GOES-R Program and GLM Update

Steve Goodman

GOES-R Program Chief Scientist

GOES-R GLM Science Team

Technical Interchange Meeting

NOAA National Weather Center, Norman, OK

June 21, 2014

The GOES-R Geostationary Lightning Mapper (GLM) Science Team Meeting

When, Where: Saturday June 21, National Weather Center, Room 3910 following the ICAE

What: A half day meeting to invite national and international participation in our planned calibration/validation and user readiness planning for on-orbit post launch testing and field programs in support of the performance assessment of the GLM. The half day Agenda (see below) will have a few short presentations followed by discussions.

AGENDA

8:00-10:15 a.m.: Cal/Val

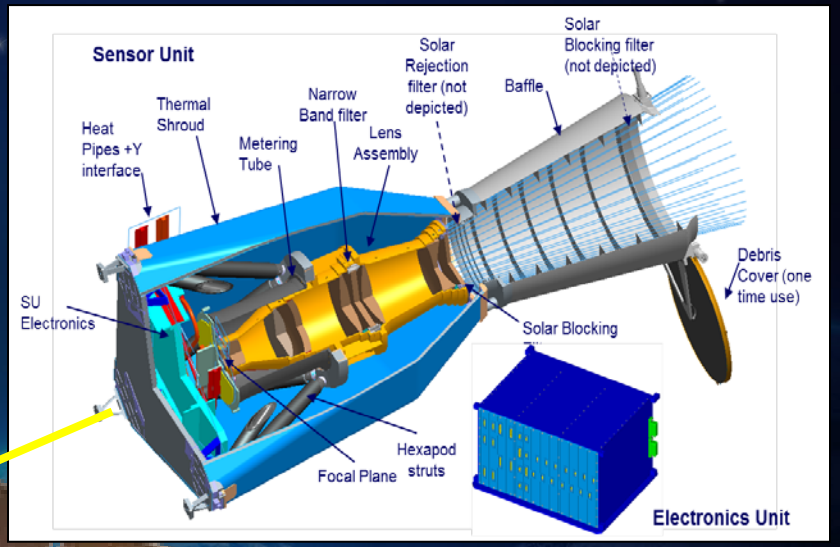
8:00-9:00: Steve Goodman, Rich Blakeslee- GOES-R GLM Status, Validation Status
9:00: Ken Cummins- Cross-comparison Tools
9:15: Discussion

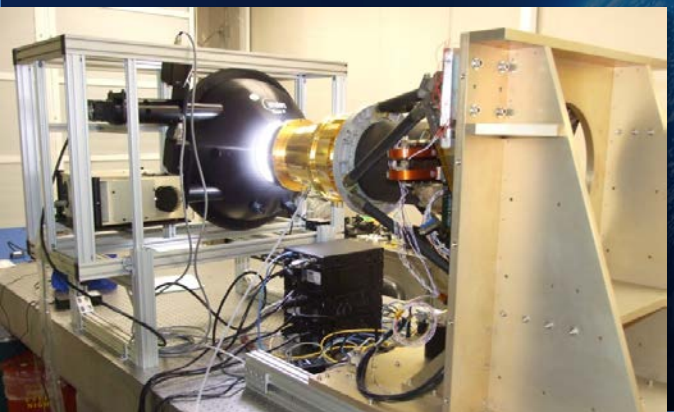
10:15-10:30: Break

10:30-11:30: Proving Ground/Training

10:30:: Brian Motta/Pete Roohr/James LaDue- Training
10:50: Kristin Calhoun- Proving Ground
11:10: Discussion
11:30: Adjourn

The Geostationary Lightning Mapper (GLM)





Objective: Why are you here?

You Have Interest in GLM Performance or Applications

- What does GLM detect, not detect and why? Causes?
  - Flash type, height, polarity, amplitude, threshold
- What correlative data and measurements are available?
  - Correlative measurements with known performance, error characteristics
  - Inventory of available correlative measurements- who has them, where does one get them
  - Where are the measurements taken (map, lat/lon, time, continuous or sporadic (ie, field campaign)
- Will you provide data or analysis? Pre- or post-launch
- Are you interested in working in collaboration with GLM team
- What is your interest in GLM- Cal/Val or Applications?
- Visiting Scientist- short, longer term visit?

GOES-R GLM Correlative Data

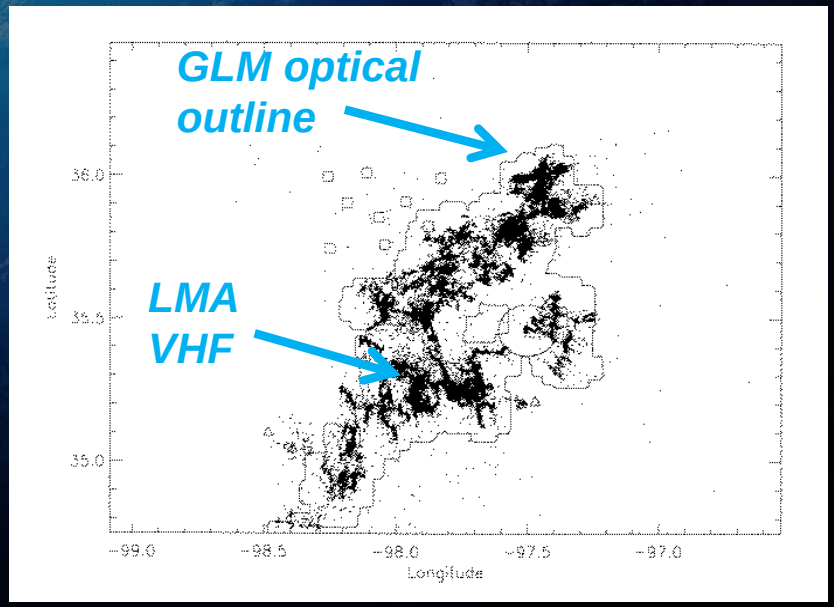
Data Source	Instrumentation Description	Data Coverage	Product Applicability
LMA/LDAR VHF Channel Mapping (North Alabama, Oklahoma, DC, West Texas, KSC)	Multi-sensor VHF time-of-arrival ground based network	~300 km range	Flash location/time, channel geometry, lightning type, flash rate.
HAMMA (Huntsville Alabama Marx Meter Array)	Multi-sensor field change and RF time-of-arrival system	~100-200 km	Flash location/time, channel geometry, lightning type, flash rate, continuing current, charge deposition, flash energy
High Speed Video	High speed video camera operating at tens of thousands of frames per second	Individual flashes	Lightning physics (e.g. optical amplitude, channel speed/length, flash type, various breakdown processes)
Field Mill Network (Kennedy Space Center)	Ground-based network of 31 electric field sensors.	~40 km	Flash location/time, charge deposition, flash energy, flash rate
National Lightning Detection Network (NLDN)	Multi-sensor ground-based lightning detection system	CONUS	Ground flash location/time, peak current, multiplicity, ground flash rate
GLD360	Multi-sensor ground-based lightning detection system	Global scale	Primarily ground flash location/time and some cloud flash detection
Earth Networks Total Lightning Network (ENTLN)	Multi-sensor ground-based lightning detection system	Global scale	Primarily ground flash location/time and some cloud flash detection
World Wide Lightning Location Network (WWLLN)	Multi-sensor ground-based lightning detection system	Global scale	Primarily ground flash location/time

Needs Updating

GLM Validation Data

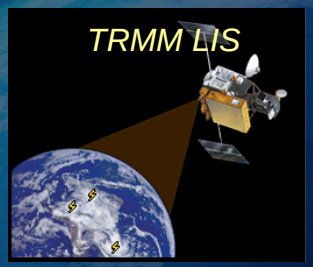


- **Ground Truth Datasets:**
  - Short-Medium Range Lightning
    - LMA North Alabama (NASA-NOAA), DC (NASA-NOAA), Oklahoma (OU CIMMS-NSSL), West Texas (TTU), NMTech, Camp Blanding (UF-DARPA), Colorado Front Range (CSU), Houston (TAMU), NASA-KSC and Wallops, Atlanta (GTRI), Toronto, Canada (EC)
    - HAMMA/Delta-E Array (North Alabama)
    - High Speed Video Cameras
    - KSC Field Mills (KSC Florida)
    - NLDN (CONUS)
  - Long Range Lightning
    - GLD360
    - WWLLN
    - ENTLN



GLM Validation Data

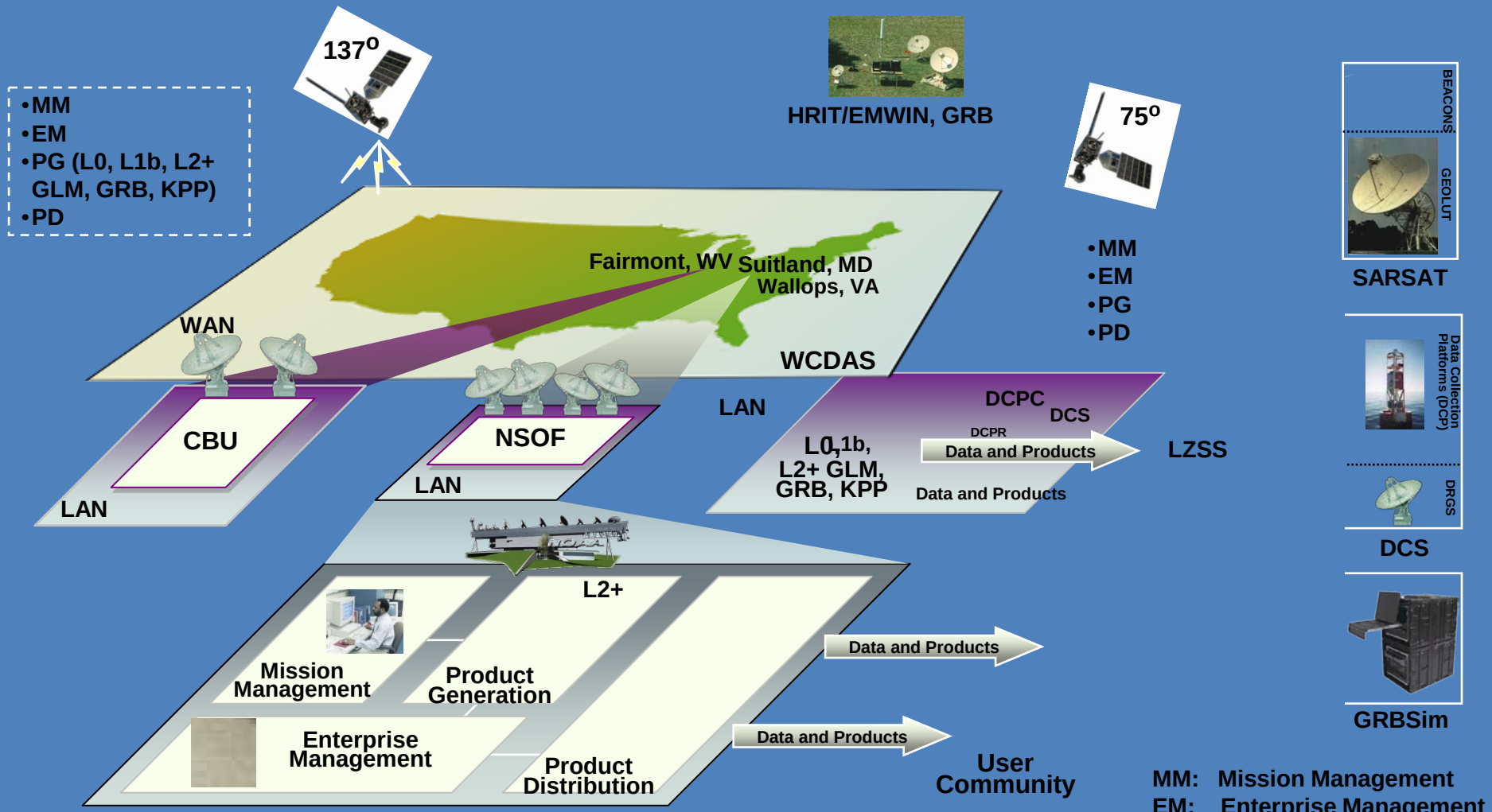
- **Airborne GLM Simulator**
  - Airborne high resolution optical (and electrical) measurements as a GLM simulator (pre- and post-launch).
  - Deploy on aircraft (e.g., ER2, Global Hawk) to observe cloud-top lightning pulses (post launch field campaigns- 2016, 2017).



