Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts.

Supplementary Information for:
Influence of Marine Emissions and Atmospheric Processing on Individual Particle Composition of Summertime Arctic Aerosol in the Bering Strait and Chukchi Sea

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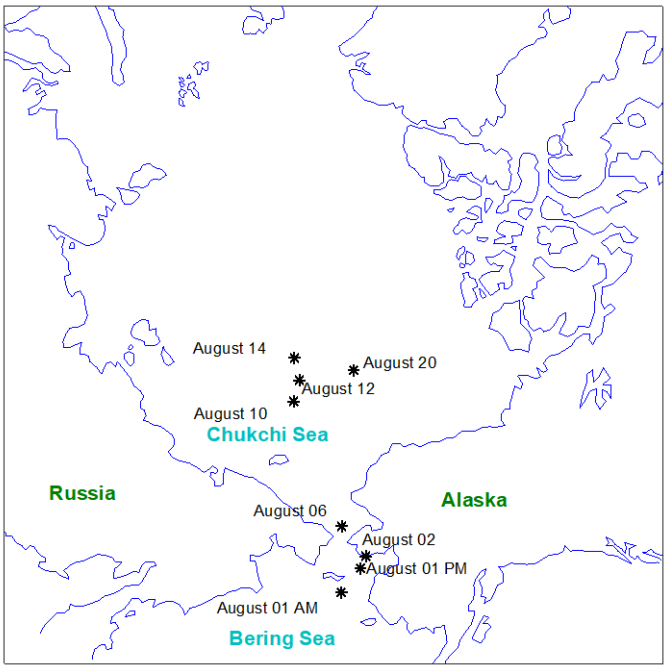

Figure S1: Locations of atmospheric aerosol particle samples collected aboard the R/V *Araon* during August, 2016.

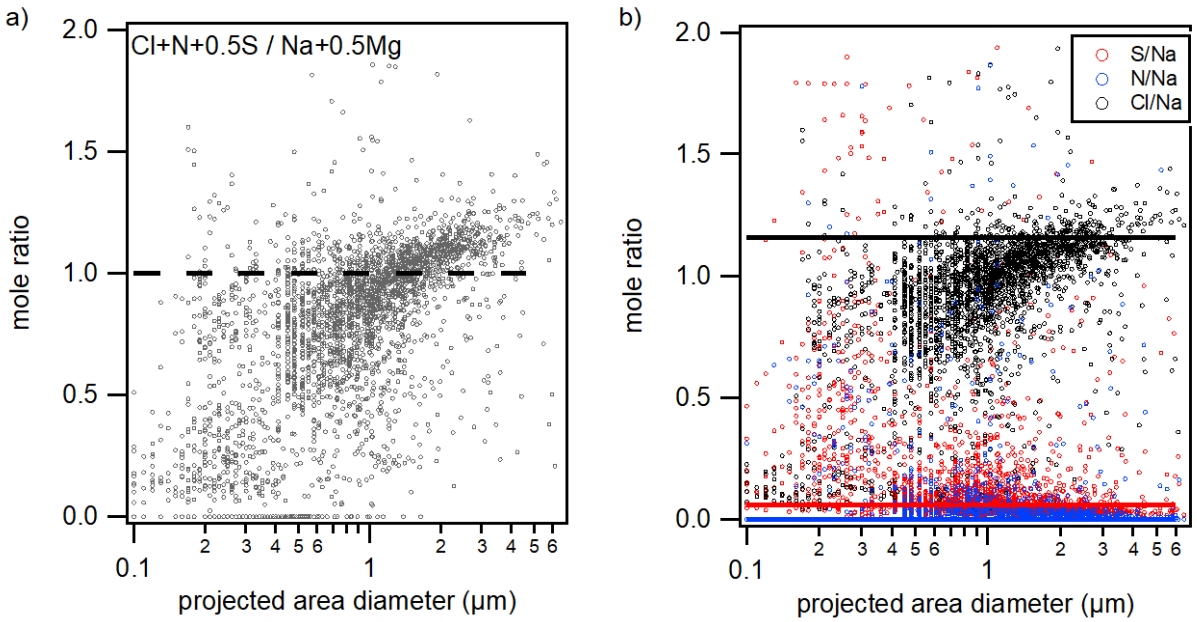

Figure S2: Individual SSA particle CCSEM-EDX mole ratios for a) Cl+N+0.5S/Na+0.5Mg, with the dashed line (1.0) corresponding to aged sea salt particles with chloride quantitatively displaced by only nitrate and sulfate, and b) S/Na, N/Na, Cl/Na, corresponding to the average ratios shown in Figure 4, with the solid lines corresponding to the standard seawater ratios (0.06 S/Na (sulfate), 0.0002 N/Na (nitrate), and 1.16 Cl/Na).[1]

