AN ATLAS OF THE MARMARA SEA: THE RESULT OF THE MULTIBEAM REFLECTIVITY SIDE SCAN SONAR AND HIGH DEFINITION SEISMIC SURVEY
for a better understanding of the western termination of the North Anatolian Fault

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The Marmara Sea is located at the western end of a major dextral strike slip fault, the North Anatolian Fault.

The Marmara Sea system is generally considered to correspond to a number of short, en echelon strike-slip fault segments distributed within three distinct depressions described as pull-apart basins (Armijo et al. [1]). Recently, Le Pichon et al. [2] proposed that there is a continuous fault across the sea, along the projected trace of the North Anatolian fault, from the Gulf of Izmit to the east to the Ganos Fault to the west. They called it the Marmara Fault. Aksu et al.[3] interpreted the results of a single channel seismic reflection survey over the whole Marmara Sea in terms of a highly complex transtensional flower structures that could corresponds at depth to this single major strike slip fault. On the basis of Turkish multi-channel seismic and multibeam bathymetry data, Imren et al. [4] demonstrated that the active strike slip fault system is located in a narrow zone along the axis of the Sea of Marmara.

On basis of these available data, a cruise was planned for the year 2000 in cooperation between INSU-CNRS-IFREMER and Tubitak and ITU with the support of the EC. A complete mapping of the Sea of Marmara below 100m depths was achieved. This study was followed by a sparker seismic profiling and side scan sonar (SAR) survey with capability to record just over the bottom (Pasisar).

The results of this survey on September 2000 on board R.V. le Suroit will be published by the Marmara scientific party and IFREMER in the form of an Atlas. Fine scale bathymetry and reflectivity with 1/100,000 scale maps are presented. The Atlas includes also representative SAR imagery as well as significant sparker and pasisar seismic profiles.

- Precise cartography using EM300 multibeam system was 25 m gridded. Bathymetric maps are presented in 3 overlying sheets. Three basins separated by highly deformed highs were mapped in detail in the Sea of Marmara.

- The reflectivity maps are presented at the same scale and the same framing. The trace of a single fault is clearly visible in the western part of the Marmara sea (Tekirdag and Central basins), meanwhile east of the central high, the Cinarcik basin is actively deformed along both its northern and southern margins.

-The Atlas includes also a mozaic of SAR imagery in the Central Basin where a small trantensional zone was identified. Additional side scan sonar images were selected to illustrate the trace of the active fault on the bottom, both in the Tekirdag Basin in the west and the Cinarcik Basin in the east.

- Selected high definition seismic profiles with a maximum penetration of 1,5 sdt provide as series of section views across the uppermost part of the fault zone.

References

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