TIMING OF DEFORMATION ASSOCIATED WITH A MAJOR DUCTILE SHEAR ZONE, RUBY MOUNTAINS, SW MONTANA

BELL, Lauren E., KROL, Michael A. - Dept. Geological Sciences, Bridgewater State University, Bridgewater, MA 02325, L1bell@student.bridgew.edu

ABSTRACT

The Ruby Mountain shear zone in south-central Montana is one of several major shear zones that are presently experiencing (Orogenic) Cretaceous, if not earlier, shear zone reactivation in the Ruby Mountains supergroup. Tectonic deformation in the Ruby Mountains has been the subject of several recent studies, resulting in an understanding of the tectonic evolution of this region. The Ruby Mountain shear zone is one of the most prominent shear zones in the region and has been the subject of several previous studies. In this analysis, we focus on the tectonic evolution of this region and the timing of shear zone deformation.

The Ruby Mountain shear zone is a major shear zone in the Ruby Mountains supergroup, and is one of several shear zones that are presently experiencing (Orogenic) Cretaceous, if not earlier, shear zone reactivation. The shear zone is located in the southern Ruby Mountains, and is one of the most prominent shear zones in the region. The shear zone is composed of a variety of metamorphic and igneous rocks, including amphibolites, quartzite, gneiss, and leucogranite.

Objectives:
- Perform Ar/Ar dating on hornblende samples from amphibolites above, within, and below the Ruby Mountain shear zone
- Establish the timing of high-grade metamorphism and deformation associated with the tectonic evolution of this region
- Integrate new age data into existing models for the tectonic evolution of this region

Perform Ar/Ar dating of hornblende samples from amphibolites above, within, and below the Ruby Mountain shear zone. The Ar/Ar dating results date Phase II to ~1785 Ma, and Phase I to ~1726 Ma. The first phase is related to regional crustal shortening associated with high-grade metamorphism and collisional tectonism.

Summary:
- Kinematic analysis indicates a two-phase movement history within the Ruby Mountain shear zone (RMZ).
- Phase I is associated with compressional tectonics and reverse movement.
- Phase II is associated with extensional tectonics and normal movement, including thrusting and normal faulting.
- The first phase is related to regional crustal shortening associated with high-grade metamorphism and collisional tectonism.
- The second phase is related to extensional collapse following crustal thickening during Phase I.

The first phase is related to regional crustal shortening associated with high-grade metamorphism and collisional tectonism. The second phase is related to extensional collapse following crustal thickening during Phase I. The shear zone is composed of a variety of metamorphic and igneous rocks, including amphibolites, quartzite, gneiss, and leucogranite.