

The impact of human-induced climate change on potential tornado intensity as revealed through multi-scale modeling

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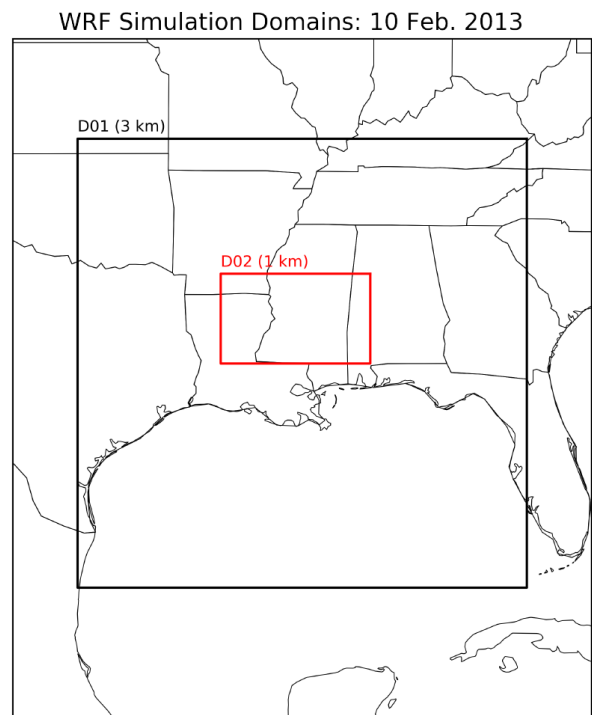
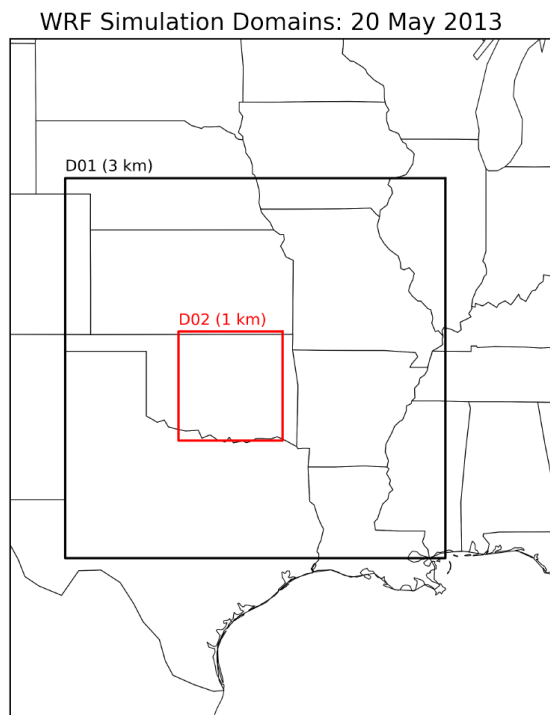
