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Understanding land surface response to changing South Asian monsoon in a warming climate

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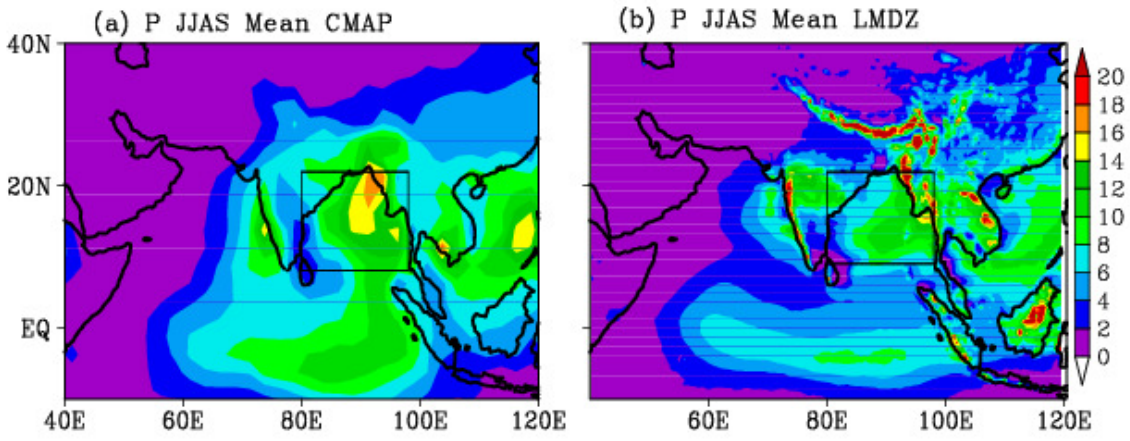

Figure S1. Spatial distribution of JJAS mean precipitation (P; mm d^{-1}) from (a) CMAP observations (1979-2005) and (b) HIST simulations of LMDZ model (1951-2005). Box indicate the Bay of Bengal (80^{o}-98^{o} E; 8^{o} -22^{o} N) region.

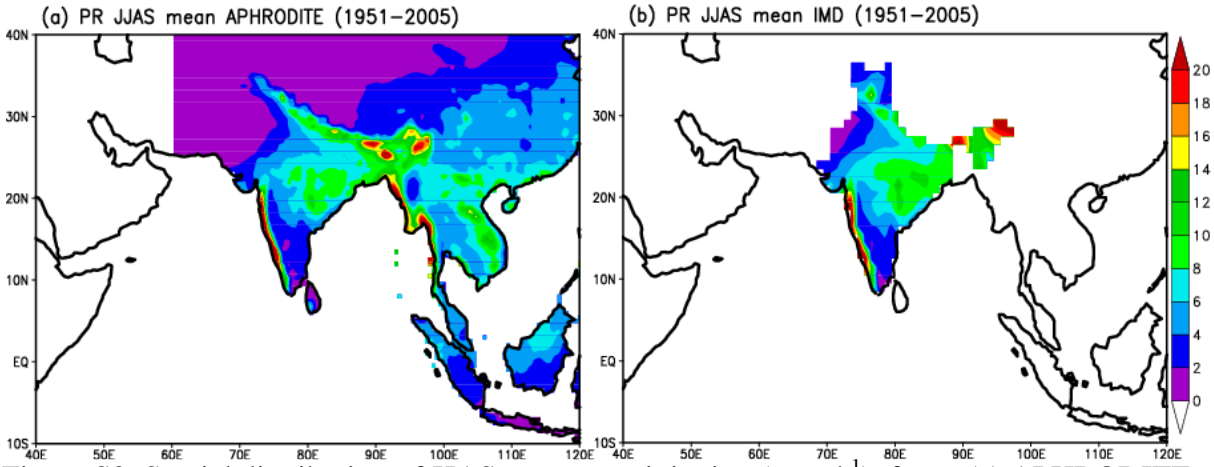

Figure S2. Spatial distribution of JJAS mean precipitation (mm d^{-1}) from (a) APHRODITE and (b) IMD data sets during 1951-2005 .

