



*Supplement of*

## **Factors controlling the concentration of water-soluble pyrogenic carbon in aerosols in Hokkaido, Japan**

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# Supplement for Factors controlling the concentration of water-soluble pyrogenic carbon in aerosols in Hokkaido, Japan

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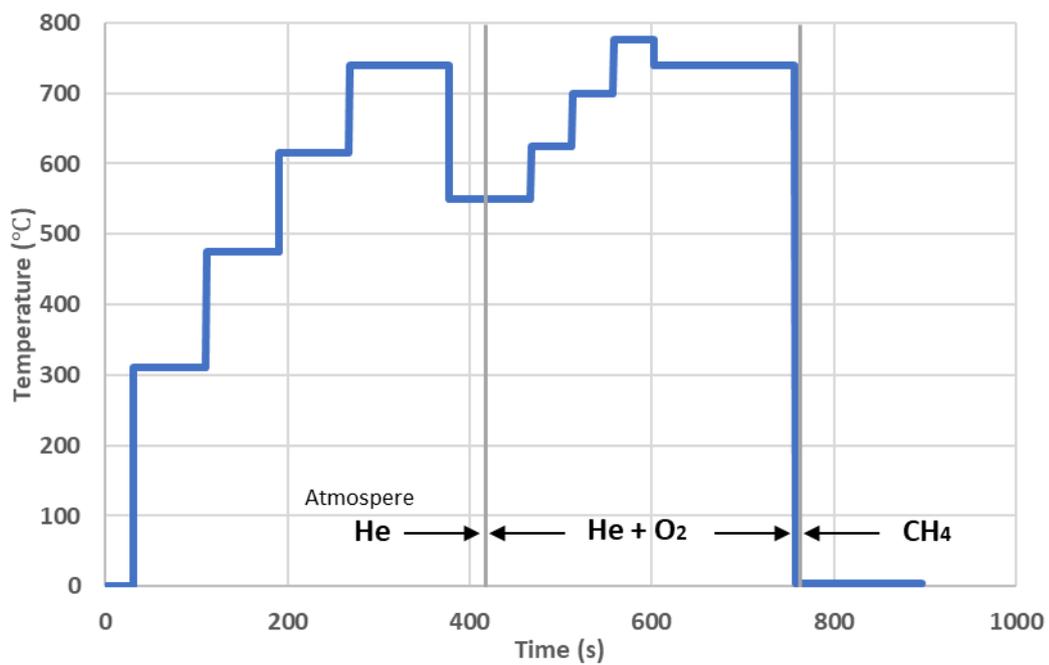
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**Table S1: Information on sample collection**

No.	Start date	End date	Air volume (m <sup>3</sup> )
1	2022/9/19	2022/9/26	10148.4
2	2022/9/26	2022/10/3	10239.6
3	2022/10/3	2022/10/11	11541.2
4	2022/10/11	2022/10/18	10166.8
5	2022/10/18	2022/10/25	10070.4
6	2022/10/25	2022/11/1	10224
7	2022/11/1	2022/11/8	10184.5
8	2022/11/8	2022/11/15	10034.1
9	2022/11/15	2022/11/22	10229.4
10	2022/11/22	2022/11/29	10083.1
11	2022/11/29	2022/12/6	10066.9
12	2022/12/6	2022/12/15	12877
13	2022/12/15	2022/12/22	10323.7
14	2022/12/22	2022/12/29	10015.7
15	2022/12/29	2023/1/5	10214.4
16	2023/1/5	2023/1/12	10143.4
17	2023/1/12	2023/1/19	10102.3
18	2023/1/19	2023/1/27	10898.9
19	2023/1/27	2023/2/2	9504.3
20	2023/2/2	2023/2/9	10014.4
21	2023/2/9	2023/2/16	10166.6
22	2023/2/16	2023/2/23	10173.7

