AMP/STAR FY22 TTA

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January 18, 2022

Highlights from the Science Teams (December)

Observations of the Total Solar Eclipse from the OMPS Sensor Data Record (SDR) Data via the ICVS Monitoring System

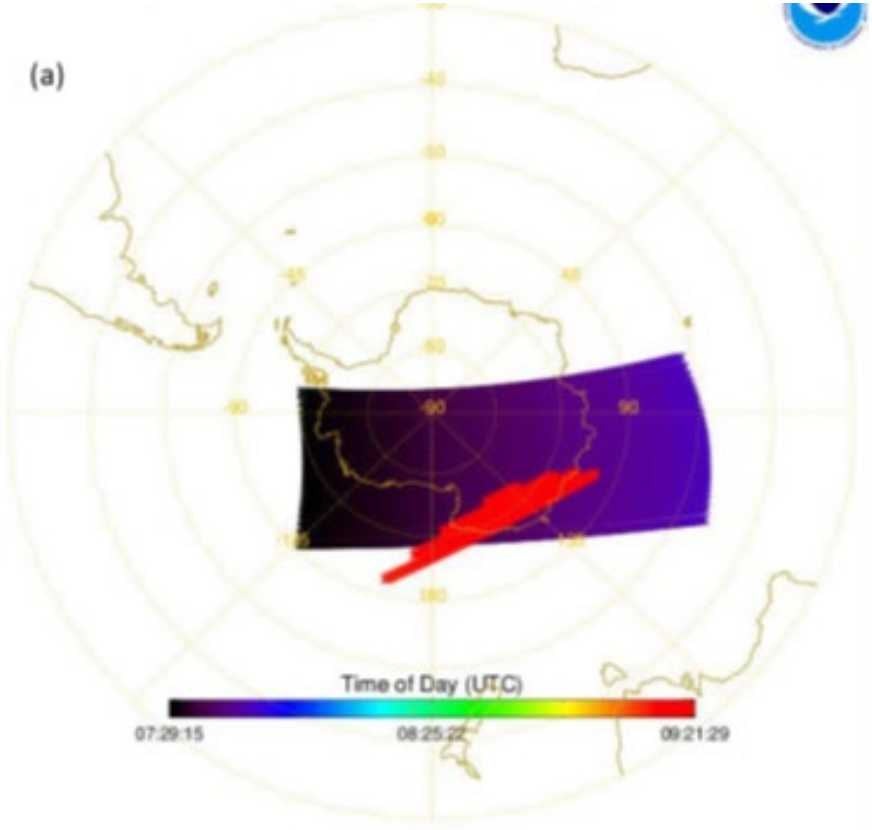
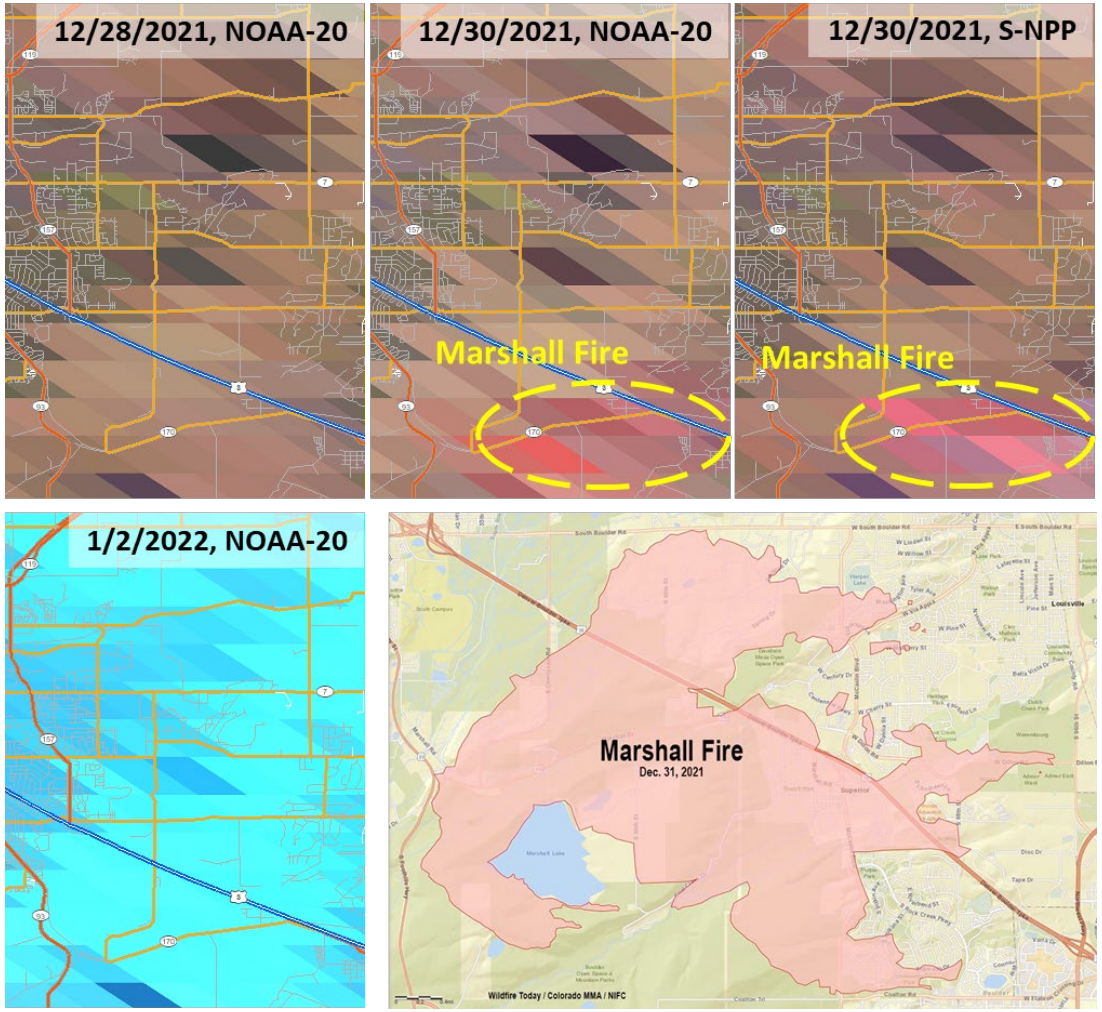


