Mesozoic Deserts and CO_2 Storage: The Glen Canyon Group, Utah, USA

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Abstract

For much of the Mesozoic an extensive desert environment extended across the Western Interior of the USA. These desert systems deposited vast dunefields, including one of the largest ergs preserved in the rock record. The Glen Canyon Group in Utah is a Triassic-Jurassic aged aeolian succession, consisting of thick, laterally extensive aeolian dune deposits, interdune lakes and oases, and dryland fluvial systems. These aeolian deposits have been identified as potential CO_2 sequestration reservoirs. The Jurassic-aged Navajo Sandstone has been the subject of research into its potential as a CO_2 reservoir, as well as naturally occurring CO_2 seeps in the Green River area. It has excellent reservoir properties, consisting of thick sandstones with high porosity and permeability, and has industry data including well logs and core. It occurs in both outcrop and subcrop, allowing for comparison and sense checking of interpretations across small and large scales. The Triassic Wingate Sandstone has received much less attention, however it too is composed of thick aeolian dune deposits. Like the Navajo Sandstone, the Wingate Sandstone has industry data, and occurs in both outcrop and subcrop. Using extensive industry data which exists across Utah is an effective way to pivot from a hydrocarbon focus to CO_2 injection, and so contribute to green energy and carbon neutral emission goals. Here we use historic industry data in conjunction with field work, to study the Navajo and Wingate Sandstones and their potential as CO_2 reservoirs, in addition to increasing our understanding of lithologic and stratigraphic complexity in one of the most significant aeolian systems in the world.