Supplementary Material

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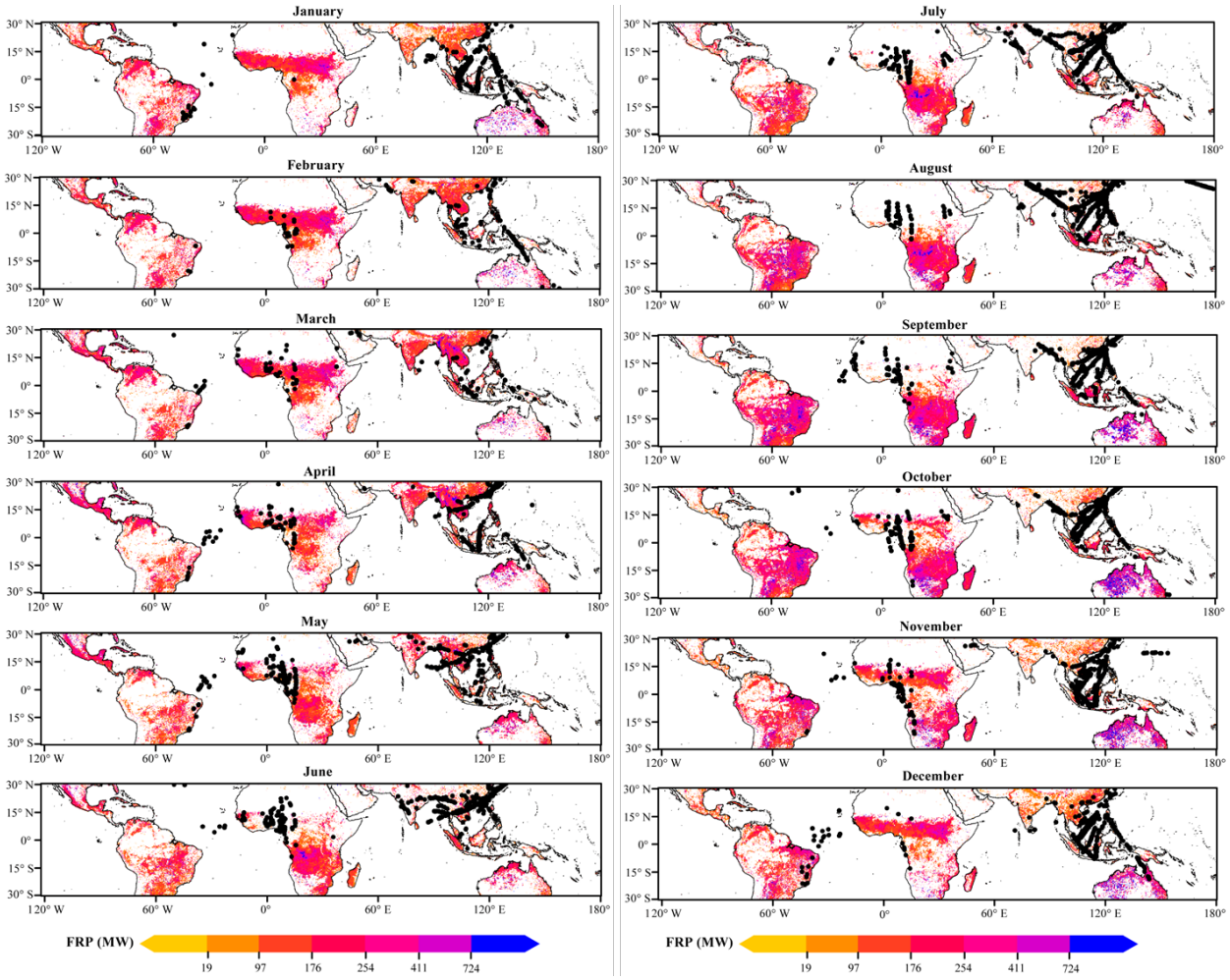

Figure SM1. Comparison of the fire radiative power derived from MODIS on the a) Aqua (nadir pass at 1:30pm LT) and b) Terra (nadir pass at 10:30amLT) satellites for July through December (2011-2019). The orange markers show the location of Extreme Ice Events (EIE) in cirrus observed in each month. (Logarithmic scale?)