Figure. Geographic coverage of the NOAA-20 OMPS Nadir Mapper SDR data that were affected by the total solar eclipse event occurred on Dec. 4th, 2021, where the color bar indicates the UTC time of the data.

To monitor the data quality of SDR data from the S-NPP and NOAA-20 instruments, the JSTAR ICVS System is monitoring a series of quality flags within the SDR data in case of occurrences of any anomalies. Recently, a total Solar Eclipse on Dec. 4, 2021, starting from Antarctica Union Glacier, was detected in the quality flag about solar eclipse from the SNPP/NOAA-20 OMPS SDR data. The figure displays the coverage of the NOAA-20 OMPS Nadir Mapper data that were affected by the total solar eclipse event on Dec. 4th, 2021, where the color bar indicates the UTC time of the data. This capability also demonstrates good calibration performance and quality of NOAA-20 OMPS NM/NP SDR data and potentials of the data in monitoring solar eclipse events.

Highlights from the Science Teams (December)

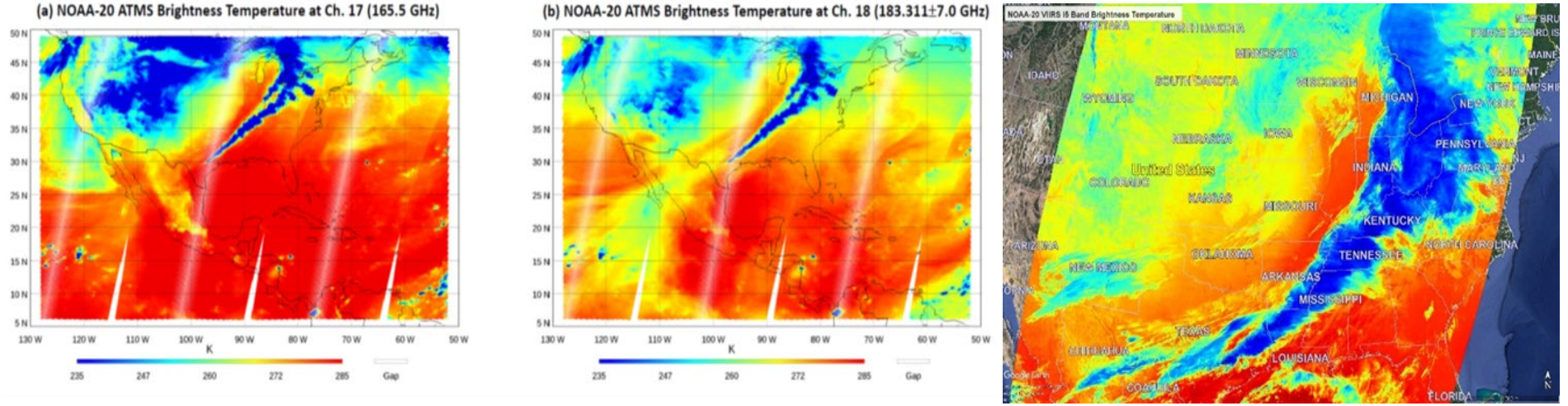
VIIRS imaged the Marshall Fire as it was burning



First reported at 11 am on 12/30/2021, the Marshall Fire became the most destructive wildfire in Colorado history, destroying ~1000 structures within its 6000-acre burned area. Clear view images captured by VIIRS show that the pixels affected by the fire had different shades of red colors (due to high reflectance values in the M10 band) as the fire was burning at its peak in the early afternoon of 12/30/2021 (upper middle and upper right). The burned area was completely covered by snow by 1/2/2022 (lower left, cyan color indicates snow cover). Notice that because NOAA-20 and S-NPP have slightly different local overpass time and very different viewing angles over the same area in the same day, the colors of the fire pixels as imaged by the two satellites are not exactly the same. All VIIRS images are shown with M10, M7, and M5 in red, green, and blue. The fire perimeter map (lower right) was produced by the Colorado MMA/NIFC.