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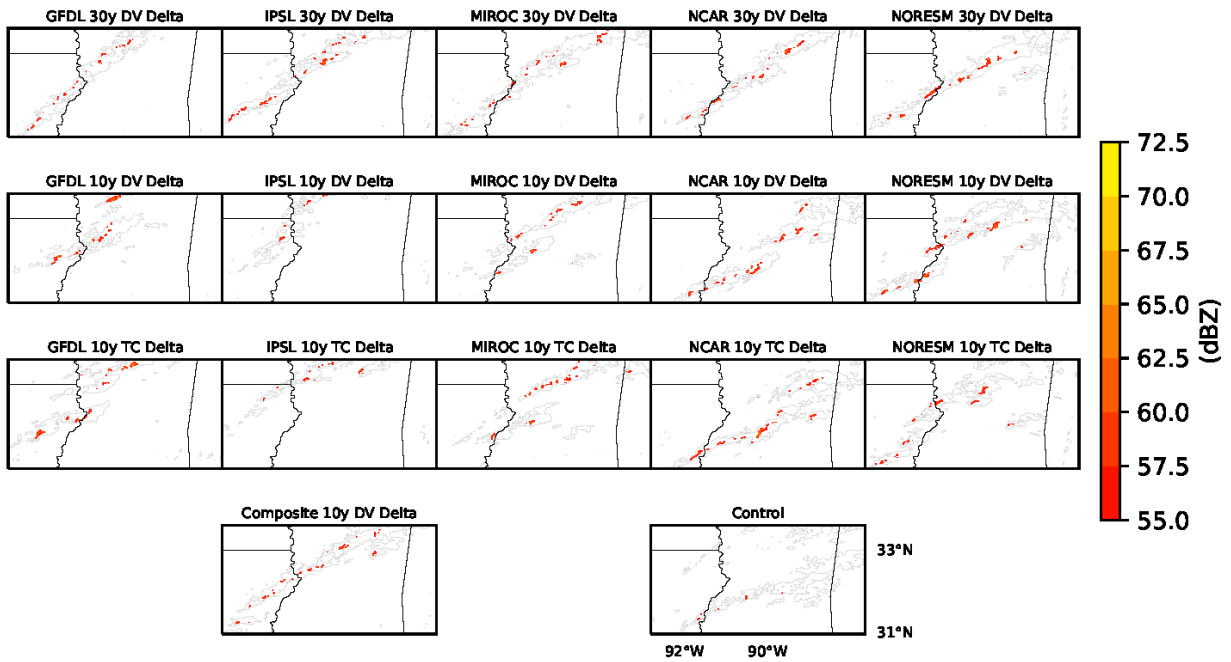
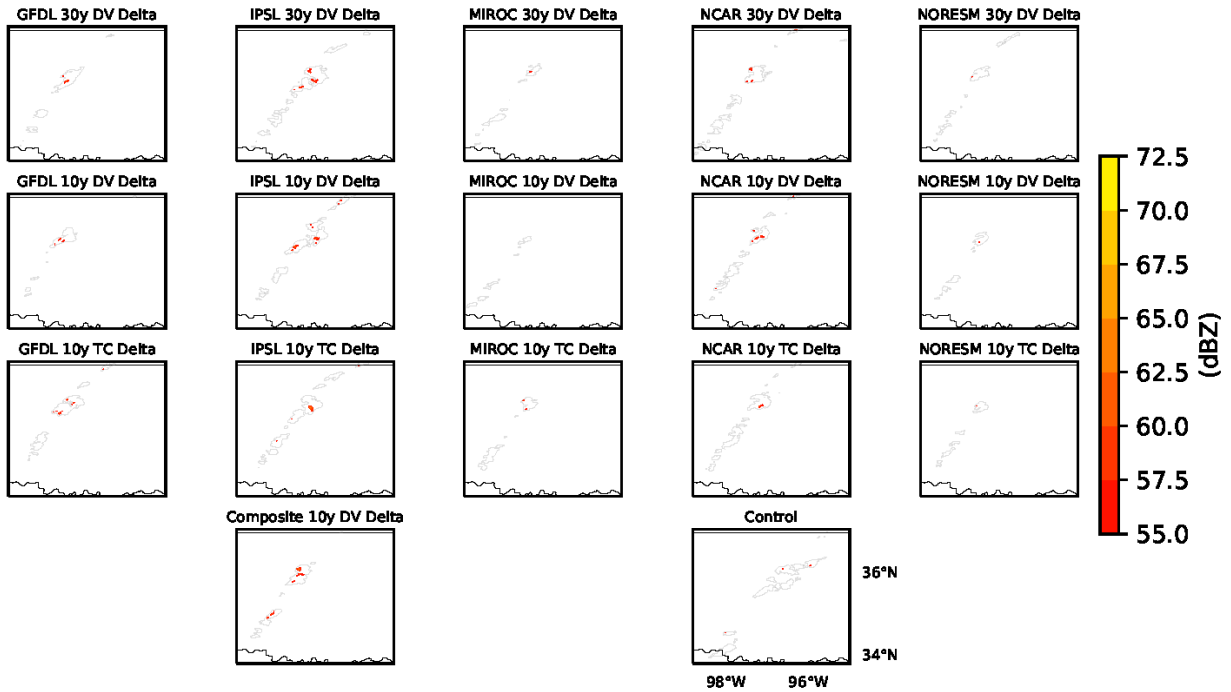
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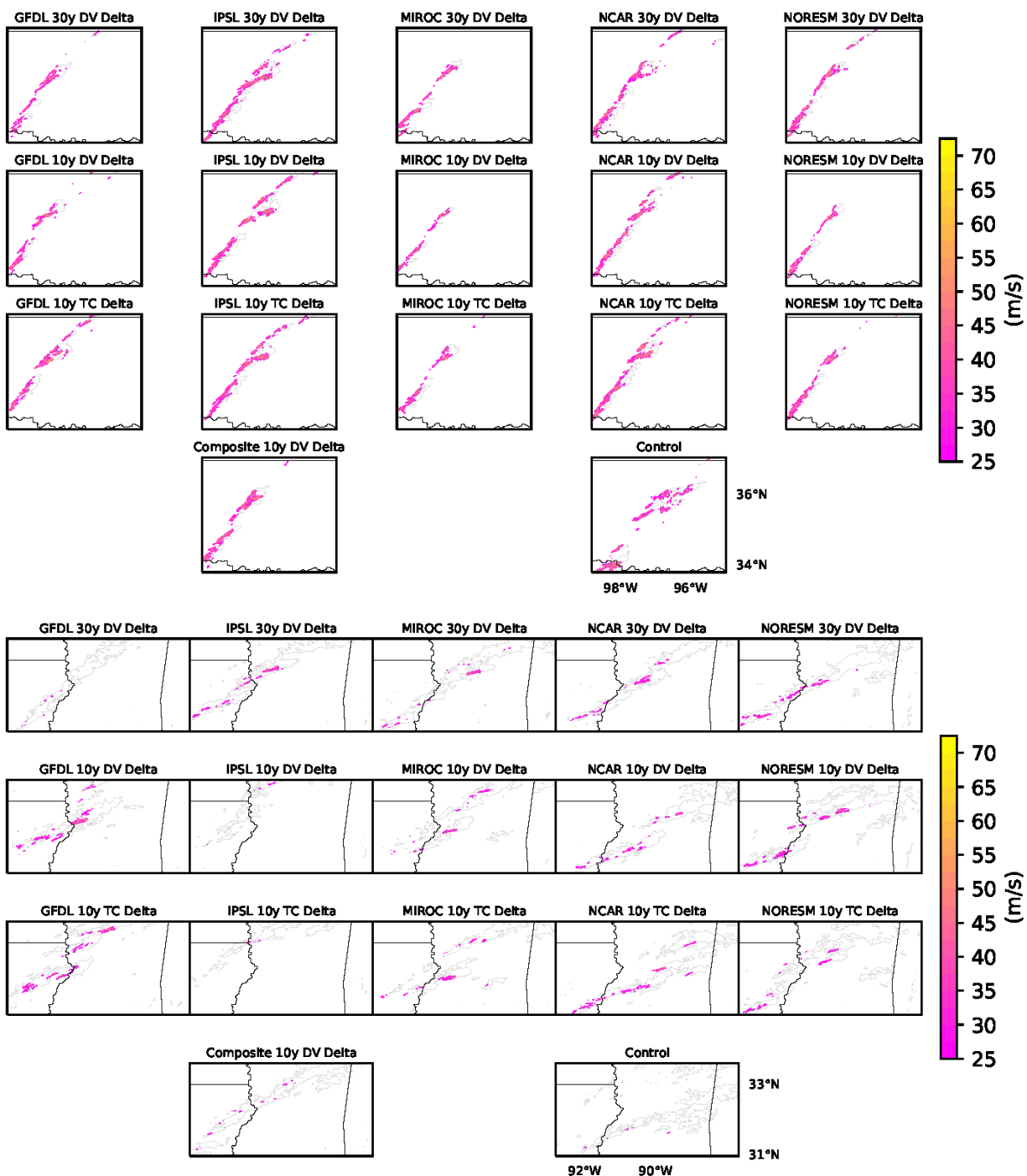
Supplementary Material



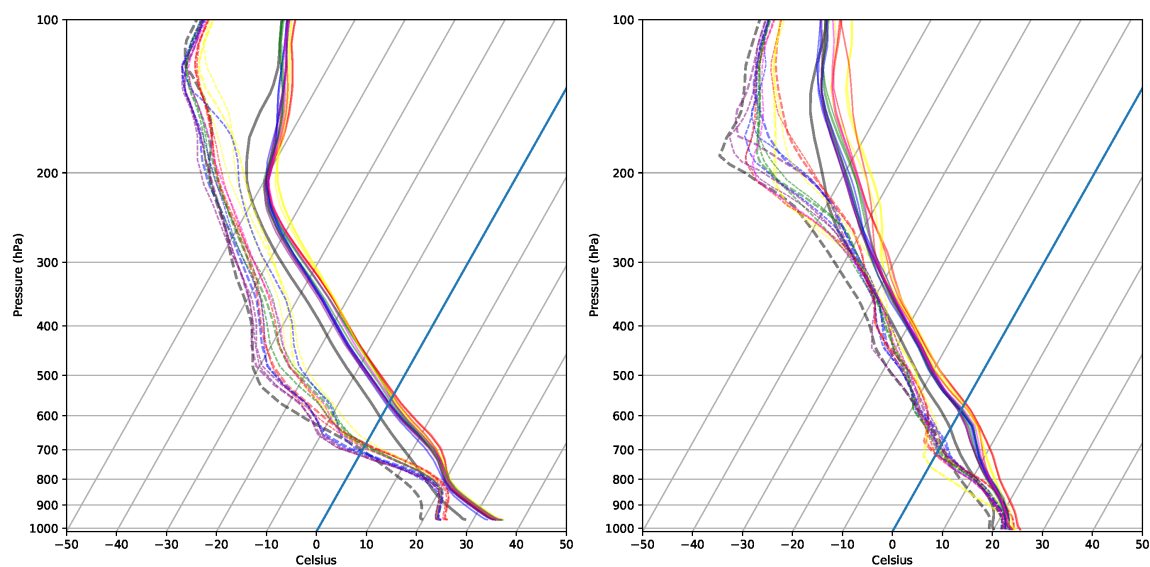
