



# Assessment of compound dry and hot extremes over India using a copula-based multivariate standardized index.

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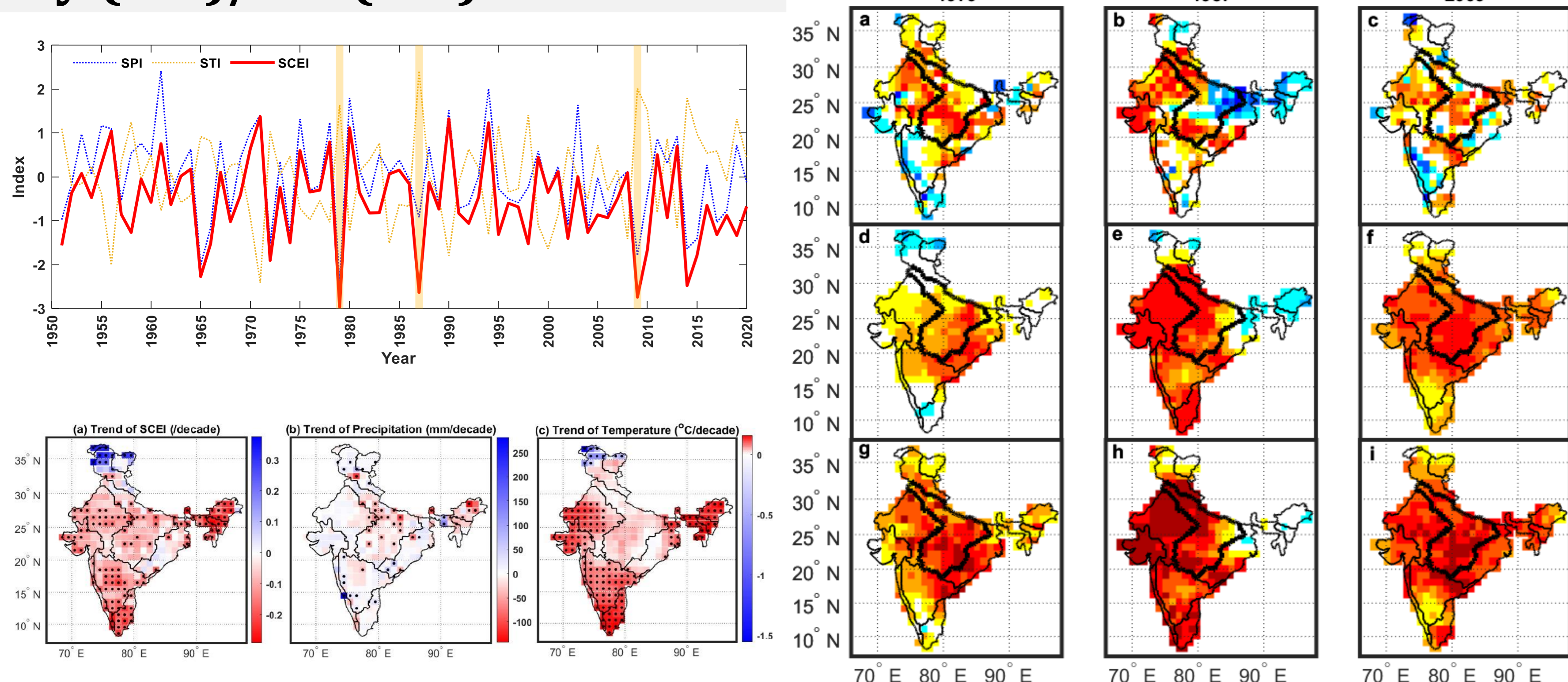


