AMP/STAR
FY20 TTA

Lihang Zhou, DPMS Deputy
Bonnie Reed, Algorithm Sustainment Lead
Alisa Young, AMP Deputy for Science
& JPSS STAR Program Manager

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On Demand VIIRS Reprocessing in the Cloud

The VIIRS team has been piloting on-demand/dynamic reprocessing in the cloud. Once the pilot is completed, STAR will have improved capabilities to do VIIRS SDR reprocessing for different periods of time and reprocessing updates. VIIRS RDR's are planned to remain in the cloud to support on-demanding reprocessing. VIIRS SDRs are currently being transferred to the Cloud since they are needed for COVID-19 cloud mask, and aerosol and trace gas work.

Highlights from the Science Teams

Aerosol Team Analyzes India Smoke for Crop Forum

The STAR aerosol team has been supporting a virtual community forum on crop burning in India by providing near real time aerosol products from SNPP and NOAA-20 VIIRS. Aerosol team members gave presentations on AOD and smoke mask algorithms. The crop burning in western India has resulted in widespread dispersion of smoke in the Indo-Gangetic Plain. The STAR aerosol team analyzed VIIRS AOD and TROPOMI NO2 from March through October 2020 to monitor the reduction in pollution due to COVID-19 lockdown and the subsequent increase in pollution as lockdown was lifted as well as due to crop burning. We developed a procedure to isolate aerosols due to urban/industrial emissions from natural emissions such as smoke and dust. By taking a ratio of NO2 to AOD we filter the AOD due to smoke. Once we do the filtering what is left is due to pollution from urban/industrial sources.

- High AOD in the Indo-Gangetic plain is due to crop burning
- Fires emit NO2 also but it is short-lived
- Using NO2/AOD ratio, we can remove smoke signal in AOD and isolate AOD due to urban/industrial sources.
  - Mostly power plants, industry, and transportation sector

November 03 -November 12, 2020, $NO_2(\mu mol/m^2)$

Nov 3 - Nov 12, 2020, VIIRS AOD

VIIRS AOD with NO2/AOD > 100 and NO2 > background (~20 $\mu moles/m^2$)

Nov 3 - Nov 12, VIIRS AOD (filtered)
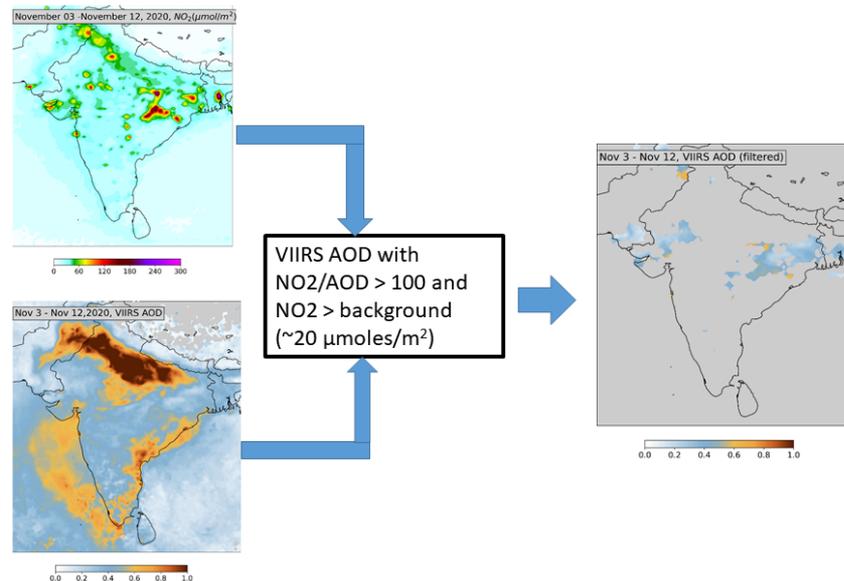
GCOS presentation by NPROVS team

Tony Reale and Bomin Sun attended and presented at the 12th Global Climate Observing System (GCOS) Reference Upper Air Network (GRUAN) Implementation and Coordination Meeting (ICM-12) held virtually, November 16-20. The meeting provided a forum on the latest technologies and strategies for compiling fully characterized environmental measurements. Bomin Sun's talk focused on comparison of Vaisala RS-41 radiosonde observations, a reference measurement at GRUAN sites, demonstrating their superior performance in the context of synchronized satellite hyperspectral infrared data. Tony Reale followed with status and plans for expanded storage (and use) of GRUAN reference observations not only in the context of satellite EDR but also for SDR Cal/Val applications, including coordination with GSICS and GNSS programs.

Lauder, Dual sondes, Radiance difference
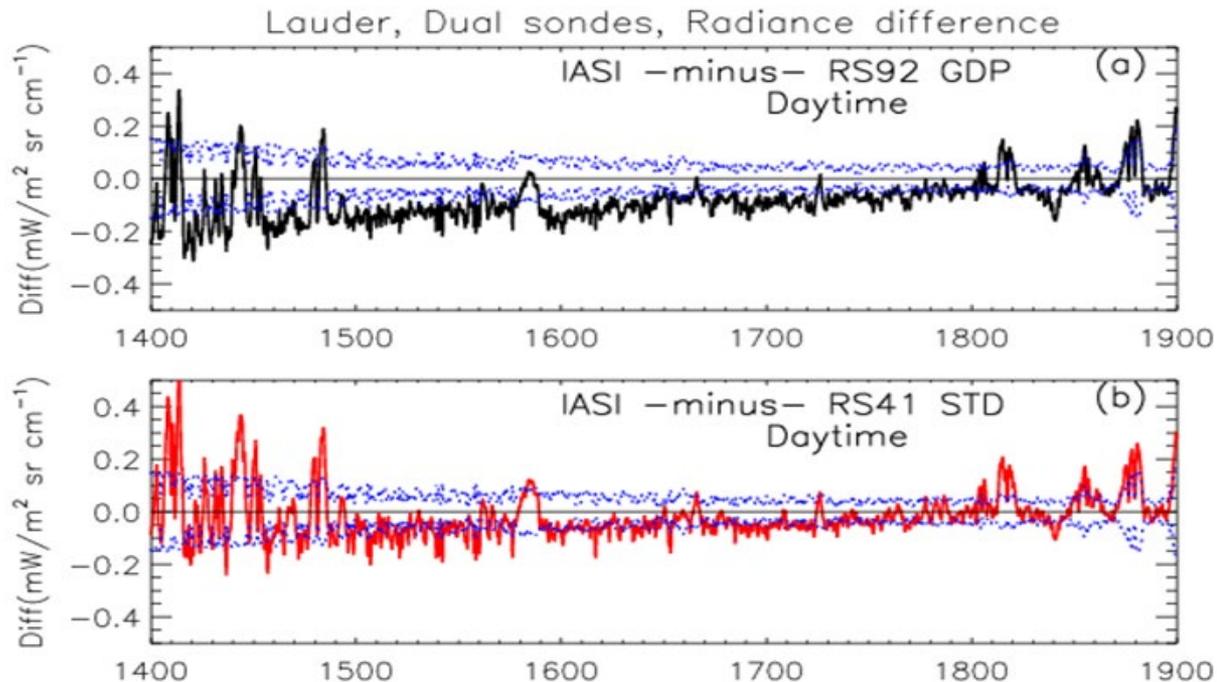
Extending Ocean Color measurements to UV region

We conducted an ocean color modeling analysis and investigated the feasibility of extending satellite ocean color remote sensing to the near-blue ultraviolet bands. We developed and tested a new deep-learning based scheme to estimate remote sensing reflectance (R_{rs}, sr^{-1}) in the near-blue UV domain (nbUV hereafter) from satellite-measured R_{rs} in the visible (~410-700 nm).

(a) $R_{rs}(360)$ (b) $R_{rs}(380)$ (c) $R_{rs}(400)$ (d) $R_{rs}(410)$

R_{rs} [sr^{-1}]

0.001   0.007   0.013   0.019   0.025

Highlights from the Science Teams
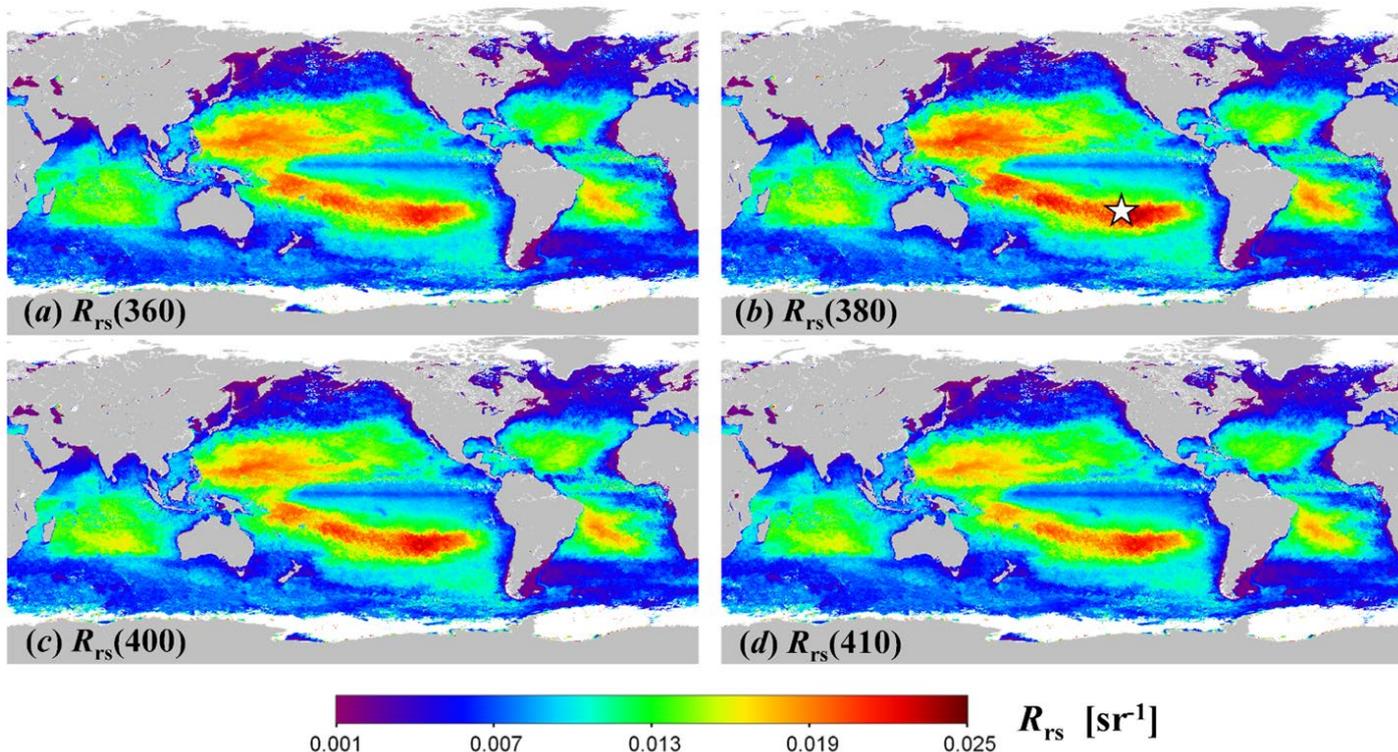
New Green Vegetation Fraction code

The VI/GVF team is working on a new computation design/process for the GVF production. Currently, GVF computation is totally independent of the VI suite computation. In other words, the VI data used for GVF derivation is generated in the GVF unit, rather than using the VI unit output. This results 1) possible vegetation data inconsistency between the VI and GVF computation units, 2) software redundancy and maintenance inefficiency, and 3) additional processing time waste. The new design tries to use the EVI data generated from the VI product suite unit as the input for the GVF computation. Due to complexity of the VI data compositing process in the GVF computation, for minimizing the GVF product noise, the EVI values computed in the current GVF unit is different to the VI unit output. Therefore, an investigation is conducted to understand the significance of such differences.
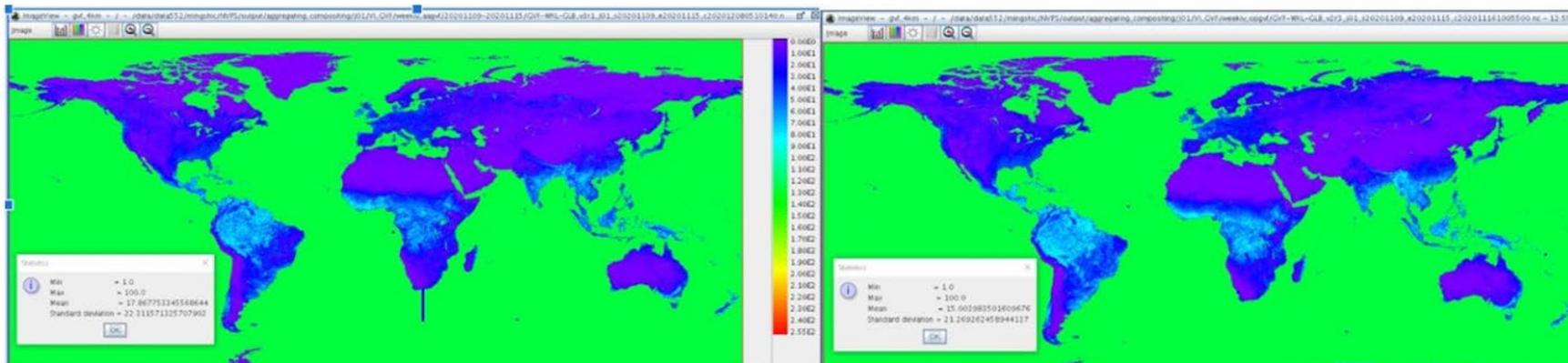
Accomplishments

- Delivery Algorithm Packages (DAPs) - Mission Unique Products:
  - 12/28/2020: OMPS SDR team delivered Initial J2 LUTs DAP to ASSISTT team

- DAPs – Enterprise Products:
  - 12/1/2020: Active Fires Patch DAP delivered to NDE. This patch serves to correct an issue that causes solar farms to be incorrectly classified.
  - 12/14/2020: NUCAPS v3.0 / HEAP v2.3 science code update (for CO_2 Validated maturity) DAP (for NPP/N20/J2/MetOp-A/B/C) delivered to ASSISTT team
  - 12/21/2020: MiRS v11.7 DAP delivered to ASSISTT/NDE/OSPO. This new version of MiRS contains a number of science and technical improvements, fixes, and extensions. The most significant are:
    - Updates to the SFR algorithm software including (1) updates for JPSS-2 processing, (2) snowfall detection algorithms for NOAA-20 and SNPP, (3) updated emissivity initialization for NOAA-20 and SNPP SFR, (4) updated bias correction for NOAA-20 and SNPP, (4) implementation of a 2-stream scattering correction in the 1DVAR SFR retrieval, (5) reactivation of Metop-A capability, and (6) minor software fixes.
    - For all ATMS bearing satellites (SNPP, NOAA-20, NOAA-21) updated handling of missing time stamps in the input Level 1 data. These scan lines are now written out with netCDF fill values in the output files.
    - Extension of MiRS preliminary processing capability to Metop-SG A1 MWS. This is an early experimental pre-launch capability.
  - 12/31/2020: OMPS NP Ozone EDR V8Pro v4r0 (J1 & NPP maintenance DAP , Prelim DAP for J2) delivered to NDE. Main updates in V8Pro v4r0 are:
    - Modified scripts and codes to add option for running J02 for V8Pro algorithm, added required tables and ancillary files for J02.
    - Replaced old RT tables and triangular slit internal bandpass models with new RT tables and new higher-fidelity models.
    - Updated soft-calibration for aerosol channel of S-NPP retrievals and make the averaged AI at Equatorial Pacific equal to zero. Set soft-calibrations for both N20 and J02 to be zero for later adjustments.

- Cloud Implementation Support / IDPS Builds Checkouts:
  - STAR submitted updated report for Block 2.3 Mx0 I&T deploy regression review/checkout to DPMS/RTN/OSPO on 12/10/2020
  - STAR supported IDPS 30-day parallel ops testing event, provided daily evaluation reports (11/6/2020 - 12/4/2020)
    - Daily reports available at google folder: https://drive.google.com/drive/folders/1PL_cMP5TFNgrFn75mYpGOAGlwCe__PrU

Accomplishments – JPSS Cal Val Supports

- NOAA-20/S-NPP Operational Calibration Support:

S-NPP	Weekly OMPS TC/NP Dark Table Updates	12/01/20, 12/08/20, 12/15/20, 12/22/20
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	12/01/20, 12/08/20, 12/15/20, 12/22/20
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	12/01/20, 12/15/20
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	12/08/20, 12/22/20
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	12/22/20
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	12/22/20

- 12/17/2020 December 2020 NOAA-20/S-NPP Cal/Val Maturity Review:

  - Validated Maturity for NUCAPS CO_2 product (S-NPP & NOAA-20)

- Dec-20: Final J2/Enterprise Cal/Val Plan delivery (for all SDR/EDR products)

- ***VIIRS Surface Type team delivered VIIRS 2019 Global Gridded Annual Surface Type product***. The new product is ready for users to download at STAR JPSS website: https://www.star.nesdis.noaa.gov/jpss/. There are three product packages (each package includes three files: Readme; 8-bit binary file for the global map; ENVI header providing important meta data info):

  - 2019 AST IGBP types in Sinusoidal projection
  - 2019 AST IGBP types in Lat/Long
  - 2019 AST 20 types in Lat/Long

Upcoming Cal/Val Maturity Reviews

- April, 2021 Maturity Review:
  - Full Validated Maturity:
    - OMPS NP Ozone EDR (V8Pro)

- JSTAR Code/LUT/Product Deliveries:

DAP to DPES:
  - Jan-21: Initial J2 LUTs (OMPS SDR, to DPMS)

NOAA-20 Algorithm DAP to NDE/CoastWatch:
  - Jan-21: Initial J2 DAP (JRR/VPW/LST/LSA, include NPP/N20 updates)
  - Jan-21: Initial J2 DAP (Surface Reflectance, include NPP/N20 updates)
  - Feb-21: Initial J2 DAP (NVPS: VI/GVF, include NPP/N20 updates)
  - Mar-21: Initial J2 DAP (V8TOz, include NPP/N20 updates)
  - Mar-21: Initial J2 DAP (MiRS/SFR, include NPP/N20 updates)
  - Apr-21: Initial J2 DAP (SST, include NPP/N20 updates)
  - Apr-21: Initial J2 DAP (NUCAPS, include NPP/N20 updates)
  - Apr-20: Vegetation Health – Final N20 / initial J2 DAP

FY21 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates DAPs				
ATMS: Final J2 PCT/MM-coef DAP	Sep-21	Sep-21		
CrIS: Initial J2 PCT DAP	Oct-20	Oct-20	10/16/20	
CrIS: Final J2 PCT/MM-coef DAP	Jul-21	Jul-21		
VIIRS: Final J2 Launch-ready LUTs/MM-coef DAP	Sep-21	Sep-21		To ASSISTT
OMPS: Initial J2 Launch-ready LUTs DAP	Jan-21	Jan-21		
Imagery: N20 NCC LUT update DAP	Jul-21	Jul-21		
Initial J2 ready DAP (include NPP/N20 updates), Clouds/Aerosol/VolcanicAsh/Cryosphere/LST/LSA/VPW	Jan-21	Jan-21		
Final J2 ready DAP (include NPP/N20 updates), Clouds/Aerosol/VolcanicAsh/Cryosphere/LST/LSA/VPW	Sep-21	Sep-21		
Initial Enterprise Fires DAP (NPP/N20/J2, I/M-Band)	Jun-21	Jun-21		
Surface Reflectance: Initial J2 ready DAP	Jan-21	Jan-21		
NVPS (VI & GVF): Initial J2 ready DAP	Feb-21	Feb-21		
Vegetation Health: Initial J2 ready/final N20 DAP	Apr-21	Apr-21		
SST: Initial J2 ready DAP (ACSPO 2.80)	Apr-21	Apr-21		
NUCAPS: Initial J2 ready DAP	Apr-21	Apr-21		
MiRS & SFR: Initial J2 ready DAP	Mar-21	Mar-21		
OMPS Ozone V8Pro: Initial J2 ready DAP	Dec-20	Dec-20	12/31/20	
OMPS Ozone V8TOz: Initial J2 ready DAP	Mar-21	Mar-21		11/25/20 DAP to ASSISTT

