Table S1 Impacts of various critical source areas (CSAs) on the six sub-regions of the CEC

			NE	NC	LP	CC	EC	SC
Indirect intrusions	**Middle troposphere**	**CSAm1**	4.68	7.00	10.24	2.89	3.73	0.86
		CSAm2	0.13	0.14	0.09	0.31	0.46	0.63
	Lower troposphere	**CSAl1**	1.16	2.09	1.40	1.31	1.83	0.41
		CSAl2	0.84	1.36	1.56	1.87	1.38	0.39
		CSAl3	0.73	0.51	0.14	0.07	0.11	0.01
		CSAl4	0.08	0.19	0.02	0.07	0.17	0.09
Direct intrusions	**Middle troposphere**	**2CSAm1**	1.64	4.15	5.99	1.02	1.12	0.10
		2CSAm2	1.04	1.78	0.73	1.52	2.48	0.53
	Lower troposphere	**2CSAl1**	0.25	0.04	0.01	0.01	0.03	0.00
		2CSAl2	0.13	0.35	0.39	0.13	0.24	0.00

Note. NE (NorthEast China); NC (North China); LP (Loess Plateau); CC (Central China); EC (East China); SC (Southern China).

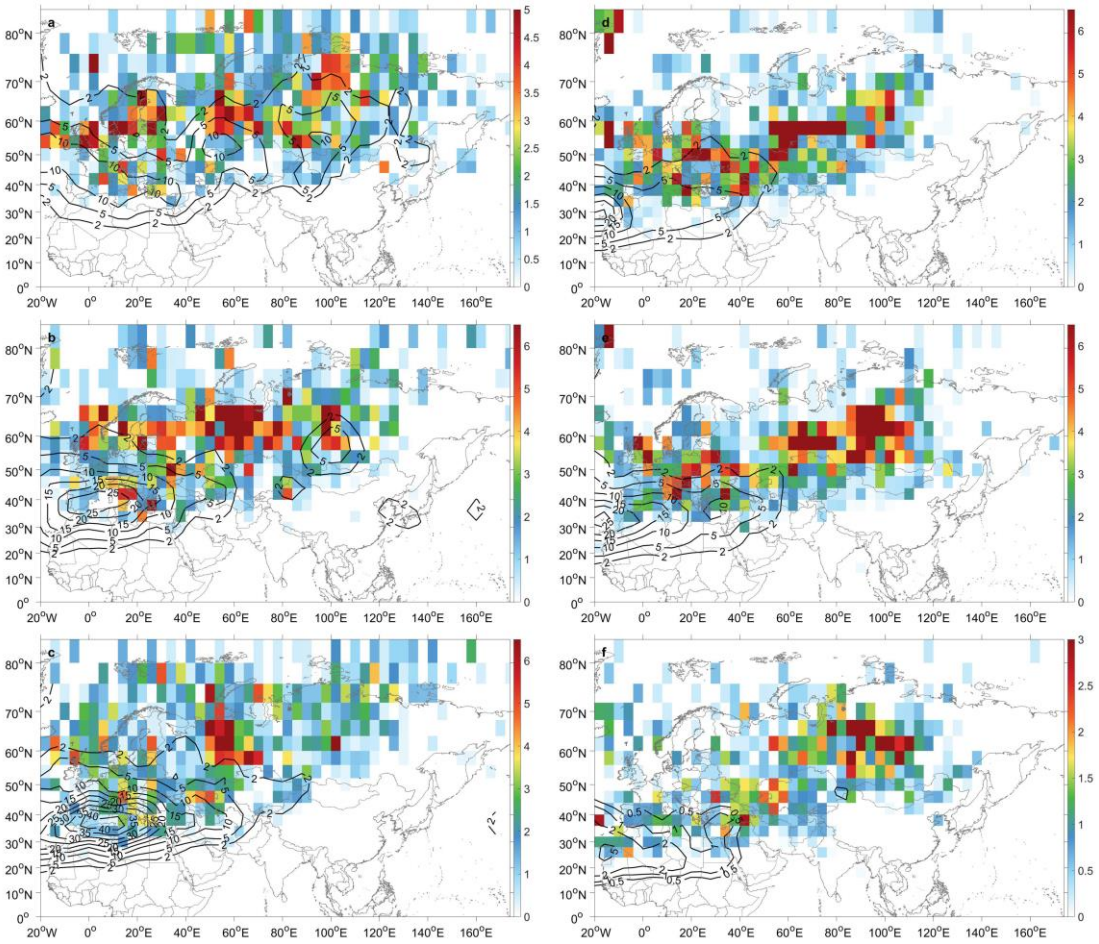

Figure S1: Distributions of CSAII for ISI intruding the lower troposphere (color shaded) and middle troposphere (black lines) of a) NE, b) NC, c) LP, d) CC, e) EC and f) SC in May in 2019.

