

From emplacement to deformation; what is the significance of the Wilderness Leucogranite in the Santa Catalina-Rincon metamorphic core complex?

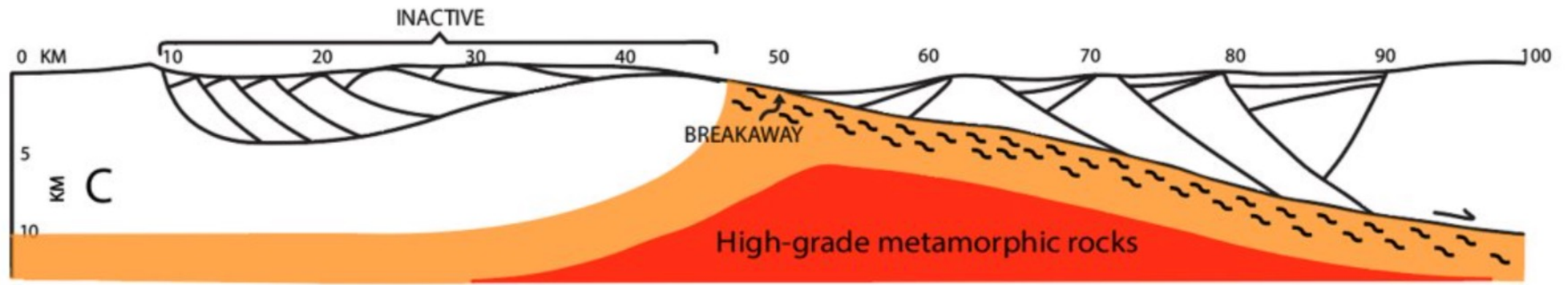
Alex Soto, George Gehrels, Clay Campbell, Michelle Foley, Wai Allen



What is the Wilderness Leucogranite?

