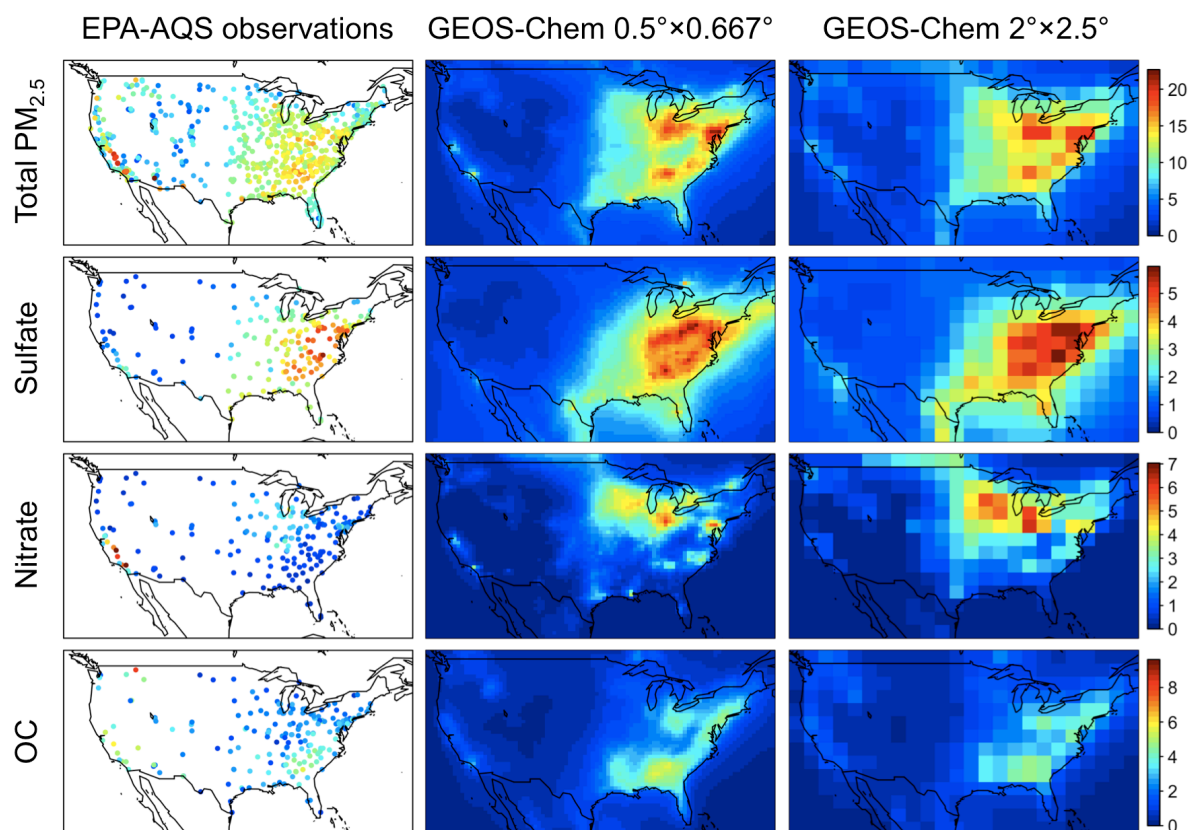


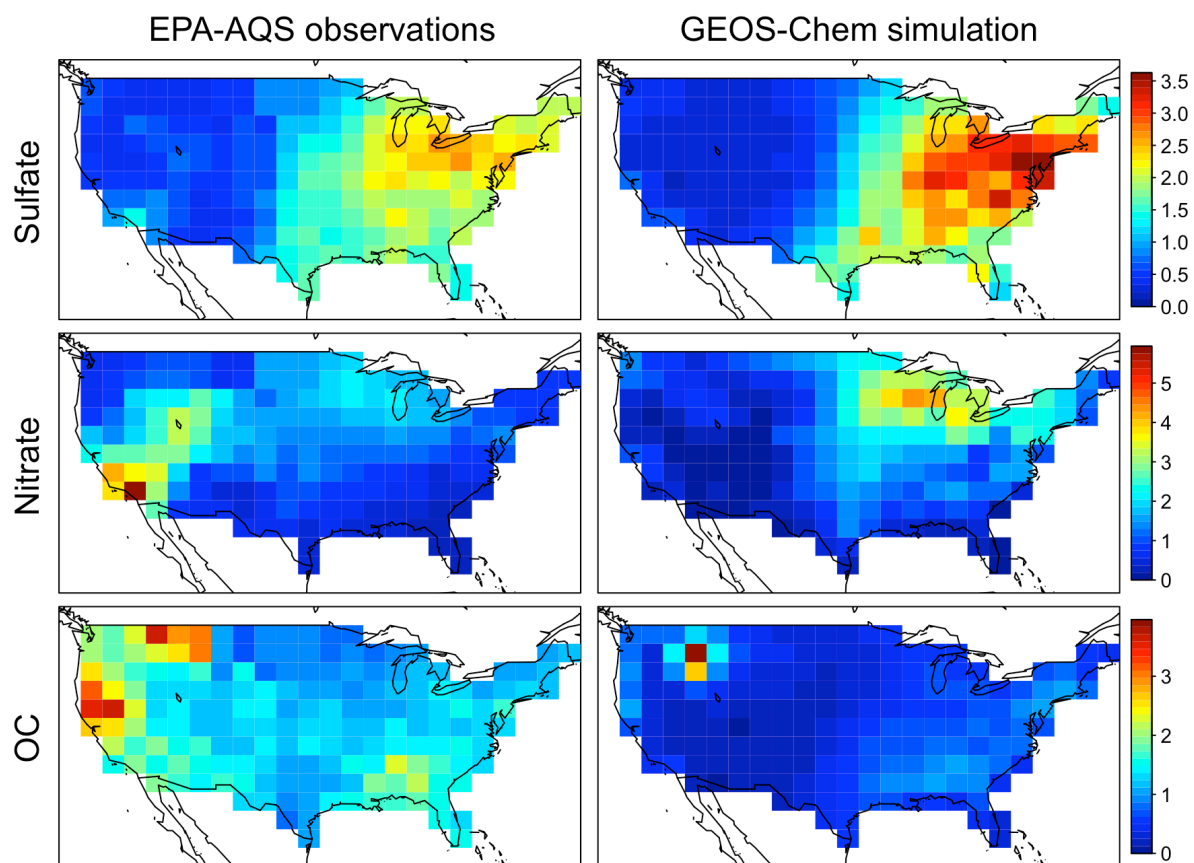
Supplementary Materials

Meteorological modes of variability for fine particulate matter (PM_{2.5}) air quality in the United