

Supplementary Information (SI)

Dropsonde Data Impact on Rain Forecasts in Taiwan Under Southwesterly Flow Conditions with Observing System Simulation Experiments

Fang-Ching Chien and Yen-Chao Chiu*

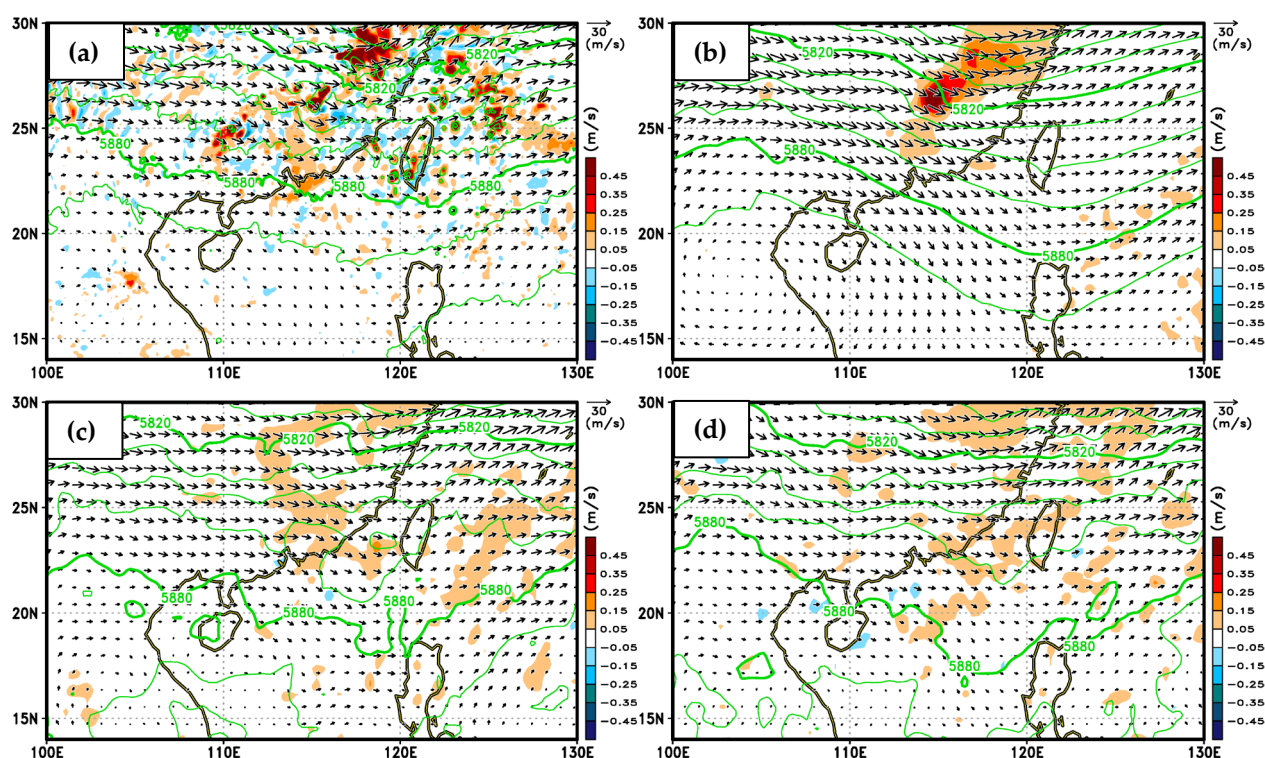


Figure S1. As in Figure 10, but for 500 hPa vertical velocity (color, m s⁻¹), 500 hPa geopotential height (contour, interval: 15 gpm), and 500 hPa winds (vector, m s⁻¹).

