

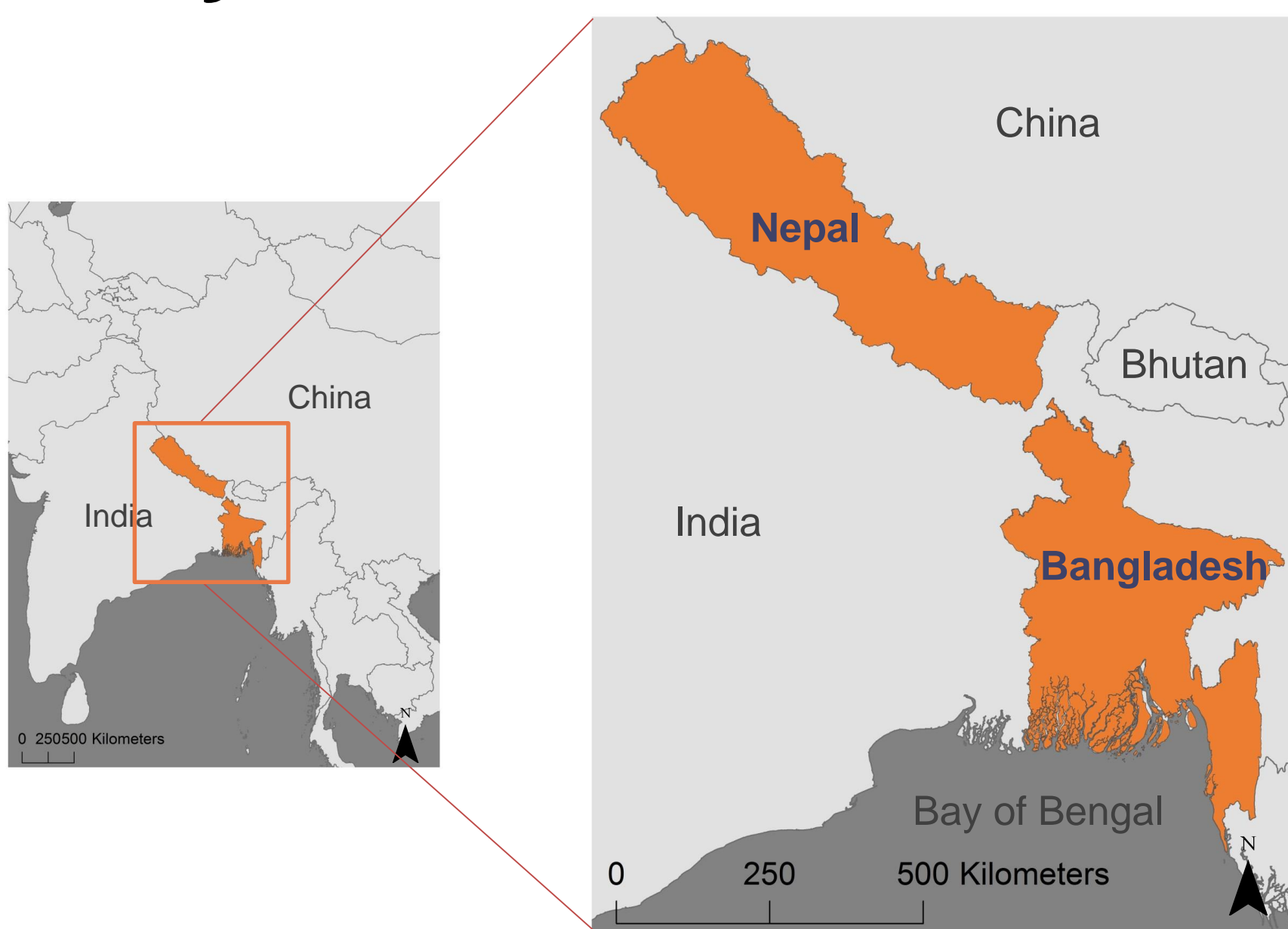
# Integrating NASA Earth Observations to Monitor Thunderstorms and Assess Lightning Exposure and Risk in the Hindu-Kush Himalayan Region

