

Supporting Information for “An indirect, negative radiative effect of water vapor in the tropics and its implications for regional surface heat stress”

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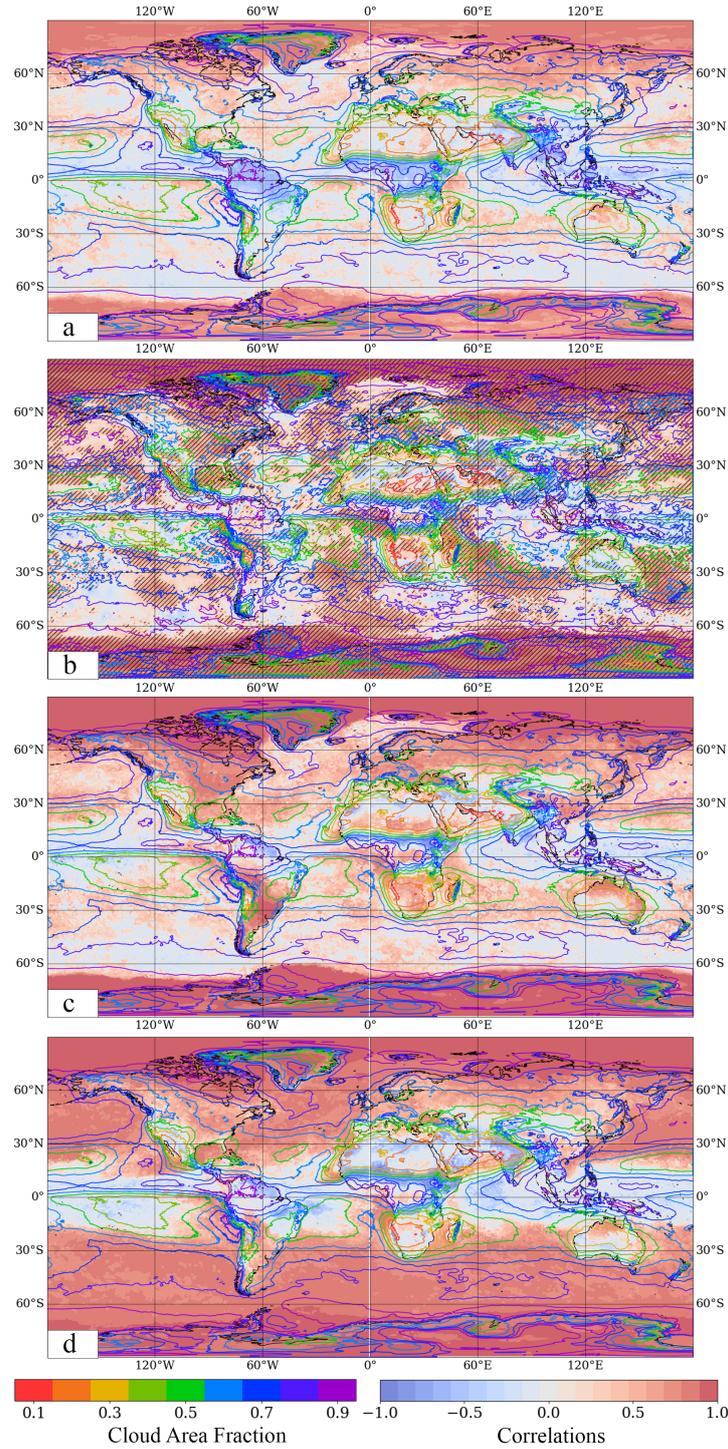


Figure S1. Correlations between – (a) daily T_{max} and CWV , (b) daily T_{max} and q_{sfc} for May 2016, (c) daily T_{avg} and q_{sfc} , and (d) daily $T_{2m,max}$ and q_{sfc} . All data from ERA5. All coefficients are multi-year modes for May 2001 to 2020 (as in Fig. 1), except panel b which shows coefficients for May 2016. Contour lines represent cloud cover averaged over the corresponding period. Correlations significant at the 95% confidence level are hatched in panel b.

