

THE HYDROGRAPHIC CHARACTERISTICS OF THE WATER MASSES IN THE SICILY STRAIT AND THE SURROUNDING REGIONS

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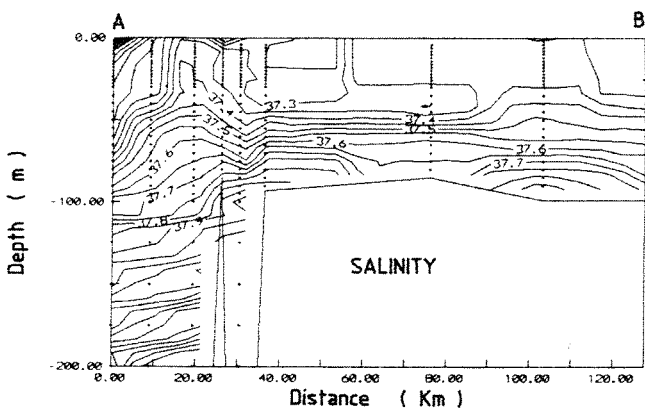
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The knowledge of the oceanographic conditions of the central region of the Mediterranean Sea extending between Sicily, Sardinia and the northern African coast is crucial for the comprehension of the whole basin dynamics. This region is surrounded by the three of the major straits and passages within the Mediterranean, all of them exerting a strong control on the water and particle fluxes from one basin to the other. An oceanographic investigation of this area based on periodic hydrographic stations and long-term current meters measurements along all the strait sections, was initiated in the frame of a cooperative effort among French, Spanish and Italian teams working under the sponsorship of IOC and CIESM and with the financial support of the EC (EUROMODEL and GEODYME Projects). In this frame, the hydrographic properties of the Sicily Strait and the surrounding regions were investigated during two oceanographic campaigns carried out in November 1993 and May 1994 by the Stazione Oceanografica of CNR. In this paper we present the results obtained in the two campaigns, that are to be considered preliminary to our future activity in this region.

The Sicily Strait is a two-sills, wide and relatively shallow strait, characterized by a very complicated bottom bathymetry. In agreement with the previous measurements (for all, GRANCINI *et al.*, 1972), in the Sicily Strait we are in the presence of a two-layer system divided by a transition layer. At the surface we find the Modified Atlantic Water (MAW) characterized by low salinity values and deepening as far as about 100 m of depth. All the previous measurements (for all, GRANCINI *et al.*, 1972) indicate that the flow of MAW mostly takes place close to the Tunisian coast. Being prevented to work in this area, we found a salinity minimum close to the Sicilian coast, and a wide region of mixing in the central channel (Figure). We then believe that, due to the presence of the Skerki Bank upstream of the strait, two separate veins of MAW reach the Sicily Strait, each bordering the two sides of it. In both periods, a portion of the MAW was seen to flow into the Tyrrhenian Sea, very close to the western Sicilian coast.

Below about 200 m of depth as far as the bottom, there is the Levantine Intermediate Water (LIW) characterized by high salinity values and flowing westward. At the strait section, the flux of LIW is splitted by the presence of a steep ridge, and most of it flows within the narrow valley (the eastern sill) between the ridge and the Sicilian shelf. In spite of the higher salinity values found on the other side of the ridge, this secondary vein does not seem to play an active role in the following path of the LIW. This can be observed in the hydrographic sections adjacent to the strait, just showing that, once in the western Mediterranean, LIW is conveyed as a unique vein directly toward the Tyrrhenian Sea, where it enters as a strong jet at the bottom of the Sicilian slope. The outflow of this water, with substantially modified characteristics, can be recognized in the central part of the Sicily-Sardinia passage.



The distribution of the MAW in the Sicily Strait during November 1993.

A and B indicate the Tunisia and Sicily sides, respectively.

REFERENCES

GRANCINI G., A. LAVENIA and F. MOSETTI, 1972. A contribution to the hydrology of the Strait of Sicily. From "Oceanography of the Strait of Sicily", Saclantcen Conference Proceedings, N. 7: 68-81.