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SUMMARY

Hazards are exciting and complex and illustrate the fundamental drivers of scientific research in both volcanic and non-volcanic settings that can impact lives and property.

As part of my training and education, I graduated summa cum laude with a BS in Geology and a minor in Physical Geography. Formerly, as a PhD Candidate in the Department of Geosciences at Boise State University and a National Science Foundation GRFP recipient, my research included using infrasound array techniques, seismic sensors, time-lapse visuals, drone data, and physical volcanology grain-size distribution to detect, track, and characterize rain-triggered lahars at Volcán de Fuego, Guatemala.

As a current Postdoctoral Researcher for the Boise State Hazards and Climate Resilience Institute, my research includes, but is not limited to, engagement in field efforts, collaborations with monitoring agencies inside and outside of the US, community engagement with emergency response stakeholders and partners in various locations around Idaho, Oregon, and Washington, and promoting professional scientific research in various academic, professional, and community settings.

HIGHLIGHTS

- Infrasound, Seismic, Grain-Size Distribution, Lahars
- NSF GRFP Recipient
- STEM Outreach and Community-Based Disaster Risk Reduction
- Wildfire Community Vulnerability and Resilience
- Idado State Lidar Data Dissemination via Outreach
- Question Formulation Technique (QFT)
- Scenario Build Outs
- Inclusive Leadership Student Board Member
- ESRI ArcGIS (10.x and Pro), ArcCollector, Erdas Imagine, Microsoft Office suite, SEM, MATLAB, Drone structure-from-motion/DEM creation, AgiSoft, Mavic Air drones, FlamMap Fire Analysis Software
- Publishing, Podcast, Spotify, Apple Podcasts, YouTube

EDUCATION

PhD Boise State University
PhD Candidate — Jan. 2020 – Dec. 2024
GPA: 3.9
Degree: Geosciences
Advisor: Dr. Brittany Brand

BS Adams State University, Colorado — May 2019
GPA: 4.0 (Summa cum laude)
Major: Geology (BS)
Minor: Physical Geography
Advisor: Dr. Robert Benson

BA University of Colorado – Boulder, Colorado — May 2008
Major: Anthropology
Supp: Licensure in Elementary Education

RESEARCH EXPERIENCE

Postdoctoral Researcher: NSF Wildland Fire & FEMA CTP Lidar Current Research
Boise State University

- Part of NSF-funded proposal "Household Response to Wildfire: Integrating Behavioral Science and Evacuation Modeling to Improve Community Wildfire Resilience"
- Conducting semi-structured interviews with City/County Emergency Managers regarding hierarchal decisions and messaging protocols during wildfire preparedness and during events
- Building out FlamMap wildfire models based on feedback from Emergency Manager/Response Teams for training tabletop exercises
- Outreach and community engagement with stakeholders and partners to disseminate Lidar data collected by the state of Idaho.

Center for Research and Creative Activity Think Big Workshop April 2025
Boise State University

- Developing a Human-Centered Approach to Research in Higher Education
- Explored new research and creative pathways using a user-centered, design-thinking approach.
- Engaged in interdisciplinary collaboration, leveraging creative techniques and co-designed methods to enhance problem identification, research impact and innovative solutions.

NDPTC/FEMA Evacuation Planning Strategies and Solutions (MGT-461) Feb 2025
Virtual Training

- **Certification** obtained on 2/24/2025

NDPTC/FEMA Social Media Tools and Techniques (PER-344) June 2024
Virtual Training

- **Certification** obtained on 6/21/2024

NDPTC/FEMA Leveraging Tools for Coordinated Community Disaster Communications (AWR-329) April 2024
Virtual Training

- **Certification** obtained on 4/5/2024

CONVERSE Grad Student Workshop July 2023 & May 2024
Albuquerque, New Mexico

- Scenario building workshop dedicated to developing volcanic hazard material to be used in story-telling workshops with experts in the field at a future date
- Worked closely with staff from South American monitoring agency to develop scenarios based around hypothetical, but realistic eruptions at a particular volcano

