



Tropical cyclone rainfall in the Mekong River Basin for 1983 - 2016

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As home to about 70 million people, the Mekong River Basin (MRB), located in Mainland Southeast Asia, is often influenced by tropical cyclones (TCs) landfall. The TCs not only cause flood and storm hazards, but also play important role in providing freshwater resource and welcomed sediment transports. Our study focuses on the climatology of TCs and associated rainfall (TCR) in the MRB for 1983-2016. Results show that: (i) the mean landfall occurrence of TCs is 4.9 yr⁻¹, leading to 32.4 mm yr⁻¹ of mean TCR (2.2% of the total precipitation), which mainly occur in monsoon-TC season (i.e., June-November); (ii) TCs highly concentrate on the lower eastern MRB, causing the largest TCR of 300 mm yr⁻¹ (11% of the local total precipitation); (iii) the annual mean contribution of TCs induced extreme precipitation - R20mm and R50mm (days of heavy precipitation rate ≥ 20 mm day⁻¹ and ≥ 50 mm day⁻¹, respectively) - to the total precipitation is large in the lower eastern MRB; (iv) 60% of the basin area is influenced by TCR on average; and (v) a significant weakening trend of the TC occurrences (-0.1 yr⁻¹) is observed. The present findings lay a foundation for further in-depth research of the potential influence of the dynamic TCs and the associated rainfall in the MRB.