Supporting Information for

Diverging trends in aerosol sulfate and nitrate measured in the remote North Atlantic on Barbados are attributed to clean air policies, African smoke, and anthropogenic emissions

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Table S1: Normalized mean bias (NMB), mean bias (MB), root-mean-sqaure error (RMSE), and the Pearson correlation coefficient (r) for EQUATES model runs for nitrate and nss-sulfate compared to observations for each year from Ragged Point.

Year	Compound	NMB (%)	MB (ug/m3)	RMSE (ug/m3)	r (pearson correlation coefficient)
2002	Nitrate	-10.18	-0.06	0.19	-0.22
	NSS-Sulfate	81.45	0.54	0.60	0.79
2003	Nitrate	-6.18	-0.03	0.15	0.60
	NSS-Sulfate	57.70	0.39	0.51	0.65
2004	Nitrate	-5.99	-0.03	0.16	0.59
	NSS-Sulfate	41.29	0.27	0.37	0.65
2005	Nitrate	-24.18	-0.15	0.24	0.84
	NSS-Sulfate	3.13	0.02	0.29	0.72
2006	Nitrate	-17.21	-0.10	0.28	0.45
	NSS-Sulfate	28.15	0.21	0.42	0.38
2007	Nitrate	-6.51	-0.04	0.14	0.62
	NSS-Sulfate	40.13	0.31	0.40	0.64
2008	Nitrate	-35.06	-0.26	0.35	0.52
	NSS-Sulfate	3.97	0.03	0.30	0.55
2009	Nitrate	-9.51	-0.06	0.20	0.28
	NSS-Sulfate	23.89	0.16	0.35	0.23
2010	Nitrate	-28.72	-0.23	0.31	0.83
	NSS-Sulfate	-14.42	-0.13	0.29	0.41
2011	Nitrate	-11.57	-0.07	0.12	0.88
	NSS-Sulfate	-8.80	-0.08	0.24	0.82
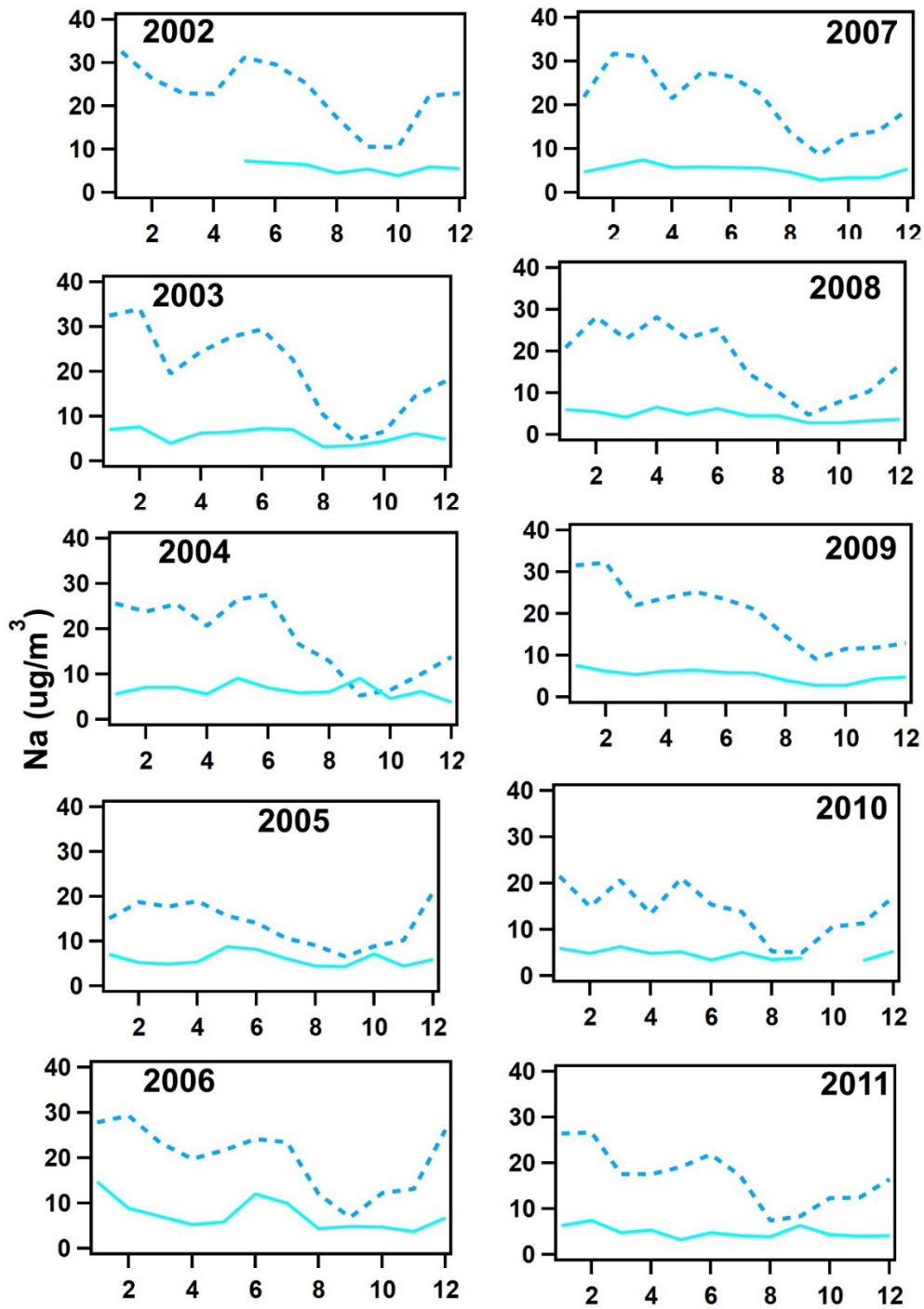
Figure S1: Monthly comparison of sodium (Na^{+}) mass concentrations measured at Barbados on filters (solid blue line) and predicted by the EQUATES model (dashed blue line) from 2002-2011.
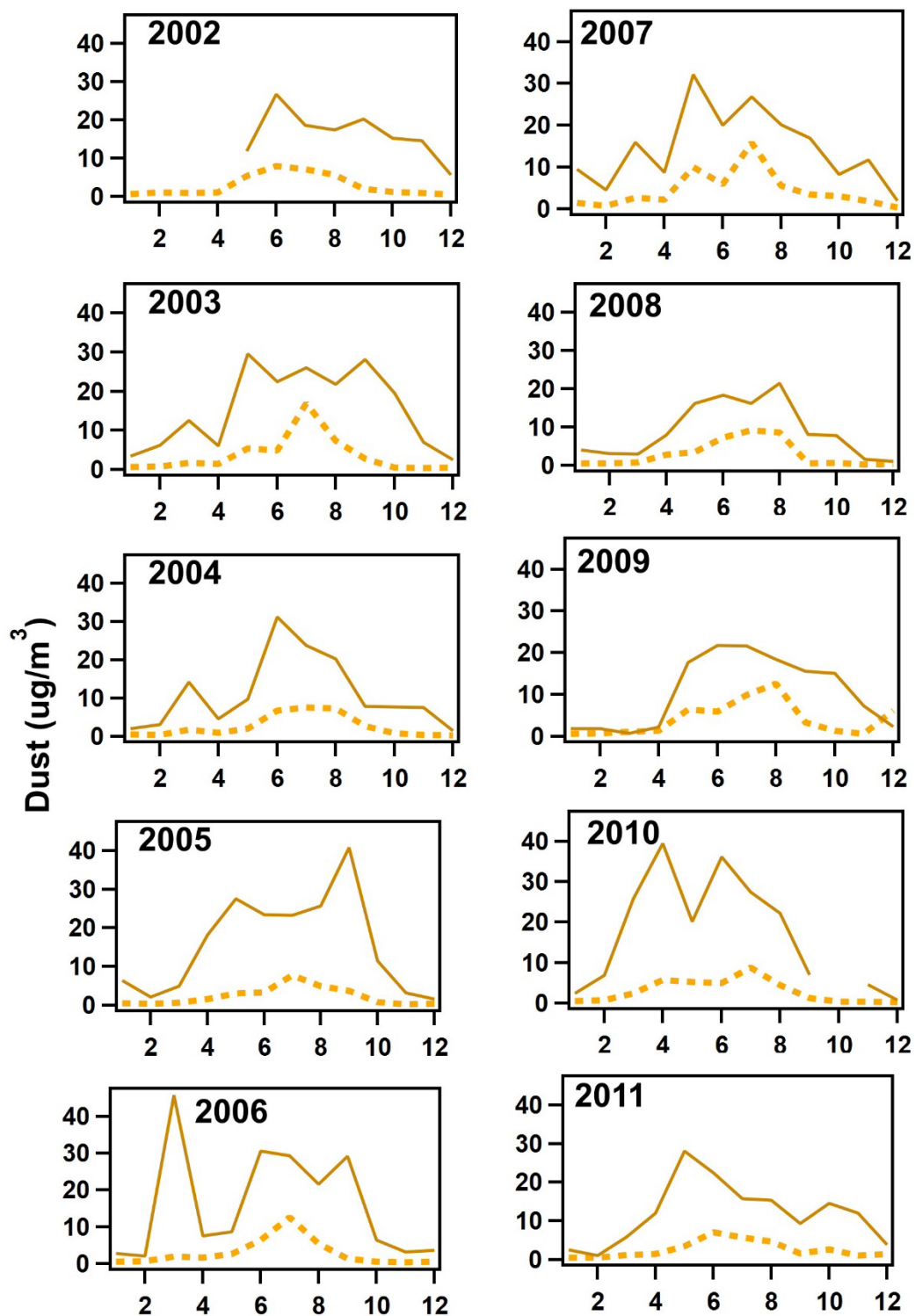
Figure S2: Monthly comparison of dust mass concentrations measured at Barbados on filters (solid brown line) and dust predicted by the EQUATES model (dashed brown line) using nss-Ca^{2+} concentrations scaled to the upper crustal abundance of calcium for 2002-2011.
