Effects of Secondary Organic Aerosol Water on fine PM levels and composition over US

Supporting Information

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Number of tables: 1

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Table S1: Characteristics of the four selected sites

Site	SOA levels	Ammonium levels	Nitrate levels	Sulfate levels	Location in CONUS
Sacramento, California	Low	Modest	Modest	Modest	West
Houston, Texas	Modest	High	Modest	High	South
Atlanta, Georgia	High	High	Modest	High	South
Toronto, Canada	Modest	High	High	High	North

Figure S1. PMCAMx modeling domain and position of the four examined sites.

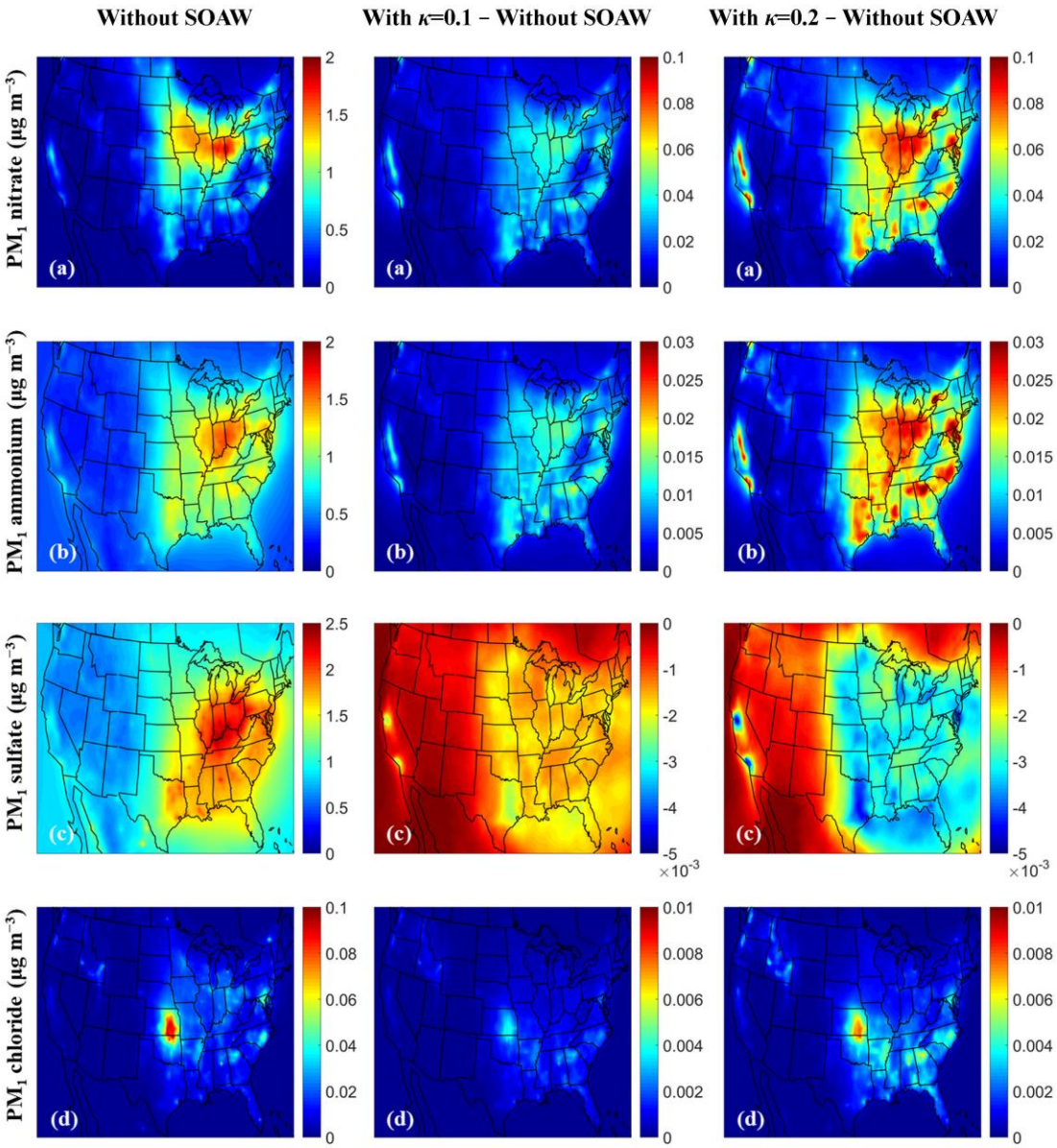

Figure S2. Annual average ground-level concentrations (in μg m^{-3}) of PM_1: **(a)** nitrate, **(b)** ammonium, **(c)** sulfate, and **(d)** chloride neglecting SOAW and the annual concentration changes when SOAW is present in the simulations with κ=0.1 and κ=0.2. A positive change corresponds to an increase. A negative change corresponds to a decrease.

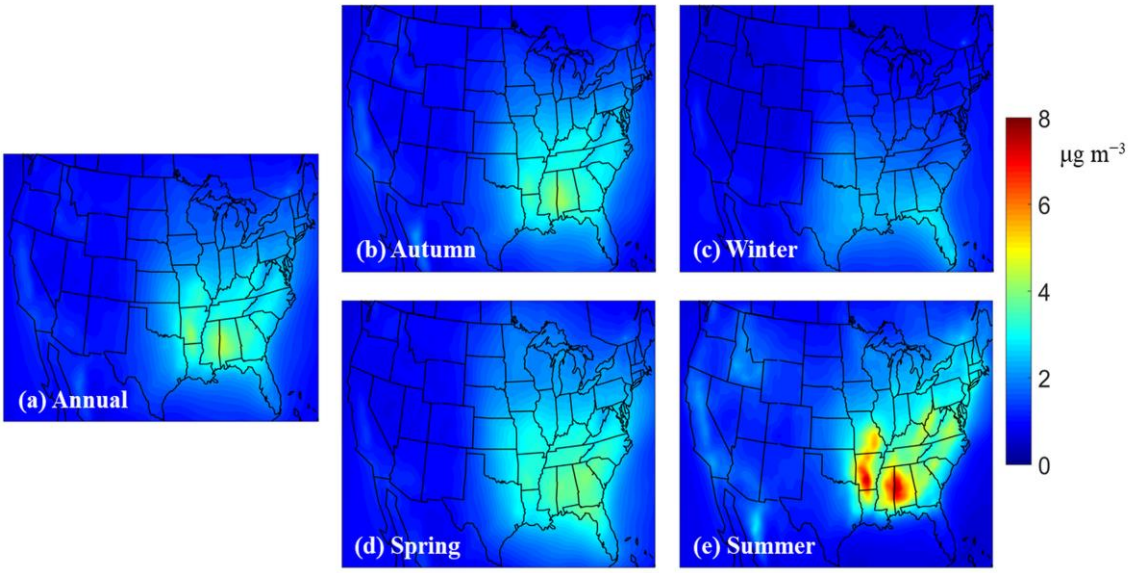

Figure S3. Average ground-level concentrations (in μg m^{-3}) of PM_1 SOA: **(a)** annual, **(b)** during autumn, **(c)** during winter, **(d)** during spring, and **(e)** during summer of 2010.

