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The Distribution of Coeval Depositional Elements Within a Stepped Slope Setting, Offshore Brunei

The modern continental slope offshore Brunei is an outstanding example of the relationship between syndepositional structure, slope accommodation space, and sediment dispersal systems. Recent research has focused on definition of depositional elements or local vertical stratigraphic successions. This 10,000km² data set provides a unique opportunity to document the lateral relationships among multiple depositional elements across distances >80km. The bathymetric profile is best described as a "stepped slope" resulting from progressive basinward thrusting, driven by updip sediment loading of the Baram delta. It is characterized by elongate, structurally controlled mini-basins 2-10 km in width and 20-60 km in length. Sediment dispersal pathways are quite tortuous across the irregular bathymetric relief. Individual flow paths can extend for >60km and encounter a variety of depositional environments along their lengths. Multiple environments are combined into readily mappable depositional elements. These include: 1) local cohesive slump complexes up to regional debris field/mass transport complexes. Cohesive slumps reflect short distance transport by down slope creep and mass transport complexes reflect long distance debris flows. 2) Submarine canyons developed by gravity mass wasting along the forelimbs of thrust cored features. Resultant bathymetric depressions locally act as sediment conduits which link mini-basins across intervening thrust cored structures. 3) Sediment dispersal fairways that range from 2-5km in width and are characterized by multiple straight/erosional or sinuous/leveed channels. 4) Distributary channel/lobe complexes consisting of sheet deposits punctuated by low relief channel features.