<b>No.</b>	<b>Start date</b>	<b>End date</b>	<b>Air volume (m<sup>3</sup>)</b>
23	2023/2/23	2023/3/2	9998.1
24	2023/3/2	2023/3/9	10245.2
25	2023/3/9	2023/3/16	10220.1
26	2023/3/16	2023/3/23	10117.1
27	2023/3/23	2023/3/30	10418.4
28	2023/3/30	2023/4/6	9955.8
29	2023/4/6	2023/4/12	8235.5
30 (dust)	2023/4/12	2023/4/13	1915.2
31	2023/4/13	2023/4/20	10118.5
32	2023/4/20	2023/4/27	10018.3
33	2023/4/27	2023/5/4	10341.1
34	2023/5/4	2023/5/11	10010.5
35	2023/5/11	2023/5/18	10066.4
36	2023/5/18	2023/5/25	10357.3
37	2023/5/25	2023/6/1	10050.6
38	2023/6/1	2023/6/8	10099.8
39	2023/6/8	2023/6/15	9978.8
40	2023/6/15	2023/6/22	10137.3
41	2023/6/22	2023/6/29	10236.6
42	2023/6/29	2023/7/6	10123.6
43	2023/7/6	2023/7/13	10373.1
44	2023/7/13	2023/7/20	10116.8
45	2023/7/20	2023/7/27	10175.2
46	2023/7/27	2023/8/3	5897.7
47	2023/8/3	2023/8/10	10189
48	2023/8/10	2023/8/17	4342.6
49	2023/8/17	2023/8/24	10148.3
50	2023/8/24	2023/8/31	4695.6
51	2023/8/31	2023/9/7	3273.8
52	2023/9/7	2023/9/14	10031.6
53	2023/9/14	2023/9/21	10296.3
54	2023/9/21	2023/9/28	10190.5



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Figure S1: Temperature protocol and atmosphere during EC/OC analysis.

