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### **3rd-Order Subtidal Sequences in the Upper Ordovician Montoya Group, New Mexico and West Texas: A Record of Global Glaciation?**

The Upper Ordovician Montoya Group is a composite 2nd-order supersequence composed of five 3rd-order depositional sequences dominated by subtidal facies. Sequence 1 consists of transgressive burrow-mottled skeletal sandstone and wackestone/packstone (Cable Canyon Sandstone and Upham Formations) overlying the regional unconformity atop the Lower Ordovician El Paso/Ellenburger Group. The HST of Sequence 1 consists of crinoidal skeletal packstone/grainstone. Phosphate (up to 5% by volume) in this sequence occurs as replacement of skeletal grains, pellets or coating abundant hardgrounds. Sequence 2, encompassing the lower Aleman Formation. The TST of Sequence 2 consists of interbedded, even-bedded dolosiltite or dolomudstone and chert (up to 70% by volume). The HST of Sequence 2 consists of cherty skeletal packstone. Sequence 3 occurs within the upper Aleman and lower Cutter Formations. The TST of Sequence 3 consists of interbedded dolomudstone or dolosiltite and chert (up to 50% by volume). The Sequence 3 HST consists of cherty skeletal wackestone/packstone overlain by burrowed and laminated dolomudstone. Sequence 4 in the Cutter Formation consists of a thin TST of skeletal packstone overlain by a thicker HST of burrowed and laminated dolomudstone. Sequence 5 is only preserved in a few downramp positions and is very similar to Sequence 4. A regional unconformity developed during the Latest Ordovician and Early Silurian as water drained from the continent during global glaciation. The abundance of spiculitic chert and phosphate in the Montoya indicates extensive upwelling, likely produced by glacially induced heat transfer, developed in this area throughout the Late Ordovician. 4th- and 5th-order subtidal and peritidal parasequences developed in the supersequence but are not correlative regionally.