Supporting Information: African dust transported to Barbados in the Wintertime Lacks Indicators of Chemical Aging

Haley M. Royer[1,2], Michael Sheridan[1,3], Nurun Nahar Lata[4], Zezhen Cheng[4], Swarup China[4],

Zihua Zhu[4], Hope Elliott[1], Andrew P. Ault[5], Cassandra Gaston[1*]

[1]Department of Atmospheric Sciences, Rosenstiel School of Marine, Atmospheric, and Earth

Science, University of Miami, Miami, FL

[2]Currently at: Department of Environmental Sciences and Engineering, University of North

Carolina at Chapel Hill, Chapel Hill, NC

[3]Department of Marine Sciences, Franklin College of Arts and Sciences, University of Georgia,

Athens, GA

[4]Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory,

Richland, WA

[5]Department of Chemistry, University of Michigan, Ann Arbor, MI

*Corresponding Author:

Cassandra J. Gaston: Email: cgaston@miami.edu, Phone: (305)-421-4979
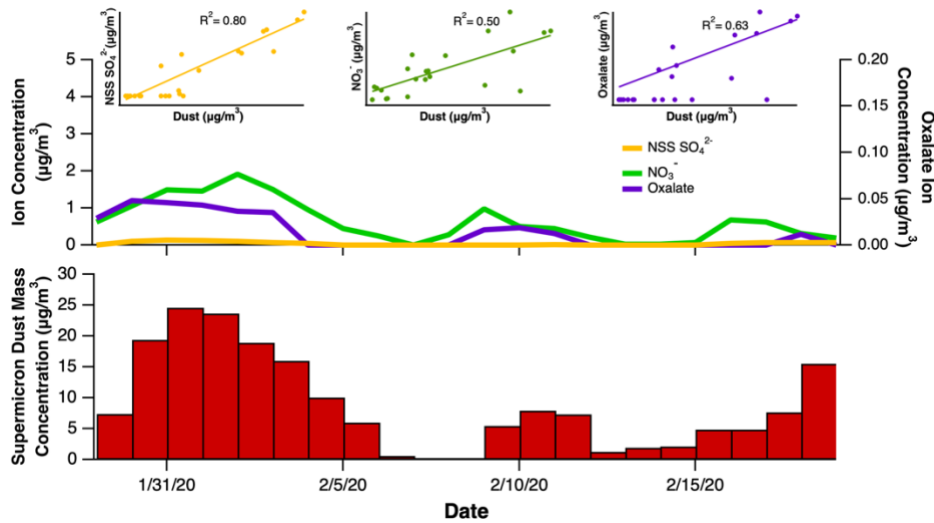
Figure S1 – Daily soluble ion content for supermicron nitrate (left axis; green), non-sea salt sulfate (left axis; yellow), and oxalate (right axis; purple) with correlation plots for each ion as a function of dust mass concentrations a) and daily supermicron dust mass concentrations b) determined for the entire sampling period. Correlation plots include all data, including data from samples with undetectable ions. Trendlines are plotted only for data with detectable dust and ions.
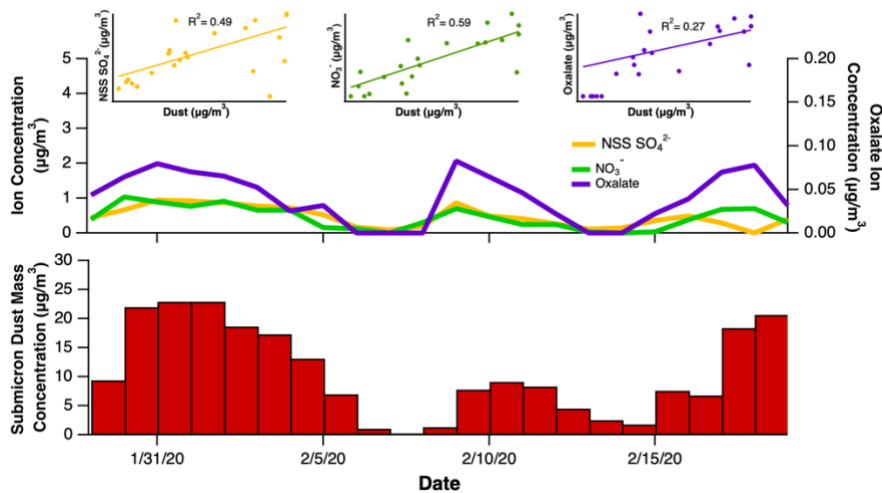
Figure S2 - Daily soluble ion content for submicron nitrate (left axis; green), non-sea salt sulfate (left axis; yellow), and oxalate (right axis; purple) with correlation plots for each ion as a function of dust mass concentrations a) and daily submicron dust mass concentrations b) determined for the entire sampling period. Correlation plots include all data, including data from samples with undetectable ions. Trendlines are plotted only for data with detectable dust and soluble ions.

