

Introduction

- The Indian Summer Monsoon (ISM) is one of the most studied meteorological component of the hydrologic cycle due to the complexity of multi atmospheric processes involved besides its great importance.
- The behaviour of Indian Summer Monsoon Rainfall (ISMR) as strong and weak ISM is moreover impacted by the large-scale coupled interactions of ocean, land and atmosphere in the tropical Indian Ocean as well as equatorial Pacific Ocean.

Objectives

- To investigate the ISMR and its spatiotemporal variability over the eastern coast of India (ECI).
- To access the variability in ISMR under El Niño–Southern Oscillation (ENSO) and Indian Ocean Dipole (IOD) phases.

Data & Methodology

- ECI comprises the Eastern coast within the administrative boundaries of states West Bengal, Orissa, Andhra Pradesh and Tamilnadu.
- The ECI is thus divided into seven zones as West Bengal (WB), North Orissa (NO), South Orissa (SO), North Andhra Pradesh (NAP), South Andhra Pradesh (SAP), North Tamilnadu (NTN) and South Tamilnadu (STN).
- Precipitation observations collected from Monsoon-Asia APHRODITE (horizontal resolution $0.25^\circ \times 0.25^\circ$; 1951-2005; Yatagai et al. 2012) and Hadley-OISST (horizontal resolution $1^\circ \times 1^\circ$; Rayner et al. 2003).