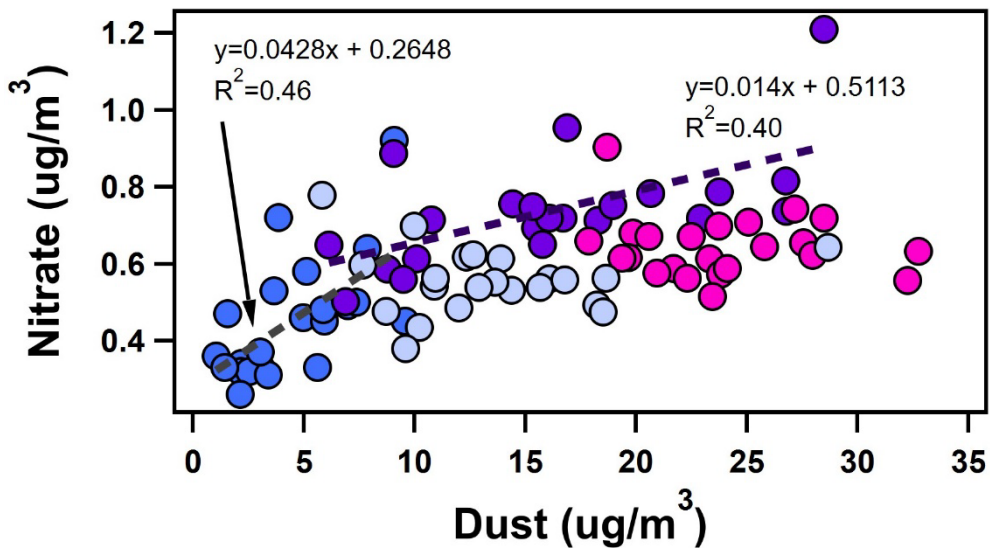
Figure S3: Comparison of nitrate and dust mass concentrations as a function of season with DJF in blue, MAM in purple, JJA in pink, and SON in light blue.