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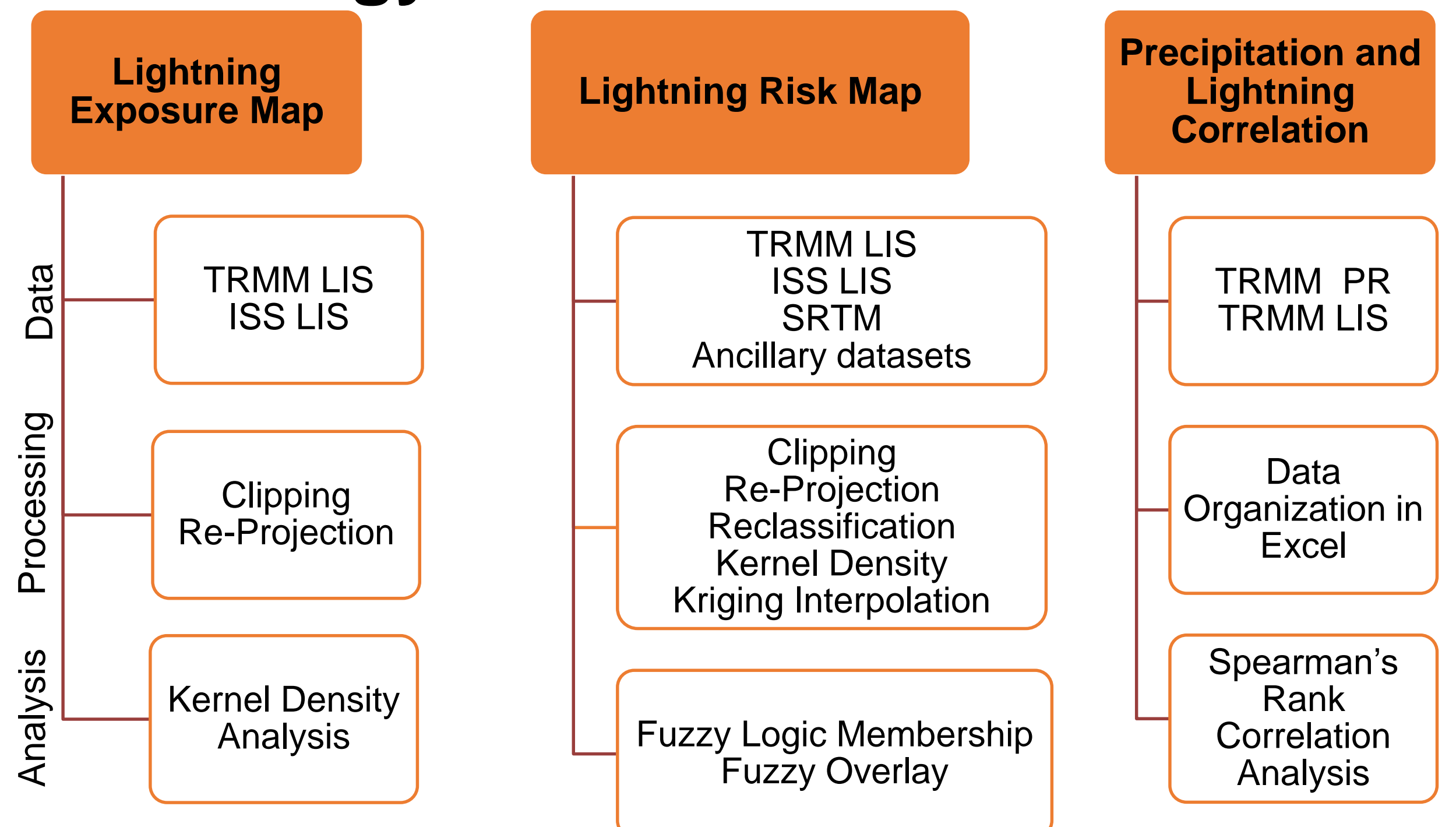
## Overview