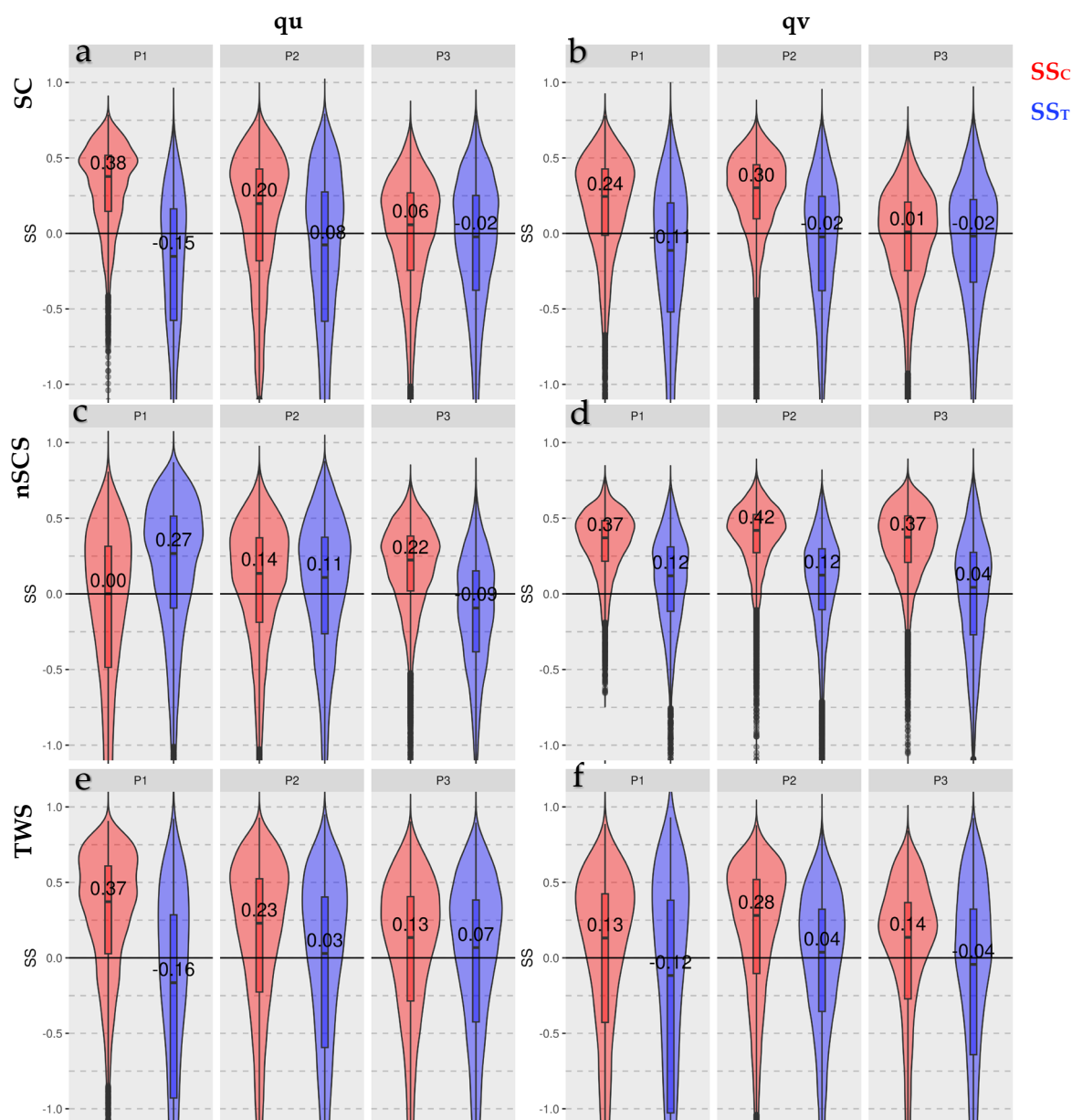
