Supplementary Information:

How to improve the air quality over mega-cities in China? --- Pollution characterization and source analysis in Shanghai before, during, and after the 2010 World Expo

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Table S1. Control strategies and new implemented technology before and during the 2010 Shanghai World Expo

Industry and Power Plants	Phase out, adjust or relocation of heavily polluting industries and power plants; Design special energy efficiency improvement program for major industries; Desulphurizing coal-fire plants by installing flue gas desulphurization (FGD) devices; Temporary close up of some factories in polluted days during the Expo.
Transportation	Upgrade and expand public transport system (developing new metro lines; establishing extensive rapid transit system and network of bus lines; promoting clean energy buses and taxis, etc.); Persist in the private car-license auction system to control the growth of vehicle number; Upgrade the vehicle emission standards to Euro IV; Access restriction of vehicles not compliant with emission standards then gradually phase out the highly polluting vehicles;
Construction Work	Establishment of smoke and dust control zone from downtown Shanghai to suburban areas; Dust-prevention measures at construction sites, requirements on the covering or containment of idle soil, cement, and construction waste.
Household and Public Buildings	Energy saving project for air conditioning and other household and commercial appliances; Energy efficiency renovation of existing public buildings; New energy-saving architectural technology for green buildings with low energy consumption.
Application of New Technology	Solar photovoltaic technology; River water-source/geothermal heat pump technology; Clean energy automobile and semiconductor lighting technology; Promotion of LED green building certifications; Energy-conservation air conditioning technology.

