Supporting Information for

Statistical Evaluation of the Temperature Forecast Error in the Lower-level Troposphere on Short-Range Timescales Induced by Aerosol Variability

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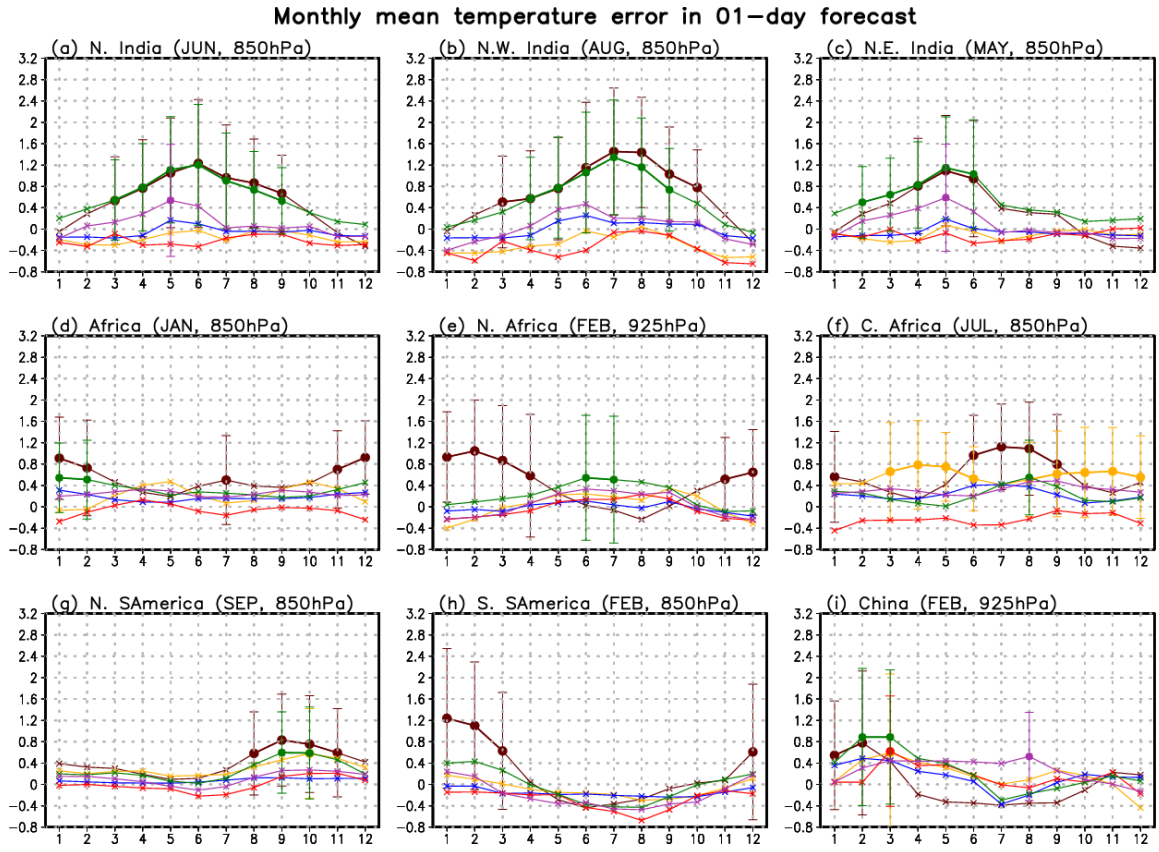2 Faculty of Life and Environmental Sciences, University of Tsukuba, Tsukuba, Ibaraki, 305-8572, Japan

