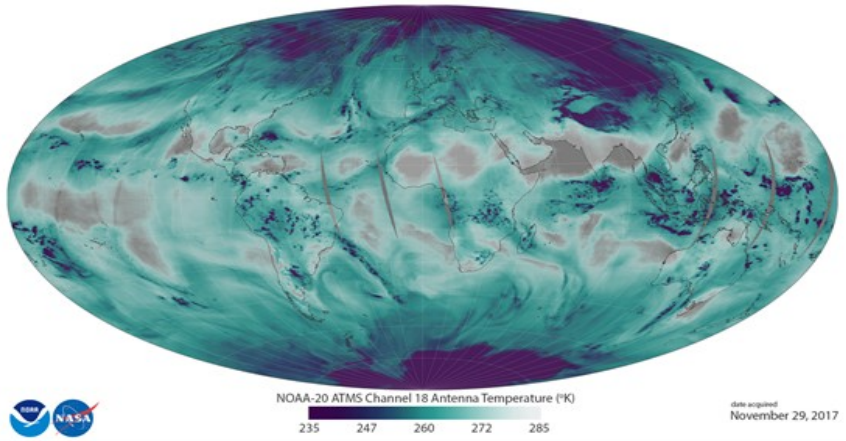

Suomi-NPP
NOAA-20
JPSS
NOAA
NASA

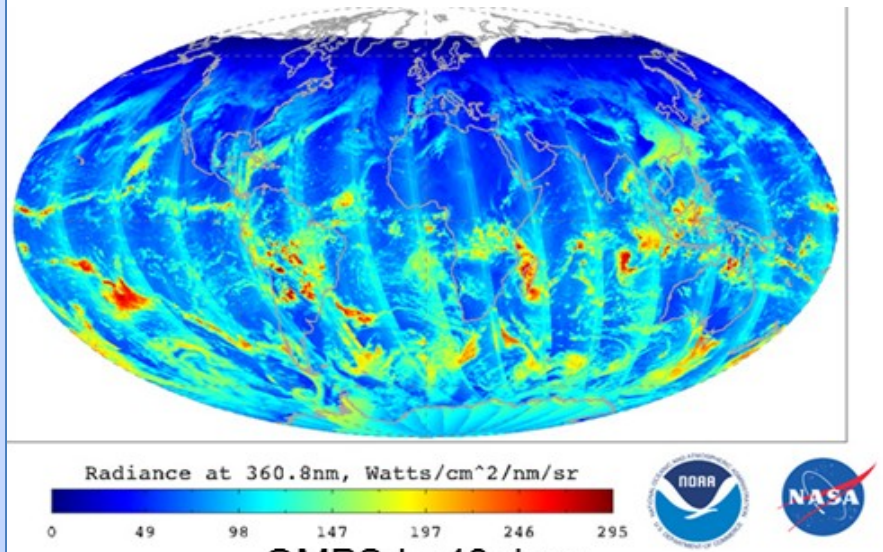
NOAA 20 Cal Val Updates

- 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

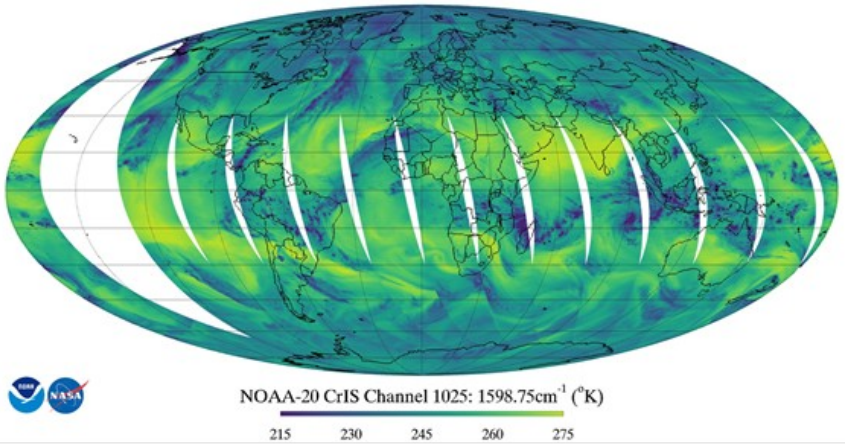


ATMS L+11 days

VIIRS L+25 days

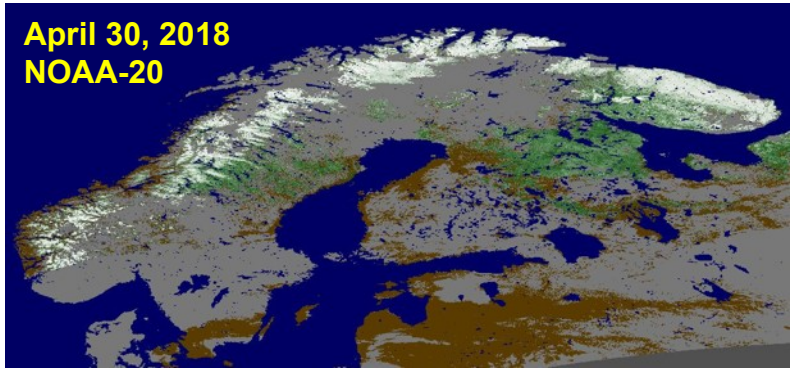


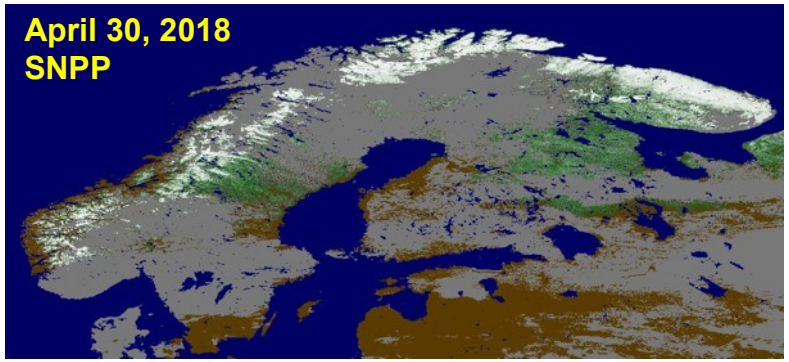
OMPS L+48 days



CrIS L+48 days

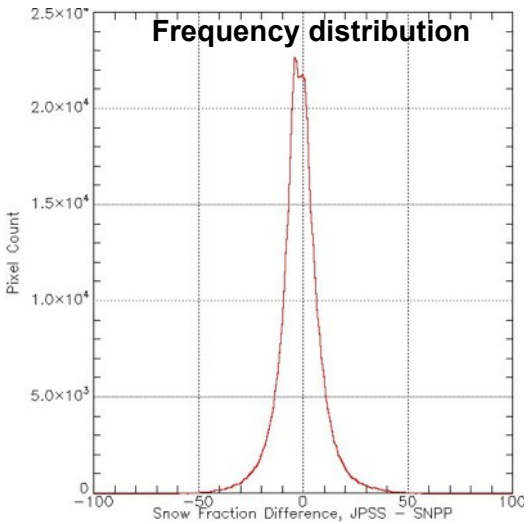
NOAA-20 vs SNPP Snow Fraction

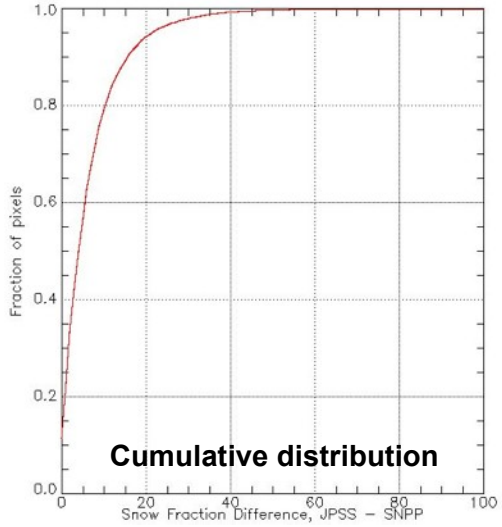




N20 vs SNPP snow fraction
FSC comparison statistics
for 0.02<FSC<0.98

Correlation: 0.94
RMSD: 0.07
Bias: 0.01

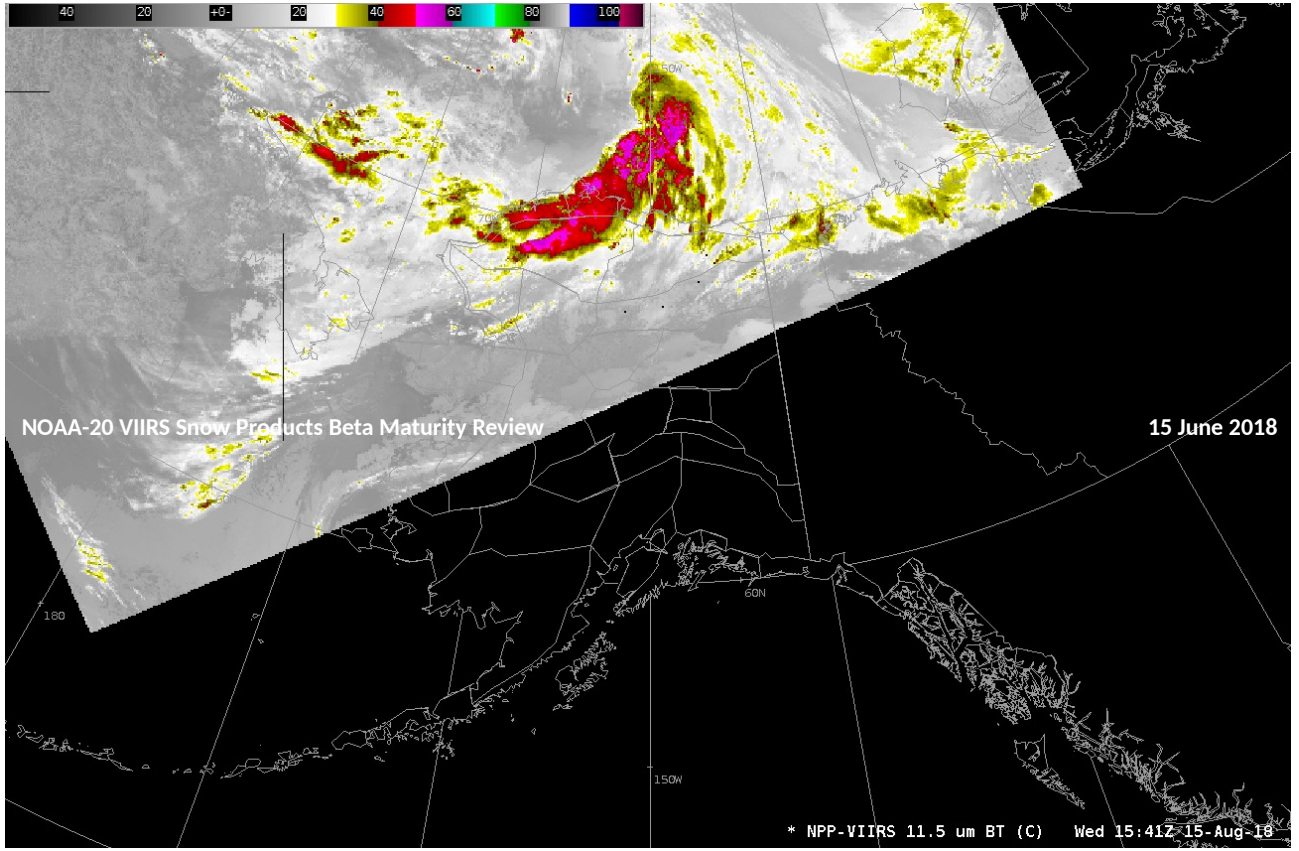




NOAA-20 vs SNPP FSC:
- Strong spatial correlation between FSC estimates
- Small RMSD (< 0.1) with negligible bias

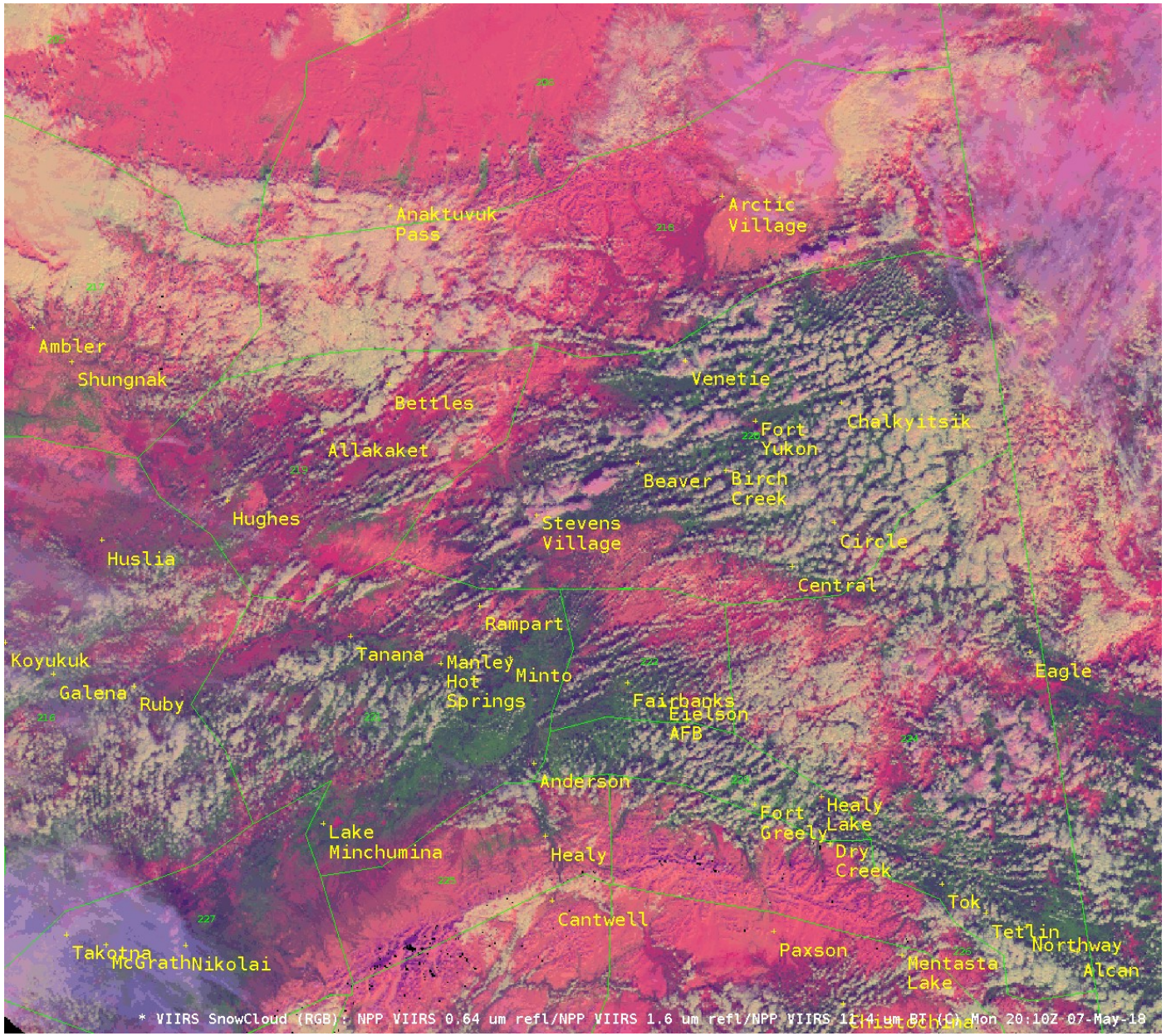
NOAA-20 & SNPP - Double Image Frequency

- 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)

VIIRS RGB composites: NOAA-20 and S-NPP



SnowCloud RGB product:
1.6μm (I3), 0.64μm (I1),
11.45μm (I5 BT)

NOAA-20 @ 2010z
S-NPP @ 2100z
NOAA-20 @ 2150z
S-NPP @ 2240z
NOAA-20 @ 2331z

Melissa Kreller (WFO Fairbanks)
@ JPSS Arctic Summit May 8

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

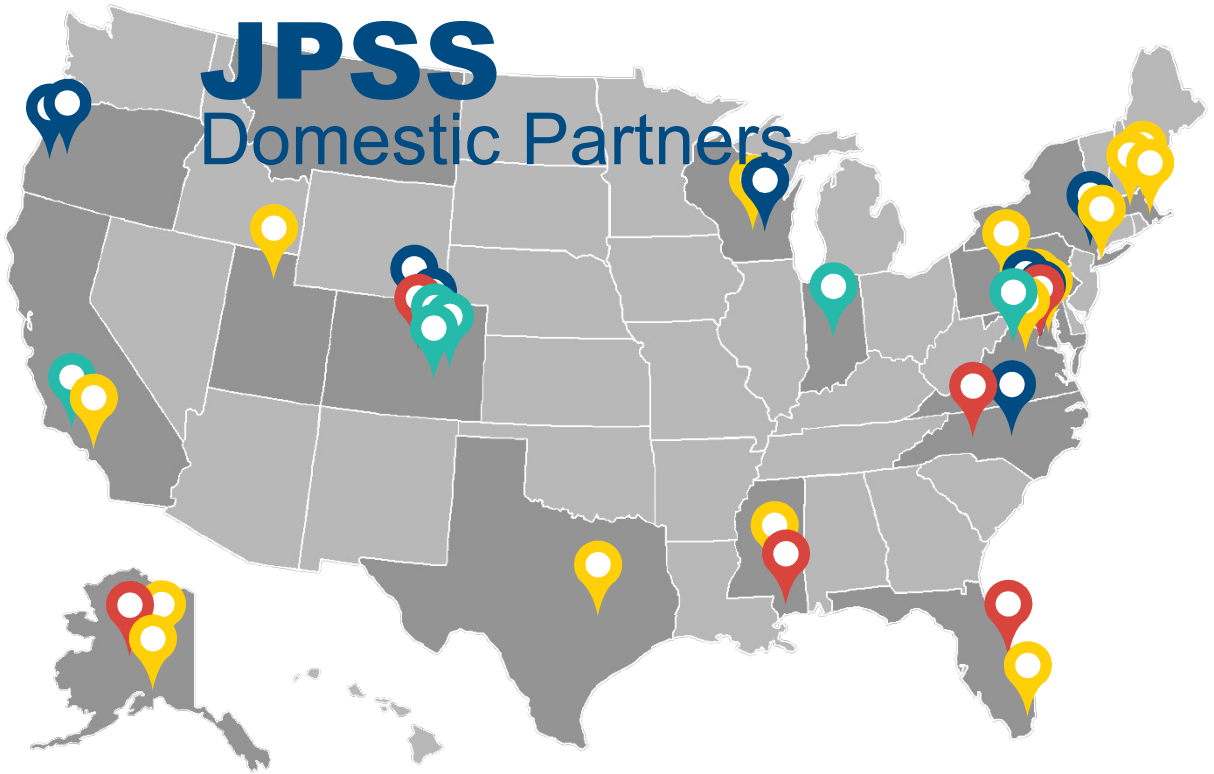
JPSS STAR (JSTAR) Science Teams

JSTAR PM: Lihang Zhou

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

Sensor	SDR Leads	EDR Leads
ATMS	Mark Liu (Gov Lead) Ninghai Sun (Tech Lead)	Mark Liu (Gov Lead); Chris Grassotti (Tech Lead) Ralph Ferraro (Validation - Hydrology) Huan Meng (Snowfall Rate)
CrIS	Flavio Iturbide-Sanchez (Gov Lead) Yong Chen (Tech Lead)	Lihang Zhou (Gov Lead) Antonia Gambacorta (Tech Lead)
OMPS	Trevor Beck (Gov Lead) Chunhui Pan (Tech Lead)	Lawrence E Flynn (OMPS Ozone)
VIIRS	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)
GCOM-W/ AMSR-2	Paul Chang(Lead) Ralph Ferraro (Project Scientist)	

Team JPSS Science



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
- IMSG
- GST
- SDL
- Aerospace
- Innovim
- STC
- Riverside

Slide Curtesy: JPSS Program (Liz Tirpak)

STAR Strategic Objectives

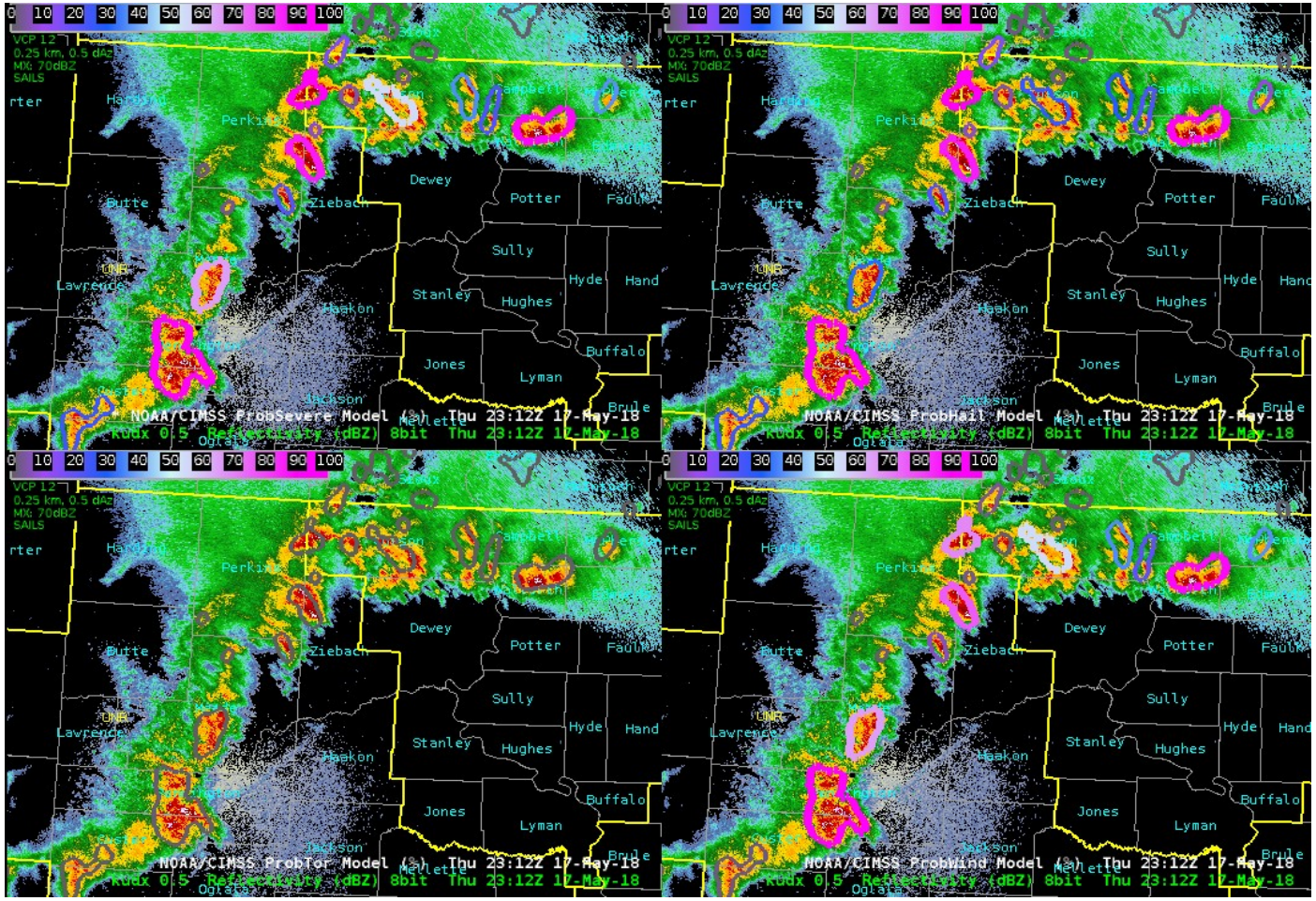
- Support NESDIS mission and Strategic Plan:
  - Ensure continuity and success of GOES R, JPSS, Metop, Jason
  - Build a comprehensive, reliable, science-based enterprise that is agile, diverse and cost-effective, in support of NOAA users
  - Top-Quality, Cutting-edge & User-valued products, from core 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

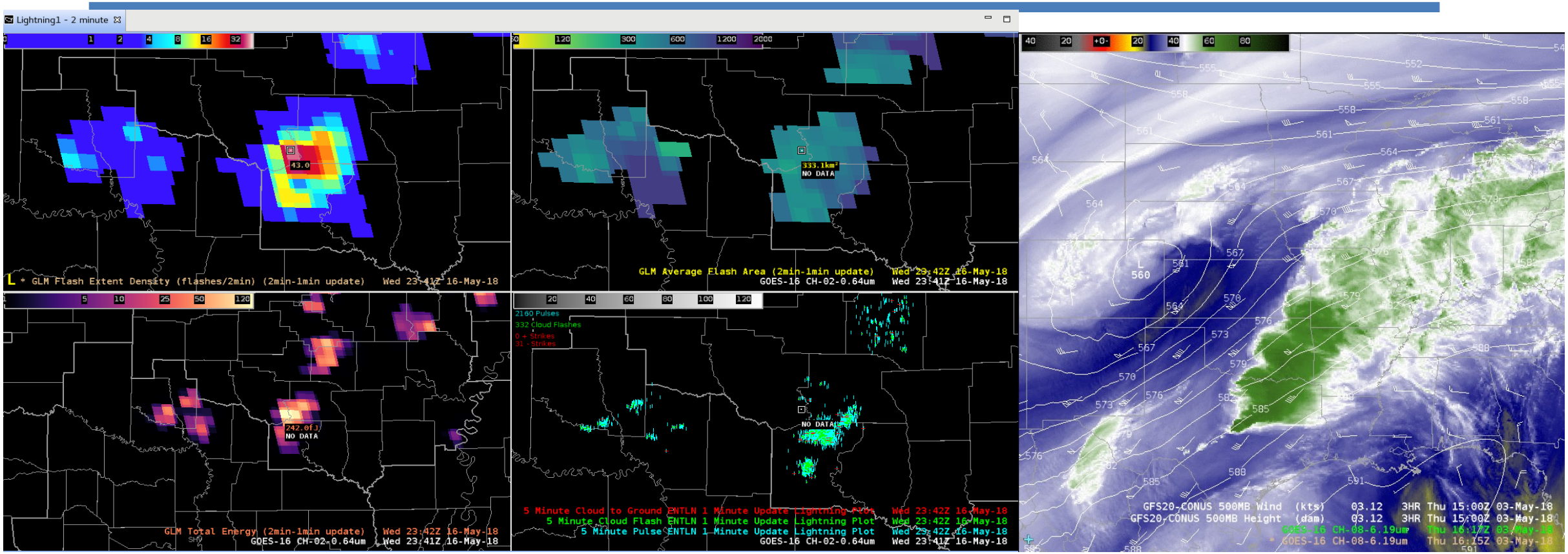
Global Constellation of Earth Observing Satellites

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: ENTLN 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

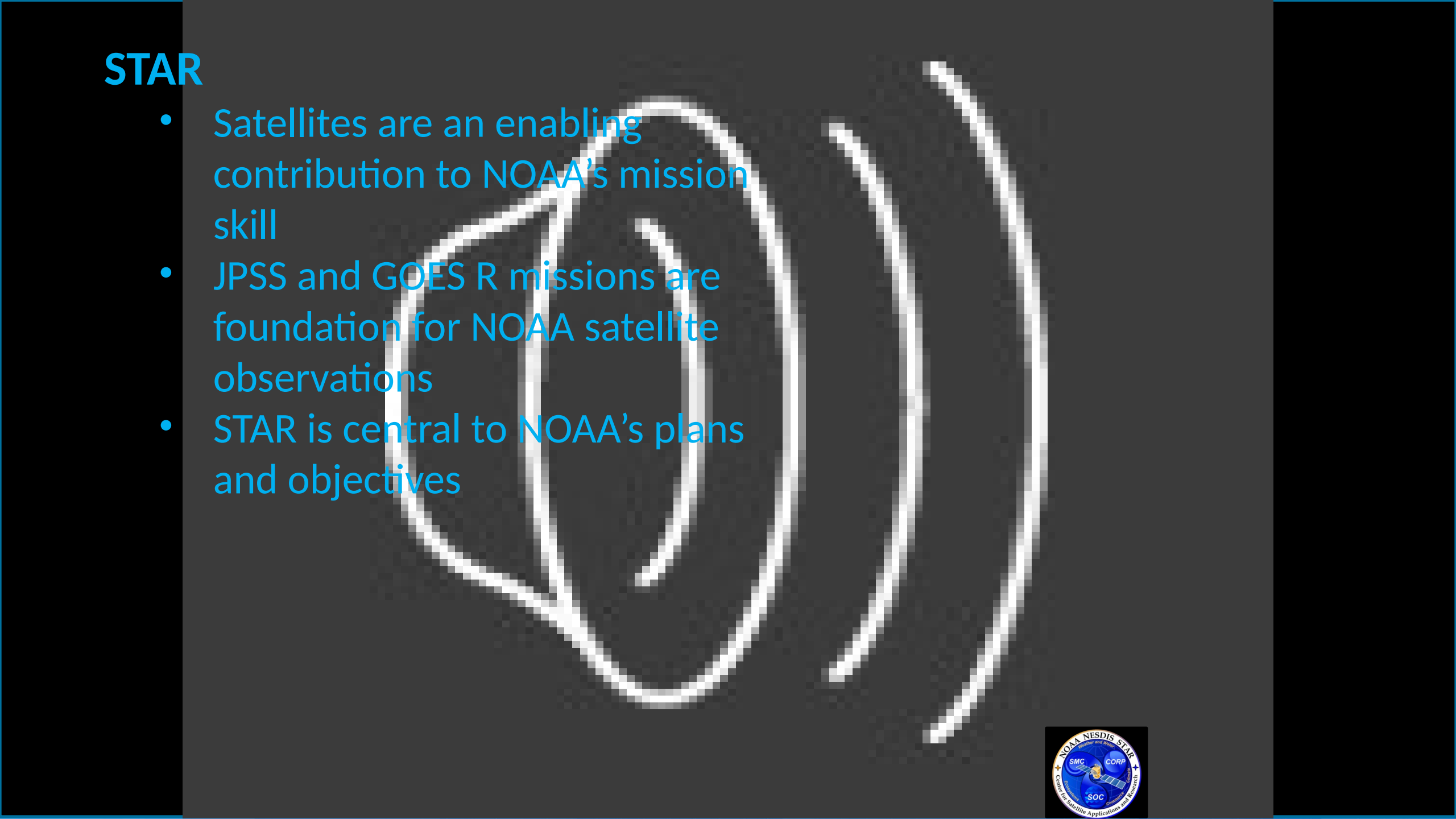
- **Enhance partnership and coordination**
  - Operational and spaceflight Agencies around the World
  - Multi-lateral bodies - CGMS, CEOS, GEO, WMO committees
  - US Agencies including NASA, NAVY, USAF, USGS
  - NOAA Line Offices