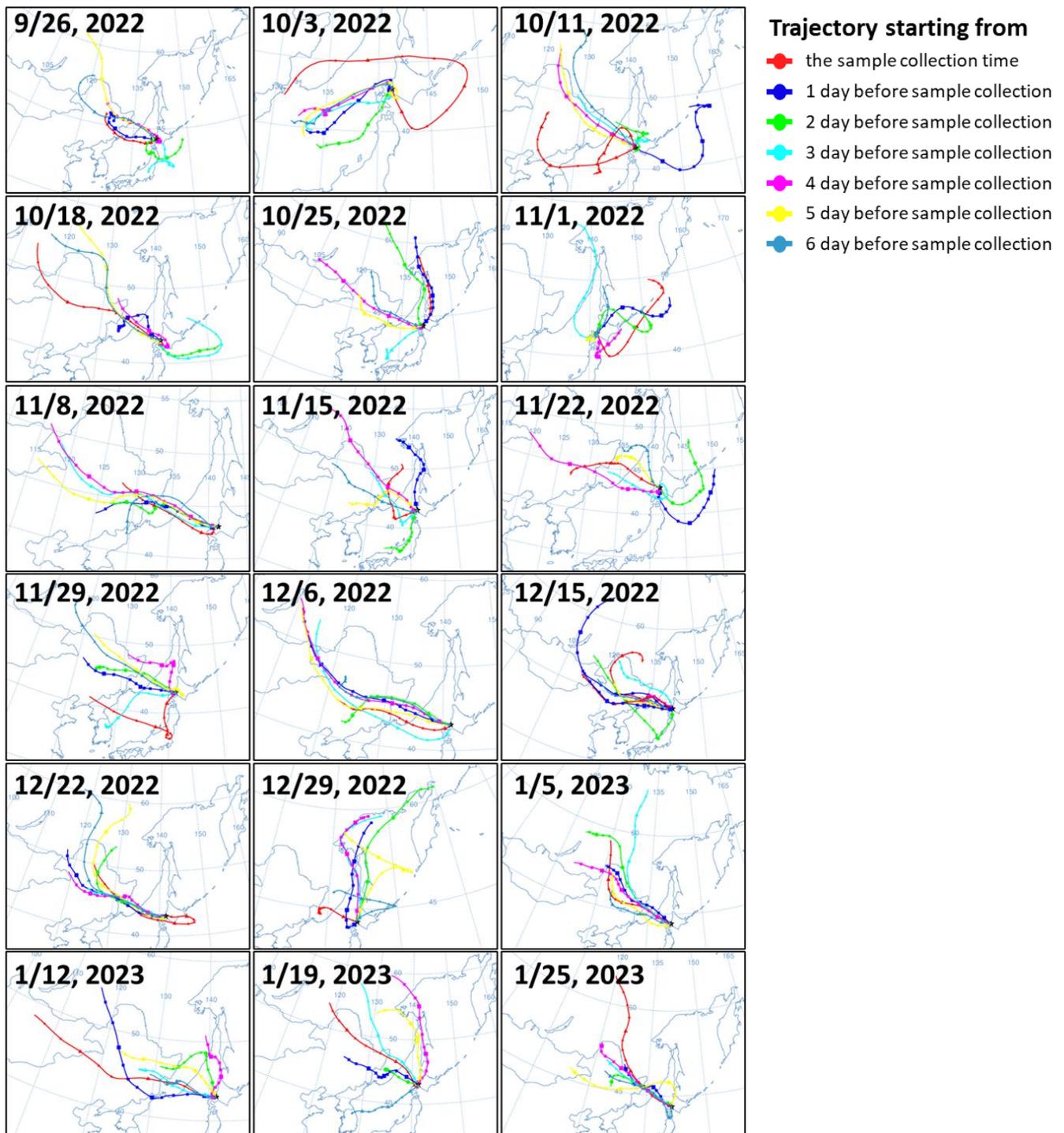


Figure S2: The 3-day back trajectories for all samples. The date on each panel represents the day the sample was collected. The colored lines indicate back trajectories starting every 24 hours from 6 days before the sample collection (every 3 hours from 15 hours before the sample collection for dust samples).

