Deep water slope and channel architecture within the Oligo-Miocene Numidian Flysch of Sicily and Tunisia.

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The Numidian Flysch is a late Oligocene to Mid Miocene deep water flysch deposit cropping out in Alpine nappes from southern Spain, through Morocco, Algeria, Tunisia and Italy. Deposition was into a southwards migrating foreland basin which trended approximately east-west across north Africa to the Italian mainland. Already a proven play in Sicily, exploration is now focusing offshore Tunisia.

Excellent outcrops of submarine channels and flow deposits in northern Sicily and Tunisia allow characterisation of the Numidian environment and the controls upon sand body architecture. In Sicily, clastic deposits are concentrated in three seperate stratigraphic units, while each displaying significant sand body architectural differences. Oligocene sands show a combination of incisional channels and constructional sheet flow, Aquitanian deposits show dominantly constructional sheet flow, and Burdigalian sands fill discrete incisional channels. The incisional channel deposits record a variety of flow processes, including high to ultra high density frictional flows and cohesive debris flows. Some evidence exists for flow transformation, from both slump bodies and high-density frictional flows, into cohesive debris flows.

Channels display steeply stepped margins while the fill comprises basal lags, and stacked scour like bodies that behave in a self-similar fashion to the parent channel body, with stepped margins, basal lags and rare lateral migration. Basal erosion surface geometries suggest a fill evolution of the channels comprising erosion, plugging and lateral incision.

The range of different sand body architectural styles through time suggests a relative sea level control on clastic sediment influx to the basin in Sicily, overprinted by the effects of regional southward basin migration and closing. Comparison of stratigraphic sections between Sicily and Tunisia highlight the importance of understanding local proximal/distal controls and responses within the Numidian basin.