| | Average N (%) | | |
Particle Type	Submicron	Supermicron	Total
Dust	1.9+0.6	2.1+0.3	2.0+0.5
Dust+Smoke	2.5+0.4	2.6+0.3	2.6+0.4
Dust+SeaSalt	1.9+0.7	2.2+0.1	2.0+0.5
Sea Salt	1.9+0.7	3.0+0.9	2.4+0.9

Table S1 – Values of average N content in individual particles of dust, internally mixed dust & smoke, internally mixed dust and sea salt, and sea salt particles in the submicron, supermicron, and total size distribution.

| | Average Particle Fraction w/ Detectable N (%) | | |
Particle Type	Submicron	Supermicron	Total
Dust	36+25	76+12	52+28
Dust+Smoke	70+17	95+5	79+19
Dust+SeaSalt	43+19	75+14	59+23
Sea Salt	23+16	38+9	30+15

Table S2 – Values of Average particle fractions with detectable N in dust, internally mixed dust & smoke, internally mixed dust and sea salt, and sea salt particles in the submicron, supermicron, and total size distribution.

| | Average S (%) | | |
Particle Type	Submicron	Supermicron	Total
Dust	3.3+2.8	1.9+1.0	2.7+0.5
Dust+Smoke	1.9+0.3	1.5+0.8	1.7+0.5
Dust+SeaSalt	2.7+1.0	2.0+0.2	2.4+0.9
Sea Salt	2.8+1.3	2.3+0.2	2.6+1.1

Table S3 - Values of average S content in individual particles of dust, internally mixed dust & smoke, internally mixed dust and sea salt, and sea salt particles in the submicron, supermicron, and total size distribution.

| | Average Particle Fraction w/ Detectable S (%) | | |
Particle Type	Submicron	Supermicron	Total
Dust	8+7	14+15	10+12
Dust+Smoke	44+15	20+11	35+18
Dust+SeaSalt	28+9	35+19	31+16
Sea Salt	36+22	87+10	58+31

