# Architecture and evolution of incisional, upper-slope submarine channel complexes within the Oligo-Miocene Numidian Flysch of Sicily and Tunisia

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The Numidian Flysch is the most widespread tectono-stratigraphic unit in the western Mediterranean. In Sicily and Tunisia it is an Oligocene to mid-Miocene flysch-type deposit sourced from the north-African passive margin and deposited into an east-west trending foreland basin. Studies of channel complex outcrops in the region of Cefalu, Sicily, allow characterisation of a large channel complex set at least 5 Km in lateral extent, with 3.5 Km of downdip exposure and a minimum thickness of 430 m. 16 discrete channel complex bodies are mapped with dimensions of 50 to 280 m in width and 15 to 85 m thick.

Channel complexes show symmetric to asymmetric basal erosion surfaces which cut steeply into slope mudstones and thin bedded turbidites. Individual channels are typically up to 15 m thick, and show a continuous and amalgamated stack of event beds bound by basinward dipping incisional surfaces which may be complex-wide, or deeply incised and of limited extent. Channel bases show distinct and conglomeratic non-cohesive debris flow and grain flow facies while channel fill consists mainly of high-density turbidite deposits and a massive sand facies. Massive structureless sandstones up to 8 m thick may be amalgamated flows, cohesionless debris flows or hyperpycnal deposits. Horizontal steps in channel complex margins, coupled with channel bounding incision surfaces and conglomeratic bypass facies suggest that a switch from aggradation to bypass is a regular and important process in the complex evolution.

Mapping of channel complexes along the coastline show a shallow eastward migration coupled with a palaeoflow swing from northwest to northeast. Complexes inland within the same system migrate to the west while displaying a palaeoflow swing from northeast to northwest. This demonstrates a genetic link between complexes within a >5 Km wide channel complex set. Migration of the deeply incisional and genetically linked channel complexes takes place within a slope setting that shows at least 430 m of aggradation through deposition of hemipelagic mudstones and fine grained turbidites. This suggests an upper slope setting in which complexes incise to reach grade. Slope steepening due to southwards migration of the encroaching foredeep could also be a major factor in complex set evolution.

This work is part of a PhD evaluating the sedimentology of the Numidian flysch both in Sicily and Tunisia. Results of channel complex characterisation will be used to construct synthetic seismic models allowing comparison of excellent outcrop exposure of upper-slope incisional channels with subaqueous and subsurface seismic data.