

Cruise Summary

1. Cruise Information

- Cruise ID: MR17-05C
 - Name of vessel: R/V Mirai
 - Title of the cruise: Arctic Challenge for Sustainability (ArCS) Project
 - Chief scientist [Affiliation]: Shigeto Nishino [JAMSTEC]
- Studies on board
- Representative of the Science Party [Affiliation]: Jun Inoue [NIPR]
 - Title of proposal: Predictability study on weather and sea-ice forecasts linked with user engagement
 - Representative of the Science Party [Affiliation]: Fumikazu Taketani [JAMSTEC]
 - Title of proposal: Ship-borne observations of trace gases/aerosols over the Arctic
 - Representative of the Science Party [Affiliation]: Shigeto Nishino [JAMSTEC]
 - Title of proposal: Observational study on environmental changes in the Pacific Arctic Ocean with intensive surveys in the shelf slope area
 - Representative of the Science Party [Affiliation]: Naomi Harada [JAMSTEC]
 - Title of proposal: How plankton responses to multi stressors such as ocean warming and acidification?
 - Representative of the Science Party [Affiliation]: Toru Hirawake [Hokkaido University]
 - Title of proposal: Response of phytoplankton community under environmental change
 - Representative of the Science Party [Affiliation]: Atsushi Yamaguchi [Hokkaido University]
 - Title of proposal: Comparison of zooplankton with differences in net mesh-size, spatial distribution of zooplankton and standing stock and material flux role of Appendicularians
 - Representative of the Science Party [Affiliation]: Bungo Nishizawa [Hokkaido University]
 - Title of proposal: Seasonal distribution of krill-eating top predators and their prey in the Chukchi Sea during fall
- Studies not on board
- Representative of the Science Party [Affiliation]: Yasunori Tohjima [NIES]
 - Title of proposal: Ship-board observations of atmospheric greenhouse gases and related species in the Arctic Ocean and the western North Pacific
 - Representative of the Science Party [Affiliation]: Akihiko Murata [JAMSTEC]
 - Title of proposal: Spatial and temporal changes of seawater CO₂ and CH₄ in the western Arctic Ocean

- Cruise period:

23 August 2017 – 1 October 2017

- Ports of departure / call / arrival:

23 August 2017, Dutch Harbor (leave port)

21 September 2017, Off Nome

(arrival and leave after an ice pilot, bear watcher, and foreign scientists disembarkation)

1 October 2017, Hachinohe (arrival in port)

- Research area:

The Arctic Ocean, Bering Sea and North Pacific Ocean

- Research map

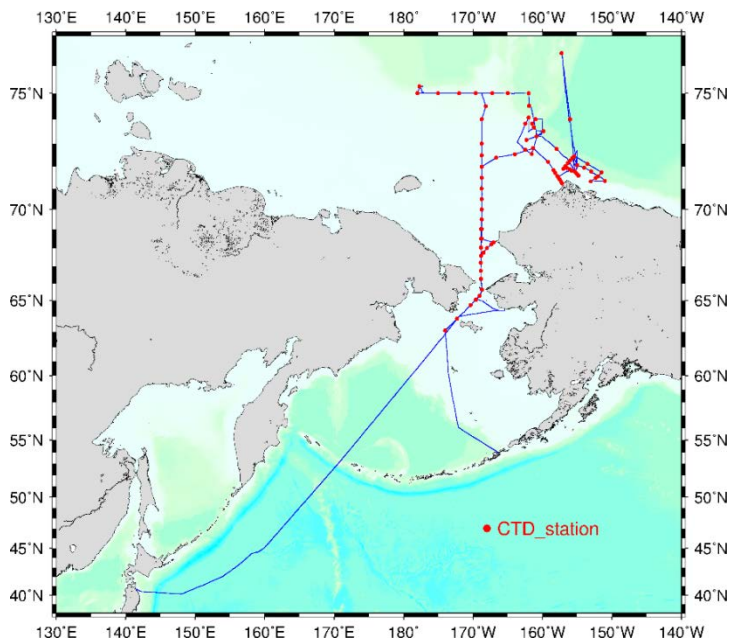


Figure 1. Research area and cruise track of MR17-05C.

2. Overview of the Observation

We conducted meteorological and hydrographic surveys including marine biogeochemical samplings in the northern Bering Sea and the Arctic Ocean on board the R/V Mirai from 23 August to 1 October 2017 under the Arctic Challenge for Sustainability (ArCS) Project. During the cruise, the above-mentioned 9 studies were carried out.

The research areas included the EEZ and the territorial sea of the USA. The observational activities consisted of CTD/LADCP/water samplings, XCTD, ocean microstructure measurements, drifting buoy deployments, optical measurements, plankton net samplings, sediment samplings, incubation experiments, visual observations of marine animals by binoculars, ship-board ocean current and surface water monitorings, meteorological measurements and samplings, aerosol observations, satellite observations, radiosondes, Doppler radar, sea ice radar, sea bottom topography, gravity, and magnetic field measurements, and mooring and sediment trap recoveries and deployments. At an ice-edge area, we approached to the sea ice by a small working boat and conducted unique surveys using a UCTD sensor, fluorometer, water sampler, and plankton net.