Sub-seasonal temporal clustering of extreme precipitation
Spatio-temporal distribution, physical drivers and impacts

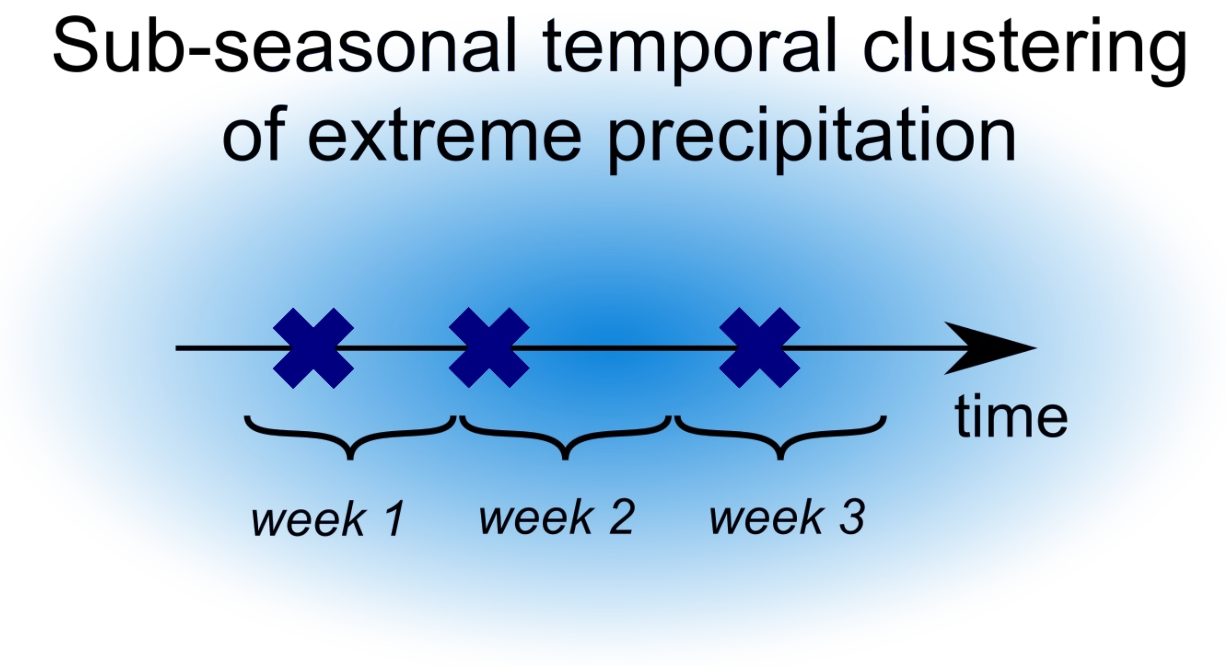
A. Tuel[1], B. Schaefli[1], J. Zscheischler[2] and O. Martius[1,3]

WHERE?

Statistical significance

HOW?

Physical drivers



WHEN?

Seasonality

WHY?