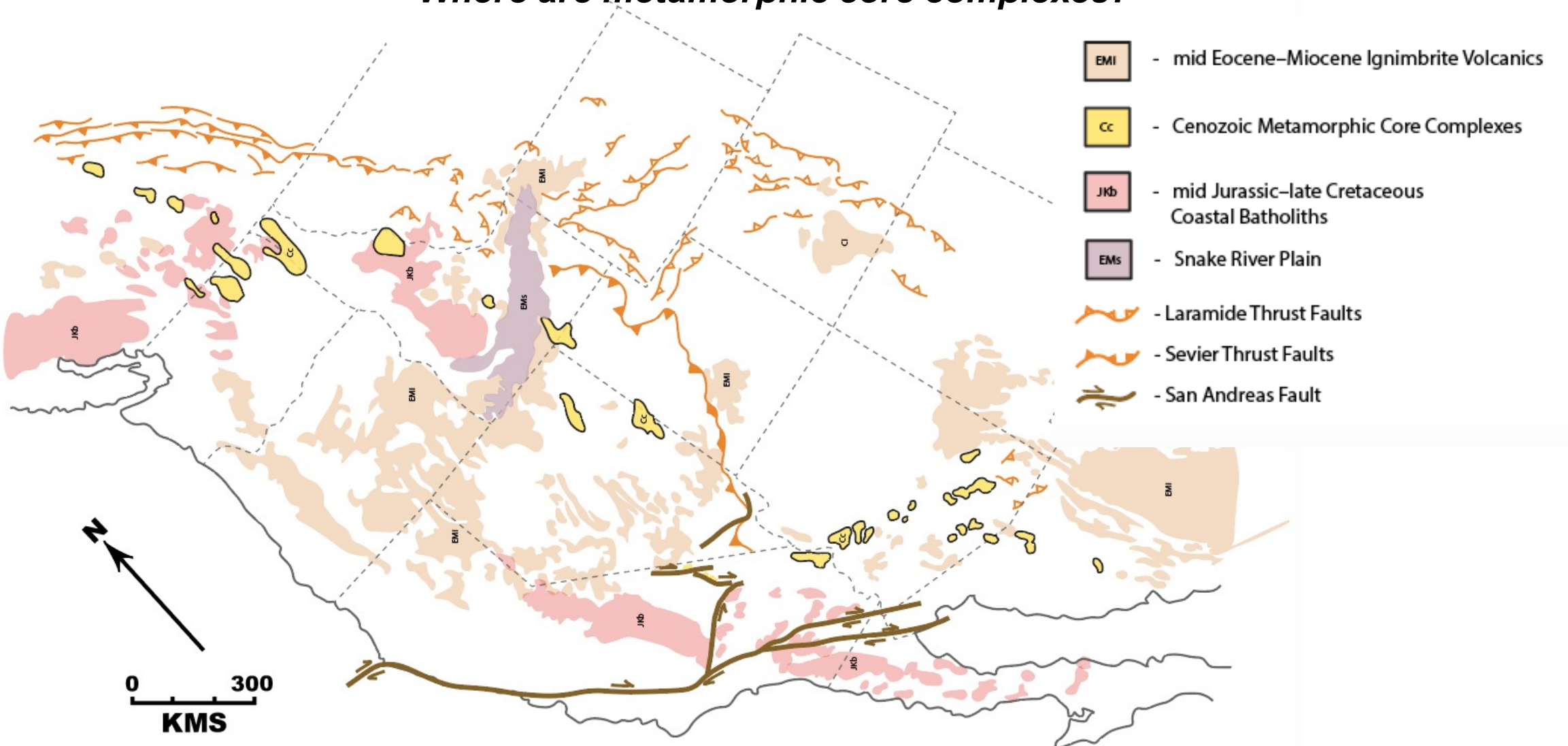


What is a metamorphic core complex?

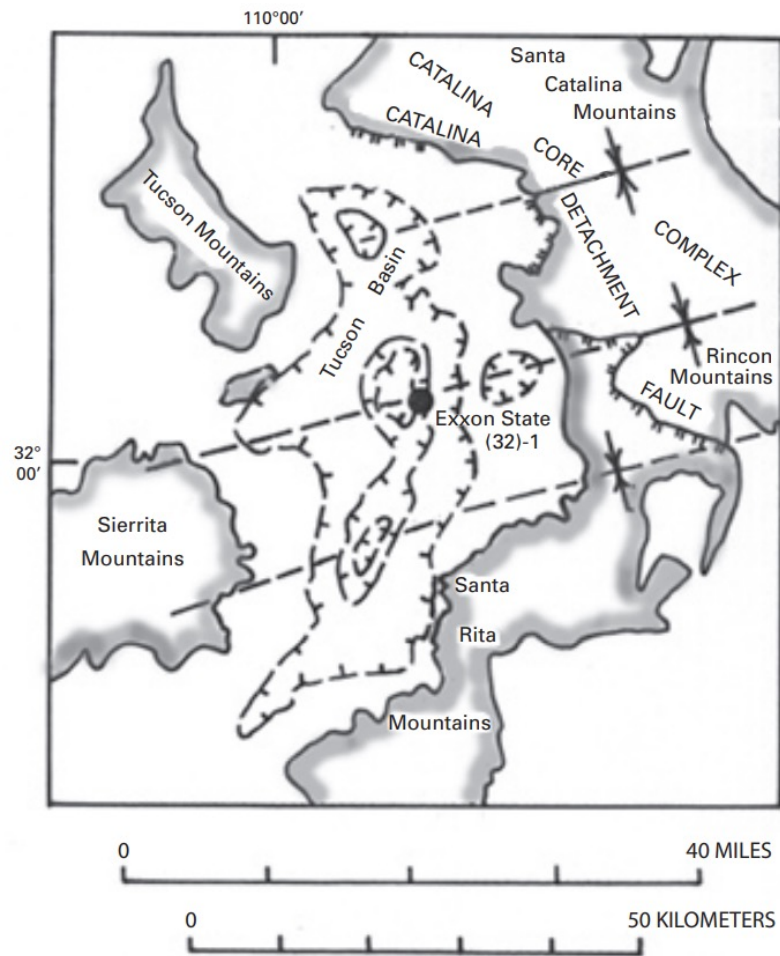


After Spencer, 1984




Where are metamorphic core complexes?



Why should we care about metamorphic core complexes?



EXPLANATION

-  Detachment fault—ticks on upper plate
-  Synforms in Catalina core complex—
dashed where projected
-  Simplified residual gravity contours