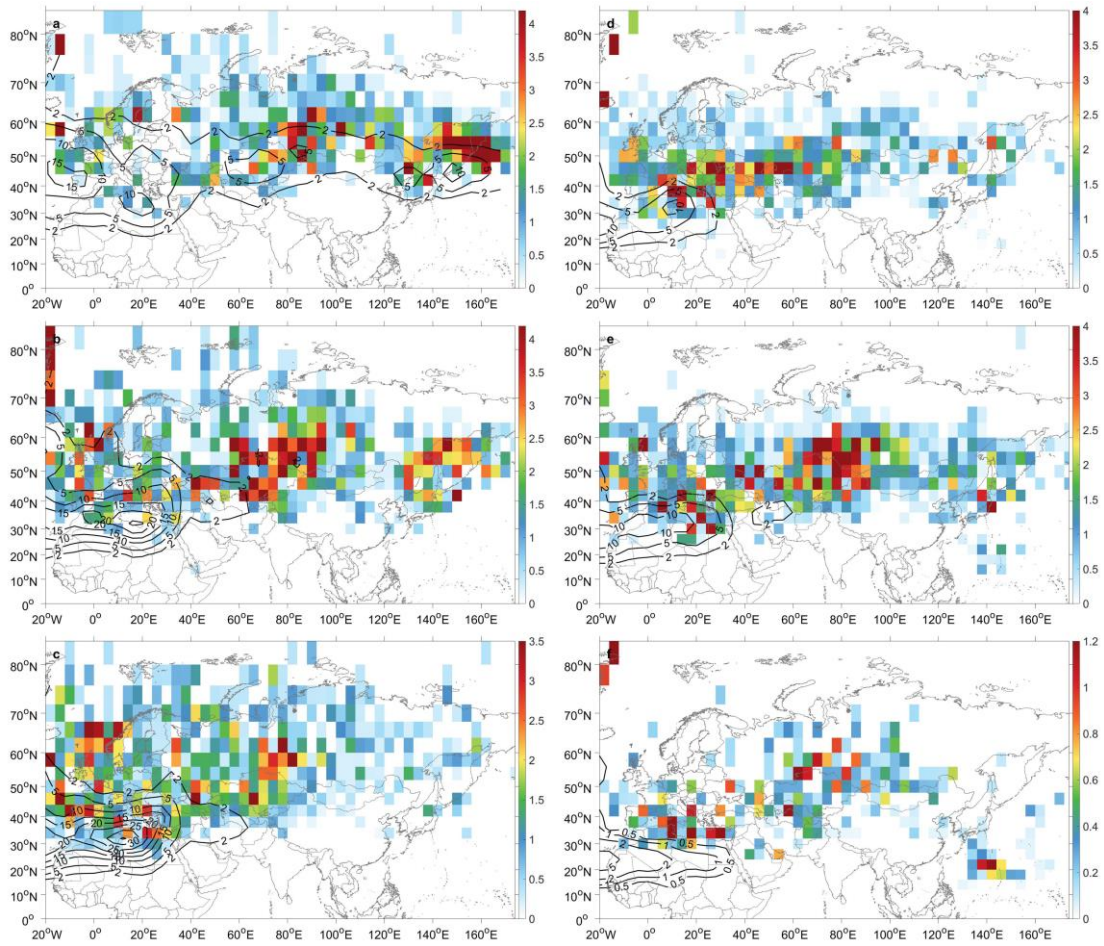

Figure S2: Same as Fig. S1 but for June.

