**Topic:** Metamorphic monazite geochronology

**Data Sources and Publications:**

*McCoy, A. M., Karlstrom, K. E., Shaw, C. A., and Williams, M. L., 2005, The Proterozoic ancestry*

*of the Colorado Mineral Belt: 1.4 Ga shear zone system in central Colorado, in Keller, G. R., and Karlstrom, K. E., eds., The Rocky Mountain region—an evolving lithosphere: Tectonics, geochemistry, and geophysics: Washington, D.C., American Geophysical Union Geophysical Monograph 154, p. 71–90.*

*McCoy 2001 data.xlsx - Excel file with McCoy U-Th-totalPb data for Idaho Springs-Ralston samples*

**Additional resources:**

*U-Th-Pb basics.pdf - A short crash course document in U-Pb geochronology created by Ellen Alexander*

*(CU postdoc)*

*McCoy, A.M., 2001, The Proterozoic ancestry of the Colorado Mineral Belt: 1.4 Ga shear zone system in*

*central Colorado, MSc thesis, University of New Mexico, 173 p.*

**Goals:**

1) To understand the general utility and approach of monazite geochronology in metamorphic rocks

2) To understand the basic approach of U-Pb isotope geochronology vs chemical U-(Th)-Pb dating (in this case by electron microprobe)

3) To understand the constraints that these data place on the geologic history of the rocks in the map area.

**Figures to create:**

Summary diagram showing relevant components of the McCoy et al (2005) study, including 1) map of Idaho Springs-Ralston shear zone segment closest to our map area with sample locations and location of our mapping area, 2) a histogram or plot of gaussian probability distribution functions for calculated monazite dates (these can be made with Excel or Google sheets), and 3) optionally, a diagram showing the most relevant components of Fig. 2, 3, and Plate 1.

**Questions to Answer:**

1. What exactly do these U-Th-Pb dates mean?
2. Why is there a variety of dates?
3. How do these data and interpretations relate to other field and analytical datasets that other students groups are working with?
4. How would this additional data and your interpretations of them affect your original map and cross-section interpretation?
5. Identify some of the main sources of uncertainty in these data and interpretations and discuss some ways that they are addressed.