

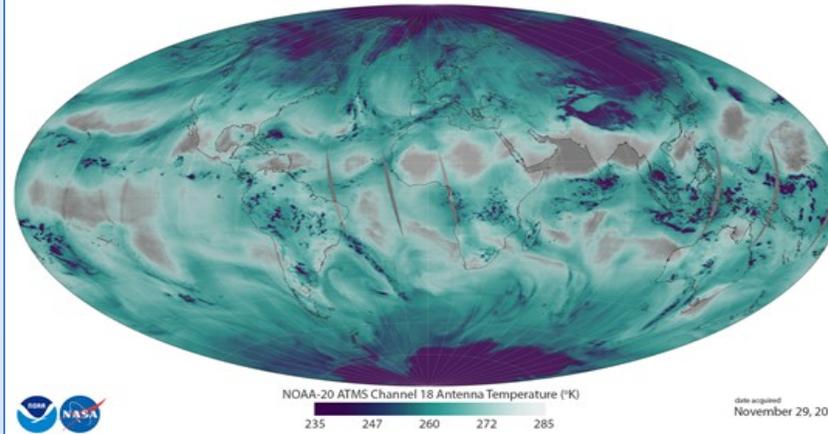


Suomi-NPP

NOAA-20

# NOAA 20 Cal Val Updates

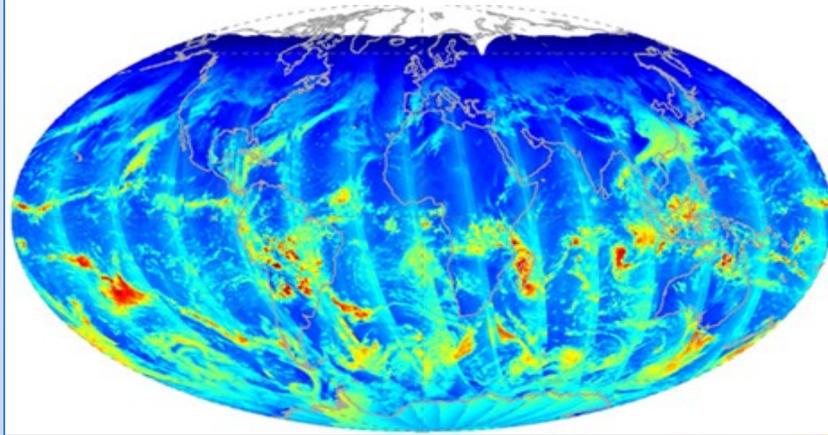
- N20 Launched: Nov. 18 2017
- First Light Images – Public Release
- N20 Cal Val Progress:
  - ✓ Key Performance Parameters (KPPs) - Provisional Maturity
  - ✓ Integrated Calibration and Validation System (ICVS) for N20 fully functional
  - ✓ All SDRs/KPPs Operational
  - ✓ CrIS and ATMS SDRs have been in use in NWS GFS model since May 2018
  - ✓ ATMS, VIIRS Validated Maturity in June 2018
  - ✓ Active Fire EDR declared Operational Jun 2018



