Supplementary materials:

Autocorrelation 2D:

934

935

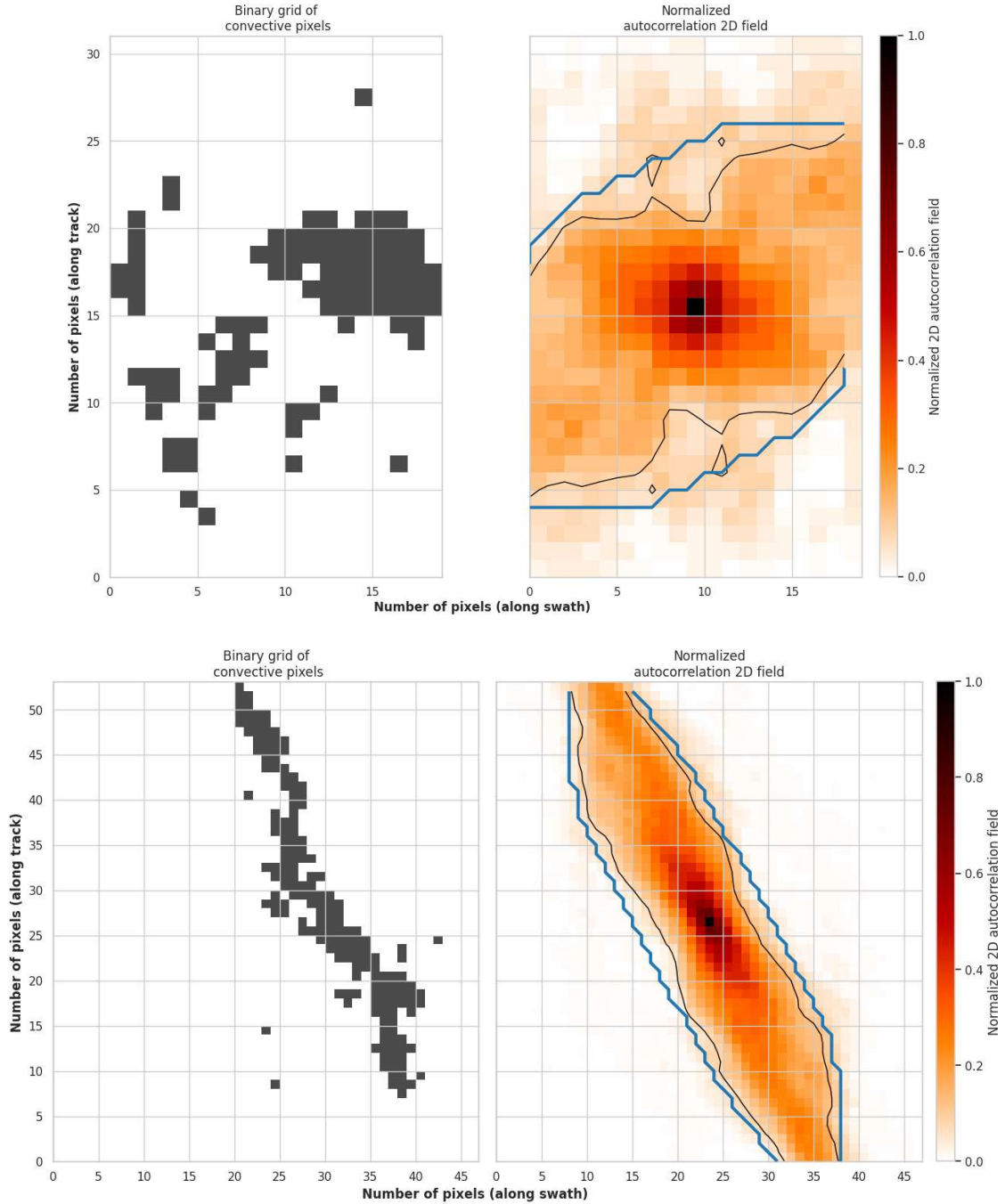
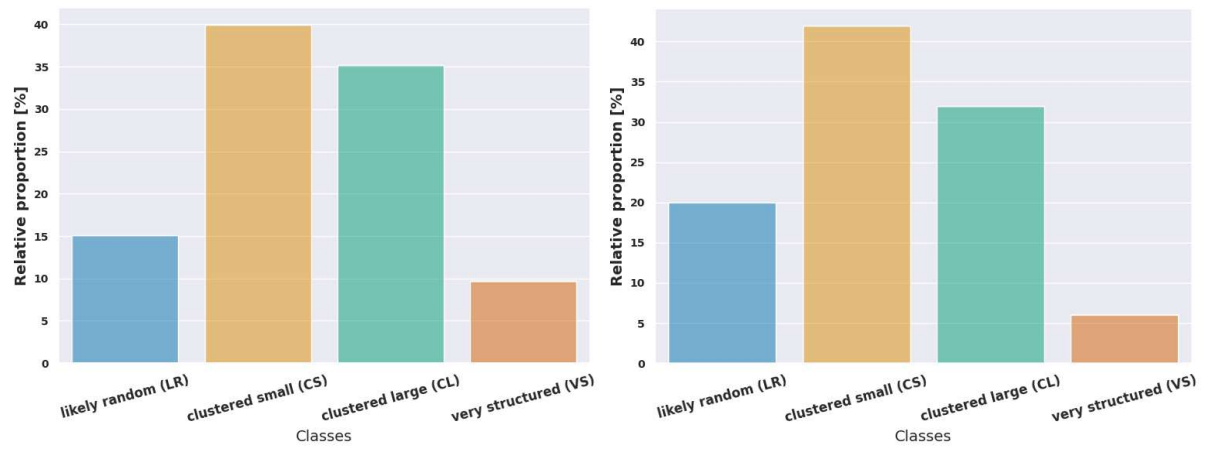
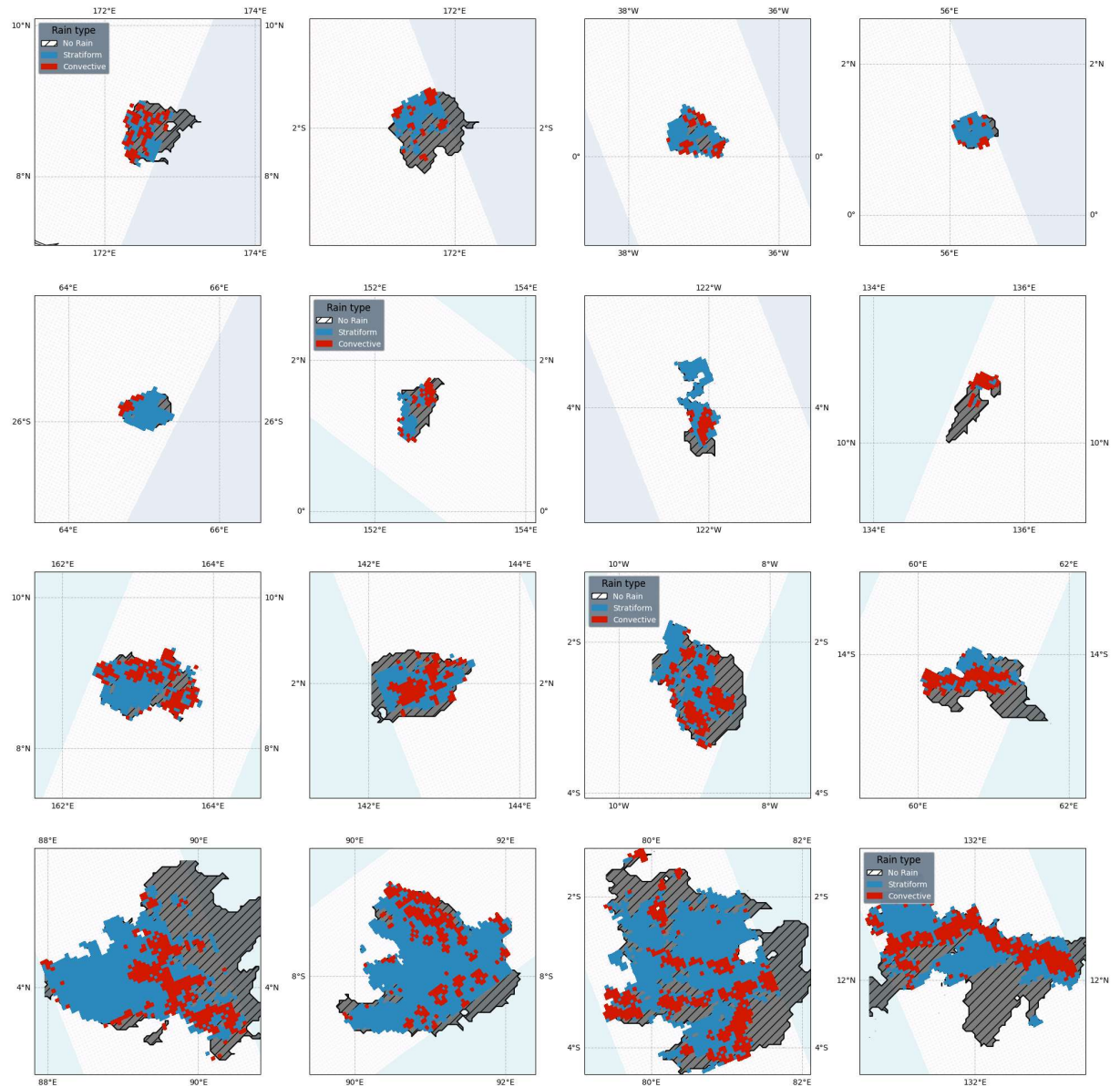
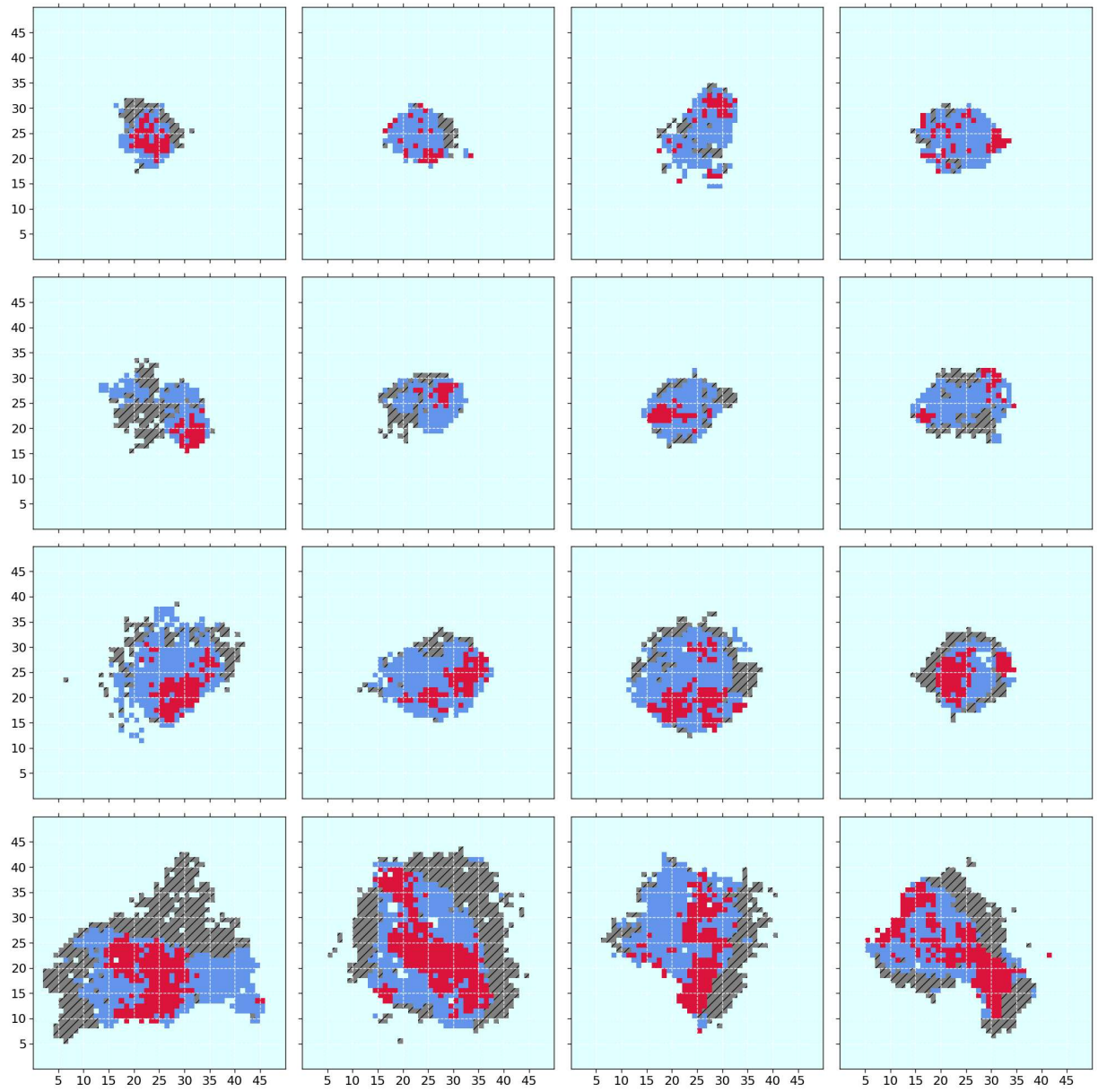



Figure S1: Same as Figure 2 for remaining selected scenes of Figure 14. Left: 2D binary scene (black pixels represent convective areas). Right: 2D autocorrelation normalized field, black contour shows the 10% contour and blue contour represents the convex contour that encompasses that 10% contour. The characteristic length L is the maximum distance between 2 points within the blue contour, here top: L≈18.44, bottom: L≈14.14

941 **Details of the 4 classes:**

942

943 *Figure S2: Histograms of the 4 classes population for Left: the TOOCAN-radar dataset, Right, the*
944 *TOOCAN-RCE dataset*

945

946   *Figure S3: Same as Figure 1, 4 other examples for the 4 organizational classes by row from top to*
947   *bottom: likely random (LR), small (CS), clustered large (CL), very structured scenes (VS)*

948

949   *Figure S4: Same as Figure 2, 4 other examples for the 4 organizational classes by row from top to*
950   *bottom: likely random (LR), small (CS), clustered large (CL), very structured scenes (VS)*