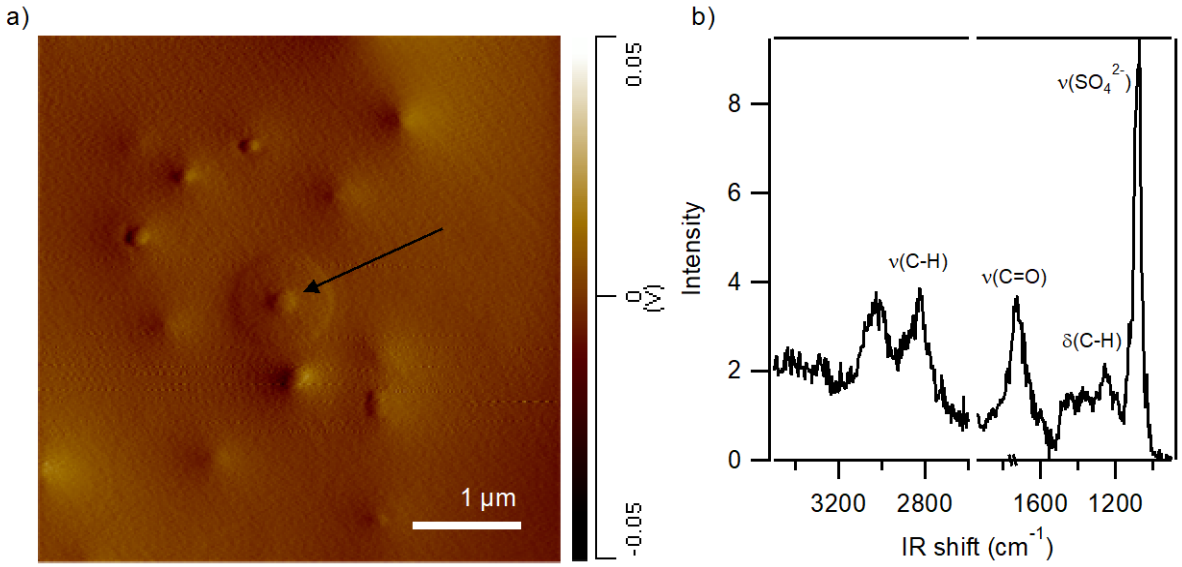

Figure S3: a) AFM deflection image and b) corresponding IR spectrum of a representative organic particle (indicated by the arrow) containing sulfate and organics.

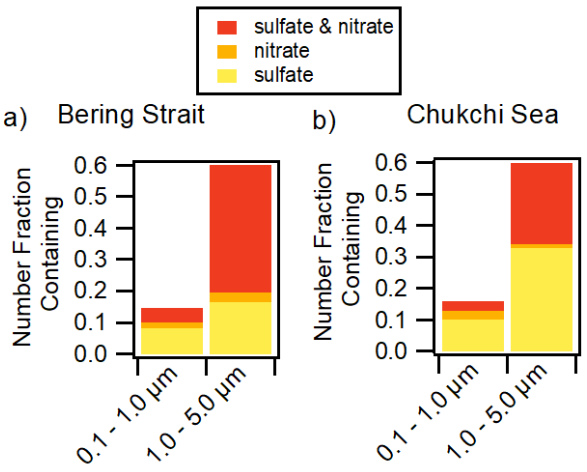

Figure S4: Number fractions, determined by CCSEM-EDX, of individual organic aerosol (OA) particles containing sulfate (S) and/or nitrate (N) for a) Bering Strait and b) Chukchi Sea samples.

Figure S5: Suomi NPP/VIIRS fires and thermal anomalies (NASA Worldview) on August 01, 2016 in eastern Russian and Alaska, shown as red dots.

References:

1 M. E. Q. Pilson, *An introduction to the chemistry of the sea*, Cambridge University Press, 2013, vol. 51.