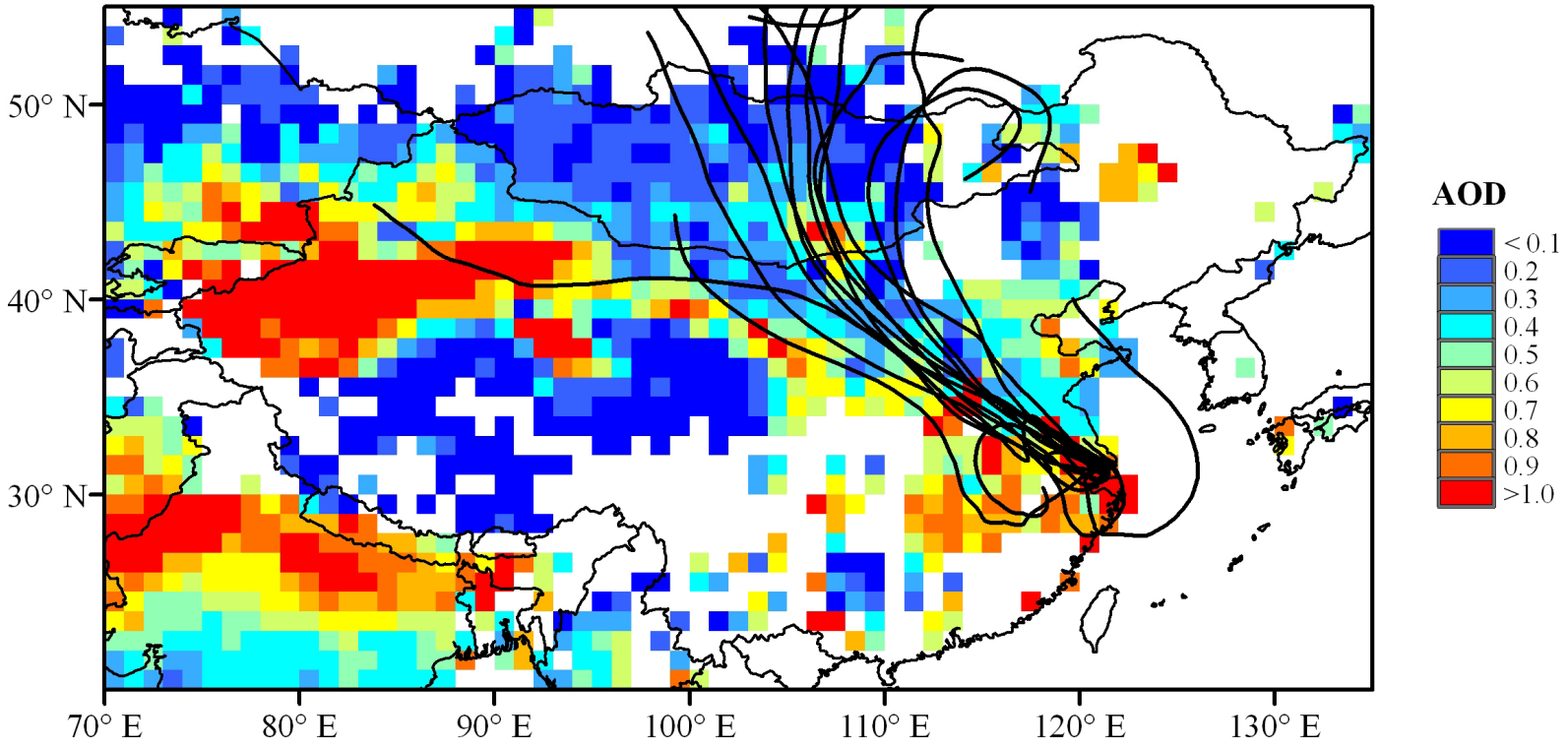

Figure S1. Three days back trajectories ending at Shanghai computed using the NOAA Hybrid Single-Particle Lagrangian Trajectory (HYSPLIT) model (R. Draxler and G. Rolph, HYSPLIT (HYbrid Single – Particle Lagrangian Integrated Trajectory) Model, 2003, http://www.arl.noaa.gov/ready/hysplit4.html) with meteorological data provided by the Global Data Assimilation System (GDAS) and the average MODIS deep blue AOD at 550 nm during the pre-Expo pollution episode (April 26 – 28, 2010).

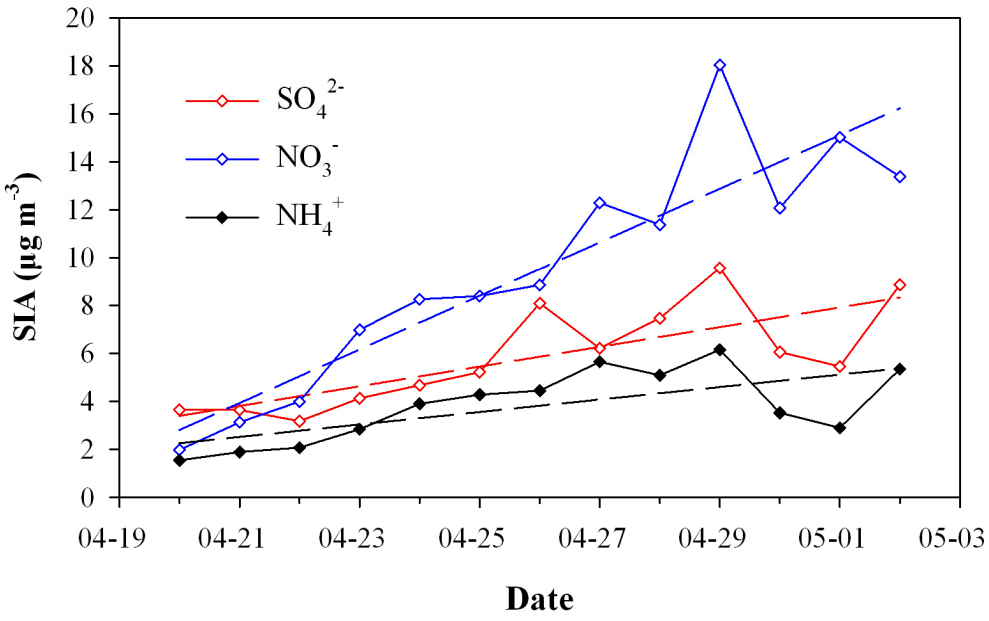

Figure S2. Daily variations of SIA (SO_4^{2-}, NO_3^- and NH_4^+) concentration from April 20 to May 2, 2010. Dash lines represent the linear fits for the three species, respectively.

