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Assessing the viability of using CHIRPS-GEFS for landslide forecasting in the Lower Mekong Region

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The Lower Mekong region is particularly prone to natural hazards caused by extreme rainfall. During monsoon seasons from June to October, heavy rainfall triggers severe flash floods and landslides, posing a threat to human lives and livelihoods. Global forecast products struggle to provide reliable estimates of extreme rainfall at regional scale, which is a big challenge in their integration in early warning systems. A newly released version of Climate Hazards Center InfraRed Precipitation with Stations (CHIRPS) Global Ensemble Forecast System (GEFS) dataset is a bias-corrected and downscaled product derived from **National Centers for Environmental Prediction (**NCEP)-GEFS. CHIRPS-GEFS product provides up to 16 days of rainfall forecasts at 5km/daily spatio/temporal resolution. This study evaluates the spatial and temporal performance of the CHIRPS-GEFS for extreme precipitation in the Lower Mekong region during monsoon seasons from 2014 to 2019. Rainfall forecasts from 1 to 5-days lead-time are analyzed against the bias-corrected Integrated Multi-satellitE Retrievals for GPM (IMERG) over the lower Mekong region. The performance is assessed using both categorical and continuous statistics such as the probability of detection, false alarm ratio, critical success index, correlation coefficient, and root mean squared error. Results describe the spatial and temporal strengths and limitations of the CHIRPS-GEFS and the influence of geomorphological conditions on its performance. This analysis provides valuable information on CHIRPS-GEFS possible integration in the lower Mekong landslide forecasting model for region-based landslide hazard assessment and situational awareness (LHASA) along the lines of the global LHASA framework.