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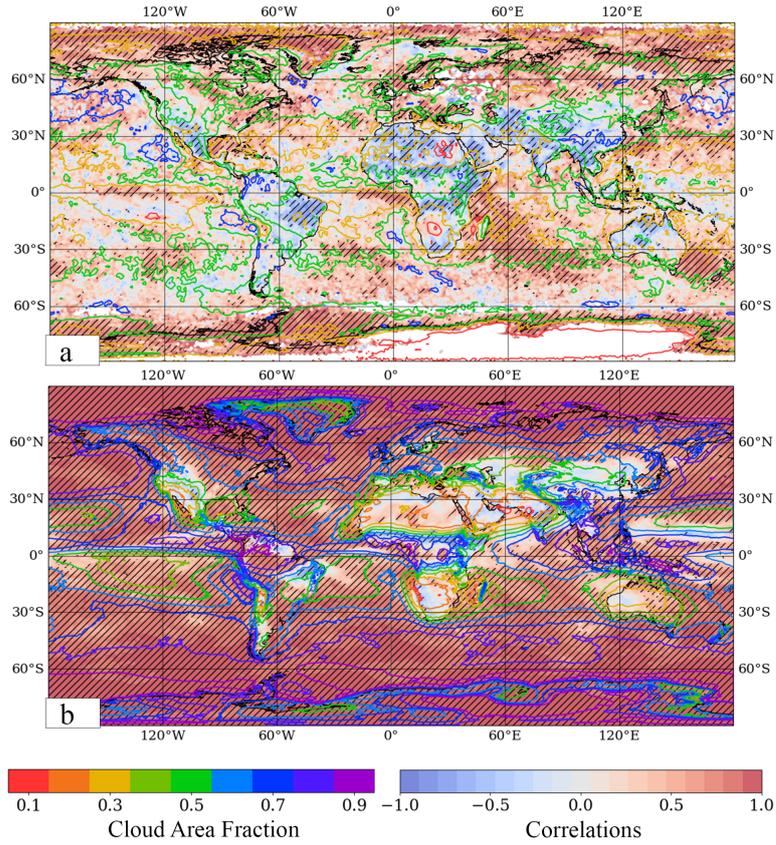


Figure S2. (a) Correlations between daily T_{max} and q_{sfc} , and daily averaged total cloud fraction from AIRS for May 2016, (b) Inter-annual correlations between monthly averaged T_{max} and q_{sfc} and corresponding daily averaged cloud cover for May 2001 to 2020 from ERA5. Correlations significant at the 95% confidence level are hatched.

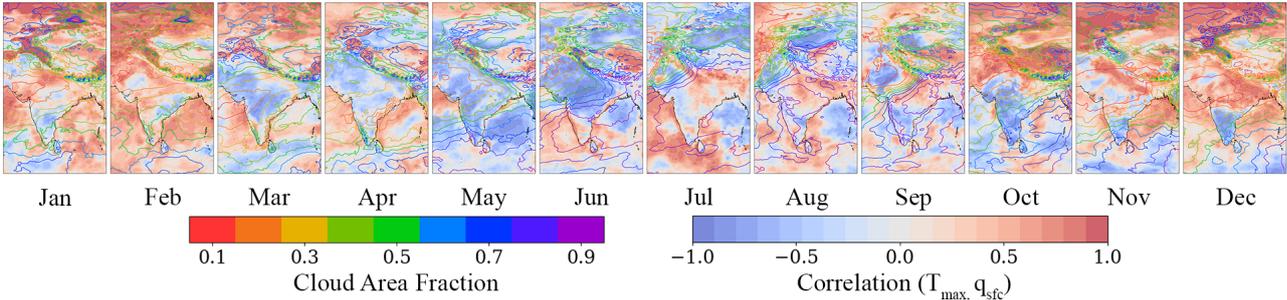


Figure S3. Grid scale correlations between daily T_{max} and q_{sfc} showing the seasonal pattern of IWVE over the Indian subcontinent for the year 2016.

