Confirming the Lowland Creek Volcanic Field geochronology & activity overlying polymetallic vein deposits of the Mt. Thompson Quadrangle in SW Montana.

Jacob Blessing, Nansen Olson, Michael Sepp, Neal Mankins

Oregon State University
College of Earth, Ocean, and Atmospheric Sciences

Montana Bureau of Mines and Geology

INTRODUCTION

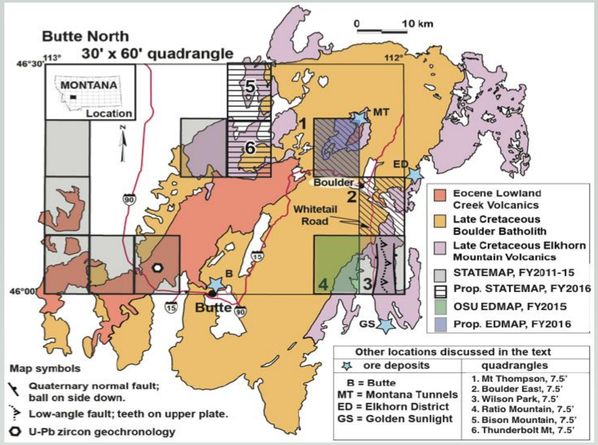
- The Mount Thompson Quadrangle is located in the central Boulder Batholith, SW Montana. The Boulder batholith is host to numerous polymetallic vein deposits, including those in the Butte District.
  - Understanding the depositional time frame of the batholith and veins is important to economic geologic exploration and resource acquisition.
- Recent USGS (EDMAP)-funded geologic mapping in the Mount Thompson Quadrangle is focusing on remapping an existing map, gathering new data of vein and fault orientation's, gathering a suite of samples for geochemical analysis to verify and updating a compilation of previous data.
- My goals are to estimate the formation ages of the Lowland Creek Volcanic vent formation and associated veins
  - by providing robust Ar^{40}-Ar^{39} ages.
  - Testing previously estimated Lowland Creek Volcanic vent ages
  - generating the first pyroclastic rock ages in this region

METHODS

Argon^{40} – Argon^{39} Geochronolgy

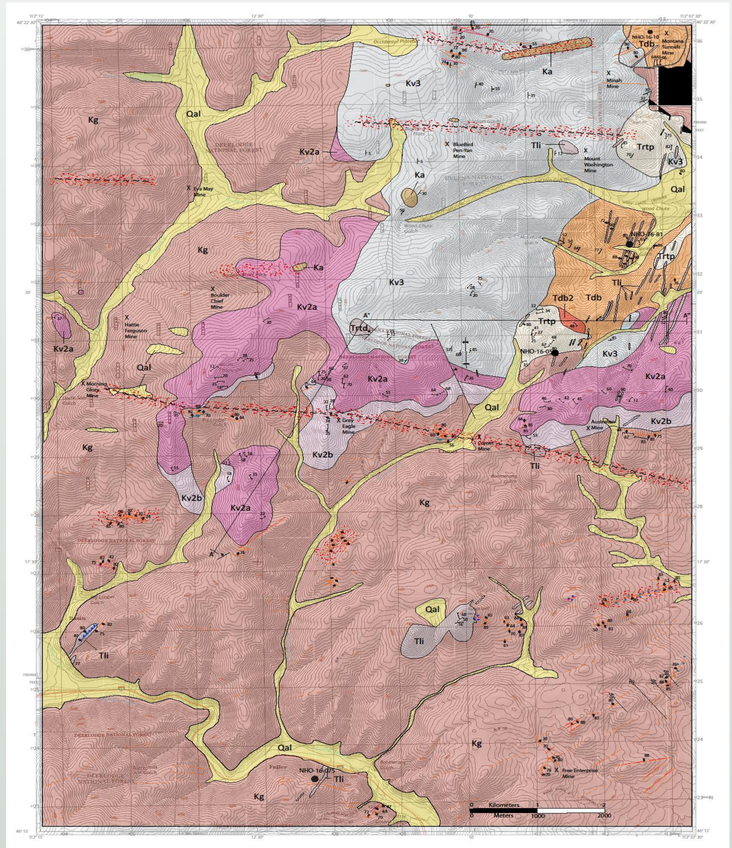
- Rocks with potassium bearing minerals are selected
- Pure mineral separates are placed next to a nuclear reactor in turn causing K^{39}(stable) to decay to Ar^{39}(un-stable man made)
- Standard Ar-Ar geochemistry mineral separations procedures
  - -Frantz magnetic separation, leaching, and hand mineral separation "picking", this is to isolate pure mineral separates.
- The Mean age is the plateau, plateau's have >50% cumulative argon release on plateaued age.
  - Fish Canyon Tuff sanadine used to populate J-curve