Table S2 – Values of Average particle fractions with detectable N in dust, internally mixed dust & smoke, internally mixed dust and sea salt, and sea salt particles in the submicron, supermicron, and total size distribution.
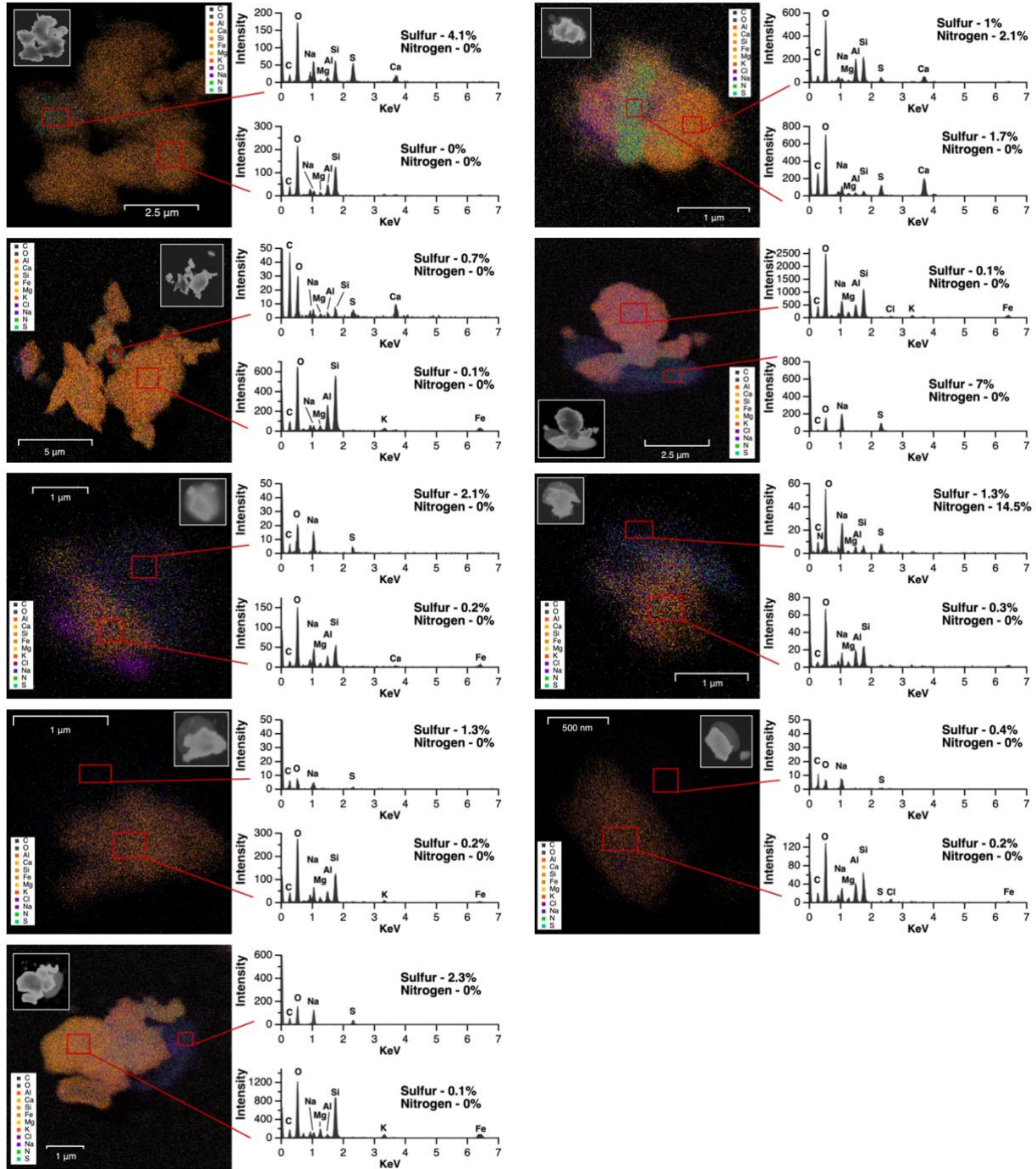
