

# Comparison of TMPA-3B42 Versions 6 and 7 Precipitation Products with Gauge-Based Data over India for the Southwest Monsoon Period

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## Abstract

The upgraded version 7 (V7) of the Tropical Rainfall Measuring Mission (TRMM) Multisatellite Precipitation Analysis (TMPA) products is available to the user community. In this paper, two successive versions of the TMPA-3B42 research monitoring product, version 6 (V6) and V7, at the daily scale are evaluated over India during the southwest monsoon with gauge-based data for a 13-yr (1998–2010) period. Over typical monsoon rainfall zones, biases are improved by 5%–10% in V7 over the regions of higher rainfall like the west coast, northeastern, and central India. A similar reduced bias is seen in V7 over the rain-shadow region located in southeastern India. In terms of correlation, anomaly correlation, and RMSE, a marginal improvement is seen in V7. Additionally, in all-India summer monsoon rainfall amounts, mean, interannual values, and standard deviation show an overall improvement in V7. Different skill metrics over typical subregions within India show an improvement of the monsoon rainfall representation in V7. Rainfall frequency in different categories also indicates an overall improvement in V7 across all scales and subregions. Over central India regions associated with the monsoon transients, the sign of the bias has changed toward a positive bias. Even if the bias in the frequency of the occurrence of light rain has improved in V7, the values still show a large difference compared to observations. Though both V6 and V7 are able to represent the anomalous dry/wet regions during contrasting monsoon years, V7 shows some improvement in amplitude of those anomalies over V6. In general, V7 has considerably improved over V6 and will continue to be in demand from various sectors of observed rainfall data users.

**Keywords:** Convective-scale processes, Monsoons, Satellite observations, Surface observations, Orographic effects, Regional effects