Results & Discussion

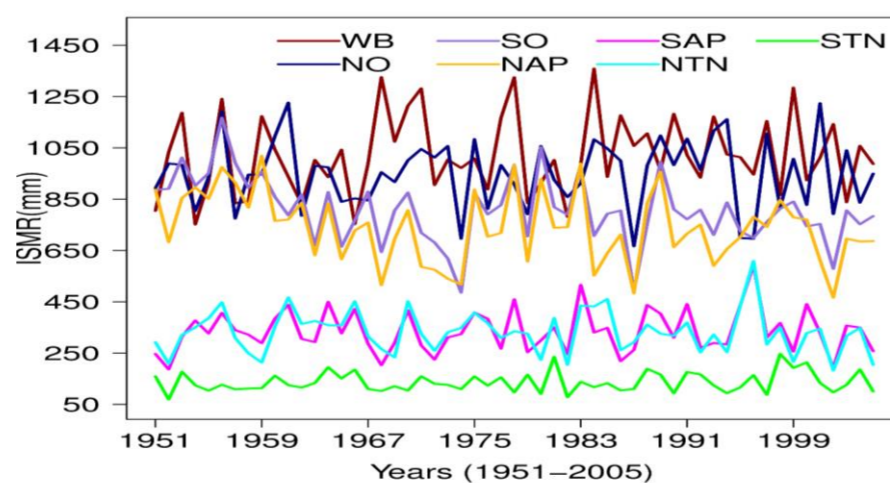


Fig 1. JJAS Rainfall during 1951-2005

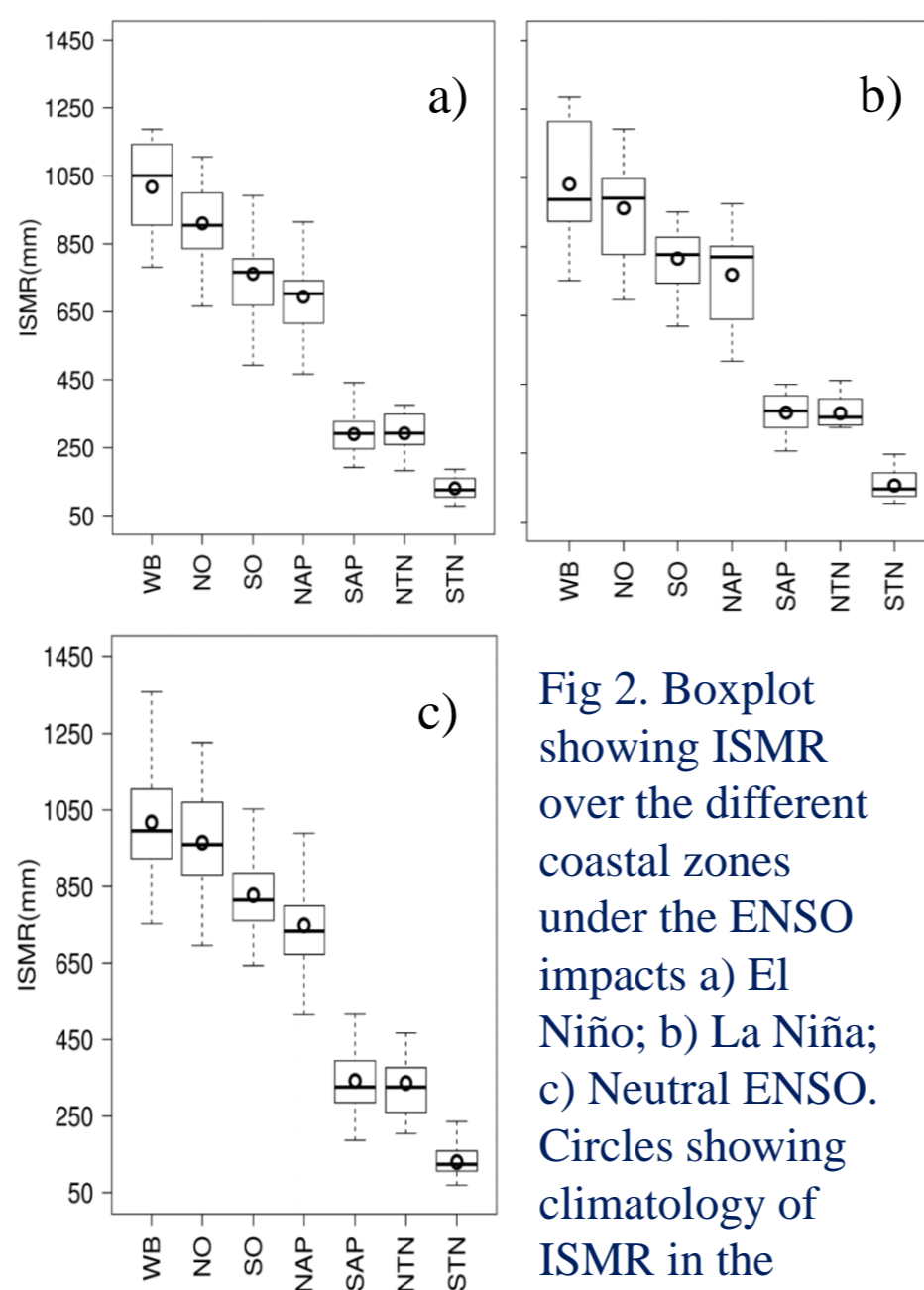


Fig 2. Boxplot showing ISMR over the different coastal zones under the ENSO impacts a) El Niño; b) La Niña; c) Neutral ENSO. Circles showing climatology of ISMR in the respective zones

