Supplement of

Hourly Precipitation Patterns and Extremization over Italy using convection-permitting reanalysis data

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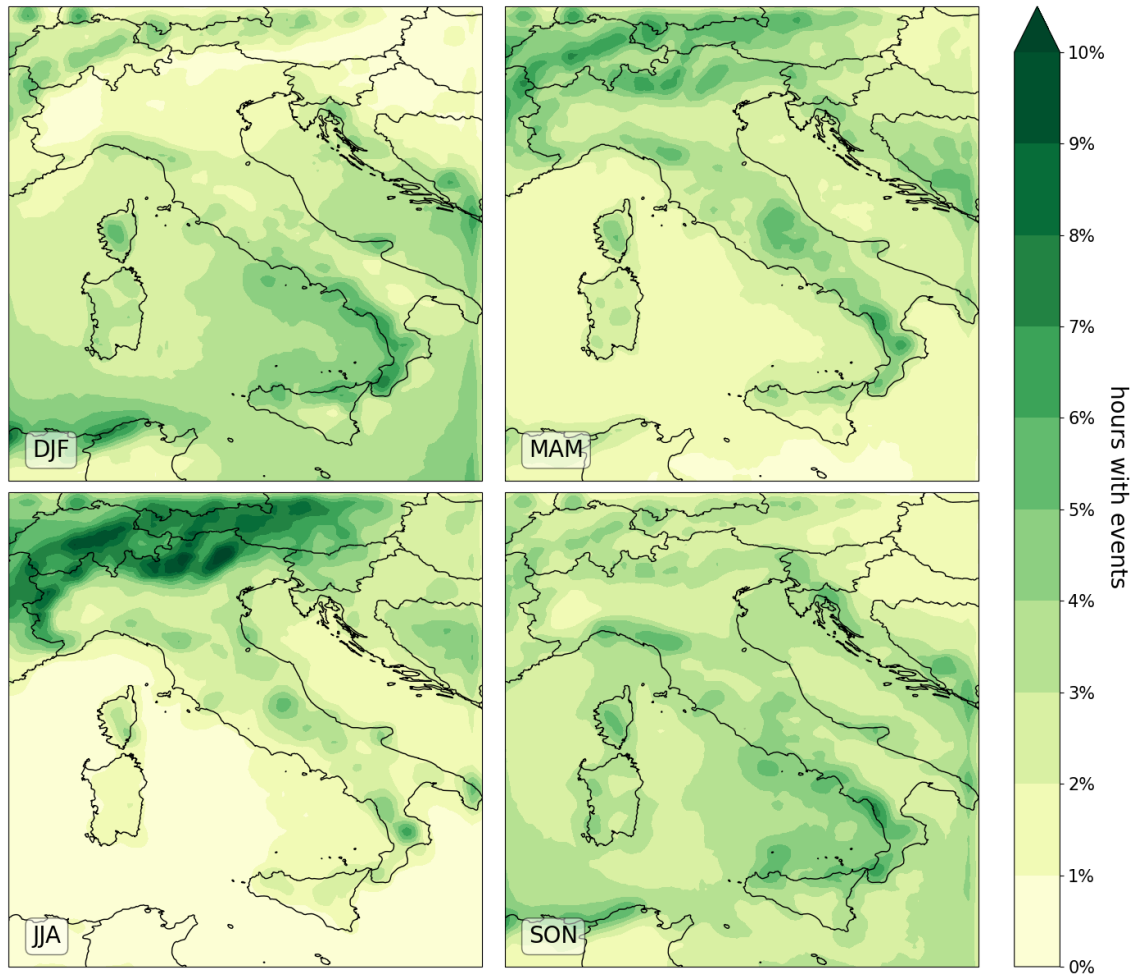
Supplementary material (figures)

Figure S1: Seasonal map of the frequency of wet hours (i.e., the percentage of hours with at least one structure detected in the window) within the 0.5 x 0.5 window (step size 0.1), averaged annually over the period 1986–2022,
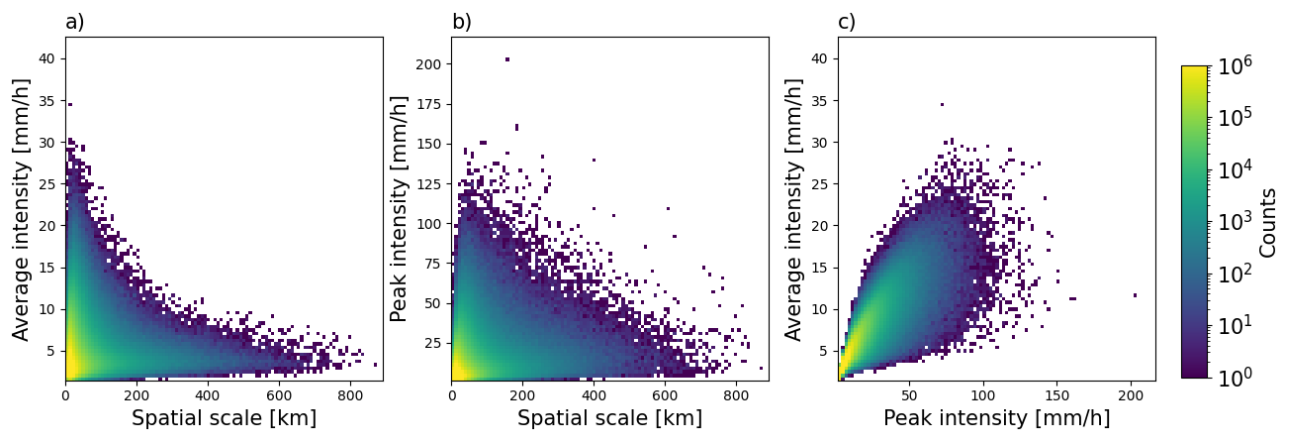

