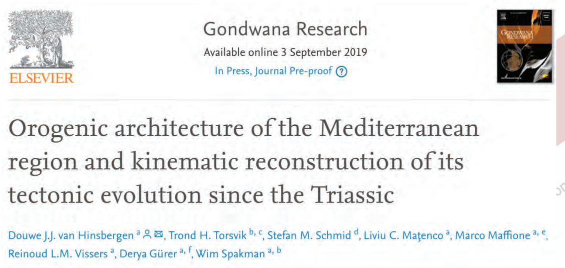
Gondwana Research
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Orogenic architecture of the Mediterranean region and kinematic reconstruction of its tectonic evolution since the Triassic

Orogenic architecture of the Mediterranean region and kinematic reconstruction of its tectonic evolution since the Triassic

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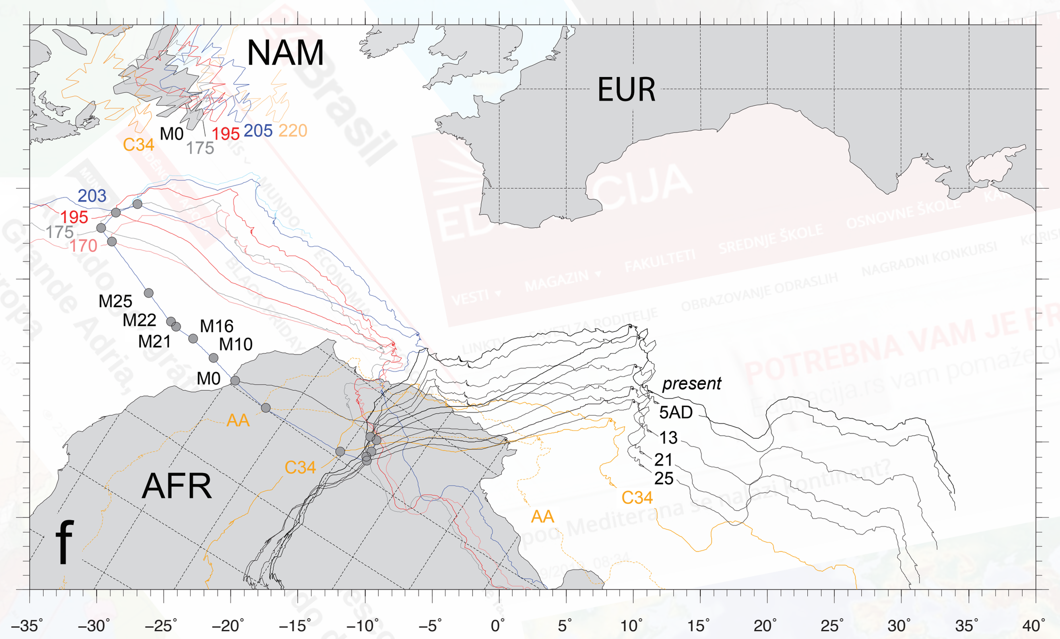
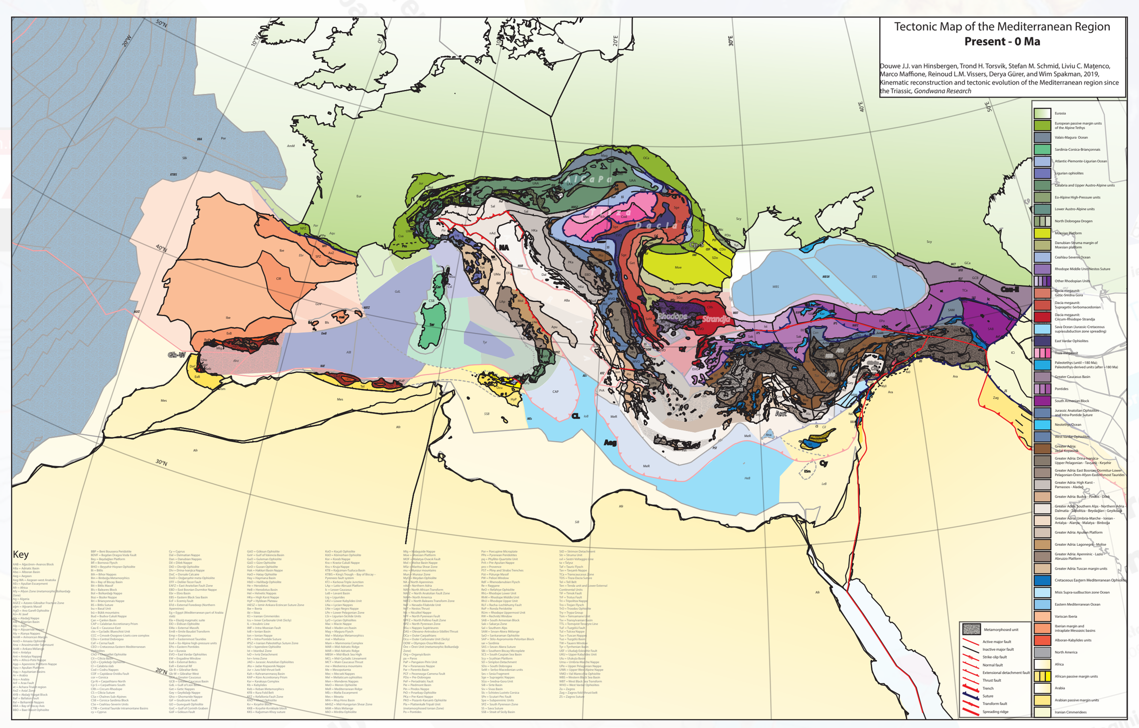
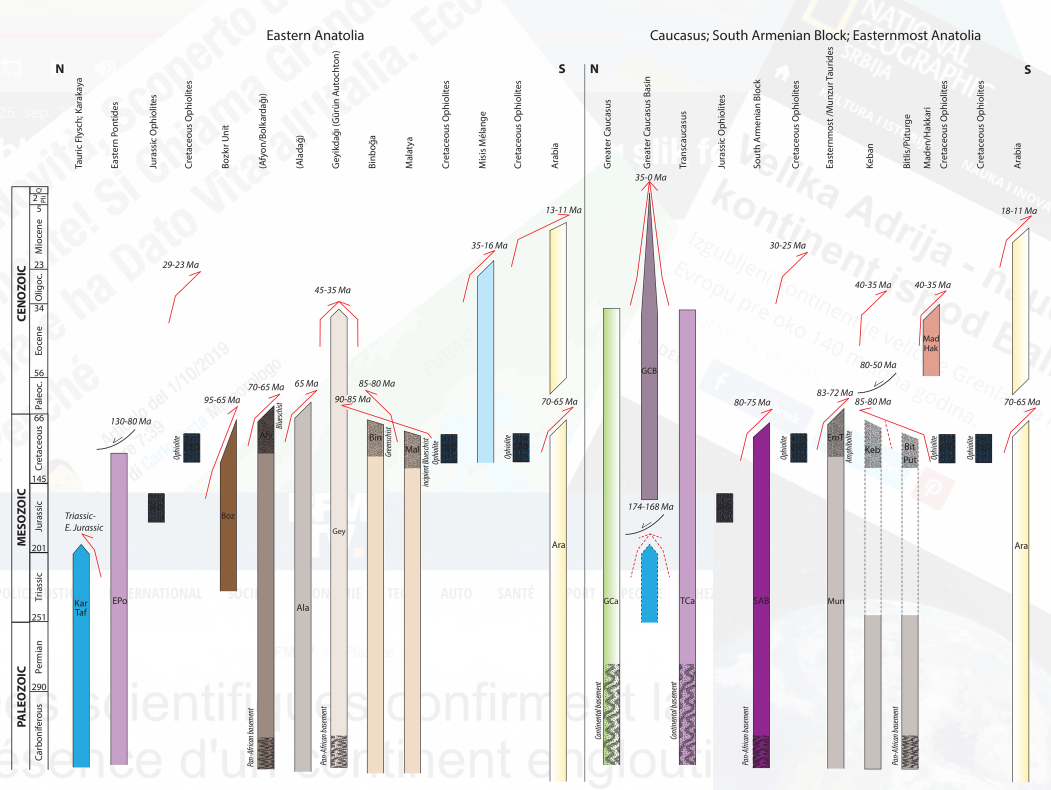


