

Table S1: High precipitation dates with domain averaged parameters such as daily accumulated precipitation (in mm), MODIS Dark Target Deep Blue (DT-DB) merged Aerosol Optical Depth (AOD) and MERRA-2 AOD. The percentage of grid points with finite MODIS DT-DB AOD value inside the domain is also shown.

Year	Month	Day	Precipitation (in mm)	MODIS DT- DB AOD	MERRA-2 AOD	Grids with finite MODIS AOD values inside domain (in %)
2001	7	14	32.8527	NaN	0.225383	0
2001	7	19	35.6275	NaN	0.129522	0
2001	7	28	36.5082	NaN	0.298442	0
2001	8	12	43.7332	0.8485	0.185965	18
2002	7	2	39.0258	NaN	0.71017	0
2002	7	20	35.9443	NaN	0.641708	0
2002	8	10	48.0192	NaN	0.369739	0
2003	7	5	33.2765	NaN	0.195504	0
2003	7	23	47.84	0.355	0.183335	9
2004	6	17	46.1075	0.271	0.120518	18
2004	7	5	46.3363	NaN	0.255433	0
2004	9	13	33.6993	0.288333	0.328729	27
2004	9	21	56.0797	NaN	0.196624	0
2005	7	9	51.1417	0.2565	0.302487	18
2005	8	14	38.1078	NaN	0.507385	0
2005	9	16	58.2242	NaN	0.122642	0
2005	9	24	52.4905	0.5705	0.150208	18
2006	6	3	48.0658	NaN	0.304683	0
2006	7	8	69.1423	NaN	0.726576	0
2006	8	26	47.725	NaN	0.363214	0
2007	7	5	40.9263	0.393143	0.201219	64
2007	7	11	36.0568	NaN	0.231489	0
2007	7	22	38.877	NaN	0.454508	0
2007	8	12	34.3018	NaN	0.259448	0
2008	6	14	69.2418	1.219	0.589199	9
2008	6	27	33.5453	NaN	0.428456	0
2008	8	26	45.7502	NaN	0.450668	0
2008	9	19	83.7933	NaN	0.135286	0
2009	6	27	35.203	1.35586	1.0748	64
2009	7	19	54.583	0.656	0.293096	9
2009	7	26	33.1407	0.9018	0.362039	45
2009	8	12	42.1283	0.2576	0.273451	45
2009	8	17	60.9722	NaN	0.192102	0
2009	8	30	33.759	0.2915	0.20784	36
2009	9	11	33.0377	NaN	0.337989	0
2010	7	5	47.6792	NaN	0.211352	0
2010	7	10	40.9872	2.55	0.727623	18
2010	7	16	52.8365	0.7755	0.216237	18
2010	7	26	33.7122	0.2535	0.117785	18
2010	7	29	49.8763	0.134	0.233702	18
2010	8	22	41.105	NaN	0.236324	0
2010	9	18	32.9807	NaN	0.145106	0
2011	7	14	34.2018	0.949667	0.351616	27

2011	7	19	42.7448	0.416667	0.205497	27
2011	8	15	48.7568	NaN	0.132182	0
2011	8	22	73.4605	0.480143	0.212764	64
2011	9	8	43.868	NaN	0.205697	0
2011	9	14	37.1833	0.498	0.299527	82
2012	7	3	36.2908	NaN	0.513859	0
2012	7	18	45.5977	2.42867	0.690129	55
2012	7	24	42.966	NaN	0.627878	0
2012	8	2	35.0897	NaN	0.552373	0
2012	9	1	35.4943	NaN	0.476696	0
2012	9	17	39.9055	NaN	0.243857	0
2013	6	10	57.8703	1.75529	1.19672	64
2013	6	16	51.92	NaN	0.142739	0
2013	7	19	47.087	NaN	0.410318	0
2013	8	8	36.3623	NaN	0.287923	0
2013	8	26	36.3528	NaN	0.530323	0
2014	6	20	35.4537	1.46078	0.756235	82
2014	7	5	35.6967	NaN	0.410552	0
2014	7	18	37.5417	NaN	0.216757	0
2014	8	3	36.9662	1.3335	0.50279	18
2014	8	13	61.5707	NaN	0.516442	0
2015	6	24	36.1328	0.605	0.364721	45
2015	7	5	77.812	1.6258	0.814888	45
2015	7	15	90.199	NaN	0.405833	0
2015	7	31	42.2708	NaN	0.154531	0
2016	7	1	58.871	NaN	0.426282	0
2016	7	14	39.7328	NaN	0.172155	0
2016	7	25	48.9102	0.463	0.403148	18
2017	7	1	36.6968	0.4645	0.309418	18
2017	7	9	40.1599	NaN	0.557355	0
2017	8	3	46.4867	NaN	0.3832	0
2017	9	20	34.6838	0.281	0.207441	64