Figure S2: Scatter density plots showing the joint distribution of individual precipitation event characteristics over the entire study period. (a) Average intensity (tot_tp/area) vs. spatial scale (axis_maj); (b) Peak intensity (tp_max) vs. spatial scale (axis_maj); (c) Peak intensity (tp_max) vs. average intensity (tot_tp/area). Color scale indicates number of occurrences at each point.
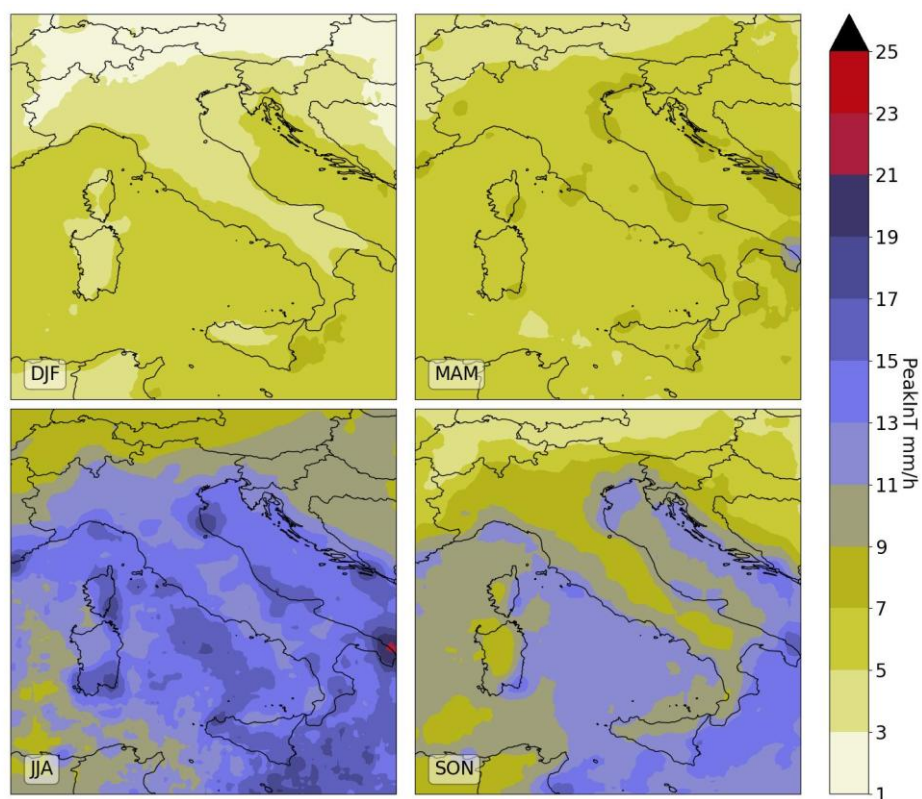
Figure S3: Seasonal map of PeakInt of the HPSSs occurring within the 0.5 x 0.5 window (step size 0.1), averaged annually over the period 1986–2022.