Highlights from the Science Teams (December)

Observations of Deadly Tornadoes from the ATMS and VIIRS



To demonstrate the data quality of SDR data, the JSTAR ICVS System is monitoring severe weather events by using SDR data. Around 9:30 pm central time on December 10, 2021, a series of supercell tornados struck Kentucky and nearby areas, caused devastated deadly damages and killed at least 80 people. Both ATMS and VIIRS data onboard the S-NPP and NOAA-20 satellites have captured synoptic scale cloud features due to the tornadoes. Figs. (a) and (b) show brightness temperatures from NOAA-20 ATMS G- and W-band channels 17 and 18 respectively. A very strong squall line feature was observed in the ATMS maps. Compared with the ATMS data, the VIIRS shows its super advantage in spatial resolution. Fig. (c) shows the NOAA-20 VIIRS nighttime thermal infrared band I5 with featured dramatically decreased brightness temperature over the affected areas, while Fig. (d) exhibits the RGB image to capture the cloudy features of the Tornado event by using the following band combinations M16-M15, M15-M14, and M15 as the R/G/B channels respectively. Similarly, the S-NPP VIIRS SDR observations also reported similar observations one hour later after the NOAA-20 (the figures are omitted). This capability also demonstrates good calibration performance and quality of NOAA-20 ATMS and VIIRS SDR data and potentials of the data in monitoring severe weather events.

Accomplishments

- Delivery Algorithm Packages (DAPs) - Mission Unique Products:
  - 12/03/2021: OMSP SDR DAP (ADR9633/ CCR5577 OMPS Nadir Mapper geolocation code change for off-nadir geolocation error correction) delivered to DPMS

    List of changed codes (1 file):
    - ProSdrOmpsTcEarth.cpp

    List of changed LUT/PCT (2 LUTs):
    - OMPS-TC-FAM-LUT_j01
    - OMPS-TC-FAM-LUT_npp
  - 12/07/2021: SNPP CrIS engineering packet v42 was uploaded (14:57-18:30 UTC)

- DAPs – Enterprise Products:
  - 12/06/2021: STAR delivered VIIRS Super DAP JRR v3.1 patch to NDE (for Cloud Height impact)
  - 12/09/2021: OMPS Ozone team delivered updated enterprise Cal/Val plan to include OMPS LP SDR & EDR Cal/Val
  - 12/15/2021: STAR delivered Enterprise ACSPO SST SPSRB documentation (External Users Manual, and System Maintenance Manual) to NDE and OSPO. There is no SST final DAP delivery needed
  - 12/20/2021: STAR delivered VIIRS Vegetation Health DAP (initial/final delivery for NOAA-21 and a maintenance delivery for S-NPP and NOAA-20) to NDE
  - 12/30/2021: STAR delivered MiRS v11.6 Patch DAP (Patch DAP for J1, J2, S-NPP) to NDE
  - 12/30/2021: STAR delivered VIIRS Gridded Land DAP (Prelim J2 DAP for Gridded LST/LSA) to NDE
  - 01/03/2022: Vegetation Health team delivered updated ATBD

- IDPS Builds Checkouts / JPSS-2 Pre-Launch Testing events:
  - 1/6/2022: JSTAR submitted Block 2.3 Mx5 I&T review/checkout report to DPMS/RTN/OSPO
    - 12/16/2021 VIIRS SDR submitted review report
    - 12/17/2021 ATMS SDR submitted review report
    - 12/23/2021 CrIS SDR submitted review report
    - 12/23/2021 Imagery EDR submitted preliminary results (issue: Bright pixels in SNPP M-6)
    - 12/29/2021 Imagery EDR submitted review report
    - 01/04/2022 OMPS SDR submitted review report

Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	12/07/21, 12/14/21, 12/21/21, 01/04/22, 01/11/22
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	12/07/21, 12/14/21, 12/21/21, 01/04/22, 01/11/22
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	12/07/21, 12/21/21, 01/04/22
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	12/14/21, 01/04/22, 01/11/22
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	12/14/21, 01/11/22
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	12/14/21, 01/11/22

- ***9/27/2021: VIIRS Global Annual Surface Type (AST-2020)***: The new VIIRS Annual Surface Type 2020 product (AST-2020, spatial resolution: 1km) based on 2020 whole year surface reflectance data is now ready for users to download at STAR FTP sites. There are three products:
  - 2020 AST IGBP types in Sinusoidal projection
  - 2020 AST IGBP types in Lat/Long
  - 2020 AST 20 types in Lat/Long

- 01/06/2022: NDE release 2.0.29 operational, includes: RHEL6 to RHEL7 for AF_Iband, SR (to v1.2), VPW, and VH
- 12/08/2021: ATMS JPSS-3 Pre-Ship Review (PSR)
- 12/07/2021: ATMS JPSS-4 Pre-Environmental Review (PER)
- Dec-2021: Aerosol team completed 9-year AOD climatology

- The official transition of the reprocessed SDRs to CLASS/NCEI started on December 1, 2021
  - The transition of the reprocessed SNPP ATMS V1 data to CLASS/NCEI was completed on December 20, 2021
  - The transition of the reprocessed SNPP ATMS V2 data to CLASS/NCEI was completed on December 30, 2021

Upcoming Milestones/Deliveries

- JSTAR Code/LUT/Product Deliveries:

DAP to DPMS:

- May-22: Final launch-ready JPSS-2 PCT/MM-coef DAP (ATMS & CrIS)
- May-22: Final launch-ready JPSS-2 LUTs/MM-coef DAP (VIIRS & OMPS)
- Sep-22: NOAA-20 NCC LUT update (VIIRS Imagery)

NOAA-20/JPSS-2 Algorithm DAP to NDE/CoastWatch:

