

Supplementary figures

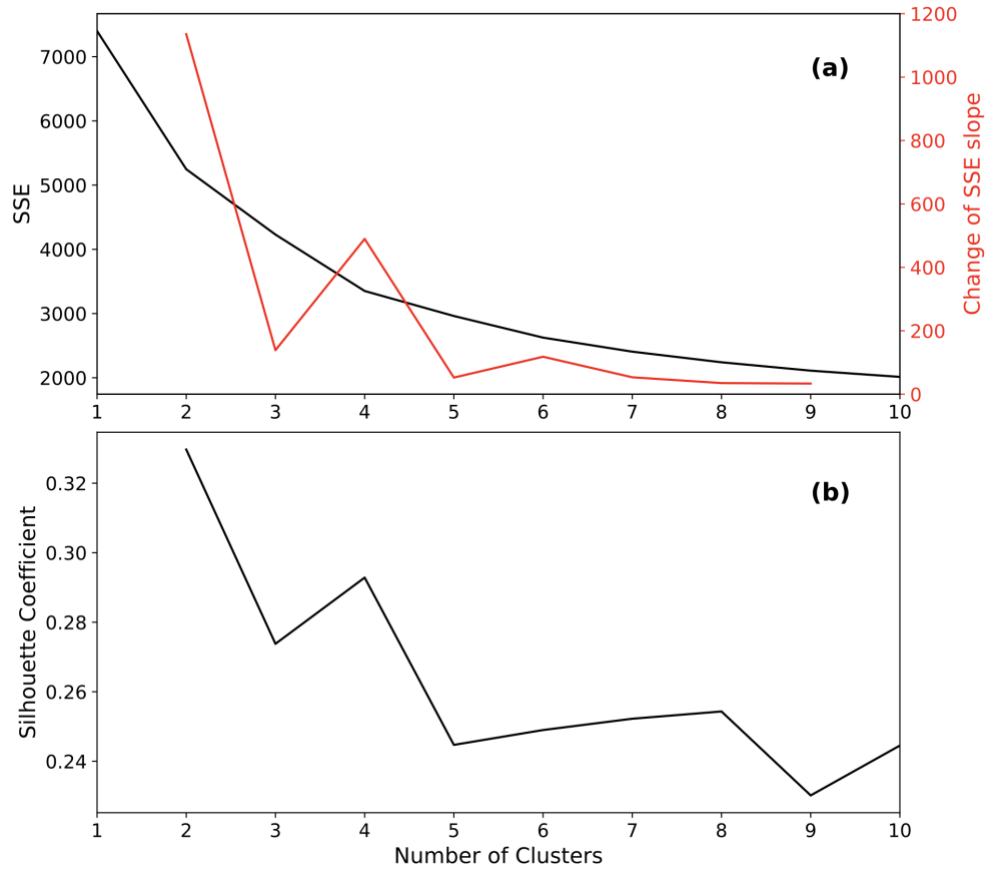


Figure S1: (a) Sum of squared errors (SSE; left y-axis) and change of SSE slope (right y-axis; red) as K varies between 1 and 10. Both $K = 2$ and $K = 4$ appear as an “elbow” in the plot where the further increase in K does not substantially reduce SSE. The change of SSE slope shown in red (right y-axis), defined as $(SSE_{K+1} - SSE_K) - (SSE_K - SSE_{K-1})$ where positive and negative values imply a slowdown and acceleration of SSE reduction, respectively, confirms this finding. (b) Silhouette Coefficient for K between 2 and 10 where values are relatively high at $K = 2$ and $K = 4$.

