Supplementary information for

Assessing the Sensitivity of Aerosol Mass Budget and Effective Radiative Forcing to Horizontal Grid Spacing in E3SMv1 Using A Regional Refinement Approach

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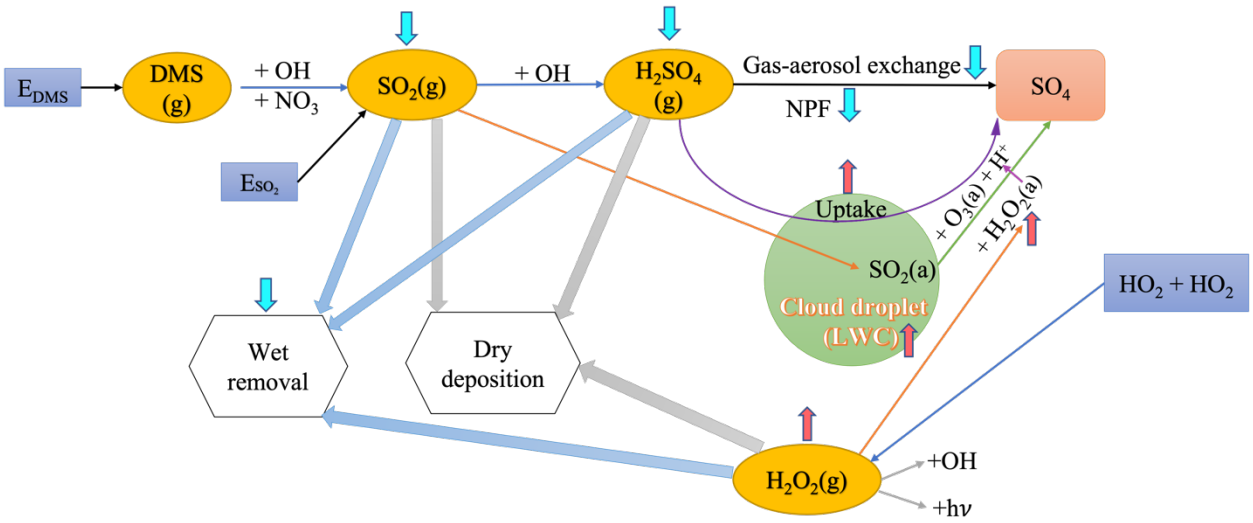

Figure S1. Schematic of the impact of RRM on sulfur chemistry. Red upward arrows indicate enhancement by RRM, while cyan downward arrows denote reduction by RRM.

