

## Reduced SST forecast error in UFS-P8 by turning off interactive aerosol and wave models

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Systematic error in sea surface temperature (SST) forecasts has plagued several generations of coupled general circulation models for decades and is one of the major sources of errors in subseasonal-to-seasonal (S2S) predictions. We have conducted a limited set of 6-month ensemble reforecasts using the Unified Forecasts System Prototype-8 (UFS-P8) initialized with two different ocean initial conditions (OICs), i.e., NOAA MOM6 3DVar ocean reanalyses and ECMWF ORAS5 to examine uncertainty of OICs and its possible impact on SST forecast error in S2S time scales. Some preliminary evaluations will be discussed.

An additional set of 1-month ensemble reforecasts for October, 2016 using the same UFS-P8 but with no interactive aerosol (GOCART) and wave (WAVEWATCH III) models was also analyzed. In the original set of UFS-P8 runs, a basin-wide warm SST error in the tropics over all the three basins is well established in week-2 and continuously grows until week-4. However, this warm SST error tends to be reduced by turning off the interactive aerosol and wave models, for instance, up to about 1.5°C in the tropical Indian Ocean. A reduction of SST error in the subtropics is also noticeable, especially in the southern Indian Ocean and southern Pacific Ocean. It is noteworthy that the computational cost of the UFS-P8 runs with no interactive aerosol and wave components is about 30% less than that of the original UFS-P8 runs. Our preliminary results may suggest that the current coupling of interactive aerosol and wave models to the other UFS-P8 components can exacerbate a systematic SST error even though it requires much computational time and therefore, we need to pay more attention to future development in their coupling process and/or of the respective components.