Model Implementation Subjective Evaluation Report

Scientific Review Team Member: Greg Patrick

Region/Service Center/Company Representing: NWS Southern Region

Proposed Change: Global Data Assimilation System/Global Forecast System v14.0

Model Developer: EMC/GCWMB

Southern Region Headquarters requested several case studies be completed for extremely high impact weather events across the region in 2016.

For Hurricane Matthew, 9/28/16 to 10/9/16, the GFS V14.0 had smaller average track errors for the F48 – F168 period when compared to the operational GFS. The operational GFS had a slightly better average track error for the F12-F36 period, but the differences were not significant for this storm. GFS V14.0 seemed to latch onto a track closer to the east coast of FL earlier than the operational GFS, which in general tended to be too far east. There did not appear to be significant differences in the average intensity errors, but it was interesting to note that the initialization (F00) for GFS V14.0 consistently reflected a weaker storm than the operational GFS.

For the case of catastrophic heavy rain and flooding across Louisiana around Aug 12, 2016, my evaluation indicates that the operational GFS outperformed GFS V14.0. Both versions struggled with the forecasts beyond F60; the mesoscale nature of this quasi-tropical event likely contributed to the event’s limited predictability beyond day 2-3. In comparing the location of the heaviest QPF between the two model runs, the operational GFS had only a slightly better forecast than GFS V14.0. However, the magnitude of the QPF was much better with ops GFS compared to GFS V14.0, as shown by the area and size of the 6”+ QPF forecasts from each model. This case could be characterized as ‘extreme’ and ‘mesoscale’; that characterization may make it difficult to determine whether or not the changes to the convective parameterization could have contributed to the degraded performance of GFS V14.0 in this particular case.

Recommendation:

Implement as proposed   x   Reevaluate after changes ___

Do not implement ___

Evaluation report signed by: PATRICK.GREGORY.RAY.1365867778

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