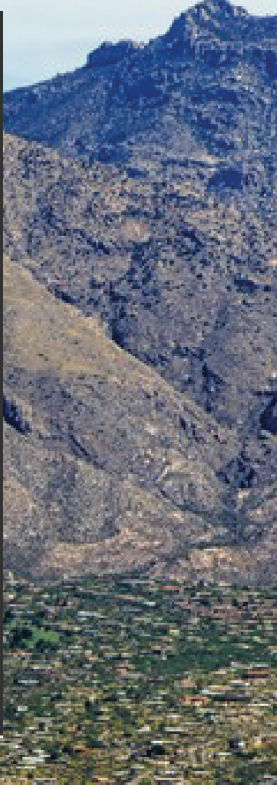
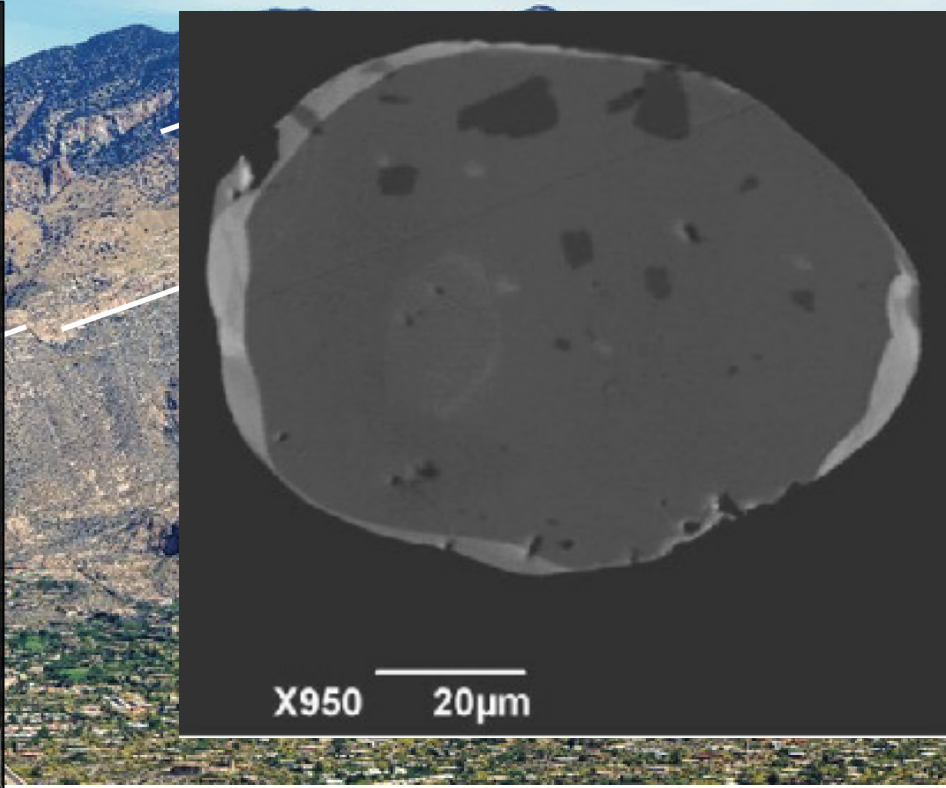
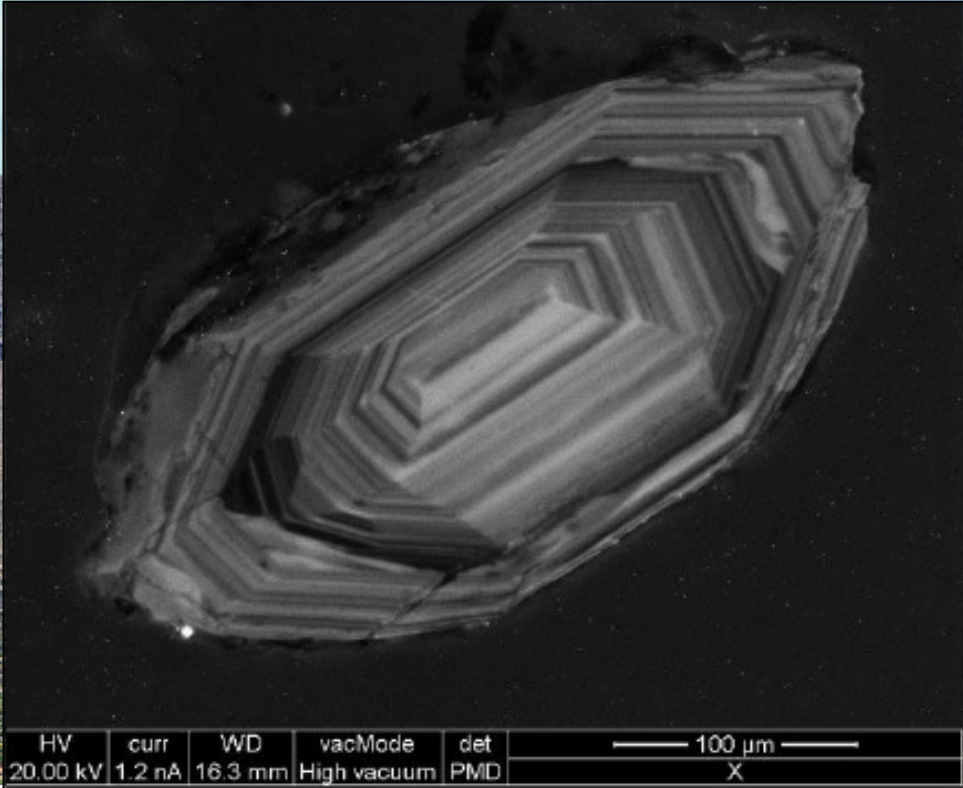
What aspect of metamorphic core complexes do we not understand?