- **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

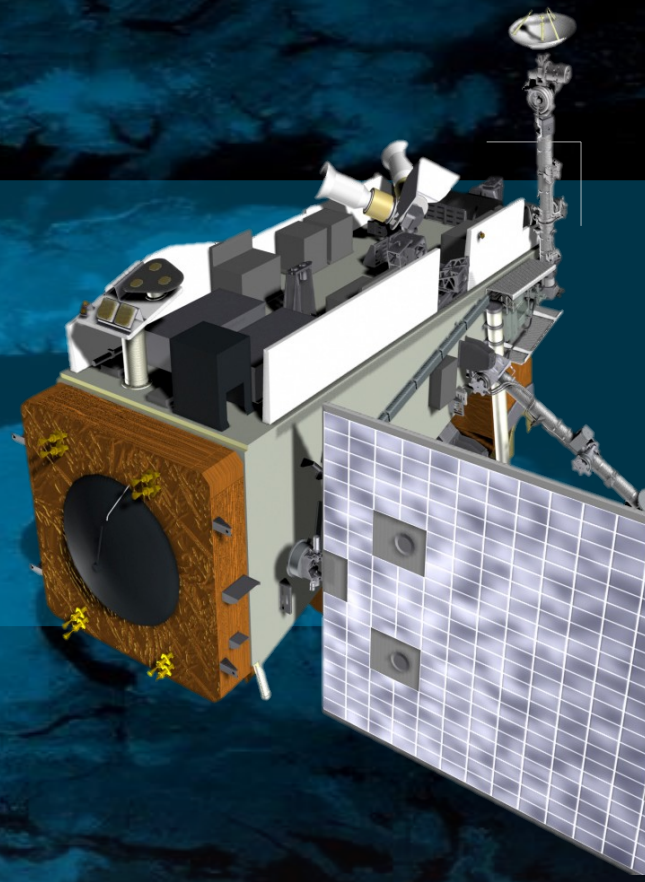
STAR

- 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



The Joint Polar Satellite System

JPSS-STAR Annual Meeting



Greg Mandt
JPSS Director & Program Manager

GLOBAL **DATA.**
LOCAL **WEATHER.**

NOAA Polar Orbiting Satellite History

1960

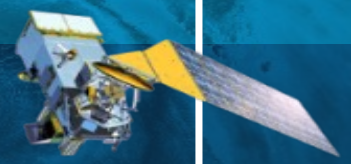
- Tiros-1 launch in April 1960. 48˚ inclination
- Nimbus-1 launch in Aug. 1964. First infrared sensor
- Tiros-9 launch in 1965. “Cartwheel configuration.” First polar orbit

1980

- Tiros-N launch in October 1978. First AVHRR
- NOAA-8 launch in March 1983
- Physically larger and had more power than their predecessors

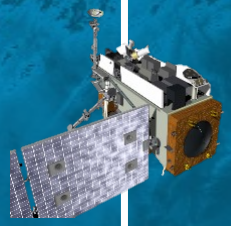
2000

- NOAA-15,16, 17. Heavier and more microwave channels
- NOAA-18, 19 Direct orbit insertion
- NPOESS/JPSS development
- NOAA + EUMETSAT IJPS agreement Nov. 19, 1998



2020

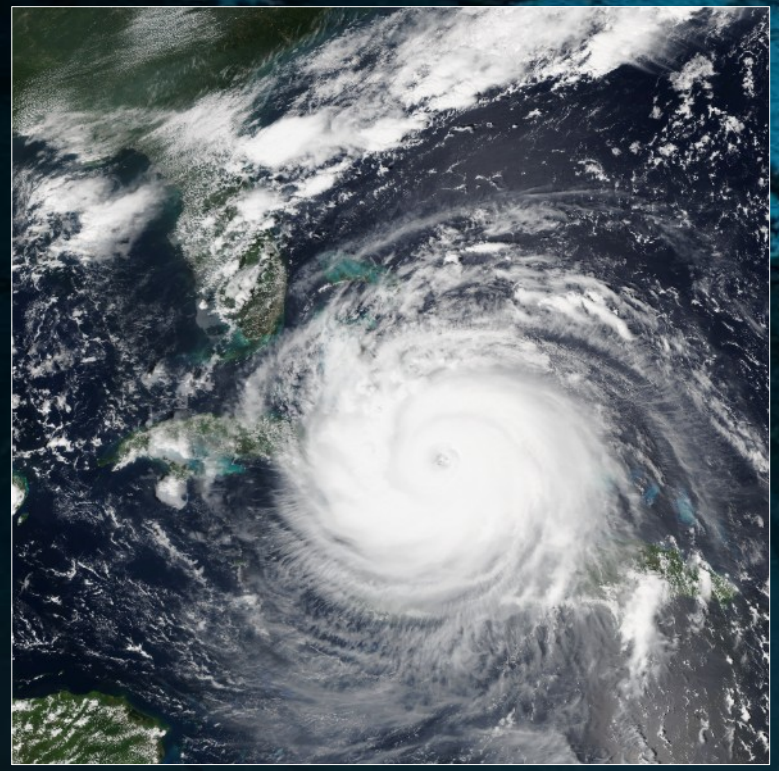
- JPSS series operational
- 22 channel imager
- Next-gen CrIS & ATMS
- Jason-2/3
- COSMIC-2 GNSS RO
- EON-MW



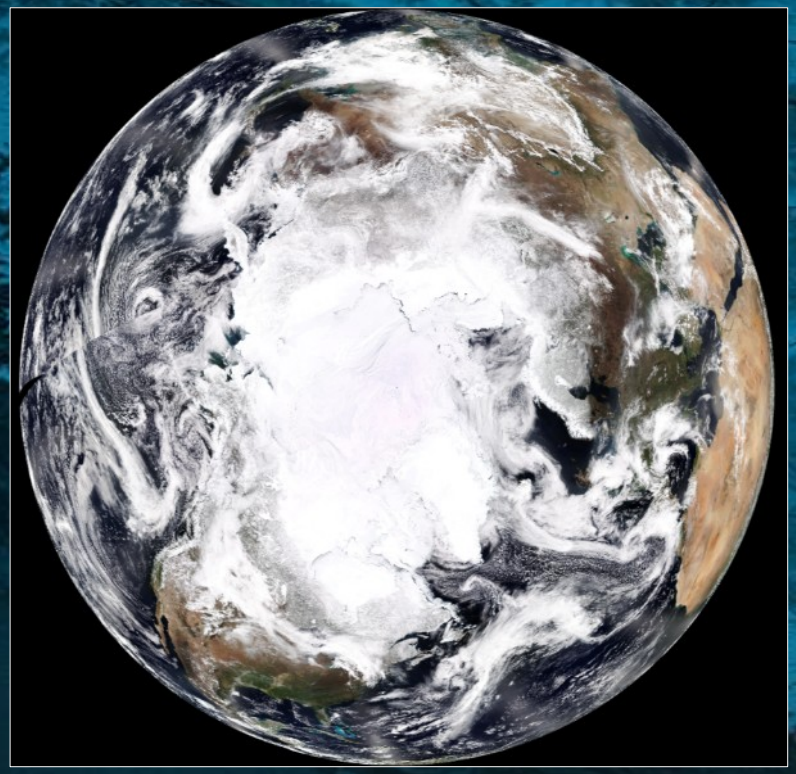
2040

?

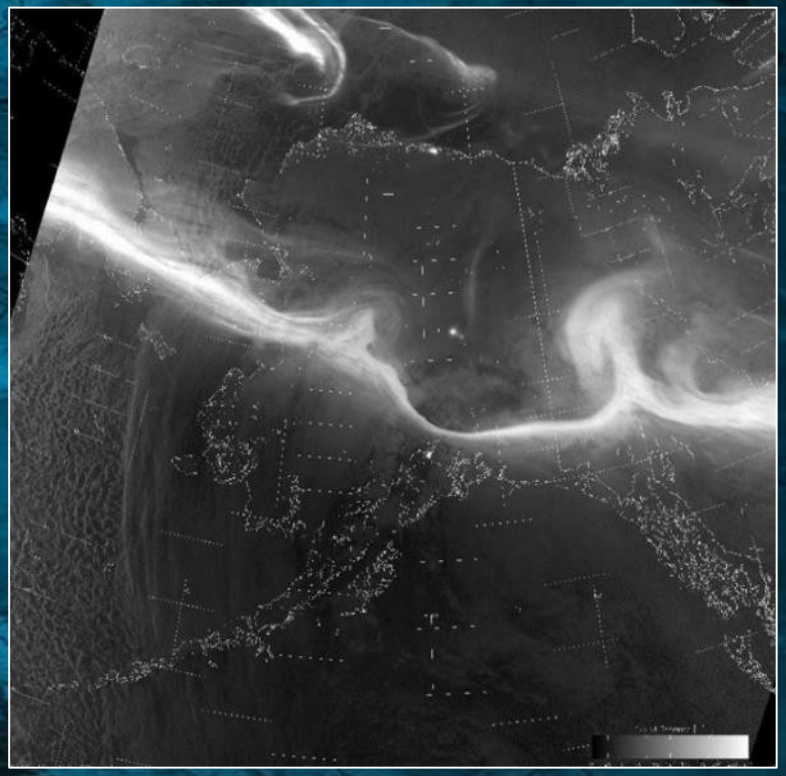
The Joint Polar Satellite System Provides...



Critical data for numerical weather prediction to enable accurate 3–7 day forecasts.



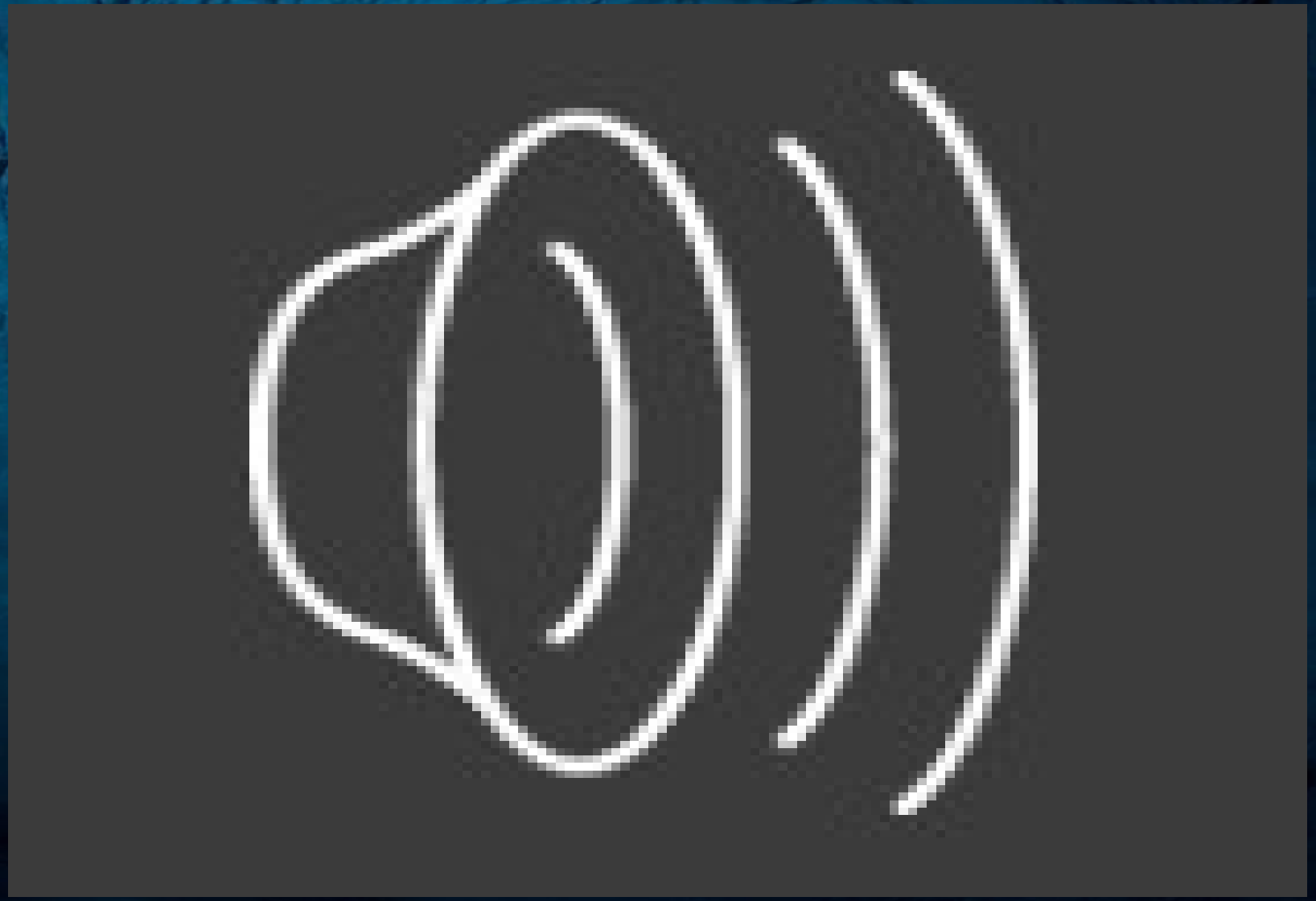
Operational weather and environment satellite observations for Alaska and the polar regions.



Global coverage and unique day and night imaging capabilities to support environmental monitoring and forecasting.

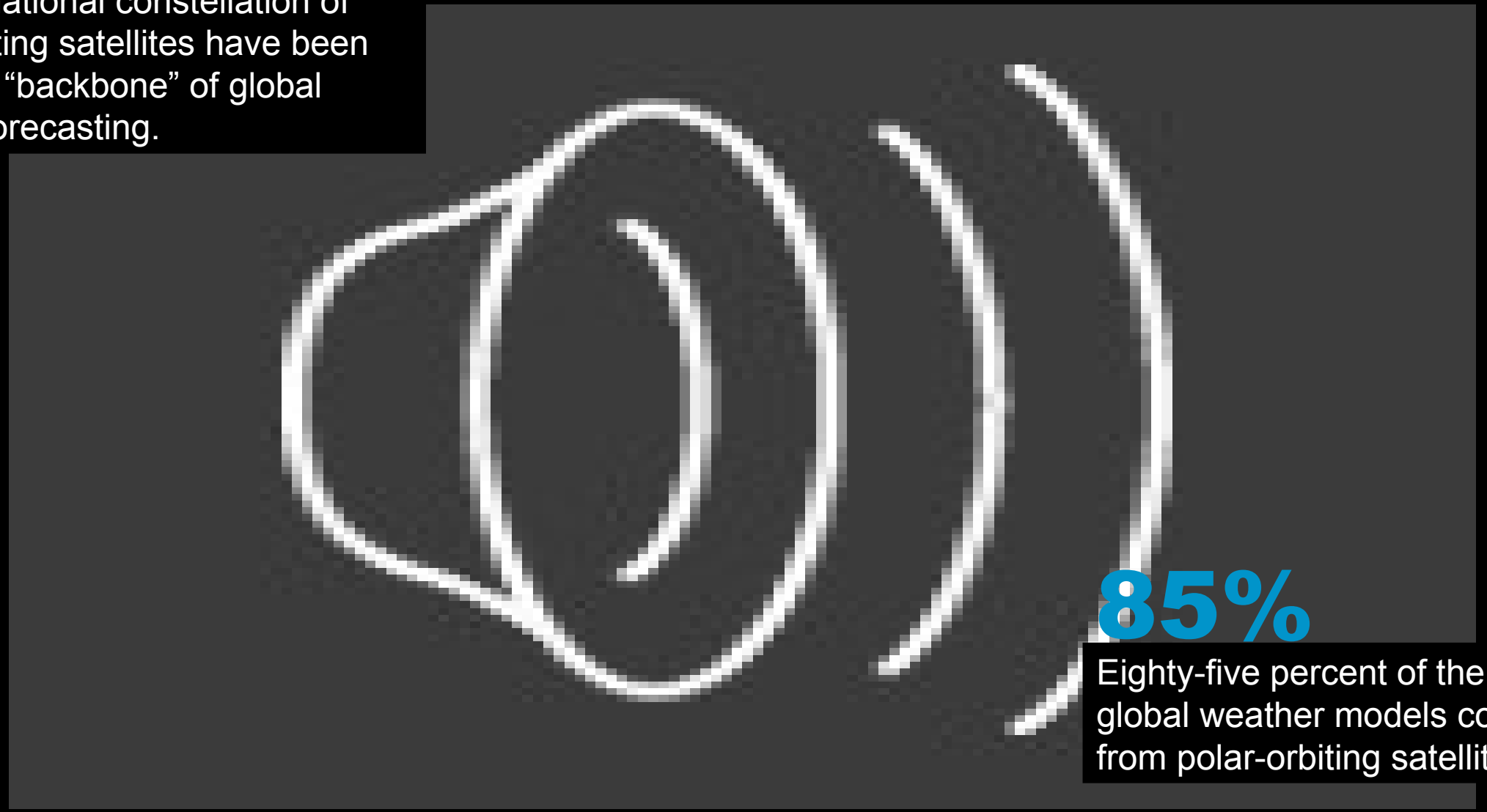
NOAA-20 is Now Operational!

- Launched into Low Earth Orbit —512 miles
- **14x** Orbits Earth 14 times pole-to-pole with SNPP
- **2x** Images entire globe twice a day
- State of the art instrumentation to collect data on Earth's atmosphere, lands, and oceans
- Sends more than 2,000 gigabytes of data to Earth every day
- Flys in the same orbit as Suomi NPP, 50 minutes apart



International Collaboration for Global Forecasting

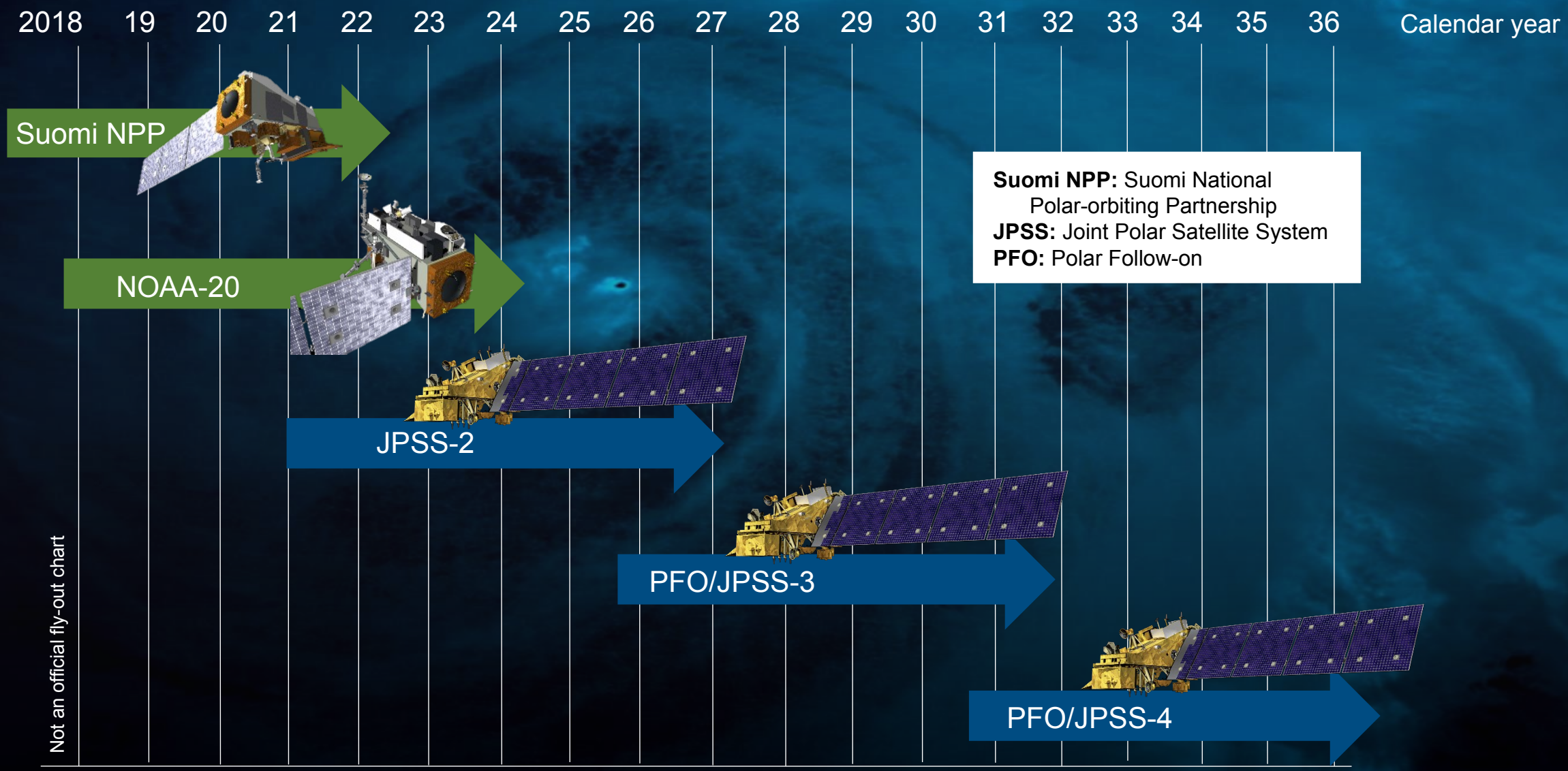
The international constellation of polar-orbiting satellites have been called the “backbone” of global weather forecasting.



85%

Eighty-five percent of the data in global weather models comes from polar-orbiting satellites.

JPSS Continuity of Operations

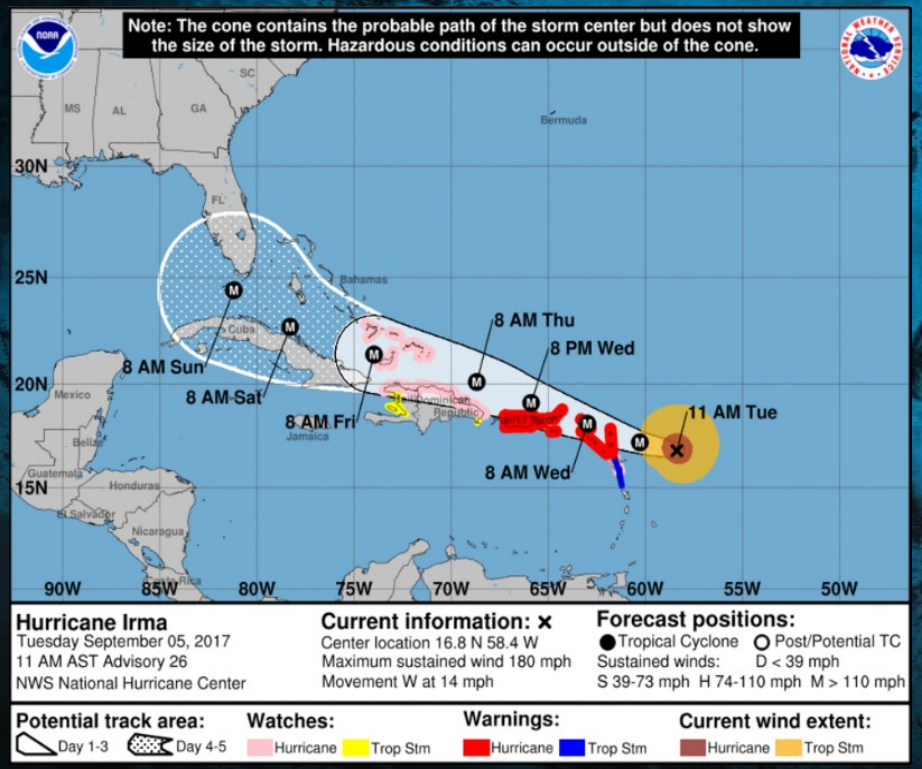


Suomi NPP: Suomi National Polar-orbiting Partnership
JPSS: Joint Polar Satellite System
PFO: Polar Follow-on

Supporting NWS

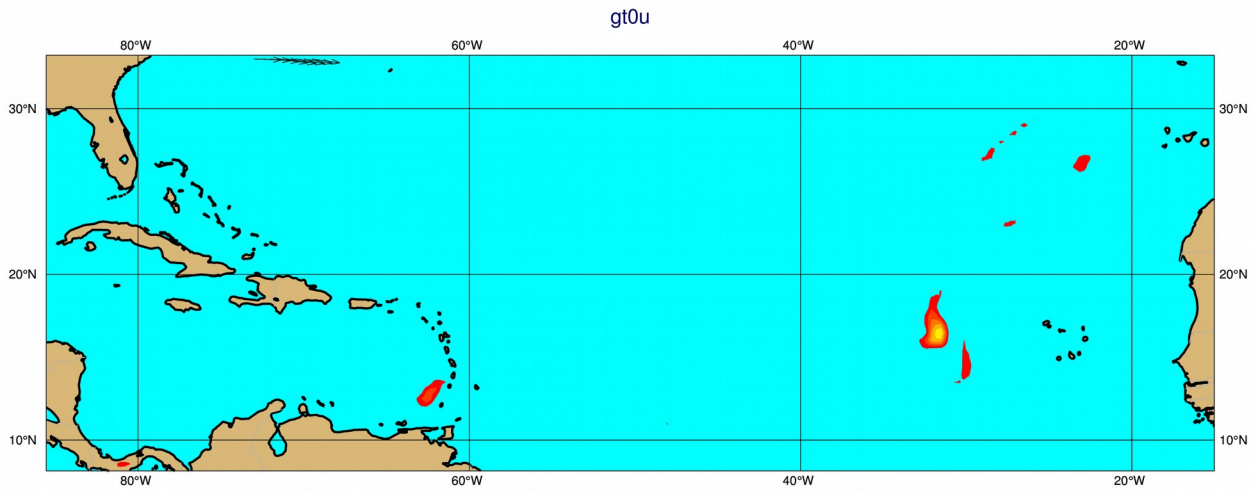
- Suomi NPP remains healthy and continues to provide accurate atmospheric and environmental data.

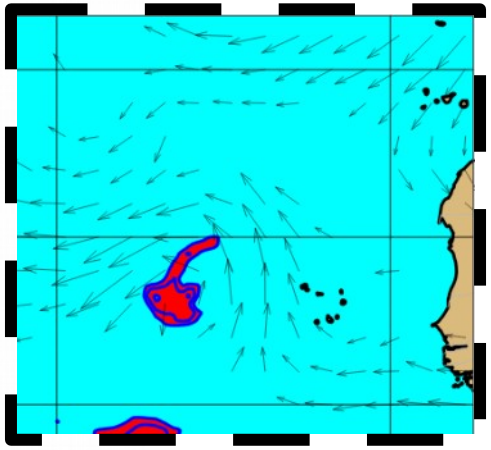
- NOAA-20 flies in the same orbit (50 minutes apart) collecting the same data as Suomi NPP.



Benefits to Users: Impact of Satellites on Forecasting of Irma

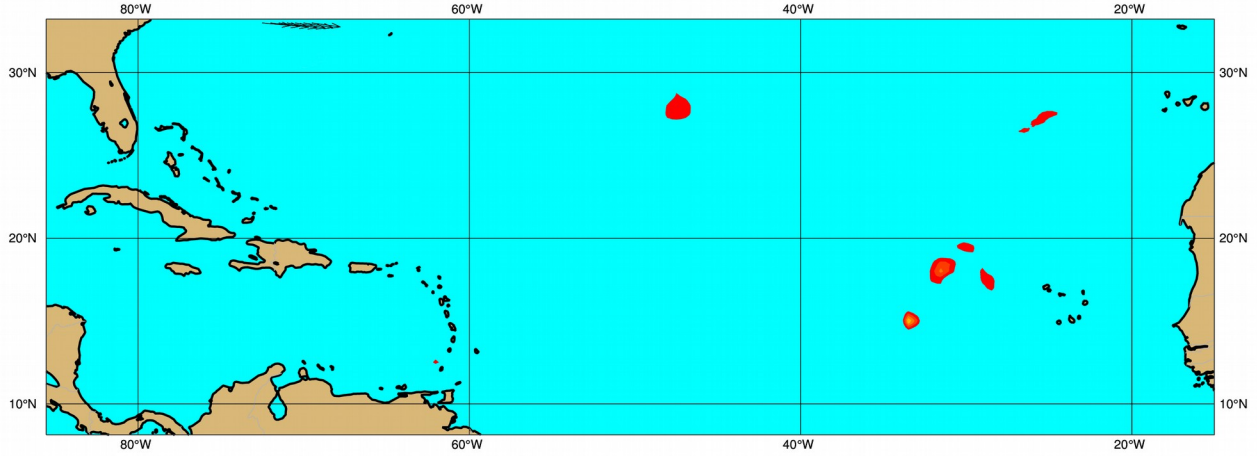
Forecast *WITH* Satellites

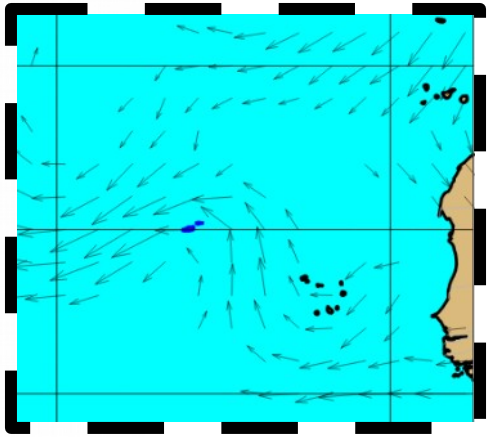




700hPa initial conditions (humidity and wind) with satellites

Forecast *WITHOUT* Satellites





700hPa initial conditions (humidity and wind) without satellites

ECMWF

JPSS Connecting the dots

Flight systems development- instruments, satellite, launch

Ground system development - data collection and processing, distribution, archive

STAR science teams - algorithms, cal/val and software packages for operations

Algorithm Management - interface between STAR, Ground, Flight, and Operations

Proving Grounds - user engagement resulting in improvements in cross-NOAA products and services

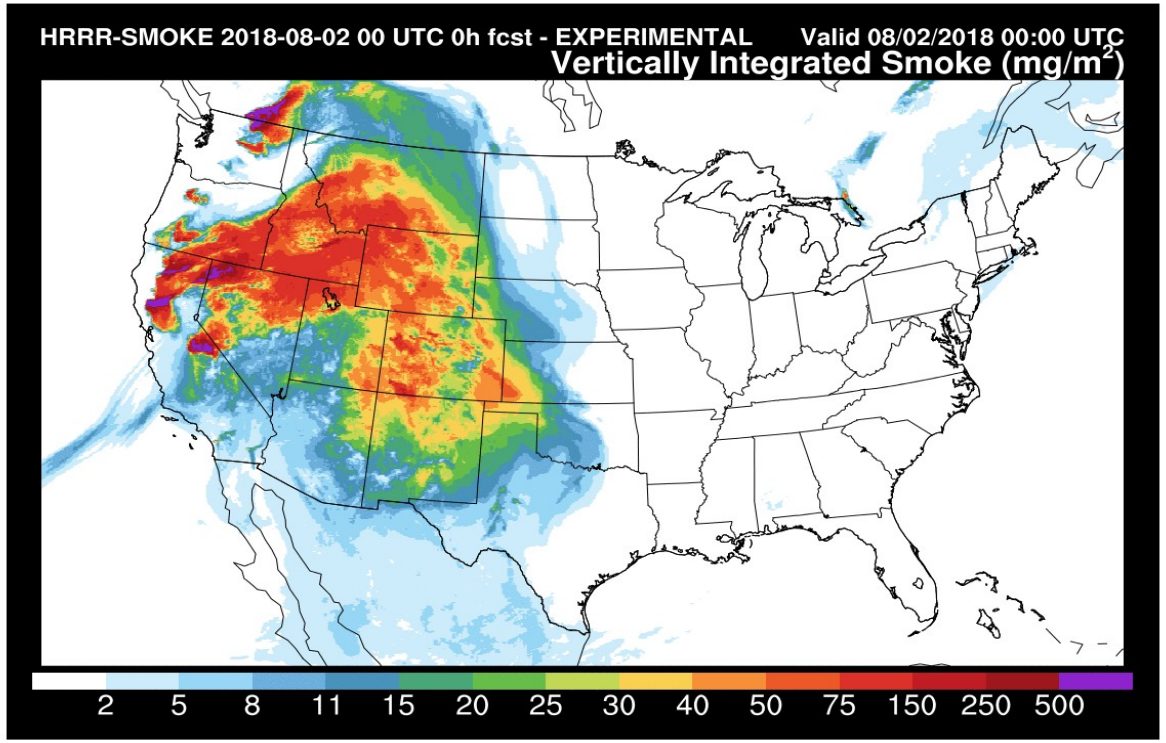
Risk Reduction - use inspired new science and applications

STAR Cal/Val focused on the algorithms & product quality

Proving Ground focused on the Applications

"I've been at California State Emergency Services and the smoke model data was **VITAL** and still is for our Department of Transportation partners dealing with AMTRAK running through northern and central California. I've met these DOT folks in person and they would like to say thank you too!"

