



Pliocene-Quaternary mass wasting along the Ionian Calabrian margin, offshore southern Italy

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The Ionian Calabrian margin, offshore southern Italy, is a tectonically active area, located above a subduction zone dominated by rollback of the African plate. A variety of mass wasting features are known to occur along the inner continental slope, based on seafloor mapping during the Italian project MaGIC (Marine Geohazards Along the Italian Coasts). New high-resolution geophysical data are available from a wider area following two surveys, in 2014 of the German RV Meteor, which acquired multibeam bathymetry (50 m DTM) and Parasound sub-bottom profiles, and in 2015 of the Italian RV OGS Explora, which acquired Chirp sub-bottom and multichannel seismic reflection profiles. Here we integrate these data with existing geophysical datasets and published exploration wells to map submarine slope failures and mass wasting deposits within the Pliocene-Quaternary succession.

The results show that features of mass failures are widespread along the steep (higher than 10°) slopes of the Ionian margin south of Calabria, and within the intra-slope basins of the margin east of Calabria. Seafloor features range from small-scale features (hundreds of meters in extent), mainly located on the canyon headwalls and sidewalls, to larger slides (up to 10 km in extent) on open slopes. Subsurface profiles across open slopes and intra-slope basins provide evidence of repeated failures, particularly in the upper Quaternary. The stratigraphic distribution of failures suggests that widespread mass wasting features occur above an unconformity tentatively dated to the Middle Pleistocene (<1 Ma). This unconformity also provides a lower bound for the onset of canyon formation. We infer that the onset of both mass wasting and canyon formation could be a response to the rapid km-scale differential uplift of Calabria over last 1 Ma, which has driven a seaward tilting of the Ionian Calabrian margin.