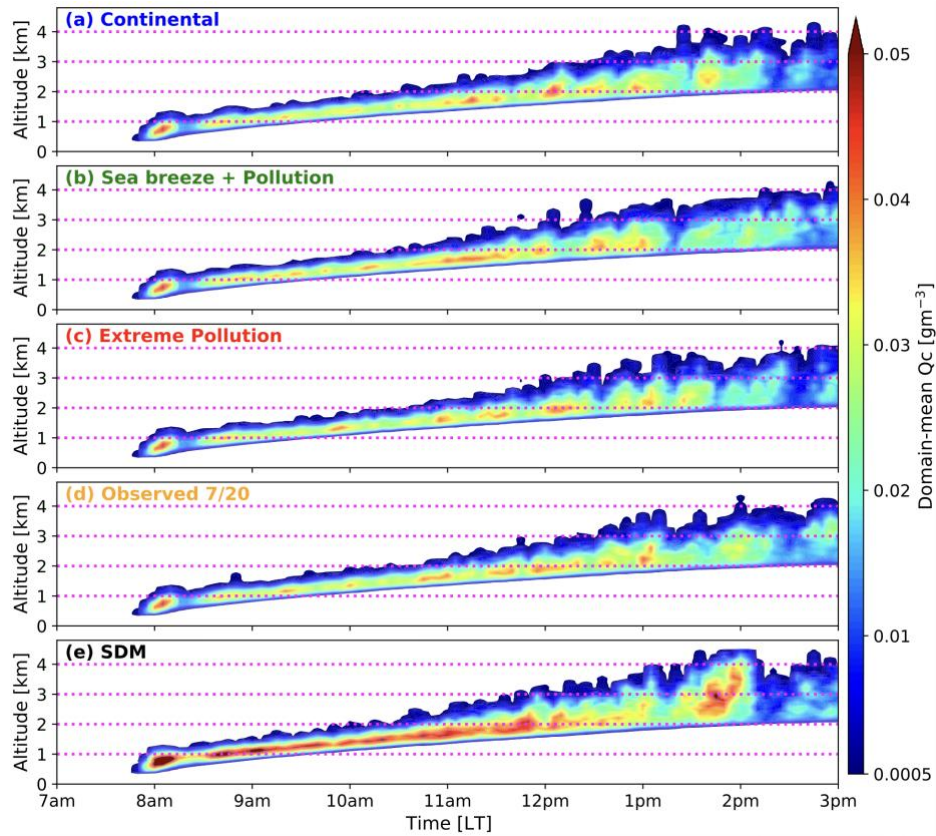


Figure S2: Domain-mean cloud mass [gm^{-3}] in the CM1 simulations using the Morrison bulk microphysics scheme with (a) Continental, (b) Sea breeze + Pollution, (c) Extreme Pollution, (d) Observed aerosols, and using (e) the SDM.