Supplemental Figure S1. Computational domains used for the regional model (WRF) simulations of the 20 May 2013 (WARM) and 10 February 2013 (COOL) events.



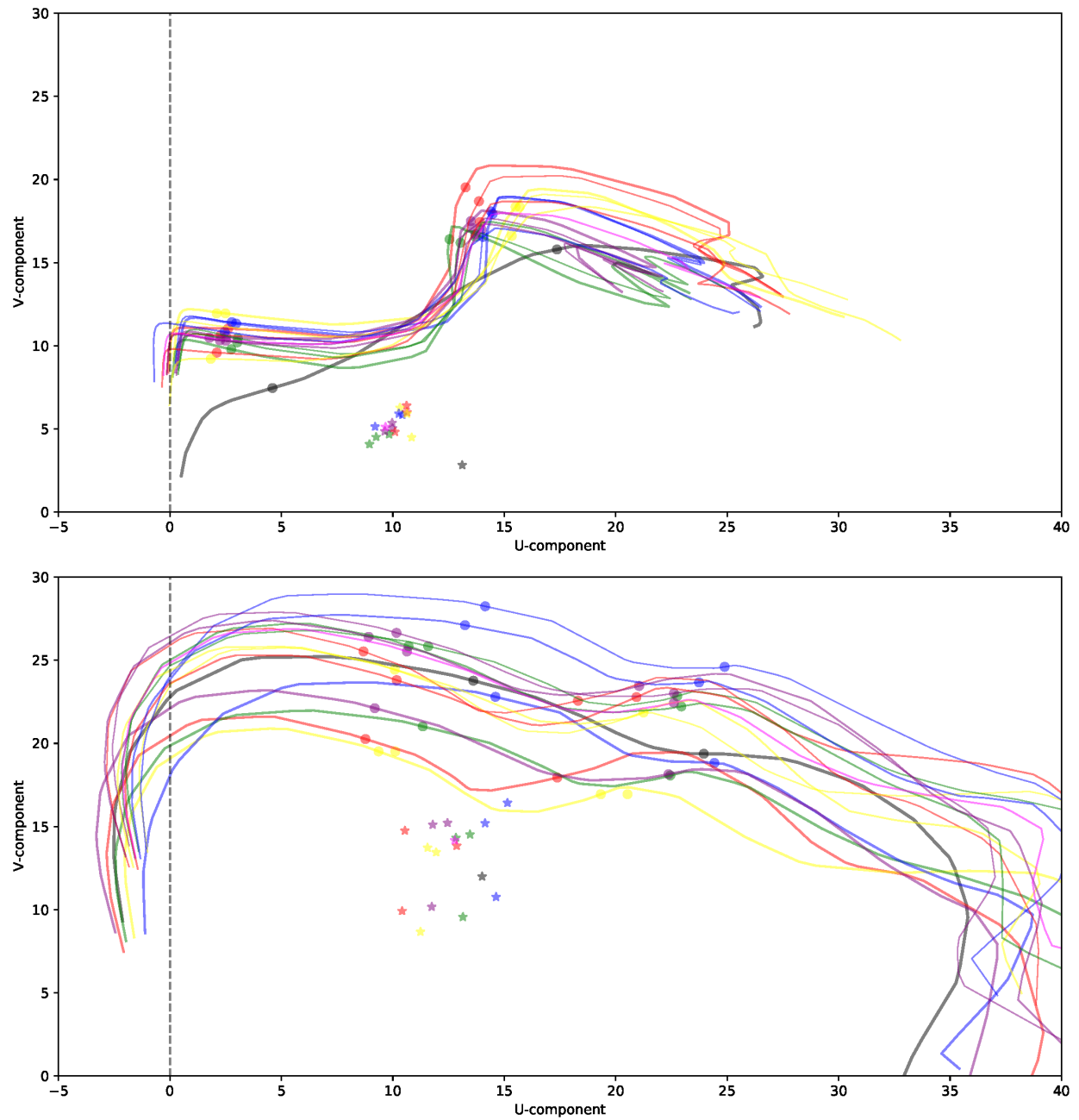
Supplemental Figure S2. Simulated radar reflectivity (dBZ) for the regional-modeling simulations of the WARM event (top panel; 2100 UTC) and