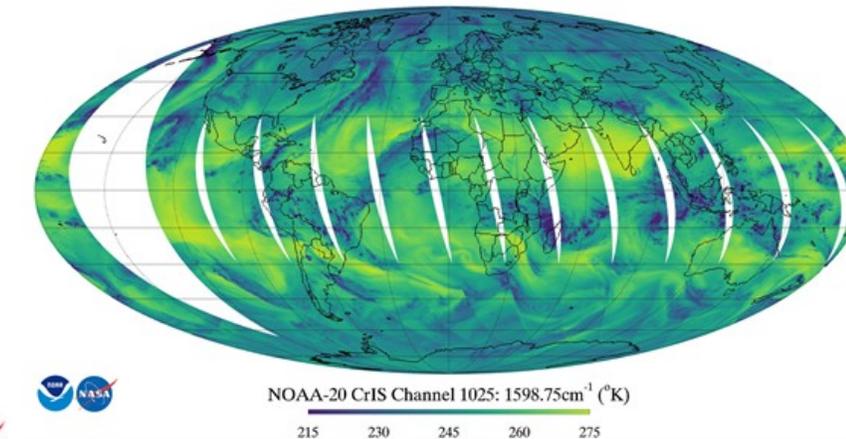
ATMS L+11 days



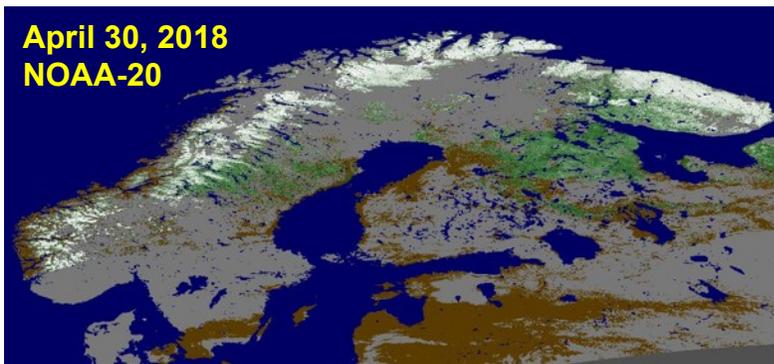
VIIRS L+25 days



OMPS L+48 days

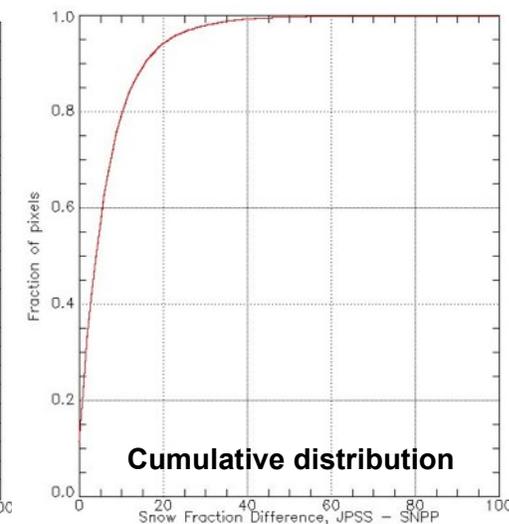
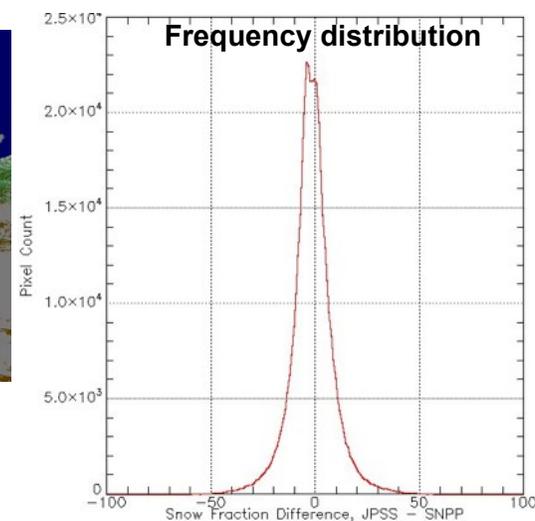
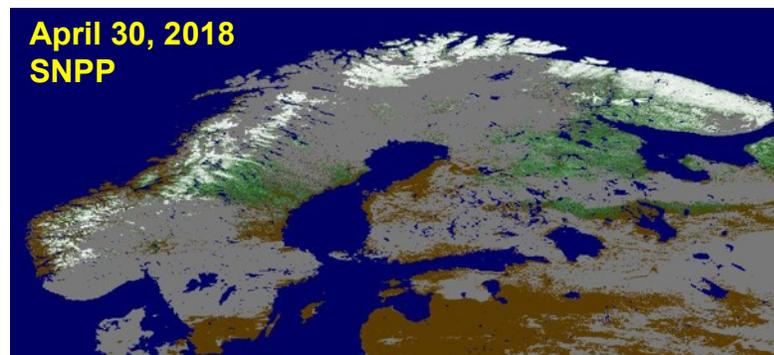


CrIS L+48 days



N20 vs SNPP snow fraction  
FSC comparison statistics  
for  $0.02 < \text{FSC} < 0.98$

