



第129回 汽水域懇談会 & 地球資源環境学科教室セミナー
129th Estuaries Open Seminar

Facies and sedimentary processes along the fluvial to marine transition zone in modern and ancient examples

現在及び地層にみる河川・海洋遷移帯の堆積相と堆積過程

日時: 2017年 12月7日(木) 18:30-19:30, 7th December (Thu), 2017
場所: 総合理工3号館301号室 (3F), Room 301, Sogo-Riko Bldg 3

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Fluvial, tidal and wave processes and their interactions control sedimentation in coastal to shallow-marine areas, having a major impact on the resulting morphology, architecture, sediment dispersal patterns and facies distribution. The area of coastal rivers, either deltas or estuaries, affected by a combination of fluvial and marine (i.e., tidal and wave) processes is defined as the fluvial to marine transition zone (FMTZ) and can extend up to several hundreds of kilometers upstream and downstream of the river mouth, depending on the relative strength of fluvial and tidal processes and the coastal plain gradient. This presentation shows the FMTZ of the modern Mekong River delta (Holocene, Cambodia and Vietnam) and of the ancient Lajas Formation (Middle Jurassic, Argentina).

In the Mekong, tide-induced water-level changes extend into Cambodia. Measured salinity intrusion extends ~15 km upstream of the river mouth during wet season, and ~50 km during dry season. The upstream (fluvial-dominated) tract of the FMTZ is characterized by low mud content, gravelly medium to coarse sand and fine sand facies, indicating fluvial dominance and significant bedload transport at least during the wet season. The downstream tract is characterized by variable mud content, tidal rhythmites and fine sand facies, suggesting tidal dominance during both wet and dry seasons. Most of sediment is transported by suspension and later arranged in bedforms by local bedload transport.

In the Lajas Formation, fluvial-tidal indicators consist of cyclically distributed carbonaceous drapes in unidirectional, seaward-oriented cross-stratifications, which are interpreted as the result of tidal modulation of the fluvial current in the upstream part of the FMTZ. Heterolithic deposits with decimetre-scale interbedding of coarser- and finer-grained facies with mixed fluvial and tidal affinities are interpreted to indicate seasonal fluvial discharge fluctuations and subordinate tidal influence. No purely tidal or tide-dominated facies were recognized. Moreover, fluvial-tidal features are found mainly in deposits interpreted as interflood (forming during low river stage) in distal (delta front) or off-axis (interdistributary) parts of the system. Along major channel axes, the interpreted FMTZ is mainly represented by the fluvial-dominated tract, whereas little or no tide-dominated section is identified.