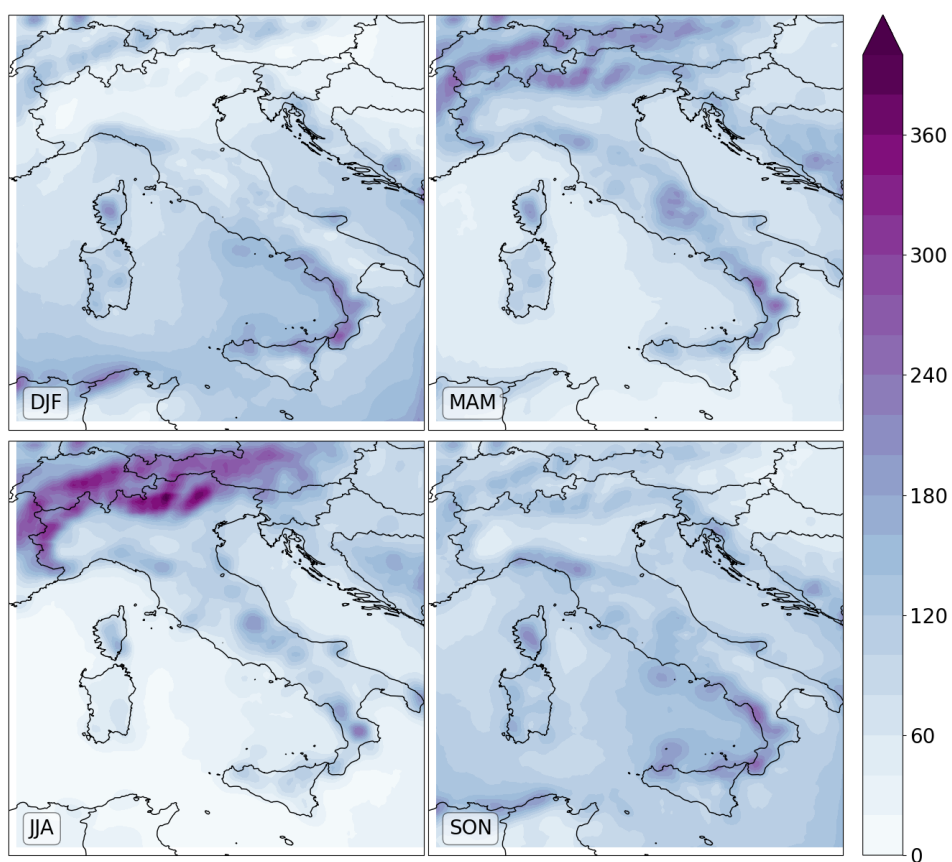

Figure S4: Seasonal map of number of events (N) occurring within the 0.5 x 0.5 window (step size 0.1), averaged annually over the period 1986–2022, from the dataset obtained with a fixed 1 mm threshold.