Khristian Mattarochia
National Weather Service
Science & Operations Office
Hanford, CA (August 1, 6:23 PM)



JPSS U.S. Partners

Cooperative Institutes

Alaska
- Cooperative Institute for Alaska Research—University of Alaska

California
- Cooperative Institute for Marine Ecosystems and Climate—UC San Diego

Colorado
- Cooperative Institute for Research in the Atmosphere—Colorado State University
- Cooperative Institute for Research in Environmental Sciences—University of Colorado

Maryland
- Cooperative Institute for Climate & Satellites—University of Maryland

Mississippi
- Northern Gulf Institute (NGI)—Stennis Space Center

Wisconsin
- Cooperative Institute for Meteorological Satellite Studies—University of Wisconsin-Madison

Government Agencies

Alabama
- NASA Marshall Space Flight Center

Alaska
- Bureau of Land Management, Alaska Fire Service

California
- Naval Research Lab
- NASA Jet Propulsion Lab
- National Marine Fisheries Service

Colorado
- NOAA OAR Earth System Research Laboratory

Florida
- NASA Kennedy Space Center

Maryland
- NESDIS, National Weather Service, National Ocean Service

University Partners

Alaska
- Geographic Information Network of Alaska (GINA)

Colorado
- University Corporation for Atmospheric Research

Hawaii
- University of Hawaii

New York
- The City College of New York

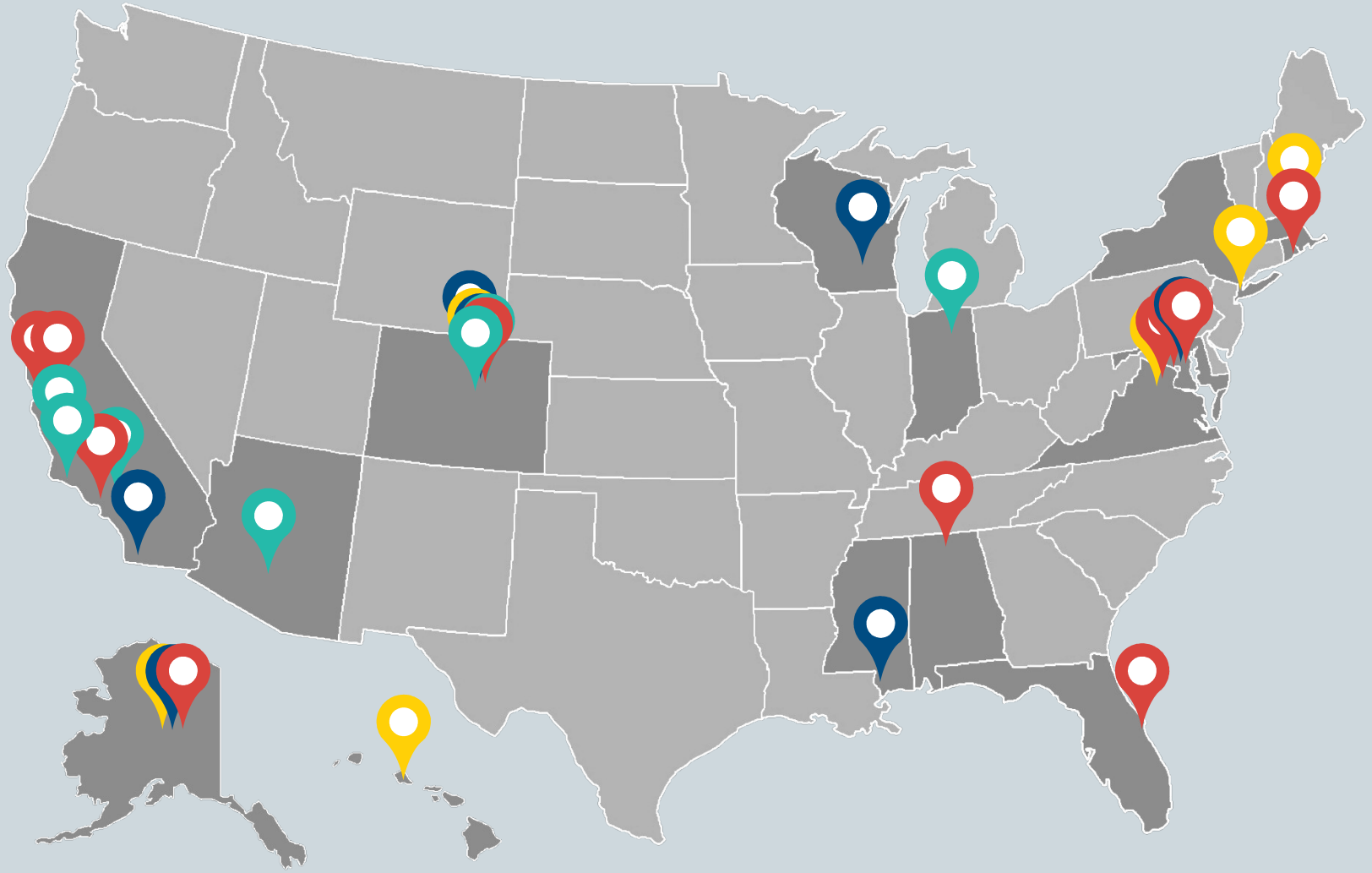
Massachusetts

Prime Contractors

Arizona
- Orbital ATK

California
- Northrop Grumman
- Raytheon Space and Airborne Systems
- United Launch Services

Colorado



THANK YOU!

For more information visit: **www.jpss.noaa.gov**

CONNECT WITH US!

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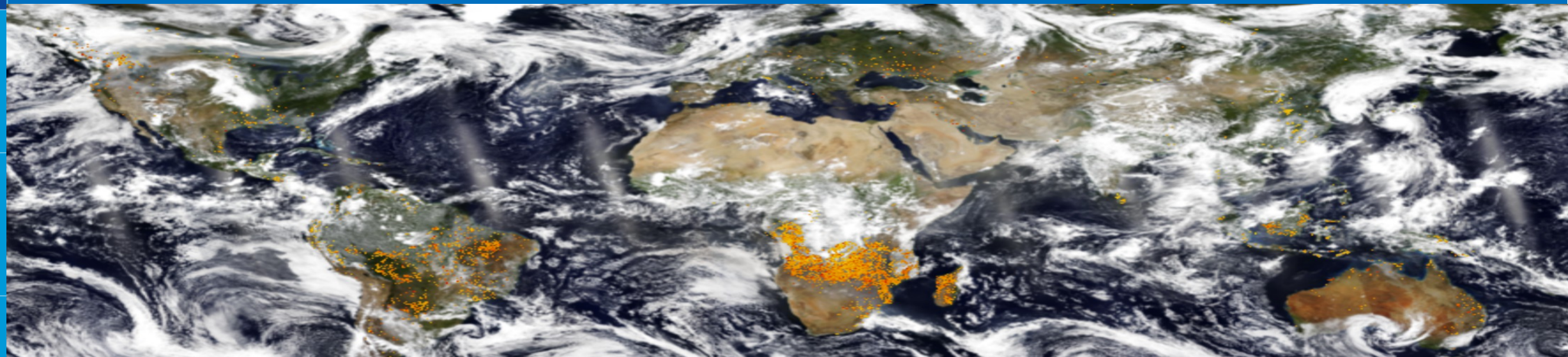
JPSS Program Science and Satellite Proving Grounds

Satellite and Information Service

August 27, 2018

Mitch Goldberg, Ph.D., JPSS Program Scientist,
National Oceanic and Atmospheric Administration



What is Program Science?

- Program Science provides science integrity for the JPSS Program

- JPSS Program Scientist provides the link between the JPSS operational user community and the JPSS Program through
  - Chairing the Low Earth Orbiting Requirements Working Group for gathering and defining requirements,
  - Managing the JPSS Proving Ground and Risk Reduction program to foster improved user applications and science feedback.
  - Provides overarching science oversight for the Program

- JPSS Project Scientist ensures instruments meet specification through oversight of prelaunch and post launch commissioning of instrument performance.

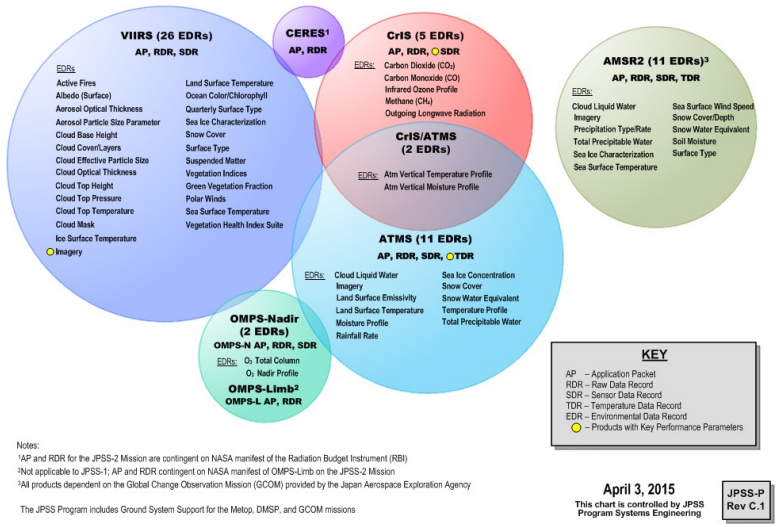
- NOAA/NESDIS Center for Satellite Applications and Research (STAR) provides the cal/val, algorithms to Ground Operations and providing algorithm maintenance/sustainment

- Algorithm Management Project (AMP) of the JPSS Ground Segment provides the interface between STAR, Ground, Flight, and Operations

Satellite Proving Ground: Goal is to improve NOAA Services through optimizing the use of satellite data along with other sources of data & information: Observations to Services to Stakeholders

JPSS Program Data Products

JPSS Level 1 Requirements Document, v1.8



GOES-R Baseline Products

ADVANCED BASELINE IMAGER (ABI)

- Aerosol Detection (Including Smoke and Dust)
- Aerosol Optical Depth (AOD)
- Clear Sky Masks
- Cloud and Moisture Imagery
- Cloud Optical Depth
- Cloud Particle Size Distribution
- Cloud Top Height
- Cloud Top Phase
- Cloud Top Pressure
- Cloud Top Temperature
- Derived Motion Winds
- Derived Stability Indices
- Downward Shortwave Radiation: Surface
- Fire/Hot Spot Characterization
- Hurricane Intensity Estimation
- Land Surface Temperature (Skin)
- Legacy Vertical Moisture Profile
- Legacy Vertical Temperature Profile
- Radiances
- Rainfall Rate / QPE
- Reflected Shortwave Radiation: TOA
- Sea Surface Temperature (Skin)
- Snow Cover
- Total Precipitable Water
- Volcanic Ash: Detection and Height

GEOSTATIONARY LIGHTNING MAPPER (GLM)

- Lightning Detection: Events, Groups & Flashes

SPACE ENVIRONMENT IN-SITU SUITE (SEISS)

- Energetic Heavy Ions
- Magnetospheric Electrons & Protons: Low Energy
- Magnetospheric Electrons & Protons: Med & High Energy
- Solar & Galactic Protons

MAGNETOMETER (MAG)

- Geomagnetic Field

EXTREME ULTRAVIOLET AND X-RAY IRRADIANCE SUITE (EXIS)

- Solar Flux: EUV
- Solar Flux: X-ray Irradiance

SOLAR ULTRAVIOLET IMAGER (SUVI)

- Solar EUV Imagery

NOAA Mission Service Areas

Weather Ready Nation

- Aviation Weather
- Fire Weather
- Hydrology and Water Resources
- Marine Weather and Coastal Events
- Hurricane / Tropical Storms
- Routine Weather
- Severe Weather
- Space Weather
- Tsunami
- Winter Weather

Resilient Coasts

- Coastal Water Quality
- Marine Transportation
- Planning and Management
- Resilience to Coastal Hazards and Climate Change

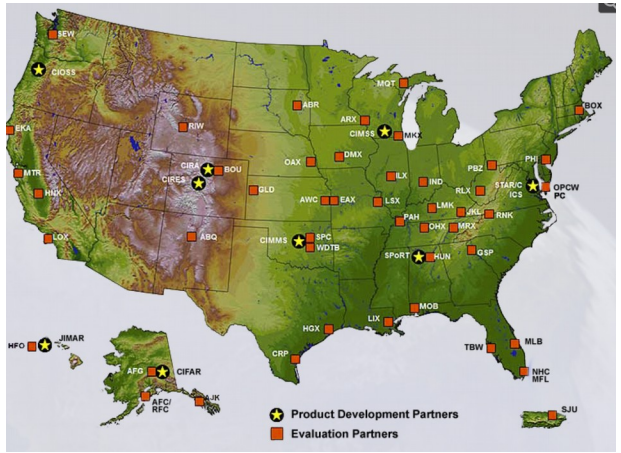
Healthy Oceans

- Ecosystem Monitoring, Assessment and Forecast
- Fisheries Monitoring, Assessment and Forecast
- Habitat Monitoring and Assessment
- Protected Species Monitoring

Climate

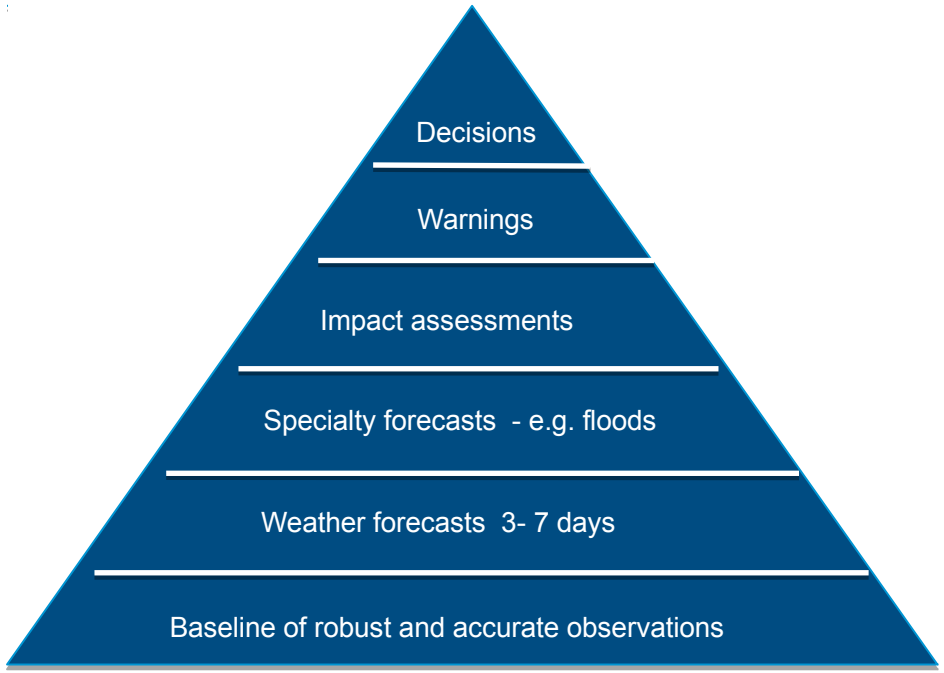
- Assessment of Climate Change and Its Impacts
- Climate Mitigation and Adaption Strategies
- Climate Science and Improved Understanding
- Climate Predictions and Projections

Addressing needs across NOAA



Proving Ground User Initiatives focus on Applications and Decision Support for NOAA Service Areas and Partners

Starting in 2014 we transitioned from individual projects to coordinated team initiatives



Climb the pyramid through:

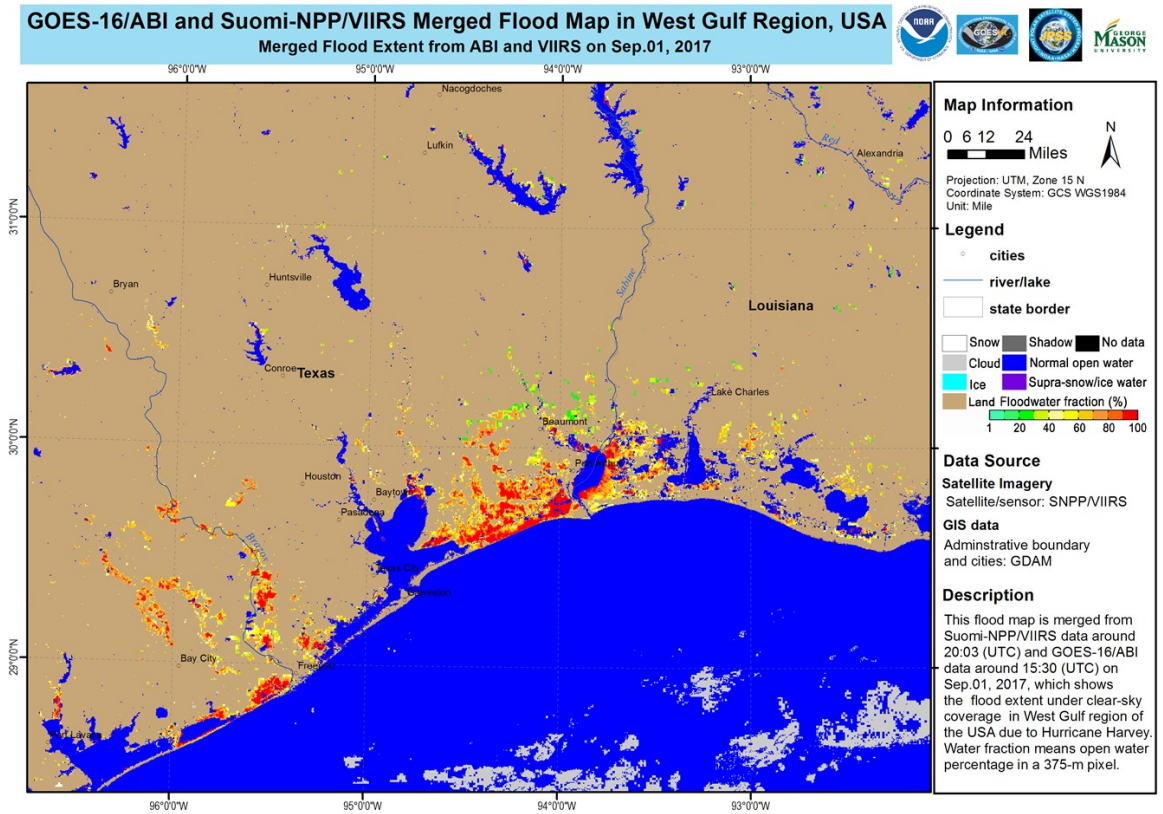
- Communicating our capabilities/needs
- Listening /understanding user needs and feedback
- Identifying user advocates/leaders
- Clearly stated objectives/deliverables
- Facilitators for managing meetings and milestones
- A very capable team

NESDIS Strategic Metric " The utilization of NESDIS developed science by internal and external partners and stakeholders through enhanced coordination with partners and the user community"

The Initiatives

The initiatives comprise of a team of developers and users working together to improve an application in a testbed environment providing assessments of utility from the users and feedback to the developers.

- Arctic
- Fire and Smoke *- will include GOES-R in 2018*
- Hurricanes and Tropical Storms
- Hydrology
- NWP
- Oceans and Coasts *- includes Sentinel 3*
- River Ice and Flooding *- includes GOES-R since 2017*
- Sounding *- includes EUMETSAT MeTOP*
- Volcanic Hazards *- new and includes both JPSS and GOES-R*



From Chris Vaughn, FEMA to Mitch Goldberg

"This is some of the best/most comprehensive data I've seen to date for this event!" "Thank you all! Very grateful for the quick turn on these products"

Floods & River Ice

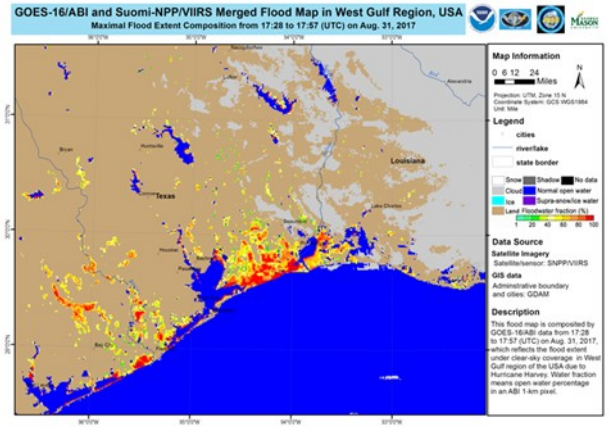
Provide conditions of river ice and standing water (flood) to NWS River Forecast Centers and FEMA. Supports International Disaster Charter

First initiative to include GOES-R

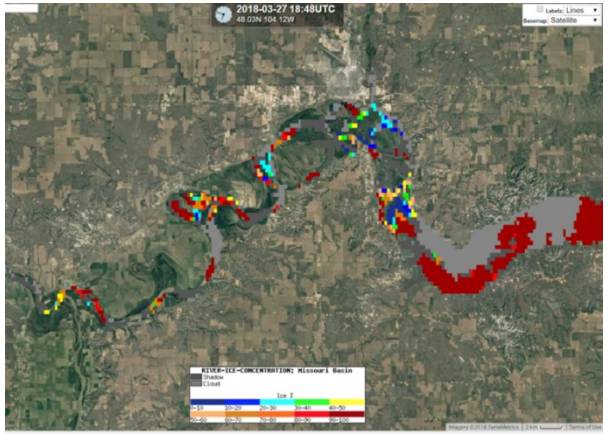
Funded Projects		
Principal Investigator	**Title**	**Institution**
Chaouch, Naira (FY15-18)	Operational river ice monitoring and forecasting over the US and the globe using SNPP and NOAA-20 VIIRS imagery	CCNY/CREST
Sun, Donglian Sanmei Li Jay Hoffman	Development of Global Geostationary-JPSS Flood Mapping Software and Products	GMU, CIMSS

Integrated JPSS/ GOES-R flood maps:

Harvey



JPSS VIIRS ice map: Missouri and Yellowstone River: 3/27/18

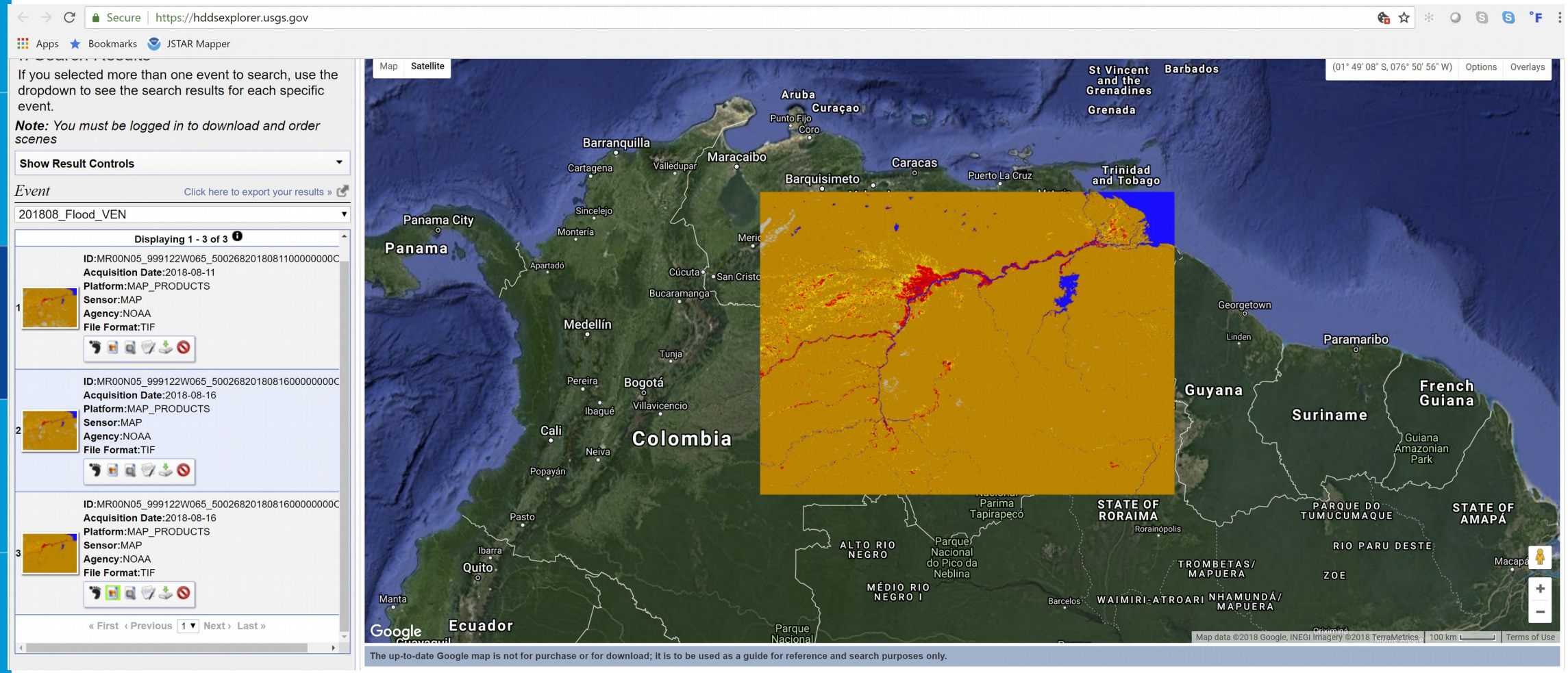


Flood/River Ice maps are integrated into AWIPS2 at each River Forecast Center, and used by FEMA

River Ice and Flooding Team – (April 2017 telecon)

Name	Organization	Name	Organization
Paul Alabi	CCNY	Paul McKee	WGRFC
Aaron Bisig	NIC	Julie Price	JPSS
Ed Capone	NERFC	Fernado Salas	NWC
Jessica Cherry	APRFC	Bill Sjoberg	JPSS
Reggina Cabrera	SERFC	Donglian Sun	GMU
Gene Derner	MBRFC	Tim Szeliga	NWC
Mitch Goldberg	JPSS	Marouane Temimi	CCNY
Andy Heidinger	STAR	Jonathan Thornburg	NCRFC
Jay Hoffman	CIMSS	Jorel Torres	CIRA
Eric Holloway	APRFC	David Vallee	NERFC
Sanmei Li	GMU	John Walker	NOAA UAS
Yinghui Liu	SSEC		

