# Supplementary Materials for

# Distributions, sources and backward trajectories of atmospheric polycyclic aromatic hydrocarbons at Lake Small Baiyangdian, northern China

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**The supplementary materials include six figures. The titles for these figures are as follows:**

Fig. S1 Values of $R^2$ as a function of the number of clusters for the backward trajectories at Lake Small Baiyangdian in four time periods. The black arrow in the four figures from (a)-(d) points to the chosen cluster numbers in the first stage. The grey arrows in figure (c) point to the chosen cluster numbers of the short-trajectory groups in the second stage. The chosen number was the number before a large change in the corresponding $R^2$ values could be observed as the cluster number decreased.

Fig. S2 Monthly distributions of the trajectories in the clusters determined by the k-means-based clustering method in the four time periods.

Fig. S3 The trajectories in the clusters determined by the k-means-based clustering method in time period 'a' from 2007.10.07 to 2007.11.14 and the corresponding percentage.

Fig. S4 The trajectories in the clusters determined by the k-means-based clustering method in time period 'b' from 2007.11.15 to 2008.03.15 and the corresponding percentage.

Fig. S5 The trajectories in the clusters determined by the k-means-based clustering method in time period 'c ' from 2008.03.16 to 2008.06.20 and the corresponding percentage.

Fig. S6 The trajectories in the clusters determined by the k-means-based clustering method in time period 'd' from 2008.06.21 to 2008.09.05 and the corresponding percentage.

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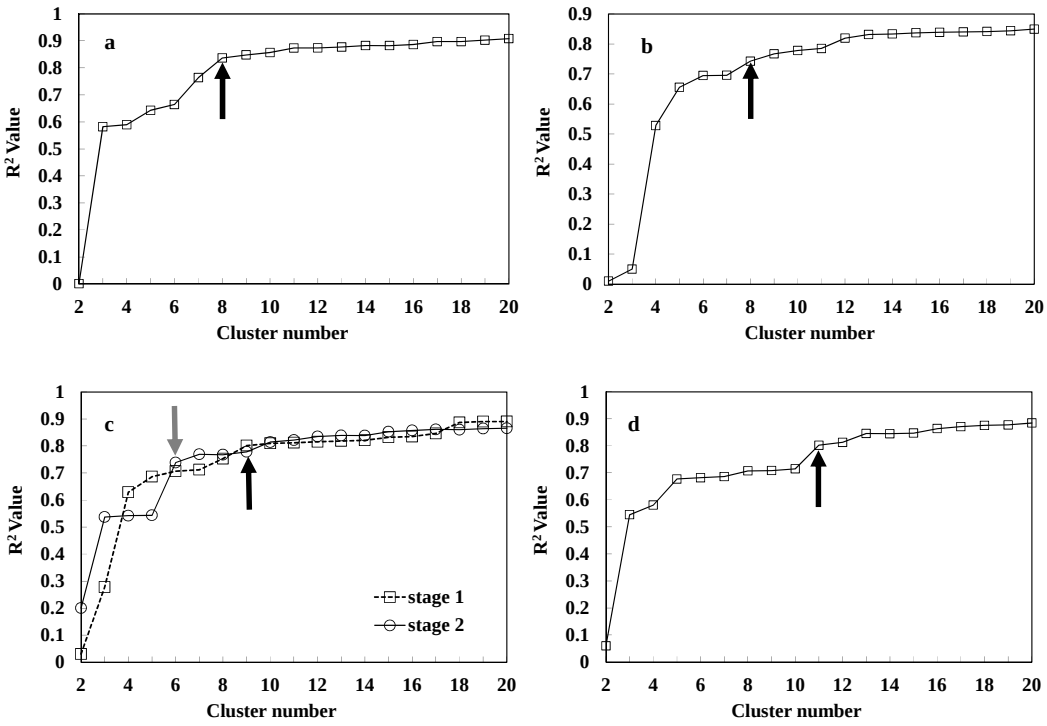



Fig. S1 Values of $R^2$ as a function of the number of clusters for the backward trajectories at Lake Small Baiyangdian in four time periods. The black arrow in the four figures from (a)-(d) points to the chosen cluster numbers in the first stage. The grey arrows in figure (c) point to the chosen cluster numbers of the short-trajectory groups in the second stage. The chosen number was the number before a large change in the corresponding $R^2$ values could be observed as the cluster number decreased.

