NOAA JPSS Monthly Program Office

AMP/STAR FY21 TTA

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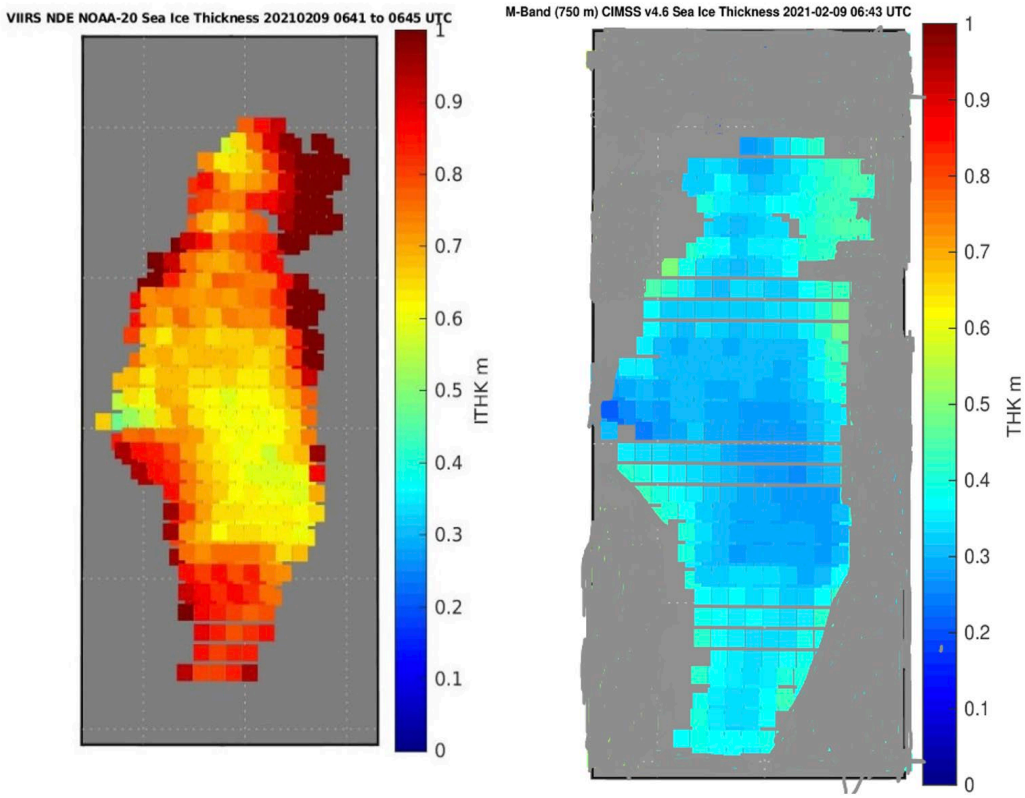
April 13, 2021

Highlights from the Science Teams

Ice thickness validation study over Lake Winnebago



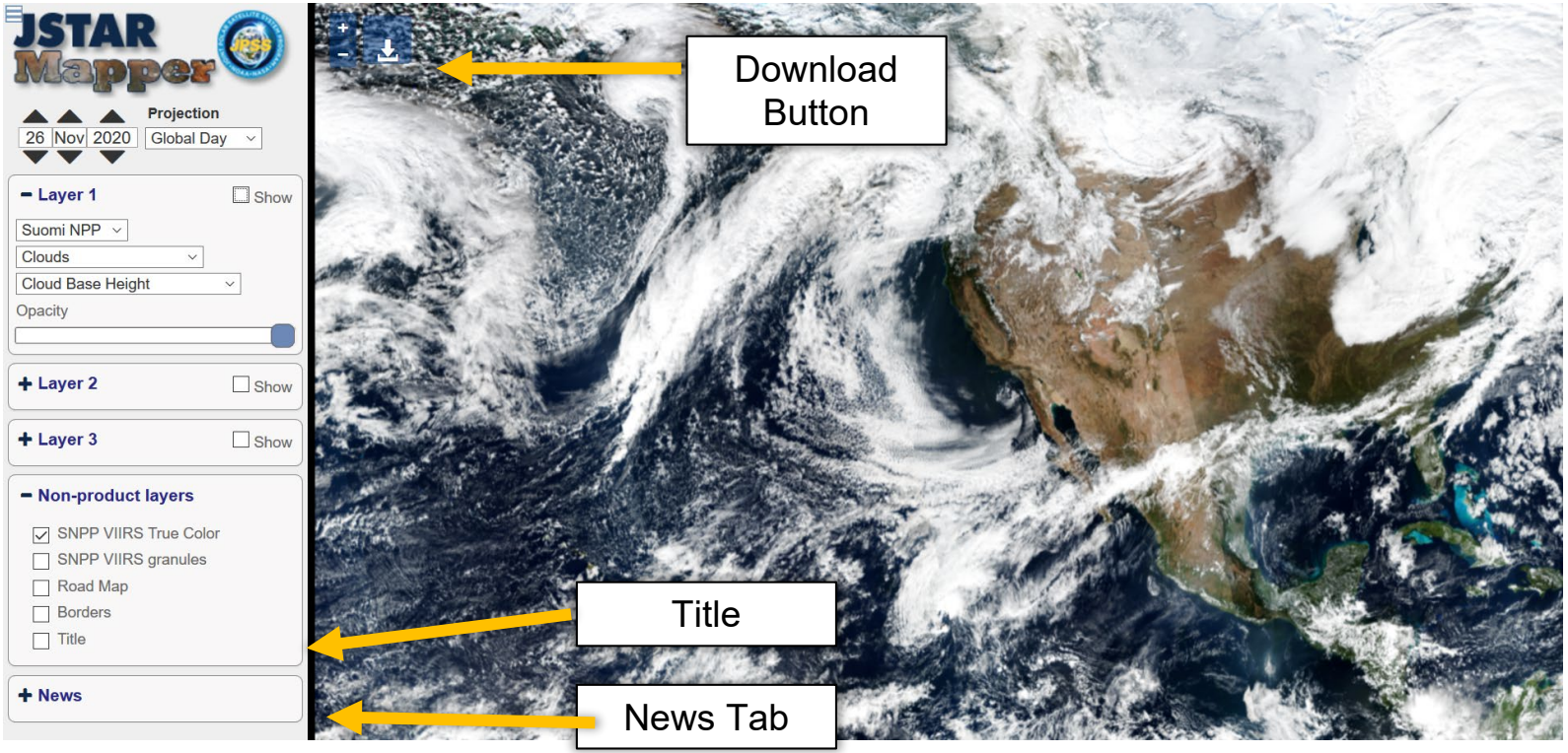
On 9 February 2021, NOAA-20 VIIRS had good coverage over Wisconsin's lakes providing an opportunity to do a rare validation over smaller inland water bodies. Lake Winnebago is a popular location for ice fishing, where average ice depths are reported by anglers on a daily basis during the winter season.

The operational VIIRS ice thickness product, which uses the One-dimensional Thermodynamic Ice Model (OTIM) algorithm version 2.3, is shown on the left figure. Results based on the newer version 4.6 are shown on the right. Version 4.6 includes improvements in the residual heat flux estimation, ice thermal dynamic process (ice growth and melt), and physical dynamic process (ice rafting, ridging, and hammocking due to ice motion), especially along the Canadian Archipelago.

By February 9, the measured average depth was close to 16 inches (0.4 meters). This observation closely matches the calculated ice thicknesses that are derived by OTIM version 4.6. Unfortunately, the current operational ice thickness product is observed to have a positive bias of 0.1 to 0.5 meters. The CIMSS Cryosphere team looks forward to implementing these improvements into operations as soon as possible.

Highlights from the Science Teams

JSTAR Mapper Upgrades

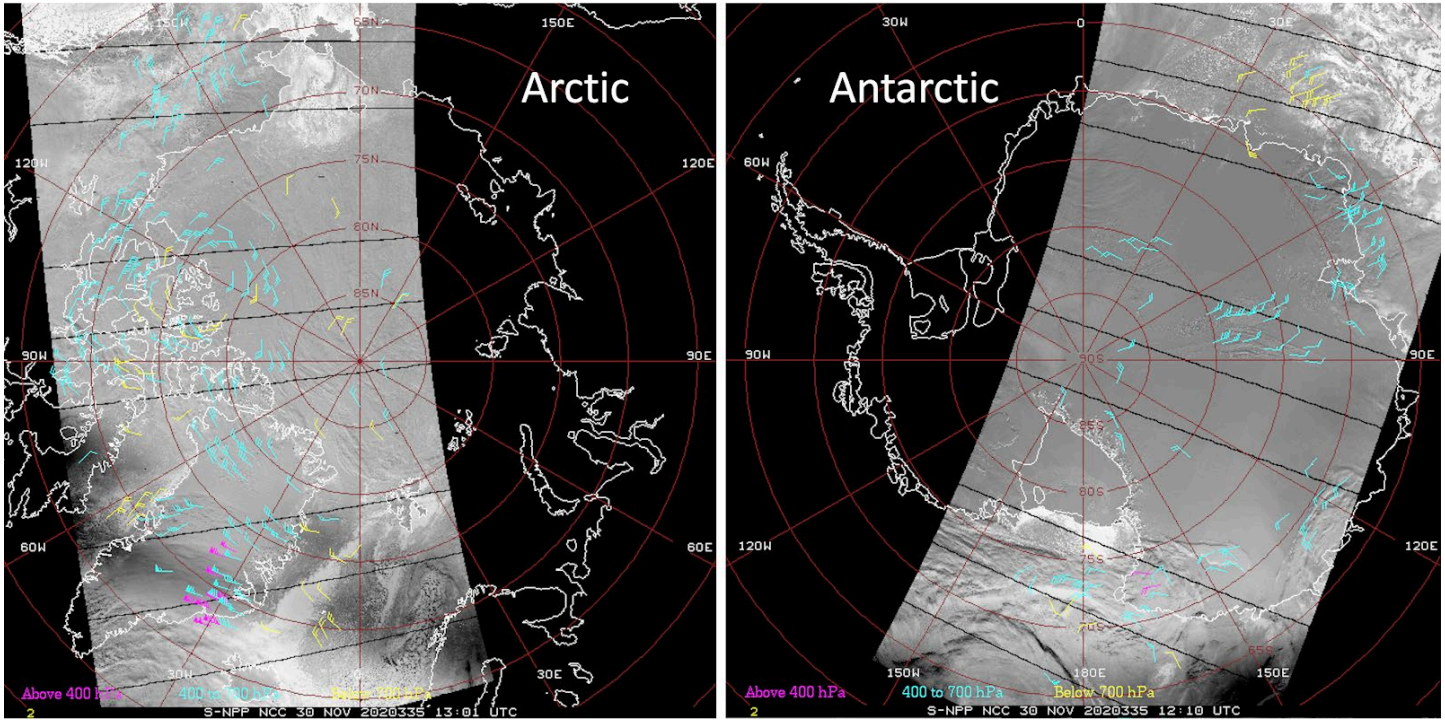


In mid-March the JSTAR Mapper team implemented several functional changes to the website. In addition to slightly changing the layout of the site to give a more modern, responsive look, the team also added a new download button. This will give users the ability to download maps from the site directly. A title toggle option was included for users to display product info in their downloaded images.

A News feature was also added. This feature displays a list of recent news, including both interesting features captured by JPSS satellites, and program news such as outages or important anomalies. The site changes were revealed in connection with the AMS STAR JPSS/GOES-R Short Course on March 17-18.

Highlights from the Science Teams

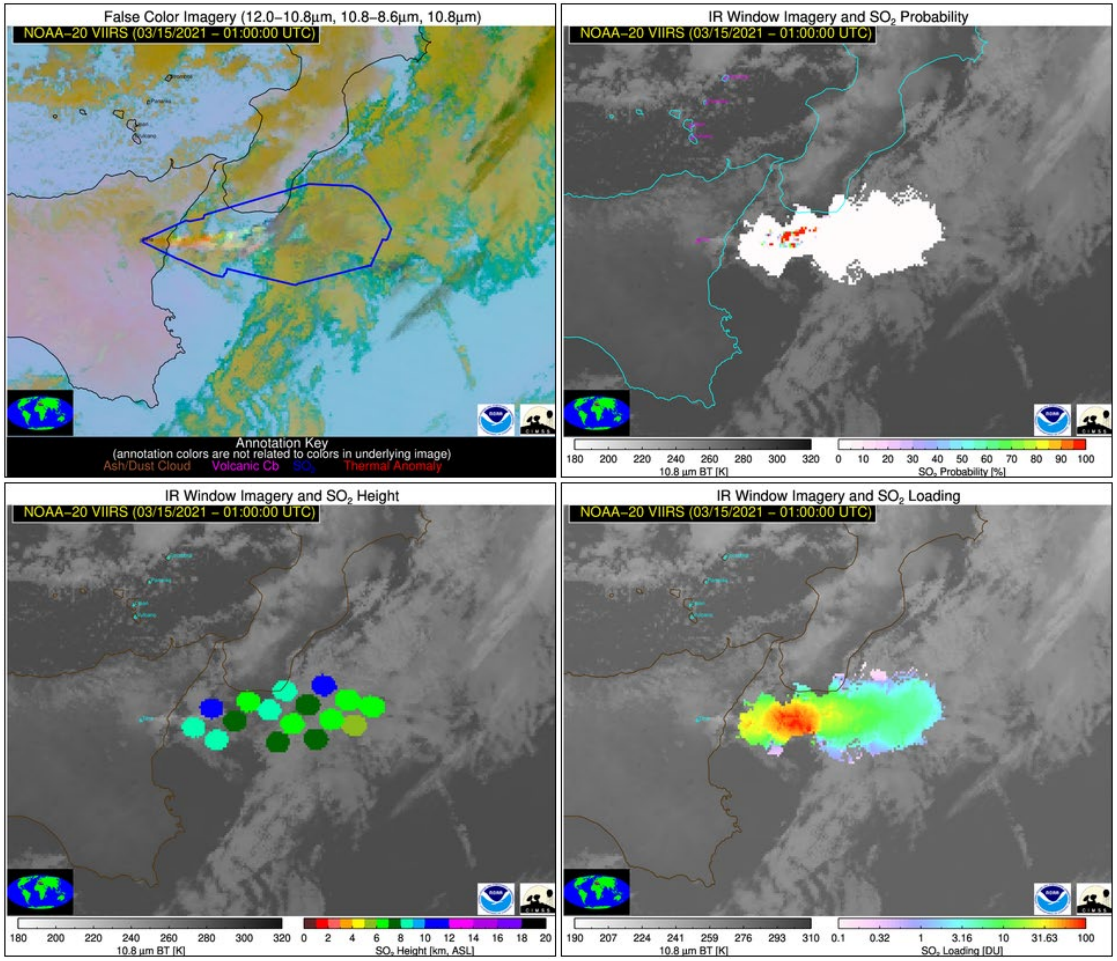
Day/Night Band Polar Winds Production



The first retrieval of polar winds using the VIIRS Day-Night Band (DNB) is shown in the figure, with examples from the Arctic and Antarctic. The Near Constant Contrast (NCC) product was used. Routine generation of the DNB polar winds at the Cooperative Institute for Meteorological Satellite Studies (CIMSS) will begin in the next few months, including validation with radiosonde winds.

Highlights from the Science Teams

Mount Etna eruption observed by VOLCAT system



Mount Etna, on the Italian island of Sicily periodically erupts, sending plumes of ash over the Mediterranean Sea. The latest series of eruptions and lava flows began in mid-February and continued through March..

The images at left show various ways of looking at the eruption from the VOLCAT system for March 15.

The combination of VIIRS and CrIS are used to detect and characterize volcanic SO_2 emissions. CrIS allows for accurate estimates of height and loading. VIIRS supports spatial mapping.

Accomplishments

- Delivery Algorithm Packages (DAPs) - Mission Unique Products:
  - 2/18/2021: OMPS SDR team delivered J2 code & LUTs DAP (ADR 9095/9501, CCR 5172) to ASSISTT team
  - 3/10/2021: OMPS J2 code & LUTs DAP (ADR 9095/9501, CCR 5172) delivered to DPMS
    - ADR9095, Issues with 1.25 second integration time for JPSS-2 OMPS-TC: 30 code files changed, 1 new code file. 12 LUT Updated.
    - ADR9501, JPSS-2 OMPS Initial Pre-Launch Table Delivery: 30 LUTs (2 versions of OMPS-TC-TIMING-PATTERN-GND-PI_j02 table are submitted, total 31 LUTs) are new for J2.

- DAPs – Enterprise Products:
  - 3/12/2021: Surface Reflectance GFS v16 testing on NDE I&T. STAR science team provided a detailed impact assessment on downstream products of GVF & VI. Recommended to pass SR in the GFS v16 testing
  - 3/31/2021: STAR delivered N4RT BUFR TOOLKIT DAP v5r0 (J01/NPP Maintenance DAP and Initial J2 DAP) to NDE
    - List of Code Changes:
      - Implemented data screening with Eclipse Flag for V8TOZ
      - Updated the Toolkit for J2 readiness
      - Updated for Winds BUFR to encode HOCT, Common QI w/o FC and G17 LHP mitigation flags; Removed brightness temperatures from the VIIRS-GHRSST BUFR
  - 4/01/2021: STAR delivered JRR Super DAP v3r0 (J01/NPP Maintenance DAP and Initial J2 DAP) to NDE.
    - Quarter degree GFS is now used instead of half degree
    - CMC SST is now used in place of OISST
    - VIIRS surface type is now used in place of AVHRR surface type
    - J2 readiness
  - ASSISTT team start receiving JRR DAP science code updates from teams for Fall DAP delivery (schedule: Nov-2021)

- IDPS Builds Checkouts:
  - 3/11/2021: JSTAR submitted report for Block 2.3 Mx1 I&T Deploy Regression review/checkout to DPMS/RTN/OSPO
  - 3/24/2021: JSTAR submitted Data Request for Block 2.3 Mx 2 SOL Deploy Regression Review/Checkout to DPMS (No SOL data requested from SDR/Imagery teams. There are no major algorithm changes in Mx2, STAR teams will skip the SOL review/checkout)

Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	03/02/21, 03/09/21, 03/16/21, 03/23/21, 03/30/21
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	03/02/21, 03/09/21, 03/16/21, 03/23/21, 03/30/21
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	03/16/21, 03/30/21
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	03/02/21, 03/23/21
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	03/23/21
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	03/23/21

- *3/30/2021: IDPS Block 2.3 Mx1 TTO. Following algorithm updates operational*:
  - PCR071302 – ADR9032/CCR5165, VIIRS TEB Calibration Corrections During Moon Intrusions & After Sync Losses
  - PCR070992 – ADR9172/CCR5018, Code Change to Fix Error in OMPS Nadir Mapper Dark Count Correction

- *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

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

Upcoming Milestones/Deliveries

- JSTAR Code/LUT/Product Deliveries:

  DAP to DPMS:
  - May-21: OMPS SDR DAP (ADR9361, Errors in OMPS Nadir Mapper off-nadir geolocation)
  - Jun-21: Imagery DAP (ADR9466/CCR5415, VIIRS NCC Banding Anomaly)

  NOAA-20 Algorithm DAP to NDE/CoastWatch:
  - Apr-21: Initial J2 DAP (MiRS/SFR, include NPP/N20 updates)
  - Apr-21: Initial J2 DAP (Surface Reflectance, include NPP/N20 updates)
  - Apr-21: Initial J2 DAP (NVPS: VI/GVF, include NPP/N20 updates)
  - Apr-20: Vegetation Health – Final N20 / initial J2 DAP
  - Apr-21: Initial J2 DAP (V8TOz, include NPP/N20 updates)
  - May-21: Initial J2 DAP (SST, include NPP/N20 updates)