International Charter Disaster Activations

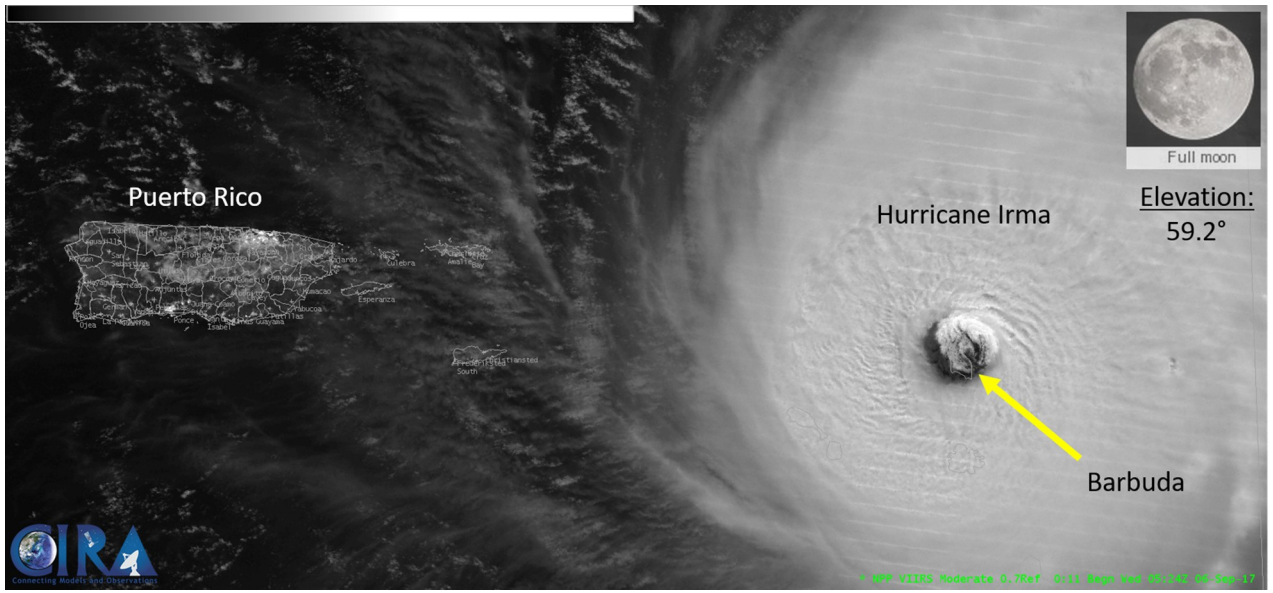


Hurricanes

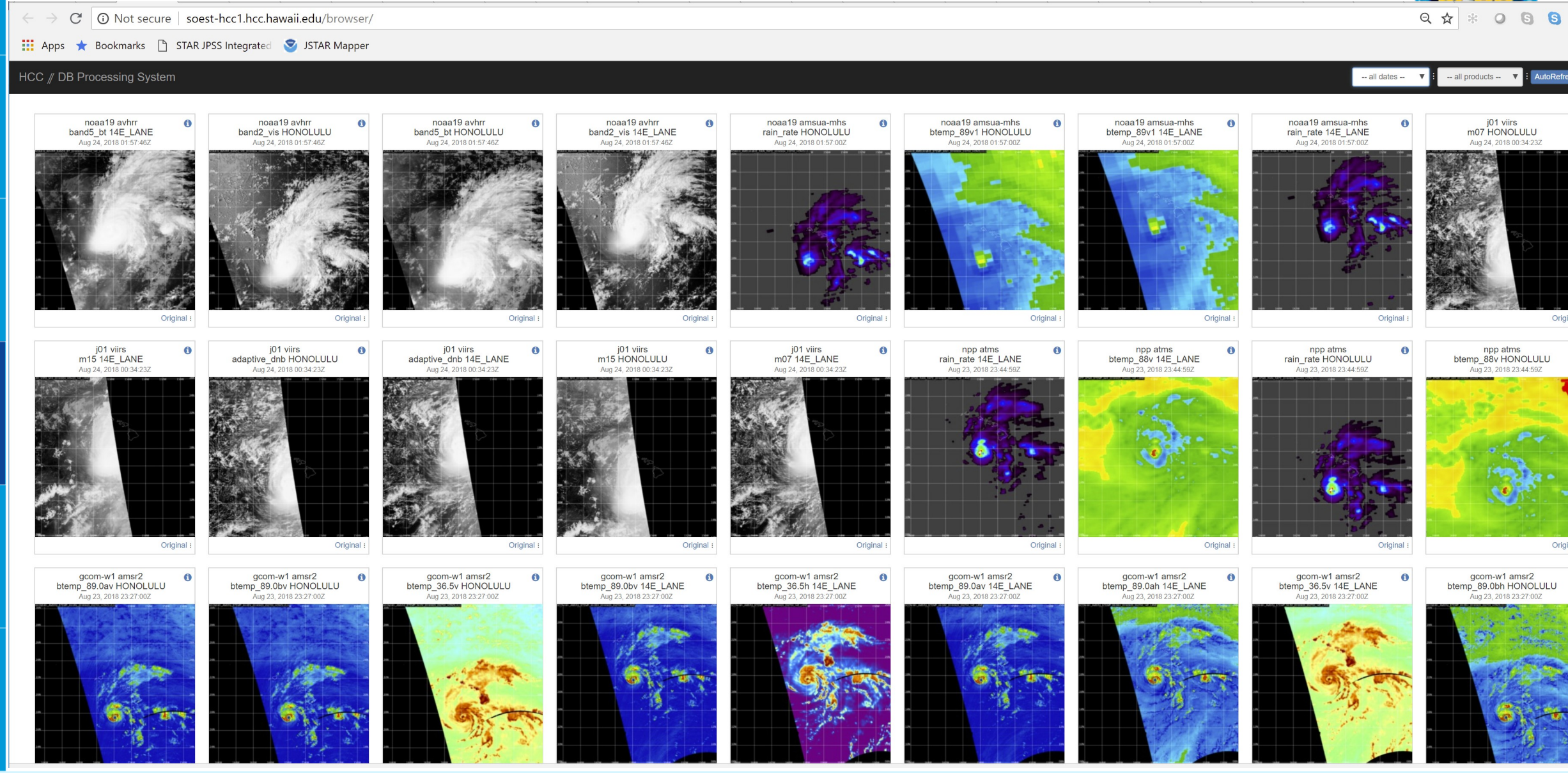
Funded Projects		
Principal Investigator	**Title**	**Institution**
Chirokova, Galina	Real-time acquisition, processing, analysis, and operational integration of TC-centric polar orbiting data. Part III: Improving Tropical Cyclone Forecast Capabilities Using the JPSS data Suite	Colorado State/CIRA
Cossuth, Josh	Real-time acquisition, processing, analysis, and operational integration of TC-centric polar orbiting data. Part I: Implementation of a data ingest, standardization, and output system.	NRL
Wimmers, Anthony	Real-time acquisition, processing, analysis, and operational integration of TC-centric polar orbiting data. Part II: Serving forecasters with advanced satellite -based TC center-fixing and intensity information.	UW/CIMSS

Making use of Direct Broadcast – Low Latency

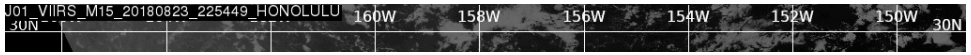
Data to improve hurricane intensity and center fixing through use of microwave imagery and products, unique day night band, along with visible/infrared imagery



Oahu Direct Broadcast provides real-time information



Where is that Eye? (Hurricane Lane – August 23, 2018)



NATIONAL HURRICANE CENTER

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

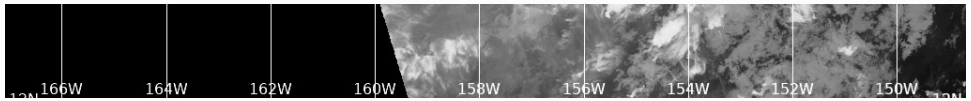
ORECASTS ▾ DATA & TOOLS ▾ EDUCATIONAL RESOURCES ▾ ARCHIVES ▾

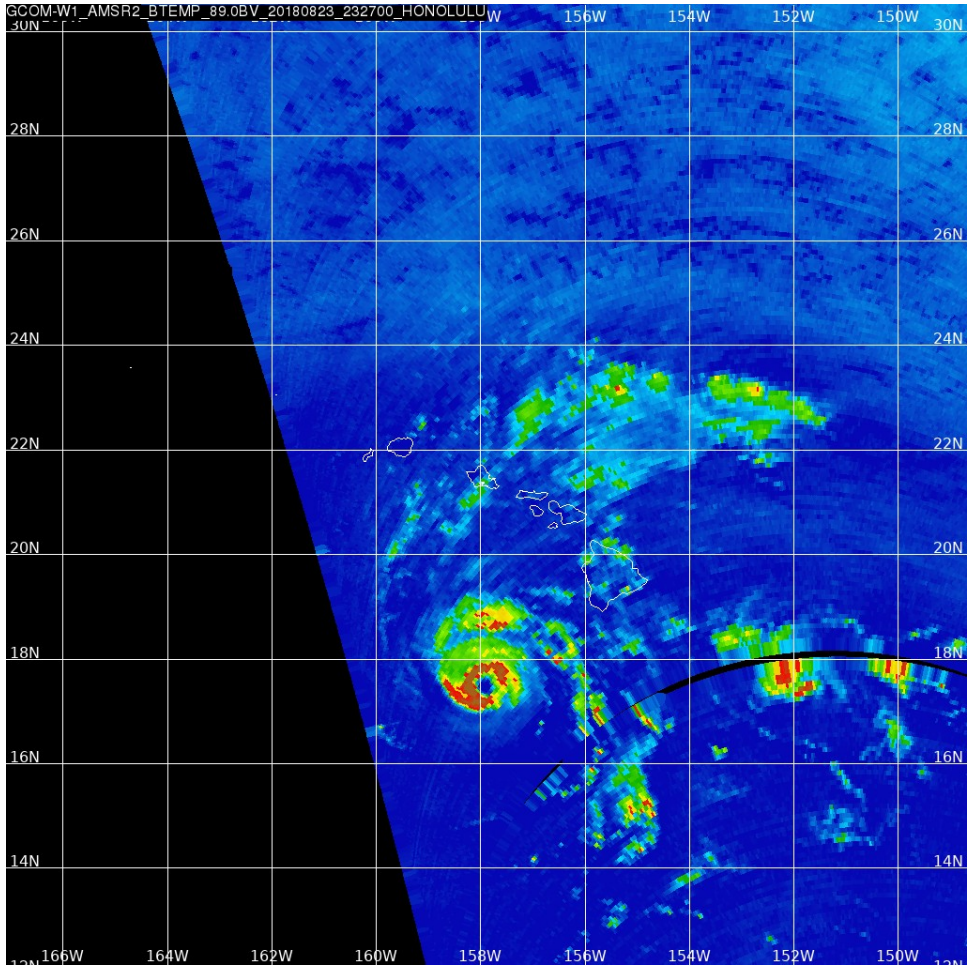
Hurricane LANE

ZCZC MIATCDEP4 ALL
TTAA00 KNHC DDHHMM

Hurricane Lane Discussion Number 10
NWS National Hurricane Center Miami FL EP142018
200 AM PDT Fri Aug 17 2018

Lane continues to gradually strengthen. Recent microwave images show a well-defined low-level eye, but this feature is not yet apparent in geostationary satellite images. The latest satellite images show an organized central dense overcast, but convection has decreased in the outer bands. An average of the Dvorak estimates from TAFB and SAB yields an initial intensity of 70 kt.





Fire &

Tim Gallaudet, Ph.D., Rear Admiral, U.S. Navy (Ret.)
Assistant Secretary of Commerce for Oceans and Atmosphere / Deputy NOAA Administrator,
Acting Under Secretary of Commerce for Oceans and Atmosphere / NOAA Administrator

Fund	
Principal Investigator	Title
Ahmadov, Ravan, Shoba Kondragunta, Ivan Csiszar	Rapidly predicti weathe product High-Re with Sm (RAP/HI
Batzil, Sam	Web-ba Estimat Using V
Ellicott, Evan	Improvi applicat Radiom product product
Elvidge, Christopher	Discrim biomas
Frost, Greg	Charact Product
Kondragunta, Shobha	Improvi Retrieva (CO/CO Refresh

Sent from my iPad

On Aug 14, 2018, at 1:30 AM, Clifford Mass <cmass@uw.edu> wrote:

I have sometimes called NOAA/NWS to task when I thought they were lagging in providing the best NWP that they were capable of....but, on the flip side, it is important to recognize when they make a major advance...and there is huge one that it is important to recognize---HRRR-Smoke.

Wildfires are the the major summer/fall severe weather in the west, with huge economic and health implications. HRRR-smoke combines the increasingly skillful HRRR model with the physics of smoke generation, advection, and radiative effects. Quite honestly, it is a home run--it appears to be highly skillful in predicting the 3D smoke distribution, and although experimental, it is used by operational forecasts and air quality agencies, among others.

Today was a great example. During the past few weeks, HRRR-smoke has accurately predicted that the smoke reaching WA State from BC and California would remain aloft, with little impacts at the surface. It was consistently correct in this. Today it predicted that the smoke would reach the surface in western WA (see graphic)....a perfect forecast as confirmed by the PM2.5 in Seattle (attached). Based on the HRRR-smoke forecast, I blogged last night that vulnerable folks should prepare...and the NWS did the same.

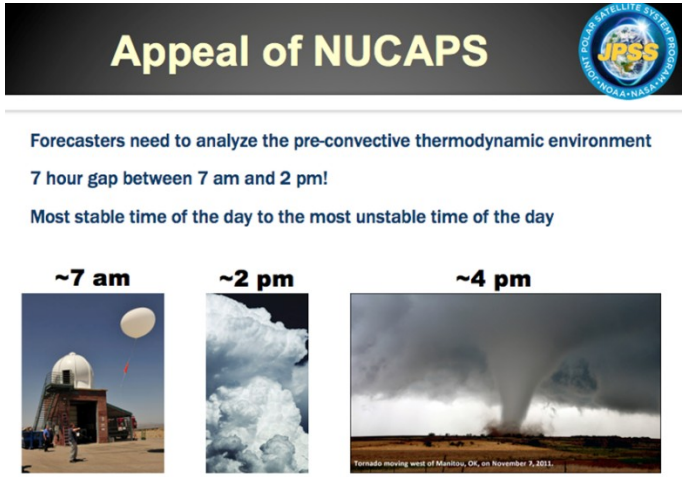
We now have the capability to predict the 3D evolution of wildfire smoke with some realism....a very major advance, and one the folks at ESRL can be very proud of...cliff

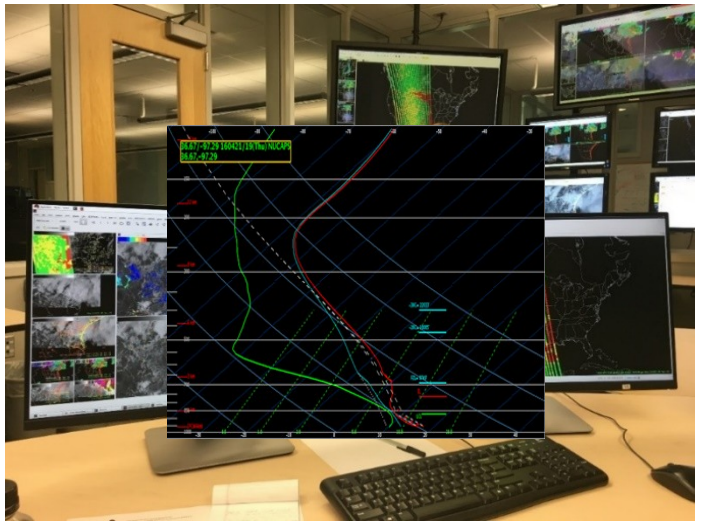
nd will be

wer, aerosol

Soundings – Part of the Hazardous Weather Testbed
Resulted in excellent feedback and enhancements; to reduce latency NUCAPS soundings will be delivered experimentally via direct broadcast

Funded Projects		
Principal Investigator	**Title**	**Institution**
Berndt, Emily	Expanded Application and Demonstration of Gridded NUCAPS in AWIPS	NASA/SPORT
Dostalek, Jack	Improving S-NPP and JPSS-1 NUCAPS Retrievals for CONUS Severe Weather Applications via Data Fusion	Colorado State/CIRA
Heidinger, Andrew	Merging NUCAPS with the VIIRS Enterprise Cloud Algorithms for Improved Polar Cloud Detection, Cloud Heights and Polar Winds	STAR
Kuciauskas, Arunas	Demonstrating, Evaluating and Promoting NUCAPS during Saharan Air Layer Events within the North Tropical Atlantic Basin	NRL
Kahn, Brian	"TRAJECTORY MODEL-ENHANCED NUCAPS FOR TRANSITION INTO AWIPS-II AND CONVECTIVE INITIATION FORECAST SKILL ASSESSMENT"	JPL, NASA/SPORT
Smith. Nadia	Improving NUCAPS Applications with product evaluation and design	STC





Better with two

GOES-R and JPSS Proving Ground Demonstration at the Hazardous Weather Testbed 2018 Spring Experiment Final Evaluation

Project Title: GOES-R and JPSS Proving Ground Demonstration at the 2018 Spring Experiment - Experimental Warning Program (EWP)

Organization: NOAA Hazardous Weather Testbed (HWT)

Evaluator(s): National Weather Service (NWS) Forecasters, Broadcast Meteorologists, Storm Prediction Center (SPC), National Severe Storms Laboratory (NSSL), University of Oklahoma (OU), Cooperative Institute for Mesoscale Meteorological Studies (CIMMS)

Duration of Evaluation: 30 April 2018 – 25 May 2018

Prepared By: Michael Bowlan (OU/CIMMS and NOAA/SPC) and Kristin Calhoun (OU/CIMMS and NSSL)

Submitted Date:

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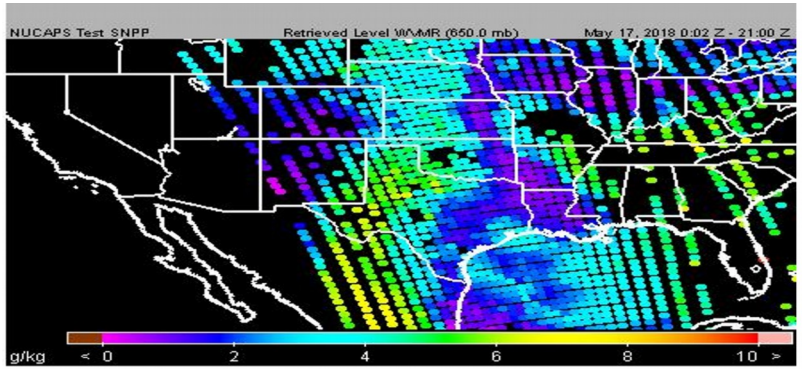
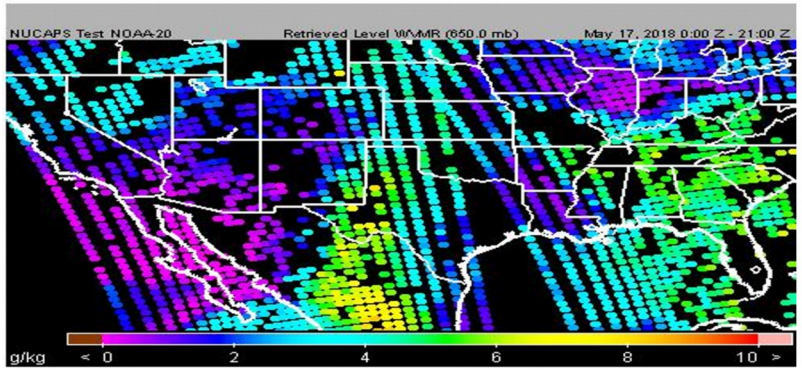
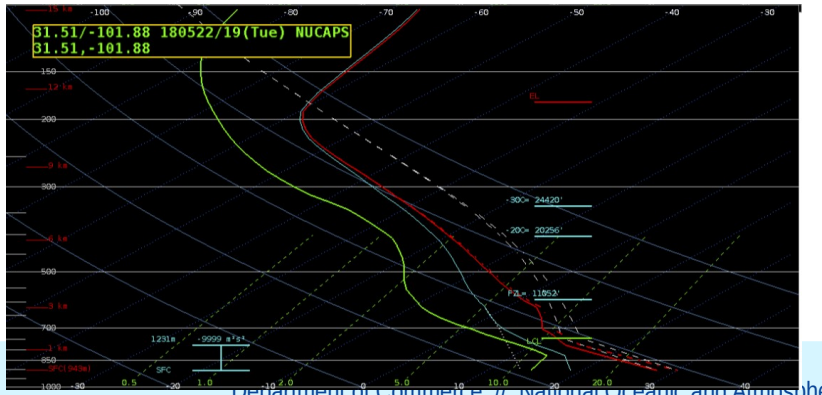






NUCAPS -Cold Air Aloft Application

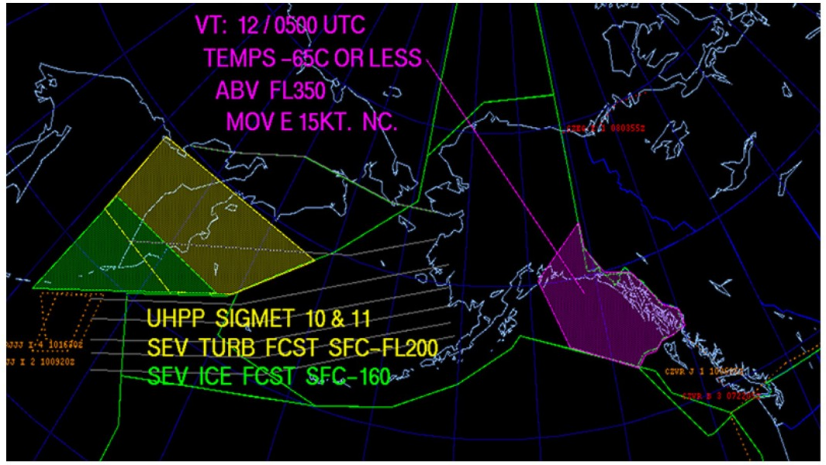
https://aerospaceamerica.aiaa.org/features/danger-in-the-air/

AEROSPACE
★★★AMERICA

Danger in the air

BY DEBRA WERNER | MARCH 2018

METEOROLOGISTS MIGHT HAVE A WAY TO WAVE PILOTS AROUND DANGEROUS POCKETS OF COLD AIR



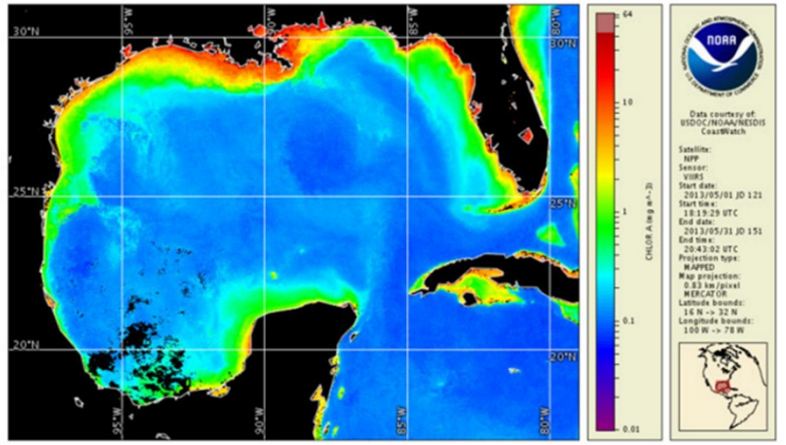
A Meteorological Impact Statement for aircraft controllers (purple hatching) shows dangerously cold air of minus 65 Celsius above 35,000 feet and moving east at 15 knots. Controllers can tell pilots to avoid such air. Credit: National Weather Service

What aviation authorities in the U.S. would really like is to equip air traffic controllers nationwide with forecast maps showing expected cells of dangerously cold air at various altitudes and locations. The controllers could then alert crews to change altitude or heading to avoid this cold air aloft.

Oceans

Funded Projects		
Principal Investigator	**Title**	**Institution**
Ahmed, Sam	CICS-CREST: Extending and Evaluating VIIRS Ocean Color Neural Network Retrievals of Harmful Algal Blooms and IOPs to Complex Inshore, Bay and Inland Waters and Examining Their Applicability to Different Bloom Types	CCNY/CREST
DiGiacomo, Paul	NOAA CoastWatch/ OceanWatch: Implement, process and serve JPSS program ocean products tailored for downstream user needs	STAR
Gladkova, Irina	Multi-sensor high-resolution gridded (super)-collated SST ACSPO L3C/L3S products	STAR
Hazen, Elliott	Using VIIRS to operationalize dynamic EBFM tools on the U.S. East and West Coasts	NMFS/SwFSC
Hyde, Kimberly	Optimization of phytoplankton functional type algorithms for VIIRS ocean color data in the Northeast U.S. Continental Shelf Ecosystem	NMFS/NeFSC
Jacox, Michael	Assimilating NOAA VIIRS Data into Near-Real-Time Ocean Models to Support Fisheries Applications off the US West Coast	NMFS/SwFSC
Mehra, Avichal (FY15- FY18)	Assimilation of VIIRS ocean color into a biogeochemical model for NCEP's Global Real-Time Ocean Forecast System in support of NOAA's Ecological Forecasting Roadmap	NCEP/EMC

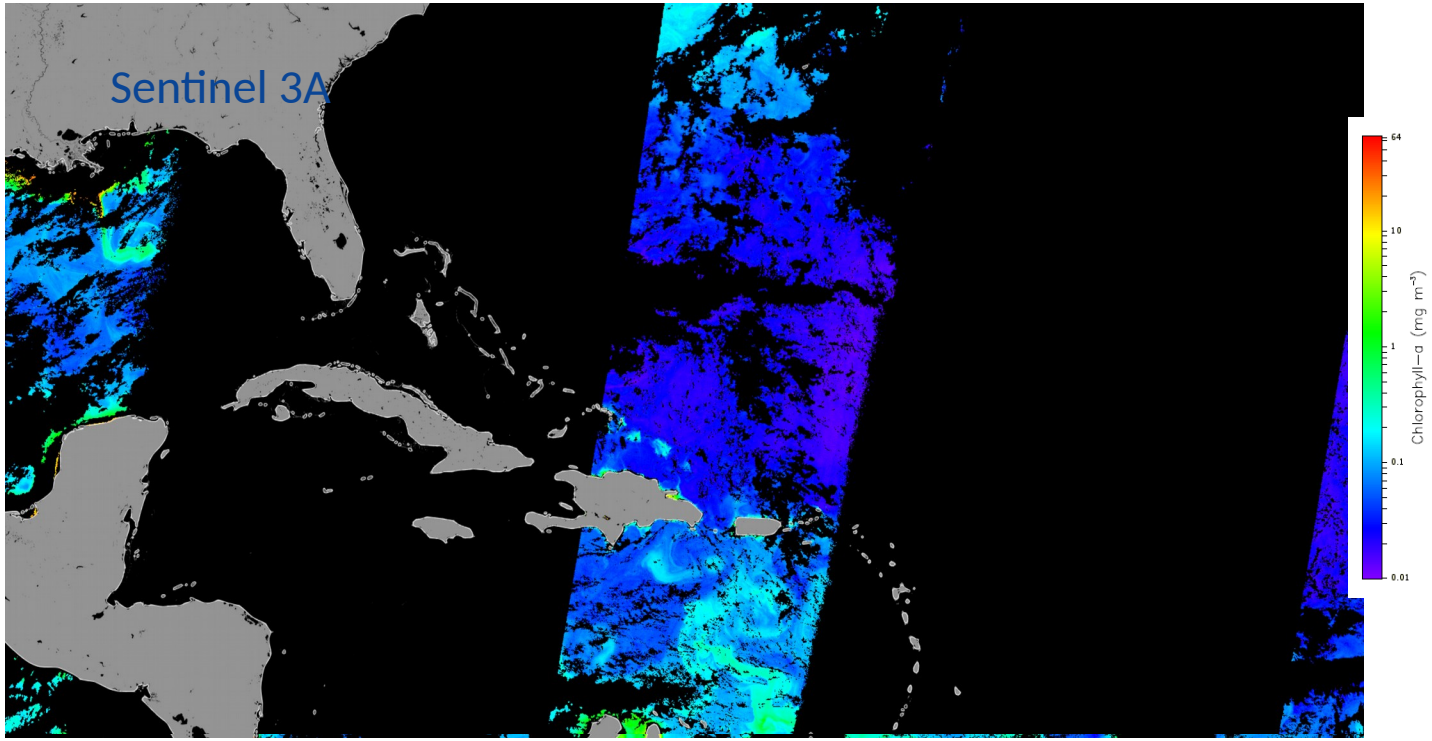
- Facilitate the use of VIIRS ocean data products
  - VIIRS SST has been implemented in code handoff for NCEP's real-time global (RTG) SST analysis
  - Annual VIIRS ocean color course
  - Advanced data portal for multitude of users
  - Data assimilation experiments
  - Funding new Fisheries projects



VIIRS derived Chlorophyll-a

Better with two

NMFS and NOS use satellite ocean color products for a variety of marine ecosystems applications (e.g. HABs) - coverage is critical

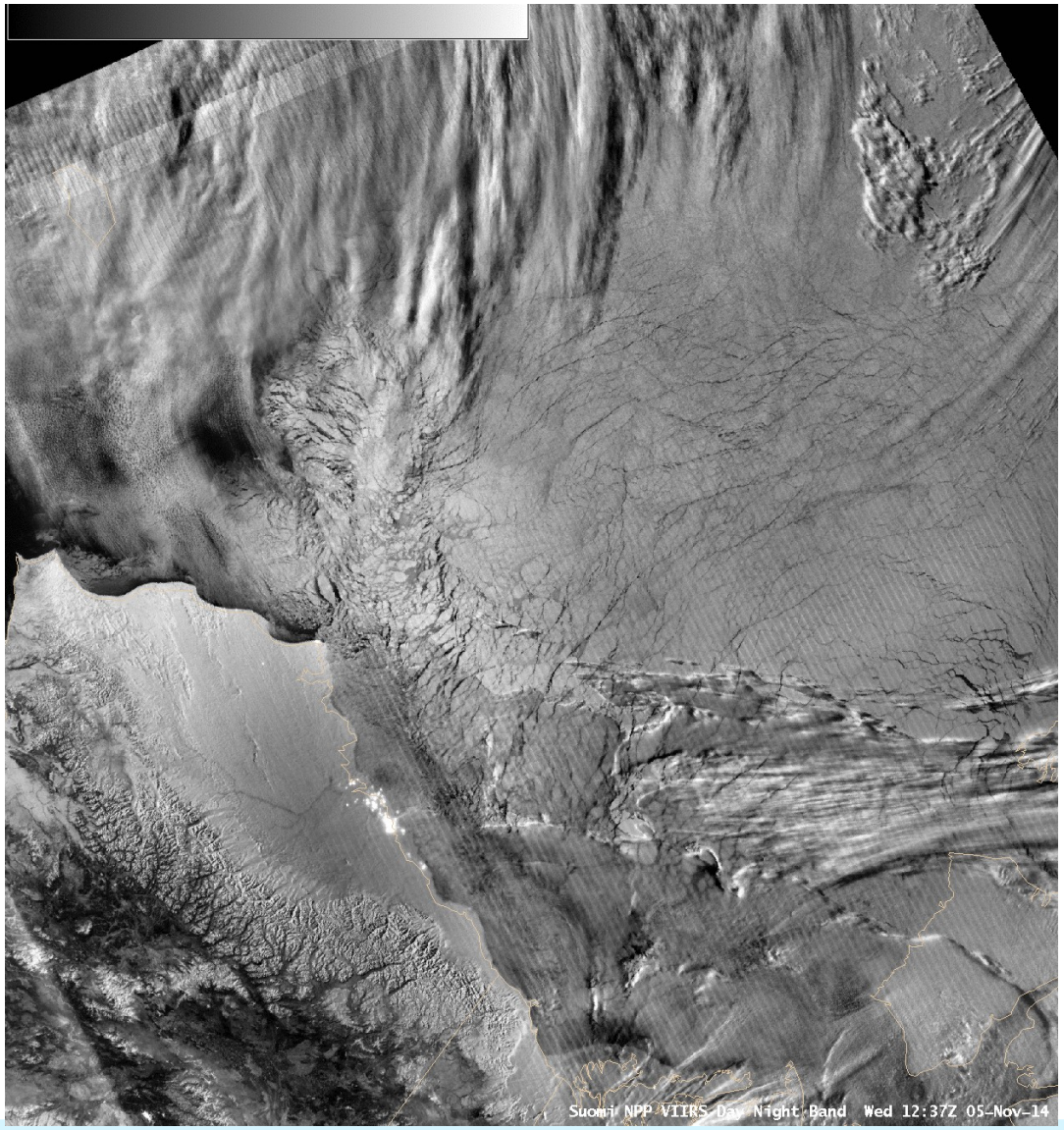


Sequence of derived Chlorophyll-a products from SNPP, NOAA-20, combined SNPP and NOAA-20, and Sentinel 3A. 50 minute separation of SNPP and NOAA-20 alleviates issue of no product in sun glint. Addition of Sentinel 3A and later 3B will fill in remaining gaps and provide exceptional daily global coverage. Enterprise algorithms used for SNPP/JPSS VIIRS and Sentinel 3 OCLI enables blending.

