

DEPOSITIONAL CHARACTERISTICS OF THE TIDAL-FLUVIAL TRANSITION IN THE GANGES-BRAHMAPUTRA DELTA, SOUTHWEST BANGLADESH: INSIGHTS FROM THE STRATAL ARCHITECTURE AND BIOSTRATIGRAPHY OF TIDE-INFLUENCED POINT BARS

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ABSTRACT

The tidal-fluvial transition represents a depositional regime in which marine and fluvial hydrodynamics interact to form sediment deposits characterized by complex sandy and muddy bedsets. An understanding of how these forces shape the internal architecture of point bar deposits is crucial for predicting the connectivity and compartmentalization of hydrocarbon-bearing fluvial reservoirs. Although studies have documented modern point bar lithofacies in fluvial-dominated and tide-dominated channels, comparatively few have investigated how the stratal architecture of these deposits changes across the fluvial-tidal spectrum, and no studies to our knowledge have utilized benthic foraminifera assemblages as a corroborative technique. The tide-influenced Gorai River is the primary conduit of sediment to the southwestern Ganges-Brahmaputra delta plain and provides a unique opportunity to investigate how the sedimentary and paleontological character of point bar deposits varies across the fluvial-tidal continuum. Sediment cores will be collected from five point bars along various reaches of the river. Following retrieval, cores will be split, logged, and photographed. Sediment samples will be taken in regular intervals and undergo paleontological and grain size analyses. We expect that the median grain size of point bar strata will display a coarse-fine-coarse trend from the marine to the fluvial realm. The faunal composition of foraminifera is expected to transition landward from calcareous to arenaceous species as a function of decreasing salinity. Ultimately, this project aims to elucidate patterns in sand bed abundance and lateral continuity across this complex depositional zone, providing a framework for identifying sand-rich point bar deposits and stratigraphic traps in ancient fluvio-deltaic rocks.