe, Wet chemistry in Class 100 clean laboratory in Class 10 laminar flow hoods

*Desirable skills:* critical thinking, analysis & problem solving, leadership, write at all levels, graphic design, teamwork, collaboration, professionalism, work ethic, project management

*Word processing and graphic design:* Microsoft Office Suite, Adobe Illustrator, Affinity Designer, LaTeX.

## **Instructional Experience**

### Boise State University

- UF100 – *Foundations of Climate Change*, Graduate Teaching Assistant, BSU *Spring 2023*  
GEOS101 – *Physical Geology*, Graduate Teaching Assistant, BSU *Fall 2022*  
GEOS697 – *Curriculum Design*, Graduate Participant, BSU *Spring 2022*
- Developed curriculum, lessons, lectures, and in-class activities for an advanced igneous petrology course. Advanced learners digest information outside of class to work together in lecture to develop high level critical thinking skills and advanced mastery of material to make connections between trace element behavior, geotectonic setting, mantle melting and magmatic processes.
  - Developed curriculum, lessons, lectures, and in-class activities for a module of a graduate teaching assistant training that centers around leading effective discussion sections.

### Linn-Benton Community College

- GS203 – *Historical Geology*, Instructor on Record, LBCC *Spring 2019*

### Oregon State University

- GEO305 – *Living with Active Cascade Volcanoes*, Graduate Teaching Assistant, OSU *Spring 2019*  
GEO315 – *Earth Materials II: Petrology*, Graduate Teaching Assistant, OSU *Winter 2019*  
GEO310 – *Earth Materials I: Mineralogy*, Graduate Teaching Assistant, OSU *Fall 2018*  
GEO415 – *Earth Materials III: Petrography*, Graduate Teaching Assistant, OSU *Spring 2018*  
GEO305 – *Living with Active Cascade Volcanoes*, Graduate Teaching Assistant, OSU *Spring 2018*  
GEO315 – *Earth Materials II: Petrology*, Graduate Teaching Assistant, OSU *Winter 2018*  
GEO101 – *Intro. to Earth Science: Solid Earth*, Graduate Teaching Assistant, OSU *Fall 2017*  
GEO305 – *Living with Active Cascade Volcanoes*, Graduate Teaching Assistant, OSU *Spring 2017*  
GEO315 – *Earth Materials II: Petrology*, Graduate Teaching Assistant, OSU *Winter 2017*  
GEO101 – *Intro. to Earth Science: Solid Earth*, Graduate Teaching Assistant, OSU *Fall 2016*

### University of Arizona

- GEOS212 – *Introduction to Oceanography*, Preceptor, UA *Summer 2014*  
GEOS218 – *Geological Disasters and Society*, Preceptor, UA *Spring 2013*

## **Invited Talks / Guest Lectures / Seminars**

- Leading Discussions lecture series* for GEOS 597 TA Professional *Spring 2023*  
Development graduate course at BSU  
*Petrologic Forensics: Why Good Volcanoes Go Bad* Epic Earth Podcast Interview *Fall 2022*  
*Geologic Structures lecture* for GEOS101 undergraduates at BSU *Fall 2022*  
*Dissertation proposal defense talk* for department seminar at BSU *Spring 2020*

<i>Petrologic Forensics at Mount Sinabung, Sumatra, Indonesia</i> invited speaker for Cascade Volcano Observatory seminar	Winter 2019
<i>Lava Domes: Conditions, Mechanisms, and Deposits</i> for VIPER Seminar Series at OSU	Winter 2019
<i>Volcanic Hazards</i> lecture for GEO201 undergraduates at OSU	Winter 2018
<i>Mt St Helens (1979 – 1980)</i> lecture for GEO305 undergraduates at OSU	Spring 2018
<i>IUGS classification of mafic igneous rocks: Peridotites and partial melting</i> lecture for GEO415 undergraduates at OSU	Spring 2018
<i>Volcanic Forensics: Magma mingling during the 2013 to present eruptions of Sinabung Volcano, Sumatra</i> for department Student Seminar Series	Winter 2018
<i>Monitoring Volcanoes</i> lecture for GEO305 undergraduates at OSU	Spring 2017

