
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.

The observation was conducted along hydrographic section named P3, which was nominally along 24 degree north from San-Diego, U.S.A. to Okinawa, Japan.

The other objectives of this cruise are as follows;

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

Other atmospheric and biogeochemical researches were conducted by researchers selected by the R/V MIRAI Operation Planning Committee.

Participants are from;
Frontier Collaborative Research Center, Tokyo Institute of Technology
Global Ocean Development (Technicians)
Graduate School of Science, Tohoku University
Graduate School of Science and Technology, Chiba University
Marine Works Japan (Technicians)
Meteorological Research Institute
National Institute for Environmental Studies
Tianjin Japan–China Graduate School
Tottori University of Environmental Studies
University of the Ryukyus

2. Cruise

Cruise Code : MR05–05
GHPO Section designation : P3
Chief Scientist :
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Ship : R/V MIRAI
Ports of Call : San-Diego – Honolulu – Okinawa – Sekinehama
Cruise Date : Oct. 31, 2005 – Jan 30, 2006

3. Cruise Track

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

4. Observations

4.1 Number of Stations

A total of 235 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

- Measurements of temperature, salinity, oxygen ,current profile using CTD/O2 with LADCP.
- Water sampling and analysis of salinity, oxygen, nutrients, CFC11,12, 113, total alkalinity, DIC, pH CH4, N2O and so on. 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).
- Water sampling of PON, 14C, 13C, 15N, 137Cs and bacteria.
- Air and rain fall Sampling
- Surface water sampling for a biogeochemical study (selected stations).
- Underway measurements of pCO2, temperature, salinity, nutrients, surface current, bathymetry and meteorological parameters.

4.3 Floats, Drifters, Drifter

One ARGO floats was launched.

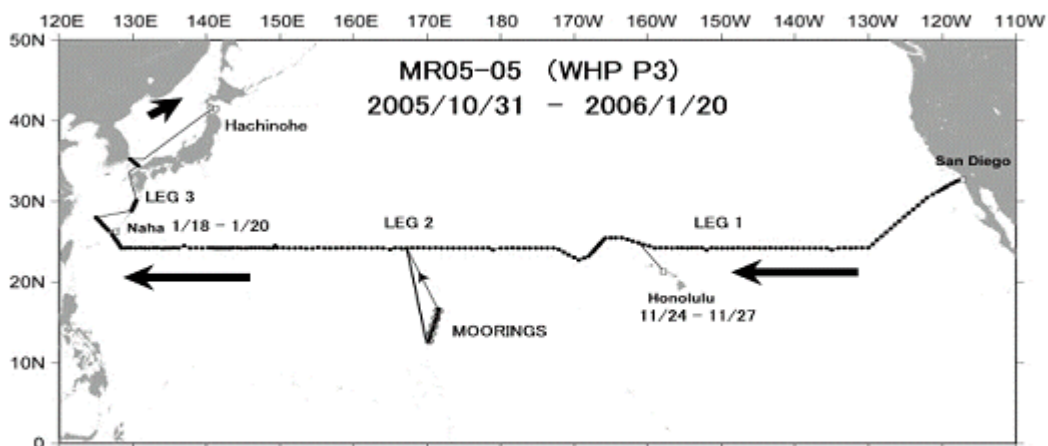


Fig.1 Cruise Track