AAPG Annual Meeting
March 10-13, 2002
Houston, Texas

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Deepwater Lobe- and Sheet-form Depositional Elements in Open Ocean and Intra-slope Basin Settings

In open ocean settings, continental slopes are steep and have generally graded profiles, with continental rise and basin plain physiographic provinces farther seaward. It is in these latter areas with flat gradients that lobe- and sheet-forms develop at the channel termini or adjacent to channel sinuous bends. The lobeforms at channel bends may be washover fans, crevasse splays and “harps”, depending upon several factors: depth of thalweg and levee-breaching of parent channel, gradients, sediment caliber etc.. The lobeforms at the channel termini consist of either single lobes or several lobes that coalesce to form a lobe complex. These lobeforms may have commonly channels whose degree of development depends on the sediment caliber and the precise nature of the seafloor gradient profile, and may have complex reservoir architecture. In the intra-slope basinal settings, continental slope gradients are out of grade and may have steep as well as flat gradients and gradient reversals. These intraslope basins separated by sills are usually caused by shale and salt tectonism. The lobeform development and the controlling factors in the intraslope basin settings are similar to those of open marine settings. However, because of greater subsidence, thick lobe- and sheet- forms occur closer to the shelf breaks in the intra-slope basin than in open ocean settings. Also, debris flow deposits are more likely to be present under the lobes and fan progradation is more due to “fill and spill” in the intra slope basins.