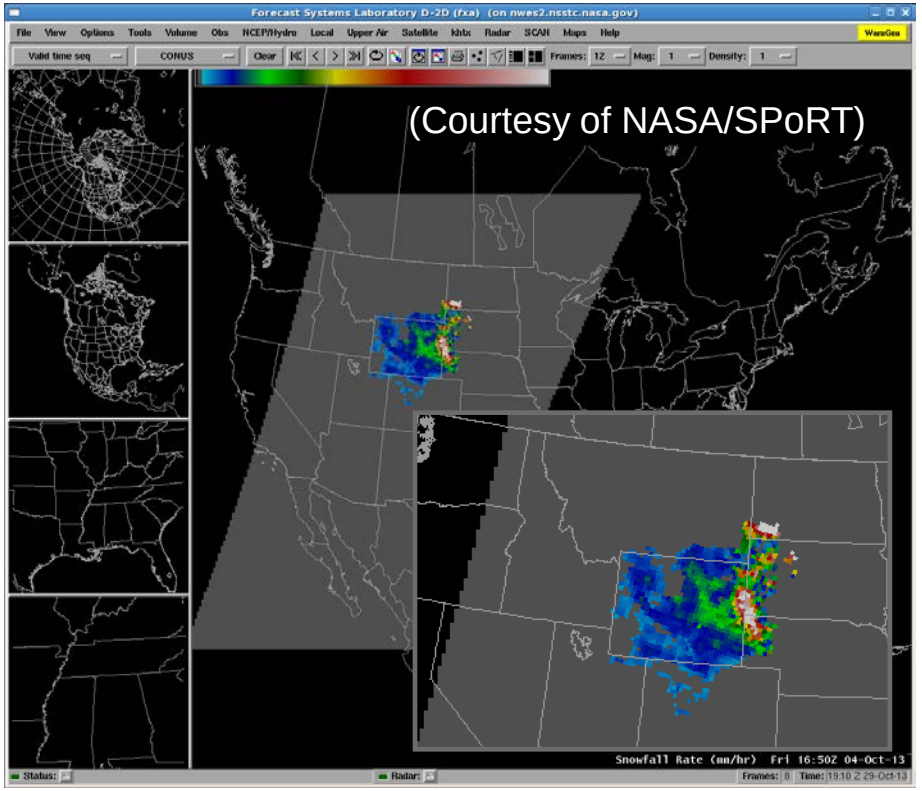
PG All Hand Meeting
CICS-MD Update

AMSU/MHS Snowfall Rate (SFR) Product

- Satellite retrieved water equivalent snowfall rate over land
- Operational product at NOAA/NESDIS - near real-time production
- Uses data from microwave sensors (AMSU and MHS) aboard POES and Metop satellites
- Estimates snowfall rate in the atmosphere and will take on average 1.5 hours to reach the surface
- Four satellites with up to eight passes per day at mid-latitude locations and more at higher latitudes



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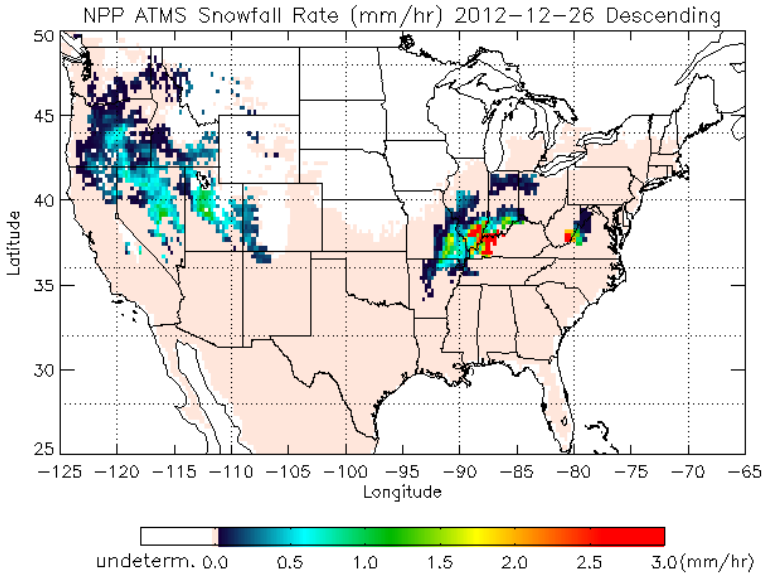
Applications

