

## **Middle-Upper Triassic Shublik Formation: Surface to Subsurface Correlation within a Revised Sequence Stratigraphic Framework**

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### **ABSTRACT**

Recent work on cores and outcrops of the Middle - Upper Triassic Shublik Formation has facilitated surface to subsurface correlations across the Alaska North Slope within a revised sequence stratigraphic framework. Five stratal packages have been identified and interpreted to represent five transgressive-regressive sequences, each of which ranges in duration from 6 - 10 million years. Each of the five sequences generally consists of a thin (~2.5 m) transgressive systems tract that exhibits a 'bell shape' log motif with an abrupt base and an upward trend of increasing gamma-ray values overlain by one or more progradational parasequences within the regressive systems tract, each of which exhibits a 'funnel shape' log motif with an upward trend of decreasing gamma-ray values and an abrupt top. Maximum flooding surfaces are commonly associated with the highest gamma-ray values within a sequence. Outcrop spectral gamma-ray profiles from the eastern Brooks Range were used to correlate observed stacking patterns into nearby exploration wells. Petrophysical log data from 123 wells were used to conduct a regional correlation of the Shublik Formation. Fourteen wells with cored intervals within the Shublik Formation were identified to corroborate regional correlations. Isochore maps constructed for each sequence illustrate the influence of paleohighs on Shublik Formation depositional patterns, and suggest the timing of reactivation of several older tectonic elements during Shublik deposition. Middle Triassic isochore maps show the development of localized depositional thickening within an embayment bounded by the Barrow and Colville highs, along with southward thickening off of the Mikkelsen High. This depositional pattern persisted until the middle of the Late Triassic, during which accommodation decreased in the embayment and large amounts of sediment were routed to and accommodated in the Ikpikpuk and Meade basins, and between the Fish Creek Platform and Mikkelsen High. These depocenters suggest reactivation of the Fish Creek Platform, Ikpikpuk Basin, and Meade Basin during the Late Triassic. The broad thickening around Point Barrow during the Late Triassic may reflect initial sediment influx from rift shoulder uplift to the north, and foreshadow a similar thickening in the lower part of the overlying Jurassic Kingak Shale.