
Facies evolution and sedimentary processes on the Calabrian accretionary wedge, from the FOCUS zone to the Ionian abyssal plain over the last 20,000 years

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Résumé

The Ionian Sea is a semi-enclosed basin in the central Mediterranean Sea, which is an excellent area for studying climatic and oceanographic processes. Located at the intersection of two subduction zones, this region is seismically active, as attested by major earthquakes and tsunamis throughout history. The largest events are recorded in the marine sedimentary archives as gravity deposits (turbidites, mega-deposits, homogenite...), which are complex to interpret over several thousand years, as they are influenced by climatic and oceanographic variations.

In 2022, the FOCUS-X2 cruise collected 20 m long sediment cores, along the North-Alfeo active fault on the Calabrian accretionary wedge, at about 1800 m of water depth, east of Sicily. The main objective of this study is to decipher the sedimentary record from the Sicilian upper slope to the deep Ionian Basin. Sediment cores cover more than 20 ka of sedimentary record, including three intervals: the last glacial period, the Holocene with the sapropelic period and the recent Holocene. The main questions are: (1) What is the variability of sedimentary processes in response to paleoenvironmental variations (climatic, eustatic and oceanographic)? (2) What is the impact of volcanism and tectonic events at local scale on the upper slope (FOCUS area) and at the basin scale?

New data have been acquired (facies analysis, grain size, physical properties and chemical composition). Stratigraphic framework is based on radiocarbon dating and tephrochronology. The correlation of the stratigraphic intervals are established between six sediment cores, leading to the following interpretations:

- Main sedimentary facies are hemipelagic deposits, sandy and silty turbidites, micro-turbidites, dark facies rich in organic matter (sapropel-like), tephra and mega-deposits.
- Sedimentation rates vary at different scales: from the upper-slope to the deep basin, regarding the local morphology on the accretionary wedge (deformations), and through time.
- Since 6000 ka, the number of gravity deposits is low and consistent with the possible

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recurrence of large earthquake events. Only one mega-deposit (megaturbidite/homogénite) is identified and corresponds to the Augias event.

The sedimentary interval between 6 and 11 ka BP is composed of a thick accumulation of numerous micro-turbidites, indicating a probable climatic control (seasonal or decennial floods).

Mots-Clés: Turbidites, dépôts gravitaires, Mer Ionienne, paléo, séismes, paléoclimat, Quaternaire