NDPTC/FEMA Volcanic Crises Awareness (AWR-233) July 2023
Albuquerque, New Mexico
As part of a Converse Scenario Building Institute Workshop

- NDPTC training offered by Bruce Houghton
- **Certification** obtained on 7/10/2023

NSF GRFP Recipient 1946726 (FAIN) Jun 2021 – Jun 2024

- Conducting research under the Doctoral NSF Graduate Fellowship Program
    - Chapter 2: Correlation of stage height and seismo-acoustic energetics for monitoring rain-triggered lahars at Volcán de Fuego, Guatemala (in progress)
    - Chapter 3: Community-based volcanic hazard educational workshop strategy with local stakeholders in Oregon/Washington (in progress)

NSF EAR Grant 1914491 Jan 2020 – Dec 2022
Lahar Dynamics and Monitoring: A Multiparametric Approach Grounded in Infrasound
Lead BSU PhD Researcher

- Using geophysical, remote sensing, and physical volcanology to detect, track, and characterize rain-triggered lahars.
- Collaborative work with Michigan Technological Institute
- Outreach efforts and collaborative work with colleagues at INSIVUMEH
    - Discussions around hazard response activities
    - Volcanic hazards and early warning systems

- Community awareness and protocols during times of crises

GOLD-EAGER Student Advisory Board, BSU, Idaho Aug 2021 – Present
Supervisor: Jen Pierce & Kendra Kaiser

- Paid committee member
- Experience with:
  - Developing inclusive workload distribution for the department
  - Organizing team meetings for all students
  - Developing an Outreach Course for the department focused on:
    - Developing materials, training, and education programs designed around geoscience hazards.

Cascade Volcano Observatory, Vancouver, Washington Jun 2019 – Dec 2019
Supervisor: Chris Harpel, Heather Wright

- Volunteer basis
- Experience with:
  - Making mounts to be used for analysis with SEM, Geo Chemistry, etc.
  - Ultrasonic machine
  - Petrographic microscope
  - SEM
  - Analyzing tephra from volcanic depositions in Peru and Mount St. Helens
  - Field work on Mount St. Helens including exposing outcrops and changing seismometer equipment.

Wagon Wheel Gap Geology, Adams State University, Colorado Jun 2018 – Feb 2020
Advisor: Dr. Robert Benson

- Conducted research and wrote a chapter in a book for the privately owned 4UR Ranch in Mineral County, CO.
- Experience with:
  - Field work around San Juan Volcanic Complex
  - Writing for publication

ASU GIS Project, Adams State University, Colorado Nov 2017 – May 2019
Advisor: Kevin Daniel (Computer Services), Dr. Robert Benson

- Worked on documenting cable pathways and related features for both ASU Computing Services and Facilities.
- Experience with:
  - ArcGIS desktop
  - ArcGIS Online
  - ArcCollector – used as interface to display data
  - GPS point collection
  - Project Lead
  - Training new work-study students

TEACHING EXPERIENCE

Community Outreach Course, Idaho Spring 2023
Creator and Primary Instructor
Co-Instructor: Karen Viskupic

- Created college-based curriculum and information centered around research regarding outreach efforts.
- Coordinated STEM outreach events with local community schools and Boise City Parks and Recreation after-school programs

Epic Earth Podcast, Idaho Aug 2021 – Present
Creator and Co-Host with Bryan Rosenblatt
Available on Spotify, Apple Podcasts and YouTube

- Created an informal podcast platform to promote positive careers in STEM
- Gives students, researchers, and professionals a way to engage in community building with scientists and scientific communication
- Challenges narratives about who belongs in STEM
- Manages media interactions with guests

Skype-A-Scientist, Various Places Fall 2020 – Present
Participant Scientist

- Have led Zoom outreach activities with elementary-grade classrooms across the world in topics related to geology, volcanoes, volcanic hazards, what is a geologist, what is a volcanologist.

