

# **The Role of Narrow Gateways on Sediment Processes and Distribution: Example from the Sicilian-Tunisian Platform, Mediterranean Sea**

REEDER, MICHAEL, STOW, DORRIK A.V. and ROTHWELL, GUY  
Southampton Oceanography Centre, Waterfront Campus, University  
of Southampton, Southampton SO14 3ZH, UK

The geological evolution of narrow oceanic gateways at convergent plate and faulted continental margins has a major effect on sediment processes and distribution. The Sicilian-Tunisian Platform clearly illustrates this complex interaction of climatic, tectonic, oceanographic and volcanic controls on sedimentation.

Tectonic uplift and rotation of the central Mediterranean region has created a series of deep ( $>1000$  m) troughs within a broad, faulted, shallower platform ( $<200$  m). The troughs are dominated by downslope gravity flows, resulting from frequent seismic and volcanic activity on their flanks. However, elongate contourite drifts are present in the central parts of some. The Malta and Sicily sills, to the east and west of the platform respectively, show mainly slow background hemipelagic sedimentation at rates of 2-5 cm/ka.

The Pleistocene climate has affected primary biological productivity across the platform and has had a major impact on water exchange between the East and West Mediterranean basins. Dense, westerly flowing Levantine Sea Intermediate Water (LIW) is channelled along the deep troughs, leading to contourite drift accumulation of up to 30 cm/ka. On exiting the troughs the LIW scours the western sill and builds contourite drifts in the western basin. The easterly flowing Atlantic Water, together with prevailing winds from the west, have transported and distributed volcanic ash and desert sand towards the eastern sill and basin. During its geological history the platform has controlled the amount of water interchange between east and west, resulting in many cycles of stagnation and the formation of organic-rich sapropels in the deeper parts of the East Mediterranean Basin.