

THE INCREASE IN LIGHTNING OCCURRENCE IN INDIA

In a recent study, we analyzed long-term satellite-based lightning observations over various parts of the Indian subcontinent. Lightning occurrences are most frequent along the Himalayan foothills and the Indo-Gangetic plains. The intensity of lightning strikes on the other hand is most vigorous along the coastal regions. In addition, these lightning properties show an increase of about 1.0 to 2.5% per year across India during 1998–2014 (See Figure). We showed that while total column water vapor is the dominant factor behind the intensification in lightning events, instability and aerosol optical depth jointly control the lightning frequency trends.

We used this knowledge to project future lightning occurrences in CMIP5 models. The analysis reveals an accelerated increase in lightning occurrence and intensity in the RCP8.5 scenario after

2050. By the end of this century, lightning frequency and intensity across the Indian region are expected to increase by 10–25% and 15–50% respectively, requiring immediate attention from policymakers.

Reference: Chakraborty, Rohit, Arindam Chakraborty, Ghose Basha, Venkat Ratnam, Madineni: Lightning occurrences and intensity over the Indian region: long-term and future projections. Atmospheric Chemistry and Physics 07/2021; 21: 11161-11177, <https://doi.org/10.5194/acp-21-11161-2021>

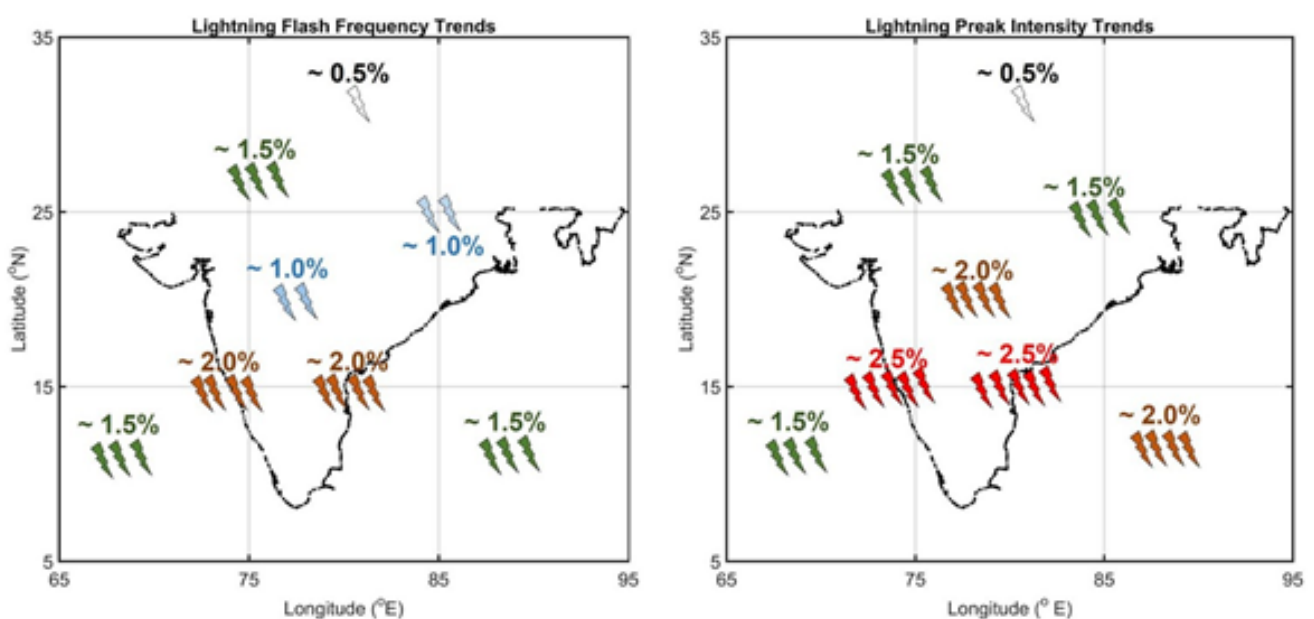


Figure: Trends (in percent) in lightning flash frequency and peak intensity over the Indian region during 1998-2014