SUPPORTING INFORMATION

	Marambio	King Sejong	Halley	Concordia/ Dome C
Nucleation slow	4.7	1.6	0.6	0.0
Nucleation fast	8.3	1.9	0.9	0.7
Nucleation weak	12.2	4.5	1.2	1.4
Bursting strong	8.7	11.3	2.8	4.1
Bursting weak	14.2	8.7	0.6	0.7
Aitken high 30	8.3	13.2	5.2	5.5
Aitken high 35	1.2	4.8	3.1	7.6
Aiten high 25	11.0	3.5	3.1	0.0
Aitken low 35	7.1	9.7	11.3	9.7
Aitken low 45	2.4	3.2	8.9	9.7
Aitken low 55	0.4	0.6	9.2	14.5
Bimodal 1	3.1	12.9	3.1	3.4
Bimodal 2	1.6	3.5	4.9	30.3
Pristine 65	10.6	11.9	12.0	5.5
Pristine 85	3.9	6.8	21.2	3.4
Pristine 160	2.4	1.6	12.0	3.4

Table S1: Percentage of the total number of measurements corresponding to each of the 16 original clusters at each site

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Category	Marambio	King Sejong	Halley	Concordia/ Dome C
Nucleation	25.2	8.1	2.8	2.1
Bursting	22.8	20.0	3.4	4.8
Aitken low	9.8	13.5	29.4	33.8
Aitken high	20.5	21.6	11.3	13.1
Bimodal	4.7	16.5	8.0	33.8
Pristine	16.9	20.3	45.1	12.4

Table S2: Percentage of the total number of measurements corresponding to each of 6 clusters at each site

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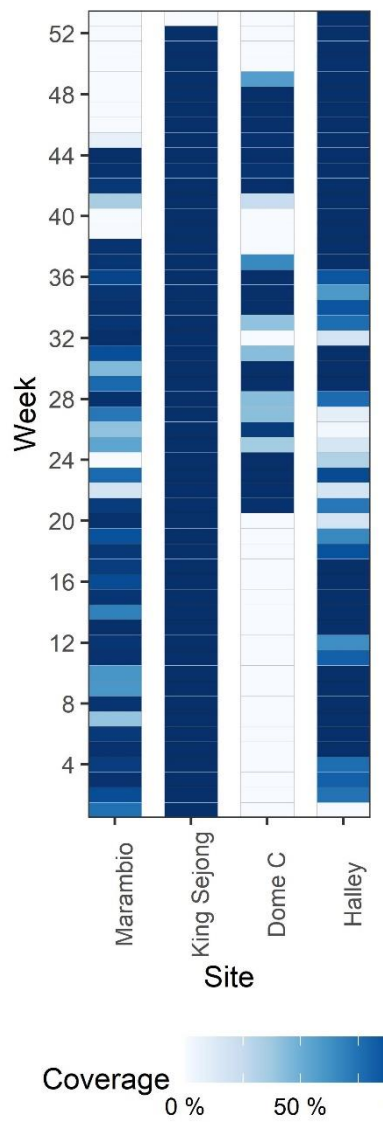
