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Tropical oceanic regions such as the western Pacific warm pool and the Indian Ocean are well known for high SST and the occurrence of copious convective rainfall. Such conditions are often regarded as synonymous at regional and global scales of analysis because their coexistence is so extensive. Upon examination of SST structure over a four year period, Li and Carbone (2012) revealed a stronger association between mesoscale SST gradients and the excitation of rainfall than SST itself; exhibit a SST bias of only +0.25C in a field of $\sim$3C variability; and are associated with forcing in 75% of $\sim$10,000 rainfall events.

This presentation statistically examines the lifecycle of heavy rainfall events, SST gradients, and large scale forcing under conditions including the Madden Julian Oscillation. Timeseries analysis illustrates mutual dependencies between upper ocean thermal structure (gradient and Laplacian of SST) and the occurrence of rainfall. Environmental factors associated with multi-day propagating rainfall events are also explored and examined for systematic behavior with respect to transient atmospheric forcings. Potential predictor variables emerge based on harmonic analysis of SST field properties and variability at sub-seasonal scales, tropospheric wind shear, and the presence or absence of a critical level.