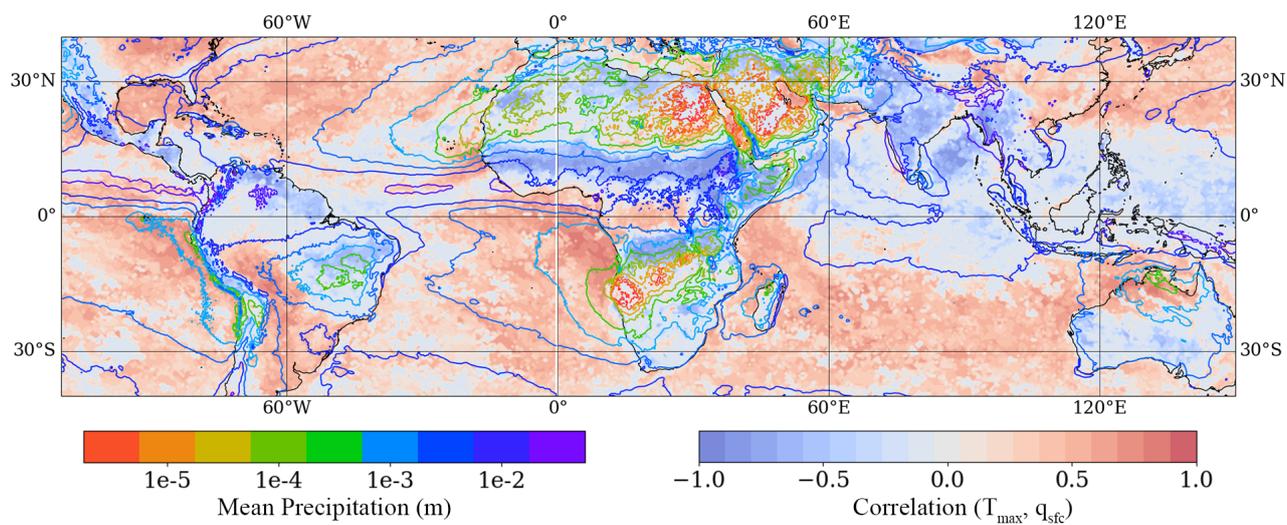


Figure S4. Same as Fig. 1 b but line contours show ERA5 precipitation averaged in May 2001 to 2020, instead of cloud fraction.

