

ENVIRONMENTAL BACKGROUND OF THE HABITAT OF *NAUTILUS* OFF THE SOUTHEASTERN COAST OF PORT MORESBY, PAPUA NEW GUINEA

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The field studies for understanding the environmental background of the habitat of *Nautilus* off the southeastern part of Port Moresby, Papua New Guinea, were carried out in the nearshore (Figs. 1 and 2) and the open sea (Fig. 1) areas. In the former area, submarine

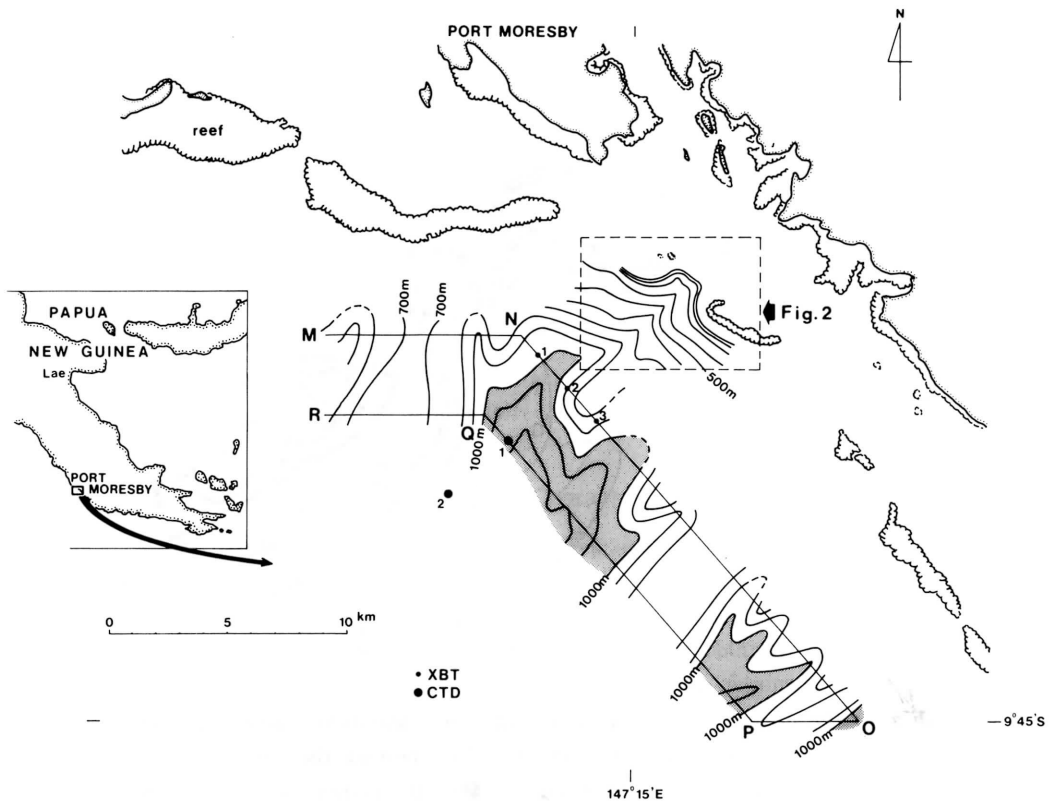


Fig. 1. Index and bathymetric contour maps of the open sea area off the southeastern coast of Port Moresby, with the echo-sounding lines and the CTD and the XBT stations.

topographic profiles and bottom sediments were obtained making use of a small fishing boat of the Research Center of the Faculty of Science, the University of Papua New Guinea. In the latter one, submarine topographic profiles along two lines nearly parallel with the coastline, 3 and 5 miles far from the edge of barrier reef, and the vertical distribution patterns of sea water temperature and salinity were also obtained by the CTD and the XBT installed on the R.V. Keiten-maru of the Faculty of Fisheries, Kagoshima University.

Submarine Topography

1) Nearshore area

Based on the echo-sounding records carried out along eight parallel lines both in the E-W and in the N-S directions, a bathymetric contour map of the area was compiled (Fig. 2). The map shows the bathymetric contour lines parallel with the outer margin of barrier reef, the gentle slope (9° - 12°) on the deep bottom from 300 m to 600 m in depth and the steep slope (17° - 59°) from the outer margin to about 300 meters deep bottom. This topographic feature is quite similar to that of Mutremdiu Bay, Palau in having steep slopes (about 40°).