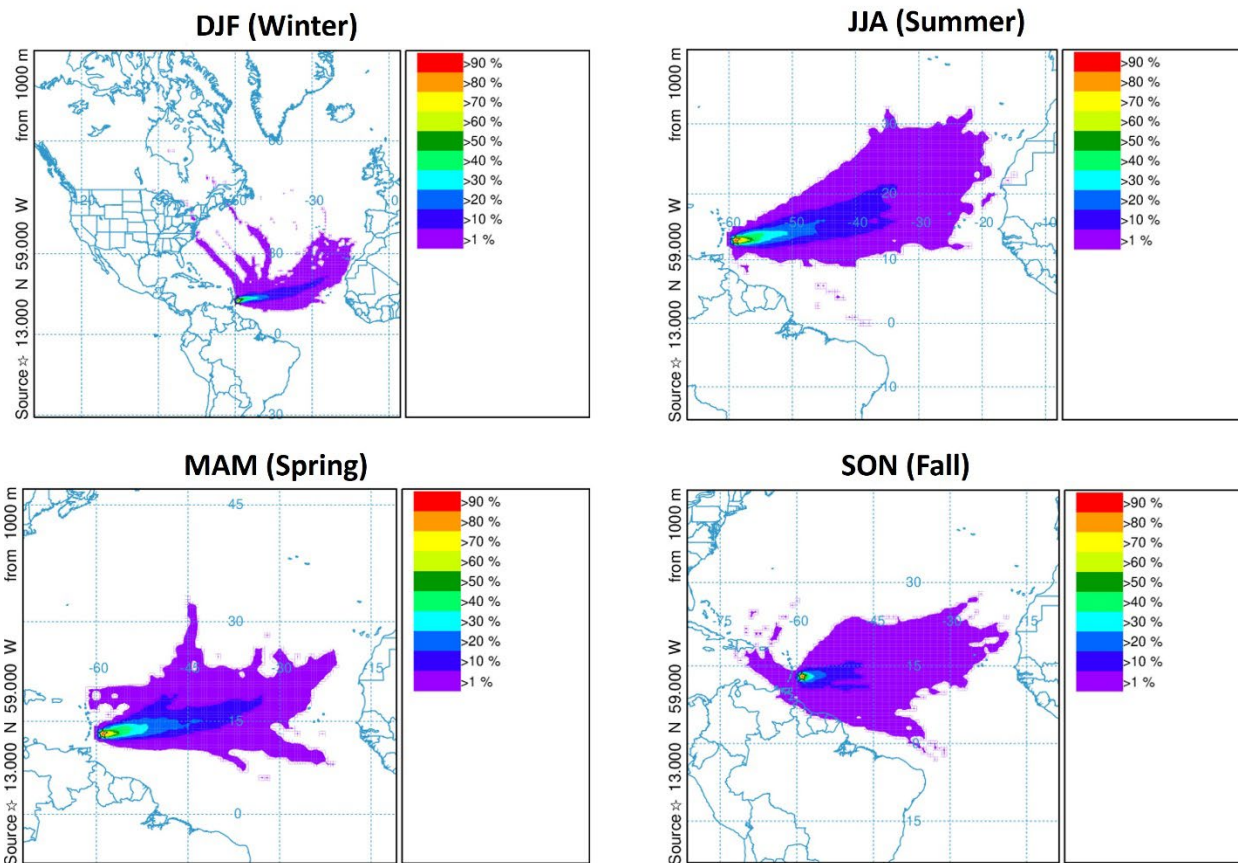
Figure S4: Seasonal HYSPLIT back trajectory frequency plots for DJF (Winter), MAM (Spring), JJA (summer), and SON (Fall). Similar patterns were observed each year and representative trajectories for 1998 are shown.
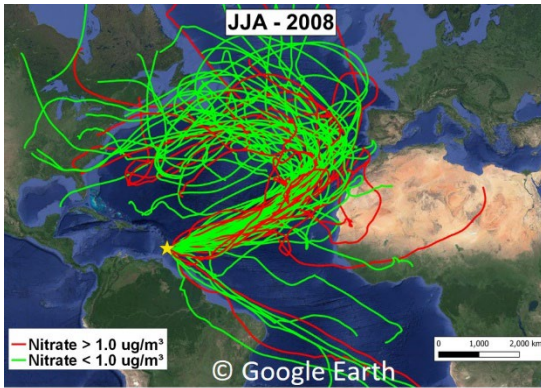
Figure S5: 315-h air mass back-trajectories initiated at 500-m for JJA 2008. Back-trajectories labeled in green are for days where nitrate concentrations measured at Ragged Point were < 1 ug/m^3 while trajectories labeled in red had nitrate > 1 ug/m^3 (from Google Earth).