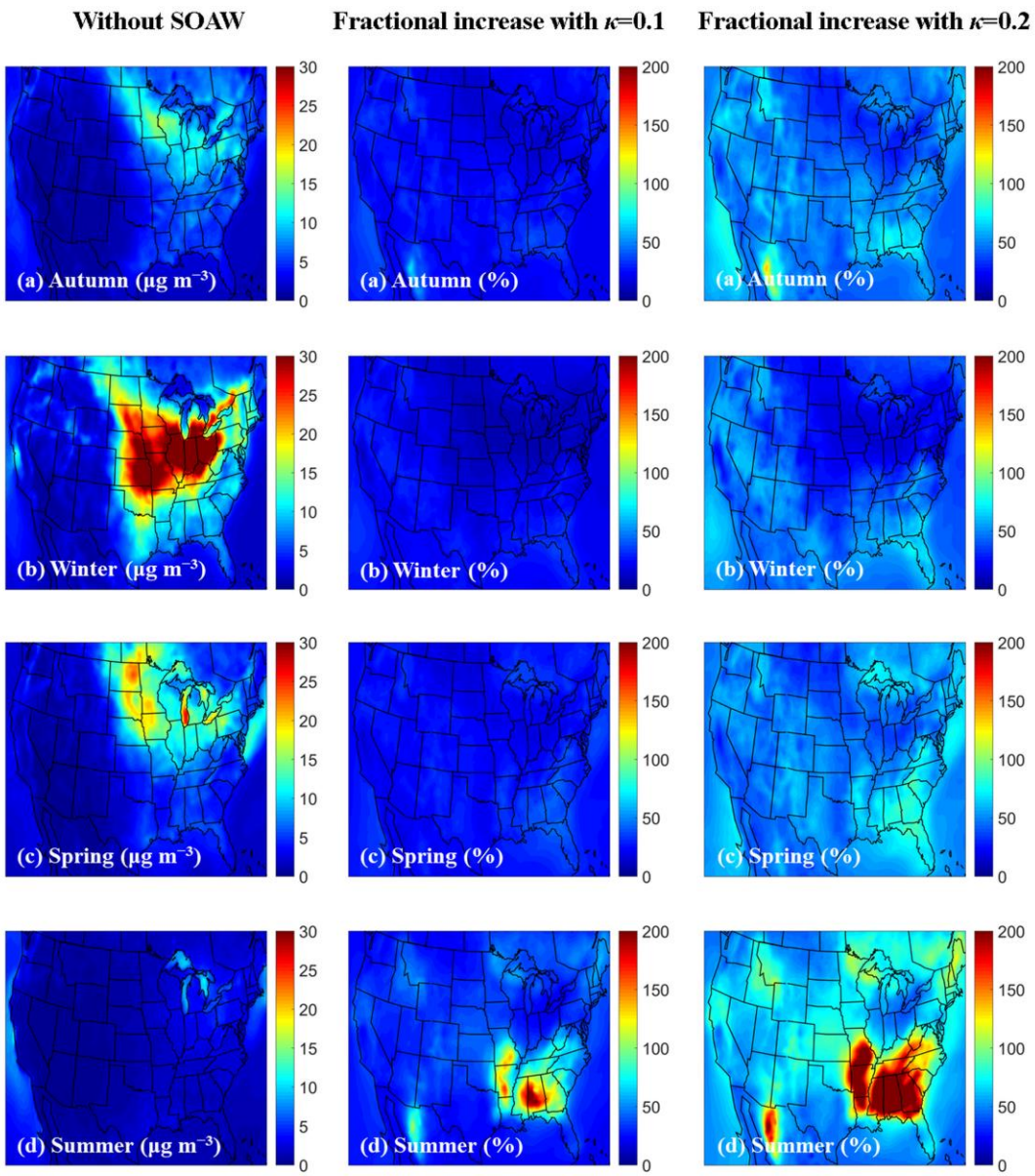

Figure S4. Average ground-level concentrations of PM_1 water neglecting SOAW (in μg m^{-3}) and the fractional increase when SOAW is present in the simulations with κ=0.1 and κ=0.2 during: **(a)** autumn, **(b)** winter, **(c)** spring, and **(d)** summer of 2010.