Correlation: 0.94  
RMSD: 0.07  
Bias: 0.01

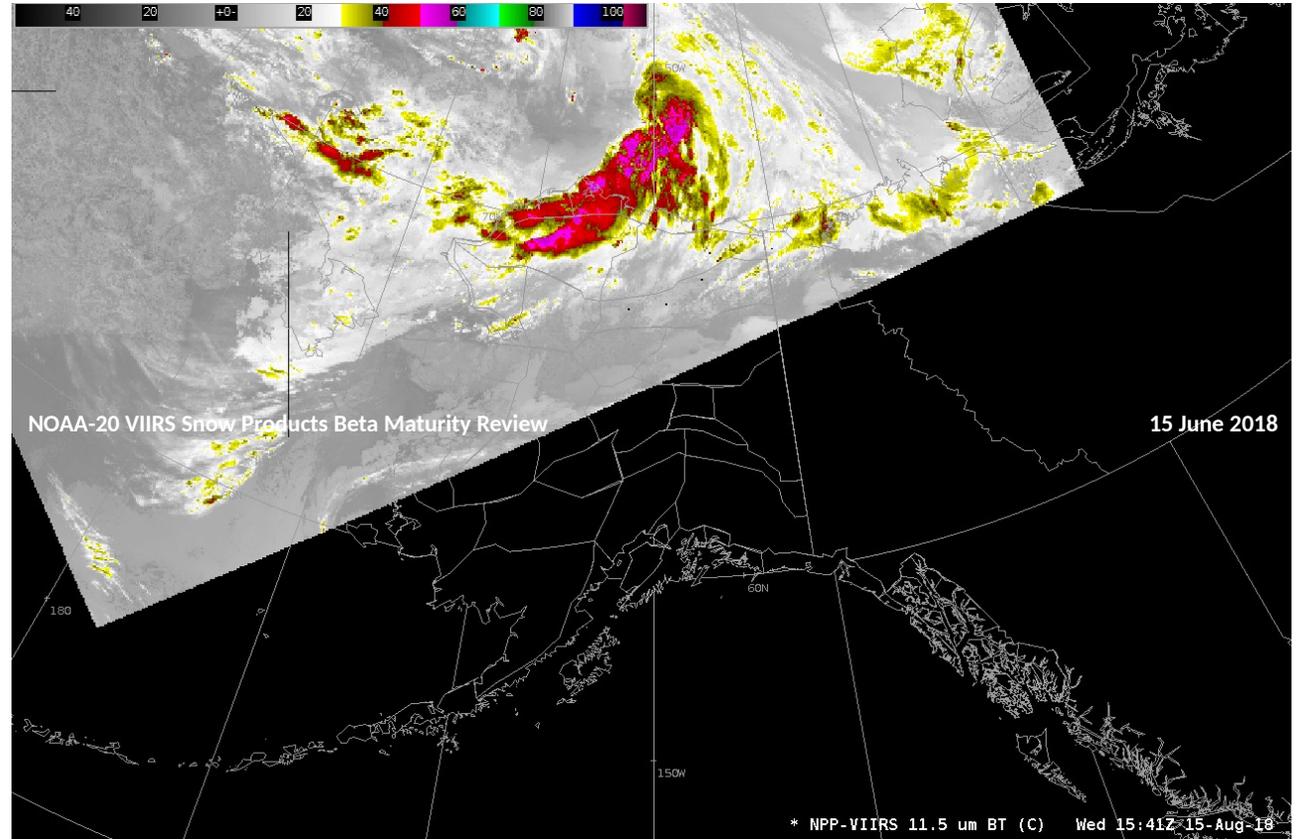


## NOAA-20 vs SNPP FSC:

- Strong spatial correlation between FSC estimates
- Small RMSD ( $< 0.1$ ) with negligible bias

# NOAA-20 & SNPP - Double Image Frequency

- Two satellite combination doubles image coverage over Alaska
- Northern Alaska - around 18 passes per day.
- Southern Alaska - 3-4 early morning and 3-4 afternoon passes per day.
- Negligible difference between SNPP and NOAA-20



Courtesy: Carl Dierking (GINA) & Nate Eckstein (NwS)





# Welcome!

**JUL 2017 - AUG 2018**

283 Table Updates

55 Alg DAPs delivered

29 PCT/LUT DAPs delivered

17 Reviews

13 Waivers / Mitigations

9 IDPS Mx Review /

Checkouts

**NOAA 20**

9 cal / val maturity reviews

SNPP

21 cal / val maturity reviews

**Since SEP 2013**

# of DRs submitted - 407

# of DRs closed - 559



## STAR JPSS 2018 Annual Science Team Meeting

### *“The JPSS Applications”*

**The First Year of NOAA-20**

**7 Years of extremely successful S-NPP Operations**

**8 Years since JPSS Program began**

*NOAA Center for Weather and Climate Prediction*



# JPSS STAR (JSTAR) Science Teams



JSTAR PM: Lihang Zhou

Management Support Team: Murty Divakarla, Xingpin Liu, Tomas Atkins, and Tess Valenzuela