Impacts

“Extreme” = monthly 99th percentile of daily precipitation

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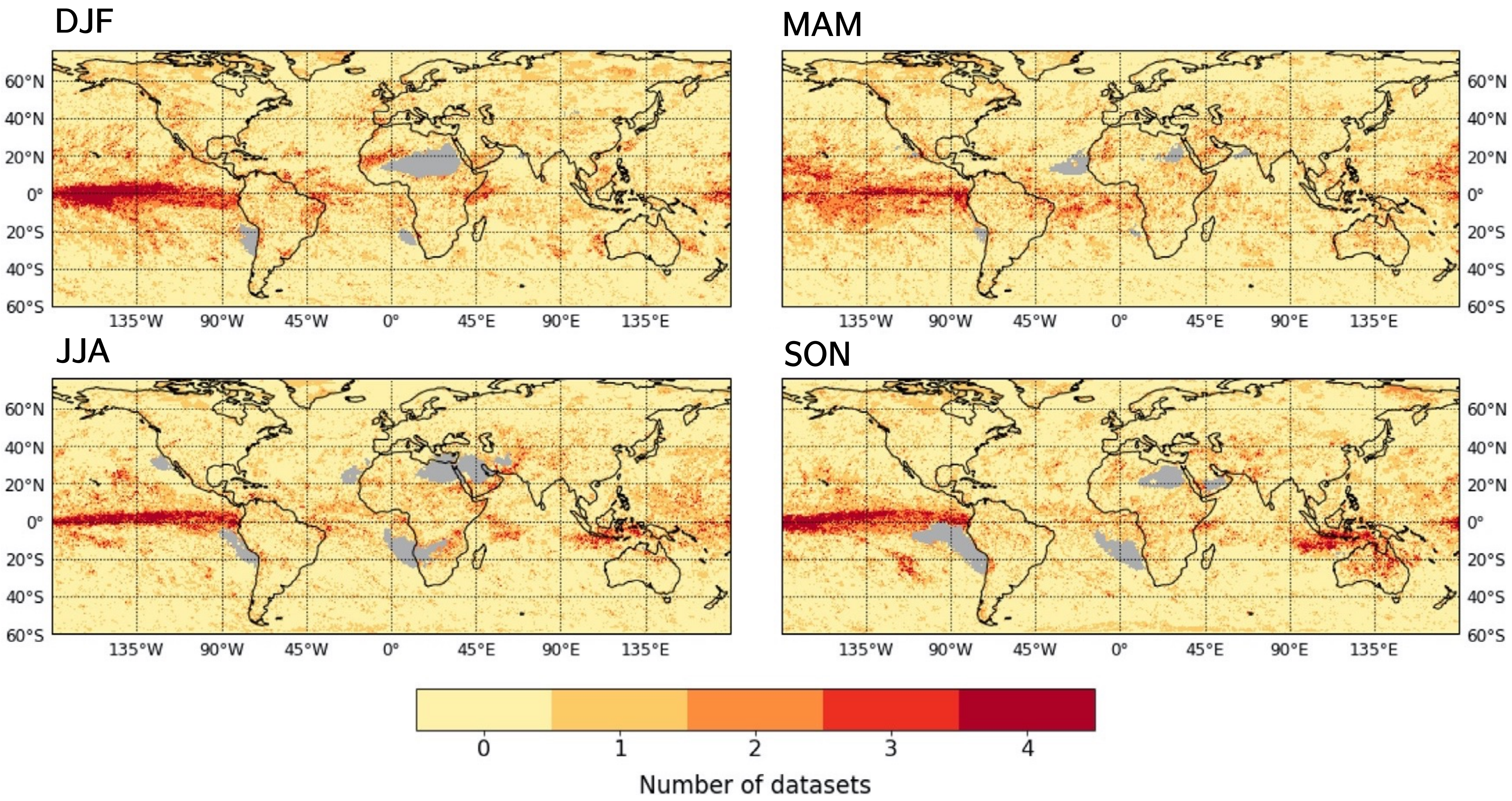
Spatio-temporal distribution



Tuel and Martius *Weather and Climate Extremes* (2021)

Regionalisation and drivers

Poisson GLM on 3-week counts

$$\begin{cases} n_t & \sim & \text{Poisson}\left(\lambda_t\right) \\ \log\left(\lambda_t\right) & = & \beta_0 + \sum_i \beta_i X_t^i \end{cases}$$

EOFs of Northern Hemisphere 21-day mean Z500

+

Spatial clustering on β_i coefficients

Tuel and Martius *Journal of Climate* (2022)