Figure S3 – Elemental maps of internally mixed dust and sea salt particles determined using SEM/EDX. Red box represents where EDX analysis occurred on the particle.
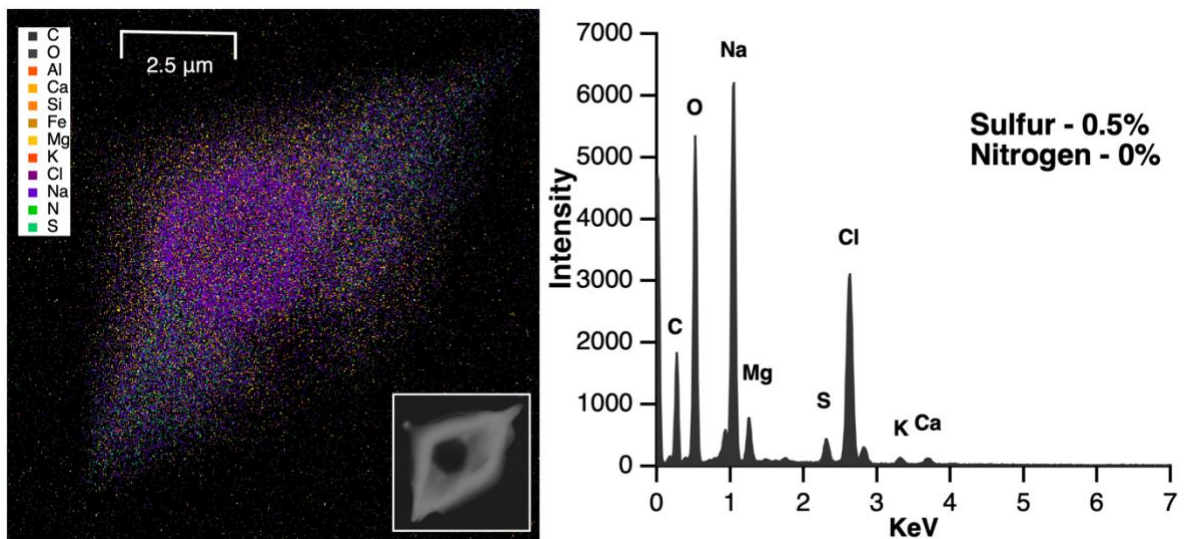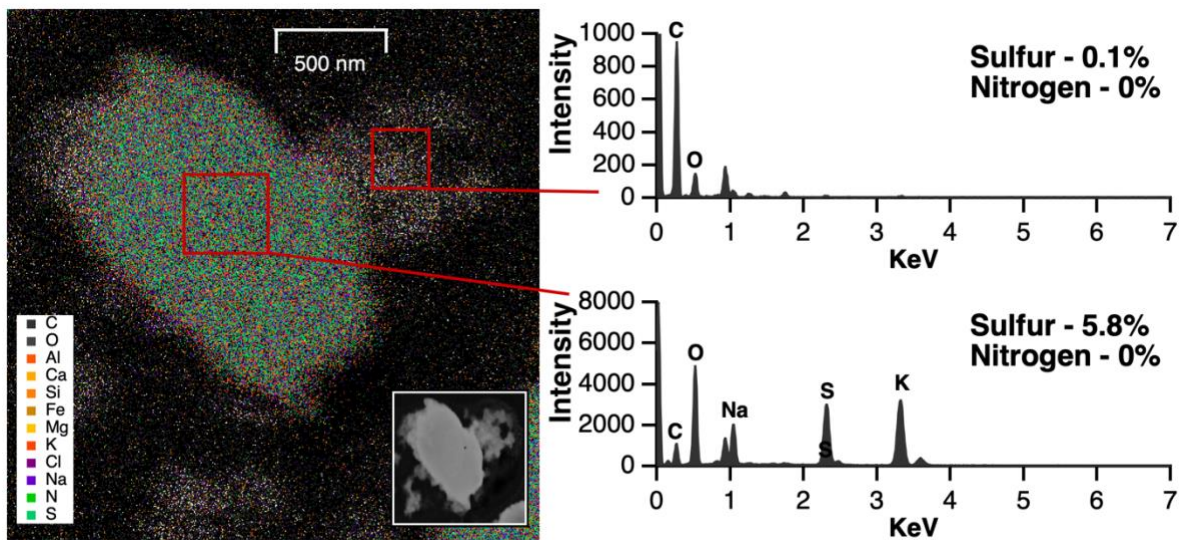