An Early Operational Assessment of the Geostationary Lightning Mapper (GLM)

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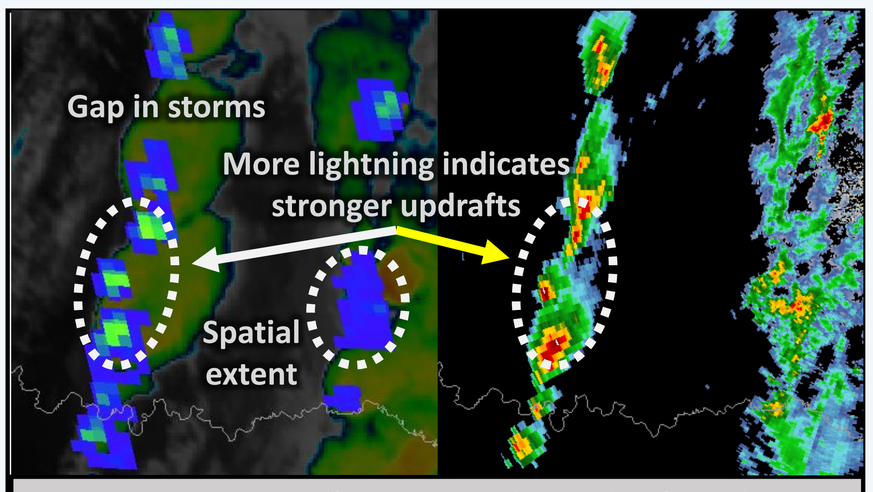
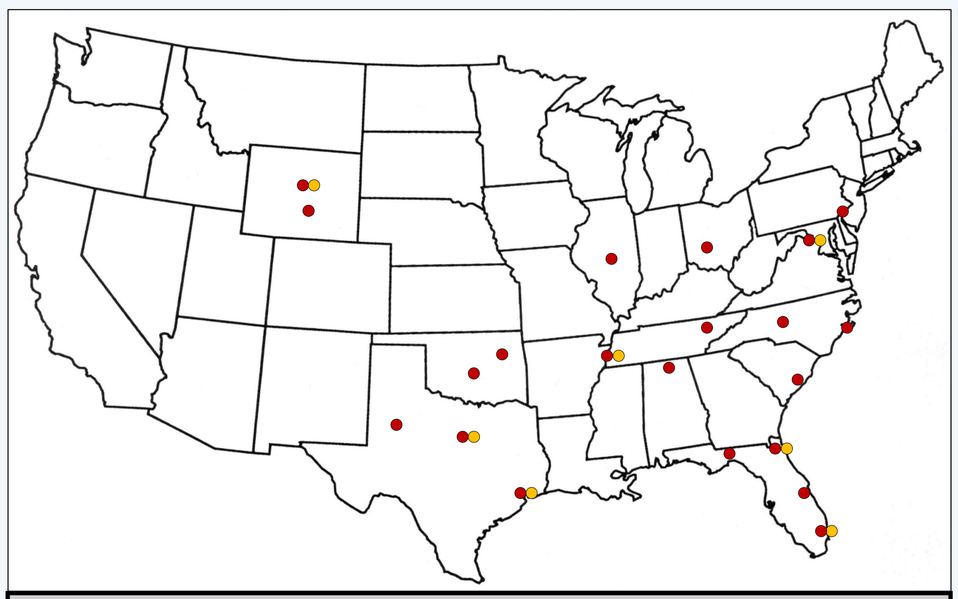
Background

- Initial GLM product display completed in Spring 2018
- Initial evaluation by forecasters who attended the Hazardous Weather Testbed
- Focus here on forecasters at their local offices with the Operations Proving Ground
- **Goals:**
  - Assess GLM in an operational setting
  - Identify training cases
  - Identify gaps in early training
- **Participants:**
  - ~24 offices and aviation sites
- **Timeframe:** Officially, June 25 – July 6
  - Informally through July and August
- **Training:**
  - Front/back page "quick guides"
  - Webinar presentation
- **Product: (right)**
  - Flash Extent Density (FED)
  - # of flashes in each grid box