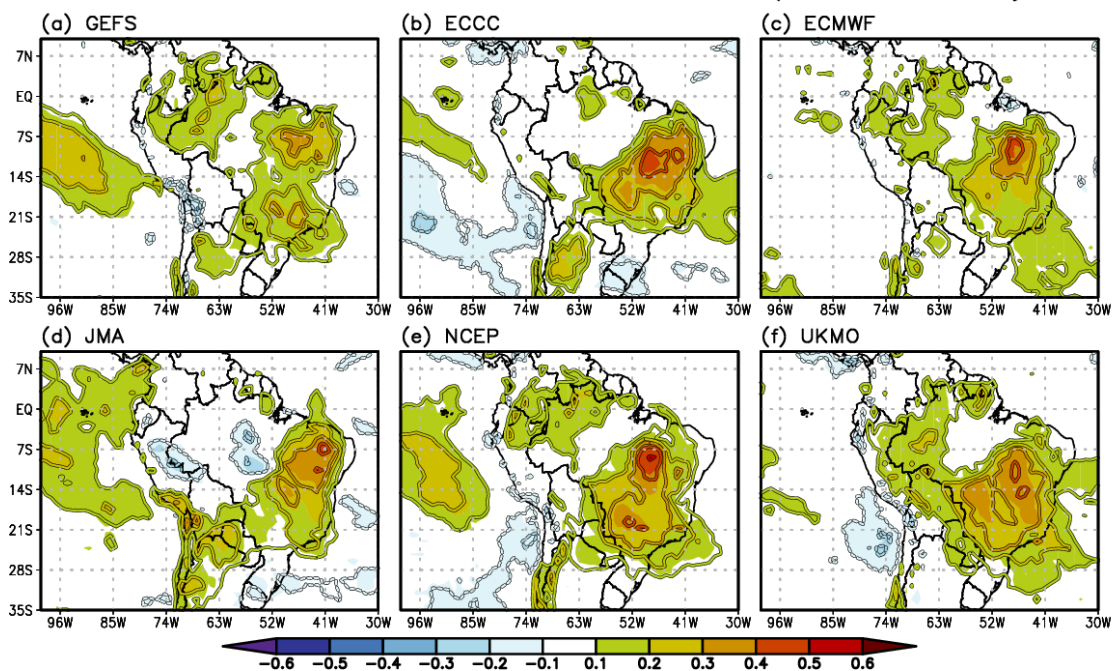## Contents of this file

Figures S1 to S6

Introduction

This supporting information includes the following table and figures:

- Monthly mean temperature error for the 1-day GEFSv12 and five operational forecasts. (Fig. S1);
- Partial correlation coefficient between temperature error and AOD anomalies using total cloud cover from ERA5 over northern South America (Fig. S2) and China (Fig. S4);
- Average temperature error in different relative humidity and total cloud cover thresholds over northern South America (Fig. S3) and China (Fig. S5);
- Correlation coefficient between temperature error of the 1-day GEFSv12 forecasts and AOD of each aerosol (Fig. S6).
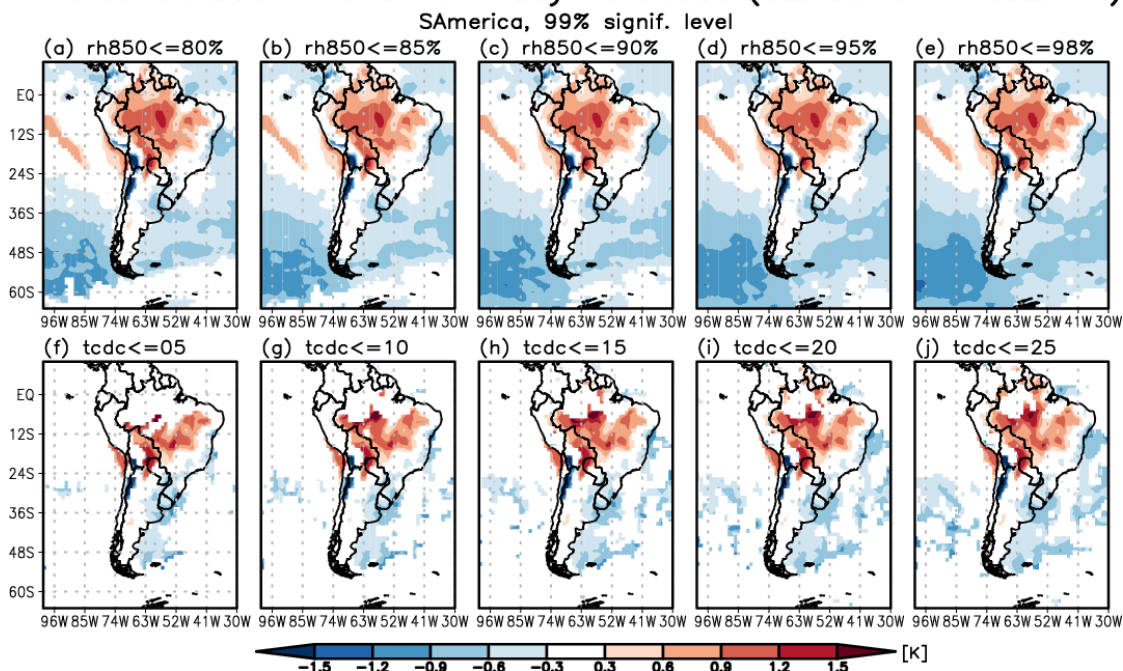
Figure S1. Similar to Fig. 5 but for the 1-day forecasts.

