GEOLOGIC MAP OF THE SOUTH-CENTRAL SAGAVANIRKTOK QUADRANGLE, NORTH SLOPE, ALASKA

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Detailed inch-to-mile bedrock geologic mapping, stratigraphic studies, and interpretation of subsurface data in the east-central North Slope foothills provide new insight into stratigraphic evolution and structural style of an otherwise poorly understood area.

Mapping and related stratigraphic studies resulted in the documentation of mappable, northeast prograding, transgressive-regressive cycles within the Campanian-Paleocene Prince Creek-Schrader Bluff-Canning sequence. Canning Formation turbidites identified west of the Toolik River are the westernmost surface exposure of these strata. The Canning Formation at the Toolik River is overlain by a terrestrial lower tongue of the Prince Creek Formation (newly identified in the map area) that thins eastward into marine middle Schrader Bluff Formation east of the Toolik River. The lower tongue of the Prince Creek Formation (elsewhere the middle Schrader Bluff Formation) is separated from the overlying upper Schrader Bluff Formation by a shaley interval which represents a regional Campanian transgressive flooding event prior to the northeastward progradation of the younger part of the Prince Creek-Schrader Bluff-Canning sequence. This shaley interval can be correlated between surface exposures and the subsurface throughout the map area.

Outcrop exposures in the map area are sparse due to abundant Quaternary cover, however new integration of subsurface information and bedrock mapping shed light into the lateral continuity of regional faults and folds in the area. Most of the faults in the map area lack a significant surface expression, although they result in hangingwall anticline-footwall syncline pairs which sometimes display small scale faulting and parasitic folding near their cores. The new mapping has improved our understanding of fold geometry, including the recognition of progressive changes in the trend of fold axes, perhaps related to the age of contractional deformation. Furthermore, we were able to document significant variability in the plunge of some large anticlinal structures, a key component in evaluating hydrocarbon trapping mechanisms.

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