

Sedimentation Processes of the Meghna Estuary: Possible Modern Analog of the Middle McMurray Open Estuary Sedimentary Systems

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The Ganges, the Brahmaputra and the Meghna River systems combinedly falls into the Bay of Bengal with the name of Meghna Estuary with its typical funnel shape. The Meghna Estuary is the largest estuary system in the world. The sedimentation processes about 300-500km in land from the estuary funnel is compared to the multiple mega scale channel fill sand overlaying by the flood plain deposits, which lately bisected by numerous relatively smaller distributary channels. Within the main funnel shaped estuary, it shows kilometre size tabular cross-bedded sand deposits as a form of island and lateral bars in the lower part as well as the seaward part. The upper part contains couple of meter thick estuarine mud in places and tidally influenced estuarine sandy to silty mud deposits over the sub-tidal estuarine sand. Small fluvial systems then develop and flood plain deposits cover the top of the entire estuarine plain from landward side.

No significant channel systems like river bi-furcation through delta development, or tidal creek extension is observed rather than a vast estuarine tidal flat plain is the characteristics of this estuarine plain.

In many areas across the Athabasca basin, the McMurray systems shows the same or very similar facies succession as it can be seen today on the Meghna estuarine system; the difference is there was a sea transgression which pushed the estuarine systems on top of the fluvial systems; and later on a shoreface sedimentation went over the estuarine systems with response to another transgressive event. With no or minimal diagenesis a detail geological model of the McMurray deposits depicts the exact depositional environment, from where dimension of channels, bars and plains can be calculated with morphometric analyses. Comparison of the McMurray Systems with depositional units in the Meghna Estuary is necessary to make a comprehensive and concrete conclusion on the Meghna estuary as a candidate for the McMurray analog.