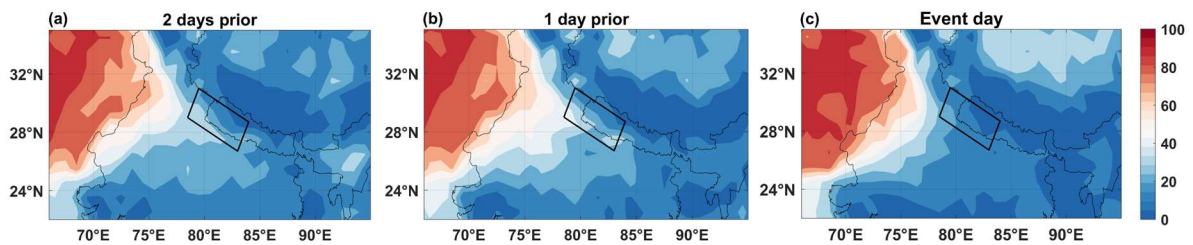


Figure S1: Percentage number of finite MODIS DT-DB AOD values that are averaged to estimate the AOD composite shown in Figure-2 (a-c) of the manuscript at each grid point for (a) two days prior, (b) one day prior and (c) the event day.

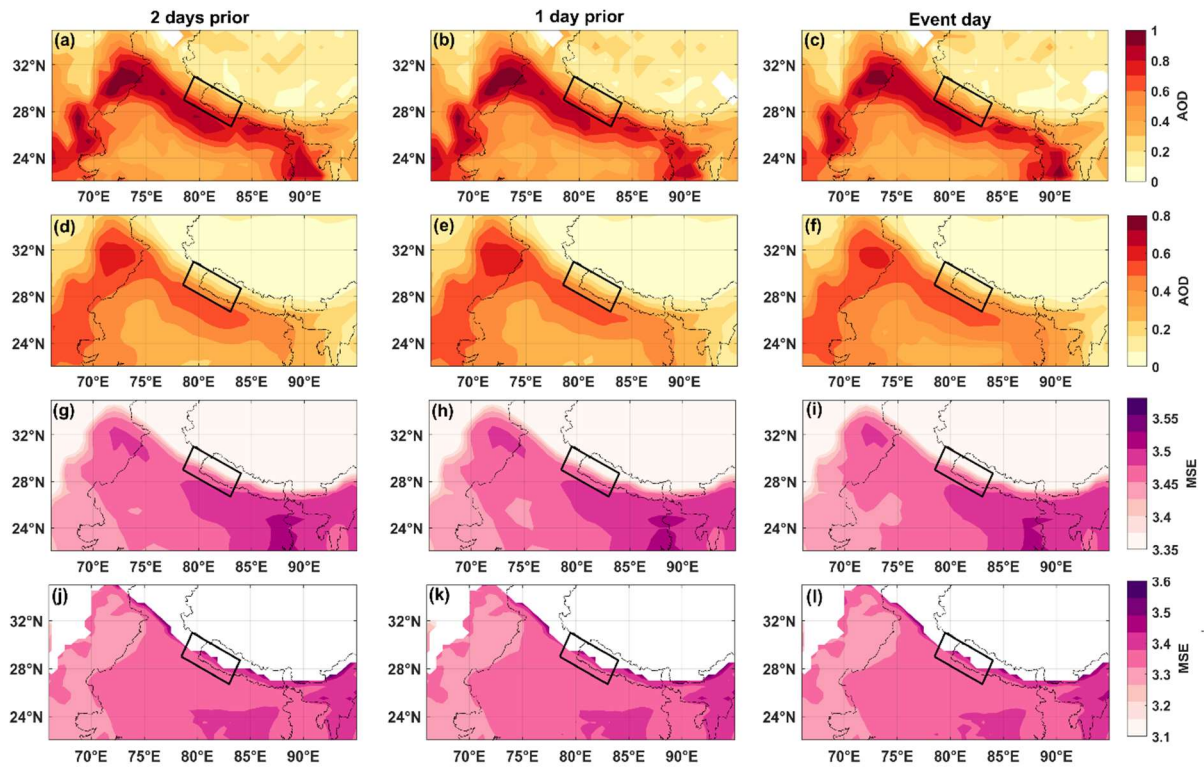


Figure S2: Composites of MODIS AOD (a-c), MERRA-2 AOD (d-f), ERA-Interim lower level MSE (g-i) in units of 10^5 J kg^{-1} and MERRA-2 lower level MSE (j-l) in units of 10^5 J kg^{-1} , for the days with precipitation <5 percentile (c, f, i, l), one day prior (b, e, h, k) and two days prior (a, d, g, j).