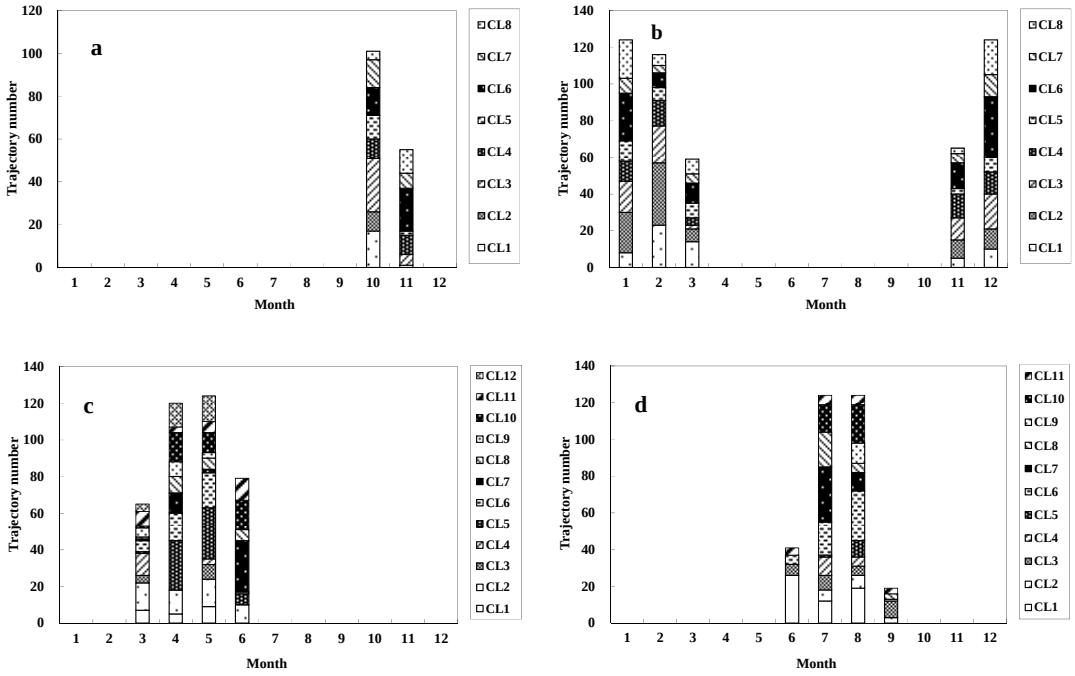
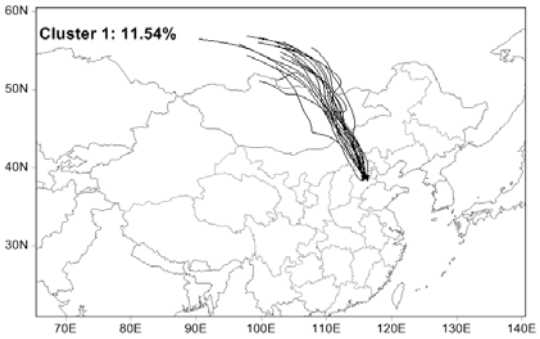
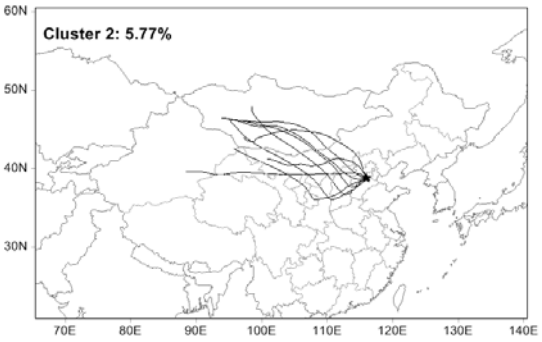
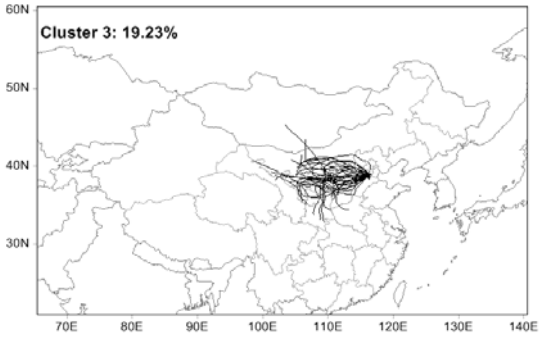
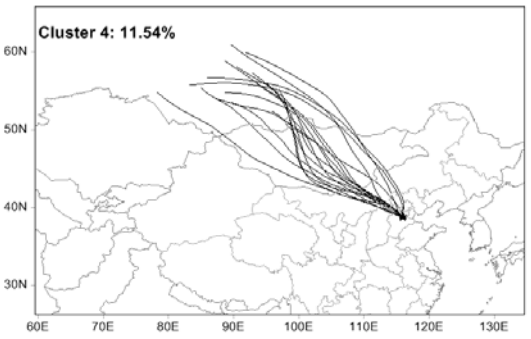