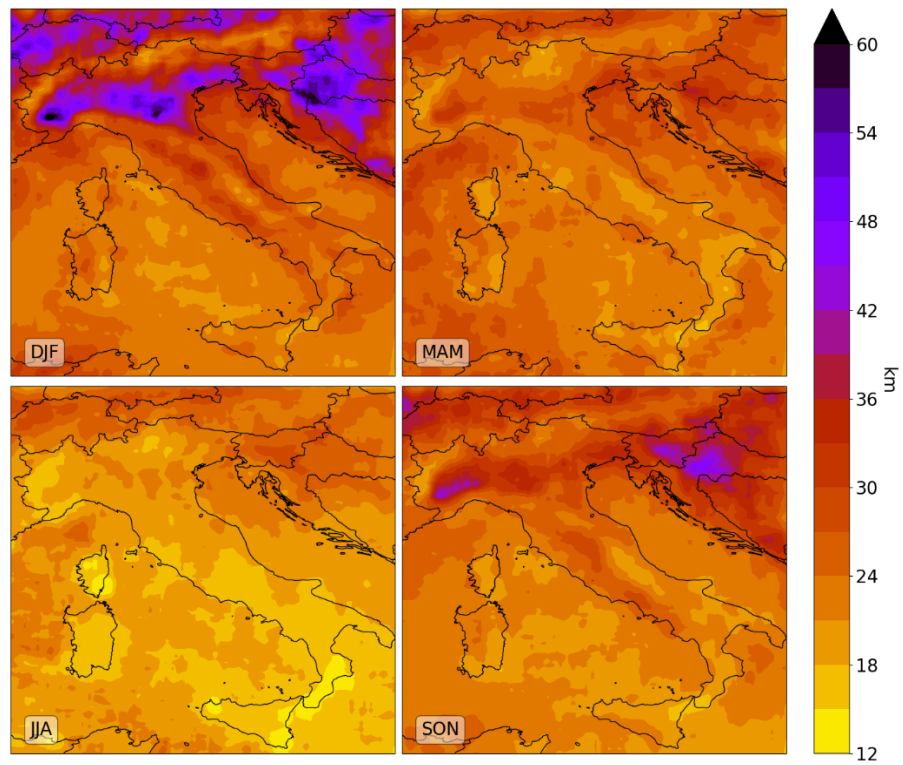
Figure S5: Seasonal map of SpatExtent of the events occurring within the 0.5 x 0.5 window (step size 0.1), averaged annually over the period 1986–2022, from the dataset obtained with a fixed 1 mm threshold.
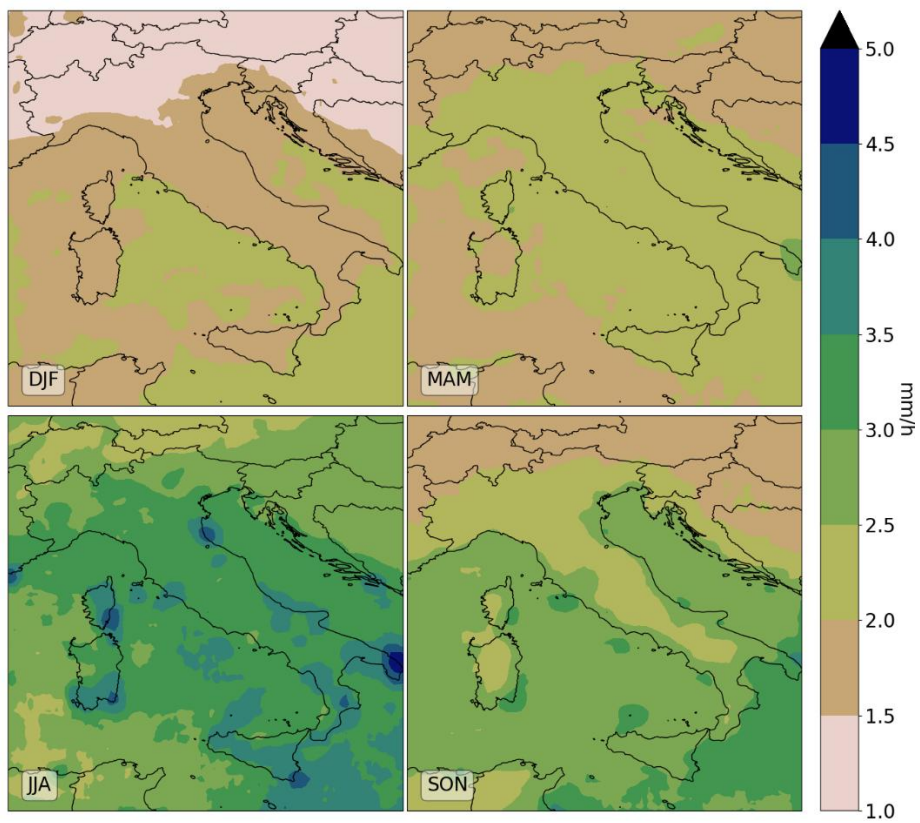

Figure S6: Seasonal map of MeanInt of the events occurring within the 0.5 x 0.5 