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Anthropogenic fine particulate matter pollution will be exacerbated in eastern China due to 21st century GHG warming

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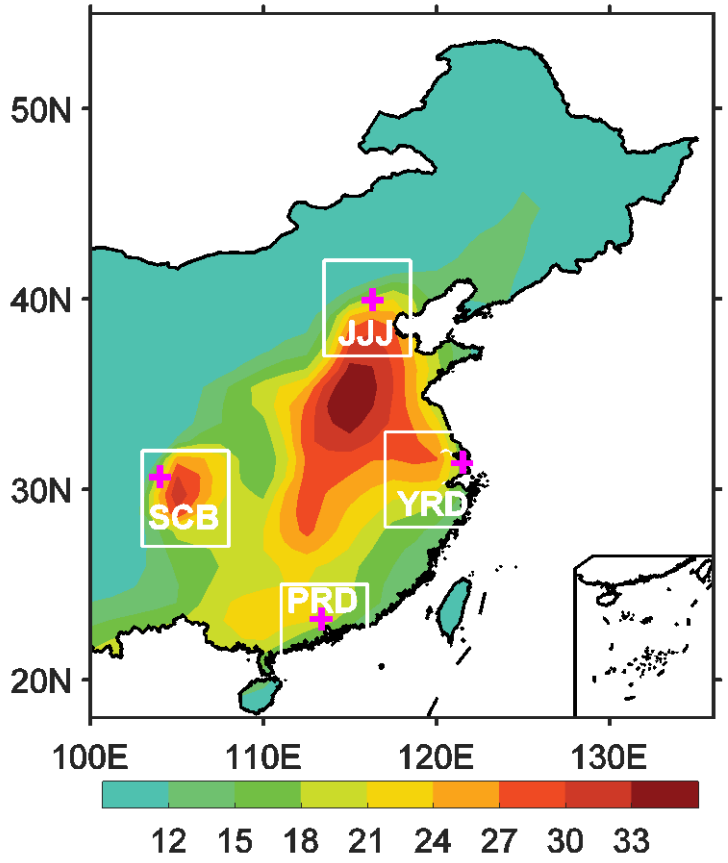

Figure S1. The simulated total $PM_{2.5}$ surface concentration (including sulfate, black carbon, primary organic matter, and secondary organic aerosols) during the years of 2006-2015 from RCP8.5_FixAerosol2005 experiment by CESM1. The boxes with 5° longitude by 5° latitude represent the four economic zones in China (JJJ: Beijing-Tianjin-Hebei; YRD: lower reach of Yangtze River valley; PRD: Pearl River Valley; SCB: Sichuan basin), in which the changes of air pollutions will be deeply discussed in the text. Units: $\mu g/m^3$.

