



The impact of cascading currents on deep-sea ecosystems in the South Adriatic (central Mediterranean).

G. Verdicchio (1), A. Freiwald (2), M. Taviani (1), F. Trincardi (1)

(1) Istituto di Scienze Marine - CNR - Bologna, Italy, (2) University of Erlangen-Nuremberg, Germany (giuseppe.verdicchio@bo.ismar.cnr.it)

The Southwestern Adriatic Margin is impacted by two strong bottom currents brushing the seafloor. The Levantine Intermediate Water (LIW), generated in the Eastern Mediterranean through intense evaporation, produces a steady-state contour-parallel current flowing southward in water depth range between 200 and 700m. The North Adriatic dense Water (NAdDW), formed seasonally in the North Adriatic Shelf through winter cooling, generates a very dense cascading current impacting the South Adriatic slope at the end of the winter.

The seasonally cascading NAdDW interact with the steady-state LIW leading to locally-enhanced energetic condition at the seafloor, which is dissected by the large Bari Canyon and shaped by repeated mass-wasting deposits, ranging from mud flow to blocky slide deposits. On the open slope, the dynamical interaction between these bottom currents of thermohaline origin is well documented by a suite of intermingled bottom currents features, such as elongated contourite drifts, bifurcated sediment waves, furrows, scour and giant comet marks. The Bari Canyon is flushed by the seasonal cascading NAdDW that resembles a long-lasting very dilute turbidity current and have enough energy to erode or prevent deposition in the canyon axes and contributing to the aggradation of a channel levee complex developed during previous stages of canyon evolution (particularly during the last Glacial Maximum). Moreover the down-canyon flowing NAdDW is responsible for the post glacial evolution of an upcurrent-migrating mud wave field at the canyon exit, in about 900m water depth.

The impact of these dense current on the irregularly shaped SW-Adriatic margin create favorable environmental condition for deep-water benthic communities that include

Scleractinia corals, sponges and several others organisms. Recently-acquired ROV data (Marum QUEST – Cruise METEOR 70/1) collected on the steep southern wall of the Bari Canyon and on displaced blocks of the Gondola Slide imaged complex deep-sea coral-bearing benthic communities commonly placed on hard ground indicating strong current activity and localized low sediment supply.