

## **Evidence for slab detachment from the flexural backstripping of a foredeep: insight on the evolution of the Pescara basin (Italy)**

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The discrepancy between the size of the Apenninic chain and the depth of the Adriatic foredeep is investigated using 2D flexural backstripping on well-constrained depth-converted cross sections in the Pescara basin (Central Italy). The procedure consisted of removal, uplift, unfolding and unfaulting of the Pliocene-Pleistocene foreland deposits to produce a paleogeographic map of the basin at the end of the Messinian and to constrain sedimentation rates since the Miocene. Results are found to support the contribution of an external load to the foreland evolution together with the Apenninic chain load. The interplay of the two types of loads resulted in spatial and temporal variations of the foredeep evolution that are quantified by paleogeographic maps and sedimentation rates obtained through backstripping. Results of the backstripping procedure indicate that >30% of subsidence was achieved since the Messinian with significant spatial variability across the basin. Estimates of average sedimentation rates based on the decompressed Miocene, Pliocene and Pleistocene sequences, show a peak in the Pliocene. These results are interpreted as representative of the effects of a combination of the Apenninic load and a complementary external contribution caused possibly by lateral propagation of the slab detachment that allowed the foredeep to overfill in the Pliocene. A contribution due to slab roll-back however cannot be ruled out. In fact, a combination of the two mechanisms is considered compatible with the outcomes of this and previous works.