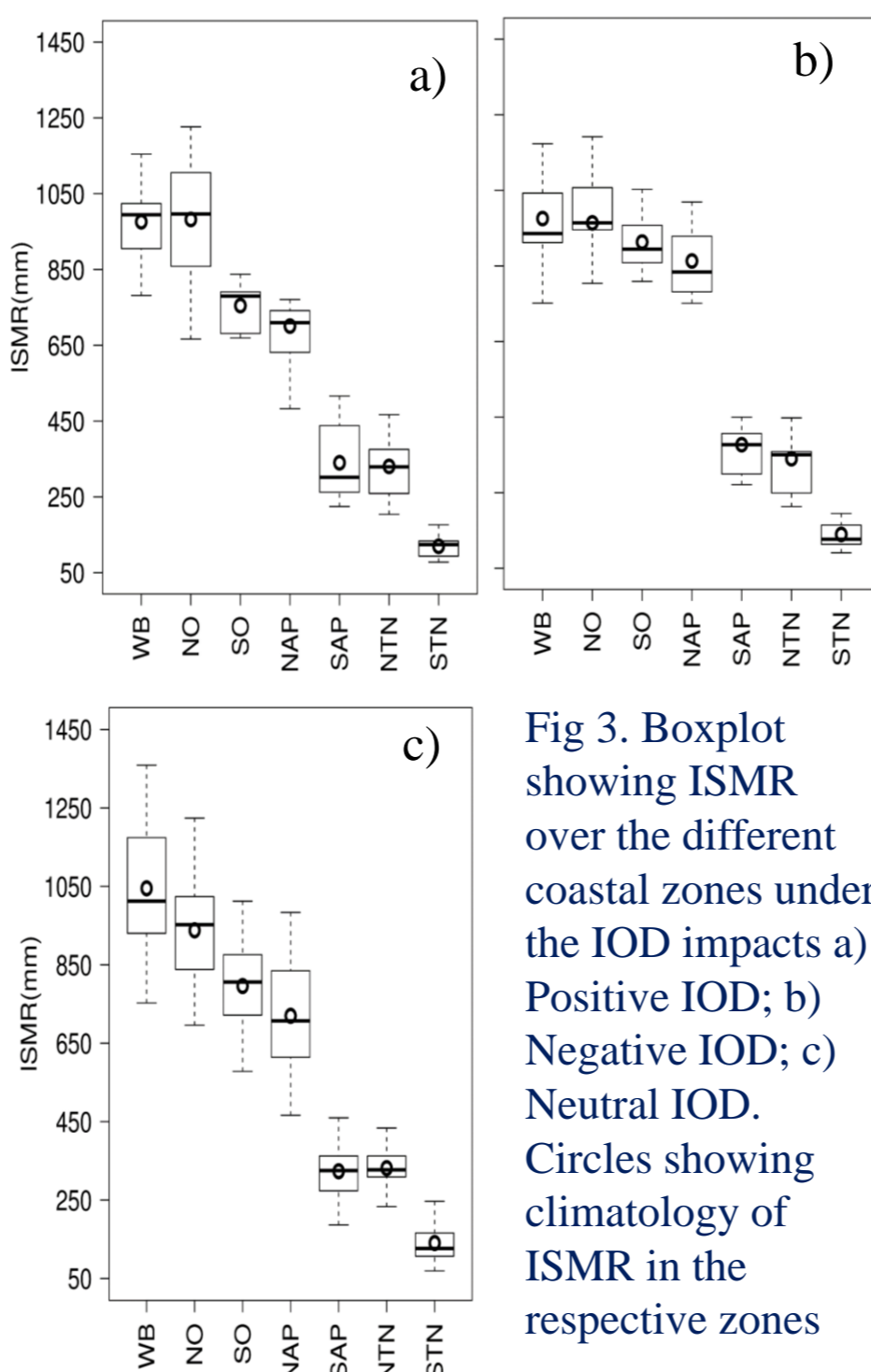


Fig 3. Boxplot showing ISMR over the different coastal zones under the IOD impacts a) Positive IOD; b) Negative IOD; c) Neutral IOD. Circles showing climatology of ISMR in the respective zones

- ECI has decreasing monsoon rainfall distribution spatially moving towards the south (coastal West Bengal to southern coastal Tamil Nadu) (Fig. 1).
- The El Niño–Southern Oscillation (ENSO) impacts the ISMR as the eastern coast of India receives less rainfall in the warming phase of ENSO in comparison to the cold phase (Fig. 2).
- The Negative IOD (NIOD) seems to favor the ISMR with higher ISMR during NIOD years in comparison to Positive IOD (PIOD) and Neutral IOD (Fig. 3).

Summary/Conclusion

Under the large scale climatic systems influences it is evident that notable impacts as increase/decrease in ISMR is present. The ENSO cooling phase and negative IOD phase are found to be favouring the ISM rainfall over the study area while reverse is for the ENSO warming phase. Also the upper ECI tends to have more spread in ISMR in comparison to the tails of ECI.

Acknowledgements & References

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Yatagai, A., K. Kamiguchi, O. Arakawa, A. Hamada, N. Yasutomi, and A. Kitoh, 2012: APHRODITE: Constructing a Long-Term Daily Gridded Precipitation Dataset for Asia Based on a Dense Network of Rain Gauges. Bulletin of the American Meteorological Society, 93, 1401–1415.

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