Geosciences Outreach Program, BSU, Idaho Jan 2020 – Present
Graduate Outreach Coordinator

- Coordinate STEM events for K-12 outreach programs through BSU Geoscience Department
- Have led and taught volcanic hazard activities (e.g., density differences, effusive vs explosive eruptions, liquid nitrogen trash can eruption), climate change activities, and wildfire activities during STEM nights and Outreach Events.
- Coordinate Outreach efforts with City of Boise at summer camps

Adams State University, Colorado Fall 2018
STEM Tutor

- Tutored students in Physical Geography, Physical Geology, and Environmental Science.

Adams State University, Colorado Fall 2018
Teaching Assistant, Geology

- Experience with assisting Geology courses and upper level courses, including: grading, setting up equipment for remote lectures, and answering any questions students may have regarding the course material.

Adams State University, Colorado June 2018
Teaching Assistant, STEAM

- Teaching assistant for the STEAM (formerly STEM) Migrant Education Program offered to high school students from across Colorado.

Elementary Education Teacher & Substitute Teacher August 2008 – May 2011
United Kingdom & United States

- Taught various elementary education subjects and grade levels, including at a Special Needs school with students with multiple learning disabilities.

PUBLICATIONS

Bosa, A.R., Bejar G., Waite, G.P., Mock, J.M., Pineda, A., and Anderson, J.F. (2024) "Dynamics of rain-triggered lahars and destructive power inferred from seismo-acoustic arrays and time-lapse camera correlation at Volcán de Fuego, Guatemala." *Natural Hazards*, 121: 3431-3472. doi: 10.1007/s11069-024-06926-1

Kaiser, K.E., Seetamraju, L., Pierce, J, Crosby, B., Llewellyn, D., Harper, J., Bosa, A., Glenn, N. (In Review) "A Framework for Increasing Inclusive Leadership Through Department Workload Policies", *submitted to Higher Education.*

Johnson, J.B, Roca, A., Pineda A., Merida R., Escobar-Wolf, R., Anderson, J., Mock, J., Bosa, A., Bejar, G., and Waite, G. (2023) "Infrasound Detection of Approaching Lahars", *Springer Nature*, 13: 6476. https://doi.org/10.1038/s41598-023-32109-2

Bosa, A., Johnson, J. B., De Angelis, S., Lyons, J., Roca, A., Anderson, J. and Pineda, A. (2021) "Tracking secondary lahar flow paths and characterizing pulses and surges using infrasound array networks at Volcán de Fuego, Guatemala ", *Volcanica*, 4(2), pp. 239–256. doi: 10.30909/vol.04.02.239256.

PRESENTATIONS AND INVITED LECTURES

Oral Presentations:

"Promoting Inclusive Leadership In The Geosciences Through The Empowerment And Formation Of Student Advisory Boards"

- Geological Society of America Annual Conference, Anaheim, CA, September 2024

"Integrating Active-Learning and the Protective Action Decision Model to Motivate Household Volcanic Risk Reduction and Action"

- Co-authored for presentation; presented by Dr. Brittany Brand
- Cities on Volcanoes 12 International Conference, Antigua, Guatemala, February 2024

"Dynamics of rain-triggered lahars inferred from infrasound array and time-lapse camera correlation at Volcán de Fuego, Guatemala."

- IAVCEI, New Zealand, in-person, Jan/Feb 2023

"Tracking secondary lahar flow paths and characterizing pulses and surges using infrasound array networks at Volcán Fuego, Guatemala."

- American Geophysical Union Annual Conference, online, Dec 2020

Poster Presentations:

"Real-Time Evacuation Decision Making And Messaging During Wildland Fire Events: A Case Study Of Ashland, Oregon And Ada County, Idaho"

- Geological Society of America Annual Conference, Anaheim, CA, September 2024

"Correlation of stage height and seismo-acoustic energetics for monitoring rain-triggered lahars at Volcán de Fuego, Guatemala"

- Cities on Volcanoes 12 International Conference, Antigua, Guatemala, February 2024

"Correlating Timelapse Imagery and Seismo-Acoustic Signals to Characterize Flow Dynamics in Rain-Triggered Lahars at Volcán de Fuego, Guatemala."

