Supplementary Materials

List of Figures

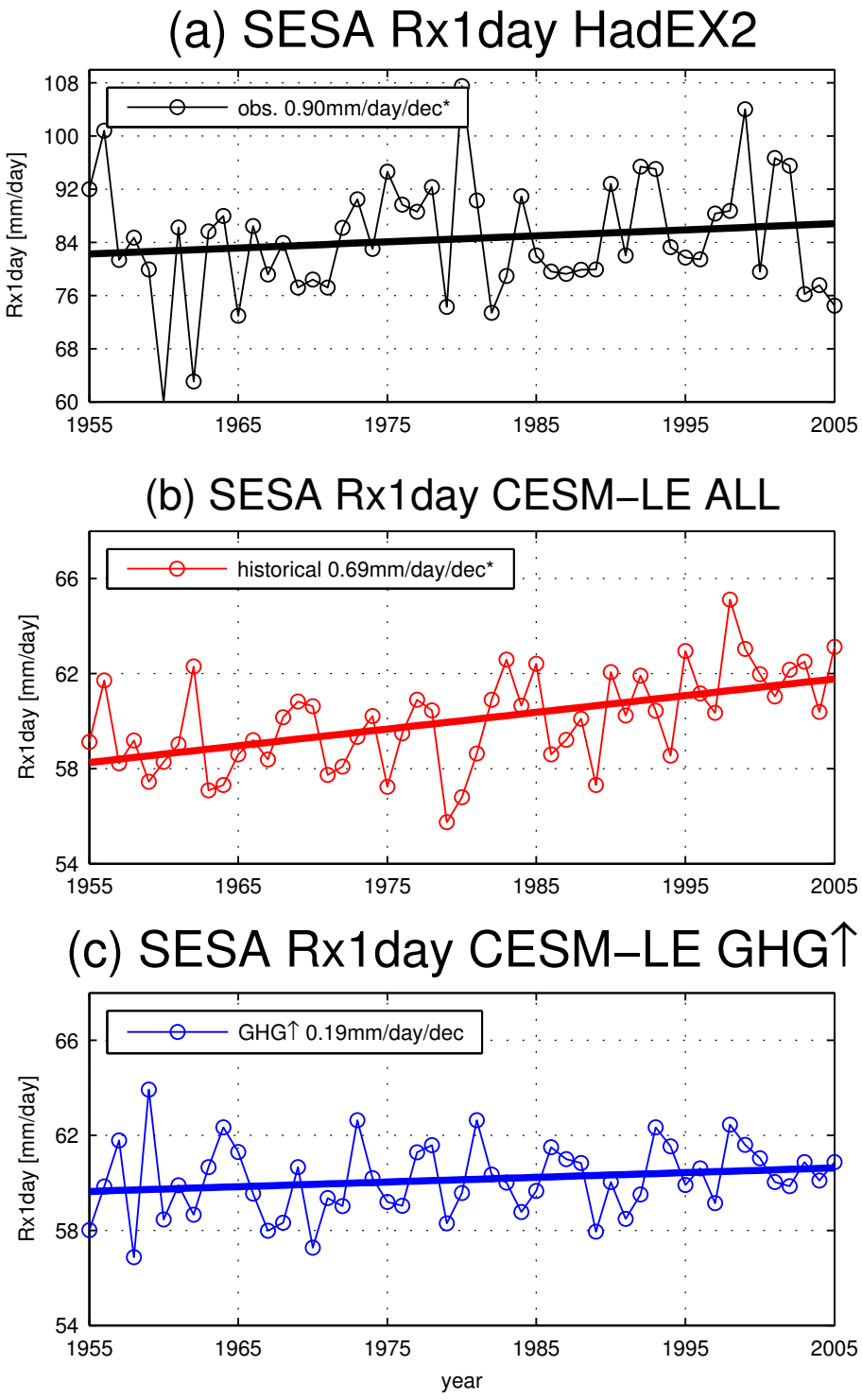

FIG. S1. SESA Rx1day during 1955-2005 in (a) HadEX2 observation dataset, (b) CESM-LE historical runs, and (c) CESM-LE GHG↑ runs. The results in (b)(c) are shown in the average of 12 ensemble runs. The linear trends are shown in the legend and asterisk indicates that the linear trend is statistically significant at the 90% level.

