

## **Bayhead delta deposits (Late Cretaceous), Grajaú Basin (MA), Brazil: an example of forced regression**

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Cretaceous deposits from eastern Grajaú Basin record mouth bar, prodelta/distal bar and distributary channel paleoenvironments. Mouth bar deposits consist of lobate sandbodies with cross lamination, soft-sediment deformation and tabular, trough, and compound cross-stratifications. Prodelta/distal bar deposits closely associate with mouth bar deposits forming coarsening upward cycles that consist of: parallel-laminated argillites, heterolithic pelite, and cross- and undulating parallel-laminated sandstones. Distributary channel deposits resemble mouth bar strata, except by the presence of: i) concave-up, basal erosive surfaces; and ii) fining/thinning upward successions. These deposits are indirectly attributed to an estuarine bayhead delta, based on: i) prograding nature; ii) influence of tidal process, suggested by opposed-dipping foresets with abundant reactivation surfaces and mud drapes; and iii) ichnological assemblage (*Taenidium*, *Teichichnus*, *Ophiomorpha*, *Skolithos*, *Palaeophycus*, *Planolites*, *Chondrites*, *Macaronichnus*?, *Diplocraterion* e *Bergaueria* ?) suggestive of coastal settings, but with low diversity typical of stressed environments. Based on facies and stratigraphic similarities, these deposits are correlatable with the bayhead delta deposits of an estuarine paleovalley (i.e., Cuiupe Formation) from São Luís Basin. This is consistent with the proposal that the studied deposits also record proximal estuarine environments. Facies architecture combined with regional key surfaces with evidence of erosion and subaerial exposure, suggest that rather than a "normal" progradation, these deposits reflect a forced regression. This is attributed to the slow drop in relative sea-level at the top of the highstand, but before a significant fall that ended the Cretaceous sedimentation in the study area, and which resulted in a sequence boundary.