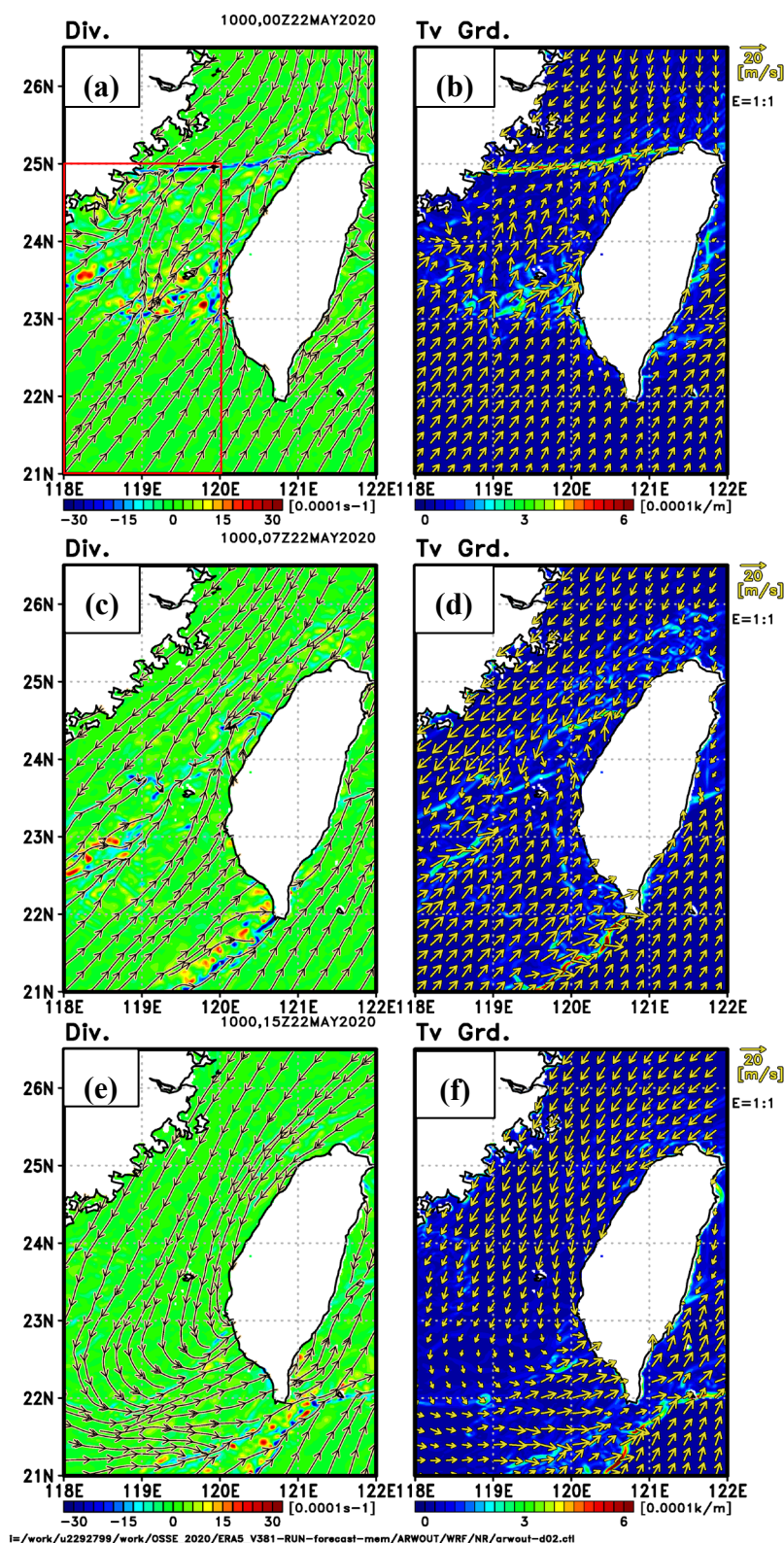