- **Satellite Observations**
  - LIS for GLM proxy data development
  - Pre-launch validation simulations (including val tool testing)
  - LIS on International Space Station (ISS LIS, launch 2016)-transfer radiometer
  - TRMM Extended Mission (possibly until 2018)
  - TARANIS (Tool for the Analysis of RAdiation from lightNIng and Sprites)

- **Cross-Calibration of GLM and MTG LI at 777.4 nm (2019)**

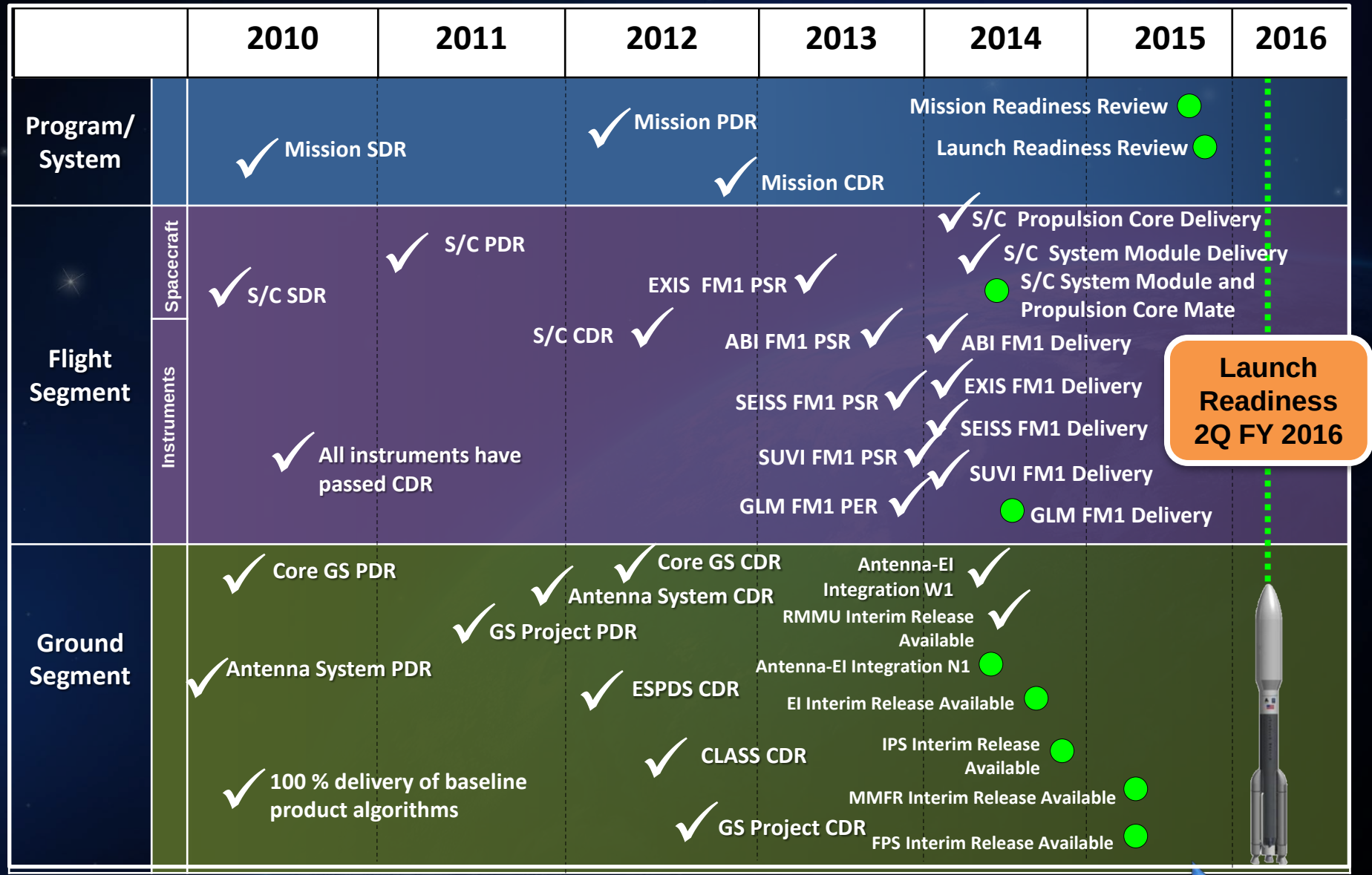
The GOES-R System Architecture



MM: Mission Management
EM: Enterprise Management
PG: Product Generation
PD: Product Distribution

GLM IV&V Team local L0 Data Store at NASA DAAC in Huntsville, AL

GOES-R Milestones

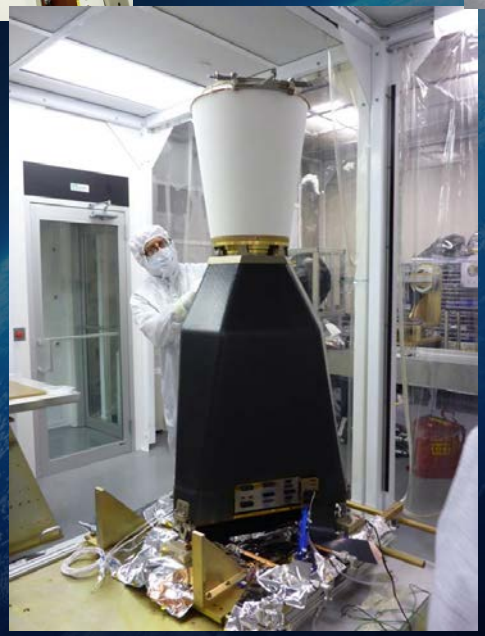


GOES- R Flight Segment Progress

GOES-R Propulsion Module and System Module delivered to Littleton

SUVI and EXIS installed on the Sun Pointing Platform

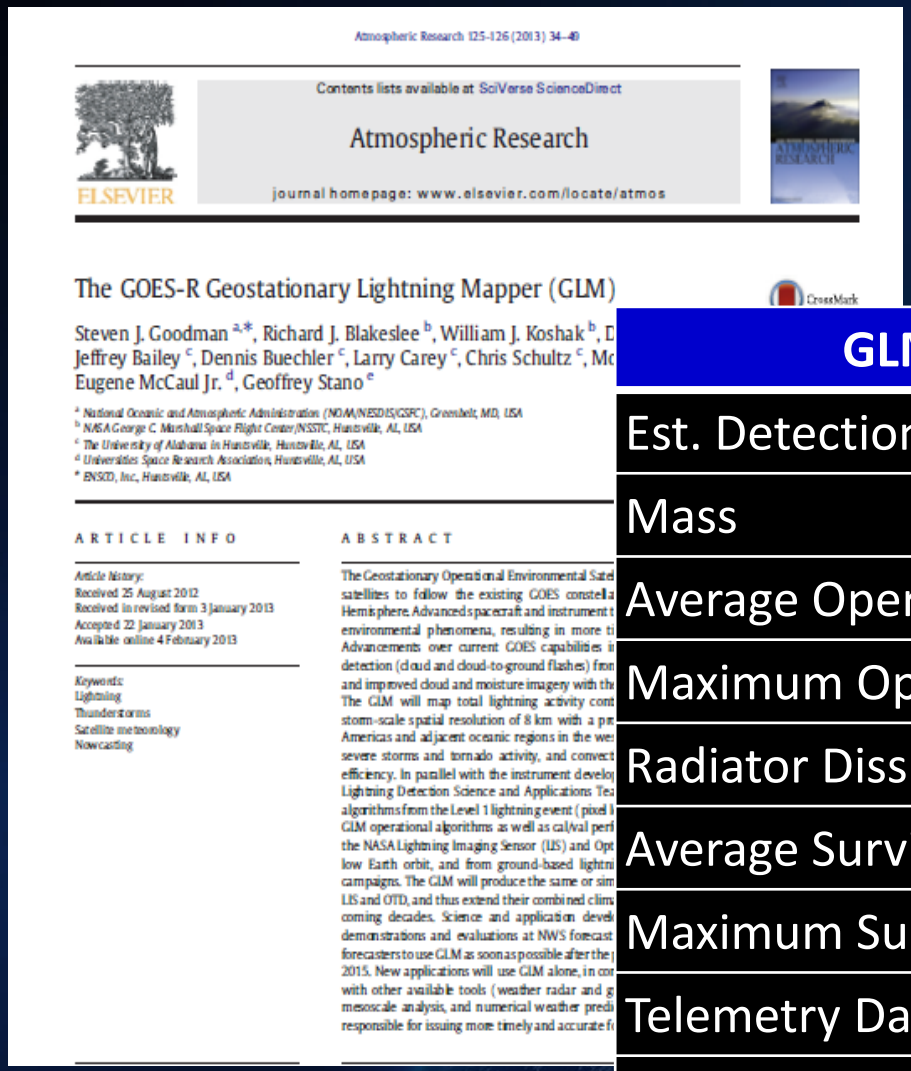
SEISS DPU integrated to System Module



GLM vibration testing complete

Solar Array Wing deployment

GLM Overview and Specifications



Atmospheric Research 125–126 (2013) 34–49

Contents lists available at SciVerse ScienceDirect

Atmospheric Research

journal homepage: www.elsevier.com/locate/atmos

The GOES-R Geostationary Lightning Mapper (GLM)

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ARTICLE INFO

Article history:
Received 25 August 2012
Received in revised form 3 January 2013
Accepted 22 January 2013
Available online 4 February 2013