FY21 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
Algorithm Cal/Val/LTM				
J2/Enterprise Cal/Val Plan - final delivery (all SDR/EDR products)	Dec-20	Dec-20	12/31/20	
GCOM: AMSR-3 Cal/Val Plan - draft delivery	Sep-21	Sep-21		
Updated JPSS-2 OMPS SDRs Pre-launch Characterization Report	May-21	May-21		
JCT2 - Data System Event (SDR teams, test/run through RDRs from JCT2-DSE, generate J2 SDRs)	Aug-21	Aug-21		
NUCAPS CO2 Full Validated Maturity (N20 & NPP)	Dec-20	Dec-20	12/17/20	
N20 OMPS NP EDR (V8Pro) Full Validated Maturity	Apr-21	Apr-21		
Transition of reprocessed SNPP SDR data to CLASS/NCEI	Sep-21	Sep-21		
JPSS-2 ICVS-LTM Test Readiness Review	Sep-21	Sep-21		
ICVS-J2 prototype Website (ready for JCT-3 test run)	Sep-21	Sep-21		
Maintain / expand existing EDR LTM web pages and mappers	Sep-21	Sep-21		
Delivery of JPSS Product Monitoring Phase 9 DAP to OSPO	Sep-21	Sep-21		
AST-2020 (VIIRS Annual Surface Type)	Sep-21	Sep-21		

FY21 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Operational/Program Support				
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/06/20, 10/13/20, 10/20/20, 10/27/20, 11/03/20, 11/10/20, 11/17/20, 11/24/20, 12/01/20, 12/08/20, 12/15/20, 12/22/20	
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/06/20, 10/20/20, 11/03/20, 11/17/20, 12/01/20, 12/15/20	
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/21/20, 11/24/20, 12/22/20	
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/06/20, 10/13/20, 10/20/20, 10/27/20, 11/03/20, 11/10/20, 11/17/20, 11/24/20, 12/01/20, 12/08/20, 12/15/20, 12/22/20	
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/13/20, 10/27/20, 11/10/20, 11/24/20, 12/08/20, 12/22/20	
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/21/20, 11/24/20, 12/22/20	
Block 2.3 Mx builds I&T deploy regression data review/checkout (**Nov-20 Mx0**; Jan-21 Mx1; Feb-21 Mx2; Apr-21 Mx3; May-21 Mx4; Jun-21 Mx5; Jul-21 Mx6; Aug-21 Mx7; Sep-21 Mx9)	Sep-21	Sep-21	11/24/20 Mx0 I&T review/checkout report 12/10/20 updated Mx0 I&T review/checkout report	
Parallel OPS support	Dec-20	Dec-20	11/6/2020 - 12/4/2020 daily POC support, weekly/monthly DAP deliveries (to both OPS & Cloud), Out of Cycle CrIS DAP delivery	
Verification of cloud implementation	Dec-20	Dec-20	11/06/20 - 12/04/20 daily reports 12/10/20 Mx0 I&T review/checkout report	

STAR JPSS Schedule

STAR JPSS Schedule: TTA Milestones

Color code:
Green: **Completed Milestones**
Gray: **Non-FY21 Milestones**

Accomplishments / Events:

- Attended JPSS-3 ATMS Pre-Environmental Review (PER). Science team comments about the waivers were provided prior to the review and presented in the review by NASA ATMS instrument scientist.
- Further discussion with NG about JPSS-2 spectral response function (SRF) and finalized the public released SRF.
- Processed NG next generation TVAC test equipment, NGSysTE, sample data to be prepared for the system evaluation in February, 2021
- Processed ATMS vs. COSMIC-1/KOMPSAT-5/COSMIC-2 RO match-up data and assessed ATMS SDR data quality using RO profile simulations
- Processed ATMS vs. AMSU/MHS SNO inter-sensor direct bias trending to help evaluate ATMS SDR data quality
- Updated ATMS SDR data quality journal paper draft
- Kept updating ATMS SDR ATBD and Users' Guide documents
- Prepared for AMS oral and poster presentations on ATMS SDR long term data quality trending

Overall Status:

|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/31/20	
Final PCT update, including Mounting Matrix Coefficients update based on the pre-launch mounting measurement report	Aug-21	Aug-21		SER + 6w (to ASSISTT)
Final PCT/MM-coef delivery	Sep-21	Sep-21		To DPMS
JCT2 - Data System Event	Aug-21	Aug-21		
Update ATMS TDR antenna pattern correction coefficients to improve SDR data quality	Jun-21	Jun-21		
Evaluate JPSS-2 ATMS spacecraft pre-launch testing data	Sep-21	Sep-21		
Support NASA SNPP ATMS scan motor current anomaly analysis	May-21	May-21		
Reprocess NPP/NOAA-20 ATMS science data using latest calibration algorithm	Sep-21	Sep-21		
Annual ATMS TDR/SDR performance report	Sep-21	Sep-21		
Parallel OPS support	Dec-20	Dec-20	Dec-20	11/6-12/4/20
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Jan-21 Mx1; Feb-21 Mx2; Apr-21 Mx3; May-21 Mx4; Jun-21 Mx5; Jul-21 Mx6; Aug-21 Mx7; Sep-21 Mx9)	Sep-21	Sep-21	11/09/20 Mx0	Report

Highlights:

ATMS & AMSU-A Mission Life Mean O-B Ta Bias Supported by GPS-RO Soundings

Created: 2020-12-09 2238 UTC

+ J01   x NPP   x N19   △ N18   □ MEB   ◇ MEA
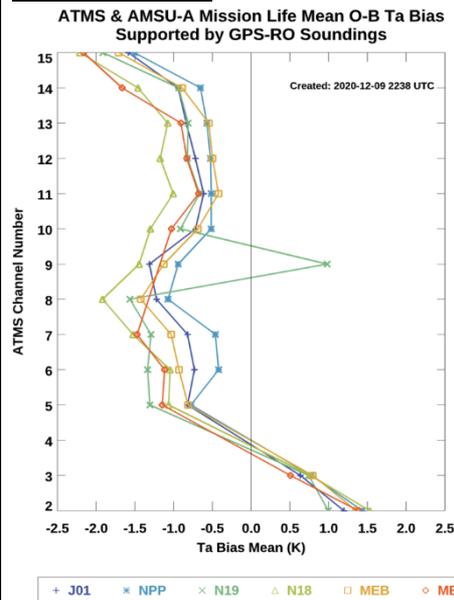
ATMS vs. AMSU/MHS SNO Direct Bias in NPP (upper) and NOAA-20 (lower)

SNPP-Metop A, SNPP-Metop B, SNPP-Metop C, SNPP-N19

N20-Metop A, N20-Metop B, N20-Metop C, N20-N19
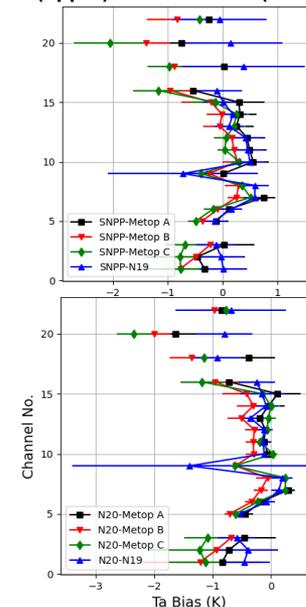
Accomplishments / Events:

-Completed the verification of the Cloud Implementation during the 30-Day Parallel OPS period. This work includes a final report containing the CrIS SDR discrepancy investigation **(Fig. 1)** and the recommendations. Differences between the On-Prem and Cloud environments were identified. Those difference are not associated with the CrIS Algorithm or Calibration Parameters. The root source of the discrepancies, initially identified and explained by the CrIS Team, have been recreated and confirmed by JPSS/Raytheon. JPSS/Raytheon recognizes that small differences might be observed on current on On-Prem strings.

-Delivered an assessment report about the performance impact of the updated CrIS SDR spike algorithm **(Fig. 2)**. Due to unexpected results, the CrIS SDR team recommends further investigation and not to activate the algorithm into operations. The quality impact of the unexpected algorithm performance in the CrIS SDR data is minimal. Potential solutions to improve the algorithm have been identified and are being analyzed.

-Performed the spectral assessment of the reprocessed S-NPP CrIS SDR data v2 over nearly 6 years, using a revised spectral validation tool that speed the validation process as shown in **(Fig. 3)**.

-Continue assessing the impact of recent calibration updates implemented operationally in the SDR processing system, using SNOs between reprocessed CrIS v2 data and IASI data.

-Completed and submitted the final delivery of the J2 CrIS Cal/Val Plan. The document contains the methodologies and Cal/Val tasks in preparation for the launch of the J2 CrIS.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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Issues/Risks:

The GST contractor, Yong Chen, leaved the CrIS Team on September 27, 2020. The Team is re-organizing to cover the large experience and the support that Yong provided to the CrIS Team in the CrIS Cal/Val activities. Dr. Erin Lynch is expected to support the CrIS Cal/Val activities as a GST contractor and FTE starting on December 28, 2020.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
PCT update based on pre-launch test data and other changes	Oct-20	Oct-20	10/16/20	
Verification of operational CrIS SDR data at FSR after the termination of NSR data			11/06/20	
Final PCT update, including Mounting Matrix Coefficients update based on the pre-launch mounting measurement report	Jun-21	Jun-21		SER + 6w (to ASSISTT)
Final PCT/MM-coef delivery	Jul-21	Jul-21		To DPMS
JCT2 - Data System Event	Aug-21	Aug-21		
Inter-sensor comparison: S-NPP and NOAA-20 CrIS SDR data against other IR observations, including MetOp/IASI, AQUA/AIRS and GOES/ABI	Sep-21	Sep-21		Report
Annual CrIS SDR performance report	Sep-21	Sep-21		
Parallel OPS support	Dec-20	Dec-20	Dec-20	11/6-12/4/20
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (**Nov-20 Mx0**; Jan-21 Mx1; Feb-21 Mx2; Apr-21 Mx3; May-21 Mx4; Jun-21 Mx5; Jul-21 Mx6; Aug-21 Mx7; Sep-21 Mx9)	Sep-21	Sep-21	11/23/20 Mx0	Report

Highlights:


(1) ADL B2.3 Mx0 tests using different versions of RDR granules. The results suggest that the root cause of the S-NPP discrepancy on 11/25 is potentially related to the content of CrIS RDR granules (A1 vs. A2) ingested into the process for CrIS SDR.

ADL using A1 granule consistent with the Cloud

ADL using A2 granule consistent with the On-Prem

(2) Location of ICT spike false alarms and calibration window size reduction for NOAA-20 CrIS on 12/09/2020.

(3) The spectral validation, in the form of absolute spectral shift, of the reprocessed S-NPP CrIS SDR data v2 over nearly 6 years.

Accomplishments / Events:

- Completed the final version of the JPSS-2 VIIRS Cal/Val Plan after addressing comments from NASA VCST, DPMS, and JSTAR

- In support of the IDPS transition to the cloud-computing environment, compared and reported on VIIRS SDR products from IDPS Parallel Operations on DP-OE and on-premises hardware for NOAA-20 and S-NPP data acquired in November and December 2020

- Delivered for deployment in IDPS operations updated NOAA-20 and S-NPP DNB offset and gain ratio LUTs generated using new moon calibration data from 12/14/2020; additionally, reprocessed the test cases using ADL B2.3 Mx0 in support of the IDPS Parallel Operations in the cloud computing environment

- Analyzed lunar calibration data from the roll maneuvers on 11/25/2020

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

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Issues/Risks:

Highlights:

| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/2020	
Launch-ready LUTs (final delivery), including Mounting Matrix Coefficients update based on the pre-launch mounting measurement report	Sep-21	Sep-21		SER + 6w (to ASSISTT)
Launch-ready LUTs (final delivery)/MM-coeff.	Oct-21	Oct-21		To DPMS
JCT2 - Data System Event	Augl-21	Aug-21		
Cal/Val tool testing/upgrade in the cloud computing environment	Sep-21	Sep-21		
Generate Science Quality (SQv2.0) Suomi NPP VIIRS SDR from 2017 onward to meet user needs (COVID-19, TROPOMI)	Dec-20	Jan-21		Hardware failure/repair
Initial NOAA-20 VIIRS recalibration & reprocessing	Sep-21	Sep-21		
Cross-calibration and monitoring between NOAA-20 and SNPP VIIRS	Sep-21	Sep-21		
Annual VIIRS SDR performance report	Sep-21	Sep-21		
VIIRS LUT update of DNB Offsets and Gains (NPP & N20)	Monthly	Monthly	On schedule	
Parallel OPS support	Dec-20	Dec-20	Dec-20	11/6-12/4/20
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Jan-21 Mx1; Feb-21 Mx2; Apr-21 Mx3; May-21 Mx4; Jun-21 Mx5; Jul-21 Mx6; Aug-21 Mx7; Sep-21 Mx9)	Sep-21	Sep-21	11/20/20 Mx0	Report

NOAA-20 and Suomi NPP Local Time of Ascending Node (equator crossing) changes during the last three years: LTAN is in the expected range of 1 min. from the 13:25 (1:25 pm) goal for both satellites; the NPP LTAN trend changed as expected after the inclination adjustment maneuver on 9/24/2020

Accomplishments / Events:
- Derived the initial version of all J2 OMPS NP/NM LUTs. The verification of the LUTS is to be done.
- Delivered SNPP/NOAA-20 OMPS weekly Dark tables and NP solar irradiance bi-weekly LUTs to GRAVITE (see the graphs next slide)
- Delivered the final version of J2 OMPS SDR Cal/Val plan to the JSTAR.
- Developed a NOAA/STAR version of OMPS NP solar raw flux code (matlab) that can produce identical results to those using the NASA raw flux package, ensuring future development of the J2 code.
- Derived and delivered SNPP RAW Flux measurement data (250 spectral sets) to EDR team
- Revised the ADL to Implement the NOAA-20 NP solar intrusion correction LUT. It is still a progress to resolve the inconsistency of the implementation between the current and high resolution versions of the ADL.
- Revised the ADL to validate the off-nadir geolocation error correction LUTs (Field of angle map) for SNPP and NOAA-20 NM.
- Provided testing reports about IDPS OMPS cloud checkout.
- Delivered inputs to the inquiry of the J2 flight tables in collaboration with the Mission Operations Support Team.
- Completed the OMPS SDR PLP inputs (JSTAR action)

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule			x		

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:
None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/18/20	
Updated JPSS-2 OMPS SDRs Pre-launch Characterization Report	May-21	May-21		
Launch-ready LUTs (initial delivery)	Dec-20	Dec-20	12/28/20	To ASSISTT
Launch-ready LUTs (initial delivery)	Jan-21	Jan-21		To DPMS
Launch-ready LUTs (final delivery), including Mounting Matrix Coefficients (PCT) updates based on the pre-launch mounting measurement report	FY22	FY22		Dec-21 To ASSISTT; Jan-22 to DPMS
J2 NM/NP dark and solar raw flux processing package preparation	Sep-21	Sep-21		
J2 NM backup spatial resolution code development	Sep-21	Sep-21		
JCT2 - Data System Event	Aug-21	Aug-21		
OMPS RDR to Level 1B processing code in preparation for J2	Sep-21	Sep-21		
NOAA-20 OMPS NP In-Band Stray Light (ADR9309)	Mar-21	Mar-21		
SNPP/NOAA-20 NM off-nadir geolocation error correction LUTs (ADR9361)	Feb-21	Feb-21		
Annual OMPS SDR performance report	Sep-21	Sep-21		
Weekly updates darks for NM and NP (NPP & N20)	Weekly	Weekly	on schedule	
Bi-weekly update NP Wavelength and solar flux (SNPP & N20)	Bi-Weekly	Bi-Weekly	on schedule	
Parallel OPS support	Dec-20	Dec-20	Dec-20	11/6-12/4/20
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Jan-21 Mx1; Feb-21 Mx2; Apr-21 Mx3; May-21 Mx4; Jun-21 Mx5; Jul-21 Mx6; Aug-21 Mx7; Sep-21 Mx9)	Sep-21	Sep-21	11/20/20 Mx0	Report

Highlights:

NOAA-20 Average Irradiance comparison between NOAA and NASA version and the linearity removal averaged solar irradiance
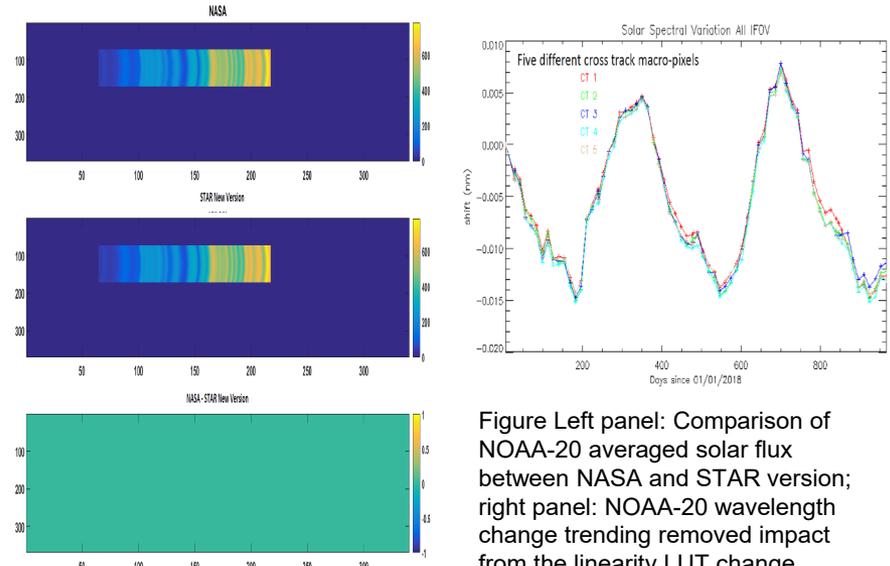

Figure Left panel: Comparison of NOAA-20 averaged solar flux between NASA and STAR version; right panel: NOAA-20 wavelength change trending removed impact from the linearity LUT change

Accomplishments / Events:

– Completed SNPP ATMS/OMPS RDR and SDR data transition to the Cloud

– Transition of the reprocessed SNPP VIIRS/CrIS RDR and SDR data to the Cloud is ongoing

– Per ESA's request, VIIRS SDR reprocessing for the period of 2018-04-01 to 2020-03-11 is ongoing

– Per ESA's request, VIIRS Enterprise Cloud Mask (ECM) reprocessing for the period of 2018-04-01 to 2020-03-11 is ongoing (highlights)

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule			X		

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

One hard drive on UMD server Bamboo is down. Need to consider mitigation plan

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Reprocessing of N20 CrIS for 2018-04-01 to 2019-06-23	Nov-20	Nov-20	Nov-20	
Extend SNPP VIIRS reprocessing to 2020	Dec-20	Jan-21		One hard drive on UMD server Bamboo is down. Need to recover the lost dataset
ECM reprocessing for 2018-04-01 to 2020-03-11	Dec-20	Jan-21		Same as above
Present validation results on the reprocessed S-NPP SDR data at the AMS Meeting	Jan-21	Jan-21		
Transition of SNPP RDR and reprocessed SDR data to CLOUD	Mar-21	Mar-21		
Complete planning and testing on transition of S-NPP reprocessed SDR data to CLASS	Sep-21	Sep-21		
Deliver preliminary evaluation results on radiometric stability of reprocessed CrIS SDR data	Sep-21	Sep-21		
Transition of reprocessed SNPP SDR data to CLASS/NCEI	Sep-21	Sep-21		

