

## **Progress in American monsoon research: Central and East ENSO influences on South America precipitation and extreme events during austral summer**

Renata Tedeschi<sup>†</sup>; Alice Grimm; Iracema Cavalcanti

<sup>†</sup> INPE, Brazil

Leading author: [rgtedeschi@gmail.com](mailto:rgtedeschi@gmail.com)

The sea surface temperature (SST) anomalies in the Equatorial Pacific Ocean, associated with El Niño (EN) and La Niña (LN) episodes, affect South America (SA) precipitation and extreme rainfall events. The objective of this study is to verify if the occurrence of SST anomalies in different regions of the Equatorial Pacific, Central and East ENSO, results in different influences on the South American precipitation and its extreme events during the summer monsoon. The criterion for defining East and Central ENSO is based on Trenberth's method applied to one region in East (140°W-90°W, 5°N-5°S) and other in Central (160°E-150°W, 5°N-5°S) Pacific. If the criterion is satisfied in both regions, the ENSO category is defined by the location of the maximum anomaly. The mean precipitation anomaly field is determined for austral summer season (and each of its months) for each category of year (Central and East EN or LN), as well as the difference between Central and East EN or LN. During summer season the anomalous precipitation patterns during both Central and East EN or LN are qualitatively similar. The major difference is the intensity of anomalous precipitation. When this analysis is made with monthly resolution, some regions have opposite sign of anomalies for different types of ENSO, as, for example, central-east SA in December of both EN and LN episodes. There is inversion of anomalies from December to January over central-east SA and parts of southeast SA, especially during Central EN. Extreme events are defined as 3-day mean precipitation above the 90th percentile. The mean frequencies of extreme events are determined for austral summer season (and each of its months) for each category of year (Central and East EN, Central and East LN and Neutral), and the difference is calculated between the mean frequencies for Central EN (LN) and Neutral, East EN (LN) and Neutral, and Central and East EN (LN). The seasonal analysis shows similar difference patterns for the two categories of EN (LN), but during East EN (Central LN) the increase (decrease) of extreme events over southeast SA (central-east SA) is greater than in Central EN (East LN). The monthly analysis also shows similar general distribution of difference patterns for Central and East EN or LN, but with different intensities in each category. However, some regional difference patterns have opposite signs for the two types of ENSO, as, for example, over parts of southeast SA and northeast SA during January of EN.