Moreton Bay, Southeast Queensland, a Modern Analogue for Clastic Reservoirs Deposited in Wave-Tide Dominated, Coastal and Shallow Marine and Shelf Depositional Systems

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Moreton Bay and the adjacent coastline in SE Queensland provide a natural laboratory in which to study the sedimentology, coastal evolution and sequence stratigraphy of a wave dominated, mesotidal sandy clastic depositional system. The area is ~130km long and ~50km wide, a broadly elongate, marine-estuarine embayment, partially protected by dune-island barriers that grade through the shoreface across a ~50km wide continental shelf.

A wide range of depositional environments exist in close proximity, ranging from bayhead deltas, sandy and mixed sandy-muddy tidal-flats, tidal channels and bars, flood- and ebb-tidal deltas and associated tidal inlet channels, barrier shorelines and strandplains, back-barrier lagoons and open marine embayments including local carbonate reefs, and coastal salt marshes and floodplain, muddy estuaries, and aeolian dune complexes on the main dune-island barriers (South and North Stradbroke, Moreton and Bribie islands). Offshore are high-energy shorefaces, mid-shelf sand ridges, and outer shelf mixed terrigenous and relict cool-water carbonate sand sheets.

These depositional environments make excellent analogues for clastic reservoirs currently being explored or producing from basins around Australia, SE Asia, and elsewhere. Based on an extensive program of boomer and sparker seismic profiling, coastal geomorphic and sediment mapping, drilling, and age-dating, a comprehensive dataset has been collated that underpins not only basic statistics for reservoir distribution, geometry and primary textural/compositional characteristics, but also a high-resolution sequence stratigraphic framework linking changes in climate, sea-level and sediment supply from lowstand, transgressive and highstand systems tracts developed during the late Pleistocene. These provide useful reality-checks for interpreting reservoir stratigraphy and associated connectivity.