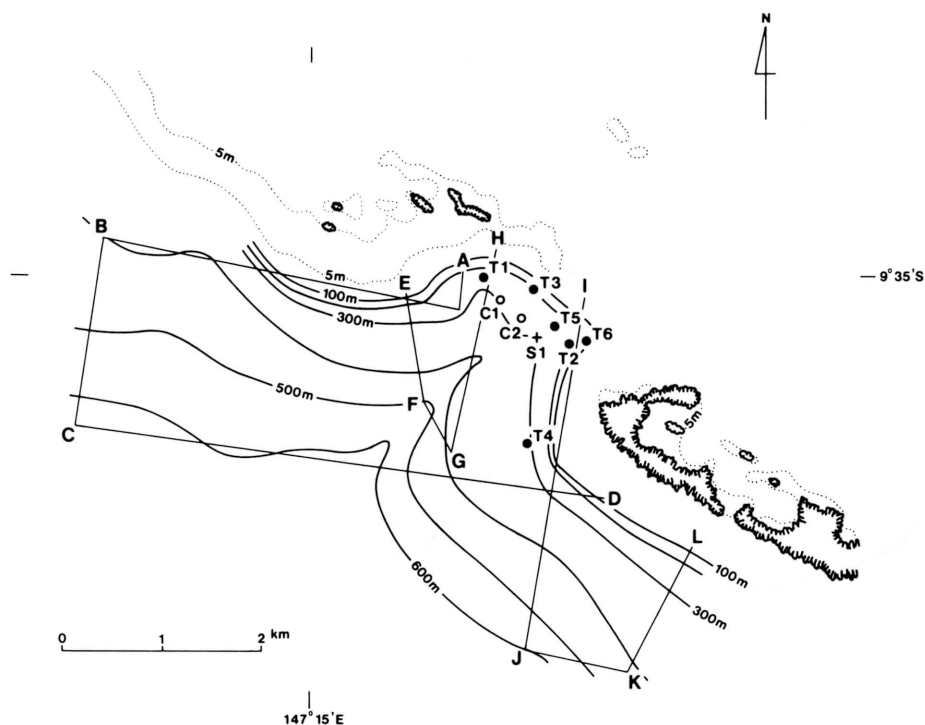


Fig. 2. Bathymetric contour map of the nearshore area off the southeastern coast of Port Moresby, showing the echo-sounding lines and stations for trapping (●), still camera work (○) and for sampling of bottom sediments (+).

2) Open sea area

Based on the off-shore topographic profiles along the two lines mentioned above, a

bathymetric contour map of this area was compiled (Fig. 1). The map shows the occurrences of two submarine valleys deeper than 1000 meters, traversing the bathymetric contour lines parallel with the outer margin of barrier reef.

Bottom Sediments

Through the present field work, bottom sediments were collected at only one station (Stn. S 1: 300 m in depth) in the nearshore area (Fig. 2). For the sampling of bottom sediments, a gravity core sampler (the Phleger type) was used. The uppermost 1 cm of the core sample was used for the mechanical analysis. The sample was analyzed by the Emery settling-tube method and by making use of the automatic grain size analyzer (Nichiei-denki Co.) to determine the relative proportion of gravel, sand, silt and clay (Fig. 3). Median diameter ($Md\phi$), sorting coefficient ($\sigma\phi$; $S\phi$) and skewness ($\alpha\phi$; $Sk\phi$) were obtained graphically from the cumulative curve (INMAN, 1952). As the result of mechanical analysis, it was recognized that this sample of sediments represents very coarse-grained ($Md\phi$: 3.6) and moderately sorted (0.905ϕ) sand with nearly symmetrical distribution ($Sk\phi$: 0.028). These values suggest that the bottom current is comparatively stable and has a velocity of about 10 cm per second (REINECK and SINGH, 1980).

