Regional and seasonal assessment of biases on high-resolution satellite precipitation Estimations in Peninsular Malaysia: 2011–2020

ABSTRACT

Satellite precipitation estimations (SPEs) have become important to estimate rainfall in remote and inaccessible areas. The study evaluates two high-resolution SPEs (IMERG and CHIRPS) in Peninsular Malaysia from 2011 to 2020. In situ rain gauge observation data were used as reference data, and a series of statistic indices were used to evaluate the performance of SPEs. In order to identify the source of error in the SPEs, an error decomposition technique was proposed whereby the bias is segregated into four different independent components. The study found that IMERG outperformed CHIRPS, with both satellites performing well in the east coast region but poor in the central region. A superior correlation between the SPEs and rain gauge observations was found during the northeast monsoon. The false bias has shown the widest range compared to other error components, indicating that it is the main contributor to the total bias of both SPEs in Peninsular Malaysia.