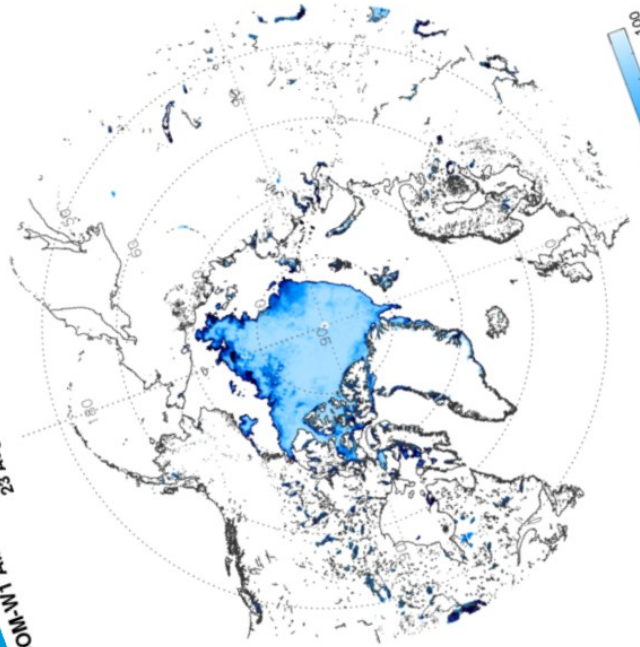
Arctic

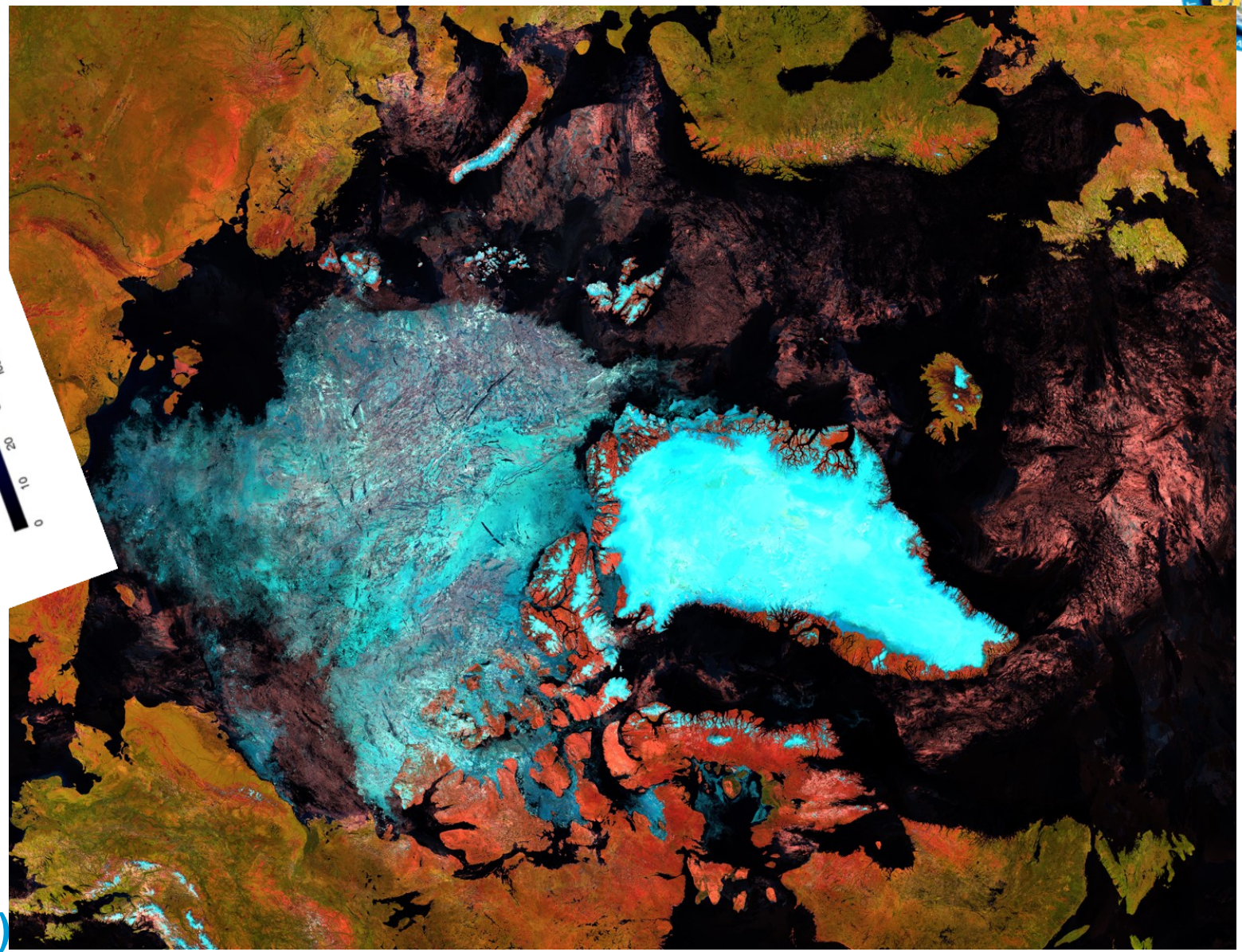
Improving warnings, forecasts and assessments of the Arctic – focused on the Alaska region services including aviation, storms, ice monitoring, fire detection, volcanic eruptions and ocean/coastal conditions (including surface winds from AMSR2) impacting lives, property and all forms of transportation.

Funded Projects		
Principal Investigator	**Title**	**Institution**
Liu, Yinghui	Ice Motion from VIIRS, AMSR2, and SAR –Development and Operational Applications	University of Wisconsin, CIMSS
Noh, Yoo-Jeong	Improving the VIIRS Nighttime Cloud Base Height and Cloud Cover Layers Products for High Latitude Weather and Aviation Forecast Applications	Colorado State, CIRA



10-day clear-sky composite from VIIRS/SNPP for 20180811-20180820 centered over the Arctic Circumpolar Region @250m





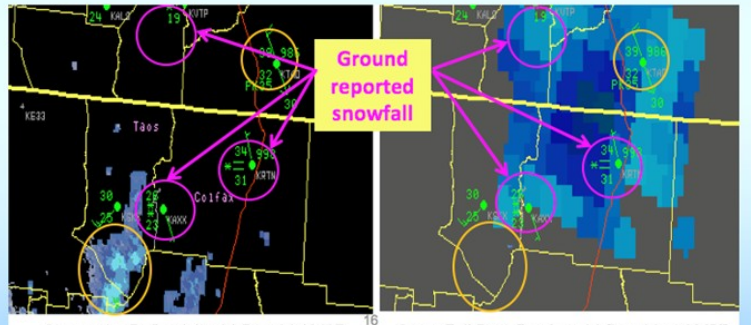
From:
Trishchenko, Alexander
(Natural Resources Canada)

Hydrology

Funded Projects		
Principal Investigator	**Title**	**Institution**
Forsythe, John, Wimmers, Tony	Merged Water Vapor Products for Forecasters using Advanced Visualization Methods	Colorado State/CIRA; UW/CIMSS
Lakhankar, Tarendra	Ensemble flood forecasting system coupling WRF-Hydro with Satellite Data (JPSS and GOES-R) for Puerto Rico	University of Mayaguez, PR
Meng, Huan	Development of Snowfall Rate over Ocean, Sea Ice, and Coast Product to Support Weather Forecasting	STAR
Xie, Pingping	Improving and Reprocessing the CMORPH Satellite Precipitation Estimates and Global OLR Analysis with Retrievals from JPSS	NWS/NCEP/CPC
Zhan, Xiwu; Wang, Nai-Yu	Improving JPSS Soil Moisture Data Products for Use in Evaluation and Benchmarking of the National Water Model	STAR; Univ of MD/CICS

- Evolving connections with the National Water Center
- Need for seasonal stream flow forecasting at NWC.
- Focus on snow, moisture and precipitation
- Multi-sensor /fusion approach for better temporal coverage

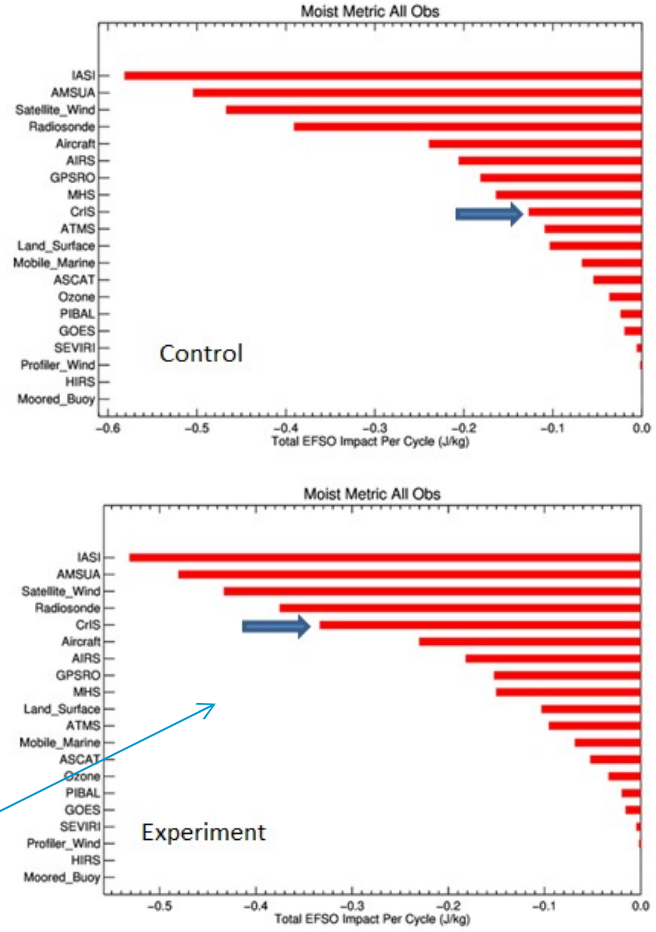
Albuquerque, NM WFO (ABQ): The product (SFR) did validate that we will be able to complement radar void coverage areas in an operational forecast environment using polar-orbiting satellite imagery.



NWP

Support improvements in NWP by better use of satellite observations in global and regional models

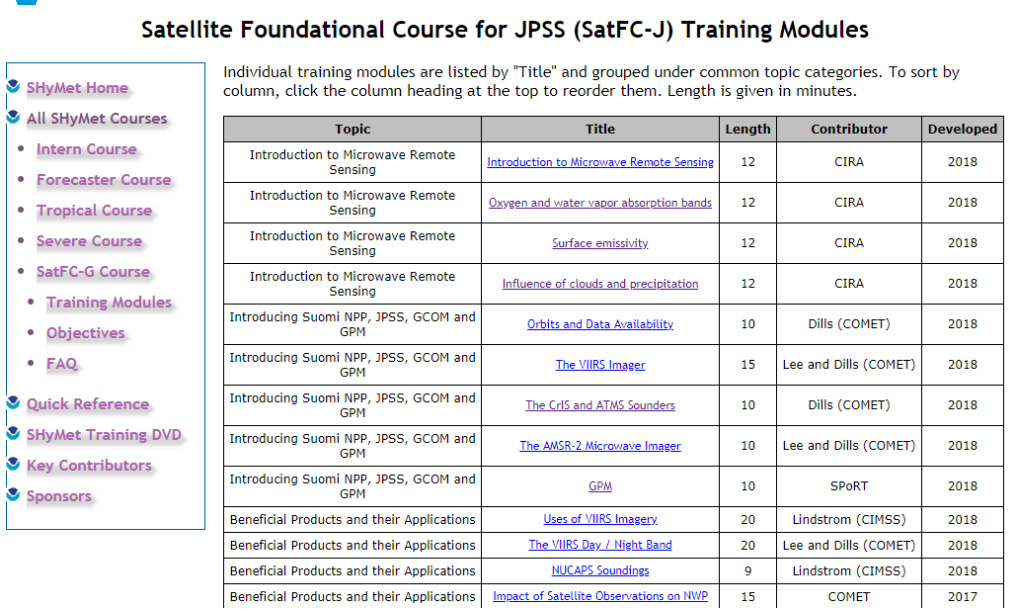
Funded Projects		
Principal Investigator	**Title**	**Institution**
Cao, Changyong	CRTM Development for Direct OMPS UV Radiance Assimilation	STAR
Cronce, Lee	Using JPSS Moisture and Temperature Retrievals to improve NearCasts of Geostationary Moisture and Temperature Retrievals	UW/CIMSS
Kalnay, Eugenia	Advanced EFSO-based QC Methods for Operational Use and Agile Implementation of New Observing Systems	UMD/CICS
Karpowicz, Bryan	ATMS/CrIS Calibration and Validation and Assimilation Improving Correlated Error, Clouds, and the Surface	NRL
Li, Jun	Improving the Assimilation of CrIS Radiances in Operational NWP Models by Using Collocated High Resolution VIIRS Data	UW/CIMSS
Lim, Agnes	Quantifying NCEP's GDAS/GFS Sensitivity to CrIS Detector Differences	UW/CIMSS
Lin, Haidao	Enhancement of direct broadcast satellite radiance assimilation capabilities for regional and global rapid update models and assessment of forecast impact	OAR/ESRL
Jung, Jim	Using Full Spectral Resolution CrIS in GFS	UW/CIMSS (JCSDA)



Adding 20 channels and adjusting assimilation weights moved CrIS from 9th to 5th

Training – wide variety of material is now available online - JPSS.NOAA.GOV

Funded Projects		
PI	**Title**	**Institution**
Connell, Bernadette	International Virtual Lab Training Activities	Colorado State/CIRA
Lindstrom, Scott	The JPSS Advocacy Channel	UW/CIMSS
Jorel Torres	JPSS NWS Satellite Training Liaison	Colorado State/CIRA
Amy Stevermer	COMET	UCAR



Satellite Foundational Course for JPSS (SatFC-J) Training Modules

- SHyMet Home
- All SHyMet Courses
  - Intern Course
  - Forecaster Course
  - Tropical Course
  - Severe Course
  - SatFC-G Course
    - Training Modules
    - Objectives
    - FAQ
- Quick Reference
- SHyMet Training DVD
- Key Contributors
- Sponsors

Individual training modules are listed by "Title" and grouped under common topic categories. To sort by column, click the column heading at the top to reorder them. Length is given in minutes.

Topic	Title	Length	Contributor	Developed
Introduction to Microwave Remote Sensing	Introduction to Microwave Remote Sensing	12	CIRA	2018
Introduction to Microwave Remote Sensing	Oxygen and water vapor absorption bands	12	CIRA	2018
Introduction to Microwave Remote Sensing	Surface emissivity	12	CIRA	2018
Introduction to Microwave Remote Sensing	Influence of clouds and precipitation	12	CIRA	2018
Introducing Suomi NPP, JPSS, GCOM and GPM	Orbits and Data Availability	10	Dills (COMET)	2018
Introducing Suomi NPP, JPSS, GCOM and GPM	The VIIRS Imager	15	Lee and Dills (COMET)	2018
Introducing Suomi NPP, JPSS, GCOM and GPM	The CrIS and ATMS Sounders	10	Dills (COMET)	2018
Introducing Suomi NPP, JPSS, GCOM and GPM	The AMSR-2 Microwave Imager	10	Lee and Dills (COMET)	2018
Introducing Suomi NPP, JPSS, GCOM and GPM	GPM	10	SPoRT	2018
Beneficial Products and their Applications	Uses of VIIRS Imagery	20	Lindstrom (CIMSS)	2018
Beneficial Products and their Applications	The VIIRS Day / Night Band	20	Lee and Dills (COMET)	2018
Beneficial Products and their Applications	NUCAPS Soundings	9	Lindstrom (CIMSS)	2018
Beneficial Products and their Applications	Impact of Satellite Observations on NWP	15	COMET	2017

AMS Short Course: Using JPSS Data Products to Observe and Forecast Major Environmental Events

Saturday, 6 January 2018, 8:30 a.m.–5:00 p.m.
Austin Convention Center 17A

AGENDA

All links will open videos of the specific presentation.

Introduction: Using JPSS Data Products to Observe and Forecast Major Environmental Events

8:40 a.m. Overview of JPSS program; Mitch Goldberg, NESDIS /NJO, Lanham, MD

9:15 a.m. Use of JPSS to support NOAA operational missions; Dan Nietfeld, NOAA /OAR Boulder, CO

9:30 a.m. Introduction to JPSS data and products and their scientific maturity (Suomi-NPP and JPSS -1); Lihang Zhou, NESDIS/STAR, College Park, MD

Innovation

Proposals		
Principal Investigator	**Title**	**Institution**
Berbery, Hugh	Maximizing CICS-MD Contributions to the JPSS PG Initiative	UMD/CICS
Key, Jeff	Development and Impact of Global Winds S-NPP/ NOAA-20 VIIRS	STAR
Miller, Steven	Visible Applications in Dark Environments, Revisited (VADER): NOAA-20 Joins S-NPP on the 'Dark-Side' to Empower Day/Night Band Research and Operational Capabilities	Colorado State/CIRA
Pavolonis, M.	JPSS Initiative for Improving Volcanic Hazard Monitoring/Forecasting	STAR
Seaman, Curtis	Exploiting VIIRS Multispectral Imaging to Support Hazard Detection, Nowcasting, and JPSS PGRR Initiatives for Benefit of Stakeholders	Colorado State/CIRA
Tong, Daniel	Improving NOAA operational forecasts of Dust Weather Hazards through assimilating JPSS aerosols and land products (AOD, Dust Mask, and Albedo)	OAR/ARL/GMU
Weisz, Elisabeth	Concept Study to Extend VIIRS Spectral Coverage Using CrIS Radiance Measurements and to Explore Potential Applications	UW/CIMSS
Zou, Cheng-Zhi	Extending the Atmospheric Temperature Climate Data Record from POES Microwave/Infrared Sounders to JPSS/ATMS/CrIS	STAR
Smith, Bill	Use of Direct Broadcast POES and GOES for Localized Convective Weather Forecasting	Hampton

Summary

NOAA's Satellite Proving Ground program supports user engagement projects

STAR has the critical role in ensuring the quality of the products.

For this meeting - we decided to combine the two activities for review and discussions.

We also have user presentations to tell us about their needs and to provide feedback.

Assimilation of Suomi-NPP and NOAA-20 ATMS data at ECMWF

Annual JPSS Science team meeting, College Park, Monday 27th August 2018

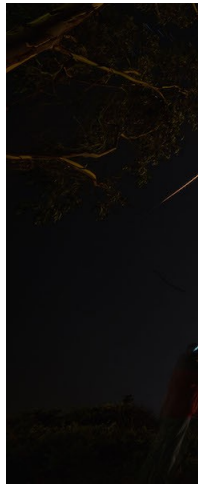
Pete Weston and Niels Bormann

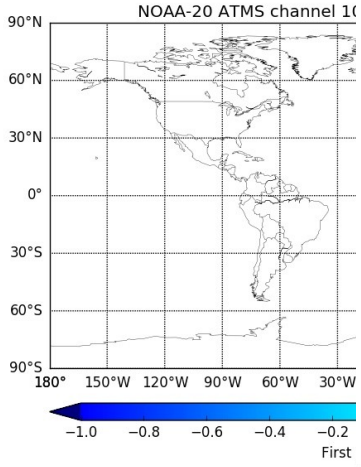
peter.weston@ecmwf.int

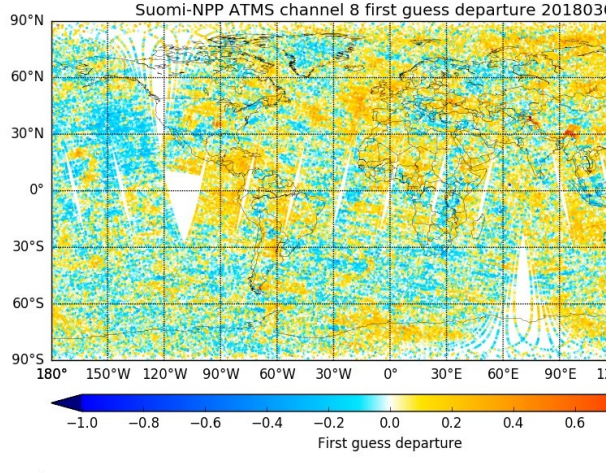
ECMWF

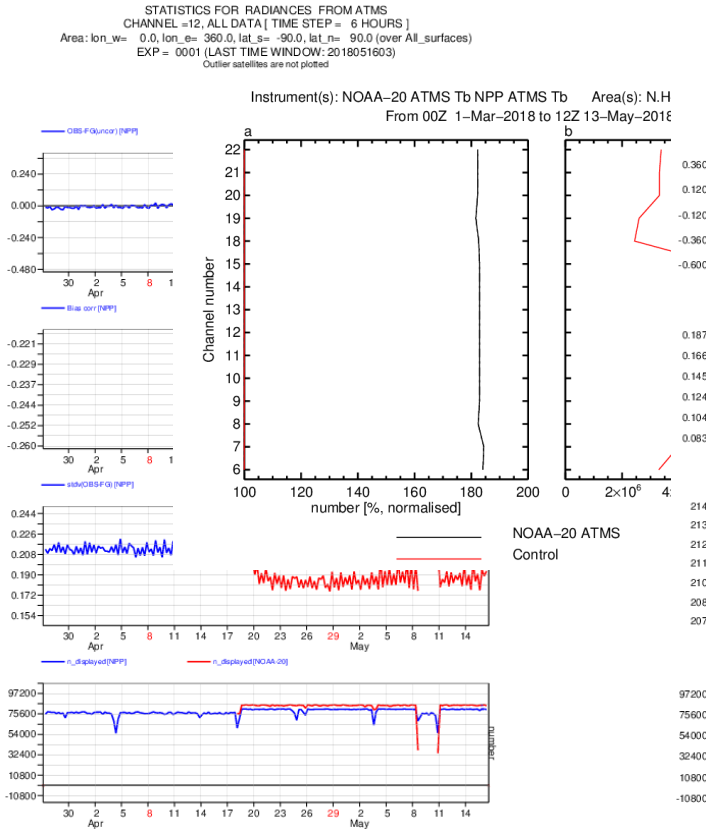
NOAA-20 ATMS timeline (an ECMWF perspective)

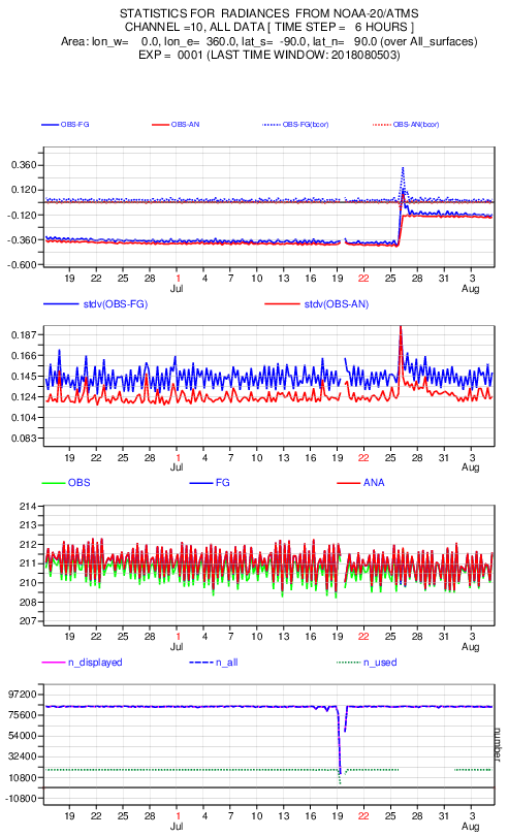
18/11/2017	19/12/2017	25/02/2018	18/04/2018	22/05/2018	01/08/2018
Launch	First sample data	NRT stream	Passive monitoring	Active assimilation	Switch to SDRs









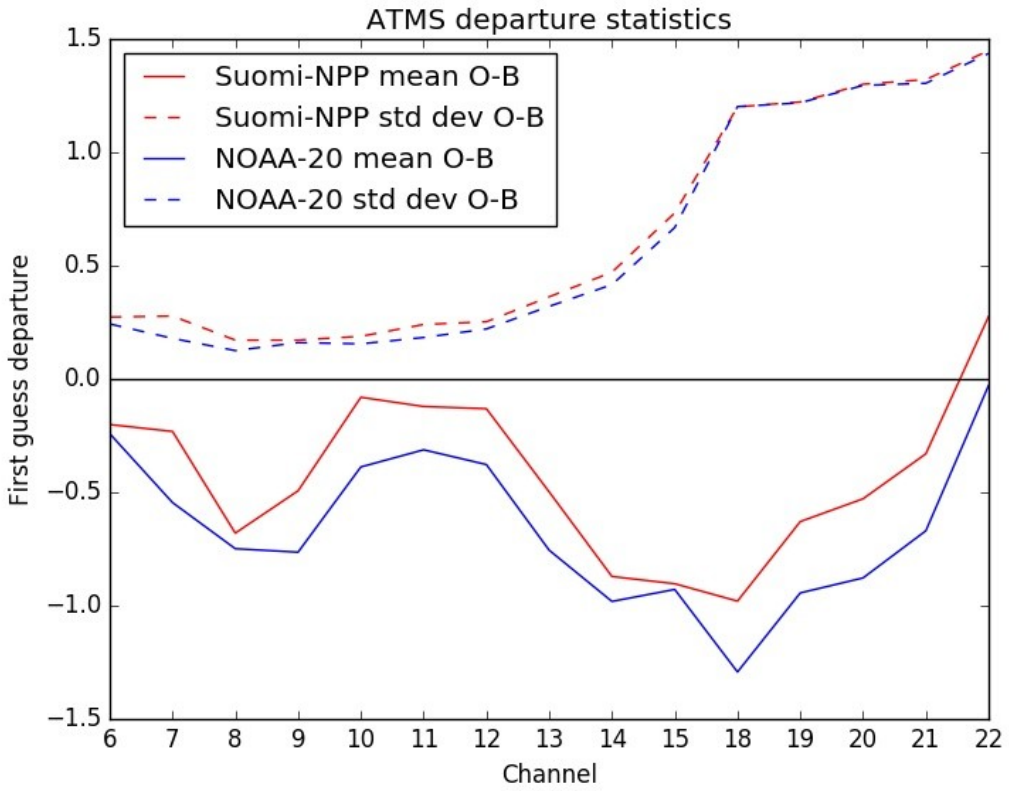


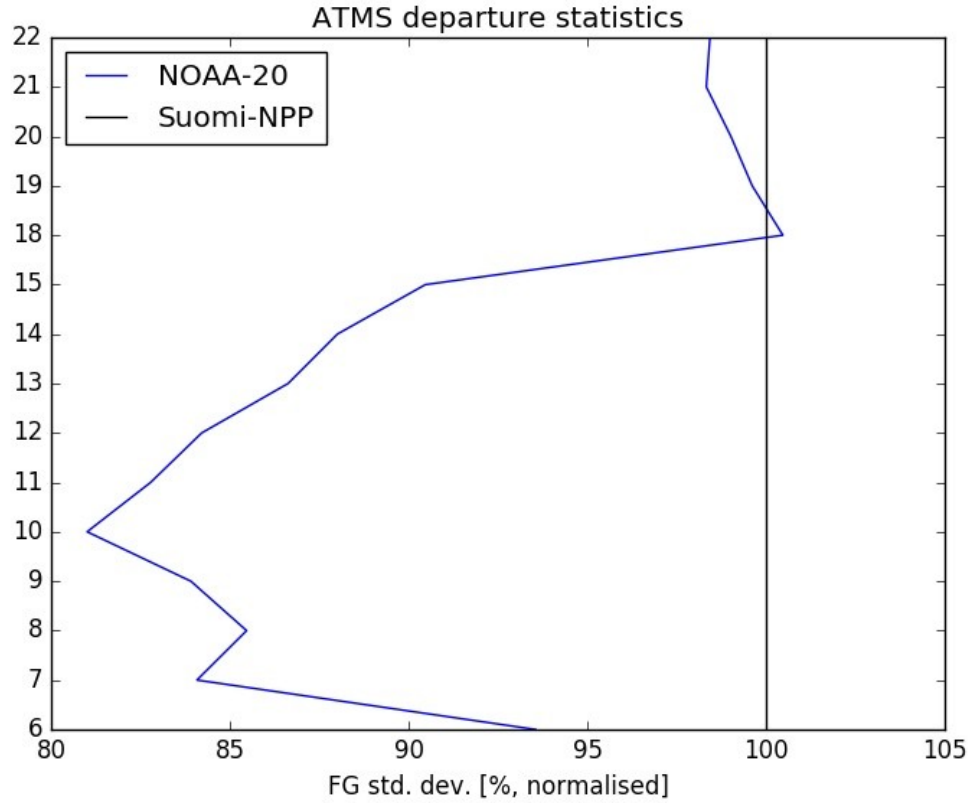
Pre-processing

- Most data presented are TDRs (before antenna pattern correction) but more on SDRs later
- 3x3 averaging makes data characteristics more similar to AMSU-A (spatial resolution, noise)
- Clear sky radiative transfer and retrieved emissivity over land and sea ice to calculate model equivalents in observation space
- Quality control includes cloud screening based on window channel first guess departures