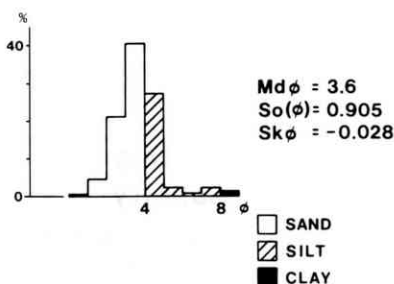


Fig.3. Grain size ratios, median diameter, sorting coefficient and skewness of bottom sediments in the nearshore area off the southeastern coast of Port Moresby.

Sea Water Characteristics

To obtain the basic information on the sea water characteristics, the CTD was lowered at one station along the 5 miles line, and the XBT was launched at the three stations along the 3 miles line off the southeastern coast of Port Moresby (Fig. 1).

The vertical sections of water temperature and salinity obtained by the CTD are shown in Fig. 4, and the former is almost the same as the data obtained by the XBT.

Water temperature slightly lowers from the surface (27°C) to 120 m in depth, and rather rapidly decreases from 120 m (24°C) to 360 m in depth (12°C). The temperature of waters deeper the 360 m seems to change gradually and at the depth of 800 m it is about 5.5°C. This feature is very similar to the one off Suva, Fiji (HAYASAKA *et al.*, 1985).

Salinity ranges from 34.5 to 35.6‰. The lowest value of salinity around 34.5‰ was recognized both in the surface and the deep (800 m) waters while the highest salinity of about 35.6‰ is in the water at the depth of about 180 m.

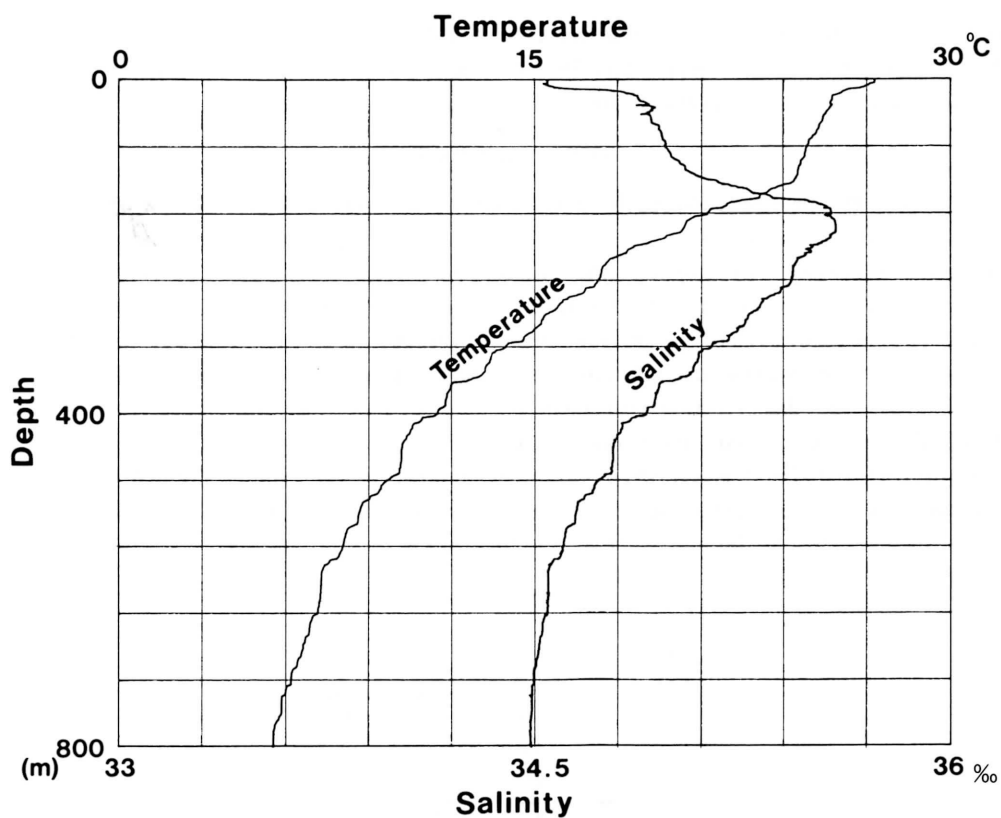


Fig. 4. Vertical distribution of water temperature and salinity of the open sea area off the southeastern coast of Port Moresby.

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