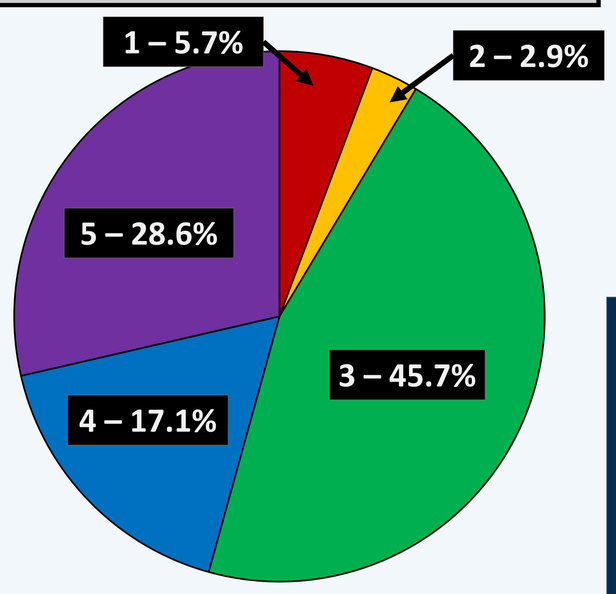


1 min GLM FED (remapped to 2 km) with ABI 10.3 µm IR (left) and radar reflectivity (right).

Initial Results and Examples

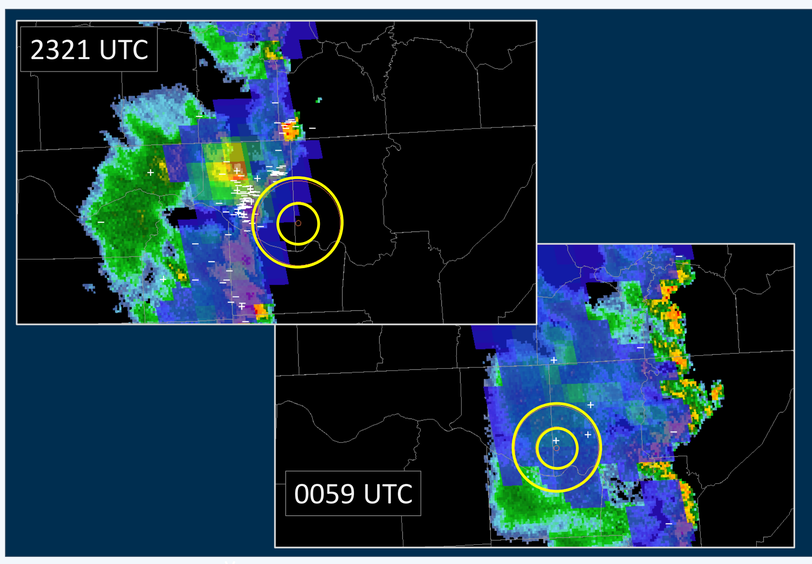


(Above) 28 location of all respondents. Red – local office; Orange – aviation support office.

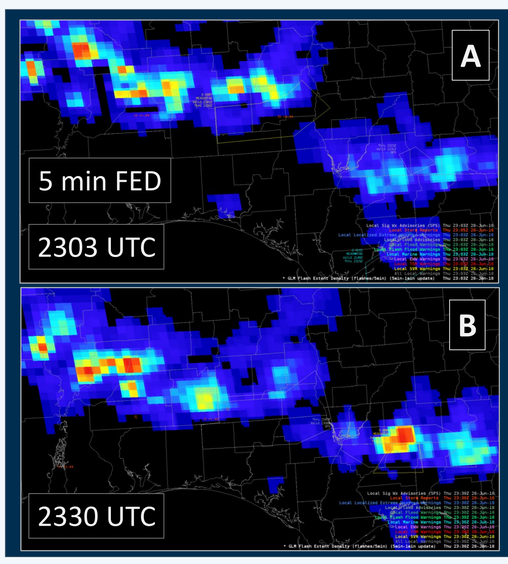


91% of responses found GLM to be 'Somewhat Useful' or better

(Above) End user rating of GLM's usefulness from 1 (Not Useful) to 5 (Very Useful) from all feedback.