35   Figure S1: Data coverage per week for each of the four Antarctic sites.
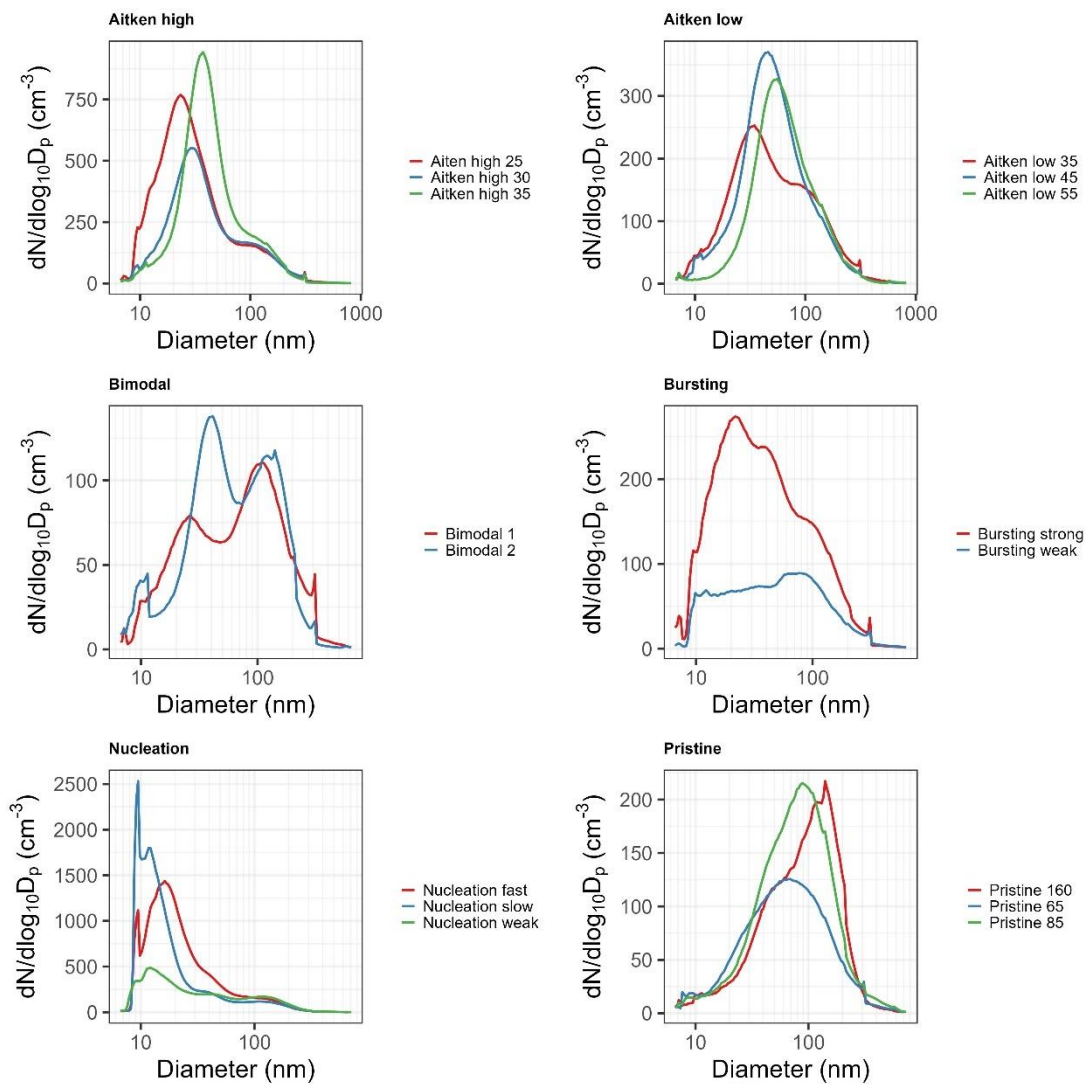
Figure S2: Mean PNSD for each of the 16 clusters produced by cluster analysis. Each panel represents a group into which these were then compiled for later analyses.