COOL event (bottom panel; 0000 UTC). The color fill indicates the areas of intense convective storms over a given simulation. The gray contours are of 30 dBZ radar reflectivity, and show the outline of the convective storms. Each subpanel represents an individual experiment composing the ensemble. See section 2 for guidance on experiment nomenclature.



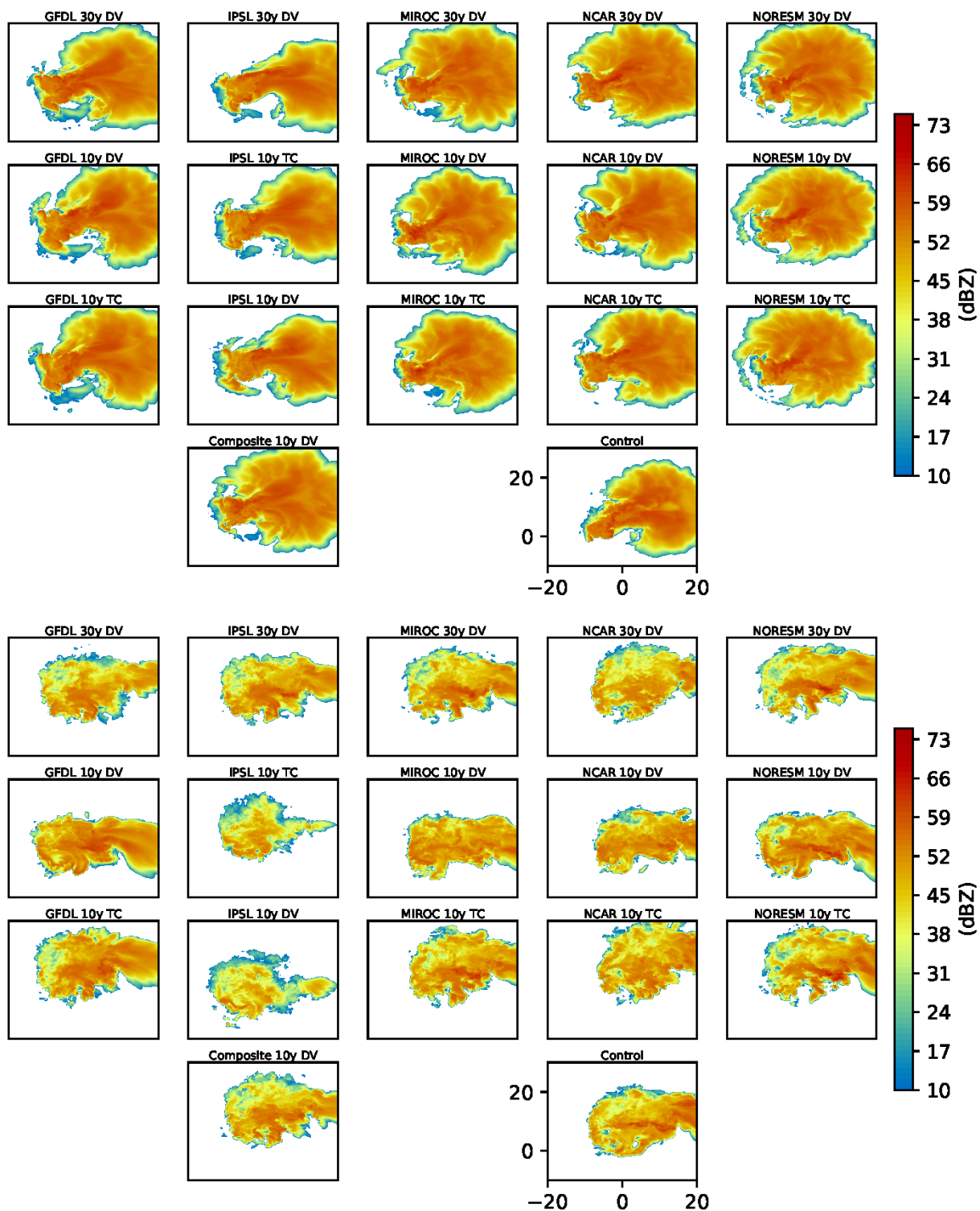
Supplemental Figure S3. Maximum vertical velocity (m/s) for the regional-modeling simulations of the WARM event (top panel; 2100 UTC) and COOL event (bottom panel; 0000 UTC). The color fill indicates the areas of intense updrafts over a given simulation. The gray contours are of 30 dBZ radar reflectivity, and show the outline of the convective storms. Each subpanel represents an individual experiment composing the ensemble. See section 2 for guidance on experiment nomenclature.



