

Changing Indian monsoon rainfall patterns under warming climate

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Abstract

The temperature and moisture distribution over Indian sub-continent is changing in recent decades under the increasing global temperature. This redistribution results in shifting wet/dry and warm/cold zones. The differential warming rates over land and surrounding sea/ocean determine intricate dynamics of the Indian summer monsoon. These differential warming rates make the Indian monsoon region to more susceptible towards drought and flood. The frequent recent floods over northwest India viz., over Gujrat and Rajasthan, are may be due to the weakening of prevailing heat-trough circulation. The weakening (increase) of the southwesterly over IGP (northwest India) reduced (enhanced) transport of moisture leading to reduced (increase) rainfall over IGP (northwest India). In addition, changing Hadley circulation pattern in the recent time decreases the rainfall over southern Indian region. The recent changes in rainfall pattern will shift climate of western India (IGP) towards relatively moist (arid) regime which supports the possible greening of Thar region.