



The NASA Short-term Prediction Research and Transition (SPoRT) Center

GOES-R Proving Ground Update

4 November 2013

Contributions from:

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Outline – 3 November 2013 SPoRT Status Report:

RGB Imagery

- RGB Evaluation for Aviation and Cloud Analysis (NTmicro, DNB products)
 - Current and upcoming evaluations, blog posts

AWG Support

- QPE Assessment results, GOES-R CI

JPSS

- Coordination with GINA for processing
- Data used in RGB Evaluation

AWIPS II

- AWIPS II plugins and EPDT

Total Lightning

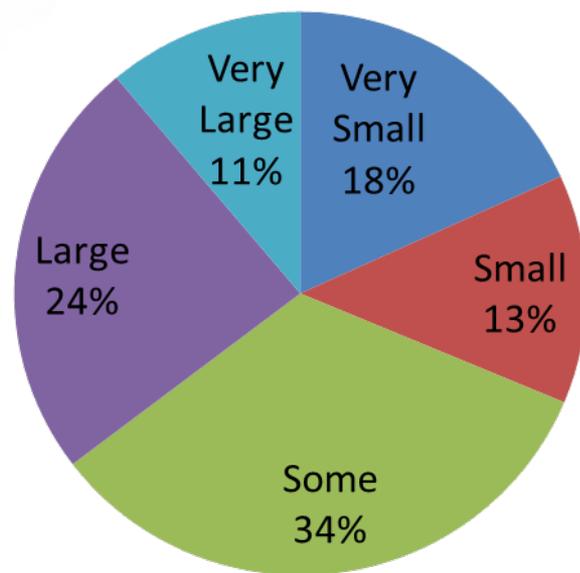
- Work with AWC
- Update on products
- HUN perspective using data in AWIPS II



RGB Evaluation for Aviation and Cloud Analysis

- Sept 15 – Oct 31.
- Products:
 - Night-time Microphysics RGB
 - DNB Reflectance RGB
 - DNB Radiance RGB
 - Compare to Hybrid 11-3.9 μ m
- Participating WFOs
 - HUN, OHX, MRX, RAH, ABQ, TFX
 - Visited OHX, provided onsite training, Quick Guides
 - Created “micro-lesson”, 8 minute module from OHX presentation as distance learning training for users
- 48 feedback forms submitted
 - 23 by RAH: Many thanks to Jonathan Blaes and staff
- Comments section most valuable
- Final report at end of Nov.

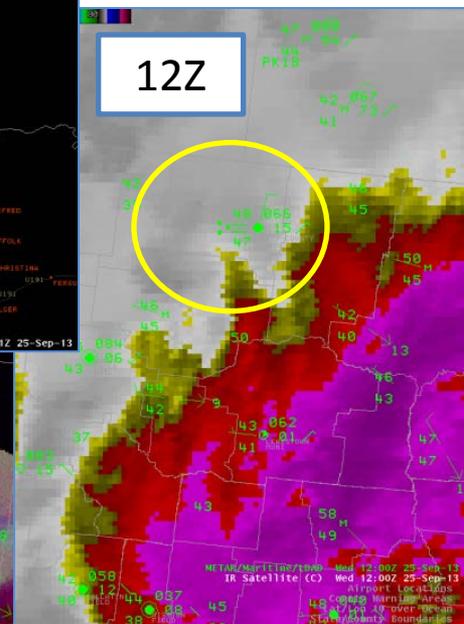
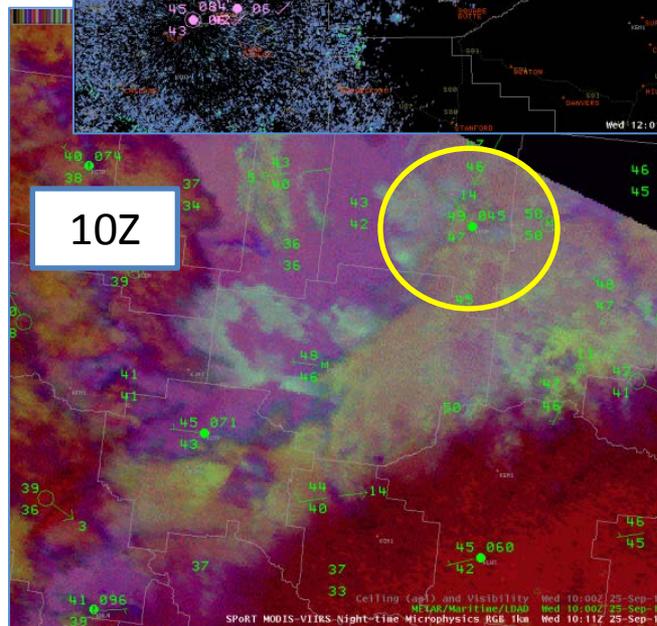
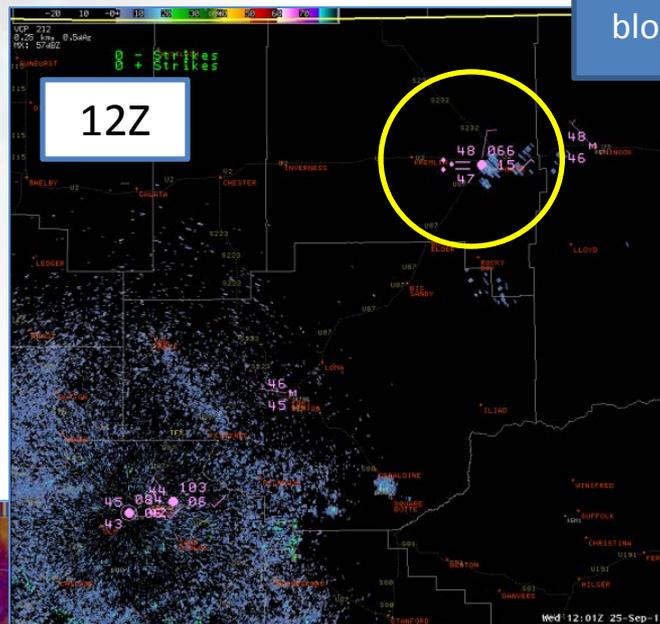
Night-time Microphysics RGB Impact to Differentiate Low Clouds v. Fog