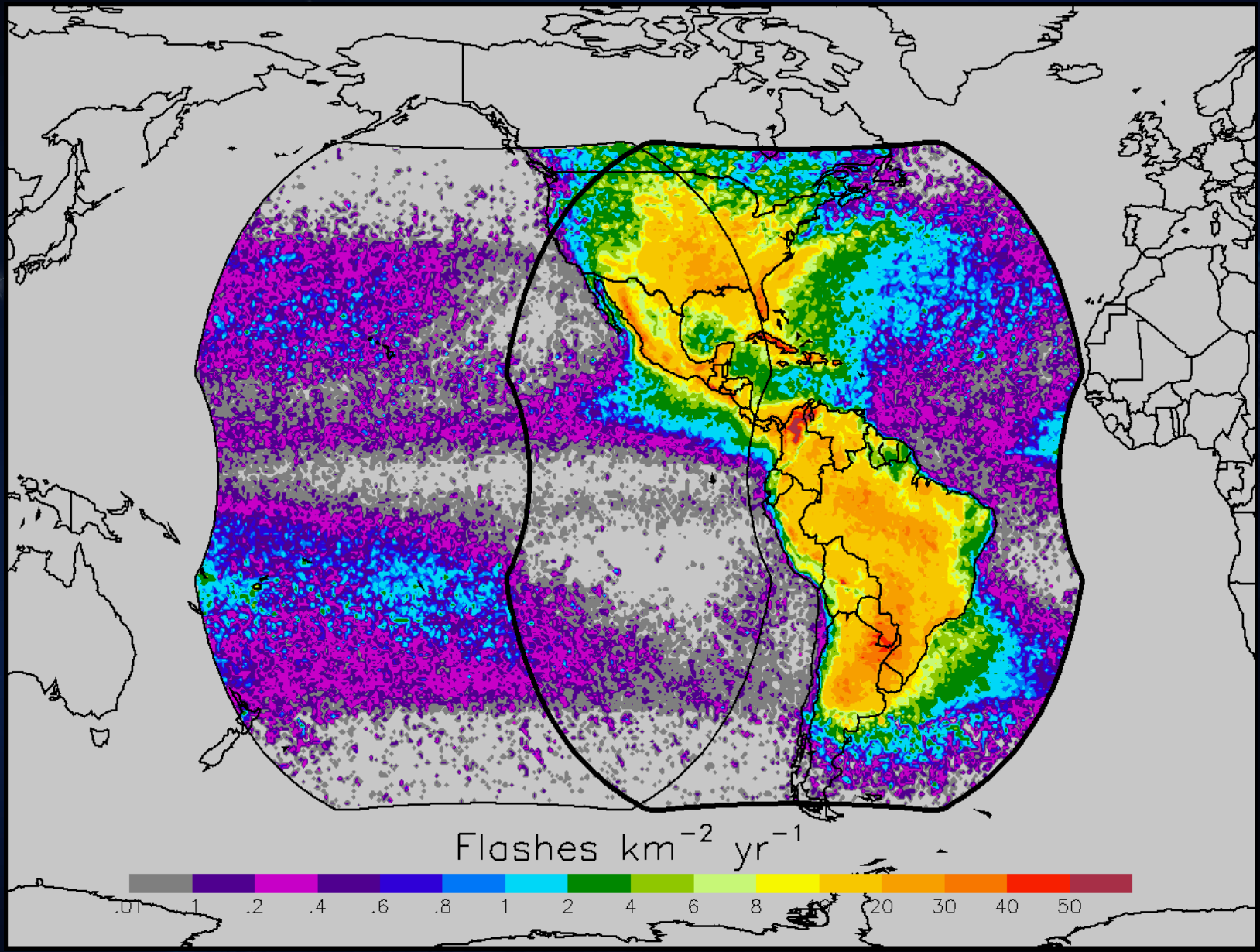
Keywords:
Lightning
Thunderstorms
Satellite meteorology
Nowcasting

ABSTRACT

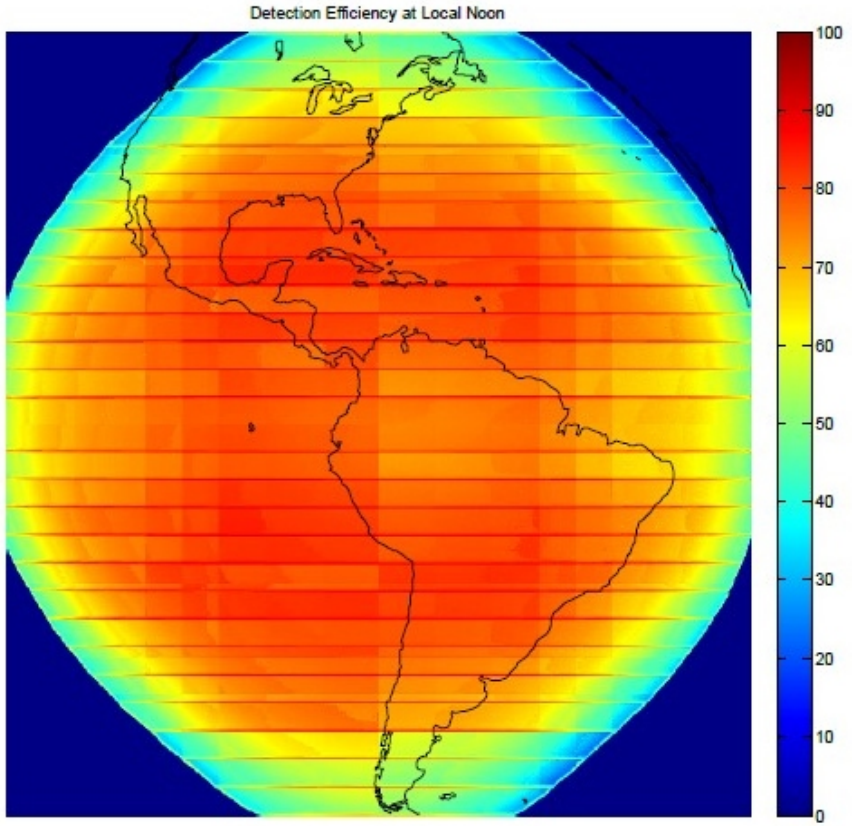
The Geostationary Operational Environmental Satel
satellites to follow the existing GOES constella
Hemisphere. Advanced spacecraft and instrument t
environmental phenomena, resulting in more ti
Advancements over current GOES capabilities i
detection (cloud and cloud-to-ground flashes) fron
and improved cloud and moisture imagery with the
The GLM will map total lightning activity cont
storm-scale spatial resolution of 8 km with a pro
Americas and adjacent oceanic regions in the wes
severe storms and tornado activity, and convect
efficiency. In parallel with the instrument develo
Lightning Detection Science and Applications Tea
algorithms from the Level 1 lightning event (pixel l
GLM operational algorithms as well as cal/val perf
the NASA Lightning Imaging Sensor (LIS) and Opt
low Earth orbit, and from ground-based lightni
campaigns. The GLM will produce the same or sim
LIS and OTD, and thus extend their combined clim
coming decades. Science and application develo
demonstrations and evaluations at NWS forecast
forecasters to use GLM as soon as possible after the p
2015. New applications will use GLM alone, in com
with other available tools (weather radar and g
mesoscale analysis, and numerical weather predi
responsible for issuing more timely and accurate f

GLM Spec	Capability
Est. Detection Efficiency	75-80%
Mass	122 kg
Average Operational Power	377 W
Maximum Operational Power	390 W
Radiator Dissipated Power	141 W
Average Survival Power	6.5 W
Maximum Survival Power	10.2 W
Telemetry Data Rate	5.7 Mbps
Volume	SU: 151 x 81 x 66 cm EU: 37.5 x 50 x 50 cm

GLM Field of View – GOES E, W



GLM Projected Detection Efficiency at Local Noon



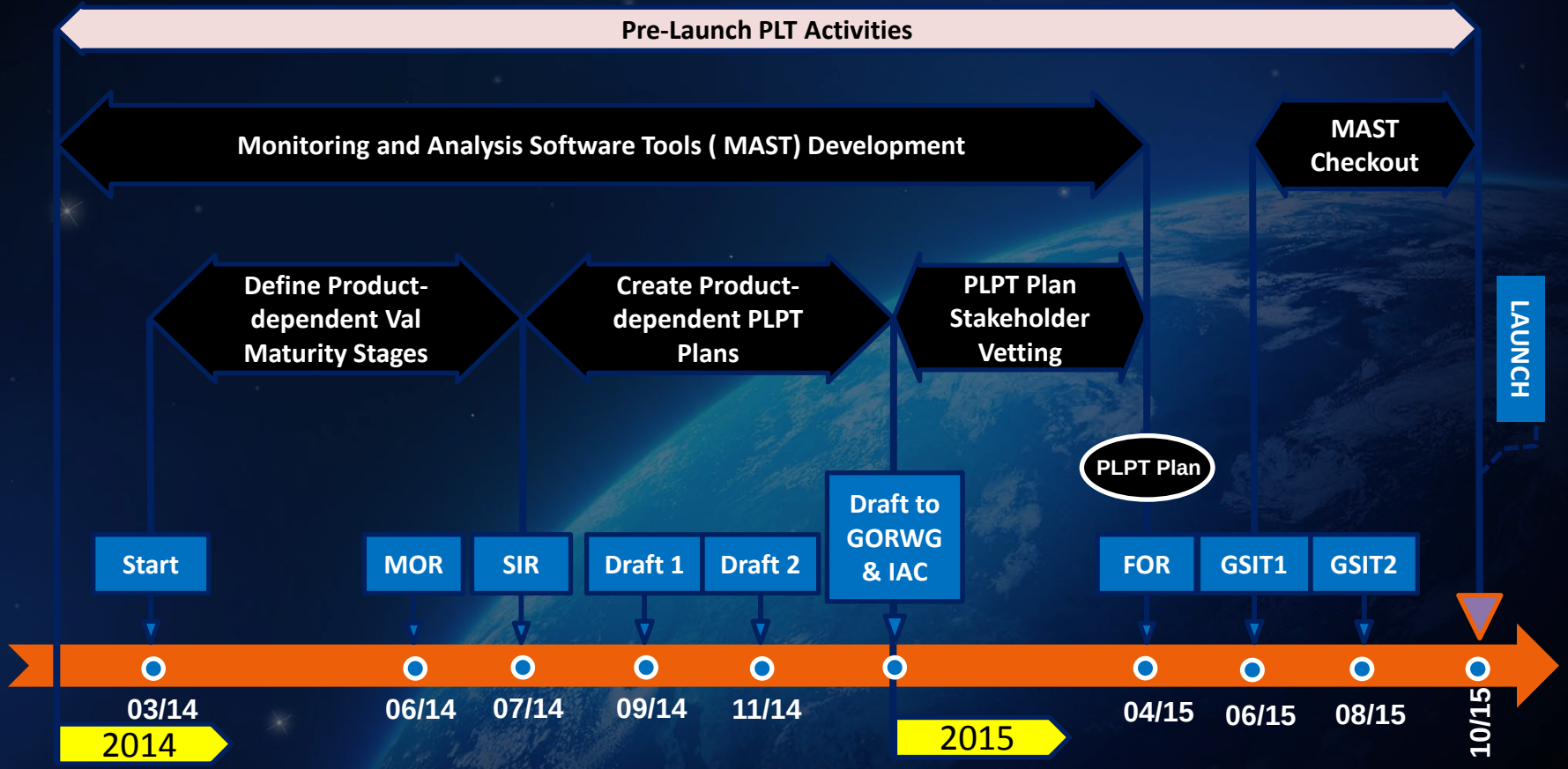
- Analysis is done with thresholds determined during lab testing with a very conservative false event rate
- 7.5 % of events are single event flashes at these threshold levels. Worst case, all of these will be removed by the ground processing algorithms.
- Lowering thresholds can increase FAR (cal est <1%, spec is 5%) and yet improve DE by having 2 or more events pass coherency filter.