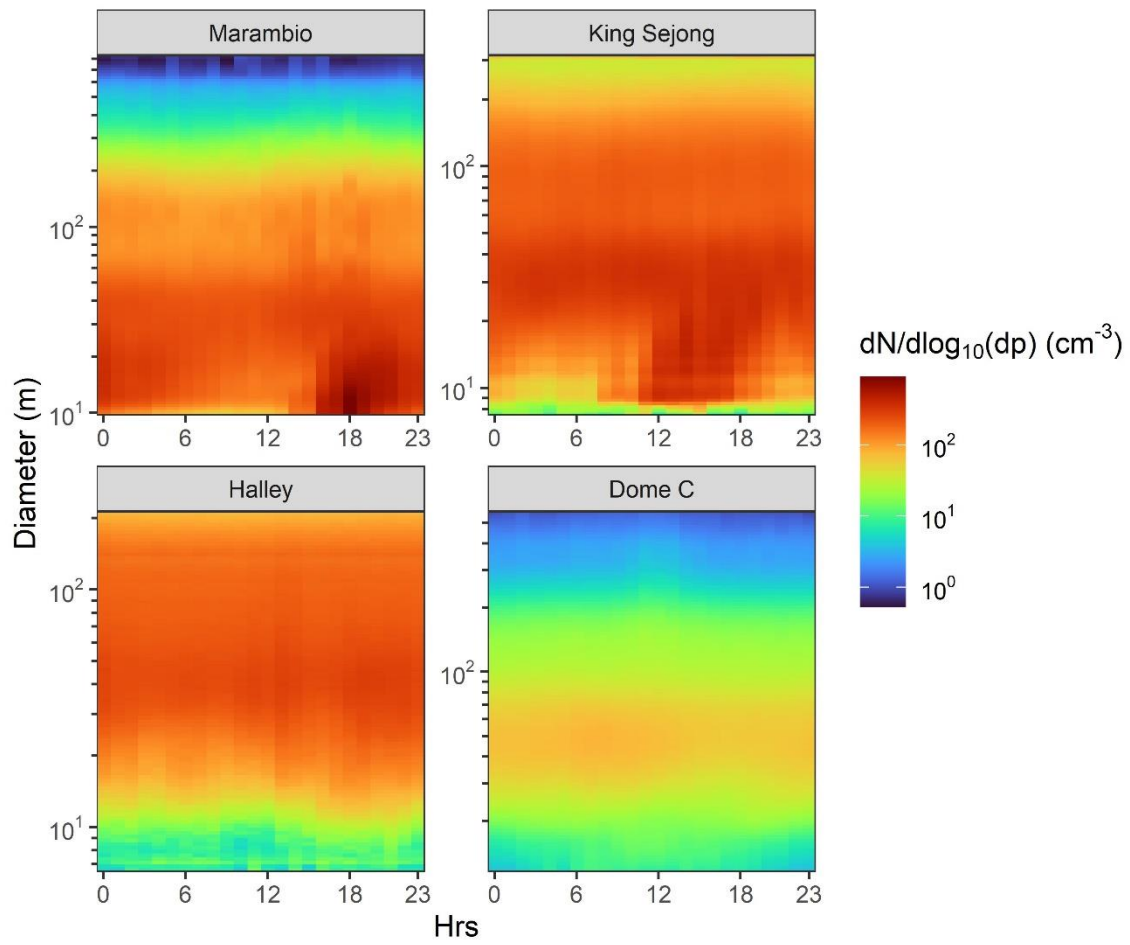
Figure S3: Mean 24-hour particle number PNSD contour plots for each of the four Antarctic sites in this study

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