RGB Evaluation for Aviation and Cloud Analysis

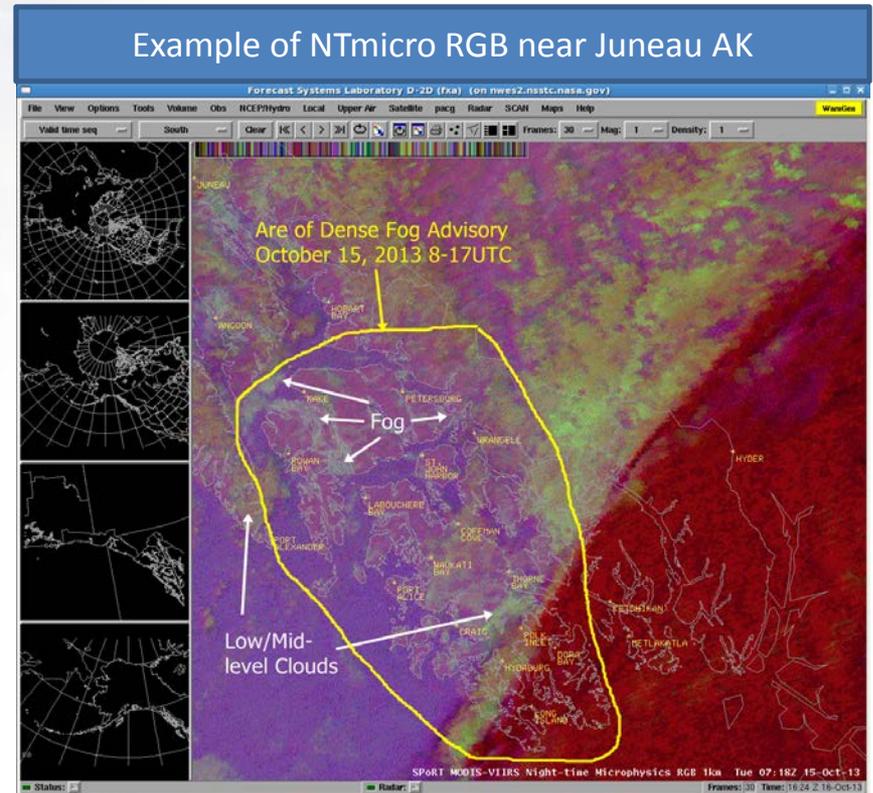
Images from Paul Nutter
blog post (see link in text)

- Blog posts by TFX, ABQ, and SPoRT during evaluation
- (Right) Paul Nutter at TFX compared various in-situ measurements (METAR, RAOB) and GOES Imagery to the VIIRS Night-time Microphysics imagery in order to understand how the RGB can diagnose precipitating clouds below radar scan.
 - Was posted to internal TFX blog for forecasters
 - Title of post:
[“Low-topped Modersate Rain – DOES VIIRS Imagery Help”](#)
 - Reposted to SPoRT blog for larger community
 - Peer reviewed publication being worked for this and an ABQ example of this application



RGB Evaluation for Aviation and Cloud Analysis

- Upcoming Evaluation with Alaska (WFOs, AAWU) and West Coast (WFOs) as well as Southern Region WFO partners in coastal locations
- Dec/Jan 2013/14
- Same products as previous evaluation
- WFOs already have products in SPoRT base menu for AWIPS I;
 - Plugin available for AWIPS II if WFO are authorized to use it;
 - otherwise web graphics (similar to HUN users)
- Coordinating with Eric Stevens for AK users: coordination and kickoff calls
 - Matt Smith, Kevin Fuell
- SR/SPoRT Collaboration call: Nov 14
 - Kris White, Lori Schultz
- To revise Quick Guide and micro-lesson training (8 minute module) to have AK-centric examples



[See blog post for details and loop of MODIS and VIIRS swath imagery](#)



RGB Imagery – Tropical PG

- Revised Quick Guide to NHC (HSU, TAFB) for the Convective Storms RGB
 - Thanks to Jochen Kerkmann (EUMETSAT) for his review and edits.
 - Examples are from lectures done at NHC.
 - Provided PDF file for intranet usage.
 - A laminated hard copy is provided for use in operations area.
- Convective Storms RGB uses SEVIRI data as proxy to ABI
 - Complements the Day-time Microphysics RGB by providing greater contrast to areas of small ice particles to identify strong convection.

SPORT

Example of "Convective Storms" RGB Imagery from SEVIRI
Image credited to Jochen Kerkmann, EUMETSAT, Darmstadt, Germany

Note the increased contrast of the colors of Conv. Storm RGB showing the strongest convection (i.e. small ice particles) in bright yellow.

Thick cloud w/ Small ice particles

Thick cloud w/ Small ice particles

Convective Storms RGB: Hurricane Isabel – 9 Sep. 2003

Day Microphysics RGB: Hurricane Isabel – 9 Sep. 2003

Bright yellow on southwest eye matches cold clouds

Cold clouds in 11um IR but little bright yellow (i.e. large particles)

Convective Storms RGB : Hurricane Igor, 14 Sep. 2010

10.8 micron channel: Hurricane Igor, 14 Sep. 2010

Resources:
More in depth information can be found at EUMeTrain's website (<http://eumetrain.org/>). This guide has many contributions from Jochen Kerkmann of EUMETSAT (<http://www.eumetsat.int/website/home/Data/Training/index.html>)

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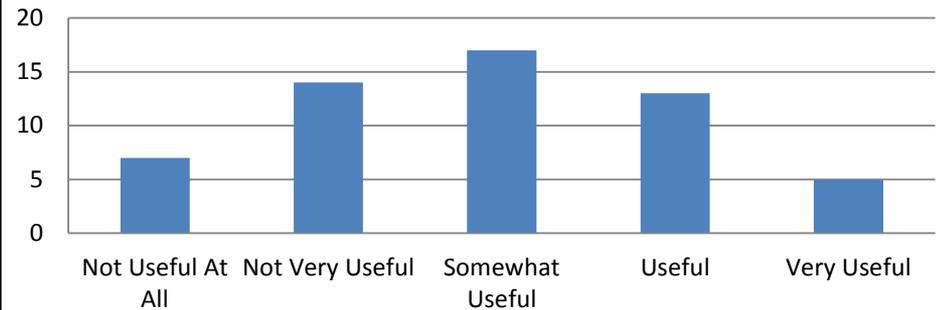