	BOL DE	EOL DE	With GPA
Primary	83 %	81 %	75 %
Redundant	86 %	84 %	78 %

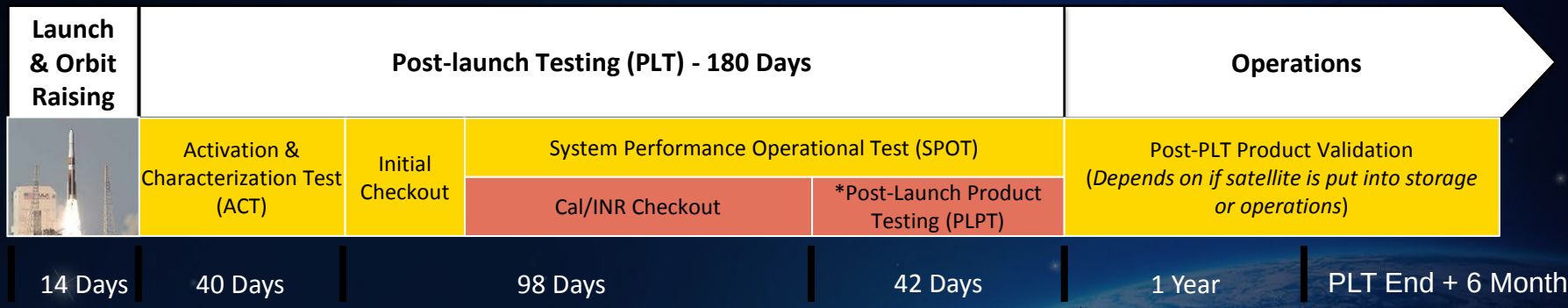
GLM spec is 70% flash DE

Post Launch Product Testing (PLPT)

Planning and Implementation Timeline



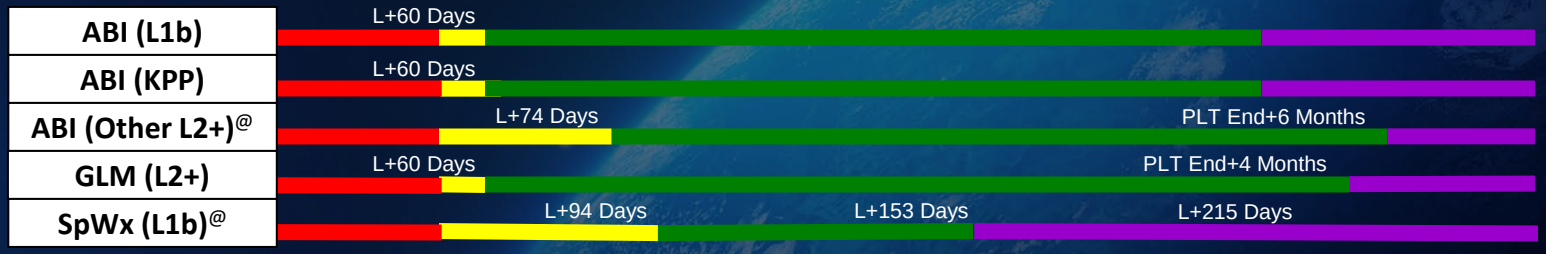
GOES-R Post-Launch Product Science Validation Stages (Nominal Timeline)

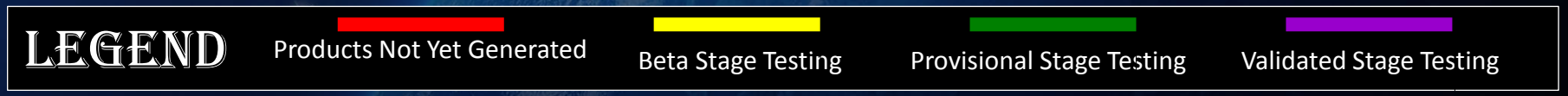


Peer-Stakeholder ABI L1b & KPP Product Validation Review **Handover ABI L1b & KPP Products to NWS**

Post-Launch Assessment Review **(PLAR)** and Handover Readiness Review **(HRR)**: **Handover S/C Ops to OSPO**

Peer-Stakeholder L2+ Product Validation Reviews **Handover L2+ Products to NWS**





Beta Validated Product

Provisionally Validated Product

Fully Validated Product

* NOAA Science Test

@ Maturity level may vary for each product, as product availability is driven by maturity of algorithm implementation, as well as, the existence of science phenomena and associated ground-truth data.

GOES-R Product (L1b and L2+) Validation Maturity Stages (Nominal Mission)

1. Beta

- Activities
  - Early release of product. (e.g., at-launch version of algorithms and their input parameters are initially used to generate the product)
  - Initial calibration applied. (L1b)
  - Rapid changes in product parameters (e.g., lookup tables, coefficients) or product algorithms can be expected.
  - Product quick looks and initial comparisons with correlative validation data are performed.
  - A thorough analysis of products are ongoing.
  - Users are engaged and products are made available to users.
- End state
  - Product is minimally validated, and may still contain significant errors (identified and unidentified).
  - Information/data from validation efforts can only be used to make initial qualitative and/or very limited quantitative assessments regarding product fitness-for-purpose.
  - Documentation of product performance and identified product performance anomalies, including recommended remediation strategies, exists.

2. Provisional

- Activities
  - Product validation, quality assurance, and anomaly resolution activities are ongoing.
  - Algorithm anomalies are identified and analyzed.
  - Incremental improvements may be GOAL:occurring.
  - Users are engaged and user feedback is provided and assessed.
- End state
  - Product performance (L1b or L2+) has been demonstrated through analysis of a large, but still limited (i.e., not necessarily globally or seasonally representative) number of independent measurements obtained from selected locations, time periods, or field campaign efforts.
  - Product analyses are sufficient for qualitative, and limited quantitative, determination of product fitness-for-purpose.
  - Documentation of product performance, testing involving product fixes, identified product performance anomalies, including recommended remediation strategies, exists.
  - Product is recommended for operational use (user decision) and in scientific publications.

3. Validated

Goal: Provisional in 6 months

- Activities
  - Product validation and quality assurance activities continue.
  - Future algorithm incremental improvements are identified.
  - User community actively testing or utilizing product .
- End state
  - Product performance has been demonstrated over a large and wide range of representative conditions (i.e., global, seasonal).
  - Comprehensive documentation of product performance exists that includes all known product anomalies and their recommended remediation strategies for a full range of retrieval conditions and severity level.
  - Product analyses are sufficient for full qualitative and quantitative determination of product fitness-for-purpose.
  - Product is ready for operational use based on documented validation findings and user feedback.
  - Product validation, quality assurance, and algorithm stewardship continue through the lifetime of the instrument.

Objective: Why are you here?

You Have Interest in GLM Performance or Applications

- What does GLM detect, not detect and why? Causes?
  - Flash type, height, polarity, amplitude, threshold
- What correlative data and measurements are available?
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  - Inventory of available correlative measurements- who has them, where does one get them
  - Where are the measurements taken (map, lat/lon, time, continuous or sporadic (ie, field campaign)
- Will you provide data or analysis? Pre- or post-launch
- Are you interested in working in collaboration with GLM team
- What is your interest in GLM- Cal/Val or Applications?
- Visiting Scientist- short, longer term visit?

NWS Preparations for GLM Use

Most-Promising GLM Contributions

- GLM represents a new/unique capability
  - High efficiency Total Lightning (TL) detection eventually stretching from the Pacific to the Atlantic (+ EUMETSAT-MTG, CMA FY-4)
- Improved Convective Warnings (combine TL, radar, other)
  - Reduced FAR, Increased POD, Increased Lead Time for Tornado Warnings and other Severe Convective Warnings
  - Enhanced Situational Awareness for Aviation Services over broad geographic area (especially trans-oceanic flights)
  - Enhanced Situational Awareness for Convective Precipitation (Flash-Flood)
- Improved Forecasts of Rapid Intensification (RI) and Rapid Weakening (RW) in Tropical Storms
- Short-term numerical weather prediction improvement-assimilation of TL as proxy for strong convection

International Collaboration

- Japan Meteorological Agency (JMA)
  - Information exchange and collaborative research on volcanic ash and cloud analysis science
  - Algorithm Working Group team member visits
  - Access to full resolution HIMAWARI imagery for PG demonstrations

- European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)
  - Collaboration in research and applications through the Convection Working Group and the Satellite Application Facilities
  - Collaboration with GLM cal/val activities
  - Development of training materials through the World Meteorological Organization (WMO) Virtual Laboratory

2014 EUMETSAT Convection Working Group workshop, April 7–11, Zagreb, Croatia.

Satellite Proving Grounds

Making GOES-R test products available to forecasters for feedback and evaluation with algorithm developers

- Satellite liaisons (subject matter experts) at NWS National Centers
- Develop training for users
- Several GOES-R level 2 products are demonstrated in the GOES-R Proving Ground.
- Examples can be found on the PG blogs and through the website www.goes-r.gov.
- International projects
- Visiting Scientist Program

NOAA Hazardous Weather Testbed (HWT)

CHUVA PROJECT

ESSL 2014 Testbed

GOES-R Proving Ground

THE GOES-R PROVING GROUND

Accelerating User Readiness for the Next-Generation Geostationary Environmental Satellite System

BY STEVEN J. GOODMAN, JAMES GURKA, MARK DEMARIA, TIMOTHY J. SCHMIT, ANTHONY MOSTEK, GARY JEDLOVEC, CHRIS SIEWERT, WAYNE FELTZ, JORDAN GERTH, RENATE BRUMMER, STEVEN MILLER, BONNIE REED, AND RICHARD R. REYNOLDS

By demonstrating the advanced capabilities of the next generation of geostationary satellites, the proving ground addresses user readiness and the research-to-operations-to-research loop.

The Geosta... Satellite R... (PG) is an... for the next ge... ronmental sate... development b... Space Admini... Oceanic and At... with NASA r... (spacecraft and... for the overall... GOES-R PG is... GOES-R Progra... Institutes; NAS... and Transition...

AFFILIATIONS: Good... Program Office, Greenb... NESDIS/Center for Sat... Collins, Colorado; Schw... Applications and Resear... National Weather Servi... Short-Term Prediction ... Alabama; SIEWERT—Coo... logical Studies, Norman... Institute for Meteorolog... BRUMMER AND MILLER—C... Atmosphere, Fort Colli...

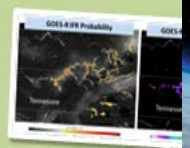
AMERICAN METE...

