



Lightning: An Essential Climate Variable

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GLM Science-2020 Meeting, Virtual September 8-10, 2020



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- a. Accumulate a long-term database to track decadal changes in lightning activity (GLM PORD, 2018)
- b. Extends continuity to the 20+ years of LEO from LIS (OTD, TRMM, ISS)
- c. Lightning now an endorsed GCOS Essential Climate Variable (GCOS Rep 227, Aich et al, EOS, 2018)

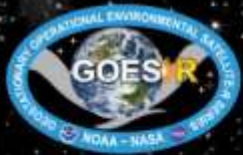


Lightning for Climate

**A Study by the Task Team on Lightning Observation
For Climate Applications (TT-LOCA)
Of the Atmospheric Observation Panel for Climate (AOPC)**

TTLOCA

GCOS-227



WMO GCOS Task Team Study



Explore potential climate applications for lightning observations and identify related challenges

Review current requirements for lightning observations in the GCOS implementation plan in the light of potential climate applications (e.g., ISCCP-NG), Context for Precipitation and Extreme Weather, Atmospheric Composition (NO_x)

Define data management and metadata standards that ensure that lightning data can be reprocessed in the future and ensure that changes in observation or processing techniques are fully documented

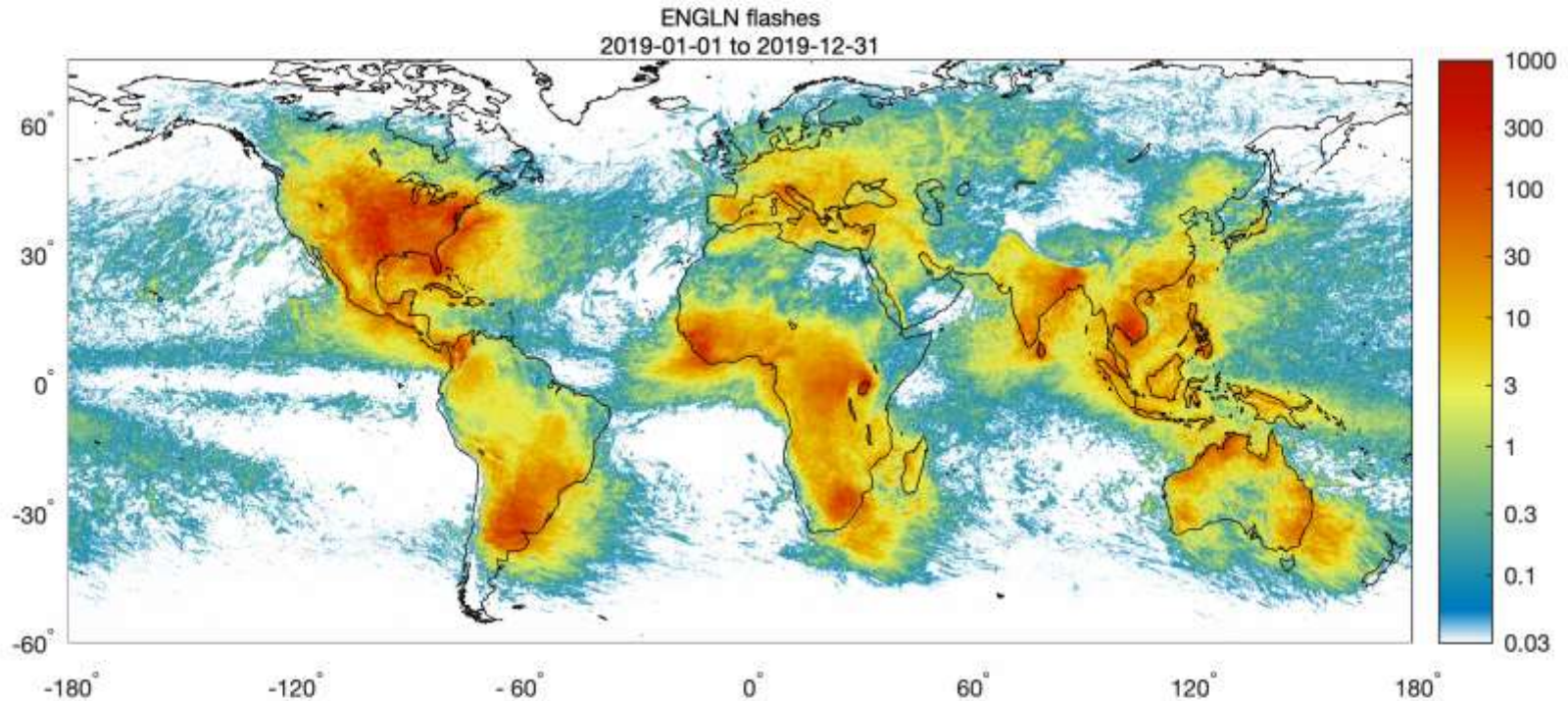
Develop a strategy for open data access for lightning data in climate applications, including providing access to data from the private sector