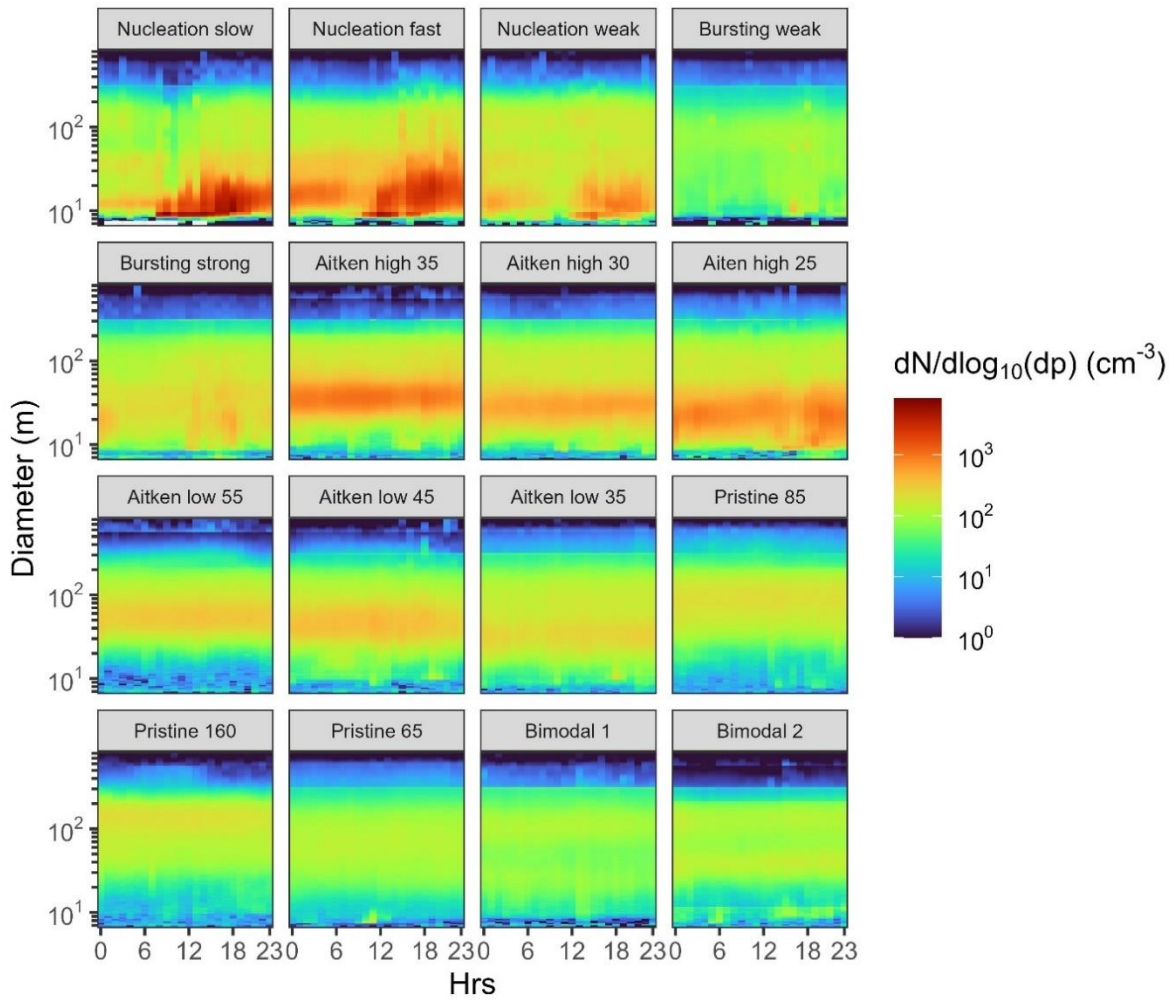
Figure S4: Mean diurnal cycle in the PNSD for all of the 16 clusters.

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