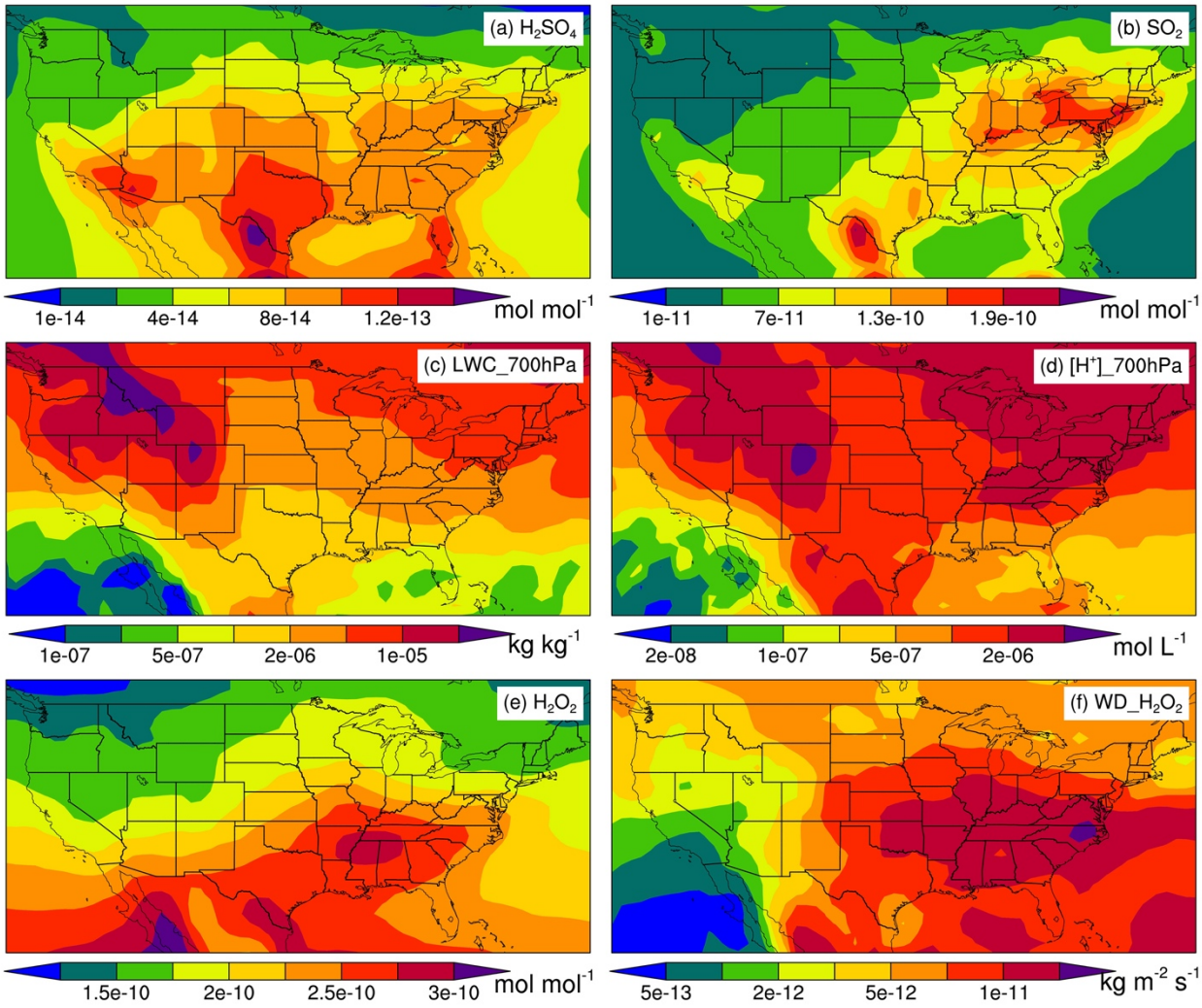

Figure S2. Spatial distributions of the annual mean (a) vertical-integrated gas-phase H_2SO_4 concentrations, (b) vertical-integrated gas-phase SO_2 concentrations, (c) large-scale cloud liquid water content at 700 hPa (kg_{water} kg_{air}^{-1}), (d) H^+ concentrations in large-scale cloud liquid water at 700 hPa, (e) vertical-integrated gas-phase H_2O_2 concentrations, and (f) wet deposition fluxes of gas-phase H_2O_2 from the LR simulation.

