Turkish J. Marine Sciences 5(3): 167-170 (1999)

The Bathymetry of the Izmit Bay

İzmit Körfezi'nin Batimetrisi

A. Cem Güneysu

University of Istanbul, Institute of Marine Sciences and Management
Vefa, 34470 Istanbul, Turkey

Abstract

The Bathymetrical Map of the Izmit Bay originally scaled 1/50.000 was prepared in 1997. The map provides information that shows the morphotectonic features of the sea-floor of the Izmit Bay.

Keywords: Bathymetry, isobath, Izmit Bay, Marmara Sea, morphotectonic features, sea floor, Northern Anatolian Fault

Introduction

One of the resources used in order to determine the geomorphology of sea floor is a bathymetrical map. The features on this kind of maps shown by isobaths, such as getting closer, getting farther or curling etc. provide the information about the geomorphology of the area just the same as the topographical maps used in land studies.

The detailed bathymetrical maps of the Turkish Seas have not yet been prepared, because the depth measurements have not been carried out for every region by the help of research vessels. Most of the available detailed bathymetrical depth values mainly dealt with harbour, bay etc. and they were prepared for mainly sailing, navigation or anchoring purposes of vessels such as ships, boats etc.

The Izmit Bay was one of the areas of which bathymetrical depth values were available to form the isobaths adequately that could show the form of the floor of the Izmit Bay. The "Bathymetrical Map of the Izmit Bay" was prepared (Figure 1) by the author in 1997 but not published till present*.

Because the northern strand of the North Anatolian Fault Zone has been extending westwards through the floor of the Izmit Bay and sweeping its coasts, such a bathymetrical map is of prime importance in morphotectonical studies. Furthermore, the Kocaeli Earthquake, which occured on August 17, 1999 on the northern strand of the North Anatolian Fault Zone, has stressed once more the necessity of having the knowledge on the form of the floor of the Izmit Bay.

The shallow and deep seismic studies carried out before August 17, 1999 and similar studies followed, along with the bathymetrical map, will help obtain the correct information about the morphotectonic of the sea floor of the Izmit Bay at present.

Publication of the "Bathymetrical Map of the Izmit Bay", is hoped to serve the workers in scientific research in future.

Method

The "Bathymetrical Map of the Izmit Bay" was prepared with the help of the depth values of navigation charts in different scales which were published by the Turkish Navy, the Department of Navigation, Hydrography and Oceanography. The depth values were carried to a bathymetrical map draft of 1/50,000 scale and then converted into isobaths every 5 metres down to minus 100 metres and every 10 metres down to 200 metres. Lack of information on homogeneous distribution of depth data at that time prevented the employment of such drawing programmes as Surfer©, AutoCad© etc. in this work. The required adjustments were made on the isobaths formed taking into consideration the connection with the land geomorphology and the map was given its final shape.

---

* A copy of this map was used without the permission of the author in a poster presentation at the International Conference on the Kocaeli Earthquake, 17 August 1999 which was held by ITU-IAHS in Istanbul, Turkey 2–5 Dec. 1999.

Results

On the "Bathymetrical Map of the Izmit Bay" (Figure 1), originally scaled as 1/50,000, the first geomorphological traces sighted are the topographic depressions. The topographic depressions traced in three regions in the Izmit Bay are first in the east of the Bay, southern part of Kocaeli, secondly, in the centre, between Hereke and Karamürsel and thirdly in the western part of the Bay, southwest of Darıca. The cliffs which were unusually formed around the depressions show the relationship between the depression formations and tectonic setting. The lineations that correspond to the fault lines are noticeable at the topographic depressions and most of the coastal areas around the Izmit Bay.

The continuation of the Hersek Delta under the sea can be observed down to -55 metres toward the northern part of the delta (Alpar and Güneysu, 1999). In the northwest of the Hersek Delta, a NE – SW trending channel, which was caused by the tectonic and fluvial processes, can be followed towards west. This channel also continues westward beyond the limits of the bathymetric map given in Figure 1.

The author hopes that this study will serve in future to multidisciplinary researchers who are working on earth sciences.

Özet

Orijinali 1/50.000 ölçekli olan İzmit Körfezi Batimetri Haritası 1997 yılında oluşturulmuştur. Bu harita, İzmit Körfezi'nin dip yapısına ait morfotektonik özelliklerin ortaya konmasına ilişkin bilgiler sunmaktadır.

References

Alpar, B. and Güneysu, A.C., (1999). Evolution of the Hersek Delta (Izmit Bay) *Turkish J. Mar. Sci.*, 5: 57-74.

Turkish Navy, the Department of Navigation Hydrography and Oceanography (1990): Navigation Map of the Izmit Harbour (1/15.000), Marmara Sea, Istanbul, Turkey.

Turkish Navy, the Department of Navigation Hydrography and Oceanography (1990): Navigation Map of the Gölcük Harbour (1/10.000), Marmara Sea, Istanbul, Turkey.

Turkish Navy, the Department of Navigation Hydrography and Oceanography (1992): Navigation Map of the Izmit Bay (1/50.000), Marmara Sea, Istanbul, Turkey.

Received 15.09.1999

Accepted 10.12.1999