

**THE EXHUMED MIOCENE-PLIOCENE ACCRETIONARY WEDGE OF THE
CENTRAL APENNINES (ITALY)
THE NEW 1:100,000 GEOLOGICAL MAP OF MOLISE**

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The Apennines of central Italy result from convergence between the European plate and the westward-subducted Adriatic lithosphere. From the Oligocene to early Pleistocene, shortening at the collisional margin involved progressive folding and thrusting of Mesozoic-Tertiary units and of late Miocene-late Pliocene clastic sequences deposited in the eastward-migrating Adriatic foredeep.

The new Geological Map of Molise at scale 1:100,000 completes two decades of field research in the central Apennines. This project has led to new cartographic coverage over an area of 25,000 km² comprising the outermost domains of the thrust belt. The Geological Map of Molise embraces a representative portion of the accretionary wedge of the central Apennines, preserved in a structural low. This area is dominated by low-competence sequences of the far-travelled Sicilide thrust sheet (Cretaceous-middle Miocene), thrust over Mesozoic-Tertiary carbonate units and over late Miocene siliciclastic deposits telescoped with the carbonate substratum of the Adriatic margin. Internal deformation of individual units is heterogeneous, reflecting competence contrasts between sedimentary packages, large-scale rotation of units during tectonic transport, and out-of-sequence propagation of thrust fronts. This system of tectonic units is largely allochthonous above the buried Pliocene foredeep and Adriatic foreland, as testified by boreholes, seismic profiles and gravimetry.

Along the Adriatic coastline, frontal thrusting above the undeformed late Pliocene-early Pleistocene foredeep is marked by a 10-15 km wide belt of chaotic and disrupted rock assemblages. Imbrication on low-angle NW-SE thrust faults involves the Mesozoic-Tertiary units and early Pliocene to early Pleistocene siliciclastic sequences. This tectonic *mélange* incorporates innumerable olistoliths of different size and provenance, derived from strong fragmentation of rocks of different ages and mixing into younger, poorly consolidated sequences. This setting is consistent with slope failure and debris avalanches at the frontal thrust, highly analogous in style and scale to current deformation and mass flow along the Hikurangi thrust front.

The Adriatic foredeep hosts the largest number of gas fields in Italy. To date, gas production in the Molise region is significant, but not the highest. South of the mapped area important stratigraphic traps (oil and gas) have been discovered in middle-upper Pliocene sands sealed by the outermost olistostromes that were derived from the eastern slope of the southern Apennines. Cross sections of the map reveal the hidden potential of the overthrust turbiditic reservoirs sealed by the tectonic *mélange*.