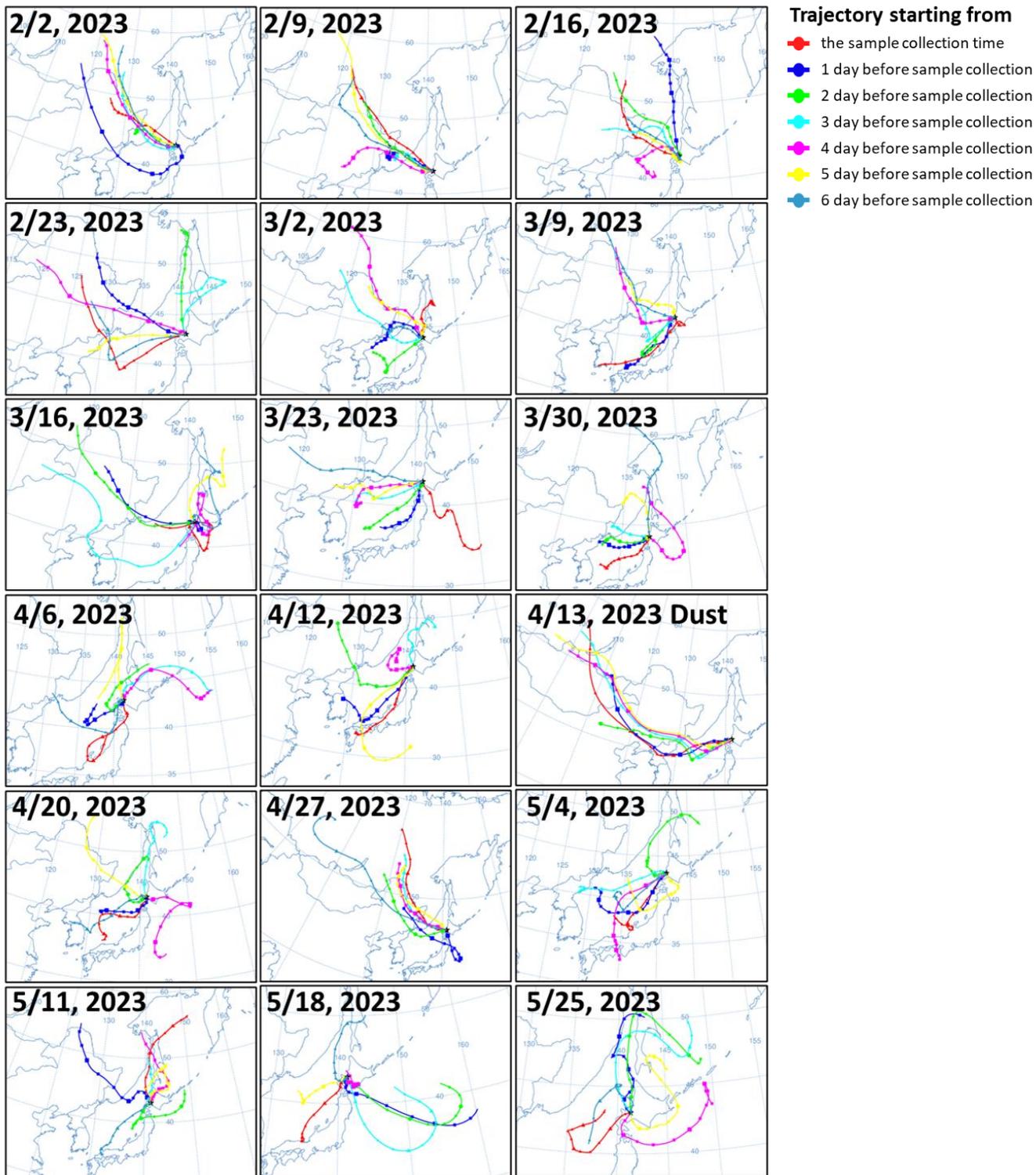


Figure S2: (Continued)

