

Global overview of Tertiary deepwater foldbelts: passive vs. active margin systems

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Abstract

Tertiary Deepwater foldbelts are an emerging global exploration frontier, which are found in both passive and active margin settings. In passive margin settings, the foldbelts are mainly gravity-driven systems that are positioned near the toe-of slope and are typically “linked” along a shale or salt decollement with coeval updip extensional structures. Structural styles in both passive and active margin deepwater foldbelts are dominated by basinward-vergent, thrust anticlines, except where underlain by thick mobile substrates, which results in simple detachment folding. The primary objectives in passive margin foldbelts are usually pre-kinematic unconfined fan systems deposited in basin plain settings. A wide variety of different petroleum systems may be present in passive margin deepwater foldbelts including those sourced from the older sub-detachment synrift section as well as post-rift clastic and carbonate sections, which are often incorporated within the foldbelt structures.

Active margin deepwater foldbelts are generally more complicated structurally than those in passive margins due to the interplay of both gravity driven thin-skinned contraction and active basement structuration. The resultant spatial distribution of structures shows considerable variation, with structures occurring throughout the shelf, slope and toe-of-slope. Because of the geographic variability of the structures relative to the depositional system, the primary deepwater clastic objectives associated with these systems can be more variable and unpredictable than in passive margin foldbelts. The number of potential operative petroleum systems in active margin deepwater foldbelts, however, is more limited than in passive margin settings because older, pre-deformation possible source rock-prone stratigraphy is often not preserved.

Speaker



Scott Sumner is currently a Geological Advisor in the Global Frontiers Team, Team in Shell Research where he is working on global-scale New Venture play synthesis. During his 23 years in the petroleum industry, working for both Shell and Unocal, he has developed considerable expertise in deepwater exploration, play analysis and prospect generation, structural interpretation, salt / mobile shale tectonics, basin dynamics, plate-tectonics, petroleum system analysis, and in the regional petroleum geology of the Far East, the Gulf of Mexico and West Africa.