

Assessing the influence of clinoform geometry and shoreline position on deposition of sandy turbidites within the Cretaceous Torok Formation, National Petroleum Reserve-Alaska

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Seismic, well log, and core data from the Torok Formation in the National Petroleum Reserve-Alaska provide an excellent opportunity to study the sedimentation processes associated with the construction and migration of large, shelf-edge clinoforms. Using data compiled by and made available through the United States Geological Survey we have begun interpreting controls on the occurrence of sandy turbidites in clinoforms of the Torok Formation. Core and logs from multiple wells reveal these sandy deposits occurring in two distinct positions on clinoforms, above and below the point of maximum curvature separating foreset from bottomset strata. We are interested in determining whether the turbidites present on the steepest sections of clinoforms represent updip extensions of thicker turbidite packages deposited on bottomsets, or whether the two represent separate depositional systems. Separate systems imply no necessary connectivity between the sandy beds on the steeply dipping foresets versus bottomsets of clinoforms. Bed thickness, sedimentary structure and grain size data from Peard 1 and Tunalik 1 are interpreted as being most consistent with deposition from turbidity currents that decelerated with movement downslope, laying down tapered deposits that pinched out before reaching the bottomsets. On the other hand, bed thickness, sedimentary structure and grain size data from Inigok 1 and Ikpikuk 1 wells are interpreted as being most consistent with deposition from turbidity currents that accelerated down foresets, depositing sand only on the toes of clinoforms. We will explore the control of clinoform geometry and shoreline position on the occurrence of one depositional pattern versus the other. Core from coastal plain and shallow marine deposits of the Nanushuk Formation will be used to constrain possible initial conditions for the turbidite systems.