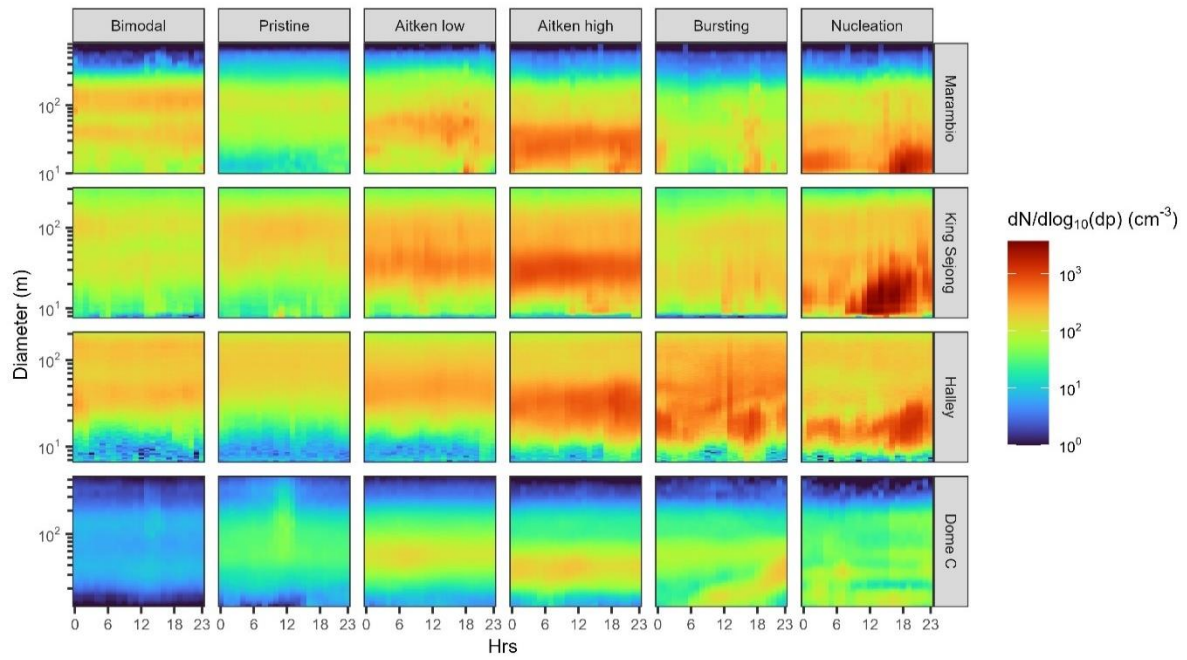


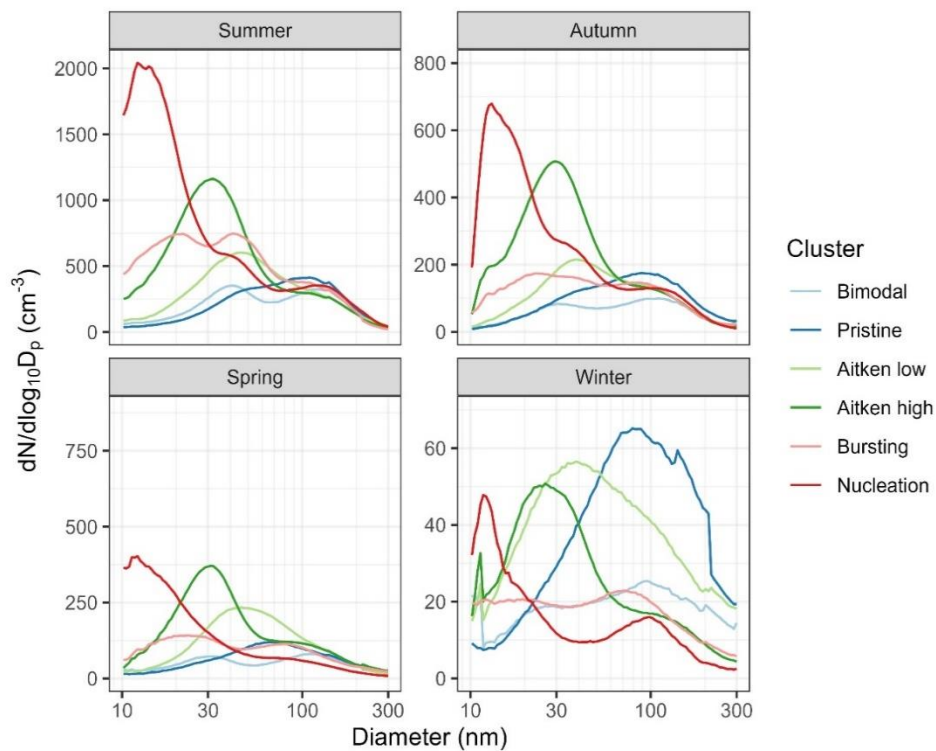
Figure S5: Mean diurnal cycle in the PNSD for each of the four Antarctic sites in this study, separated by clusters.

