



# SOUTH DAKOTA MINES

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## Department of Geology and Geological Engineering GGE Research Highlights...

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SDSM&T Geology & Geological Engineering

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GGE Research Highlights...

PhD student Olivia Dayne's research:

Mid-ocean ridge basalts (MORB) occasionally erupt with large plagioclase and olivine megacrysts that are not in chemical equilibrium with the lavas that carry them. These lavas are termed plagioclase ultra-phyric basalts (PUBs). The megacrysts in PUB contain melt inclusions which can be geochemically analyzed to gain a snapshot into the lavas which are in equilibrium with the megacrysts beneath the surface. By using the major elements, trace elements, and volatile abundances (such as CO<sub>2</sub>) within the melt inclusions, we can tie the chemistry of the melt inclusions to the lavas erupting PUB.

My research utilizes these data to better understand the magmatic processes creating these anomalous MORB in addition to investigating any correlation between the tectonic setting of the ridge and the processes manipulating lavas at depth. These data will also be used to model the carbon budget of the mantle using the CO<sub>2</sub> abundances of the melt inclusions. The carbon budget of the mantle can be used to better understand the carbon cycle of the exosphere.

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