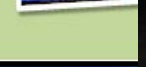
GOES-R Proving Ground

FY12 Annual Report

November 28, 2012

Revised January 22, 2013

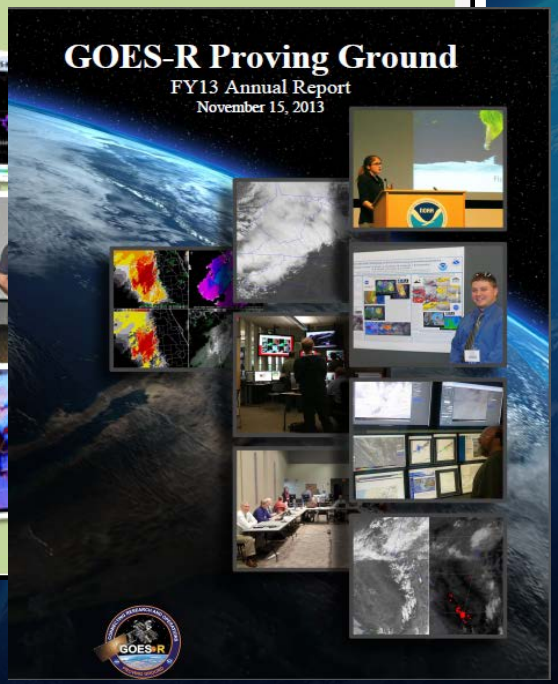


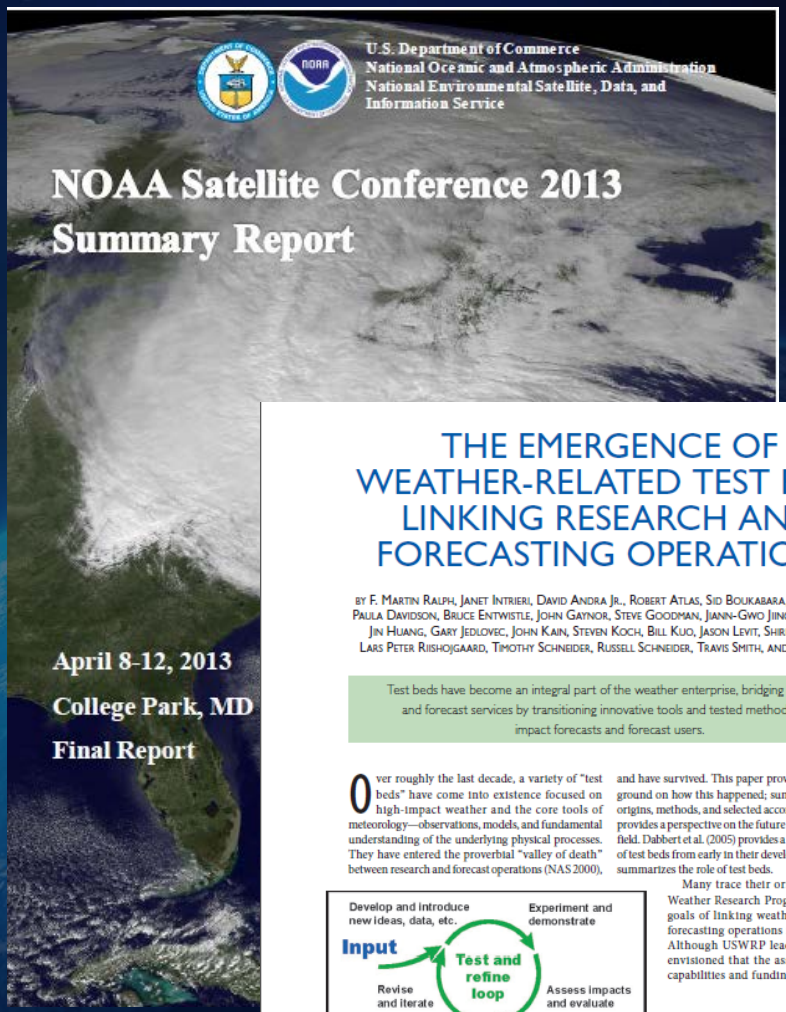


GOES-R Proving Ground

FY13 Annual Report

November 15, 2013





U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Environmental Satellite, Data, and Information Service

NOAA Satellite Conference 2013 Summary Report

April 8-12, 2013

College Park, MD

Final Report

THE EMERGENCE OF WEATHER-RELATED TEST BEDS LINKING RESEARCH AND FORECASTING OPERATIONS

BY F. MARTIN RALPH, JANET INTRIERI, DAVID ANDRA JR., ROBERT ATLAS, SID BOUKABARA, DAVID BRIGHT, PAULA DAVIDSON, BRUCE ENTWISTLE, JOHN GAYNOR, STEVE GOODMAN, JIANN-GWO JIING, AMY HARLESS, JIN HUANG, GARY JEDLOVEC, JOHN KAIN, STEVEN KOCH, BILL KUO, JASON LEVIT, SHIRLEY MURILLO, LARS PETER RIISHOJGAARD, TIMOTHY SCHNEIDER, RUSSELL SCHNEIDER, TRAVIS SMITH, AND STEVEN WEISS

Test beds have become an integral part of the weather enterprise, bridging research and forecast services by transitioning innovative tools and tested methods that impact forecasts and forecast users.

Over roughly the last decade, a variety of "test beds" have come into existence focused on high-impact weather and the core tools of meteorology—observations, models, and fundamental understanding of the underlying physical processes. They have entered the proverbial "valley of death" between research and forecast operations (NAS 2000), and have survived. This paper provides a brief background on how this happened; summarizes test bed origins, methods, and selected accomplishments; and provides a perspective on the future of test beds in our field. Dabbert et al. (2005) provides a useful description of test beds from early in their development and Fig. 1 summarizes the role of test beds.

Many trace their origins to the U.S. Weather Research Program (USWRP)'s goals of linking weather research and forecasting operations more effectively. Although USWRP leadership initially envisioned that the associated gaps in capabilities and funding could be filled

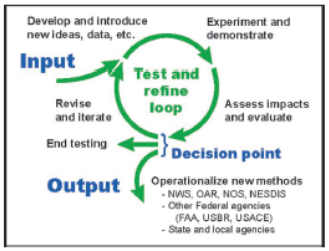


FIG. 1. Conceptual schematic of the test bed process for a hypothetical project, tool, or concept—including innovation, demonstration, evaluation, and, where suitable, a transition to operations within a federal, state, or local organization. NOS = National Ocean Service; USBR = United States Bureau of Reclamation; and USACE = U.S. Army Corps of Engineers.

GOES-14 SRSOR 1-min Super Rapid Scan Experiment

GOES-R Demonstrations at NOAA Testbeds and Proving Grounds
(http://cimss.ssec.wisc.edu/goes/srsor2014/GOES-14_SRSOR.html)

- Dates:
  - May 8-22, 2014
  - August 14-28, 2014

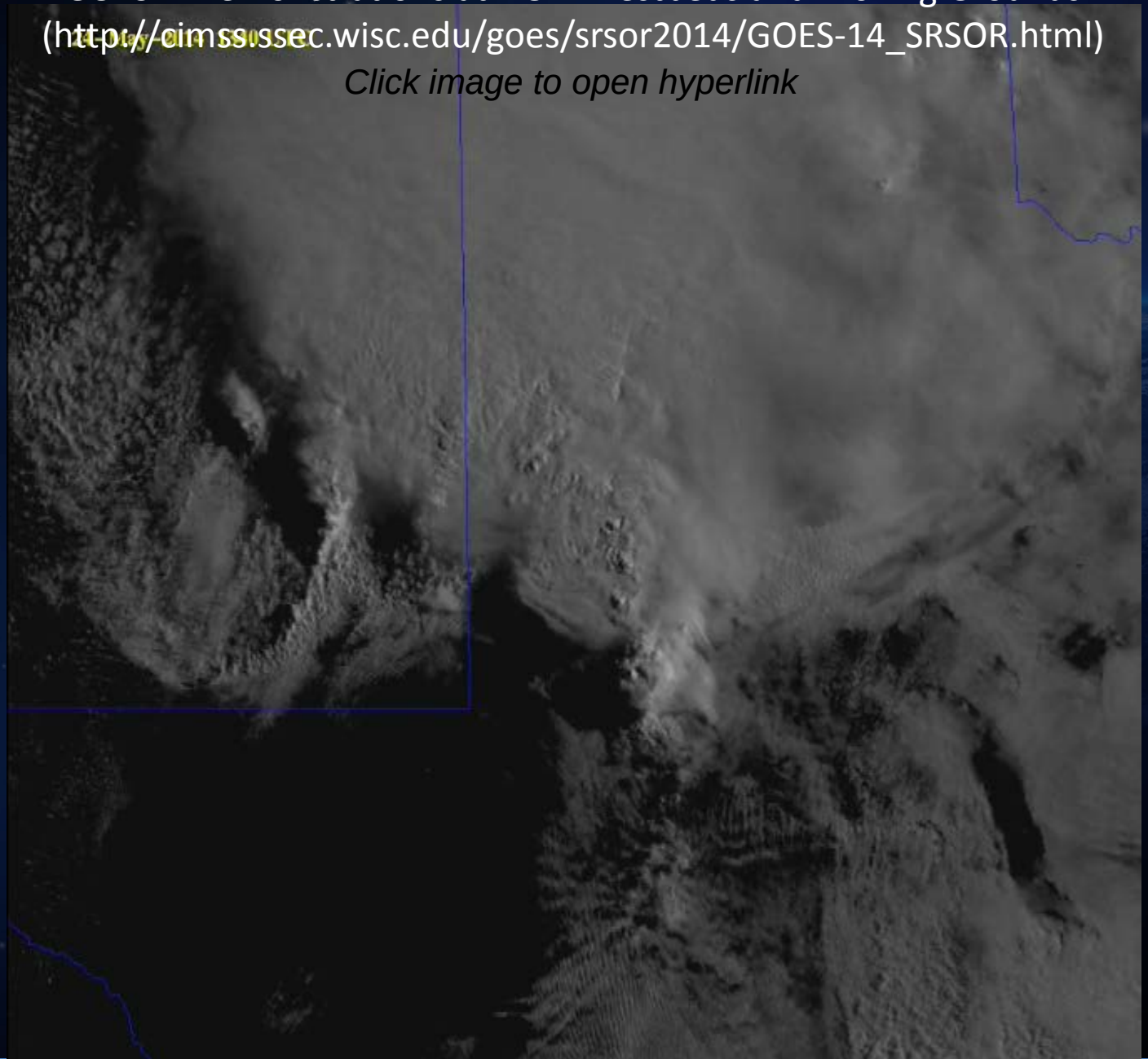
- Target Locations:
  - Norman, OK- NEXRAD, MPAR, OKLMA (primary site)
  - Huntsville, AL- NEXRAD, UAH dual-pol radars, NALMA
  - Sterling, VA- NEXRAD, TDWR, DCLMA
  - Fort Collins, Colorado- NEXRAD, CSU-CHILL, NCLMA
  - Melbourne/KSC, FL- NEXRAD, LDAR II
  - IPHEX/Hydrometeorology Testbed - GPM validation campaign
  - Atlantic Ocean/GulfMex Basin- NASA EV-1 Hurricane and Severe Storm Sentinel-HS3 science flights