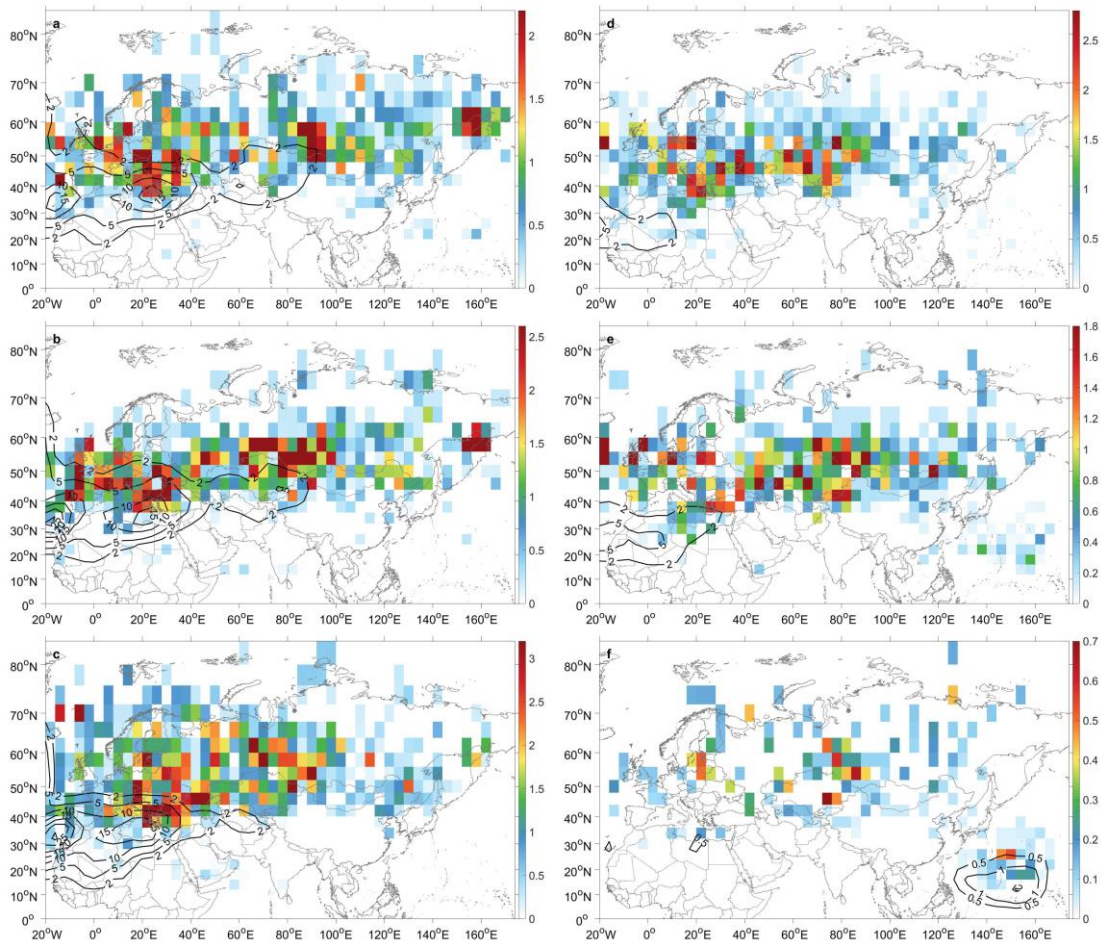

Figure S3: Same as Fig. S1 but for July.

