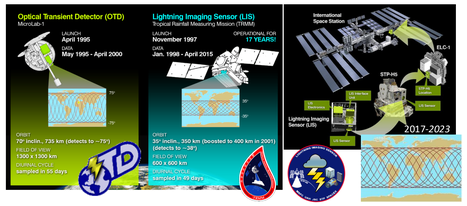
Final granule and lightning climatology products from NASA low-Earth orbit sensors covering 1995-2023

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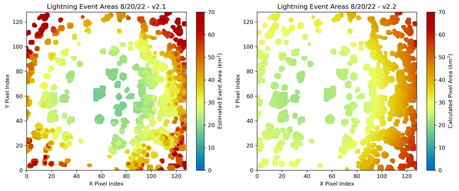
1. Overview

- Since 1995, NASA has launched three different low-Earth orbit (LEO) missions to observe global lightning from space: the Optical Transient Detector (OTD), the Tropical Rainfall Measuring Mission (TRMM) Lightning Imaging Sensor (LIS), and the International Space Station (ISS) LIS.
- This poster provides an overview of the final products from these missions, including combined climatologies.

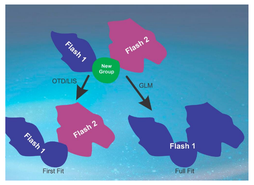


2. Methodological Updates

- Orbit granules getting updated event, group, and flash footprints to correct for long-lived area calculation oversimplification
- ISS LIS granules delivered to NASA Earthdata, TRMM LIS currently reprocessing

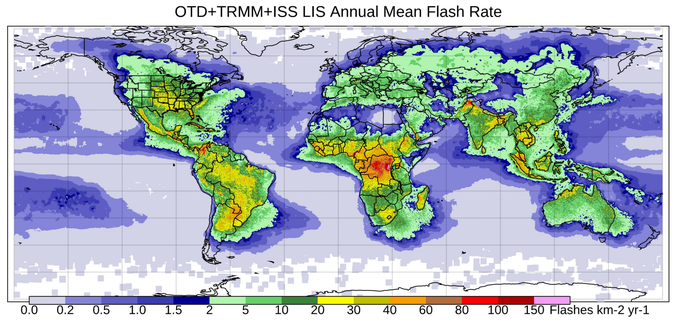


- Reclustering LIS flashes using a GLM-like approach currently being tested
- Experimental products planned in 2026

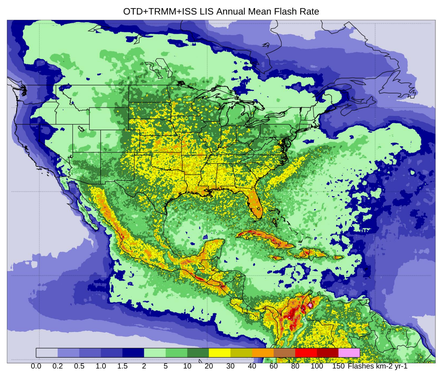


3. Updated Lightning Climatology Products

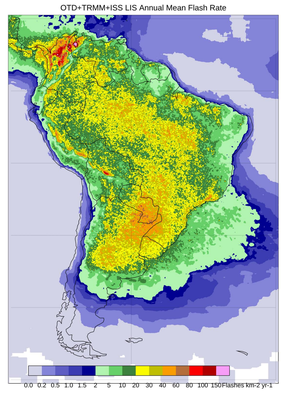
Dataset: https://doi.org/10.5067/LIS/LISCLIMO/DATA101
Companion Paper: https://doi.org/10.1175/JAMC-D-25-0110.1

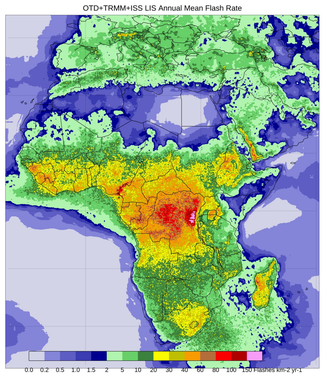


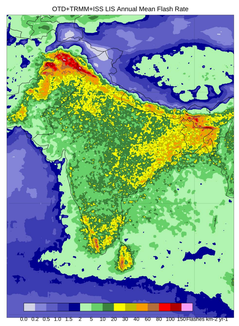
- OTD + TRMM/ISS LIS
- 1995-2023 w/ 2-year gap (2015-2017)
- Baseline grid resolution is 0.1 degrees, but coarser available
- Annual, Seasonal, Monthly, Diurnal, etc.

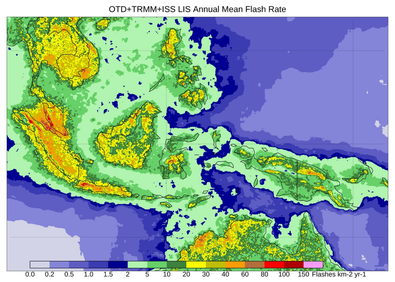


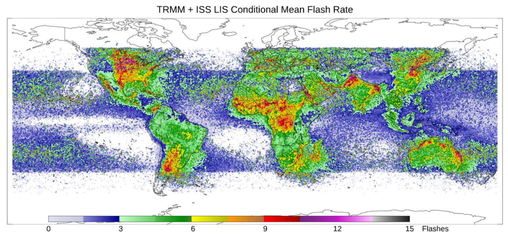
Zoomed focus on regional lightning hot spots (North & South America, Africa, Indian Subcontinent, Maritime Continent)



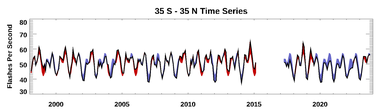




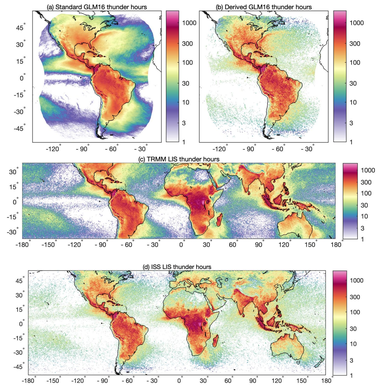




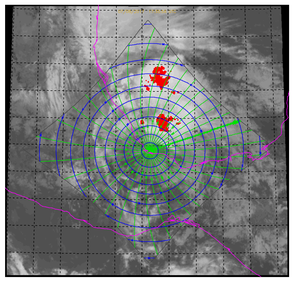
- Left: Conditional mean flash rate
- Below: Time series of global flash rates (blue below avg, red above)



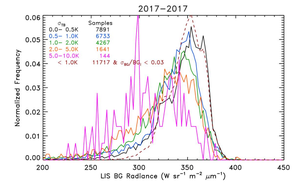
4. Additional Products and Applications

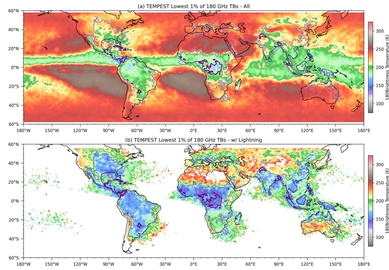


- Thunder hour climatologies for TRMM & ISS LIS delivered to Earthdata
- Uses GLM-based scaling factor to correct for LEO-based sampling by LIS



- Geolocated ISS LIS backgrounds vs. ABI for deep convective clouds
- Results consistent w/ TRMM





- ISS microwave radiometers (TEMPEST & COWVR) overlapped with LIS during 2022-2023
- G-band scattering highly correlated with lightning

- NASA Lightning Mapping Array (LMA) was deployed to the Republic of Korea in 2023
- Comparison with ISS LIS and microwave radiometers