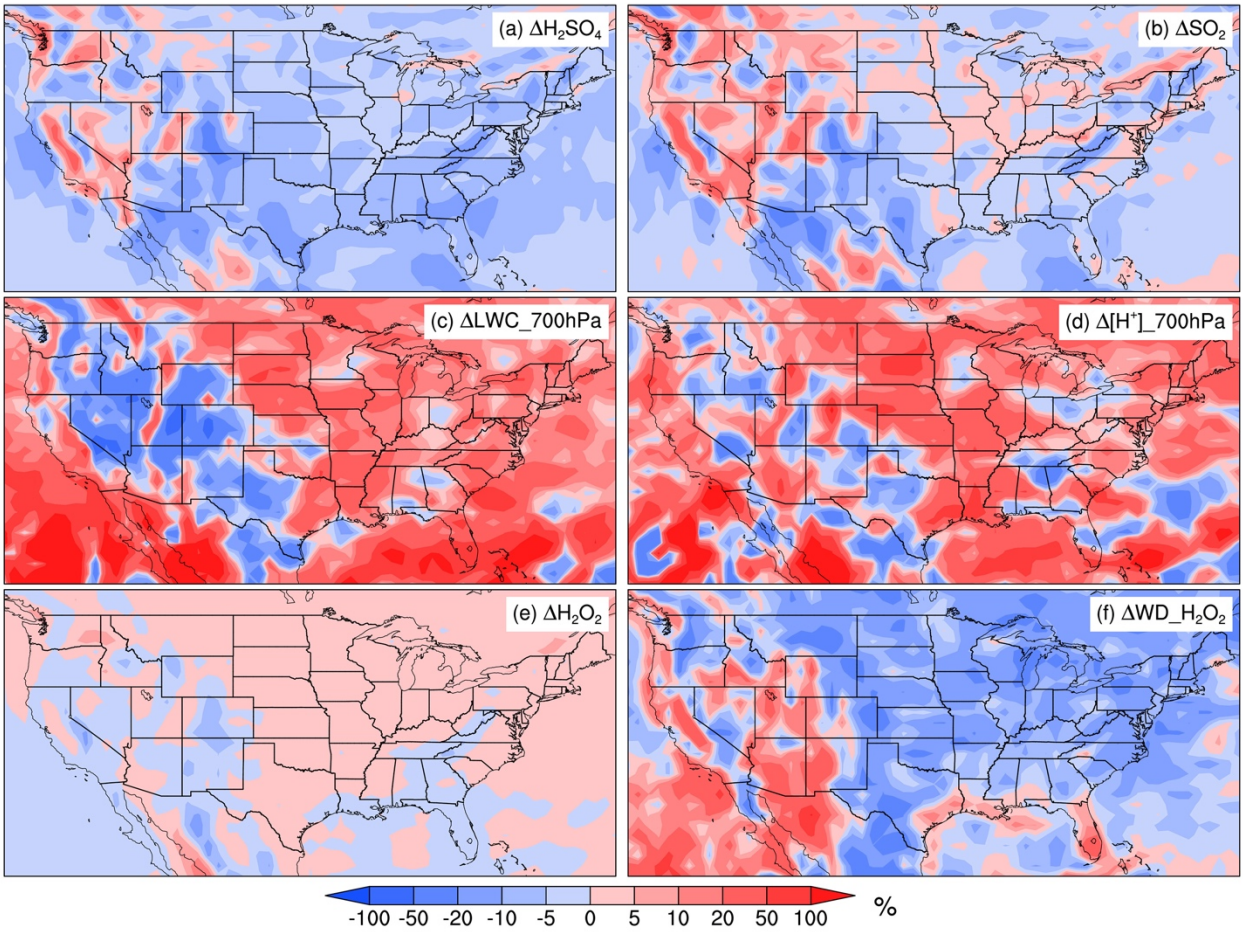

Figure S3. The same as Figure S2 but for the relative differences between the RRM and LR simulations.

