

A methodology for attributing extratropical cyclones to climate change: the case study of storm Alex in 2020

Mireia Ginesta , Pascal Yiou, Gabriele Messori, Davide Faranda

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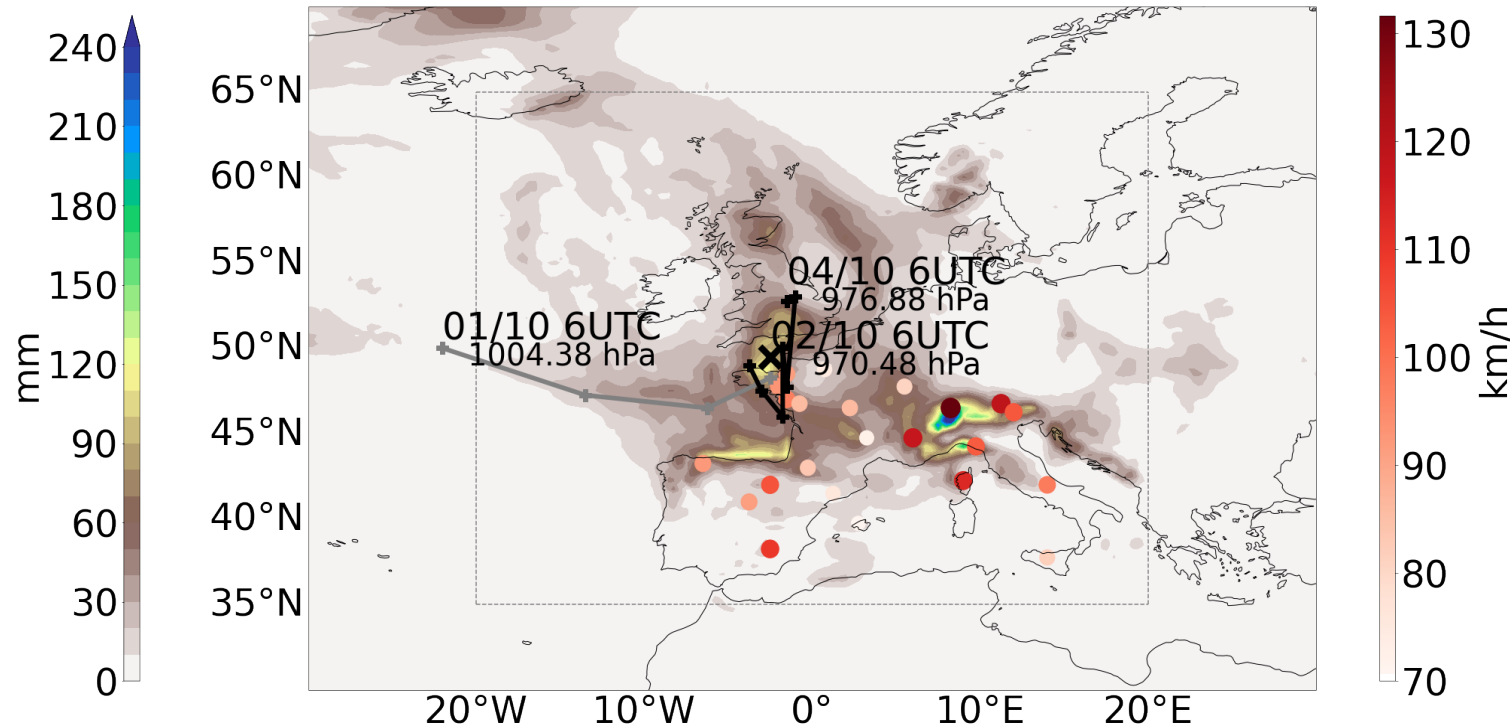
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INTRODUCTION

Extreme Event Attribution → ALEX, a high impact extratropical cyclone in October 2020