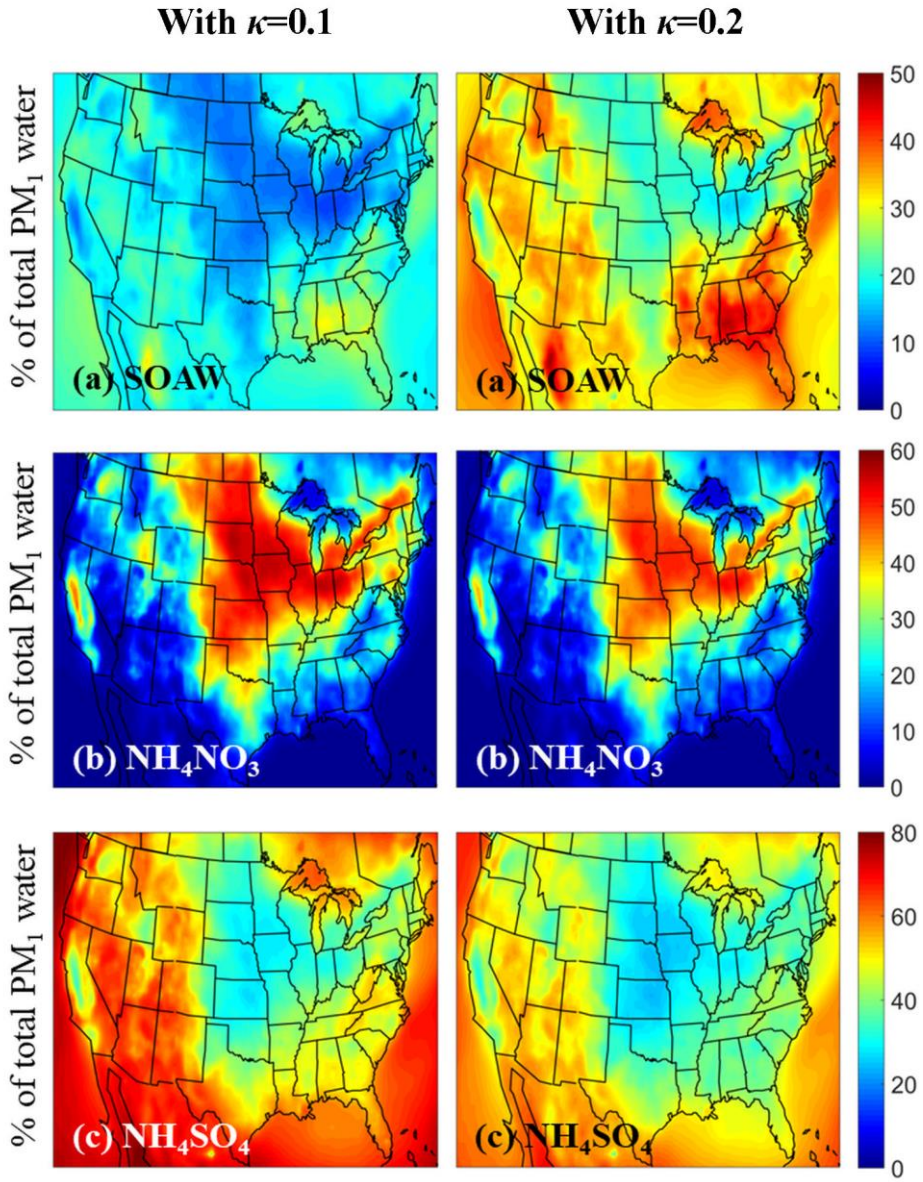

Figure S5. Annual average contribution to total PM_1 water concentrations from: **(a)** SOAW, **(b)** ammonium nitrate water, and **(c)** ammonium sulfate water when SOAW is present in the simulations with κ=0.1 and with κ=0.2 during 2010.