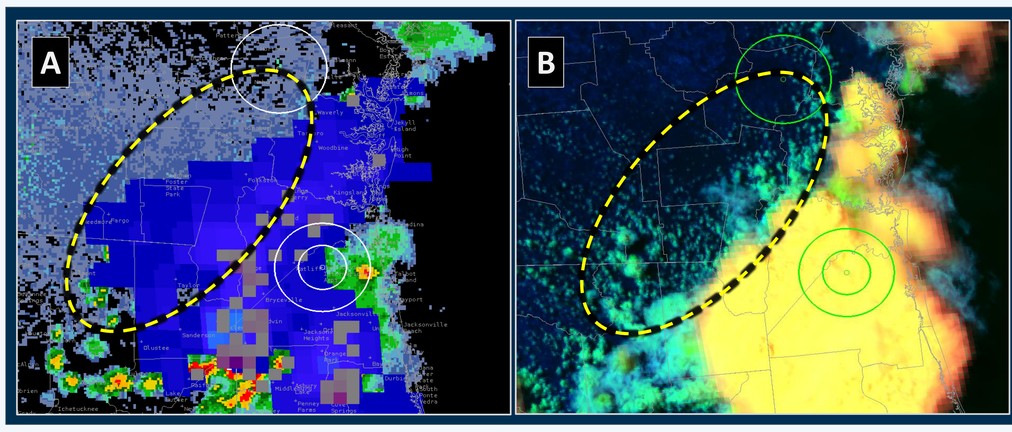


(Left) Storms approaching airport (9 and 18 km – yellow rings) with GLM FED and NLDN cloud-to-ground points at 2321 UTC. GLM's greatest impact was later at 0059 UTC. GLM simply and clearly showed lightning extending westward over the airport. Provided confidence for forecasters to maintain an airport weather warning.



(Left) Previously severe storms approaching the Gulf Coast, but GLM noted weakening at 2303 UTC (A). Forecasters provided alerts versus warnings.

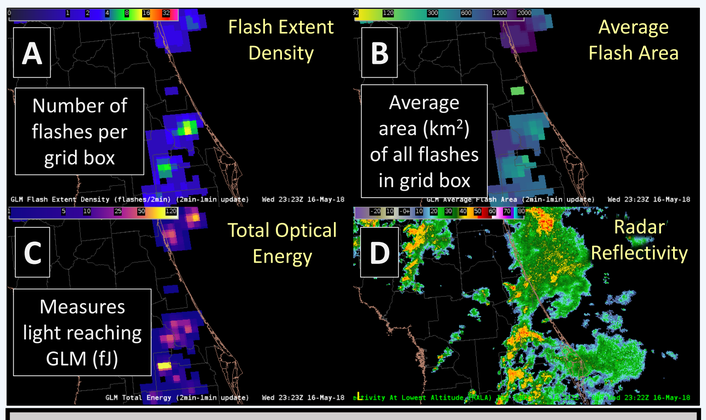
By 2330 (B) storms began to re-intensify. Forecasters began shift to issuing severe weather warnings. The line continued to intensify through 2354 (C) leading to additional warnings.



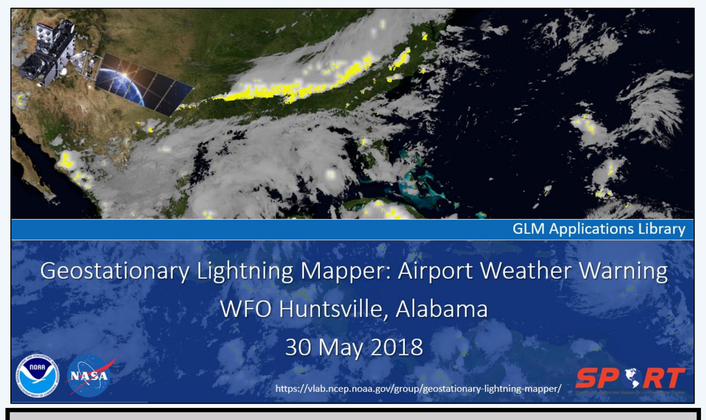
(Left) GLM detects a large flash (A – dashed oval) that appears to discharge into clear air (B). The spatial extent is likely too big as light is being emitted from the side of the storm and off surrounding clouds to create a "large" flash.

Future Work

- Training to address issues raised in assessment
  - "Clear air discharges" and low GLM counts in some supercells
- Evaluate products beyond Flash Extent Density
  - Average Flash Area and Total Optical Energy (center)
- Applications Library of operational cases (right)



(Above) Flash Extent Density (A), Average Flash Area (B), Total Optical Energy (C), and radar (D).



(Above) Intro to the airport weather warning applications library case. (QR links to module)