States: implications for PM_{2.5} sensitivity to climate change

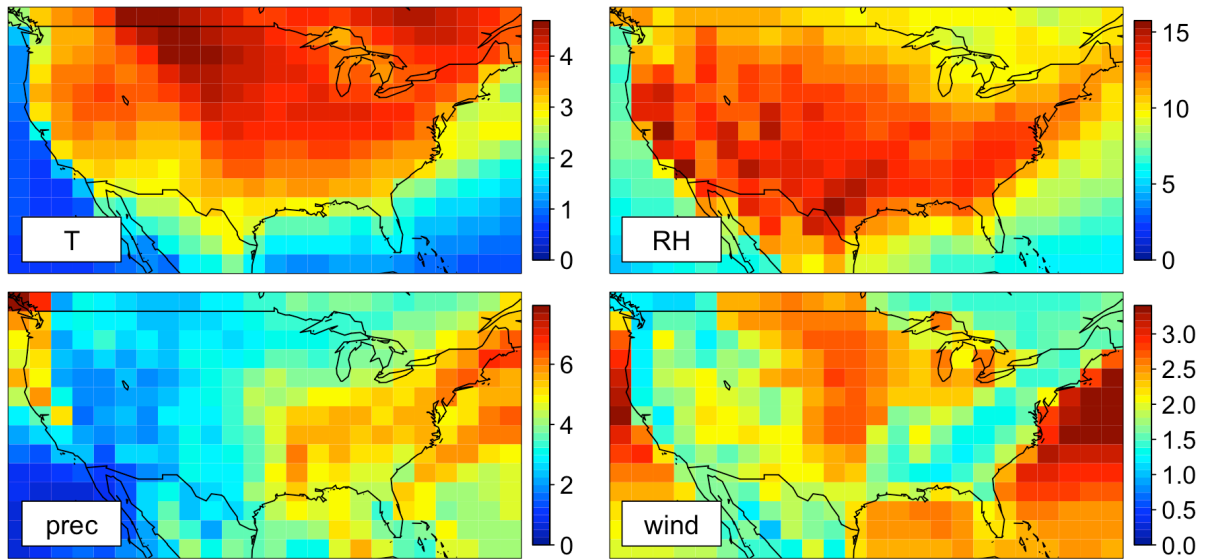
A. P. K. Tai, L. J. Mickey, D. J. Jacob, E. M. Leibensperger, L. Zhang, J. A. Fisher, H. O. T. Pye