Partial correlation coefficient between T850 error and AOD anomaly
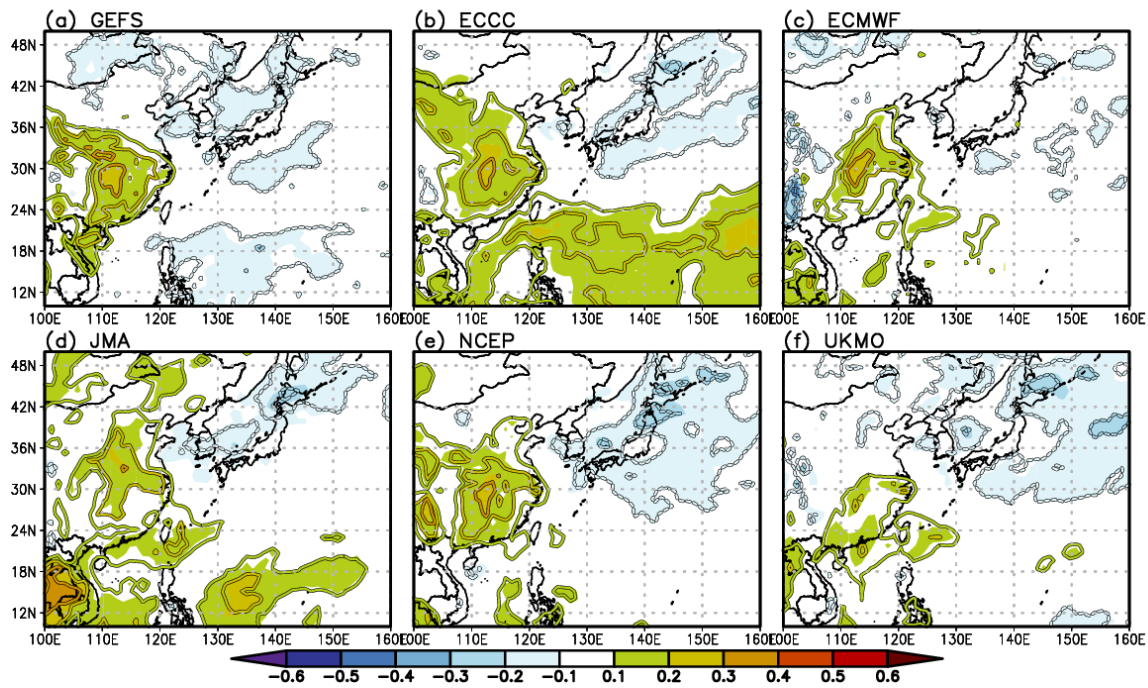(TCC, Jul–Nov, 03–day forecast)

Figure S2. Similar to Fig. 9 but for the TCC retrieved from ERA5.

