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Preliminary Correlation and Isopach Map of Navajo-Aztec-Nugget Sandstones, Western United States

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Preliminary Correlation and Isopach Map of Navajo-Aztec-Nugget Sandstones, Western United States

Lower and middle Jurassic sandstones across western North America were correlated using stratigraphic thickness and lithofacies data obtained from the AAPG-produced Correlation of Stratigraphic Units of North America (COSUNA) data charts and spreadsheets. An isopach map and a series of stratigraphic cross-sections were created to display the lateral and horizontal extent of the correlated formations. The goal was to determine lateral equivalents of the primarily lower Jurassic Navajo Sandstone from Utah, Arizona, and Colorado. The Nugget Sandstone of Wyoming, Utah, and southern Idaho, and the Aztec Sandstone of southeastern California and southern Nevada were determined to be laterally equivalent to the Navajo. Both sandstones were primarily lower to middle Jurassic, but outcrops in southern California extended into the upper Triassic. One unnamed upper Triassic quartzite bed in southern California may also have been an equivalent of the Aztec Sandstone. The sandstones were primarily underlain by a shaley or silty mudstone, with the exception of the Aztec in California, which was underlain by a volcanic bed in some outcrops. Similarly, silty or shaley mudstones overlaid the sandstones, with rare occurrences of the Twin Creek Limestone in southern Wyoming and northern Utah, and a volcanic ash bed in southern California. The Navajo was the most recognizable of the sandstones; however, all of the sandstones were determined to be lithostratigraphically equivalent, although diachronous in age. Thicknesses of the sandstones ranged from 5 meters (Nugget) in northern Wyoming to 1400 meters (Aztec) in southern Nevada, with an average thickness of around 381 meters. The correlated sandstones cover an area of approximately 446,000 km². The Navajo has generally been accepted as an eolian erg; however, given the thickness and lateral extent of the formation, which exceeded the 30 meter average thickness for modern eolian erg deposits, the depositional environment of the Navajo Sandstone should be reevaluated.