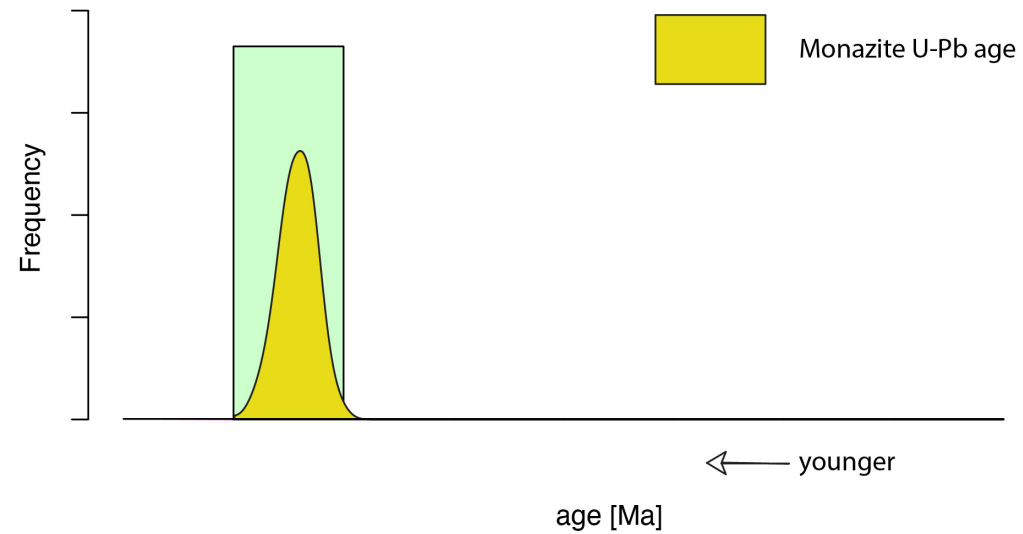
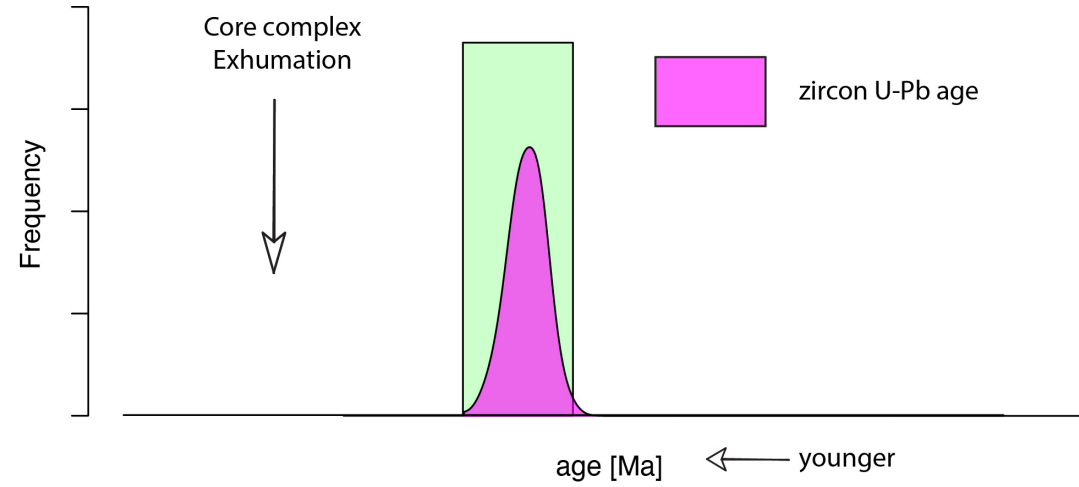
How can figure out when the Wilderness Leucogranite was metamorphosed?

