Abstract:

CRUSTAL EVOLUTION AND AGE RELATIONSHIPS IN AN ARCHEAN HIGH GRADE GNEISS TERRANE, WET MOUNTAINS, COLORADO

ASH, Amanda W., Dept of Geology, Amherst College, Amherst, MA 01002, awash@amherst.edu; SIDDOWAY, C.S., and NOBLETT, J.B., Dept of Geology, Colorado College, Colorado Springs, CO 80903

The ~ 1.7 Ga Archean suite of the Wet Mountains in south central Colorado is a ductilely deformed, high-grade gneiss terrane with a pervasive planar fabric. In a six km^2 area on the easternmost flank of the core of the Wet Mountains, we have identified the following units, in order of abundance: (1) a regionally dominant, commonly migmatitic, pink quartzo-feldspathic gneiss with garnet-bearing and augen-rich phases; (2) a biotite-amphibole gneiss (with >10% quarts); (3) a grey, quartz-biotite gneiss with rare Sillimanite-bearing and more common augen-rich phases; (4) an amphibolite containing <10% quartz (and distinguished from the biotite-amphibole gneiss on that basis). Unit thicknesses vary from tens of meters to millimeters and in many places units are intimately interlayered and not mappable as separate lithologies. This character is attributed to multiphase deformation, based on observations of isoclinal folding in all units and high strain zones most common in the grey, quartz-biotite gneiss. The grey quartz-biotite gneiss and the biotite-amphibole gneiss exhibit no mutual cross-cutting relationships and are therefore believed to be cogenetic. A sedimentary protoliths is hypothesized for both of these lithologies owing to their high silica content and major and trace element geochemistry; an igneous protoliths is postulated as the source of the less abundant amphibolites. The pink quartzo-feldspathic gneiss occurs in both concordant and discordant bodies, which, with related meta-pegmatites and meta-aplites, cross-cut all other units. This relationship indicates a granitic protoliths for the pink, quartzo-feldspathic gneiss and its younger relative age.