

1. Introduction

The purpose of this cruise is to observe the ocean and atmosphere in the western tropical Pacific Ocean for better understanding of climate variability involving the ENSO (El Nino/Southern Oscillation) phenomena and Asian monsoon variability, which largely influence social and economical activity in the eastern Asian region. Particularly, the warm water pool (WWP) in the western tropical Pacific, which is characterized by the highest sea surface temperature in the world and plays a major role in driving global atmospheric circulation, is focused in this study.

For above purpose, we recovered and re-installed six TRITON (TRIangle Trans-Ocean buoy Network) buoys along 130E and 137-138E lines in the western equatorial Pacific. We also observed low-latitude western boundary currents, which are important factors of ocean climate in the western equatorial Pacific, using CTD/XCTD and shipboard Acoustic Doppler Current Profiler (ADCP) under the 2006-07 El Nino condition.

Additionally we conducted meteorological, chemical, biological and geophysical observations in the western equatorial Pacific not only for above purpose but also for research of exchange of greenhouse gasses between ocean and atmosphere, and so on.

2. Summary

1. Cruise Code: MR06-05 Leg 3
2. Project Name: Tropical Ocean Climate Study
3. Ship: R/V Mirai
4. Chief Scientist: Yuji Kashino (IORGC, JAMSTEC)
5. Period: December 14, 2006 – January 20, 2007 (38 days)
6. Ports call: Singapore (Dec. 14, 2006) – Hachinohe (Jan. 18, 2007) – Sekinehama (Jan. 20, 2007)

3. Observations

1. TRITON mooring deployment and recovery : 6 sites
(8N130E, 2N130E, 0N138E, 2N138E, 5N137E, and 8N137E)
2. CTD and water sampling : 10 casts at 6 sites
CTD observations were conducted near the TRITON buoy sites. Measurement depth was until the ocean bottom or 1000m depth.
Water was sampled at 17-20 layers for analysis of salinity, dissolved oxygen, nutrients, total carbon dioxide, nutrients, nitrogen oxide, trace metals, microflora, chlorophyll a, methane, particulate organic matter.
3. XCTD : 64 casts
Along 18-20N, 130E, 8N, 7N and 137-138E lines until 1000m depth.
4. Surface water and air samplings : 12 casts
Surface water was sampled using a bucket. Air was sampled on the compass deck of R/V Mirai.
Both samplings were conducted at the CTD casts and 18-20N123E, 18-20N128E, 18-

20N130E, 13N130E, 13N 137E, and 18N137E.

5. Sea Skaters (Halobates) sampling : 7 casts

Sea Skaters were sampled using a net near the TRITON buoy sites and 6N130E.

6. Continuous observations :

Surface meteorological observations (wind, air temperature, pressure, humidity, radiation, rain rate, turbulent flux, and cloud base height)

Aerosol and cloud profile measurements using cloud profiling radar, sky radiometer, and two-wavelength lidar

Current observations by a shipboard ADCP:

Surface temperature, salinity, dissolved oxygen, and chlorophyll-a measurements by intake method

Rain and water vapor were sampled.

Bathymetry, sea surface gravity and geomagnetic measurements

7. Recovery of Ocean Bottom Electromagnetometer :

We tried to recover an Ocean Bottom Electromagnetometer deployed at 37-08N, 150-47E in May 2005, however, could not recover it because of bad sea state.