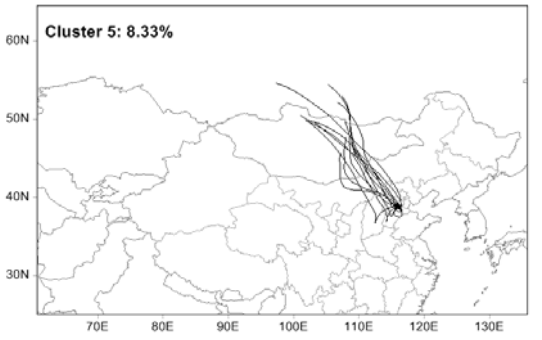

Fig. S2 Monthly distributions of the trajectories in the clusters determined by the k-means-based clustering method in the four time periods.

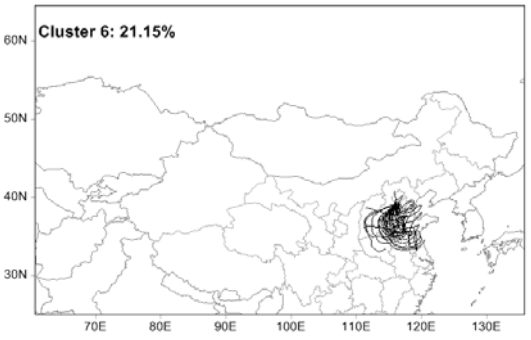

Cluster 1: 11.54%
60N
50N
40N
30N
70E
80E
90E
100E
110E
120E
130E
140E


Cluster 2: 5.77%
60N
50N
40N
30N
70E
80E
90E
100E
110E
120E
130E
140E


Cluster 3: 19.23%
60N
50N
40N
30N
70E
80E
90E
100E
110E
120E
130E
140E


Cluster 4: 11.54%
