



## **Variability in heat stress and heat wave over the Indian subcontinent**

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India, with 1.32 billion people is the second most populous country in the world with considerably high levels of population density. Previous research shows global temperatures continue to increase causing in increased heat stress and Heat waves affecting the communities and causing extensive damage to crops and agro-rural economy. In this context, SWAT data of the NCEP over the 36-year from 1979 to 2014 are used to access the long term variability of heat stress and heat wave. Over this period, more than 150 days a year, the Eastern coastal region of India have significantly higher no of peak heat stress days (> 120 degrees Fahrenheit) as compared to 100 days in another part of the country leaving the hill states of India where Heat Stress are below 20 days. This may be due to westerly wind from Bay of Bengal drawing heat and moisture to the landmass. The heat stress has increased most in the north-eastern region, more the 4 degrees Fahrenheit, as compared to rest of the country from 1979 to 2014 which can be a result of increased humidity and solar insolation. The country has witnessed an average of 4 to 6 heat wave days a year over the region but few states such as Bihar, Jharkhand, Punjab and Haryana have witnessed more than 8 days a year where relative humidity has gone up due to increased precipitation causing increased heated days. The analysis shows that a high percentage of land mass are venerable to the increased heat stress, although more detailed studies considering the spatial and temporal distribution of the population are needed to be done for the future scenarios. This work can be used as a guideline for the next steps in detailed studies on mitigation plan and decision making.