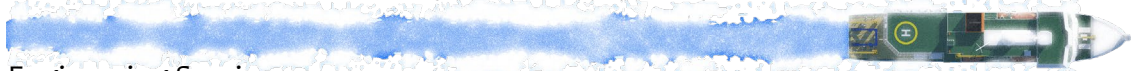




International Workshop on Arctic Ocean Observation:
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Technology & Engineering Session

History, methods, and findings of the Okhotsk sea-ice observations onboard SOYA over 25 years

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[Abstract: 12pt]

1. Recently the sea ice conditions have been changing rapidly in the Arctic Ocean. The sea ice extent has decreased significantly especially in summer, resulting in the decrease in multi-year fraction and the spread of seasonal ice zones. Thus, we need to reconsider the environmental system in the Arctic Ocean in both science and engineering. A new research vessel will provide a useful platform for this purpose. We have been conducting sea ice observations in the Sea of Okhotsk, a typical seasonal ice zone, for many years using P.V. 'Soya' in collaboration with Japan Coast Guard. Taking this opportunity, we will briefly introduce our activities in the Sea of Okhotsk.
2. Although the observational history of the Sea of Okhotsk spans over 130 years near the Hokkaido coast, it is since the cooperative observation with PV 'Soya' started in 1996 that the real situation about sea ice growth and melting has been revealed. Since then, the observations have been continued for 28 years except for 2021 when it was canceled due to the COVID-19. Observations have been conducted in the two-fold ways: monitoring of meteorological and ice conditions and addressing ad hoc research topics. Through the analysis of surface heat budget, inner structure of sea ice, thickness distribution, floe size distribution and whatever, the various characteristics of sea ice have been elucidated step by step. Recently our focuses are extended to the roles of sea ice in biogeochemistry. In this presentation, looking back over the past observations, we will talk about their contribution to the knowledge of the sea ice in this region and also in the polar regions to consider the future activities using the new research vessel in the Arctic Ocean.



Patrol Vessel 'Soya'

[Reference]

- 1) Toyota, T., et al. (2022). The interannual variability of sea ice area, thickness, and volume in the southern Sea of Okhotsk and its likely factors. *Journal of Geophysical Research: Oceans*, 127(12), e2022JC019069. <https://doi.org/10.1029/2022JC019069>