TECTONIC ARCHITECTURE AND SEDIMENTOLOGY OF EDREMIT BAY BASED ON SINGLE CHANNEL SEISMIC IMAGING

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Abstract
Seismostructural charactersitics of Edremit Bay, northeast Aegean Sea were investigated by 350 km of single channel Airgun reflection survey. Preliminary interpretation of shallow seismic data indicates that Edremit Bay is bounded with normal faults with strike slip components. General direction of this fault system is NE-SW and this complex transtensional regime may be seen as a transfer zone between the extensional regime of the Aegean region and strike-slip regime of the North Anatolian Fault System. This tectonic pattern can also be traced from GPS and seismicity measurements. The components between the faults can be moved downward and westward due to normal and transform fault activities respectively. The presence of left lateral movement component at NE-SW trending faults is not clear and needs to be confirmed.

Keywords: Tectonics, Seismics, Sea level, Aegean Sea, Edremit Bay

Introduction
Single channel airgun reflection seismic survey were conducted on Edremit Bay. This study presents the late Quaternary stratigraphic and tectonic evolution of the Edremit bay at northeastern Aegean Sea (Fig. 1) using high-resolution seismic-reflection profiles. A history of deltaic deposition is recognized from 130 ka to the present, under the influence of active transtensional tectonics and high-frequency sea-level fluctuations. The study area is part of a string of transtensional basins that developed along the western seaward extension of the North Anatolian Transform Fault.

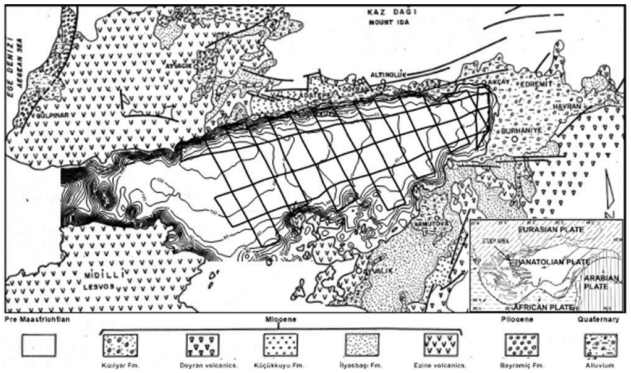

Fig. 1. Map showing location of the study area with bathymetry and location of seismic profiles. Geologic data modified from Siyako et al., [2].

Material and Methods
This study is based on acoustic and seismic data acquired during the cruise performed at Edremit Bay. Seismic surveys carried out on board the RV "K.Piri Reis", (Fig. 1). Areal sedimentary and tectonic framework for water depths of more than 100m have been recognized by analysis of reflection configuration in airgun profiles using the technique that described in Allen and Posamentier [1].

Discussion and Conclusions
Sequence stratigraphic analysis of Edremit Gulf establishes some general principles regarding the relationships of margin sedimentation to sea level changes. Sea level history determined from seismic stratigraphy links with the global eustatic sea level record based on oxygen isotopic curveys (Shackleton and Opdyke [3]). Edremit Bay basin correlates with lowstands of sea level in 2 to 6 whereas basin wide transgression surfaces correspond to the stages 5 to 1 transitions, when main deglaciations occurred. Present bathymetry shows that, when the sea level is lower than 100 m during the last glacial stage lacustrine or less saline conditions prevailing in the Gulf of Edremit. Seismic reflection profiles shows that, Pleistocene depositions and deltaic sedimentation in the Edremit bay largely controlled by mainly sea level changes and tectonic movements of North Anatolian Fault (NAF) system. Edremit Bay also has an asymmetric structure like other Western Anatolian grabens. NE-SW directed young faults are located in the Edremit Bay that parallel to southern branch of the North Anatolian Fault and these faults are associated with earthquakes occurred in the last hundred years tectonic formation of bay is thought to be still continuing. The blocks between the faults can be moved westward and downward due to transform and normal fault activities. The presence of left lateral movement component at NE-SW trending faults needs to be well defined. Faults may develop in any direction with the condition of appropriate Geometry. The westward movement of fault blocks is modelling the western coast of Anatolia and Aegean Sea bathymetry. Investigated data and other observations on coastal areas of eastern Aegean Sea indicate that the Edremit Bay is affected by westward movements rather than N-S openings.

References
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