60N
50N
40N
30N
60E
70E
80E
90E
100E
110E
120E
130E


Cluster 5: 8.33%
60N
50N
40N
30N
70E
80E
90E
100E
110E
120E
130E


Cluster 6: 21.15%
60N
50N
40N
30N
70E
80E
90E
100E
110E
120E
130E

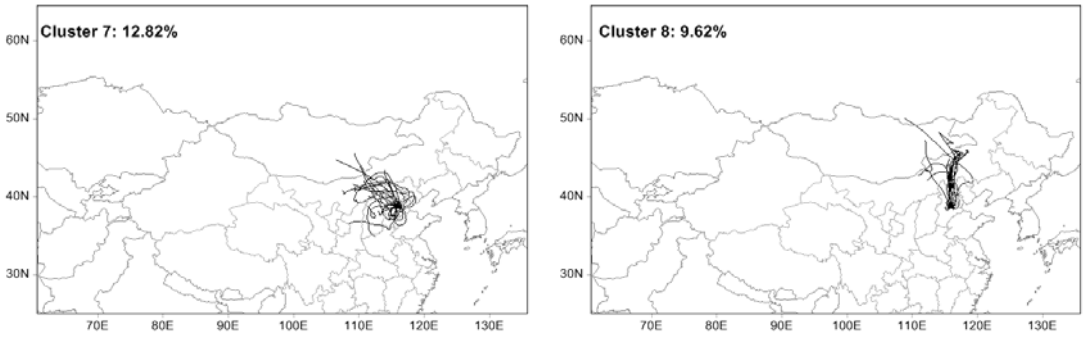
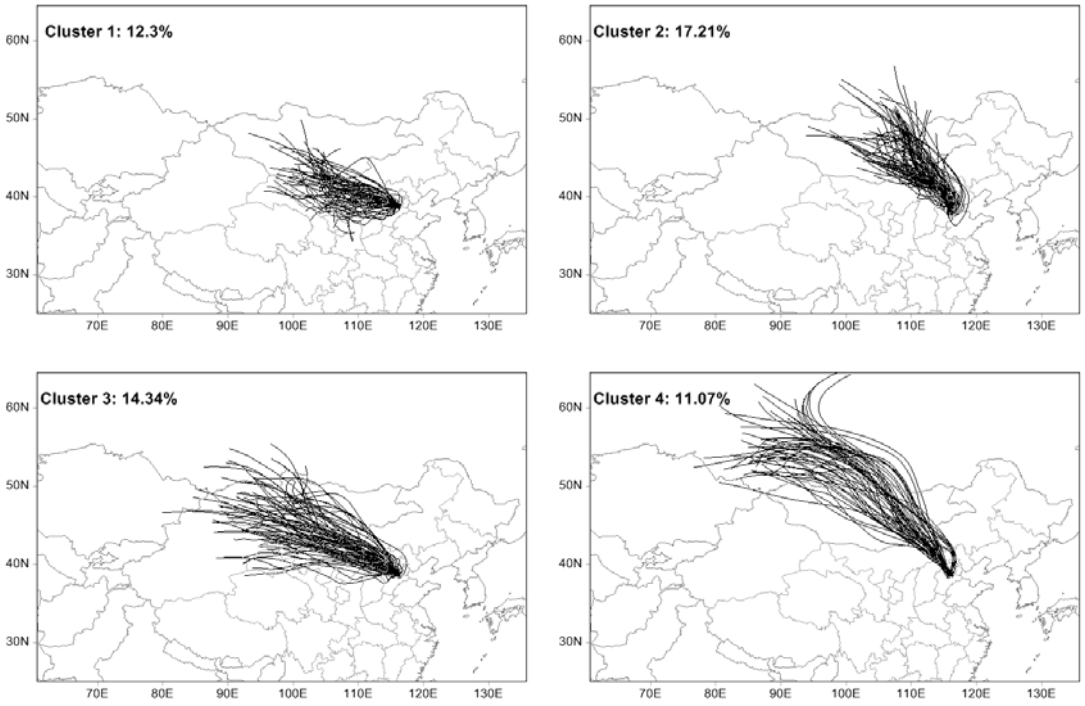



Fig. S3 The trajectories in the clusters determined by the k-means-based clustering method in time period ‘a’ from 2007.10.07 to 2007.11.14 and the corresponding percentage.