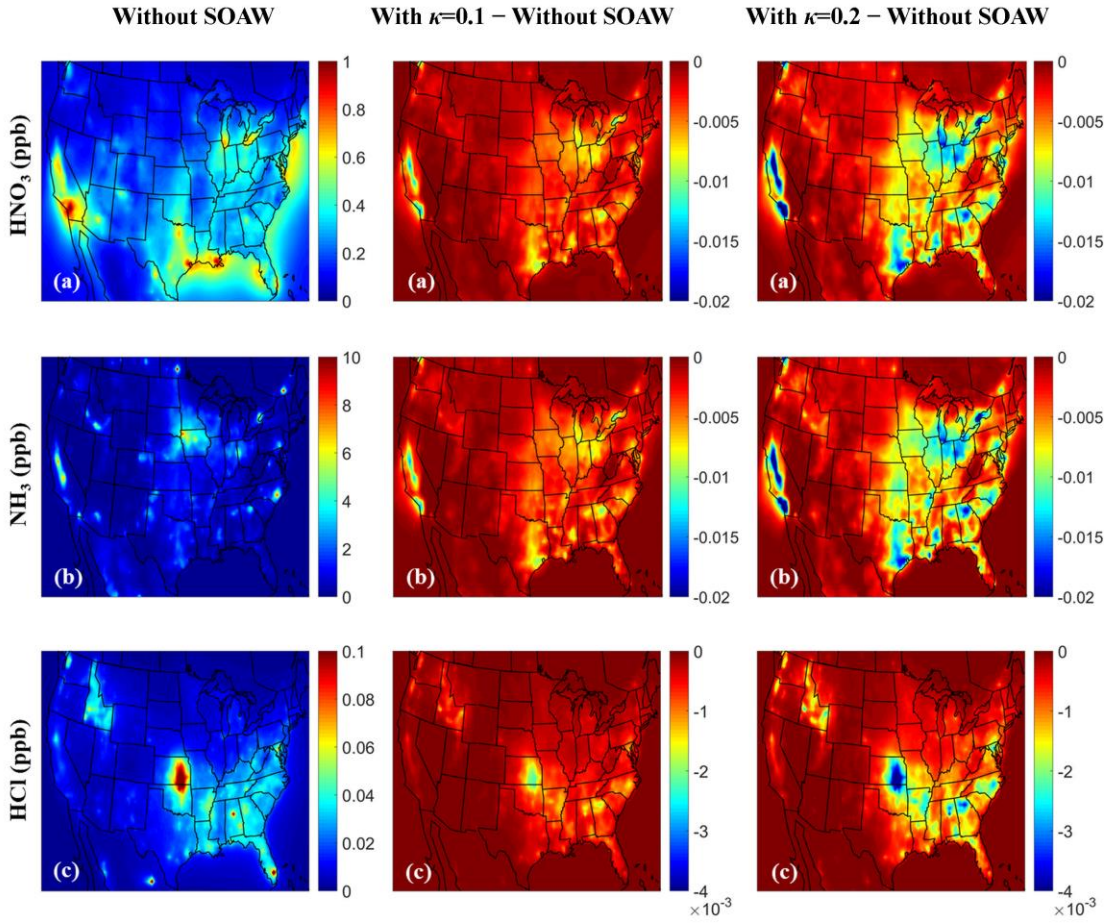

Figure S6. Annual average ground-level concentrations (in ppb) of gas phase: **(a)** nitric acid, **(b)** ammonia, and **(c)** hydrochloric acid neglecting SOAW and the annual concentration changes when SOAW is present in the simulations with κ=0.1 and κ=0.2. A negative change corresponds to a decrease.

