Major Hydrocarbon Generation in the Northern Gulf of Mexico Apparently Resultant of Interactions between Mantle, Lithosphere, Sedimentosphere, and Hydrosphere

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From planetary center to outermost extent of planet Earth, there are eight geospheres: core, mantle, lithosphere, sedimentosphere, hydrosphere, cryosphere, atmosphere and biosphere intertwined with several layers. Each geosphere has unique characteristics and boundry zones. The type and extent of boundry interactions is poorly known with ranges from no interaction to bisecting the adjacent geosphere. i. e., magma from mantle bisecting the lithosphere,

Relative to interactions between mantle, lithosphere, sedimentosphere, and hydrosphere, there are subduction zones. Subduction may be a large input into evolution of the northern Gulf of Mexico. Continental rifting commenced with the North Atlantic Basin opening. Mantle plume inputs occurred. Rift-related exumation of peridotites which, along with water,yielded serpentine and produced methane, initiating a hydrocarbon system. Subducted of then (cool) Farallon Plate slab from the Pacific Basin beneath Mexico could have its termination "under" the Gulf itself, creating a mechanism for basin-deepening and enhanced sediment accumulation. Compression from east of Yucatan Peninsula suggests at least underthrusting beneath the Peninsula. Early Gulf rapid rifting and sedimentation produces extension along all of basin flanks. Such extension facilitates normal faulting which permits fluid transmission between sedimentary wedge and basement.

As here presented, early basement/lithosphere has been made more heterogeneous and mechanically weakened. These suggested geologic complexities may modify basin-development and temperature-pressure regimes within the sedimentary wedge and basement. Thus, consideration of geosphere-interactions with evolving basement and sediment complexities could provide basin-spanning background geologic heterogeneity influencing the actual generation of hydrocarbons.