

Outer-Shelf to Upper Slope Storm Deposits in the Tingmerkuk Sandstone (Neocomian), Western North Slope, Alaska

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In the western De Long Mountains, a 103-meter thick regressive succession of Valanginian to Barremian age quartzose sandstone and black shale, referred to as the Tingmerkuk sandstone, rest with apparent conformity above the Kingak Shale. The Tingmerkuk is coeval with the Kuparuk River Formation in the subsurface of the NPRA. At the type locality on Tingmerkuk Mountain, the upper 30 meters of Kingak is Berriasian to Valanginian and comprised of black shale with thin interbeds of horizontal, wavy, and wave and current ripple cross laminated sandstone. Sandstones in the Tingmerkuk are very fine to fine grained, thin to thick bedded, sharp-based, and the undersides of many beds include *Planolites* and groove casts. Sedimentary structures include horizontal laminae, wavy laminae, small-scale hummocky cross stratification, wave and current ripple cross lamination, wave ripple bedforms, and convolute lamination. The following vertical sequence was observed in many sandstone beds: basal scour surface \pm *Planolites* and groove casts, horizontal lamination, wavy parallel lamination or hummocky cross stratification, wave and current ripple cross lamination, and wave ripple bedforms. Stratification sequences in sandstone beds are commonly disrupted by convolute lamination. The thickness of sandstone beds, sandstone:shale ratio, and textural maturity progressively increase upsection through the Tingmerkuk sandstone. Sedimentary structures preserved in sandstone beds in the upper Kingak and throughout the Tingmerkuk, and foraminifera recovered from both units, suggest deposition as tempestites above storm wave base in an outer shelf to upper slope setting. Limited paleocurrent data suggest eastward transport from a westerly source. The source terrane for the Tingmerkuk may have been the Chukchi platform.