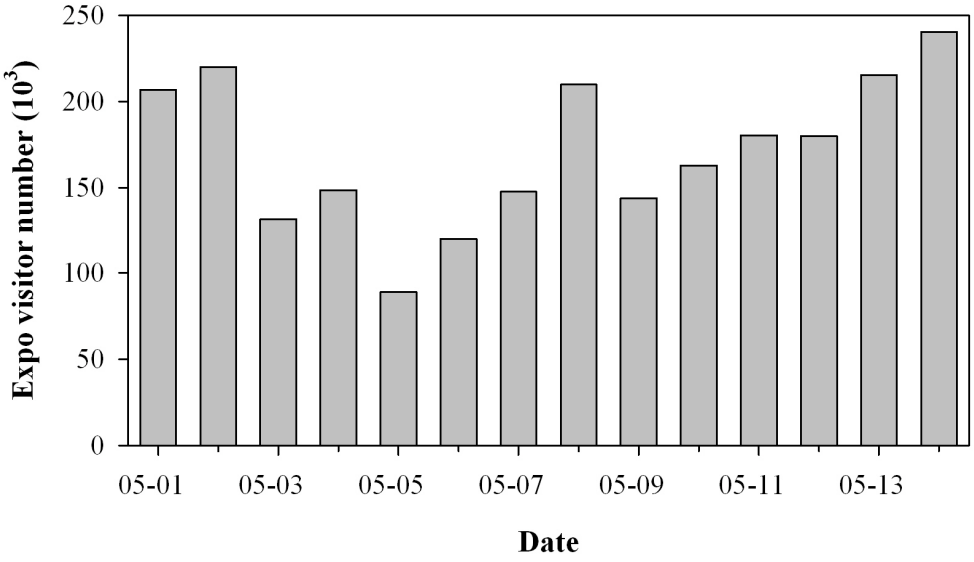

Figure S3. Daily number of the Expo visitors from May 1 to 14.