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 (combined code & LUT DAPs, ADR9095 & ADR9501)	Jan-21	Mar-21	03/10/21	12/28/20 DAP to ASSISTT
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	Mar-21	04/01/21	downstream data testing
Initial Enterprise Fires DAP (NPP/N20/J2, I/M-Band)	Jun-21	Jun-21		
Surface Reflectance: Initial J2 ready DAP	Jan-21	Apr-21		downstream data testing
NVPS (VI & GVF): Initial J2 ready DAP	Feb-21	Apr-21		Data testing
Vegetation Health: Initial J2 ready/final N20 DAP	Apr-21	Apr-21		
SST: Initial J2 ready DAP (ACSPO 2.80)	Apr-21	May-21		Cloud deliveries
NUCAPS: Initial J2 ready DAP	Apr-21	Apr-21	02/26/21	
MiRS & SFR: Initial J2 ready DAP	Mar-21	Apr-21		documentation update
OMPS Ozone V8Pro: Initial J2 ready DAP	Dec-20	Dec-20	12/31/20	
OMPS Ozone V8TOz: Initial J2 ready DAP	Mar-21	Apr-21		11/25/20 DAP to ASSISTT

FY21 STAR JPSS Milestones

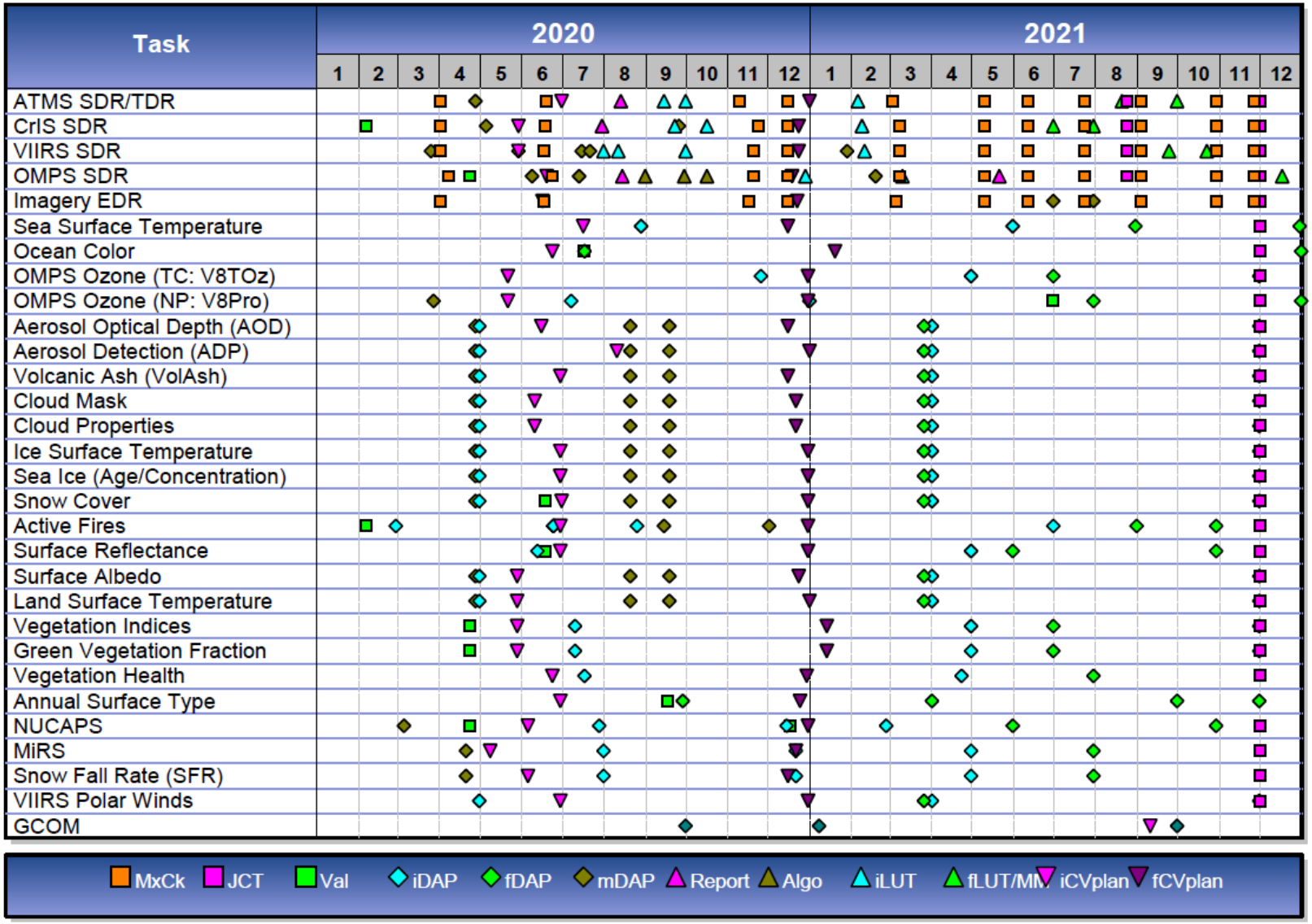
Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
Algorithm Cal/Val/LTM				
J2/Enterprise Cal/Val Plan - final delivery (all SDR/EDR products)	Dec-20	Dec-20	12/31/20	
GCOM: AMSR-3 Cal/Val Plan - draft delivery	Sep-21	Sep-21		
Updated JPSS-2 OMPS SDRs Pre-launch Characterization 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	May-21	May-21		Dry run: 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, 01/05/21, 01/12/21, 01/19/21, 01/26/21, 02/02/21, 02/09/21, 02/16/21, 02/23/21, **03/02/21, 03/09/21, 03/16/21, 03/23/21, 03/30/21**	
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, 01/12/21, 01/26/21, 02/09/21, 02/23/21, **03/16/21, 03/30/21**	
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/21/20, 11/24/20, 12/22/20, 01/19/21, 02/17/21, **03/23/21**	
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, 01/05/21, 01/12/21, 01/19/21, 01/26/21, 02/02/21, 02/09/21, 02/16/21, 02/23/21, **03/02/21, 03/09/21, 03/16/21, 03/23/21, 03/30/21**	
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, 01/05/21, 01/19/21, 02/02/21, 02/16/21, **03/02/21, 03/23/21**	
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/21/20, 11/24/20, 12/22/20, 01/19/21, 02/17/21, **03/23/21**	
Block 2.3 Mx builds I&T deploy regression data review/checkout (**Nov-20 Mx0**; **Mar-21 Mx1**; May-21 Mx2; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	Sep-21	Sep-21	11/24/20 Mx0 I&T review/checkout report 12/10/20 updated Mx0 I&T review/checkout report 02/26/21: Mx1 SOL review/checkout report **03/11/21: Mx1 I&T review/checkout report**	
Parallel OPS support	Dec-20 Jan-21	Dec-20 Jan-21	11/6/2020 - 12/4/2020: daily POC support, weekly/monthly DAP deliveries (to both OPS & Cloud) 1/11/2021 – 1/21/2021 **daily reportts**	
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**

ATMS SDR

March, 2021

Accomplishments / Events:

- Finished reprocessing lifetime S-NPP ATMS RTM simulation using ECMWF forecast data as background using the same CRTM version as NOAA-20 ATMS so as to improve the science data inter-satellite comparison accuracy. Also filled the SDR O-B bias gaps before 2017.
- Revisited ATMS NGSysTE pre-testing data and prepared fo NGSysTE TVAC testing using ATMS Engineering Development Unit (EDU)
- Provided daily NGSysTE TVAC testing data analysis results and participated daily tag-up meetings to discuss the potential issues found in data analysis
- Recommended constant forward scanning mode for NGSysTE TVAC test to help analyze near field contamination study
- Kept developing ATMS SDR User's Guide document
- Discussed the ATMS science data quality journal article manuscript

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			

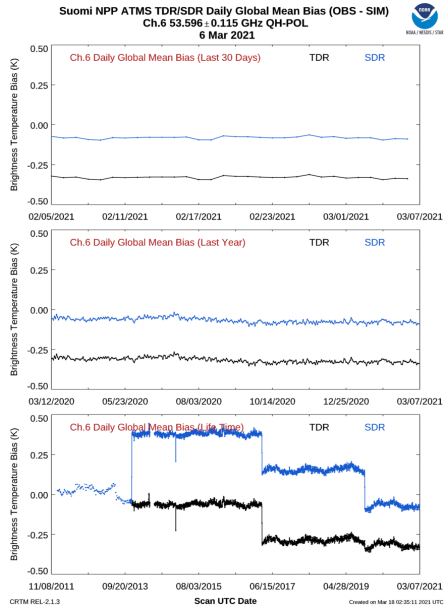
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

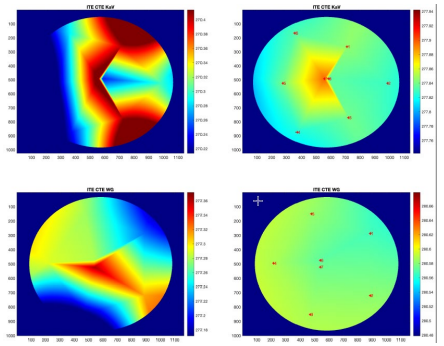
None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/31/20	
Initial J2 PCT update: re-delivery			02/05/21	
Final J2 PCT update, including Mounting Matrix Coefficients update based on the pre-launch mounting measurement report	Aug-21	Aug-21		SER + 6w (to ASSISTT)
Final J2 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 Jan-21	11/6-12/4/20 1/11-21/21
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**; **Mar-21 Mx1**; May-21 Mx2; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	Sep-21	Sep-21	11/09/20 Mx0 I&T 02/16/21 Mx1 SOL 03/03/21 Mx1 I&T	Report

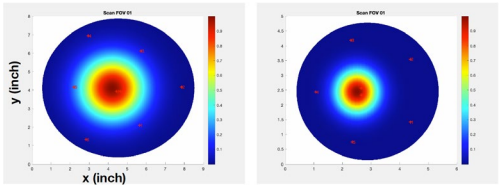
Highlights:



ATMS Internal Calibration Target Temperature gradient observed in JPSS-2 (left) and NGSysTE (right) TVAC tests



NGSysTE TVAC antenna gain distribution over PRT at K band (left) and W band (right)



CrIS SDR

March, 2021

Accomplishments / Events:

- As part of supporting the monitoring and diagnostics of the recent NOAA-20 noise anomalies, created a scan-by-scan noise monitoring tool for a faster and more detailed response to future noise events **(Figure 1)**.
- Performed the radiometric, spectral, and geolocation assessment of Block 2.3 Mx1 I&T regression. Compiled and submitted a checkout report to JPSS management. CrIS team recommend the operational implementation of the Block 2.3 Mx1.
- Expanded the assessment of the J2 TVAC Diagnostic Mode Nonlinearity by computing the nonlinearity coefficients using the magnitude of the spectrum, and computing the statistics **(Fig. 2)** and error of the nonlinearity coefficients.
- As part of the CrIS-IASI intercomparison work, obtained new noise estimates for the Metop-C IASI reconstructed radiances using the noise covariance matrix of the IASI-C instrument.
- On March 24, 2021, A Scene Selection Module (SSM) anomaly happened for about 2 hours. Assessed the Radiometric, Spectral, Geolocation, and Noise impact on the SDR product and found that there was no major impact on the CrIS SDR data quality aside from the missing data.
- Performed assessments of the upgraded CrIS Cal/Val tools based on CRTM v2.3.0 rather than CRTM v2.0. A spectral assessment showed a consistency within about +/- 0.1 ppm and a radiometric performance assessment using a double difference method showed agreement close to 0K for the LW and MW bands, and less than 0.01K for the SW band **(Fig. 3)**.
- In support of the CrIS SDR Spectral calibration, investigated the bi-modal pattern of the distribution of the spectral shifts for SNPP CrIS. Confirmed that the two modes correspond to even and odd Fields of Regards (FORs) which manifest in a Doppler Shifting and Sweep effect **(Fig. 4)**.

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.*
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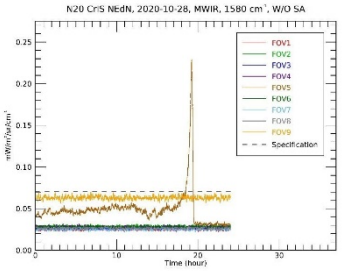
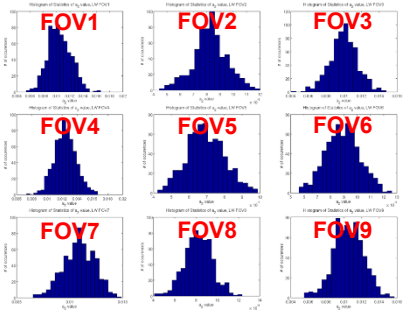
Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
Initial J2 PCT update based on pre-launch test data and other changes	Oct-20	Oct-20	10/16/20	
Initial J2 PCT update: re-delivery			02/08/21	
Verification of operational CrIS SDR data at FSR after the termination of NSR data			11/06/20	
Final J2 PCT update, including Mounting Matrix Coefficients update based on the pre-launch mounting measurement report	Jun-21	Jun-21		SER + 6w (to ASSISTT)
Final J2 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 Jan-21	11/6-12/4/20 1/11-21/21
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**; **Mar-21 Mx1**; May-21 Mx2; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	Sep-21	Sep-21	11/23/20 Mx0 I&T 02/24/21 Mx1 SOL 03/08/21 Mx1 I&T	Report

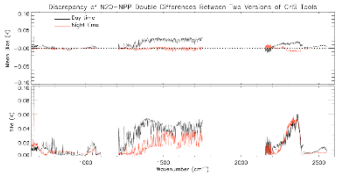
Highlights:



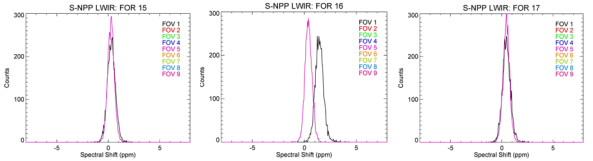
(1) Output of new scan-by-scan noise monitoring tool. NOAA-20 operational NEdN on 3/10/2021.



(2) Statistical distributions of the CrIS J2 TVAC DM nonlinearity coefficients for ~640 interferograms in a single experimental run among the nine LWIR FOVs.



(3) Discrepancies of the double difference of daily averaged NOAA-20 and NPP observations-minus-simulations (O-B) using the tools with different versions of CRTM.



(4) The PDFs of the S-NPP CrIS spectral shift for FOVs 1 and 5 illustrating the Doppler Shift and Sweep effect

VIIRS SDR

March, 2021

Accomplishments / Events:

- Compared radiometric calibration of the NASA and NOAA Level 1b (SDR) products for NOAA-20 VIIRS reflective solar bands and held a technical interchange virtual meeting with NASA Goddard and Langley scientists to support this instrument becoming the on-orbit reference for the Global Space-based Inter-Calibration System (GSICS)
- Created and delivered for deployment in the IDPS operations updated NOAA-20 and S-NPP DNB offset and gain ratios LUTs generated using new moon calibration data from March 13, 2021
- Conducted VIIRS onboard blackbody warm-up/cool-down tests of TEB calibration for S-NPP on March 15-17, 2021, and for NOAA-20 on March 29-31, 2021
- Analyzed lunar calibration data from the NOAA-20 and S-NPP measurements on February 23, 2021, and March 24, 2021

Overall Status:

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

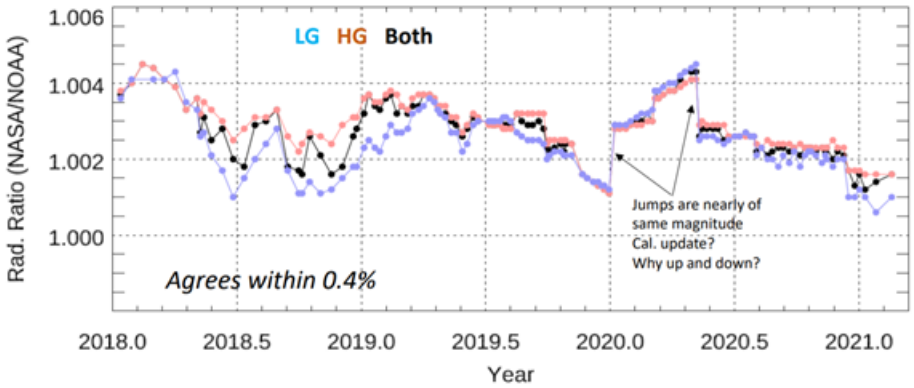
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

none

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
Initial J2 LUTs: re-delivery			02/10/21	
Launch-ready J2 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 J2 LUTs (final delivery)/MM-coeff.	Oct-21	Oct-21		To DPMS
JCT2 - Data System Event	Aug-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	01/31/21	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		
N20 DNB LGS-GAINS LUT #6 update (ADR9526)			01/28/21	
VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	On schedule	NPP & N20
Parallel OPS support	Dec-20	Dec-20	Dec-20 Jan-21	11/6-12/4/20 1/11-21/21
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**; **Mar-21 Mx1**; May-21 Mx2; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	Sep-21	Sep-21	11/20/20 Mx0 I&T 02/17/21 Mx1 SOL 03/08/21 Mx1 I&T	Report

Highlights:



Comparison between NOAA-20 VIIRS band M1 (411 nm) radiance products from NASA and NOAA shows minor differences (up to ~0.4%) due to updates of the calibration coefficients (LG=Low Gain; HG=High Gain)

OMPS SDR

March, 2021

Accomplishments / Events:

- Delivered OMPS weekly Dark tables and NP solar irradiance bi-weekly LUTs to the ASSITT.
- Conducted an intensive analysis on the SDR#2 action (SNPP and NOAA-20 NP SDR data quality comparison) by using TomRad, V-CRTM and 32-day averaged difference method.
- Drafted the analysis report about the SDR#2 action to confirm that the latitude dependency in SNPP and NOAA-20 NP radiance differences are caused majorly by non-sensor error sources due to different viewing conditions in SZA, geographical location, atmospheric/surface conditions.
- Completed the backup computation capability for SNPP and NOAA-20 NP solar flux bi-weekly LUT derivation and delivery.
- Started to initialize the PCA algorithm for reconstructing NOAA-20-like SNPP NP SDR data.
- Started to prepare reprocessing SNPP and NOAA-20 SDR data.
- Explored a new cross-validation method for SNPP and NOAA-20 NM by using VIIRS M1-band data as a bridge.
- Supported the SSEC about incorporating OMPS SDR LUTs into new OMPS CSPP package for Direct Broadcast System users.
- Reviewed "Joint Polar Satellite System (JPSS) Ground Segment Data Product Specification" and "NESDIS-Product_Baseline-v1.2 02-23-2021".
- Completed the SNPP and NOAA-20 NM FAM LUTs for off-geolocation error correction. However, a potential corner issue is raised, which might result in nadir geolocation adjustment for NM and then NP geolocation adjustment. The analysis is in progress.