- SFR can be paired with GOES IR/VIS/WV images to track the movement and evolution of snowstorm
- Fill in data gaps in regions with limited radar, gauge, and/or GOES observations
- Identify snowstorm extent and areas with most intense snowfall
- Advantage of the time lag between satellite retrieval and ground observation
  - ❖ Reduced latency
  - ❖ Nowcasting
- Collaborating with SPoRT and several WFOs to evaluate the product in the 2013-2014 snow season

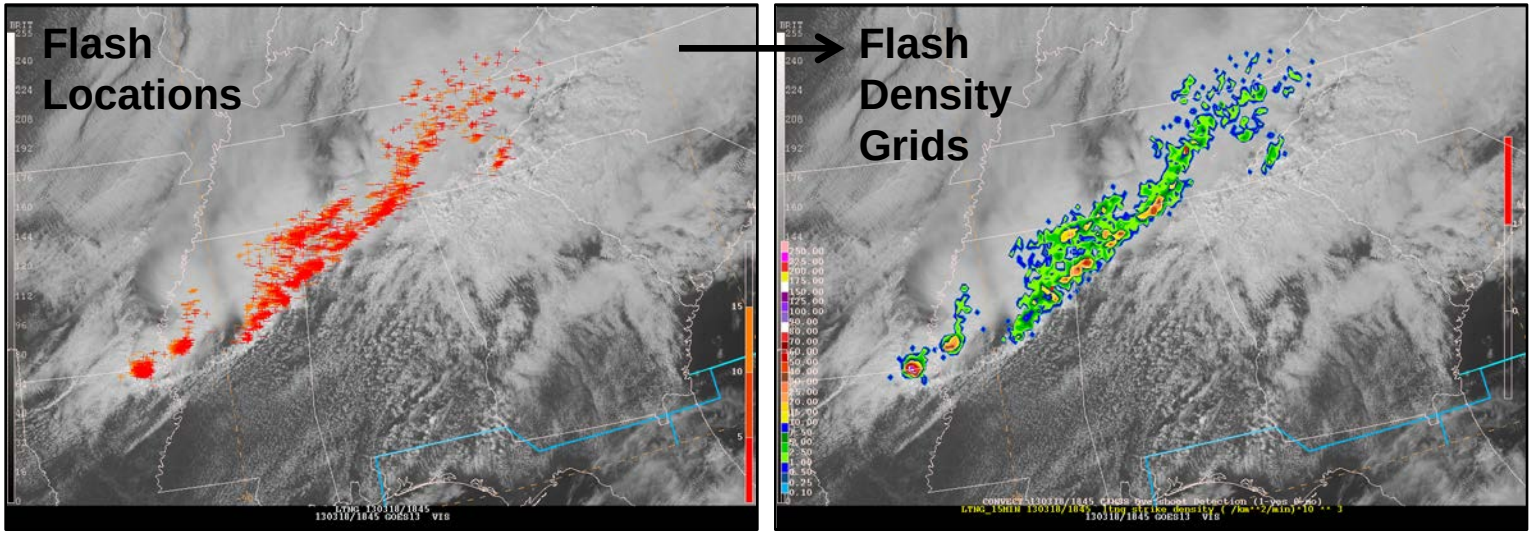
ATMS Snowfall Rate Product

- Advanced Technology Microwave Sounder (ATMS)
  - ATMS is the follow-on sensors to AMSU and MHS
  - ATMS is onboard NPP and future JPSS satellites
- ATMS snowfall project funded by JPSS Proving Ground program
  - Complete prototype algorithms by the end of 2013
  - Next step: extension to colder climate



Lightning Product Evaluation at OPC

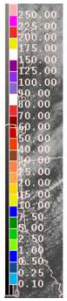
- **GOES-R Proving Ground Project**
  - » Create flash density grids at GLM resolution using a ground-based network (i.e., GLD360)
- **Evaluation during Summer 2013**
  - » Develop training materials, shadow forecasters, and compose report
- **Expand to other NWS Centers**



Collaborators
Joe Sienkiewicz
Greg McFadden
Michael Folmer
Scott Rudlosky
Dustin Shea

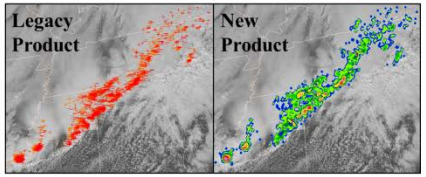
Developed a Training Quick Guide

GLD360 Lightning Density Product (Operational Use)



GLD360 Lightning Density Product

- Lightning density is the number of strokes in a grid cell over a given period of time.
- Density units are strokes per km^2 per min, and are multiplied by a scaling factor to obtain the scale units.
- The frequency of lightning strokes often is indicative of convective intensity.
- Product is provided at 2-min, 15-min, and 30-min intervals on 8×8 km grids.