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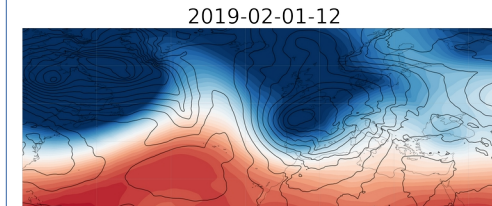
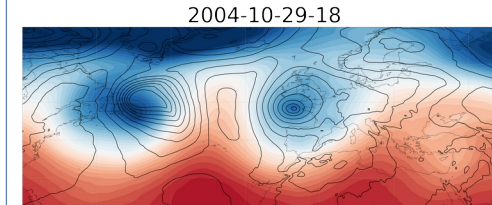
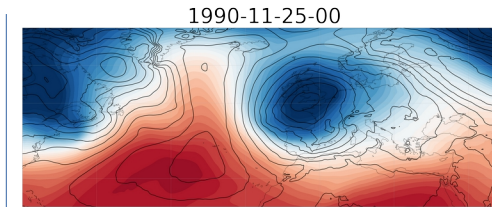
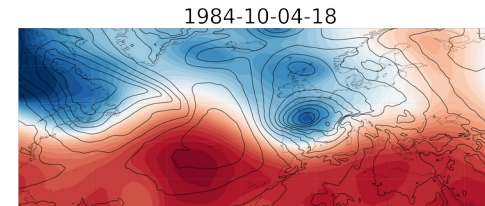
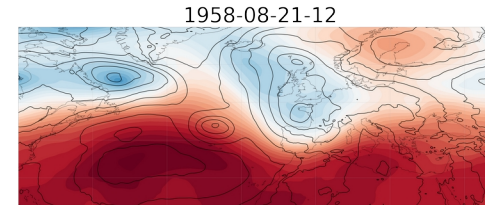
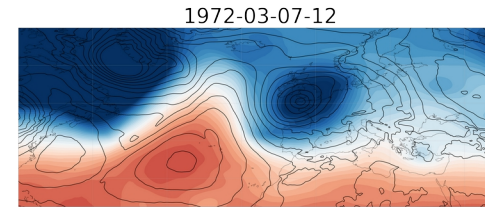
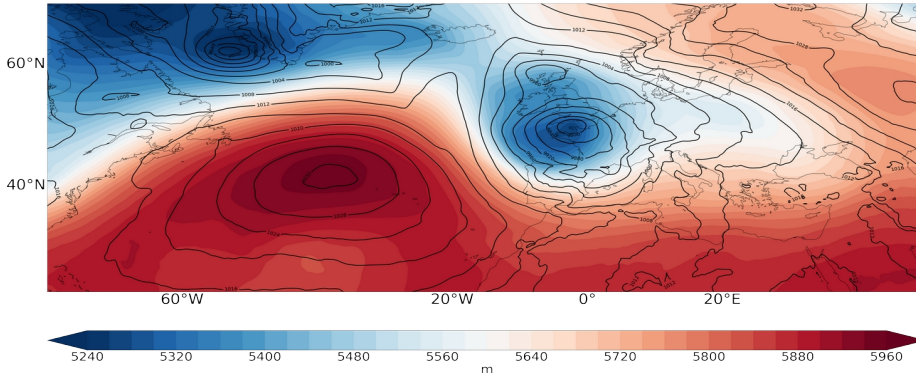
RESEARCH APPROACH

- ERA5 6-hourly data
- Two 30-year long periods:
 - Counterfactual [1950-1985]
 - Factual [1985-2021]

Analogue circulation patterns

- 2nd of October 2020 at 6:00UTC
- SLP (20W–20E, 35–65N) to identify 30 analogue cyclones

ALEX SLP & ZG500 2020-10-02-06



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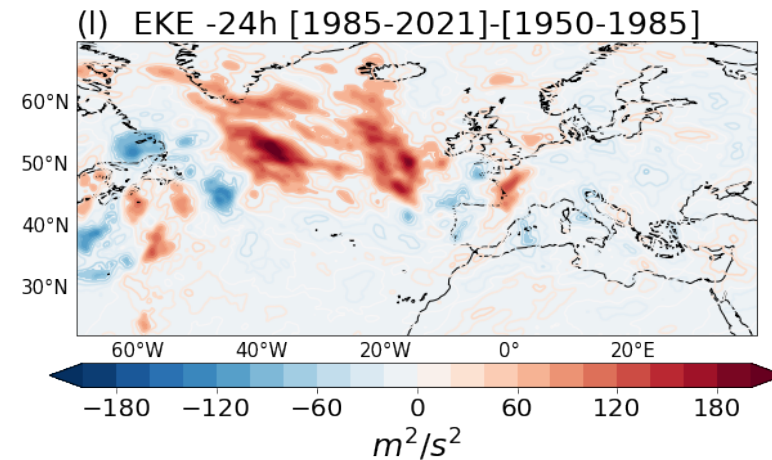
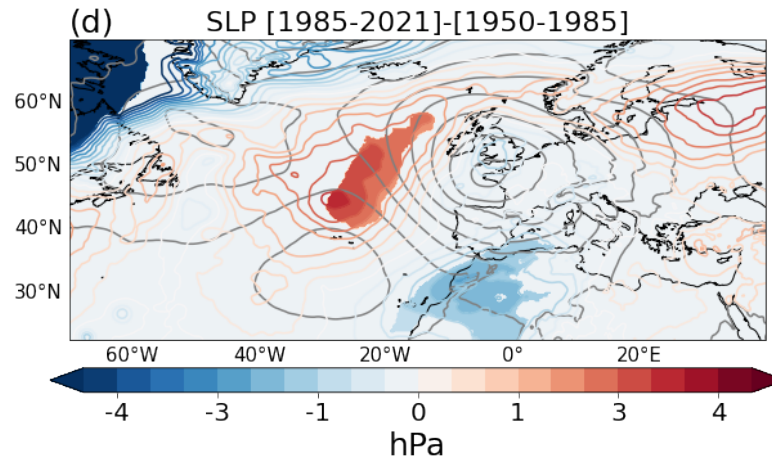
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RESULTS

