
3D Visualization and Characterization of a Mississippi River–Scale Deepwater Channel-Levee System on the Basin Plain, Gulf of Mexico

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EXTENDED ABSTRACT

Nearly 2 mi below sea level in the Eastern Gulf of Mexico, a 300+ mi long relict channel-levee system once rivaled the scale of the modern subaerial Mississippi River. The meandering system was first imaged using side-scan sonar in 1987 by the U.S. Geological Survey's GLORIA EEZ-Scan 85 Scientific Staff project, and briefly described by Twitchell et al. (1991). The U.S. Bureau of Ocean Energy Management (BOEM) recently visualized the channel system using modern 3D seismic surveys and state-of-the-art visualization software. Originating out of an ancestral canyon to the northeast of Mississippi Canyon, the meandering system is entrenched between the stacked Mississippi fan complex to the southwest, salt domes to the north, and the Florida Escarpment to the east (Figs. 1 and 2). Due to that constraining architecture, the system developed a nearly perfect linear geometry along the floor of the basin and remains observable on the seabed for approximately 175 mi. An additional 150 mi is fully buried beneath younger Pleistocene turbidite deposits and Holocene slope facies. Regional mapping of this system has established it as part of the "Blue Unit," a well-known shallow mapping unit in the Mississippi Canyon leasing protraction area.

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