EGU21-15759, updated on 01 Apr 2022
https://doi.org/10.5194/egusphere-egu21-15759
EGU General Assembly 2021

Compound Events of Tropical Cyclone and Flooding in India

Akshay Rajeev and Vimal Mishra
Earth Sciences, Indian Institute of Technology (IIT) Gandhinagar, India (rajeev_akshay@iitgn.ac.in)

India is severely affected by tropical cyclones (TC) each year, which generates intense rainfall and strong winds leading to flooding. Most of the TC induced floods have been attributed to heavy rain associated with them. Here we show that both rainfall and elevated antecedent soil moisture due to temporally compounding tropical cyclones cause floods in the major Indian basins. We assess each basin's response to observed TC events from 1980 to 2019 using the Variable Infiltration Capacity (VIC) model. The VIC model was calibrated (R2 > 0.5) and evaluated against observed hourly streamflow for major river basins in India. We find that rainfall due to TC does not result in floods in the basin, even for rainfall intensities similar to the monsoon period. However, TCs produce floods in the basins, when antecedent soil moisture was high. Our findings have implications for the understanding of TC induced floods, which is crucial for disaster mitigation and management.