

# Cruise Summary

## 1. Cruise Information

(1) **Cruise ID:** KS-22-11

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

(3) **Cruise Title**

Study on watermass mixing, material transport, and biological conditions with submesoscale processes off Sanriku

(4) **Chief Scientist**

Eisuke Tsutsumi (AORI)

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

S22-26 Eisuke Tsutsumi (AORI)

(6) **Research Titles**

S22-26 Study on watermass mixing, material transport, and biological conditions with submesoscale processes off Sanriku

(7) **Cruise Period**

2022/08/04 - 2022/08/10

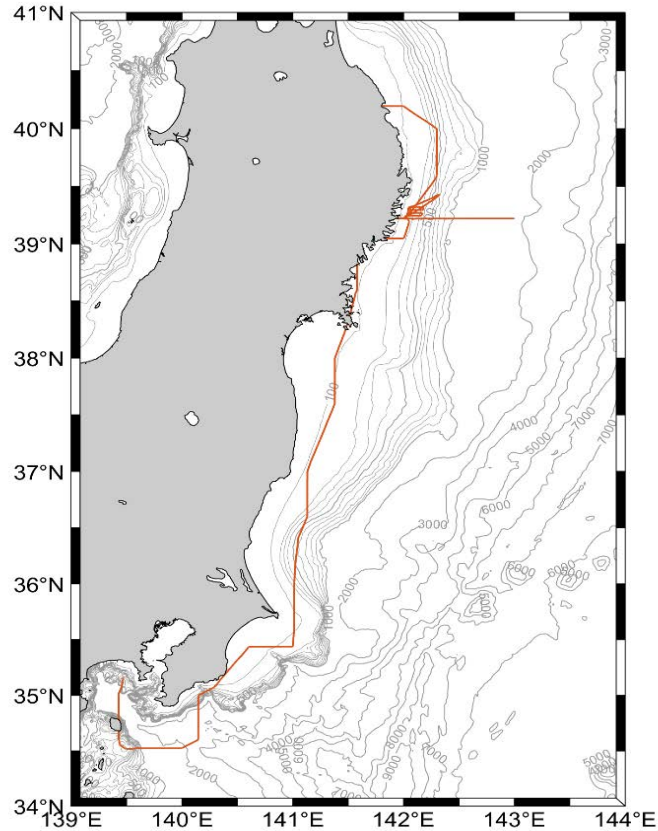
(8) **Ports of departure/call/arrival**

Hachinohe - Yokosuka

(9) **Research Area**

Off Sanriku

## (10) Cruise Track



## 2. Overview of the Observation

The KS-22-11 research cruise onboard Shinsei Maru was conducted from August 4 to 10, 2022, to investigate the generation of submesoscales (i.e., ocean structures with 100 m to 1 km scales) and impacts of the submesoscales on the material transport, biological environment, and ecosystem in the Sanriku ocean. We made (1) current survey using two bottom-mounted acoustic Doppler current profilers (ADCPs) off Otsuchi Bay, (2) tow-yo measurements with a multi-parameter CTD along a 60-mile zonal transect (OT line) and four 15-mile zonal transects (U1-U4 lines) off Sanriku (3) microstructure turbulence casts with VMP-250 (7.5-mile interval), and CTD/LADCP/ISUS casts and eDNA/nutrients/NORPAC samplings (15-mile interval) on the OT line, (4) time-series turbulence measurements at the mooring sites for approximately 30 hours, (5) microstructure turbulence measurements within the Tsugaru Warm Current (TWC) using two autonomous floats (micro-ALTO float), (6) continuous multi-parameter analysis of the surface water including nitrate concentration and colored dissolved organic matter (CDOM),

(7) continuous measurements of current velocity and acoustic backscatter using shipboard ADCP and echosounder, and (8) continuous measurement of air-sea fluxes by shipboard atmospheric measurements. All investigations were carried out almost as planned, and we successfully obtained in-situ data about physical and biogeochemical environments around the submesoscale front, which is caused by the interaction between the TWC and the Sanriku coasts, and submesoscales around the TWC-Oyashio front.