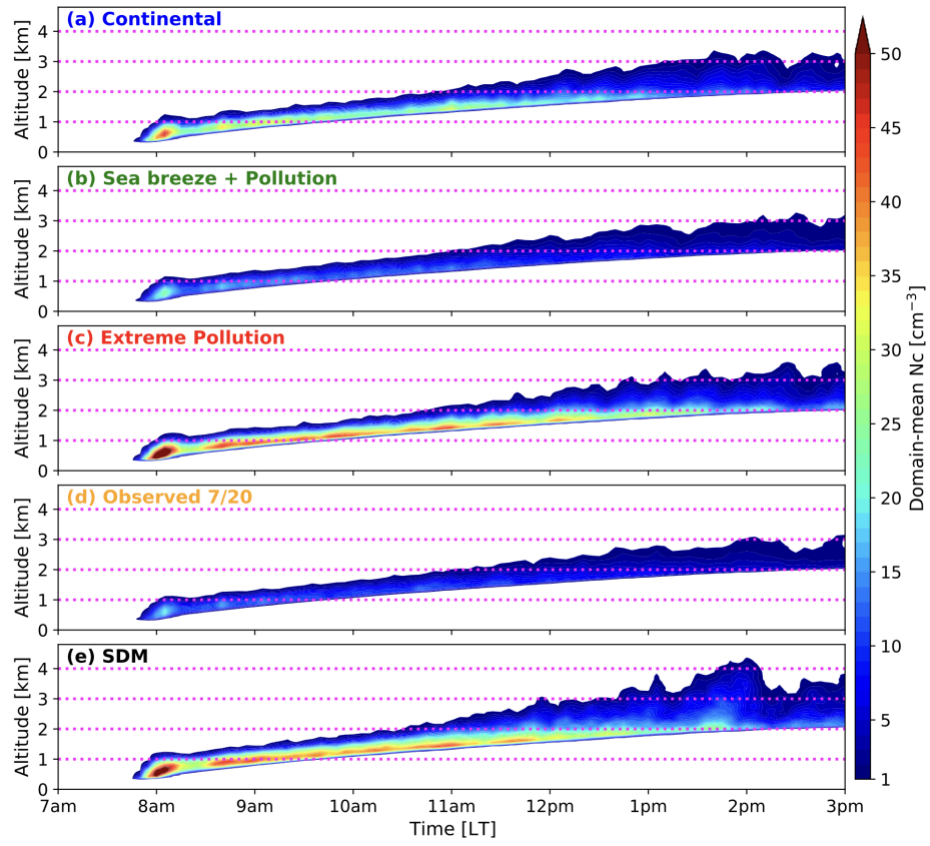


Figure S3: Same as Figure S2 but for domain-mean droplet number concentration [cm^{-3}].

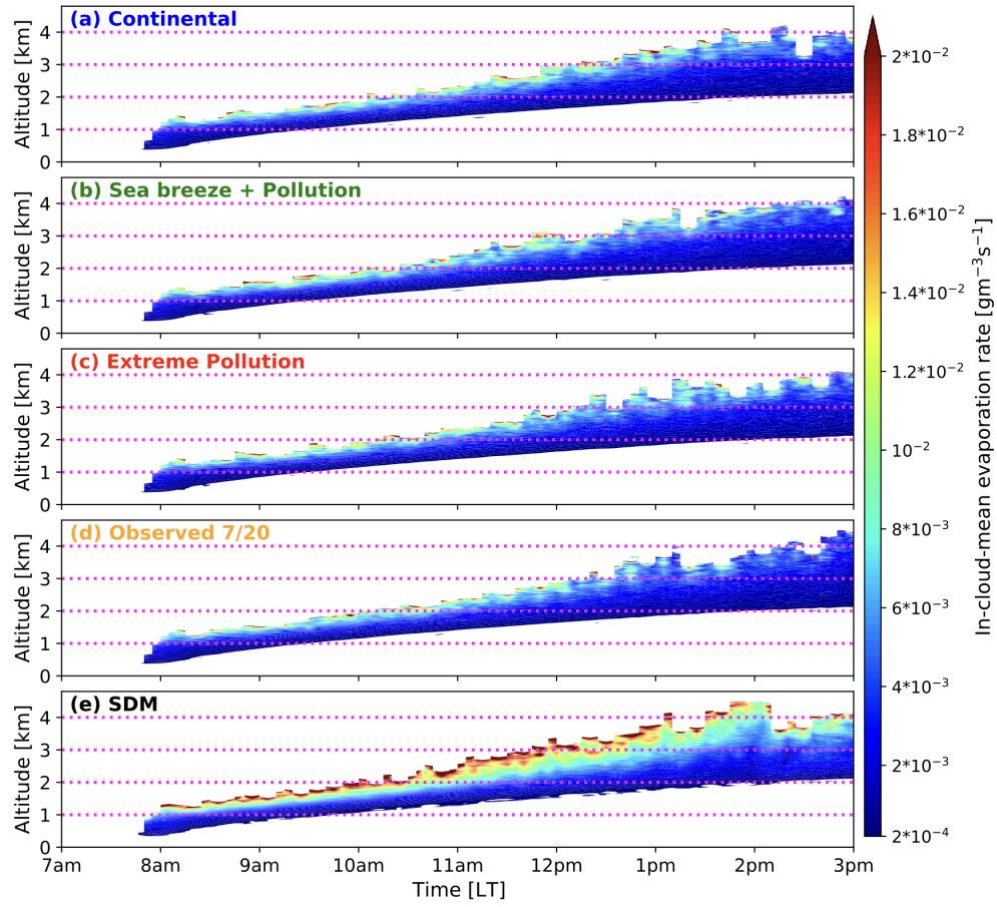


Figure S4: Same as Figure S2 but for in-cloud-mean evaporation rate [$\text{gm}^{-3}\text{s}^{-1}$].