NESDIS GOES-R QPE Assessment Summary

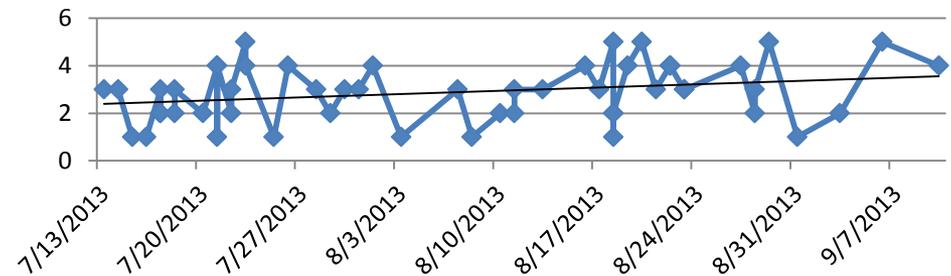
No. Offices	No. Surveys	No. Participants
5	77	17 people (+ 1 anon)

- 5 offices
 - AJK, AFG, AFC, and the APRFC and SJU
- July 15 to Sept 15
- Users have reviewed and provided input to final report.
- Edits to be finalized by November 15

What was the utility of GOES-R QPE in data-deprived regions, such as mountainous terrain and off-shore?

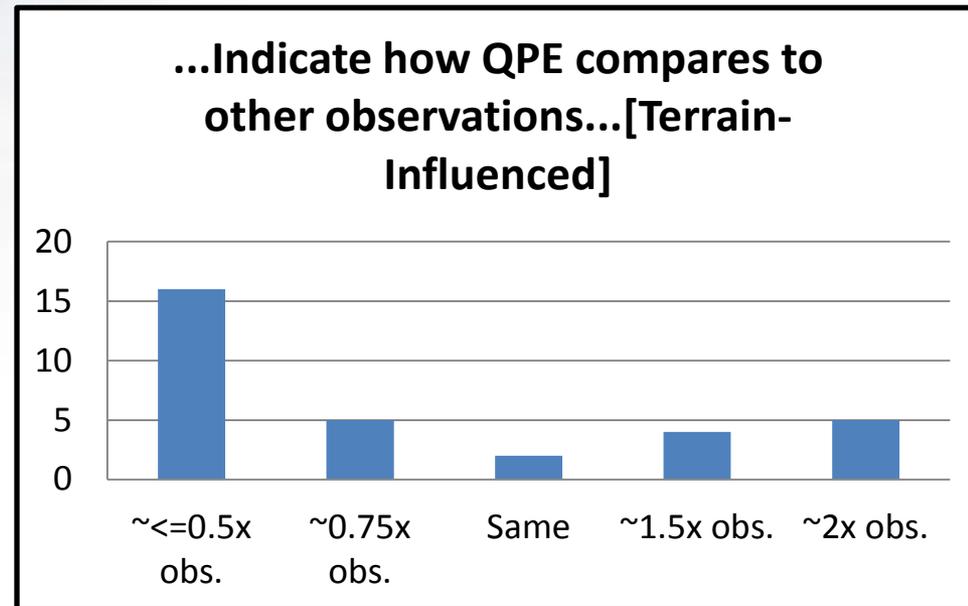


Time Trend of QPE Utility, Where 1 is "Not Useful at All" and 5 is "Very Useful"



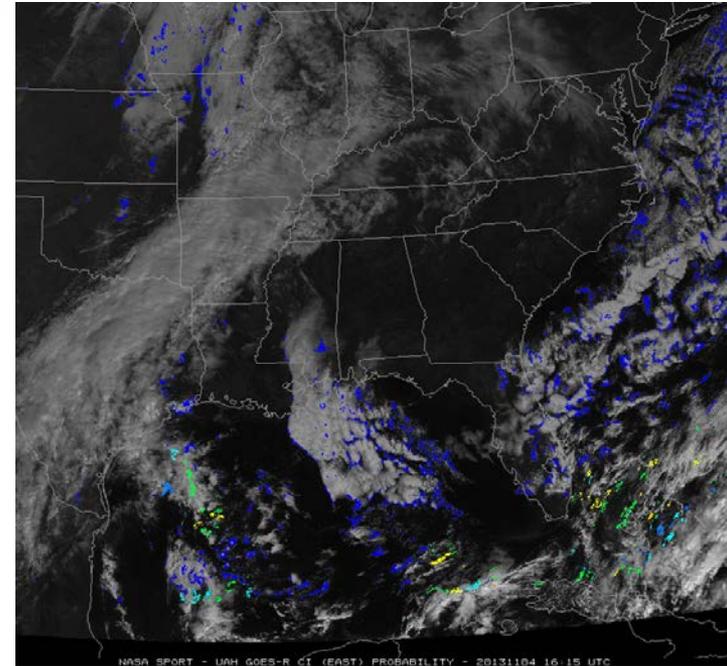
NESDIS GOES-R QPE Assessment Results and Recommendations

- Tended to
 - Underestimate rainfall in SJU
 - Be inconsistent in AK
- However...
 - Users found utility in the product and tended to account for biases the longer they used it, particularly in SJU
- Recommendations:
 - To account for orography
 - To fully utilize GOES-R's spatial and temporal resolution
 - To filter out or better accommodate cirrus clouds



UAH GOES-R CI Assessment

- Assessment Preliminary Results
 - Sept 1 – Oct 31
 - ABQ, CRP, HUN, MFL, and informally, MLB
 - Weaker participation owing to gov't shutdown and mild weather
 - CRP, MFL, HUN reports Med to High confidence and 30-45 minute lead times
 - ABQ (using the newly released GOES-West algorithm) reported Low to Med confidence and 0 min lead time, indicating some problems with the new algorithm (some of which have already been resolved during the assessment because of the ABQ feedback)
- Operations Progress
 - Now on the operations floor at AWC
- Discussing Spring 2014 Evaluation to wider audience given these testbed results