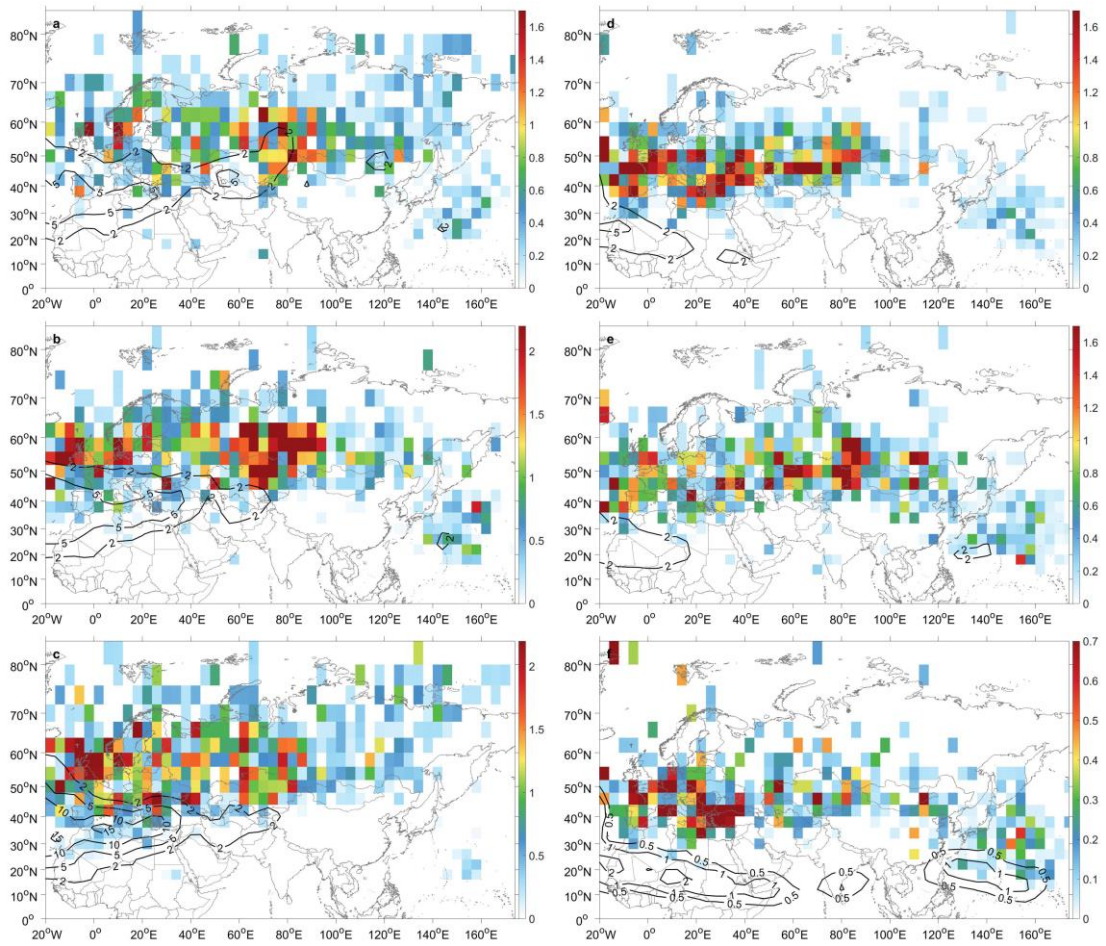

Figure S4: Same as Fig. S1 but for August.