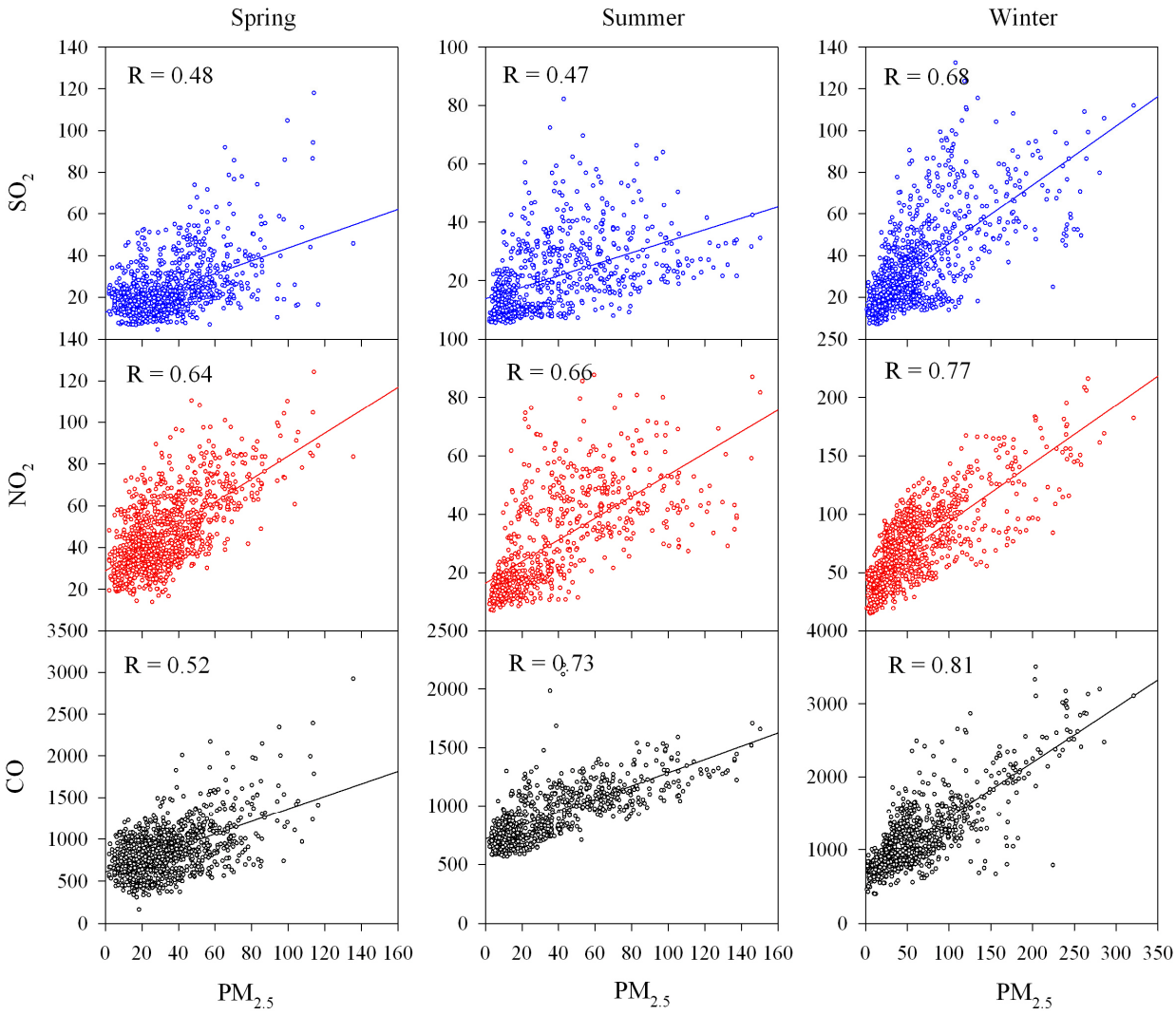

Figure S4. Linear correlations between SO_2, NO_2, CO and $PM_{2.5}$ in the three seasons in 2010, respectively. The correlation coefficients between each pair are shown in the figure.