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Figure S6: PNSD clusters separated by Austral season. Range 10 – 300 nm shown (where data is common between sites). Figure S6: PNSD clusters separated by Austral season. Range 10 – 300 nm shown (where data is common between sites). Summer: December to February; Autumn: March to May; Winter: June to August; Spring: September to November

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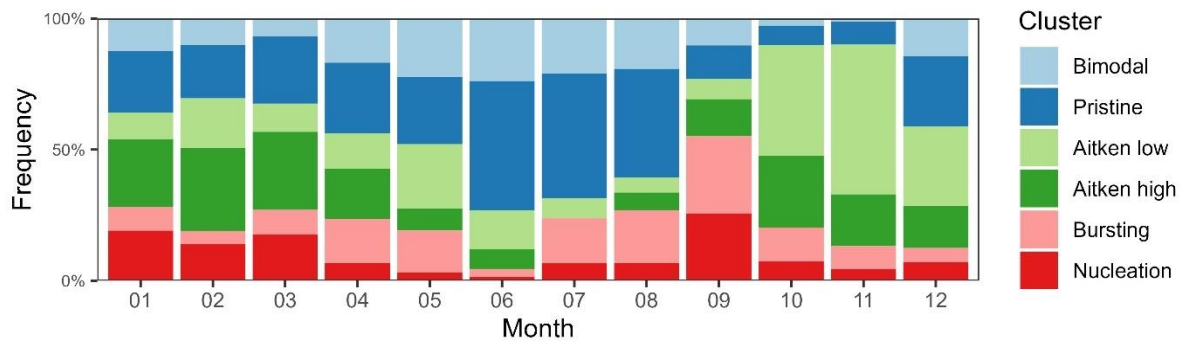