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 J2 LUTs (initial delivery), to ASSISTT	Dec-20	Dec-20	12/28/20	To ASSISTT
Launch-ready J2 LUTs (initial delivery), to DPMS	Jan-21	Mar-21	03/10/21	B2.3 Mx0 TTO
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	02/08/21	1/14/21 to ASSISTT
SNPP/NOAA-20 NM off-nadir geolocation error correction LUTs (ADR9361)	Mar-21	Apr-21		NM FAM LUTs might include nadir geolocation adjustment due to a possible corner issue. Then, NP geolocation should be adjusted too.
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 Jan-21	11/6-12/4/20 1/11-21/21
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**; **Mar-21 Mx1**; May-21 Mx2; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	Sep-21	Sep-21	11/20/20 Mx0 I&T 02/24/21 Mx1 SOL 03/08/21 Mx1 I&T	Report

Highlights:

32D-AD NR Difference (%) vs. SZA Difference for SNPP and NOAA-20 NP SDR Data

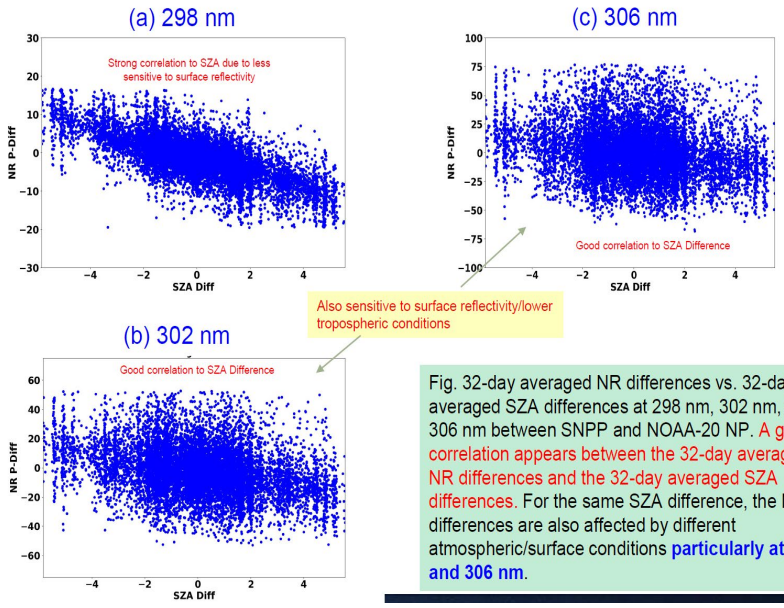


Fig. 32-day averaged NR differences vs. 32-day averaged SZA differences at 298 nm, 302 nm, and 306 nm between SNPP and NOAA-20 NP. A good correlation appears between the 32-day averaged NR differences and the 32-day averaged SZA differences. For the same SZA difference, the NR differences are also affected by different atmospheric/surface conditions **particularly at 302 and 306 nm**.

SDR Reprocessing

March, 2021

Accomplishments / Events:

- Transition of the reprocessed SNPP VIIRS SDR data to the Cloud is ongoing (finished ~4.5-year data transition as of 3/19/2021)
- The transition of the reprocessed VIIRS SDR and VIIRS Enterprise Cloud Mask (ECM) for the period of 2018-04-01 to 2020-03-11to ESA is ongoing
- Analysis of the radiometric stability of reprocessed SNPP CrIS data compared to AIRS is on going
- Discussed with CLASS regarding the transition of reprocessed data to CLASS/NCEI, including agreement on algorithm version representation and access in CLASS, Reconciliation/Retransmission implementation at STAR, data version, data naming, and data size, etc. (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:

N/A

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	Jan-21	The short delay was caused by one hard drive on UMD server Bamboo was down in Dec.,
ECM reprocessing for 2018-04-01 to 2020-03-11	Dec-20	Jan-21	Jan-21	Same as above
Present validation results on the reprocessed S-NPP SDR data at the AMS Meeting	Jan-21	Jan-21	Jan-21	
Transition of SNPP RDR and reprocessed SDR data to CLOUD	Jun-21	Jun-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: Reprocessed SNPP SDR data to be transitioned to CLASS

Instrument	Data Product	Start Time	End Time	Number of Days	File Number/Day (Aggregatated)	Average File Size (Aggregated)	Total File num after aggregation (estimated)	Total data size after aggregation (estimated) (unit T)
ATMS	Version 1					Unit (M)	1057764	1.9833075
	ATMS-GEO	11/08/2011	03/08/2017	1948	181	1.72	352588	0.5922376563
	ATMS-SDR	11/08/2011	03/08/2017	1948	181	2.1	352588	0.7230808594
	ATMS-TDR	11/08/2011	03/08/2017	1948	181	1.94	352588	0.6679889844
ATMS	Version 2					Unit (M)	1574157	2.951544375
	ATMS-GEO	11/08/2011	10/15/2019	2899	181	1.72	524719	0.8813639453
	ATMS-SDR	11/08/2011	10/15/2019	2899	181	2.1	524719	1.076083887
	ATMS-TDR	11/08/2011	10/15/2019	2899	181	1.94	524719	0.994096543
CrIS	Version 2					Unit (M)	1390985	142.2170204
	GCRSO	02/20/2012	01/29/2020	2901	181	1.3	525081	0.6666067383
	SCRIS	02/20/2012	01/29/2020	2901	181	132.6	525081	67.9938873
	SCRIF	12/04/2014	01/29/2020	1883	181	221	340823	73.55652637
OMPS	Version 1					Unit (M)		3.287496406
NP	GONPO	01/25/2012	03/08/2017	1870	14	6.68	26180	0.1707835938
	SOMPS	01/25/2012	03/08/2017	1870	14	14.28	26180	0.3650882813
TC	GOTCO	01/25/2012	03/08/2017	1870	14	6.5	26180	0.1661816406
	SOMTC	01/30/2012	09/30/2018	2436	14	77.63	34104	2.585442891
VIIRS	Version 1				7620	Unit (M)	23180040	1614.755391
	GITCO	01/02/2012	04/30/2020	3042	254	382.28	772668	288.4526592
	GIMGO	01/02/2012	04/30/2020	3042	254	341.04	772668	257.3346628
	GMODO	01/02/2012	04/30/2020	3042	254	93.84	772668	70.80777844
	GMTCO	01/02/2012	04/30/2020	3042	254	103.64	772668	78.20245266
	GDNBO	01/02/2012	04/30/2020	3042	254	180.52	772668	136.2129173
	SVM01	01/02/2012	04/30/2020	3042	254	13	772668	9.809261719
	SVM02	01/02/2012	04/30/2020	3042	254	13.2	772668	9.960173438
	SVM03	01/02/2012	04/30/2020	3042	254	19.72	772668	14.87989547
	SVM04	01/02/2012	04/30/2020	3042	254	19.96	772668	15.06098953
	SVM05	01/02/2012	04/30/2020	3042	254	20.32	772668	15.33263063
	SVM06	01/02/2012	04/30/2020	3042	254	12.76	772668	9.628167656
	SVM07	01/02/2012	04/30/2020	3042	254	32.28	772668	24.35715141
	SVM08	01/02/2012	04/30/2020	3042	254	15.48	772668	11.68056703
	SVM09	01/02/2012	04/30/2020	3042	254	8.08	772668	6.096833438
	SVM10	01/02/2012	04/30/2020	3042	254	15	772668	11.31837891
	SVM11	01/02/2012	04/30/2020	3042	254	12.44	772668	9.386708906
	SVM12	01/02/2012	04/30/2020	3042	254	21.48	772668	16.20791859
	SVM13	01/02/2012	04/30/2020	3042	254	41	772668	30.93690234
	SVM14	01/02/2012	04/30/2020	3042	254	22.48	772668	16.96247719
	SVM15	01/02/2012	04/30/2020	3042	254	22.24	772668	16.78138313
	SVM16	01/02/2012	04/30/2020	3042	254	22.08	772668	16.66065375
	SVI01	01/02/2012	04/30/2020	3042	254	50.2	772668	37.87884141
	SVI02	01/02/2012	04/30/2020	3042	254	52.72	772668	39.78032906
	SVI03	01/02/2012	04/30/2020	3042	254	52.72	772668	39.78032906
	SVI04	01/02/2012	04/30/2020	3042	254	89.64	772668	67.63863234
	SVI05	01/02/2012	04/30/2020	3042	254	89.24	772668	67.33680891
	SVDNB	01/02/2012	04/30/2020	3042	254	36.32	772668	27.40556813
	IVOBC	01/02/2012	04/30/2020	3042	254	14.68	772668	11.07692016
	ICDBG	01/02/2012	04/30/2020	3042	254	131.88	772668	99.51118734
	IVCDB	01/02/2012	04/30/2020	3042	254	209.76	772668	158.2762106

ICVS

March, 2021

Accomplishments / Events:

- Finished updating ICVS RDR data processing modules to support JPSS-2 RDR data processing capability. Generated JPSS-2 ICVS RDR sample images using NOAA-20 RDR data as proxy data and demonstrated the sample images in internal ICVS-JPSS2 web site.
- Kept updating OMPS NP NOAA-20 vs S-NPP 32-day zonal mean inter-sensor comparison package by improving quality control procedures.
- The similar analysis about the zonal mean to the NP is also applied to ATMS, CrIS, VIIRS. All results demonstrate the latitude dependency of the zonal mean in the four sensors including NP is less relevant to inter-senor sensor calibration radiometric bias.
- Started updating ICVS VIIRS vector webpage product long term trending csv files to support interactive mode of ICVS products.
- Created NOAA-20 vs. S-NPP ATMS 32-day mean global map using gridded data and improved quality controls.
- Monitored and analyzed the impacts of NOAA-20 CrIS MW FOV5 noise and S-NPP CrIS scene selector module (SSM) event.

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			

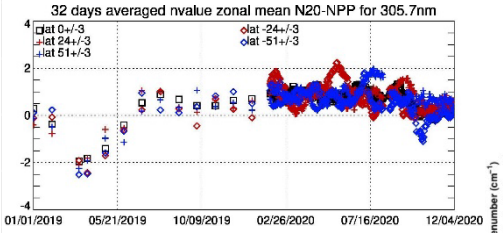
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

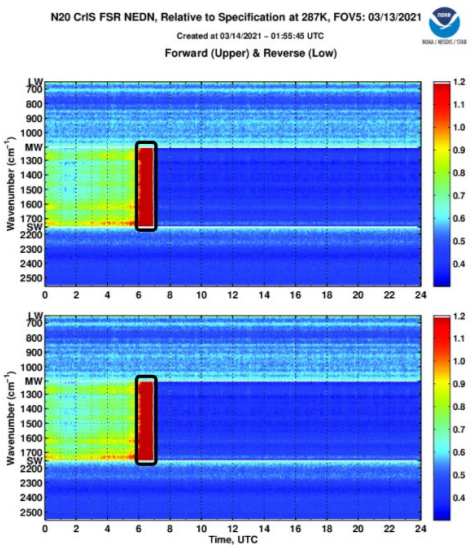
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Develop JPSS-2 ICVS prototype RDR portion (beta) (SNPP or N20 as proxy)	Jan-21	Jan-21	Jan-21	
Develop JPSS-2 ICVS prototype SDR portion (beta)	Apr-21	Apr-21		
Develop ICVS-Vector code prototype (beta)	Jun-21	Jun-21		
Develop 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

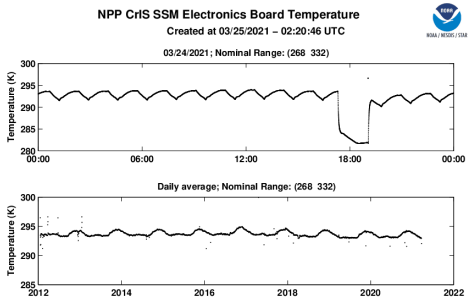
N20 vs. NPP 32-day mean bias zonal mean



NOAA-20 CrIS MW FOV5 Noise Trending



S-NPP CrIS SSM Event Unit Temperature on Mar. 24th, 2021



VIIRS Imagery

March, 2021

Accomplishments / Events:

- **NCC banding anomaly**: The code changes for the NCC banding anomaly have been developed and forwarded to ASSISTT. Special 3rd Tuesday meetings will be suspended and follow-up will be via email, with reporting on this issue at 1st Tuesday Imagery meetings. Tim Dorman, imagery JAM, is developing the CCR and will lead the code changes thru the many steps, and the Imagery will be checked at critical points. Also provided were a one-orbit dataset from NOAA-20 and a presentation covering this anomaly from discovery to solution.
- **Change from 6 to 16 M-bands:** A presentation to justify the change from 6 to 16 M-bands as VIIRS EDRs was presented to an PMR/IDPS algorithm splinter meeting. Follow-up questions were answered via email. See the Image of the Month in the lower-right, an example of an RGB product that utilizes M-bands M8 (1.24 µm), M10 (1.61 µm), M5 (0.67 µm); those bands are currently not available as EDRs, nor (disappointingly) are they available to NWS AWIPS CONUS 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		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.*

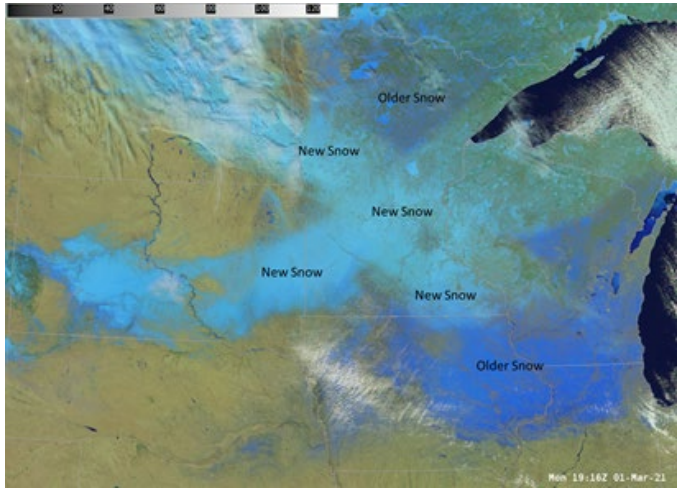
Issues/Risks:

Code-change solution for NCC banding over Antarctica and Greenland for both NPP and J01 will be followed thru into operations.

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**; **Mar-21 Mx1**; May-21 Mx2; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	Sep-21	Sep-21	11/15/20 Mx0 I&T 02/17/21 Mx1 SOL 03/05/21 Mx1 I&T	

Highlights: Image of the Month

Three-color/RGB snow-melt product that would utilize M-bands that are currently not available as EDRs, nor are available to NWS AWIPS users!



Clouds

March, 2021

Accomplishments / Events:

- The ECM team analyzed an issue brought up by the cryosphere team were the current ECM LUT tends to overcloud over extremely cold ice cover in the Great Lakes. The analysis shows that this was due to the reflectance tests. The most recent LUT that was delivered appears to address this issue and is part of the next code delivery
- Supporting JPSS Aviation Initiative/Alaska Cloud Demo, the CIRA team provided Douglas Wesley (AAWU) with VIIRS cloud base and low layer cloud fractions for comparison with Alaska Aviation Guidance data (developed to provide short-term weather conditions to local airports). The cloud products were reprocessed for selected 2019-2020 winter cases and locations.

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:

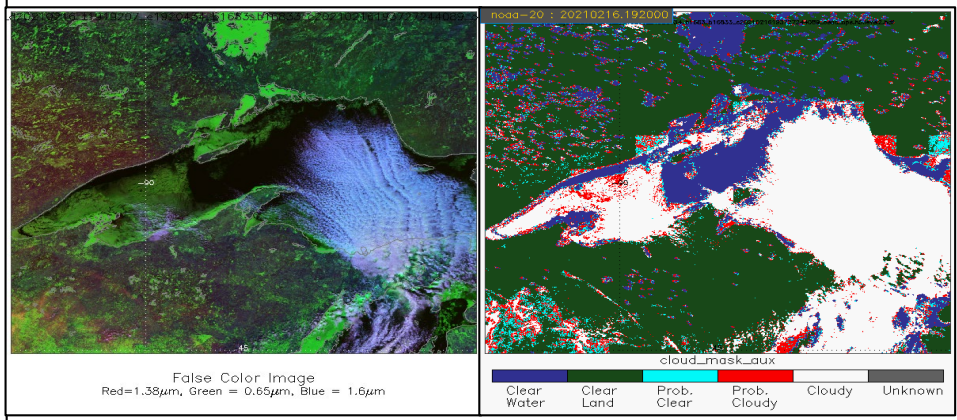


Figure 1. False color RGB image (left) and the operational Enterprise Cloud Mask (ECM v2r3 - right). NOAA-20/VIIRS 2021-02-16 19:17 - 19:20 UTC. box=[45,-92,50,-85]. ECM partially correctly detects clouds over the sea-ice in the West part of Lake Superior, and partially falsely marks pixels as cloud.

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	Mar-21	04/01/21	downstream data testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-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	Feb-21	
Work with NCEP on ASR assimilation. Adjust mask as necessary	Mar-21	Sep-21		Waiting for ASR team assessment of new LUT
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	Mar-21	04/01/21	downstream data testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-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	Feb-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	Mar-21	04/01/21	downstream data testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-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	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	Sep-21		This is an ongoing assessment requiring large subset of data. Task is on track
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	Mar-21	04/01/21	downstream data testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-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	Mar-21	04/01/21	downstream data testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-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	Mar-21	04/01/21	downstream data testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-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	Mar-21	04/01/21	downstream data testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-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	Feb-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		

Aerosol

March, 2021

Accomplishments / Events:

- Historical S-NPP VIIRS aerosol optical depth products have been reprocessed with the latest version of the Enterprise algorithm on the Amazon Web Service (AWS) Cloud servers during the periods of 2012-2015 and 03/2017-03/2018. Validation with ground measurements shows the retrieval accuracy and precision meet the requirements.
- The process of generating Level 3 gridded aerosol optical depth products with reprocessed data has started. The Level 3 products will be used in the COVID-19 project to study the impact of reduced human activity.
- Kondragunta participated in a NASA workshop on its future mission Aerosols Clouds Convection and Precipitation and gave a presentation on the applications of emerging NASA and NOAA satellite missions

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			

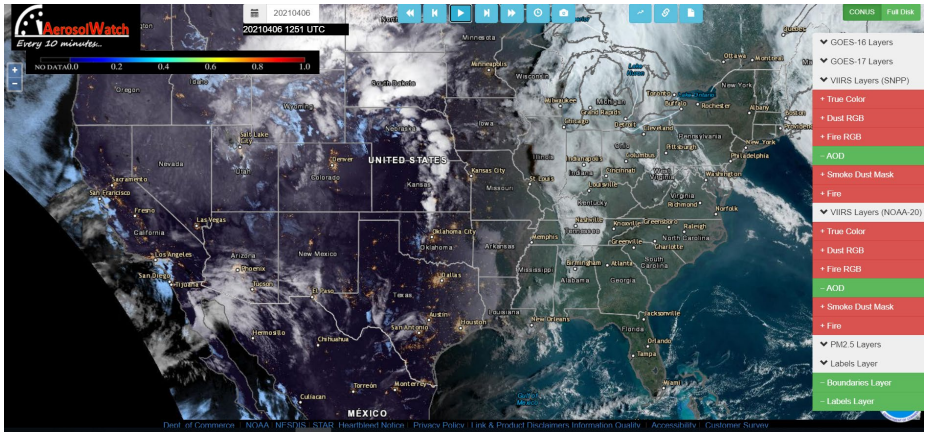
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

No risks

Milestones	Original Date	Forecast Date	Actual Completion Date	Notes and/or 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	Mar-21	04/01/21	downstream testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	08/18/20	
Algorithm Updates/Cal-Val Activities				
Details in next slides				

Highlights:



AerosolWatch hosted by STAR highlights benefits of blending Geostationary and JPSS data for Aerosol Optical Depth over CONUS

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

March, 2021

Accomplishments / Events:

- Successful test of primary VOLCAT components in the NESDIS Common Cloud Framework
- VOLCAT products support monitoring of Kilauea eruption
- Additional filtering options added to the VOLCAT event dashboard
- There were no volcanic ash EDR code updates for the final J2 DAP to ASSISTT (J2 updates were delivered as part of a previous DAP)

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			

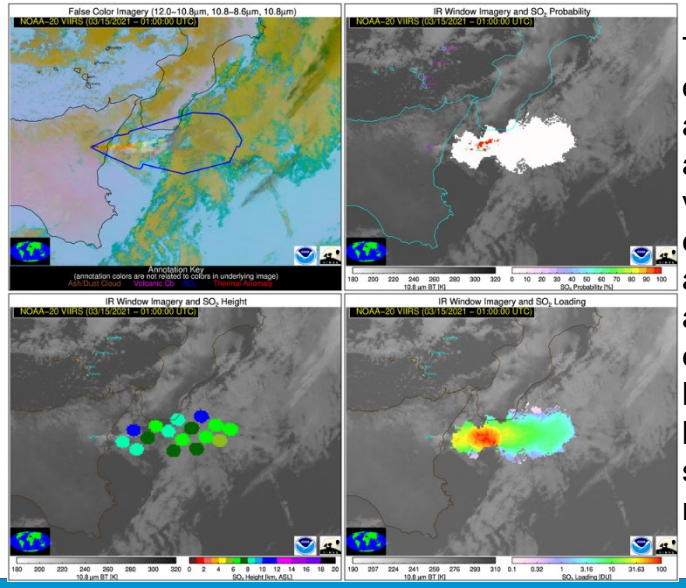
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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	Mar-21	04/01/21	downstream testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-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: VOLCAT VIIRS/CrIS SO_2 products capture explosive events from Mount Etna (Sicily)



The combination of VIIRS and CrIS are used to detect and characterize volcanic SO_2 emissions. CrIS allows for accurate estimates of height and loading. VIIRS supports spatial mapping.