zircon age = time of crystallization

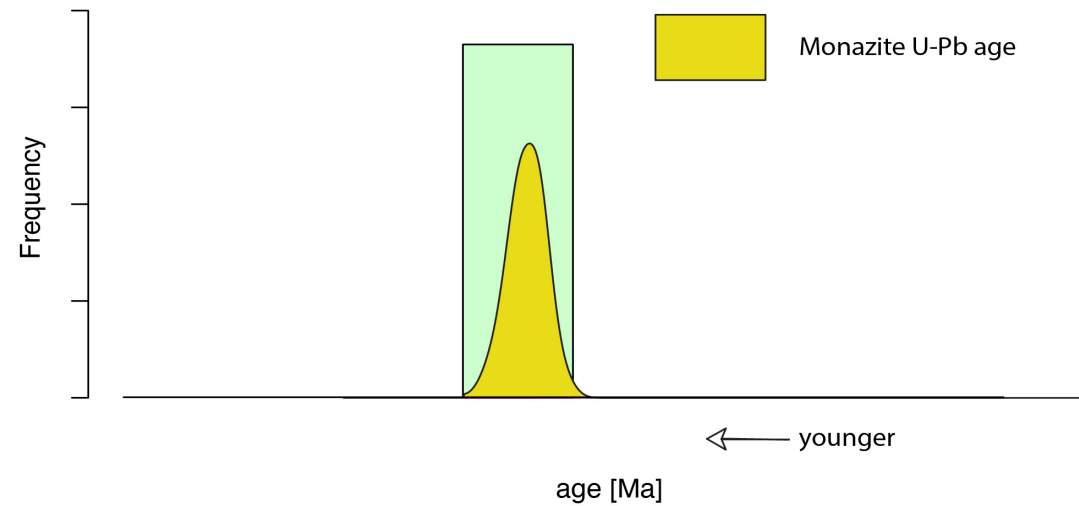
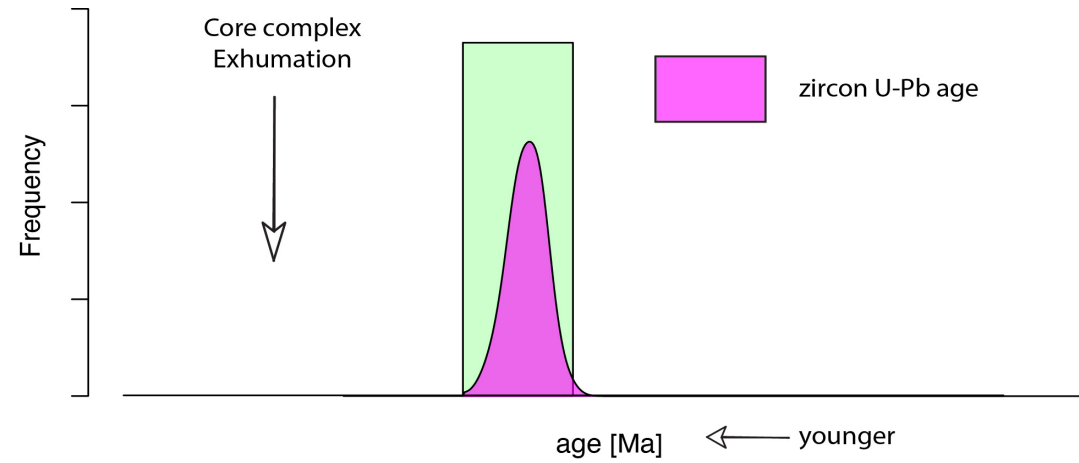
monazite age = time of metamorphism



