

1. Objectives

The equatorial Pacific has distinguished characteristics, those are it occupies a large region of the world's ocean and the warmest water of the planet exists there. The western equatorial Pacific contains so-called warm water pool. Nitrate is depleted there and primary production is small. In the central and eastern equatorial Pacific, vertical flux of nutrients is enhanced due to Quasi-stationary upwelling caused by equatorial divergence and consequently chlorophyll a concentration and primary production rate increased along the equator. However, primary production and biomass are not as high as would be expected from the flux of nutrients could support. This is called high nutrient low chlorophyll situation. Since this east to west asymmetry is affected by ENSO event, there is a significant variability in physical characters on seasonal-interannual scale with impact to biogeochemistry, as well potentially with the similar scale of variability.

In order to investigate the mechanism of this biogeochemical variability, Japan Marine Science and Technology Center (JAMSTEC) conducted biogeochemical observation cruise in the equatorial Pacific. Participants are from ;

- Central Research Institution of Electric Power Industries
- Dalhousie University
- Geological Survey of Japan
- Global Ocean Development (Technicians)
- Hokkaido University
- Kansai Environmental Engineering Center
- Kumamoto University
- Kyushu University
- Marine Works Japan (Technicians)
- Meteorological Research Institute
- Nagoya University
- National Institute of Radiological Sciences
- Seikai National Fisheries Research Institute
- Tohoku University
- Tokyo University
- University of Sizuoka

2. Cruise

Ship : MIRAI
Chief Scientist : Takeshi KAWANO, Ocean Research Department, JAMSTEC
Cruise Code : MR02-K01
Project title : Bio-optical research
Period : Jan 7, 2002 – Feb. 16, 2002
Ports of call : 1) Yokohama, Japan
2) Honolulu, U.S.A.
3) Guam, U.S.A.
4) Hachinohe, Japan
5) Sekinehama, Japan

3. Cruise Track

Cruise track is shown in Fig.1. Continuous measurements of surface seawater and meteorological measurements were made whole through the cruise. We made hydro-casts at 12 stations. Sediment Traps were recovered at Station 6, 9 and 14, and deployed at Stations 3, 6, 12 and 14.

4. Observations

We made a comprehensive observation to investigate carbon cycle especially in a biological aspect. Our observation includes ;

- Hydrocast for physical, chemical and biological parameters such as salinity, nutrients, dissolved inorganic carbon, plant pigments and so on.
- XCTD (Fig.2)
- Atmospheric and oceanic CO₂ measurements.
- In situ and simulated in situ incubation for primary productivity and new productivity.
- Sediment trap moorings to observe export production.
- Distribution of phytoplankton and zooplankton.
- Etc.