Cryosphere

March, 2021

Accomplishments / Events:

- *Implemented new Enterprise ABI algorithm that follows the general approach of the binary and fractional snow cover retrieval utilized in the operational VIIRS snow algorithm*

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	Mar-21	04/01/21	downstream testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Preparation for JPSS-2	Sep-21	Sep-21		
Transition VIIRS Enterprise snow algorithms to operations for ABI	Mar-21	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: Enterprise Snow Cover Fraction improves consistency between JPSS and GOESR products used in blended products

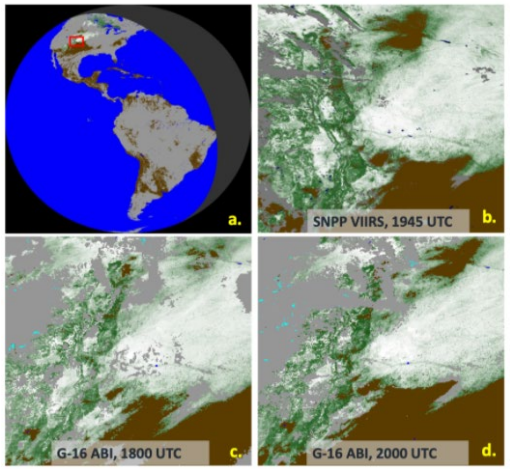


Figure 1a: Full disk GOES-16 ABI snow fraction product. b: VIIRS snow fraction for a smaller region (region is shown in red in Figure 1a). c,d: GOES-16 ABI snow fraction derived over the same region at 1800 and 200 UTC. Note: the geographical projection of VIIRS and ABI snow products is not the same.

Active Fires

March, 2021

Accomplishments / Events:

- Verified the implementation of the solar farm flag bug fix in NDE Operations
  - bug fix was implemented on February 22
  - after a period of further verification, on March 2 the JSTAR Mapper Team switched back to displaying the operational product
- Worked with the CSPP on implementation of the persistent anomaly flags in the CSPP version of the VIIRS I-band product

Overall Status:

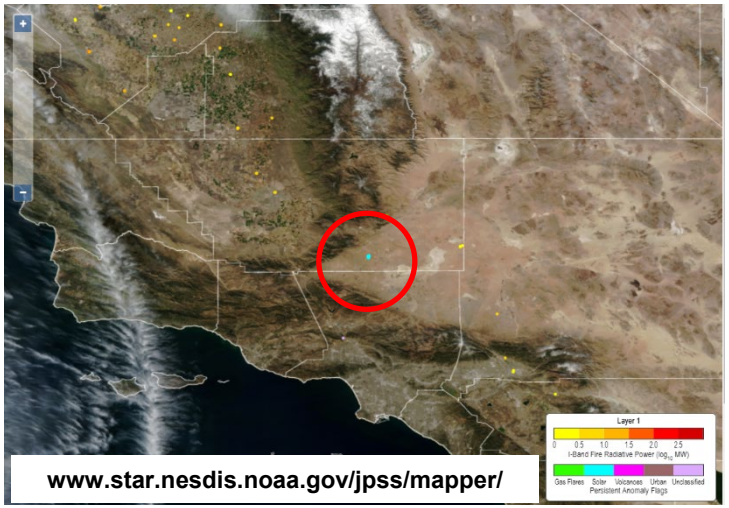
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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	
Enterprise Active Fires DAP to ASSISTT	Aug-20	Aug-20	08/25/20	
Initial Enterprise Fires DAP to NDE	Jun-21	Jun-21		
Final J2 updates DAP to ASSISTT	Aug-21	Aug-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:



Persistent anomalies in Southern California, flagged as "Solar Farm" (light blue) in the operational Suomi NPP VIIRS I-band product on March 2, 2021. Display from JSTAR Mapper.

Surface Reflectance

March, 2021

Accomplishments / Events:

- The LPD team is taking the responsibility of scientific support of the SR production
- Got familiar with the SR algorithm basis and VIIRS SR product processing architecture.
- Set up the SNPP and NOAA20 VIIRS SR evaluation plan and product monitoring
- Collecting and processing the ground measurements (AERONET 39 sites and RadCalNet 4 sites) and matched satellite data (VIIRS SDR radiance, VIIRS Geometry, VIIRS level 2 SR product)

Overall Status:

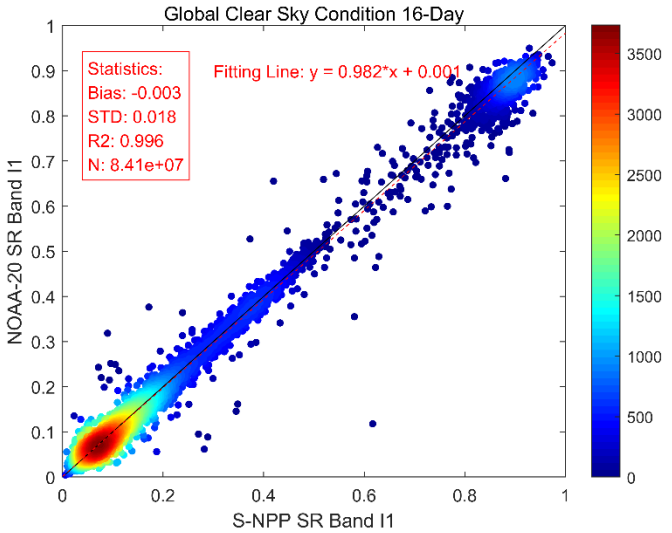
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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:

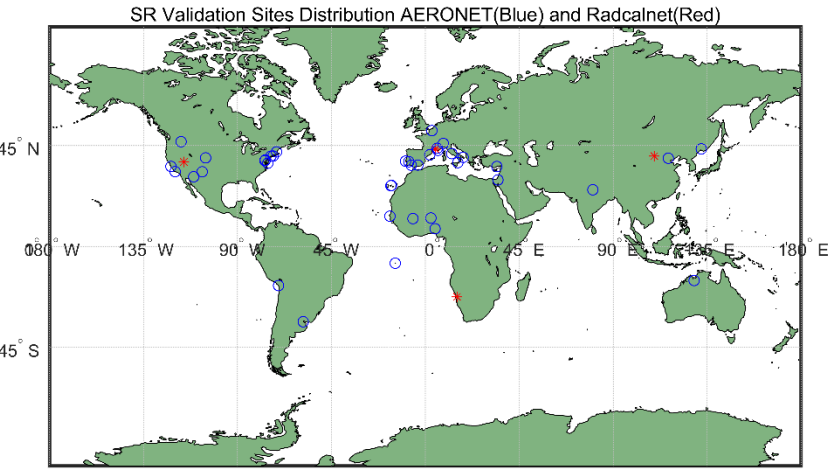
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Apr-21		downstream testing
Final J2 ready DAP to ASSISTT	May-21	May-21		
Final J2 ready DAP to NDE (include 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

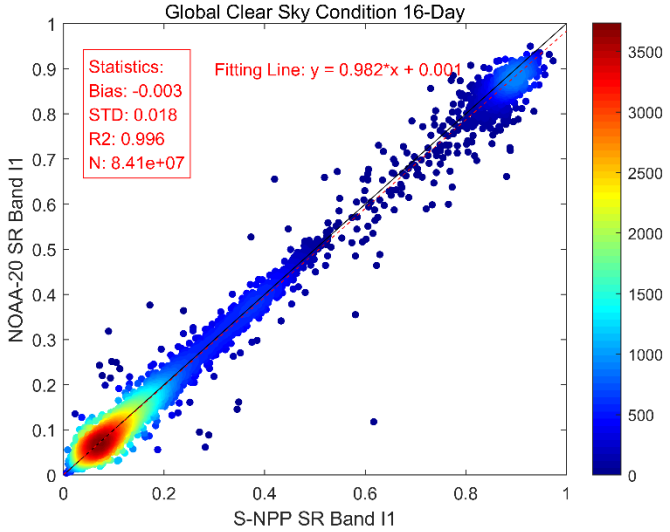


Consistency analysis of surface reflectance data observed from SNPP and NOAA-20. Overall the consistency is observed.

Monthly Progress – SR PRODUCT

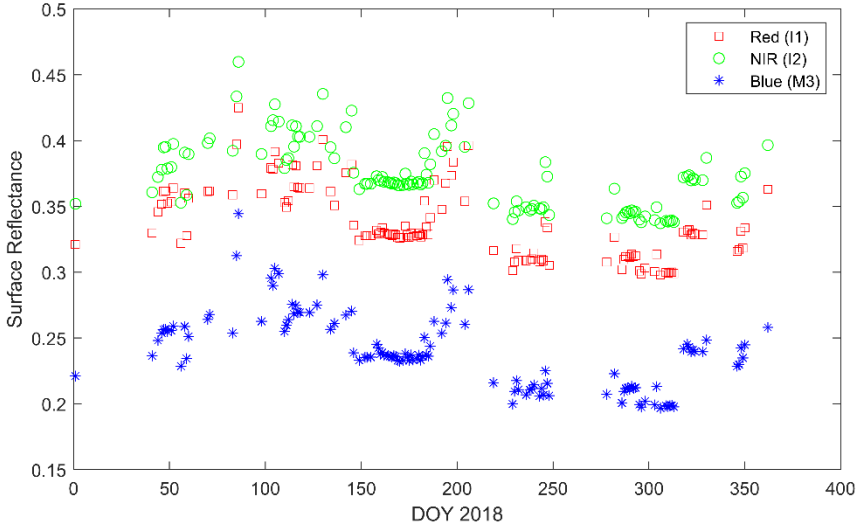


SR Evaluation Site Locations

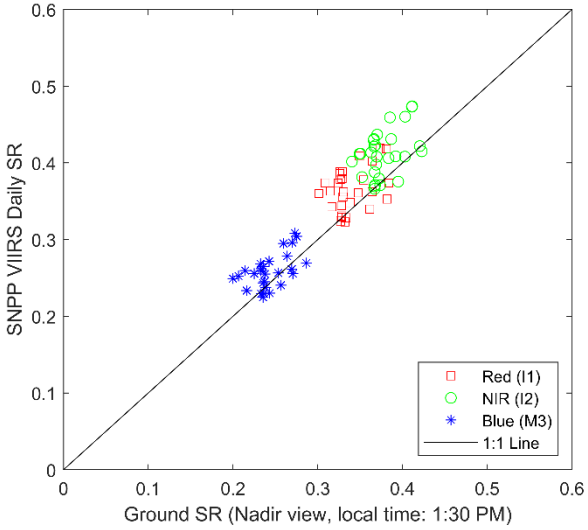


Inter-Comparison between SNPP and NOAA20

RadCalNet Railroad Valley Site



Ground measured VIIRS SR. The year of 2018



Preliminary validation result
Only best quality SR used

Surface Type

March, 2021

Accomplishments / Events:

– STAR-UMD VIIRS Surface Type team has downloaded and processed S-NPP and NOAA-20 VIIRS granule surface reflectance data acquired in March 2021.

– The team has completed derivation of monthly composites and annual classification metrics using 2020 VIIRS data acquired by both S-NPP and NOAA-20.

– The team has started to extract training data based on the 2020 annual metrics and use them to train the SVM classification model.

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			

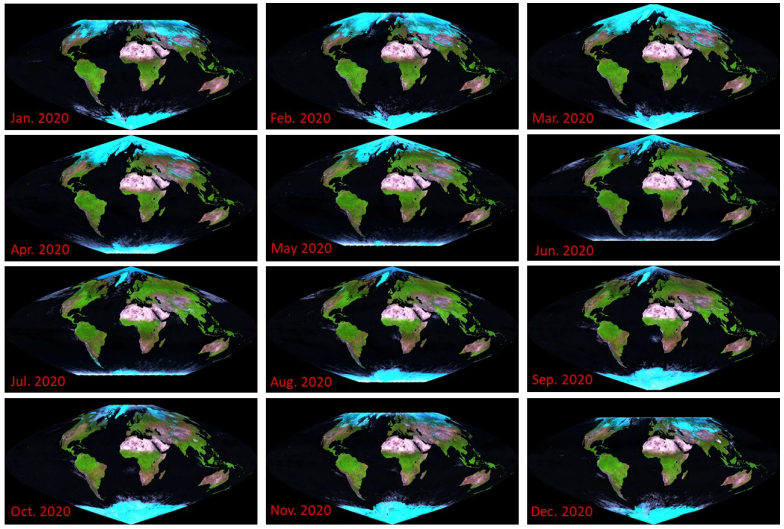
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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	Mar-21	04/01/21	10/1/20: SCR
Deliver AST-2019 to NDE	Nov-21	Nov-21		
Annual performance report	Sep-21	Sep-21		

Highlights:



VIIRS Monthly composites created using daily observations from S-NPP and NOAA-20. Green and cyan indicate areas covered by vegetation and snow.

Land Surface Temperature

March, 2021

Accomplishments / Events:

- Updated the cross satellite comparison between VIIRS and MODIS LST products. The dates with good global coverage were selected. (slide 2)
- Proposed the adaptive composition method for L3 VIIRS LST product taking into account the view zenith angle in the composition matrix. Completed the science code update and the method test on both NOAA20 and SNPP VIIRS LST. (slide 3-6)
- Collaborated with ASSITT team on the L3 LST difference observed in v1r4 and v2r0. The snow input selection and its impact on the JSTAR EDR product was summarized.
- Provided the global L3 VIIRS LST to soil moisture team to support the development of soil moisture product with 1 km spatial resolution.
- Finished the CISESS annual report for JPSS VIIRS LST project.
- Generally completed the manuscript for the book chapter on the LST validation.

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
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	Mar-21	04/01/21	downstream testing
Final J2 ready DAP to ASSISTT	Mar-21	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)	Nov-21	Nov-21		

Highlights:

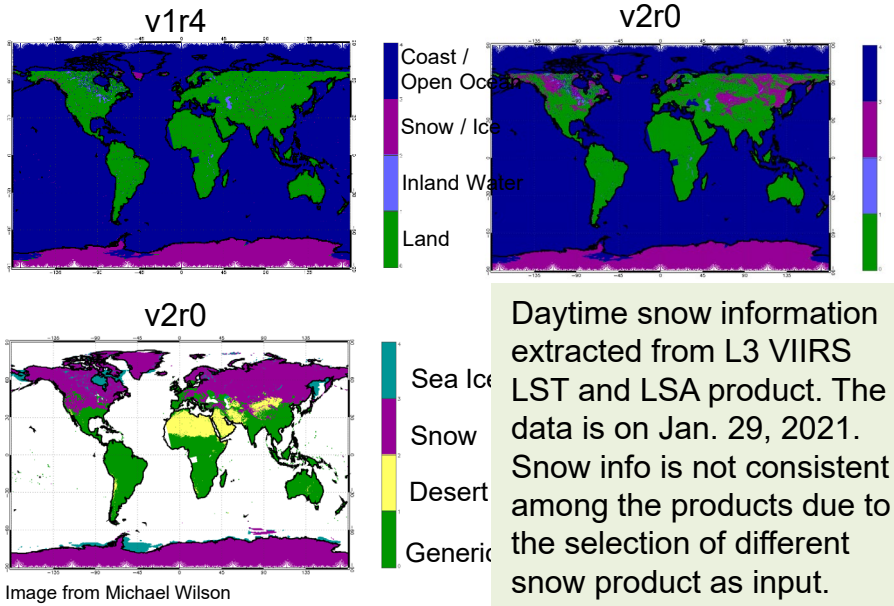
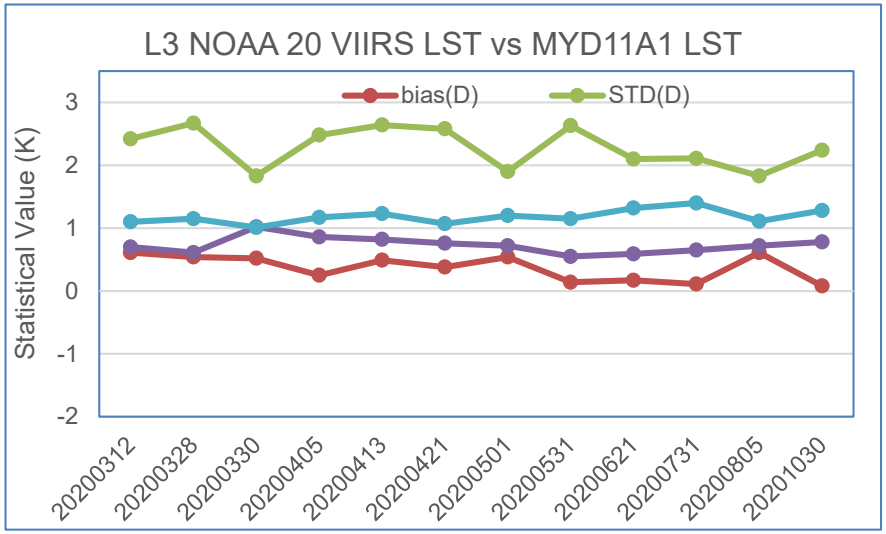
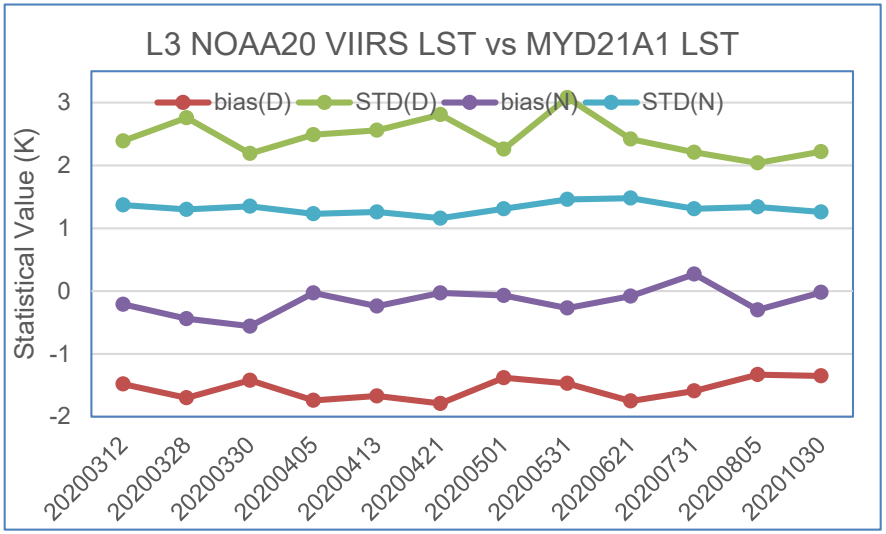


Image from Michael Wilson

Daytime snow information extracted from L3 VIIRS LST and LSA product. The data is on Jan. 29, 2021. Snow info is not consistent among the products due to the selection of different snow product as input.

