

MR10-01 Cruise summary

1. Cruise information

Cruise ID

MR10-01

Name of vessel

R/V Mirai

Title of cruise

Change in material cycles and ecosystem by the climate change and its feed back

Chief scientist

Kazuhiko Matsumoto (RIGC/JAMSTEC)

Representative of science party

- Sanae Chiba (RIGC/JAMSTEC)
“Change in material cycles and ecosystem by the climate change and its feed back”
- Toshi Nagata (Ocean Research Institute/University of Tokyo)
“Studies on the microbial-geochemical processes that regulate the operation of the biological pump in the subarctic and subtropical regions of the western North Pacific”
- Toru Kobari (Kagoshima University)
“Effects of mesozooplankton on food web and vertical flux”
- Naomi Harada (RIGC/JAMSTEC)
“Study on development of new paleo-proxies”
- Hiroaki Yamagishi (National Institute for Environmental Studies)
“Analysis of spatiotemporal distribution of net community productivity base on continuous measurements of dissolved oxygen/argon ratio”
- Mitsuhide Satoh (University of Tokyo)
“Basic studies on effects of iron supply on seasonal variations of cryptophytes in the northwestern Pacific”
- Osamu Tsukamoto (Okayama University)
“On-board continuous air-sea eddy flux measurement”
- Tetsuichi Fujiki (RIGC/JAMSTEC)
“Development of drifting buoy system with *in situ* sea surface pCO₂ sensor”

- Atsushi Tsuda
“Identification of zooplankton species by fecal pellets”
- Nobuo Sugimoto
“Lidar observations of optical characteristics and vertical distribution of aerosols and clouds”
- Masahisa Kubota
“Anatomy of the ocean-atmosphere interface in mid-latitudes”
- Toshio Suga
“Variability of Salinity and Temperature in the North Western Pacific (Argo program)”
- Kunio Yoneyama
“Archive of surface meteorological data”
- Masao Nakanishi
“Tectonic evolution of the Pacific Plate”
- Takeshi Matsumoto
“Standardising the marine geophysics data and its application to the ocean floor geodynamics studies”
- Hiroshi Ichikawa
“Observational Research on the Kuroshio Transport and Sea Surface Flux”
- Naoyuki Kurita
“Water sampling for making isotope distribution map over the Ocean”
- Motoyoshi Oda
“Coccolithophore and Planktic foraminiferal ecology at NW Pacific”

Cruise period / Ports of call

Leg1: 20 Jan. 2010 – 6 Feb. 2010 (Sekinehama – Yokohama)

