

# 109-5 - NEW GEOLOGIC MAPPING OF THE PHILLIP SMITH MOUNTAINS A-1 NW 7.5' QUADRANGLE, CENTRAL BROOKS RANGE, ALASKA



Monday, 16 October 2023



8:00 AM - 5:30 PM



*Hall B (2, David L Lawrence Convention Center)*

## Booth No. 247

### Abstract

Geologic mapping in the Phillip Smith Mountains A-1 NW 7.5' quadrangle conducted under the auspices of the EDMAP program was completed to evaluate the stratigraphic and structural history of Devonian–Mississippian sedimentary units assigned to the Endicott Mountains allochthon in the central Brooks Range. Primary units in the map area include the Skajit Limestone, Beaucoup Formation and Hunt Fork Shale. The Upper Devonian (Frasnian) Beaucoup Formation includes repeating sections of black shale, quartz arenite, carbonate and chert pebble conglomerate and discontinuous limestone. Contact relationships between the Beaucoup Formation and thick limestone layers previously assigned to the Skajit Limestone remain uncertain. The Upper Devonian (Frasnian–Famennian) Hunt Fork Shale is dominated by black shale with minor thin (<5 cm) interbeds of quartz arenite. The Hunt Fork appears to depositionally overlie the Beaucoup Formation, although the contact is generally sheared. Both units are intruded by mafic dikes and sills of probable Devonian age.

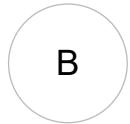
All units exhibit cleavage that is axial planar to outcrop-scale folds. Phyllitic shale and siltstone units have a slaty cleavage, whereas thicker sandstone, limestone and mafic intrusive units have a spaced cleavage. Folds in Beaucoup limestone vary from open upright to tight overturned with a north-vergent asymmetry. Cleavage-bedding relationships in clastic rocks throughout the area are consistent with north-vergent folding. Shallowly (<20°) south-dipping limbs are most common but separated by small domains characterized by moderately to steep (40–80°) south-dipping overturned bedding. Deformation is interpreted to reflect Mesozoic Brookian thrusting; there is no field evidence for earlier deformation. The structurally highest units in the southeast corner of the map area include the Carboniferous Kayak Shale and Lisburne Group, which rest in thrust contact on the Hunt Fork Shale. Extensional deformation is recorded by a northwest-striking normal fault that offsets units and contractional structures across the map area. New geochronological and geochemical analyses will help refine regional correlation of the Beaucoup Formation and Hunt Fork Shale and evaluate the tectonic setting of Devonian units of the Arctic Alaska terrane.

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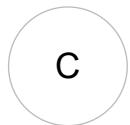
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