NOAA20 VIIRS LST vs MYD11A1 and MYD21A1





	Bias(D)	STD(D)	Bias(N)	STD(N)
V-MYD11A1	0.37	2.29	0.73	1.18
V-MYD21A1	-1.56	2.45	-0.17	1.32

- NOAA20 LST is close to MYD11A1 at daytime with a mean bias of 0.37 K while close to MYD21A1 at nighttime with a mean bias of -0.17 K.
- Agreement is better at nighttime with STD of 1.18K and 1.32 K comparing the STD of 2.29 K and 2.45 K at daytime for MYD11A1 and MYD21A1, respectively
- Consistent large cold bias ranges between -1.79 K to -1.33 K with mean value of -1.56 K is observed between NOAA20 LST and MYD21A1 at daytime.

Adaptive Composition Method in detail

1) Cloud
2) Smaller viewing angle
3) If angle is larger, then use following criteria

- Combined angle and atmospheric conditions
  - Daytime
    - Moist condition (tpw >3g/cm2)
      - LSTs at smaller angle or LST at larger zenith angles with angle difference less than **5** deg and their values being larger by at least 2K.
    - Relative moist condition(3 >= tpw >1.5g/cm2)
      - If grid angle < 25, LSTs at smaller angle or LSTs at larger zenith angles with angle difference less than **10** deg and their values being larger by at least 2K.
      - If grid angle > 25 , LSTs at smaller angle or LSTs at larger zenith angles with angle difference less than **5** deg and their values being larger by at least 2K.
    - Dry condition (tpw <= 1.5)
      - LSTs at smaller angle or LSTs at larger zenith angles with angle difference less than 10 deg and their values being larger by at least 2K.
  - Nighttime
    - Moist condition (tpw >3g/cm2)
      - LSTs at smaller angle or LSTs at larger zenith angles with angle difference less than **5** deg and their values being smaller by at least 2K.
    - Relative moist condition
      - If grid angle < 25, LSTs at smaller angle or LSTs at larger zenith angles with angle difference less than **10** deg and their values being smaller by at least 2K.
      - If grid angle > 25 , LSTs at smaller angle or LSTs at larger zenith angles with angle difference less than 5 deg and their values being smaller by at least 2K.
    - Dry condition
      - LSTs at smaller angle or LSTs at larger zenith angles with angle difference less than 10 deg and their values being smaller by at least 2K.

L3 VIIRS LST Output update

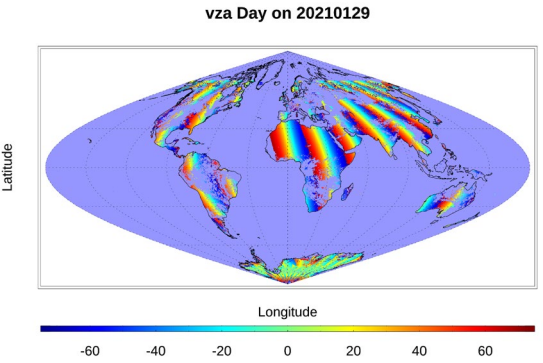
Name	Type	Description	Data Type	Dimension	Unit
LST_Day	output	Daily daytime LST for each pixel	signed Short	43200*21600	K
QC_Day	output	Quality control flags for daytime LST	signed Byte	43200*21600	unitless
View_Time_Day	Output	Measurement time for Daytime LST	signed Byte	43200*21600	hour
View_Angle_Day	Output	View zenith angle of daytime LST	signed byte	43200*21600	Degree
Metadata	Output	Global general information statistics	String Numeral type		NA

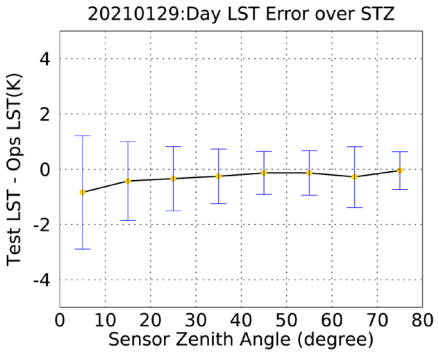
newly added metadata

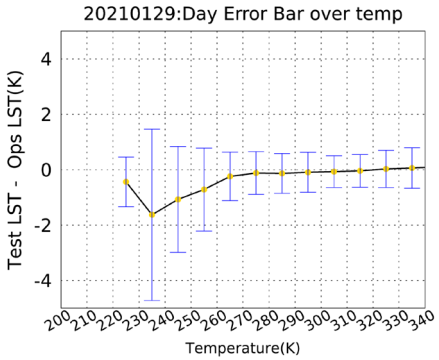
view_angle_min
View_angle_max

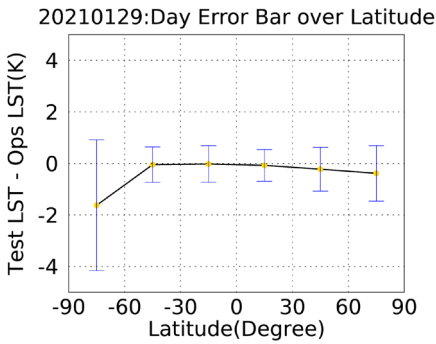
The nighttime LST is updated accordingly

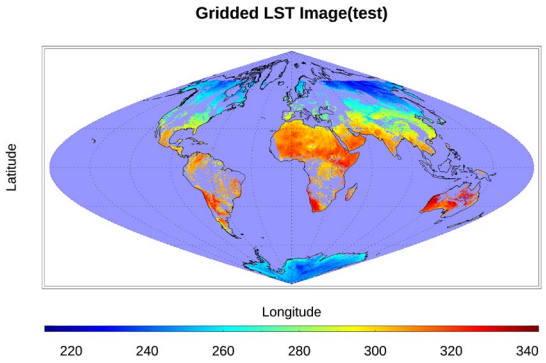
L3 LST composition-NOAA20 LST Daytime (adaptive composition method vs operational)

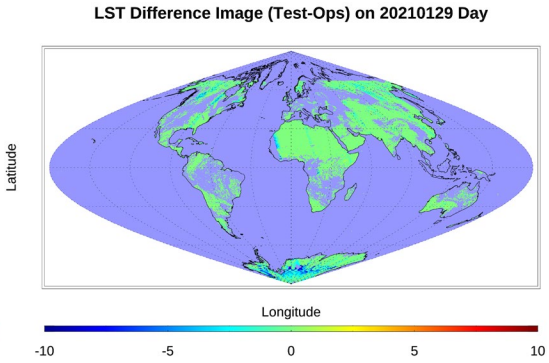


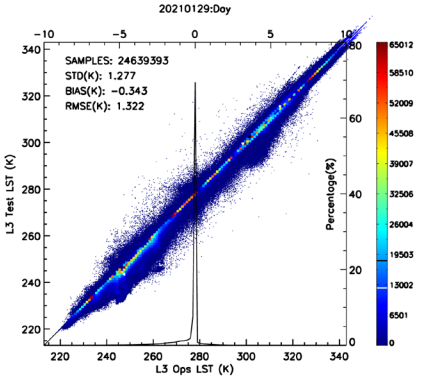






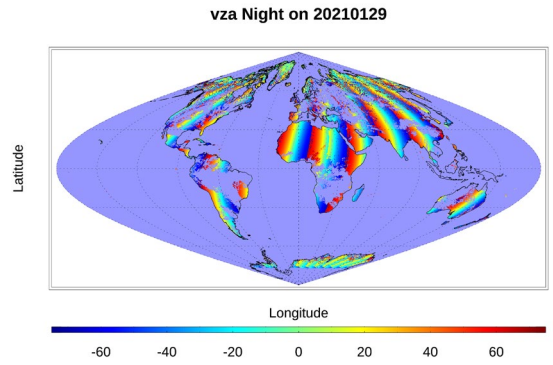


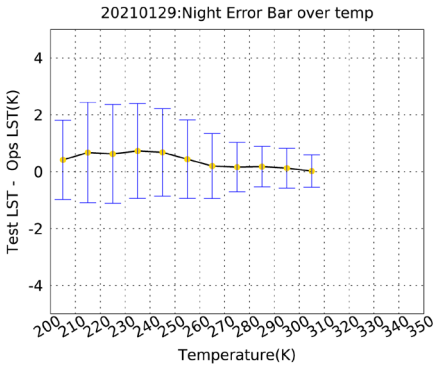


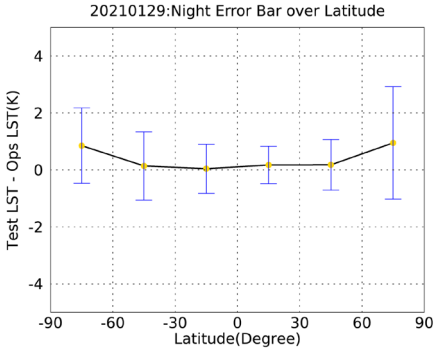


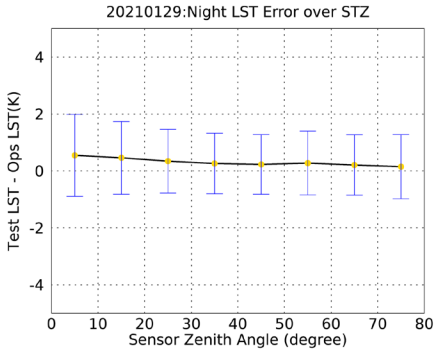
- The LST based on the original and adaptive composition method is compared with the operational L3 LST.
- More impact on polar region and cold temperature
- Composition method difference can be observed from the edge of angle pattern in the low latitude area

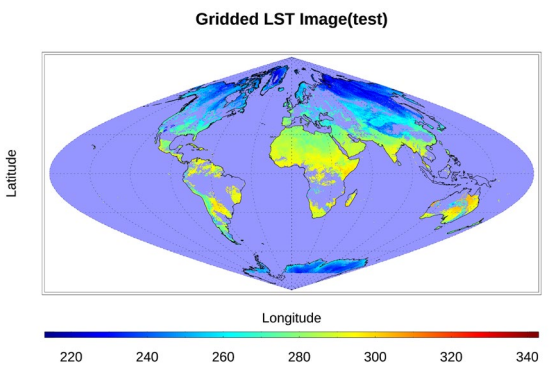
L3 LST composition-NOAA20 LST Nighttime (adaptive composition method vs operational)

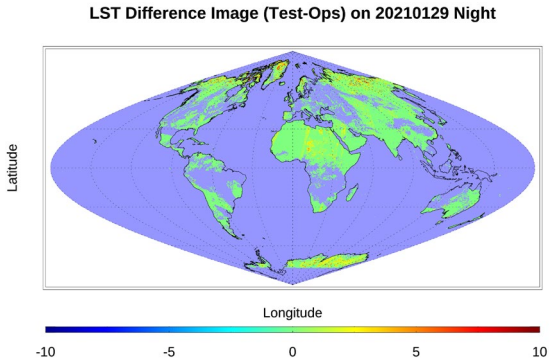


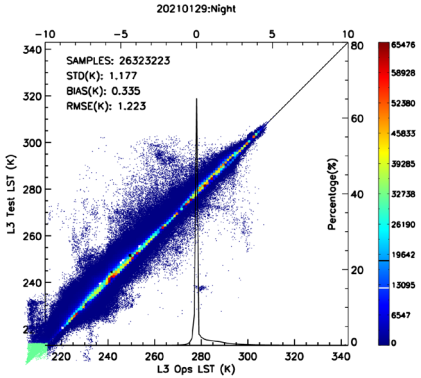












- The LST based on the adaptive composition method is compared with the operational L3 LST.
- It is found that the daytime LST generated using the adaptive composition method is overall colder than the operational LST while the nighttime LST is warmer than the operational LST
- The cold end temperature is affected more than the warm temperature.
- The polar area LST is affected more than the low latitude area for both daytime and nighttime, which is expected.

Surface Albedo

March, 2021

Accomplishments / Events:

- Further processing the VIIRS albedo climatology to complement the sea-ice part and the needed parameters (Highlight & Slide 2).
- Checked the variation of the matchup number in the long-term monitoring system (Slide 3).
- Checked the comparison result between v1r4 and v2r0 from the ASSISTT and investigated the reported issues (Slide 4)
- Prepared for and submitted the JPSS albedo annual report to CISESS
- Revising the in-situ cloud detection algorithm using downward shortwave radiation as input (in progress)
- Reviewed two manuscripts about albedo validation and application 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.*

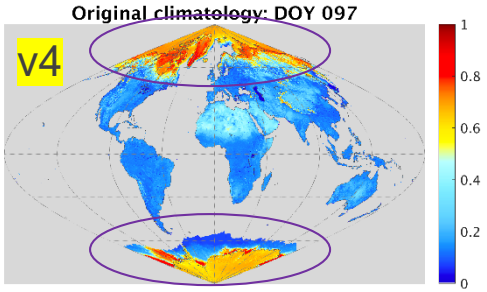
Issues/Risks:

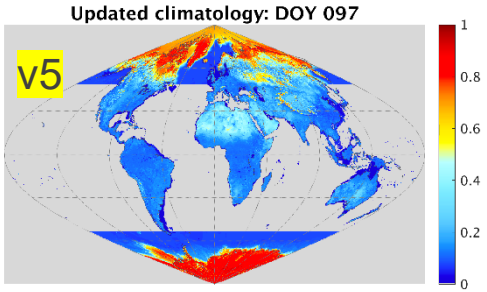
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
CalVal Report on current SNPP and N-20 data	Dec-20	Dec-20	Dec 20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates, ASSISTT delivery)	Jan-21	Mar-21	04/01/21	downstream testing
Final J2 DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Code developed for BRDF computation	Mar-21	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)	Nov-21	Nov-21		

Highlights:

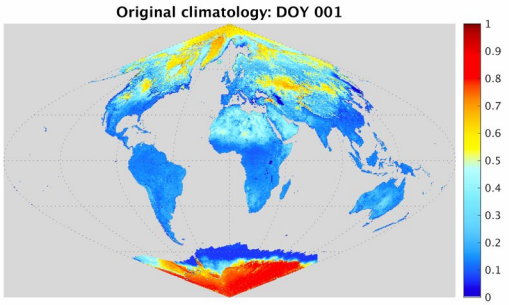
VIIRS albedo Climatology v5 ready

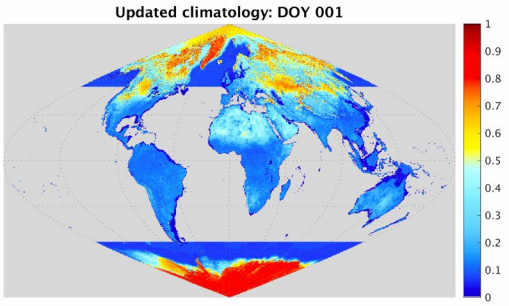
- Re-generate the land climatology from the MODIS albedo in the recent two decades
- Complement sea-ice tiles to response the new sea-ice mask





Generate climatology v5





Updates in v5

- Re-generate the land climatology from the MODIS albedo in the recent two decades
  - GEE was used
  - In-situ data was deployed to evaluate the quality of the climatology
- Complement sea-ice tiles to response the new sea-ice mask
  - Project the possible sea-ice tiles ever denoted in IMS/SSMI ice mask but not in v4 climatology
  - Tiling the statistics to the climatology data over the new tiles

Task list in last month

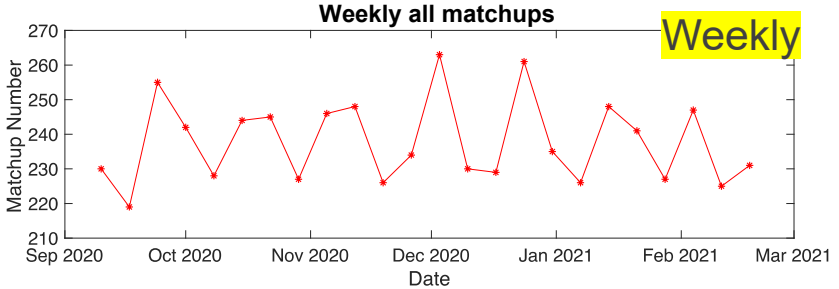
- Check the land climatology
- plot and check the climatology
- Add sea-ice climatology
- Complement the tiles not in previous version
- Add parameter rho

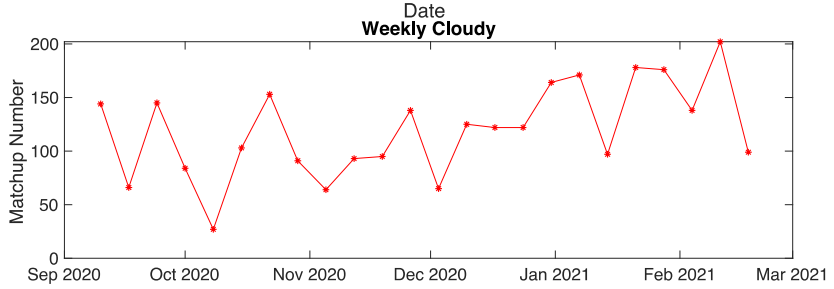
Version ID	Update content	Remaining Issues	Status
FY17 v1	• Initial delivery of 5km climatology; • cover land and Arctic sea-ice	• Lower-resolution than current VIIRS product; • With stripe-type fill value over sea-water; • No coverage over Antarctic sea-ice	Outdated
FY18 v2	• Downscale land-part resolution to 1km; • cover land and Arctic sea-ice;	• Discontinuity in Greenland; • With stripe-type fill value over sea-water; • Lower resolution and 2 missing tiles over Arctic sea-ice; • No coverage over Antarctic sea-ice	Operational
FY19 v3	• Updated the sea-ice resolution to 1km	• Discontinuity in Greenland; • With stripe-type fill value over sea-water; • No coverage over Antarctic sea-ice	DAP delivered
FY20 v4	• Remove the Horizontal discontinuity in Greenland; • Remove the stripe-type fill value over sea-water; • Add Antarctic sea-ice climatology • Filled the polar night regional period through temporal filtering	• The double peak issue in albedo time series in Greenland • The horizontal parallel line over Greenland in polar night border still show lightly • The v17 tiles (Antarctic land) has too low value in the polar night and the annual variation looks not right.	DAP delivered
FY21 v5	• Land polar snow albedo was revised to address all the issues remained in v4. • More sea-ice pixels will be added to adapt to the new sea-ice mask	• Need regular update with latest data	In development

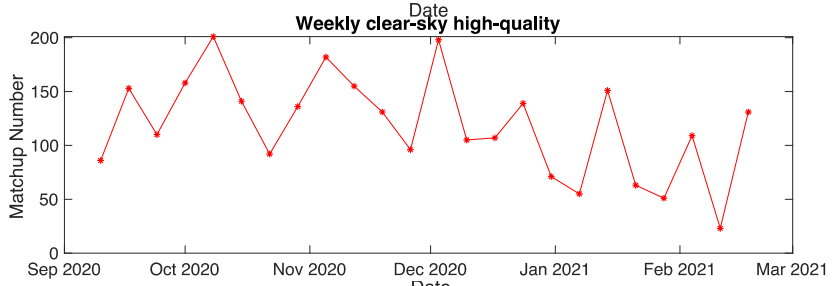
Variation of the matchup number in the LTM

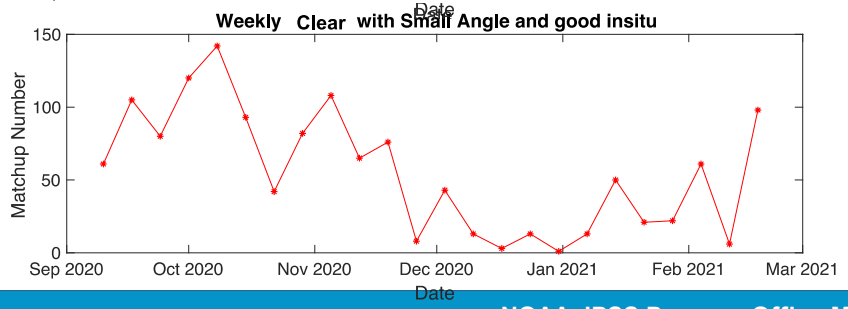
Background: It was observed that the high-quality matchup size has dramatic change in February (from 6 to 90). The weekly/daily matchup variation pattern has been investigated.