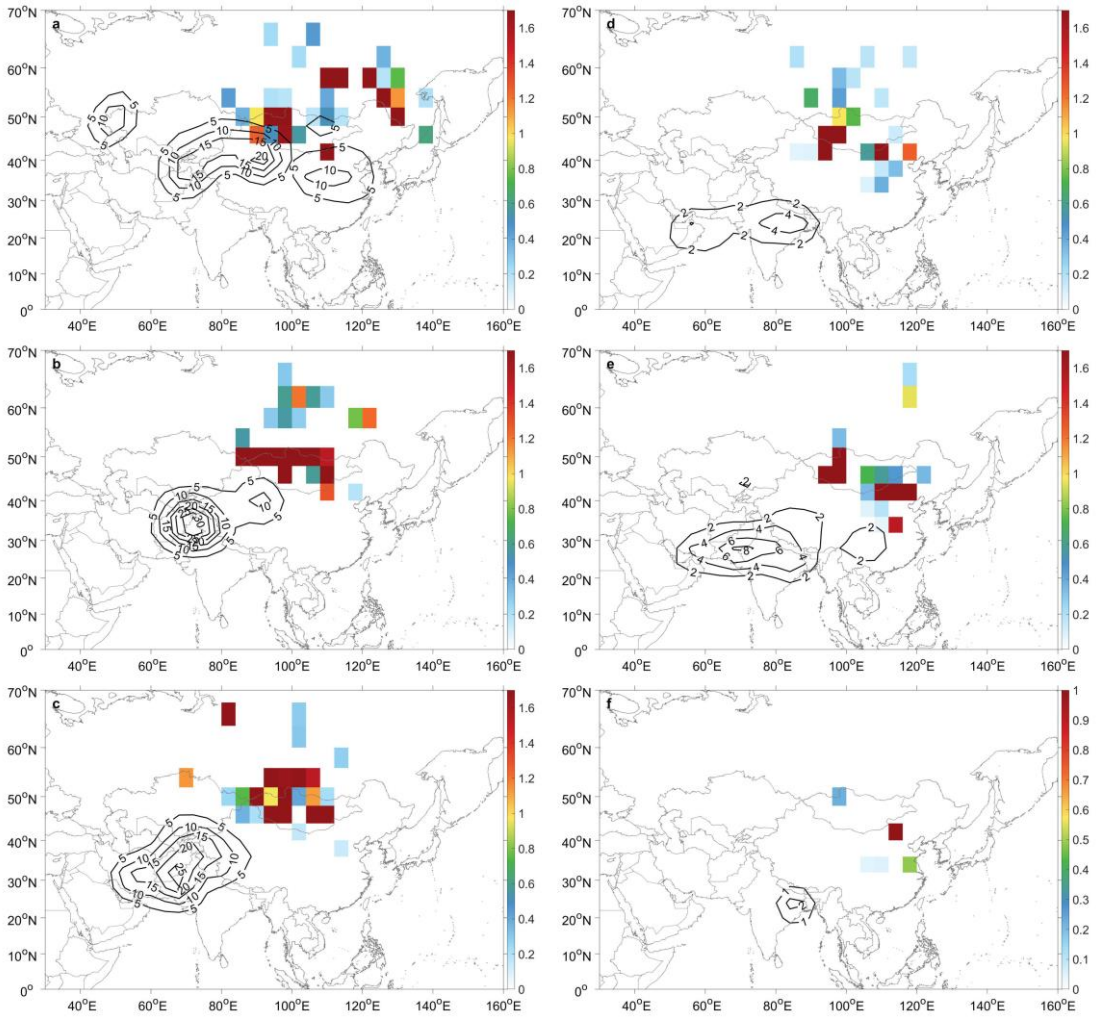

Figure S5: Distributions of CSAII for DSI intruding the lower troposphere (color shaded) and middle troposphere (black lines) of a) NE, b) NC, c) LP, d) CC, e) EC and f) SC in May in 2019.