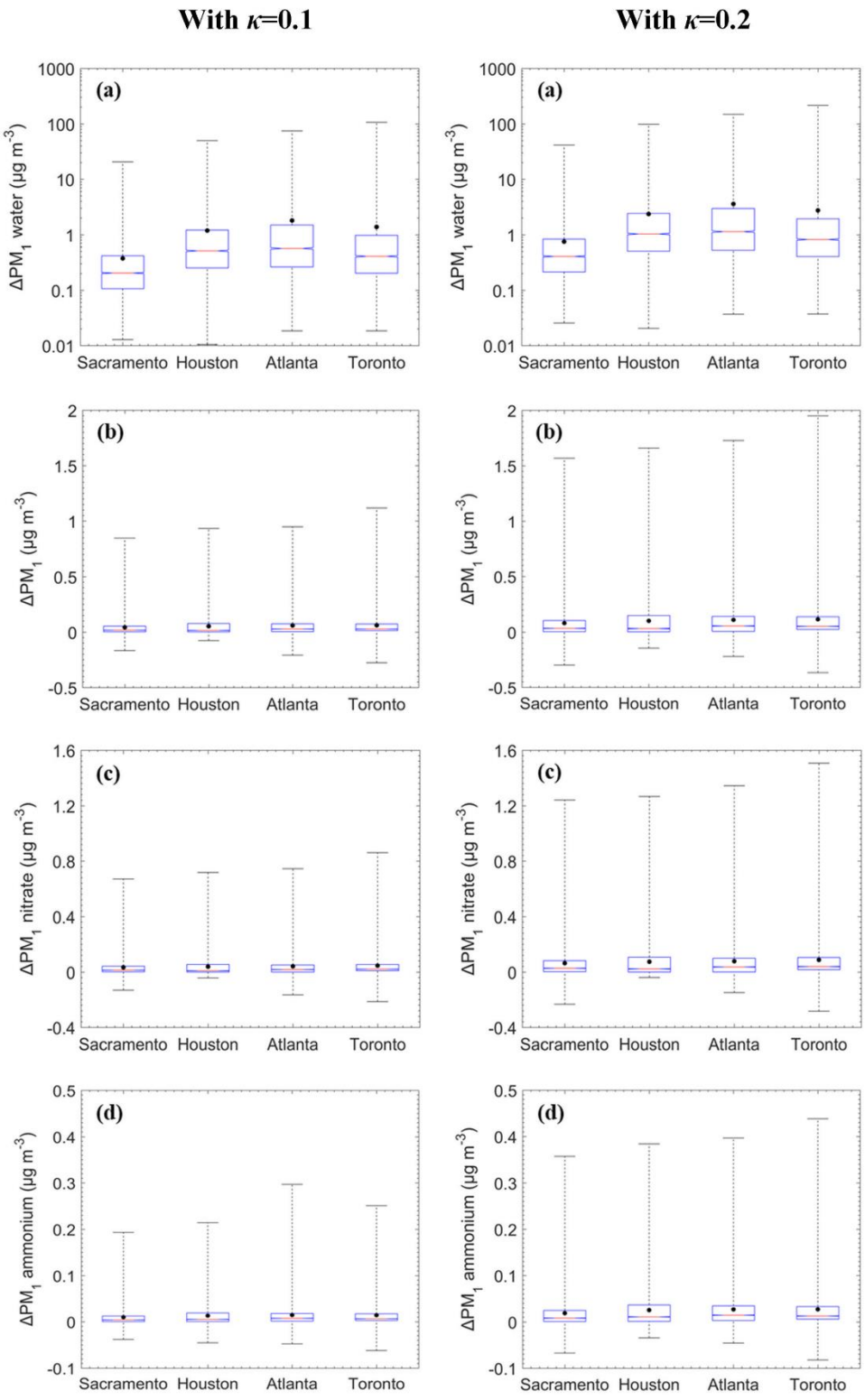

Figure S7. Box plots for concentration changes in the hourly PM_1: **(a)** water, **(b)** total dry, **(c)** nitrate, and **(d)** ammonium due to SOAW when κ=0.1 and κ=0.2 for Sacramento, California; Houston, Texas; Atlanta, Georgia; and Toronto, Canada during 2010. The red line represents the median, the black dot is the mean value, the upper box line is the upper quartile (75%) and the lower box line is the lower quartile (25%) of the distribution. A negative change corresponds to a decrease.

