

Sedimentology on the estuary shore

ABSTRACTS VOLUME



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ASSOCIATION OF
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**SEDIMENTOLOGY ON THE
ESTUARY SHORE**

**38TH IAS MEETING
HUELVA-SPAIN
26-28 June 2025
ABSTRACT BOOK**

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Down slope variability of turbidite channel architecture (Taza – Guercif Basin, Tortonian, NE Morocco)

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Abstract: Submarine channels are significant seafloor features that traverse slopes and transport sediment into deeper water. Up-dip, they can incise the shelf and provide a link to coastal systems. Despite decades of research, field examples recording the down-stream evolution of architecture and facies of upper slope channel-fills remain limited. During the Tortonian, in the Taza-Guercif Basin a marine transgression recorded by deep-water marlstones led to the drowning of a mixed carbonate-siliciclastic costal system. This study documents the lower stratigraphy of the Tachrift Turbidite System, which incised these marlstones. The monoclinial arrangement of the outcrops in numerous dry valleys oriented perpendicular to palaeoflow offers an almost unique opportunity to study the three-dimensional depositional architecture of a channelized system down the slope profile, from shallower to deeper water. Field mapping at a 1:5000 scale, acquisition of photopanels, combined with sedimentary logging and facies analysis, enabled the identification of more than 50 genetically related channel-fills. These features are separated by marlstone intervals meters in thickness, into which they create major erosional surfaces. Dimensions of channel-fills are up to 5 m thick and range from 5 to 200 m width. Channel-fills are dominantly fine to medium-grained turbidites, but may include coarser basal lags, debrites, and mud-clast horizons. Channel axes to margin transitions may record grain-size fining and an increase in sedimentary structures. The studied channel-fills are interpreted to have been deposited in the upper slope and show variable architectural styles moving down-current: 1) Erosional channel-fills, with no associated overbank deposits; 2) Laterally migrating channel-fills, with up to 2 m thick and 200 m wide overbank deposits; 3) Vertically offset stacked channel-fills, which display poorly-developed overbank deposits; 4) Mixed vertically and laterally offset channel-fills, displaying overbank deposits up to 2 km wide and 8 m thick. The four end-member styles of architecture imply that slope morphology plays an important control on channel-fill architecture. These results may aid characterisation and prediction of channel-fills in upper slope settings in the subsurface.

Key words: upper-slope, deep-water, depositional styles, outcrop analogue, Miocene.