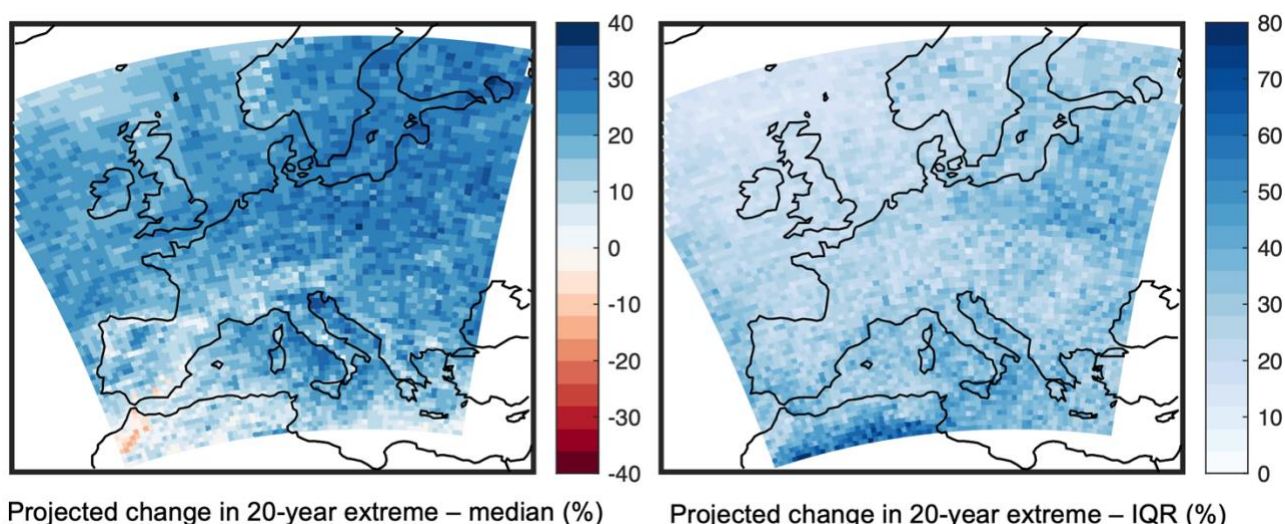


How will different storm types affect future hydro-climatic extremes?

(Proposer: Francesco Marra)

Summary: In this project, we aim at understanding and quantifying how different storm types contribute to hydro-climatic extremes. We seek an answer to an under-explored question in climate change adaptation: “**How will changes in different storm types affect future hydro-climatic extremes?**” Addressing this question is critical for providing projections of future extremes based on the comprehension of the underlying processes.

Predicting the probability of occurrence of extreme events in the future is at the backbone of our strategies for climate change adaptation and resilience. Despite its importance, the practical approach to estimating the probability of extremes mostly relies on statistical extrapolations from small samples of empirical data. Explicit inclusion of the available physical knowledge in these statistical models is still at an embryonal stage and requires a multidisciplinary approach at the intersection of atmospheric physics, statistics and hydrology.



This project aims at highlighting the contribution of different types of storms to the statistics of hydroclimatic extremes. The PhD candidate will combine approaches typical of statistical hydrology with the process understanding of atmospheric physics. A classification of historical storms based on the dominant physical process will be developed and the contribution of different storm types to the probability of occurrence of extreme events will be assessed. This will allow the candidate to propose innovative projections of future extremes based on the expected changes in storm types from climate model simulations.

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