Nicole Salladin - Project Profile

2023 AGeS-Grad awardee
Project Title: Applying Detrital Zircon and Sanidine Dating to Constrain Early Eocene Chronostratigraphy and Provenance Trends in the Southeastern San Juan Basin
Lab: *New Mexico Geochronology Research Laboratory*
Lab Mentors: *Matt Heizler, Julia Ricci*

Figure 1: *This is me collecting detrital samples for analysis in the San Juan Basin in the chilly month of November.*

What scientific question(s) does your research address and what motivates this work?
My research addresses the provenance, paleoflow, and tectonic evolution of the Eocene San Jose Formation in the San Juan Basin. The goal of the study is to assess what was happening in northern New Mexico during the last gasps of the Laramide orogeny in the

region. This work is motivated by the previous work of others, who analyzed much of the section below the San Jose Formation using U-Pb detrital zircon dating.

What chronometric tool did you employ and why?

I used Ar^{40}/Ar^{39} detrital sanidine dating in this study. Detrital sanidine dating is proving to be a powerful tool in analyzing Cenozoic strata in basins. The Ar^{40}/Ar^{39} process produces extremely precise and accurate dates, allows for a more detailed spectral signature, and helps identify specific volcanic inputs. Detrital sanidine dating can also be extremely powerful when used in conjunction with U-Pb detrital zircon dating, as my research partner did in his study of this same area.

What were some of the key takeaways of your research?

1. Laramide structures may have been active all the way into the Eocene
2. The San Jose Formation contains a large amount of Precambrian grains
3. Paleoflow varied during the deposition of the separate members of the formation

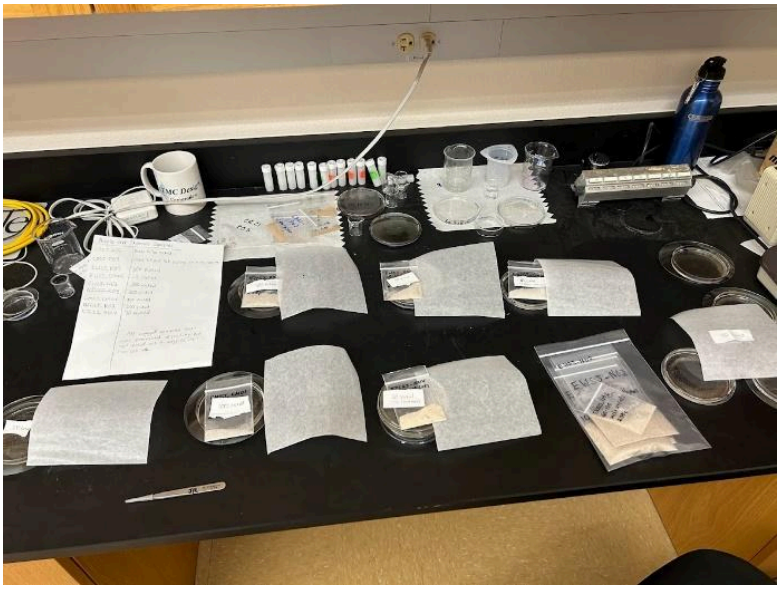

Figure 2: *This is a photo of all nine of my samples during the picking process. Each detrital sanidine grain must be picked by hand for analysis.*

What new experiences, opportunities, and collaborations did you gain as an AGeS-Grad awardee?

I had so many opportunities with the AGeS-Grad grant. I was able to work with the fantastic researchers at the New Mexico Bureau of Geology, who were instrumental in the success of this project. I was also able to pay in full for this research with the grant,

which was crucial to the success of data collection and processing. Additionally, I connected with other AGeS-Grad awardees and enjoyed sharing my research with like-minded individuals.

What is one piece of advice you have for future AGeS-Grad award applicants or awardees?

My advice would be to take full advantage of everything this grant has to offer, and don't hesitate to apply! It is truly a wonderful program.

Figure 3: *A field photo of the uppermost member of the San Jose Formation in the San Juan Basin. I had the pleasure of working in one of the most beautiful places I have ever been.*