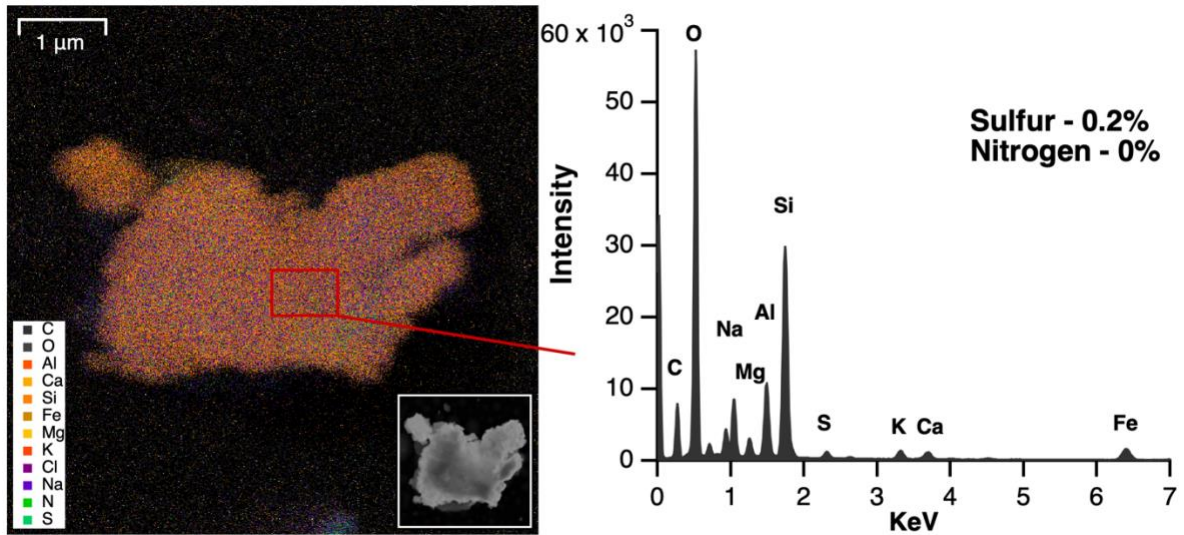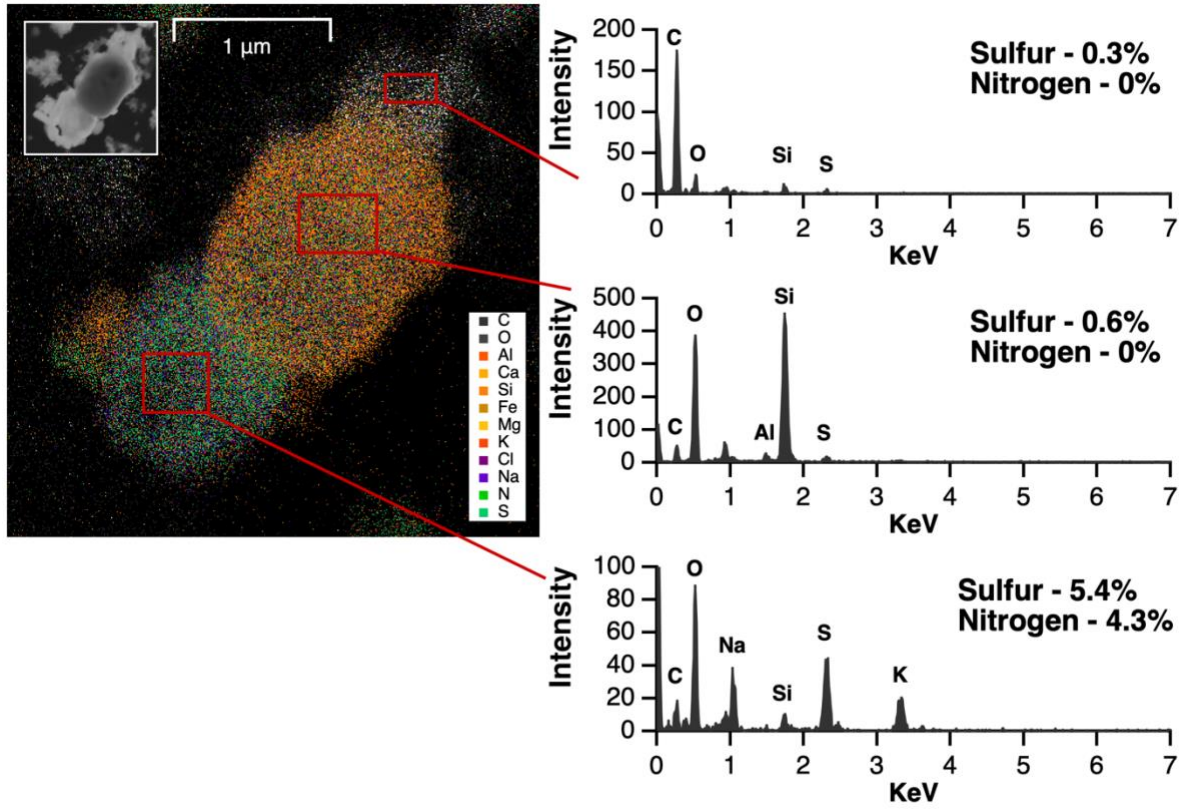
Figure S4 – Elemental maps and corresponding EDX spectra for a dust particle, smoke particle, sea salt particle, and internally mixed dust and sea salt particle.