window (step size 0.1), averaged annually over the period 1986–2022, from the dataset obtained with a fixed 1 mm threshold.
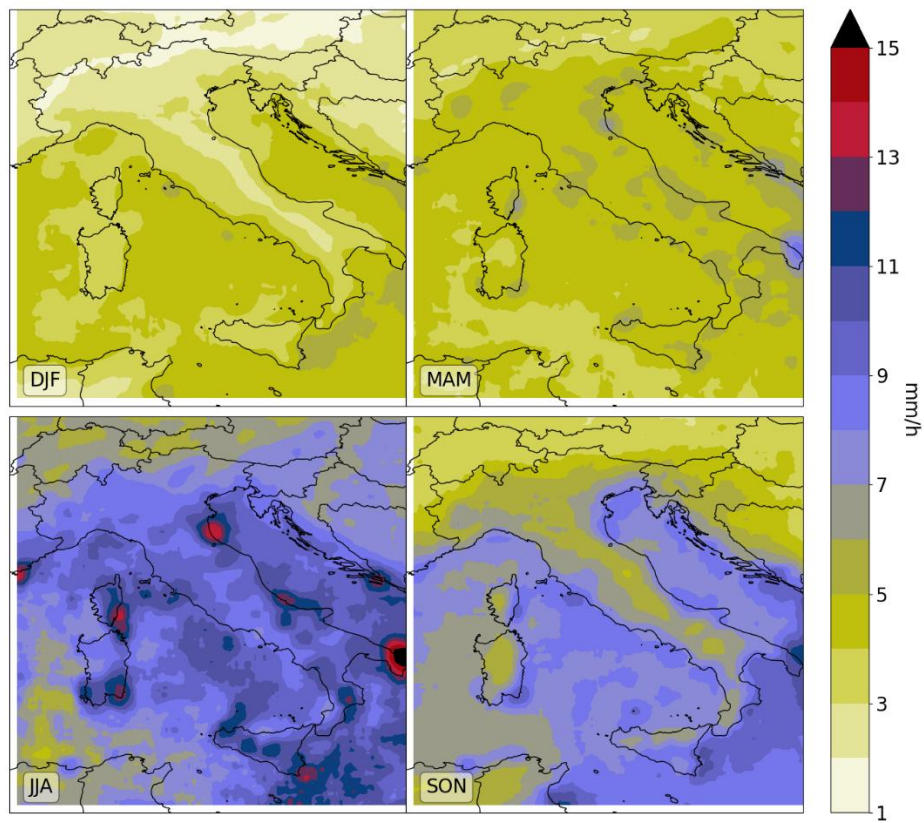
Figure S7: Seasonal map of PeakInt of the events occurring within the 0.5 x 0.5 window (step size 0.1), averaged annually over the period 1986–2022, from the dataset obtained with a fixed 1 mm threshold.
