EGU21-1736, updated on 18 Oct 2021
https://doi.org/10.5194/egusphere-egu21-1736
EGU General Assembly 2021

Future Changes in extreme precipitation over South Asia and its causes

Mayank Suman[1] and Rajib Maity[2]
[1]Research Assistant, Department of Civil Engineering, Indian Institute of Technology Kharagpur (mayanksuman@protonmail.com)
[2]Associate Professor, Department of Civil Engineering, Indian Institute of Technology Kharagpur (rajib@civil.iitkgp.ac.in)

Indian Summer Monsoon is vulnerable to climate change. Analysis of precipitation over India suggests more increase in extreme precipitation over south India as compared to north and central India during post-1970 (1971-2017) as compared to pre-1970 (1930-1970) (Suman and Maity, 2020). This contrast in the characteristics of extreme precipitation over south and north India is expected to continue as revealed by the analysis of precipitation from the Coordinated Regional Downscaling Experiment (CORDEX) simulations. Additionally, precipitation extreme are expected to shift southward over South Asia in the future (2006-2100 as compared to 1961-2005). For instance, the Arabian Sea, south India, Myanmar, Thailand, and Malaysia are expected to have the maximum increase (~18.5 mm/day for RCP8.5 scenario) in mean extreme precipitation (average precipitation for the days with more than 99th percentile of daily precipitation). However, north and central India and Tibetan Plateau show relatively less increase (~2.7 mm/day for RCP8.5 scenario). The increase in extreme precipitation over most part of South Asia can be attributed to stronger monsoon due to increase in air temperature over Tibetan Platue and Himalayas, stronger positive Indian Ocean Dipole events, and high precipitatible water over land areas in the future. However, while analysis of moisture flux and moisture convergence at 850mb, an intense eastward shift is noticed for moisture flux (over Indian Ocean region). This shift in moisture flux along with associated changes in moisture convergence over landmass are found to intensify during days with extreme precipitation. These changes are expected to intensify the observed contrast in extreme precipitation over south and north India and shift the extreme precipitation southward over south Asia, causing more extreme precipitation events in the countries like Myanmar, Thailand, Malaysia, etc.

Keywords: Extreme Precipitation; Indian Summer Monsoon; Climate Change; Indian Ocean Dipole.

Reference:

Suman, M., Maity, R. (2020), Southward shift of precipitation extremes over south Asia: Evidences from CORDEX data. *Sci Rep* **10,** 6452 (2020). https://doi.org/10.1038/s41598-020-63571-x.