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Coastal and orographic effects on extreme precipitation revealed by weather radar observations

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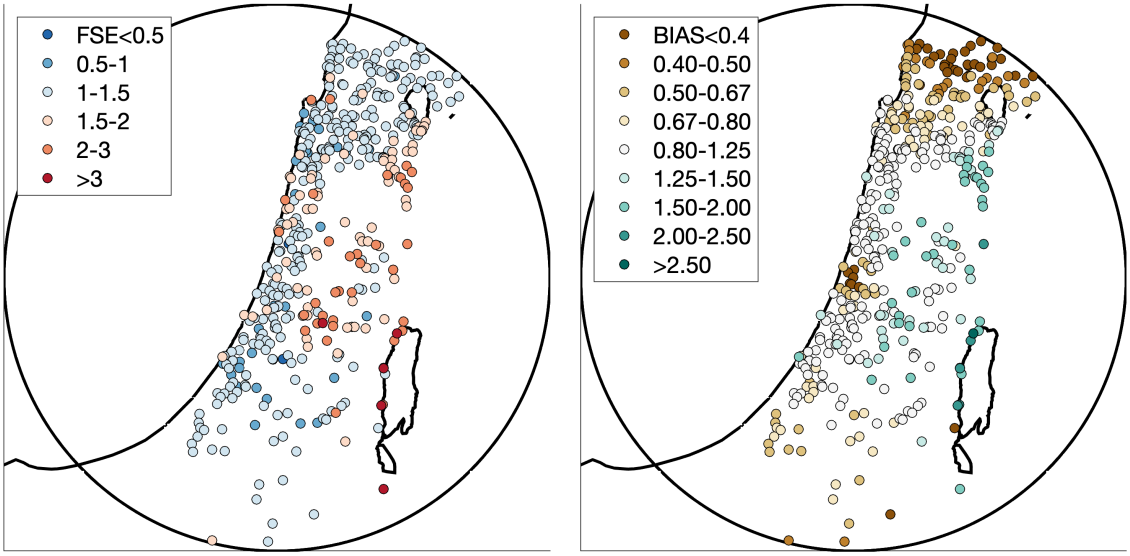

Figure S1. Maps of the validation statistics (Fractional Standard Error – FSE, and multiplicative bias defined as the total radar amount divided by the total rain gauge amount – BIAS) of the radar archive. Statistics are computed for daily rainfall amounts in days for which at least 22 hours of radar data are available; at least 6 radar volume scans with no more than 15-minute gaps are required for an hour to be defined as available.

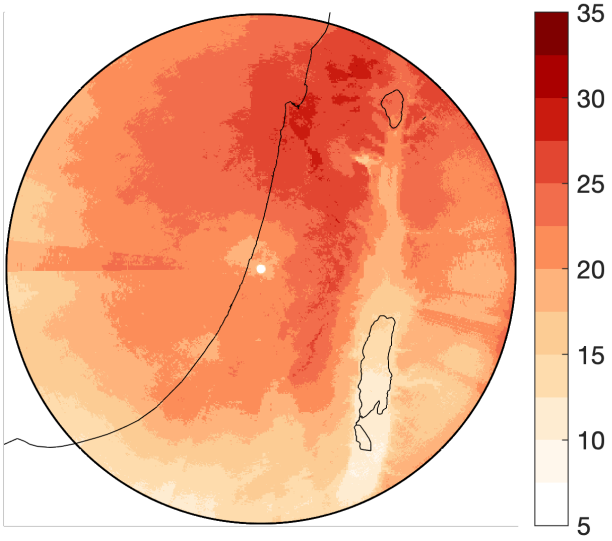

Figure S2. Spatial distribution of the average yearly number of storms (parameter n, which is the same for all durations) as derived combining weather radar archive and rain gauges using the here-proposed method. Some residual radar errors can be noticed, such as the over-estimated beam west of the instrument.