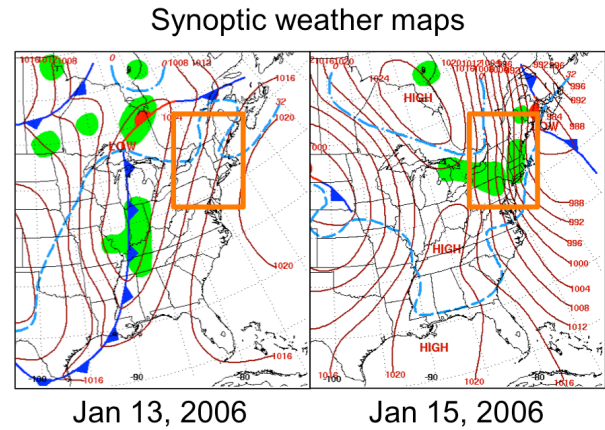
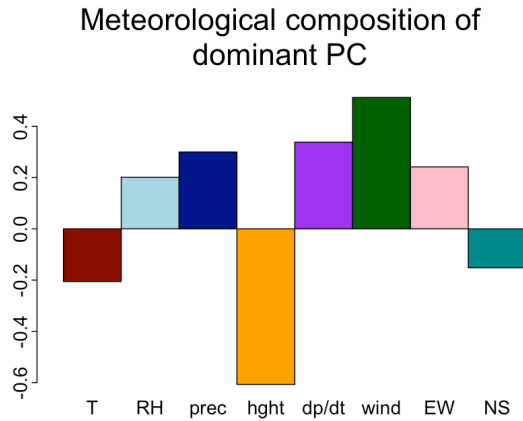
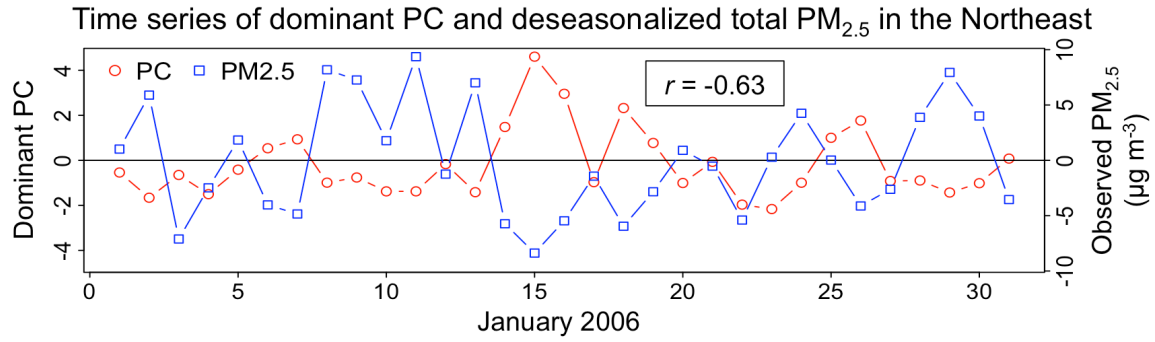
Annual mean observed (EPA-AQS) and simulated (GEOS-Chem) concentrations of total PM_{2.5}, sulfate, nitrate and organic carbon (OC) for 2006. GEOS-Chem results are shown for simulations at 0.5°×0.667° and 2°×2.5° resolution. Concentrations are in units of $\mu\text{g m}^{-3}$.



