



# Disentangling increasing compound extremes at regional scale during Indian summer monsoon

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## Background and Motivation

- ISM precipitation is crucial for agricultural activities... India has witnessed compound dry and hot summers that occurred during 1957, 1972, 1979, 2002, 2009 and 2014, causing a significant crop yield reduction<sup>1</sup>.
- Widespread increase in compound extremes is likely to pose a substantial challenge to the future food security of billions of people....
- Present study disentangle different types of compound extremes and identify climate change hotspots.

## Methodology

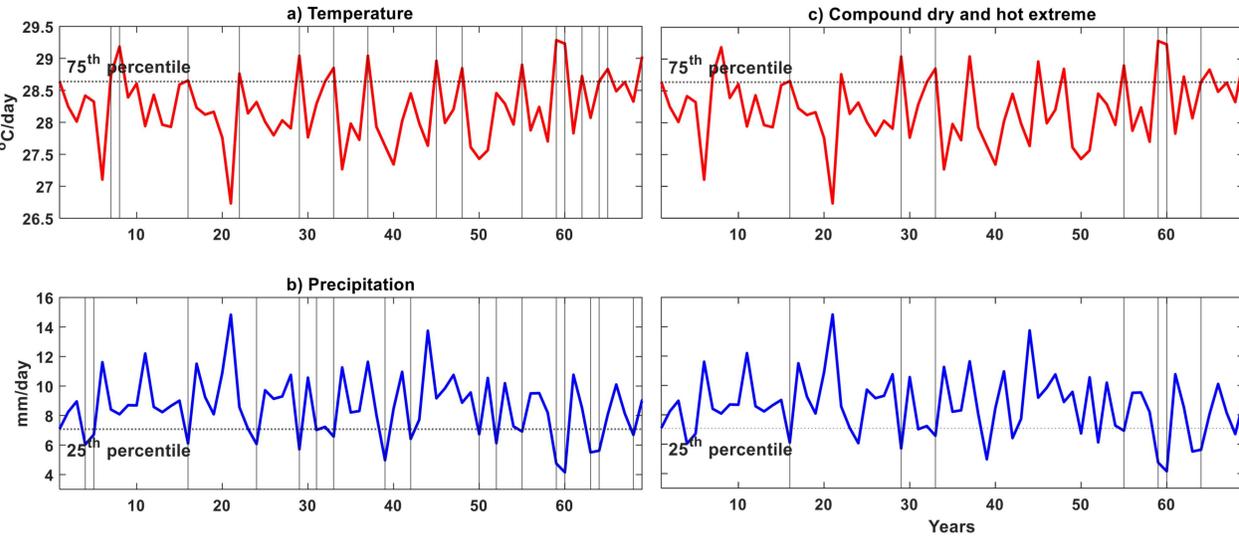
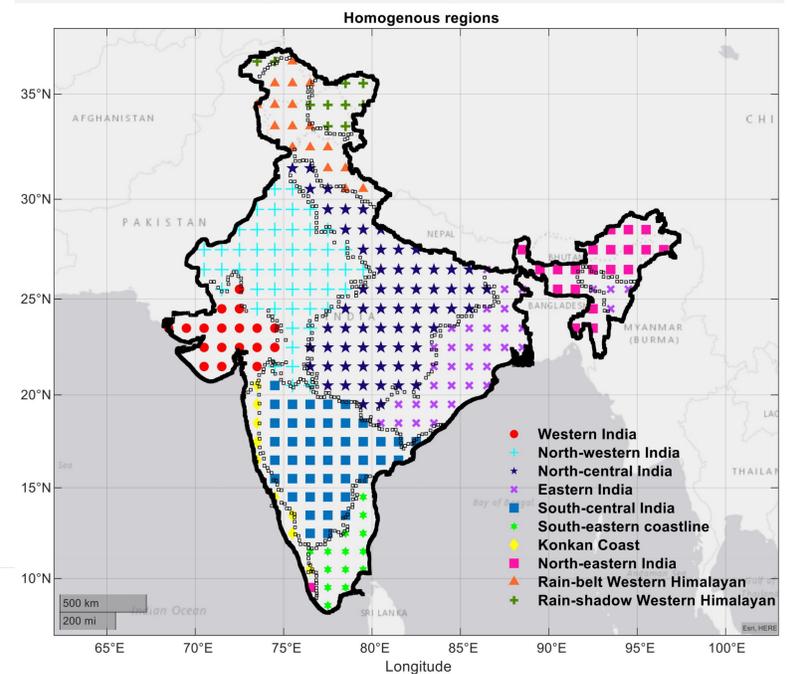
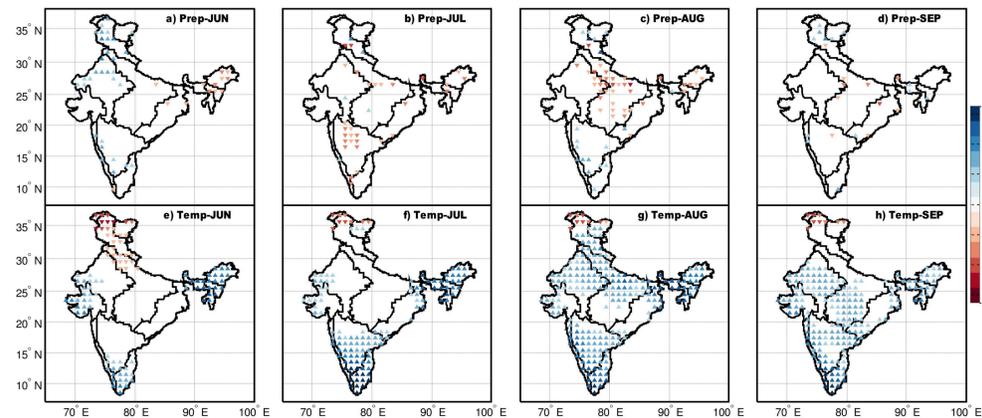


