

## Role of tropical cyclones in determining the fate of Bay of Bengal vapor contributed rain $\delta^{18}\text{O}$ values

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The evaluation of robust future climate prediction is well dependent on the cognition of past and present hydrological systems which could be traced through the oxygen isotopic composition ( $\delta^{18}\text{O}$ ) of rain. Compared to Peninsular and Southern India, explanation for the variability in  $\delta^{18}\text{O}$  values of monsoonal rain is sparse for the Eastern India. Analysis (and published records) of Indian summer monsoon (ISM) rain at the entry point of Bay of Bengal (BoB) vapor into the continent showed the gradual depletion of  $^{18}\text{O}$  in the ISM rain is determined by the surface run-off and location of cyclone generation in BoB. The timing and density of cyclones control the maxima in amount and minima in  $\delta^{18}\text{O}$  value of ISM rain and possibly also responsible for the long-term (last 10 years) decrease in rain  $\delta^{18}\text{O}$  values (and amount). Large spatial variation and temporally robustness of weak and insignificant amount effect suggested reconsideration of reconstructed past climate records along the track of BoB vapor. The memory effect of atmospheric vapor is found to lower the amount effect.