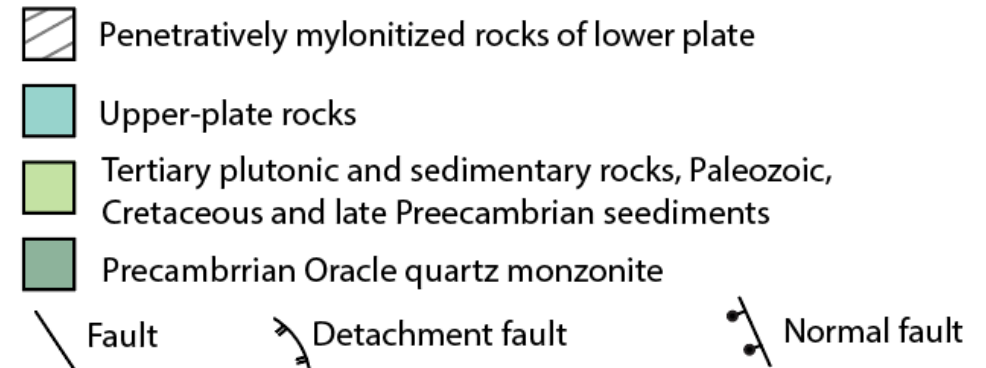
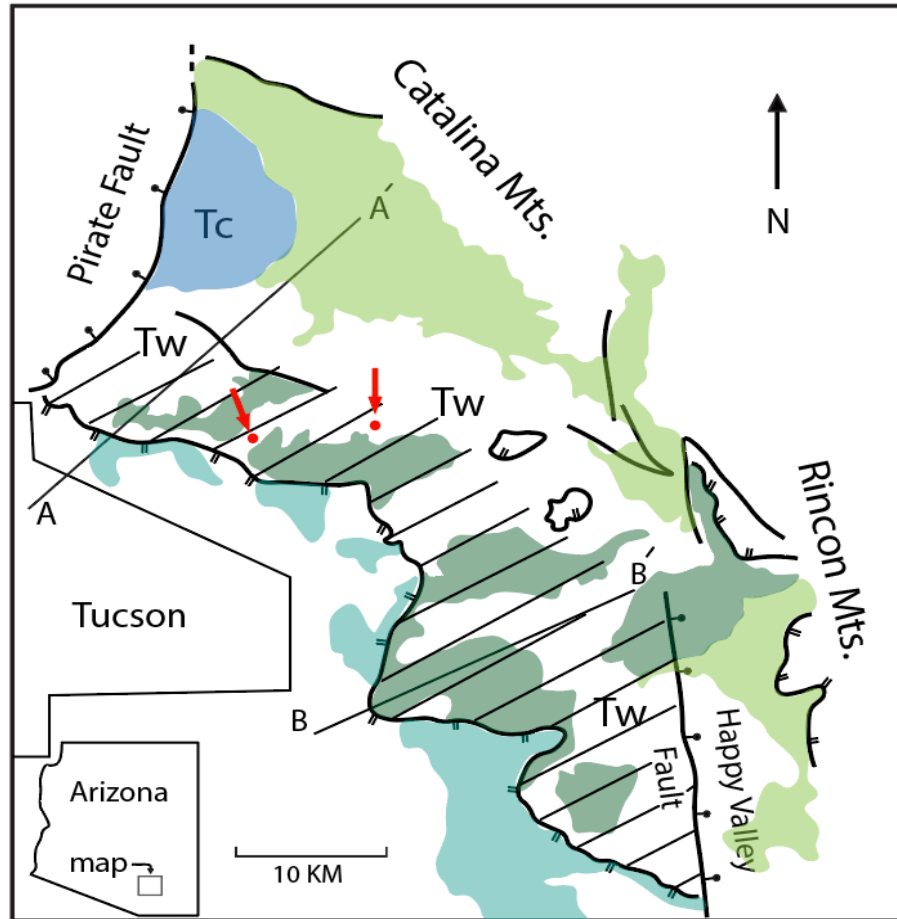
Hypothesis one: Zircon age dates are older than monazite age dates



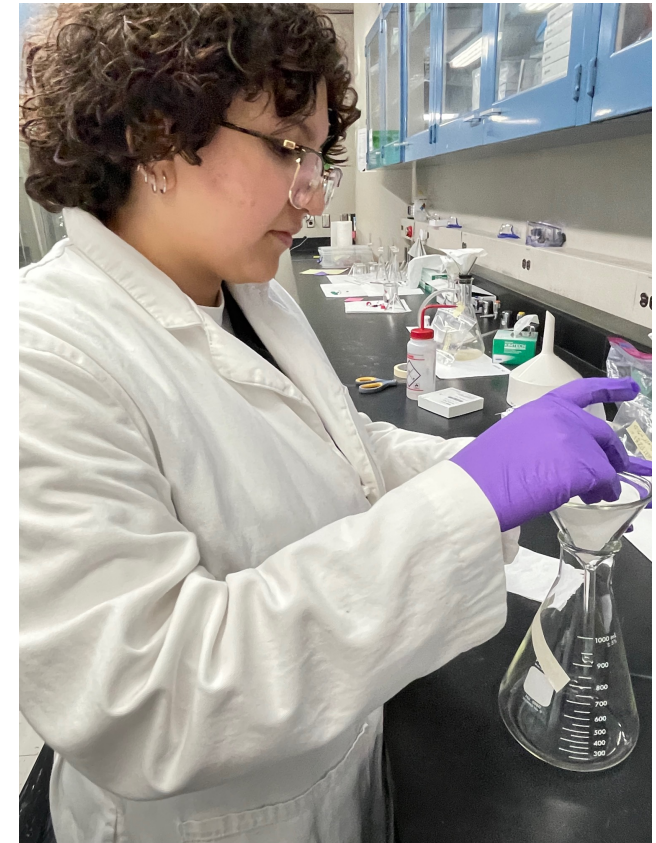
Hypothesis two: Zircon age dates are the same as monazite age dates