Figure S7: Relative mean monthly contribution of each cluster per month across all sites

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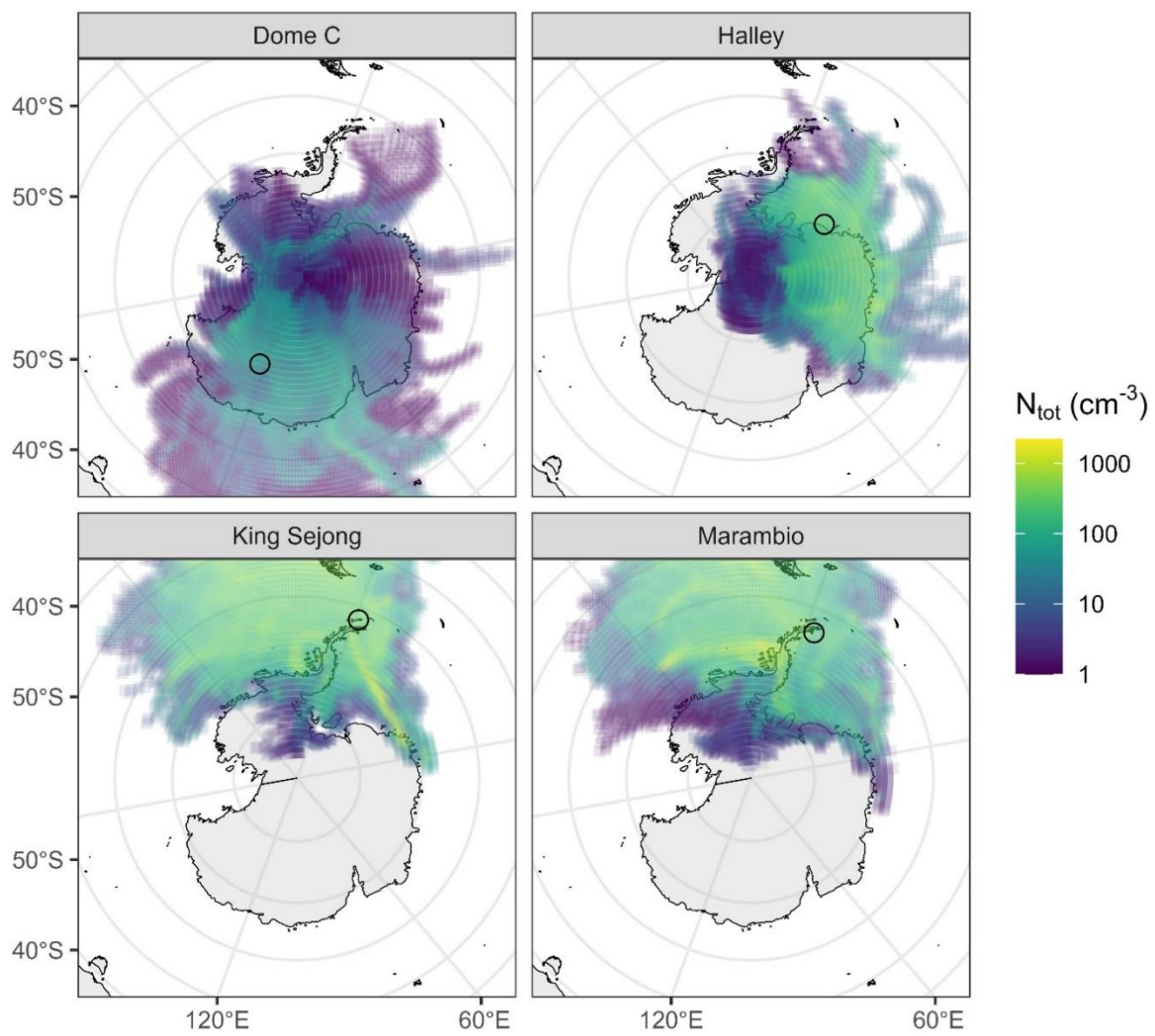
Figure S8: Particle number CWTs of 72 hour air mass trajectories for each site. Trajectories calculated with HYSPLIT.

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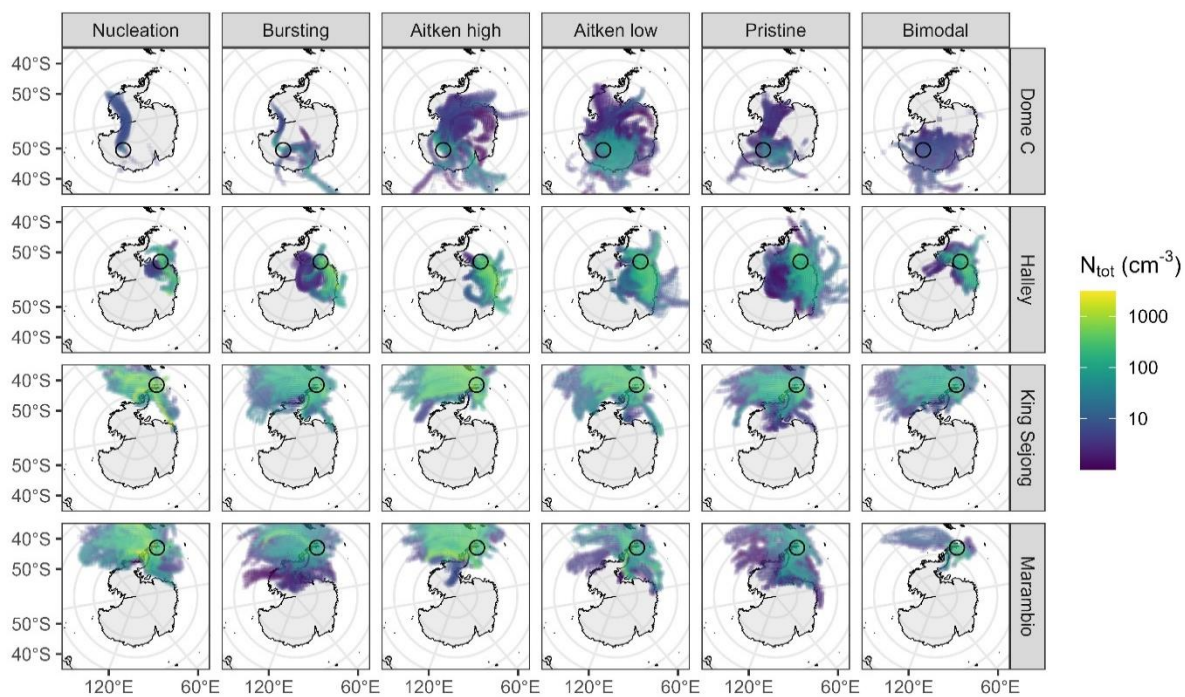
Figure S9: Particle number CWTs of 72 hour air mass trajectories for each cluster for each site. Trajectories calculated with HYSPLIT.