JPSS PG

OCONUS/Alaska

- SPoRT Processing on GINA Virtual Machines
 - RGB products
 - GOES/POES Hybrid
 - Delivery (LDM) Testing beginning today
 - Ongoing telecons with GINA and AK WFOs
- SPoRT Composite SST being used by Ice Desk
 - Reduces prep time for selected products by 50%+
- Modeling collaborations
 - Pursuing future collaborative funding opportunities with Alaska RFC, UAF, NOHRSC
- December-January Assessment of MODIS & VIIRS RGB imagery suite
 - Nighttime Microphysics
 - Day-Night-Band



AWIPS II

Experimental Products Development Team

-Spring2013: Mar. 12-14 Huntsville, AL

15 attendees; Basic plug-in *training*

-Fall2013: Sept. 24-26 Huntsville, AL

10 attendees; *Code Sprint*

-Spring2014: March/April/May (?) Huntsville, AL

Group A (same attendees): Advanced training

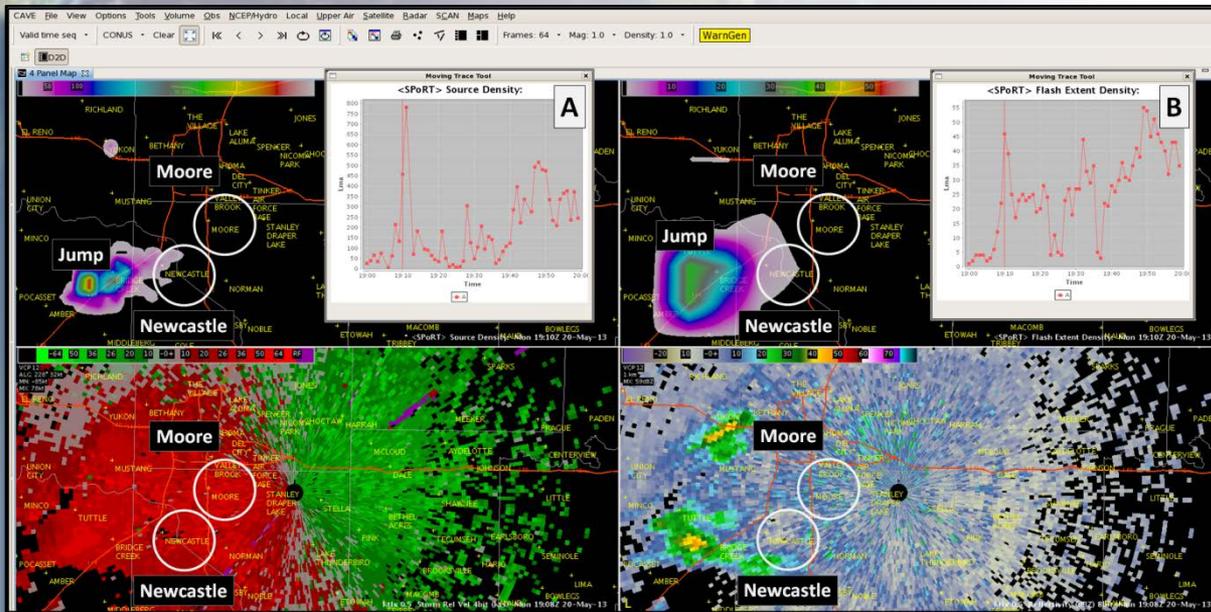
Group B (new attendees): Basic training

-Fall2014:

Code Sprint



Pseudo-GLM Ongoing Activities

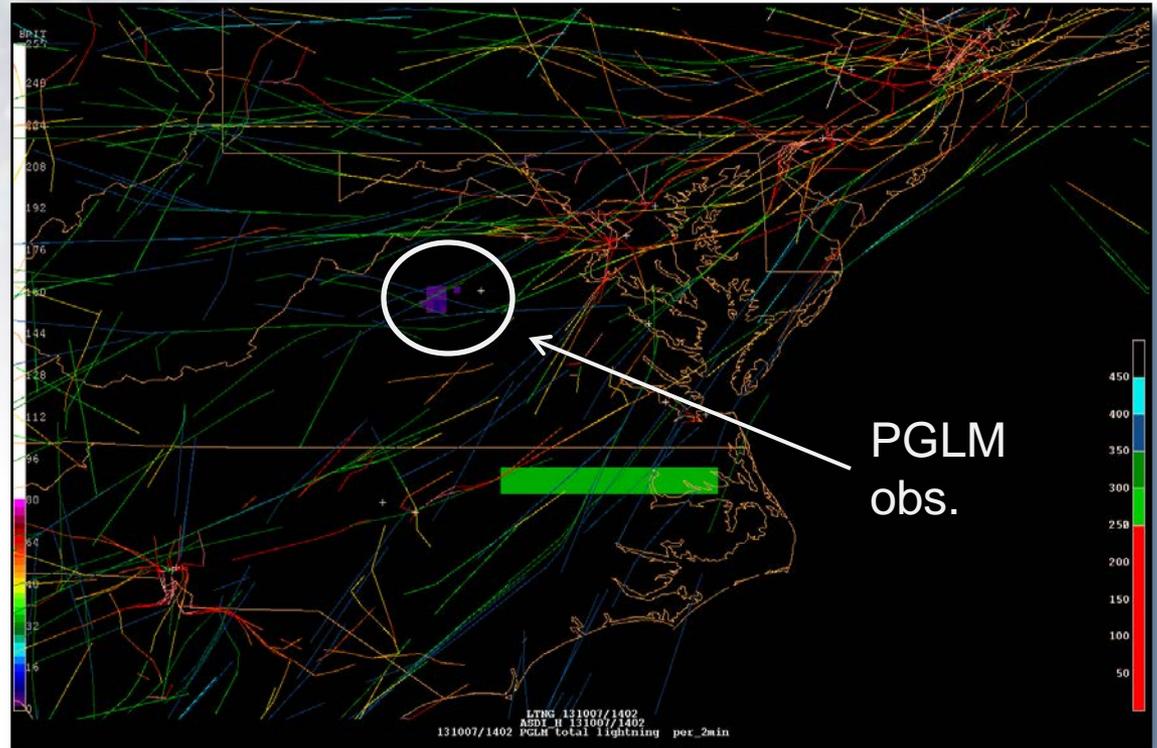


- Continuing collaborations to incorporate the new Central Florida and Wallops Island LMAs
- Coordination call on preparing the total lightning tracking tool for the earned OPG proposal evaluation
- Tracking tool now works for radar, satellite, total lightning, and other gridded products
- Preparing for a major spring 2014 evaluation
 - In addition to Spring Program and OPG
- AMS: Colorado LMA, Spring Program, Moore tornado (upcoming NWA article as well)



