

NT12-14 Cruise Summary

1. Cruise Information

1.1 Cruise number: NT12-14

1.2 Name of vessel: NATSUSHIMA

1.3 Title of the cruise: Investigation of the atmospheric response to the Kuroshio Extension

1.4 Chief scientist: Yoshimi Kawai

Ocean-Atmosphere Interaction Research Team

Ocean Climate Change Research Program

Research Institute for Global Change (RIGC)

Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

1.5 Representative of the science party: Yoshimi Kawai

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1.6 Title of proposal: Investigation of the atmospheric response to the Kuroshio Extension

1.7 Cruise period: 11-19 June 2012

1.8 Ports of call: From / To JAMSTEC Wharf.

1.9 Research area: Kuroshio Extension Region (see Figure below)

2. Overview of the Observation

2.1 Purpose

Investigate the effects of the Kuroshio Extension on the atmospheric boundary layer, atmospheric pressure, clouds, etc. through sea surface heat and momentum flux.

2.2 Outline

The enormous heat release and the accompanying local minimum of sea level pressure (SLP) over the Kuroshio Extension will contribute to the development and occurrence of extratropical cyclones and play an important role in climate. However, nobody has clarified the processes in which the local minimum of SLP is formed and maintained, and the ones in which the Kuroshio Extension affects precipitation. In this investigation we performed atmospheric observations by using GPS radiosondes, barometer, radiometers, ceilometer, etc. at a fixed point and along a section in the Kuroshio Extension region to examine the effects of the Kuroshio Extension on the atmospheric boundary layer, atmospheric pressure, clouds. We also obtained sea temperature, salinity, and current shear vertical profiles by using XCTD and MSP, and observed wave height, direction, and period by using a drifting buoy. These data are utilized to investigate the shallowing process of the ocean mixed layer, and the relationship between surface heat/momentum flux and the ocean turbulence. The data obtained in this cruise will be also used for data assimilation, and validation of numerical models.

2.3 Observations and activities

- 1) We performed radiosonde observations every 2 hours and MSP/XCP observations every 4 hours at the fixed point (35°45'N, 143°00'E) south of the SST front of the Kuroshio Extension. Wave height, direction, period, etc. were also observed with a drifting buoy around the fixed point for a half day. This buoy was recovered in this cruise.
- 2) We performed radiosonde and XCTD observations every 15' in latitude from 38°N to 35°N along 143°E. The radiosonde and XCTD observations were also done at 37°27'N, 143°14'E twice.
- 3) We observed shortwave and longwave radiations, air temperature, relative humidity, wind speed, wind direction, atmospheric pressure, cloud base height, rain rate, sea surface temperature, and surface current during the cruise.

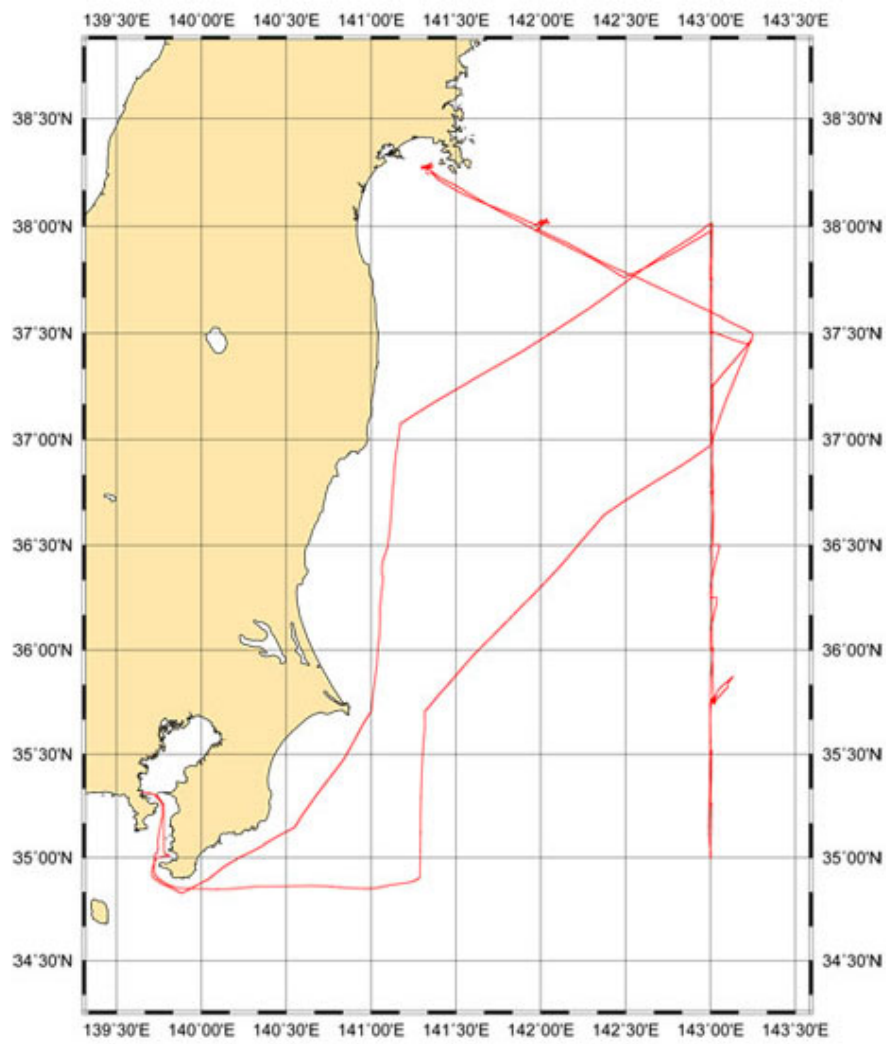


Figure. Cruise track (red line) of NT12-14.