

# Sequence Architecture of Marginal Marine Strata of the Jurassic Sundance Formation in the Black Hills Region, Wyoming and South Dakota

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The Late Jurassic Sundance Formation was deposited in a shallow epicontinental seaway associated with the subduction of the Pre - Farallon slab under the western margin of North America. The sediments deposited on the eastern passive margin of the seaway are exposed in the Black Hills in northeast Wyoming and western South Dakota. Previous investigations of the Sundance have focused primarily on the lithostratigraphic correlations of the unit. We apply sequence - stratigraphic principles in correlation of geophysical well log data and outcrop measured sections to establish a chronostratigraphic framework for the Sundance shallow marine facies. Nine detailed measured sections were described from the Sundance in the Black Hills. Preliminary observations indicate basal lowstand deposits are represented by the Canyon Springs Member. The overlying Stockade Beaver Creek Member is interpreted to represent the transgressive to early highstand systems tracts. The maximum flooding surface lies above the retrograding succession of the Stockade Beaver Creek Member and late highstand to lowstand deposits are interpreted as the locally massive Hulett Member. The Lak and Redwater Shale Members that overlie the Hulett are mudstones that contain Belemnites indicating another marine transgression. Analyses of facies distributions in this study area suggest that published shoreline configurations on the eastern margin of the basin need revision, or that a detached lowstand deposit lies west of the published paleoshoreline. The correlation of these strata provides a more detailed interpretation of the depositional framework of this unit.