PGLM at the National Centers

- Major success with aid of AWC satellite champion
- PGLM and GOES-R CI now on ops floor
- Training completed in Sep. / Oct.
- Responding to forecaster questions
- Based on feedback, will likely update the PGLM mosaic to a different format

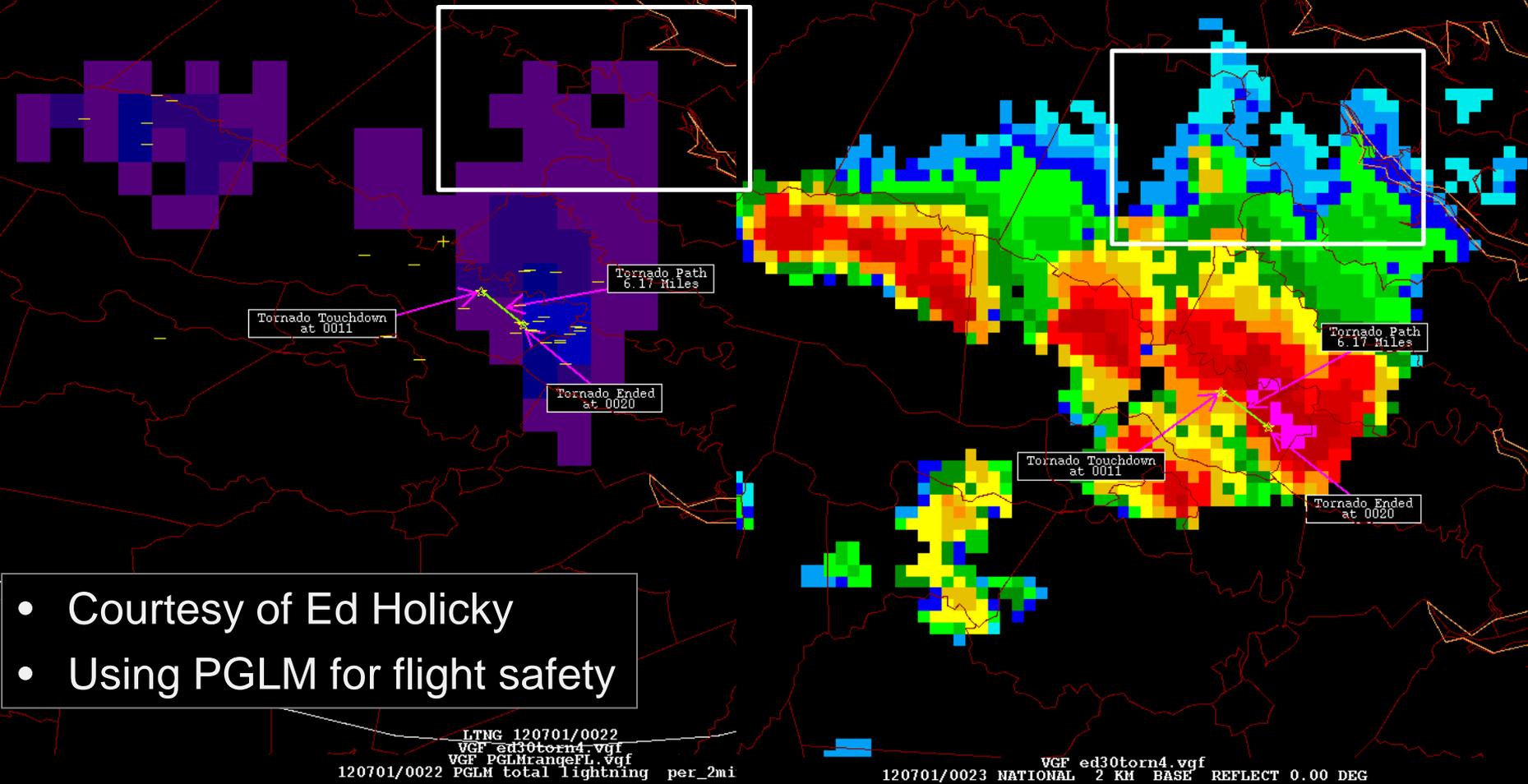


DCLMA PGLM: No NLDN strikes, but aircraft struck in flight on Oct. 7. Aircraft tracks shown too.