Sensor	SDR Leads	EDR Leads
<b>ATMS</b>	Mark Liu (Gov Lead) Ninghai Sun (Tech Lead)	Mark Liu (Gov Lead); Chris Grassotti (Tech Lead) Ralph Ferraro (Validation - Hydrology) Huan Meng (Snowfall Rate)
<b>CrIS</b>	Flavio Iturbide-Sanchez (Gov Lead) Yong Chen (Tech Lead)	Lihang Zhou (Gov Lead) Antonia Gambacorta (Tech Lead)
<b>OMPS</b>	Trevor Beck (Gov Lead) Chunhui Pan (Tech Lead)	Lawrence E Flynn (OMPS Ozone)
<b>VIIRS</b>	Changyong Cao (Gov Lead) Slawomir Blonski (Tech lead)	Don Hillger (Imagery) Menghua Wang (Ocean Color) Alex Ignatov (Sea Surface Temperature) Jeff Key (Polar Winds, Snow, Sea Ice, Ice Surface Temperature) Shobha Kondragunta, Istvan Laszlo (Aerosols) Andrew Heidinger (Clouds) Mike Pavolonis (Volcanic Ash) Ivan Csiszar (Active Fires, Surface Reflectance) Bob Yu (Land Surface Temperature, Surface Albedo, Vegetation Index, Green Vegetation Fraction) Felix Kogan (Vegetation Health) Jerry Zhan (Surface Type)
<b>GCOM-W/ AMSR-2</b>	Paul Chang(Lead) Ralph Ferraro (Project Scientist)	

## University Partners

- Alaska**
  - University of Alaska Fairbanks
  - Geographic Information Network of Alaska (GINA)—University of Alaska
- California**
  - University of Southern California
- Florida**
  - University of Miami
- Maryland**
  - Bowie State University
  - Morgan State University
  - University of Maryland  
Baltimore County
- Massachusetts**
  - Boston University
  - MIT Lincoln Lab
  - University of Massachusetts

## Mississippi

## Cooperative Institutes

- Colorado**
  - Colorado State University
  - University of Colorado
- Maryland**
  - SCSB and CICS, University of Maryland College Park
  - University of Maryland  
College Park
- New York**
  - CREST, City University of  
New York (CUNY)
- North Carolina**
  - CICS, North Carolina State University

## Government Agencies

- Alaska**
  - NOAA, Fairbanks Command and Data Acquisition Station
- Colorado**
  - NOAA, National Centers for Environmental Information
- Florida**
  - NASA Kennedy Space Center
- Maryland**
  - NASA Goddard
- Mississippi**
  - NOAA, National Centers for Environmental Information
- North Carolina**
  - NOAA, National Centers for Environmental Information



## Prime Contractors

- California**
  - Microsemi Corporation
- Colorado**
  - Ball Aerospace
  - Raytheon Intelligence and Information Systems
  - United Launch  
Services LLS
- Indiana**
  - ASPB and CIMSS,  
Harris Corporation
- Virginia**
  - Orbital ATK

## Support Contractors

- Maryland**
  - ERT
  - IMSS
  - GST
  - SDL
  - Aerospace
- Innovim
- STC
- Riverside

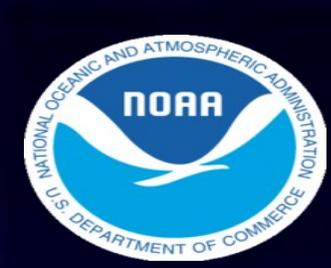
Slide Courtesy: JPSS Program (Liz Tirpak)



# STAR Strategic Objectives



- Support NESDIS mission and Strategic Plan:
  - Ensure continuity and success of GOES R, JPSS, Metop, Jason
  - Build a comprehensive, reliable, science-based enterprise that is agile, diverse and cost-effective, in support of NOAA users
  - Top-Quality, Cutting-edge & User-valued products, from core and emerging Obs. Systems, to maintain leadership and stewardship.
- Trust and Confidence with stakeholders
- Prioritize activities to
  - Address user requirements,
  - Optimize applications' effectiveness and
  - Maintain cutting-edge innovation to increase efficiency and effectiveness



# Trends - A Pivotal Time for Satellite Earth Observations

- Science and Models – Moving to increased earth system understanding, coupling, higher resolution (spatial, temporal)
- Operational Forecasters – Need integrated information products tied to use
- Big Earth Data - processing, distribution, archive, easy access, security – all challenges
- Technologies – AI, Deep learning, IOT, Cloud, HPC advances
- Business models – Commercial Data, Citizen Science
- New technologies in satellites and launch



