

## **STRUCTURAL INTERPRETATION OF MULTI-CHANNEL SEISMIC REFLECTION DATA IN THE GULF OF İZMİT, MARMARA SEA.**

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Active submarine tectonics in the Gulf of İzmit, eastern Marmara Sea, was investigated by high resolution multi-channel seismic reflection data. The data were collected along 63 lines by R/V MTA Seismic-1 in September 1999 (total of 348 km). Seismic profiles are mainly in N-S direction with 1 and 0.5 km intervals. Data collection parameters are as follows: 1 or 2 generator-injector (GI) airgun (each with 45 cubic inch volume) energy source, 24-channel streamer (18 live channels) with 6.25 receiver group interval, 6.25 or 12.5 m shot interval, 12.5 m near offset, 1 ms sampling interval, 1.5 s record length. These parameters provided 9 fold common-depth-point (CDP) data for stacking. The data were processed in the Department of Geophysics, İstanbul Technical University (ITU). A conventional data processing stream was applied as follows: data transcribing, in-line geometry definition, editing, CDP sorting, gain correction, band-pass filtering, velocity analysis, normal-move-out (NMO) correction, muting, stacking, band-pass filtering, automatic gain control, and post-stack finite-difference time migration. Finally, we obtained the first stacked and migrated seismic sections in the Gulf of İzmit for interpretation. These new sections have much better reflection continuity, signal to noise ratio and reflector geometry due to sorting, stacking and migration when compared to the single-channel sections.

The northern branch of the right-lateral North Anatolian Fault (NAF) controls the structure of the Gulf of İzmit. It enters the gulf from the easternmost tip and follows the central axis mainly in E-W direction. The fault is traced in the stacked and migrated sections as a vertical discontinuity from the sea bottom to the 0.5 seconds. Below 0.5 seconds the trace of the fault is hardly followed under the strong sea bottom multiples. Bathymetric image map shows 3 basins in the gulf from east to west: Eastern, Central (Karamürsel) and Western basins. General seismic character in the Karamürsel Basin displays that the dextral fault has a dip slip in places which is correlated to the bathymetry and around parallel to sub-parallel sediments to the south and folded strata to the north. To the north coast of the gulf, a south dipping, reflector is clearly observed on the seismic sections. This structure is traced from the sea bottom to the 1 s. Maximum slope of this structure is about to 21° and between the 0.3-0.5 seconds it has a hill shaped. On the map view, this structure is followed just front of the northern shoreline of the gulf.