

The biennial rainfall relationship in the tropical western hemisphere has weakened in recent decades

January 11 2018

Biennial rainfall relationship could be observed in the tropical eastern hemisphere associated with the tropospheric biennial oscillation, and the tropical western hemisphere. In the tropical western hemisphere, previous studies have revealed that a biennial relationship exists between the interannual rainfall anomalies over Central America (CA) and equatorial South America (ESA). Understanding the behavior and mechanisms of such a biennial rainfall relationship has important applications, due to the importance of rainfall variability to agriculture, economies and society in these regions.

In a recent study published in *Atmospheric and Oceanic Science Letters* (Wang and Wu 2017), the authors from the Guangdong Ocean University report that this biennial [rainfall relationship](#) between CA and ESA has weakened remarkably since 2000. This weakened biennial rainfall relationship could be contributed by the weakening in both the in-phase rainfall transition from CA rainfall to ESA rainfall (i.e., strong rainfall over CA in boreal [summer](#) followed by strong rainfall over ESA in the following austral summer, and vice versa) and the out-of-phase transition from ESA rainfall back to CA rainfall in the following year (i.e., strong rainfall over ESA in austral summer followed by weak rainfall over CA in the following boreal summer, and vice versa).

"The observed decadal changes in the biennial relationship between CA and ESA rainfall can be attributed to changes in the effects of the El

Niño-Southern Oscillation (ENSO) and tropical North Atlantic (TNA) sea surface temperature (SST) since 2000," says Dr. Lei Wang, the lead author of the study. "The changes may be associated with more frequent occurrences of the central Pacific or "Modoki" type El Niño."

This decadal weakening of the biennial rainfall relationship in the tropical western hemisphere may add to the difficulty in predicting the [rainfall variability](#) in the CA and ESA regions. The strategies used for seasonal climate predictions in the CA-ESA regions may need to be changed or adjusted due to this weakening of the biennial rainfall relationship over these regions.

More information: Lei WANG et al, Weakening of the biennial relationship between Central American and equatorial South American rainfall in recent decades, *Atmospheric and Oceanic Science Letters* (2017). [DOI: 10.1080/16742834.2017.1387757](https://doi.org/10.1080/16742834.2017.1387757)

Provided by Chinese Academy of Sciences

Citation: The biennial rainfall relationship in the tropical western hemisphere has weakened in recent decades (2018, January 11) retrieved 25 April 2024 from <https://phys.org/news/2018-01-biennial-rainfall-relationship-tropical-western.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.