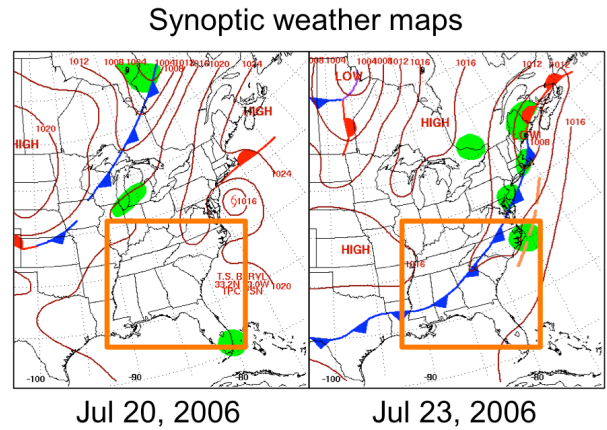
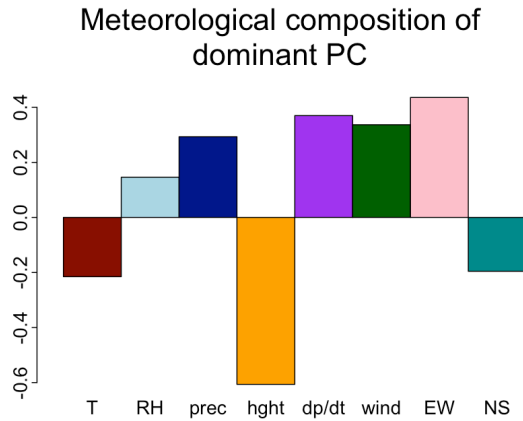
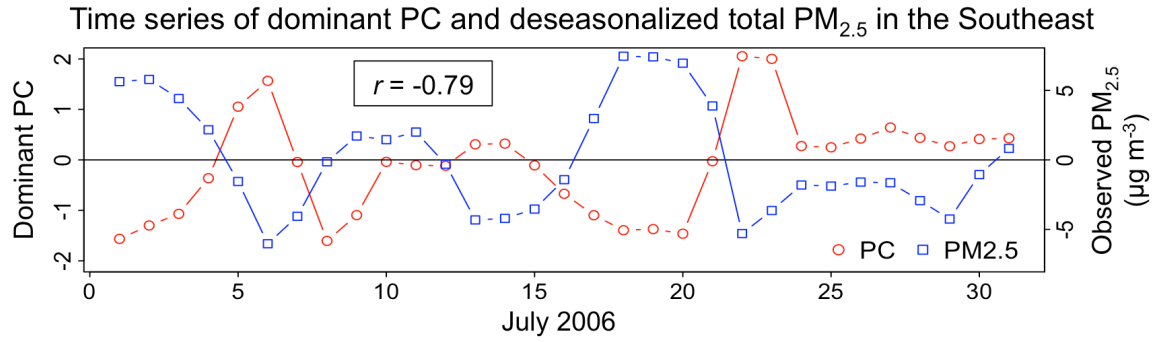
Standard deviations of deseasonalized concentrations of sulfate, nitrate and organic carbon (OC) for both observations (EPA-AQS) and simulations (GEOS-Chem).



