

Department of Meteorology M.S. Defense Announcement

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Variability of Hawaiian winter rainfall during La Niña events since 1956

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Date: Wednesday, June 18, 2014

Time: 10:00am

Location: IPRC Conference Room, POST 414

Abstract:

Rainfall trends in Hawaii during La Niña years have undergone abnormal variability since the early 1980s, making seasonal forecasts more challenging to perform. Traditionally, Hawaii receives greater than normal precipitation during La Niña wet seasons. Recently, the wet seasons of La Niña years have experienced less than normal rainfall. A change-point analysis has been performed to determine the shift in precipitation occurs in 1983, forming two epochs in the study used for comparison. The first epoch runs from 1956 to 1982 and the second epoch spreads from 1983 to 2010. A normalized rainfall anomaly assessment is performed, illustrating the drying trend in Hawaiian precipitation during La Niña years. Furthermore, location specific changes in rainfall anomalies throughout the Hawaiian Islands are examined. Influenced by variations in tropical sea surface temperatures, circulation features in the northern Pacific Ocean have changed during La Niña wet seasons. Strengthening and broadening of the eastern North Pacific subtropical high, coupled with an elongation and intensification of the subtropical jet stream are main influences to account for lack of precipitation during the recent La Niña wet seasons. Moisture transport analysis shows that variations in circulation structures are the greatest cause for a reduction of moisture in the Hawaiian region during the second epoch. A case study concerning North Pacific precipitation analysis of two contrasting years is also performed.