

Salt sediment interaction Offshore Libya: “Where is the Salt?”

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The presence of Messinian evaporites has been interpreted to be widespread across much of offshore Libya, particularly within the Sirt Embayment. However, the presence of mobile halite appears to be restricted to only the westernmost offshore areas of Libya. The age of the mobile halite is interpreted to be Triassic/Jurassic and not related to Messinian evaporate deposition. During 2004-2005, new 2D pre-stack time migrated seismic data were acquired and used to examine the large-scale structural, depositional, and salt tectonic features of the Libyan shelf and slope. The data cover approximately 38,000 line kilometers in water depths ranging from 15 to over 3000 meters.

Some existing models for offshore Libya have interpreted a widespread layer of halite lying at the Messinian unconformity which thickens basinward. This interpretation was probably based on the fact seismic reflection continuity was lost over much of the basin just beneath the unconformity. Recent data and current understanding of salt behavior do not support this interpretation. We interpret the presence of a relatively thin, high amplitude and high velocity, layer of non-halite evaporates (mainly anhydrite) to be associated with the Messinian unconformity. Where this high amplitude and high velocity layer is absent or eroded, seismic continuity below the unconformity is restored.

True halite is interpreted to exist in offshore Libya only in the far west of the Pelagian shelf near the Tunisian border. Beneath the Pelagian shelf are a series of tight contractional folds that we interpret to be salt cored. Basins adjacent to the folds have geometries characteristic of salt withdrawal and true salt diapirs exist just to the west in Tunisian waters. The fold crests were bathymetric highs which served as nucleation sites for nummulitic bank development, major reservoirs on the Pelagian shelf.