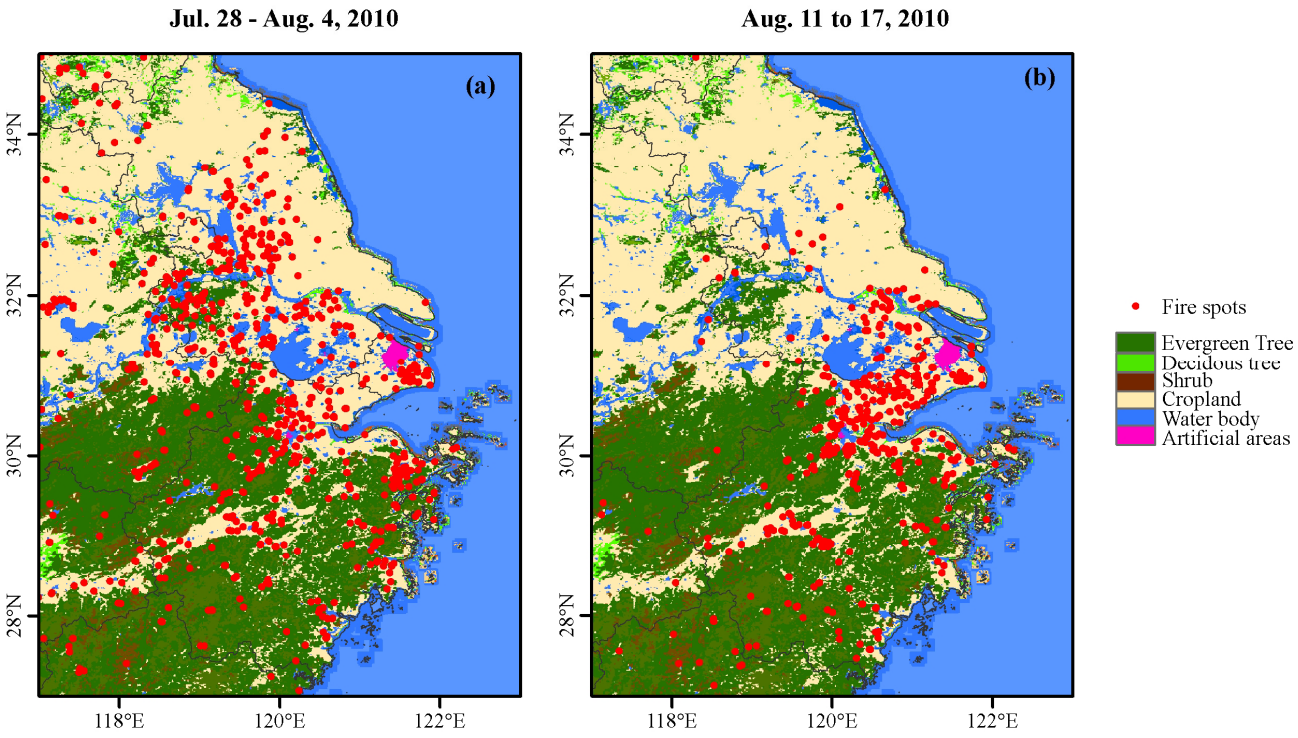

Figure S5. Fire spots (red dots) detected from MODIS during the two intense pollution episodes. Land cover types are overlaid in the figure.