- Boise State University Graduate Student Showcase, April 2023

"Dynamics of rain-triggered lahars inferred from infrasound array and time-lapse camera correlation at Volcán de Fuego, Guatemala."

- American Geophysical Union Annual Conference, online, Dec 2021
- Seismological Society of America Annual Meeting, online, April 2021

"Using Remote Sensing and GIS to Track the Modification of Fluvial Geomorphology of the Rio Grande with the Introduction of Erosion Control Structures in South Central Colorado."

- Geological Society of America Annual Conference, Seattle, WA, October 25, 2017

GeoClub Presentations:

Graduate Stories and Research

- Boise State University GeoClub guest talk, Spring 2020.

"2017 GSA Conference, Seattle, WA."

- Adams State University Lunchtime Talk, Feb 7, 2018.

PROFESSIONAL AFFILIATIONS

CONVERSE Graduates and Early Career Researchers, July 2023 – Present
Student member & Co-President

International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), 2021- Present
Student member, Commission on Volcanic Hazards and Risk, Commission on Cities and Volcanoes

GSA, 2016-Present
Student Member

American Geophysical Union (AGU), July 2019 – December 2021
Regular Member

Rocky Mountain Association of Geologists, May 2019 – Dec 2021
Student Member

Colorado Field Institute, Sept 2018 – Dec 2021
Student Member
AIPG, Jan 2018-Dec 2021
Young Professional Member

HONORS AND AWARDS

National Science Foundation Graduate Student Fellowship, Spring 2021 – Spring 2024
- Fellowship that "recognizes and awards students who have demonstrated the potential to be high achieving scientists and engineers, early in their careers."

Department of Geosciences Burnham Grant Award, Fall 2020
- Graduate student award for graduate research support

Rocky Mountain Association of Geologists Neal J. Harr Award, Spring 2019
- Student Award for "outstanding scholastic excellence and achievement in geology."

Edward M. Ryan Outstanding Geoscience Student, Spring 2019
- Award for academic record over the course of studies at Adams State University

Association for Women Geoscientists, **Laramide Chapter,** Spring 2019 & Spring 2018
- Award for academic excellence

Porters Scholar, Adams State University, August 2016 – May 2019
- Scholarship offered to STEM majors who are in good standing.

COMMUNITY SERVICE

Union of Concerned Scientists and Science Rising, Spring 2021 – Fall 2023
State of Idaho Coordinator

- Volunteer position to organize events based around science advocacy
- Hosted two events to encourage and increase student voting populations – especially in STEM, which is the lowest student voting population of all.

Rio Grande National Forest, Fall 2017 – May 2019

- Volunteer mine mapping project with the RGNF geologist and biologist.
- Used GPS units to track where abandoned mines and related features (e.g. tailings, pits, etc.) were located, and potential habitats for bats.

Volunteer for Outdoor Colorado (VOC), Fall 2017 – May 2019

- Trail building and maintenance around the San Luis Valley
- Conducted as part of the Adams State GeoClub community projects

OTHER

- Dual citizenship: US & UK
- Ed Ryan Museum, Adams State University, Docent Aug 2016 – May 2019

REFERENCES

Dr. Brittany Brand (advisor)
Associate Professor of Geosciences
Department of Geosciences
Boise State University
Boise, ID 83725-1535
brittanybrand@boisestate.edu

Dr. Jennifer Pierce (committee member)
Professor of Geosciences
Director of i-CLEER (Idaho Climate Literacy Education Engagement and Research)
Boise State University
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Dr. Dan Luna (Outreach Organizer)
Assistant Clinical Professor
Department of Geosciences
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Beth Bartel
USGS Mendenhall Post-Doc Researcher

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