- Jan-22: Final J2 NUCAPS DAP (include NPP/N20 updates)
- Jan-22: Final NVPS J2 DAP (VI & GVF)
- Jan-22: Final OMPS Ozone V8TOz DAP
- Mar-22: Final OMPS Ozone V8Pro DAP
- Feb-22: Final J2 Active Fires DAP (include NPP/N20 updates)
- Feb-22: Final J2 Super DAP (Clouds, Aerosol, Volcanic Ash, Cryosphere, VPW, LST, LSA)
- Feb-22: Final J2 Global Gridded LST/LSA DAP (Prelim J2 DAP delivered to NDE on 12/30/2021)
- Feb-22: Final MiRS J2 DAP (include SFR)
- Mar-22: J2-ready Ocean Color DAP to ASSISTT (CoastWatch □ ASSISTT)
- Jun-22: J2-ready Ocean Color DAP to Cloud (ASSISTT □ NCCF)

FY22 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates DAPs				
Final launch-ready JPSS-2 ATMS PCT/MM-coef DAP	May-22	May-22		
Final launch-ready JPSS-2 CrIS PCT/MM-coef DAP	May-22	May-22		
Final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP	May-22	May-22		
Final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP	May-22	May-22		
Final J2 ready Super DAP (include NPP/N20 updates), Clouds/Aerosol/VolcanicAsh/Cryosphere/LST/LSA/VPW	Feb-22	Feb-22	**12/06/21 v3.1 patch**	
Final J2 ready Active Fires DAP (include NPP/N20 updates, I-Band)	Feb-22	Feb-22		
Surface Reflectance: Final J2 ready DAP	Oct-21	Oct-21	10/07/21	
NVPS (VI & GVF): Final J2 ready DAP	Jan-22	Jan-22		
Vegetation Health: Initial/Final (combined) J2 ready DAP	Dec-21	Dec-21	12/20/21	
SST: Final J2 ready DAP (ACSPO 2.80)	Dec-21	Dec-21	Initial/Final DAP: 09/16/21 EUM & SMM doc: 12/15/21	No final DAP delivery needed
NUCAPS: Final J2 ready DAP	Jan-22	Jan-22		
MiRS & SFR: Final J2 ready DAP	Feb-22	Feb-22	**12/30/21 v11.6 patch**	
OMPS Ozone V8Pro: Final J2 ready DAP	Mar-22	Mar-22		
OMPS Ozone V8TOz: Final J2 ready DAP	Jan-22	Jan-22		**11/26/21 V8TOz v4r2 to ASSISTT**
L3 Global Gridded LST/LSA (J2 DAP)	Feb-22	Feb-22	**12/30/21 Prelim J2 DAP**	
Reformatting Toolkit	Feb-22	Feb-22		
AMSR-3 ready DAP (include AMSR-2 updates)	Sep-22	Sep-22		

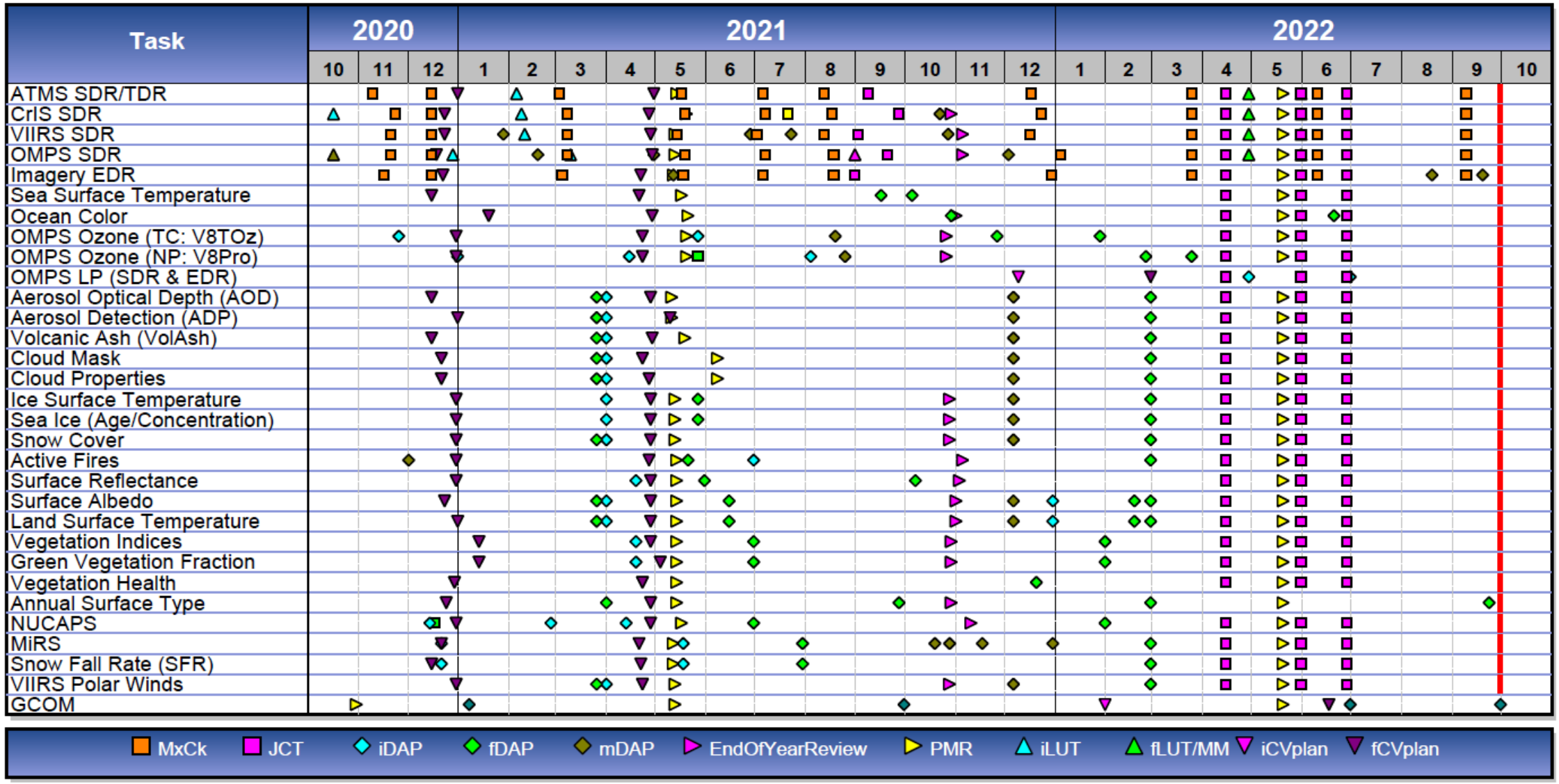
FY22 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
Algorithm Cal/Val/LTM				
FY21 End of Year Science Team Presentations (all teams)	Oct-21	Oct-21	Oct/Nov-2021	
FY23 Program Management Review (all teams)	Jun-22	Jun-22		
Enterprise Cal/Val plan for J2 OMPS LP SDR & EDR	Dec-21	Dec-21	12/09/21	
GCOM: AMSR-3/Enterprise Cal/Val Plan - draft delivery	Jan-22	Jan-22		
GCOM: AMSR-3/Enterprise Cal/Val Plan - final delivery	Jun-22	Jun-22		
AST-2021 (VIIRS Annual Surface Type)	Sep-22	Sep-22		
Support Alaska Demo (JPSS Aviation Initiative)	Sep-22	Sep-22		
JPSS-3 pre-launch test data review/analyze (SDR teams)	Sep-22	Sep-22		
Update J2-ICVS prototype to support J2 ICVS readiness(for JCT-3 test)	Feb-22	Feb-22		
Maintain / expand existing EDR LTM web pages and JSTAR Mappers	Sep-22	Sep-22		
Images of the Month	Monthly	Monthly		

