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**An Integrated Framework For the Understanding of the Petroleum and Reservoir Systems in the Mars-Ursa Basin:  
Deep-Water Gulf of Mexico**

Unraveling the structural evolution of the Mars-Ursa Basin, especially defining areas of salt inflation or deflation, is fundamental to understanding the complex interaction between salt movement and sedimentation. This framework provides a context to understand and predict reservoir and hydrocarbon distributions within the basin.

The Late Miocene to early Pliocene sediments of the Mars-Ursa basin can be subdivided into packages of genetically related strata on the basis of their seismic facies. Two major packages are described: 1) high amplitude, laterally continuous reflectors representing sand and 2) low amplitude to opaque discontinuous reflectors representing mass transport complexes or finer-grained deposits. Compensation style deposition is observed within the basin as a result of shifting entry points, transport direction, or accommodation space.

In terms of the hydrocarbon systems, results from a three-dimensional, integrated basin model constructed over the Mars-Ursa Basin indicate that source rock generation began in the mid to late Miocene. Currently, the source rock is likely early to middle maturity in the region of the Mars Field and middle to late maturity in the Ursa Field. Modeling results also suggest that the proximity of sand influenced by topography allows fluids to flow over a large portion of the basin and explains the connectivity in the reservoirs. These results suggest that multiple migration pathways exist from source to trap throughout the basin.