

Sequence Stratigraphy and Diagenesis of the Short Creek Oolite Member, Keokuk Limestone, Kansas and Missouri.

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This study investigates deposition and diagenesis of oolitic and crinoidal carbonates deposited on a Mississippian (late Osagean and early Meramecian) distally steepened ramp in Kansas and Missouri. Field and petrographic observations identify three major units. Lower and upper units consist of bioclastic wackestone, packstone and grainstone, whereas middle units consist of oolitic grainstone. Units in the south were never subaerially exposed immediately after oolite deposition, but the middle unit (oolite) in the north was subaerially exposed. Oolitic sediments to the north have meniscus and pendant cements that must have precipitated during subaerial exposure immediately postdating deposition because these cements are not present within overlying rocks. Syntaxial overgrowths around crinoid fragments precipitated during late Mississippian subaerial exposure events, and an equant/blocky cement occluded remaining pore space during Pennsylvanian time or later. Early, syntaxial overgrowth cements have non-luminescent and slightly- to brightly-luminescent zoned cements whose alternations repeat up to 7 times. $\delta^{18}\text{O}$ values (‰ VPDB) of early, zoned cements are between -8.20 and -4.55 , and $\delta^{13}\text{C}$ values (‰ VPDB) between -0.15 and 3.44 . Combining Tm ice measurements and overlain cathodoluminescent and plane polarized light photomicrographs, the origin for these early, zoned cements has been discovered. Tm ice measurements from primary, all liquid inclusions from -3.0 to -2.0 ° were likely precipitated from slightly saline waters. Measurements from -1.2 to -0.1 °C were precipitated from mixing zone waters, whereas measurements of 0.0 ° were precipitated from meteoric waters. No measurement of -1.9 °C (probable seawater) has been documented. Tm ice measurements from pendant cements are 0.0 °C.