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Hydrocarbon production and subsurface expression of the China segment of the Tepetate Fault Zone, Louisiana

The China Segment is a portion of the Tepetate Fault Zone that traverses St.Landry, Acadia, and Jefferson Davis parishes. It is part of the larger Baton Rouge-Tepetate Fault System that is a major down-to-the-basin growth fault zone that traverses the northern portion of south Louisiana. This fault system exhibits syndepositional growth in the late Eocene and Oligocene periods with surface fault-line scarps and floodplain deformation indicating movement during Pleistocene and Holocene. The Baton Rouge Fault Zone comprises the eastern and central portion of the fault system, the Tepetate Fault Zone comprises the western portion and presents a more complex, sinuous, and segmented trace in the subsurface.

The China Segment exhibits surface expression consisting of a series of scarps that comprise the China fault-line scarp. The fault-line scarps exhibit displacement ranging from 1.5 to over 3 meters. These scarps offset the surface of the Prairie Alloformation and associated abandoned river channels indicating reactivation and movement during the Pleistocene. Deformation of flood plains, where crossed by the trace of Tepetate Fault Zone, demonstrates Holocene fault movement.

Eight named hydrocarbon producing fields associated with the China Segment have cumulative production of 106 MMBO + 410 BCFG. Producing structures are predominately fault generated rollover anticlines. The China Segment is also recognized as a barrier to freshwater flow in regional freshwater aquifers. The affect of fault reactivation on hydrocarbon entrapment and freshwater resources is uncertain.