## Geophysical studies in the Gulf of Edremit

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Approximately 500 line-kilometers of single-channel continuous seismic reflection and magnetic profiles were obtained with 40 cu-in PAR airgun system and proton magnetometer in the Gulf of Edremit (Western Turkiye). The data were collected from the research vessel K. Prir Reis of the Institute of Marine Sciences and Technology (Izmir-Turkiye). Fig. 1 shows the schematic tectonic map of the western Turkiye and surroundings.



Fig. 1: Schematic tectonic map of Marmara region and western Turkiye derived from WONG et al, 1990 and AKSU et al, 1990.

Detailed interpretations of the geophysical data show that the Gulf of Edremit is also an asymmetric graben as well other east-west trending grabens in the western Turkiye, associated with the regional north-south extension of the Aegean plate. These grabens and the intervening horsts control the west flowing drainage systems of western Turkiye.

Fig. 2 shows the geological map of Gulf of Edremit area and the seismic lines were measured during the cruise and offshore exploration well Edremit-1. The interpretation of seismic data shows that there are several NE-SW trending faults in the Gulf of Edremit which are subparallel to the major "southern strand of North Anatolian Fault (NAF)". The activities of these faults began probably in early Miocene and are still continuing.



Fig. 2 : Geological map of Gulf of Edremit area (from SIYAKO et al, 1989) and seismic and magnetic lines.

From the magnetic data is shown that there are no important anamolies in the northern side of Gulf of Edremit. But in the southern side of region there are some important anamolies, because of the volcanic rocks which appear on land and on islands. There was also further obtained gravity data from the Gulf of Edremit besides obtained seismic and magnetic measurements. Calculated gravity models from Bouguer Map of north western Turkiye show that there are 2-3 km thick sediments in the Gulf of Edremit which are transported by the streams of "Edremit Gayl", "Havran Cayl" and "Karadere". The sediments in the eastern side are thicker than the western side in the Gulf of Edremit.

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Mudvolcanoes in the Black Sea

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During 1991 an international group of scientists and students carried out a training and research program on board the Russian Research Vessel "Celendzhik". In the Russian sector of the Black Sea this was partially directed towards a study of the distribution and character of mudvolcances in an area South East of the Crimean peninsula, by means of subbotom profiling and side scan sonar recording, followed by box- and gravity coring.

In the study area the upper two seconds of the sedimentary sequence consist of Plio/Quaternary sediments with well stratified, parallel to sub parallel reflectors which locally are interrupted by the piercing and diapirism of the mudvolcances. The mudvolcances generally have a mushroom shaped or volcanic crater like cone that rises 40-120 m out of the surrounding, flat seafloor. Their diameter at the seabottom ranges from 900-2700 m. However, a number of mudvolcances has an asymmetrical shape, with a depressional sink and with rims along the margins. Numerous diapiric structures were also observed at greater depth below the seafloor, sometimes associated with growth faults extending from their tops towards the surface, and with faulted or folded reflectors above and on top. Aside from positive features in the sedimentary column, collapse structures at depth can al so be observed, and are relatively abundant. abundant.

abundant. Side scan sonar records show the presence of smaller scale vents and seeps and locally show the presence of mudflows, carrying blocky lumps of semiconsolidated material over the rims. Most probably the bright spots observed at 440-600 ms TWT below the seafloor represent the presence of gas; earlier results from MSU indicate the presence of methane and gas hydrates in and near the zone where mud volcanoes are abundant.

Fig. 1 Shows the shallow seismic reflection and (partially) sidescan sonar recording lines (indicated by nrs) of Black Sea cruise R.V. "*Gelendzhik*" 1992 in the area south east of the Crimean peninsula. Circles give positions of ( expected) mudvolcanoes.



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