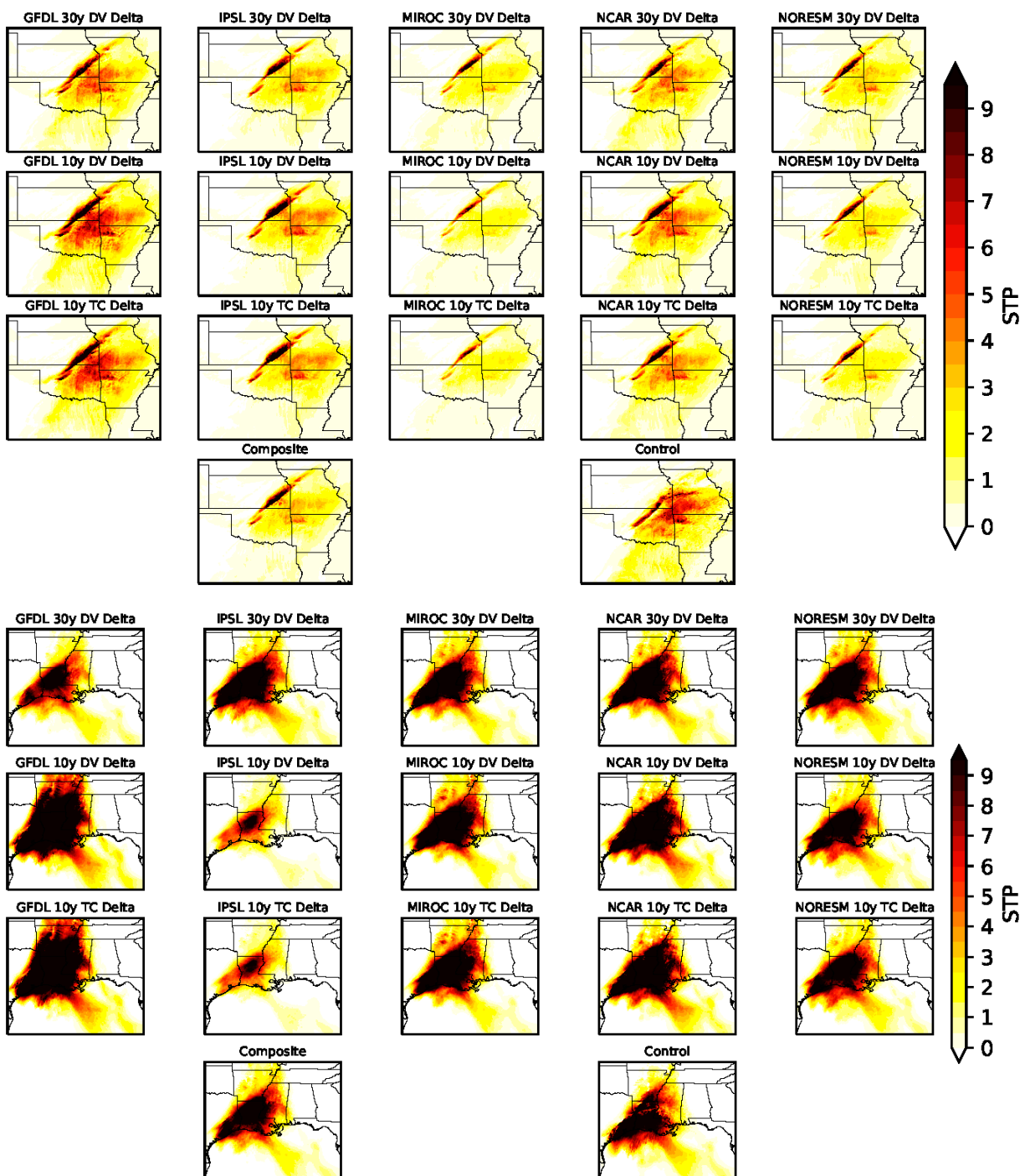
Supplemental Figure S4. Initial and boundary conditions of temperature and dewpoint ($^{\circ}\text{C}$) for the idealized modeling simulations, for the WARM event (left panel) and COOL event (right panel), as presented on skew-T/log-p diagrams. The solid and dashed black (colored) lines are the temperature and dewpoint for the CTRL (PGW) simulations.



Supplemental Figure S5. Initial and boundary conditions of horizontal wind components (m/s), for the WARM event (top panel) and COOL event (bottom panel), as presented on hodograph plots. The solid (colored) lines are for the CTRL (PGW) simulations. Asterisks show estimated storm motion for a right-moving supercell, and closed circles indicate heights of 1 and 3 km.



Supplemental Figure S6. Simulated radar reflectivity (dBZ) for the idealized-modeling simulations of the WARM event (top panel) and COOL event (bottom panel) at 30 min. Each subpanel represents an individual experiment composing the ensemble. See section 2 for guidance on experiment nomenclature.



Supplemental Figure S7. Analysis of the significant tornado parameter (STP; nondimensional) over the respective simulation domains (D01; see Fig. S1) of the WARM event (top panel) and COOL event (bottom panel). The calculations were performed using model output at 1800 UTC for the WARM event, and 1500 UTC for the COOL event, which generally represent pre-convective times across the respective simulation domains. See section 2 for guidance on experiment nomenclature.