

ABSTRACT

In the Philippines, the MJO has been shown to have an effect on seasonal rainfall in both *habagat* and *amihan* seasons. Comparison between PAGASA surface rainfall data and gridded products including APHRODITE V1101, APHRODITE V1801, TRMM 3B42 v7, and GPM IMERG Final Precipitation v06 showed that the latter best represents extreme rainfall events albeit with a wet bias. Rainfall probability distribution functions during RMM Phase 5 and 6 (3, 7, and 8) are skewed higher (lower) compared with mean NDJF at the 50th, 75th (wet) and 90th (extreme wet) percentiles. Percentage change of likelihood of exceeding the 90th percentile rainfall threshold rises by 23% (falls by 11%, 17%, and 31%) and the 95th percentile threshold by 59% (falls by 20%, 54%, and 14%) in Phase 6 (Phases 3, 4, and 7). Active tropical cyclone (TC) days generally bring more precipitation compared with non-TC days in NDJF although it is only in Phases 4-7 where this difference is significant. The likelihood of extreme wet events rises by at least 100% in Phases 3-6 during TC days and at least 15% in Phase 6 during non-TC days. Meanwhile, an anomalous cyclonic circulation emerges over central Philippines in Phases 3-7 at extreme wet events. This cyclonic circulation persists even during non-TC days. Because the MJO can be forecasted with skill for up to 2 weeks, this research on the modulation of the MJO on extreme precipitation events may aid in disaster risk preparation and water resource management.

Keywords: MJO, extreme precipitation, tropical cyclones