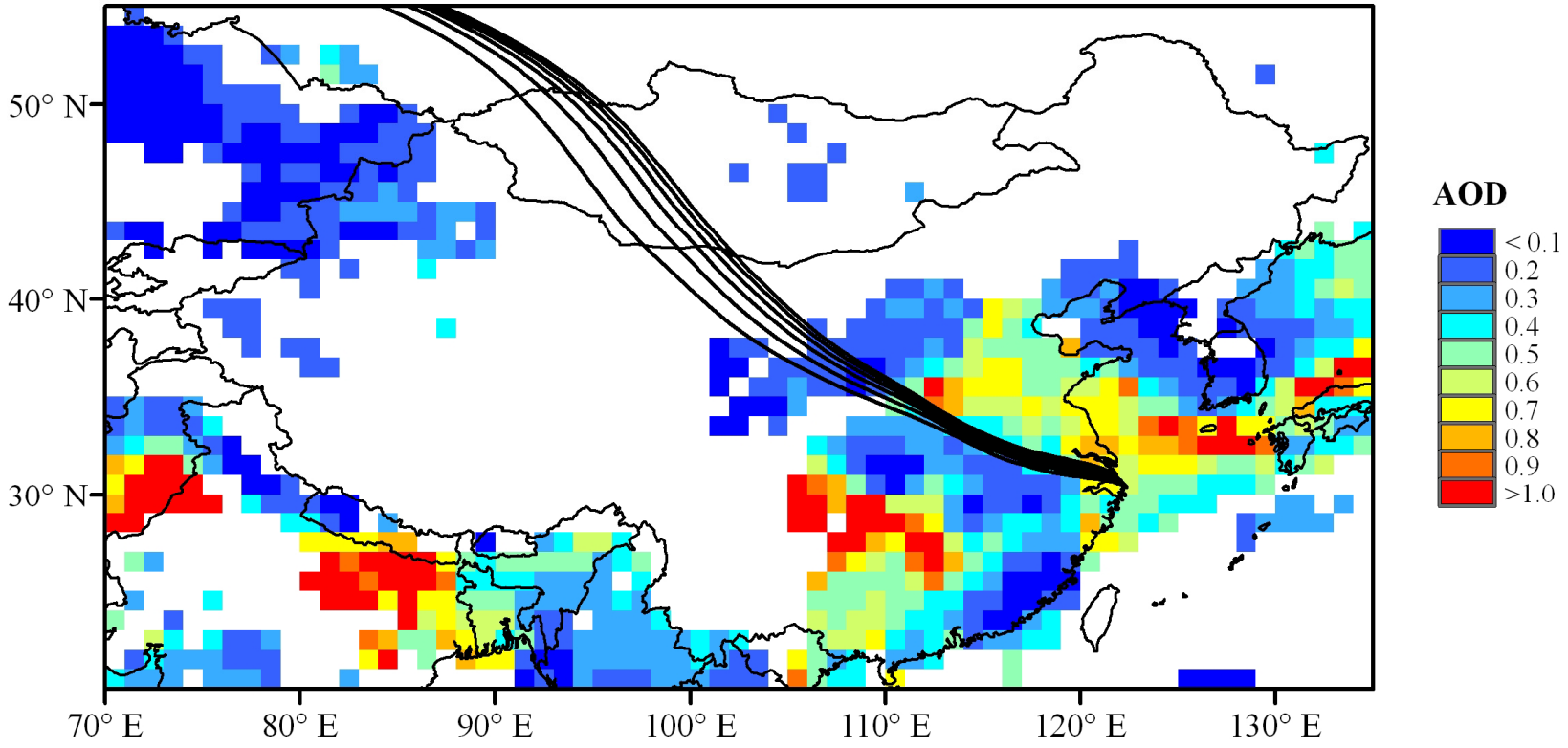

Figure S6. Same as Figure S1 but for November 12.

