Discussion on Training GLM, Total Lightning, Apps

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NOAA Satellite Science Week

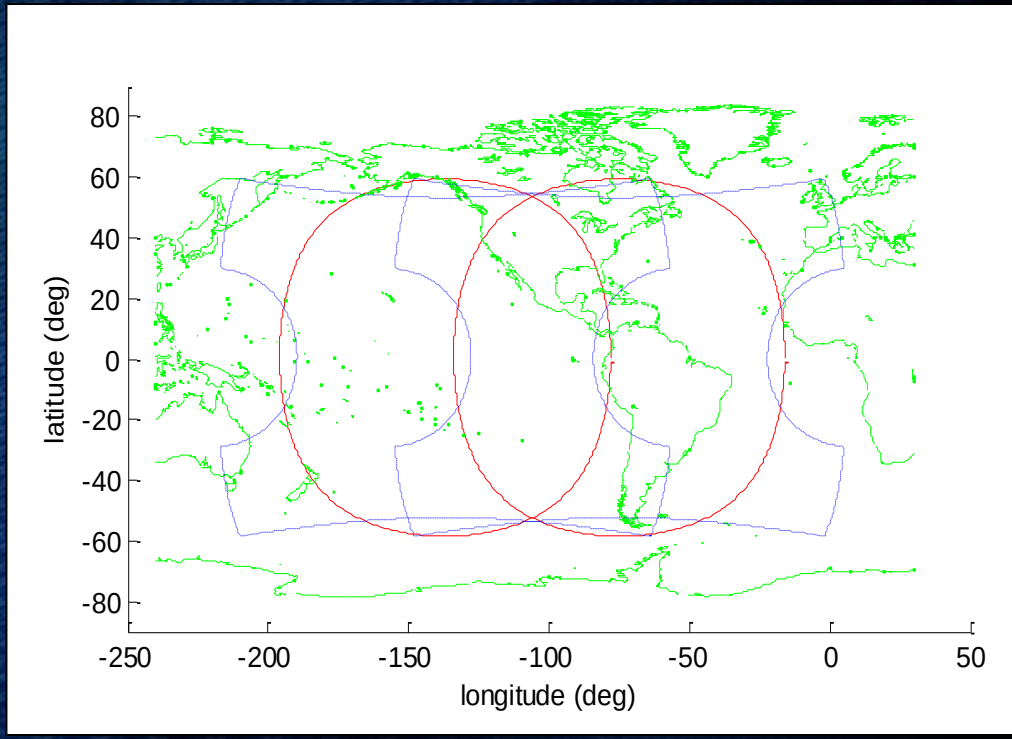
May 2012

GLM Discussion: Issues

1. Operational Severe Weather Forecast/Warning Applications
2. NWS Impact-Based Decision Support Services (public safety for large venues/events) for a WRN
3. Lightning Alerts for dense & prolific cloud-ground strikes
4. Public, Aviation, Fire Weather Applications, Marine Safety

Geostationary Lightning Mapper (GLM)

- Detects total strikes: in cloud, cloud to cloud, and cloud to ground
  - Compliments today's land based systems that only measures cloud to ground (about 15% of the total lightning)
- Increased coverage over oceans and land
  - Currently no ocean coverage, and limited land coverage in dead zones