GOES-14 SRSOR 1-min Super Rapid Scan Experiment

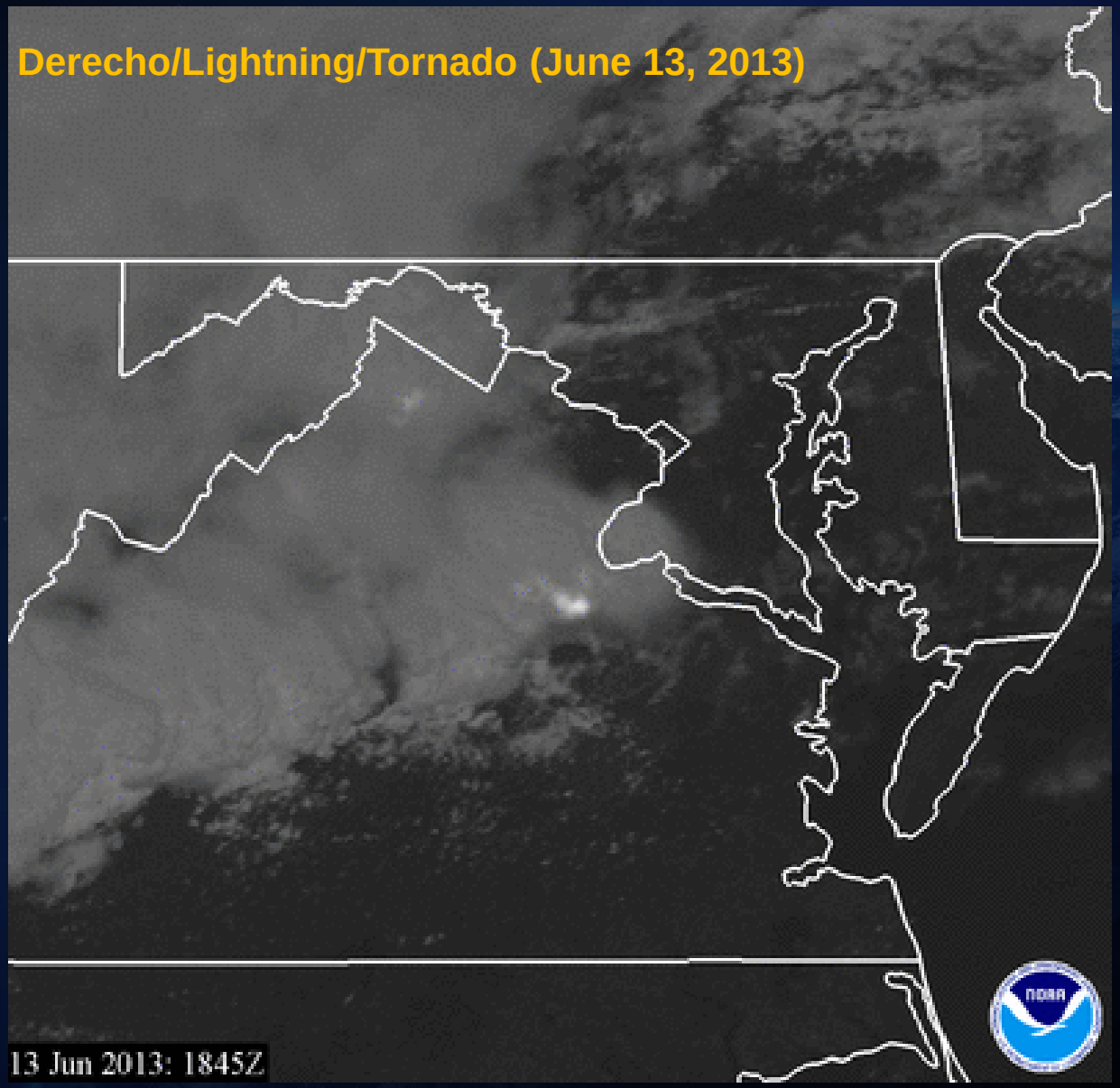
GOES-R Demonstrations at NOAA Testbeds and Proving Grounds

(http://cimss.ssec.wisc.edu/goes/srsor2014/GOES-14_SRSOR.html)

Click image to open hyperlink



GOES 14 Out-of-Storage SRSOR

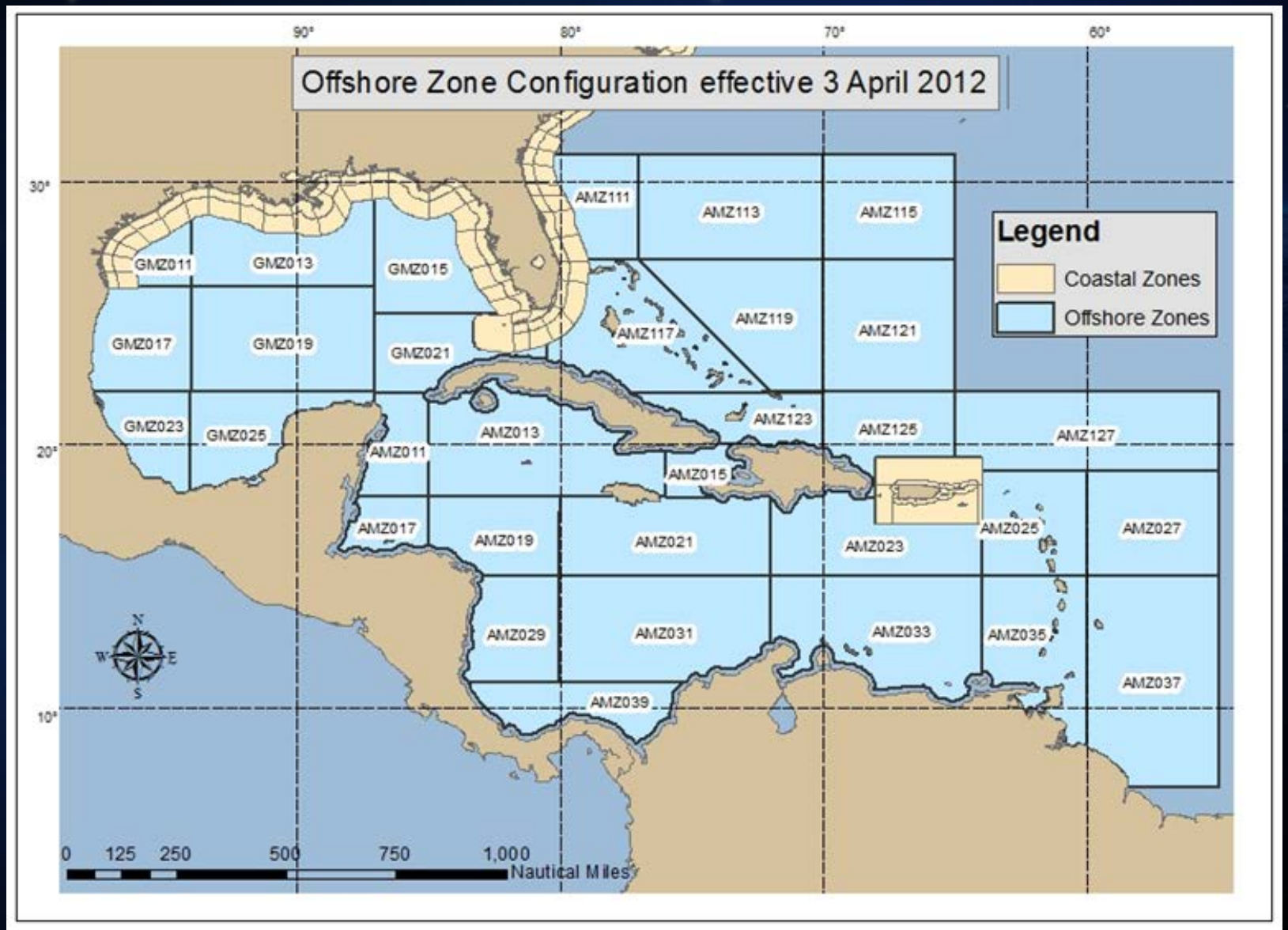


S. Rudlosky

http://cimss.ssec.wisc.edu/goes/srsor2013/GOES-14_SRSOR.html

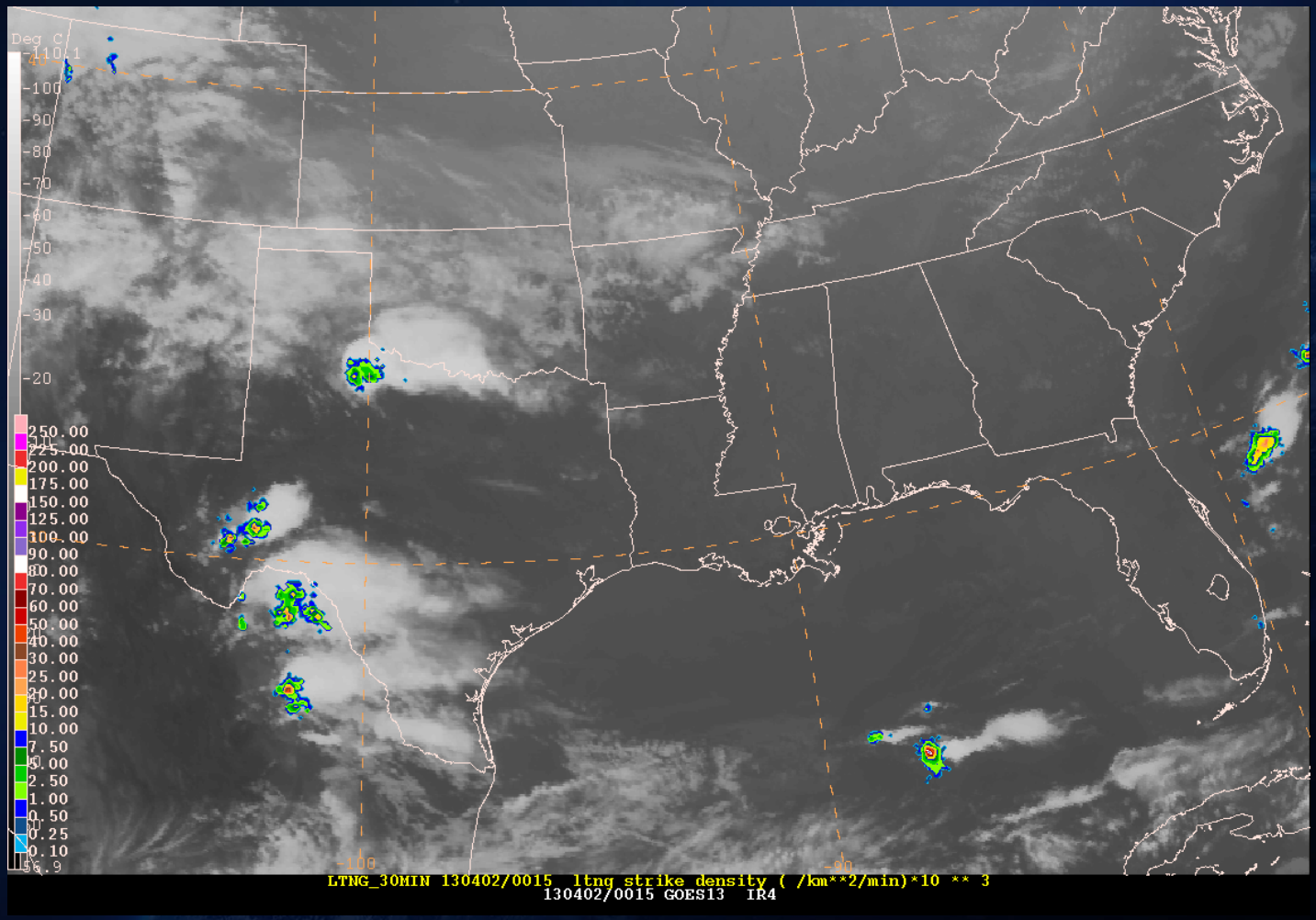
Photpo credit Buddy Denham- sailing between Long Island and Jersey shore

