



Atmospheric Origins of Extreme Rainfall in the UK

Where do storms really come from?

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1 Introduction

- Extreme rainfall continues to be a widespread problem in the UK resulting in extensive flooding such as in 2015 when over 4200 homes were evacuated.
- Changes in the magnitude and frequency of these events are due to a non-stationary climate. Current techniques fail to account for this, and rely solely on data approaches to understanding.
- This study looks to provide an atmospheric basis for extreme value rainfall in the UK by identifying and clustering the spatial origins of these extreme storm events.

2 Storm Trajectories

- Annual maximum rainfall was extracted for 44 cities across the UK, these cities are shown in figure 1.
- For each of the AMAX event the atmospheric trajectories were extracted.
- These trajectories were then clustered, resulting in the storm types as shown in section 3.



3 Storm Types

These storms are most likely to cause extreme rainfall in the South-Western regions.



Northern storms are second most likely to produce above average extreme events.



Atlantic storms are the least likely to result in above-average events.



Eastern storms produce the most above-average extreme events.



South-Western storms resemble atmospheric rivers. These cause more frequent events in the West.



Southern storms resemble atmospheric rivers and cause more frequent extremes in the East.



4 Conclusions

- Trajectories originating resemble atmospheric rivers.
- Storms originating in the North Sea produce more above-average extremes.
- North Sea storms are most damaging in Wales and least damaging the South West.
- There exists no correlation between storm type magnitude and the North Atlantic Oscillation.
- Storms originating in the North and Western Atlantic become more frequent during a positive NAO phase.

5 Find out more

Atmospheric Rivers

These are large plumes of water vapor rising from the tropics. Scan the QR code to see one in action.



Full paper

To get more information on these storm types scan the QR code for a copy of the original manuscript.