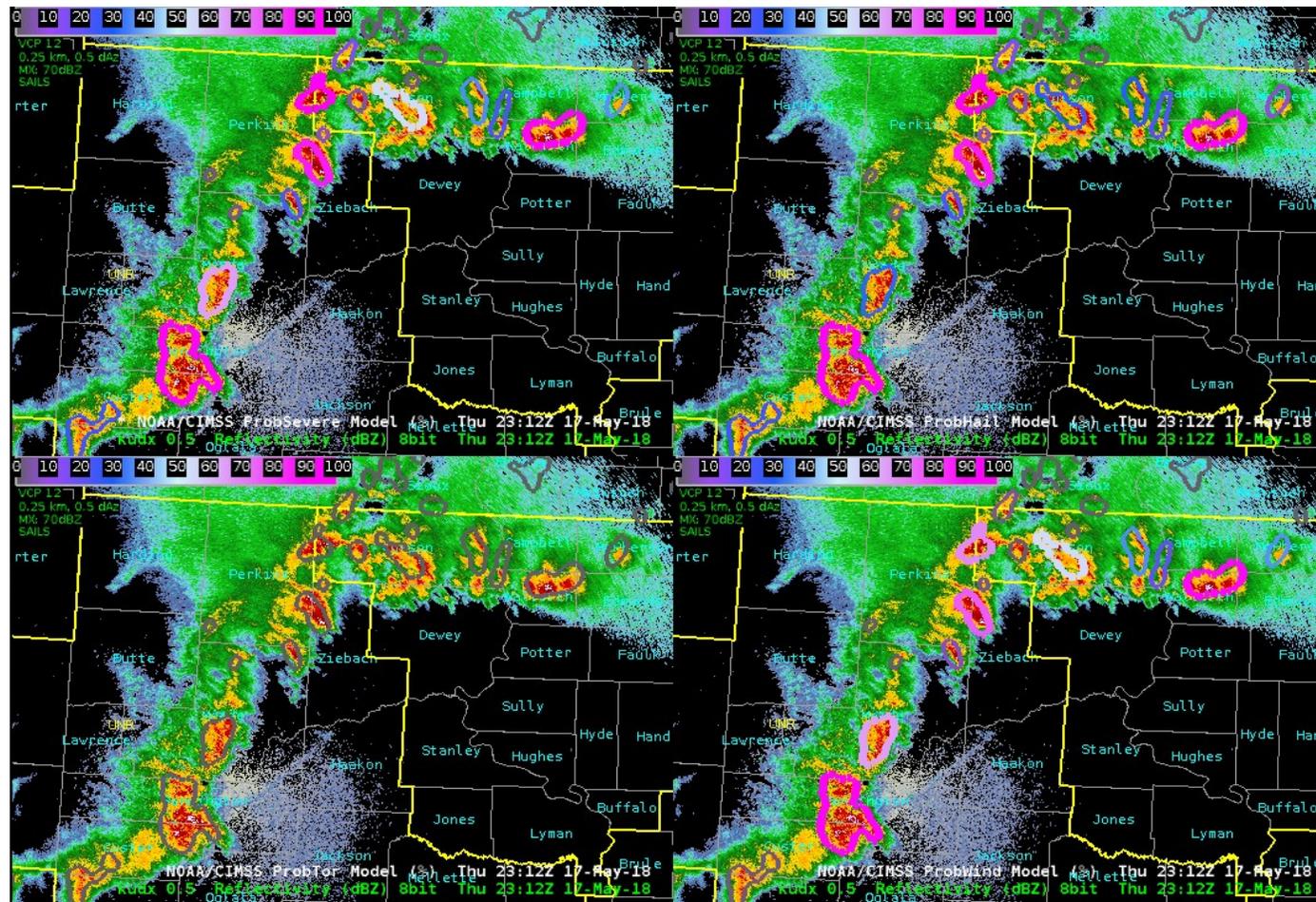
# Global Constellation of Earth Observing Satellites