- Will move to SPC ops floor next
- Also available at SAB/TAFB/OPC now



PGLM example from AWC

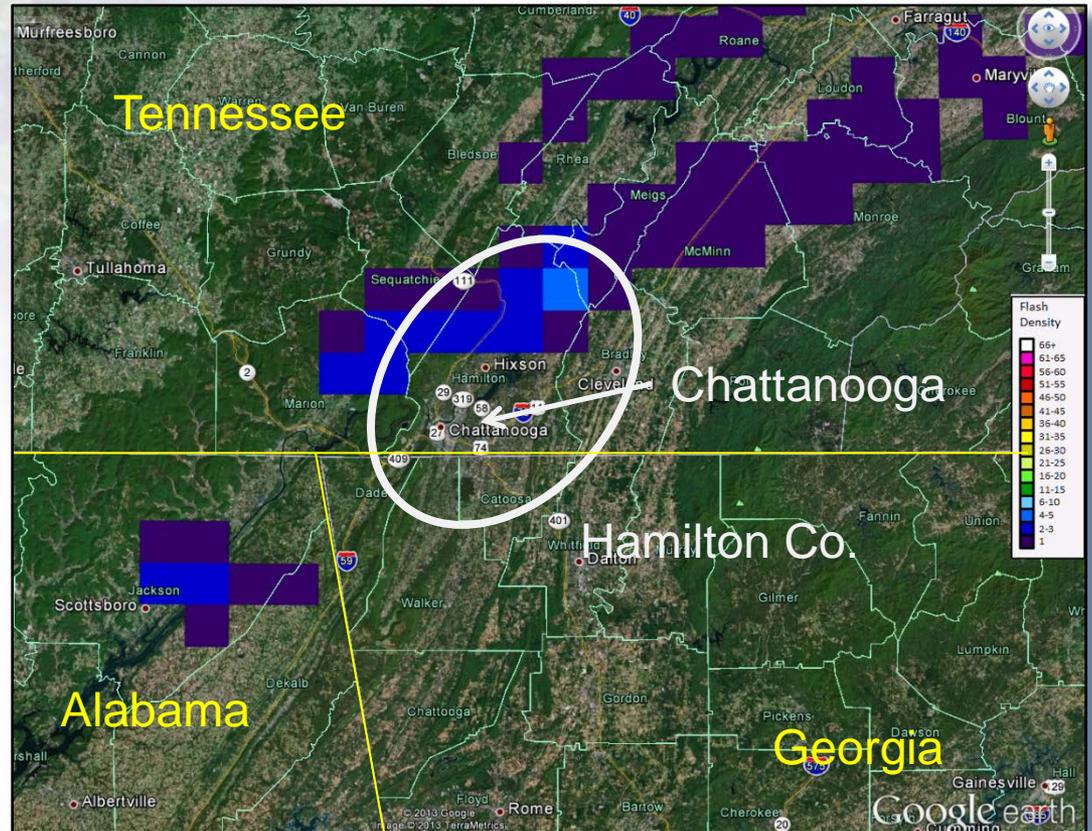


- Noting spatial extent of PGLM in stratiform region with no NLDN strikes

- Aid in forecasting convection
- PGLM can be first evidence of convection

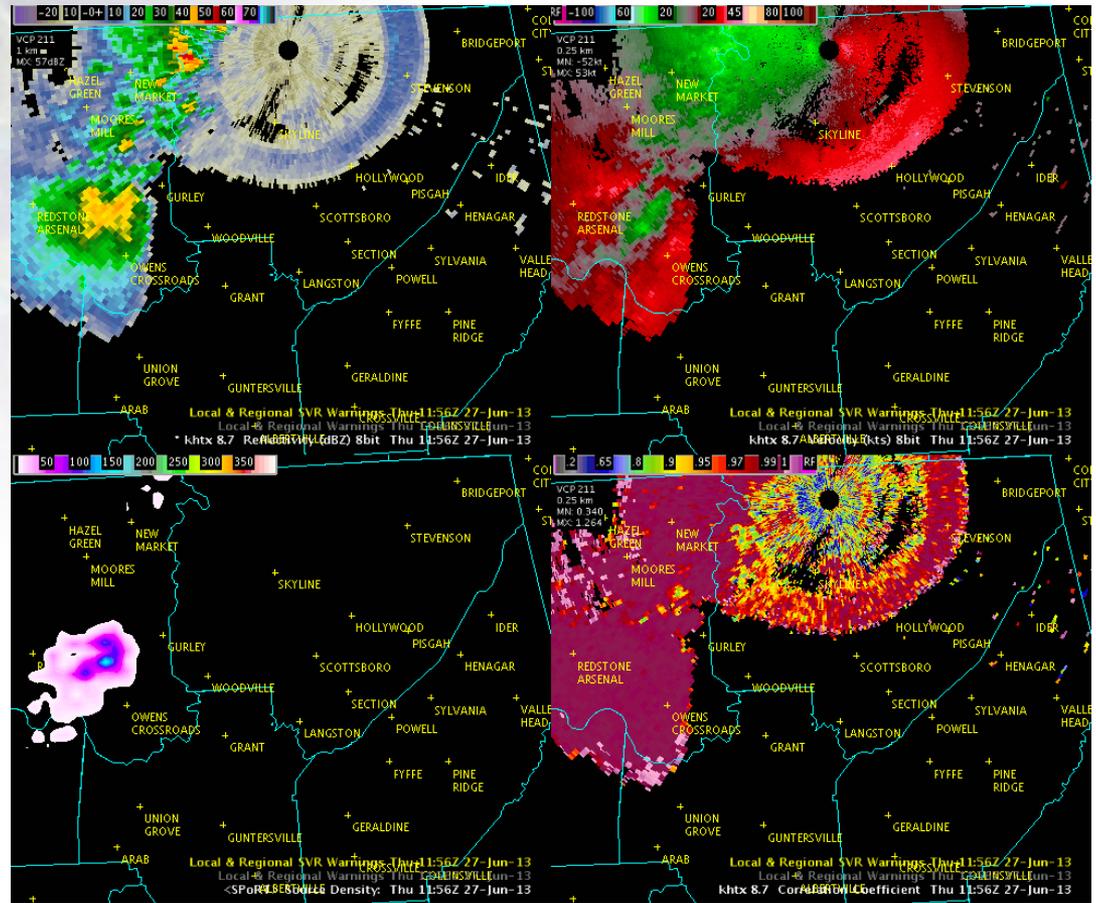
PGLM and Emergency Operations

- PGLM has been available to the EMA at Chattanooga / Hamilton Co., TN since early 2013
- Had season to demonstrate product in Google Earth
- Coordinating for 2014 formal evaluation
- Positive feedback
- Very useful to compare radar to PGLM observations