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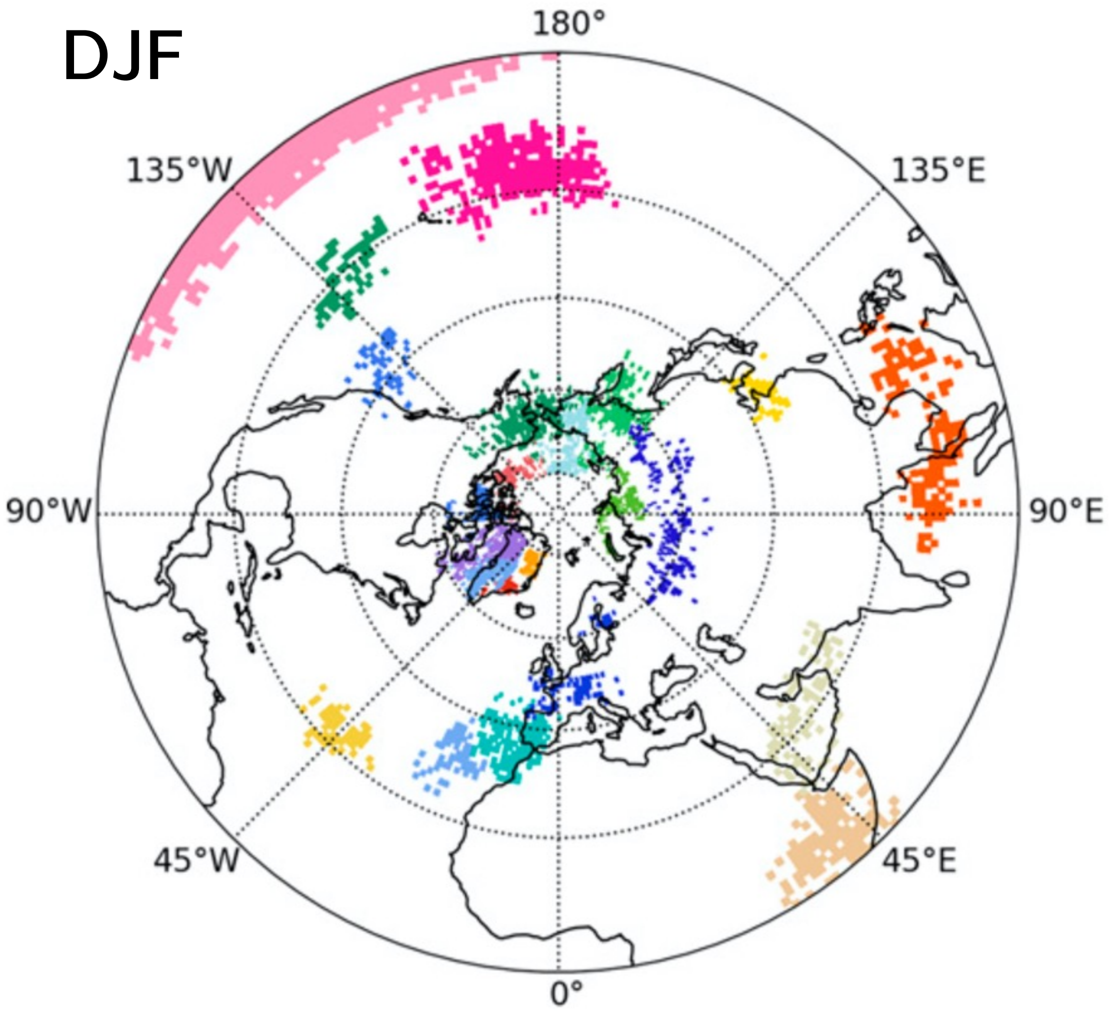
+ Spatial clustering on β_i coefficients



Tuel and Martius *Journal of Climate* (2022)