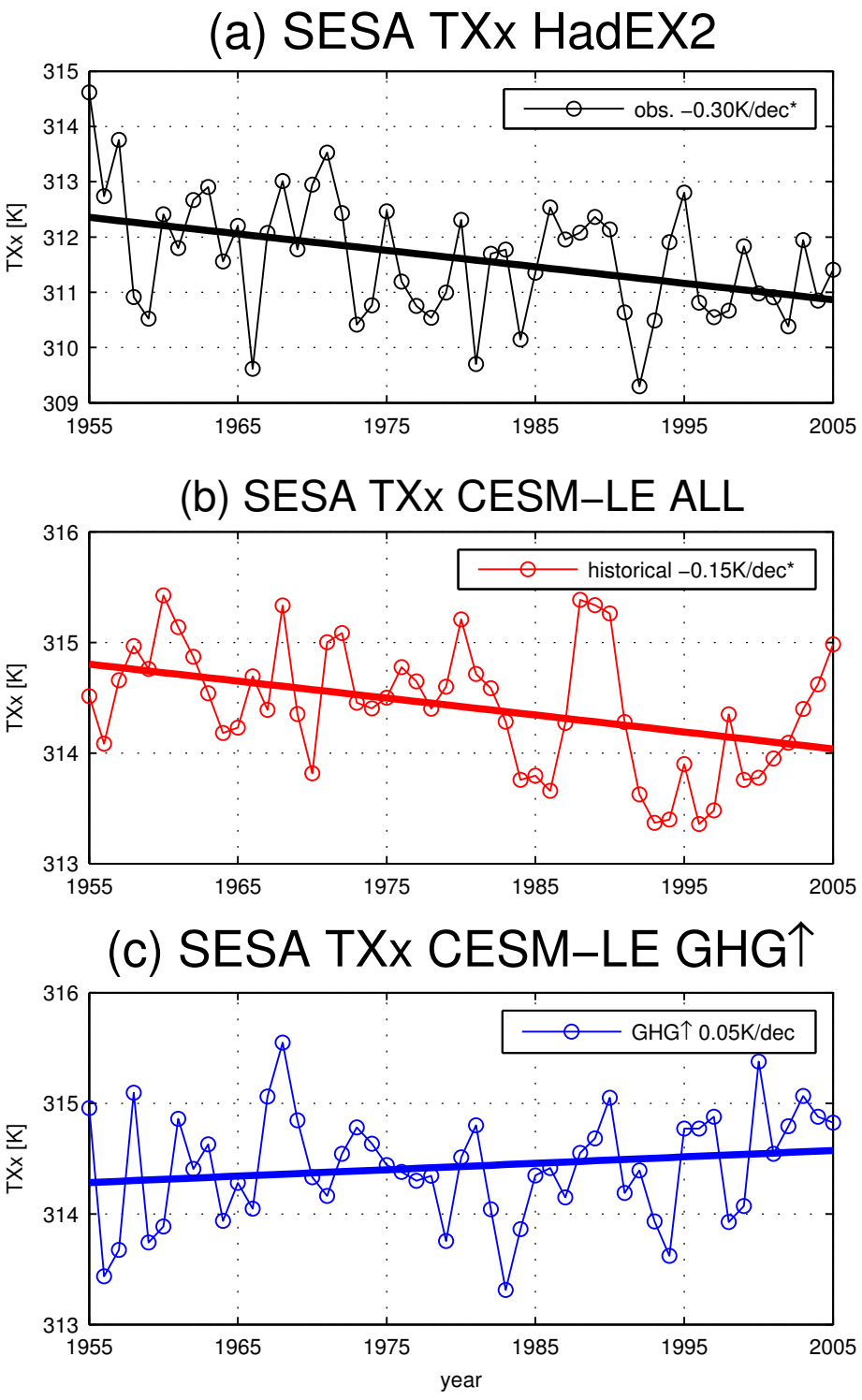

FIG. S2. Similar to Fig. S1 but for SESA TXx.

