

Erin Alexander, Arizona State University, Tempe, Arizona, USA for their project: *Hydrothermal Hazard Mapping in Yellowstone*.

I am a 5th year Geology PhD candidate at Arizona State University studying the geology of thermal areas in Yellowstone National Park under Professor Everett Shock. My research aims to map the geologic structures controlling the plumbing of thermal areas and address potential hydrothermal hazards associated with them.

My work focuses on 4 different hot spring regions that range from acidic to alkaline and lukewarm to superboiling in a variety of geologic settings. Hot springs rapidly resurface the area around them, so traditional mapping is difficult in thermal areas. I use an interdisciplinary approach combining detailed field mapping, hot spring geochemistry, and USGS airborne geophysics. Mapping reveals how faults, fractures, and contacts relate to the positions of the springs. Hot spring chemistry tells us about the type of water coming up and what subsurface processes it has undergone. Geophysics projects surficial contacts into the subsurface and reveals what happens to the layers at depth.

Thermal area mapping in Yellowstone affects more than just the springs. Geologic structures influence dangerous hydrothermal explosions, such as the one in 2024 that blasted tourists with rocks and boiling mud in Biscuit Basin. My work provides a three-dimensional view of the subsurface in thermal areas that can constrain likely pathways for hydrothermal explosions. With this predictive view, we may be able to plan where to place future infrastructure projects to ensure longevity and safety for the many visitors of Yellowstone. I am incredibly grateful to have received the Howard and Jean Lipman Foundation Research Grant that supported my final field season in Yellowstone this summer and pushed forward this exciting and important work.

