
Fault-Related Reservoir Compartmentalization in the Oligocene Vicksburg Formation, Brooks County, Texas

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GCAGS Explore & Discover Article #00321*

http://www.gcags.org/exploreanddiscover/2018/00321_crowe.pdf

Posted September 29, 2018.

*Article based on an abstract published in the *GCAGS Transactions* (see footnote reference below).

ABSTRACT

Growth faulting, in passive rift margins, is common as continuous sedimentation results in subsidence due to overburden pressure. Formations can slip along the glide plane of the depositional strata, causing a series of normal faults extending basinward. As deposition persists, these growth faults migrate basinward as sediment deposition progrades. Over time, as the faulting accumulates running roughly parallel to the shoreline, there exists a potential for isolation of portions of what once was a continuous reservoir. These compartmentalized portions of the reservoir may contain pressures which are completely different from those of other parts of the reservoir. This suggests that these compartments are completely isolated from one another.

In the Gulf of Mexico Basin, various siliciclastic layers, including the Oligocene Vicksburg Formation, yield environments which have large fault offset and juxtaposition of reservoir quality and non-reservoir quality rocks, which could allow compartmentalization of reservoirs. An understanding of the behavior and potential for accumulation of isolated reservoirs in siliciclastic depositional environments could yield greater recovery of hydrocarbon and other fluids accumulated within compartmentalized reservoirs. In order to determine how the potential of growth faulting to restrict fluid flow, a knowledge of the properties which determine the fault's ability to restrict the movement of fluids is crucial.