Plutonic Lithics Record Variations in the Magmatic System beneath the Akaroa Volcanic Complex, New Zealand

Elizabeth Teeter, 2018

Plutonic lithics from the Cretaceous Akaroa Volcanic Complex (AVC), New Zealand, have textures and compositions that record the dynamic magmatic processes that shaped this volcanic system. The AVC is a multi-vent system with multiple shallow magma bodies above a deep plutonic source (Hampton and Cole, 2009; Hartung, 2011). Plutonic lithics are crystallized rock fragments of the underlying magma chamber that are subsequently incorporated into the erupted materials. Such lithics are essential to understand magmatic processes that occurred in regions, such as the AVC, with limited exposure of the plutonic body.

My research with Professor Rachel Beane of the Earth and Oceanographic Science department focused on plutonic lithics from Paua Bay, New Zealand that I collected during my study abroad semester in New Zealand with Frontiers Abroad. I collected 20 lithics from Paua Bay and had 13 thin sections made. This summer, I focused on 4 of the 13 thin sections. I used Bowdoin's Scanning Electron Microscope to analyze my samples with techniques such as Energy Dispersive Spectrometry (EDS), Cathodoluminescence (CL), and Electron Backscatter Diffraction (EBSD). EDS analysis looks at composition of thin sections, CL imaging shows textures present within samples, and EBSD mapping analyzes crystallographic preferred orientation of minerals