Weekly

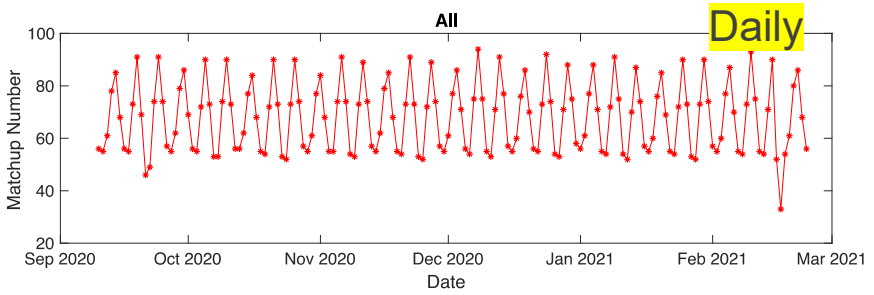


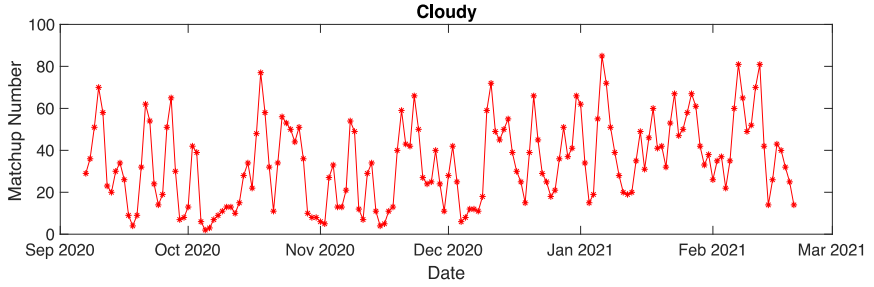


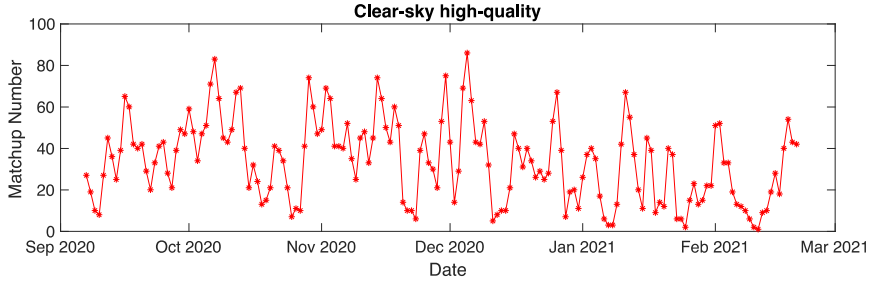




Daily







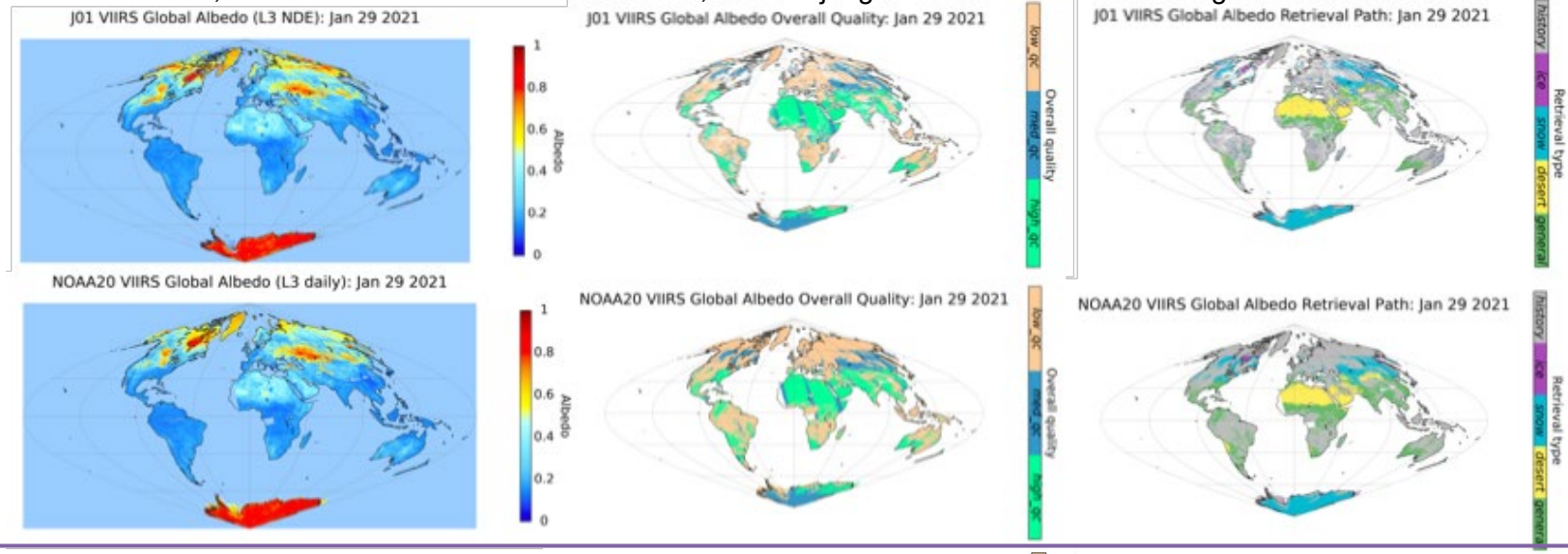
Conclusion: The dramatic fluctuation of matchup number in February is mainly due to the weather condition change. A minor reason is the data outage in the SCDR.

Comparison between the v2r0 and v1r4 L3 albedo

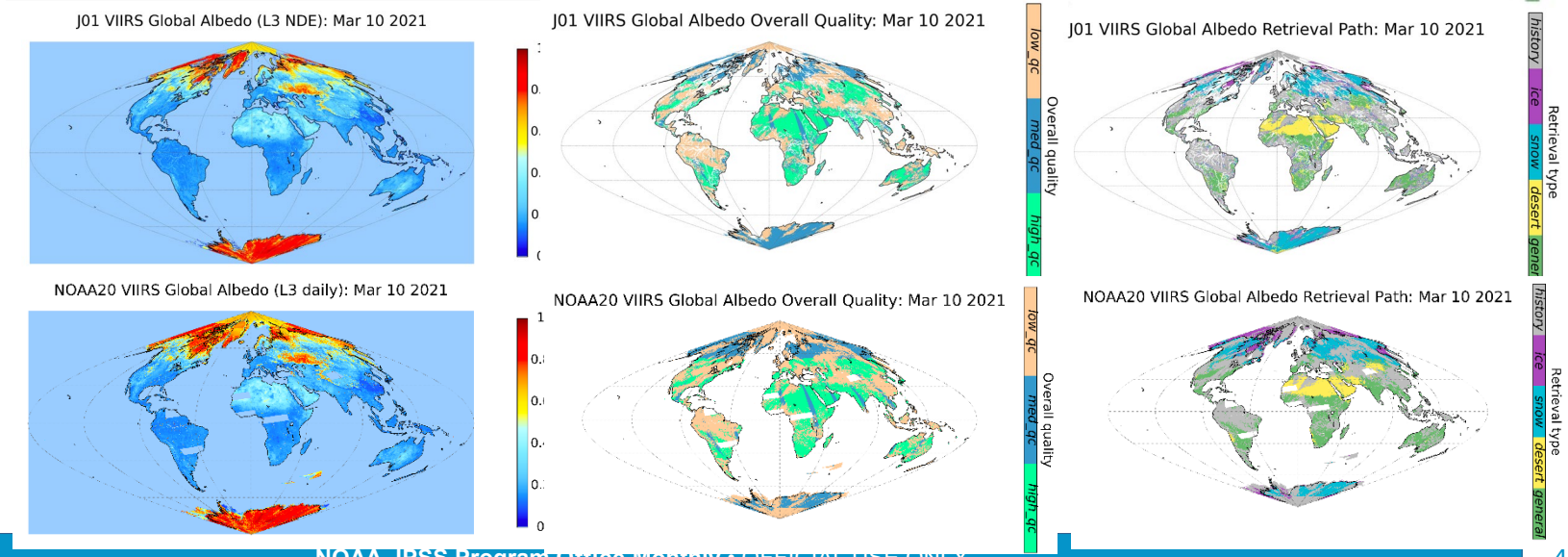
Data source: 1) Level 2 LSA files v1r4, pulled from OPS. 2) Level 2 LSA files v2r0, generated by Eric Buzan (on data517)

Regions of Concern: 1) Jan 29 test case: Sea Ice in Arctic shows up in v1r4, but not v2r0. This happened on the data of Jan 29, but not appeared on Mar 10 and after; Assume it is related to the offline data, and it is judged as an occasional running issue.

Jan 29, Arctic sea-ice missing



Mar 10, Normal



NVPS
(Vegetation Index & Green Vegetation Fraction)

March, 2021

Accomplishments / Events:

- Redesigned the current operational GVF data structure and implemented multi-thread GVF system to reduce operational time. Preliminary tests show the optimized GVF reduced the operational time from 4+ hours to around 1 hour.
- NPP/ NOAA20 combined Vegetation Index generated with two different algorithms and evaluated.
- Evaluate impacts of surface reflectance data update (GFS v15-v16) to VI and GVF and found no significant impacts on VI and GVF products
- Compared V2r1 daily NDVI time series with V1r4 NDVI at high latitude areas and confirmed the consistency between v2r1 daily VI and v1r4 daily VI

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.*

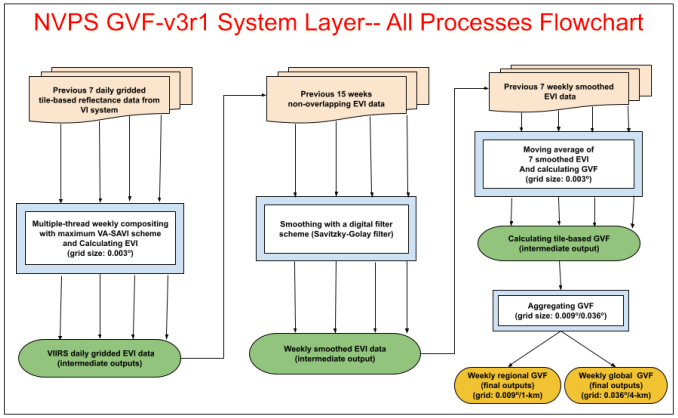
Issues/Risks:

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	01/13/21	
ATBD update, Detail Design Document Development	Jan-21	Jan-21	01/29/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Mar-21	Apr-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		

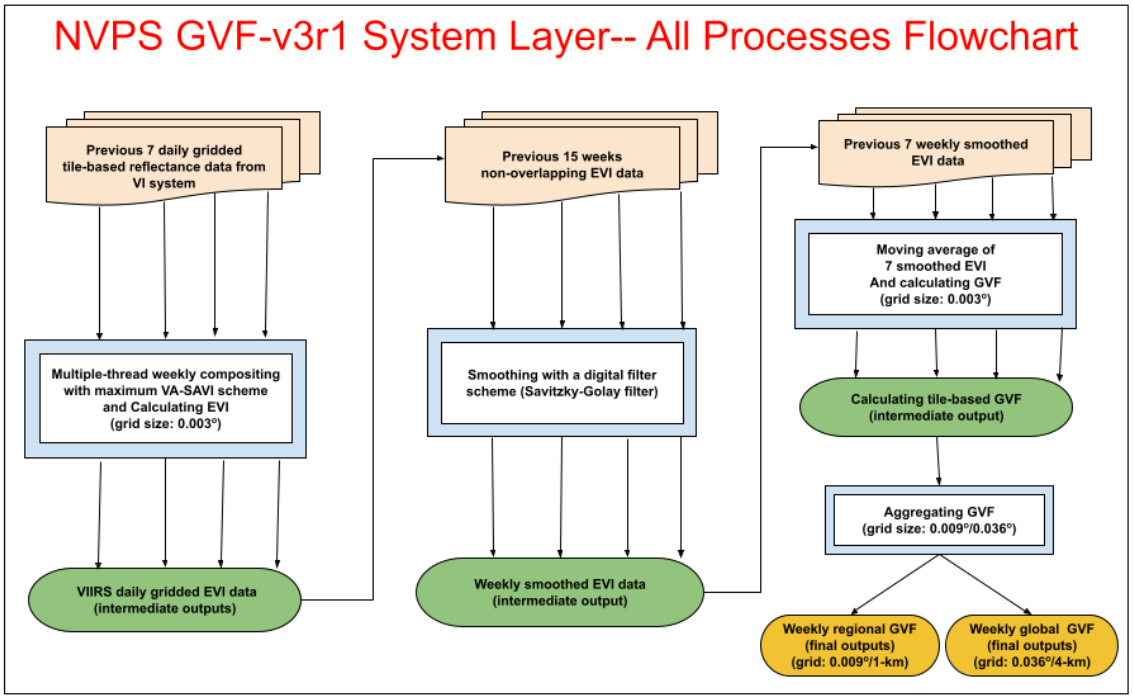
Highlights:

Redesign of GVF system



- GVF run time reduced from more than 4 hours to less than 1 hour
- Use intermediate products from NVPS VI system
- Change from single thread to multi-thread implementation
- Merging the original 6 process units into 4 process units

Optimized NVPS GVF-v3r1 Flowchart



Optimized NVPS GVF-v3r1 over the operational GVF-v2r3 with the following characteristics:

- Using the gridded surface reflectance intermediate products from NVPS VI system as inputs of the GVF-v3r1 to save operational time of around 2 hours
- Changing the original single thread implementation of each process into multi-thread implementation
- Merging the original 6 process units into 4 process units to reduce I/O processes

Comparison of running time between GVF-v3r1 and GVG-v2r3

Operational GVF-v2r3 Running Time

NVPS_GVF Running Time with VIIRS Observations On 20200414

Process (Unit)	Running Time (H:M:S)
Daily TGM & GRD:	2:15:57
weekly composite:	1:6:40
calcEVI:	0:7:51
TSsmooth:	0:41:24
calcGVF:	0:3:49
aggGVF:	0:4:14
Subtotal:	4:19:55

NVPS_GVF Running Time with VIIRS Observations On 20200415

Process (Unit)	Running Time (H:M:S)
Daily TGM & GRD:	2:20:45
weekly composite:	1:6:43
calcEVI:	0:7:49
TSsmooth:	0:41:36
calcGVF:	0:3:43
aggGVF:	0:4:8
Subtotal:	4:21:44

NVPS_GVF Running Time with VIIRS Observations On 20200416

Process (Unit)	Running Time (H:M:S)
Daily TGM & GRD:	2:15:4
weekly composite:	1:7:15
calcEVI:	0:7:56
TSsmooth:	0:42:0
calcGVF:	0:3:45
aggGVF:	0:4:11
Subtotal:	4:17:11

Optimized VI-GVF-v3r1 Running Time

NVPS_GVF Running Time with VIIRS Observations On 20200414

Process (Unit)	Running Time (H:M:S)
weekly composite:	0:37:34
TSsmooth:	0:9:34
calcGVF:	0:3:39
aggGVF:	0:4:6
Subtotal:	0:54:54

NVPS_GVF Running Time with VIIRS Observations On 20200415

Process (Unit)	Running Time (H:M:S)
weekly composite:	0:35:23
TSsmooth:	0:10:18
calcGVF:	0:3:38
aggGVF:	0:4:6
Subtotal:	0:53:25

NVPS_GVF Running Time with VIIRS Observations On 20200416

Process (Unit)	Running Time (H:M:S)
weekly composite:	0:35:25
TSsmooth:	0:9:55
calcGVF:	0:3:34
aggGVF:	0:4:9
Subtotal:	0:53:3

- Above left and right tables record running time of operational GVF-v2r3 and optimized VI-GVF-v3r1 with VIIRS NOAA-20 observations in the period from April 14 to 16 of 2020, respectively.
- Tests show that the optimized VI-GVF-v3r1 significantly reduced running time from around 4 hours 20 minutes (with operational GVF-v2r3) to less than 55 minutes.

