Review comments on “Evaluation of Aerosol Optical Depth forecast from NOAA's Global Aerosol Forecast Model (GEFS-Aerosols” submitted by Partha et al.

General comments:

In this manuscript, the authors present a comprehensive evaluation on the NOAA latest operational forecast model GEFS/Aerosol performance on simulating AOD on a global scale. The model performance is evaluated in various ways which include seasonal, regional and case studies. Both satellite retrieval and AERONET data are used to verify the GEFS/Aerosol predictions of AOD. In addition, the simulations from the previous operational capability NGACv2 are included for comparison. The results indicate that the GEFS/Aerosols show better performance in simulating AOD than the previous operational model, especially during wildfire events. Overall the manuscript is well-written and verification tool and methods have been widely used and acceptable. The manuscript may provide useful information for both model and forecast product users to better understand the model performance and the operational forecast product. However, I have several major comments for the authors’ reference which may require some additional efforts.

Specific comments:

1. A short paragraph or section is suggested to provide a brief description of METPlus verification tool since it is the main method used in this study.
2. Table 3 is suggested to move to Appendix or Supporting Material since similar results are presented in Figure 9.
3. AOD is an important parameter to be verified. It will be very helpful if PM2.5 verification can be included since the GEFS/Aerosol predicted PM2.5 and its compositions are used to generate lateral boundary conditions of aerosol species to support the regional air quality forecast capability. How the GEFS/Aerosol performs in simulating PM2.5 is lacking and important.
4. Several subtitles are not well represented with their actual content. For instance, Sections 4.2 and 4.3 require further refinement.
5. Many grammar errors are found throughout the manuscript. The authors are required to do a careful grammar checking. In addition, some sentences require further refinement. More details can be found within the manuscript.