Encourage space agencies and operators of ground-based systems to provide global coverage and reprocessing of existing data sets (hourly to daily)

Review current data storage facilities and explore the options of a global data center for lightning data for climate applications (NOAA NCEI, GHRC DAAC)

Based Lightning Climatology (IC, CG, Total)

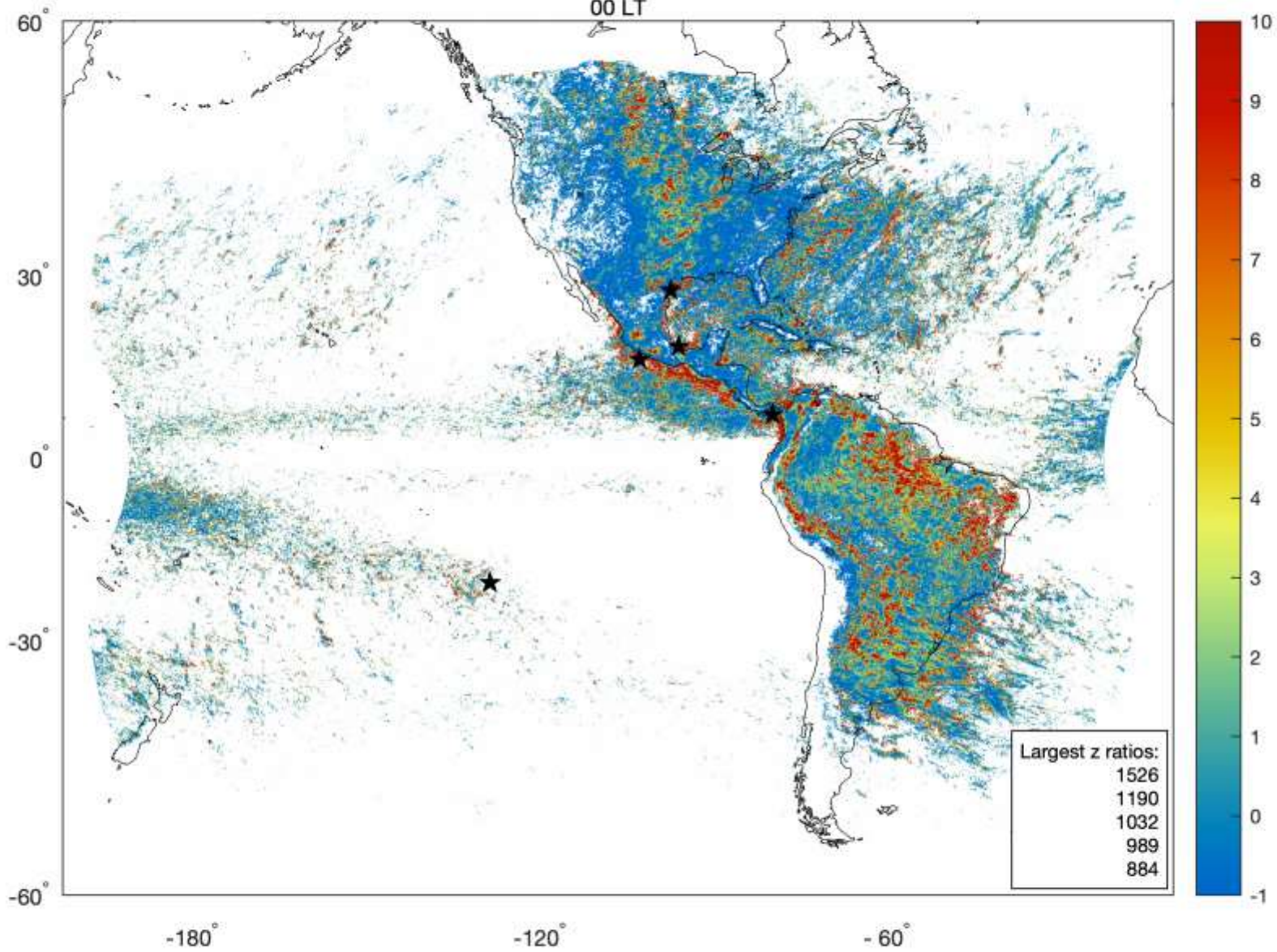
2019: An Initial Feasibility Study



ENGLN, GLD360, GLM 16/17, WWLLN

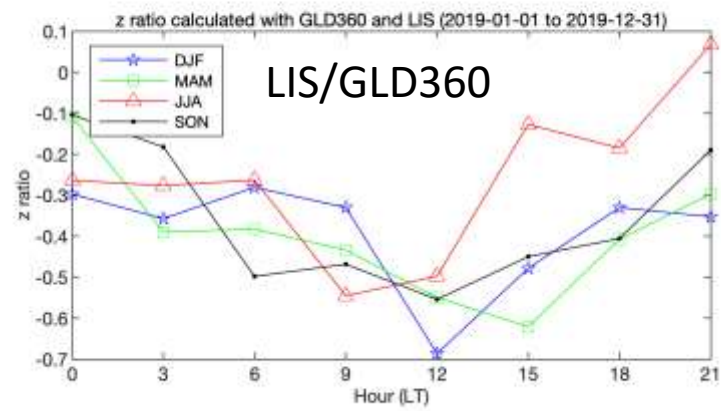
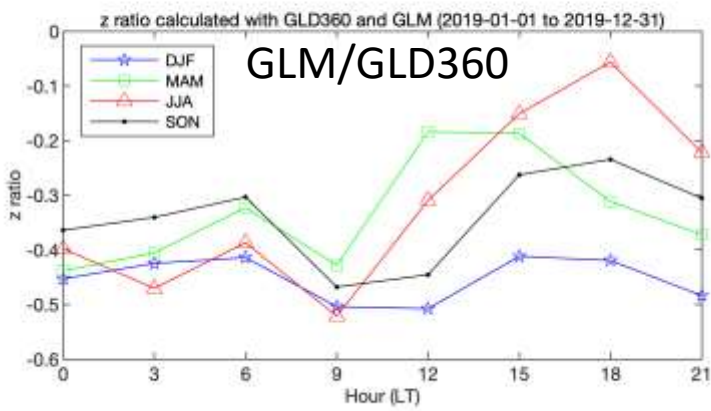
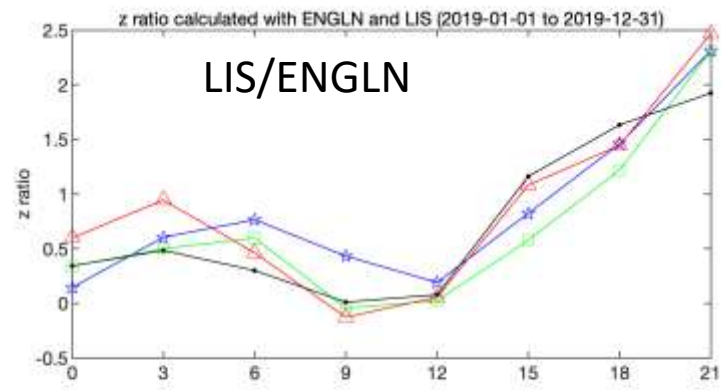