Offshore Waters Forecast Zones
3 April 2012



Large MCC (04/02 – 04/04)

GOES-13 Infrared overlaid with (Vaisala) GLD-360 Lightning Density

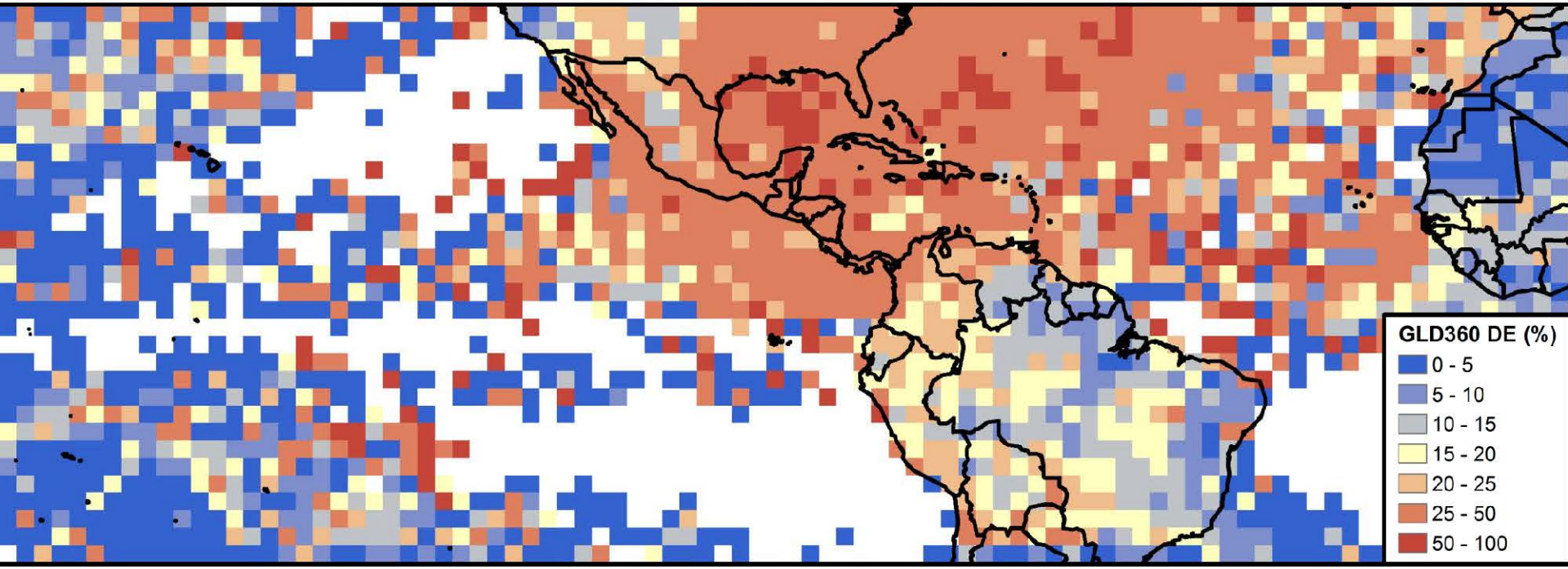


GLD360 Analysis (2012)

- GLD360 performance relative to the TRMM Lightning Imaging Sensor (LIS)
- White grid cells indicate no LIS flashes

Metric	GLD360
DE (%)	25.3
LD (km)	12.6
Multiplicity	1.85

Regional DE (%)	GLD360
North America	33.4
South America	17.5
Oceans	33.0



2° × 2° Grid

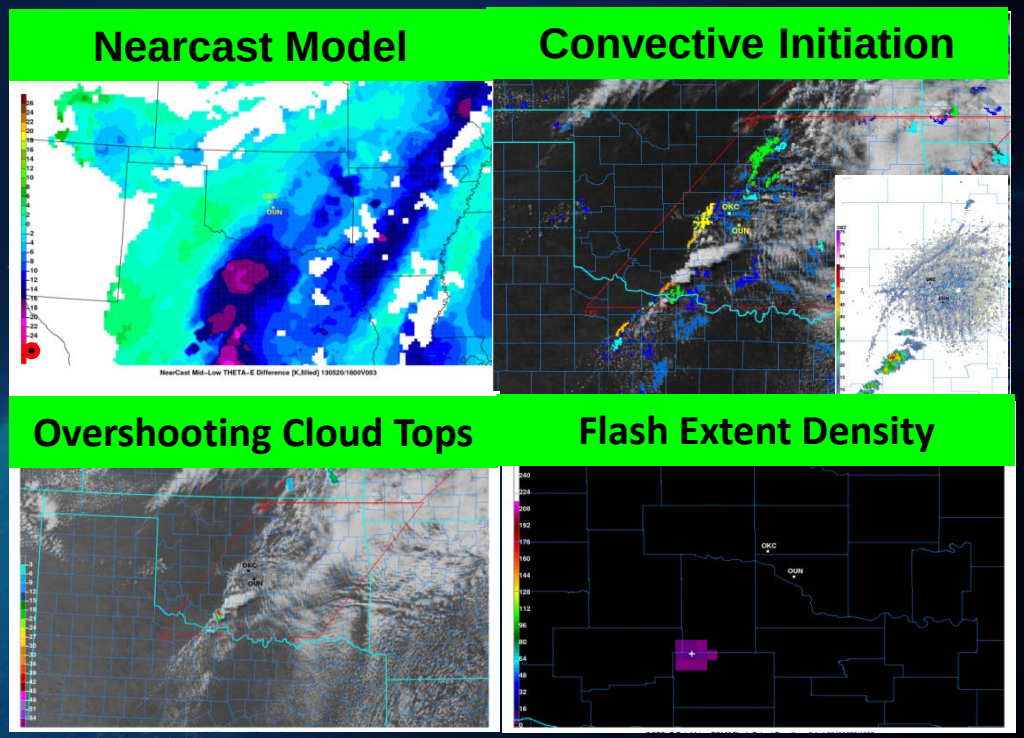
Compiled by Scott Rudlosky
NESDIS/STAR/SCSB

GOES-R Science Seminars

- Promote more frequent communication with the user community about GOES-R science and demonstration activities
  - Semi-monthly virtual science seminars
  - Allow scientists to highlight their work to the rest of the community
  - Webinars archived

http://www.goes-r.gov/users/sci-sem/index.html

GOES-R Convective Toolkit Products
Moore, OK Tornado Outbreak May 20, 2013

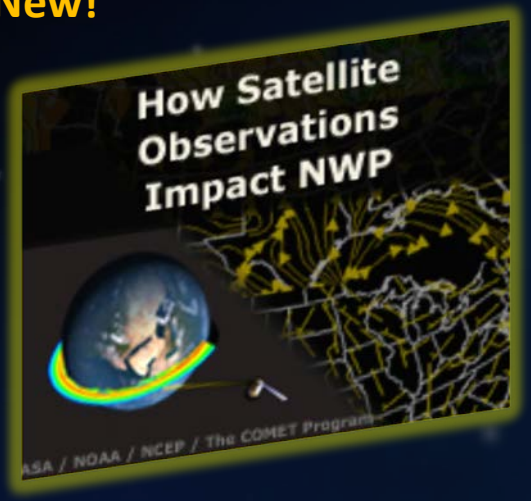


From January 24, 2014 Science Seminar on Severe Weather. These products provide enhanced situational awareness of the convective environment.

Courtesy of Chad Gravelle, OPG/CIMSS

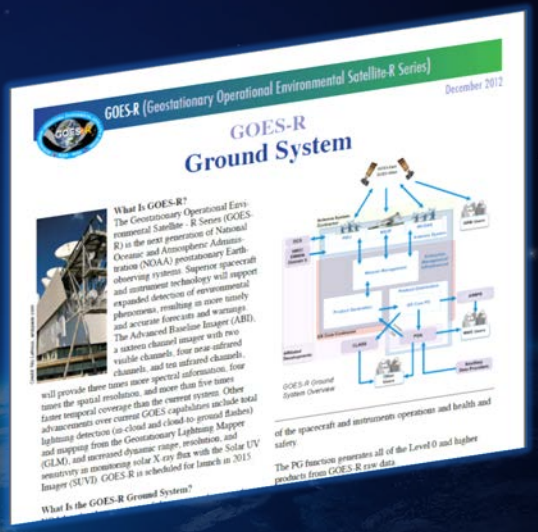
Training and User Education Materials

New!



Online Training Modules

- How Satellite Observations Impact NWP
- GOES-R ABI: Next Generation Satellite Imaging (COMET)
- GOES-R: Benefits of Next-Generation Environmental Monitoring (COMET)
- Satellite Hydrology and Meteorology for Forecasters (SHyMet)
- SPoRT product training modules
- VISIT Training Resources
- Commerce Learning Center



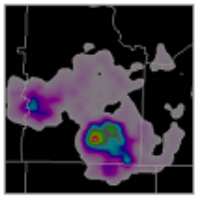
New!