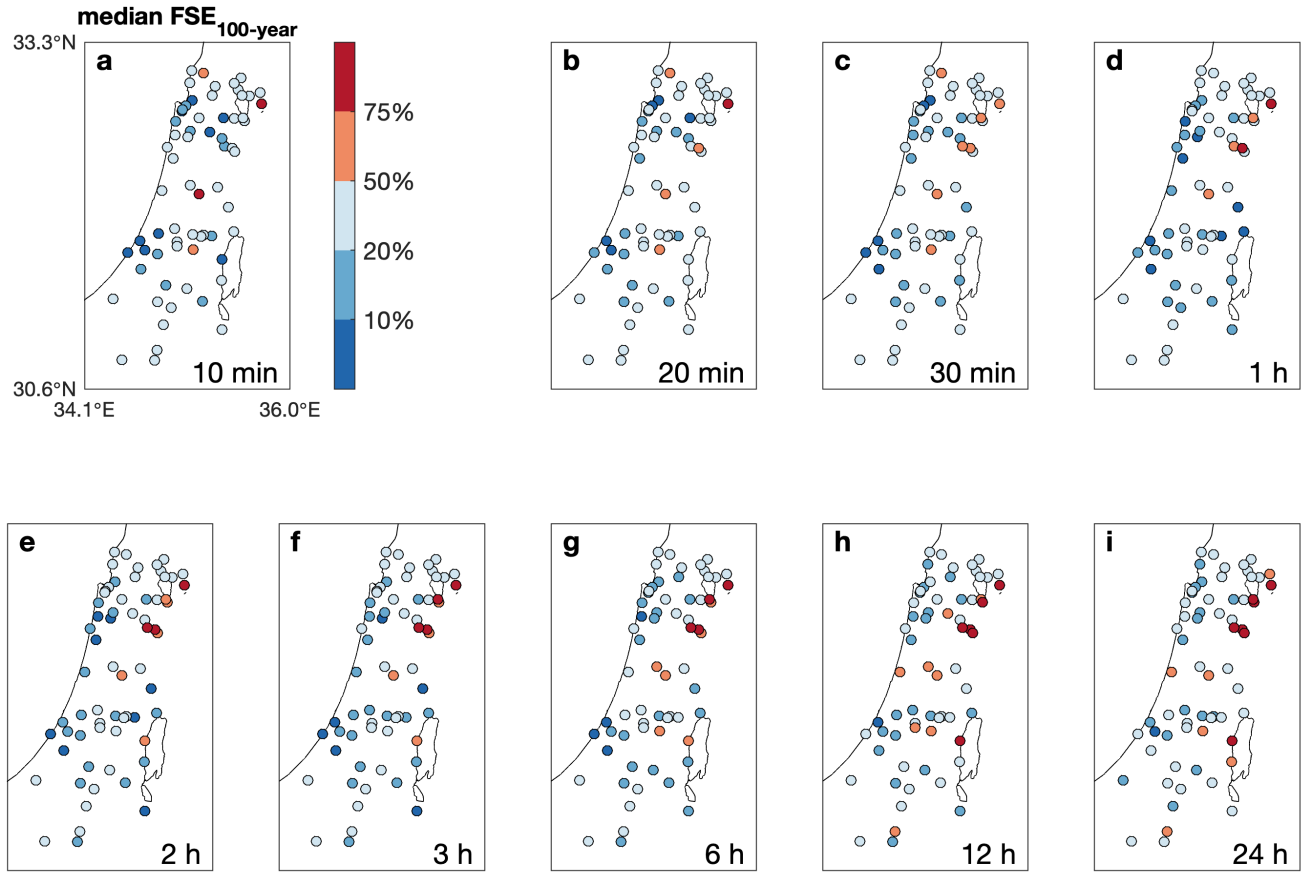

Figure S3. Spatial distribution of the median Fractional Standard Error (FSE) for the 100-year return levels at different durations estimated using SMEV on the radar archive.

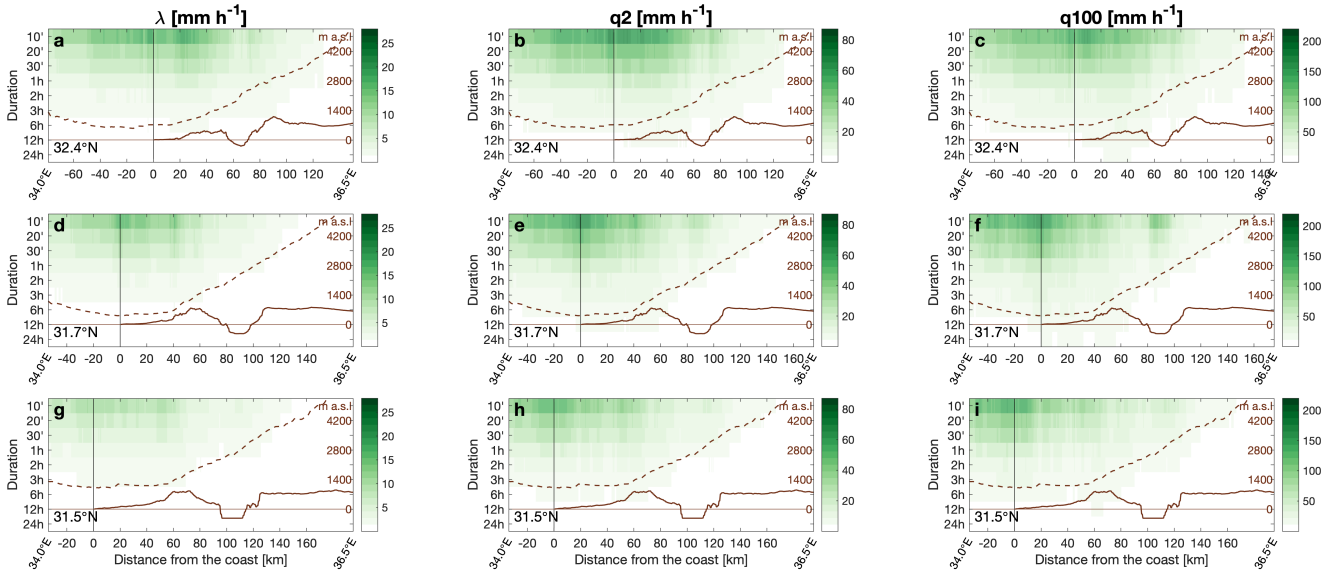

Figure S4. Longitudinal variations of the scale parameter (a, d, g), 2-year (b, e, h) and 100-year (c, f, i) return levels along the three transects (see Fig. 1) as a function of the distance from the coastline (x-axis) and of duration (y-axis). Transects are obtained averaging the 10-km region surrounding the three latitudes. The terrain profile and the sampling height of the lowest non-blocked radar beam are superimposed as solid and dashed lines, respectively (see right hand-side y-axis).