

# MR05-02 Cruise Summary

## 1. Objectives

It is well known that the oceans play a central role in determining global climate. However, heat and material transports in the ocean and their temporal changes have not yet been sufficiently quantified. Therefore, the global climate change is not understood satisfactorily. The purposes of this research are to evaluate heat and material transports including carbon, nutrients etc, in the North Pacific and to detect its long term changes and basin-scale biogeochemical changes since the 1990s.

P10 is the hydrographic section nominally along 149 degree east from Hokkaido, Japan, to the coast of Papua New Guinea. The P10 cruise was the first in two WHP re-visit cruise aboard R/V MIRAI in 2005 followed by P3.

The other objectives of this cruise are as follows;

1. to observe surface meteorological and hydrological parameters as a basic data of the meteorology and oceanography,
2. to observe sea bottom topography, gravity and magnetic fields along cruise track to understand the dynamics of ocean plate and the accompanying geophysical activities,
3. to contribute to establishment of data base for model validation,
4. ARGO sensor calibration and its deployment in the western Pacific.

Participants are;

- Global Ocean Development (Technicians)
- Graduate School of Agricultural and Life Sciences, the University of Tokyo
- Graduate School of Environmental Science, Hokkaido University
- Graduate School of Science, Tohoku University
- Marine Works Japan (Technicians)
- Meteorological Research Institute
- National Institute for Environmental Studies
- Tottori University of Environmental Studies
- University of the Ryukyus

## 2. Cruise

Cruise Code : MR05-02

GHPO Section designation : P10

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Ship : R/V MIRAI

Ports of Call :                      Sekinehama – Hachinohe – Guam  
Cruise Date :                        May 25, 2005 – July 2, 2005

### 3. Cruise Track

Cruise Track and station locations are shown in Fig.1.

### 4. Observations

#### 4.1 Number of Stations

A total of 124 stations were occupied using a Sea Bird Electronics 36 bottle carousel equipped with 12 liter Niskin X water sample bottles, a SBE911plus equipped with SBE35 deep ocean standards thermometer, SBE43 oxygen sensor, Seapoint sensors Inc. Chlorophyll Fluorometer and Benthos Inc. Altimeter and RDI Monitor ADCP.

#### 4.2 Sampling and measurements

- a. Measurements of temperature, salinity, oxygen, current profile, fluorescence using CTD/O2 with LADCP, fluorometer.
- b. Water sampling and analysis of salinity, oxygen, nutrients, CFC11,12, 113, total alkalinity, DIC, and pH. The sampling depth in db were 10, 50, 100, 150, 200, 250, 300, 400, 500, 600, 700, 800, 900, 1000, 1200, 1400, 1600, 1800, 2000, 2200, 2400, 2600, 2800, 3000, 3250, 3500, 3750, 4000, 4250, 4500, 4750, 5000, 5250, 5500, 5750 and sea bottom (minus 10db).
- c. Water sampling of PON,  $^{14}\text{C}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$  and  $^{137}\text{Cs}$ .
- d. Surface water sampling for a biological study.
- e. Underway measurements of  $\text{pCO}_2$ , temperature, salinity, nutrients, surface current, bathymetry and meteorological parameters.

#### 4.3 Floats, Drifters, Drifter

2 ARGO floats (APEX floats) were launched.

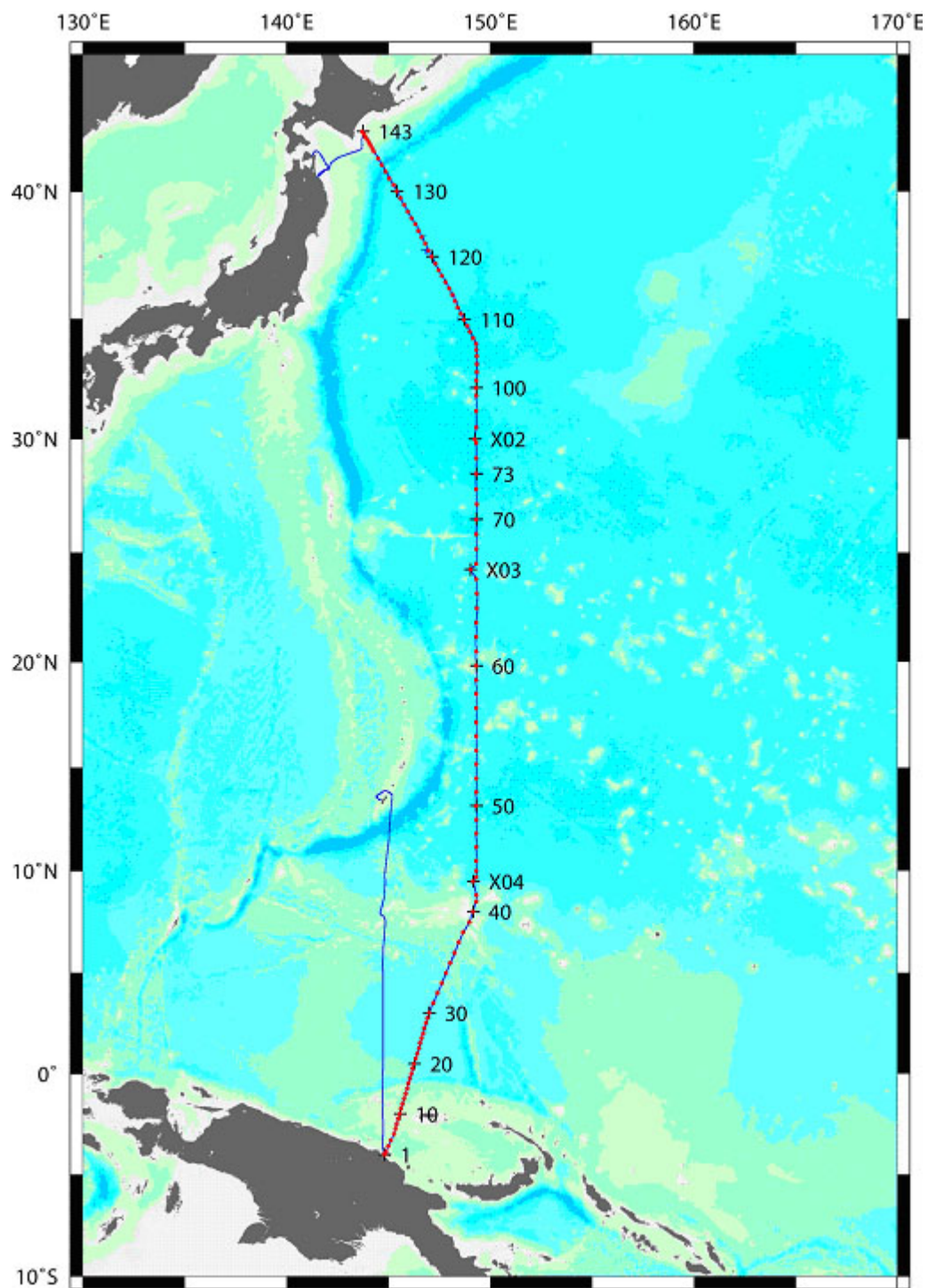


Fig.1.1 Cruise Track