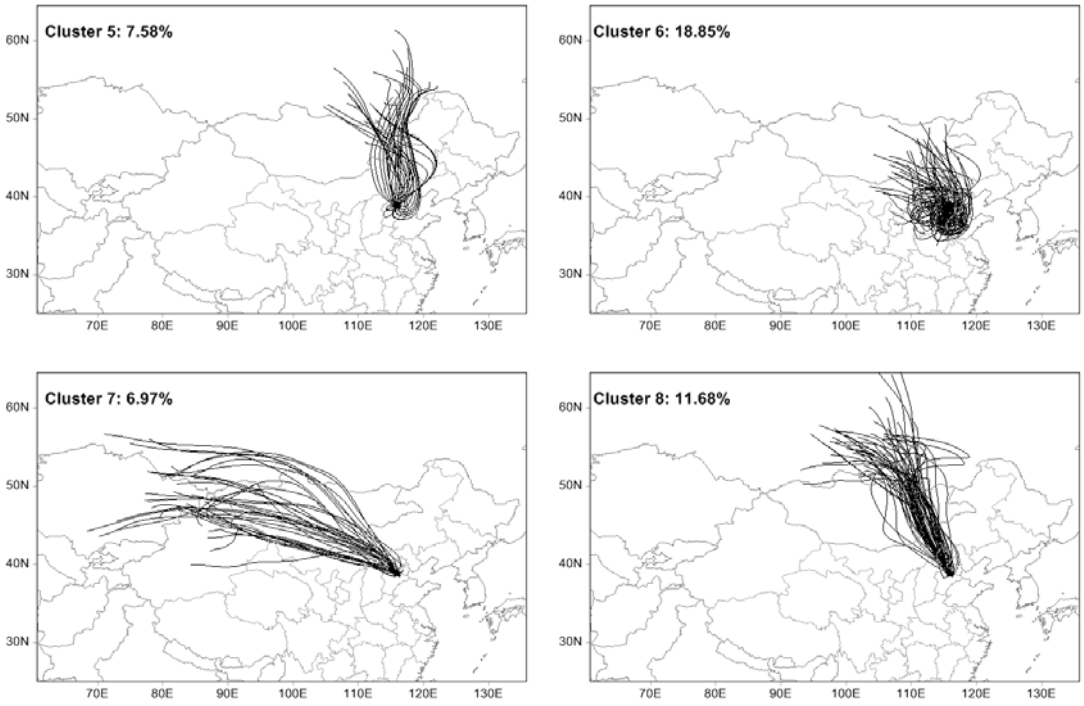
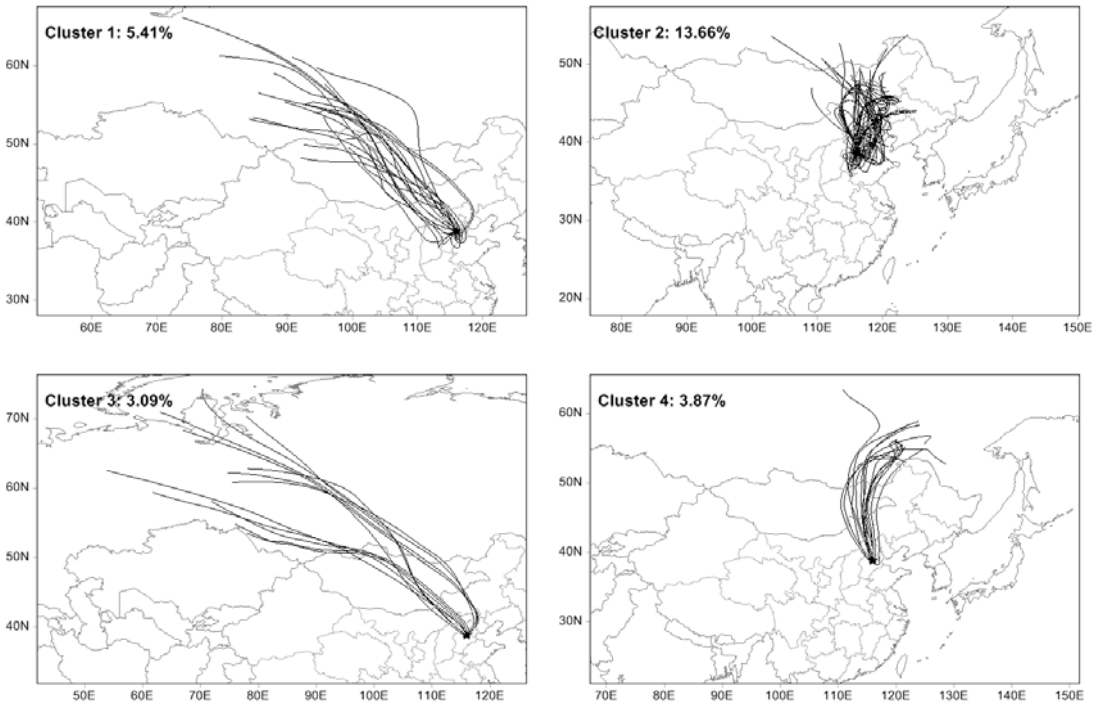