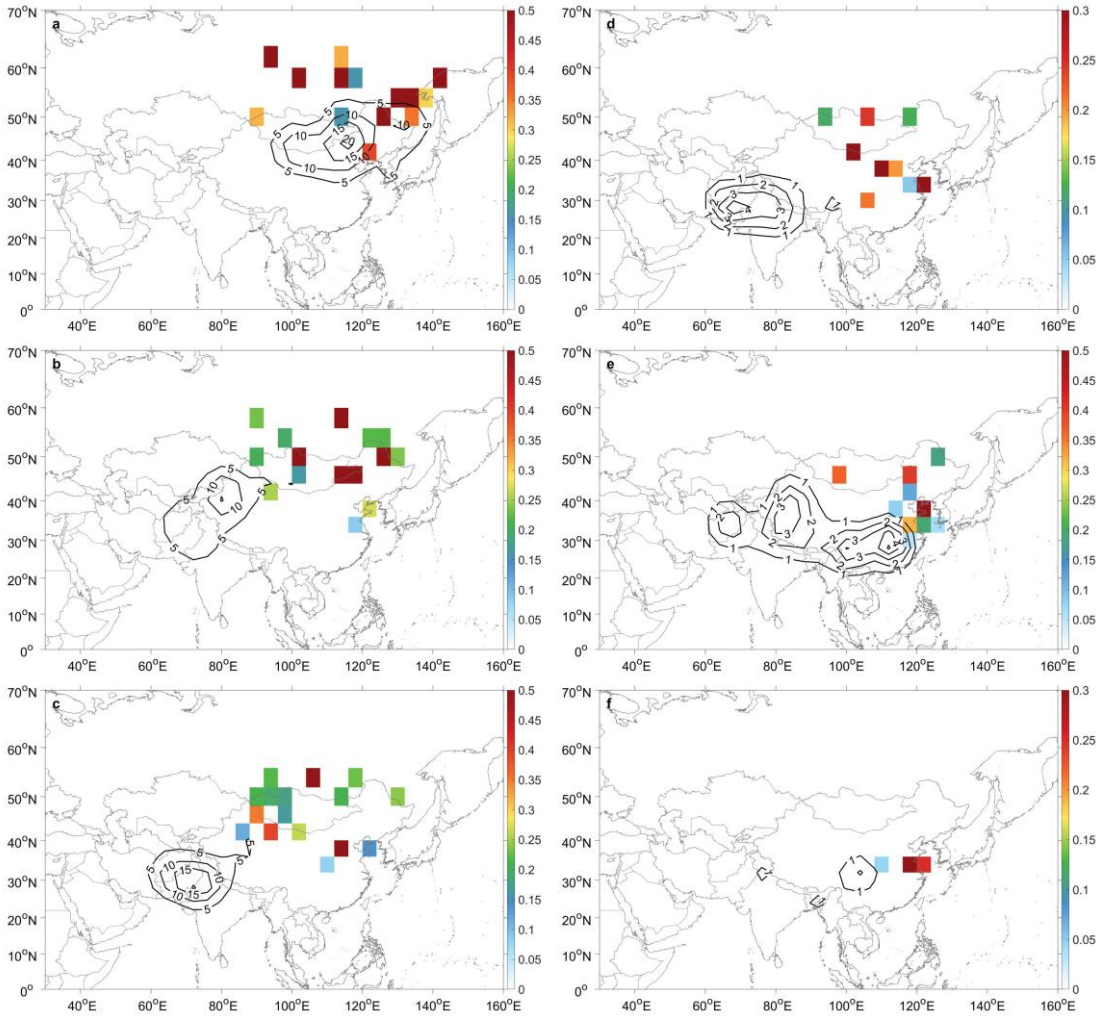

Figure S6: Same as Fig. S5 but for June.

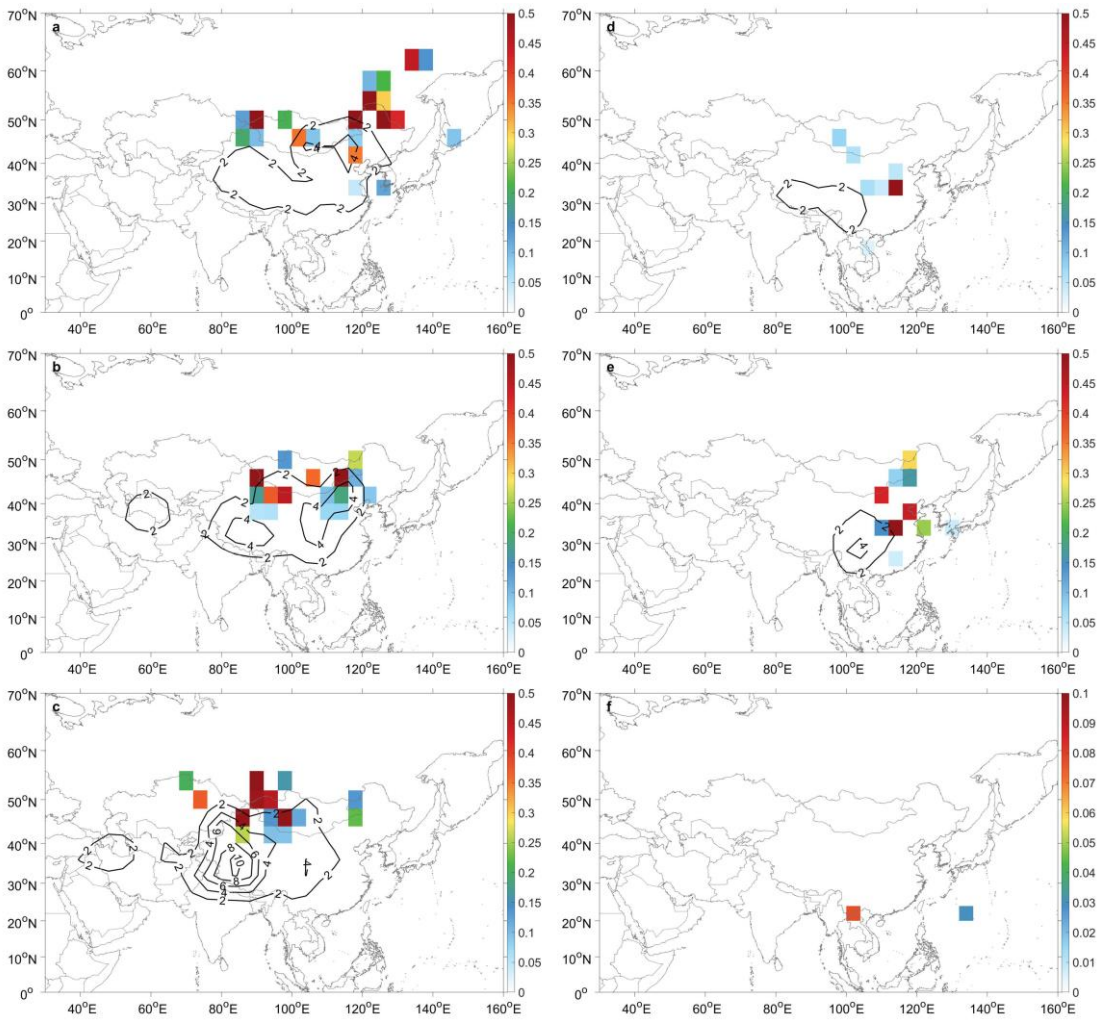

Figure S7: Same as Fig. S5 but for July.

