Rapid reduction of black carbon emissions from China: evidence from 2009–2019 observations on Fukue Island, Japan

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Supplement materials

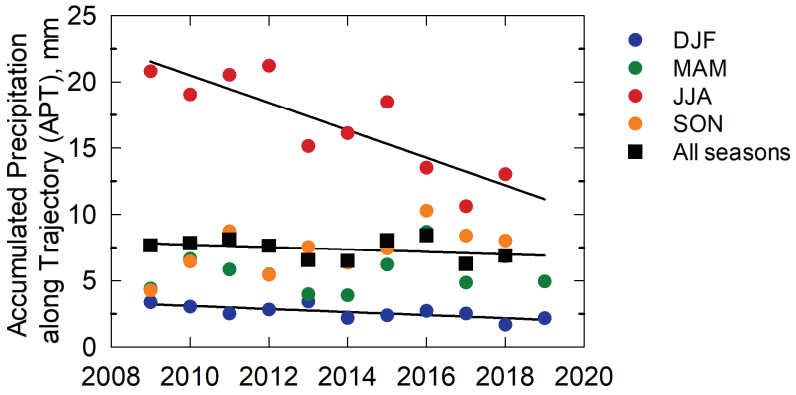

Figure S1. Trends in APT for air masses arriving at Fukue for all and individual seasons. Regression lines are shown for JJA, all seasons, and DJF.

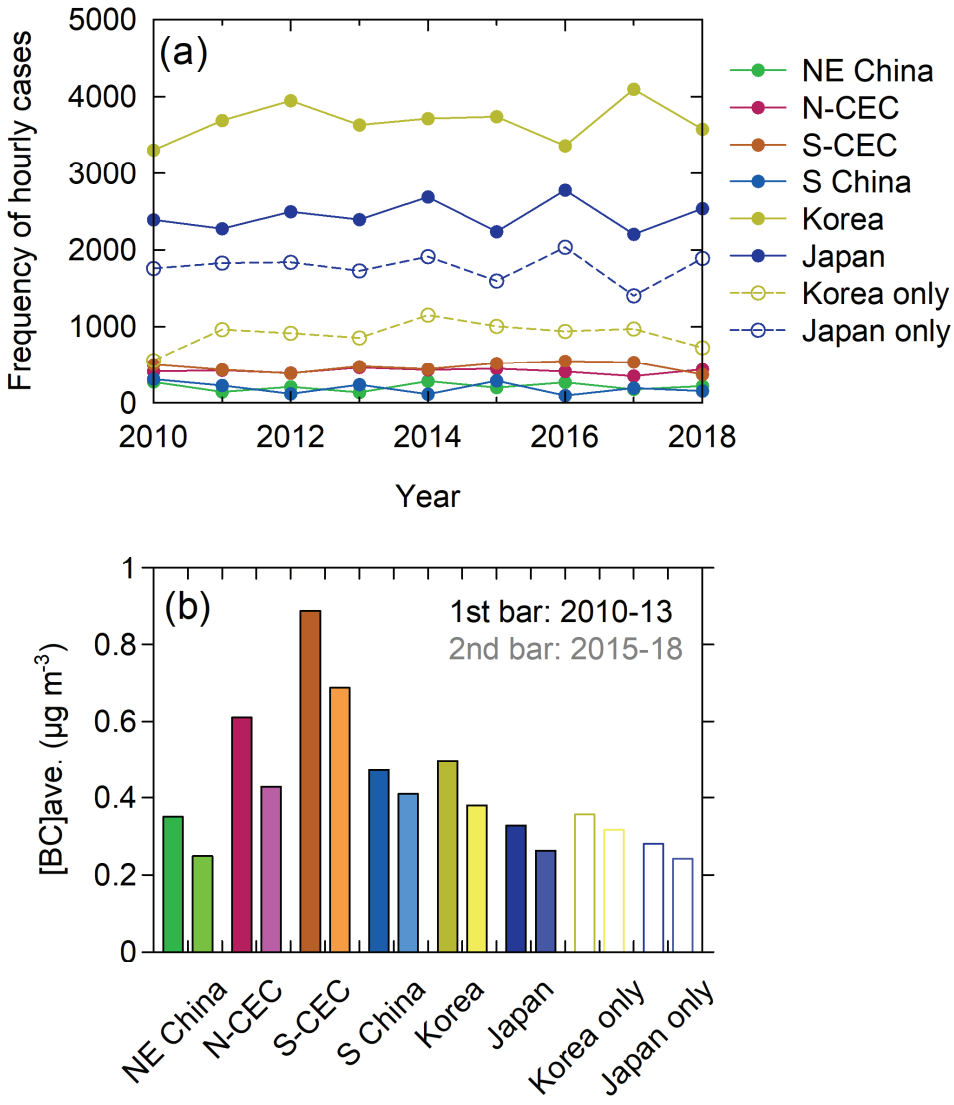

Figure S2. (a) Statistics and trends of number of hourly cases of observed air masses from different origin areas. (b) Averaged BC mass concentrations for individual air mass origin areas, for the periods of 2010–13 and 2015–18.

