

## **Supplementary Information**

### **Implications for biomass/coal combustion emissions and secondary formation of carbonaceous aerosols in north China**

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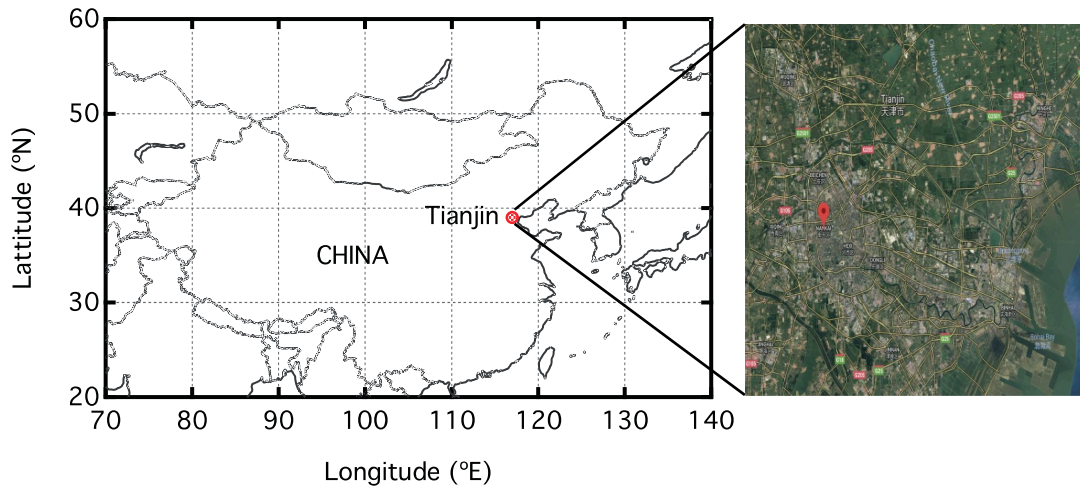
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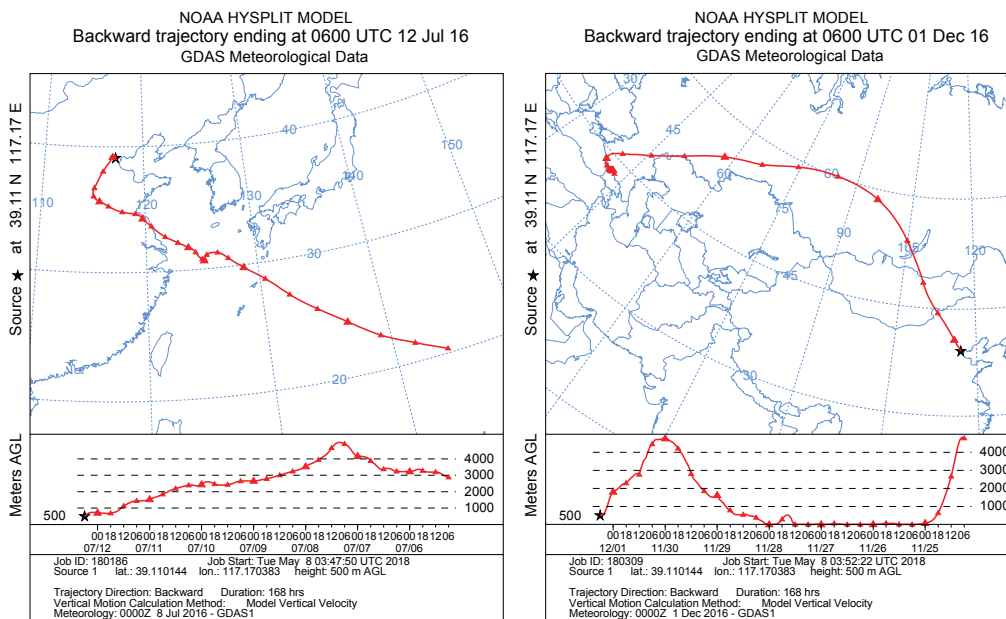
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#### **Backward air mass trajectories**

Seven-day backward air mass trajectories arriving at 500 m above the ground level (AGL) over Tianjin were computed using Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPPLIT) model of the National Oceanic and Atmospheric Administration (NOAA). The representative air mass trajectories are shown in Fig. S2. In summer, the air masses were originated in the Pacific Ocean region and passed over the Bohai Sea and eastern parts of Chinese mainland. They originated in Eurasia and passed over Siberia, Mongolia and northern parts of China in winter. However, unlike in summer, the air parcels were travelled at very low altitude for most of the time in winter (Fig. S1).



**Figure S1.** Map of China with sampling site, Tianjin located at 39°N and 117°E adjacent to the Bohai Sea, north China.



**Figure S2.** Plots of the backward air mass trajectories arriving at 500 m AGL over Tianjin, north China on 12 July and December 1, 2016, representing the general trajectory of the air masses arrived over Tianjin in summer and winter seasons, respectively.