

## A LONG OCEANOGRAPHIC SECTION FROM THE SOUTH OF KYUSYU, JAPAN TO THE EQUATOR, 145°E IN NOVEMBER 1990

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### Introduction

In the second year of the research project, "Man and the environment in Papua New Guinea", oceanographic observations were carried out by the Keiten Maru (G. T. 860 tons), fishing training ship of Kagoshima University from 6 to 13 November, 1990. The line and locations of the oceanographic observations (Fig. 1) were almost the same as the first cruise in 1989. The oceanographic observations were made by Expendable Bathythermographs (XBT) and the Conductivity, Temperature, and Depth Recorder system (CTD System). The XBT was launched every one degree of latitude from 27° 00'N to 20° 00'N, and every half degree of latitude from 19° 30'N to equator at 49 stations.

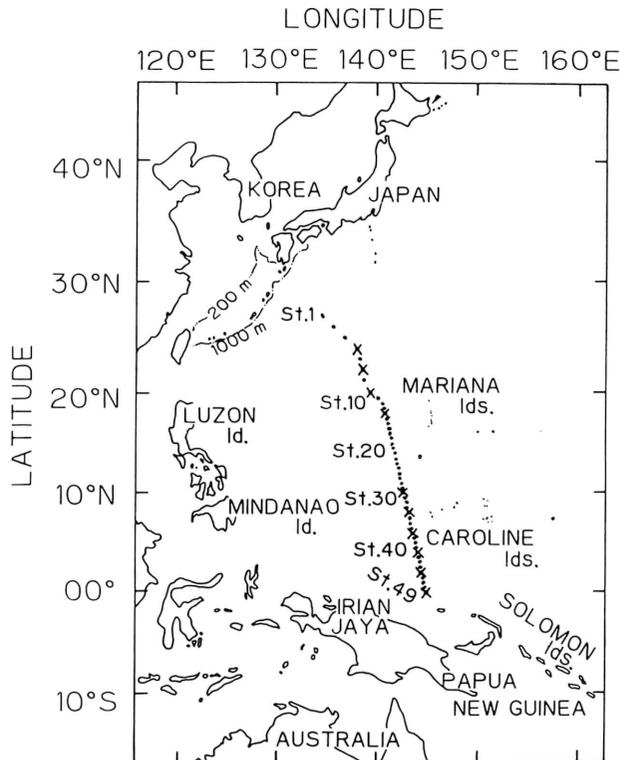


Fig.1 The locations of oceanographic observations.  
(Dots shows XBT stations and crosses shows CTD stations)

The CTD was cast every two degrees of latitude from 22° 00'N to the equator at 10 stations. From 18° 00'N to 10° 00'N, the weather was foul, so CTD observations were cancelled at some stations.

