

MR12-03 Cruise Summary

1. Cruise Information

- 1) Cruise Code: MR12-03
- 2) Ship Name: R/V Mirai
- 3) Title of Cruise (project): Tropical Ocean Climate Study
- 4) Chief Scientist: Yuji Kashino (RIGC, JAMSTEC)
- 5) Cruise Period: 17 July 2012 – 29 August 2011 (44 days)
- 6) Ports call: Sekinehama (Japan) - Sekinehama (Japan)
- 7) Research Area: Western equatorial Pacific and Kuroshio Extension region

2. Overview of Observations

- 1) Maintenance of TRITON moorings
Nine buoys were recovered and re-deployed at 5N,147E, 2N,147E, 0N,147E, 5S,156E, 2S,156E, 0N,156E, 2N,156E, 5N, 156E, and 8N156E
- 2) Deployment and recovery of subsurface ADCP moorings
Three moorings were deployed at 0N,156E, 2.6S,153.3E and 2.8S, 153.2E.
Two moorings were recovered at 0N147E and 0N156E.
- 3) CTD and water sampling: 43 casts
Observations were conducted every 15 or 30 nautical miles along 147E and 156N lines until 500m -1000m depth with a lowered ADCP. CTD casts were also conducted until 1000m or 2000m depth when Argo floats were lunched at 2.7S, 153.3E and 12N, 154.3E.
- 4) XCTD: 36 casts
Measurement depth is 1000m. Observations were conducted in the tropical region.
- 5) Ocean turbulence observations: 78 casts
Ocean turbulence was observed at the same stations along 147E and 156E lines until 500m depth.
- 6) Launch of Argo floats: 2 floats
Two floats were deployed at 2.7S, 153.3E and 12N, 154.3E.
- 7) Surface drifters.: 20 drifters
Drifters were deployed between 5S and 14N along 156E line.
- 8) Radiosonde observation: 45 casts
Radiosonde observation was conducted in the Kuroshio Extension region together with XCTD observation.
- 9) Rain and surface water samplings: 37 and 42 casts, respectively
- 10) Rock sampling using a dredge: 6 times
Rock samplings were carried out 6 times around 4-16S, 157-23E on the flanks of the three sea mount on the Ontong Java Plateau.
- 11) Continuous observations:
Current profile observation by a shipboard ADCP
Sea surface temperature, salinity, and dissolved oxygen by intake method
Measurements of atmospheric and oceanic pCO₂ using the non-dispersive infrared gas analyzer
Surface meteorological observations (wind, air temperature, pressure, humidity, radiation, rain rate, turbulent flux, and cloud base height)
Aerosol observation using the Sky radiometer
Aerosol and cloud profile measurements using a two-wavelength lidar
Column-averaged dry-air mole fractions of CO₂ and CH₄ using an optical spectrum analyzer
Bathymetry, sea surface gravity and geomagnetic measurements