T bias at 850 hPa on 01–day forecast (GEFScntl − NCEPfnl)
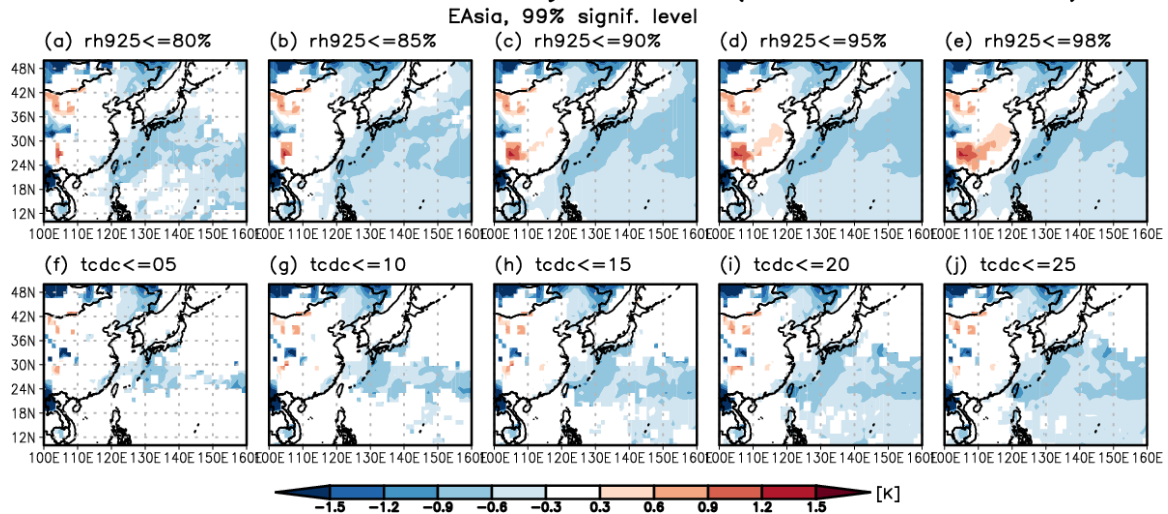SAmerica, 99% signif. level

Figure S3. Similar to Fig. 10a but for the days for (a-e) the relative humidity at 850 hPa lower than (a) 80% to (e) 98% and for (f-j) the TCC lower than (f) 5% to (j) 25% average.

Partial correlation coefficient between T925 error and AOD anomaly
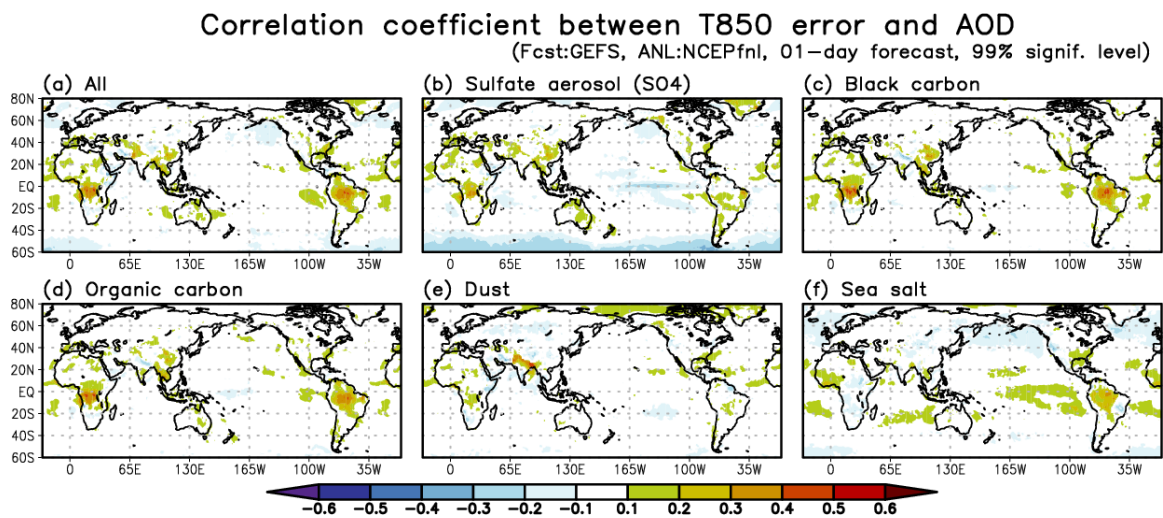(TCC, Dec–Apr, 03-day forecast)

Figure S4. Similar to Fig. S2 but for China.

T bias at 925 hPa on 01-day forecast (GEFScntl – NCEPfnl)
EAsia, 99% signif. level

Figure S5. Similar to Fig. S3 but for China.

Correlation coefficient between T850 error and AOD

(Fcst:GEFS, ANL:NCEPfnl, 01−day forecast, 99% signif. level)

Figure S6. Similar to Fig. 6a but for the 1-day GEFSv12 forecast error and AOD of the (a) total, (b) sulfate, (c) black carbon, (d) organic carbon, (e) dust, and (f) sea salt aerosols.