Inclusion of the oceanic diurnal variability in NCEP CFS

Xu Li

Abstract

The Near-Surface Sea Temperature (NSST) analysis has been developed to improve oceanic variables in NWP at NCEP.

NSST is the T-Profile in the uppermost ocean down to the base of the diurnal thermocline. It represents the oceanic variables required in air-sea flux calculation (SST) and satellite radiance simulation (T-Profile in the skin layer).

About 6 months of cycling run has been done with NCEP Global Forecasting System. The results have shown the improvement in SST analysis, the use of satellite radiance and weather forecasting. It is planned to have NSST in next implementation of NCEP GFS.

The incorporation of NSST into NCEP CFSv2 can resolve two issues: (1) Too weak diurnal variation in the oceanic component. (2) The mismatch between SST and T1 (the model’s first layer temperature) and between T1 and other oceanic variables.

A scheme has been developed to combine NSST into the air-sea coupled NCEP CFS, in which the key is the conversion between the NSST analysis variable (foundation temperature), and T1 with the help of the NSST profile. The preliminary check by oceanic data assimilation group has shown the scheme works well.