Recent Updates in Sea Ice Modeling within U.S. Navy Earth System Prediction Capability (ESPC) model

The U.S. Navy Earth System Prediction Capability (ESPC) model is a fully coupled, atmosphere/ocean/sea ice model. The resolution of ESPC is 1/12 degree when run in ensemble mode (12 ensemble members), 1/25 degree when run in deterministic mode (one high resolution member). Here we present an overview of ESPC and focus on recent work to the sea ice modeling component. ESPC was updated to use the Community Ice codE version 6 (CICE6) that includes landfast ice (LFI) physics. The improvement in deterministic and ensemble mean LFI is examined. In addition to utilizing the default CICE6 LFI model with spatially uniform parameters, we developed spatially varying LFI parameters using historical LFI observations from the U.S. National Ice Center, showing improvement in modeled LFI in several Arctic regions. In addition, we will show improvement in the modeled sea ice by assimilating ice thickness observations from CryoSat-2 and future plans for implementation of these updates.

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