



Effect of Ocean Heat Variables on Tropical Cyclone-Related Precipitable Water

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With the recent devastation of the 2017 hurricane season, understanding the response of tropical cyclones (TCs) to the surrounding conditions has become increasingly important. While previous studies have researched the relationship between sea surface temperatures (SSTs) and TC qualities, the dependence structure between ocean temperature conditions and tropical cyclone-associated precipitable water has not been explored in detail. Based on previous studies, we hypothesized that SSTs associated with TC events possess a positive relationship with precipitable water attributed to individual events. Using tropical cyclone best track data and satellite products, we examined the relationship between local SSTs with tropical cyclone-associated total precipitable water. We observed that both local and relative SSTs establish an upper bound on TC-related precipitable water, resembling the relationship SST possesses with TC wind speed. In addition, we explored recent shifts in precipitable water associated with SST thresholds. Evaluating the conditional distributions from two study periods reveals a subtle but significant shift in TC-related precipitable water under extreme SST conditions. We plan to highlight the 2017 storms in our analysis to evaluate the magnitude of the events in relation to historical records and the contribution of ocean conditions to observed precipitable water conditions.