



Messinian Salinity Crisis and Course of Messinian Valleys in the Southern Shelf of the Sea of Marmara

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The Messinian Salinity Crisis widely accepted as one of the most interesting events concerning the Mediterranean marine environment in the earth's geological history. Late Miocene tectonic changes in Mediterranean–Atlantic connectivity caused this huge event. The Sea of Marmara region has been improperly considered as a gateway between the Paratethys and Mediterranean since the Middle Miocene. However, it is a very important location for paleoclimatic research including the sea level change associated with the Messinian Salinity Crisis. Although considerable work has been carried out on the Messinian Salinity Crisis, very little has been reported on the status of the Marmara Sea during the Messinian. The case study includes the southern shelf and North İmralı Basin of the Marmara Sea, which is in the region located from the Çanakkale Strait (Dardanelles) to İmralı Island. The structural and stratigraphic interpretation were carried out using high resolution multi-channel seismic reflection (MCS) data which were collected with the facilities of Seismic Laboratory (SeisLab) in the Institute of Marine Sciences and Technology and R/V K. Piri Reis belonging to Dokuz Eylül University under the frame of several projects including TÜBİTAK-NSF. Seismic profiles acquired in southern shelf of the Marmara Sea suggest that Messinian fluvial erosion has occurred at the base of all the main sub-basins. The southern shoreline has provided well-preserved evidence of Messinian fluvial erosion followed by the post-crisis marine reflooding. Interpretation is focused on the nature of erosion related to this acoustic basement and to a major angular unconformity that may merge with it. The basement and erosion surface are interpreted in the Çanakkale outlet and on the southern shelf of the Sea of Marmara. A buried East-West to NW-SE channel cut into acoustic basement that may belong to the Messinian period was interpreted on the MCS data. For instance, based on interpretation of these data, the channel could come into existence at the Messinian. The Messinian Salinity Crisis has significantly affected the Çanakkale and Marmara region, and the Black Sea. In the Marmara domain, the Messinian fluvial network interpreted on land is to be drawn offshore. Also these data are implying that fault activity associated with the majority of the subsidence and sedimentation in the Sea of Marmara transtensional basin commenced after the Messinian Salinity Crisis.