
Latest Pleistocene 'Blue Unit' of the Mississippi Fan System, Gulf of Mexico

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GCAGS Explore & Discover Article #00098*

http://www.gcags.org/exploreanddiscover/2016/00098_bjerstedt_et_al.pdf

Posted September 13, 2016.

*Article expanded from an abstract published in the *GCAGS Transactions* (see footnote reference below) and delivered as an oral presentation at the 66th Annual GCAGS Convention and 63rd Annual GCSSEPM Meeting in Corpus Christi, Texas, September 18-20, 2016.

ABSTRACT

Shallow water flow events in the central Gulf of Mexico that have caused drilling complications define the approximate areal extent of an Upper Pleistocene fan-channel sequence termed the 'Blue unit' by shallow geohazard interpreters in the Mississippi Canyon protraction area. Mapping on 3D time volumes has established that the Blue unit can be traced throughout the Mississippi Canyon, Atwater Valley, DeSoto Canyon, and Lloyd Ridge protraction areas. The Blue unit is a low-stand system deposited during the Wisconsin glaciation (marine isotope stage [MIS] 4) approximately 71 kya. It is interpreted with a lower canyon-cutting facies, and an upper sheet sand facies deposited in the channel and in ponded overbank areas formed between salt diapirs.

A deep canyon was cut in the shelf edge during the MIS 4 low stand with the knick-point centered on the South Pass Southeast Area. The canyon trends south-southeast and was apparently diverted east-southeast by rising salt diapirs. Where the Blue unit is present near the modern Mississippi Canyon it is less organized and dominated by mass transport deposits. Here it is also highly deformed by salt diapirism and erosional beheading by younger channel systems.

Erosion and canyon incision in northwestern Mississippi Canyon grades eastward into a fan system deposited on the basin plain. Farther southeast in the Elbow area of the eastern Gulf of Mexico to the current limit of 3D data coverage the Blue unit can be genetically linked to a well-organized meandering channel-levee system along the toe of the Florida Escarpment. Abandonment of the meandering system resulted from sea level rise at MIS 2 (29 kya) and updip channel avulsion that diverted sediment to create younger channel-fan complexes to the southwest, most notable of which is the modern Mississippi Fan.

