

An Update from the Satellite Climate Studies Branch (SCSB)

Ralph Ferraro

**Chief, Satellite Climate Studies Branch
NOAA/NESDIS/STAR/CoRP**

5th CICS-MD Science
Meeting

11/29 - 12/1/2016



CoRP and Federal Presence at CI's

5th CICS-MD Science Meeting

11/29 - 12/1/2016



CREST

1. City College New York
2. Hampton University
3. UMBC
4. University of Puerto Rico
5. Cal State Univ. - Los Angeles

CICS Consortium Members

6. Princeton
7. Howard University
8. UC - Irvine
9. Columbia
10. CUNY
11. Duke
12. University of Miami
13. Oregon State
14. Remote Sensing Systems

Why?

- Promotes closer scientific engagement
- Leverages expertise of both groups
- Multidisciplinary problem solving
- Helps promote outreach
- Shapes NOAA's next generation of scientists!



Our SCSB Family

5th CICS-MD Science
Meeting

11/29 -
12/1/2016



NOAA Federal Employees



Ralph Ferraro
Satellite Hydrology



Chris Brown
Ecological Modeling



Huan Meng
Snowfall/JPSS

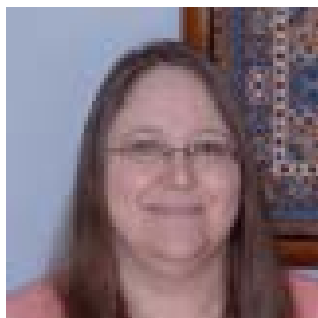


Scott Rudlosky
Lightning/GOES-R



Tom Smith
Climate/Time Series

Additional “Family” Members



Deb Baker
Administration



Ama Ba
NOAA/NWS

NRAP (1-year)
CICS Proving Ground



**Emily
Rosenthal**

NOAA WRP
Summer Intern
May – Aug 2016

FY16 Focus Areas

5th CICS-MD
Science Meeting

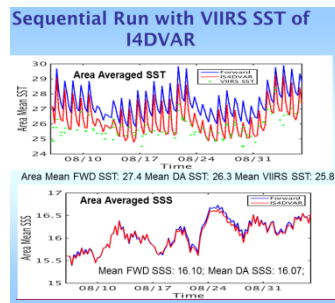
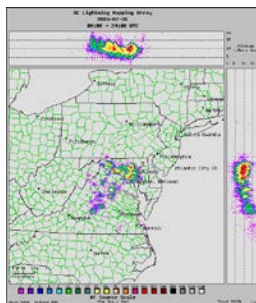
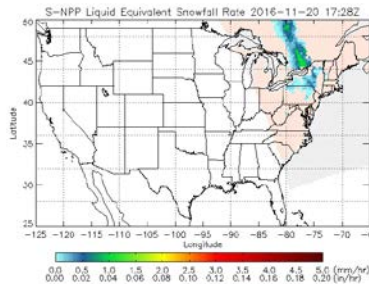
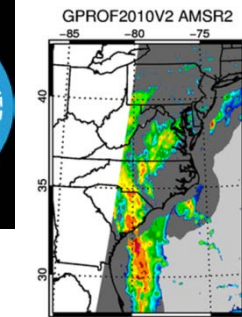
11/29 -
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Satellites

Operational/Research Products

Training

Climate Monitoring and Prediction



Earth Networks Total Lightning Network (ENTLN) Quick Guide

Operational Use and Benefits

- Detect electrically active storms (IC produces CG)
- Determine the total extent of the lightning threat
- Track convective cells evolution as larger features
- Identify strengthening and weakening storms
- Monitor convective mode and storm evolution
- Supplement radar data where coverage is poor
- Prepared for the Geostationary Lightning Mapper

Lightning Terminology

- The ENTLN detects the components of both intra-cloud (IC) and cloud-to-ground (CG) flashes, and algorithms use waveform shapes to differentiate between the IC and CG pulses (i.e., components)
- The IC and CG pulses are combined (generally into IC (cloud) and CG flashes using space (10 km) and time (17 sec) criteria
- CG flashes contain at least one CG pulse and many IC pulses (the number of pulses observed per flash varies regularly, due to varying sensor density)