## Grants And Honors

Travel & Research funds total so far **\$23,905**

Geosciences Graduate Student Conference Travel Grant, \$500	2023
ASBSU Conference Travel Grant, \$400	2023
SZ4D Community Meeting Travel Grant, \$1500	2022
CONVERSE Workshop Travel Grant, \$380	2022
NSF GeoPRISMS Workshop Travel Grant, \$350	2022
Will and Rose Burnham Research Grant, \$1500	2021
William Taubeneck Fellowship (3 years), \$4,500	2016, 2017, 2018
Graduate Student Committee Travel Grant Award (3 times), \$1200	2017, 2018, 2019
USGS Jack Kleinman Award for Volcano Research, \$400	2017
Geological Society of America (GSA) Lipman Research Award, \$2650	2017
UCLA SIMS Workshop Travel Grant, \$500	2017
ASU SIMS Workshop Travel Grant, \$425	2017
UA NASA Space Grant Internship, \$9,600	2015

## Manuscripts In Preparation (*To Be Submitted*)

- Bowers, J.**, Schwartz, D., Wanless, V. D., Schmitz, M. D., Giordano, G., Manga, M., (202x). Pyroclast-scale geochemical evidence for the eruption of coexisting magma bodies and magma mixing during the Curacautín ignimbrite-forming eruption. *To be submitted to Scientific Reports*.
- Bowers, J.**, Schwartz, D., Wanless, V. D., Schmitz, M. D., (202x). Isotopic and trace element constraints on the petrogenesis of the Curacautín ignimbrite, Chile. *To be submitted to Geochemistry, Geophysics, Geosystems*.

## Manuscripts Under Review / In Revision

- Bowers, J.**, de Silva, S., Tepley, F., Prambada, O., Putra, A., Pratomo, I., McCausland, W., Indrastuti, N., and Nugraha, A. (202x). Petrological Forensics at Sinabung Volcano, Sumatra, Indonesia: Evidence for polybaric crystal rearing and vertically extensive crystal mush in the May 16th, 2016, dome collapse. *Journal of Volcanology and Geothermal Research* (in revision).

## Peer-Reviewed Papers

- Marshall, A., Brand, B., Martinez, V., **Bowers, J.**, Walker, M., Wanless, V.D., Andrews, B., Manga, M., Valdivia, P., and Giordano, G. (2021). The mafic Curacautín ignimbrite of Llaima volcano, Chile. *Journal of Volcanology and Geothermal Research*.

## Conference Abstracts

- Bowers, J.,** Schwartz, D., and Wanless, V.D. (2023). Role Of Small-Scale Geochemical Variability In Understanding Magma Evolution And Eruption Dynamics, Paper Number 1418 accepted for Oral presentation at 2023 Scientific Assembly, IAVCEI, 30 Jan - 03 Feb.
- Bowers, J.,** Schwartz, D., and Wanless, V.D. (2022). How important is small-scale geochemical variability to constraining sources and processes?, Abstract V52C-0019 presented at 2022 Fall Meeting, AGU, Chicago, IL, 12-16 Dec.
- Bowers, J.,** Schwartz, D., and Wanless, V.D. (2022). How important is small-scale geochemical variability to constraining sources and processes?, SZ4D Community Meeting, NSF-funded, Houston, TX, 13-16 Nov.
- Bowers, J.,** Wanless, V.D., Myers, M., Schwartz, D., Andrews, B. (2022). Volatiles And The Curacautín Magma: Excess volatiles influence on explosive mafic eruption, Volatiles from Source to Surface, A GeoPRISMS Workshop, NSF-funded, Bozeman, MT, 23-26 May.
- Bowers, J.,** Wanless, V.D., Schwartz, D., Brand, B., and Andrews, B. (2021). Elucidating geochemical heterogeneity and evolution of the explosively erupted Curacautín magma, Llaima volcano, Chile, Abstract V35C-0143 presented at 2020 Fall Meeting, AGU, New Orleans, LA, 13-17 Dec.
- Bowers, J.,** Wanless, V.D., Schwartz, D., Marshall, A., and Brand, B. (2020). Petrological Forensics of the Curacautin Magma(s), Abstract V004-0016 presented at 2020 Fall Meeting, AGU, Virtual, 1-17 Dec.
- Bowers, J.,** de Silva, S., and Tepley, F. (2019). Petrological Forensics of the Mount Sinabung, Sumatra, Indonesia Magma Reservoir prior to May 2016 Dome Collapse, Geological Society of America Cordilleran Section Meeting *Abstracts with Programs*. Submitted for Oral
- Bowers, J.,** de Silva, S., and Tepley, F. (2018). Volcanic Forensics: Magma mingling during 2013 to present eruptions of Sinabung Volcano, Sumatra, Volcanology Students of Oregon; Oregon State University. Corvallis (OR); Abstract. Oral.
- Bowers, J.,** de Silva, S., Tepley, F., Pratomo, I., Putra, A., and Mucek, A. (2017). Petrological forensics of magma mingling during 2013 to present eruptions of Sinabung Volcano, Sumatra, Geological Society of America *Abstracts with Programs*. Vol. 49, No. 6. Poster
- Bowers, J.,** de Silva, S., Mucek, A., Pratomo, I., and Putra, A. (2017). Understanding the resurgence and restlessness at calderas: insights from climatic and post-climatic eruptive compositions with particular reference to Toba Caldera, IAVCEI Scientific Assembly, Abstract MT23B-024. Poster.
- Bowers, J.,** Hamilton, C., and Palafox, L. (2016). Lava Flows and Yardangs on Mars, Statewide NASA Space Grant Symposium; University of Arizona. Tucson (AZ): NASA SGC. Presentation G-3. Abstract. Oral.
- Abell, J., **Bowers, J.,** Carroll, J., Lunn, E., Valachovic, J., and Kapp, P. (2014). Wind over rock: Quantifying the structure and geometries of ‘yardangs’, University of Arizona GeoDaze Symposium. Poster
- Bowers, J.,** Joyce, K., Young, D., and Gehrels, G. (2013). Zircon Ages of the Sediment from Connecticut River, University of Arizona GeoDaze Symposium. Poster

