

## **Timing and mechanism of the opening of the Western Black Sea Basin**

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The Black Sea consists of two main basins separated by a continental ridge. The western basin is oceanic in nature, while the eastern basin is believed to have a thinned continental basement. Data for the timing and mechanism of opening of both basins come mainly from the geology of the surrounding regions, but are very limited from the basins itself. In this presentation, the timing and the mechanism of the opening of the Western Black Sea Basin based on data from sedimentary basins of the Western Black Sea region, Turkey, will be discussed.

The southern passive margin of the oceanic Western Black Sea Basin consists of two tectonic units, the Istanbul Zone in the west and the Sakarya Zone in the east. These tectonic units are delimited by a fundamental, north-south Araç-Daday shear zone. The Istanbul Zone is covered by a sedimentary succession deposited in a southerly-deepening continental margin during the Early Cretaceous. This margin was bisected lengthwise during the Maastrichtian forming the Zonguldak Basin in the northwest and the Ulus Basin in the southeast. Both of these basins were deformed in the Early Cainozoic. To the east of the Araç-Daday shear zone, the northerly-deepening Sinop Basin dominates the architecture of the Pontides in the north, during the Early Cretaceous. It began forming by extension in the Barremian and was destroyed by a single phase but progressive north-south compression in the Late Eocene-Oligocene.

After the juxtaposition of the Central Pontides and the Istanbul Zone during the Cenomanian, an E-W trending extensional magmatic arc has been established on these sedimentary basins in response to northward subducting Neo-Tethys to the south. Back-arc and intra-arc extension gave rise to extensive normal faulting period and thinning of the continental crust in the Western Black Sea region. During the Middle-Late Santonian, arc magmatism stopped and the entire region was covered by a deep marine. This period corresponds to the breaking-up the continental crust and starting of sea-floor spreading in the Western Black Sea Basin.

The arc magmatism started again during the Campanian, and ceased at the beginning of the Maastrichtian. At the same time, the Neo-Tethys Ocean closed to the south. After the closing of this ocean, a compressional regime started to affect the Western Pontides. This compressional regime is still active in the eastern part of the Western Black Sea region while it was replaced by an extensional period during the Middle Miocene in the western part.

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