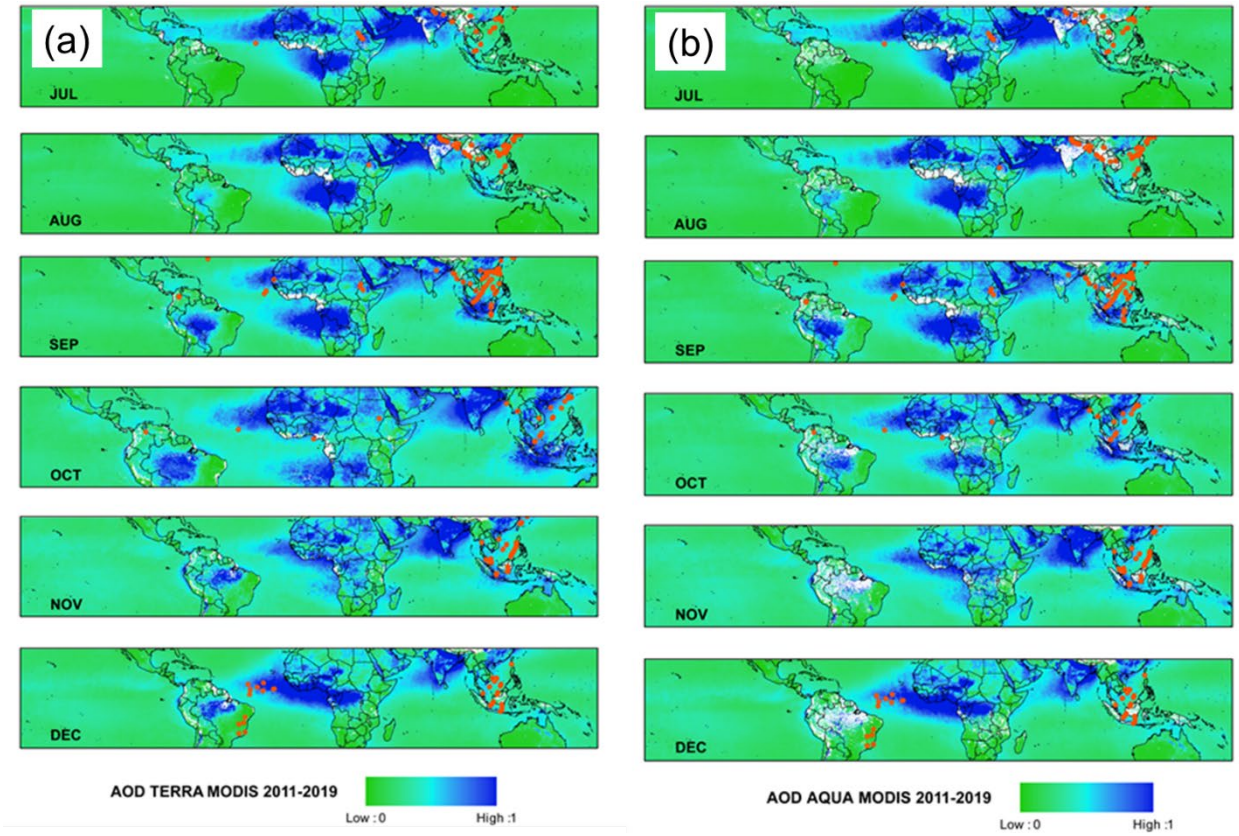

Figure SM2. Comparison of the aerosol optical depth (AOD) derived from the a) Terra (nadir pass at 10:30am LT) and b) Aqua (nadir pass at 1:30pm LT) and MODIS satellite images. The AOD plotted is a nondimensional value normalized here to fall between 0 (lowest) to 1 (highest). The orange markers show the location of Extreme Ice Events (EIE) in cirrus observed in each month. White regions correspond to the widespread presence of clouds that render impossible the determination of AOD.