Global first guess departure statistics: NOAA-20 v Suomi-NPP ATMS

- Biases are similar between the instruments
- Standard deviations of first guess departures are significantly smaller (>15% for some channels) for NOAA-20 than Suomi-NPP due to lower instrument noise

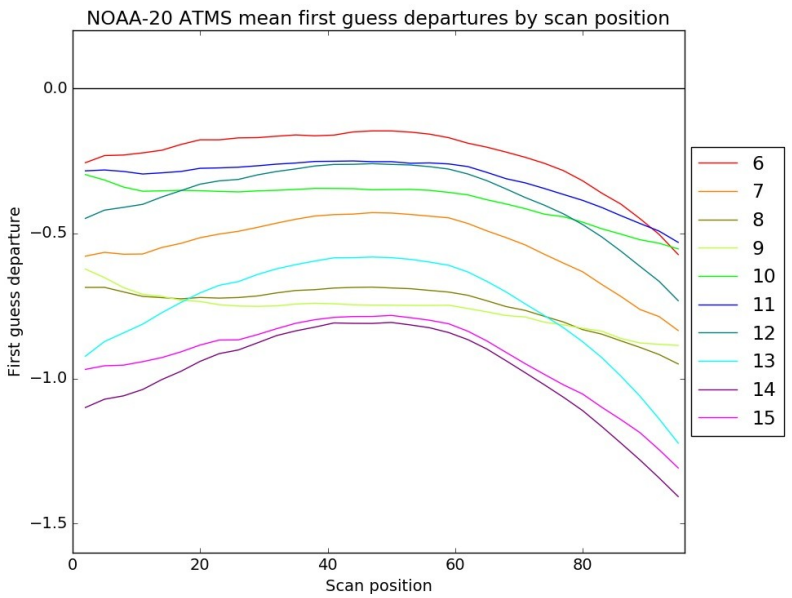


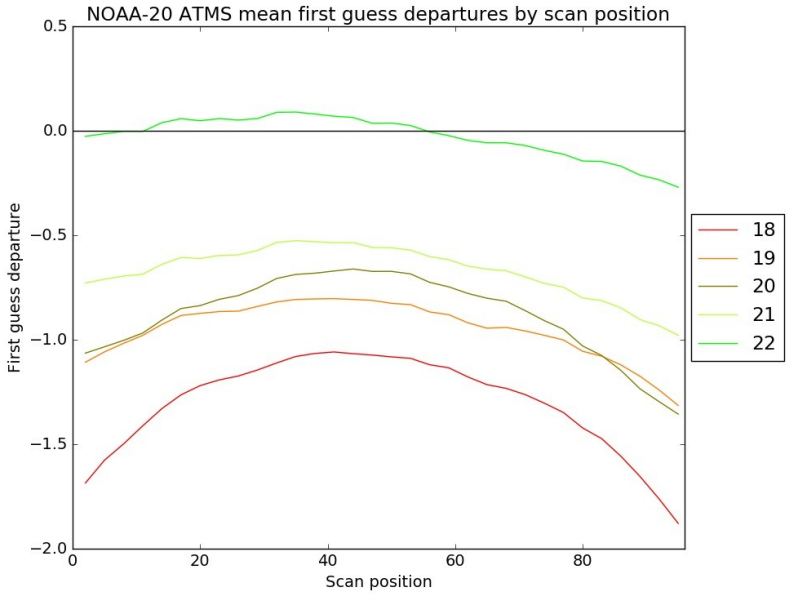


Scan dependent biases

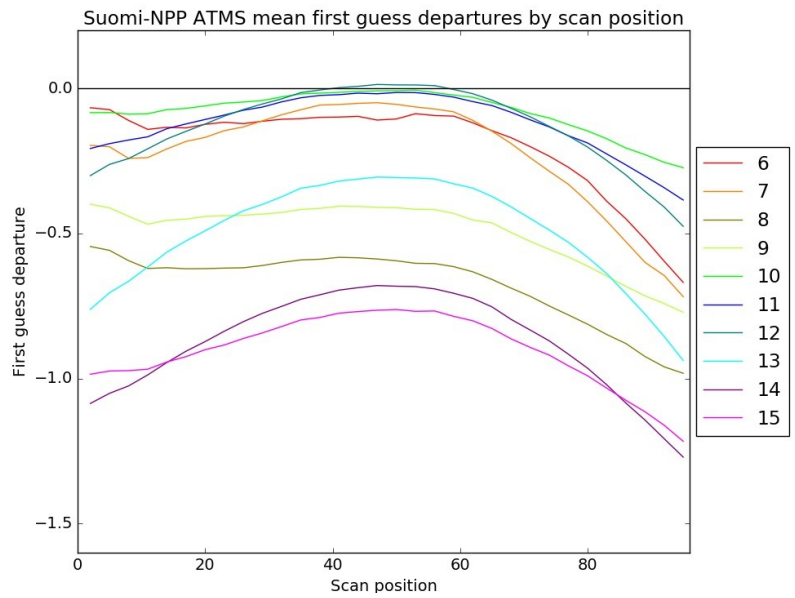
- Scan dependent biases are similarly symmetric for NOAA-20 and Suomi-NPP TDRs
- Magnitude of biases is slightly larger for NOAA-20

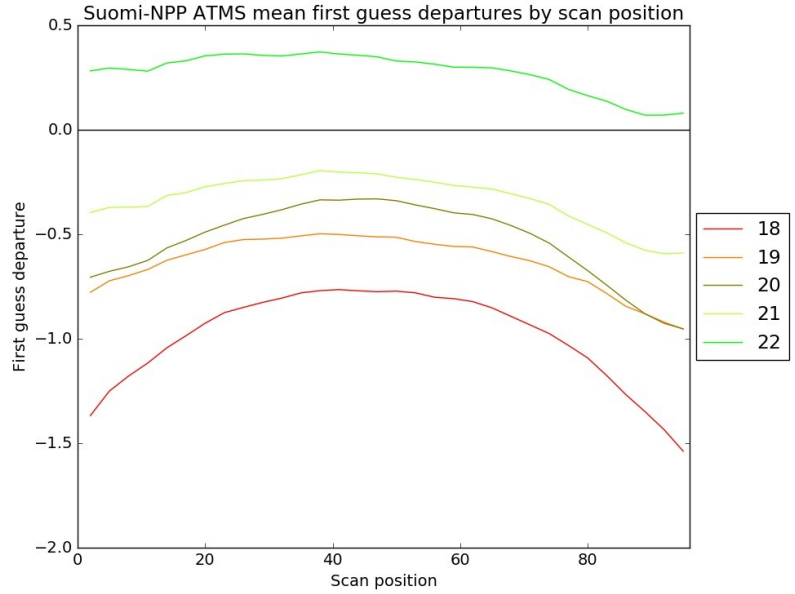
NOAA-20





Suomi-NPP

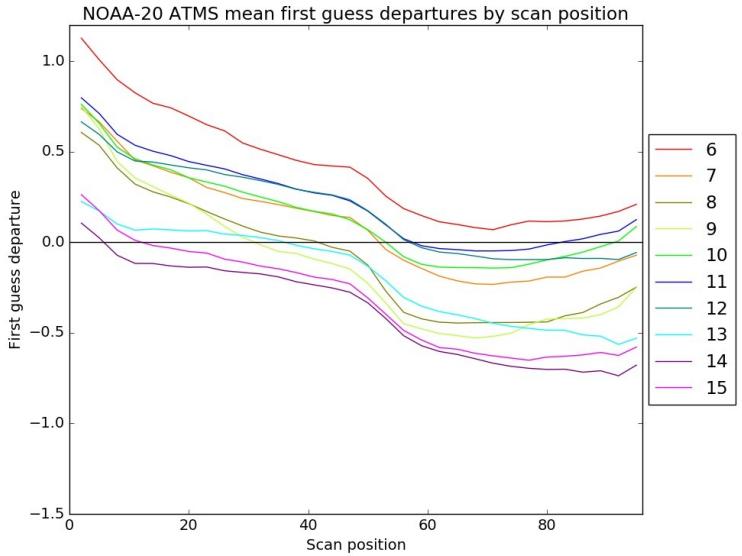




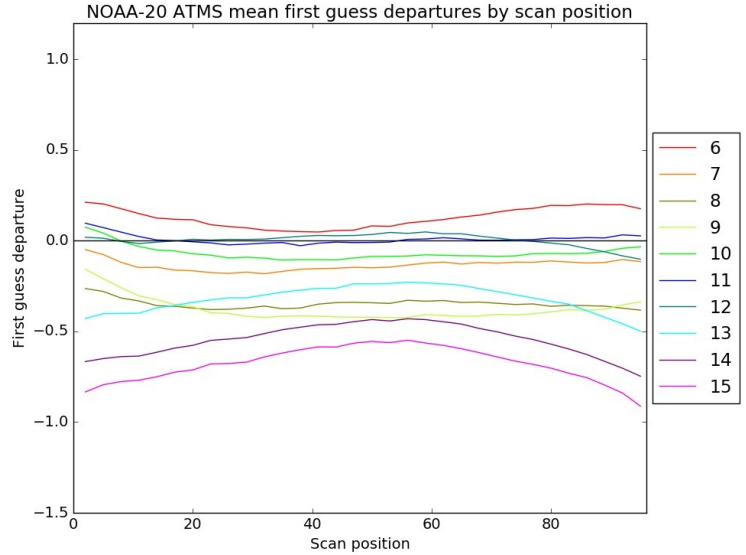
NOAA-20 ATMS TDR & SDR scan biases

- NOAA-20 updated SDRs have much more symmetric scan biases than NOAA-20 original SDRs
- NOAA-20 updated SDRs have more symmetric and smaller magnitude scan biases than NOAA-20 TDRs
- NOAA-20 updated SDRs have more symmetric and smaller magnitude scan biases than Suomi-NPP SDRs

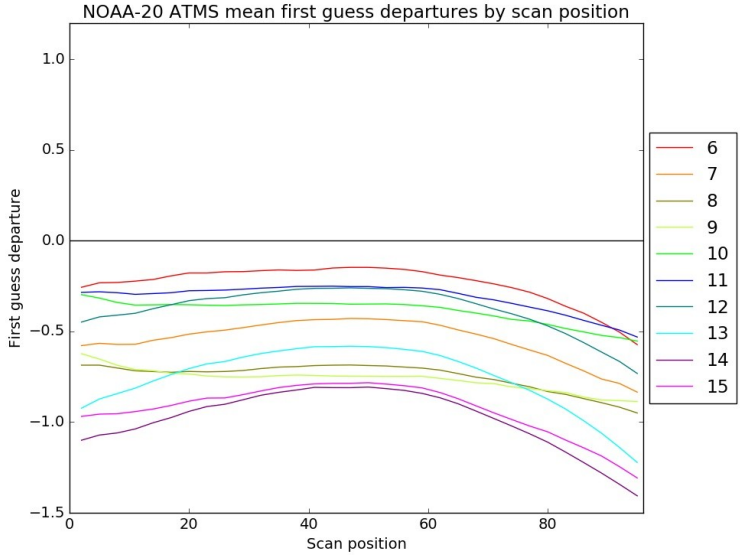
NOAA-20 original SDRs



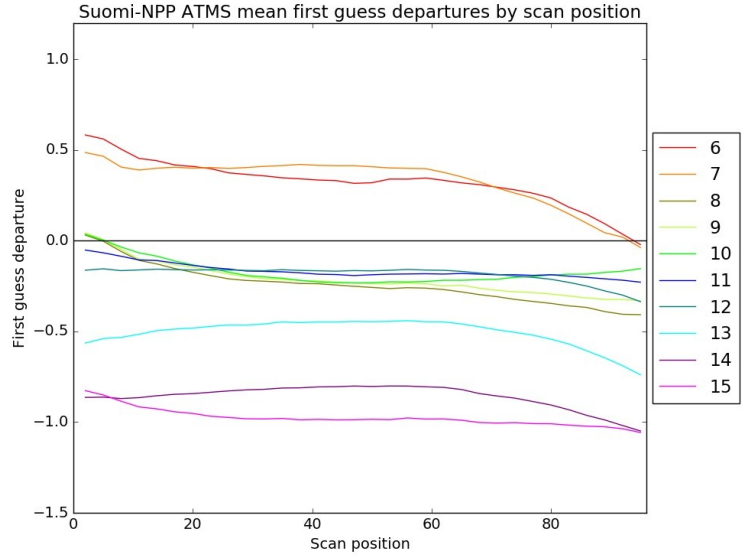
NOAA-20 updated SDRs



NOAA-20 TDRs



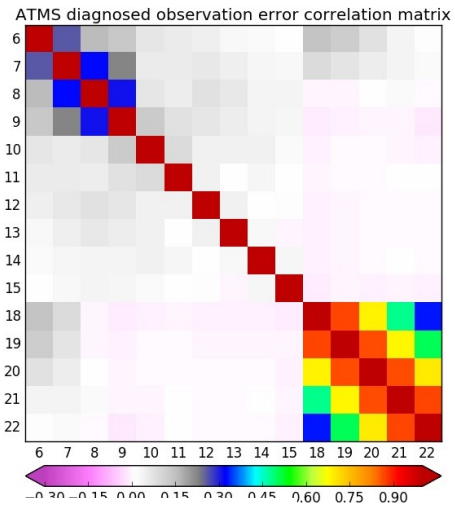
Suomi-NPP SDRs



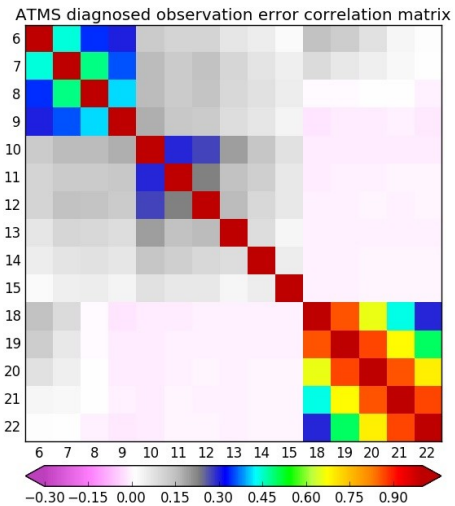
Striping and correlated instrument noise

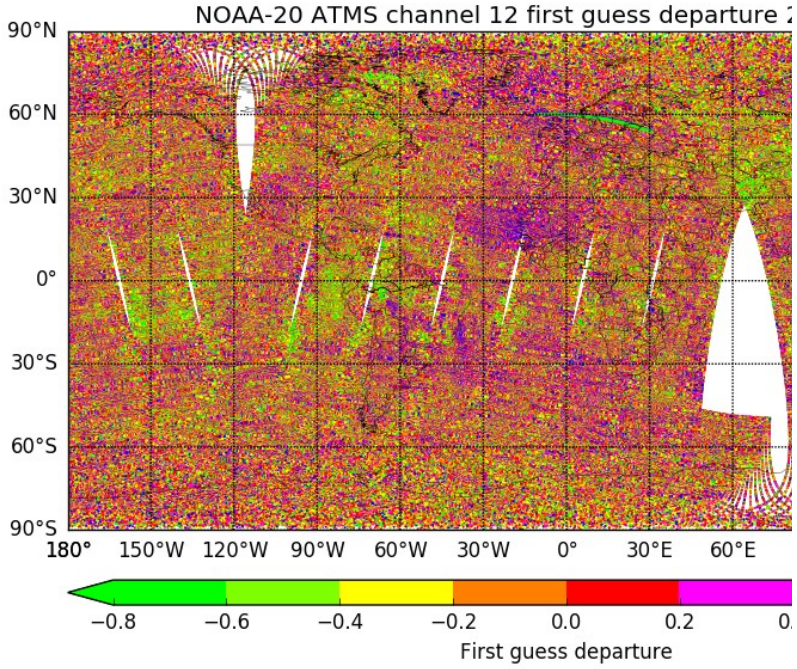
- Diagnosed inter-channel error correlations appear to be significantly weaker for NOAA-20 ATMS
- Striping is also reduced but not completely removed

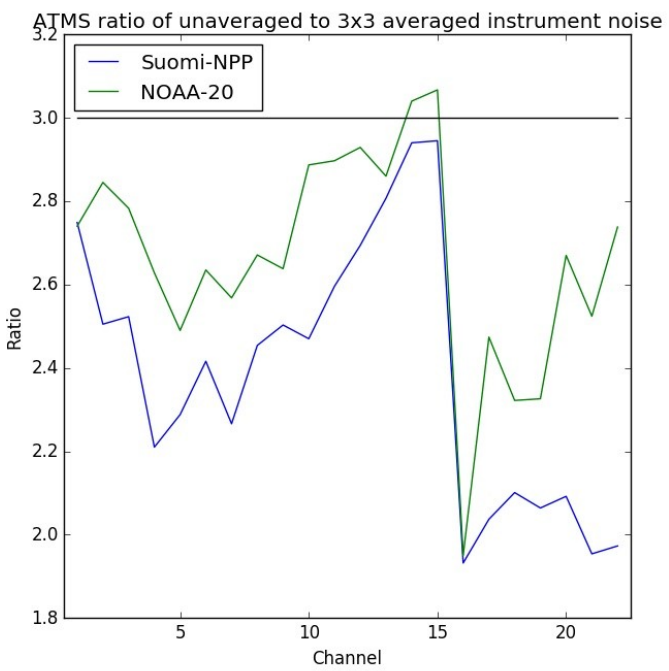
NOAA-20

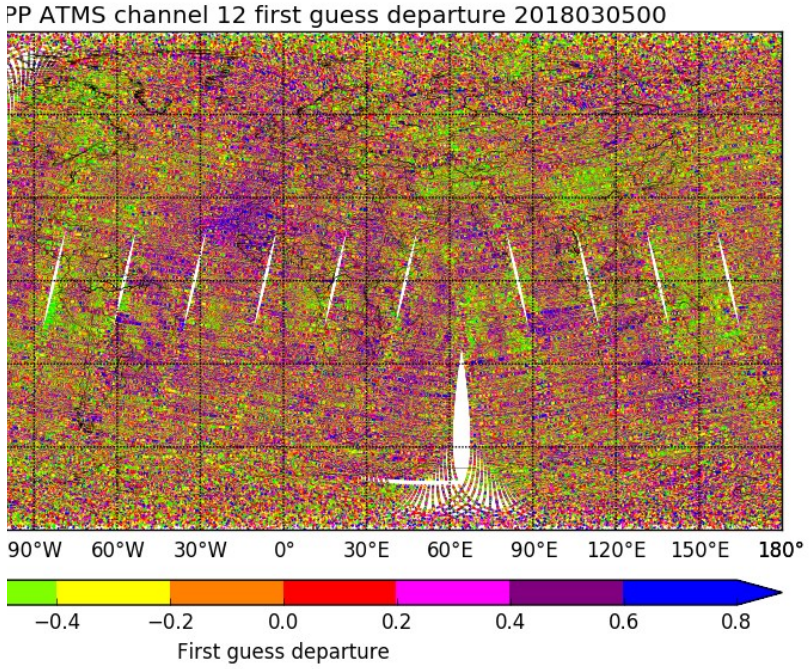


Suomi-NPP





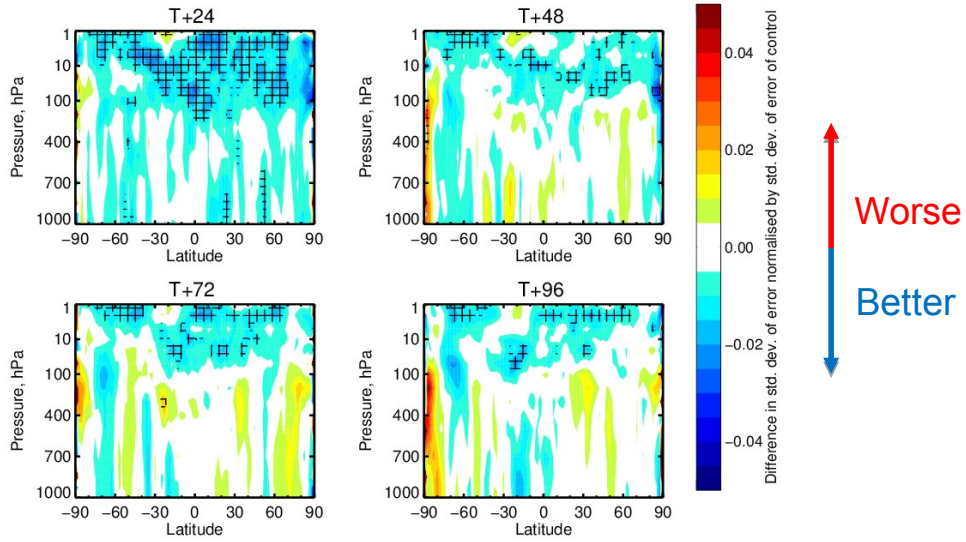




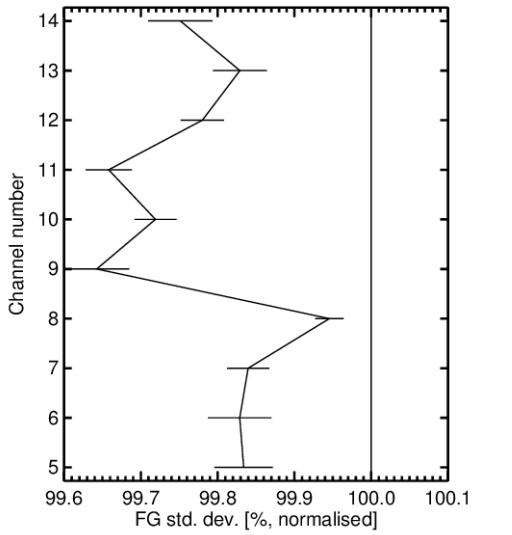
Assimilation experiment results – From three and half months

- Improved first guess fits to:
  - Temperature observations (AMSU-A, CrIS, GPSRO)
  - Humidity observations (MHS, GEO CSRs)
- Neutral to slightly positive forecast scores:
  - Improved geopotential height forecasts, particularly in the stratosphere

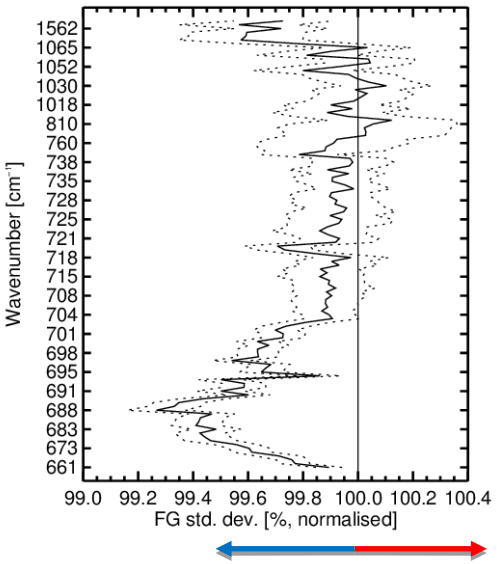
Change in RMSE of geopotential height forecasts



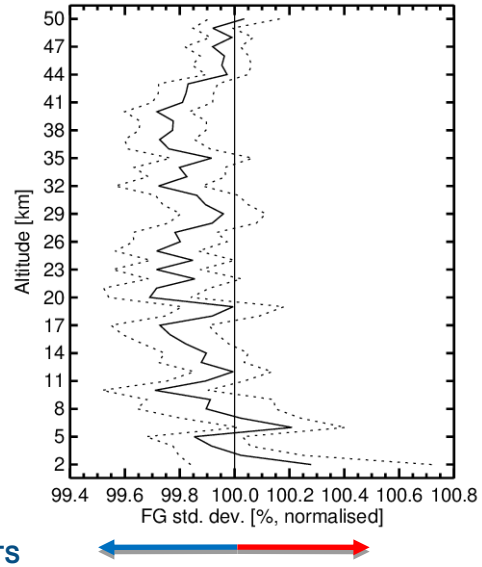
AMSU-A



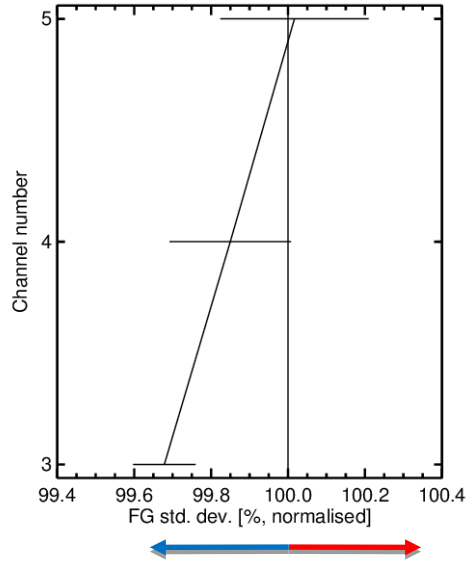
CrIS



GPSRO

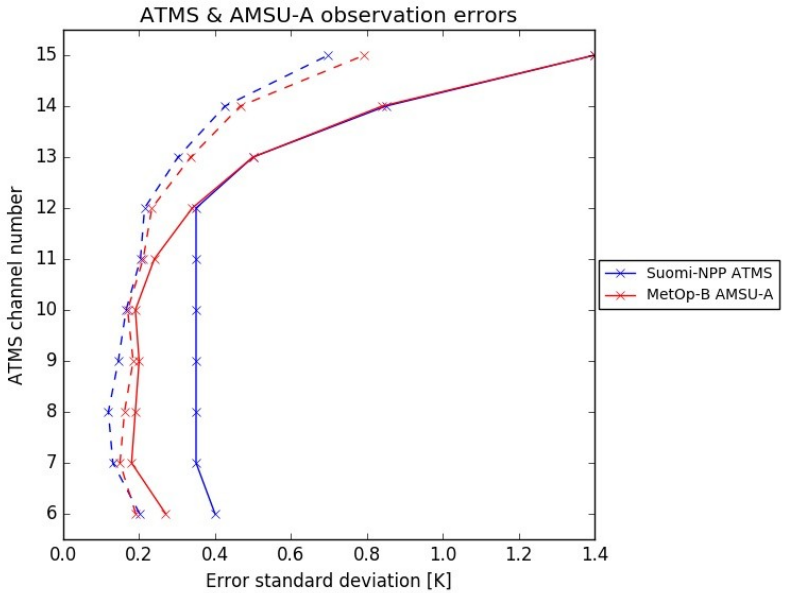


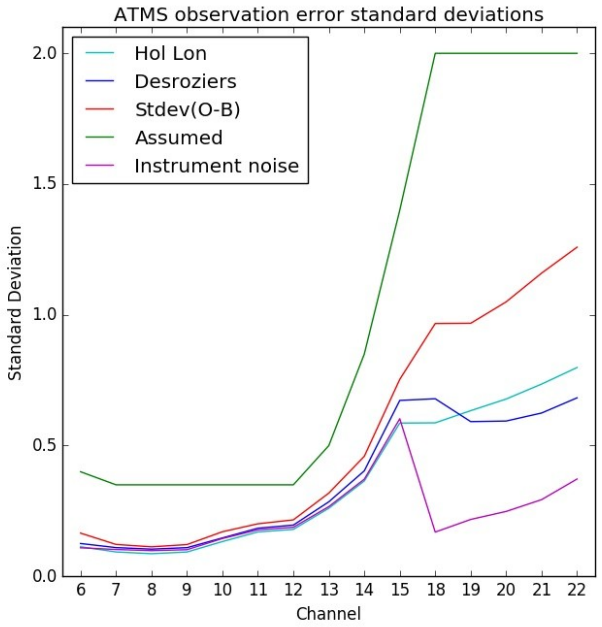
MHS

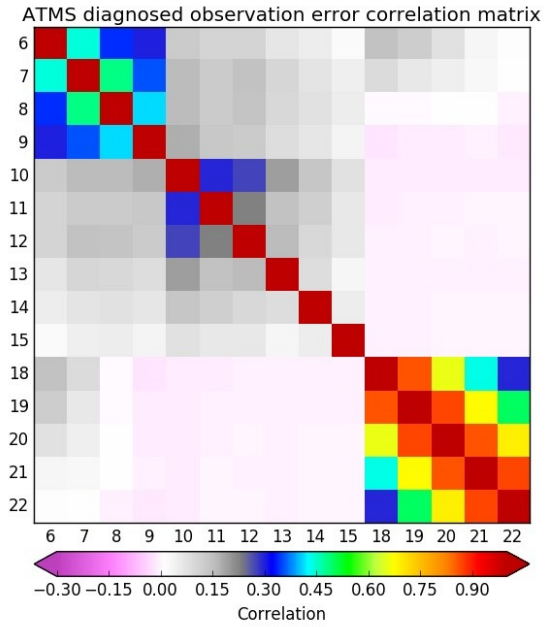


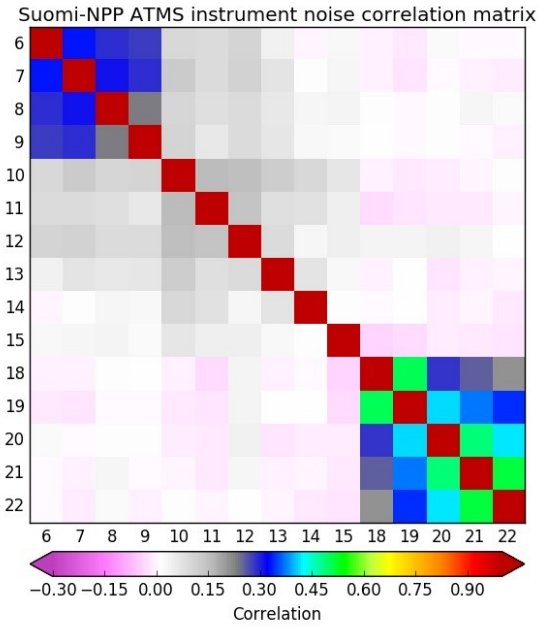
Suomi-NPP ATMS correlated errors

- Initial assumed observation errors for Suomi-NPP ATMS were uncorrelated and inflated due to correlated instrument noise
- Since then forecast improvements have been attained by accounting for correlated errors directly (e.g. for IASI, CrIS)
- Diagnose error standard deviations and correlations using Hollingsworth-Lönnberg and Desroziers' methods