On-line Documents

- GOES-R Fact Sheets (18)
- User Readiness Plan
- GRB Downlink Specifications and Product Users Guide
- Proving Ground Demonstration Final Reports and Annual Reports

Training Modules for the GOES-R Proving Ground: Total Lightning

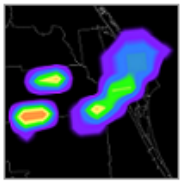
TRAINING



Total Lightning Training: Part 1
Download *(for NWS users; 8.3 MB)*
Launch in browser
(user guide)

This is Part 1 of 2 Lightning Mapping Array training modules. This module introduces the user to total lightning and the source density product provided by NASA SPoRT. While the North Alabama Array is the focus of this module, the concepts can be applied to any total lightning network. Users will learn the difference between total lightning and National Lightning Detection Network (NLDN) data. Also, the concept of a lightning jump will be introduced, which has great use in enhancing the warning decision making process. This module is 16 minutes long and requires the flash plug-in. (March 2009)

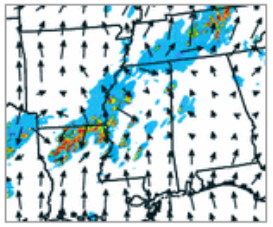
TRAINING



Pseudo Geostationary Lightning Mapper
Download *(for NWS users; 14 MB)*
Launch in browser
(user guide)

This module is an update to the original 2010 training module with new information, graphics, and content. This module introduces SPoRT's Pseudo Geostationary Lightning Mapper Flash Extent Density product and variants for use in the GOES-R Proving Ground. The Pseudo GLM is intended as a training product for forecasters ahead of the GOES-R era and to prepare forecasters for the more robust GLM Proxy product under development by the Algorithm Working Group. Experts with total lightning and the GLM have contributed to this module that provides brief overviews of total lightning and the actual GLM instrument. Additionally, the Pseudo GLM is described and examples of its use are provided. As this module is intended for preparation for GOES-R Proving Ground activities, particularly the Hazardous Weather Testbed's Spring Program the length is a little longer than most SPoRT modules. This module is 37 minutes long and requires the flash plug-in. (Updated March 2012)

TRAINING



WRF Model Lightning Forecast Algorithm (LFA)
Download PDF *(1.2 MB)*
Authors: Eugene McCaul, Kevin Fuell, Geoffrey Stano, and Jonathan Case

This tutorial provides background information on the development, calibration, and application of the Lightning Forecast Algorithm (LFA), as implemented into the Weather Research and Forecasting (WRF) numerical weather prediction model. The LFA is a demonstration product for use in the GOES-R Proving Ground to develop model proxy fields of total lightning that could be used in future data assimilation applications of the Geostationary Lightning Mapper. Since the initial journal publication in 2009, the LFA has been implemented into the NSSL WRF 4-km daily model runs beginning in Spring 2010, and was incorporated into the Storm Scale Ensemble Forecast runs for the 2011 Experimental Forecast Program in Norman, Oklahoma. The LFA is also being run within the High Resolution Rapid Refresh at the Global Systems Division in Boulder, CO. (November 2011)

http://weather.msfc.nasa.gov/sport/training/

GOES-R Science Program

http://www.goes-r.gov/users/risk-reduce/index.html

GOES-R
Geostationary Operational Environmental Satellite R-Series

A collaborative mission between NOAA and NASA

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User Information
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– Receiver Links
Proving Ground
– Cooperative Institutes
– Demonstrations
– Partners
Risk Reduction
Training

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GOES-R Risk Reduction - Fiscal Year 2014 New Starts

>> 2015 New Starts

Towards providing forecasters with better identification and analysis of severe pyroConvection events using GOES-R ABI and GLM Data
Principal Investigators: Bryan Baum (CIMSS), Scott Bachmeier (CIMSS)
Proposal Abstract | Proposal Summary

Toward an operational use of stroke level lightning data in severe weather forecasting
Principal Investigators: Phillip Bitzer and Lawrence Carey (Univ. of Alabama-Huntsville)
Proposal Abstract | Proposal Summary

Satellite Product Analysis and Distribution Enterprise System (SPADES)
Principal Investigator: William Denig (NESDIS-NGDC)
Proposal Abstract | Proposal Summary

Using total lightning data from GLM/GOES-R to improve real-time tropical cyclone genesis and intensity forecasts
Principal Investigators: Alexander Fierro (CIMMS) and Mark DeMaria (NWS-NHC)
Proposal Abstract | Proposal Summary

Development of GOES-R ABI Hail Validation and Assessment Products
Principal Investigators: Kevin Gallo (NESDIS-STAR), Phil Schumacher (NWS-Sioux Falls WFO), Josh Boustead (NWS –Omaha WFO)

Risk Reduction Vision

Capable, informed users

Flexible, inventive providers

Knowledge brokers that recognize new connections between capabilities and needs

Champions of new opportunities

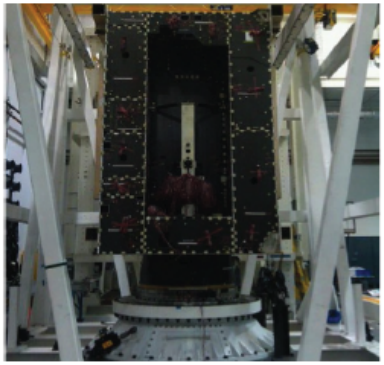
GOES-R Quarterly Newsletter

A Note from Greg Mandt, GOES-R System Program Director

Welcome to the inaugural issue of the GOES-R Quarterly Newsletter. The newsletter will highlight significant news and activities across the program for our stakeholders, industry partners, and the public. I hope you will find this to be a valuable resource in keeping up on the latest happenings with the GOES-R Series Program! The GOES-R Program welcomes your comments and feedback regarding the newsletter. Email us at nesdis.goesr@noaa.gov.

Highlights

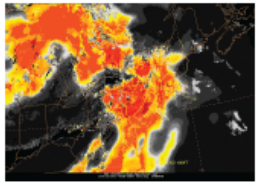
Lockheed Martin delivered the GOES-R core structure to the company's Mississippi Space and Technology Center on NASA's Stennis Space Center where it is undergoing propulsion system integration. The team is integrating GOES-R's fuel tanks, lines, thermal controls and other systems within the core structure. A press release was issued January 7, 2013.



The rigid external structure of the GOES-R satellite, which will enclose the satellite's propulsion system and support the payloads, was designed by Lockheed Martin and manufactured by ATK Aerospace Group's Space and Components Division, in San Diego. Photo credit: ATK

The Product Anomaly, Ticket, Relationship, Organization, and Notification tool (PATRON) became operational on February 1, 2013 at the NOAA Satellite Operations Facility (NSOF) in Suitland, VA to support satellite product operations at the NESDIS Office of Satellite Products and Operations (OSPO). PATRON, developed by the GOES-R Data Operations Support Team (DOST) and Harris Corp, is an early release of the enterprise management system being developed for GOES-R. Originally created specifically for the GOES-R Ground Segment, the tool was soon implemented to support other NOAA environmental satellites in operation today. A press release was issued March 21, 2013.

The first annual Aviation Weather Center Winter Weather Experiment (WWE) was conducted February 11-22, 2013 at the Aviation Weather Testbed in Kansas City, MO. The experiment was part of GOES-R Proving Ground activities and provided a pre-operational environment in which to test and evaluate new GOES-R products



The GOES-R Fog and Low Stratus product demonstrated February 11, 2013 at the Aviation Weather Center as part of the 2013 Winter Weather Experiment.

To subscribe: nesdis.goesr@noaa.gov

A Note from Greg Mandt, GOES-R System Program Director

We had another successful quarter for the GOES-R Series Program, with the achievement of several critical milestones as you'll read below. Looking forward, we are nearing completion of the remaining instruments while continuing to make steady progress with the spacecraft and development of our ground segment. I thank you for your dedication and commitment to work aggressively to meet our goals. As always, we want to hear from you. If you have questions, feedback or additional ideas, email us at nesdis.goesr@noaa.gov.

Highlights

GOES-R's primary instrument, the Advanced Baseline Imager (ABI), successfully completed the Proto-Flight Model (PFM) Pre-Shipment Review (PSR) on September 26. The three day review culminated with concurrence from the Integrated Independent Review Team that the ABI PFM can proceed toward shipment. In early 2014, the ABI PFM will be shipped from its developer, Exelis, to the spacecraft developer, Lockheed Martin Space Systems Co. (LMSSC), to be installed onto the first GOES-R spacecraft. NOAA issued a press release on October 31 to announce the milestone. In addition, a new video and fact sheet featuring ABI were released, highlighting the many improvements that the instrument will bring to weather forecasting and issuing warnings. NASA issued a web feature and created a Flickr gallery of ABI images in support of the accomplishment.

Engineers at Exelis prepare the completed ABI PFM for transport to its Rochester facility where it will be stored until shipment to LMSSC for integration onto the GOES-R spacecraft. Credit: Exelis

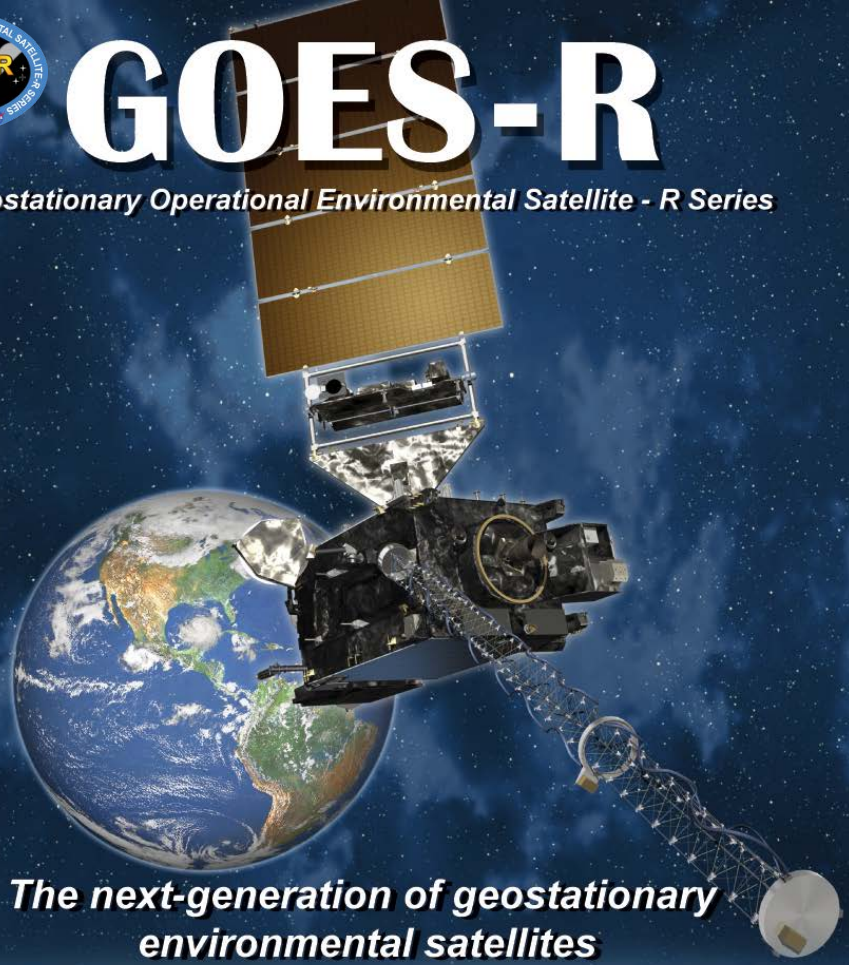
did you know? ...that the GOES-R Ground Segment will process approximately 40 times more data than is possible today?

Summary

- Launch Readiness Date: Decision in October on Oct or Dec 2015 launch, no later than 2nd Quarter FY 2016
- User Readiness components: User System, Risk Reduction, Proving Ground, Training
- Joint Center for Satellite Data Assimilation (JCSDA)/National Centers for Environmental Prediction (NCEP) preparations for GOES-R underway
- Products available for validation/testing 60 days after launch, also made available to users for science assessment
- Program studying request for GOES-R operations following Post-Launch Testing (PLT)
- AWG/CWG continued pre-launch assessments and planning PLT
- AWG developing of deep dive L1B and L2 product monitoring tools
- CLASS archives L1B and L2 products, GLM L0 at NASA Huntsville
- 1-min Super Rapid Scan Experiment- evaluate rapid refresh imagery

GOES-R

Geostationary Operational Environmental Satellite - R Series



The next-generation of geostationary environmental satellites

Advanced imaging for accurate forecasts

Real-time mapping of lightning activity

Improved monitoring of solar activity

Spacecraft image courtesy of Lockheed Martin

Thank you!

For more information visit www.goes-r.gov

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