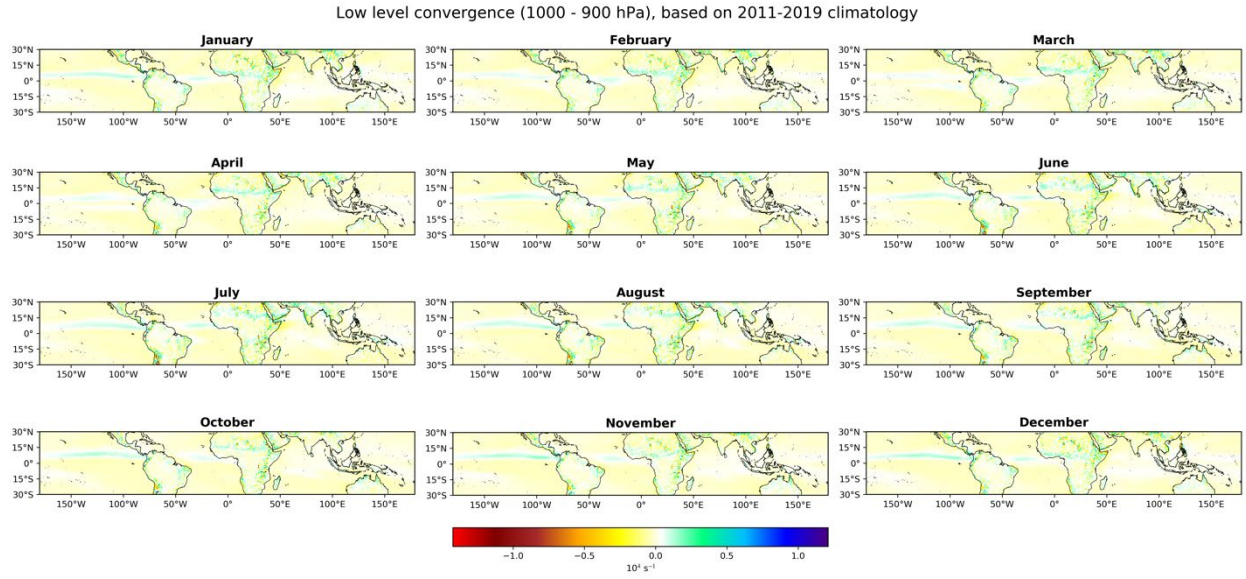

Figure SM3. Spatial distribution of the horizontal wind divergence at 850 hPa, determined from ERA5 reanalysis (2011-2019). The dark dots show the location of cirrus with Extreme Ice Events (EIE) in cirrus observed in each month.