Fig. S4 The trajectories in the clusters determined by the k-means-based clustering method in time period ‘b’ from 2007.11.15 to 2008.03.15 and the corresponding percentage.



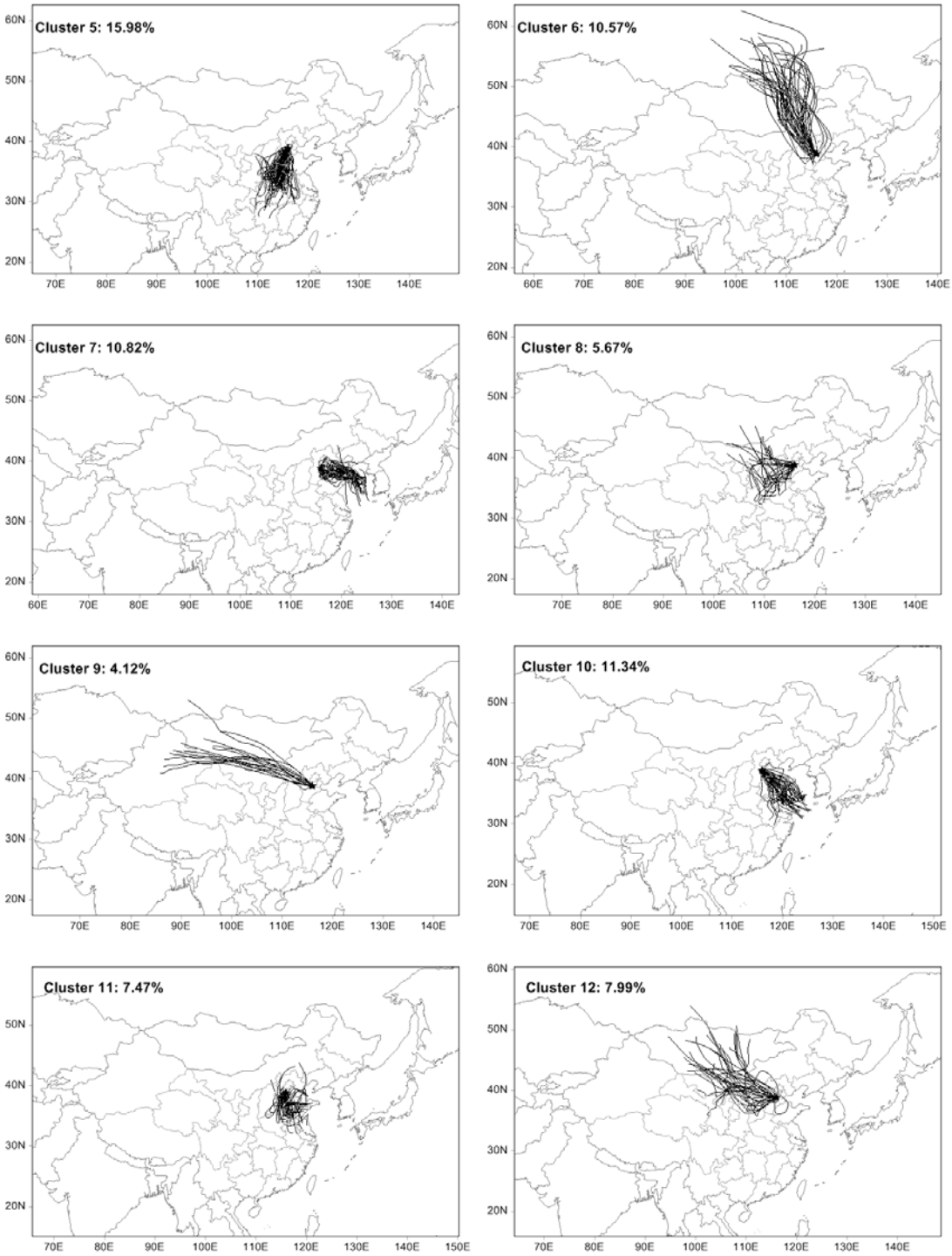
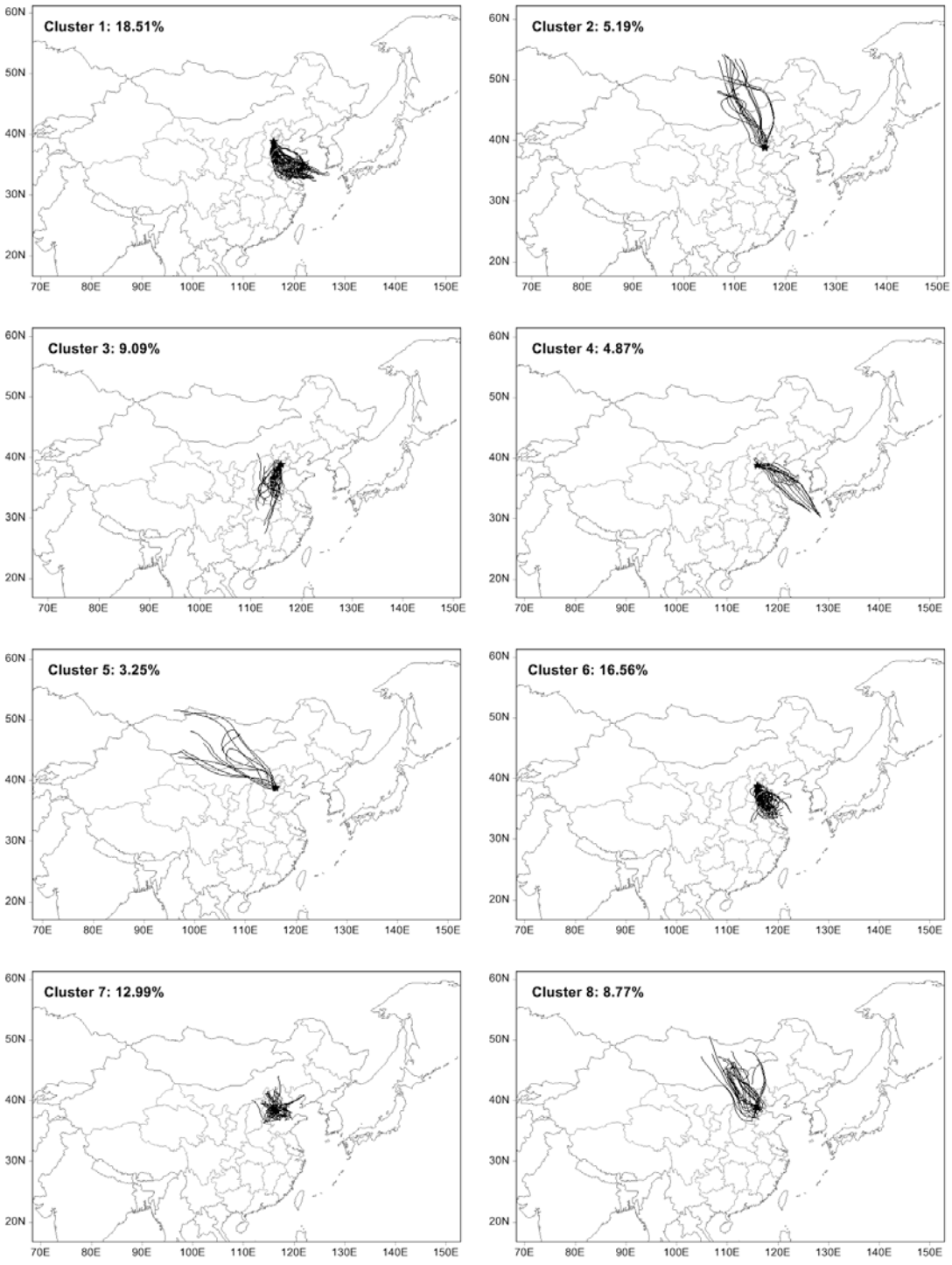



