

DETAILED SEDIMENTOLOGIC AND SEQUENCE STRATIGRAPHIC ANALYSIS OF THE UPPER CRETACEOUS TUNUNK SHALE MEMBER OF THE MANCOS SHALE FORMATION, HENRY MOUNTAINS REGION, UTAH

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ABSTRACT

Lower-Middle Turonian strata of the Tununk Shale were deposited along the western margin of the Cretaceous Western Interior Seaway during the Greenhorn second-order sea level cycle. However, the presence of multiple cyclic coarsening-upward successions (parasequences) within the Tununk Shale in outcrops indicates that higher-frequency sea level fluctuations are superimposed on the second-order Greenhorn cycle. In this study, 3 stratigraphic sections with detailed sedimentologic observations will be measured near Hanksville, Utah, in order to document detailed facies characteristics and variations within the Tununk Shale. Within each section, sedimentological data including lithology, grain-size, bedding thickness, sedimentary structures, paleocurrent direction, bioturbation characteristics, and amount and types of fossil fragments will be documented to describe the lamina/bed-scale variations in physical and biologic attributes. Relatively unweathered samples will be collected for detailed facies description on polished slabs, petrographic analysis in thin sections, and SEM analysis.

Detailed facies analysis will help fully understand the vertical stacking patterns of parasequences and how they vary laterally and build into depositional sequences. Results from petrographic studies will then be incorporated into the developed sequence stratigraphic framework. Petrographic composition and texture of mudstones can reveal important information, such as provenance, climate of their source region, sedimentation rate, and energy conditions during deposition. This information will help tease out the dominant controlling factors (e.g. eustatic sea-level change, tectonism, and climate change) which produce the observed high-frequency sea level cycles. On that basis, a source-to-sink system and a genetic model of mudstone deposition can be developed.