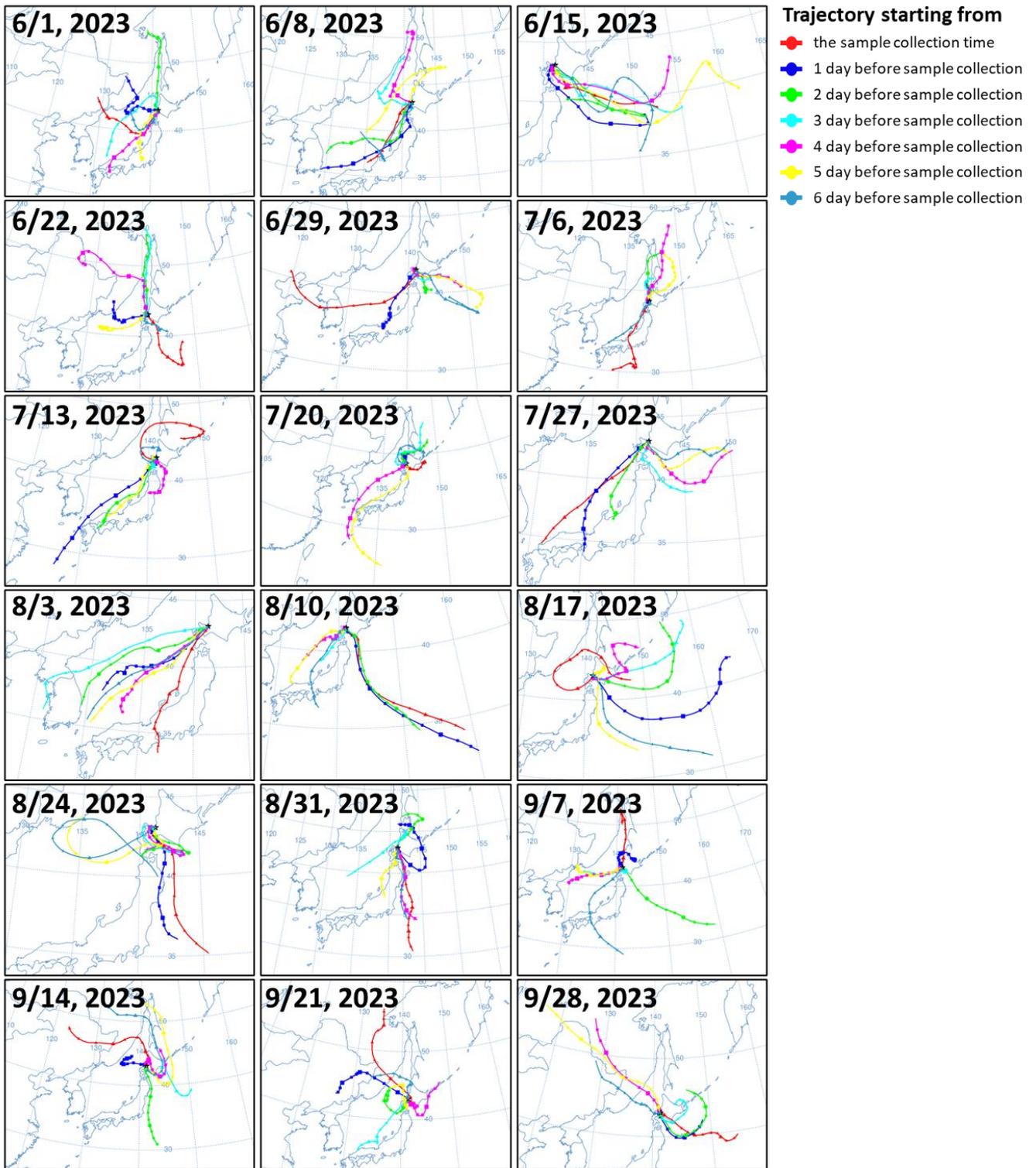
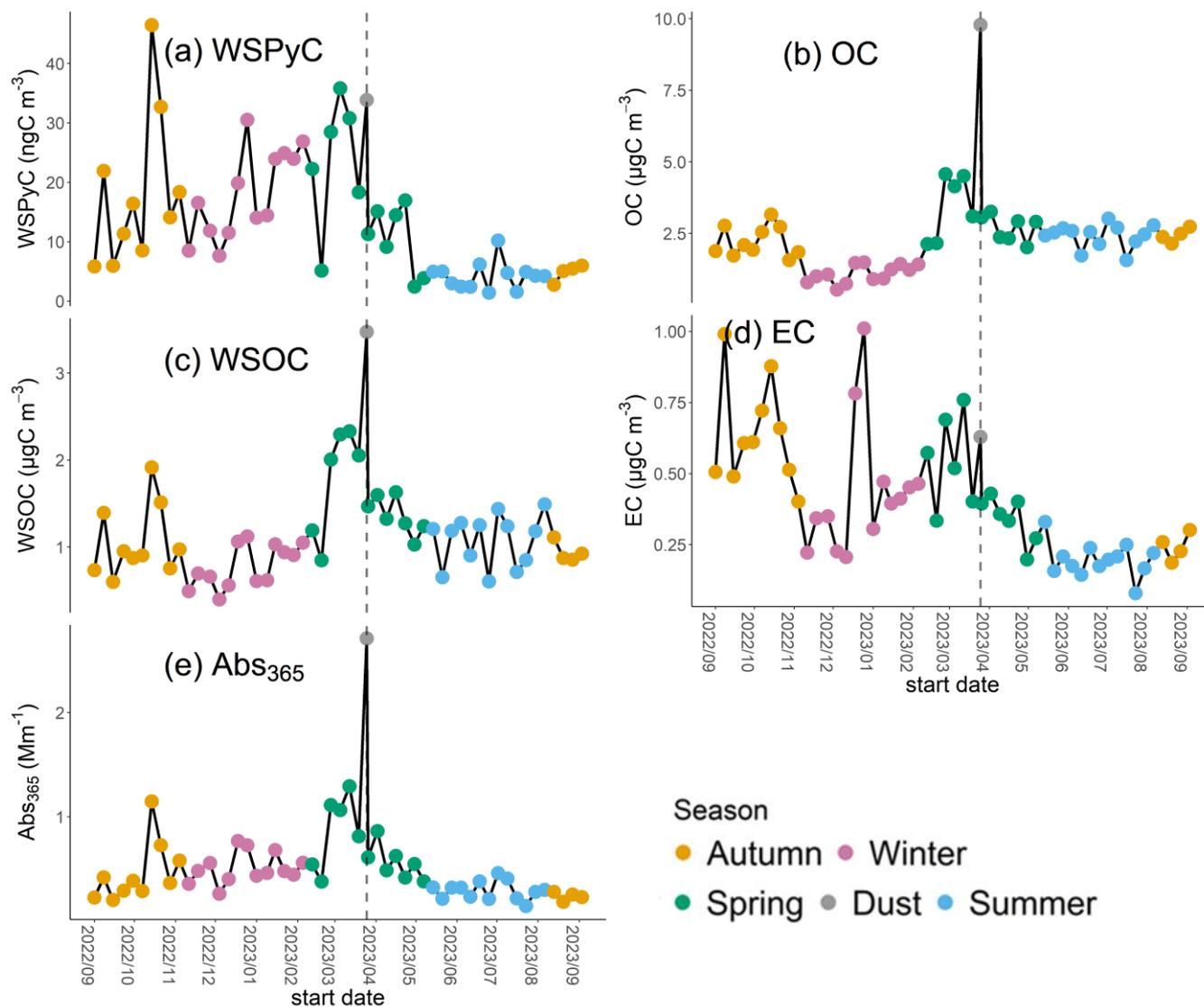


