

PDAC Field Trip Funding Report
Dalhousie University Advanced Field School: April 27 – May 25, 2019
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This year's Dalhousie University Advanced Field School was a four week long course taking place in Nevada, Utah, and California. With the generous contribution from PDAC, eleven students participated in mapping and analyzing various environments, and developed a wide range of skills that will help us in both our future careers and studies.



Class photo of the advanced field school students, instructors, and TAs.

The field school worked out of four camp locations for the duration of the trip; the Valley of Fire in Nevada, as well as Monarch Canyon, Panamint Canyon, and the Inyo Mountain range just outside of Big Pine in California. Our course included four large projects and a number of smaller day-long field trips. Through the variety of projects, students developed skills in mapping and field techniques, and participating in a working camp's routine. The projects ranged both in scale and focus, primarily focusing on structural geology and field mapping.



The sun rising over tents in the Valley of Fire, a few minutes before students wake up and begin preparing for the day.

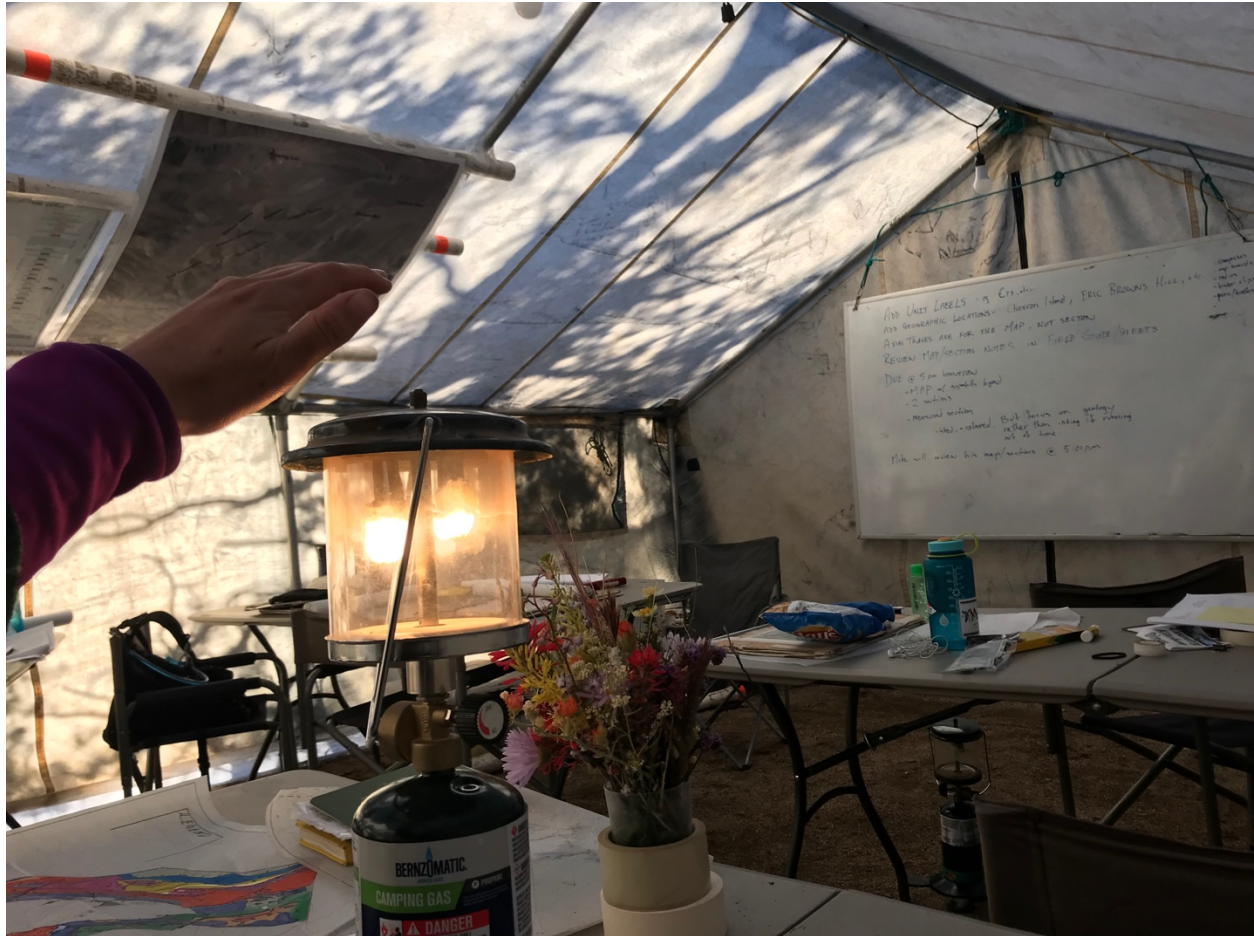
Our first campsite was in the Valley of Fire, Nevada, with a project studying the Rainbow Gardens and Thumb Formations. The project focused on creating a detailed stratigraphic column in groups of two or three for two and a half days, over a section that was approximately 100m in length. Through the observations, students then created a depositional and tectonic history of the region and discuss the influences and processes in basin development. Smaller field trips during this time included excursions around Lake Mead – including the Hoover Dam – and parts of Arizona and Utah.