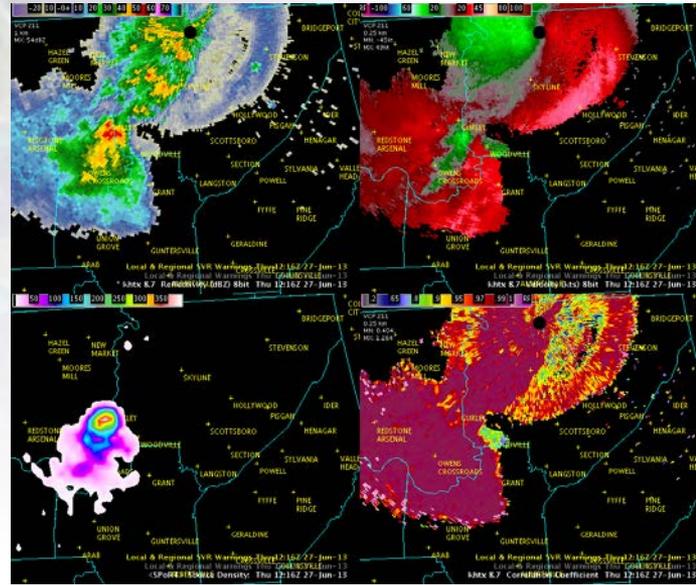
North Alabama Lightning Mapping Array Data in AWIPS II

- AWIPS Test Authorization Note (ATAN) 1089 approved, allowing LMA plug-in for use at WFO Huntsville, AL
- LMA source density data operational again in AWIPS II at Huntsville beginning late March 2013, after being absent since June 2012.
- Data useful in this series of images to help with severe thunderstorm warning decision. Notice the jump in lightning sources (lower left) prior to the rapid increase in reflectivity data (upper left) and warning issuance.



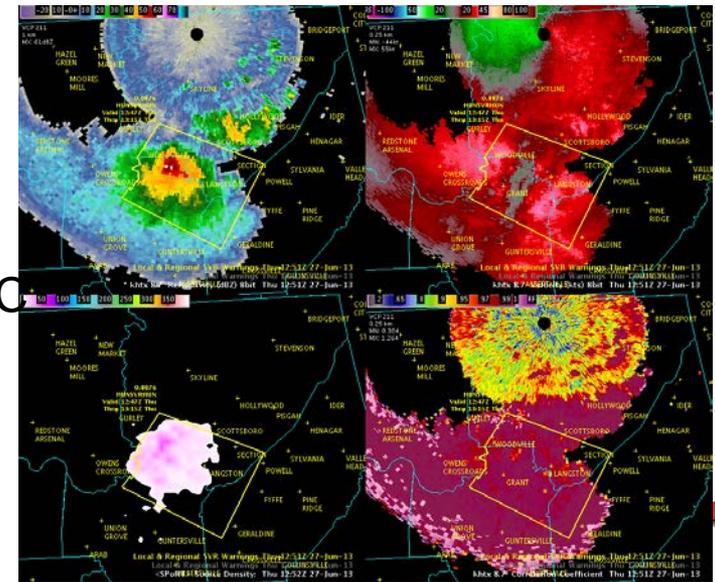
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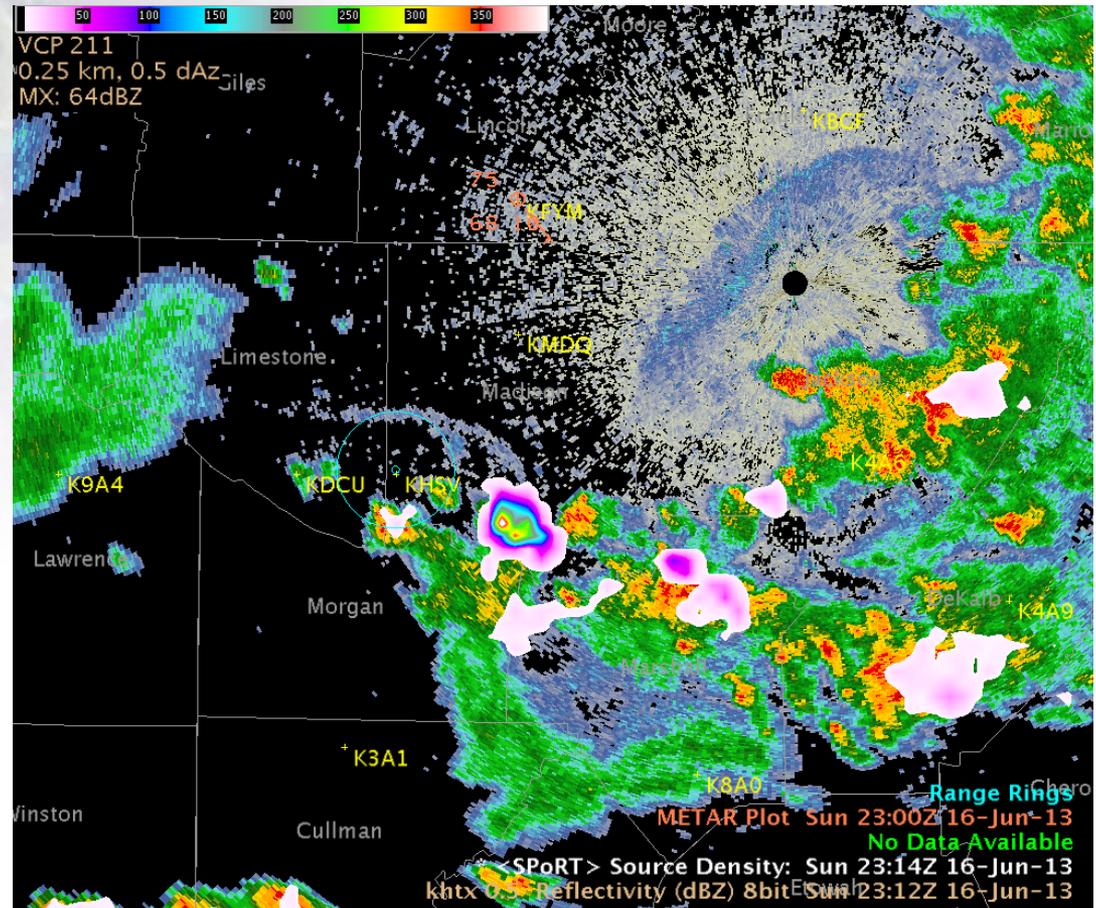
1216 UTC