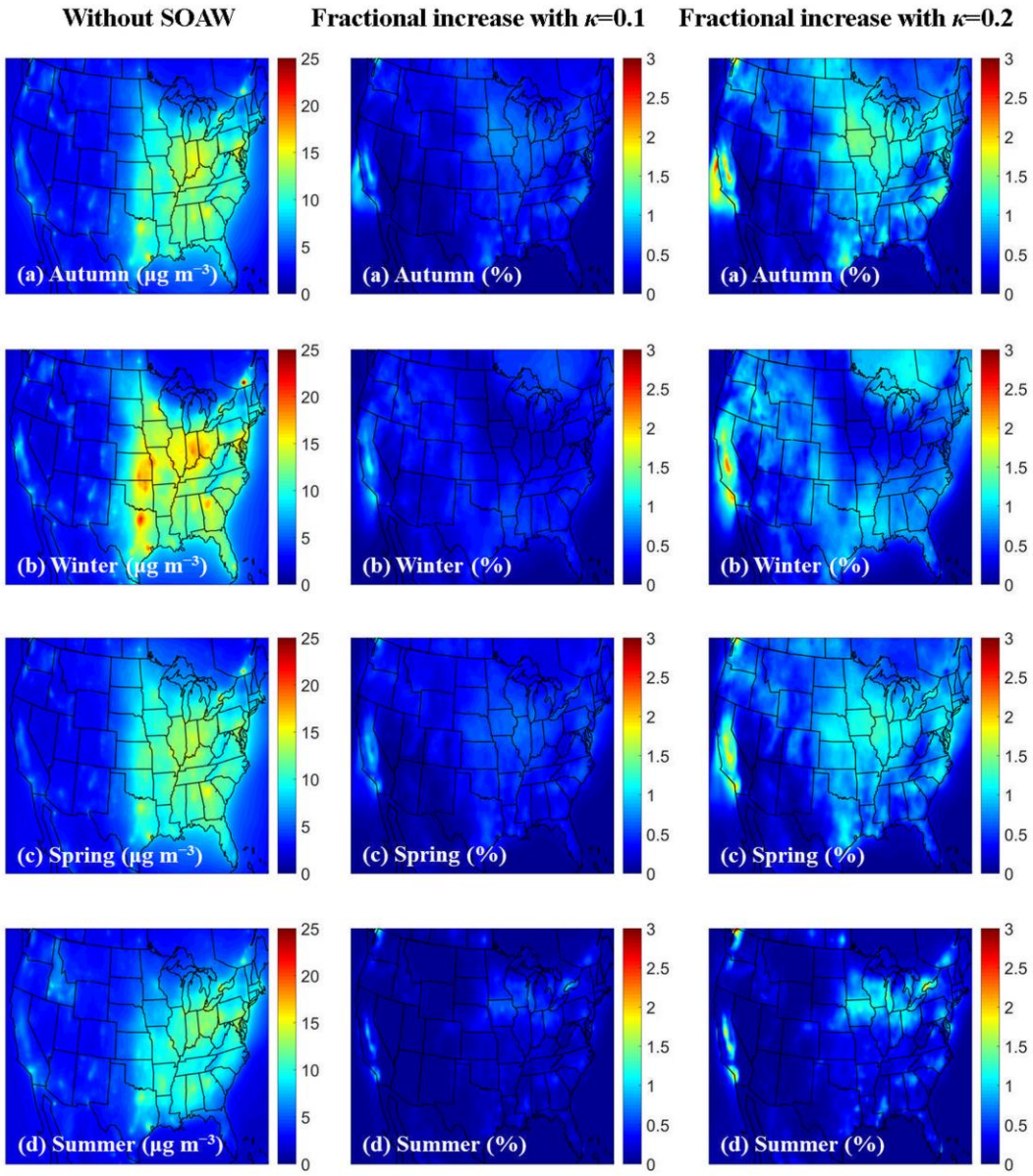

Figure S8. Average ground-level concentrations of total dry PM_1 neglecting SOAW (in μg m^{-3}) and the fractional increase when SOAW is present in the simulations with κ=0.1 and κ=0.2 during: **(a)** autumn, **(b)** winter, **(c)** spring, and **(d)** summer of 2010.