Cruise Summary

1. Cruise Information

(1) **Cruise ID:** KH-23-2

(2) **Vessel:** R/V HAKUHO MARU

(3) **Cruise Title**

Comprehensive biogeochemical studies on distributions and cycles of trace elements and their isotopes in the western North Pacific and the equatorial Pacific (GEOTRACES)

(4) **Chief Scientist**

Hajime OBATA (The University of Tokyo)

(5) **Representative of the Science Party**

SH23-02 Hajime OBATA (The University of Tokyo)

(6) **Research Titles**

SH23-02 Comprehensive biogeochemical studies on distributions and cycles of trace elements and their isotopes in the western North Pacific and the equatorial Pacific (GEOTRACES)

(7) **Cruise Period**

2023/06/01 - 2023/06/25

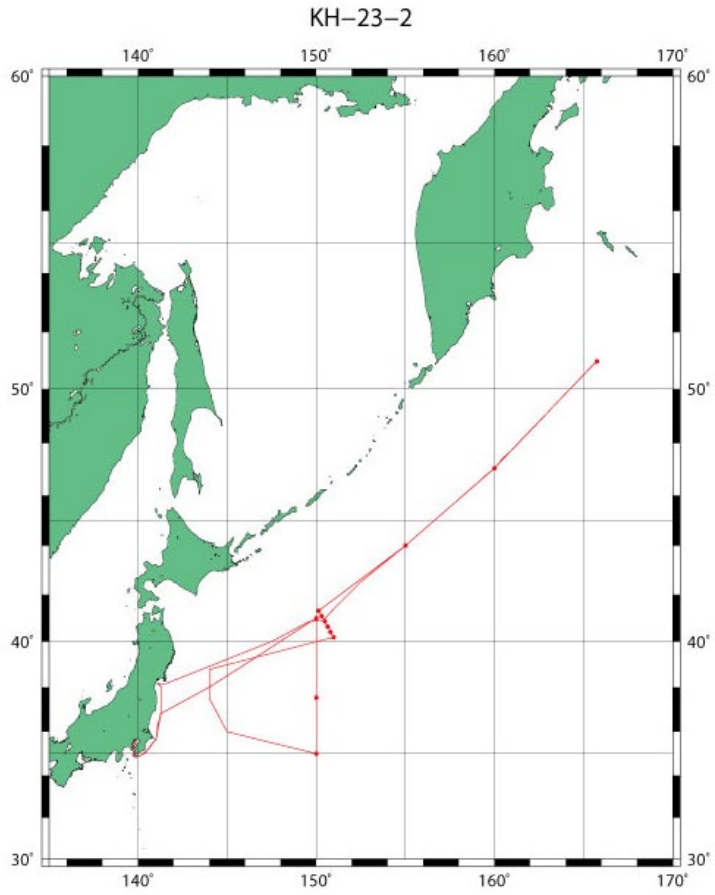
(8) **Ports of departure/call/arrival**

Ariake - Daiba

(9) **Research Area**

western North Pacific

(10) **Cruise Track**



2. Overview of the Observation

The Hakuho Maru KH-23-2 cruise was conducted from 1 to 25 June 2023 (25 days in total) in the western subarctic Pacific by following KH-22-7 cruise. These cruises had been internationally authorized as a part of the GEOTRACES section study in the western Pacific Ocean (GP22). This cruise aimed at establishing the 2-dimensional profiles of GEOTRACES TEIs in the western Pacific along 155°E and 150°E to investigate TEIs in seawaters and sediments of the western Pacific. This section includes subarctic Pacific known as a typical High Nutrient, Low Chlorophyll (HNLC) zone.

We have taken air, seawater, and sediment samples for chemical analyses. Water samples were collected from surface to near the bottom by using a clean CTD Carousel Multi Sampling system (24 Niskin-X (12L) bottles) attached at the end of an Aramid yarn cable. The system was also equipped with various chemical sensors

for in situ measurements. For the precise measurements of trace radioactive nuclides in seawater, large-volume water samplers with a volume of 250 L were also used for seawater sampling. Bottom sediment was taken with a multiple corer. Suspended particles were taken using an in situ filtering system. Chemical analyses on board the ship as well as those on shore-based laboratories were and will be carried out in clean conditions for trace elements such as Fe, Cu, Zn, Mn, Cd, Co, Pb, Pt, Pd, rare earth elements together with natural and anthropogenic radionuclides. In addition, we occupied one station (OP-15R, 44°N, 155°E) for repeated observation with the data obtained by the previous KH-22-7 cruise.
This cruise was originally planned as KH-22-7 cruise Leg. 3. However, because of rapid increase of oil price, we postponed the cruise in 2023. During this cruise, thirty-four scientists, technicians, and students were on board to pursue international collaborative studies on GEOTRACES. The obtained data by this cruise will play an important role in the GEOTRACES program as zonal line data in the western Pacific Ocean.