EVOLUTION OF PALEOHYDROLOGY AND DEPOSITIONAL PATTERNS IN A DESERT ERG: RESOLVING REGIONAL-SCALE STRATIGRAPHY OF THE JURASSIC NAVAJO SANDSTONE, CENTRAL UTAH

Peter Steele
University of Utah, Geology & Geophysics, Salt Lake City, UT, USA
peterarthursteele@gmail.com

ABSTRACT

The eolian Jurassic Navajo Sandstone represents the largest erg to have existed on Earth. Despite the record of a vast dry desert, this prominent formation also contains distinctive surfaces and limestones that indicate periods of high-water table conditions. This research will examine the west-east basinal extent of lithofacies. Specifically, I will link stratigraphy between the established Navajo erg-center in southwestern Utah and the thin erg-margin in eastern Utah by examining intermediate localities in the San Rafael Swell of central Utah near Justensen Flats. The hypothesis of this study is that high-water table features are most concentrated in the eastern extent and at lower stratigraphic intervals, as predicted by an eastern Uncompahgre Uplift hydrologic catchment. The objectives to test this hypothesis are to 1) resolve regional-scale stratigraphic stacking patterns, 2) determine vertical changes in paleoclimate proxies, and 3) reconstruct bed-formation processes. This research will utilize direct field measurements, laboratory analyses, and model visualizations to reconstruct spatial stratigraphic variability in the Navajo erg deposition. Field studies will document detailed stratigraphic and sedimentological characterizations of the Navajo complex where it transitions towards the erg center. Analyses will enable synthesis of cross-sectional internal stratigraphic stacking, to reconstruct paleohydrology and paleoclimate through the vertical evolution of the basin deposition. This will culminate in determining whether there were substantial changes in groundwater and fluvial transport across the Navajo desert during early wet-eolian phases that transitioned into a drier erg through time.

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