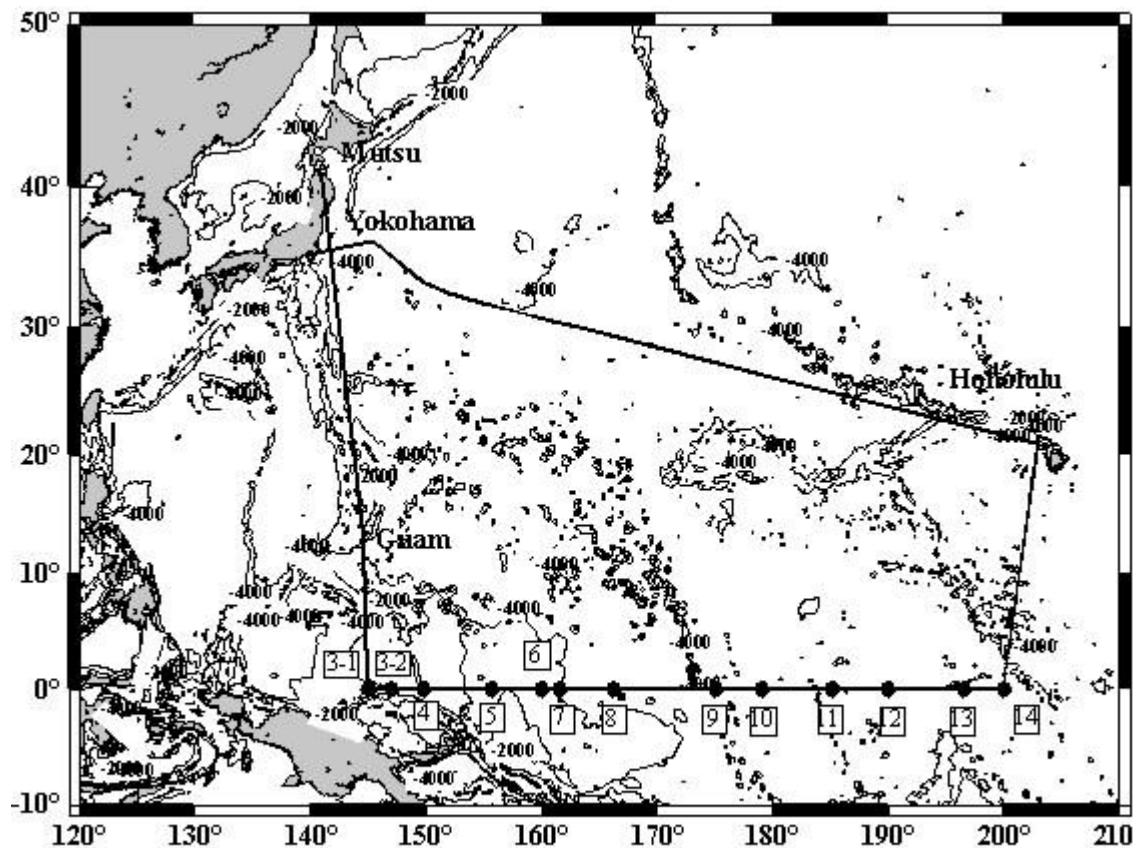


Fig.1 MR02-K01 Cruise Track

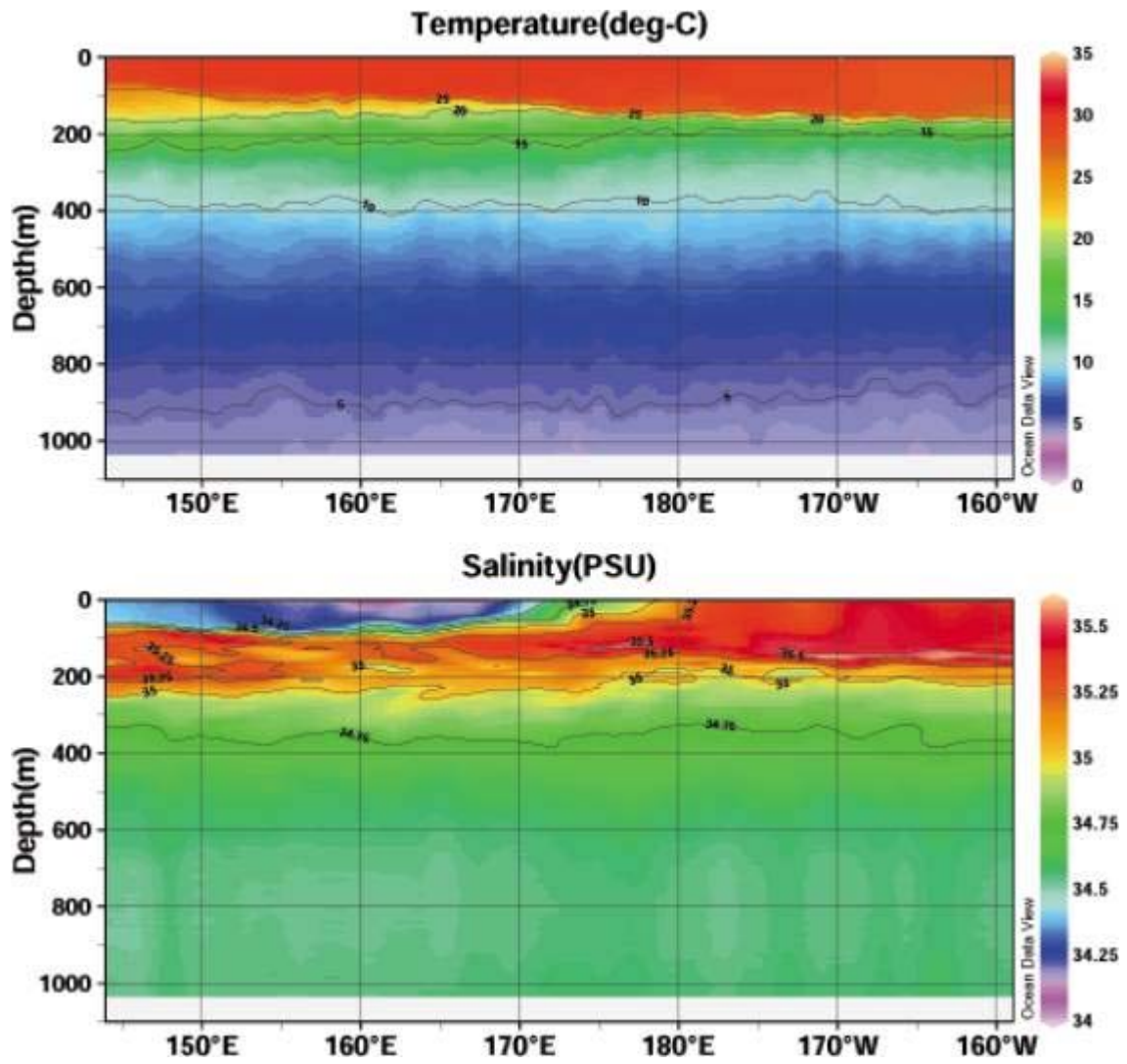


Fig.2 Vertical Section of Temperature (above) and Salinity (below)