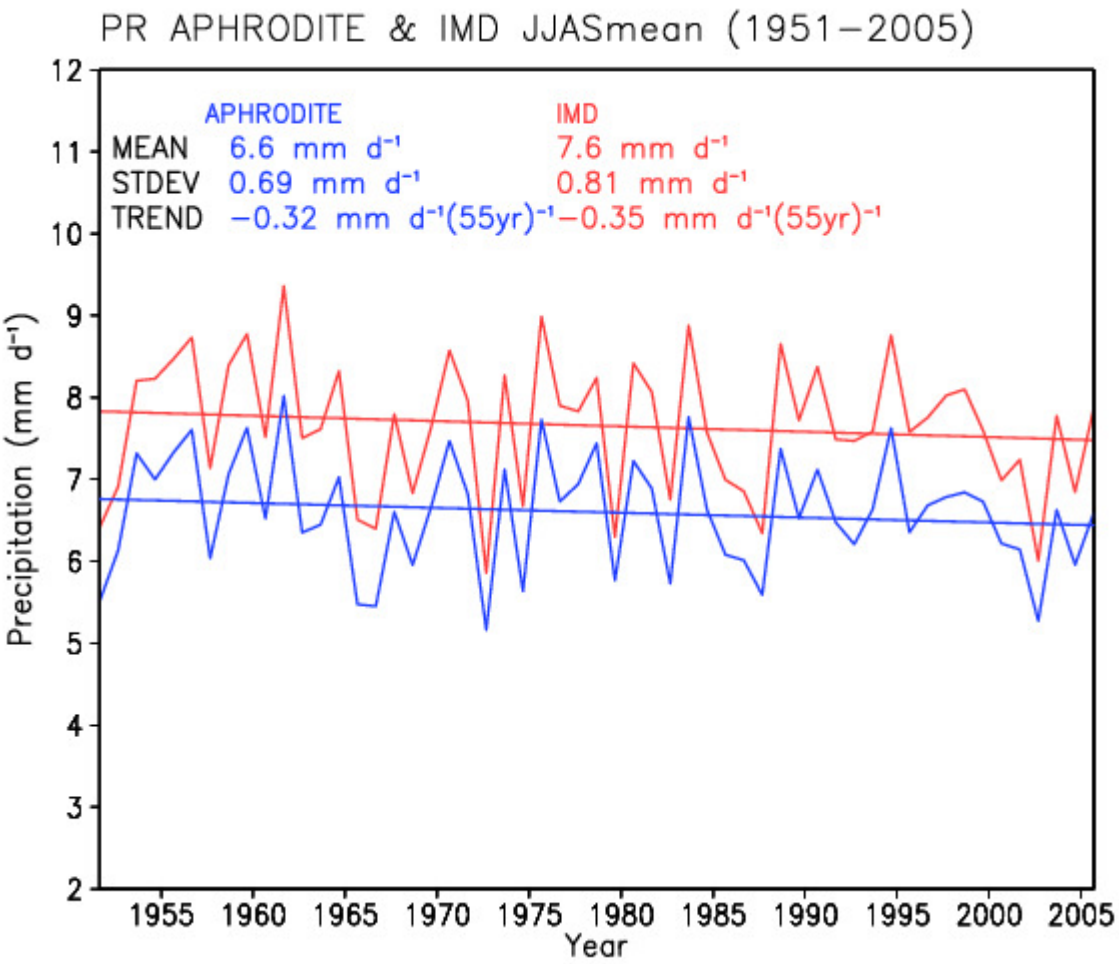

Figure S3. Area averaged time series of JJAS mean precipitation from (blue) APHRODITE and (red) IMD over the domain 70 ^{o} -90^{o} E; 10 ^{o} -28^{o} N for the period 1951-2005. The numerical values indicate the mean, interannual variability and long term trends in precipitation.

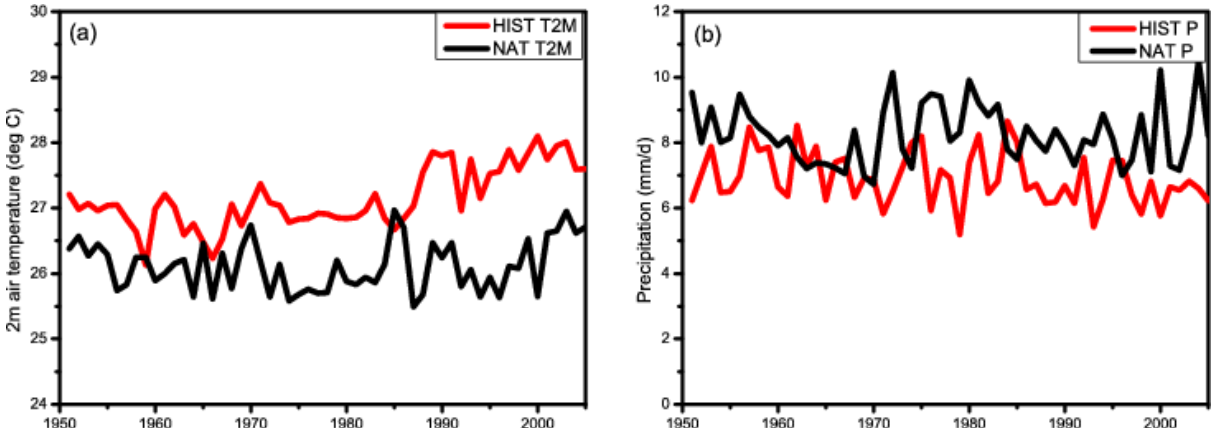

Figure S4. Area averaged time series of JJAS mean (a) 2m air temperature (^{o}C) and precipitation (mm d^{-1}) from LMDZ (red) HIST and (black) NAT simulations. Linear trends in 2m air temperature and precipitation for HIST experiment are 1.1 °C $(55\ yr)^{-1}$, -0.8 mm d^{-1} $(55\ yr)^{-1}$ respectively (and significant at 95% level). The trends in NAT are close to zero and statistically not significant.