FY22 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date
Operational/Program Support			
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/05/21, 10/13/21, 10/19/21, 10/26/21, 11/02/21, 11/09/21, 11/16/21, 11/23/21, 11/30/21, **12/07/21, 12/14/21, 12/21/21, 01/04/22, 01/11/22**
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/13/21, 10/26/21, 11/09/21, 11/23/21, **12/07/21, 12/21/21, 01/04/22**
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/12/21, 11/09/21, **12/14/21, 01/11/22**
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/05/21, 10/13/21, 10/19/21, 10/26/21, 11/02/21, 11/09/21, 11/16/21, 11/23/21, 11/30/21, **12/07/21, 12/14/21, 12/21/21, 01/04/22, 01/11/22**
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/05/21, 10/19/21, 11/02/21, 11/16/21, 11/30/21, **12/14/21, 01/04/22, 01/11/22**
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/12/21, 11/09/21, **12/14/21, 01/11/22**
Block 2.3 Mx builds deploy regression review/checkout (**Jan-22 Mx5**; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8. SDRs and VIIRS Imagery teams)	Sep-22	Sep-22	**Mx5 SOL: 11/23/21; Mx5 I&T: 01/07/22**
Participant/support JPSS-2 pre-launch testing events (Jan-22 JCT3-Ambient; Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22	

STAR JPSS Schedule: TTA Milestones



Color code:

Green: **Completed Milestones**

Gray: **Non-FY22 Milestones**

ATMS SDR

December, 2021

Accomplishments / Events:

- Participated and supported the JPSS-3 ATMS Pre-Ship Review (PSR) and JPSS-4 ATMS Pre-Environmental Review (PER), which successfully passed the board review.
- science team inputs about the JPSS-3 ATMS pre-launch performance based on the calibration Thermal Vacuum (TVAC) test datasets.
- Finished updating the IDPS ATMS NEDT calculation code to apply the newly updated scan level NEDT calculation algorithm described in ATBD. Generated operational-like SDR data to verify the updates. Submitted JPSS ADR to start the approval processing for the implementation in IDPS
- Verified the IDPS block 2.3 Mx5 I&T data to support ground system update pre-operational review.
- Held a series of TIMs with NASA and NG ATMS teams to discussed and clarify the way to perform ATMS antenna measurement, which may potentially improve the antenna pattern correction accuracy
- Kept updating JPSS-2 spacecraft telemetry and diary RDR data decoder using the latest format change with NASA Flight Project POC. Tested the updated J2 spacecraft telemetry data decoding program using JCT2a DSE data to verify ATMS related spacecraft telemetry parameters.
- Reviewed the JPSS-2 data format book with the updated APs in spacecraft RDR data.
- Kept updating ATMS SDR User's Guide document

