

Development of the Seasonal Forecast System of the Interannual Sea-ice Variability Using CICE5 Model

Yoo-Geun Ham¹, and Jeong-Gil Lee¹

¹ Department of Oceanography, Chonnam National University, Gwangju, Korea

ABSTRACT

Using the CICE5 model, the initialization technique based on the nudging scheme is developed to assimilate the PIOMAS monthly sea-ice thickness, OISST daily sea-ice concentration, and OISST daily SST. The initialization using the observed SST and sea-ice concentration has a systematic problem that the sea-ice thickness has a serious positive bias from the beginning of the prediction. On the other hand, by assimilating the sea-ice thickness in addition to the sea-ice concentration and the SST, the bias in the initial condition is significantly reduced, and the prediction skill using the dynamical sea-ice model is also improved. By initializing the sea-ice thickness, sea-ice concentration, and SST, the correlation skill of total sea-ice extent in the forecast starting from September 1st, is over 0.5 up to 5-month lead forecast, even though the simple nudging scheme is utilized. In addition, the correlation skill over the Barent-Kara sea, which is important to predict the winter climate variability over the East Asia, is generally over 0.6 up to 6-month lead forecast. This implies that the sea-ice variables are well initialized in the developed dynamical prediction system to lead skillful forecast of the interannual sea-ice variation. The future development plan of the seasonal forecast system of the sea-ice variation will be also discussed.