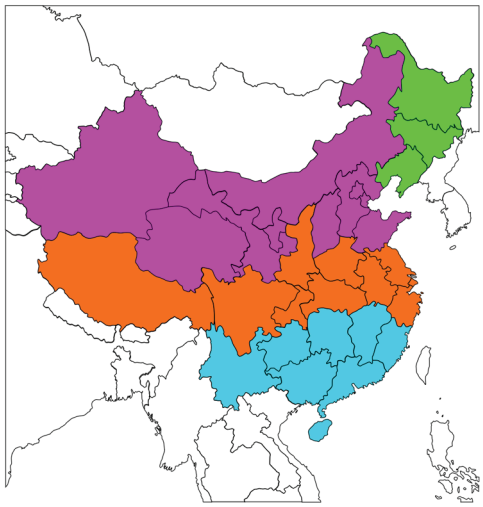

Figure S3. Approximate assignment of Chinese provinces into the four regions of China: Region I (NE China) as green, Region II (N-CEC) as magenta, Region III (S-CEC) as orange, and Region IV (S China) as light blue.

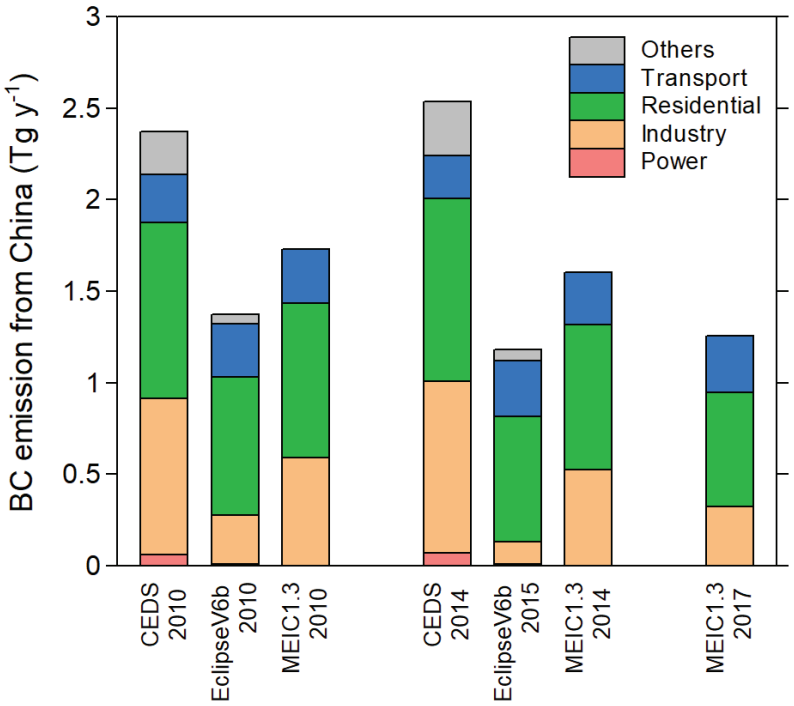

Figure S4. Sectoral breakdown of BC emission from China for CEDS, Eclipse V6b, and MEIC1.3 for 2010, 2014 (2015 for Eclipse V6b), and 2017 (for MEIC1.3 only). CEDS, Eclipse V6b, and MEIC1.3 data are from Hoesly et al. (2018), Klimont et al. (in prep., 2019), and Zheng et al. (2018), respectively.

Table S1. Trends of estimated emission of CO for all seasons and DJF.

All seasons						
	N	E(2014-17)/REAS2.1(2008)	Trend (y^{-1})	Trend (% y^{-1})	*R*	*P*
All regions I−VI	1962	1.31	−0.07 ± 0.01	−5.2 ± 0.9	−0.97	0.029
Region I (NE China)	1201	1.40	−0.07 ± 0.03	−5.3 ± 1.9	−0.89	0.11
Region II (N-CEC)	2444	1.17	−0.04 ± 0.01	−3.7 ± 0.8	−0.95	0.047
Region III (S-CEC)	2810	1.03	−0.07 ± 0.02	−6.9 ± 1.5	−0.96	0.043
Region IV (S China)	1014	1.05	−0.10 ± 0.02	−9.6 ± 2.0	−0.96	0.041
Region V' (Korea only)	5345	1.45	−0.04 ± 0.02	−2.5 ± 1.5	−0.77	0.23
Region VI' (Japan only)	9304	1.35	−0.05 ± 0.00	−3.8 ± 0.4	−0.99	0.0087
DJF						
	N	E(2012-18)/REAS2.1(2008)	Trend (y^{-1})	Trend (% y^{-1})	*R*	*P*
All regions I−VI	17884	1.46	−0.11 ± 0.01	−7.3 ± 0.6	−0.98	8.0×10^{-5}
Region I (NE China)	398	1.63	0.05 ± 0.02	2.8 ± 1.3	0.69	0.085
Region II (N-CEC)	927	1.20	−0.06 ± 0.01	−4.9 ± 0.7	−0.95	0.00089
Region III (S-CEC)	914	1.07	−0.11 ± 0.02	−10.1 ± 1.8	−0.93	0.024
Region V' (Korea only)	2034	1.94	−0.10 ± 0.04	−5.4 ± 1.9	−0.78	0.038
Region VI' (Japan only)	789	1.78	−0.09 ± 0.02	−5.0 ± 1.1	−0.90	0.006