STRUCTURAL GEOLOGY OF MID-PROTEROZOIC GNEISSES AND GRANITIC ROCKS EAST OF THE ILSE FAULT, WET MOUNTAINS, COLORADO

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Mid-Proterozoic amphibolite-grade biotite-hornblende gneisses are intruded by several generations of granitoids in the Wet Mountains, east of the Ilse Fault. NW- to WSW-striking foliations in isoclinally folded migmatitic gneisses characterize the rocks between South Hardscrabble Creek and Locke Park. Mineral lineations plunge generally downdip to the NE or NNE, with some subhorizontal E-W lineations also measured. Axial surfaces of folds broadly parallel foliation and hinge lines of folds coincide with lineations, suggesting that folding and tectonic lineation developed during the same event. Kinematic shear sense interpreted from mesoscopic textures associated with lineation is top-to-SW. A later, down-to-NE extension crenulation developed locally. Static mineral recrystallization textures overprinted the gneissic fabrics throughout the study area.

Fabrics within a broad shear zone (Newlin Creek shear zone) in gneissic granodiorite broadly parallel fabrics in host gneisses. The granodiorite resembles the Boulder Creek pluton, found north of the study area. It contains foliated xenoliths of biotite gneiss. The snear zone is truncated by fine-to-medium-grained granite with weak to moderate foliation. Granite bodies and sills also cut gneissic foliation and segregation layering throughout the study area. At intrusive margins, included blocks of granodiorite or biotite-hornblende gneiss country rocks show wispy foliation, irregular passive folds, and ghost-like textures indicative of high temperature assimilation. Thermal metamorphism induced by the intrusive bodies may have been responsible for the observed regional textural overprint.

The area is being studied by a Keck undergraduate research group to address questions of rock protoliths, structural evolution, and tectonic setting. The significance of the Wet Mountains study area is that it lies within a transitional zone bounding terranes of Yavapai and Mazatzal affinity within the accreted crust of Colorado.