Students explaining the depositional history of their stratigraphic section in Rainbow Gardens.

After the Rainbow Gardens project, our camp moved to Monarch Canyon for our second project, in which we studied a series of deformation events, and the subsequent metamorphic and tectonic structures that can help identify them. This project required a strong grasp of mineral assemblages and growth patterns. Through identification of both rock type and mineral assemblages, a map of the canyon as well as a deformation history up to and including the iconic detachment system that the Death Valley region is known for was created over the course of three days. This was a project that required some guidance from our instructors Mike Young and John Gosse, and as a result our class would spend part of the morning learning about the general structures and concepts that were necessary for an understanding of the project, before separating into groups of threes to map the canyon together.

Driving out of Monarch Canyon, our group moved camps to Panamint Valley. Our class set up the first iteration of a functioning field camp, with both a kitchen and office tent. We stayed in Panamint Valley for a further three days while working on our third project – mapping an alluvial fan in Panamint Valley. This proved to be one of the more challenging projects, with a large study area and a requirement to understand larger scale tectonic movement, students set out to map the ages of the fan surfaces and faults over the Manly Fan. This project was also conducted in groups of three. The groups created a depositional and tectonic history of the study area, based off of indicators such as desert pavement, fault type, and fault displacement.



The study tent set up during the Big Poleta project, warming up with the help of lanterns before students started map interpretations after dinner.

The final project took up the biggest portion of field school. Over the course of ten days, our class mapped 10 square kilometers of Big Poleta, a famous geology site in the Inyo Mountain range of California. The class worked in pairs mapping in the field, and each student created an independent field map and cross section based off their interpretations. As this was the most intense field project, the class had field trips interspersed between mapping days. Notable trips included the Long Valley Caldera field trip, where we learned about both the volcanic history of the caldera, as well as the relationship between geological risk assessment and politics. The other full-day field trip was an expedition to the Big Pine Skarn, in which students created a map of skarn deposits over an abandoned mine site.



The class in an eroded bed of tuff that created unique columnar structures, discovered during the Long Valley Caldera field trip day.

The Dalhousie Advanced Field School provided the opportunity to the students in the class of 2019 to develop academic, personal, and professional skills while working in the field. We have many people and sponsors to thank for making this project possible, with one of the largest supporters being PDAC. Thanks to PDAC's generosity, this trip was made more affordable to students paying both school and travel costs. We would also like to thank our supervisor and the primary coordinator for this trip, Michael Young, who has poured countless hours of time into planning and organizing this trip for all involved, and who was the catalyst to make our relationship with PDAC possible. We could not have done it without our generous sponsors, and we are all extremely thankful for the contributions that PDAC has made in order to make this once in a lifetime experience possible.