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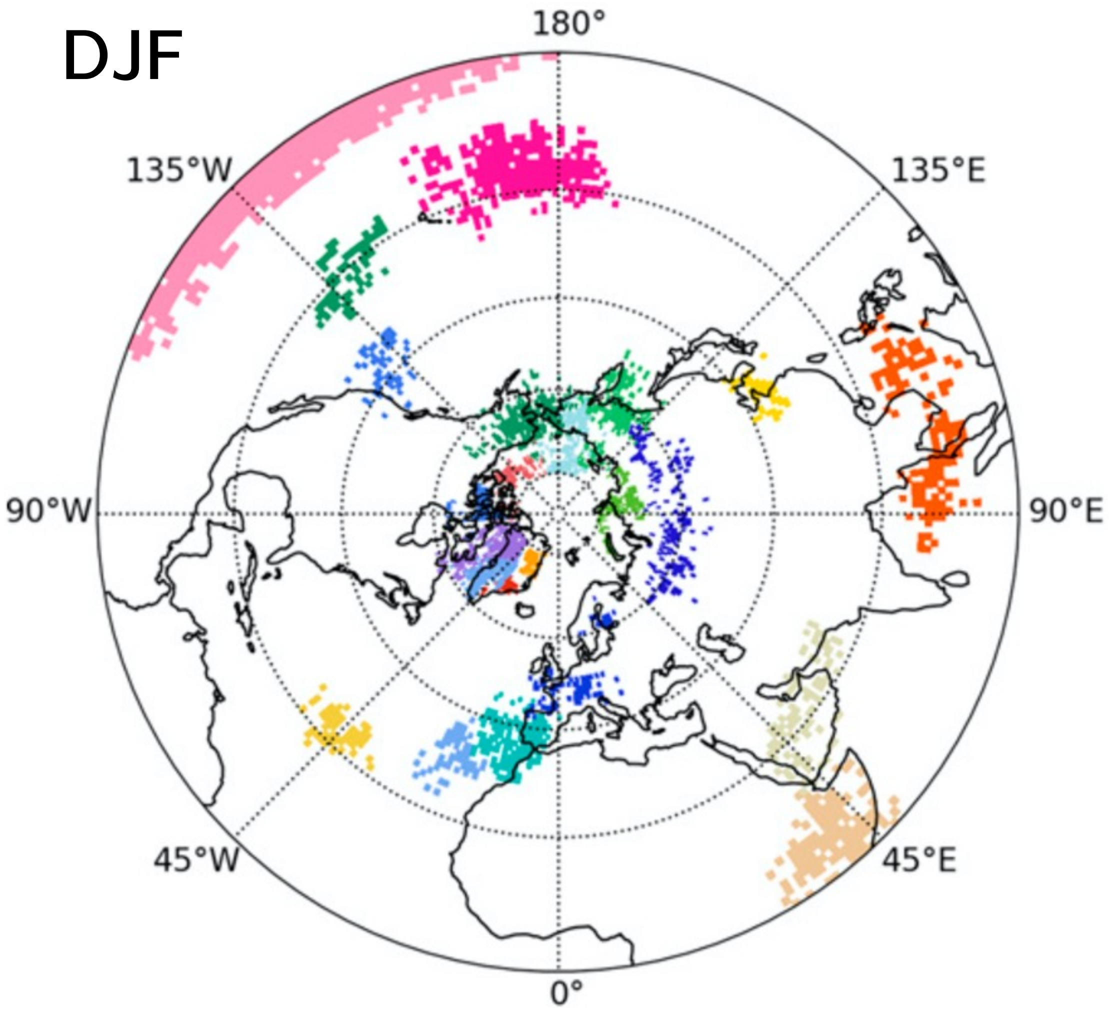
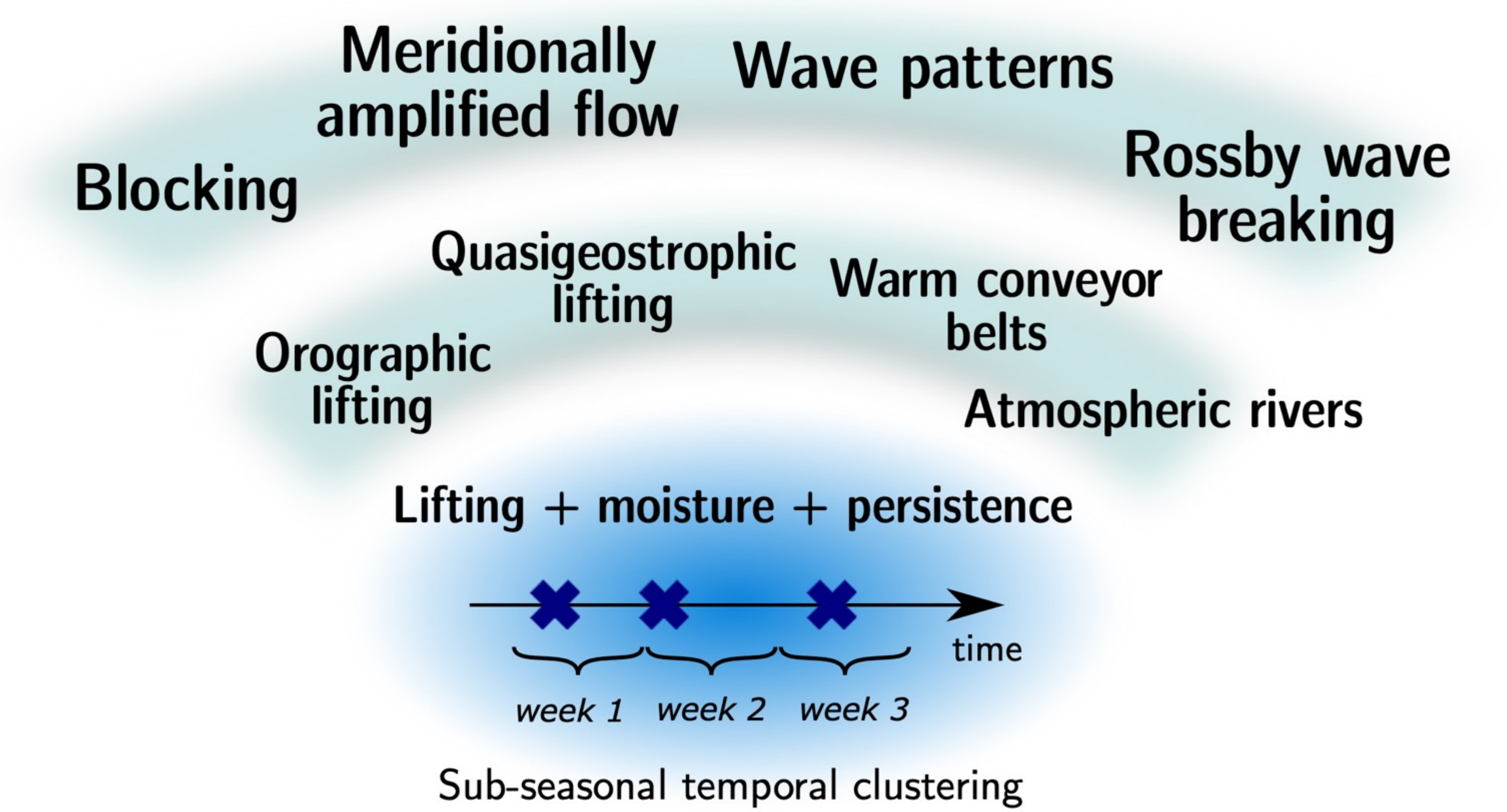
