

TECTONICALLY MODIFIED COASTAL SHORELINE IN THE MARMARA REGION, NW TURKEY: EVIDENCE FROM THE ARCHEOLOGICAL SITE

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Keywords: Coastal modification, North Anatolian Fault Zone, Prince Islands, KüçükÇekmece Lagoon, Iznik Lake, Byzantine Establishment

Active tectonic structures are present along the coast of the Marmara Sea and surrounding areas, extensively modifying the Neogene-Quaternary sequence (e.g., Barka and Kadinsky-Cade, 1988, Koral and Şen, 1995, Koral, 1998). The units were folded and faulted by neotectonic structures, some of which are linked to the seismically active North Anatolian Fault Zone (NAFZ). Proximity of a submerged or elevated ancient settlement to the nearby active tectonic feature is evidence for a tectonically induced coastal change in the Marmara region (Fig. 1).

A small submerged rocky mass named ‘Yıldız Kayalıkları/Vordonisi’ is one the Prince Islands, located about 1 km south of the Asian coast of the city of Istanbul in the Marmara Sea (Fig. 1). The Prince Islands comprise nine closely spaced islands with unique tectonic geological features (e.g., İşbil, 2012; Tur, 2007). Historical records and underwater searches indicate ‘Vordonisi’ is said to have supported a monastery during the Byzantine time, circa 850 AD, which now lies submerged under several meters of water (Meriç, 2010).

“Bathonea” is named after an ancient settlement that existed on the K. Çekmece Lake, a lagoon situated inland on the northern coast of the Marmara Sea (Fig.1). With cultural layers extending from the Middle Iron Ages to 12th centuries, a part of this settlement characterized by a Quaternary age coquina horizon is elevated, but its mole now lie under the water level of the lake (Aydingün and Bilgili, 2015).



Figure 1. Locations of investigation near Istanbul, Turkey, indicated by dashed boxes.

Likewise, the Iznik (Nicaea) Lake, an inland lake located along the NAFZ, has elevated Quaternary terraces on the adjacent slope (e.g., Meric et al., 2018) (Fig. 1), while a Byzantine structure dated about 400AD is located tens of meters away from the northern shoreline and occurs submerged (Fig. 2).



Figure 2. Submerged archeological site of St. Neophytos Basilica in the Iznik (Nicaea) Lake, situated along the central strand of the NAFZ. (Taken from www.arkeofili.com)

These sites are situated either near the active NAFZ or its secondary branches. The northern Marmara region has been affected by many strong historical earthquakes, especially by those of 740, 989, 1509, 1766, and 1894, whose epicenters are considered to have been close by, in addition to events dating to 861, 869, 1011, 1032, 1063, 1296, 1332, 1346, 1419, 1542, and 1556 AD (Ambraseys and Finkel, 1987, 1991). Coastal changes observed along the fault line during the August 1999 Golcuk (Izmit) (Mw=7.46) and Kaynaşlı (Mw=7.2) events (e.g., Barka, 1999; Herece, 1999; Öztürk, et al., 2000; Koral, 2007) make it plausible to relate the submergence or elevation of the archeological site to a shoreline and land modification along the seismically active NAFZ.

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Joint Meeting and Field Trip of IGCP 610 and INQUA POCAS Focus Group, Antalya, Turkey, 14-21 October 2018

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