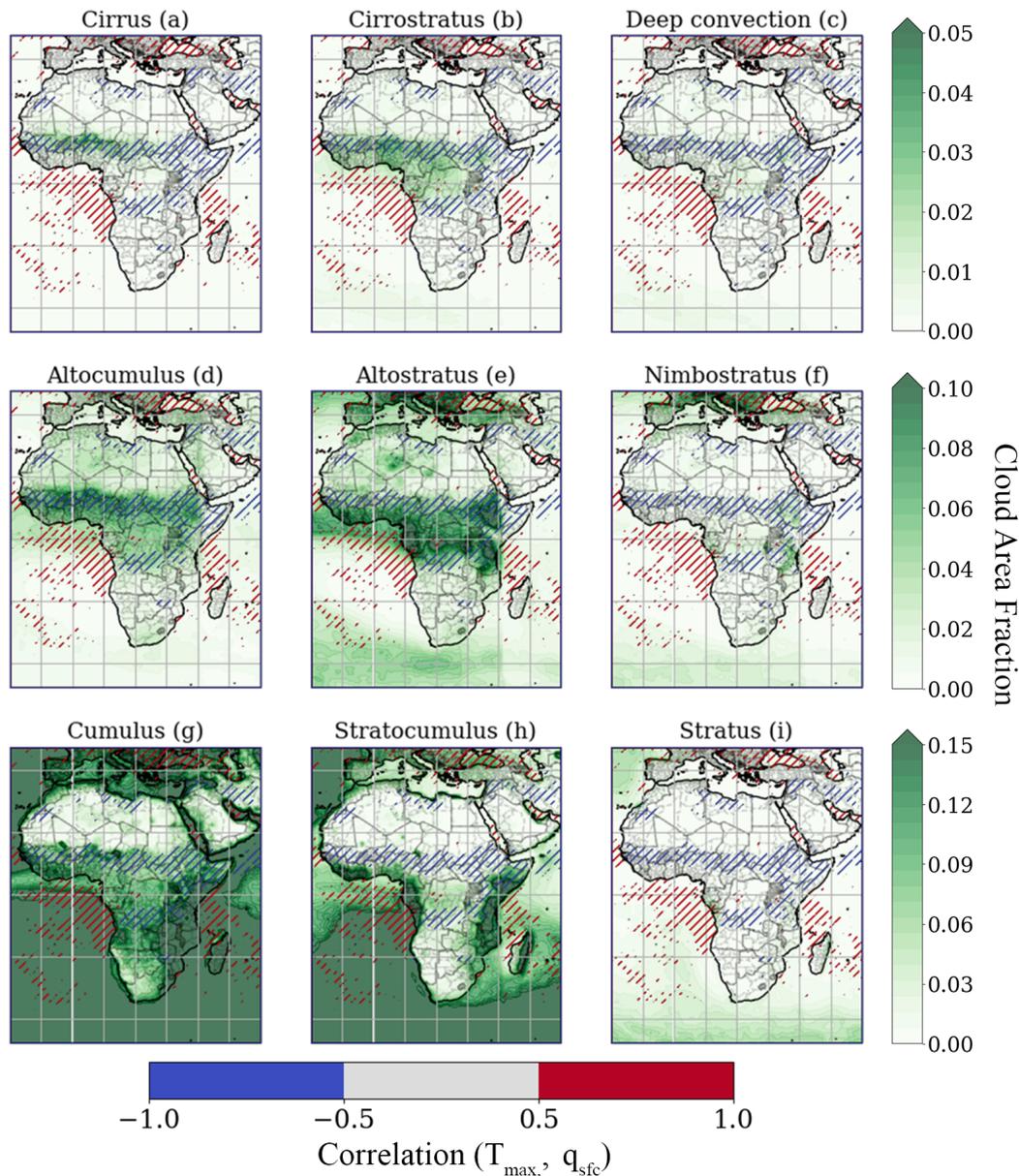


Figure S5. May cloud fraction averaged between 2001 and 2020 derived from CERES Cld-TypHist 1°x1° monthly data. Panels are arranged with highest clouds at the top and lowest clouds at the bottom. Optical depth increases from left to right. (a) Cirrus, (b) Cirrostratus, (c) Deep Convective clouds (d) Altostratus, (e) Altostratus and (f) Nimbostratus, (g) Cumulus, (h) Stratocumulus and (i) Stratus. The blue and red hatching show regions with IWVE correlations between -1 to -0.5 and 0.5 to 1 respectively from Fig. 1b.

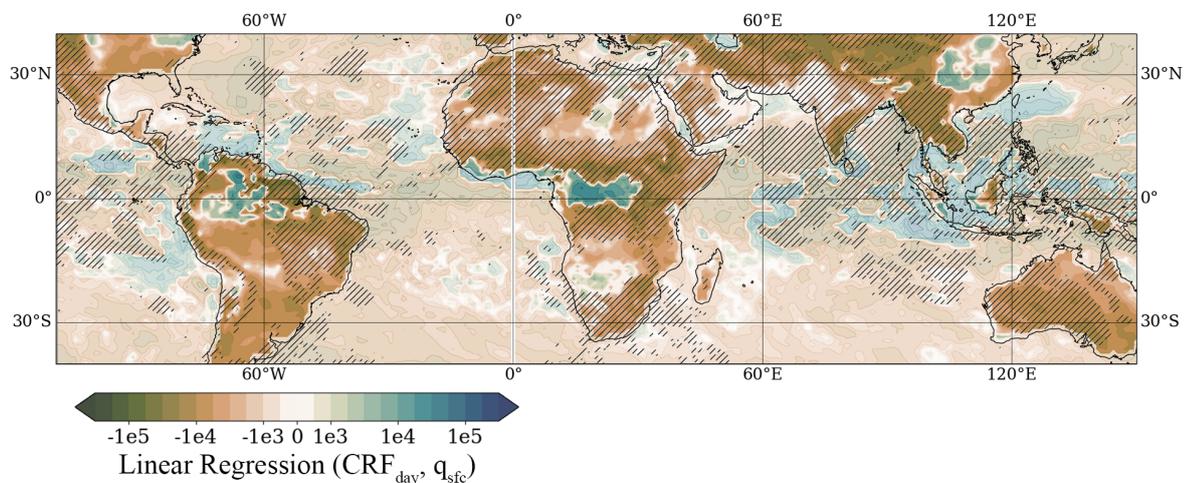


Figure S6. Same as Fig. 6 but with daily average CRF from CERES SYN1deg daily scale data for May 2016. Hatching shows all regions with negative IWVE correlations. Data obtained from ERA5.