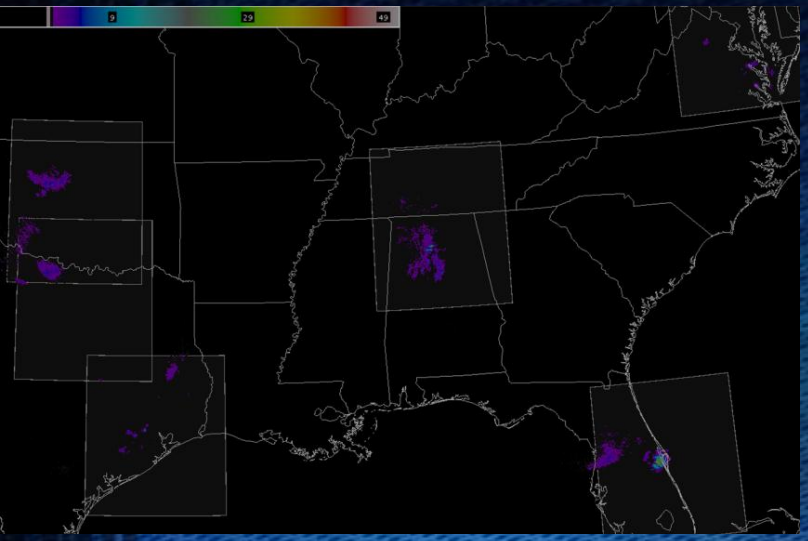
GOES R Lightning Mapper

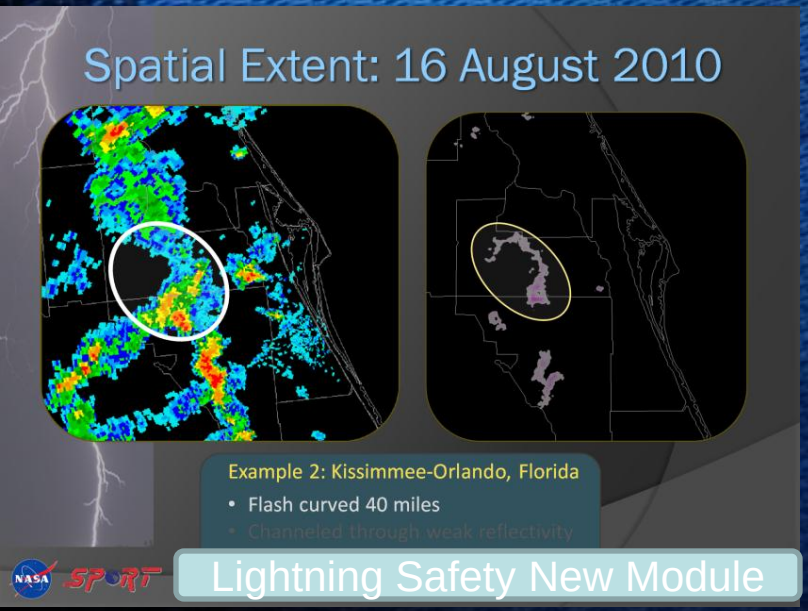
- **Predict onset of tornadoes, hail, microbursts, flash floods**
  - *Tornado lead time -13 min national average, improvement desired*
- **Track thunderstorms, warn of approaching lightning threats**
  - *Lightning strikes responsible for >500 injuries per year*
  - *90% of victims suffer permanent disabilities, long term health problems, chiefly neurological*
  - *Lightning responsible for 80 deaths per year (second leading source after flooding)*
- **Improve airline/airport safety**
  - *routing around thunderstorms, saving fuel, reducing delays*
  - *In-cloud lightning lead time of impending ground strikes, often 10 min or more*
- **Provide real-time hazard information, improving efficiency of emergency management**
  - **Large venue public safety, HAZMAT safety, & outdoor/marine warnings**
- **NWP/Data Assimilation**
- **Locate lightning strikes known to cause forest fires, reduce response times**
- **Multi-sensor precipitation algorithms**
- **Assess role of thunderstorms and deep convection in global climate**
- **Seasonal to interannual (e.g. ENSO) variability of lightning and extreme weather (storms)**
- **Provide new data source to improve air quality / chemistry forecasts**

Currently Available Training

- VISIT **CONUS Lightning**
- VISIT **Lightning Meteorology I**
- VISIT **Lightning Meteorology II**
- COMET **Intro to Tropical Met**
- COMET **Fire Weather Climatology**
- COMET **GOES-R Benefits**
- VISIT **GOES-R 101**
- SPoRT **Lightning Mapping Array**
- SPoRT **PGLM Training**
- VISIT **Use of GOES/RSO Imagery w/Remote Sensor Data for Diagnosing Severe Wx**

Current Training Activities





New activities

- ➢ Mosaic product (all networks product)
- ➢ New visualizations (maximum density)

New training module

- ❖ Initial use for NWS
- ❖ Examples to be converted to PGLM

New training has more operational focus

- ✓ Severe weather applications
- ✓ Airport Weather Warnings
- ✓ Lightning safety applications
- ✓ Aim for release before Spring 2012
- ✓ Update current PGLM training

AWG Meeting Discussion

What you said:

1) Forecasters want Intermediate data/displays for GLM

2) High flash rates (5-12 per second) can be problematic for algos

3) Need GLM-compatible flash definition

4) 3D view can show flash initiation and ground strike location

5) Lightning info needs to be integrated with radar, vertical profile information

6) Lightning Jump Algorithm

7) Lightning Warning Algo

8) SCAMPER/QPE Algo

What I heard:

Reduce "black box" for forecasters so they understand the processing

Forecasters will see that it's a significant storm, what is value-add ?

LMAs provide more detailed data needed to understand storm-scale lightning science/apply GLM flash grid

This can be important information for forecasters to consider

Optimal displays are ad-hoc. Need to build decision-making visualizations

Thresholds sensitive to storm environment, type. Tornado signature ?

Correlation with svrwx better. 1" hail*

5-min Lightning Prob. Maps, merge LMA and CG point data. Output:CG lightning lead time given 1st IC.

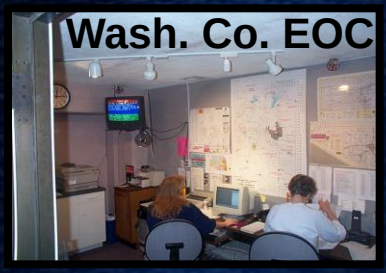
Calibrates IR predictors to MW RR

Vision 2014: Distributed and Collaborative Simulations Focused on Human Factors and Decision-Support

Other Gov't Decision Makers

USGS science for a changing world

US Army Corps of Engineers®



- Collaborative simulations and interagency exercises: partnerships, teamwork and decision support
- Intraoffice and interoffice simulations

(like FEMA, NASA/SMG, DOD)

Internet

WAN/NOAAnet/VRF