## Field Experience

Application of advanced field methods in volcanology, Central Oregon (1 week)	2022
Physical Geology Field Trip (Physical Geology course; Leader; 1 Day)	2022
Curacautin ignimbrite scientific field investigation and sampling (~ 3 weeks)	2020
Petrology Field Trip to Oregon Coast (Petrology course; Co-leader; 3 times)	2017 – 2019
Sinabung Volcano scientific field investigation and sampling (~5 weeks total)	2016, 2018
Toba Caldera scientific field investigation and sampling (~3 weeks)	2016



Long Valley Caldera volcanological field study (3 days)	2016
Central Idaho comprehensive field study and independent geologic mapping (~5 weeks)	2016
Anza Borrego, CA. Geological mapping and sedimentological analysis (~1 week)	2015

### Students Mentored

*Mekayla Layne*, Senior undergraduate at BSU. (Mentored her with whole-rock groundmass picking for ICP-MS, clean lab whole-rock dissolution and solution dilution, ICP-MS pyroclast trace element analysis, data reduction, Undergraduate Research Showcase poster revision, etc.)

*Sarah Lapinski*, Geobridge undergraduate research at OSU. (Mentored her through transition from community college to four-year university, EPMA data reduction, coding, data visualization, paper writing, GSA research grant proposal revision, academic career preparation, etc.)

*Nicole Hunt*, Geobridge undergraduate research at OSU. (Guided her through transition from community college to four-year university, paper writing, research proposal revision, etc.)

*Asmara Lehrman*, Undergraduate field assistant from Trinity University. (Mentored her with conducting field work, writing field observations, describing volcanic deposits, collecting and cataloging volcanic samples, academic career preparation, graduate school application, etc.)

*Tiff Demezas*, Undergraduate laboratory assistant at OSU. (Mentored her with whole-rock sample processing, magnetic mineral separation, heavy liquid mineral separation, picking zircon crystals, park service career preparation, etc.)

*Katherine Landoni*, Junior undergraduate at OSU. (Guided her through academic career preparation, getting involved in undergraduate research, graduate school application, etc.)

### References

1. V. Dorsey Wanless, PhD – Doctoral Advisor  
*Assistant Professor, Boise State University*  
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Email: [dwanless@boisestate.edu](mailto:dwanless@boisestate.edu)
2. Darin Schwartz, PhD – Doctoral Collaborator and Co-Author  
*Research Scientist, Boise State University*  
Boise, ID  
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3. Mike Brudzinski, PhD – Mentor and SZ4Grads Collaborator  
*Professor, Miami University, Ohio*  
Oxford, OH  
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