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Generate JPSS-2 ATMS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22		
Update of ATMS non-linearity correction coefficients after applying TVAC target thermal gradient correction	Mar-22	Mar-22		
Verify and finalize JPSS-2 ATMS processing coefficients table (PCT) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	Mar-22	Mar-22		
Deliver final launch-ready JPSS-2 ATMS PCT/MM-coef DAP to ASSISTT	Apr-22	Apr-22		
Deliver final launch-ready JPSS-2 ATMS PCT/MM-coef DAP to DPMS	May-22	May-22		
FY23 Program Management Review	Jun-22	Jun-22		
Improvement of ATMS lunar calibration algorithm by updating lunar temperature estimation model	Aug-22	Aug-22		
Analyze ATMS reprocessing data. Cooperate with EUMETSAT for ATMS reprocessing data application in climate study	Sep-22	Sep-22		
JPSS-3 ATMS pre-launch measurement and test data review/analyze	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Jan-22 JCT3-Ambient; Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		
Block 2.3 Mx builds deploy regression review/checkout (**Dec-21 Mx5**; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8)	Sep-22	Sep-22	**12/17/21 Mx5**	

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			

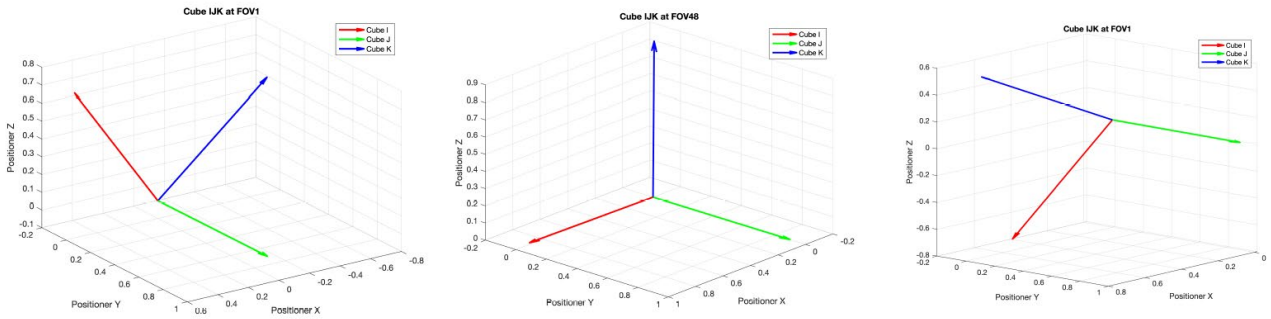
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Highlights:

ATMS alignment of K band cub IJK in positioner coordinate system at scan position 1, 48, and 96. Clarification of correct alignment will help improve the antenna pattern correction



CrIS SDR

December, 2021

Accomplishments / Events:

- Performed an intensive data quality assessment after the upload of the SNPP CrIS Engineering Packet Version 42, completed on December 7, 2021. The upload included an update of the geolocation mapping parameters to improve the SNPP CrIS geolocation accuracy. Aside from finding that the Radiometric and Spectral Accuracy, Noise and Telemetry are within the specifications and were unaffected by the software update, the geolocation assessment showed that the geolocation accuracy has improved for SNPP CrIS (by more than 200 microradians for FOR 30 in the in-track direction) **(Fig. 1)**.
- The CrIS SDR Team has detected that the NOAA-20 CrIS has experienced a 14th MW FOV5 Noise increase event on 11/27/2021, and the start of a 15th noise event on 12/22/2021. In addition, on 12/13/2021, S-NPP CrIS had one granule with 10 FORs with an invalid SDR product around 8:40z. These events are closely being monitored.
- Presented a Poster at the AGU fall meeting entitled: "Performance assessment of the JPSS-3 CrIS instrument from the thermo-vacuum testing". Pre-launch test results confirm that JPSS-3 CrIS sensor meets the radiometric performance as shown in **Fig. 2.**
- Worked toward the improvement of the Spike Detection/Correction Algorithm. Determined that the Spike Algorithm false alarms are not caused by the change in ZPD settings, as illustrated in **Fig. 3**. An investigation using daily MWIR ICT interferograms showed statistically asymmetric bins in the daily averaged FOV7 interferogram, that could be root source of spike false alarms. To avoid potential false alarms, the algorithm parameters need to be further optimized so that all kernel interferogram data samples with large magnitude value be screened out during the spike detection process.
- Assessed and completed the Block 2.3 Mx5 I&T Regression Checkout. The comparison results show the data quality of the Block 2.3 Mx5 meets the JPSS requirements and is ready for its operational implementation.
- Completed and submitted the JPSS-3 CrIS TVAC Prelaunch Characterization Report. The prelaunch assessment of J3 CrIS has shown that J3 CrIS meets the instrument's requirements and has a similar performance to SNPP, NOAA-20 and J2 CrIS **(Fig. 2)**

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		See Issues/Risks

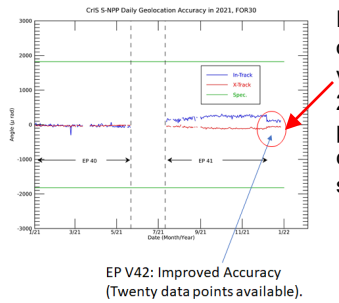
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Dr. Zhipeng (Ben) Wang left the CrIS SDR team to work at NASA, he was mainly focused on the spectral calibration and CrIS/ABI intercomparison work. **The team is working on finding the corresponding support.**
Dr. Erin Lynch left the CrIS SDR team to work for NOAA/OPPA as a federal employee. She was mainly focused on the Geolocation calibration and the CrIS/IASI intercomparison work. **The team is working on finding the corresponding support.**