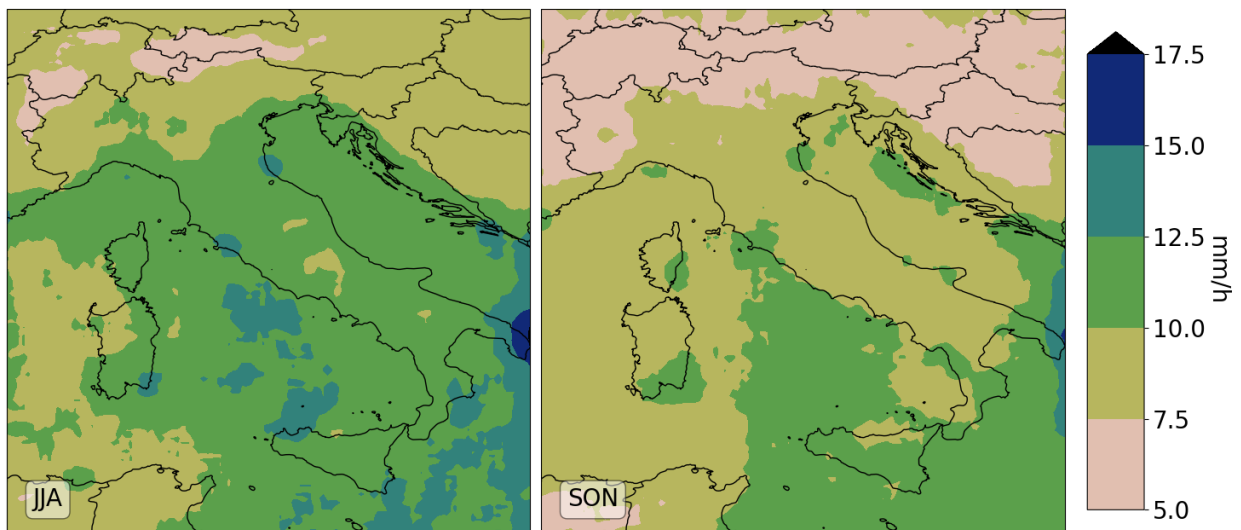

Figure S8: JJA and SON maps of MeanInt of HPEs occurring within the 0.5 x 0.5 window (step size 0.1), averaged annually over the period 1986–2022.
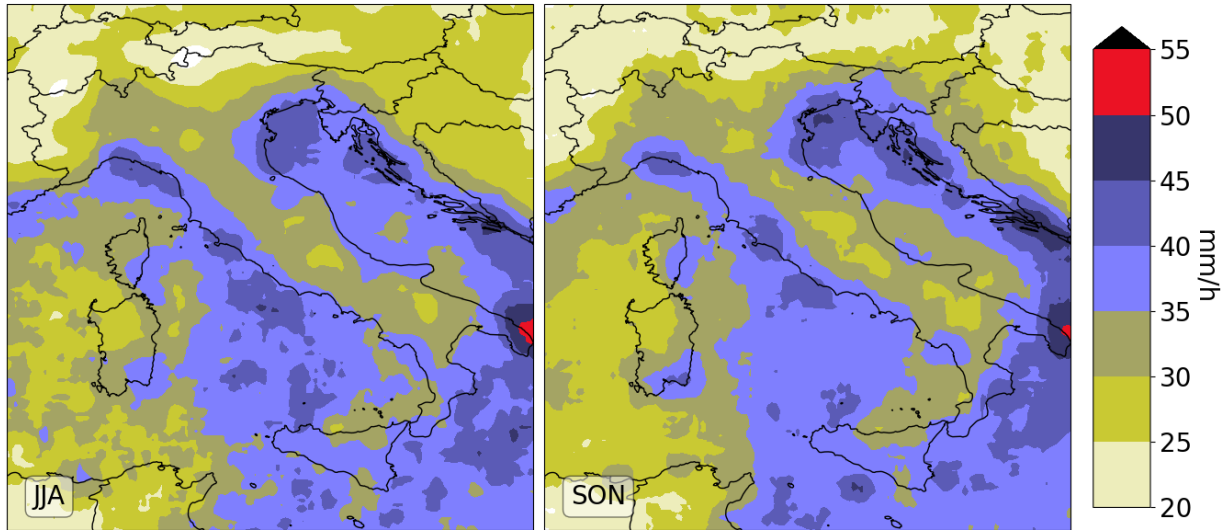
Figure S9: JJA and SON maps of PeakInt of HPEs occurring within the 0.5 x 0.5 window (step size 0.1), averaged annually over the period 1986–2022.
