

Project: National Blend of Models (NBM) Temperature

Goals:

1. Perform a temperature verification study, comparing GFS MOS (MDL) with the National Blend of Models (NBM) and a bias-corrected version of the NBM (bcNBM). MDL is considered the benchmark in this study since it was the source of populating temperatures in GFE prior to summer 2018.
2. Establish a process of storing the raw NBM temperatures in GFE, calculating biases in the database, and finally populating a bcNBM grid in GFE.

Status:

1. Verification has been completed for much of 2018 (Apr-Nov), with the results summarized below. The temperature forecasts are being continually archived in the database for use in future verification studies.
2. As of summer 2018, the bcNBM temperature grid is being populated in GFE. The bcNBM grid (and no longer the MDL) is the official starting point for the temperature forcing in GFE.

Method:

Verification Details

- Temperature forecast verification (MAE/Bias) available since April 2018.
- Forecast lead times of one to ten days (i.e. Fcst hrs of 24 to 240)
- Forecast models included are MDL, NBM, bcNBM, and Climatology (Climo)

NBM/bcNBM Grids

- In order to produce the bcNBM grids, we take the raw NBM temperature grid and bias correct using observations. In other words, it is meant to correct for consistent biases between the grid point forecast value and the observation within that gridpoint.
- The bias correction is performed over the past 30 days, computing the average Day 1 bias. This bias is then applied to all forecast lead times within the current 07Z NBM run.

Outcomes, Findings:

The figures below show some of the key findings of the verification study over the period from April–November 2018. There are over 22,000 observations from the entire CBRFC area included in these results. The main results are summarized as follows:

- bcNBM is the best performing model, on average producing the most accurate (lowest MAE) and consistent (lowest % run-to-run variability) forecast.
- Generally, the MDL forecast has the largest errors of the models considered. More importantly, as the MDL is derived from a single GFS model run, its forecasts are much more inconsistent from one day to the next, especially at longer lead times (bottom figure). This results in inconsistent hydrographs.