Highlights: ECMs generated from operational/reprocessed VIIRS SDR (2018-05-01)

Number of Pixels in Different CM Categories

Total number of pixels: 2,487,091,200

Opr \ Rep	Clear	Prob clear	Prob cloudy	cloudy
Clear	739,311,193	1,424,287	18,845	4,808
Prob Clear	732,226	149,238,446	1,141,409	41,737
Prob Cloudy	5,117	587,786	185,431,688	1,071,928
Cloudy	385	2,022	547,127	1,407,532,196

• 99.776% (2,481,513,523 out of the total 2,487,091,200) of the ECMs are the same, 0.224% (5,577,677 out of the total 2,487,091,200) are mis-matched

• 98.67% (5,505148 out of 5,577,677) of the mis-matches occur between two neighboring categories, i.e. "clear" to "probably clear", "probably clear/cloudy" to "probably cloudy/clear", and "cloudy" to "probably cloudy"

Accomplishments / Events:

- Finished ICVS-Vector web page conceptual demonstration version and provided sample products demonstration for each instrument and spacecraft module. Web pages are available in https://www.star.nesdis.noaa.gov/icvs-beta/index_icvs_vector.php . Currently, only limited number of long term trending products are provided. Daily and long term trending products of all individual parameters will be added step by step at the same time to maintain the current NRT ICVS website.
- Monitored and reported the abnormal NOAA-20 CrIS MWIR ICT reverse scanning impulse spikes after the implementation of new spike detection algorithm.
- Developed a algorithm to convolve GOME-2 SRF with OMPS/NM SRF so as to improve the inter-sensor comparison results between GOME-2 and OMPS/NM
- Prepared AMS annual conference presentations and posters

Overall Status:

|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Develop JPSS-2 ICVS prototype RDR portion (beta) (SNPP or N20 as proxy)	Jan-21	Jan-21		
Develop JPSS-2 ICVS prototype SDR portion (beta)	Apr-21	Apr-21		
Develop ICVS-Vector code prototype (beta)	Jun-21	Jun-21		
Develop ICVS anomaly impact watch portal prototype (beta)	Jul-21	Jul-21		
Develop ICVS testbed code (beta)	Aug-21	Aug-21		
Support JPSS-2 ICVS-LTM Test Readiness Review	Sep-21	Sep-21		
Implement the Git repository for ICVS (beta)	Set-21	Set-21		
Promote the ICVS top product matrices for operation	Sep-21	Sep-21		
Maintenance and update of SNPP/NOAA-20 ICVS monitoring tool	Sep-21	Sep-21		Daily as needed
Provide Instrument Performance Weekly, Monthly, Quarterly and Annual Reports	Sep-21	Sep-21		Monthly, quarterly and annual
Support SDR Team, NASA Flight Project, and OSPO Anomaly Analysis	Sep-21	Sep-21		Ad hoc

Highlights: Significantly contribute to STAR SDR Teams

NOAA-20 CrIS MW ICT Impulse Spikes
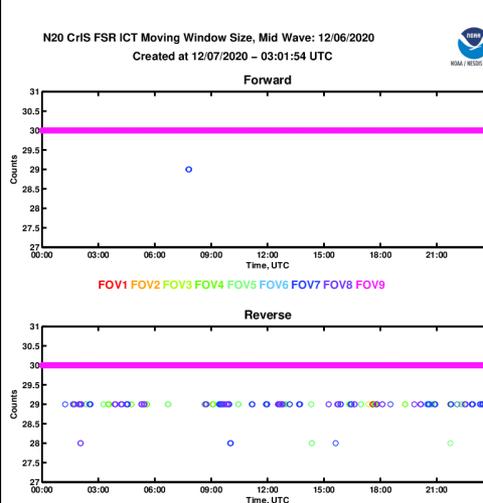
OMPS NM spectral response function vs. convolved SRF

VIIRS Imagery

December, 2020
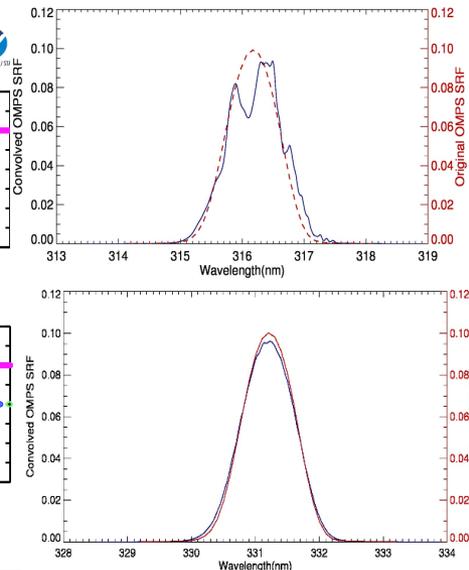
Accomplishments / Events:

- **VIIRS Imagery Cal/Val Plan for JPSS-2** in being finalized (making the last technical edits) for submission by end of year.
- Generated new Imagery product loops and case study blogs (see weekly reports with images).
- Presentation for AMS 2021 is being prepared for video recording, to be presented in January.
- **Captured Total Solar Eclipse over South America** (see lower-right quadrant for image) with NOAA-20 Imagery product (Day Land Cloud RGB) with dark hole at center of eclipse.
- Recently-discovered NCC banding is being investigated with regard to the spatial and temporal extent. The next report on the NCC banding will be given at the January Imagery Team meeting.
- ADR 9466 has been submitted (by Sue Venter and Don Hillger) to document the NCC banding anomaly/discrepancy.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic			X		3
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

Newly-discovered NCC banding over Antarctica for both NPP and J01 needs detailed analysis and potential solution.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/22/20	
N20 NCC LUT update DAP (to ASSISTT)	Jun-21	Jun-21		ASF tool update
N20 NCC LUT update DAP (to DPMS)	Jul-21	Jul-21		
Images of the Month to STAR JPSS Program/website and interesting Imagery to Social Media outlets	Monthly	Monthly		
Annual VIIRS Imagery performance report	Sep-21	Sep-21		Report
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy regression support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Jan-21 Mx1; Feb-21 Mx2; Apr-21 Mx3; May-21 Mx4; Jun-21 Mx5; Jul-21 Mx6; Aug-21 Mx7; Sep-21 Mx9)	Sep-21	Sep-21	11/15/20 Mx0	

Highlights: Image of the Month

NOAA-20 VIIRS Captures Total Solar Eclipse
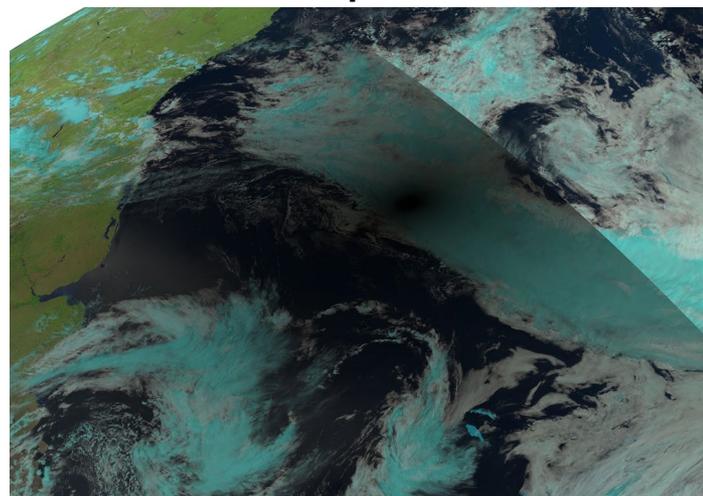
Figure: NOAA-20 VIIRS Day Land Cloud RGB from ~17:13 UTC, 14 December 2020 showing the impact of the total eclipse on this imagery product.

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Clouds

Accomplishments / Events:

- Analysis of Jan 2021 SuperDAP delivery showed no deficiencies in the Cloud algorithms.Overall, the analysis showed that the algorithms are performing as expected. An example of the analysis done is shown in the Highlights section/
- Cloud Team Cal/Val plans are scheduled for delivery at the end of the month.
- Progress on implementation of the DNB city light mask to improve the ECM at night in collaboration of CIMSS and CIRA, which will be also utilized for nighttime CBH.
- The CIRA team gave remote presentations on DNB nighttime cloud detection, cloud vertical cross-sections for aviation users, and improved multilayer cloud detection using machine learning at 2020 AGU Fall Meeting, which are part of 1) NOAA Satellite Proving Grounds to Enhance User Applications and 2) Earth Observations from Geostationary Satellites: Applied Research and Applications.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones:

- ***See following slides***

## Highlights:

Figure 1: NOAA-20 Cloud Top Pressure (CTP) from January 20, 2020. The top section of the figure shows CTP from the v3r0 DAP delivery (upper left) and the NOAA CLASS, which was v2r1 (upper right). The lower left image shows the CTP differences. The two right images show the latitudinal distribution of the two datasets and a histogram of the bias. These plots show the ascending mode.

Clouds (Cloud Mask)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/10/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Initial J1 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Add in DNB into ECM2 LUTs	Mar-21	Mar-21		
Work with NCEP on ASR assimilation. Adjust mask as necessary	Mar-21	Mar-21		
Verify ECM LUT against J2 simulated data	Aug-21	Aug-21		
Support Alaska Demo and ESRL usage and reviews	Aug-21	Aug-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Apply CALIPSO tools to NDE Mask with Lunar Ref	Sep-21	Sep-21		
Develop collaboration wtith OAR/ESRL/GML on use of RadFlux Cloud Fraction for Verification including high-latitude sites	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21		

Clouds (Cloud Phase/Type)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	07/29/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Optimize cloud phase thresholds for NOAA-21 and maintain code consistency with GOES-R deliveries	Mar-21	Mar-21		To ASSISTT
Modify phase as needed based on height/winds interaction and development from GOES-R	Aug-21	Aug-21		
Support S-NPP and NOAA-20 EDR monitoring	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21		

Clouds (ACHA)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/10/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Support NCEPs use for ASR assimilation	Mar-21	Mar-21		To ASSISTT
Continue improving multilayer ACHA by analysis of CALIPSO and AEOLUS lidars and extend to level of best fit of Polar Winds	Mar-21	Mar-21		To ASSISTT
Extend the treatment of scattering to support 3.75 micron	Aug-21	Aug-21		
Continue working with FAA for them to use ACHA products	Sep-21	Sep-21		
Continue support of Alaska Demo CTH requests	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21		

Clouds (DCOMP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/10/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Develop a method that includes IR measurements to improve the performance of potentially thin clouds using ACHA technique	Aug-21	Aug-21		
Inter-sensor calibration studies by using visible reflectance and cloud optical thickness from GOES, JPSS and MODIS. Adjust VIIRS M5 and M7 as needed	Sep-21	Sep-21		
Develop collaboration with OAR/ESRL/GML on use of RadFlux Cloud Optical Depth for Verification	Sep-21	Sep-21		
Support Alaska Demo, primarily during AK rainy season	Sep-21	Sep-21		
Consistency checks for day and night retrievals	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21		

Clouds (NCOMP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	07/29/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Extend NCOMP with JPSS-2 LUT	Jul-21	Jul-21		
Adding improved unit test tools to science code	Sep-21	Sep-21		
Consistency checks for day and night retrievals	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21		

Clouds (Cloud Base)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/10/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Leverage GOES-RR to target characterization of overlapping cloud assess CBH performance for multi-layer cloud systems	Jun-21	Jun-21		
leverage DCOMP nighttime COD (DNB) to improve performance over IR-only	Sep-21	Sep-21		
Validate products from SAPF and begin ARM data analysis to fill CALIOP/CloudSat void	Sep-21	Sep-21		
Support Alaska Demo and necessary reviews	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21		

Clouds (CCL)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	07/31/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Include super-cooled and convective probability	Mar-21	Mar-21		To ASSISTT
Continue the visualization and demonstration of CCL for the Aviation Weather Center, with focus on Alaska Region and Hawaii	Sep-21	Sep-21		
Support Alaska Demo and necessary reviews	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21		

Accomplishments / Events:

- Six AGU presentations by the aerosol team members

- Team member Hongqing Liu has successfully installed the code to reprocess cloud and aerosol products on cloud. Other members of the aerosol team also have their Amazon Web Services accounts on the cloud. Initial goal is to successfully reprocess the entire SNPP VIIRS AOD record

- EPA has included some material that we provided on surface PM2.5 estimates derived from VIIRS AOD in their planning reports

- Beta version of MyEnvironment dashboard consisting of monthly means maps of AODs, time series over chosen cities etc. is ready for testing by the users.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

No risks

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/15/20	AOD
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	08/10/20	ADP
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	AOD
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/31/20	ADP
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Algorithm Updates Review	Sep-20	Sep-20	08/18/20	
Algorithm Updates/Cal-Val Activities				
Details in next slides				

Highlights:

Aerosol (AOD & ADP) Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates/Cal-Val Activities				
Aerosol Optical Depth (AOD):				
Update surface reflectance relationships using current functional relationship with extended S-NPP, NOAA-20 and AERONET data	May-21	May-21		
Improve angular and seasonal representation of surface reflectance relationships	Jul-21	Jul-21		
Update preliminary LUT and gas-absorption parameterization for J2 if needed	Sep-21	Sep-21		
Evaluate merged S-NPP/NOAA-20 AOD product	Jun-21	Jun-21		
Evaluate gridded AOD products	Jul-21	Jul-21		
Continue individual AOD product (S-NPP, NOAA-20) validation and cross-validation	Aug-21	Aug-21		
Maintain satellite-ground AOD matchups used for products evaluation	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
Aerosol Detection (ADP):				
Improve dust detection over the vegetated surface	Jun-21	Jun-21		
Develop surface type-dependent thresholds over land	Jun-21	Jun-21		
Exploring the use of trace gases product from TROPOMI to separate smog from smoke	Jun-21	Jun-21		
Exploratory research on an approach to combine CO/CO2 absorption bands with AAI to expand smoke detection for thick/brownish smoke plumes even over clouds	Sep-21	Sep-21		
Continue long-term validation of SNPP and NOAA-20 VIIRS ADP by comparisons with AERONET, CALIPSO, MISR, and IMPROVE	Jun-21	Jun-21		
Exploring the angular dependence of ADP by combing NOAA-20 with SNPP	Jun-21	Jun-21		Report
Annual algorithms/products performance report	Sep-21	Sep-21		

Volcanic Ash

Accomplishments / Events:

- Continued developing new volcanic cloud detection and characterization capabilities in support of changing ICAO requirements (e.g. lightning based eruption detection, an SO2 information product for aviation, and satellite/model integration)

- Continued to provide experimental products and services in support of VAAC and volcano observatory operations, while supporting early NESDIS Common Cloud Framework transition activities

- Supported JSTAR volcanic ash EDR cal/val activities, including analysis in support of J2 ready DAP

- Delivered J2 cal/val plan

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Software and LUT updates in preparation for J2	Sep-21	Sep-21		
Refine thresholds and LUT's for S-NPP and NOAA-20 as needed	Sep-21	Sep-21		
Development activities that support transition to VOLCAT	Sep-21	Sep-21		
Routinely validate volcanic ash products	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights:

Illustration of the VIIRS contribution to the VOLCAT thermal monitoring of Kilauea (Hawaii), which recently became active again. VIIRS volcanic radiative power (VRP) estimates are an important complement to geostationary based monitoring.

False Color Imagery (12.0–10.8μm, 10.8–3.7μm, 10.8μm)
NOAA-20 VIIRS (01/03/2021 – 11:41:42 UTC)
VIIRS VRP: 3374 MW

Annotation Key (annotation colors are not related to colors in underlying image)
Ash/Dust Cloud   Volcanic Cb   SO2   Thermal Anomaly

VIIRS + GEO VRP time series

Cryosphere
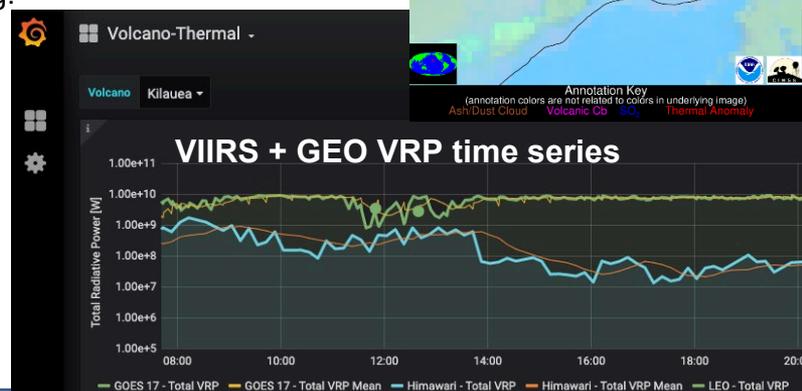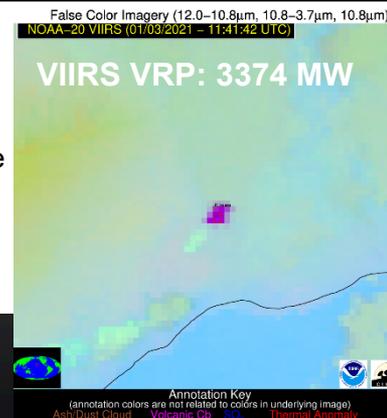
Accomplishments / Events:

- The new corrected version of the VIIRS cloud mask (v2r3) became operational in the beginning of August 2020. It replaced the v2r2 cloud mask that was used since the second half of 2018, which was determined to be overly aggressive over snow-covered land. The analysis of the new cloud mask and of the VIIRS snow product generated with this mask during the month of November 2020 indicates that the new cloud mask provides a more realistic cloud identification over partially snow-covered area than v2r2. The effective area coverage of the VIIRS snow product (i.e., the fraction of clear-sky pixels available for snow cover mapping) in the Northern Hemisphere has increased from 25-26% in 2018-2019 to 45% in 2020

- VIIRS products samples provided by ASSISTT for the upcoming SuperDAP delivery were evaluated qualitatively and quantitatively. Only small differences were noted, probably due to changes in the cloud mask.

- Compared VIIRS Ice Thickness Products with IceBridge flight data. The mean ice thickness for the VIIRS product along the track was 2.68m, compared to 2.80m for the IceBridge aircraft-based thickness. Standard deviations were 1.48m and 2.32m, respectively.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation/ Comments
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Preparation for JPSS-2	Sep-21	Sep-21		
Transition VIIRS Enterprise snow algorithms to operations for ABI	Mar-21	Mar-21		
Continued validation of NOAA-20 and S-NPP products: Product error assessments and improvements/updates	Sep-21	Sep-21		
Continuous monitoring of S-NPP and NOAA-20 products	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights:

VIIRS Ice Thickness Product shows good agreement with IceBridge data
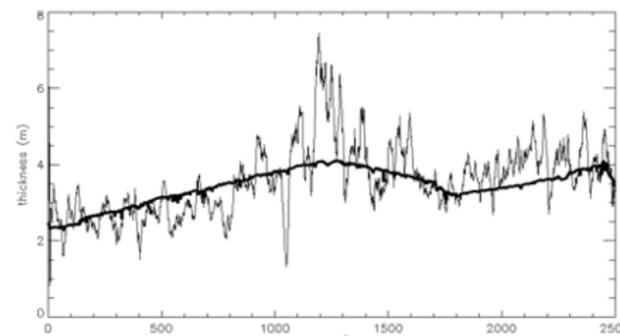
NPP-VIIRS ice thickness product (dark, smoother line) vs. IceBridge ice thickness measurements (jumpy line) along the flight track, for approximately 2500 observations. IceBridge observations were smoothed with a running 20-point filter.

