

## **The North Anatolian Fault**

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The North Anatolian Fault (NAF) is a 1200-km-long dextral strike-slip fault zone that formed by progressive strain localization in a generally westerly widening right-lateral keirogen in northern Turkey mostly along an interface juxtaposing subduction-accretion material to its south and older and stiffer continental basements to its north. The NAF formed approximately 13 to 11 Ma ago in the east and propagated westward. It reached the Sea of Marmara no earlier than 200 ka ago, although shear-related deformation in a broad zone there had already commenced in the late Miocene. The fault zone has a very distinct morphological expression and is seismically active. Since the seventeenth century, it has shown cyclical seismic behavior, with century-long cycles beginning in the east and progressing westward. For earlier times, the record is less clear but does indicate a lively seismicity. The twentieth century record has been successfully interpreted in terms of a Coulomb failure model, whereby every earthquake concentrates the shear stress at the western tips of the broken segments leading to westward migration of large earthquakes. The August 17 and November 12, 1999, events have loaded the Marmara segment of the fault, mapped since the 1999 earthquakes, and a major,  $M \leq 7.6$  event is expected in the next half century with an approximately 50% probability on this segment. Currently, the strain in the Sea of Marmara region is highly asymmetric, with greater strain to the south of the Northern Strand. This is conditioned by the geology, and it is believed that this is generally the case for the entire North Anatolian Fault Zone. What is now needed is a more detailed geological mapping base with detailed paleontology and magnetic stratigraphy in the shear-related basins and more paleomagnetic observations to establish shear-related rotation.