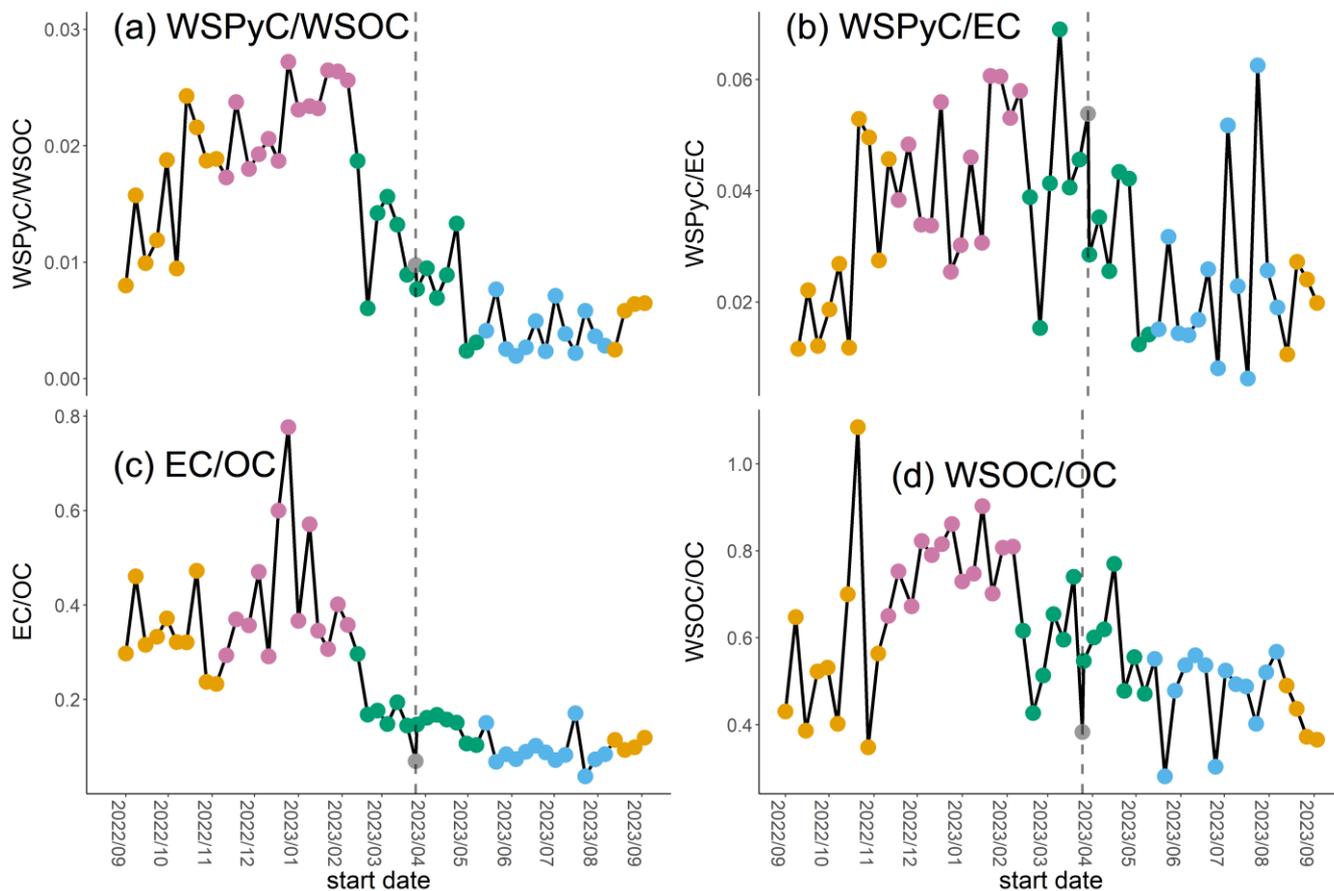
Figure S2: (Continued)