Fig. S5 The trajectories in the clusters determined by the k-means-based clustering method in time period ‘c ’ from 2008.03.16 to 2008.06.20 and the corresponding percentage.


Cluster 1: 18.51%
Cluster 2: 5.19%
Cluster 3: 9.09%
Cluster 4: 4.87%
Cluster 5: 3.25%
Cluster 6: 16.56%
Cluster 7: 12.99%
Cluster 8: 8.77%
60N
50N
40N
30N
20N
70E
80E
90E
100E
110E
120E
130E
140E
150E

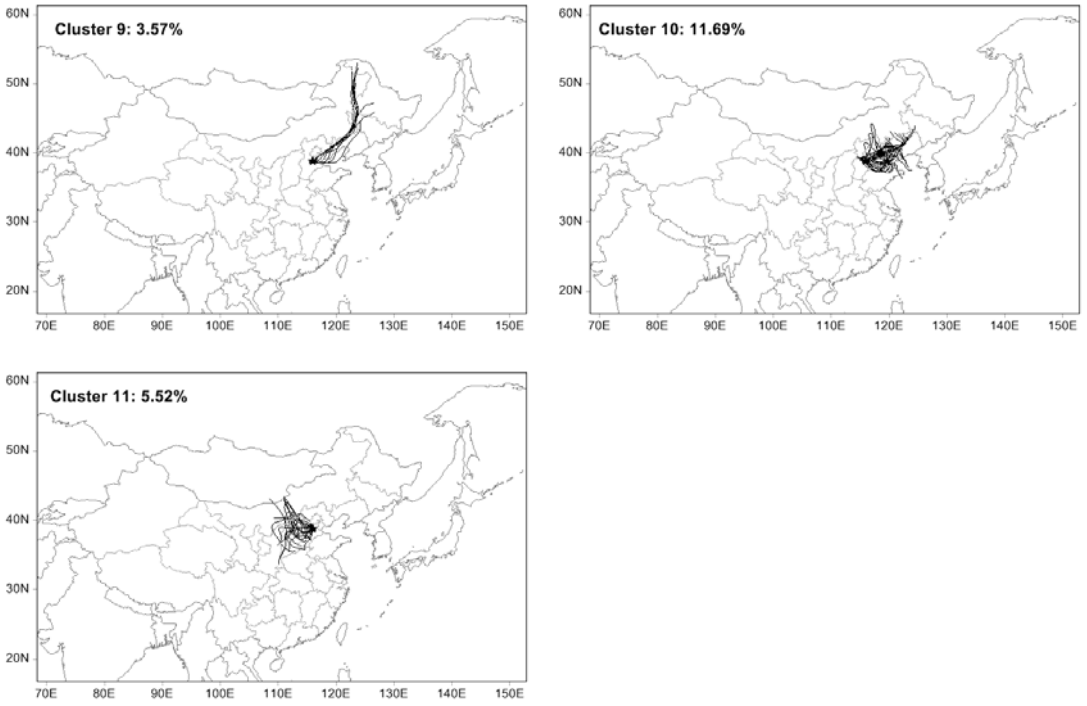



Fig. S6 The trajectories in the clusters determined by the k-means-based clustering method in time period ‘d’ from 2008.06.21 to 2008.09.05 and the corresponding percentage.