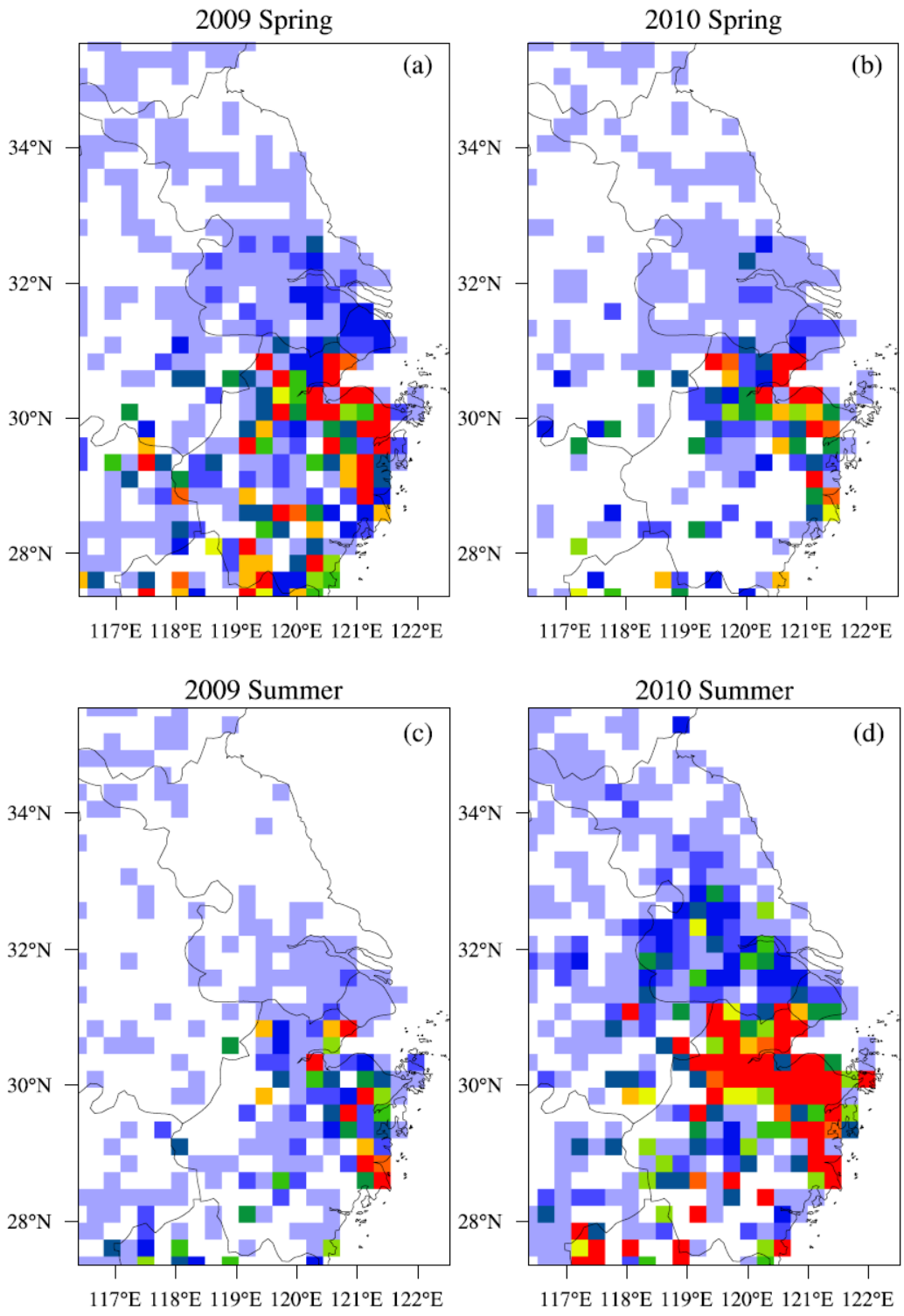

Figure S7. Spatial distribution of biomass burning carbon emission from FLAMBE during spring (April 2 - May 14) and summer (July 25 to August 24) in 2010 and 2009, respectively.

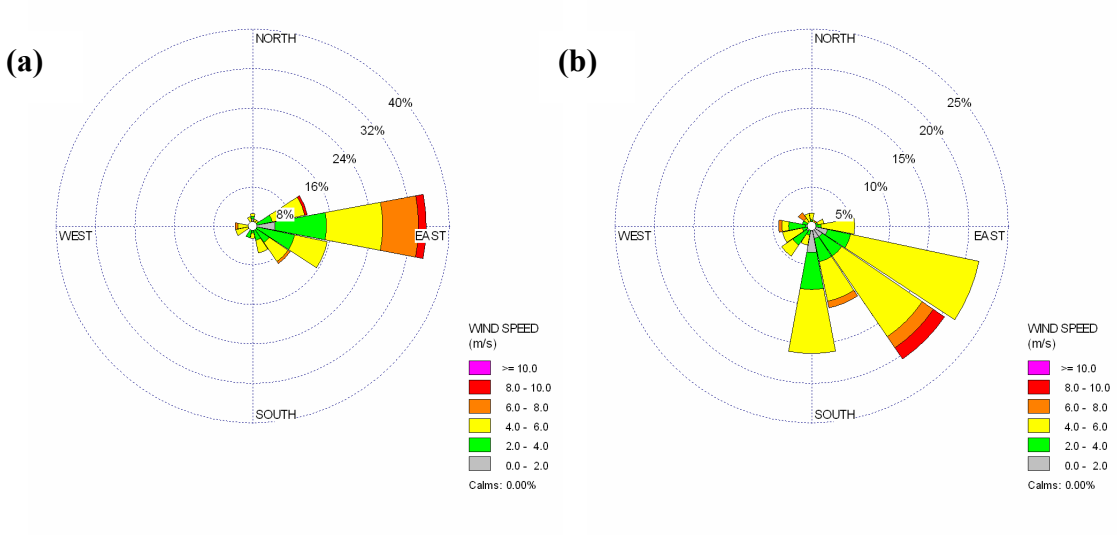

Figure S8. Wind rose plot during the summer study period (July 25 to August 24) of (a) 2009 and (b) 2010. Each circle represents the percentage of the winds from a particular direction, and different colors represent the ranges of wind speeds.