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The Influence of Syndepositional Salt Tectonics on Carbonate Platform Development and Stratal Architecture: Examples of Gravitationally-Driven Extension and Rafting (Aptian-Albian Carbonates of the South Atlantic Basins, Upper Jurassic of the Gulf Of Mexico)

One of the most underestimated factors influencing carbonate platform development and its internal architecture is the role of syndepositional tectonics in the form of local uplift/subsidence related to underlying movement of mobile evaporite lithologies. In many passive margin settings, thick layers of evaporite ('salt') accumulate above the regional break-up unconformity above the syn-rift section, for example the divergent Mesozoic margins of the Gulf of Mexico, west Africa (Angola/Congo) and South America (Brazilian margin). In these Mesozoic examples, widespread carbonates overly these evaporites, for example: (1) the Upper Jurassic Smackover/Buckner/Haynesville ramp carbonate complex of the US Gulf of Mexico rests upon mobile Middle Jurassic Louann salt; (2) the Albian carbonate systems of both west Africa (Congo and Kwanza Basins offshore Angola) and Brazil (Santos Basin) overly thick Early Aptian salt associated with the breakup of Pangaea. Within these systems, numerous examples exist of syn-depositional salt tectonics that was active during the development of the carbonate ramp and rimmed shelf systems. Typically, two modes of salt-influenced activity occurs: (1) pillowing and diapiric uplift of mobile salt can create topographic highs that are favorable sites for carbonate accumulation; (2) gravitationally driven extension and downdip lateral migration of incipient thin carbonate deposits occurs over the mobile salt unit in the form of 'raft tectonics'. In both scenarios, carbonate sedimentation is active while the local substrate is effected by salt-induced uplift, enhanced subsidence, and/or lateral sliding. The common occurrence of such phenomena in many Mesozoic divergent leads to complex facies tracts relations and stratal geometries.