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**Figure S3: Temporal variations in concentration of (a) WSPyC, (b) OC, (c) WSOC, (d) EC and (e) Abs<sub>365</sub>. The dashed line represents the dust sample. The horizontal axis represents the sampling start date, with continuous sampling conducted until just before the next sampling.**

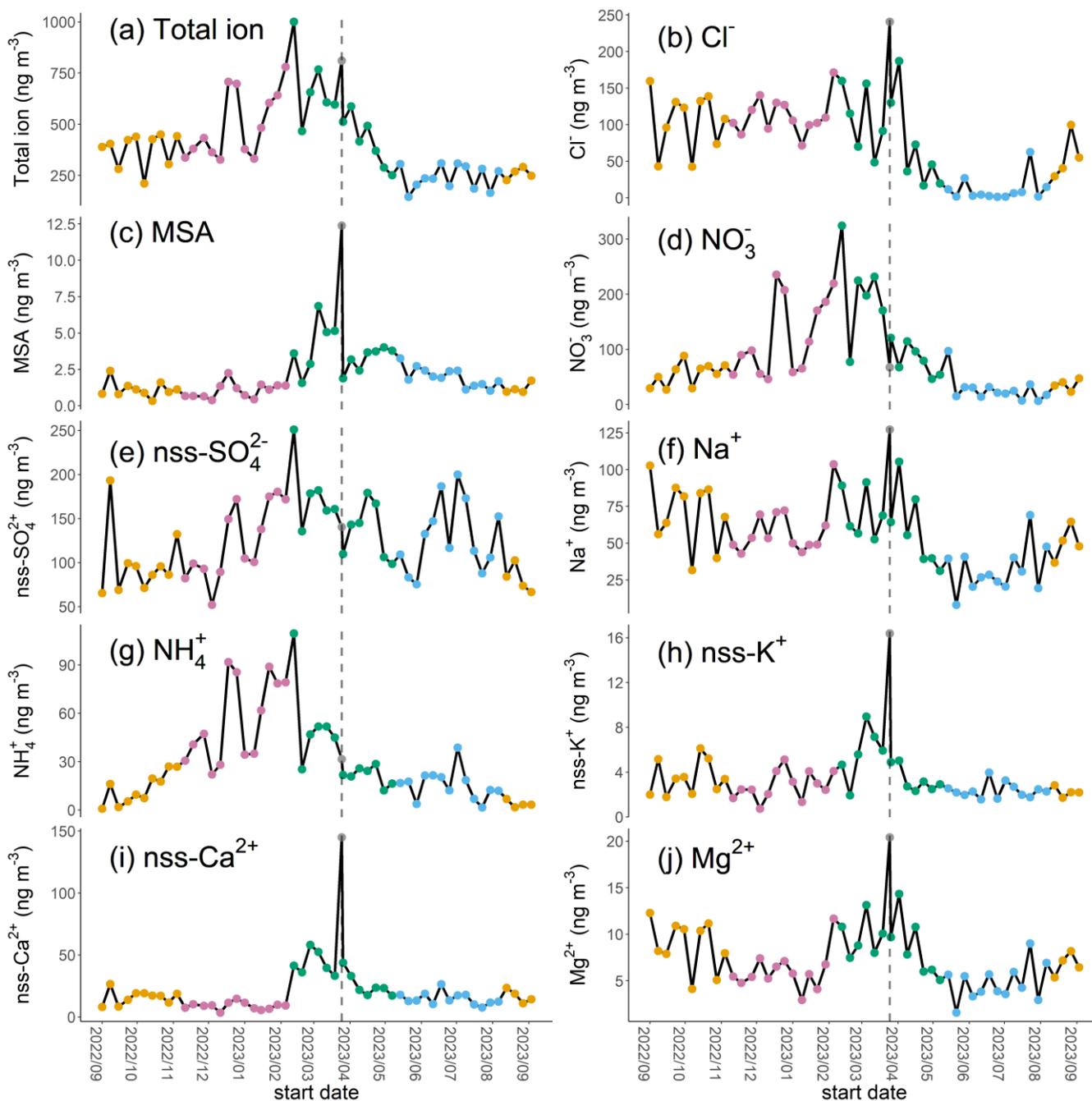
Season  
 ● Autumn ● Winter ● Spring ● Dust ● Summer



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**Figure S4:** Temporal variations in ratio of (a) WSPyC/WSOC, (b) WSPyC/EC, (c) EC/OC and (d) WSOC/ OC. The dashed line represents the dust sample. The horizontal axis represents the sampling start date, with continuous sampling conducted until just before the next sampling.

