

**The interplay between sedimentary supply, sea-level rise and tectonics
from the last glacial maximum onwards: insights from the Sant'Eufemia continental shelf
(Offshore Calabria, Italy)**

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New high-resolution, multichannel seismic data, acquired in the Sant'Eufemia Gulf, provide constraints on the architecture of submarine depositional features (e.g. prograding wedges) formed since the last glacial maximum (LGM). Sedimentological and quantitative micropaleontological analyses of gravity cores integrated with calibrated radiocarbon age of samples allow us to calibrate the seismic profiles, constrain the sedimentation rate and reconstruct the paleoenvironmental evolution of the study area since the earliest Bølling-Allerød. Five sediment grain size intervals and benthic foraminifera assemblages outline the evolution of the sea-bottom environment. Basal coarse sand grains along with shallow water and epiphytic benthic foraminifera (e.g. genus *Asterigerinata*, *Elphidium*) point to an infralittoral environment. After that, we record a progressive grain size reduction culminating at the top core, where dominant silt, clay and benthic foraminifera assemblages point to a muddy bottom circalittoral environment. A reduced organic matter flux is observed in benthic foraminifera after 5.5 ka, supporting the evidence from calcareous plankton. Sedimentation rates vary from 4.9 to 12.9 cm/kyr.

The prograding wedges formed at distinct water depths at which the sea level was stationed or lowered during the relative sea-level rise from the LGM to the basal Holocene. The erosional surfaces and marine terraces result from wave action above the depth of closure. Therefore, the above features are suitable for reconstructing a relative sea-level curve. The error bar includes uncertainties due to the a) seismic velocities used for the time-to-depth conversion of profiles, b) water depth related to the formation of depositional and erosional features, and c) tectonics. The reconstructed sea-level rise curve shows a step-like trend, starting from the Heinrich stadial 1, followed by sea level rise during the warm and ice-melting period of Bølling-Allerød, with a peak of the rising rate during the Melt Water Pulse 1-A. Subsequently, it shows evidence of sea level still standing during the cold stadial Younger Dryas, followed by a rapid increase in sea level during the Melt Water Pulse 1-B. The obtained curve of relative sea-level rise was compared with the a) eustatic sea-level curve proposed by Lambeck et al. (2014) corrected for the Glacial Isostatic Adjustment (GIA), b) relative sea-level curve by Lambeck et al. (2011) for Briatico, seven eustatic sea level curves plus one calculated in the Mediterranean, all corrected for the GIA. The best overlap was obtained with the high-mantle-viscosity from the GIA correction model of the Australian National University (ANU14-HV). It is noteworthy that the eustatic sea-level curve proposed by Lambeck et al. (2014) overlaps our relative sea-level curve throughout the analyzed time interval.

Lambeck K. et al. (2011) - Sea level change along the Italian coast during the Holocene and projections for the future.

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Lambeck K. et al. (2014) - Sea level and global ice volumes from the Last Glacial Maximum to the Holocene. Proc. Natl Acad. Sci., 111, 15296-15303, <https://doi.org/10.1073/pnas.1411762111>.