*How do we best harness it?*



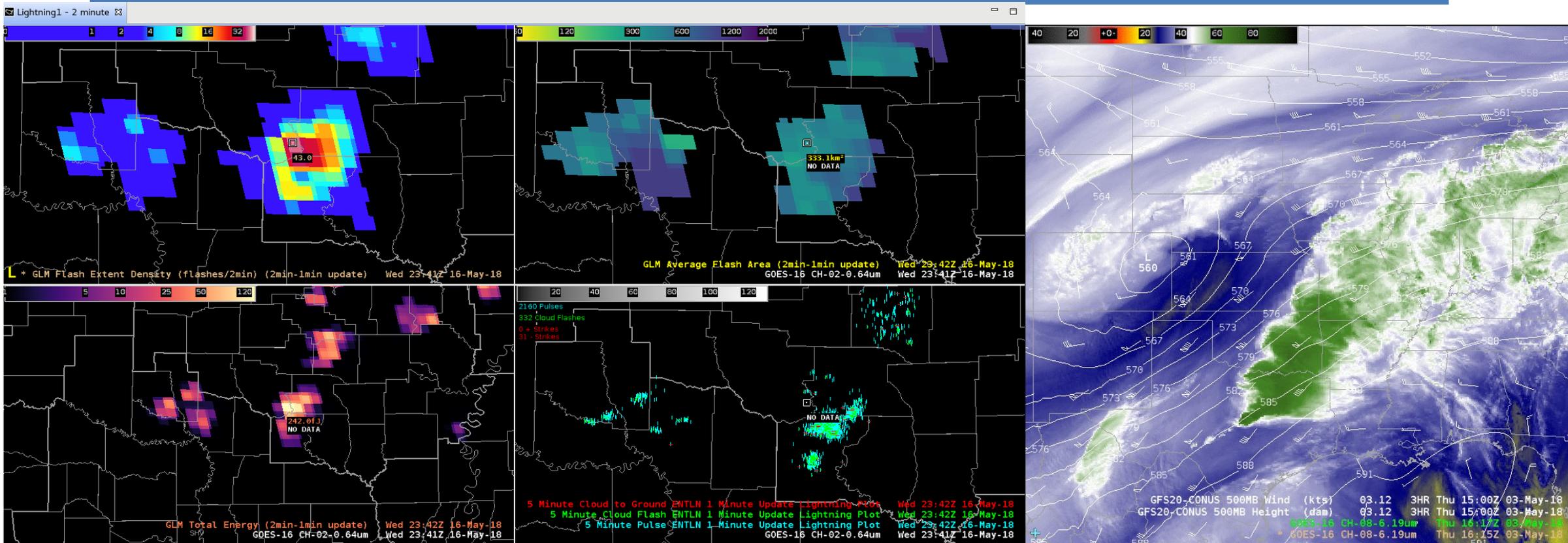
# Example: Higher information content



2312 UTC 17 May 2018 4 panel of 0.5 degree radar reflectivity and ProbSevere All Hazards (upper left), ProbHail (upper right), ProbTor (lower left), and ProbWind (lower right) contours for a complex of storms in western South Dakota. ProbSevere helped forecasters rank storms to interrogate in this busy environment.



# GOES R - Enables new Combinations



Forecaster screenshot from blog post on 16 May 2018.

Top left: 2-min sum of Flash Extent Density.

Top right: 2-min Average flash area.

Bottom left: 2-min sum of Total Energy.

Bottom right: ENTNLN pulses (blue), flashes (green) and CG lightning (red).

: 1617 UTC 03 May 2018 GOES-16 6.19um “upper-level water vapor” imagery with GFS 500mb heights (white contour) and winds (white wind barbs).



# Meeting the Challenges: Partnerships and Transformation



- **Enhance partnership and coordination**
  - Operational and spaceflight Agencies around the World
  - Multi-lateral bodies - CGMS, CEOS, GEO, WMO committees
  - US Agencies including NASA, NAVY, USAF, USGS
  - NOAA Line Offices
- **Transform how we do Algorithms, Data & Information Products**
  - Business model move from mission focus only to enterprise (Level 2 and above)
    - Source agnostic, fit for purpose, application targeted, use inspired
    - Enterprise algorithm and product portfolio
  - Technology move to higher information content
    - Integrated , Blended, Fused Data Products
    - Advanced assimilation, calibration / validation
  - Expand operational satellite remote sensing
    - Advance Satellite Oceanography and Hydrology
    - Enable Coupling of Oceans, Atmosphere, Land, Space to meet NOAA Skill Improvement Objectives

Increase Agility, Expand Performance, Increase Value

# STAR

- Satellites are an enabling contribution to NOAA's mission skill
- JPSS and GOES R missions are foundation for NOAA satellite observations
- STAR is central to NOAA's plans and objectives

