

Evaluation of impact on regional observing system through Observing System Experiment in Northwest Pacific

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The National Institute of Fisheries Science (NIFS) and the Korea Hydrographic and Oceanographic Agency (KHOA) have been collecting temperature and salinity profile data for the marginal seas around the Korean peninsula using CTD. NIFS collects data during even months, while KHOA collects data during odd months. According to Chang et al. (2023), assimilating data from the marginal seas around Korea improves the subsurface temperature/salinity structure in the East Sea, as well as in the Kuroshio-Kuroshio Extension region, by controlling the Kuroshio axis through the improved Tsugaru Warm Current. Although Chang et al. (2023) only utilized data obtained by NIFS during even months, they demonstrated that regional observation data has a significant impact on the ocean prediction system in the Northwest Pacific area.

In this study, we conducted a sensitivity experiment to investigate the impact of regional observation data for all months on the ocean prediction system. We applied Ensemble Optimal Interpolation (EnOI) to the Korea Operational Oceanographic System-Ocean Predictability Experiment for Marine Environment (KOOS-OPEM). The physical properties of all experiments that assimilated regional observation data were improved in the Kuroshio-Kuroshio Extension region. Notably, the experiments that assimilated all observation data obtained from both NIFS and KHOA showed the most significant improvement.

In conclusion, our study highlights the role of regional observing networks in enhancing ocean forecast skill through the Ocean Observing System Experiment. We suggest placing greater emphasis on the importance of regional ocean observation networks in enhancing the accuracy of ocean prediction systems, both locally and in open ocean regions, including the

Pacific Ocean.

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