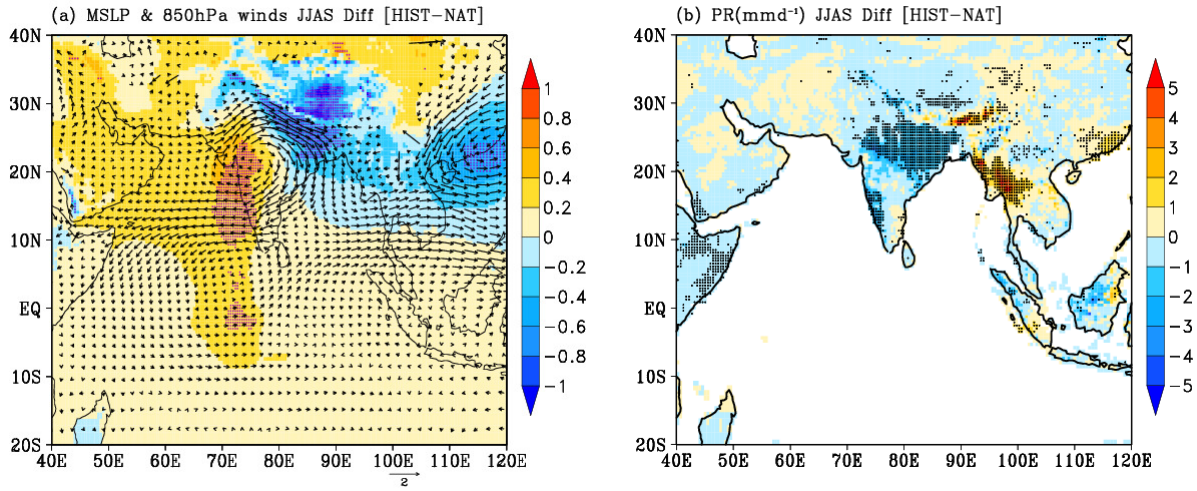

Figure S5. Spatial distribution of JJAS mean difference (HIST-NAT) of (a) Mean sea level pressure (shaded; hPa), wind at 850 hPa (vectors; ms^{-1}) and (b) precipitation (mm d^{-1}) between HIST and NAT experiments of LMDZ for 1951-2005. The significant differences at 95% level for wind and precipitation are stippled.

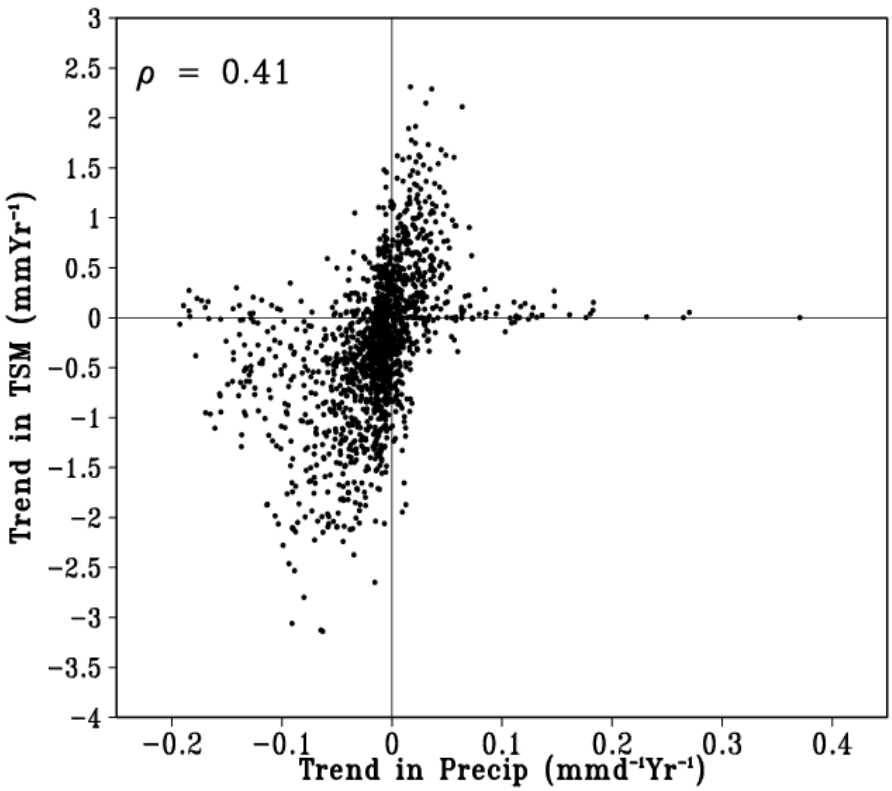

Figure S6. Scatter plot of trends in JJAS mean precipitation versus total soil moisture over the Indian land region 70°E-90°E; 10°N-28°N for the 55-year (1951-2005) period for HIST simulation of LMDZ.