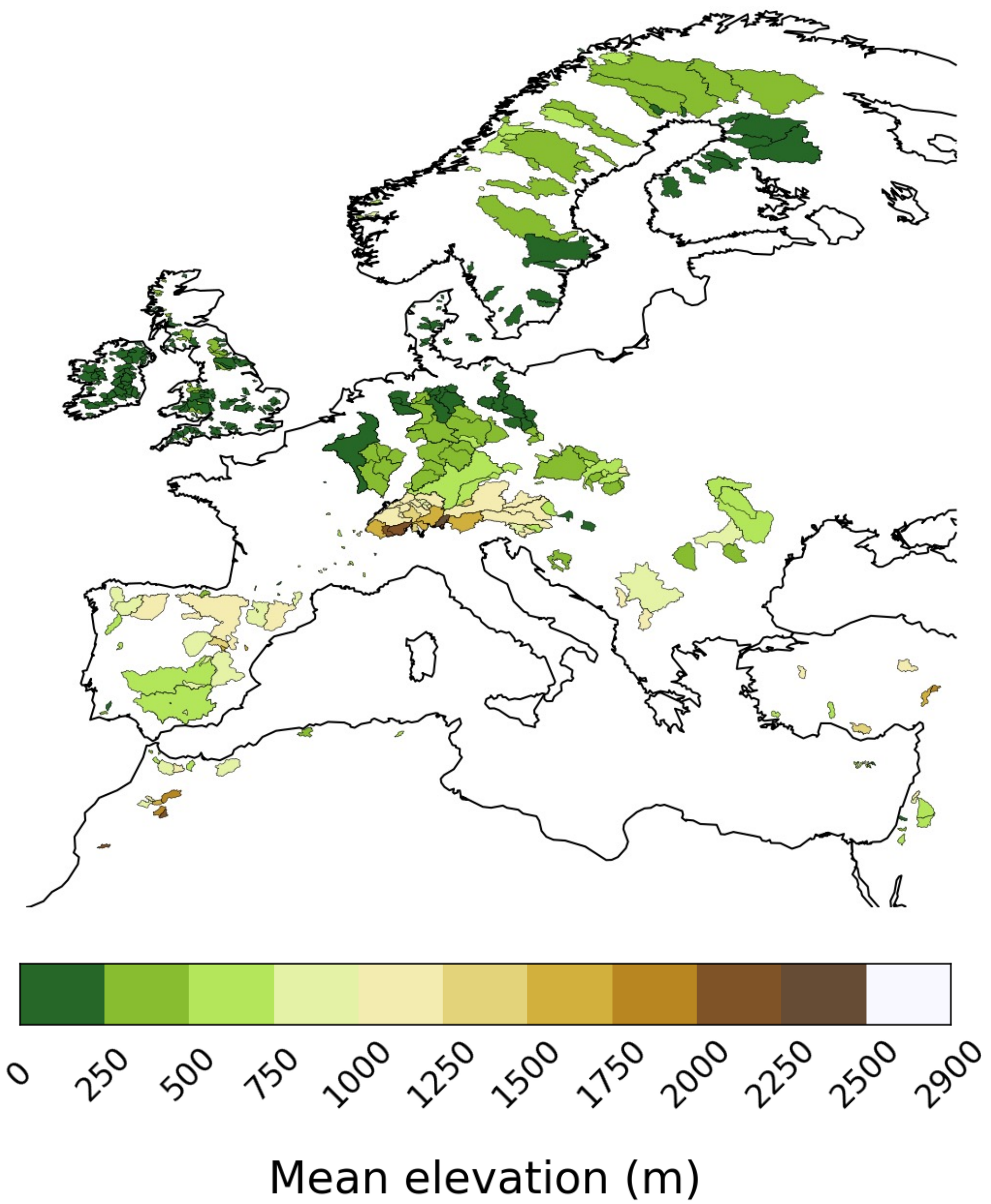
DJF