Accomplishments / Events:

- Discovered that the solar farm flags are not set in the operational product due to a bug in the operational version of the code
  - The impact on overall product quality is minimal, but a fix was developed and delivered to avoid occasional false alarms
- Worked with the CSPP team on the evaluation of two types of data anomalies discovered in the DB product
  - The fire team developed a fix for one of the root causes
  - The other issue was related to the SDR code and the STAR VIIRS team developed a solution
- Performed analysis of M-band vs. I-band FRP during the 2020 Western US fire event
  - A ~10-30% increase in total FRP was observed from the I-band, consistent with the lower detection limit

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Enterprise Active Fires DAP to ASSISTT	Aug-20	Aug-20	08/25/20	
Initial Enterprise Fires DAP to NDE	Jun-21	Jun-21		
Final Enterprise Fires DAP to NDE	Oct-21	Oct-21		
I-band algorithm improvements	Sep-21	Sep-21		
J2 readiness and sensor performance evaluation	Sep-21	Sep-21		
ASSIST, NDE and DB integration and testing support	Sep-21	Sep-21		
Suomi NPP / NOAA-20 data analysis and feedback	Sep-21	Sep-21		
Persistent anomaly data files updates	Quarterly	Quarterly		
Annual algorithms/products performance report	Sep-21	Sep-21		
Active Fires Patch DAP to NDE			12/01/20	

Highlights:
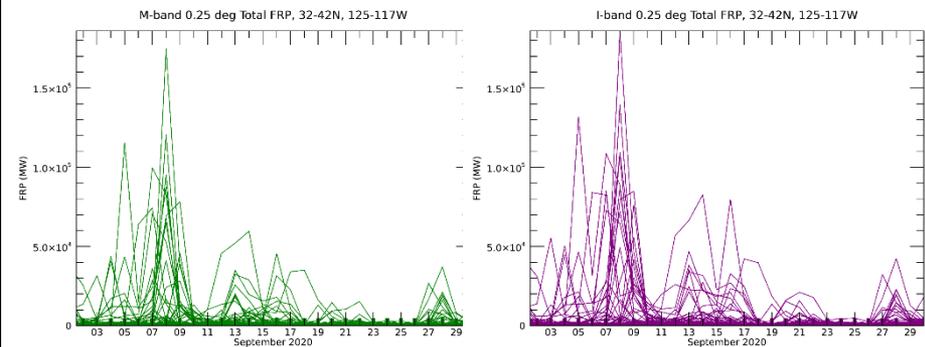
Time series of total fire radiative power (FRP) output from 0.25 degree grid cells in the Western US in September 2020. Left: VIIRS M-band product. Right: VIIRS I-band product. An increase of the FRP output from the I-band product is observed and needs to be taken into account in emission models.

Surface Reflectance

December, 2020

Accomplishments / Events:

- The surface reflectance code, enabled to process JPSS-2 data, and also including the proper handling of the NOAA-20 VIIRS I3 bad detector was delivered to T4

- The science team is engaged in discussions with the VIIRS SDR team and the NASA Land Science Team on the implications of the observed calibration differences for shortwave bands between Suomi NPP and NOAA-20 VIIRS

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		
Final J2 ready DAP to ASSISTT	May-21	May-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Oct-21	Oct-21		
NOAA-20 algorithm adjustments (I3 bad detector)	May-21	May-21		
Algorithm testing and updates (ECM, QF)	Sep-21	Sep-21		
ASSIST integration and testing support of updated code delivery	Sep-21	Sep-21		
Continuing LTM and extension to NOAA SR products	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights:

Suomi NPP vs. NOAA-20 VIIRS I3 Surface Reflectance for February 6-21, 2020, based on 16-day averages of global gridded data. The biases are due to calibration differences. The science community has expressed concerns regarding data compatibility and continuity between the two sensors. Figure from the NOAA-20 Validated Maturity Review presentation.

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Accomplishments / Events:

– STAR-UMD VIIRS Surface Type team has downloaded and processed S-NPP and NOAA-20 VIIRS granule surface reflectance data acquired in December 2020.
– The team is assessing a stable surface type product derived from multi-year VIIRS observations for use by EMC models. Initial results show that the VIIRS product is better than the MODIS product currently used by EMC (MODIS-EMC) in representing urban areas:
  – Many suburban residential areas established in recent years not mapped by MODIS-EMC are represented by the VIIRS product
  – Some commission errors in the MODIS-EMC product have been corrected in the VIIRS product
– The team has delivered the J2 Cal/Val Plan

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/24/20	
AST2020 (Annual Surface Type):				
Complete monthly composites of global gridded VIIRS data (9 land bands + thermal bands) for VIIRS AST20 based on 2020 VIIRS data. Generate global annual classification metrics	May-21	May-21		
Generate VIIRS AST20 based on 2020 VIIRS data using SVM algorithm	Aug-21	Aug-21		
Comparison of AST20 with surface type validation data	Sep-21	Sep-21		
Delivery of AST20 (available for users through STAR FTP)	Sep-21	Sep-21		
AST DAP NDE delivery (ASSISTT, with JRR DAP)				
Deliver AST-2018 to NDE	Jan-21	Jan-21		10/1/20: SCR
Deliver AST-2019 to NDE	Sep-21	Sep-21		
Annual performance report	Sep-21	Sep-21		

Highlights:

The newly delivered VIIRS surface type product is shown to better represent current surface conditions than the MODIS product used by EMC according to Google images.

Accomplishments / Events:

- Evaluated the LST test data from the framework version2 super DAP. The evaluation covers the level 2 granule and level 3 gridded VIIRS LSTs from both NOAA20 and SNPP satellite. Issues were found with the emissivity data which caused the problematic LST retrieval. (highlight, slide 2-5)
- Cooperated with ASSISTT team to resolve the above problem. (slide 6-8)
- Finished the cal/val report on current SNPP and NOAA20 LST product.
- Prepared the user guide on how to download the VIIRS LST data from NOAA CLASS website.
- Updated the webpage contents of the STAR LST product as user pointed out.

Overall Status:

|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

1. Project has completed.
2. Project is within budget, scope and on schedule.
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4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
CalVal report on current SNPP and N-20 Product	Dec-20	Dec-20	Dec-20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/31/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates, ASSISTT delivery)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Experimental error estimate dataset	May-21	May-21		
Validation and improvement of L3 LST product	Jul-21	Jul-21		DAP
Annual algorithms/products performance report	Aug-21	Aug-21		
Validation tool update; Validation with extended data set	Sep-21	Sep-21		
Routine Validation of L2 LST & gridded LST products	Sep-21	Sep-21		
Final J2 ready DAP to NDE (include NPP/N20 updates, ASSISTT delivery)	Sep-21	Sep-21		

Highlights:

Problematic LSE in FW2 test data
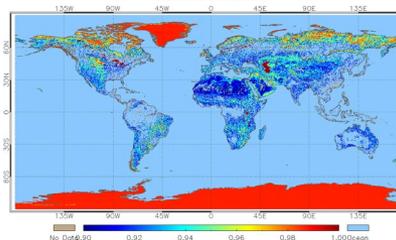
FW2-Emis11 FW2-Emis12 Local-Emis11 Local-Emis12
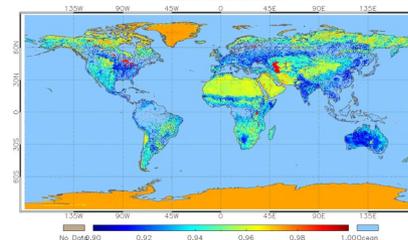
- Impact on LST:
  - The LST quality flag is affected(bit 6-7). land cover type: 0-land, 1-inland water,2-snow/ice;3-coastal/ocean. Note that the land, inland water and ocean bit is from land/sea mask not the land surface type
  - Spectral LSE might be affected so as the LST value
  - The impact might be different between daytime and nighttime case
- Evaluation:
  - The land cover type quality fla̶g̶ ... ̶ional LST and FW2 test data
  - Both daytime and nighttime granules were selected for the check
  - LSE and LST value were compared.

Land cover type quality flag

NOAA20   Daytime   **Nighttime**

Legend:
- Land
- Snow
- Inland water
- Coastal/ocean
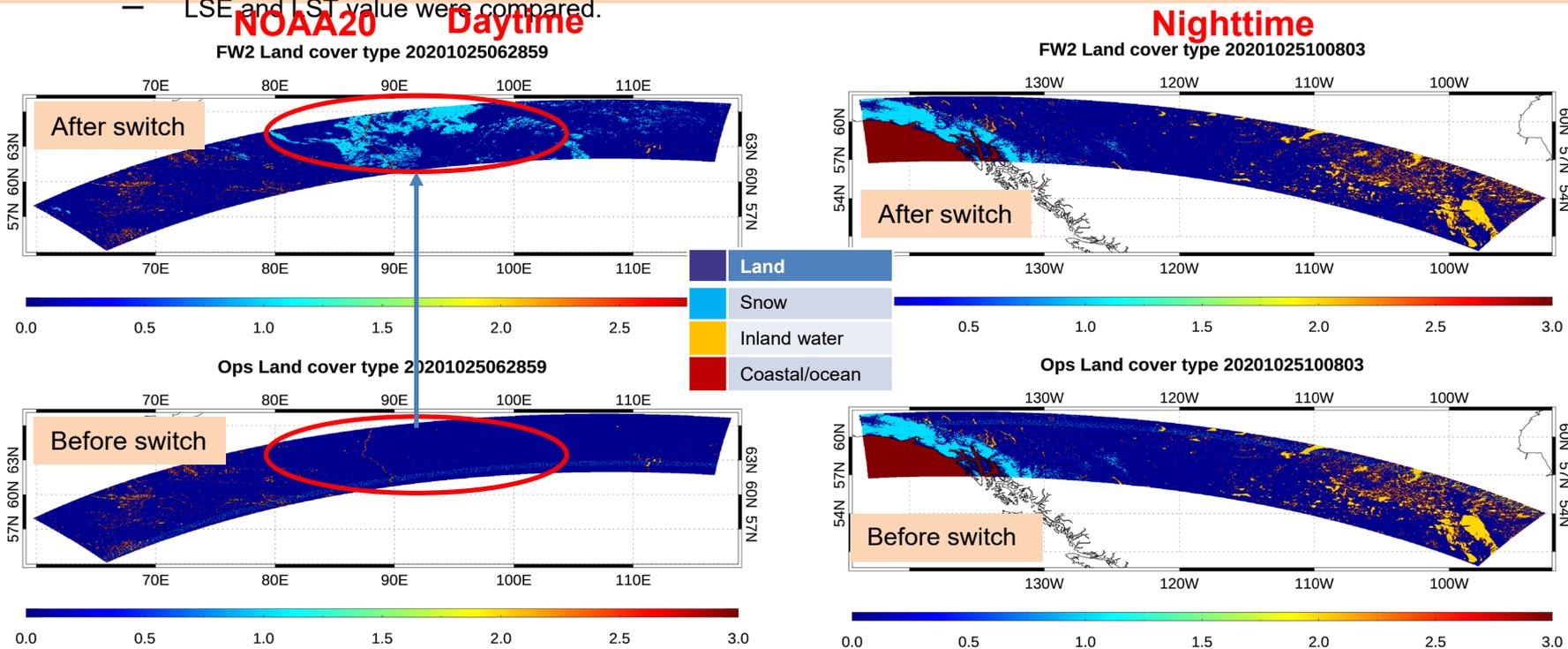
- More snow presence at daytime observed in the LST data after the switches from OISST to CMCSST
- snow presence at nighttime is not obviously observed after the switches from OISST to CMCSST

Update: GFS resolution from 0.5 deg to 0.25 deg

TPW related quality flag

Daytime

NPP

Nighttime

FW2 Water vapor 20201025204936 UTC

After

FW2 Water vapor 20201025110041

After

Ops Water vapor 20201025204936 UTC

Before

Ops Water vapor 20201025110041

Before

TPW related quality flag
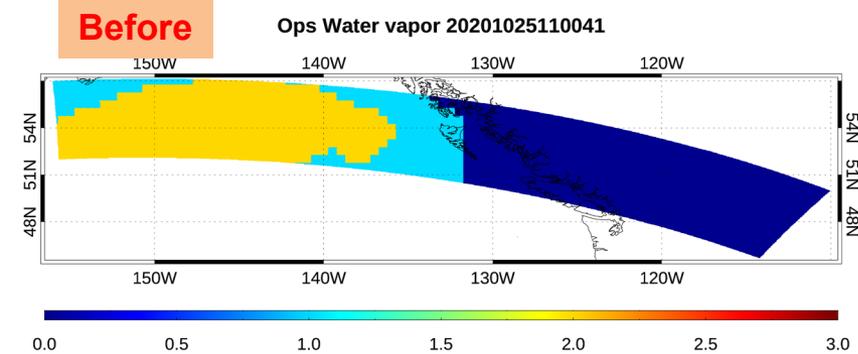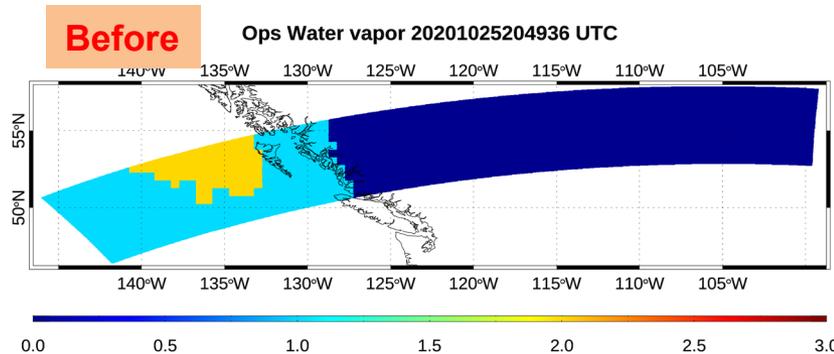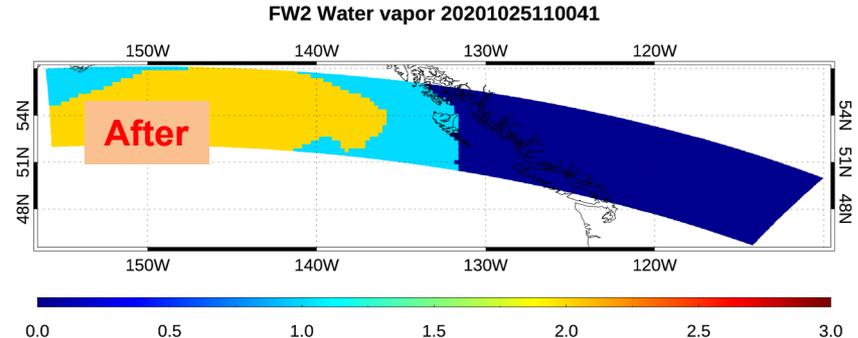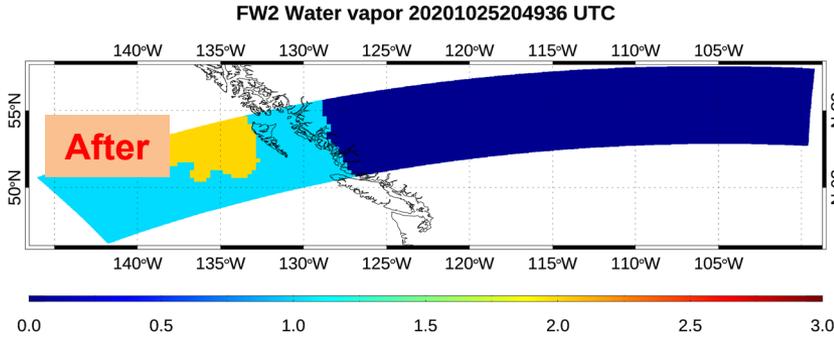
- More details of the water vapor condition were shown after the update. It looks consistent from the test case

LSE- NOAA 20 granule comparison
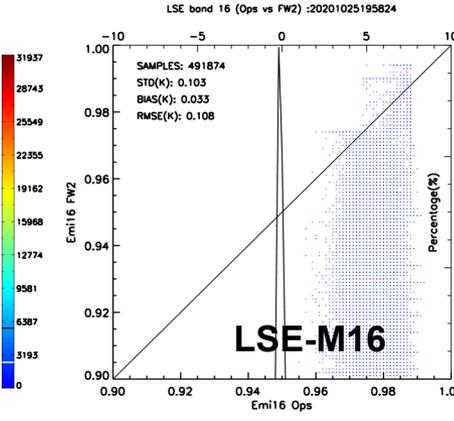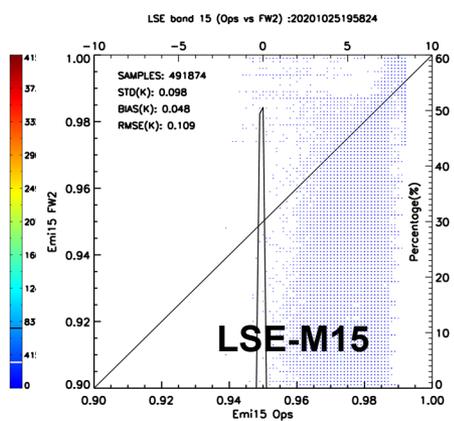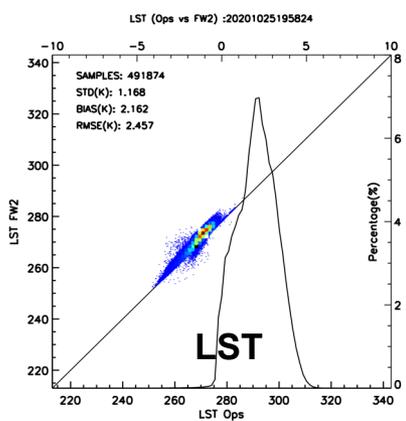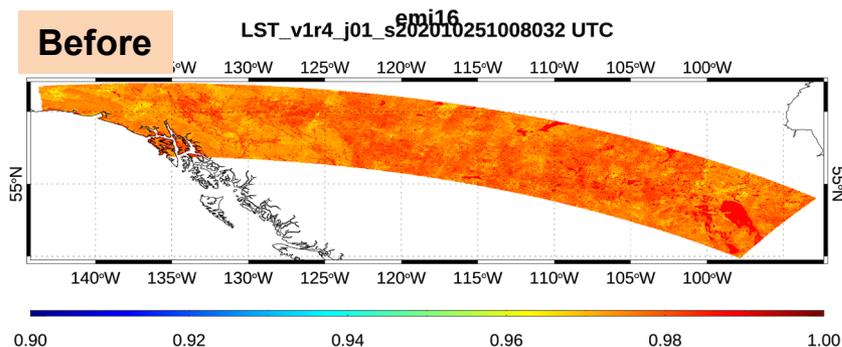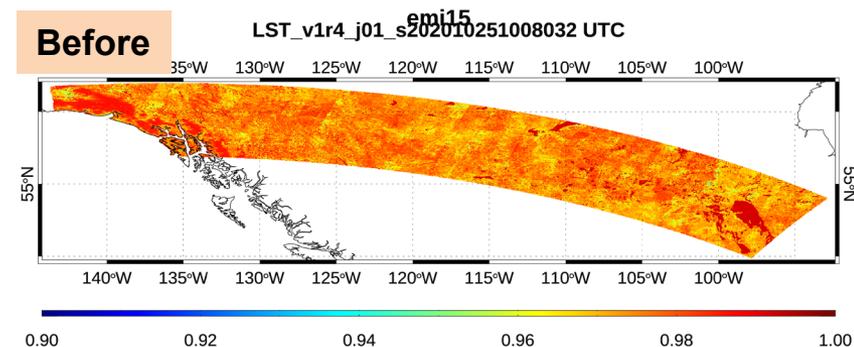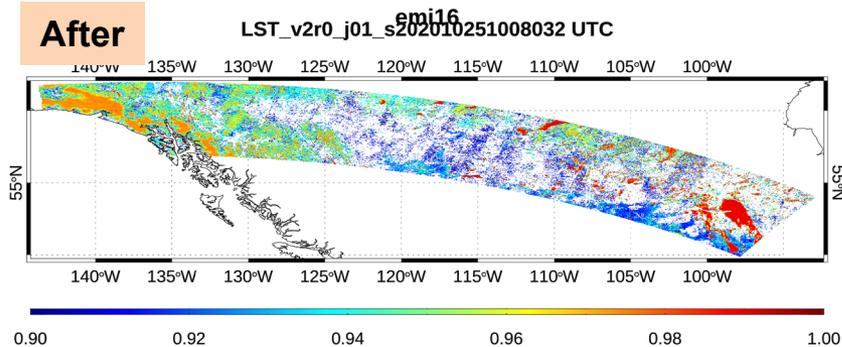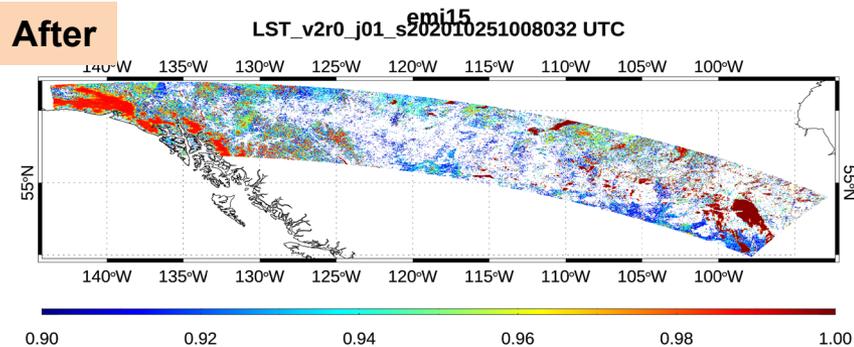
- The FW2 LSE is problematic as shown in the image. The NDE LSE looks reasonable.
- The low LSE caused warmer LST retrievals.