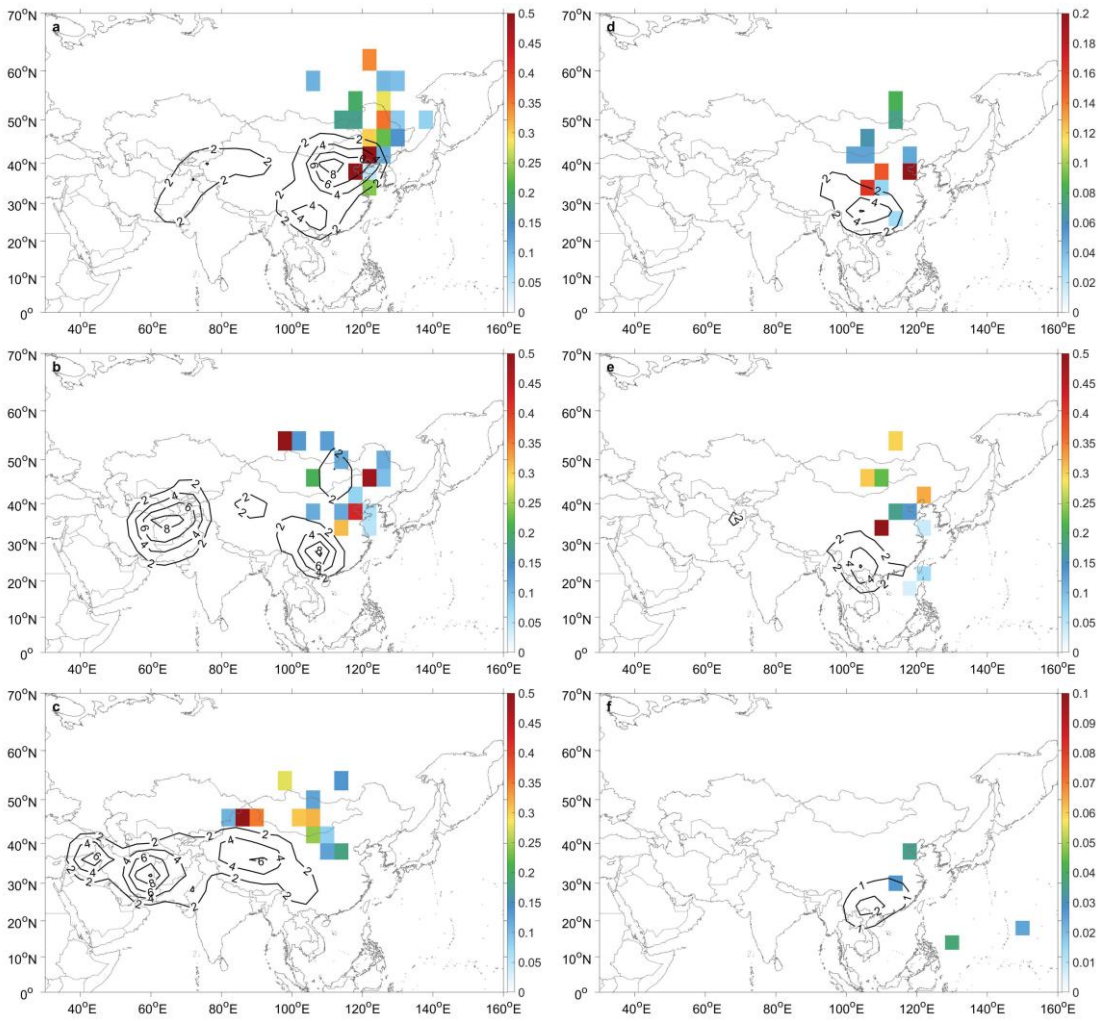

Figure S8: Same as Fig. S5 but for August.