Illustration of a typical compound dry and hot extreme (c) and its comparison with univariate events (a) Temperature >75th percentile and (b) Precipitation <25th percentile. The vertical and horizontal lines are shown to visualize an event and the threshold used to define the event)

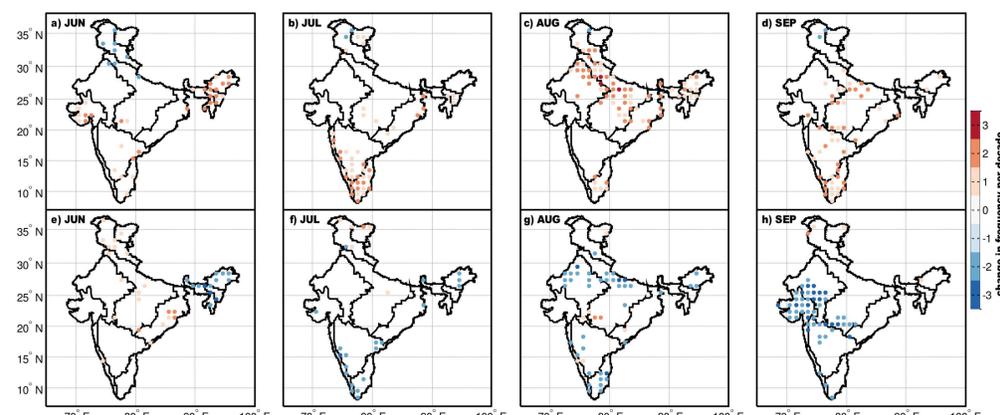
## Homogenous regions of India



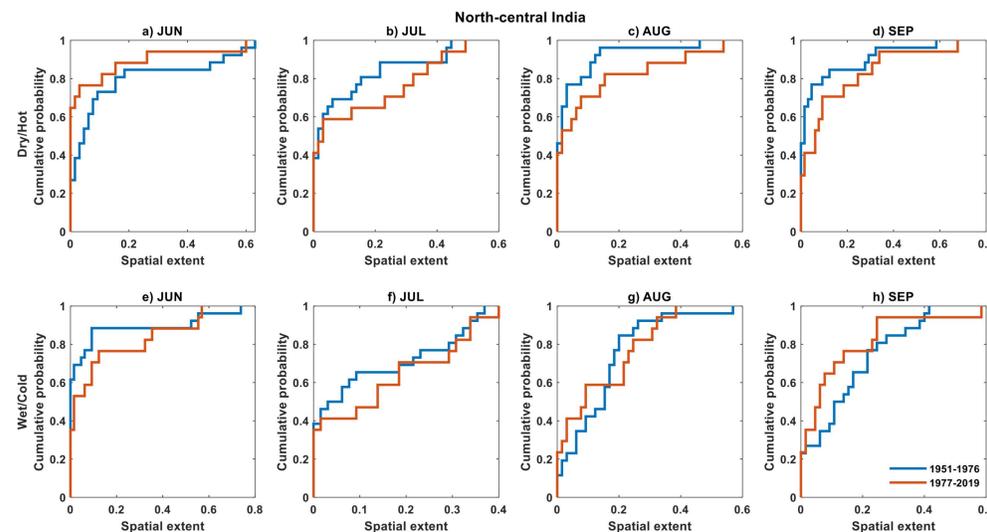
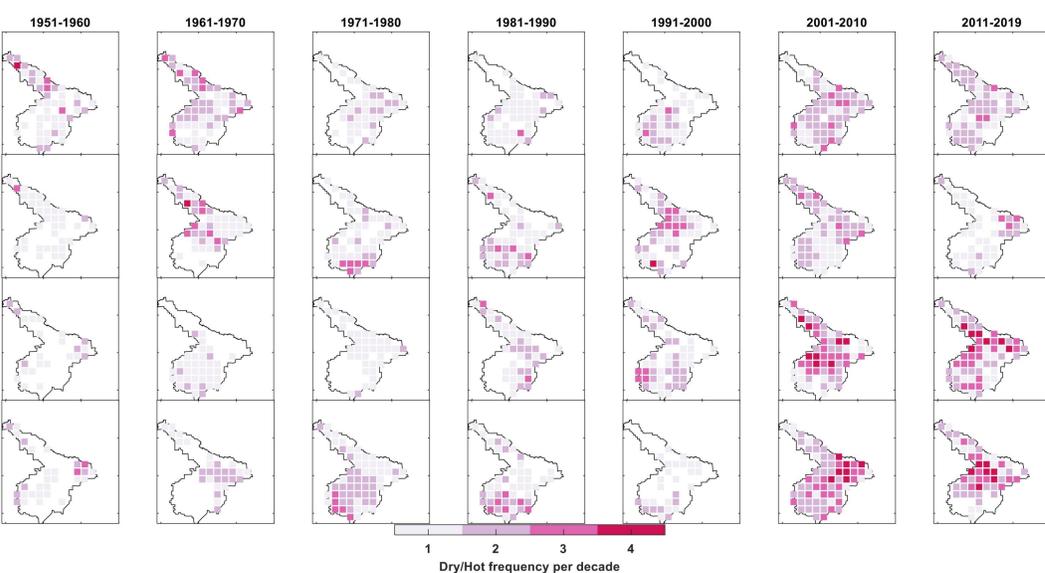
## Changing pattern of precipitation and temperature



## Changes in the frequency of compound extremes



## Changes in the spatial extent of compound extremes



## Conclusions

- Study finds a widespread three-fold rise in compound dry and hot summer monsoon extremes during the past decades over India.
- This increasing pattern of CDHE is high across North-central India, Western India, North-eastern India and South-eastern coastlines.

## Remarks

Know more....



<sup>1</sup> R.K. Guntu, and A. Agarwal, Scientific reports, 11, 16447 (2021).