Supplemental Material

Precipitation Sensitivity to Local Variations in Tropical Sea Surface Temperature

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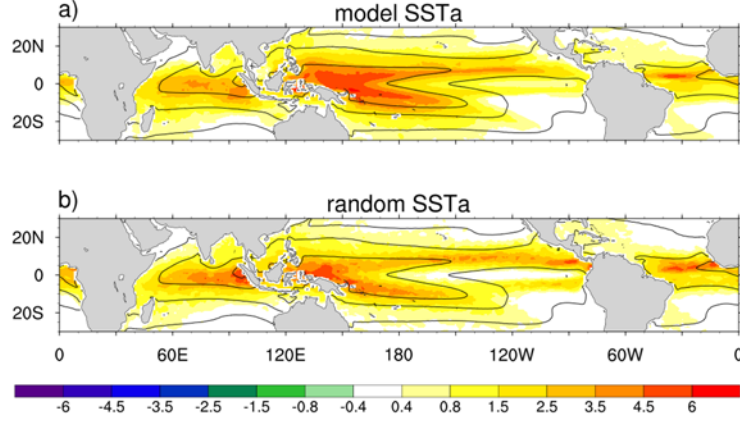* *Corresponding author* E-mail: Jie.He@noaa.gov

Figure S1. Point-wise regression coefficients of anomalous monthly precipitation on SST from the uncoupled GFDL-FLOR simulation with SST anomalies taken from the coupled GFDL-FLOR simulation (a) and random SST anomalies (b). Both simulations have the same climatological SSTs from the coupled GFDL-FLOR simulation. In the random SST simulation, we specify a patch of time-varying (t) SST anomalies centered at each grid point (i): $SST_i'(x, y, t) = A_i(t) \cdot cos^2(\frac{\pi}{2}\frac{y-y_i}{y_w}) \cdot cos^2(\frac{\pi}{2}\frac{x-x_i}{x_w})$, where the amplitude of the anomalous SST patch is determined by Gaussian white noise A_i with an amplitude of 0.7 °C. x_w and y_w determine the zonal and meridional width of the patch and are set to 4° and 2°, respectively. The SST anomaly at each grid point is the sum of all patches that encompass that grid point.
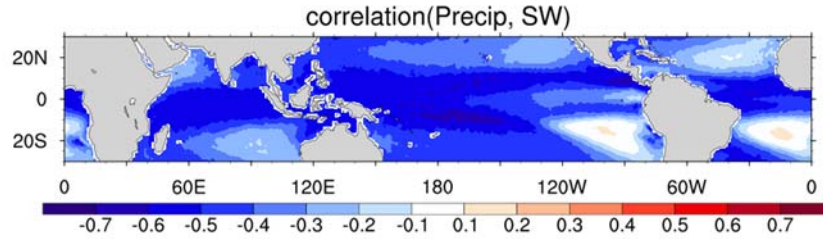
Figure S2. Correlation between anomalous daily surface net shortwave radiation and precipitation. Data are taken from the GFDL-FLOR AMIP_fullSST simulation. Note that the absolute value of the correlation is above 0.5 for most convective regions.
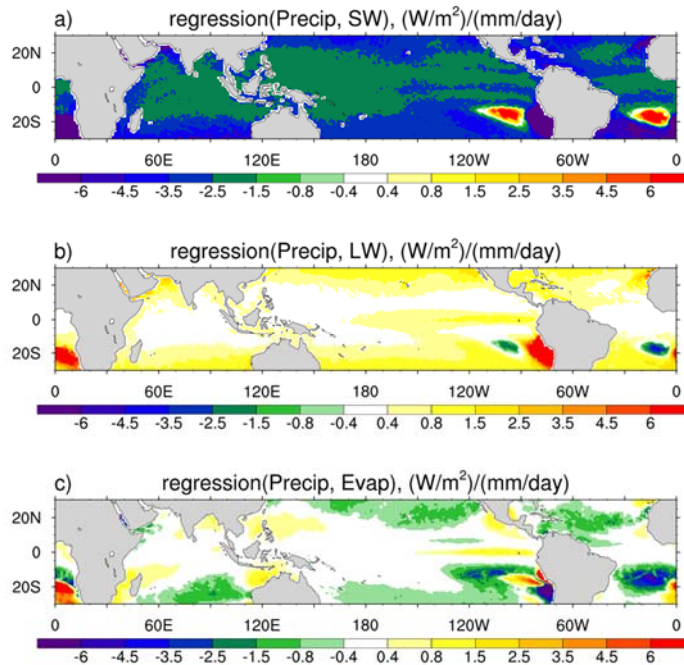

Figure S3. Point-wise regression coefficients of daily surface shortwave radiation (a), downwelling longwave radiation (b) and evaporation (c) anomalies onto daily precipitation anomalies from the GFDL-FLOR AMIP_fullSST simulation.