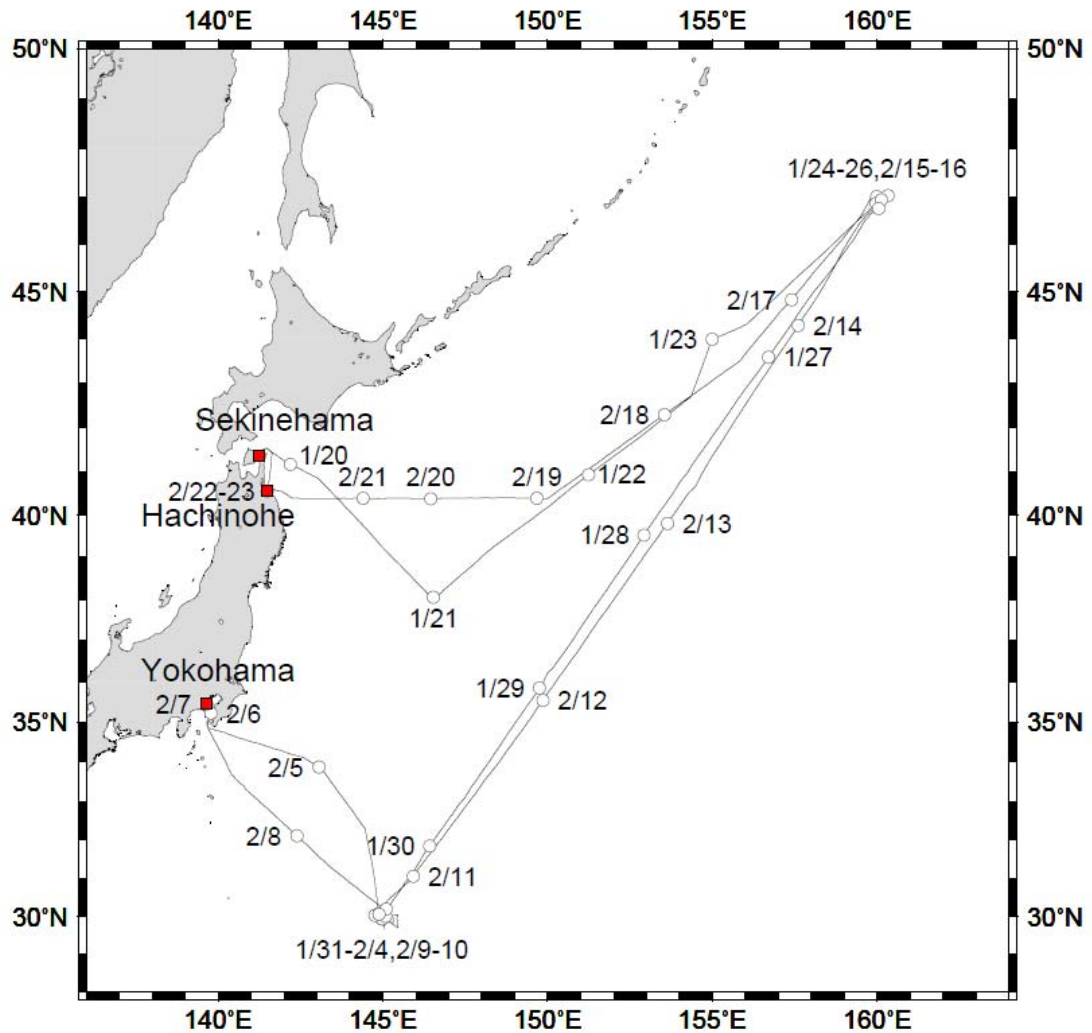
Leg2: 7 Feb. 2010 – 24 Feb. 2010 (Yokohama – Sekinehama)

Research area

Western North Pacific

Cruise track

MR10-01 Cruise Track



2. Overview of the observation:

Purpose

We focused on a subarctic gyre and a subtropical gyre in the western North Pacific to evaluate the mechanisms of changes in the oceanic structure in ocean ecosystems derived from the climate change. In general, biological pump is more efficient in subarctic gyre than subtropical gyre because large size phytoplankton is abundant in subarctic gyre by eutrophic oceanic condition. However, its responses against the climate change will be different in each gyre. Therefore, we arranged the time-series observation stations in the subarctic gyre (K2: 47°N, 160°E) and the subtropical gyre

(S1: 30°N, 145°E) in the western North Pacific. The seasonal variability of oceanic structures will be estimated by the mooring buoy and the seasonally repetitive ship observations scheduled for next several years.

Activities

CTD/Water Samplings

XBT/XCTD

ARGO float

Biogeochemical (BGC) Mooring Recovery/Deploy

Profiling buoy (POPPS) Mooring Deploy

Surface Drifting Buoy

Particle Meter (LISST-100)

Spectroradiometer (SPMR)

Fast repetition rate fluorometer (FRRF)

Plankton net (Single NORPAC)

Plankton net (Twine NORPAC)

Multi-depth plankton net system (IONESS)

Vertical multi-depth plankton net system (VMPS)

Multiple core sampler

Surface pCO₂ sensor buoy

Dissolved oxygen/argon ratio

Water Vapor $\delta^{18}\text{O}$

Rainfall $\delta^{18}\text{O}$

Sea Surface Water $\delta^{18}\text{O}$

ADCP Continuous Observation

Sea Surface Water Monitoring System

Meteorological Observation System

Dual Polarization Lidar

Eddy Flux Measurement System

Seabeam, subbottom profiler

Geophysical Continuous Observation (Magnetometer, Gravity meter)