L3 NOAA20 LST/LSE comparison

NOAA20 FW2 LST Image (Day) on 20201025
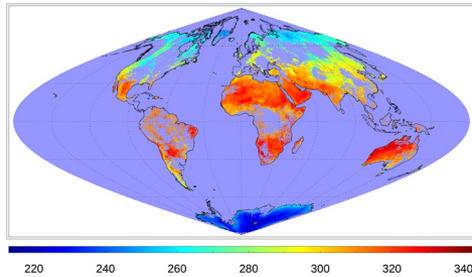
NOAA20 Ops LST Image (Day) on 20201025
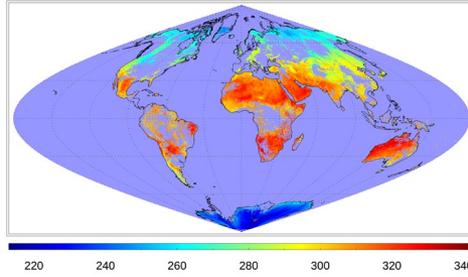
NOAA20 LST Difference Image (Day) on 20201025

20201025:Day

SAMPLES: 3122146
STD(K): 1.536
BIAS(K): 1.674
RMSE(K): 2.272
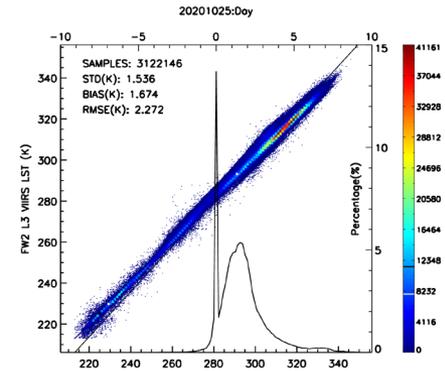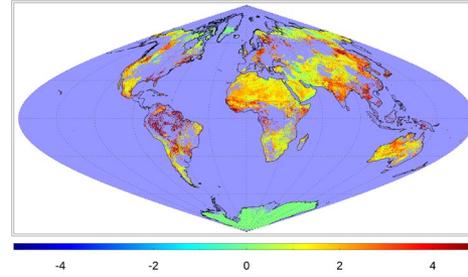
NOAA20 FW2 LST Image (Night) on 20201025
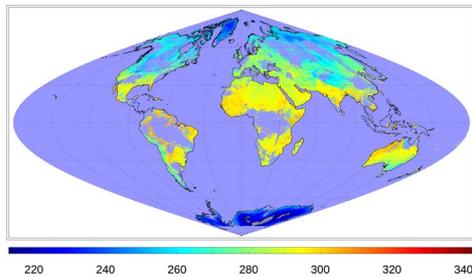
NOAA20 Ops LST Image (Night) on 20201025
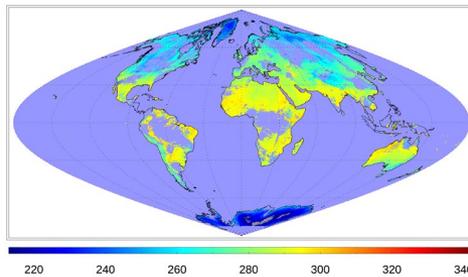
NOAA20 LST Difference Image (Night) on 20201025

20201025:Night

SAMPLES: 3222069
STD(K): 1.551
BIAS(K): 1.978
RMSE(K): 2.514

Emi15 on 20201023

Problematic LSE

Emi16 on 20201023

Problematic LSE
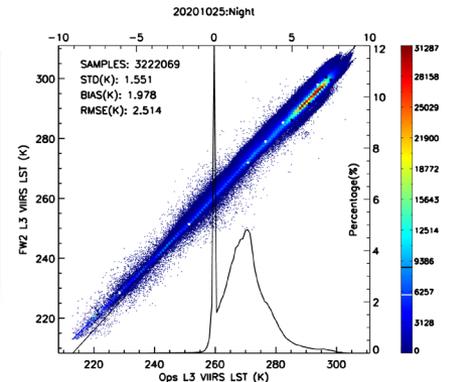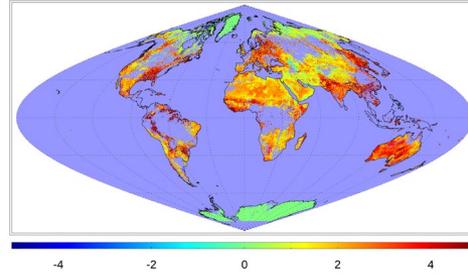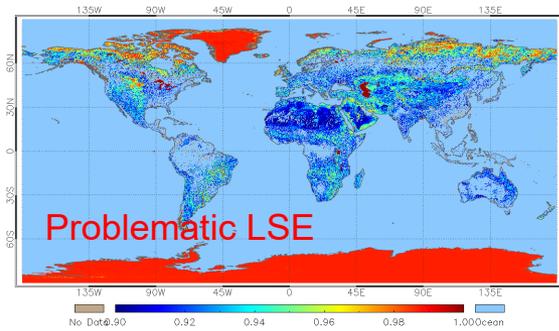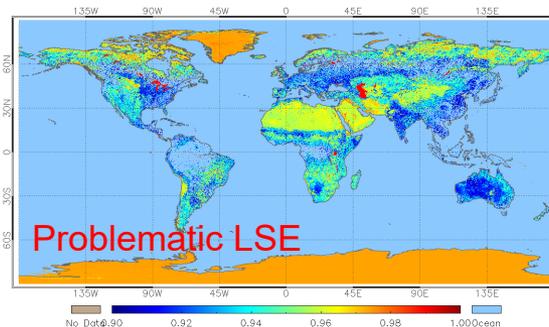
- It is found the FW2 LST is on average 1.7 K and 2.0 K warmer than the operational LST for daytime and nighttime, respectively.
- LST is quite close at Antarctic area and Greenland area

NOAA20 Emis11(local) on 20201023
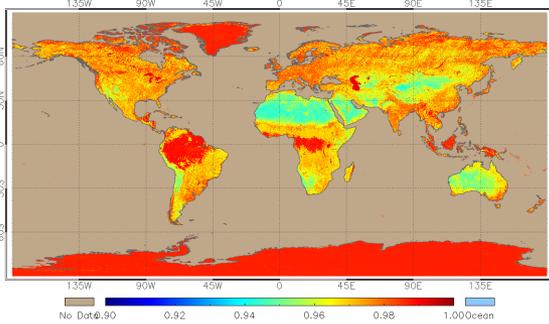
NOAA20 Emis11(rerun) on 20201023
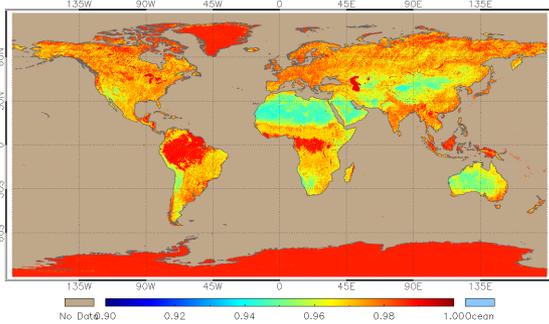
NOAA20 Emis11 diff(rerun−local) on 20201023

LSE band 15 (Local vs rerun) :20201023

LSE band 16 (Local vs rerun) :20201023

LSE broadband (Local vs rerun) :20201023
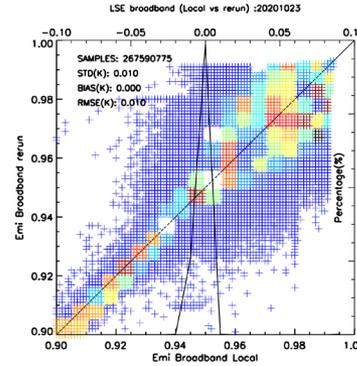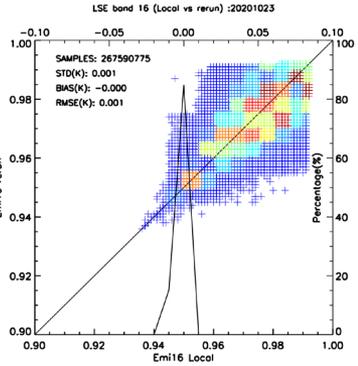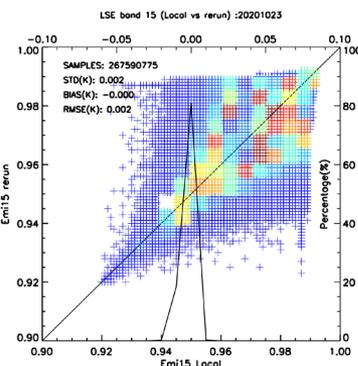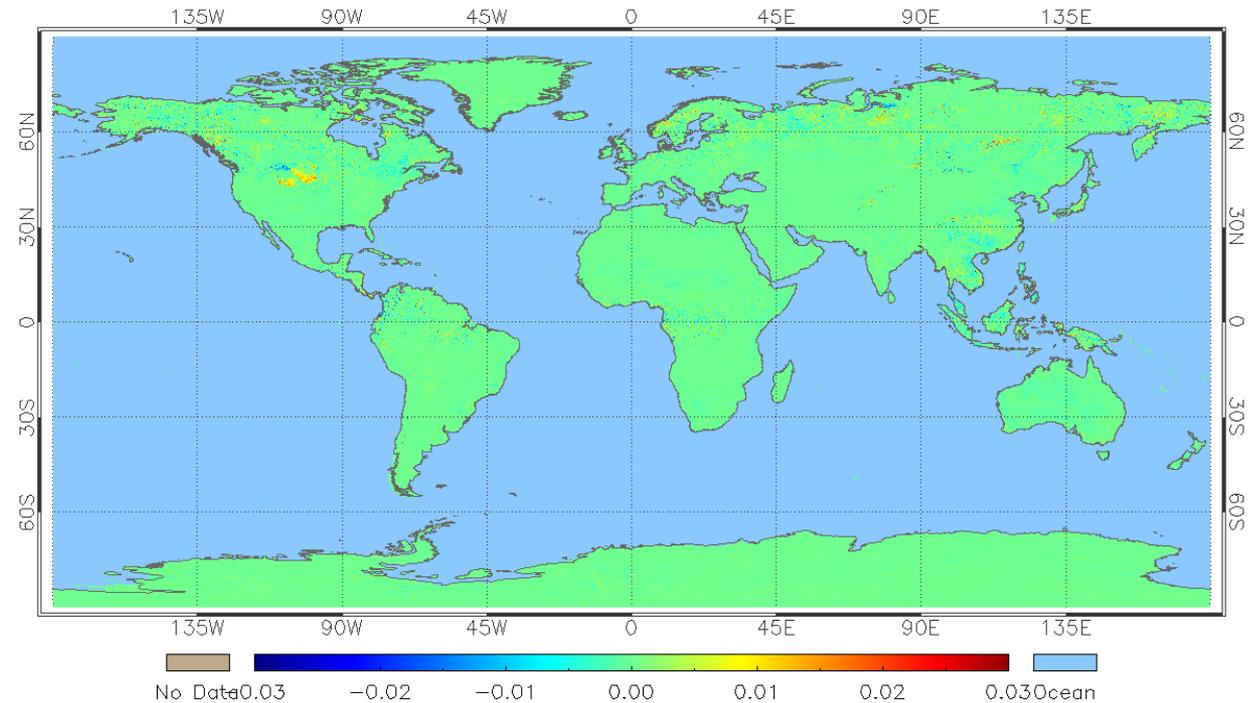
- The rerun LSE is statistically consistent with the local generation. Bias is close to 0 for Emi11, Emi12 and BBE.
- Broadband emissivity shows more scattered estimation.
- Note that the two LSE used input from different sensor: local LSE used the input for SNPP while the rerun LSE used the input from NOAA20. The input is confirmed from the log file.

Before — NOAA20 Day LST on 20201025
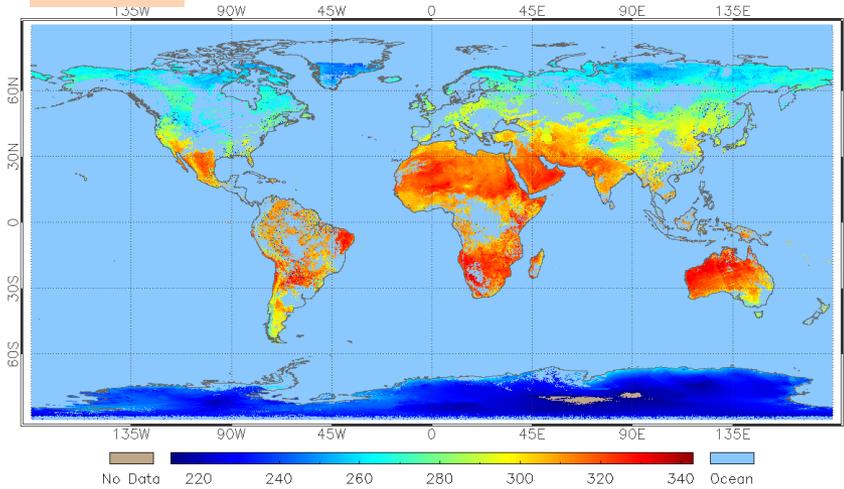
Rerun-previous — NOAA20 ... 20201025
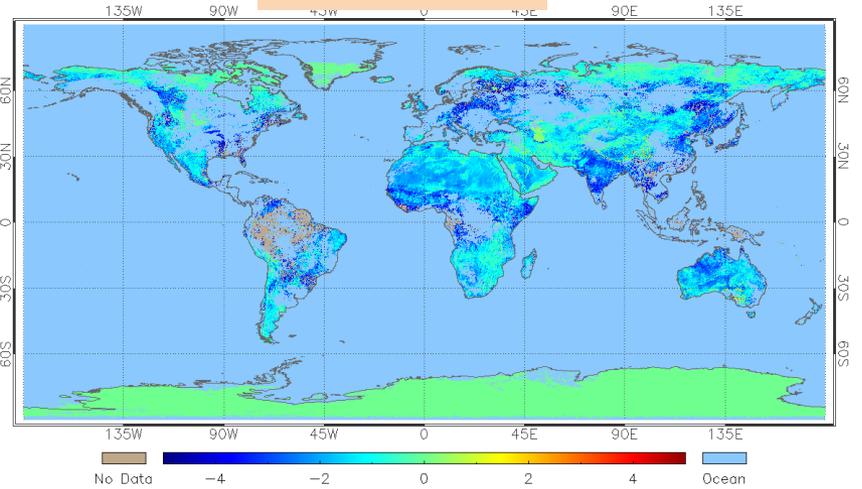
After — N20 Day LST on 20201025
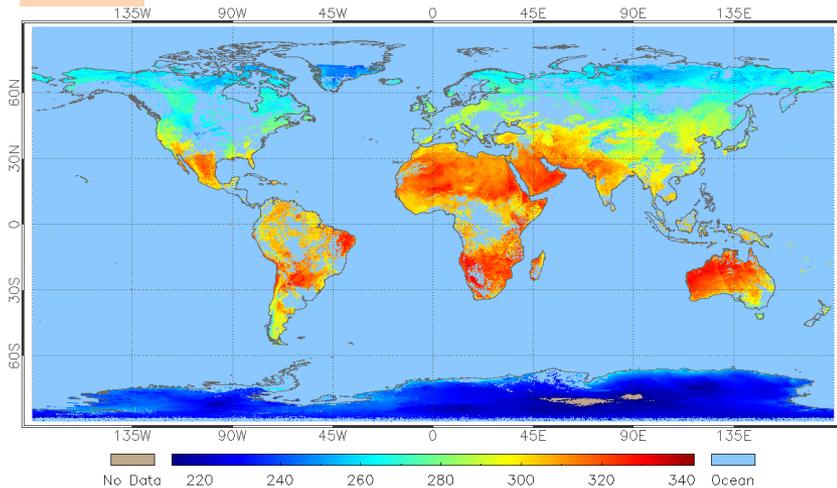
Rerun-ops — NOAA20 ... ps) on 20201025
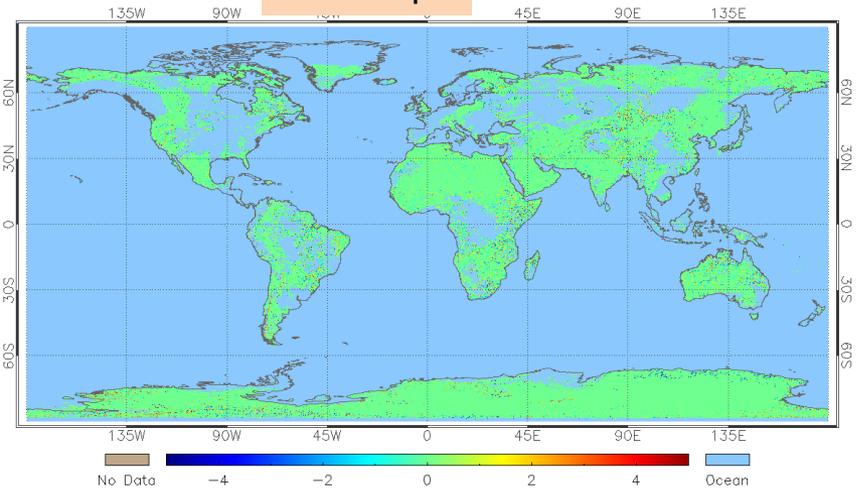
- The warmer LST has been corrected in the rerun results
- The new result is close to the operational LST at global scale.

