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Department of Atmospheric Sciences Seminar Announcement

Department of Atmospheric Sciences, S.O.E.S.T., University of Hawai'i at Mānoa
2525 Correa Road, HIG 350; Honolulu, HI 96822 ☎956-8775



Hawaiian Winter Precipitation Variability during Central Pacific (CP) and Eastern Pacific (EP) El Niño Events

Mr. Bo-Yi Lu

Ph.D. Candidate

Department of Atmospheric Sciences
University of Hawai'i at Mānoa

Date: Wednesday, October 16, 2019
Refreshments: 3:00pm at MSB courtyard
Cookies, Coffee & Tea Provided
Seminar Time: 3:30pm
Location: Marine Sciences Building, MSB 100

Abstract:

The large-scale atmospheric circulation of the North Pacific associated with two types of El Niño – the eastern Pacific (EP) and the central Pacific (CP) – is studied in relation to Hawaii winter rainfall. The eastern and central equatorial Pacific undergo active heating and convection during EP El Niño winters. The local Hadley circulation is enhanced and upper-level westerly jet stream of the North Pacific is elongated eastward. Owing to the impact from both phenomena, stronger anomalous descending motion and divergence anomalies occur near Hawaii. The anomalously strong sinking motion near Hawaii, the anomalous moisture flux divergence over the subtropical North Pacific, and reduction of easterly trade winds, characteristics of EP winters, are all unfavorable for winter rainfall in Hawaii. As a result of this strong and robust signal, dry conditions prevail in Hawaii and the standard deviation of winter rainfall during EP winters is smaller than the climatology.

In contrast, for CP winters, the maximum ocean heating is weaker and shifted westward to near the dateline. The subtropical jet stream retreats westward and the anomalously sinking motion near Hawaii is variable and generally weaker during CP winters. Although the anomalous moisture flux divergence still exists over the subtropical North Pacific, its magnitude is much weaker relative to EP winters. Without strong forcing, rainfall in the Hawaiian Islands during CP winters is close to the long-term mean, except for a slightly drying on Kauai. The spread of rainfall from one CP event to another is also larger compared to the climatology.