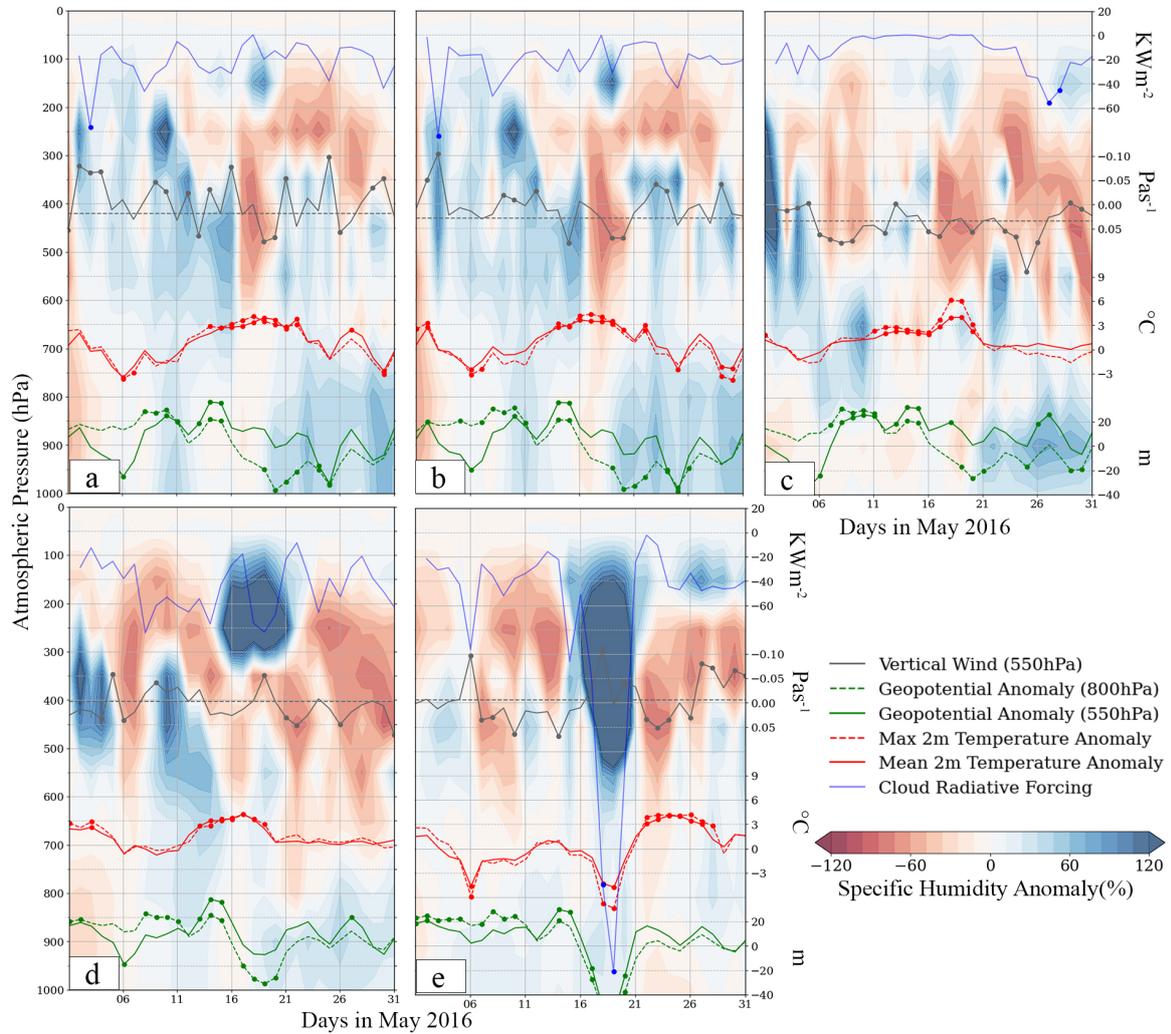


Figure S7. Same as Figure 8 but for (a) Datia, Madhya Pradesh (b) Lucknow, Uttar Pradesh, (c) Radhanpur, Gujarat, (d) Patoda, Maharashtra, and (e) Dachepalli, Andhra Pradesh.