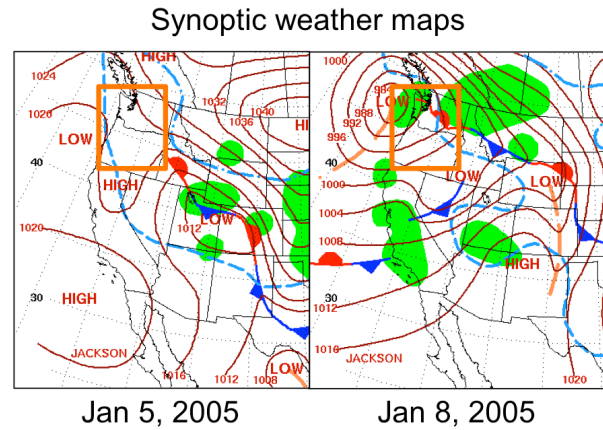
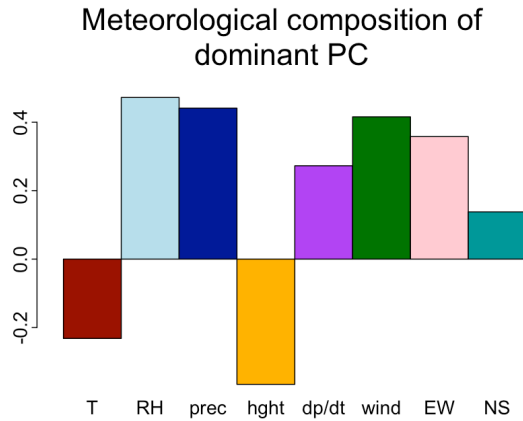
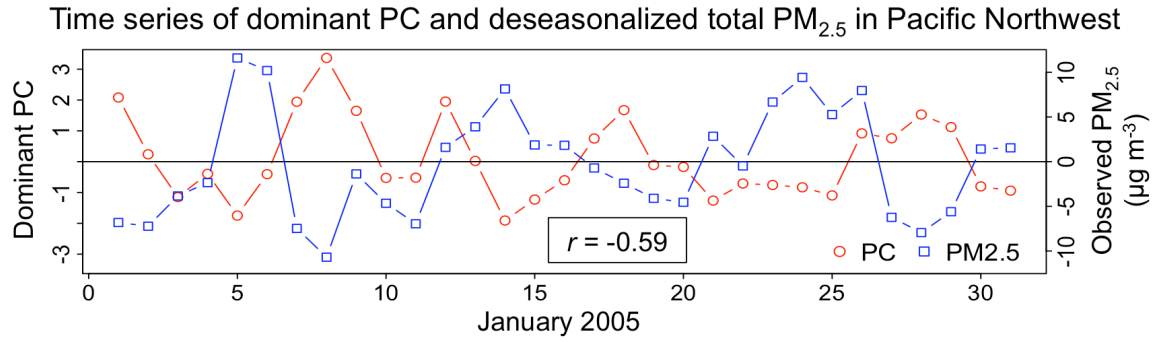
Standard deviations of deseasonalized GEOS-5 meteorological variables: temperature (K), relative humidity (%), precipitation (mm d⁻¹), and wind speed (m s⁻¹).



Dominant meteorological mode for observed PM_{2.5} variability in the Northeast inferred from the principal component analysis. Top panel: time series of deseasonalized observed total PM_{2.5} concentrations and the dominant meteorological mode or principal component (PC) in January 2006. Bottom left: composition of this dominant mode as measured by the coefficients α_{ki} in Eq. (3). Meteorological variables (x_k) are listed in Table 1. Bottom right: synoptic weather maps from the National Center for Environmental Prediction (NCEP) (<http://www.hpc.ncep.noaa.gov/dailywxmap/>) for 13 and 15 January, corresponding to maximum negative and positive influences from the principal component. The Northeast is delineated in orange.



Dominant meteorological mode for observed $PM_{2.5}$ variability in the Southeast inferred from the principal component analysis. Top panel: time series of deseasonalized observed total $PM_{2.5}$ concentrations and the dominant meteorological mode or principal component (PC) in July 2006. Bottom left: composition of this dominant mode as measured by the coefficients α_{ki} in Eq. (3). Meteorological variables (x_k) are listed in Table 1. Bottom right: synoptic weather maps from the National Center for Environmental Prediction (NCEP) (<http://www.hpc.ncep.noaa.gov/dailywxmap/>) for 20 and 23 July, corresponding to maximum negative and positive influences from the principal component. The Southeast is delineated in orange.



Dominant meteorological mode for observed PM_{2.5} variability in the Pacific Northwest inferred from the principal component analysis. Top panel: time series of deseasonalized observed total PM_{2.5} concentrations and the dominant meteorological mode or principal component (PC) in January 2005. Bottom left: composition of this dominant mode as measured by the coefficients α_{ki} in Eq. (3). Meteorological variables (x_k) are listed in Table 1. Bottom right: synoptic weather maps from the National Center for Environmental Prediction (NCEP) (<http://www.hpc.ncep.noaa.gov/dailywxmap/>) for 5 and 8 January, corresponding to maximum negative and positive influences from the principal component. The Pacific Northwest is delineated in orange.