

Evolution of the Onion Creek Salt Diapir and Related Salt-Withdrawal Minibasin During the Plio-Pleistocene: Analysis of Growth Strata and Progressive Unconformities, Grand County, Utah

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The evolution of salt structures is often difficult to constrain because few are currently active today in easily accessible locations. The Onion Creek salt diapir is an excellent example of a modern salt diapir, well exposed at the surface with a clear minibasin adjacent to it. In addition to a well-exposed flanking minibasin, the Onion Creek salt diapir is small enough to allow a detailed analysis of the surface deformation features, in order to understand its development.

The Onion Creek salt diapir and the adjacent withdrawal basin developed during the Plio-Pleistocene. A general understanding of the evolution of the Onion Creek salt diapir was published over 25 years ago, focused on the older history of the diapir, but more detailed work is required to develop a model of its more recent evolution. By measuring closely spaced, detailed stratigraphic sections to identify subtle syn-tectonic unconformities (created by slight changes in the relief of the diapir and depth of the withdrawal basin) and mapping key horizons, a 3D model of the salt diapir and minibasin are developed. Coupled with age constraints from photo-luminescence dating of quartz grains and isotope age dates of two distinct ash beds, it will be possible to develop a much more detailed model of the diapir and minibasin evolution.

This study illustrates salt-sediment interaction and salt kinematics during salt withdrawal and withdrawal basin evolution. Better understanding of diapir growth and withdrawal basin evolution will potentially aide in locating hydrocarbon traps and reduce risk in drilling operations adjacent to salt diapirs in analogous settings less risky.