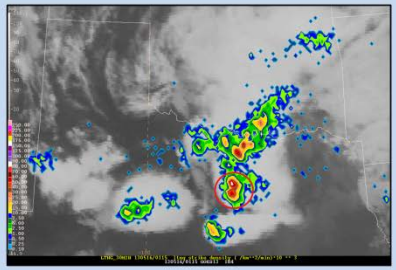
Operational Usage and Benefits

- Track convective cells beneath cloud shields
- Distinguish thunderstorms from rain-only areas
- Identify strengthening or weakening convection
- Monitor convective mode and thunderstorm evolution
- Diagnose initial atmospheric conditions
- Supplement/verify short-term model forecasts

Suggested Product Pairings

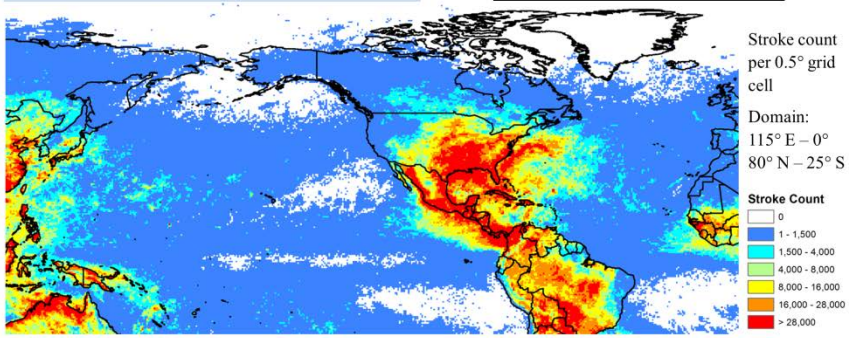
- Visible and IR Imagery
- RGB Imagery
- Wind Vectors
- Surface Map
- Model Precipitation Estimates
- Sea Surface Temperatures
- Overshooting Top Detections
- Convective Initiation
- Cloud Top Cooling

Example Usage: Identify Splitting Supercells

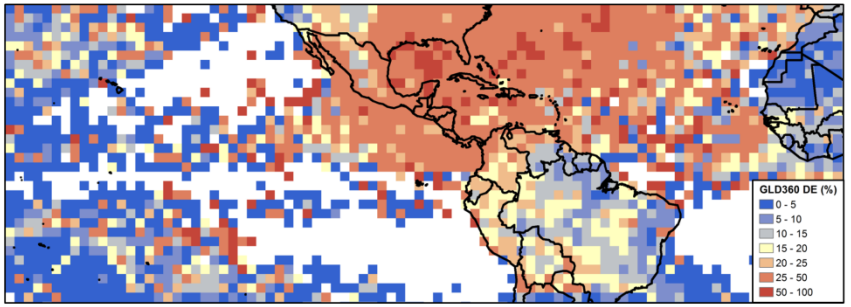


Animated Examples: http://alturl.com/24iqz

GLD360 2012 Stroke Distribution



GLD360 Lightning Density Product (Data Properties)



GLD360 Detection Efficiency (DE)

- GLD360 DE was computed relative to the polar-orbiting TRMM Lightning Imaging Sensor (LIS).
- Analysis assumes that LIS observes all flashes, but the actual LIS DE varies from 90% during night to 70% at noon.
- The map above displays the fraction of all LIS flashes that were detected by the GLD360 during 2012.
- White cells indicate no LIS flashes for comparison.
- Regional Detection Efficiencies:
  W. Hemisphere = 25.3% Oceans = 33.0%
  North America = 33.4% South America = 17.5%