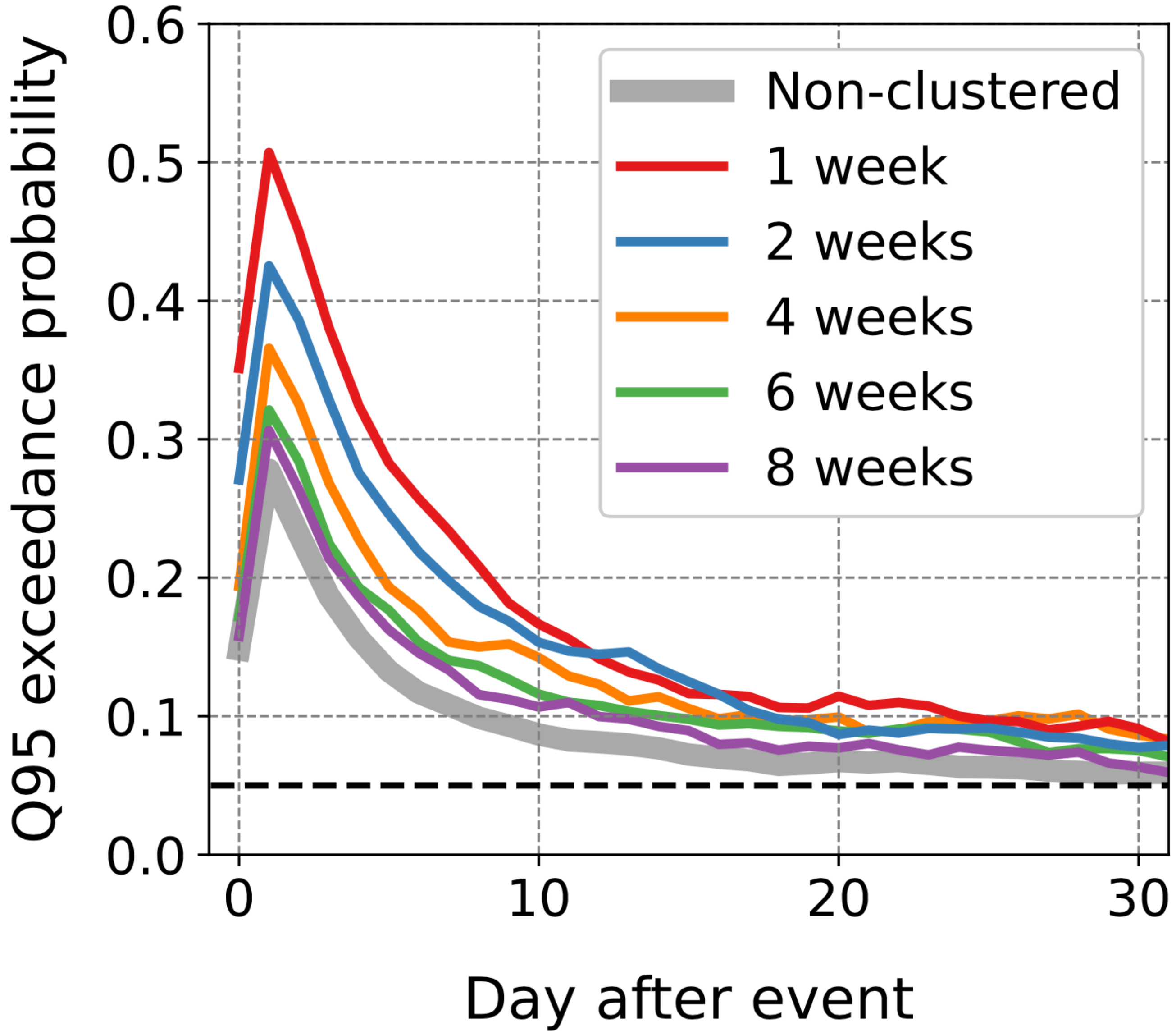




Tuel and Martius *Journal of Climate* (2022)

Impacts on streamflow





Modulated by catchment area, extreme precipitation magnitude, role of snow

Tuel et al. *HESS* (2022)

References

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