Algorithms for combining NPP and NOAA20 VI

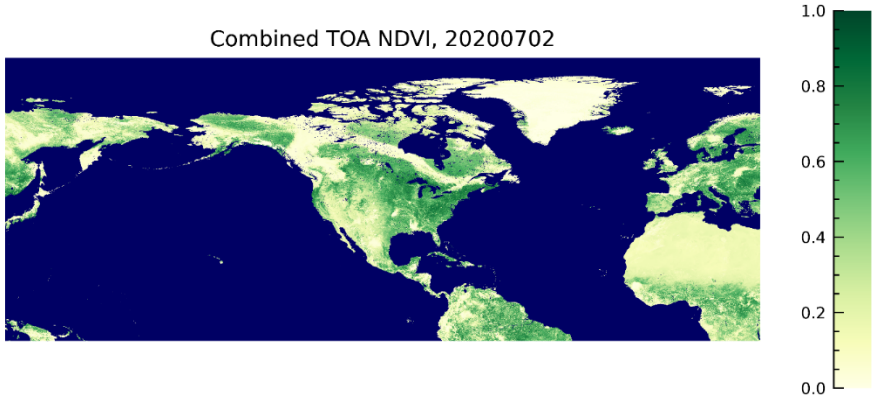
Original

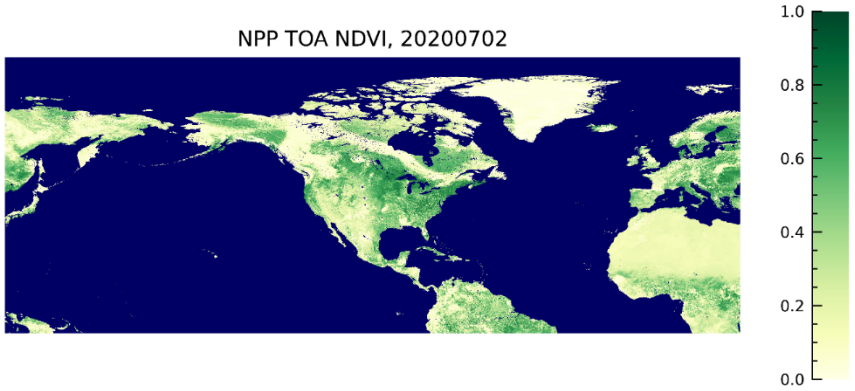
- Apply view angle/ soil adjusted vegetation index (VA-SAVI) compositing at each pixel to select NPP or NOAA20 data

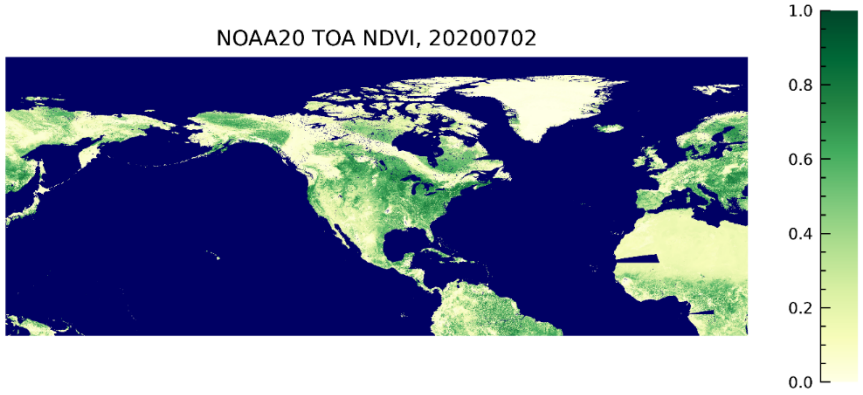
New

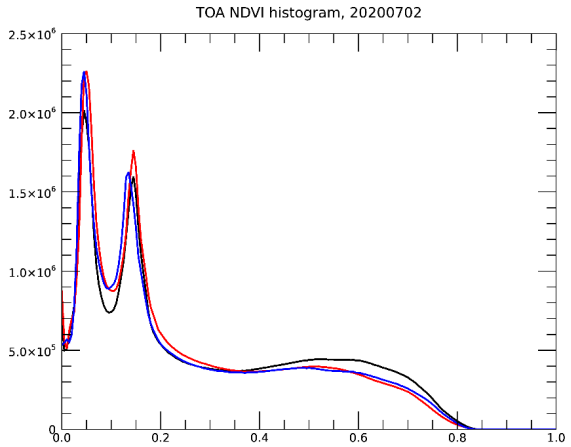
- If either NPP or NOAA20 is less cloudy than the other, choose the one that's less cloudy
- If both are equally cloudy, but one has less aerosol than the other (climatology and low aerosol in the same category for this purpose), choose the one with lower aerosol
- If cloud and aerosol are the same, select using VA-SAVI algorithm

Sample combined daily vegetation index TOA NDVI, 20200702, new algorithm







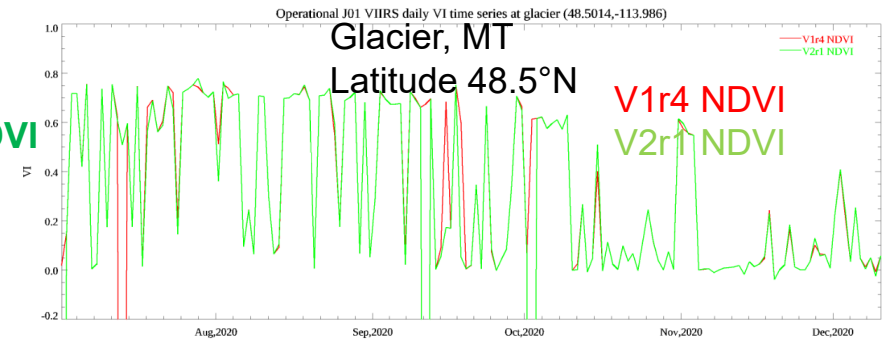


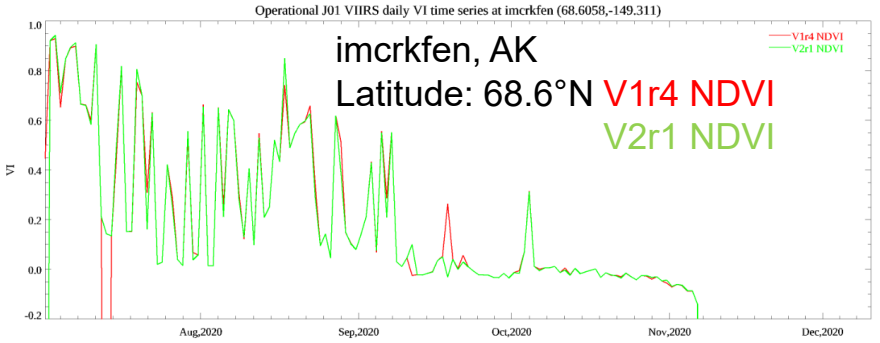
Combined
NPP
NOAA20

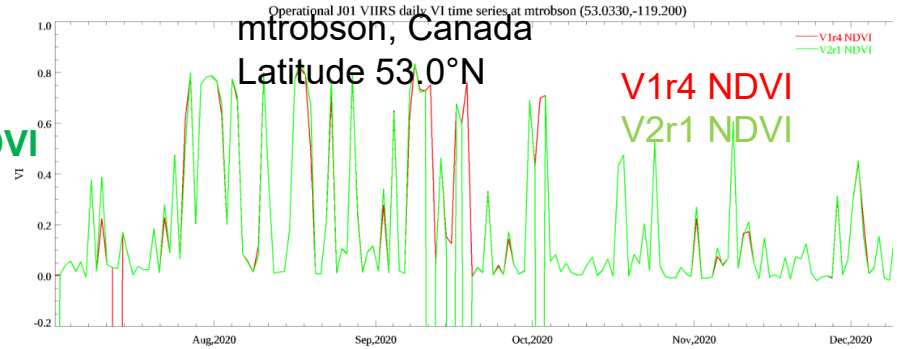
Summary of combined VI (new algorithm)

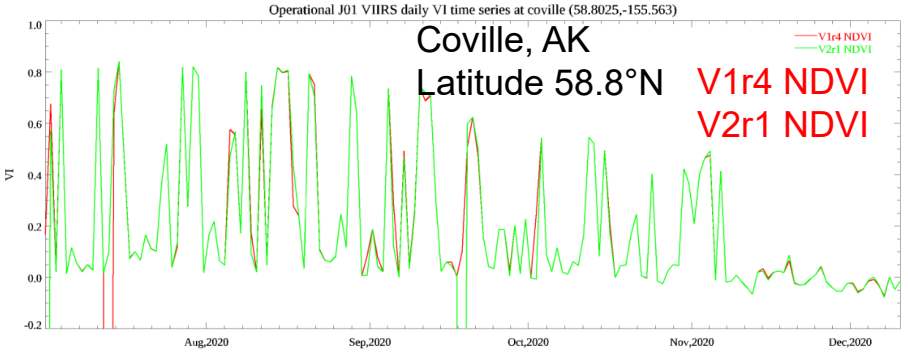
- The primary advantage of the combined product is to give users a single product with the highest possible quality rather than having to choose between two different products.
- About half of the pixels come from NPP and half from NOAA20
- Differences between combined VIs and NPP or NOAA20 alone VIs are modest
- VIs tend to be slightly higher in combined data
- Combined data have more confident clear pixels and fewer confident cloudy pixels
- Combined data have more low aerosol pixels and generally fewer high aerosol pixels
- View zenith angles are lower for combined VIs

Daily NDVI time series comparison (V1r4 vs. V2r1) at high latitude areas







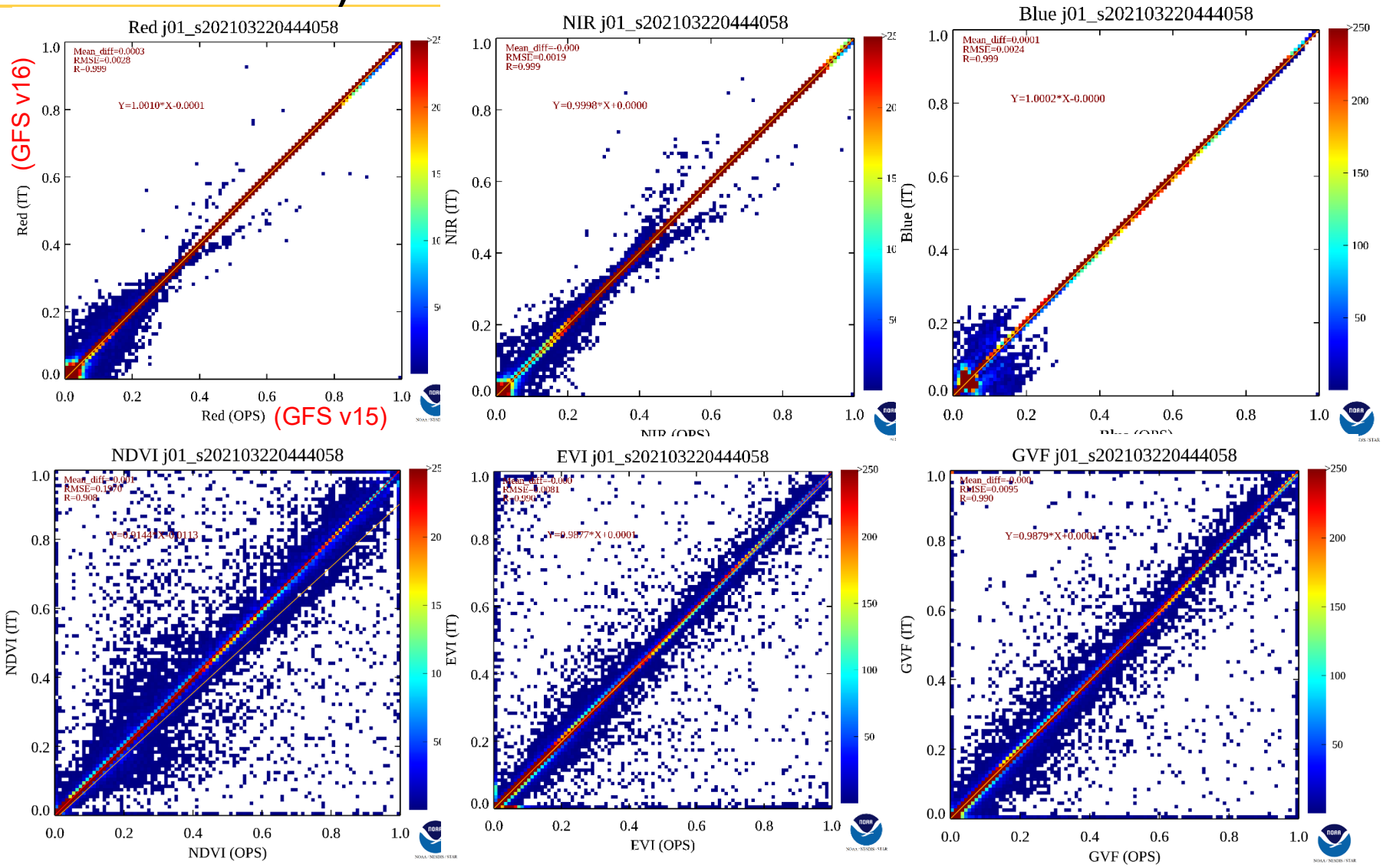


- V2r1 daily NDVI are very close to V1r4 daily NDVI, even at very high latitude areas where multiple orbits are available, which confirmed the consistency between v2r1 daily VI and v1r4 daily VI
- In a 0.036-degree grid, partial sampling aggregation is close to full sampling aggregation

Suggestion:

No need to modify the VI V2r1 aggregation method to include different view angle observations

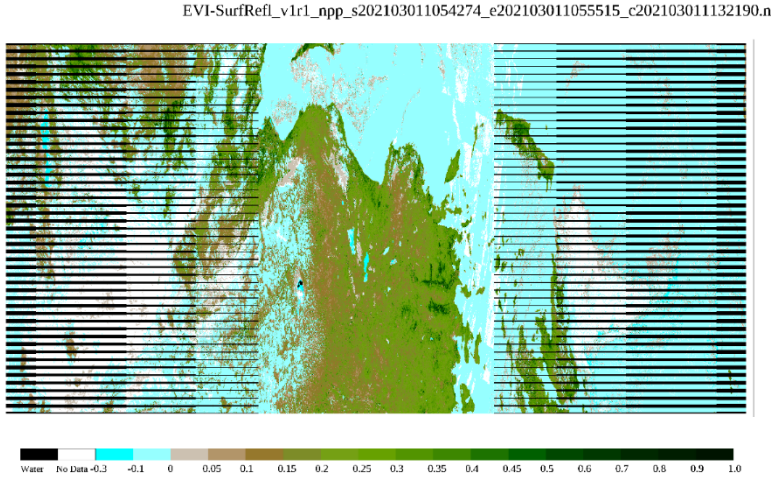
Evaluate impacts of surface reflectance data update (GFS v15-v16) to VI and GVF



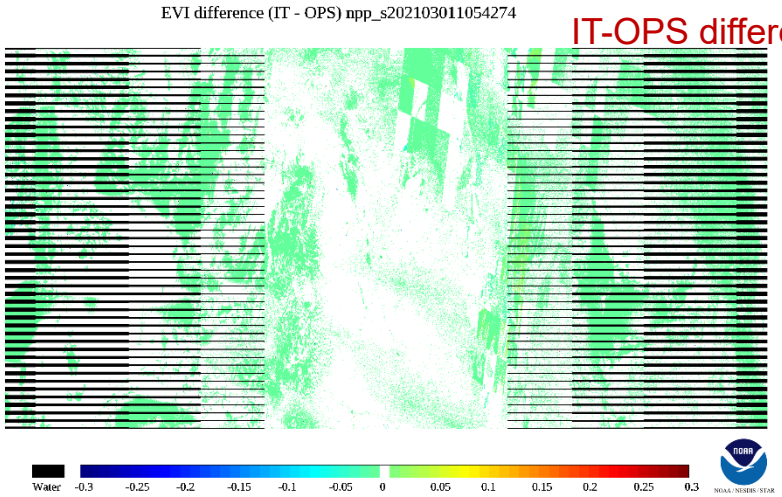
- The overall difference between OPS and IT surface reflectance is small (R>0.99) (X axis: GFS v15, Y axis: GFS v16)

Evaluate impacts of surface reflectance data update (GFS v15-v16) to VI and GVF

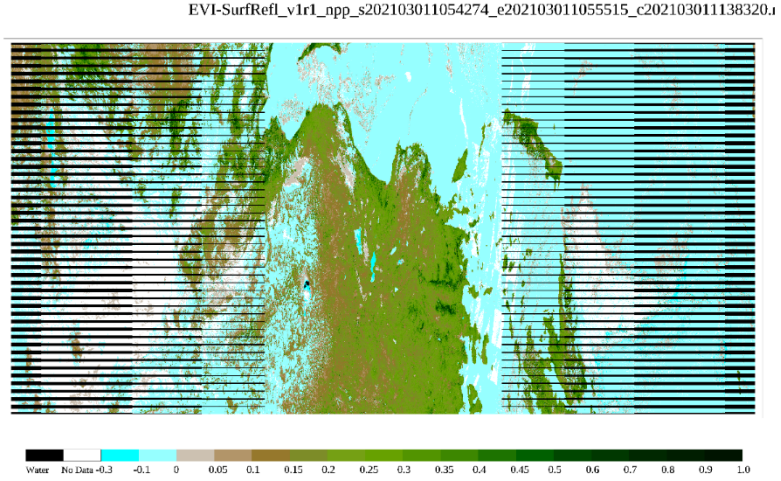
IT EVI

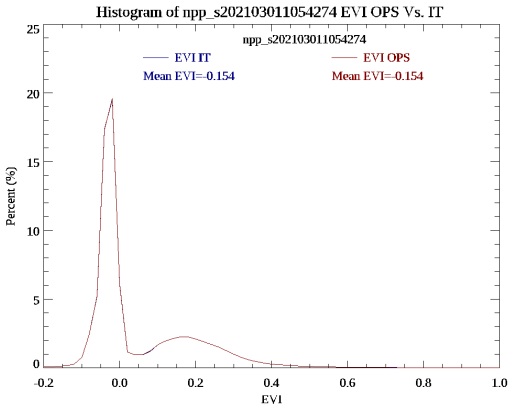


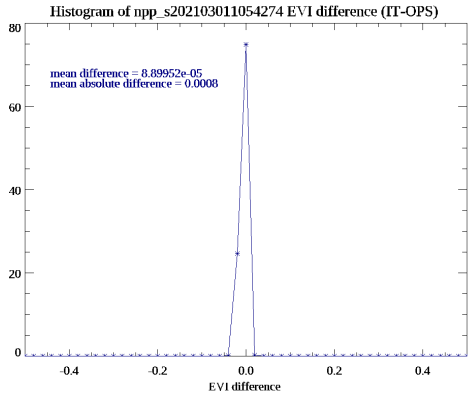
IT-OPS difference



OPS EVI







- The overall difference between OPS and VI and GVF is small
- There is no significant impacts on VI and GVF products due to the surface reflectance data update from GFS v15 to v16

Vegetation Health

March, 2021

Accomplishments / Events:

- Helped NDE with latency issue in generating cross-year VHP;
- The revised re-compositing manuscript got provisionally accepted;
- Generated climatology and VH data using 9-year S-NPP data to compare with current data, especially in desert region (Highlighted);
- Drafted the outline for a potential manuscript of application of vegetation health products on locust detection and monitoring;
- Generated a series of data and figures of VIIRS/VHP-1 and -4, -16 km resolution products, covering 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			

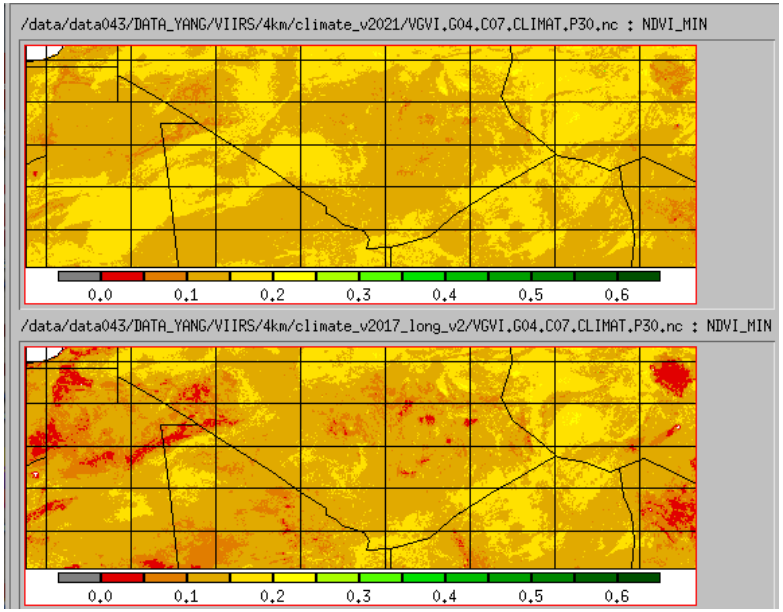
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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: Climatology Comparison in Desert Region



Ocean Color

March, 2021

Accomplishments / Events:

- The Report for Dedicated JPSS VIIRS Ocean Color Calibration/Validation Cruise September 2019 is now available at NOAA Library! It can be accessible online at https://repository.library.noaa.gov/view/noaa/28881

- M269 data after post-calibration has been posted. Lw1 for water leaving radiances (using top and middle arm) was used until March 5, 2020 when part of the optical train for the middle arm was flooded. We found the cause of the flooding and have added a new step in our pre-deployment routine to check for possible leaks.