Season  
 ● Autumn ● Winter ● Spring ● Dust ● Summer



30 **Figure S5:** Temporal variations in concentration of (a) Total ion, (b)  $\text{Cl}^-$ , (c) MSA, (d)  $\text{NO}_3^-$ , (e)  $\text{nss-SO}_4^{2-}$ , (f)  $\text{Na}^+$ , (g)  $\text{NH}_4^+$ , (h)  $\text{nss-K}^+$ , (i)  $\text{nss-Ca}^{2+}$ , and (j)  $\text{Mg}^{2+}$ . The dashed line represents the dust sample. The horizontal axis represents the sampling start date, with continuous sampling conducted until just before the next sampling.

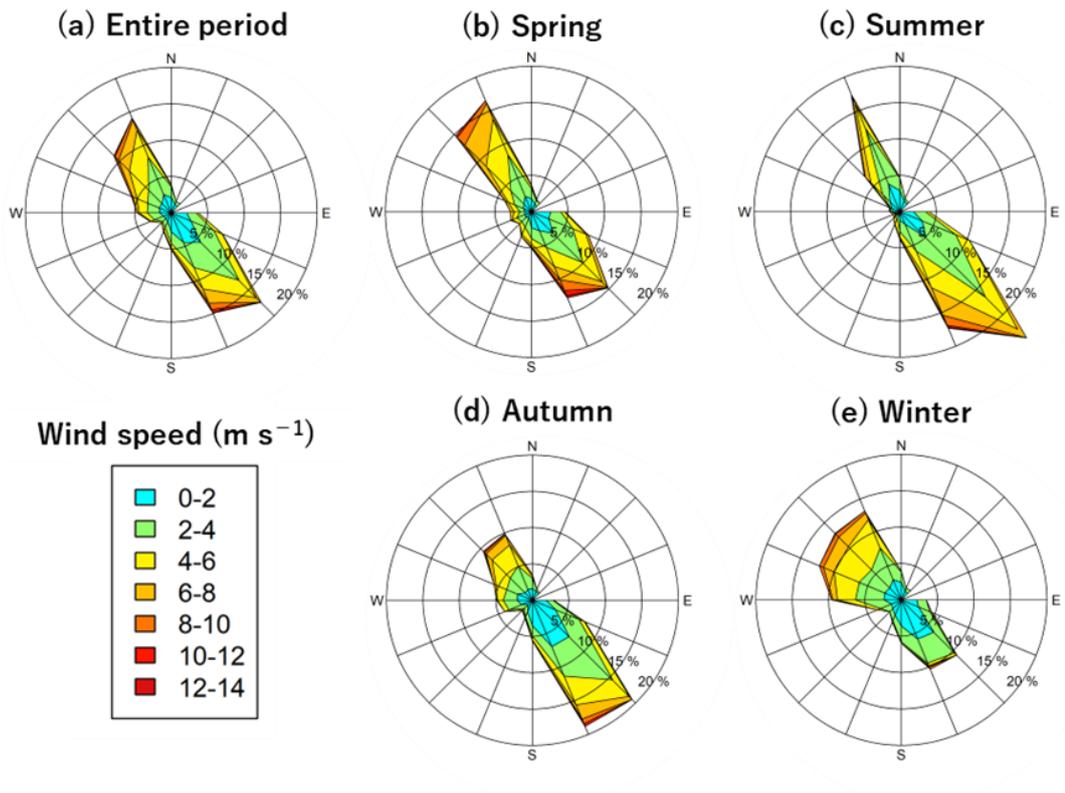


Figure S6: Wind rose plots for the (a) whole observation period, (b) spring, (c) summer, (d) autumn, and (e) winter.