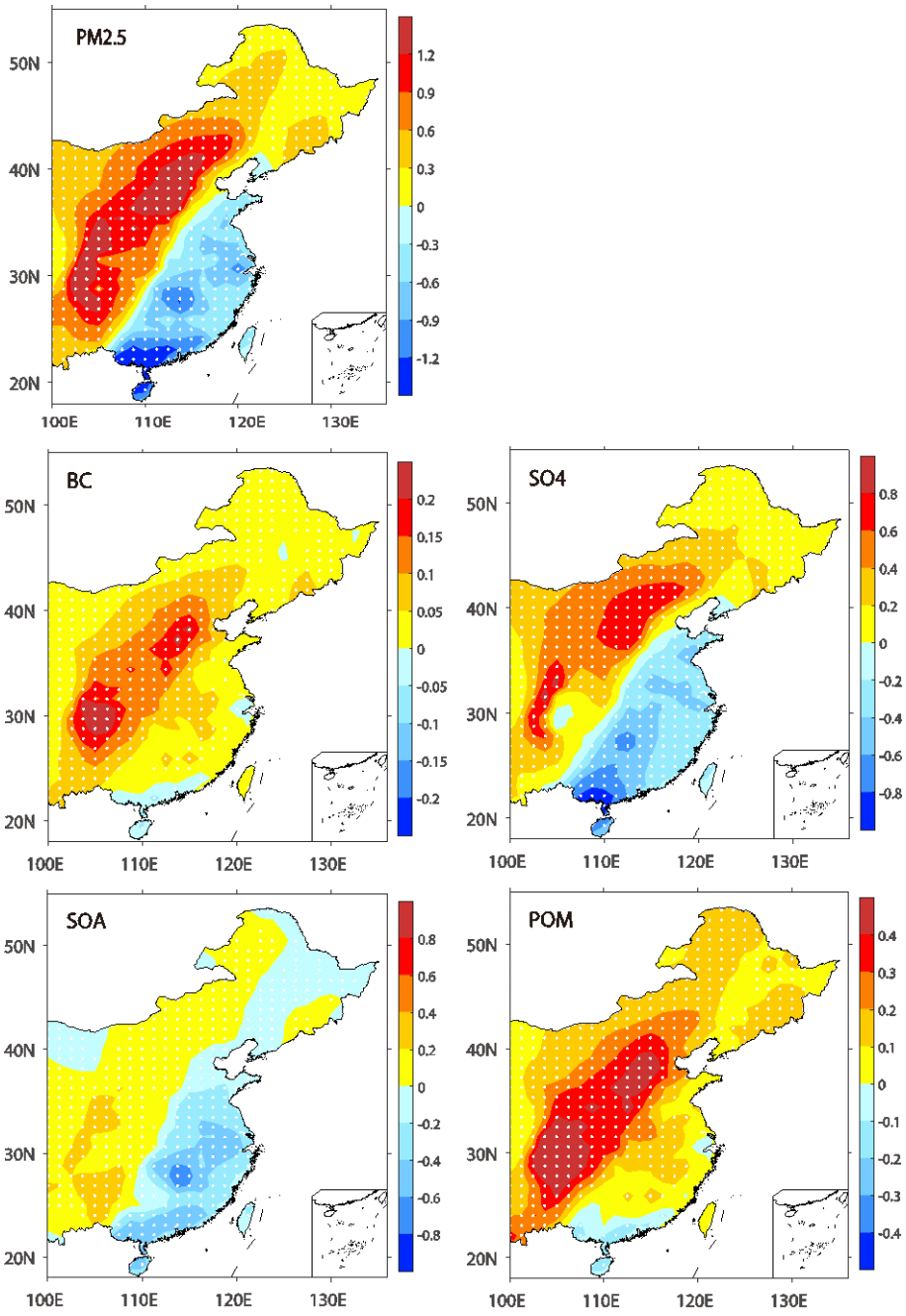

Figure S2. Simulated linear trends of the total $PM_{2.5}$ surface concentration as well as its associated species (BC, SO_4, SOA, and POM) across eastern China for the years of 2006-2099. The linear trends are calculated by the nonparametric Mann-Kendall and Sen's methods, and the significant trends with 0.01 significant level are illustrated by dots. Units: $\mu g/m^3/100a$.

