Dynamic Hurricane Prediction with the NCEP CFS CGCM

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Since 1998 the Climate Prediction Center (CPC) of NOAA has issued a Hurricane Season Outlook (HSO) for the North Atlantic and Eastern North Pacific basins. In 2009 a dynamic hurricane season prediction system was introduced to support the HSOs. The dynamic system is based on the T382 version of the National Centers for Environmental Prediction (NCEP) Climate Forecast System (CFS), which is a fully coupled atmosphere-land-ocean general circulation model (CGCM).

Predictability of tropical storms (TS) in the coupled prediction system is assessed based on a series of experimental forecast runs from May through November for 1981-2008. They were generated to evaluate tropical storm statistics in the CFS at the highest possible spatial resolution available in 2008. TSs in the CFS runs are identified using the TS detection method devised by Carmago and Zebiak (2002). Storms depicted in the CFS have very realistic tracks and robust seasonal cycles in all four basins over the Northern Hemisphere. Comparisons of interannual variability in storm activities indicate that the CFS has a fair level of forecast skill and captures the shift to a more active storm era in the Atlantic during the post-1995 period. Forecasts and verifications for the 2009-2012 seasons will be presented.

The TS analysis procedure is also applied to the 45-day CFSv2 forecasts at the T126 resolution to assess the TS predictability in intraseasonal time scales. The intraseasonal predictability is evaluated with the CFSv2 hindcast data from 1999-2010 and it is anticipated to provide both storm counts and possible track locations for week 2 and beyond as part of input for the CPC Global Tropics Hazards Outlook. Some preliminary results on this assessment activity also will be presented.