Science and Technology Infusion Climate Bulletin
NOAA's National Weather Service
37th NOAA Annual Climate Diagnostics and Prediction Workshop
Fort Collins, CO, 22-25 October 2012

Prediction Skill of Monthly SST in the North Atlantic Ocean in NCEP Climate Forecast System Version 2

Zeng-Zhen Hu[1], Arun Kumar[1], Bohua Huang[2, 3], Wanqiu Wang[1], Jieshun Zhu[3], and Caihong Wen[1,4]

[1]*Climate Prediction Center, NCEP/NWS/NOAA, MD*
[2]*Department of Atmospheric, Oceanic, and Earth Sciences, Gorge Mason University, VA*
[3]*Center for Ocean-Land-Atmosphere Studies, MD*
[4]*WYLE Science, Technology and Engineering Group, McLean, Virginia*

ABSTRACT

This work evaluates the skill of retrospective predictions of the second version of the NCEP Climate Forecast System (CFSv2) for the North Atlantic sea surface temperature (SST) and investigates the influence of El Niño-Southern Oscillation (ENSO) and North Atlantic Oscillation (NAO) on the prediction skill over this region. It is shown that the CFSv2 prediction skill with 0-8 month lead displays a "tripole"-like pattern with areas of higher skills in the high latitude and tropical North Atlantic, surrounding the area of lower skills in the mid-latitude western North Atlantic (Fig. 1). This "tripole"-like prediction skill pattern is mainly due to the persistency of SST anomalies (SSTAs), which is related to the influence of ENSO and NAO over the North Atlantic. The influences of ENSO and NAO, and their seasonality, result in the prediction skill in the tropical North Atlantic the highest in spring and the lowest in summer. In CFSv2, the ENSO influence over the North Atlantic is overestimated but the impact of NAO over the North Atlantic is not well simulated. However, compared with CFSv1, the overall skills of CFSv2 are slightly higher over the whole North Atlantic, particularly in the high latitudes and the northwest North Atlantic.

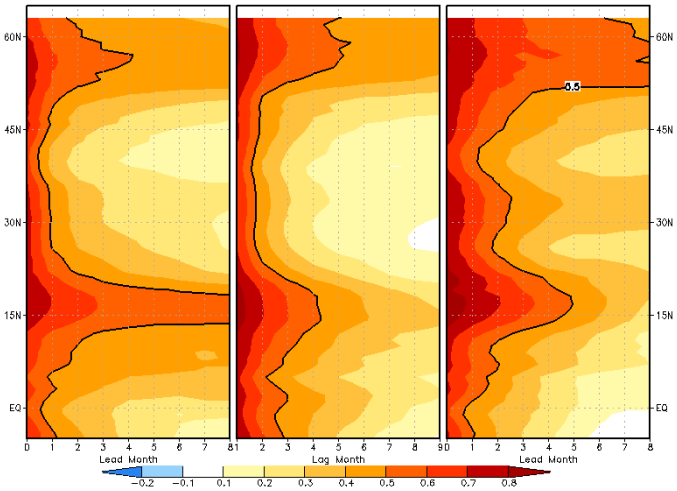

Fig. 1 Zonal averages over the North Atlantic Ocean for correlations between OIv2 SSTA and CFSv2 predicted SSTA (left), lag correlations of OIv2 SSTA (middle), and correlations of SSTA between initial conditions and 0-8 month predictions of CFSv2 (right). Only 0.5 contour is plotted.

The model prediction skill beyond the persistency initially presents in the mid-latitudes of the North Atlantic and extends to the low latitudes with time. That might suggest that the model captures the associated air-sea interaction in the North Atlantic. The CFSv2 prediction is less skillful than that of SSTA persistency in the high latitudes, implying that over this region the persistency is even better than CFSv2 predictions. Also, both persistent and CFSv2 predictions have relatively low skills along the Gulf Stream.

This work has been published in *Climate Dynamics* in 2012.

Paper published

Hu, Z.-Z., A. Kumar, B. Huang, W. Wang, J. Zhu, and C. Wen, 2012: Prediction skill of monthly SST in the North Atlantic Ocean in NCEP Climate Forecast System version 2. *Clim. Dyn.*, doi: 10.1007/s00382-012-1431-z (published online).

Correspondence to: Zeng-Zhen Hu, Climate Prediction Center, NCEP/NWS/NOA, 5830 University Research Court, College Park, MD 20740-3818; E-mail: Zeng-Zhen.Hu@noaa.gov.