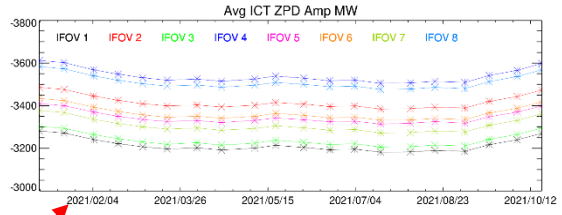
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/29/21	
Deliver the engineering packet v42 with new mapping parameters for SNPP CrIS	Oct-21	Oct-21	10/22/21	
Report the comparison assessment of CrIS radiometric nonlinearity correction formalism	Feb-22	Feb-22		
Support and participate in the J3 CrIS Pre-ship Review	Mar-22	Mar-22		
Generate JPSS-2 CrIS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22		
Verify and finalize JPSS-2 CrIS processing coefficients table (PCT) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	Apr-22	Apr-22		
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to ASSISTT	Apr-22	Apr-22		
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to DPMS	May-22	May-22		
JSTAR CrIS Website upgrade	Aug-22	Aug-22		
Demonstrate the functionality of the methods planned to be used to mitigate the failure of the J2 CrIS neon calibration system	Sep-22	Sep-22		
New developments and studies (working on the CrIS principal components generation, enhance the infrared cloud detection algorithm for radiometric assessment)	Aug-22	Aug-22		
FY23 Program Management Review	Jun-22	Jun-22		
JPSS-3 CrIS pre-launch measurement and test data review/analyze	Sep-22	Sep-22		
JPSS-3 CrIS Pre-launch evaluation tools development	Sep-22	Sep-22		
JPSS-3 Flight/Ground support	Sep-22	Sep-22		
Radiometric inter-comparison of S-NPP and NOAA-20 CrIS SDR data against other IR observations, including MetOp/IASI, AQUA/AIRS and GOES/ABI	Jun-22	Jun-22		
Perform regular RDR and SDR data analysis for instrument and data health	Sep-22	Sep-22		
Support investigation and resolution of anomalies from CrIS sensors including potential intensive Cal/Val activities	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Jan-22 JCT3-Ambient; Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8)	Sep-22	Sep-22	12/23/21 Mx5	

Highlights:



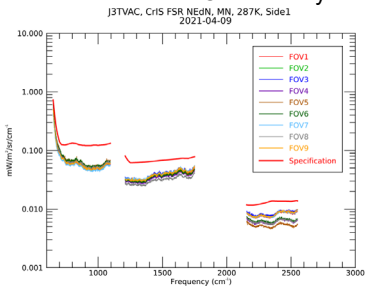
EP V42: Improved Accuracy (Twenty data points available).

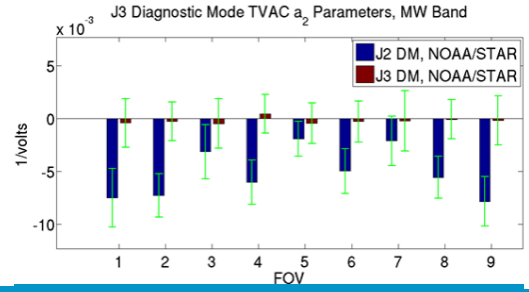
(1) SNPP CrIS Geolocation Accuracy Improvement for FOR 30 after the completion of the Engineering Packet v42 upload on December 7, 2021. The in-track performance is showing a clear improvement after the software update completion.

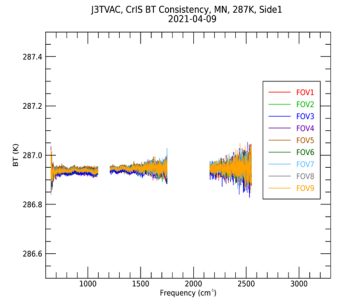


(3) Trend of daily averaged NOAA-20 CrIS ICT ZPD amplitude for the MWIR band between January and October 2021 shows that it has been stable while the ICT Spike False alarm has been trending upward (FOV 9 is out of family but with the similar trending, not shown).

(2) JPSS-3 TVAC Noise Performance (Left), Radiometric Nonlinearity Performance (Middle) and FOV-to-FOV Radiometric Consistency after nonlinear correction is applied (Right).







VIIRS SDR

December, 2021

Accomplishments / Events:

- Demonstrated that VIIRS Imagery bands can be used to detect container ship backlogs at maritime ports and to monitor other port activities, despite limited spatial resolution
- After comparing NOAA-20 and S-NPP VIIRS SDR radiometric and geolocation products generated by IDPS B2.3 Mx5 on the I&T system (DP-TE) and by IDPS B2.3 Mx4 on the OPS system (DP-OE), prepared and submitted VIIRS SDR Cal/Val team's report from the final checkout of IDPS Block 2.3 Release Mx5, recommending Mx5 transition to operations as planned
- Created and delivered for deployment in the IDPS operations updated NOAA-20 and Suomi NPP DNB offset and gain ratios LUTs generated using the new moon calibration data from December 4, 2021
- Assisted in scheduling NOAA-20 and Suomi NPP roll maneuvers for VIIRS lunar calibration on December 14, 2021, and analyzed the collected data to monitor radiometric response of the reflective solar bands

