Supplement to: Nonlinear response of extreme precipitation to warming in CESM1

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Temperature (K) vs. Time (Year)

- a) CESM1 LE
- b) All but aerosols (fixed at 1920)

∆Rx1day/∆T (%/K) vs. Time (Year)

- c) ΔRx1day/ΔT (%) vs. ΔT (K)
- d) Linear regression slope = 1.1 %K⁻¹

Rx1day (mm/d) vs. Temperature (K)

- e) Quadratic fit

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**Figure S1.** Nonlinear response of extreme precipitation to warming in simulation with fixed anthropogenic aerosol forcing. Following Fig. 1 with a 20-member CESM1 ensemble with anthropogenic aerosol forcing fixed at 1920 values.

**Figure S2.** Change in extreme precipitation for (a) E3SM and (b) CESM2, two descendent models of CESM1. (b) The same analysis on one member of the CESM1-LE shown for comparison. Following Fig. 5, for 1pctCO2 CMIP6 DECK experiments.
**Figure S3.** Two ways of quantifying the dynamic component: vertical pressure velocity at 500 hPa and horizontal convergence at 850 hPa.

**Figure S4.** Timeseries of (a) global mean near surface air temperature anomaly and (b) change in maximum day of precipitation averaged globally each year (relative to 1986-2005 mean) for CESM1-LE simulations (black), 15 member ensemble with anthropogenic aerosols fixed at 2005 values (red), and the difference between them (blue).