## Subduction dynamics of Central and Eastern Anatolia since the Late Cretaceous reconstructed from sedimentary basins in the Neotethyan suture zone

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Subduction and accretion of crustal fragments during the closure of the Neotethys since the Mesozoic formed the Anatolian fold-and-thrust belt. Sedimentary basins overlying key locations between accreted domains of different metamorphic grade may help to quantitatively kinematically restore subduction evolution, and to identify timing, directions and amounts of post-accretionary extension, shortening and strike-slip faulting.

The Ulukışla basin straddles and is sandwiched between the HT-LP Kırşehir Block (KB) to its north, and the HP-LT Bolkardağ/Afyon zone (BD) to its south and lies on ophiolitic basement. At its southern margin a series of small-offset faults consistent with an early phase of (late Cretaceous-Paleocene) N-S extension, may have been associated with extensional exhumation of BD. Close to the contact with KB, a series of large-offset listric normal faults compatible with E-W extension offsets sediments and the base of newly dated Paleocene volcanics, showing that E-W extension prevailed until beyond 56 Ma. This is likely genetically linked to regional extension in the KB and overlying basins. Subsequently, N-S directed contraction led to E-W striking folds and thrusts, to back-thrusting of the BD over the basin, probably in Oligocene time, and coeval left lateral strike-slip motion along the Ecemiş fault (EF) at the eastern basin margin.







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At 70 Ma, we go from 2 parallel subduction zones to 1. The remaining southern one has a kinked geometry with N-S and E-W segments. Deformation focuses on the central segment, causing rotations in the Kirsehir Block. Eastward migration of triple junction through time.







At 65 Ma, the volcanic arc in western Anatolia shuts down, the Kirsehir Block collides with the Pontides, leading to oroclinal bending.

Peak metamorphism in the of the passive margin of the Taurides at 70-65 Ma.

At the same time the Ulukisla fore-arc basin forms north of the Taurides segment accommodated by N-S extension.

60-56 Ma extension in the northen part of the Ulukisla Basin linked to the Kirsehir segment.

At 30 Ma onset of regional N-S shortnening, folding and thrusting, and development of angular unconformities in the Ulukisla Basin. Deposition of the Aktoprak molasse basin.

Onset of sinistral movement along the Ecemis Fault zone (total displacement >65

km). Transpressional deformation along the fault zone leads to reburial of the southern tip of the Kirsehir block and associated structures in the basin

We explain the interplay between two extension directions in terms of a kinked subduction zone with N-S and E-W segments. The latter can be followed farther east, to the Sivas region that covers the contact between the KB, the Pontides and the Taurides. We restore Cenozoic convergence across the Sivas basin, equivalent to ~300 km shortening restored in Central Anatolia, 60-75 km displacement along the EF, and an eastward increase due to counter-clockwise rotation (of >10°) of the Taurides documented paleomagnetically. We propose a long-lived Cenozoic subduction scenario for the Sivas region.



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