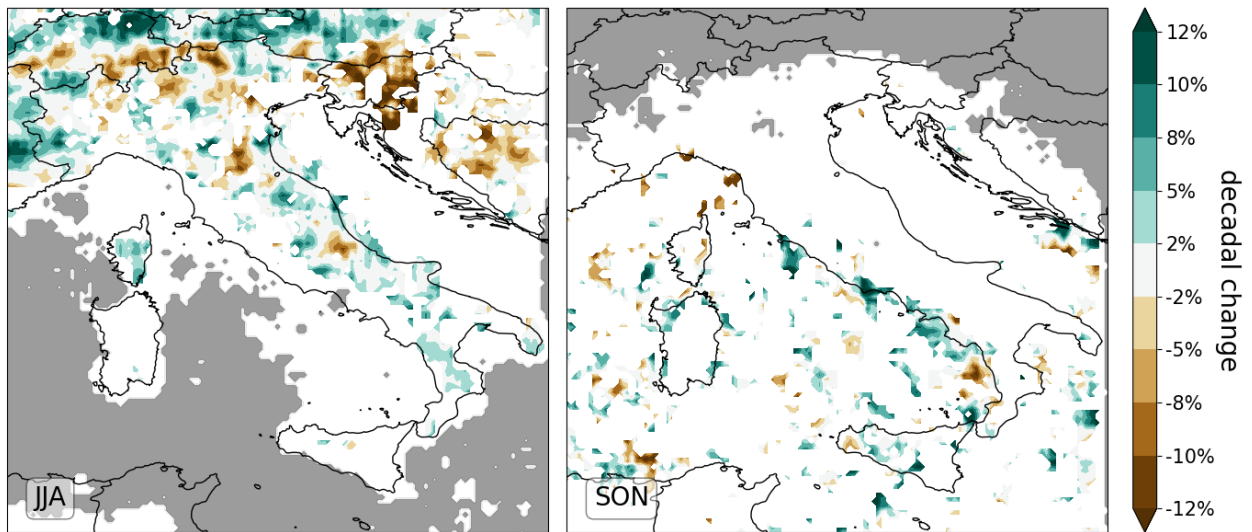

Figure S10: Maps of the decadal relative trends in HPEs SpatExtent occurring within each 0.5° × 0.5° window (sliding step: 0.1°) for summer (JJA) and autumn (SON). Areas with more than 10 years without EPEs are masked in grey.

Figure S11: Maps of the decadal relative trends in HPEs MeanInt occurring within each 0.5° × 0.5° window (sliding step: 0.1°) for summer (JJA) and autumn (SON). Areas with more than 10 years without EPEs are masked in grey.
