

Practical Salt Tectonics: A 2-day Short Course Emphasizing the Geometry and Evolution of Salt Structures

Short Course

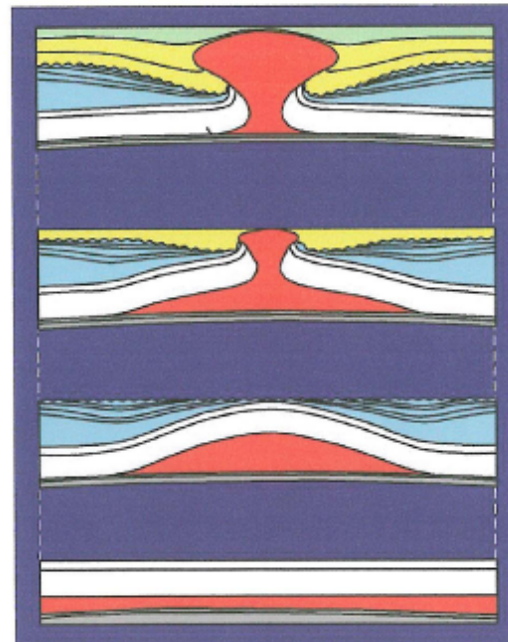
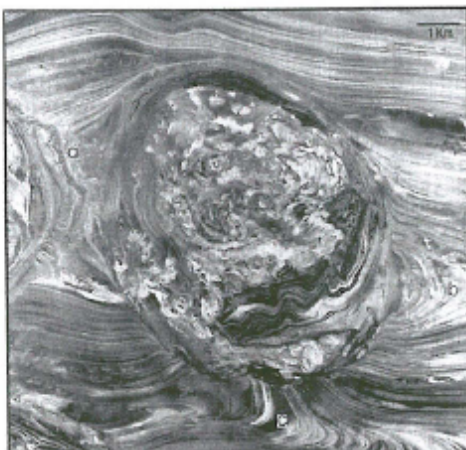
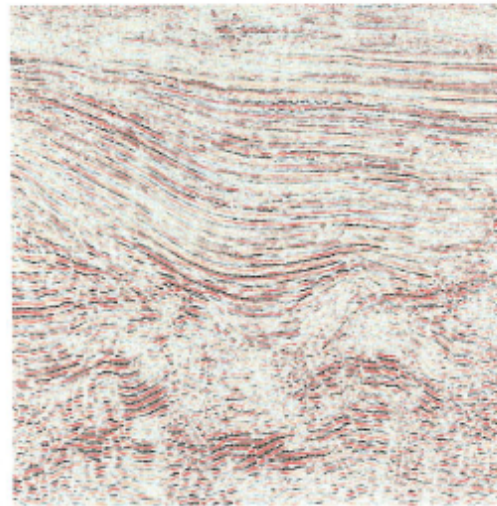
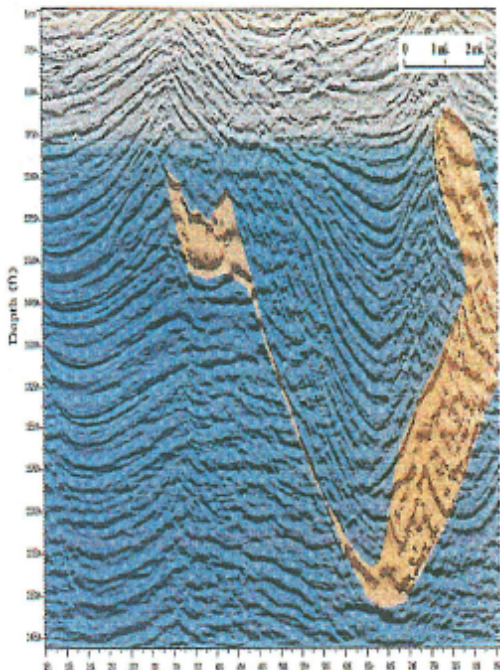
by

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PETROLEUM SOCIETY CIM - HALIFAX SECTION

Oct. 7 & 8, 2002

Halifax, Nova Scotia



There has been an enormous revolution in our understanding of salt tectonics in the past decade (see Jackson, 1995, for an excellent history of salt tectonics research). The beginnings of the revolution date back a little farther within some of the exploration companies, but their ideas only become public starting in about 1989. Our increased

understanding of the geometry & evolution of salt bodies and associated strata is due in large part to the fortuitous convergence of advances in three areas:

1. **Seismic imaging.** There has been a steady improvement in seismic data acquisition and processing over the years. But with the advent of such techniques as pre-stack depth migration, images of salt bodies become much clearer, with improved pictures of the bases of salt sheets and overhangs and the steep flanks of many diapirs (e.g., Ratcliff, 1993).
2. **Experimental and numerical modeling.** Attempts to model salt deformation have been made for many decades (e.g., Nettleton, 1934), but until just recently, both salt and its overburden were modeled as viscous fluids. Starting in the late 1980s, however, B. Vendeville and coworkers started modeling the overburden as a brittle material, more keeping with reality. The results demonstrated salt's more passive role of reacting to rather than causing deformation (e.g., Vendeville and Jackson, 1992a, b) and fundamentally changed the ways most people look at salt deformation.
3. **Structural restoration.** The technique of cross-section restoration was first applied to salt structures in the late 1980s (e.g., Worrall and Snelson, 1989). In the past decade, numerous people have used restoration to reconstruct the history of salt movement and associated deformation of surrounding strata.

In this course we will concentrate on the new ideas about salt tectonics. Many of the illustrations used here are examples of the three areas of advance listed above. Much of the work has been concentrated in the northern Gulf of Mexico, but the impact of the advances has spread to salt basins worldwide. Thus, we will also examine the geometries and structural styles of salt from such places as the North Sea, the Berents Sea, the Red Sea, offshore West Africa, offshore Brasil, The Canadian Arctic, and the Spanish Pyrenees.

Salt tectonics is not just about structural geology. The history of salt deformation plays a large role in the spatial and temporal distribution of sedimentary facies (reservoirs) and in the generation, migration, and entrapment of hydrocarbons. Thus, the ultimate goal of the course is not only to help participants to become better interpreters of seismic data in areas of salt tectonics, but also to help them understand the interactions between salt deformation, sedimentation, and fluid flow. A thorough understanding of these concepts can only aid in the exploration for, and exploitation of, hydrocarbons in salt basins.