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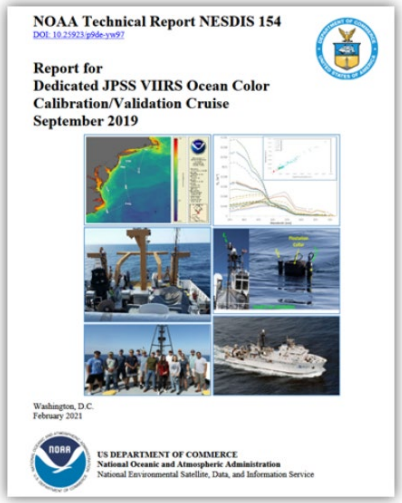
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	01/19/21	
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		
Final J2 ready DAP delivery (include NPP/N20 updates) to CW	Dec-21	Dec-21		cc ASSISTT
Complete MSL12 v1.40 preparation and implementation	Jun-21	Jun-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	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: *New Report with detailed information regarding JPSS and Suomi-NPP Ocean Color Data*



Sea Surface Temperature

March, 2021

Accomplishments / Events:

- Institute of Marine Sciences of the Federal University of Ceará (Labomar/UFC) in Fortaleza, Brazil started using NOAA JPSS VIIRS SST.
- VIIRS SST was tested at LABOMAR as a potential replacement of the Metop AVHRR FRAC SST produced by EUMETSAT Ocean and Sea Ice Satellite Application Facility (OSISAF) in Lannion, France.
- LABOMAR receives JPSS VIIRS SST data from the NASA/JPL Physical Oceanography Distributed Active Archive Center (PO.DAAC) where NOAA Advance Clear Sky Processor for Ocean (ACSPO) SST products are being archived.
- This adds to the ranks of other existing international users of ACSPO JPSS SST, including UK Met Office, Canadian Met Centre, Australian Bureau of Meteorology, Danish Met Institute, and Japan Met Agency.
- We continue working with LABOMAR to assist with transition to JPSS VIIRS SST in their operations, and evaluation of the resulting improvements in their products and services.

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			

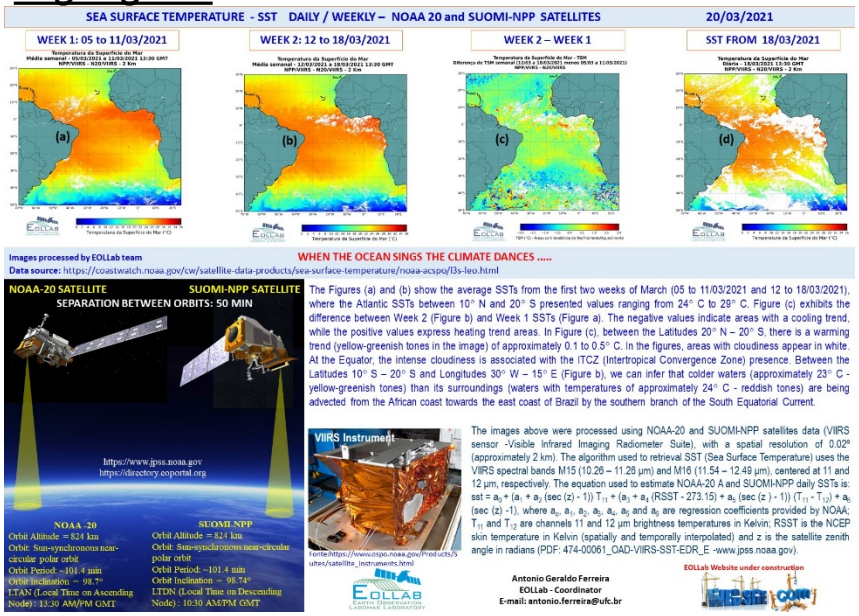
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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)	Apr-21	May-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:



VIIRS Polar Winds

March, 2021

Accomplishments / Events:

- The first retrieval of polar winds using the VIIRS Day-Night Band (DNB) is shown in the Highlights below, with examples from the Arctic and Antarctic. The Near Constant Contrast (NCC) product was used. Routine generation of the DNB polar winds at the Cooperative Institute for Meteorological Satellite Studies (CIMSS) will begin in the next few months, including validation with radiosonde winds.

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	Mar-21	04/01/21	downstream testing
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-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: New VIIRS Day Night Band Winds

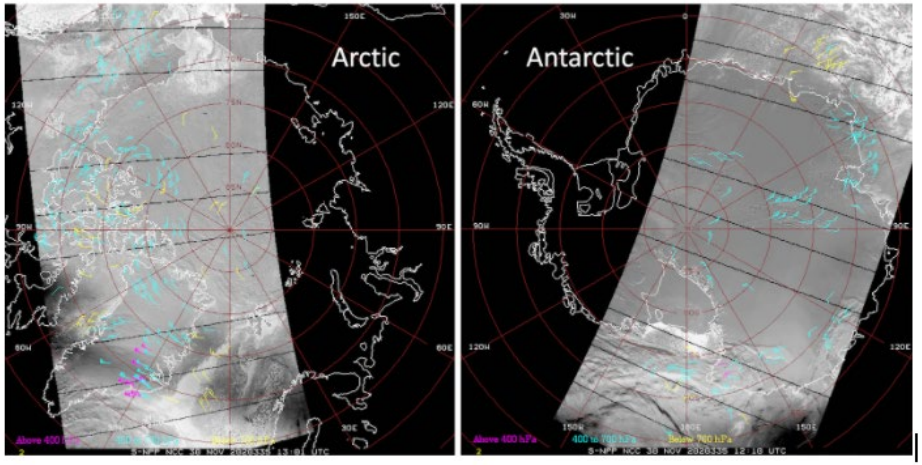


Figure: The first retrievals of VIIRS polar winds from the day-night band over the Arctic (left) and Antarctic (right) on 30 November 2020.

NUCAPS Products

March, 2021

Accomplishments / Events

NUCAPS team submitted the final version of the README file for the CO2 validated maturity. The CO2 validated maturity version (HEAP 2.3) that is currently running on the NDE I&T string is expected to be in operations by May 2021. The team also provided necessary updates to the CLASS webpage and "Notes" section for user awareness.

Continued MW RTA fast forward model development for EPS-SG IASI-NG/MWS augmentation. Exercised truncation of the IASI-NG (~16,000) channel radiances to IASI (~8000) using the latest IASI-NG synthetic data for the EPS-SG pre-processor.

Continued efforts developing NUCAPS version for the 'Mission-long' EDR reprocessing. The proposed version uses the HEAP 2.3 validated maturity algorithm as the baseline with the addition of Averaging Kernels (AKs) and improved stability indices.

Discussed with the UMBC and STC team on the SARTA model updates for the Ammonia (NH3) retrievals and laid out plans for NUCAPS NH3 implementation.

Continued working with the CrIS SDR team on the evaluation IASI Level-1D reconstructed radiances. Evaluation of the NUCAPS retrievals using Level-1D reconstructed radiances showed very good consistency with the operational products that use Level-1C MetOp IASI radiances.

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	02/26/21	
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		

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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3. *Project has deviated slightly from the plan but should recover.*
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Issues/Risks:

Highlights

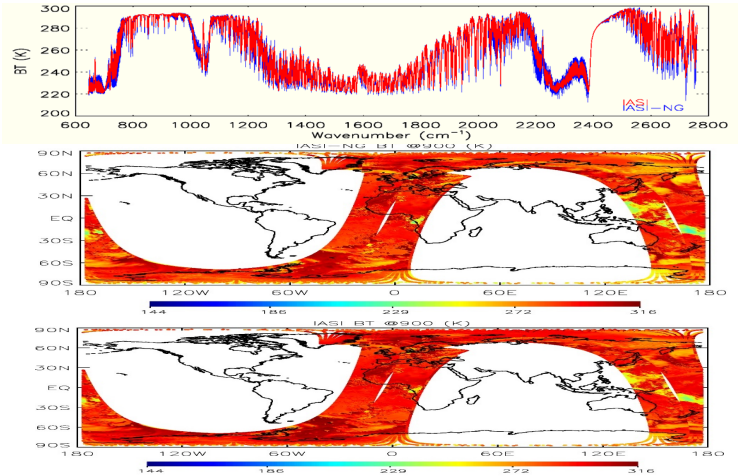

Figure: Truncation of IASI-NG synthetic data (~16,000) channel radiances to IASI (~8000) towards the development of the NUCAPS for the EPS-SG IASI-NG augmentation. This is part of NUCAPS team efforts on the pre-processor implementation NUCAPS algorithm for EPS-SG augmentation.

MiRS Products

March, 2021

Accomplishments / Events:

- Changes required by the MIRS v11.6 Software Code Review conducted by OSPO are now also implemented into v11.7 of MiRS and pushed to the software code repository master branch (Git). This will assure that all future versions will contain the code changes.
- As part of planned multiauthor paper on two Smoky Mountain severe flooding events (6 Feb and 12-13 Apr 2020), analysis has continued including validation of MiRS JPSS precipitation rates. Agreement with the ground-based MRMS rain rates is quite good for both events. See 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.*
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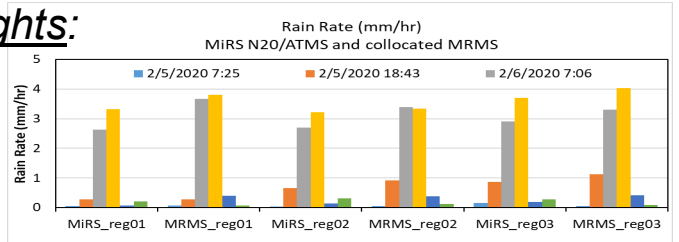
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
MiRS v11.7 to ASSISTT			12/21/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Mar-21	Apr-21		documentation update
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:



MiRS ATMS vs. MRMS area-averaged rain rates for the February (top) and April (bottom) flooding events. The area averages are computed for 3 different sized regions of interest, 1x1, 1.5x1.5, and 2x2 degrees, respectively. The time series show good agreement.

Snowfall Rate

March, 2021

Accomplishments / Events:

- Provided a short animation of the SFR product from the snowstorm on February 15, 2021 to the JSTAR team. The animation showed the product tracking the storm with ten satellites. It is being displayed on the JSTAR website.
- The ATMS SFR validation study has provided some insight about the algorithm, e.g. the product overestimates when 2 m relative humidity (rh2m) is low but performs well if rh2m is above 90%. This reveals the need for the consideration of snow sublimation in future development.
- The development of a snowfall detection algorithm using machine learning is still ongoing but has made significant progress.

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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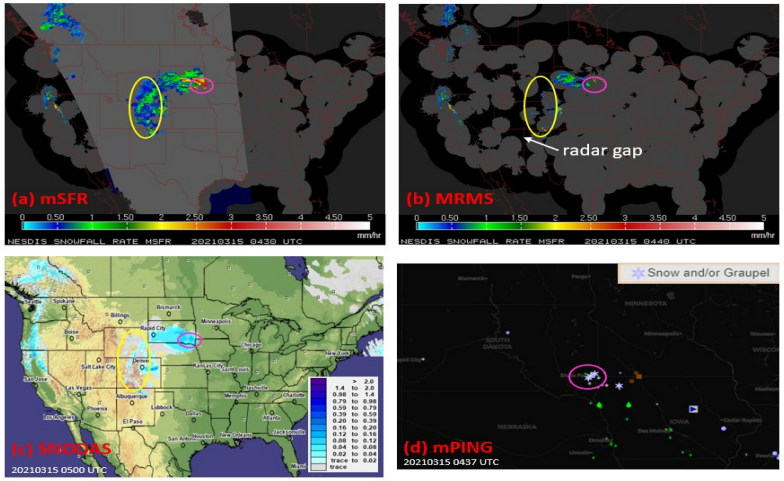
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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	Apr-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	Jun-21	Jun-21		
Deliver updated SFR package (for JPSS-2, NOAA-20, and S-NPP) to MiRS team for integration	Jun-21	Jun-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: Satellite Fills Radar Gaps



Snowfall products and report for the snowstorm on March 15, 2021 around 4:30 UTC, (a) satellite-radar merged snowfall rate (mSFR); (b) MRMS radar snowfall rate; (c) SNODAS hourly snowfall analysis; (d) mPING crowdsourcing weather report.

OMPS Ozone

March, 2021

Accomplishments / Events:

- Updated JSTAR comment sheet for OMPS Ozone related JPSS Data Product Specifications
- Reviewed OMPS SDR analyses comparing NOAA-20 and SNPP, provided comments and suggestions

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.

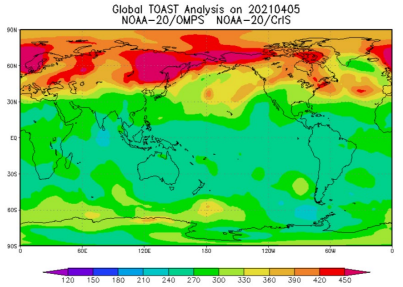
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

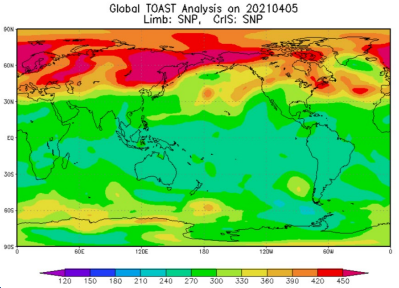
Issues/Risks:

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)	Apr-21	Apr-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:

False color map of total ozone from N20 TOAST and SNPP LTOAST show similar large-scale features





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 One-Line V8Pro Code fix and New NOAA-20 Adjustment Table as a Patch Delivery to NDE with CC to ASSISTT	Jan-21 Apr-21 (forecast)	
Complete work with NDE to resolve two OMPS V2Lmb issues -- Latency / TIme Out and Ancillary File errors.	Feb-21	Patch DAP to NDE 2/11/21 V2Limb
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	

GCOM-W1 Products

March, 2021

Accomplishments / Events:

- Algorithm updates to ASSISTT for planned GAASP updates in FY21
  - RR is in progress
  - SSW will make delivery by end of April; testing final updates in hurricane conditions
- Continued product O&M
- Planned tag up with NASA GPM team on May 4 to discuss progress/plans on the rain rate EDR (GPROF2017)
- Keeping abreast of GOSAT-2 AMSR3 activities so plans can be developed for use at STAR

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.*
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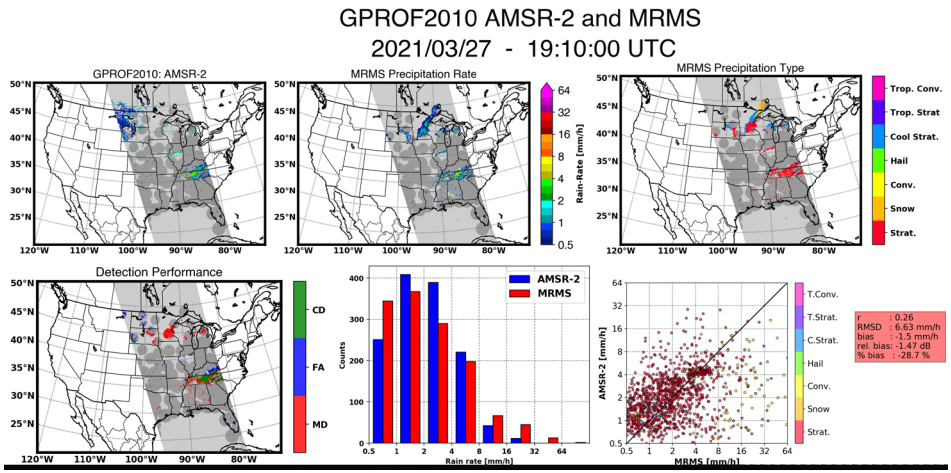
Issues/Risks:

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				
GAASP patch DAP to NDE			01/07/21	
GAASP patch DAP to CSPP			01/19/21	
Improved SSW and RR algorithms	Mar-21	Apr-21		ASSISTT received RR
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:

AMSR-2 overpass captures the heavy rainfall associated with flooding in KY and TN on 27Mar2021. In general, the estimates were too low when compared with MRMS radar product. The improved algorithm (not shown) that is being transitioned to operations performed better.



NOAA Products Validation System (NPROVS) and Environmental Data Record (EDR) Long Term Monitoring (LTM)

March, 2021

Accomplishments / Events:

- A NOAA Office of Education Student Scholarship Internship Opportunity (SSIO) with Tony Reale as mentor was approved for a minimum 3-months appointment beginning May 24 2021. The student, Cassandra Calderella, currently attends UMBC pursuing a Masters degree in Atmospheric Physics and a student of Dr Belay Demoz who also directs the GRUAN site at Beltsville Maryland.
- An assessment of potential seasonal variations between current NUCAPS Operational (v2.5) and the pending v3.0 upgrade is underway; v3.0 is tentatively scheduled for operational implementation May/June. Latest results indicate that differences between v2.5 and v3.0 are much greater in summer than during winter (see Highlight). The cause is being investigated, as this could impact AWIPS users looking at pre-convective environments.
- The EDR LTM team has added an image download icon to JSTAR Mapper allowing users to download an image containing every product displayed on a given map including colorbars for each selected product and an optional title

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		

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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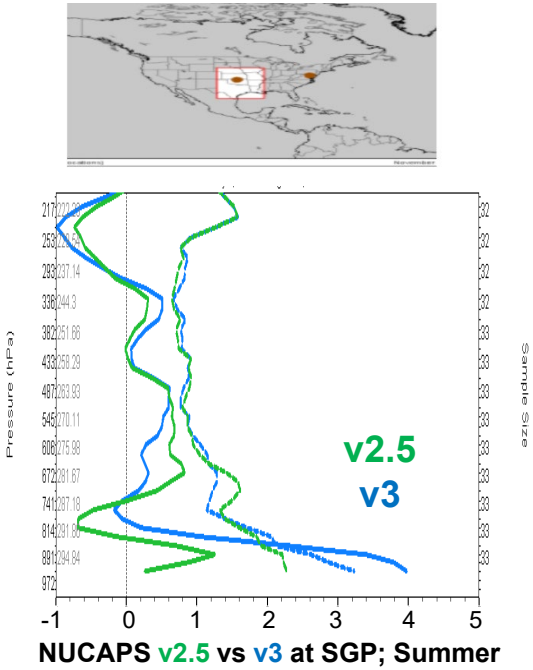
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks: None

Highlights: NUCAPS v2.5 vs v3 analysis

The upper panel shows the GCOS Reference Upper Air Network (GRUAN) / JPSS Dedicated (NOAA-20) Radiosonde site located at South Great Plains (SGP), Oklahoma. The lower panel shows Mean (solid) and Standard Deviation (dash) vertical statistics for NOAA-20 NUCAPS minus SGP Radiosonde (within 2-hr) for current Operational **v2.5 (green)** and pending Test **v3 (blue)** during summer. Results cover the troposphere from 200 hPa (12km) to the surface for NUCAPS IR+MW soundings. A significant difference is observed between **v2.5** and **v3** during summer with increased warm bias in the lower troposphere; little or no difference is observed during winter nor over sea (not shown). The **v3** is tentatively scheduled to replace the operational **v2.5** in May/June 2021.



NUCAPS v2.5 vs v3 at SGP; Summer