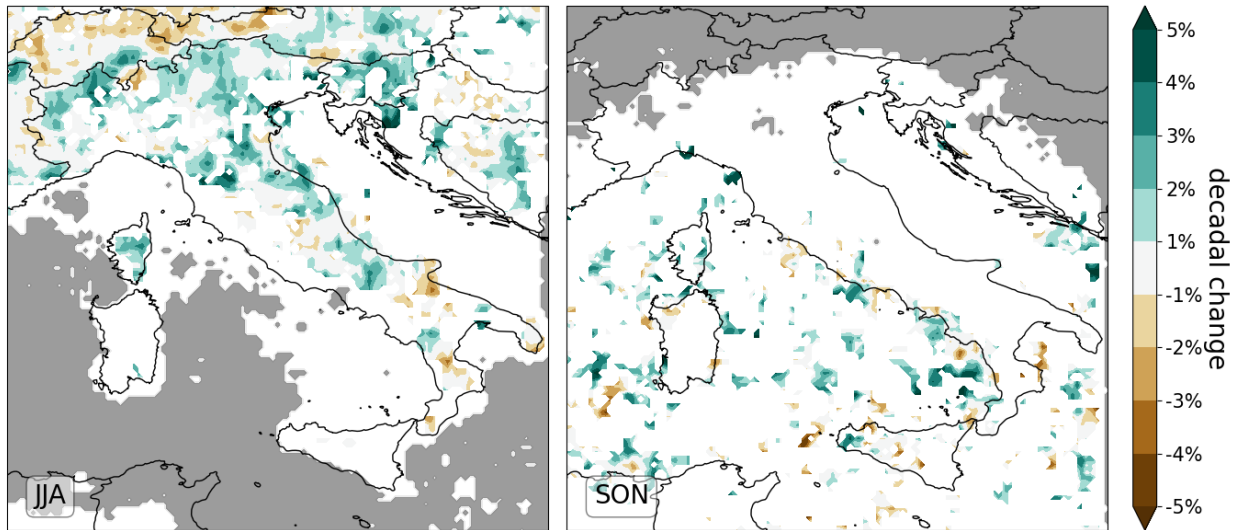

Figure S12: Maps of the decadal relative trends in HPEs PeakInt occurring within each 0.5° × 0.5° window (sliding step: 0.1°) for summer (JJA) and autumn (SON). Areas with mor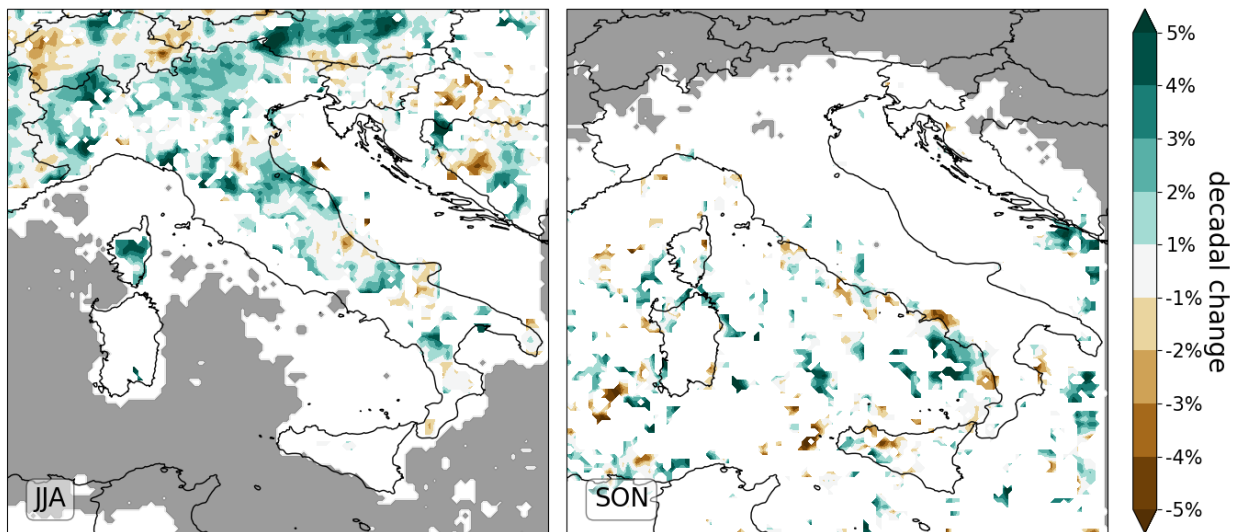e than 10 years without EPEs are masked in grey.