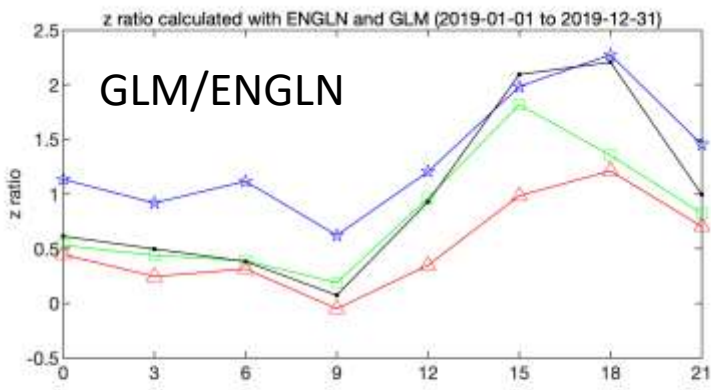
z ratio for ENGLN and GLM (2019-01-01 to 2019-12-31)

00 LT





Z ratio – 2019 Seasonal





Summary

- Candidate Archives

- NCEI/CLASS (Monica Youngman, Jeff Privette)
- NASA GHRC DAAC (Geoffrey Stano)
- Science Data Set Submission Forms
- Packaged with Metadata

- Lightning Data Set Attributes

- Space
- Ground
- Combined
- Attributes TBD, Temporal Resolution TBD
- Initial feasibility study of Z ratio with GLM/LIS : ENGLN/GLD360

$$Z \text{ (GLM)} = (\text{GLM [total]} - \text{ENGLN:GLD [CG]}) / \text{CG}$$

