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Technical Implementation Notice 16-09
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From: Tim McClung
 Chief Operating Officer
 NWS Office of Science and Technology Integration

Subject: Reset of Ocean Initial Conditions in the Operational Climate
Forecast System version 2 (CFSv2) to Remove Atlantic Ocean Cold Bias:
Effective March 28, 2016

Beginning with the 0600 Coordinated Universal Time (UTC) model run on Monday, March 28, 2016, the National Centers for Environmental Prediction (NCEP) Central Operations (NCO) will implement a fix to the Global Ocean Data Assimilation System used in the Climate Forecast System (CFSv2). This fix is expected to remove an erroneous cold anomaly in the equatorial and South Atlantic Ocean temperature.

A large temperature cold bias emerged in the ocean initial conditions along the equator in the spring of 2015 and grew to include the South Atlantic in the summer of 2015. These cold biases have translated into cold biases in the same regions in CFSv2 forecasts. The El Niño-Southern Oscillation (ENSO) forecasts from the CFSv2 from December 2015 show unusual behavior, in that the El Niño event does not transition to neutral but rather experiences a double-dip El Niño, which is not realistic. A fix has been tested that re-initialized the ocean initial conditions in the operational CFSv2 from an offline global ocean data assimilation system (GODAS), which uses a weak relaxation to climatology (the National Oceanographic Data Center (NODC) World Ocean Database 2009 (WOD09)) to control the noise.

The NCEP Environmental Modeling Center (EMC) tested this re-initialization strategy for four initial months (December 2015 through March 2016). Results can be viewed here:

[http://www.nco.ncep.noaa.gov/pmb/changes/downloads/CFSv2 Atlantic
c cold bias problem.pdf](http://www.nco.ncep.noaa.gov/pmb/changes/downloads/CFSv2_Atlantic_cold_bias_problem.pdf)

EMC found that there was no Atlantic cold bias in the initial states as compared to current operational CFSv2. The long lead forecasts evolved from the current El Niño event into neutral or La Niña conditions during the next 9 months in the Niño3.4 SST plumes.

Based on the positive results of the CFSv2 tests and the severity of the cold bias anomaly in the Atlantic Ocean, NCEP will implement this change outside of the normal upgrade process. Users do not need to take any action and will continue receiving data as they do today.

For questions regarding the correction to the CFS GODAS and resulting improvement to the Atlantic cold bias, please contact:

Suranjana Saha
NCEP EMC
College Park, MD
301-683-3727
suranjana.saha@noaa.gov

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