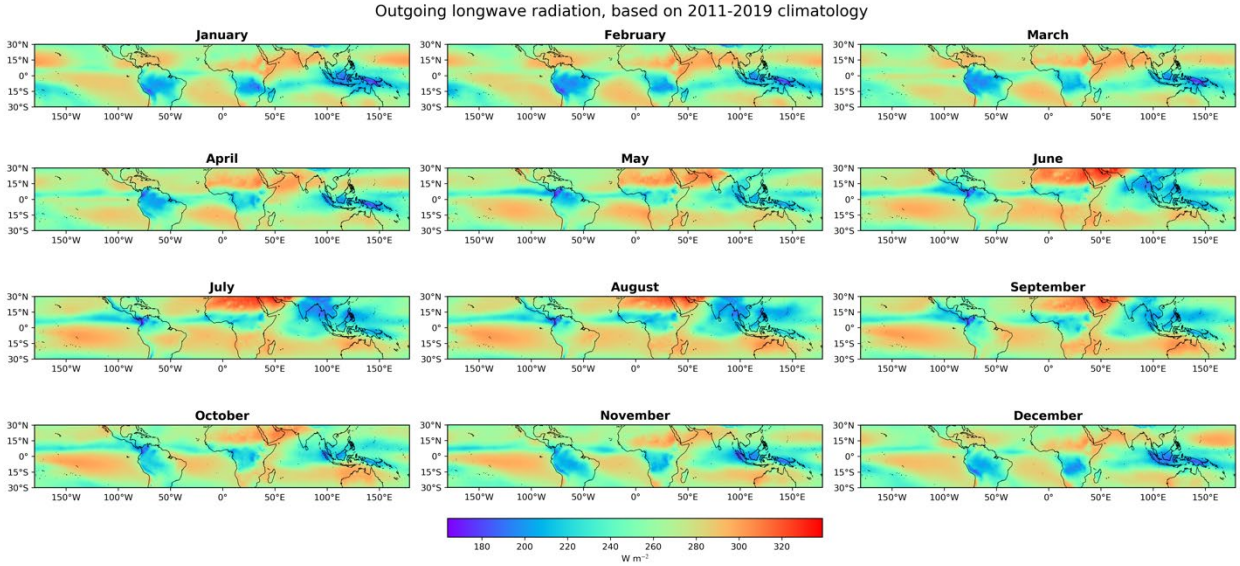

Figure SM4. Spatial distribution of the outgoing longwave radiation OLR, determined from ERA5 reanalysis (2011-2019).

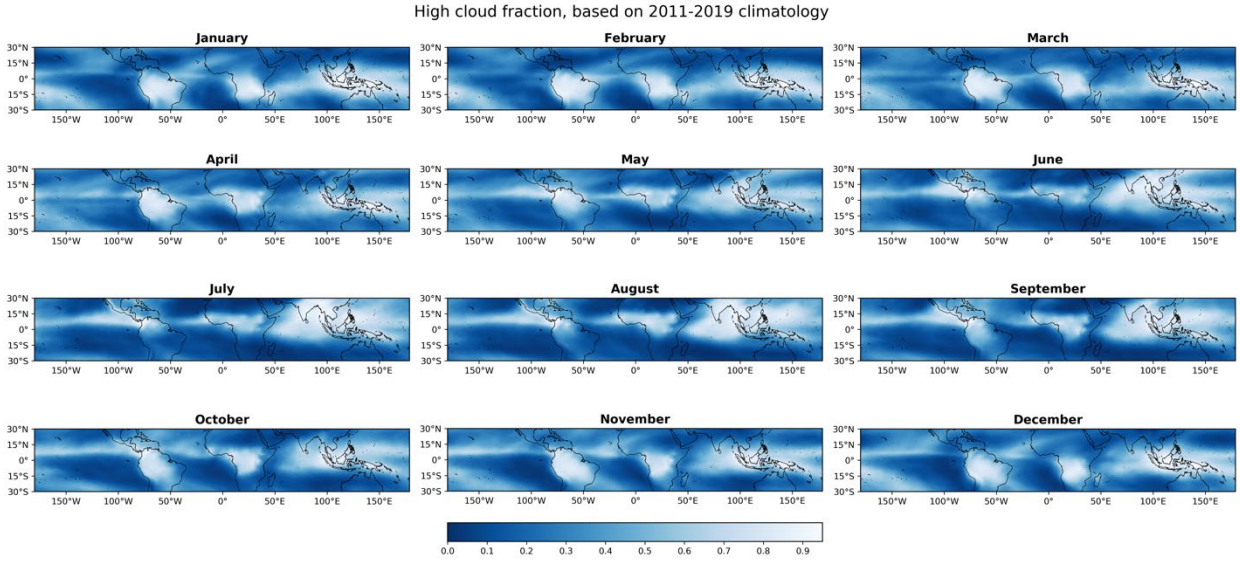

Figure SM5. Spatial distribution of the high cloud fraction determined from ERA5 reanalysis (2011-2019)

Table SM1: Names and locations of the Megacities shown in Figures 1 and 7

Name	*Latitude*	*Longitude*
Bagalore	11.4	12.9716
Bangkok	10.2	13.7563
Beijing	19.6	39.9042
Cairo	20.1	30.0444
Chennai	10.5	13.0827
Chongqing	14.8	29.4316
Delhi	28.5	28.7041
Dhaka	19.6	23.8103
Guangzhou	12.6	23.1291
Jakarta	10.5	-6.2088
Karachi	15.4	24.8607
Kinshasa	-13.2	4.4419
Kolkata	14.7	22.5726
Lagos	13.5n	6.5244
Lahore	11.7	31.5204
Manila	13.5	14.5995
Mumbai	20	19.076
Osaka	19.3	34.6937
Rio de Janeiro	13.3	-22.9068
Sao Paulo	21.7	-23.5505
Shanghai	25.6	31.2304
Shenzhen	11.9	22.5431
Tianjin	13.2	39.3434
Tokyo	37.5	35.6762