



THE LABORATORY OF TREE-RING RESEARCH

presents a talk by

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Climatic Changes and Their Effects on Rainfall in Hawai'i

Tuesday, September 22, 2015 - 4:00pm to 5:00pm

Room: Bannister 110

In the past three decades rainfall has been decreasing over many parts of the Hawaiian Islands, while temperatures have been rising. If these trends continued, severe deficit in the moisture availability could affect many parts of the Hawaiian Islands, with devastating impacts on Hawai'i's native ecosystem. In this presentation I will discuss how climate variability on the large-scale and rainfall variability on the small scale are related. Based on these empirical relations, statistical downscaling methods have been developed for the Hawaiian Islands. The results of the statistical downscaling process show that the dry leeward sides of the islands are expected to experience a continued drying trend. Wet windward sides, where trade winds provide most of the rainfall, are likely to see small changes or moderate increases in the rainfall during the wet season. In the dry summer season, however, Oahu, Maui Nui and most parts of Hawai'i Island could experience a reduction in rainfall according to the statistical downscaling, whereas dynamical model results suggest the opposite trend. Currently, the confidence in the trend pattern is higher for the wet season than for the dry season. Besides the seasonal mean precipitation changes, I'll present results of the analysis of heavy rain events, and a new 34-year analysis of synoptic weather pattern associated with kona lows. In summary, the results suggest that combining information from climate variability, synoptic weather pattern, and local rainfall variability into a consistent future rainfall scenarios will require the combination of independent downscaling methods and independent climate metrics (or targets). Such extended scientific research will increase our ability to study the potential impacts for the Hawaiian Island's hydrology and native ecosystems.