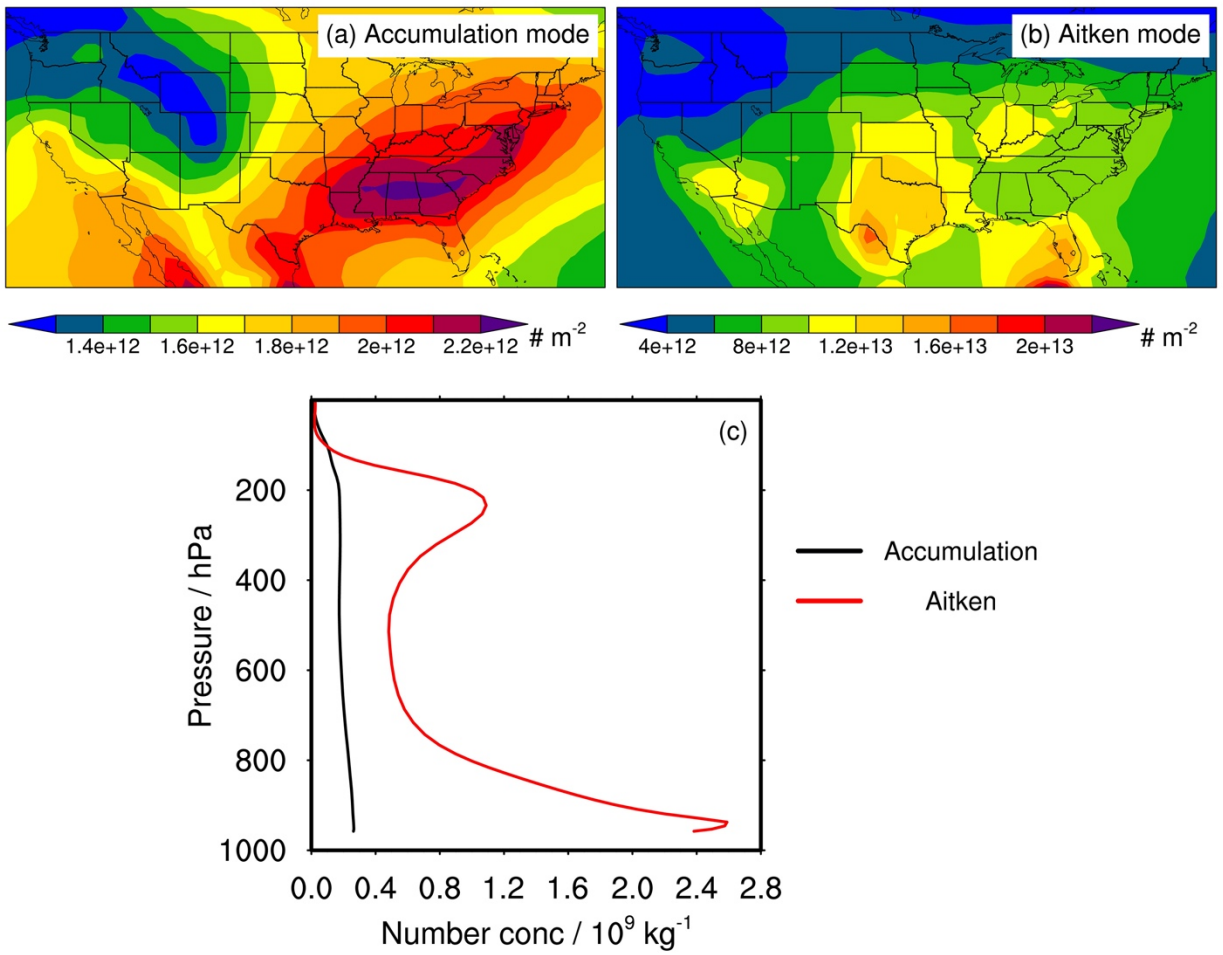

Figure S4. (a, b) Spatial distributions of annual mean vertical-integrated IAP number concentrations (# m^{-2}) for (a) accumulation and (b) Aitken modes from the LR simulation. (c) Vertical profiles of annual regional mean IAP number concentrations (10^9 kg_{air}^{-1}) for accumulation and Aitken modes from the LR simulation.

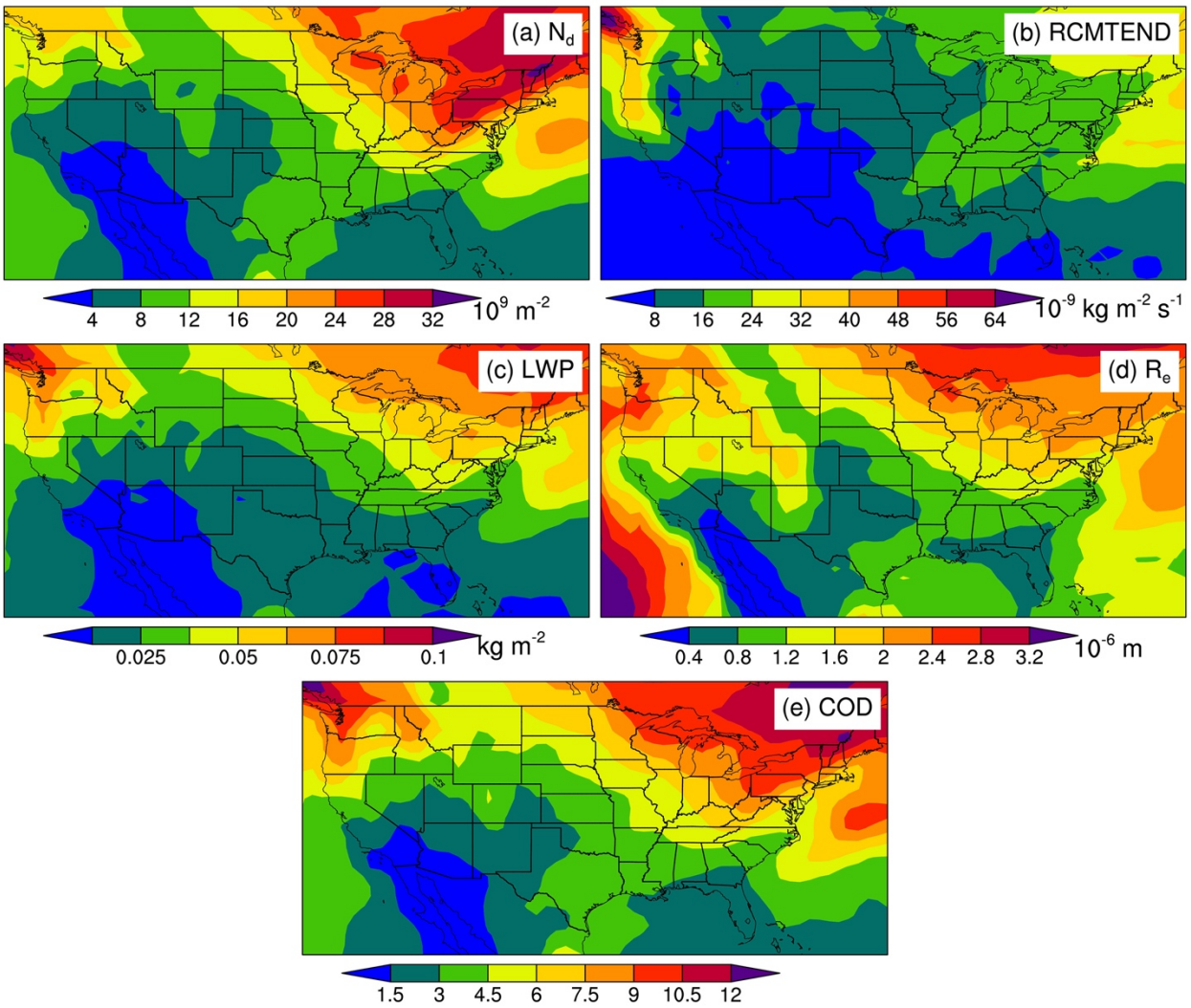

Figure S5. Same as Figure 12 but for the LR simulation results.