Co-PPARE

## Background and Motivation

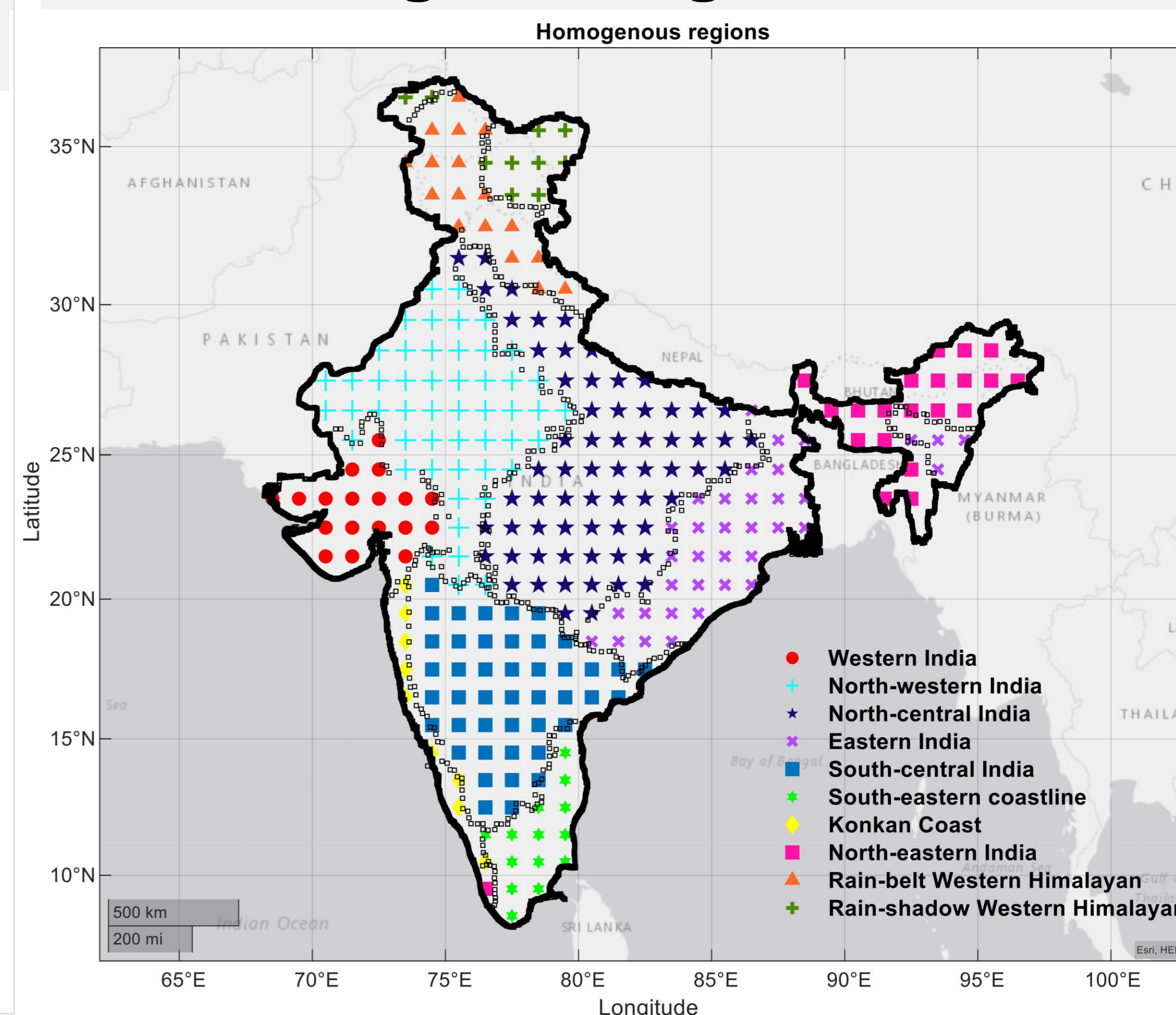
- ISM precipitation is crucial for agricultural activities... India has witnessed compound dry and hot summers that occurred during 1957, 1972, 1979, 2002, 2009 and 2014, causing a significant crop yield reduction<sup>1</sup>.
- Widespread increase in compound dry and hot extremes is likely to pose a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

