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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



# Spatiotemporal rainfall patterns in Hawai'i and the influence of large- scale modes of climate variability

**Dr. Abby G. Frazier**

Fellow

East-West Center, Research Program

**Date:** Wednesday, October 3, 2018  
**Refreshments:** 3:00pm at MSB courtyard  
Free Cookies, Coffee & Tea Provided  
(Please Bring Your Own Cup)  
**Seminar Time:** 3:30pm  
**Location:** Marine Sciences Building, MSB 100

### Abstract:

The geographically isolated Hawaiian Islands are not immune to the effects of climate change. As the global climate warms, understanding historical rainfall variations is important to provide context for future changes. This talk focuses on a spatial trend analysis of Hawaiian rainfall from 1920 to 2012, and an attribution analysis to determine the influence of natural variability on these rainfall variations and whether we can detect an anthropogenic signal. Utilizing a high-resolution gridded data set of annual and seasonal rainfall, trends were calculated for every 250-m pixel across the state to produce spatially continuous trend maps. Over 90% of the state experienced drying trends, with the western part of Hawai'i Island experiencing the largest significant long-term declines. A running trend analysis revealed areas with persistent trends through time. To quantify the influence of natural variability (ENSO, PDO, and PNA) on the rainfall time series, an EOF analysis was performed on the gridded seasonal rainfall. The leading components were modeled with indices of large-scale climate variability using multiple linear regression. To assess whether an anthropogenic signal can be detected, pattern correlations were calculated between recent trends and future expected changes from downscaling projections. Results give weak and inconclusive evidence for detection of anthropogenic signals above natural variability in the observed rainfall trends at this time. Overall, this work contributes to our understanding of natural climate variability in Hawai'i, and provides important spatial details for natural resource management.

### Bio:

Dr. Abby Frazier is Research Fellow at the East-West Center in Honolulu, Hawai'i with the Early Career Scholars Program. Her research interests include climatology, geospatial analysis, geostatistics, climate variability, big data analysis, and landscape ecology. Prior to joining the East-West Center, she was a post-doctoral Research Geographer with the USDA Forest Service, Institute of Pacific Islands Forestry, completing a drought synthesis for the Hawaiian Islands. Dr. Frazier received her Ph.D. and M.A. degrees in Geography from the University of Hawai'i at Mānoa studying rainfall variability in the Hawaiian Islands, and has a B.S. in Mathematics and a B.A. in Geography from the University of Vermont.