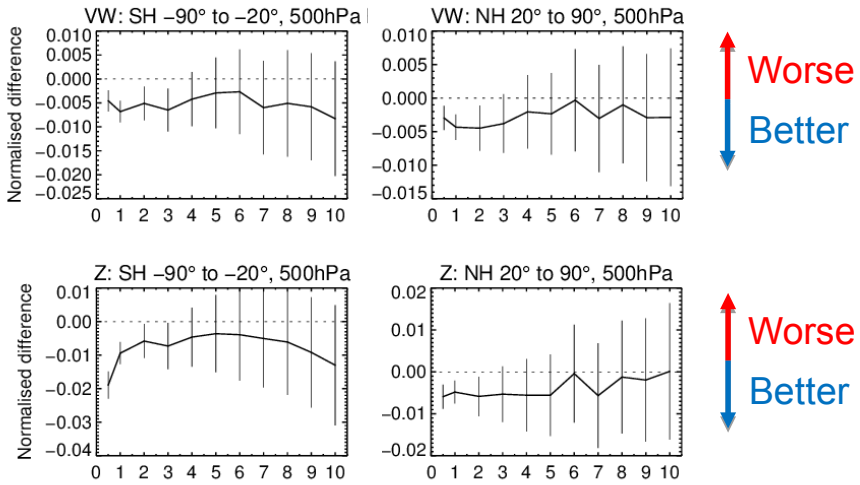


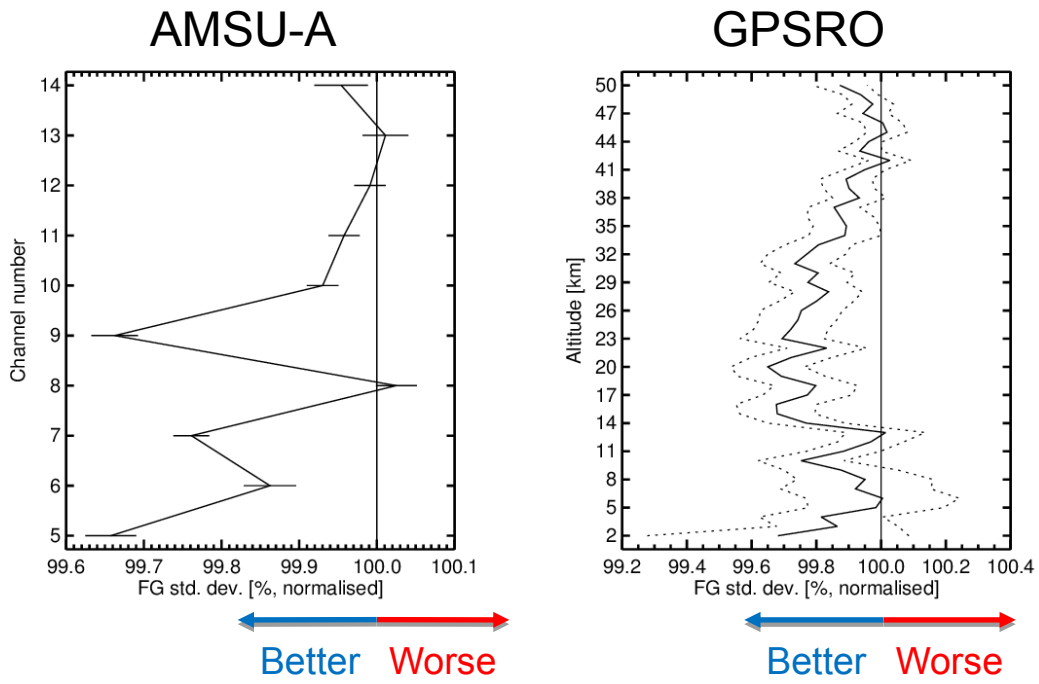
Thanks to Vince Leslie for the instrument noise correlation matrix

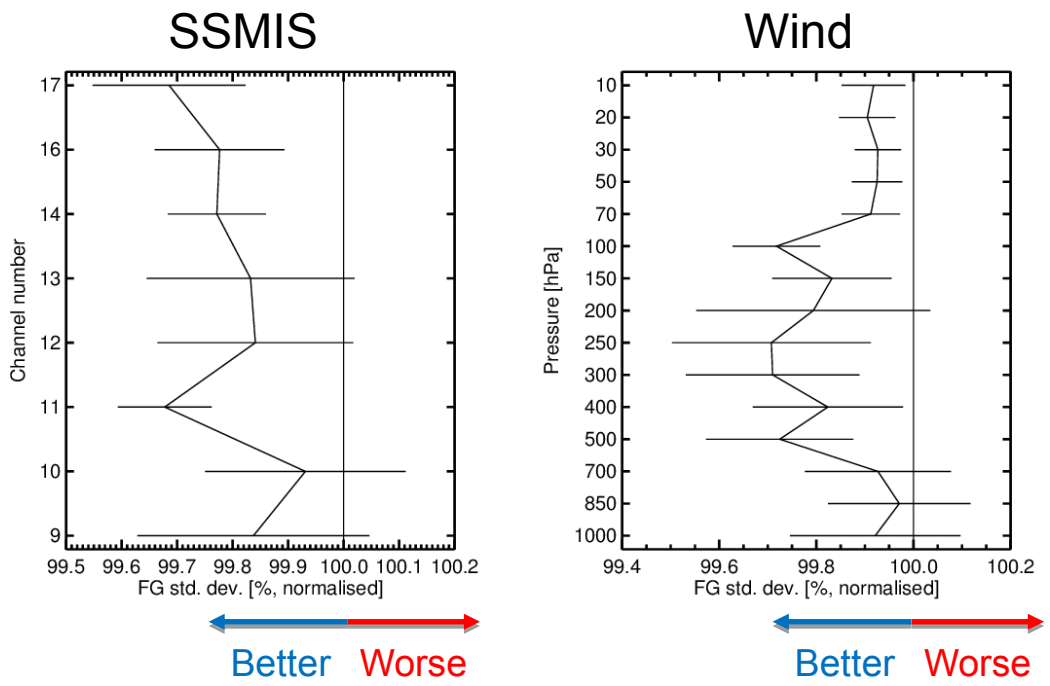
Results

- Several inflation factors were tested, x1.75 gave optimal results
- Improved first guess fits to temperature, humidity and wind observations
- Improved extra-tropical forecasts of geopotential height, temperature and vector wind to day 3

Change in RMSE of vector wind (top) and geopotential height (bottom) forecasts

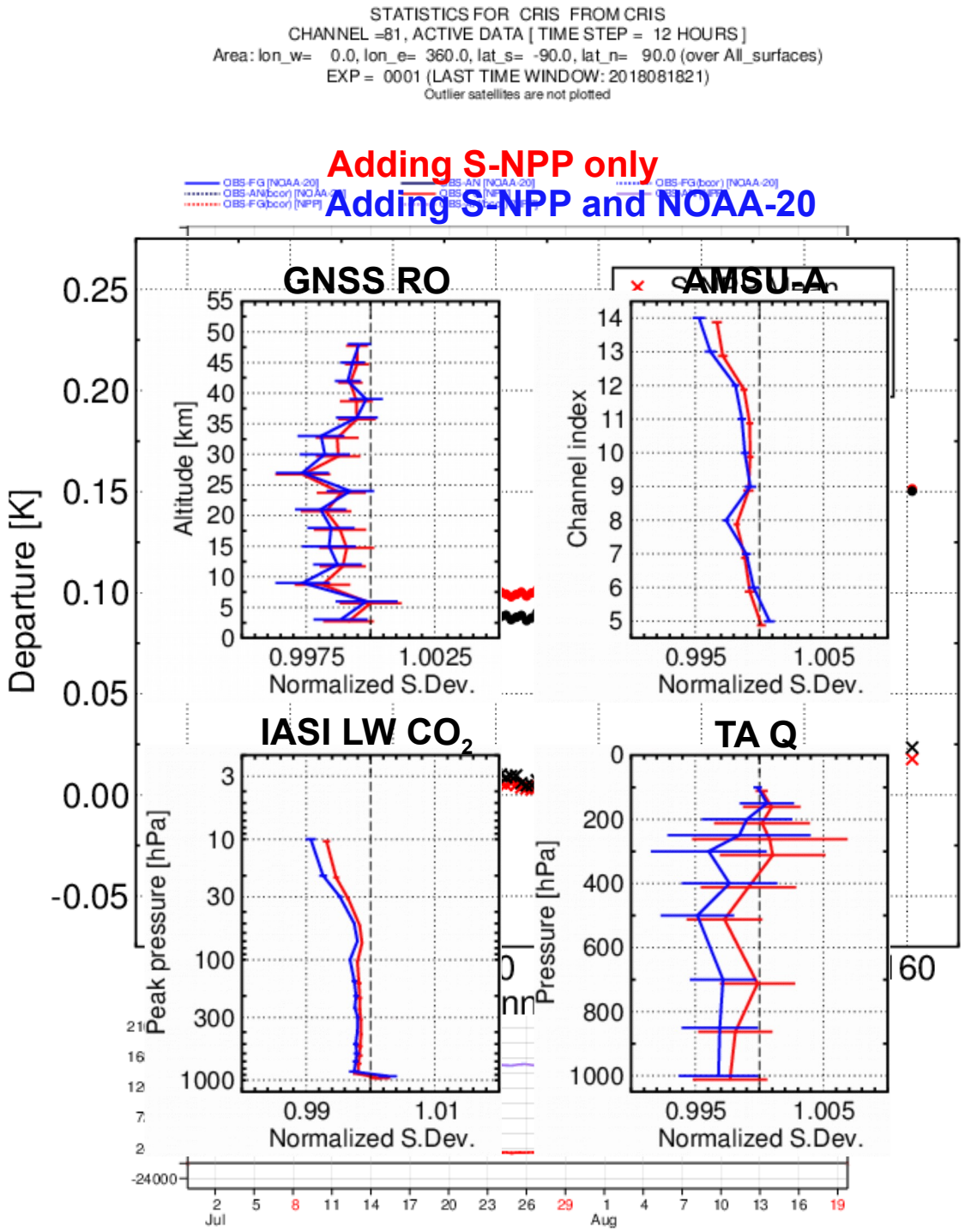






NOAA-20 CrIS update (Reima Eresmaa)

- Using 111 LWIR channels (We use 118 Suomi-NPP CrIS channels)
  - No humidity sounding channels or aerosol detection
  - Due to ongoing performance issues with new RTTOV coefficients
- Operational monitoring from 1st August 2018
  - Slightly different biases to Suomi-NPP CrIS
  - Lower noise than Suomi-NPP CrIS
- Research experiments from 1st May 2018
  - Incrementally improved first guess fits
  - Neutral forecast scores so far
- Operational assimilation to be introduced soon

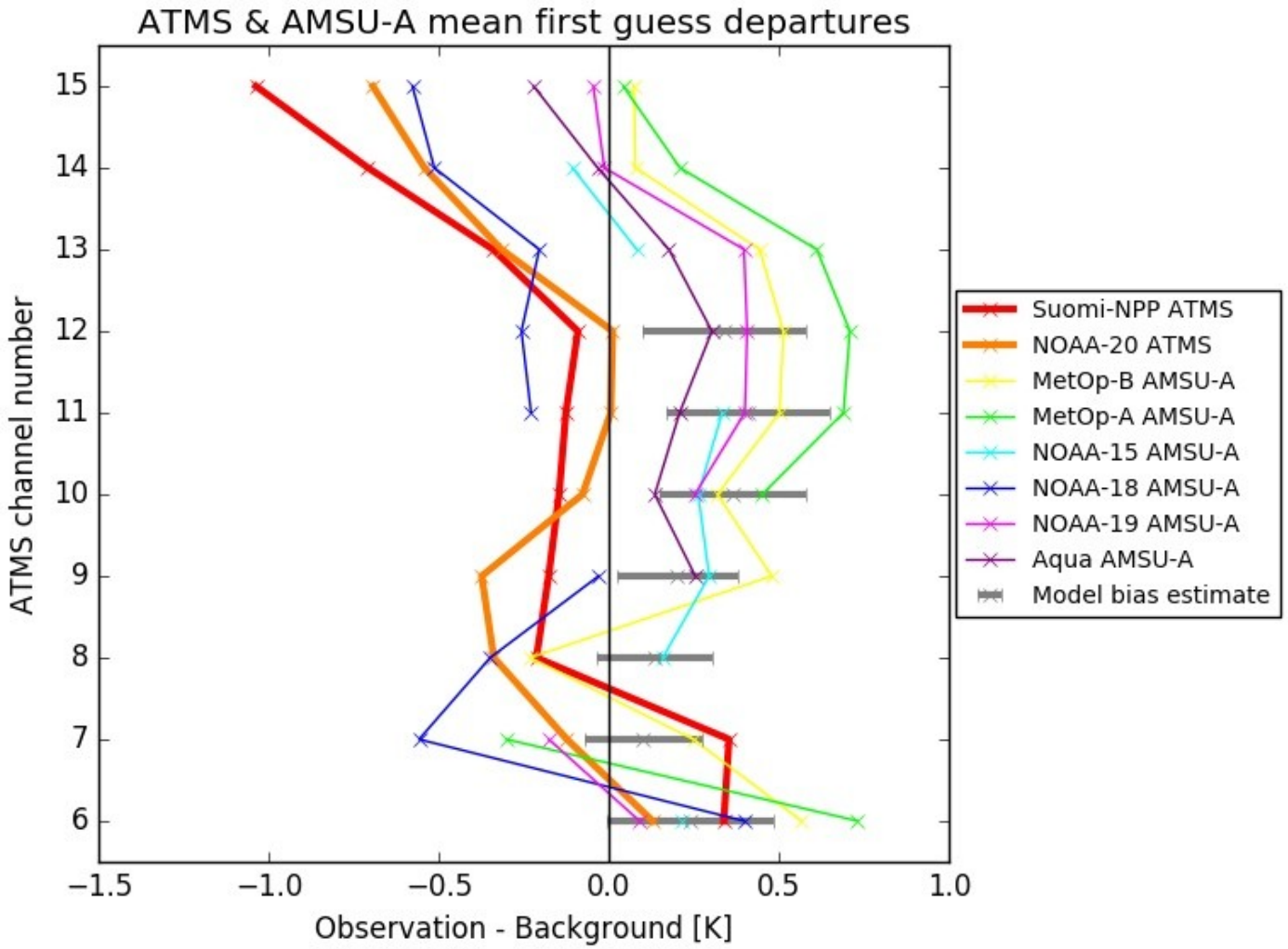


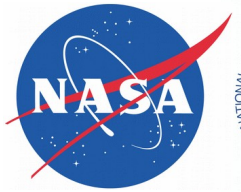
Conclusions and future work

- NOAA-20 ATMS:
  - Data are of very good quality with comparable biases to Suomi-NPP and significantly lower and less correlated noise
  - Assimilation experiments lead to improved forecasts of geopotential height, temperature, humidity and wind particularly in the stratosphere
- Suomi-NPP ATMS correlated errors:
  - Correlated instrument noise and representation errors can be taken account of directly allowing more weight to be given to the data
  - Results show significant improvements to short-range temperature, humidity and wind forecasts as well as medium-range wind and geopotential height forecasts
- Ongoing work includes:
  - The use of correlated errors for NOAA-20 ATMS
  - Implementation of operational assimilation of NOAA-20 CrIS
  - Investigation of benefits of increased temporal frequency of ATMS observations e.g. for tropical cyclones

ATMS and AMSU-A biases (after antenna pattern correction)

- NOAA-20 ATMS biases consistent with Suomi-NPP ATMS biases at cold end of AMSU-A “pack”
- Grey points and uncertainty bars indicate GRUAN estimated IFS model biases





2019 JPSS STAR Annual Meeting

Algorithm Management Project Update

Arron L. Layns
Algorithm Management Project Lead

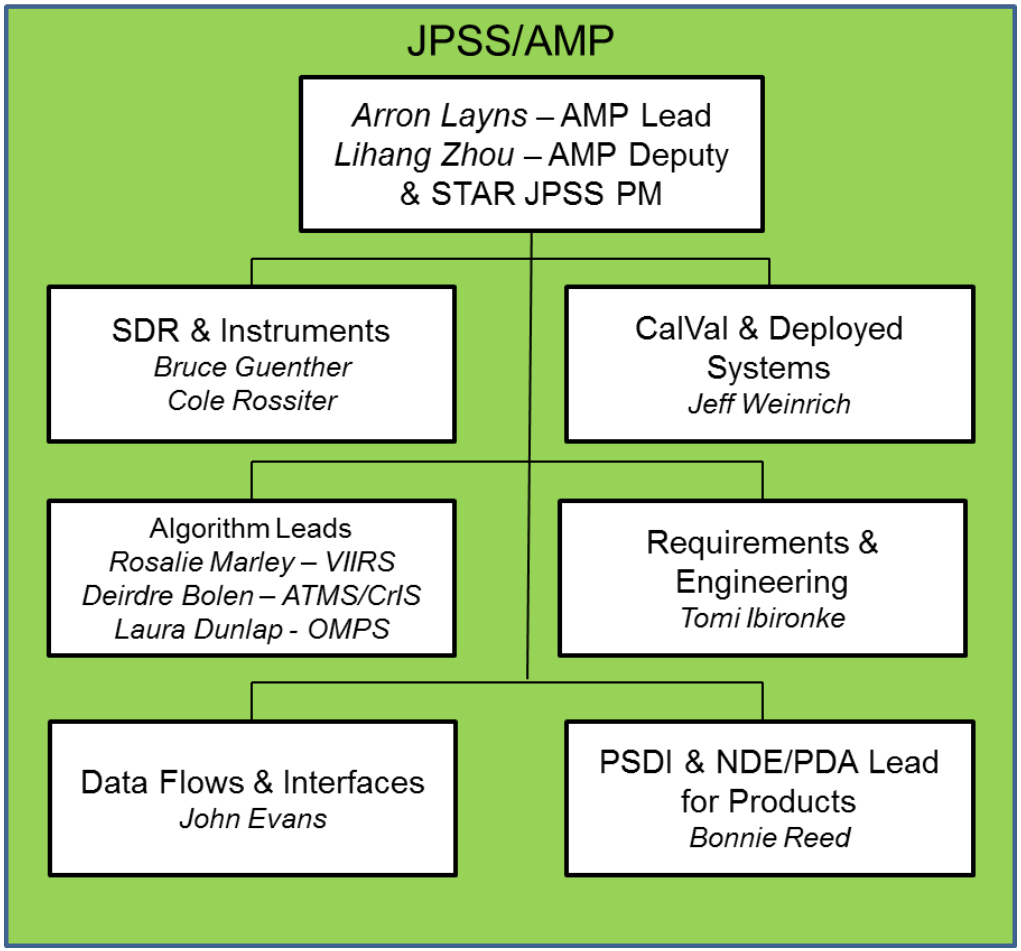
August 27, 2018

Agenda

- Organizational Update
- Priorities
- Lessons Learned

Organization

- On August 1, 2018, JPSS established the Ground Segment Project led by Heather Kilcoyne
- AMP and the associated JSTAR activities are now part of the JPSS Ground Segment Project



Strategic Priorities (1 of 2)

- **S-NPP in the Long-Term Monitoring Phase of the Cal/Val Process**
  - Sensors and their related products are mature and stable
  - Need to complete the Enterprise EDR migration to NDE including operationalizing the remaining EDRs and turning off production/distribution/archive of the IDPS-generated EDRs
    - OSPO notified all ESPC users in July 2018 that distribution of the S-NPP EDRs generated by IDPS (with the exception of VIIRS Imagery EDRs) will cease on December 31, 2018.
  - Maintenance updates should continue to address sensor variability and/or degradation
- **NOAA-20 in the mature stages of the Intensive Cal/Val Phase**
  - Progress through the maturity phases is progressing well.
  - Continuing to work with OSPO and ESPDS to operationalize the N20 algorithms through the monthly algorithm builds on NDE.

Strategic Priorities (2 of 2)

- **JPSS-2 is in development phase**
  - Continue to closely engage with Flight Project and Project Science Teams during sensor build and development phases
    - VIIRS sensor characterization nearing completion
    - ATMS, CrIS, and OMPS environmental testing coming up in 2018-2019
    - AMP closely monitors all Flight risks with potential science data quality impacts (e.g., waivers)
    - AMP/STAR is invited to all Instrument PMRs and has access to all applicable materials
  - Plan and schedule any J2 code change or table deliveries.
- **Algorithm enhancements/improvements**
  - Must be submitted through the DRAT for IDPS
  - Can be done through maintenance releases for NDE assuming the change does not significantly change the processing requirements or require >160 hours of OSPO time to implement. Otherwise, submit through SPSRB user request.
  - Known changes being tracked by JPSS:
    - Remove CrIS Truncated Spectral Resolution processing (only maintain the Full Spectral Resolution processing)
    - Remove dependency on gridding software for OMPS SDR
    - Add terrain correction to the VIIRS Imagery EDRs
    - Add VIIRS Imagery EDRs for all 16 M bands (beyond the 6 that are produced today)

Lessons Learned

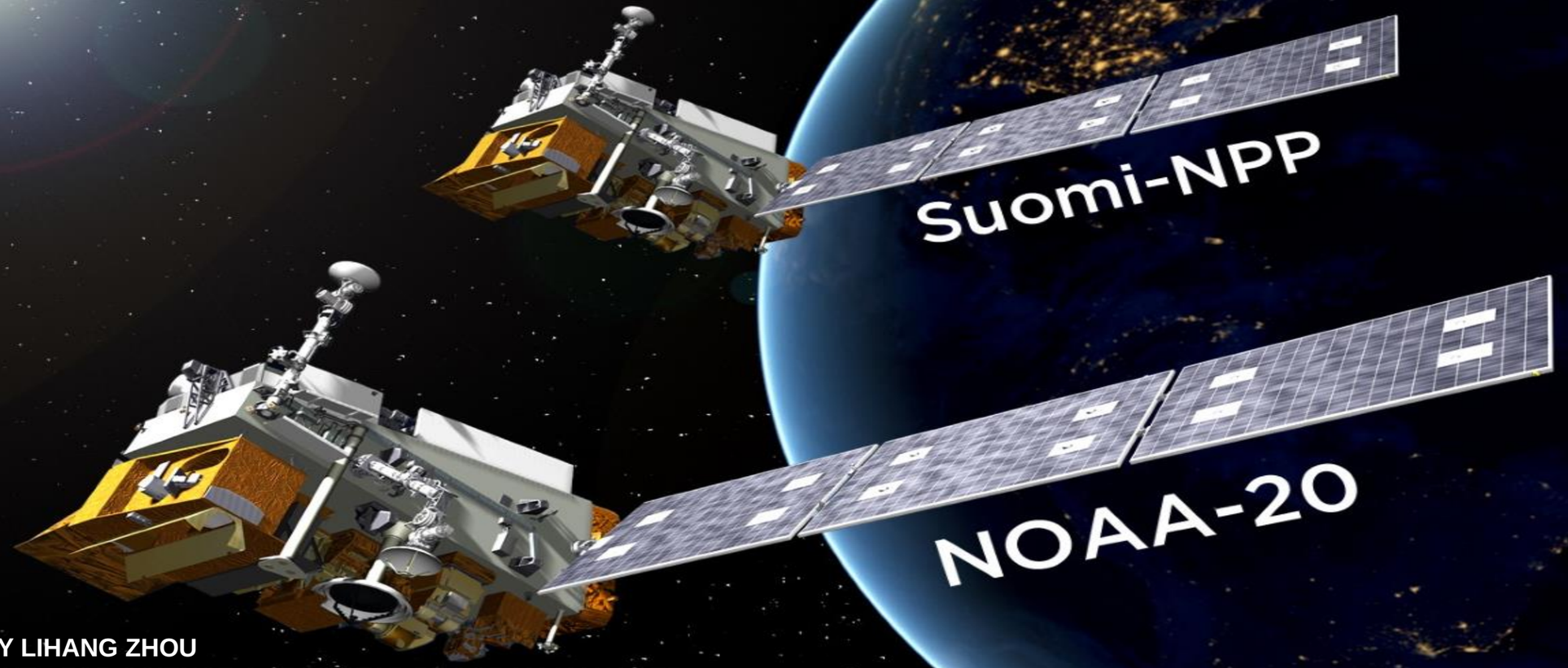
- AMP/STAR submitted lessons learned to Ground Segment Project for incorporation into overall Ground and Flight , where applicable, Lessons Learned
  - Staging the algorithms: Recommend all “J2-ready” SDR and EDR algorithms be staged on IDPS or NDE strings in time for the J2 test events or data flows
  - Pre-launch Test Data Flows: Recommend JPSS-2 test data be flowed through all RDR/SDR/EDR algorithms on IDPS and NDE at least 2 times prior to J2 launch
  - Instrument information: Recommend early access to potential instrument performance waivers and sensor-specific values needed for ground tables
  - Flight coordination: Recommend participation in instrument PMRs and review of Flight CCRs
  - Ground Schedule Coordination
    - Plan further in advance any J2 (or other) algorithm (code) changes with IDPS, DPES, and RTN
    - Improve post-launch algorithm change process to enable quick algorithm changes, if needed, quickly after launch
  - HRD: Recommend pre-launch HRD test data be provided to the HRD user community such as UW and DRL
  - Geolocation: Recommend verification of time difference protocols

All lessons learned were accepted by the Ground Segment

Summary

- JPSS will continue to support the end-to-end product lifecycle for all JPSS missions.
- The past year has seen real success in getting the N20 KPPs to operation very efficiently.
- Over the next year, the focus for AMP/STAR should be:
  - maintaining SNPP
  - completing the calval and product operationalization for N20
  - prepping for J2, including applying lessons learned to future missions.