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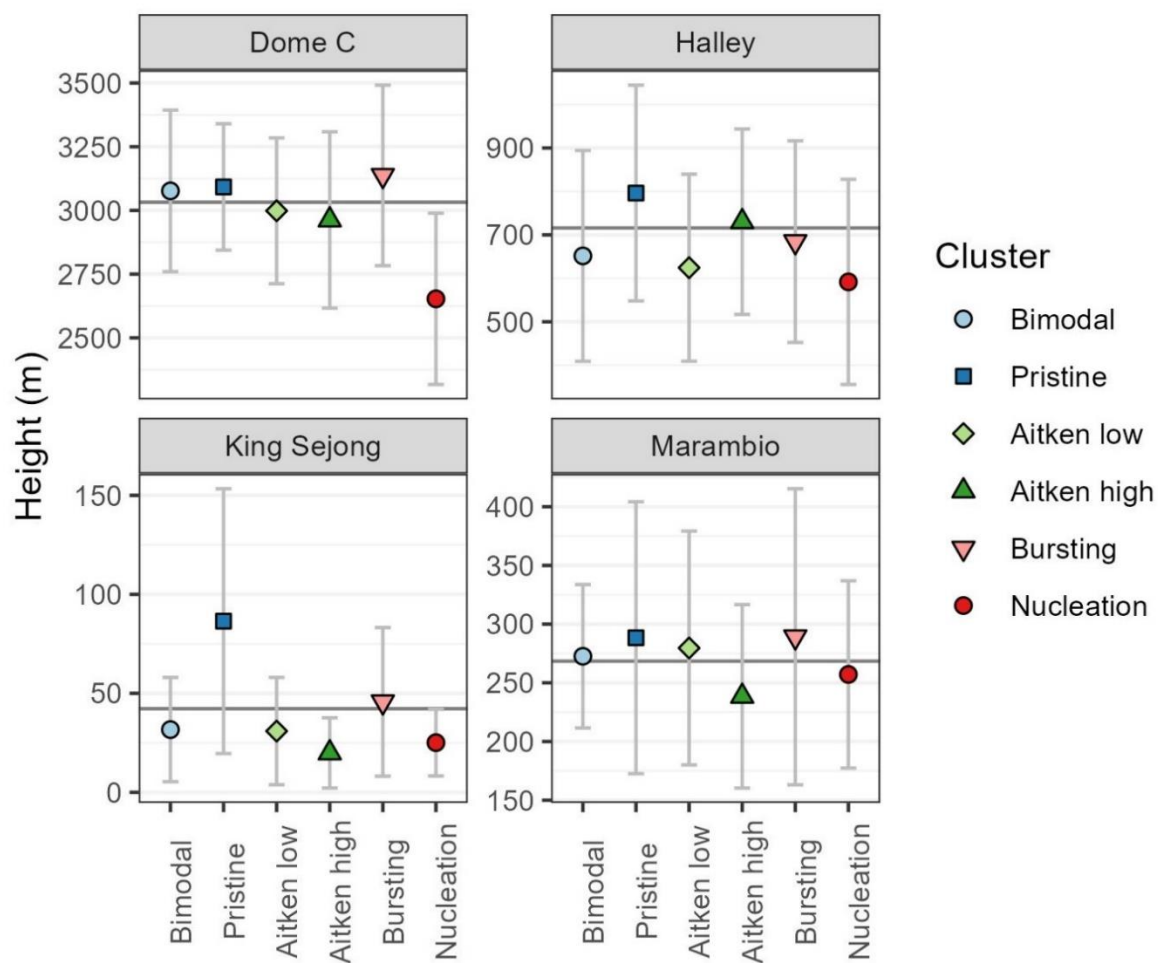
Figure S10: Mean trajectory height for 72 hour back trajectories per cluster per site. Error bars indicate 1 standard error. Horizontal line represents mean trajectory height. Trajectories calculated with HYSPLIT.