Plio-Pleistocene Depositional Systems and Mass Transport Complexes of Northwest Borneo

Bray, Alexander[1], Bill Wilks[2], Andrew Cullen[3] (1) Located at Sarawak Shell Berhad, Lutong, Malaysia (2) Located at Sarawak Shell Berhad, Miri, Sarawak, Malaysia (3) Shell Malaysia Exploration and Production, Deepwater Exploration, Miri, Malaysia

The Plio-Pleistocene geology of deepwater Sabah has been studied using ~8000 km2 of 3-D seismic. These data reveal a steep slope with channel systems interacting with thrust-induced bathymetric features. The majority of these systems fill and spill multiple basins as they flow down slope to the ultimate basin floor. Some channels, however, cut across structural highs. These may be structurally controlled. With respect to the capacity for turbidity flows to deliver their coarser fraction to the ultimate basin floor, we believe the fill and spill systems are less efficient, but provide better opportunity for stratigraphic traps on anticlinal flanks. Also commonly observed are two different classes of Mass Transport Complexes (MTCs): large-scale failure of the shelf and local mass wasting of thrust induced bathymetric highs. The former produce regional events that may form pressure and hydrocarbon seals. The regional MTCs, however, are also capable of beheading structures and removing sufficient overburden to degrade retention capacity. Local MTCs produce complex relations between fold geometry of the forelimb and on-lapping syn-kinematic sediments. These processes provide good analogs for interpreting the deeper, less well-imaged geology and must be accounted when developing geologic models for exploration.