Before

NOAA20 Night LST on 20201025
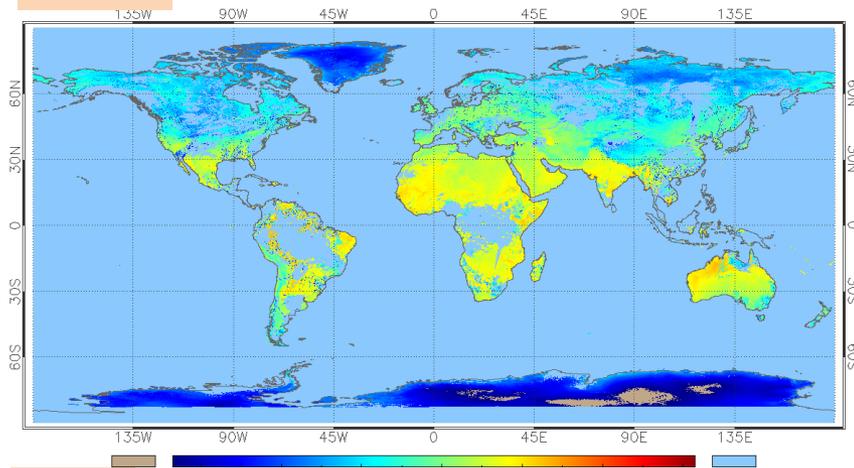
Rerun-previous ST(rerun-previous) on 20201025
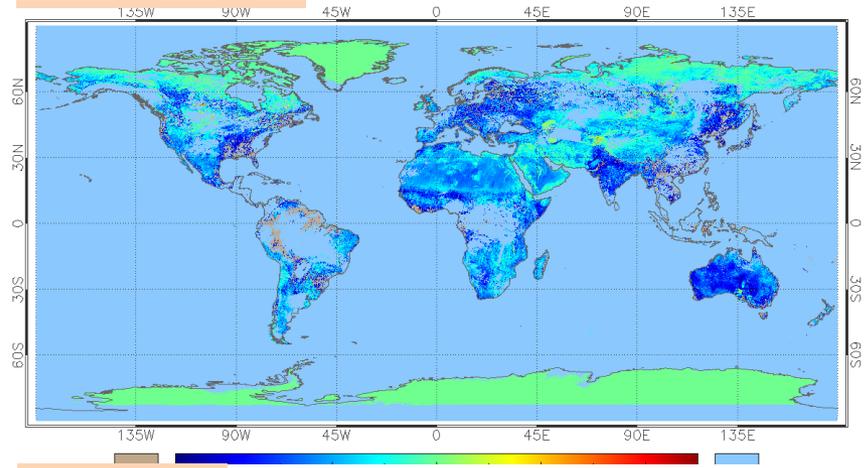
After

N20 Night LST on 20201025

No Data 220 240 260 280 300 320 340 Ocean
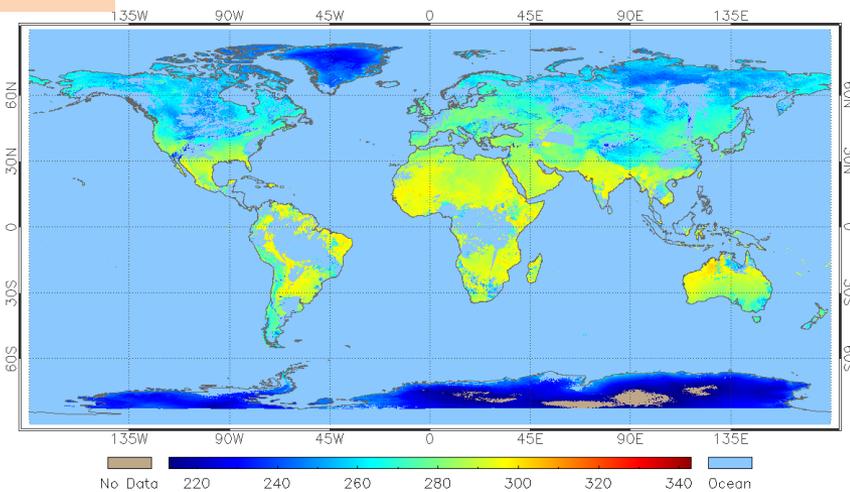
Rerun-ops NOAA20 LST(rerun-ops) on 20201025
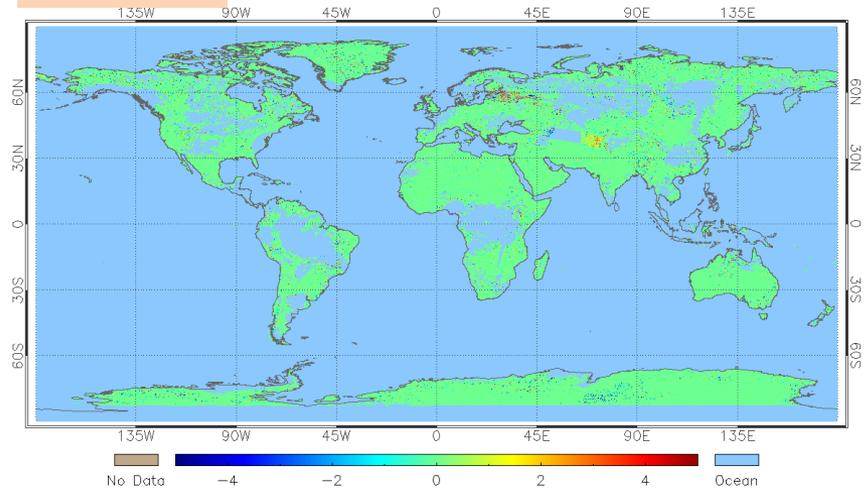
No Data −4 −2 0 2 4 Ocean

- The warmer LST has been corrected in the rerun results
- The new result is close to the operational LST at global scale.

Accomplishments / Events:

- Checked the Framework v2.0 test data from ASSISTT and provided feedback for data revision. Test result has proved the successful fix of polar albedo issue in v2.0 by changing the snow/ice input data (e.g. ***Highlight and Slide #1***)

- Generated land LUTs for JPSS-2 VIIRS sensor

- Prepared and submitted a SPSRB Project Plan for VIIRS BRDF development that is requested from user recently

- Mapped the Geolocation data from granule to tiles in preparation for BRDF retrieving (***Slide #2***)

- Presented the VIIRS albedo progress in 2020 Fall AGU (***Slide #3***)

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
CalVal Report on current SNPP and N-20 data	Dec-20	Dec-20	Dec 20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates, ASSISTT delivery)	Jan-21	Jan-21		10/1/20: SCR
Final J2 DAP to ASSISTT	Mar-21	Mar-21		
Code developed for BRDF computation	Mar-21	Mar-21		
Snow albedo LUT and update	Apr-21	Apr-21		
Sample BRDF data evaluation comparing to MODIS data	Jun-21	Jun-21		
Annual algorithms/products performance report	Aug-21	Aug-21		
BRDF component code integration done	Sep-21	Sep-21		
Support to the NDE and STAR ASSIST requests	Sep-21	Sep-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		

Highlights:

SURFALB_v1r4_j01_s202010251643309_e202010251644554_c202010251701270.nc

Albedo old

Albedo updated

Effect in polar albedo by changing the snow/ice input

In albedo quality flag, the Retrieval path changed as expected:

- false 'desert in polar region' → snow
- sea-ice → more complete coverage

In albedo, it shows more complete and smooth distribution

Case 1
South Pole

Case 2
North Pole

VIIRS BRDF pre-step 2 – mapping Geolocation
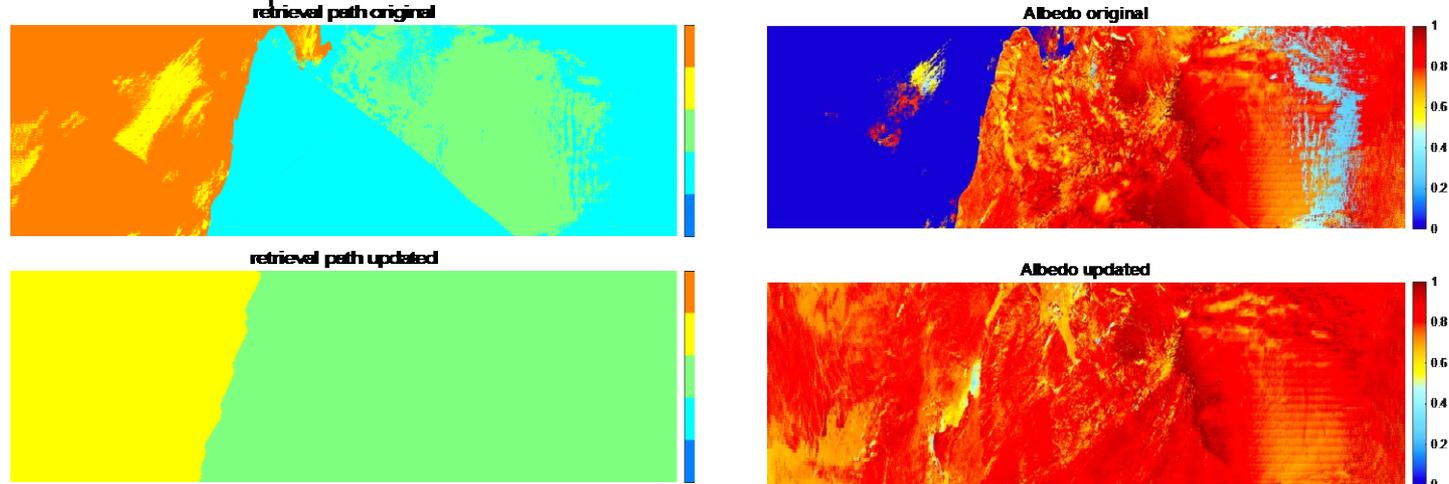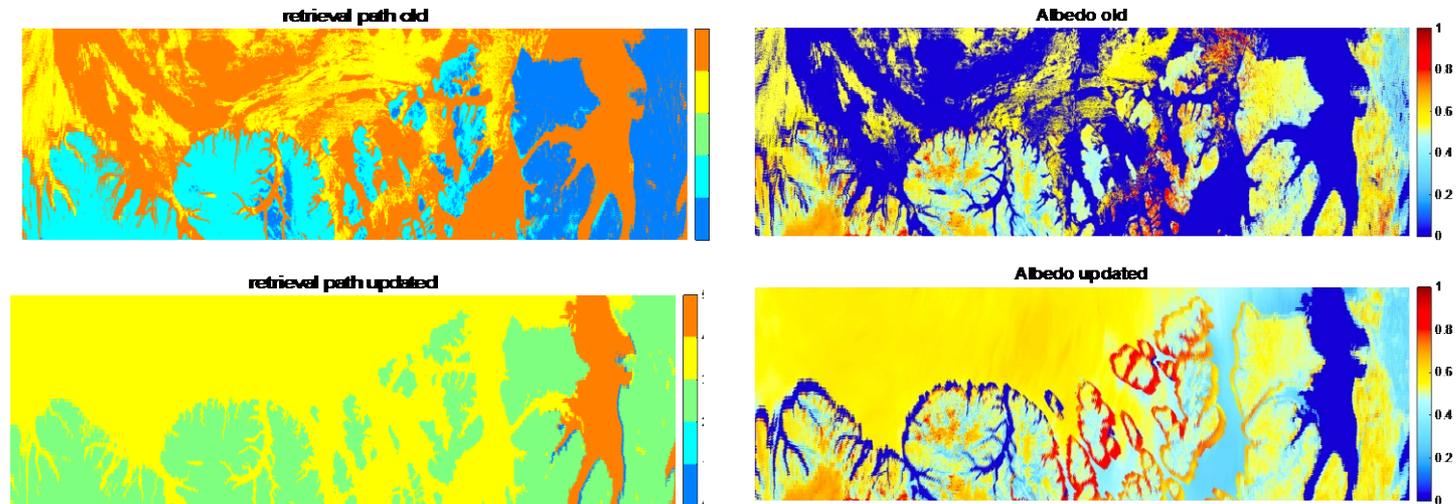
The geolocation angles has been mapped from granule to tiles as well as the Surface Reflectance and its Quality Flag

These layers composes all the required input data for VIIRS BRDF generation if they have qualified performance.
Further evaluation of the input data would be conducted through test.

Presenting VIIRS albedo in AGU

Enhancement of snow/ice albedo performance in VIIRS surface albedo products

Jingjing Peng[1], Yunyue Yu[2], Aolin Jia[3], Dongdong Wang[3], Shunlin Liang[3]

1. ESSIC, UMD 2. STAR, NOAA 3. GEOG, UMD

Abstract and background

Surface Albedo value varies with surface types, which is illustrated in percentage

Product Features and Highlights

VIIRS_Albedo_2020_AGU_Jingji...

Monitoring and Evaluation

Real-time monitoring

NOAA-20 VIIRS Global Albedo (Daily Composite): Dec 20, 2020
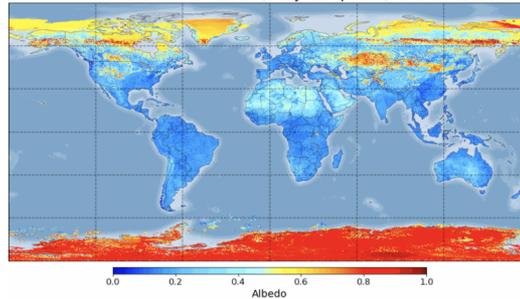
Figure 3 Real-time monitoring of VIIRS albedo

Validation

L2 granule albedo vs. SURFRAD

NOAA-20 VIIRS v.s. All
(20190917 - 20200929)

QF(insitu)=0: N=3541
BIAS:-0.01; STD:0.03

QF(insitu)=1: N=443
BIAS:-0.02; STD:0.03
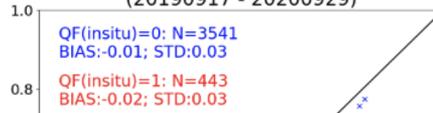
Mitigations and Effect

- Using improved cloud mask and all-weather snow mask as input
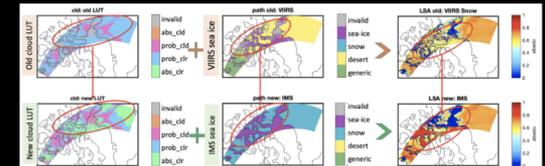
Figure 7 Using he improved VIIRS cloud mask and the IMS snow/ice mask has apparently improved the polar albedo continuity and stability

Applications and Path Forward

VIIRS Albedo Product Page
VIIRS Albedo Product ATBD and References
VIIRS Albedo Monitoring Webpage

The VIIRS albedo has fulfilled its first goal to be globally continuous and comparable to existing products while produced in near-real time.

The VIIRS albedo is carefully monitored and validated with time-series of ground daily mean albedo using site measurements collected from

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Accomplishments / Events:

- Evaluation of Version 2.1 VI algorithms and analysis of factors influencing differences with Version 1.4 is in progress. Consistency with Version 1.4 is good.in the daily data, but some significant differences found in the weekly data. Further investigation will be performed.

- Tested the new VI-GVF system in the period from Oct. 15 to Nov. 15 of 2020 and verified significant improvement in processing time from 6+ hours in the operational weekly GVF system to ~2 hours in the VI-GVF

- Produced NOAA-20 GVF data for Oct and Nov 2020 at the STAR local computer

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Evaluation of the V2.1 VI algorithms	Dec-20	Dec-20	Dec-20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	Dec-20	
ATBD update, Detail Design Document Development	Jan-21	Jan-21		
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Feb-21	Feb-21		
Software optimization update	Apr-21	Apr-21		
Final J2 ready DAP to ASSISTT	Jun-21	Jun-21		
Annual algorithms/products performance report	Aug-21	Aug-21		
SNPP and NOAA-20 product calibration and validation	Sep-21	Sep-21		
Experimental blended data developed	Sep-21	Sep-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		

Highlights:

Weekly NDVI (Weekly VI v1r4)
Daily NDVI (Local run v1r4)
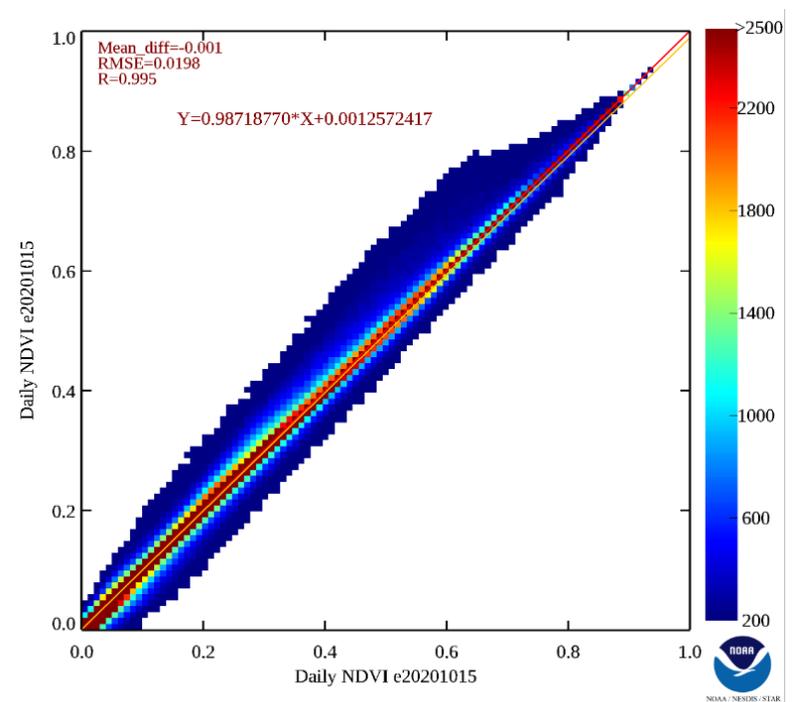
- Composite resolution difference resulted in bias
- VI of V2r1 is slightly lower than the VI of V1r4 over vegetated areas
- Daily aggregation coverage difference did not introduce VI bias

Evaluation of NDVI difference (v1r4 vs. v2r1)

Weekly NDVI

Mean_diff=0.0115
RMSE=0.0692
R=0.968

Y=1.0258118*X+0.0027680408

(V2r1 version)

Weekly NDVI e20201015

Weekly NDVI e20201015

(Weekly VI v1r4)

Daily NDVI

Mean_diff=-0.001
RMSE=0.0198
R=0.995

Y=0.98718770*X+0.0012572417

Daily NDVI e20201015

Daily NDVI e20201015

(Local run v1r4)

- Composite resolution difference resulted in bias
- VI of V2r1 is slightly lower than the VI of V1r4 over vegetated areas
- Daily aggregation coverage difference did not introduce VI bias

Evaluation of EVI difference (v1r4 vs. v2r1)

Factor	V1R4	V2R1
Composite resolution (1)	0.003 degree	0.036 (GLB) 0.009 (REG) degree
Daily aggregation coverage (2) (spatial sampling)	Average SR over 12*12 window	Average SR over 12*12 window, but limited to the dominant view angle observations

Weekly VI involved factors 1 and 2
RMSE=0.04

Mean_diff=0.0098
RMSE=0.0407
R=0.973
Y=0.90924346*X+0.0089175348

(weekly VI v1r4)