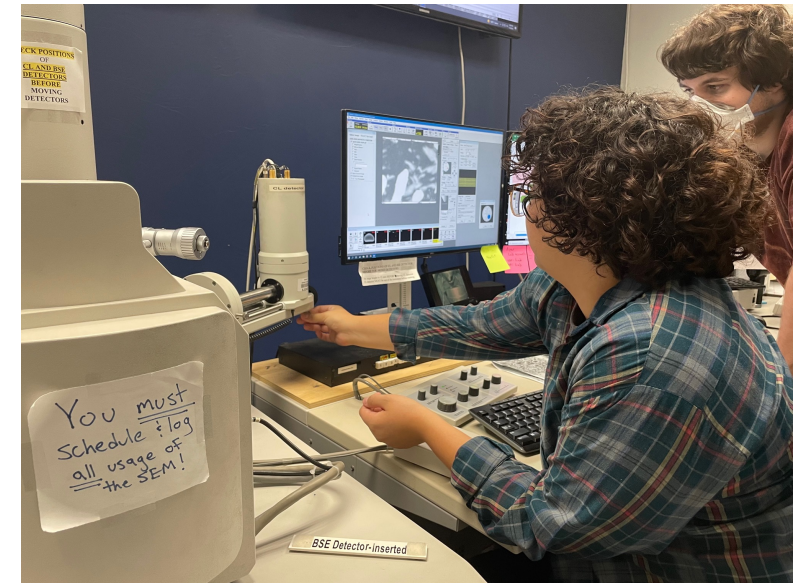
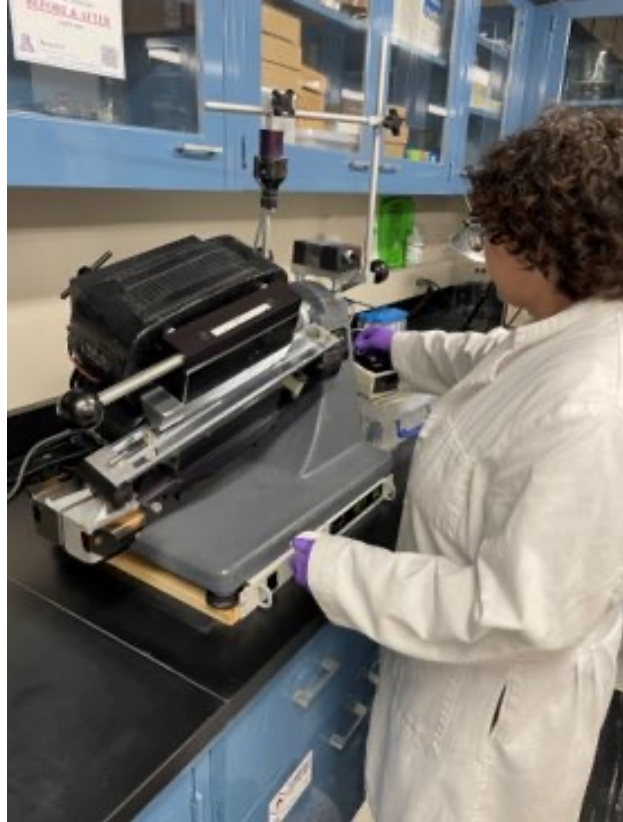
Testing the hypotheses