### Results and Discussion

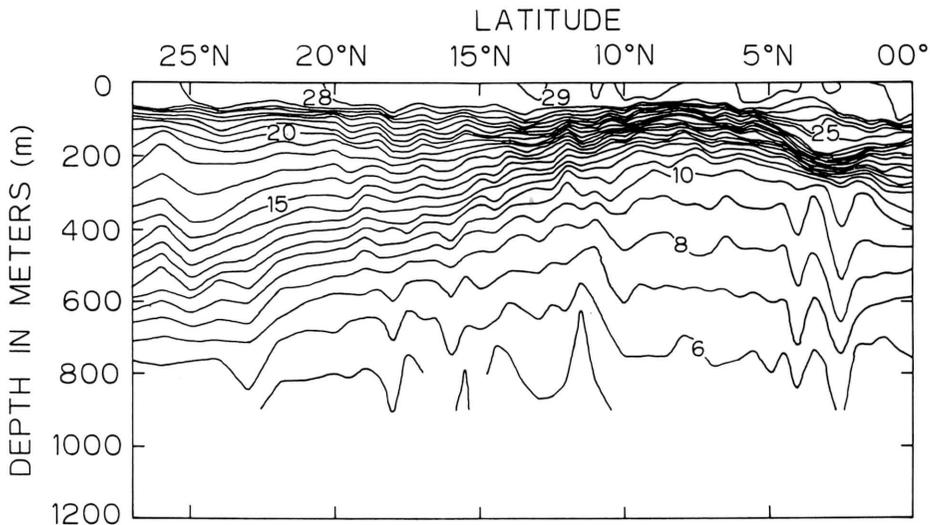


Fig. 2 Distribution of water temperature (°C) in the vertical section

#### *Vertical section of temperature*

Fig. 2 shows the distribution of water temperature in the vertical section along the course. The surface water temperature was higher than 29°C in almost all sections from about 14°N to the equator. The highest surface temperature was 29.74°C at 0° 30'N, 144° 52'E. The surface water with temperature values more than 26°C was present in the surface mixed layer about 70 m thick over the whole sections. The up slope of the isotherms between 11°C and 19°C from the north to the south at about 27°N showed the existence of the Kuroshio countercurrent. A sharp thermocline with a core temperature of 20°C is found from the equator to about 13°N at depths between 100 and 200 m. This thermocline formed a ridge at about 7° 30'N (countercurrent ridge), which indicated the boundary between the North Equatorial Current and the North Equatorial Counter Current. The 20°C isotherm depth at this ridge is about 100 m (at 8° 30'N) though it was about 110 m (at 7° 30'N) in November of 1989 (YUWAKI *et al.*, 1990).

The isotherm of the thermocline spread as we moved toward the north from about 19°N at depths between 150 m and 400 m, which indicated the existence of the Subtropical Mode Water.

#### *Vertical section of salinity*

Fig. 3 shows the distribution of salinity in the vertical section. A blank space is where

no data could be collected due to weather.

Surface water salinity lower than 34.00‰ less than 50 m thick was observed between about 21°N - 23°N and about 4°N - 9°N. The lowest value was 33.086‰ on the sea surface at 22° 00'N.

Below the surface, saline water of more than 35.00‰ was found at depths between 90 and 270 m extending from the equator to about 4°N whereas the last year's survey in November of 1989 showed that of more than 35.00‰ was found at depths between 50 and 200 m extending from the equator to about 6°N (YUWAKI *et al.*, 1990).

Similarly in 1989 subsurface saline water of more than 34.70‰, was found in the thermocline layer at depths between 75 and 200 m extending from 6° 30'N towards the north (YUWAKI *et al.*, 1990). We couldn't declare to exactly where in this survey, since we had no data around this area. However the subsurface saline water more than 34.80‰ suggested to exist from 9°N towards the north at a depth of about 100 m by the data obtained both at 8° 00'N and 10° 00'N.

Below the subsurface saline water, the intermediate water characterized by low saline of less than 34.50‰, the North Pacific Intermediate Water extending to about 9°N at a depth of 200 m the same as last year.

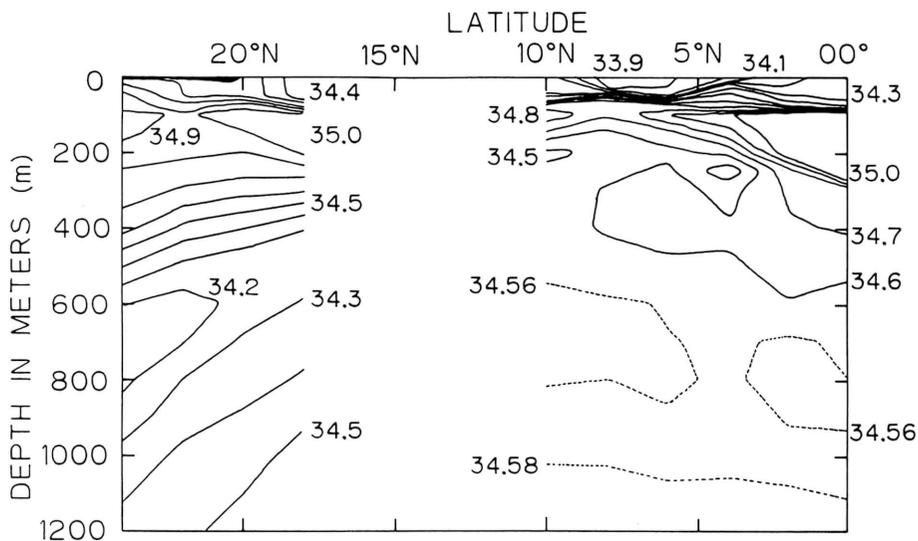


Fig.3 Distribution of salinity (‰) in the vertical section

#### Reference

- YUWAKI, Y., HIGASHI, M., MASUMITSU, S. & NISHI, T. 1990. Kagoshima Univ. Res. Cent. South Pac., Occasional Paper, No.20, 68-71