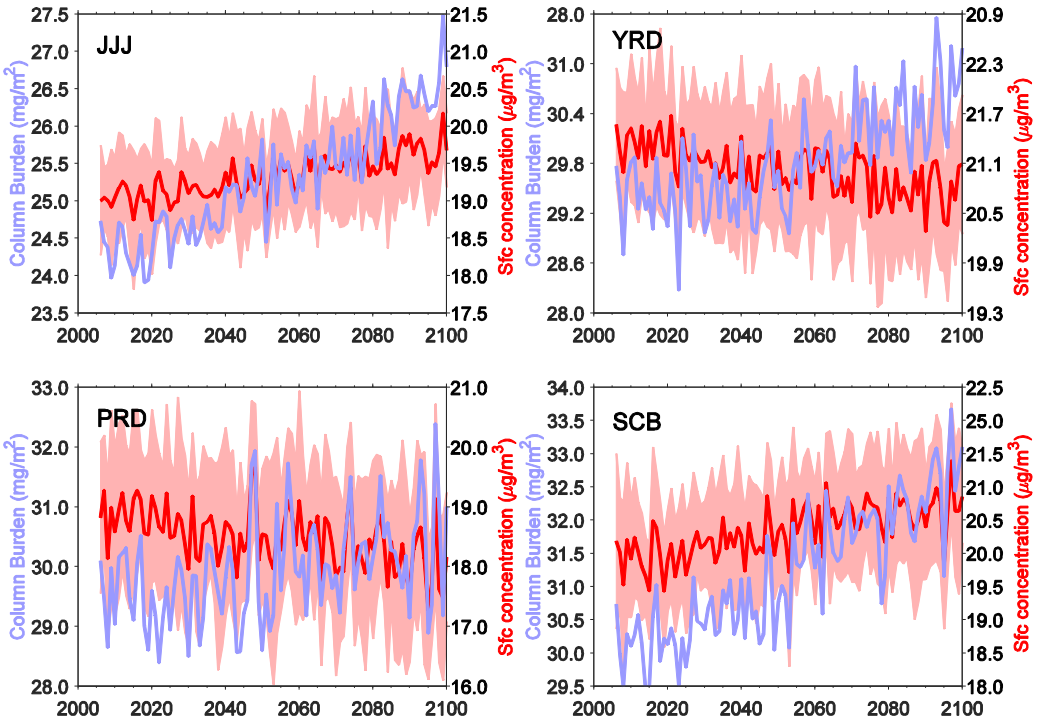

Figure S3. Plots of future changes of total $PM_{2.5}$ loadings averaged over four economic zones in China, including JJJ, YRD, PRD, and SCB, in term of the surface concentration (μg/m^3, right axis in red) and column burden (mg/m^2, left axis in blue) from the simulations of RCP8.5_FixAerosol2005 experiment. Ensemble variance (1 sigma) for surface concentration is shown in red shadings.

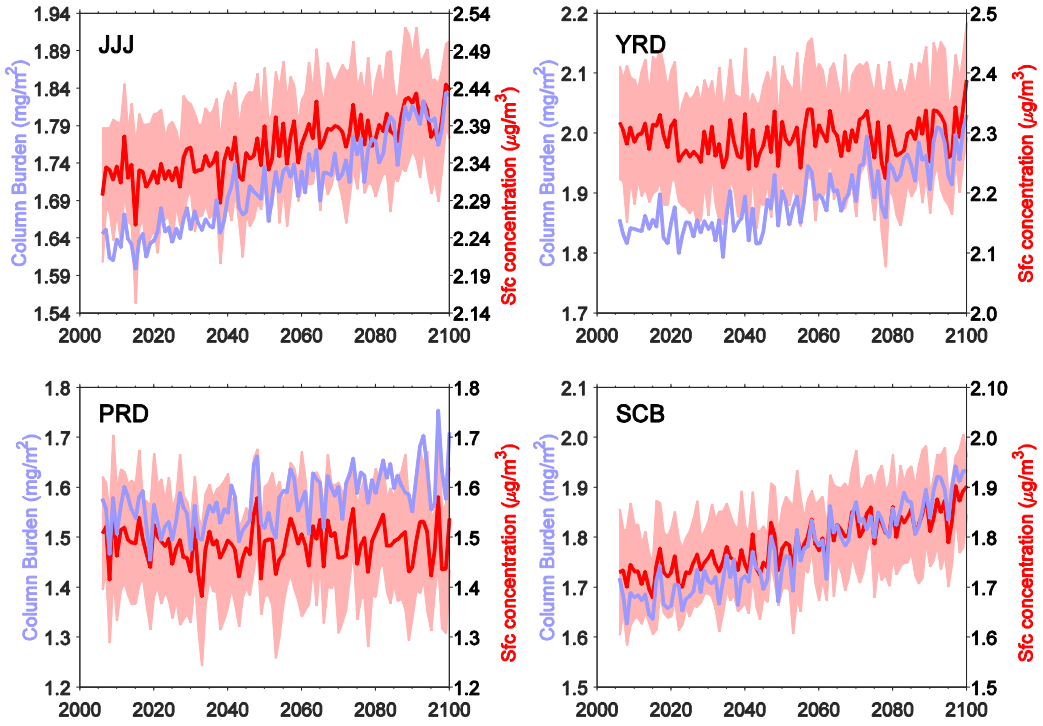

Figure S4. Similar to Figure S3 but for the BC.