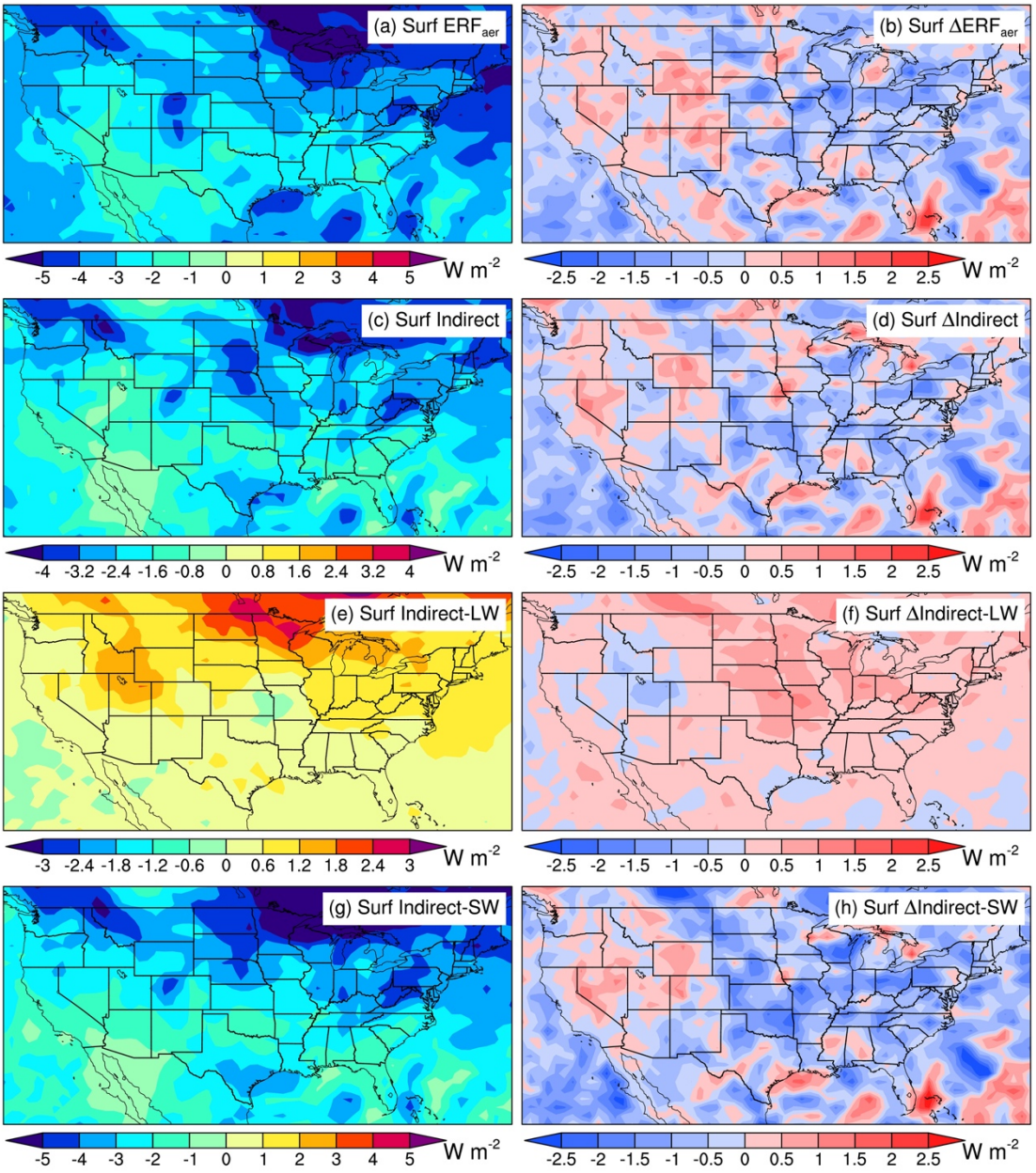

Figure S6. Same as Figure 13 but for surface ERF$_{aer}$.