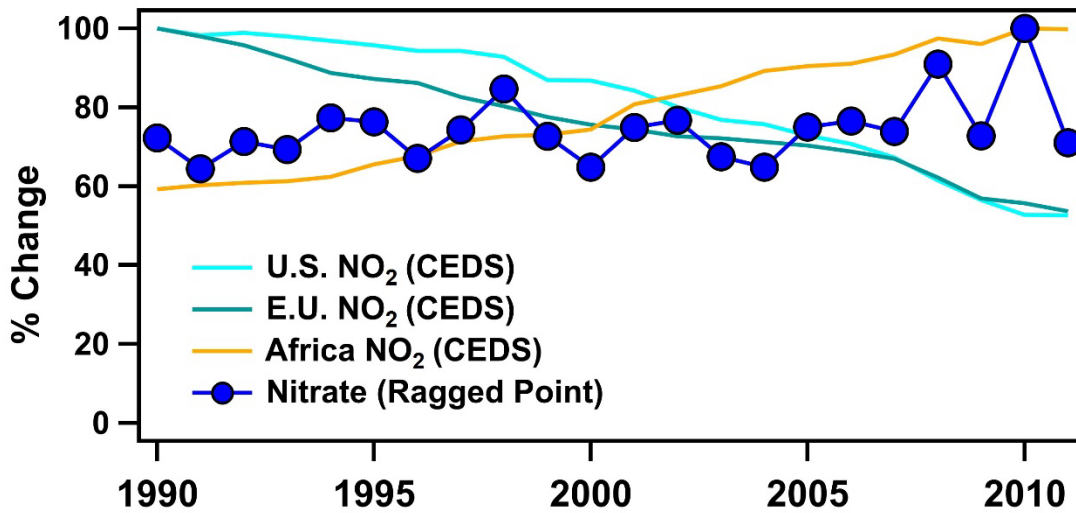
Figure S6: Nitrate mass concentrations measured at Ragged Point from 1990-2011 are shown in blue lines with markers. Emissions of nitrogen dioxide (NO_2) from McDuffie et al., 2020 are included for comparison. Decreasing emissions of NO_2 from the US and EU are shown in blue lines. Increasing emissions of NO_2 from Africa are shown in orange.
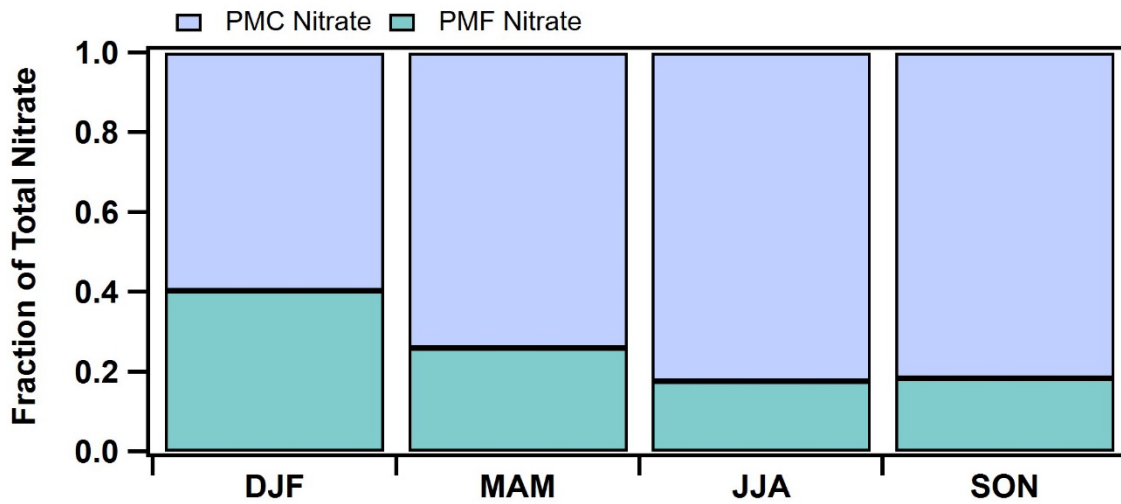
Figure S7: Seasonal averages of coarse mode (PMC, light blue) and fine mode (PMF, dark teal) contributions to aerosol nitrate predicted by EQUATES.
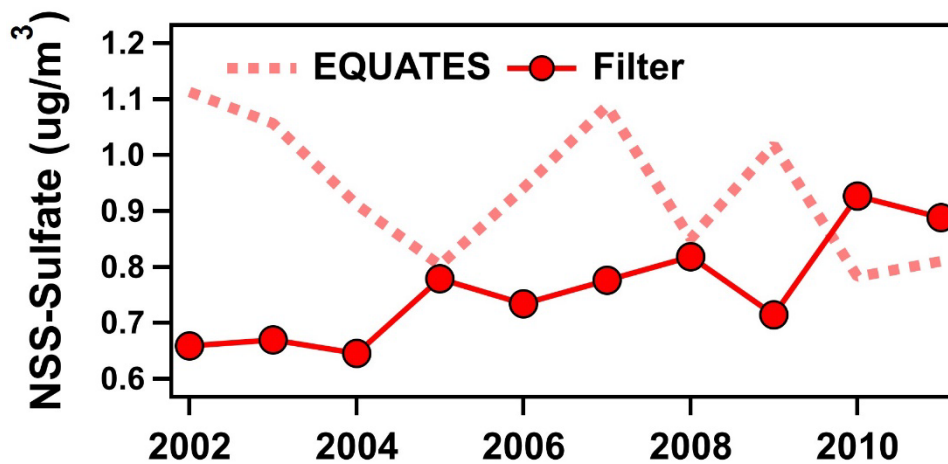
Figure S8: Annual averages of NSS-Sulfate measured from filters collected at Ragged Point (solid red line) and predicted by EQUATES (dashed pink line).
