

Comparison of ENSO Indicators and Applications to Precipitation Patterns in the Southeastern US

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The Japanese Meteorological Association index (JMAI) and the Oceanic Niño index (ONI) are two popular methods for characterizing ENSO episodes. In the standard application of the JMAI, a El Niño (La Niña) episode is defined when the 5-month averaged sea surface temperature anomalies recorded in the tropical Pacific Ocean are greater than +0.5°C (lower than -0.5°C) for at least six consecutive months, including October-to December. The episode then lasts from October to the following September included. A modification to this method has recently been suggested, where the episode stops as soon as the temperature conditions are no longer met.

We compared the standard and modified JMAI and the ONI by analyzing differences in mean and median average monthly precipitations recorded on 172 stations over Alabama, Florida and Georgia.

The three indicators gave equivalent results from September to March: El Niño (La Niña) episodes were associated with dryer (wetter) conditions over the three states. For these months, the modified JMAI yielded slightly more significant results. However, with the modified JMAI, significantly less (more) precipitations were recorded in Alabama and central Georgia during El Niño (La Niña) summer episodes. Moreover, the modified JMAI appeared to be usually more sensitive than the ONI, with more stations reporting a significant impact of ENSO phases, at greater degrees of significance.

Therefore, the use of the modified JMAI might be recommended to characterize the impact of ENSO variability on environmental data.

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