JPSS-STAR (JSTAR) Program Updates



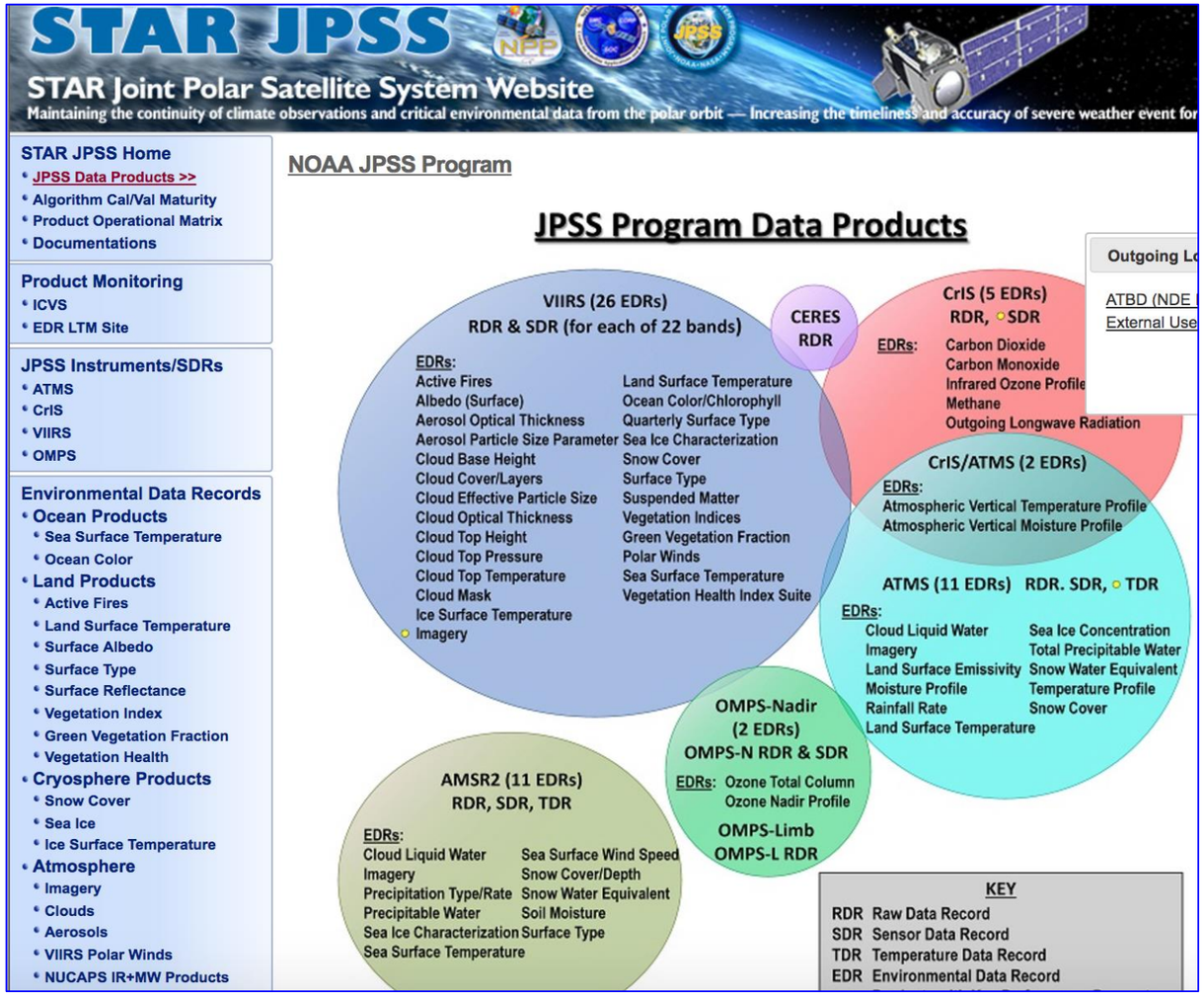
PRESENTED BY LIHANG ZHOU
JPSS AMP DEPUTY FOR SCIENCE & JPSS STAR PROGRAM MANAGER
NOAA/NESDIS/CENTER FOR SATELLITE APPLICATIONS AND RESEARCH (STAR)

CONTRIBUTIONS FROM MURTY DIVAKARLA, XINGPIN LIU, TOM ATKINS, TESS VALENZUELA
MEMBERS OF JPSS STAR SCIENCE TEAMS
JPSS PROGRAM SCIENCE
JPSS ALGORITHM MANAGEMENT PROJECT (AMP)
ARE THANKFULLY ACKNOWLEDGED

JPSS STAR (JSTAR) Program

Goal: To provide *robust, affordable, and flexible state-of-art* scientific solutions to meet JPSS requirements

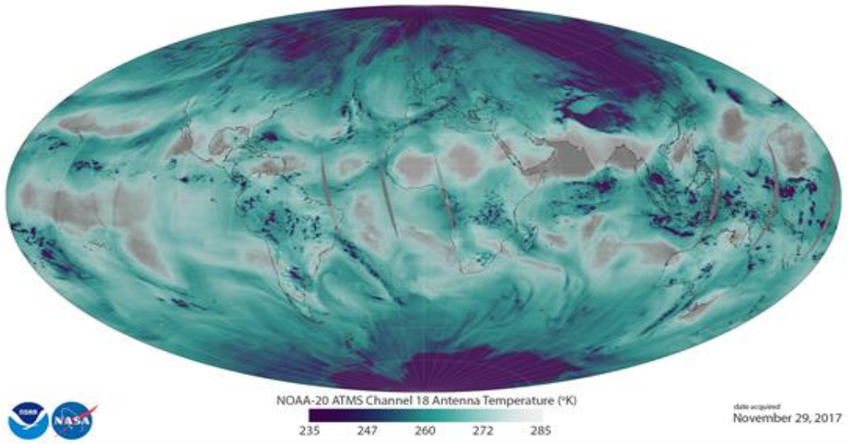
- Leverage hundreds of scientists from NOAA, NASA, DOD, and NOAA's Cooperative Institutes (University partners) and Industry Partners
- Apply first-hand knowledge of algorithms and Cal Val, developed in POES, GOES, DMSP, EOS, MetOP, and GOES-R, for JPSS Program
- Work closely with JPSS Program Science, Algorithm Management Project (AMP), STAR ASSISTT, and all other elements/partners to ensure the developments meet the users' requirements, and efficient science to operation transitions
- Facilitate science consistency across systems
  - Enterprise Approaches (same science for multiple observation platforms)
  - Reprocessing capabilities
  - Blended products for users applications
  - Consistent Cal Val tools for science monitoring and maintenance



Well calibrated/validated, high quality datasets is the foundation for all applications

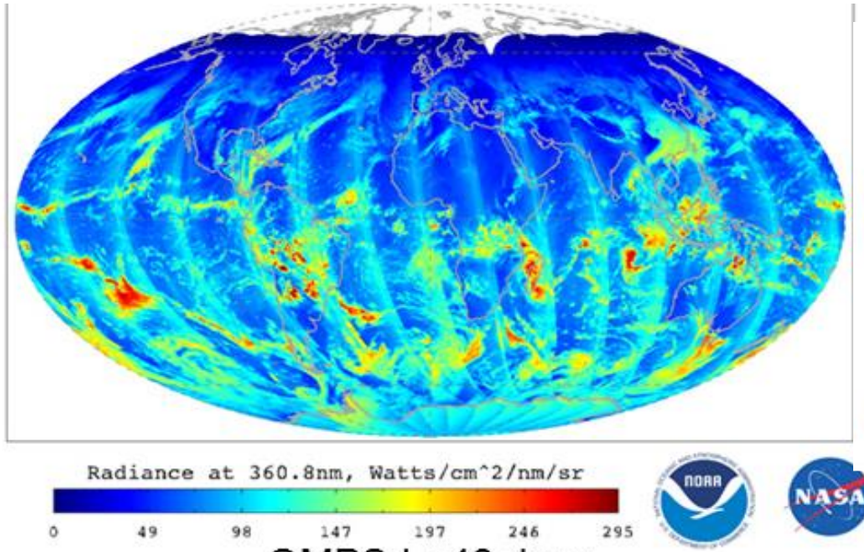
NOAA-20 (N20) Cal Val Updates

- N20 Launched: Nov. 18 2017
- N20 Post Launch Cal Val Highlights:
  - ✓ ATMS SDR/TDR Beta: Dec. 2017
  - ✓ Key Performance Parameters (KPPs) Beta: Jan 2018
  - ✓ KPPs Provisional (Ready for Operation): Feb. 2018
  - ✓ KPPs declared operational: March 2018
  - ✓ Key EDRs Provisional* (SST, Aerosols, Active Fire, MIRS): April 2018
  - ✓ N20 data used in NWS GFS model; Ozone Beta; Integrated Calibration and Validation System (ICVS) fully functional and public released: May 2018
  - ✓ ATMS, VIIRS SDRs Validated; NUCAPS T/Q Provisional: June 2018
  - ✓ Clouds, SFR, LST/LSA Beta: July 2018
  - ✓ Imagery EDRs Validated; Vegetation Beta: August 2018

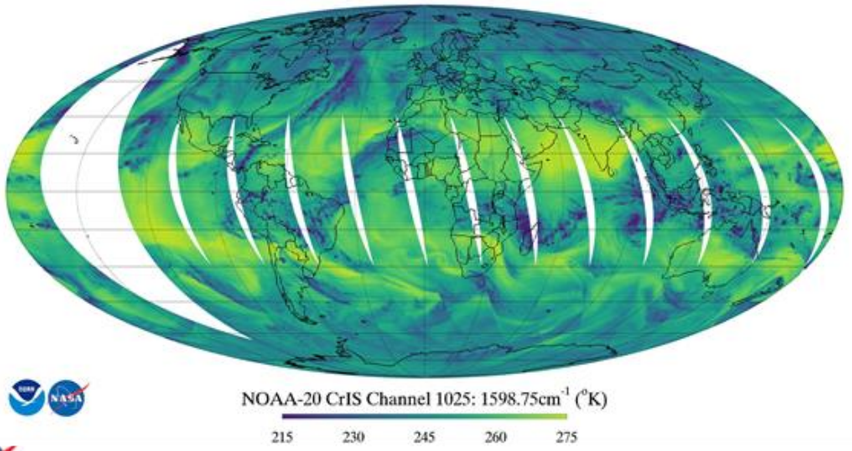


ATMS L+11 days

VIIRS L+25 days



OMPS L+48 days

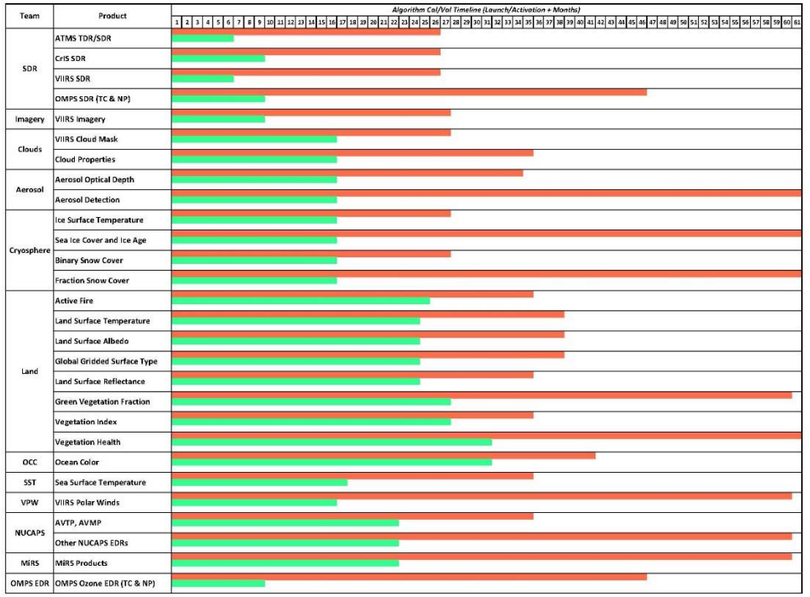


CrIS L+48 days

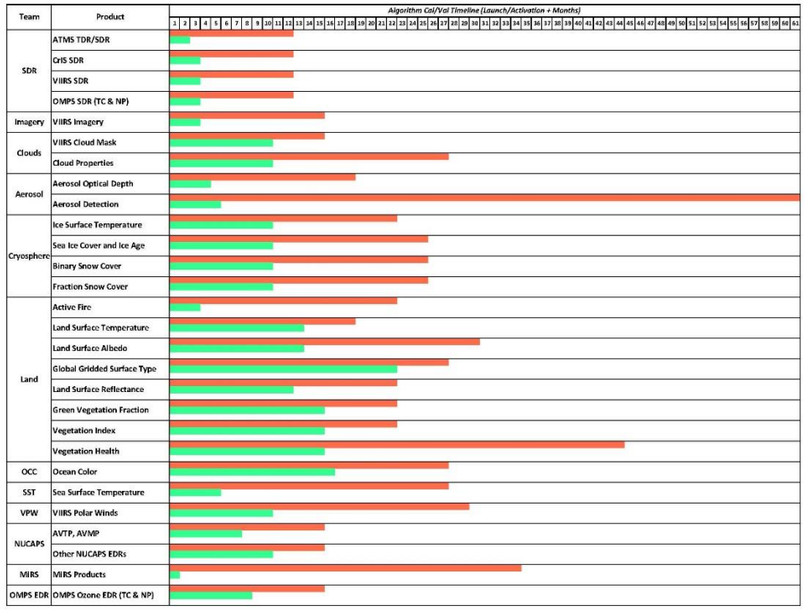
S-NPP/NOAA 20 Cal Val Maturity

Algorithm enhancements and improvements based on user needs; enterprise algorithms

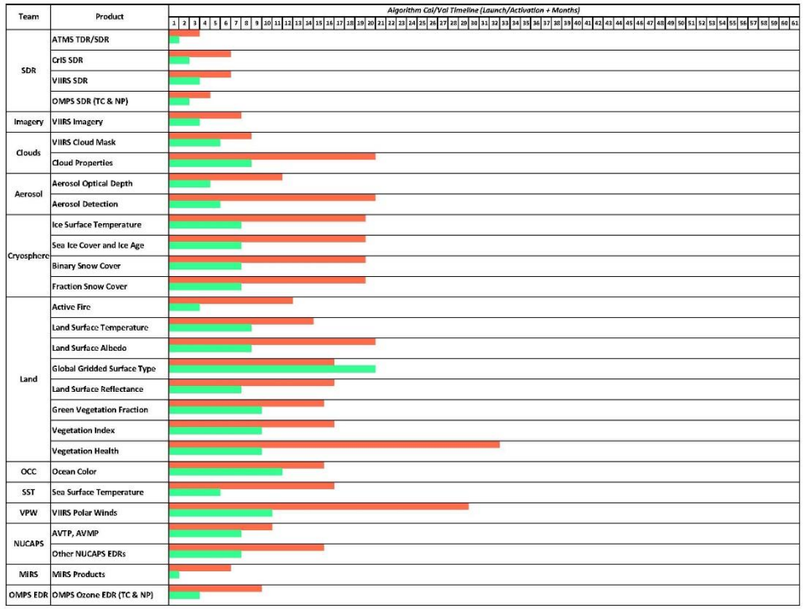
S-NPP **Validated** N-20



S-NPP **Provisional** N-20

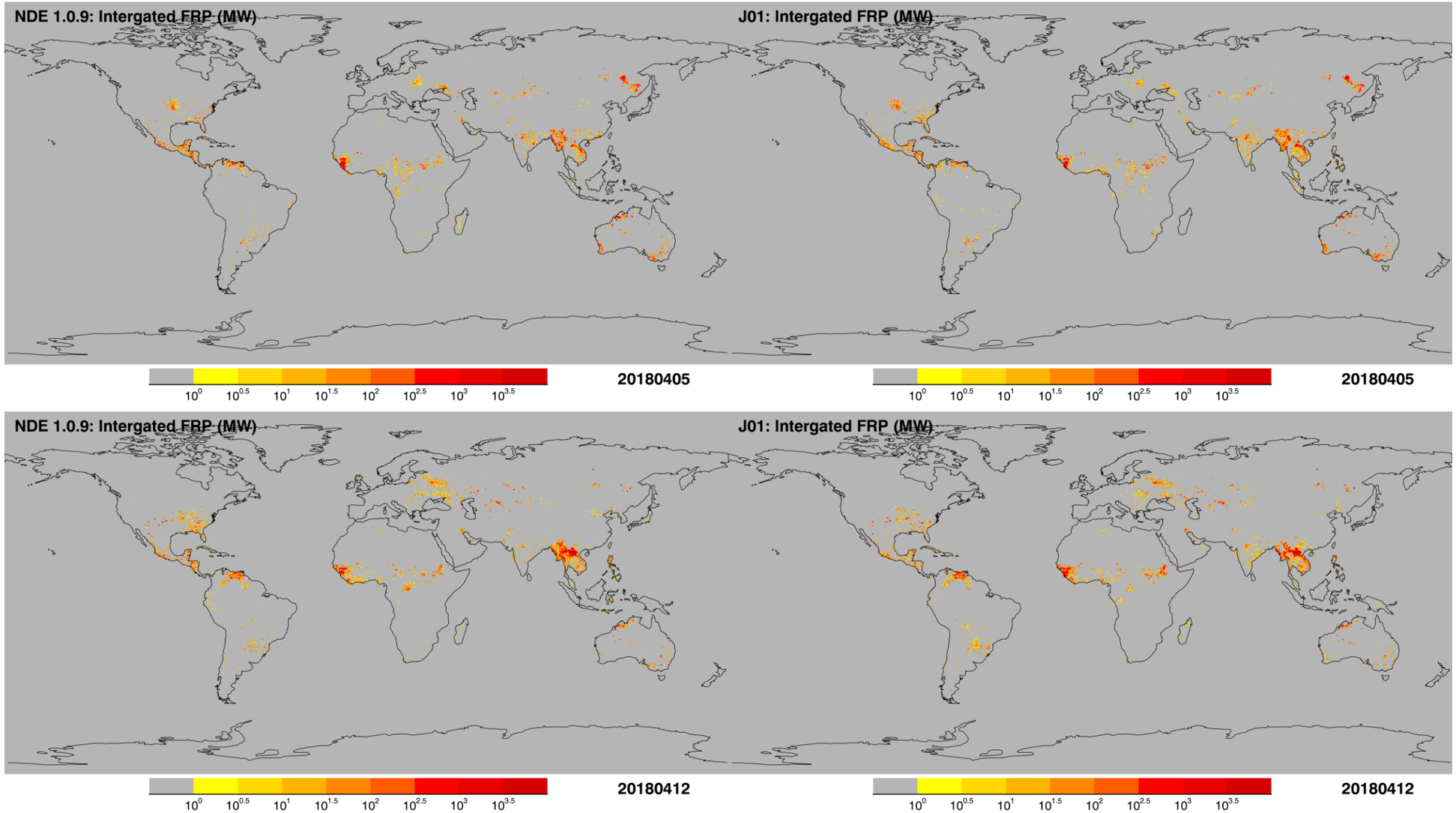


S-NPP **Beta** N-20



Lessons learned from the S-NPP experience helped expedite N-20 Cal/Val Maturity

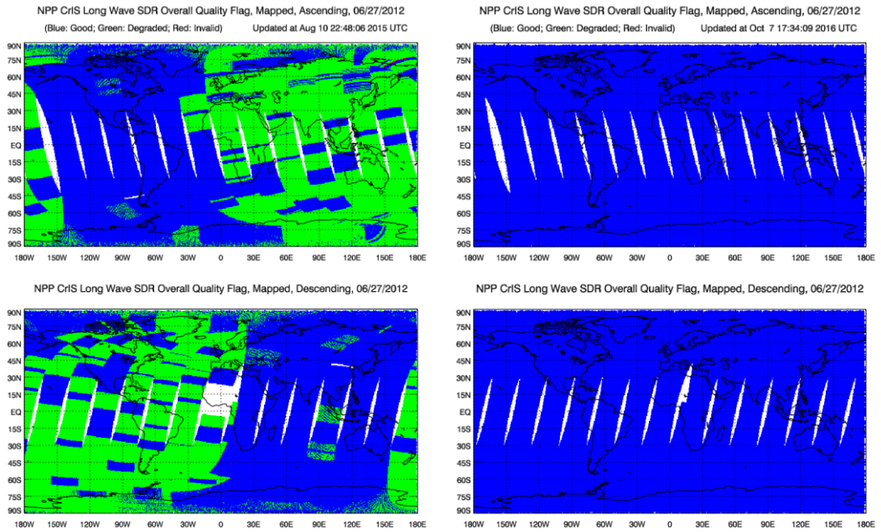
FRP: Suomi NPP vs. NOAA-20: 750m



N20 Active Fire Declared Operational June 20 2018! Lead: Ivan Csiszar

STAR SNPP Science Reprocessing - CrIS SDR Data Reprocessing

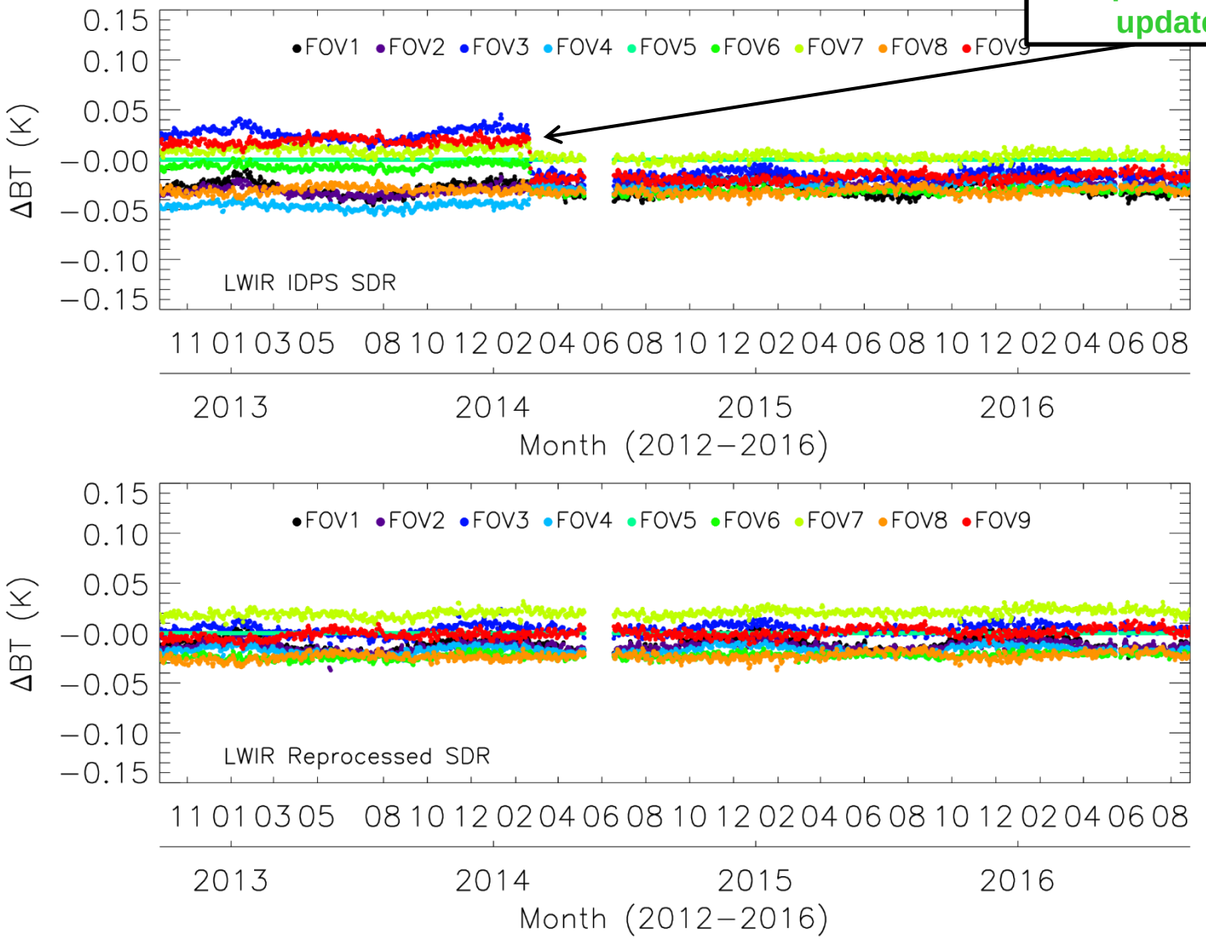
- Engineering packet version 37 and new MW FOV7 NL a2 coefficient
- ADL Block 2.0 with A4 calibration algorithm and improved geolocation algorithm
- TSR SDR for the whole history
- FSR SDR since December 4, 2014
- Latest RDR version
- CrIS TSR data reprocessing from February 20, 2012 to August 31 2016 completed



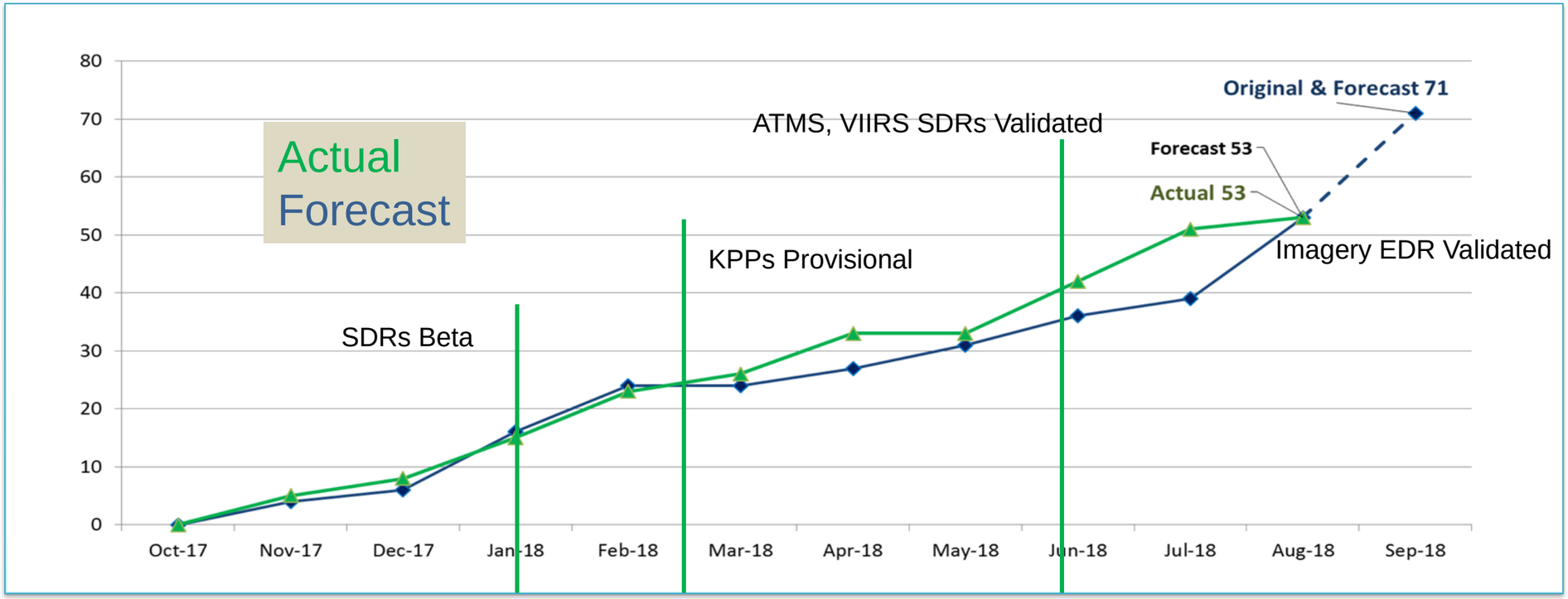
06/27/2012

CrIS Radiometric Stability: Daily Mean FOV-2-FOV Difference wrt FOV5

02/20/2014 CrIS non-linearity coefficient and ILS parameters update



J-STAR Milestones Completion as of August 2018



Maturity	Products	Date
Validated	ATMS TDR/SDR	06/15/18
	VIIRS SDR	06/15/18
Provisional	CrIS SDR	02/16/18
	OMPS NM SDR	02/18/18
	OMPS NP SDR (pending MX2 TTO)	02/18/18 (07/02/18 Mx2 TTO)
	VIIRS Imagery EDR	02/19/18
	Active Fire EDR	02/19/18
	Aerosol Optical Depth & Particle Size	03/20/18
	Aerosol Detection	04/18/18
	Sea Surface Temperature	04/18/18
	MIRS Products	11/29/17
	NUCAPS AVTP, AVMP	06/15/18
Beta	Cloud Mask	04/18/18
	Surface Reflectance	06/15/18
	NUCAPS O3, CO, CO2, CH4 and OLR	06/15/18
	OMPS Ozone EDR V8Pro, V8TOz	02/13/18
	ATMS Snow Fall Rate	06/20/18

N20 Pre-Launch and Post-Launch Algorithm Updates

Pre-Launch

- ✓ Mounting Matrix Coefficient Tables for J1 Instruments
- ✓ PCT/LUT Updates
- ✓ End-to-End testing support to ensure data product integrity
- ✓ Schedules for L+90 Cal/Val activities and Post Launch Testing (PLT)

Post-Launch

- ✓ Support for PLT Activities
- ✓ PCT and LUT Updates
- ✓ OMPS weekly fast track dark table updates for operations
- ✓ VIIRS monthly straylight and DNB fast track updates for operations
- ✓ J1 EDR Delivery Algorithm Package (DAP) deliveries for Active Fire, SST, OMPS Ozone, MIRS, NUCAPS, Clouds, Aerosols and Cryosphere EDR algorithms

SNPP Science Maintenance, Deliveries, Long Term Monitoring

Agenda; Highlights; Expected Outcomes

Highlights

Status of SDR, EDR products and future **plans** for improvements

Each session features presentations on **applications** from end users

Poster presentations and lab demonstrations

NESDIS **Leadership** Brown Bag Lunch Presentation

Trends and Drivers: A unique session on overarching topics, such as Transition science to operation and MSN, AI/Deep Learning, reprocessing.

Blended products workshop: Current status, common approaches; future improvements

	Monday 27 August	Tuesday 28 August	Wednesday 29 August	Thursday 30 August
0830 - 1015	Keynotes + Program Overviews	Soundings, Ozone, and Trace Gas EDRs Soundings Initiative	Hydro EDRs (including GCOM) Hydrology Initiative	Blended Products Workshop
1015 - 1030	Break	Break	Break	Break
1030 - 1200	SDRs Data Assimilation Initiative	Land EDRs Flood & River Ice Initiative	Trends & Drivers	Blended Products Workshop
1200 - 1315	Lunch	Lunch	Dr. Volz Brown Bag Lunch Talk	Lunch
1315 - 1445	Ocean EDRs Oceans Initiative	Smoke & Fire Initiatives	Imagery EDRs Monitoring and Visualization	Blended Products Workshop
1445 - 1530	Break	Break	Break	Break
1530 - 1700	Atmosphere EDRs (Aerosols, Clouds, Volcanic Ash) Aviation Initiative	Cryosphere EDRs Arctic Initiative Cal/Val System and Science Suports Minisession	Wrap Up	Blended Products Workshop
1730 - 1900	Poster Session			

NCWCP | ESSIC 4102 | ESSIC 3rd Floor

ESSIC is located across the street from NCWCP in the MSquare Bldg., 5825 University Research Court

https://www.star.nesdis.noaa.gov/star/meeting_2018JPSSAnnual.php

Outcomes:

Annual Meeting Report that summarized the sessions, major findings, users' recommendations, and follow up actions.

White paper on NESDIS operational blended products summarize the presentations and discussions of Blended Products Workshop

Review team plans for the upcoming year

Understanding of the program structure and process

Strategic planning for JPSS algorithm and Cal/Val development

JPSS Poster Session and Lab Demonstrations

Monday, August 27, 5:30-7:30 PM
CICS - Proving Ground and Training Center
3rd Floor, 5825 University Research Court

Time	Name of the Presenter	Demonstration
5:45 – 5:55 PM	Scott Rudlosky, UMD, CICS	Overview of CICS Proving Ground and Training Center
6:00 - 6:10 PM	Ryan Smith, Charlie Brown, and Tom Atkins, STAR	JSTAR-Mapper
6:15 - 6:30 PM	Tony Reale, Bomin Sun, Mike Petty, Ryan Smith, Charlie Brown, and Lihang Zhou, STAR	NPROVS (NUCAPS and MIRS Sounding Products)
6:30 – 6:45 PM	Patrick Meyers, Mark Sannutti, and Ralph Ferrao, UMD, CICS	JPSS Products in AWIPS
6:50 - 7:00 PM	Karlis Mikelsons and Veronica Lance, STAR	OCVIEW

Summary

- ✓ JSTAR teams provide full support to the science product algorithm development and improvement, Cal/Val, and continuity to NOAA-20 and beyond.
- ✓ Suomi-NPP has produced ~7 years of excellent data products.
- ✓ NOAA-20 KPPs and SDR are operational. EDR products are going through Cal/Val Maturity reviews as scheduled, and some are ahead of the schedule.
- ✓ Excellent progress towards replacement and upgrades of S-NPP algorithms with NOAA Enterprise Algorithms, and reprocessing S-NPP data records with the most matured algorithms for consistent long-term high quality data products.
- ✓ Science outreaches thru Program Science such as holding Technical Interchange Meetings (TIMs) for in-depth discussions on collaborations with OAR/CPO Programs, and users from NOAA OAR Laboratories (ESRL and GFDL).
- ✓ Product quality monitoring systems for S-NPP/N20 – ICVS, EDR Long Term Monitoring, JPSS Mapper are in place for synergistic use of data products and analyzing long term trending, as well as the real-time event based applications.

Moving Forward

- ✓ **JPSS-2 pre-launch** preparations started. Algorithm updates and delivery schedules are being worked out.
- ✓ **Common standards for Cal/Val** processes and Maturity for data products
- ✓ **Enterprise algorithms** and cost effective solutions for Science Mission Life-Cycle support
- ✓ **Reprocessing** using most matured algorithm for consistent long-term product quality metrics and working with NCEI/CLASS to make the data sets public available
- ✓ **Fusion** of polar and geostationary satellite constellation products towards measurement based approach (**service-oriented, mission-agnostic**)
- ✓ Engaged with JPSS AMP, OSPO, OSGS, OSAAP, other key partners to advance **Research to Operation**; Engaged with science programs through PGRR to realize the challenge of taking **O**perational Products-to-**A**pplications-to-**I**nformation (**OAI**) needed for decision makers.

Thank You and Enjoy the Meeting!!