Daily VI only involved factor 2
RMSE=0.01

Mean_diff=0.0001
RMSE=0.0107
R=0.996
Y=1.0009495*X+-0.00017569285

(daily VI v1r4)
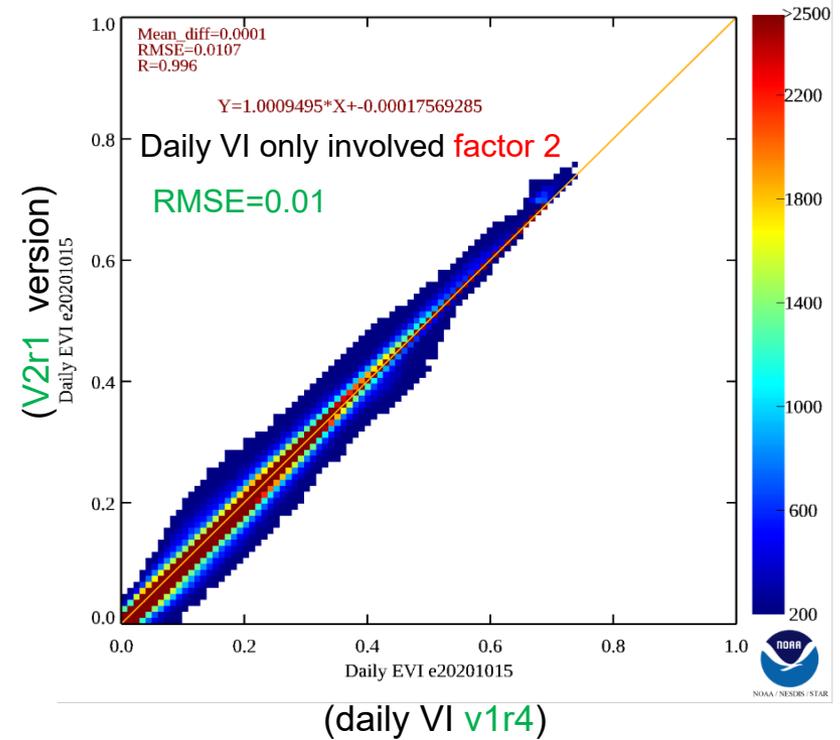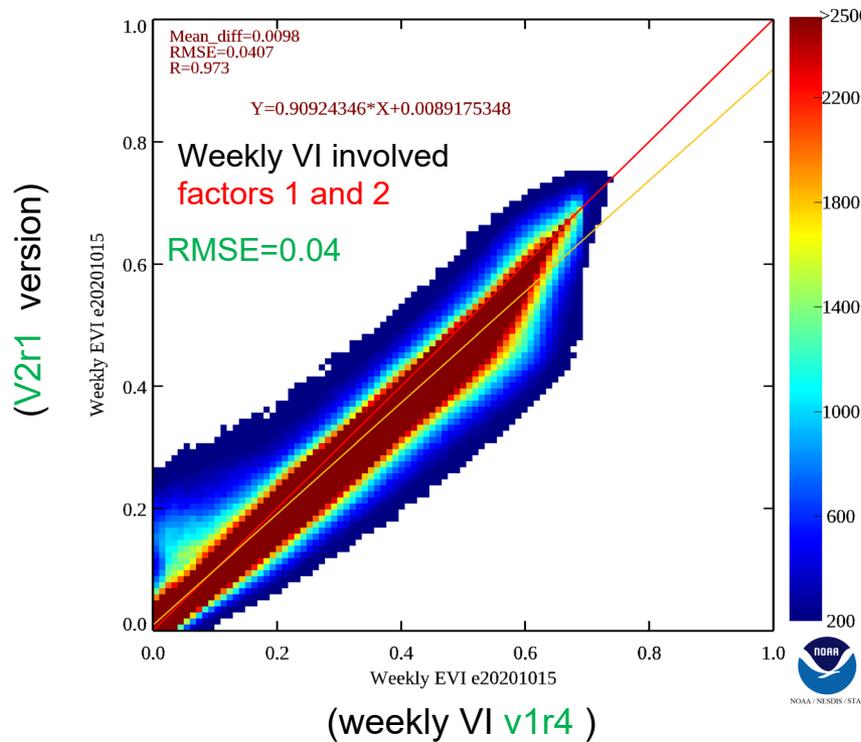
- Factor 1 is the major factor causing VI difference, contributing 75% of VI difference
- Factor 2 contributed 25% of VI difference

# Daily mean VI values and difference statistics Version 2.1 versus version 1.4 time series
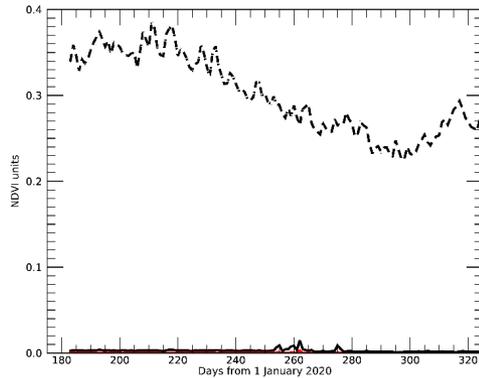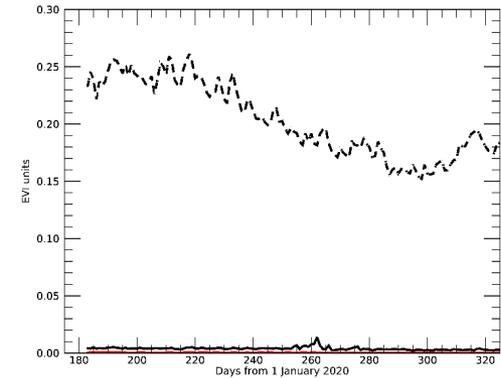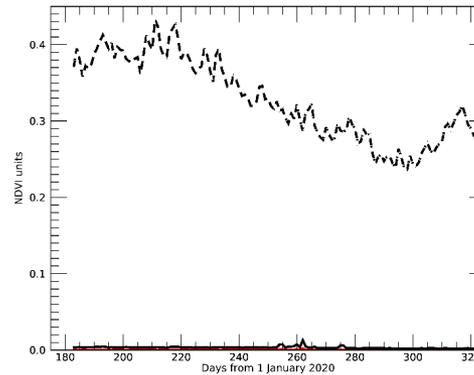
TOA NDVI

TOC NDVI

(Dash) v2.1 mean VI

(Dot) v1.4 mean VI

Bias

Standard deviation

RMS difference

Weekly mean VI values and difference statistics Version 2.1 versus version 1.4 time series
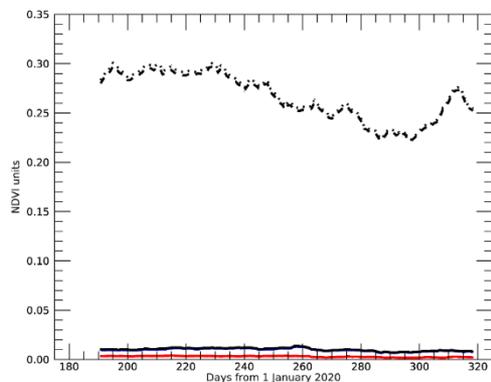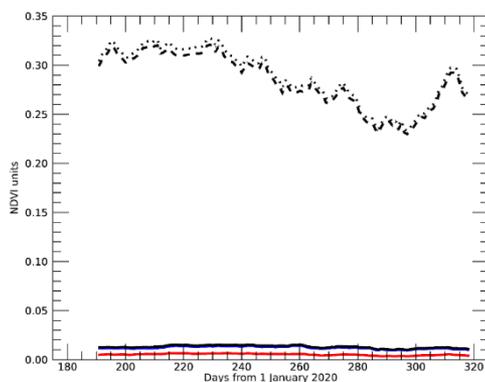
TOA NDVI   TOC NDVI   TOC EVI
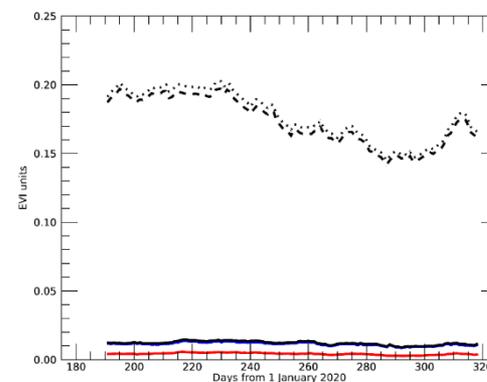
(Dash) v2.1 mean   Bias
VI   Standard deviation
(Dot) v1.4 mean VI   RMS difference

Biweekly mean values and difference statistics Version 2.1 versus version 1.4

TOA NDVI
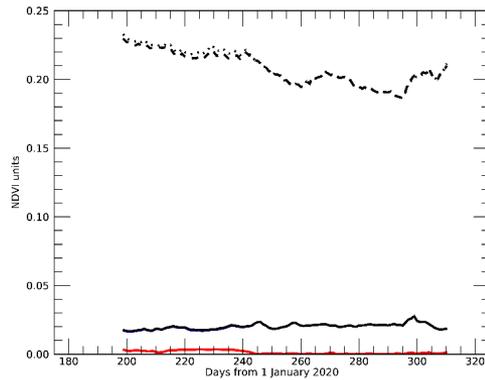
TOC NDVI
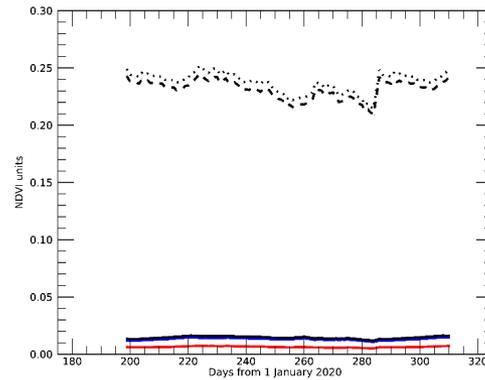
TOC EVI
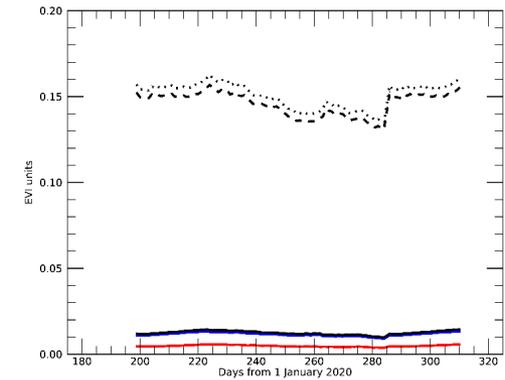
(Dash) v2.1 mean VI

(Dot) v1.4 mean VI

Bias

Standard deviation

RMS difference

➢ Reconfiguration is expected to result in substantial savings to GVF run time.
➢ Unit 1 will be run within VI module.
➢ Unit 2 will be run within GVF module.
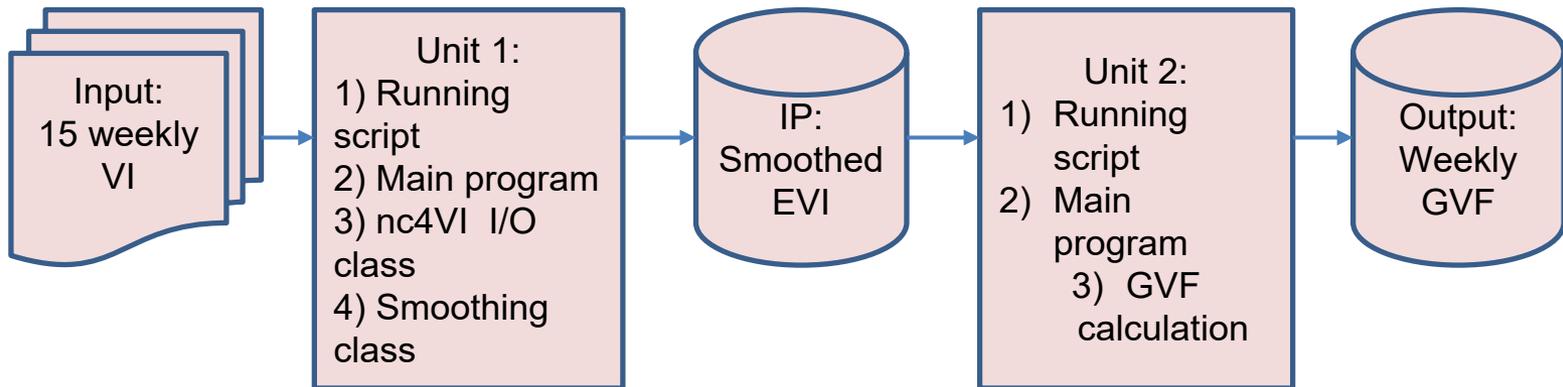
Reduced CPU processing time of GVF from VI

```
Record Running Time(RRT) of updated GVF VI on VIIRS Observations

GVF Running Time with VIIRS Observations On 20201015
============================================================
Process (Unit)                    Running Time (H:M:S)
------------------------------------------------------------
TSsmooth:                         0:0:29
------------------------------------------------------------
calcGVF:                          0:0:1
------------------------------------------------------------
Daily Mosaic:                           0:0:2
GVF Running Time with VIIRS Observations On 20201016
============================================================
Process (Unit)                    Running Time (H:M:S)
------------------------------------------------------------
TSsmooth:                         0:0:24
------------------------------------------------------------
calcGVF:                          0:0:2
------------------------------------------------------------
Daily Mosaic:                           0:0:2
GVF Running Time with VIIRS Observations On 20201017
============================================================
Process (Unit)                    Running Time (H:M:S)
------------------------------------------------------------
TSsmooth:                         0:0:21
------------------------------------------------------------
calcGVF:                          0:0:2
------------------------------------------------------------
Daily Mosaic:                           0:0:2
GVF Running Time with VIIRS Observations On 20201018
============================================================
Process (Unit)                    Running Time (H:M:S)
------------------------------------------------------------
TSsmooth:                         0:0:33
------------------------------------------------------------
calcGVF:                          0:0:2
------------------------------------------------------------
Daily Mosaic:                           0:0:2
```

```
GVF Running Time with VIIRS Observations On 20201113
============================================================
Process (Unit)                    Running Time (H:M:S)
------------------------------------------------------------
TSsmooth:                         0:0:20
------------------------------------------------------------
calcGVF:                          0:0:2
------------------------------------------------------------
Daily Mosaic:                           0:0:1
GVF Running Time with VIIRS Observations On 20201114
============================================================
Process (Unit)                    Running Time (H:M:S)
------------------------------------------------------------
TSsmooth:                         0:0:20
------------------------------------------------------------
calcGVF:                          0:0:2
------------------------------------------------------------
Daily Mosaic:                           0:0:2
GVF Running Time with VIIRS Observations On 20201115
============================================================
Process (Unit)                    Running Time (H:M:S)
------------------------------------------------------------
TSsmooth:                         0:0:18
------------------------------------------------------------
calcGVF:                          0:0:3
------------------------------------------------------------
Daily Mosaic:                           0:0:2


******************* Period: 20201015-20201115*******************
start running time:                   Tue Dec  8 04:56:13 UTC 2020
end running time:                     Tue Dec  8 05:10:16 UTC 2020
Total running time:                   0:14:3
```

Accomplishments / Events:

- A review paper entitled "An ongoing blended long-term vegetation health product for monitoring global food security" by Wenze Yang, Felix Kogan and Wei Guo has been published with Agronomy (highlighted);

- Installed a series of R packages (e.g. rgeos) relating to Species Distribution Models (SDM), searched and followed some SDM cases, aiming to deepen the research on the relationship between vegetation health and locust activities;

- Generated a series of data and figures of VIIRS/VHP-1 and -4, -16 km resolution products, covering December 2020;

- Updated lately monthly and weekly locust maps.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/29/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Apr-21	Apr-21		
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Dec-21		N20 final DAP
Update 1 km VH data for OSPO, USDA, NIDIS	Sep-21	Sep-21		
VIIRS-0.5 km SMN & SMT (8-year Max-Min Climatology)	Sep-21	Sep-21		
40-year Vegetation Greenness (MDVI) & Global warming	Sep-21	Sep-21		
Climate warming & temperature (SMT) in agricultural regions	Sep-21	Sep-21		
FAO locust activity vs VHindices in 2021	Sep-21	Sep-21		
NDVImax/min & BTmax/min: 0.5 and 1 km correlation	Sep-21	Sep-21		
Regional drought and global warming trends	Sep-21	Sep-21		
Algorithm: VHindices-Locust (Africa, Arabia & India)	Sep-21	Sep-21		
Algorithm: VHindices-Malaria (South America)	Sep-21	Sep-21		
VHindices vs Locust (Africa, Arabia & India) 2020 & 2019	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights: A Review Paper Has Been Published

Review

An Ongoing Blended Long-Term Vegetation Health Product for Monitoring Global Food Security

Wenze Yang [1,*], Felix Kogan [2] and Wei Guo [1]

1. I M Systems Group Inc., College Park, MD 20740, USA; Wei.Guo@noaa.gov
2. Center for Satellite Applications and Research, National Environmental Satellite Data and Information Services (NESDIS), National Oceanic and Atmospheric Administration (NOAA), College Park, MD 20740, USA; Felix.Kogan@noaa.gov
* Correspondence: Wenze.Yang@noaa.gov; Tel.: +1-301-683-3577

Abstract: Remotely observing global vegetation from space has endured for nearly 50 years. Many datasets have been developed to monitor vegetation status. Tailored to specifically monitor global food security concerning drought and crop yield, a suite of datasets based on vegetation health

Accomplishments / Events:

The SeaPRISM instruments and the robotic arm were swapped, replaced the 12Vdc battery charger and both 12Vdc batteries that provide power to instruments, computer and communication devices and changed out main computer. In addition, the satellite dish was aligned with a different satellite due to the original satellite nearing end-of-life expectancy to assure several more years of uninterrupted communication. Data is flowing again to NASA as of December 10, 2020. Waiting for a clear day to determine data quality.

 NRL has set up operational processing and Website in support of the upcoming April 2021 Northern Gulf of Mexico cruise. SNPP and NOAA-20 VIIRS and Sentinel-3A and 3B OLCI chlorophyll and Sea Surface Temperature products are currently being processes daily.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20		
Initial J2 ready DAP delivery (include NPP/N20 updates) to CW	Dec-20	Dec-20		
Initial J2 ready DAP delivery to OSPO (from ASSISTT)	Jun-21	Jun-21		
Final J2 ready DAP delivery (include NPP/N20 updates) to CW	Sep-21	Sep-21		
Final J2 ready DAP delivery to OSPO (from ASSISTT)	Dec-21	Dec-21		
Complete MSL12 v1.40 preparation and implementation	Jun-21	Jun-21		
Update MSL12 LUTs and various coefficients for J-2	Jun-21	Jun-21		
Complete testing/verification of J-2 OC data processing	Sep-21	Sep-21		
Working on improvement of the ocean color data processing system (MSL12), particularly over global coastal and inland water regions	Sep-21	Sep-21		
Improve the merged VIIRS OC data from SNPP and NOAA-20, and gap-free global Chl-a data	Sep-21	Sep-21		
Continue VIIRS Cal/Val data analysis (SNPP & NOAA-20 comparison)	Mar-21	Mar-21		
In situ data collections from OC Cal/Val team including NOAA dedicated cruise and other opportunities, and continue Cal/Val for ocean color EDR	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights: Plans for NOAA Calval 2021 cruise track
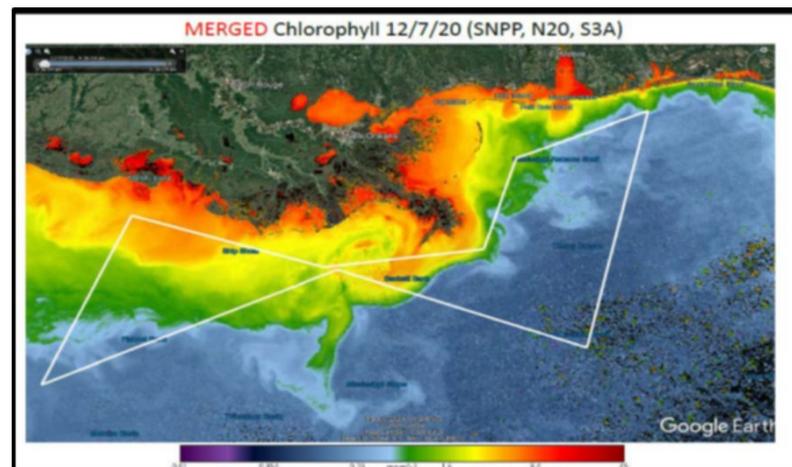
Merged SNPP, NOAA 20 and Sentinel 3A chlorophyll image for December 7, 2020 displayed in Google Earth using the generated KMZ file posted on the website above. The NOAA Calval 2021 cruise track shown is a temporary daily track where 3-4 days planned for coincident sampling with the WavCIS AOC site.

