Improvement of Dynamic Seasonal Prediction with ARGO Assimilation Data

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According to the international CLIVAR (Climate Variability and Predictability) program, short-term climate prediction will be a focus of research in the future ten to fifteen years. Short-term climate prediction depends greatly on the oceanic observational data (especially the profile data of temperature, salinity, current of global ocean). ARGO (Array for Real-Time Geostrophic Oceanography) aims to rapidly, accurately, and widely collect the data of temperature, salinity, velocity of the upper ocean. The assimilation of ARGO observational data will lead to significant improvement in initial condition for oceanic model, and further result in the improvement in the accuracy of short-term climate prediction.

In this study, experiments are designed to investigate the impact of ARGO assimilation data on dynamic seasonal prediction based on the global atmosphere-ocean coupled model (NCC_CGCM) and the global oceanic data assimilation system (NCC_GODAS) of National Climate Center of China Meteorological Administration. Firstly, under the conditions with and without ARGO observational data, oceanic assimilation data are obtained by utilizing NCC_GODAS, respectively. Then hindcasting experiments for global climate in the summer of six years (1998-2003) have been conducted by using the two sets of assimilation data as initial conditions as well as NCC_CGCM. Analyses of experiment results indicate that the NCC_CGCM hindcasting performance is better when ARGO assimilation data is used than when no-Argo assimilation data is used. ARGO data shows a good application foreground.