Prep Work



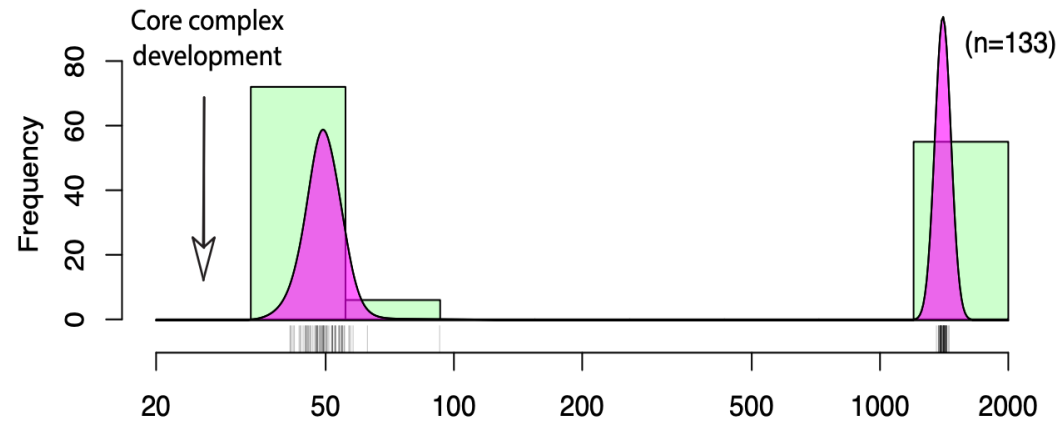
Prep Work Continued



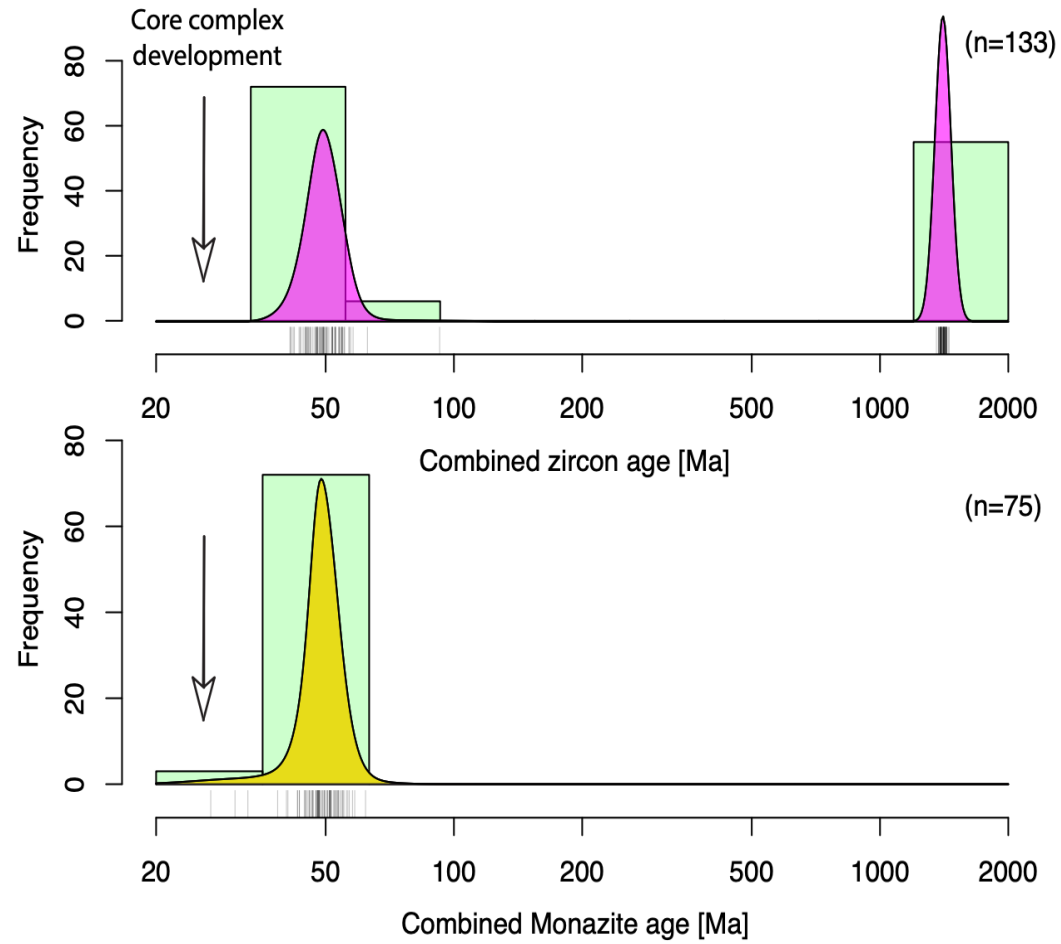
Mass Spectrometer



Results



Results



Conclusions

- 1) Modern sands sampled both the Wilderness and Oracle
- 2) Even if zircon ages show two age populations, monazite ages all cluster around 50 Ma, reflecting a profound metamorphic event
- 3) Most observable features in the Catalina-Rincon is considerably older than metamorphic core complex development
- 4) What then, happened around 50 million years ago that caused such a profound metamorphic event?
- 5) Finally, what role, if any did such an event play in the later development of the Catalina-Rincon core complex?

