40-3 - Booth No. 155: INTERDUNE DEPOSITS AND STRATIGRAPHIC FRAMEWORK OF THE NAVAJO SANDSTONE IN THE LAKE POWELL AREA, UTAH, USA

Sunday, September 22, 2024

8:00 AM - 5:30 PM

Hall D (Anaheim Convention Center)

Booth No. 155

Abstract

The Western Interior of the USA was dominated by desert environments for much of the Jurassic. Of these desert environments, the most extensive by far was the Navajo Sandstone erg, which, in conjunction with its correlative Nugget and Aztec Sandstones, is thought to have covered well over 500,000 km^2, and is one of the largest ergs preserved in the rock record. The Navajo Sandstone is also one of a few geologic units which show promise as a potential CO_2 sequestration reservoir in Utah. It outcrops along the eastern and southern margin of the state, and subcrops throughout most of the central area.

The Navajo Sandstone consists of stacked eolian deposits, composed of well sorted, clean sandstone, deposited in commonly tabular, high angle cross bedded paleodunes, which are on average 15 m thick. Interspersed between these paleodunes are interdune deposits. Interdune deposits consist of sandy to calcareous, predominantly planar bedded, lensoid units, ranging from <1 m up to 7 m thick. In some cases, these interdune deposits occur along more extensive stratigraphic bounding surfaces. Dating within the Navajo Sandstone has historically been very difficult, as a result of its predominantly clean, aeolian sandstone composition. In addition, complexity of internal stratigraphic surfaces coupled with a low structural dip and generally flat topography has resulted in a poor understanding of the internal stratigraphy of the Navajo Sandstone. Exceptional three-dimensional exposures of the Navajo Sandstone in the upper portions of Lake Powell permit us to relate interdune carbonates to a hierarchical bounding surfaces model. Here we use this combined approach to interpret the internal stratigraphy of the Navajo Sandstone in this region. This work forms part of a larger study of the Navajo Sandstone across Utah and its potential as a CO2 reservoir, by developing a more comprehensive stratigraphic framework, and increasing understanding of stratigraphic complexity within one of the most significant eolian systems in the world.

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