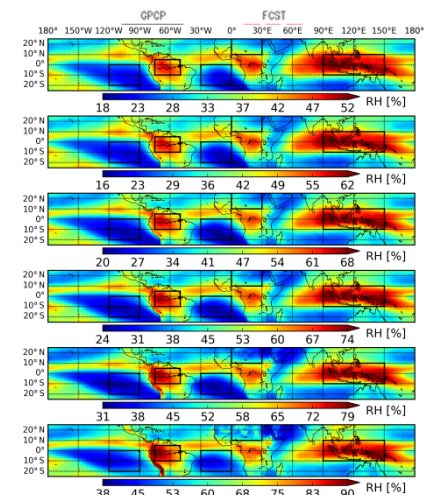
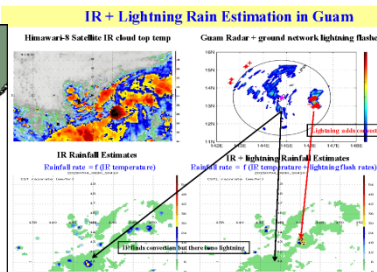
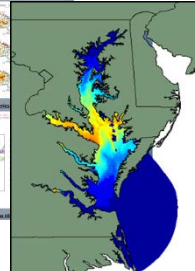
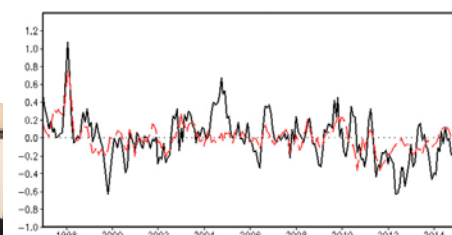
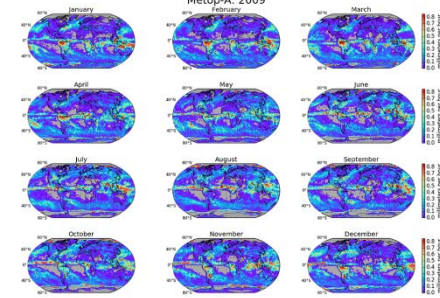
Gridded ENTLN Products

- ENTLN pulses and flash density grids in AWIPS simply report the pulse/flash counts within grid cells of various sizes over various periods of time
- Grids are provided at different spatial and temporal resolutions to accommodate a variety of users
- The frequency of lightning flashes often indicates updraft storm intensity (especially cloud flashes)
- Spatial interpretation and alternate color curves can enhance the gridded flashes

AWIPS Displays

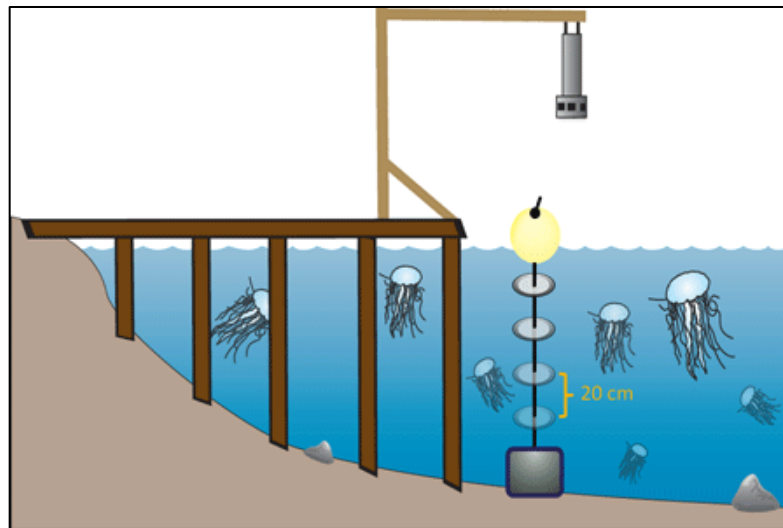
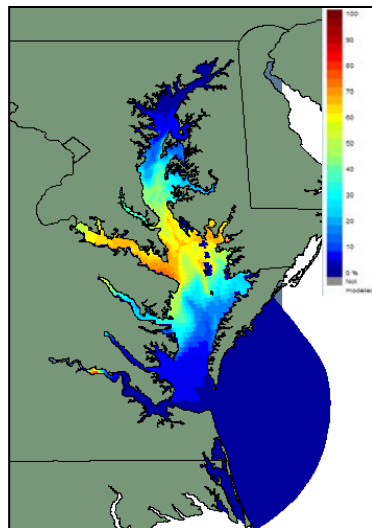
- Positive (negative) CG flashes are depicted by 1 to 4 red (blue) circles (labeled circles in AWIPS)
- Default cloud flash symbol has changed from circles (shown to left)
- The magnitude can be manually increased to better view the cloud flash symbols
- IC and CG pulses are both indicated by purple (2) symbols
- Pulse probe better depicts the spatial coverage, while pulse covers are more indicative of spatial storm intensity
- Forecasters often use ENTLN grids in their convective initiation and severe weather outlooks (projections)