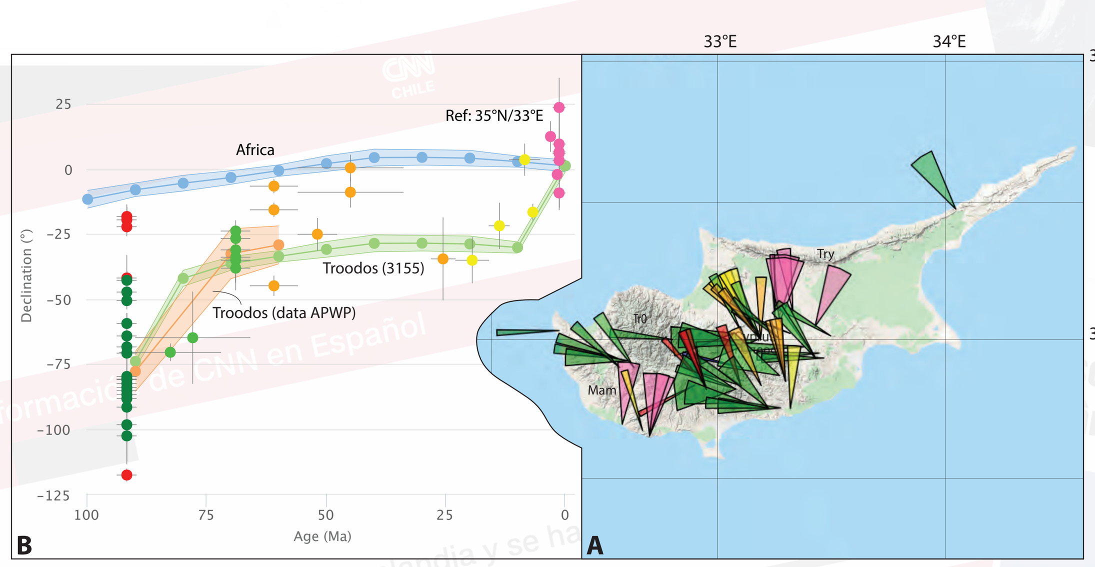
Step 1: Constrain net area gain and loss in Mediterranean realm from Atlantic Ocean & Red Sea reconstructions



Step 2: Construct tectonic map of Mediterranean (for Alps-Carpathians-Balkan-Aegean based on Schmid et al., Gondwana Research 2019)



Step 3: Identification of orogenic architecture; compilation of structural geological constraints on motion (extension, transform, shortening)



Step 4: Testing of reconstruction against paleomagnetic data compilation - where necessary iteration of reconstruction within structural constraints (2300 published sites in Mediterranean region from Triassic to Pleistocene)

Summary

In this paper we provide a kinematic restoration of Mediterranean tectonic evolution from the Present back to 240 million years ago. To this end, we review the architecture of the Mediterranean orogens from the Atlantic coast in the west to the Caucasus and the East Anatolian plateau in the east. We provide a comprehensive review of the architecture of Mediterranean orogens and basins and built a reconstruction based on Atlantic and Red Sea Ocean floor reconstructions and structural geological constraints on Mediterranean deformation. This reconstruction is tested against a paleomagnetic database of ~2300 published paleomagnetic sites from the Mediterranean region. We provide 12 (paleo-)tectonic maps of the region and isolate first-order differences between our reconstruction and previous propositions. All reconstruction files and paleomagnetic files, as well as A1 versions of the (paleo)tectonic maps and a movie of the reconstruction are provided as Supplementary Information to this paper.