



## **Response of Asian climate and monsoons to the Tibetan Plateau topography**

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The climate of Asia is vastly diverse throughout the continent, with two main monsoonal systems controlling the climate to the East and the South (Molnar et al., 2010; Ao et al., 2016). Studies examining the onset and development of the monsoons and the aridity over Central Asia have generated significant debate over the years not only about the drivers forcing the change but also about the timing. One of the drivers that researchers agree upon is the uplift of the Tibetan Plateau (TP) (Liu and Dong, 2013; Jian et al., 2014) which provides a heat source opposing the Hadley circulation (Molnar, 1993) and also affects the location of the low pressure belt over South Asia. Modeling efforts in the past have used GCMs to study the difference in circulation with the TP flattened versus present elevation (Hahn and Manabe, 1975; Zoura et al., in prep.) but in this study we go a step further, using 6 more simulations for the in-between stages of the TP uplift using the HadCM3. Specifically, we begin with the flat TP elevation and then we run a simulation for every 1000m of uplift until we reach the present-day elevation values. Overall changes in TP elevation alter the flow of both the westerlies and southerlies, which are considered to be the main moisture source for inland Asia as well as one of the primary forcing mechanisms driving regional changes in hydrology since the Eocene to Oligocene transition.