Compiled by Dr. Scott Rudolph (NOAA/NWS/ESS/ST/SL) - See also: Lightning and the 30 March 2016
Contributions from Jason Jordan, Tiffany Meyer, Brian Morris, and Matthew Elliott

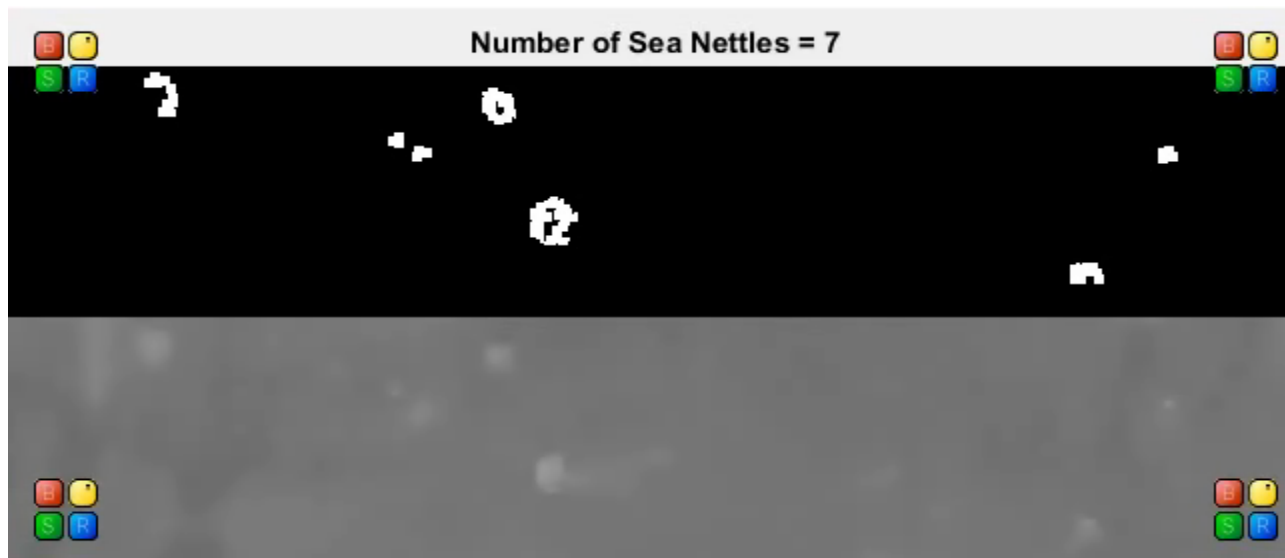


Unique Example – Joint SCSB and UMD Activity Verifying Sea Nettle Predictions Using the JellyCam

Likelihood Of
Presence
Prediction



JellyCam
Schematic



Automated
Detection &
Counting
System

Chris Brown

*Deepika
Regani, UMD
EE M.S.
student*

FY17 - Emerging Opportunities

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• Water!

- NOAA's National Water Initiative
 - Precipitation Fusion for regional monitoring
 - Seasonal Precipitation Forecast
- NOAA/NWS/National Water Center
 - National Water Model – forcings from satellite products for WRF-Hydro
 - Situational awareness
 - Water quality – what happens AFTERwards?

• GOES-R

- Rapid scan
- Lightning

• JPSS-1

- CICS-MD/SCSB Satellite Proving Ground/Training Center (PGTC)

• Climate

- Exploitation of CDR's
 - Monitoring and Prediction
- Expansion of CDR's to JPSS
 - e.g., expand AMSU/MHS to ATMS