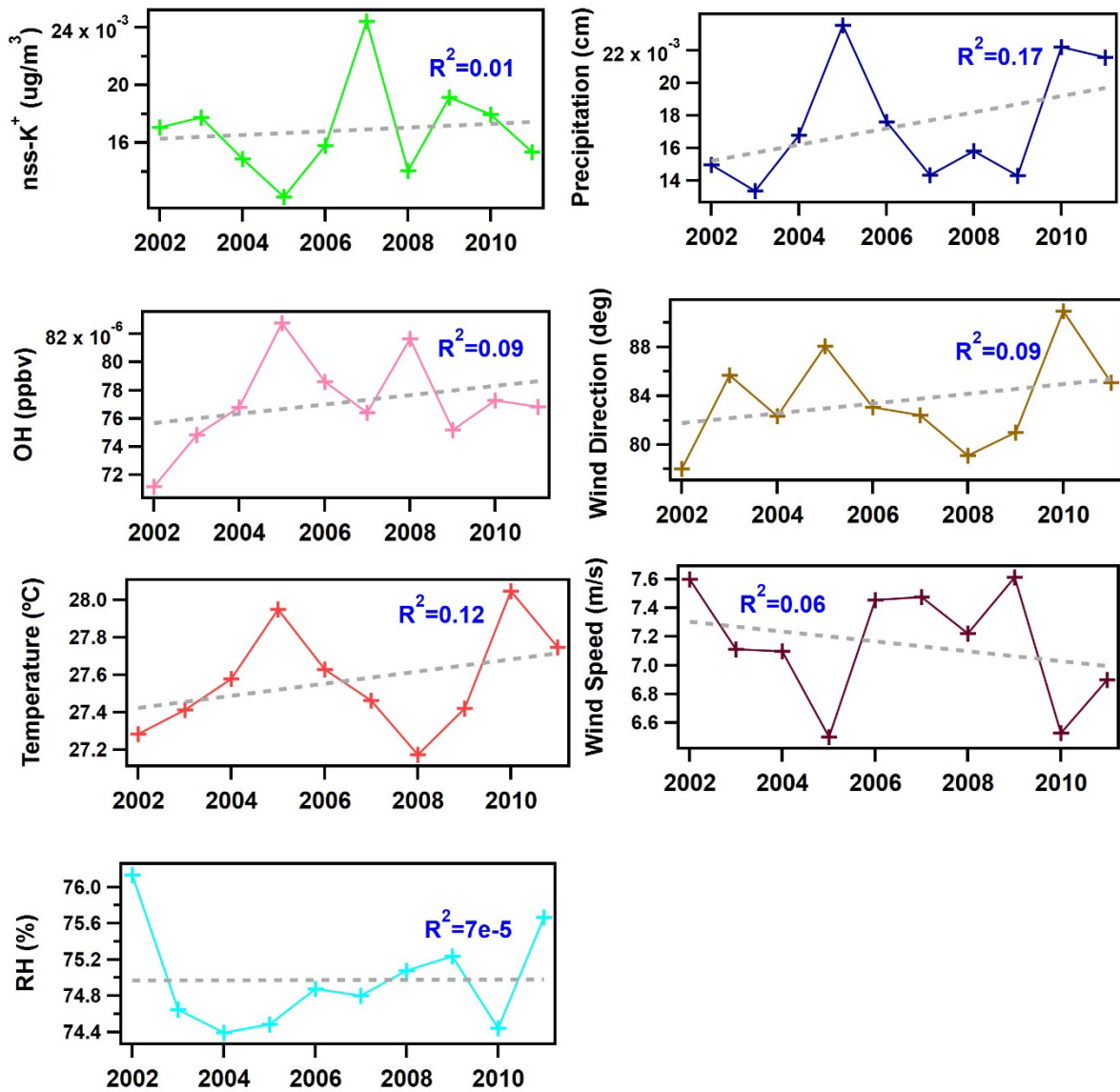
Figure S9: Annual averages of non-sea salt-potassium (nss-K+), hydroxyl radical concentrations (OH), temperature, relative humidity (RH), wind speed, and wind direction calculated from EQUATES model predictions. Linear fits and correlation coefficients are also shown.