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Variations in sedimentation rates in the eastern Marmara Sea (Turkey) as related to bottom morphology, active tectonism, sea-level changes and sediment input patterns

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To better understand the influences of bottom morphology, tectonism, sea-level changes and terrigenous input patterns on sedimentation rates prevailed during the late Quaternary in the eastern Marmara Sea, 18 gravity sediment cores were taken during the 2003 cruise of R/V MTA-Sismik 1, between the deeper Çınarcık Basin and shallower İzmit Gulf, at water depths from 49 down to 442 meters. 19 bulk sediment samples with relatively higher total organic carbon contents were selected from different core sections to date the sediments by conventional C14 method. Sediments were composed of mud with percentages ranging from 51 to 99 and total organic carbon contents varied between 1,1 and 2,7. The amount of total carbonate was between 7 and 15 % in bulk sediments. Uncorrected radiocarbon dates obatined ranged between 1,650 and 39,645 C14-years BP. The sedimentation rates calculated from the C14 data and sediment depths in the cores displayed a wide range of values, from 1,8 to 53,3 cm/1000 C14-years. The relatively lower rates of sedimentation (2,7-14,4 cm/1000 yrs) were obtained from both mid-shelf cores at 56-84 m and upper-slope cores at 189-442 m water depths whereas sediments on the shelf edge at 95-109 m water depths displayed higher sedimentation rates (25-45 cm/1000 years). It is suggested that overall higher rate values are confined approximately to the present-day shelf edge areas, or formerly last-glacial lowstand deltas where sediment input was likely high. Slope sediments with lower rates (5-14 cm/1000 years) likely could be marker of gravity mass movements (i.e. slides, slumps) of sediments due to unstability on slope as a result of earthquakes or/and other factors. Within the cores, generally upcore-decreasing rate values are believed rather to represent effects of diagenesis of organic matter with burial. These preliminary results indicate that various environmental and depositional conditions seem to be responsible for changes in sedimentation patterns during the last approximately 40,000 yrs in the eastern Marmara Sea.