GLD360 is not the GOES-R GLM

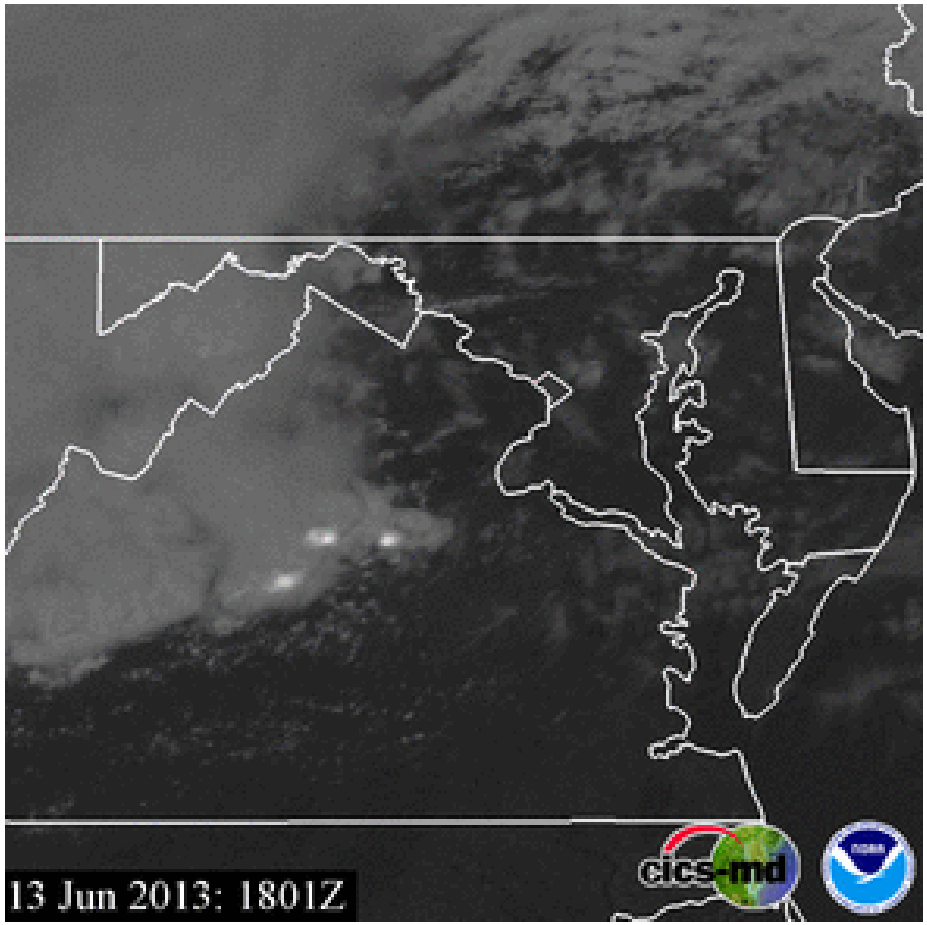
- GLD360 detects VLF radio waves emitted by lightning, while the GLM is an optical detector.
- GLD360 detects primarily CG strokes, whereas the GLM will detect total lighting (IC + CG).
- GLD360 detected 25% of LIS flashes in the Western Hemisphere during 2012, while GLM will detect at least 70% of all flashes in its field of view.
- GLD360 detection efficiency varies spatially, while GLM will provide nearly uniform observations.
- Despite these differences, both systems provide instantaneous observations at the same spatial scale.

GLD360 Detection Method

- The GLD360 is a global network of ground-based sensors which detect very low frequency (VLF) radio waves emitted by lightning.
- Global coverage is achieved with relatively few sensors because the VLF radio waves are trapped by the earth-ionosphere waveguide and propagate for thousands of kilometers with minimal attenuation.
- Uses a combination of arrival time, arrival azimuth angle, range estimation, and amplitude to locate strokes. Strokes must be detected by at least three sensors to be accurately located.
- GLD360 detects primarily cloud-to-ground (CG) strokes, but also detects some strong intra-cloud (IC) flashes (network does not distinguish between CG and IC).

Forecaster Notes:

SRSOR plus DCLMA Observations



Ongoing Effort

- Goal: Develop proving ground provider capabilities at CICS
- Steps Forward
  - Obtain a NOAAPORT connection
  - Implement operational software (AWIPS-II, McIDAS, and WDSS)
  - Create AWIPS-II displays for existing products
  - Identify operational partners and establish IT connections
  - Train CICS-MD Scientists and UMD Students on these systems
- Our efforts will speed up the implementation of existing products and contribute to the collaborative development of new operational products.