1. Circulation patterns



2. Persistence

	[1950-1985]	[1985-2021]
θ^{-1} (hours)	20.79 [18.9 22.74]	24.06 [21.42 26.82]

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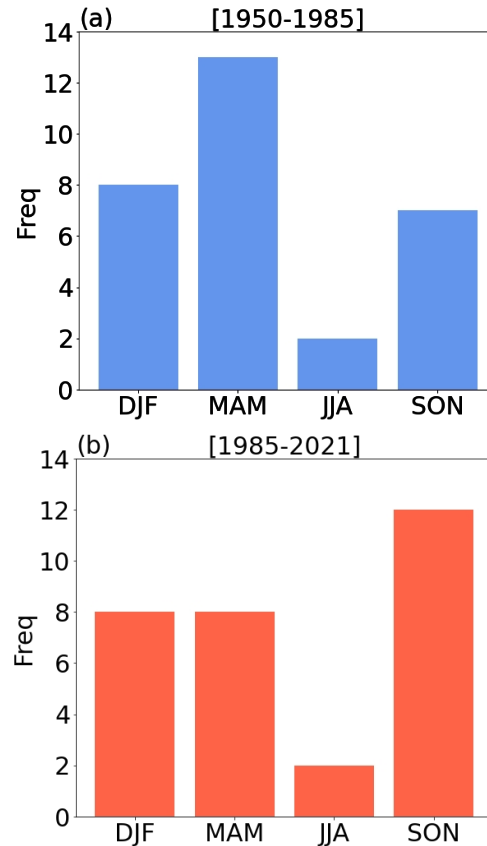
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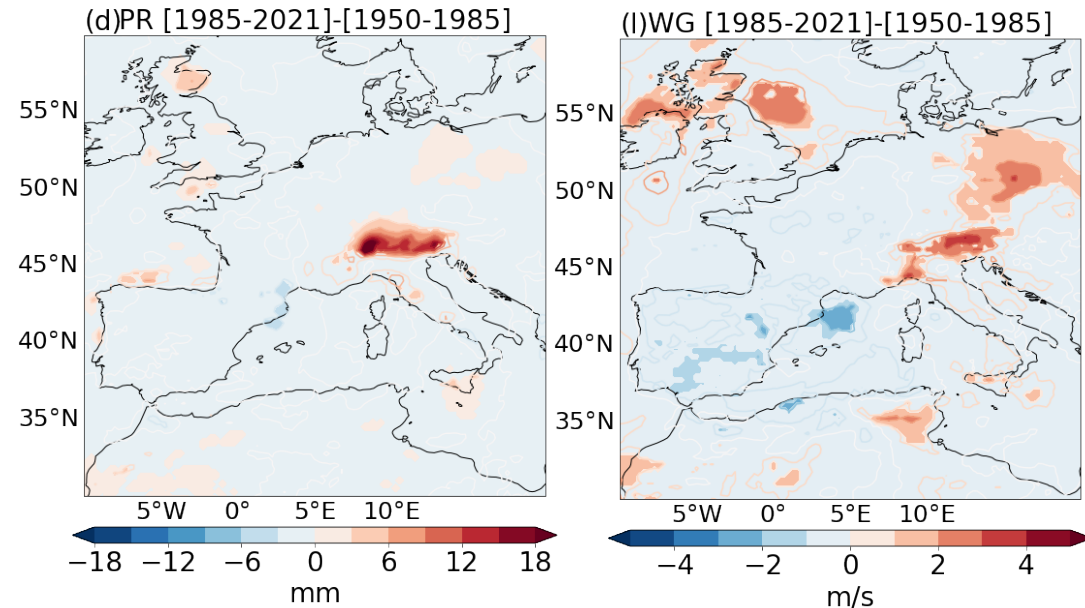
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RESULTS

3. Seasonality of analogues



4. Impacts



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CONCLUSIONS

Alex-like storms in the factual period are ...

More persistent → favours extreme events that result from prolonged weather conditions

More intense and deep (specially in the autumn)

More frequent in autumn

They produce **more precipitation** → more severe flooding events



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