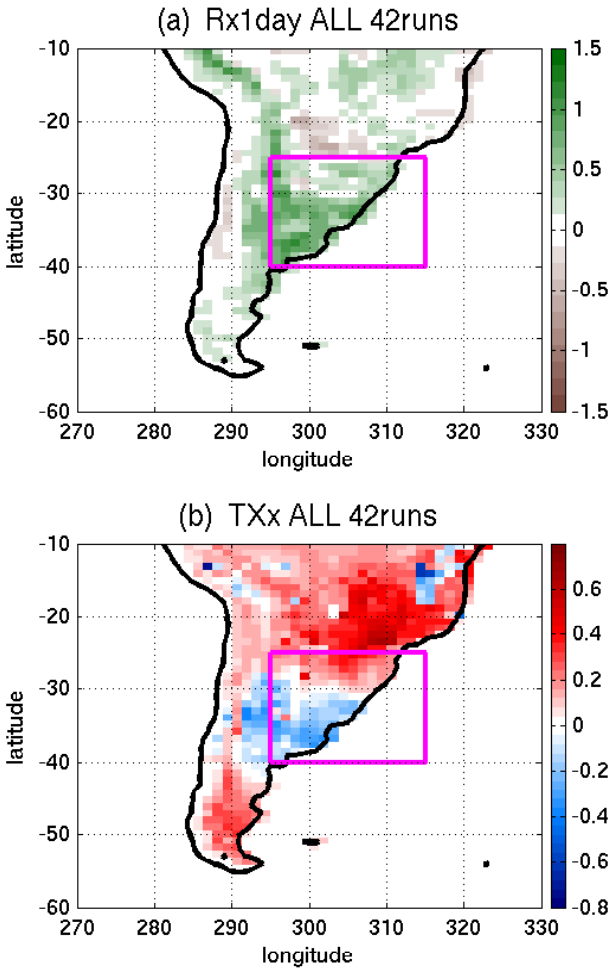

FIG. S3. Similar to Fig. 1b and Fig. 2b but with 42 historical runs. Trends are statistically significant at the 90% level at all grid points.

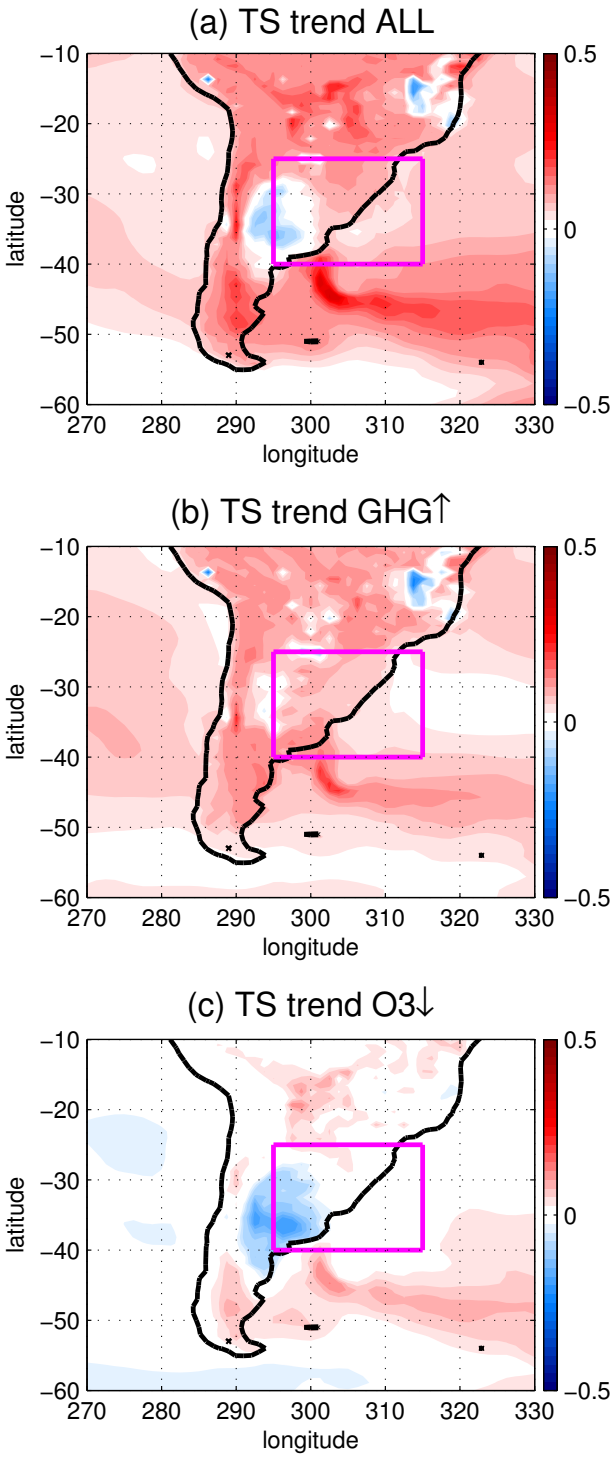

FIG. S4. Similar to Fig. 4 but for monthly surface temperature in CESM-LE (a) historical runs, (b) GHG↑ runs, and (c) O3↓ during Oct-Nov-Dec-Jan-Feb-Mar (ONDJFM). The unit is K/decade. Trends are statistically significant at the 90% level at most grid points.

