

The Geometry and Emplacement History of the Major Allochthonous Salt Sheets in the Central US Gulf of Mexico Slope: A Regional Review

Peel, Frank J.

BHP Billiton Petroleum, Houston, Texas

Abstract

The continental slope of the US Gulf of Mexico is dominated by giant allochthonous salt bodies. Recent seismic interpretation of the whole area on 2D and 3D data has enabled us to make a regional TWT map of the top and base of the major salt sheets, and to make a first-pass pseudo-depth map of the base salt structure. The base-salt structure is a critical tool in the understanding of the nature and evolution of the salt bodies. These form distinct families with different characteristics in different regions. A very large salt canopy underlies most of Garden Banks and Keathley Canyon protraction areas, which formed as a single giant allochthon, fed from the north and glaciating progressively southwards. East of this, there exist several canopy complexes consisting of merged salt tongues with numerous original subcircular feeder stems. These complexes cover most of Green Canyon, Walker Ridge, southern Mississippi Canyon and northern Atwater Valley.

By taking sequential slices through the base allochthonous salt, we have created a movie which gives an impression of the sequential emplacement and spreading of the salt. This shows how the giant salt sheet in the central Gulf of Mexico margin spread progressively southwards, in contrast to the progressive growth and merging of mushroom-like bodies further east. The implications of these different styles for hydrocarbon prospectivity in each area will be discussed.

This movie would show the paleo-extent of salt bodies if the subsalt stratigraphy were uniform and horizontal. To make a true paleogeographic movie, we will need to map the subsalt truncations of numerous mapped horizons.