## Comparison of Compound Dry and Hot extremes (SCEI) with Dry (SPI)/Hot(STI) extremes

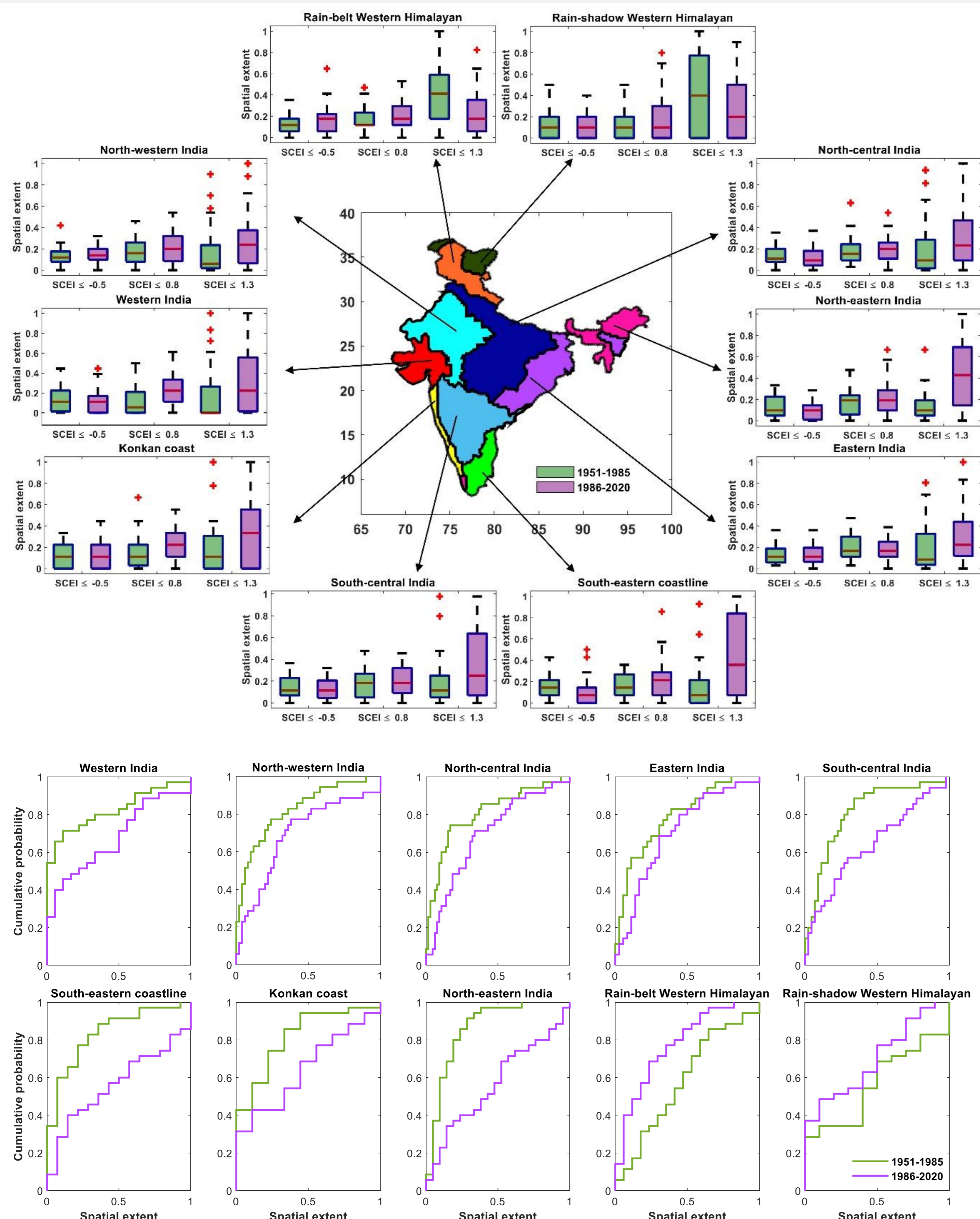


Comparison of SCEI (Standardized compound event indicator) with SPI (Standardized Precipitation Index) and STI (Standardized Temperature Index) during JJAS for the period 1951-2020