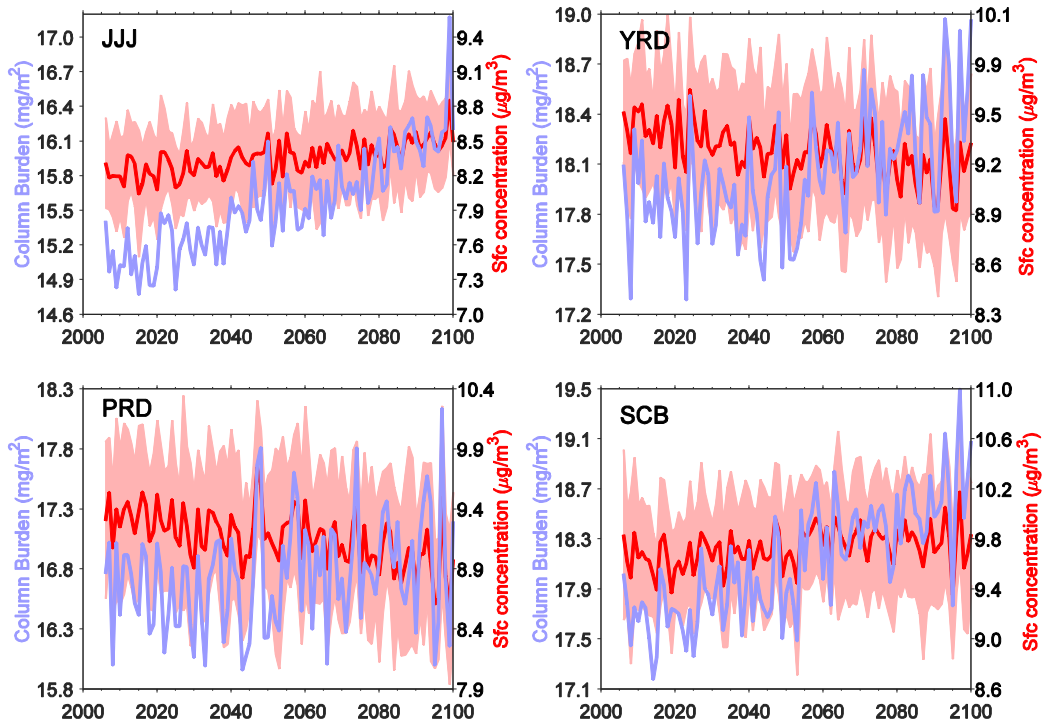

Figure S5. Similar to Figure S3 but for the SO_4.

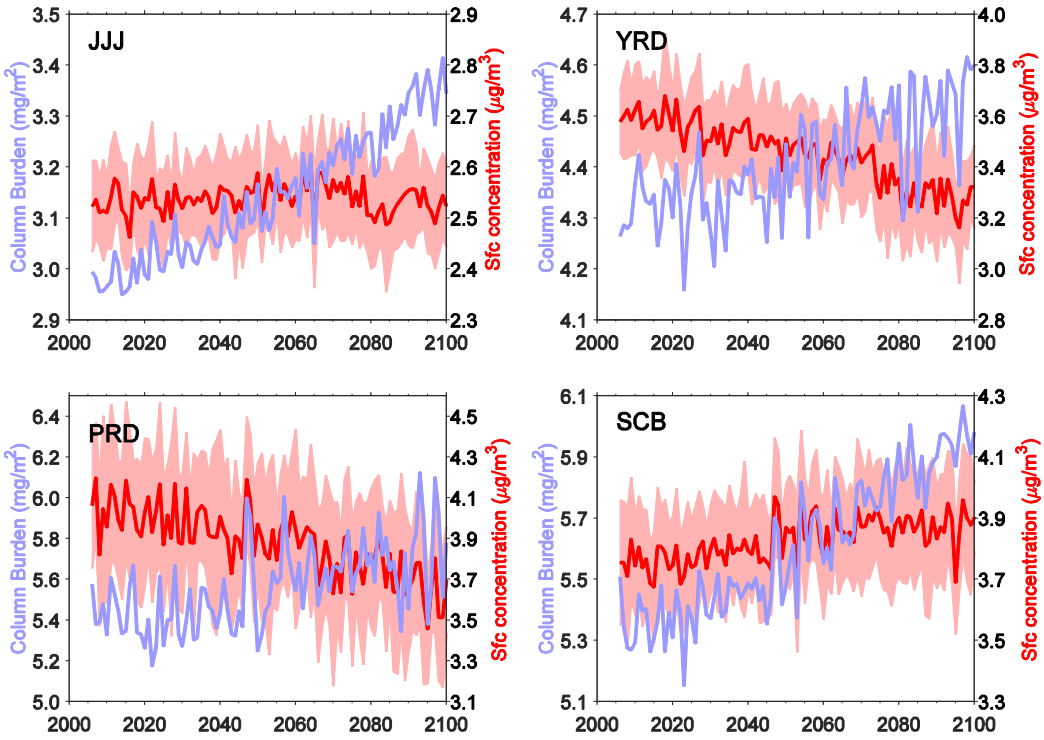

Figure S6. Similar to Figure S3 but for the SOA.