Sea Surface Temperature

Accomplishments / Events:

– J2 Cal/Val Plan Completed

– SST Team supported an initial J2 DAP via ASSISTT to NDE. The previously delivered DAP was updated with the new version of L3U code, which supports more consistent bias between L2P and L3U products.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Apr-21	Apr-21		ACSPO 2.80
Final J2 ready DAP to ASSISTT	Aug-21	Aug-21		ACSPO 2.90
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Dec-21		
Algorithms improvements (clear-sky mask, SST thermal fronts) to support data fusion (ACSPO 2.90)	Aug-21	Aug-21		
J2 ACSPO and Cal/Val Readiness	Sep-21	Sep-21		
Support N20/NPP SST Cal/Val & fixes	Sep-21	Sep-21		
Continue archival w/PO.DAAC/NCEI. Work w/NCEI to complete holdings	Sep-21	Sep-21		
Maintain SQUAM, *i*Quam, ARMS, match-up codes, RAN infrastructure. Improve & optimize	Sep-21	Sep-21		
NOAA SST Cal/Val Tools ready to monitor N21 SST	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights:

ACSPO Global 0.02º Gridded Super-collated L3S-LEO product released on Coast Watch website: https://coastwatch.noaa.gov/cw/satellite-data-products/sea-surface-temperature/noaa-acspo/l3s-leo.html

Accomplishments / Events:

- VIIRS products samples provided by ASSISTT for the upcoming SuperDAP delivery were evaluated qualitatively and quantitatively. The polar winds samples showed some large differences in wind vector height, apparently due to changes in the cloud height algorithm (ACHA). These are not errors, as the changes to ACHA were intentionally made to provide a better match to CALIPSO data. The result is that the cloud top heights, and therefore the wind vector heights, increased (in altitude; decreased in pressure). Further work on the impact of these changes will be undertaken, though this is not a problem that would delay the DAP delivery.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Jan-21		10/1/20: SCR
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Sep-21	Sep-21		
Prototype the derivation of winds with the DNB using the heritage windco algorithm	Sep-21	Sep-21		
Implementation of the shortwave IR (2.25 μm) band winds	Sep-21	Sep-21		
Adapt QC method designed for winds derived using optical flow from image pairs to VIIRS tandem winds	Sep-21	Sep-21		
Assess the use of cloud heights derived from LEO hyperspectral sounders (CrIS, IASI)	Sep-21	Sep-21		
Collaborate with NWP community on model assimilation and impact studies	Sep-21	Sep-21		
Continue to improve products monitoring capability	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights:

### Polar Winds Height Changes in SuperDAP
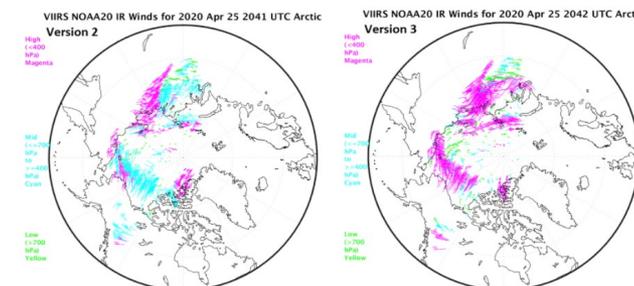
Figure: Version 2 (currently operational; left plot) and version 3 (right) VIIRS polar winds over the Arctic on 25 April 2020 at ~2041 UTC, in three pressure height categories.

Figure: Version 3 on right hand side (SuperDAP) has more Magenta-colored High-Winds. This is expected to be an improvement over current Version 2 winds and provide a better match to CALIPSO observations.

NUCAPS Products

Accomplishments / Events

NUCAPS CO_2 validated maturity review for CO_2 EDR, held on 12/17, was well received by the JPSS STAR Program managers, external agencies, and stakeholders. The NUCAPS team provided charts demonstrating (a) the enterprise nature of the NUCAPS version 3.0 in producing consistent quality products from JPSS (S-NPP/NOAA-20) and MetOp Series (MetOp-A/B/C), (b) the latest algorithm did not adversely affect the products that are already of validated maturity, (c) validation of CO_2 with TCCON, ATOM, and Aircore reference data sets, (d) user applications of CO_2 products for COVID-19 and user feedback. The review panel recommended that the NUCAPS CO_2 product be designated at Validated Maturity pending on completion of the action for quantitative OCO-2 comparisons.

NUCAPS team continued collaborations with NOAA-GML on (a) trace gas products validations with GML measurements, and (b) Ozone and water vapor validations.

Team members are working on the OLR paper submission to Remote Sensing, and in preparation of a manuscript for the BAMS article.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Validated Maturity: CO2 (S-NPP & NOAA-20)	Dec-20	Dec-20	12/17/20	12/17/20
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
NUCAPS3.0/HEAP2.3 to ASSISTT			12/14/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Apr-21	Apr-21		
Final J2 ready DAP to ASSISTT	May-21	May-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Oct-21	Oct-21		
NUCAPS averaging kernels for T/H2O/O3/CO/CH4/CO2	Sep-21	Sep-21		
Improve trace gas retrievals	Sep-21	Sep-21		
Explore the use of alternate technologies for certain NUCAPS modules such as AI-based bias tuning and regression	Sep-21	Sep-21		
Collection of validation data sets and collocated matches of satellite radiances and ancillary data sets for product validations and monitoring	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights
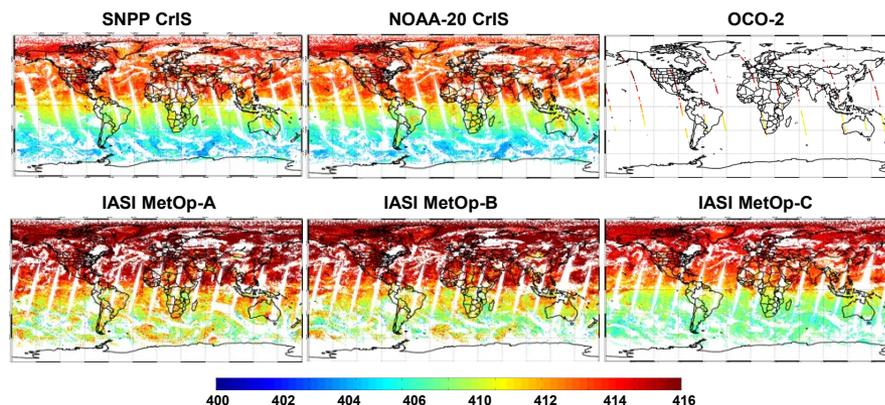
Figure 1. NUCAPS algorithm produces consistent trace gas products from JPSS (S-NPP/NOAA-20) and MetOp series (MetOp-A/B/C). Figure shown is a depiction of the CO_2 product derived from the NUCAPS v3.0 with the review panel recommendations for validated maturity. The team is currently working on quantitative evaluations with the OCO and other correlative observations.

Accomplishments / Events:

- The MiRS team officially released a delivery algorithm package (DAP) for version 11.7 of MiRS. This new version of MiRS contains a number of science and technical improvements, fixes, and extensions. The most significant include the extension of MiRS preliminary processing capability to Metop-SG A1 MWS. This is an early experimental pre-launch capability, tested only on STAR-generated simulated proxy data. Significant tuning, testing and other modifications are expected before and after launch, currently planned for 2023.
- Work has continued on evaluating and implementing best machine learning approaches for a dynamic radiometric bias correction for ATMS. Currently a channel by channel evaluation of predictive performance of both a neural network (NN) and random forest (RF) model is underway.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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Issues/Risks:

None

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
MiRS v11.7 to ASSISTT			12/21/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Mar-21	Mar-21		
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Dec-21		
Integrate SFR updates	Jun-21	Jun-21		
AI based radiometric bias correction	Aug-21	Aug-21		
Explore AI application for improved first guess for all weather temperature and water vapor retrievals in particular the enhancement under hurricane conditions	Sep-21	Sep-21		
ATMS SDR reprocessing data verification	Sep-21	Sep-21		
Algorithm maintenance and monitoring	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights:

Assessment of the relative importance of the Random Forest input predictors on the output prediction of the radiometric bias. The input predictors listed in order are: latitude, satellite zenith angle, brightness temperature in channels 1-22, CLW, TPW, and Tskin. BT22 is largest importance.

Accomplishments / Events:

- Updates to the SFR algorithm software incorporated into latest MiRS package for NDE including (1) updates for JPSS-2 processing, (2) snowfall detection algorithms for NOAA-20 and SNPP, (3) updated emissivity initialization for NOAA-20 and SNPP SFR, (4) updated bias correction for NOAA-20 and SNPP, (4) implementation of a 2-stream scattering correction in the 1DVAR SFR retrieval, (5) reactivation of Metop-A capability, and (6) minor software fixes.

- A winter storm brought intense snowfall to a large swath of the Mid-Atlantic and the Northeast on December 16-17. The total snow accumulation broke the all-time record in part of Pennsylvania. The microwave snowfall rate (SFR) product captured the storm with a suite of satellites including NOAA-20 and S-NPP.

Overall Status:

|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	
MiRS v11.7 to ASSISTT			12/21/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Mar-21	Mar-21		ASSISTT delivery
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21		MiRS delivery
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Dec-21		ASSISTT delivery
Updated SFR algorithms for JPSS-2	May-21	May-21		
Deliver updated SFR package (for JPSS-2, NOAA-20, and S-NPP) to MiRS team for integration	May-21	May-21		11/20/20 SFR package to MiRS
Explore AI-based snowfall detection	Sep-21	Sep-21		
NOAA-20 and S-NPP cross-calibration/comparison	Sep-21	Sep-21		
Algorithm maintenance and monitoring	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights: Snowfall Rate captures intense Northeast and Mid-Atlantic Event December 16-17 2020 very well
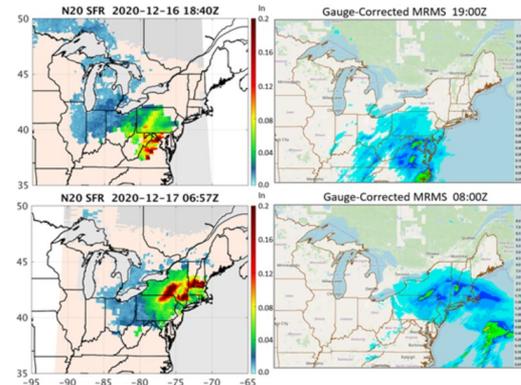
Left column: NOAA-20 SFR product; right column: the corresponding gauge-corrected MRMS hourly precipitation.

OMPS Ozone

December, 2020

Accomplishments / Events:

Completed testing of broad bandpass retrievals for J02-ready V8TOz.. Delivery to ASSISTT by 11/30/2020.

Assisting OMPS SDR team with testing of In-band Stray Light Corrections. CCR for code changes has been approved. Sample day of data is in testing with V8Pro.

Assisted with script changes to manage ancillary file names for the V2Limb. A solution has been implemented in operations.

Collecting ozone product files for April 30, 2020 focus day study comparing ground-based and satellite ozone records. Generating overpass matchups from V2Limb for GML ground stations.

Participated in Korean GEMS Calibration/Validation Team workshop. BATC has approved the release w/o restriction of GEMS key calibration tables.

Created V2.0 of the J02 Ozone Calibration & Validation Plan incorporating changes from JPSS review.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule			X		Ozone Profile agreement between S-NPP and NOAA-20 is elusive.

1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	05/21/20	
J2 Cal/Val Plan – V2.0 delivery	Dec-20	Dec-20	12/30/20	
Initial J2 ready DAP to ASSISTT	Jul-20	Jul-20	v4r0: 07/07/20	V8Pro
Initial J2 ready DAP to ASSISTT	Nov-20	Nov-20	v4r2: 11/25/20	V8TOz
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Dec-20	Dec-20	12/31/20	V8Pro
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Ma-21	Mar-21		V8TOz
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21		V8Pro
Final J2 ready DAP to ASSISTT	Jun-21	Jun-21		V8TOz
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Dec-21		V8Pro
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		V8TOz
Algorithm Updates Review	Sep-20	Sep-20	08/18/20	
Algorithm Updates/Cal-Val Activities				
Details in next slides				

Highlights: This year's Ozone Hole has been very stable and is still present.

NOAA-20 OMPS V8 Total Ozone - Antarctic
23 Nov 2020

NOAA/NESDIS/STAR

NOAA JPSS Program Office Monthly • OFFICIAL USE ONLY   65
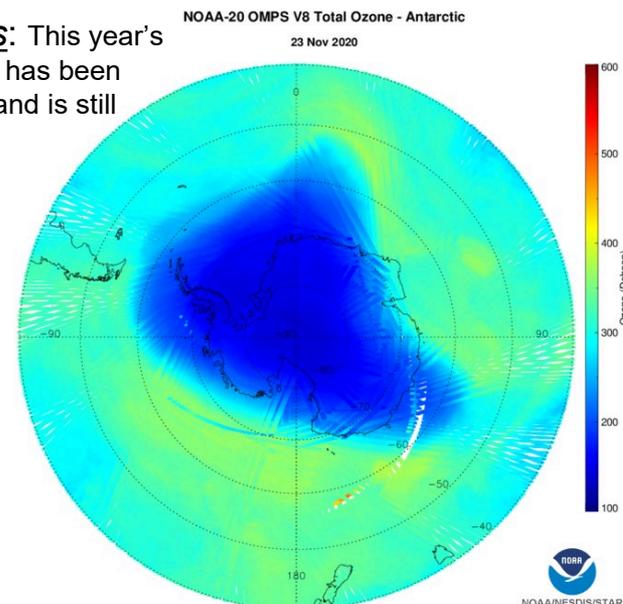
OMPS Ozone (V8Pro, V2Limb & V8TOz) Milestones

Milestones	Scheduled Date	Actual Completion Date
Provide V8TOz and V8TOS DAP to ASSISTT with new code and tables for broad bandpasses, and updated capability to handle 30x241 FOVs SDR Granules in preparation for J02.	Nov-20	11/25/20 v4r2 V8TOz
Provide DAP to ASSISTT with new V8Pro code and tables to implement improved channel interpolation and latitude-dependent soft calibration adjustments.	Jan-21	
Complete work with NDE to resolve two OMPS V2Lmb issues -- Latency / TIme Out and Ancillary File errors.	Feb-21	
Demonstrate V8TOz and V8Pro processing of J02 test data as provided by the OMPS SDR team.	Jun-21	
Complete evaluation of NDE resource needs for three-slit processing of the S-NPP OMPS Limb with V2Limb and make a decision on whether to switch from 1 slit to 3 slits.	Jul-21	
Complete rehosting of CloudRR algorithm at STAR	Aug-21	

Accomplishments / Events:

- Planning for 3 product updates into GAASP during FY21
- STAR GAASP near real-time processing system back online after CENTOS upgrade caused numerous library issues.
- Continued product O&M
- Work continues on testing algorithm updates for SSW and RR, which are on track and to be completed by March 2021

Overall Status:

|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

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### Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
AMSR-3 Schedule (launch: Apr-2023)				
AMSR-3 Cal/Val Plan - draft delivery	Sep-21	Sep-21		
AMSR-3 Cal/Val Plan - final delivery	Mar-22	Mar-22		
Initial AMSR-3 ready DAP to ASSISTT	FY22	FY22		
Initial AMSR-3 ready DAP to NDE (include AMSR-2 updates)	FY22	FY22		
Final AMSR-3 ready DAP to ASSISTT	FY22	FY22		
Final AMSR-3 ready DAP to NDE (include AMSR-2 updates)	FY22	FY22		
Algorithm Updates Review	FY22	FY22		
Algorithm Updates/Cal-Val Activities				
Improved SSW and RR algorithms	Mar-21	Mar-21		
Transition algorithm updates to operations	Aug-21	Aug-21		
Reprocess mission data set	Sep-21	Sep-21		
Technical Information Meeting between NOAA and JAXA	Sep-21	Sep-21		
Annual report on AMSR2 algorithms and data product performance	Sep-21	Sep-21		

Highlights: TPW Percent Normal plot from depicting the higher levels of moisture being drawn from the south during the Christmas day snow storm in in the Northeast.

TPW Percent Normal for 20201225

AMSR2 TPW Percent Normal 20201225
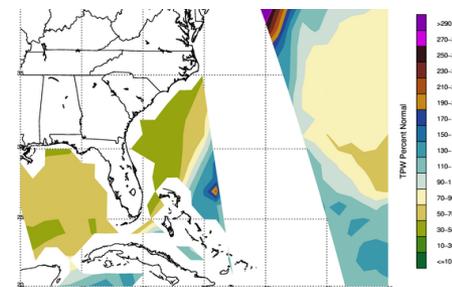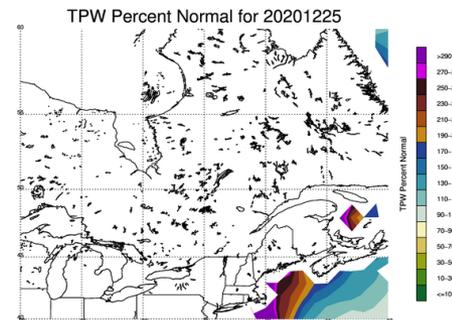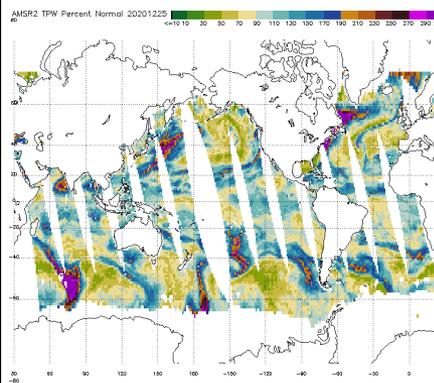
Accomplishments / Events:

- NPROVS staff continue to monitor pending changes in NUCAPS operational soundings associated with the implementation of NUCAPS v2.91c which is scheduled to replace the existing operational v2.5 early next year.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

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Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
LTM				
Maintain / expand existing EDR LTM web pages and mappers	Aug-21	Aug-21		
NPROVS				
Support NUCAPS / MiRS EDR soundings for NPP, NOAA-20 and MetOp-C; COSMIC-2, ...	Aug-21	Aug-21		
Manage JPSS dedicated radiosonde program (ARM, AEROSE, ...), expand to store SDR (GSICS)	Aug-21	Aug-21		
Support AWIPS- NUCAPS initiatives and case studied demonstrating NUCAPS value to users	Aug-21	Aug-21		

Highlights: *NPROVS assists with NUCAPS/HEAPS test data stream check-out by comparing vertical temperature and moisture profiles to nearby radiosondes*