Geophysical Research Abstracts
Vol. 13, EGU2011-134, 2011
EGU General Assembly 2011


# Late Pleistocene to Holocene water exchanges between the Marmara and Black seas and wa-ter level changes: new evidence from high-resolution seismic and core studies

Kürşad Kadir Eriş (1) and M.Namık Çağatay (2)
(1) Turkey (akeris@firat.edu.tr), (2) Turkey (cagatay@itu.edu.tr)

The Sea of Marmara (SoM) is connected to the Black Sea and the Aegean Sea through the straits of İstanbul and Çanakkale, respectively. While the SoM forms the oceanographic gateway between the Black and Aegean seas, the chronology of paleoclimatic and paleocea-nographic events associated with the late Pleistocene–Holocene transitions is crucial for the understanding of the sea-level history in this region. Although considerable work has been carried out on paleoceanographic aspects of the SoM, very little has been reported on sea-level changes during the time period extending from the last glacial maximum (LGM) to the Holo-cene. The late Pleistocene to Holocene sedimentary record of the northern shelf of the Sea of Marmara (SoM) has been documented by detailed seismo-, chrono-, and biostratigraphic analyses using sub-bottom (Chirp) profiles and sediment cores. The reflection profiles reveal the presence of four seismic stratigraphic units S4-S1 that are equivalent to lithostratigraphic units L4-L1, separated from each other by shelf-crossing unconformities of Q1 to Q3. At the Sea of Marmara entrance to the Strait of İstanbul (SoI), seismic and chronostratigraphic analyses have revealed high-frequency sea-level fluctuations since 12 14C ka B.P. (uncali-brated).

During MIS 3 and the main part of MIS 2 (60-15 14C ka B.P.), disconnection from the Mediterranean and Black seas together with a dry climate resulted in a regression in the SoM that gave rise to the Sea of Marmara transformed into a brackish lake. The post-glacial fresh-water transgressive stage of the Marmara 'Lake' occurred between 15 and 13.5 14C ka B.P., leading to a rise in water level to –85 m by 13.0 14C ka B.P. as evidenced by broad wave-cut terraces along the northern shelf. The seismic profiles at the Sea of Marmara entrance to the Strait of İstanbul (SoI) reveal wave-cut terraces at water depths of –76 and –71 m. According to age model of piston core MD04-2750, timing of these stillstands are assigned ages of 11.5 and 10.5 14C ka B.P. Ancient shorelines at –65 m along the northern shelf were presumably formed soon after the Younger Dryas at ca. 10.1 14C ka B.P. The strong evidence for the Holo-cene outflow from the Sea of Marmara to the Black Sea is first recorded in this study from the Sea of Marmara entrance to the Strait of İstanbul. The existence of bioherms on the reflector surface together with abundant Brizalina spathulata and Protoglobulimina pupoides in the core suggests a return to higher salinities due to strong Mediterranean water incursion into the SoM at ∼8.8 14C ka B.P. This finding is consistent with the flood hypothesis advocated by Ryan et al. (1997, 2003) that the catastrophic flooding of the Black Sea occurred some 8000 years ago and could be the factual foundation of the Biblical myth of the Deluge, of Noah's Flood.