Figure S2. Violin plots showing the distribution of skill scores (red: SSc; blue: SSr) based on the RMSE of (a) x-component moisture flux (q_u , $\text{g kg}^{-1} \text{ m s}^{-1}$) and (b) y-component moisture flux (q_v , $\text{g kg}^{-1} \text{ m s}^{-1}$) averaged horizontally over the SC region (red box in Figure 10a) at each full hour during P1, P2, and P3. The moisture fluxes are first averaged vertically from the surface to 700 hPa and temporally over ± 7 hours around each full hour. The shaded area shows the probability density with a greater width indicating a higher frequency of occurrence. Associated box plots are included within each violin plot for reference. Box edges are the lower (Q1) and upper (Q3) quartiles, the horizontal black line with value is the median, and outliers are indicated by black dots. The numbers of samples are 8192 in P1, 24576 in P2, and 27648 in P3. (c,d) As in (a,b), but for the nSCS region (green box in Figure 10a). (e,f) As in (a,b), but for the TWS region (red box in Figure 10d).



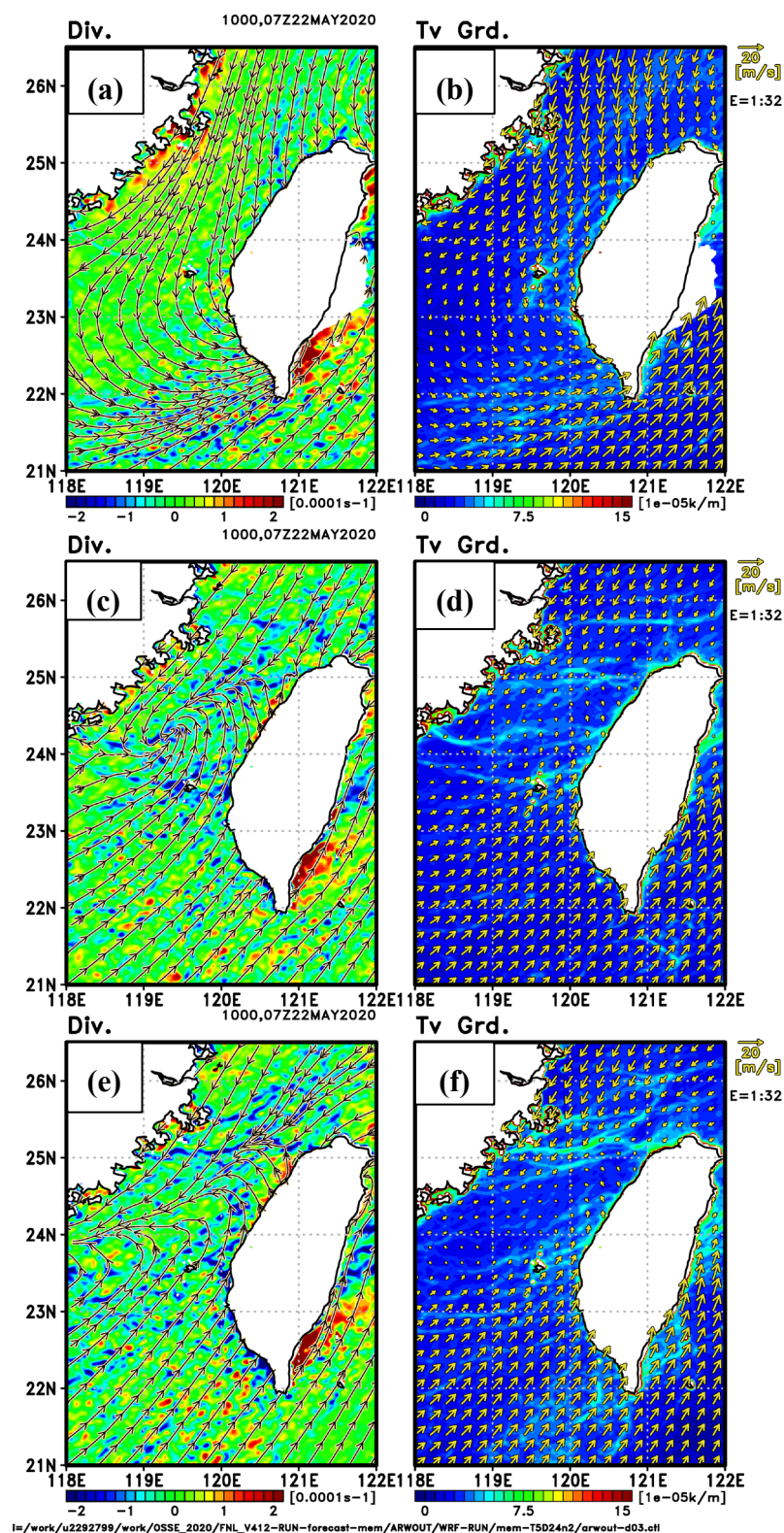


Figure S4. (a,b) As in Figure S3c,d, but for the ensemble mean of NODA at 0700 UTC 22 May 2020. (c,d), As in (a,b), but for CTL. (e,f), As in (a,b), but for T5D24. Note that the color scales differ between Figure S3 and this Figure.