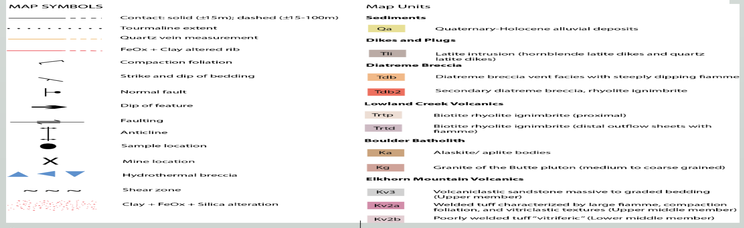
STUDY AREA

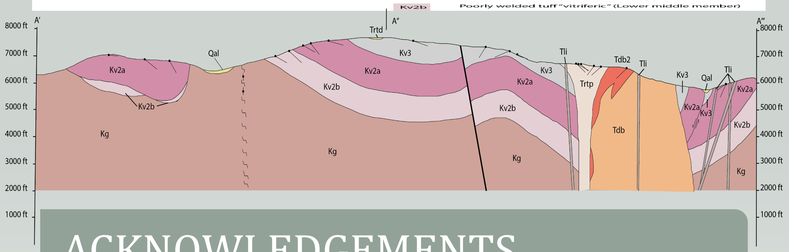


MT. THOMPSON 7.5' QUADRANGLE

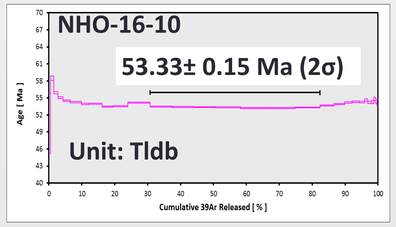
Note: This map is not finalized.

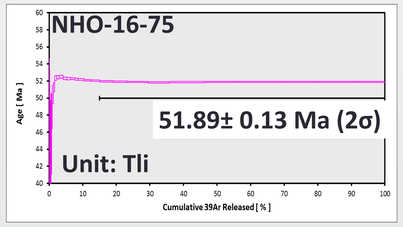


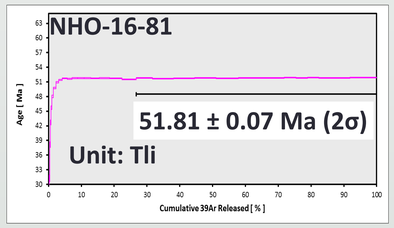


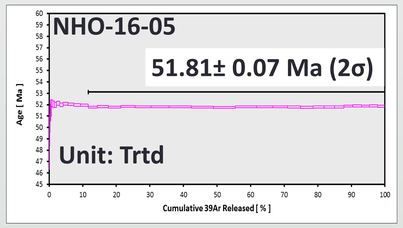


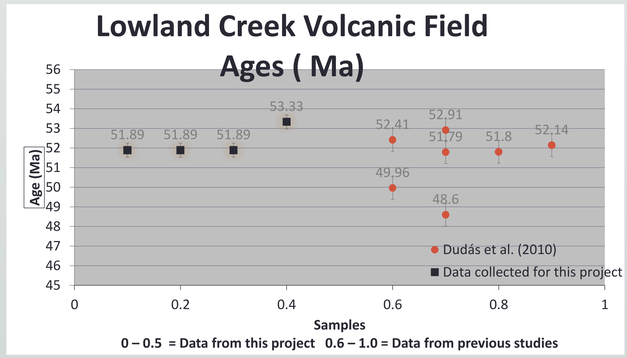
RESULTS











DISCUSSION AND CONCLUSIONS

- The results show that Lowland Creek Volcanic vent formation happened 51.9 million years ago in the Mt. Thompson quadrangle .
- The ages overlap with dikes and vein systems ages that are economically significant in the Butte district.
- The formation ages of 51.9 Ma support and fit with the geologic context of the region.

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