Intense thunderstorms throughout the Hindu-Kush Himalayan (HKH) region along with an increase in population have triggered an upsurge in lightning-related deaths. Partnering with the NASA Global Hydrology Resource Center Distributed Active Archive Center, NASA SERVIR Science Coordination Office, Bangladesh Meteorological Department (BMD), Nepal Department of Hydrology and Meteorology (DHM), and the International Centre for Integrated Mountain Development, this study investigated the lightning risks in the HKH region and the correlation between precipitation and lightning using space-based earth observation systems including: the Lightning Imaging Sensor (LIS) aboard the Tropical Rainfall Measuring Mission (TRMM) and International Space Station (ISS), the TRMM Precipitation Radar (PR), and the Shuttle Radar Topography Mission (SRTM).

## Study Area



## Methodology

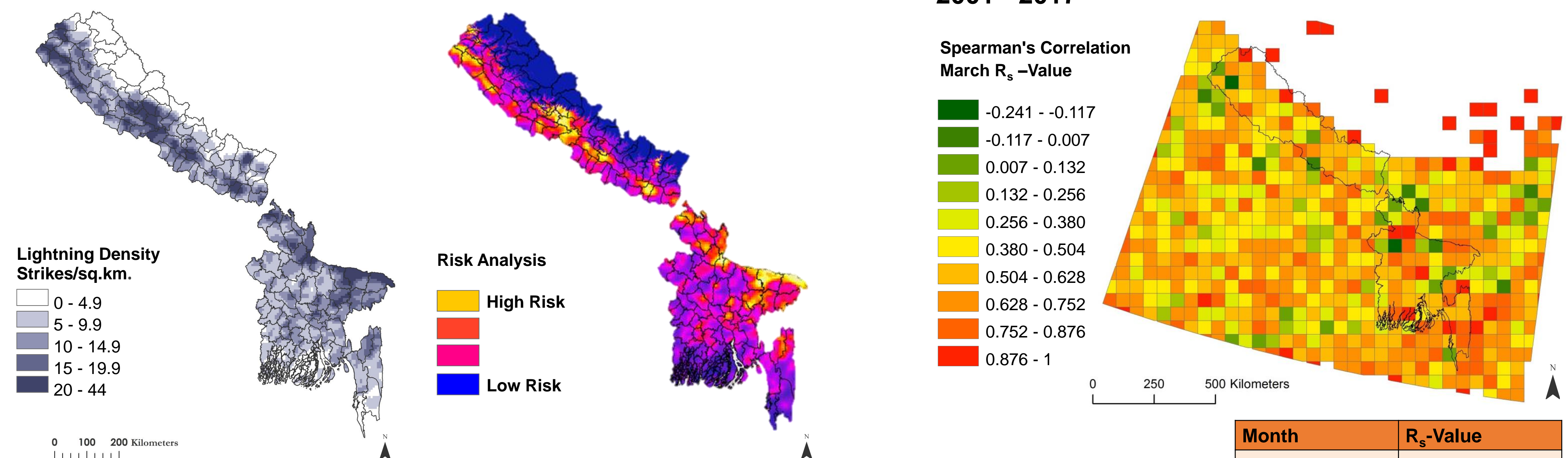


## Results

Lightning Exposure 2001 - 2017

Lightning Risk 2001 - 2017

Precipitation and Lightning Correlation 2001 - 2017



## Conclusions

The Lightning Exposure Map indicated that the most lightning-prone areas were the western regions of Nepal and the Sylhet District in Northeastern Bangladesh. The Lightning Risk Map highlighted populations in the northern regions of Bangladesh and the southern belt of Nepal as most vulnerable to lightning activity. The correlation between Precipitation and Lightning was positive, with high positive values during the pre-monsoon season, indicating that precipitation and lightning are closely correlated during this time of year. These end products will assist the BMD and the DHM in increasing hazard awareness and issuing earlier warnings to reduce lightning casualties in this region.

## Acknowledgements

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Month	R <sub>s</sub> -Value
January	0.68021
February	0.77266
March	0.82939
April	0.83069
May	0.80599
June	0.64459
July	0.32119
August	0.37081
September	0.59054
October	0.68054
November	0.50358
December	0.53021