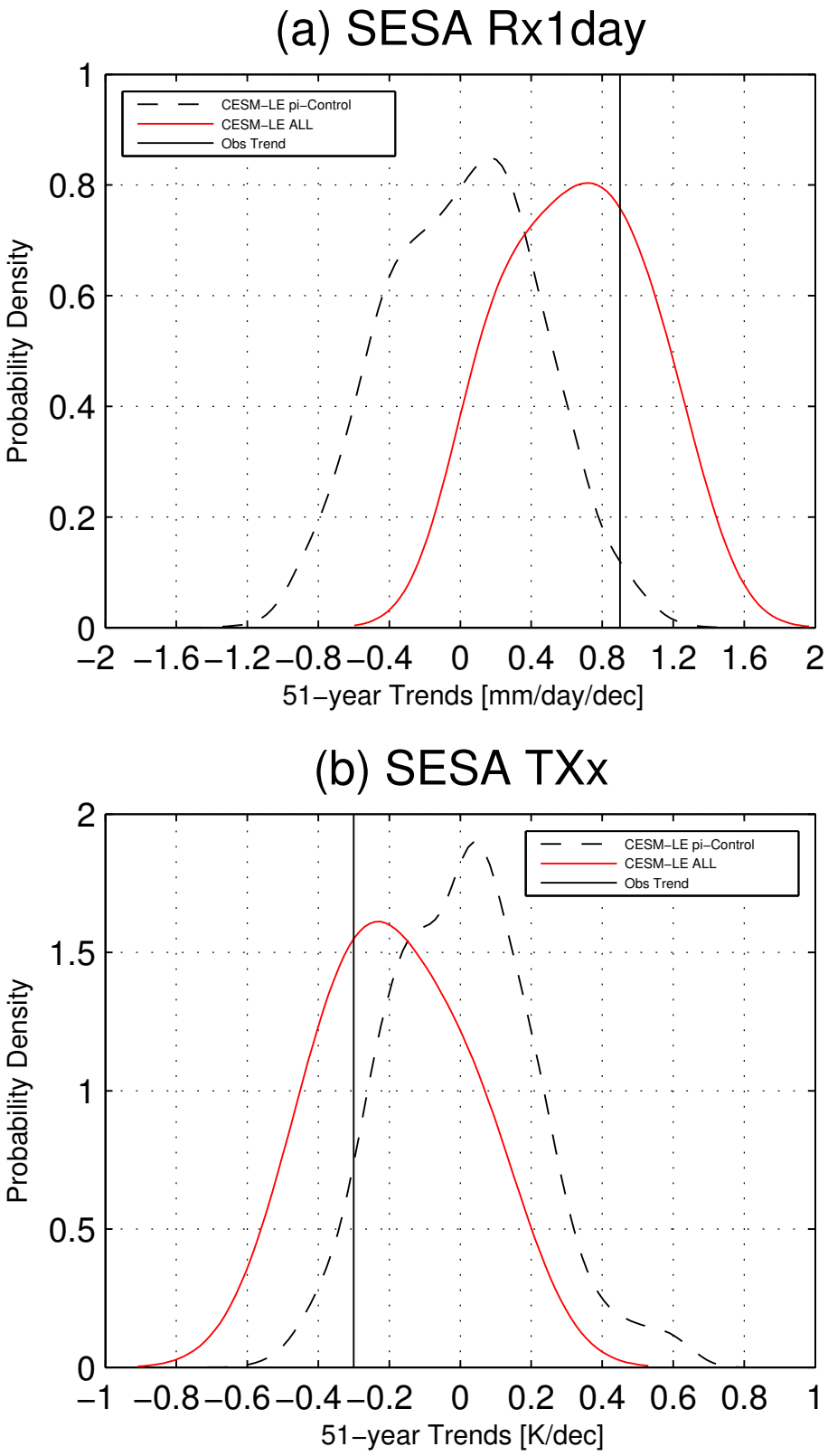

FIG. S5. Density distributions of 51-year trends of (a) SESA Rx1day and (b) SESA TXx in the preindustrial integration (dashed black lines) and 12-member historical runs (solid red lines). The observed trends from the HadEX2 observation dataset are shown in solid black lines. The CESM-LE preindustrial integration is 1,700-year long and the probability density distribution is obtained by computing all consecutive and overlapping 51-year trends.