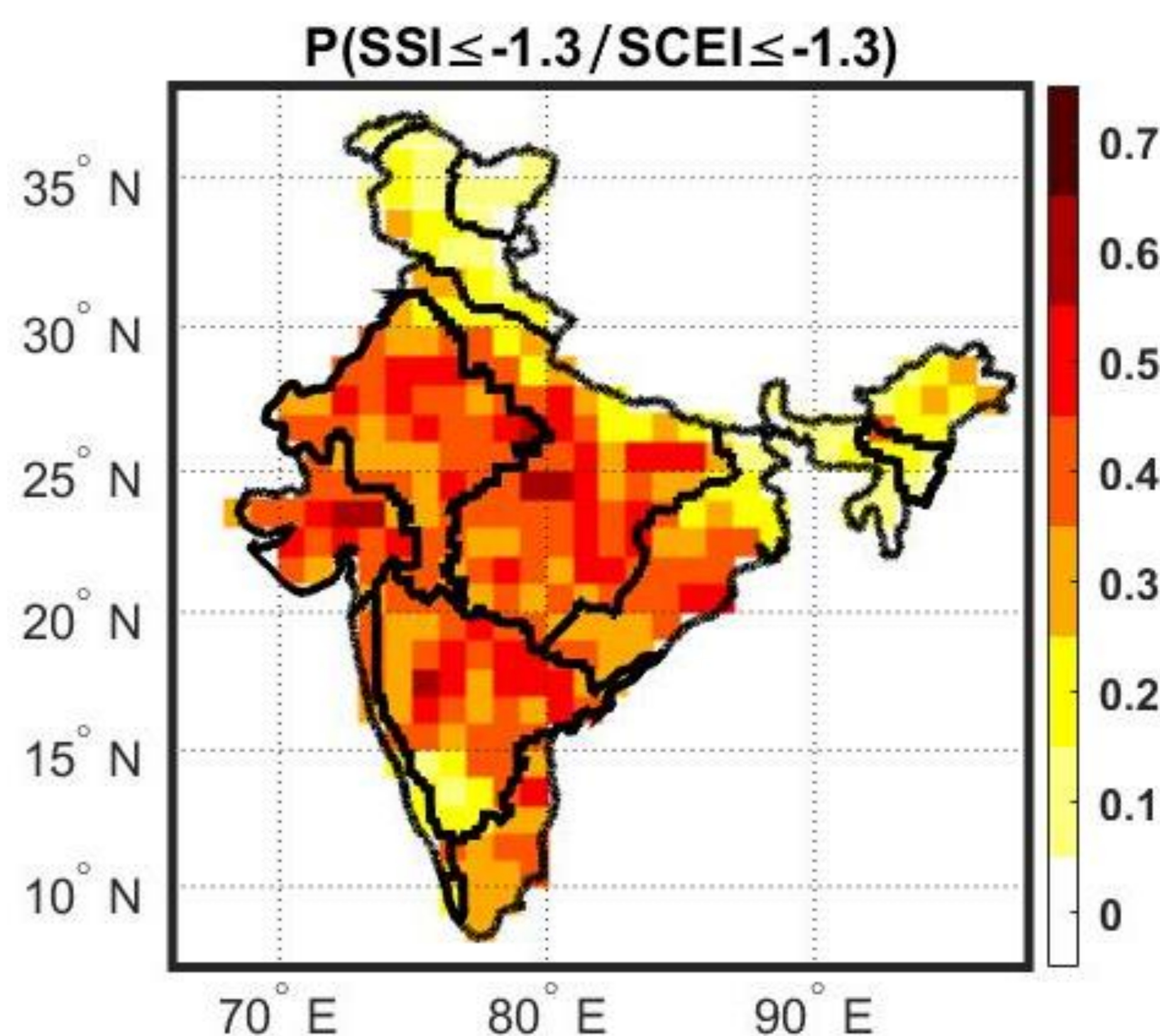
## Homogenous regions of India



## Spatial extent of SCEI severity



## Implications to agricultural drought



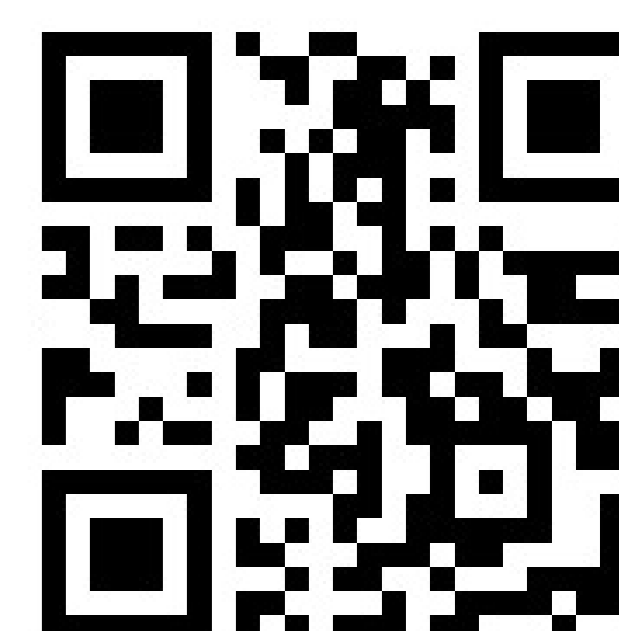
The conditional probability of  $SSI \leq -1.3$  given the values of  $SCEI \leq -1.3$  for JJAS during the period 1951-2020 across Homogenous regions of India.

## Conclusions

- Study finds a significant change in the statistical distribution of compound dry and hot extremes of severe category for the past three decades
- The changing pattern of spatial extent of compound extremes has implications to increase in the widespread agricultural droughts..

## Remarks

Know more.....



## Acknowledgements

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