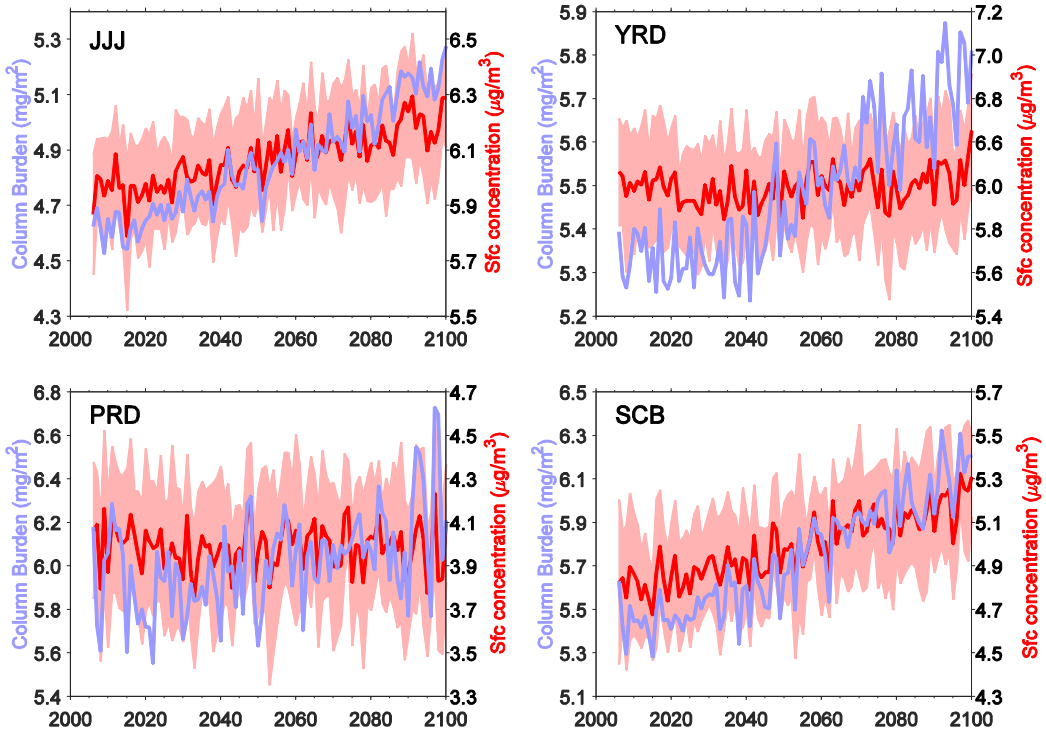

Figure S7. Similar to Figure S3 but for the POM.

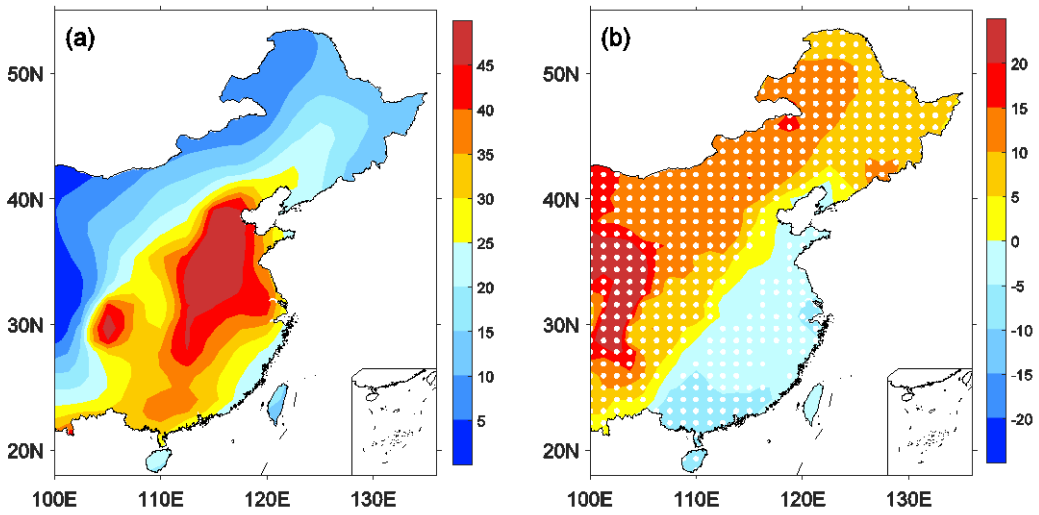

Figure S8. Changes of the anthropogenic $PM_{2.5}$ pollution days across eastern China from the RCP8.5_FixAerosol2005 experiment. The pollution days is defined as the daily $PM_{2.5}$ surface concentration exceeding the 90^{th} percentile threshold that estimated from the period of 2006-2015. Left panel illustrates the annual averaged air pollution days in 2006-2015 and right panel shows changes of the pollution days at the end of 21^{st} century with respect to 2006-2015. Dots mean the changes are significant at the 95% confidence level using Student T-test for all years and ensembles. Units: days.