

# Architecture of Delta Front Deposits, More Complex than Basinward Dipping Clinoforms

Cornel Olariu\*, Janok P. Bhattacharya  
University of Texas at Dallas,  
2400 Waterview Pkwy. #418, Richardson, TX, 75080, USA  
cornelo@utdallas.edu

and

Liviu Giosan  
Woods Hole Oceanographic Institute, Woods Hole, Massachusetts

## **ABSTRACT**

Delta front deposits represent the most dynamic part of a delta system. High variability of interaction between fluvial and marine processes within the delta front area suggests a complex architecture of delta front deposits. Modern delta front shows a complicated morphology consisting of multiple terminal distributary channels and levee deposits. There may be asymmetric distribution of facies within deltaic lobes and even landward dipping clinoforms. The preservation of morphological complexities of delta front deposits depends on the variability between fluvial and marine processes.

Sf. Gheorghe lobe of modern Danube Delta has an asymmetric morphology due to longshore current. The asymmetry is also reflected in heterogeneities of delta front deposits, the updrift side deposits are amalgamated sands and the downdrift side has more heterolithic deposits with sand/ mud alternations. Cliff exposed of the Cretaceous Panther Tongue Delta in, Book Cliffs area, Utah show terminal distributary channels deposits within a delta front. On a dip oriented cliff face, landward dipping beds were interpreted as upstream migrating mouth bars. The complicated architecture of Panther Tongue delta front deposits was preserved because the system was fluvial dominated.

Historically delta front deposits are most typically thought to consist of basinward dipping clinoforms (the inclined depositional surfaces), but we show that at sedimentological scales, bed geometry can be significantly more complicated with beds dipping landward, seaward or parallel with the shoreline.