1252 UTC



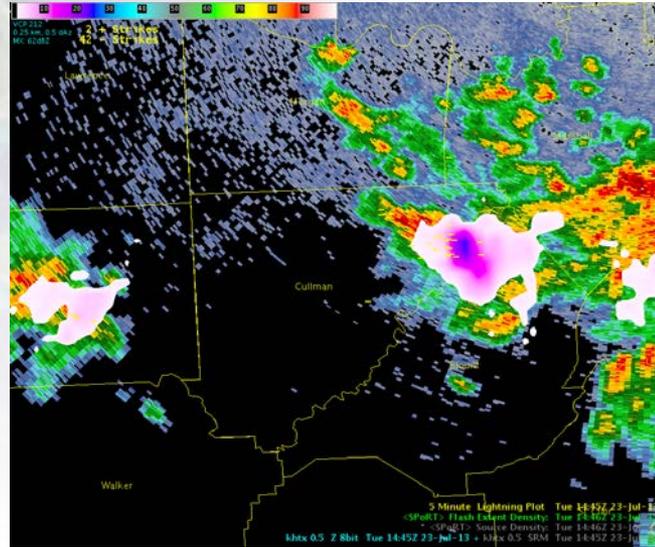
North Alabama Lightning Mapping Array Data in AWIPS II

- Total lightning were used in this case from June 16, 2013 to help with an Airport Warning for Huntsville International.
- Data were particularly useful in this case since a system-wide outage occurred with National Lightning Detection Network data in AWIPS.
- This highlights the importance of system redundancies.
- Additionally, total lightning data are useful in real-time watches for airports and outdoor venues since intra-cloud lightning often precedes cloud-to-ground lightning.



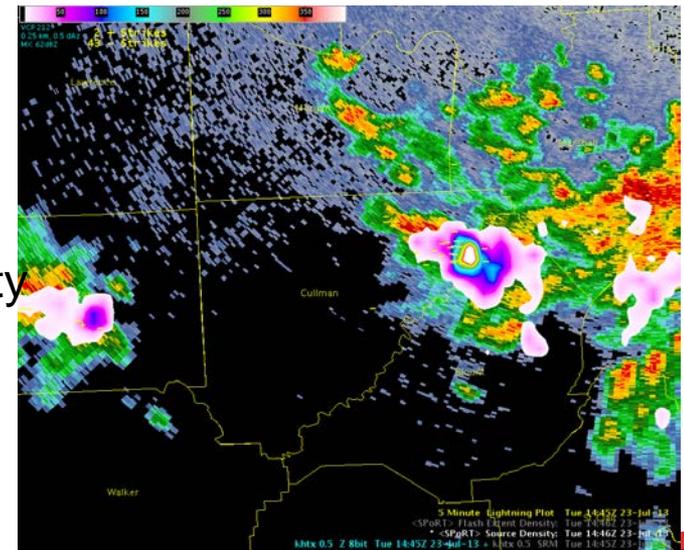
North Alabama Lightning Mapping Array Data in AWIPS II

- Due to higher processing available, *flash extent density* data were included in AWIPS II in test mode only beginning April 2013.
- Initial research indicates an advantage of flashes over sources, with statistical flash “jumps” occurring before source “jumps”, on average.
- More data are currently being collected and evaluated, and training is in development for forecasters before inclusion in operations.



Flash Extent Density

Source Density



SPoRT 2014 Virtual Workshop

- 3rd SPoRT Virtual Workshop to be held February 12-13, 2014
- Potential interest from 18 collaborative offices to date
- Call for abstracts sent today, November 4th, 2013
- Priority given to following collaborative research topics...
 - Use of high-resolution MODIS, VIIRS, and other SPoRT observational imagery and products for real-time analysis, prediction, advisories and warnings
 - Applications of new products being formally evaluated as part of the JPSS or GOES-R Proving Grounds (e.g. VIIRS Day/Night Band RGBs, NESDIS QPE, UAH GOES-R CI, etc)



AMS 2014 Presentations Related to GOES-R & JPSS

Fuell K., B. Guyer, D. Kann: **Integration of RGB "Dust" Imagery to Operations at the Albuquerque Forecast Office**

Fuell K., A. Leroy, M. Smith, S. Miller, D. Kann, D. Berhardt, N. Rydell, R. Cox: **SPoRT transition of JPSS VIIRS Imagery for Night-time Applications**

LeRoy A., K. Fuell, L. Rosa: **NASA-SPoRT Methodology for JPSS and GOES-R Proving Ground Assessments**

Stano, G. T., E. Szoke, S. Rutledge, N. Rydell, R. Cox, and R. Mazur: **Colorado Lightning Mapping Array collaborations through the GOES-R Visiting Scientist Program.**

Stano, G. T., K. M. Calhoun, A. M. Terborg: **Assessment of the pseudo geostationary lightning mapper products at the Spring Program and Summer Experiment.**

Stano, G. T., C. J. Schultz, L. D. Carey, D. R. MacGorman, and K. M. Calhoun: **A total lightning perspective of the 20 May 2013 Moore, Oklahoma supercell.**

Burks, J. E., G. T. Stano, and K. Sperow: **Lightning tracking tool for assessment of total cloud lightning within AWIPS II.**

Gravell, C. M., J. Mecikalski, R. Petersen, J. Seiglauff, and G. T. Stano: **Using GOES-R demonstration products to bridge the gap between severe weather watches and warnings for the 20 May 2013 Moore, OK tornado outbreak.**

Schultz, E. V., C. J. Schultz, L. D. Carey, D. J. Cecil, G. T. Stano, M. Bateman, and S. J. Goodman: **Lightning jump algorithm for GOES-R Geostationary Lightning Mapper (GLM) proxy data.**

Smith M., K. Fuell, J. Nelson, M. Kreller: **Using the SPoRT POES/GOES Hybrid Product in OCONUS Forecasting**



A satellite view of Earth's surface, showing the Western Hemisphere. The United States, Mexico, and the Caribbean Sea are visible. The image is faded and serves as a background for the text.

END OF SEPTEMBER UPDATE QUESTIONS?

