

Owen McCaffrey, The University of Wisconsin-Madison, Madison, Wisconsin, USA for his project: *Lithium Retention and Mobilization between Clays and Brines in the Lithium Triangle*.

I am a third-year PhD candidate in the Department of Geoscience at the University of Wisconsin-Madison, working under the supervision of Dr. Kristina Butler. My research is centered on the genesis and distribution of critical mineral deposits, with a focus on lithium and boron accumulation in closed basin systems. By combining clay mineralogy, experimental geochemistry, and isotope analysis, I investigate how these elements become fixed in the minerals that host them and under what conditions they are released.

My project examines the role of clay minerals in the lithium cycle of Andean brine and sedimentary deposits, centered on the Salar de Pastos Grandes in Salta, Argentina. In basins where lithium-rich clays occur alongside a brine resource, it remains unclear whether those clays act as net sources or net sinks of lithium to the surrounding fluids. Through reaction experiments and geochemical characterization of clay end-members from the basin, I aim to determine the direction and magnitude of this exchange, and what it means for how brine grade and resource longevity are estimated.

Support from the Lipman Student Research Grant will help fund the analytical costs of the experimental and isotopic work. This award will advance my broader goal of improving the sustainability and cost effectiveness of critical mineral extraction.

I earned my B.S. in geology-chemistry from Grand Valley State University before beginning my doctoral studies. I am grateful to the Howard and Jean Lipman Foundation and the Geological Society of America for supporting my research.

