

Presentation Time: 9:00 AM-1:00 PM

NEW GEOLOGIC MAPPING IN THE ARCTIC D-1 SW and NW 7.5' QUADRANGLES, NORTHEASTERN BROOKS RANGE, ALASKA

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Establishing the Paleozoic tectonic setting of the northeastern Brooks Range is critical to understanding the timing and transition from an active to passive margin setting in Arctic Alaska. Previous mapping in the Arctic 1:250,000 Quadrangle (Brosgé et al., 2001) revealed unnamed Paleozoic volcanic rocks and clastic units that are key to constraining this tectonic evolution. New mapping results improve characterization of the stratigraphic and structural relationships in this sequence exposed in the Arctic D-1 SW and NW Quadrangles. We identify informal units: the Devonian Double Mountain complex, which includes a felsic, mafic and shale member, and the Mississippian Chandalar unit.

The felsic member of the Double Mountain complex is exposed in a bimodal volcanic center that dominates the central portion of the map area. Lithologies include metamorphosed rhyolitic crystal tuff and massive rhyolite with local flow banding and/or columnar jointing, and volcanoclastic layers. Brosgé et al. (2001) mapped a Devonian rhyolite unit 'Dr' distinct from other volcanics, 'PzV'. We observed that these Dr units reflect intense quartz-sericite-pyrite alteration rather than a distinct protolith and thus abandon use of the Dr unit. The mafic member consists of dikes and sills within the complex. The shale member includes chlorite-rich phyllite and mudstone interbedded with thin layers of lithic arenite and wacke. The informal Chandalar unit overlies the complex on a prominent angular unconformity and includes interbedded lithic (chert) arenite and wacke, shale, siltstone, quartz arenite, and minor polymictic conglomerate. The Double Mountain complex and Chandalar unit are structurally overlain by the Kayak Shale and Lisburne Group. The Brookian thrust fault separating these units defines a shallowly plunging antiform with the volcanic and clastic units exposed in a structural window. This implies that the Endicott Mountain Allocthon (EMA) thrust sheet is more far-travelled here than previously thought, and the frontal EMA thrust likely terminates in the Arctic D-1 NW quadrangle rather than in Arctic D-1 SW quadrangle. Additional field mapping and geochronologic and geochemical analyses will help establish the magmatic setting of the Double Mountain complex and test links to adjacent Arctic terranes.

Session No. 100--Booth# 119

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