



Figure S1. Distribution of major vegetation types in China (GlobCover 2009). Provinces included: (1) Anhui, (2) Beijing, (3) Chongqing, (4) Fujian, (5) Gansu, (6) Guangdong, (7) Guangxi, (8) Guizhou, (9) Hainan, (10) Hebei, (11) Heilongjiang, (12) Henan, (13) Hongkong, (14) Hubei, (15) Hunan, (16) Inner Mongolia, (17) Jiangsu, (18) Jiangxi, (19) Jilin, (20) Liaoning, (21) Macao, (22) Ningxia, (23) Qinghai, (24) Shaanxi, (25) Shandong, (26) Shanghai, (27) Shanxi, (28) Sichuan, (29) Taiwan, (30) Tianjin, (31) Xinjiang, (32) Xizang, (33) Yunnan, (34) Zhejiang.

Table S1. Emission factors of multiple pollutants for each land use type (unit: g·kg⁻¹).

Category	Land use type	CO ₂ ^a	CO ^a	CH ₄ ^a	NMHC ^a	NO _x ^a	NH ₃ ^a	SO ₂ ^a	BC ^b	OC ^b	PM _{2.5} ^a	PM ₁₀ ^a
cropland	Post-flooding or irrigated croplands (or aquatic)	1353.5	76.1	2.8	9.8	2.91	1.4	0.4	0.63	2	5.04	6.335
cropland	Rainfed croplands	1353.5	76.1	2.8	9.8	2.91	1.4	0.4	0.63	2	5.04	6.335
cropland	Mosaic cropland(50-70%) / vegetation (grassland/shrubland/forest) (20-50%)	1669.38	84.72	3.4	5.83	3.5	0.91	0.47	0.52	6.275	7.92	8.51
grassland	Mosaic vegetation (grassland/shrubland/forest) (50-70%) / cropland (20-50%)	1669.38	84.72	3.4	5.83	3.5	0.91	0.47	0.52	6.275	7.92	8.51
forest	Closed to open (>15%) broadleaved evergreen or semi-deciduous forest (>5m)	1710	88.04	4.15	13.33	1.96	1	0.49	0.82	5.65	10.15	12.75
forest	Closed (>40%) broadleaved deciduous forest (>5m)	1703.17	87.04	3.36	10.77	2.98	1.03	0.63	0.77	7.625	12.26	12.75
forest	Open (15-40%) broadleaved deciduous forest/woodland (>5m)	1703.17	87.04	3.36	10.77	2.98	1.03	0.63	0.77	7.625	12.26	12.75
forest	Closed (>40%) needleleaved evergreen forest (>5m)	1700	83.74	3.18	10.44	3.14	1.15	0.63	0.77	7.625	12.65	13.05
forest	Open (15-40%) needleleaved deciduous or evergreen forest (>5m)	1700	83.74	3.18	10.44	3.14	1.15	0.63	0.77	7.625	12.65	13.05
forest	Closed to open (>15%) mixed broadleaved and needleleaved forest (>5m)	1704.39	86.27	3.56	11.51	2.69	1.06	0.56	0.79	6.97	11.69	12.9
forest	Mosaic forest or shrubland (50-70%) / grassland (20-50%)	1669.38	84.72	3.4	5.83	3.5	0.91	0.47	0.52	6.275	7.92	8.51
grassland	Mosaic grassland(50-70%) / forest or shrubland (20-50%)	1669.38	84.72	3.4	5.83	3.5	0.91	0.47	0.52	6.275	7.92	8.51

Table S1. Continued.

shrubland	Closed to open (>15%) (broadleaved or needleleaved, evergreen or deciduous) shrubland (<5m)	1669.38	84.72	3.4	5.83	3.5	0.91	0.47	0.52	6.275	7.92	8.51
grassland	Closed to open (>15%) herbaceous vegetation (grassland, savannas or lichens/mosses)	1651.07	82.06	3.37	5.94	3.77	0.87	0.48	0.5	4.84	7.11	9.19
grassland	Sparse (<15%) vegetation	1632.75	79.4	3.33	6.04	4.04	0.83	0.48	0.48	3.4	6.3	9.86
forest	Closed to open (>15%) broadleaved forest regularly flooded (semi-permanently or temporarily) - Fresh or brackish water	1765.5	94	1.5	6.8	2.1	0.6	0.8	0.52	6.275	11.2	12.5
forest	Closed (>40%) broadleaved forest or shrubland permanently flooded - Saline or brackish water	1765.5	94	1.5	6.8	2.1	0.6	0.8	0.52	6.275	11.2	12.5
grassland	Closed to open (>15%) grassland or woody vegetation on regularly flooded or waterlogged soil - Fresh, brackish or saline water	1765.5	94	1.5	6.8	2.1	0.6	0.8	0.52	6.275	11.2	12.5

Note: Lowercase letters indicate the data source.

Sources are from the following: ^a(Andreae and Merlet, 2001; Streets et al., 2003; Cao et al., 2004; Michel et al., 2005; Wiedinmyer et al., 2006).

^b(Andreae and Merlet, 2001; Streets et al., 2001; Reddy and Venkataraman, 2002; Cao et al., 2006).

References

- Andreae, M. O., and Merlet, P.: Emission of trace gases and aerosols from biomass burning, *Global Biogeochemical Cycles*, 15, 955-966, doi:10.1029/2000GB001382, 2001.
- Cao, G., Zheng, F., and Wang, Y.: Inventory of TSP, PM₁₀, PM_{2.5} emissions from biomass burning in China (in Chinese), *The Chinese Journal of Process Engineering*, 4(Supplement), 700-704, 2004.
- Cao, G., Zhang, X., Zheng, F., and Wang, Y.: Estimating the Quantity of Crop Residues Burnt in Open Field in China (in Chinese), *Resources Science*, 28, 9-13, 2006.
- Michel, C., Lioussé, C., Gregoire, J. M., Tansey, K., Carmichael, G. R., and Woo, J. H.: Biomass burning emission inventory from burnt area data given by the SPOT-VEGETATION system in the frame of TRACE-P and ACE-Asia campaigns, *J Geophys Res-Atmos*, 110, doi:10.1029/2004jd005461, 2005.
- Reddy, M. S., and Venkataraman, C.: Inventory of aerosol and sulphur dioxide emissions from India. Part II - biomass combustion, *Atmos Environ*, 36, 699-712, doi:10.1016/S1352-2310(01)00464-2, 2002.
- Streets, D. G., Gupta, S., Waldhoff, S. T., Wang, M. Q., Bond, T. C., and Yiyun, B.: Black carbon emissions in China, *Atmospheric Environment*, 35, 4281-4296, doi:[https://doi.org/10.1016/S1352-2310\(01\)00179-0](https://doi.org/10.1016/S1352-2310(01)00179-0), 2001.
- Streets, D. G., Yarber, K. F., Woo, J. H., and Carmichael, G. R.: Biomass burning in Asia: Annual and seasonal estimates and atmospheric emissions, *Global Biogeochemical Cycles*, 17, n/a-n/a, doi:10.1029/2003gb002040, 2003.
- Wiedinmyer, C., Quayle, B., Geron, C., Belote, A., McKenzie, D., Zhang, X., O'Neill, S., and Wynne, K. K.: Estimating emissions from fires in North America for air quality modeling, *Atmospheric Environment*, 40, 3419-3432, doi:10.1016/j.atmosenv.2006.02.010, 2006.