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			

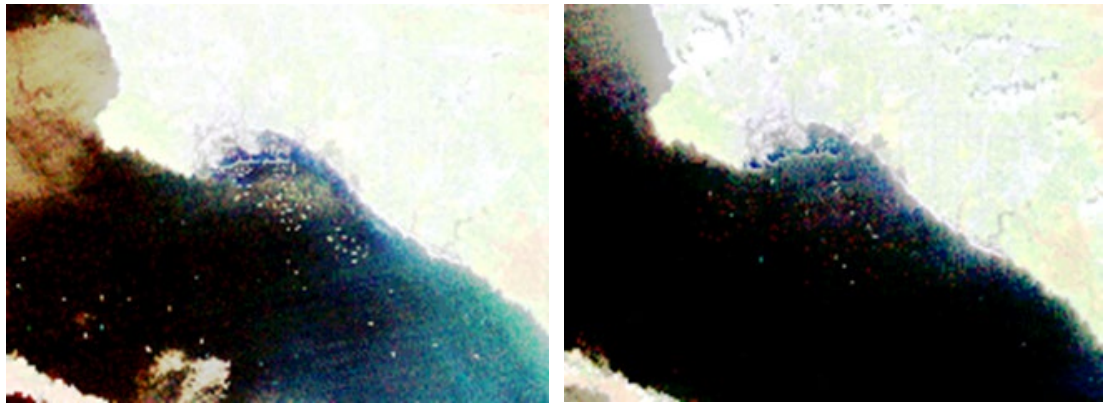
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
DAP delivery (ADR9760/CCR5724, N20 VIIRS-SDR-F-PREDICTED-LUT Update #7)			10/27/21	
Generate JPSS-2 VIIRS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22		
Verify and finalize JPSS-2 VIIRS lookup tables (LUTs) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	Mar-22	Mar-22		
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to ASSISTT	Apr-22	Apr-22		
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to DPMS	May-22	May-22		
FY23 Program Management Review	Jun-22	Jun-22		
NOAA-20 VIIRS TEB RVS and Offset change testing and validation	Dec-21	Dec-21	Nov-21	
RDR code change to handle anomalous packets(similar to DB anomaly over Mexico)	Mar-22	Mar-22		
Develop VIIRS Global Area Coverage (VGAC) production capabilities in collaboration with NCEI to meet user needs (ISSCP, EUMETSAT, and others)	Sep-22	Sep-22		
OnDemand reprocessing delivery to CLASS (SNPP recalibrated & reprocessed VIIRS SDR)	Sep-22	Sep-22		
NOAA-20 VIIRS recalibration & reprocessing (on CLOUD)	Sep-22	Sep-22		
Delivery of VIIRS RSB calibration LUTs to mitigate degradation, as needed	Sep-22	Sep-22		
Delivery of VIIRS DNB straylight LUTs, as needed	Sep-22	Sep-22		
NOAA-20 VIIRS as GSICS reference	Mar-22	Mar-22		Report 1
Absolute calibration using CEOS RadCalNet Sites	Jun-22	Jun-22		Report 2
Offline RSB/DNB/TEB Cal/Val analyses	Jun-22	Jun-22		Report 3
Continue cross-calibration and monitoring between NOAA-20 and SNPP VIIRS	Sep-22	Sep-22		Report 4
JPSS-3 VIIRS pre-launch measurement and test data review/analyze	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Jan-22 JCT3-Ambient; Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8)	Sep-22	Sep-22	12/16/21 Mx5	
Operational Support: VIIRS LUT update of DNB Offsets and Gains (S-NPP & NOAA-20)	Monthly	Monthly		

Highlights:



More than 50 ships were detected at the Port of Los Angeles on 2021-10-01 (left), compared to a dozen ships on the same day in 2019 (right), demonstrating the potential capability of VIIRS to monitor backlogs and other port activities.

OMPS SDR

December, 2021

Accomplishments / Events:

- Delivered OMPS biweekly NP solar irradiance bi-weekly LUTs.
- Studied in depth the J2 OMPS characterization at the prelaunch.
- Conducted the sensitivity analysis of the vectorized CRTM model OMPS NM radiance simulation to the bandpass coefficients at different cross-track locations.
- Continued to develop the interface packages for the VCRTM OMPS-NP radiance simulations.
- Delivered nine tables to CRTM team including SNPP/NOAA-20 NM BPS, NOAA-20 NP BPS to support the VRTM OMPS simulation transmittance coefficient generation.
- Continued verification studies of reprocessed OMPS SDR data.
- Analyzed the NASA OMPS L1b processing code to understand the calibration principle from RDR to L1B data.
- Continued understanding calibration process from raw solar data to raw solar flux data.
- Established a backup for the bi-weekly solar LUT coefficient generation and verification.
- Submitted a long abstract about the OMPS NP sensor degradation analysis to the 2022 IGRASS conference.

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
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
DAP (ADR9633/CCR5577 OMPS TC geolocation code change for off-nadir geolocation error correction)			12/03/21	
Generate JPSS-2 OMPS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22		
Verify and finalize JPSS-2 OMPS lookup tables (LUTs) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	Mar-22	Mar-22		
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to ASSISTT	Apr-22	Apr-22		
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to DPMS	May-22	May-22		
FY23 Program Management Review	Jun-22	Jun-22		
OMPS SDR Calibration ATBD (update)	Jun-22	Jun-22		
Development/Update (Internal delivery):				
ADL-OMPS offline processing code update (with flexible NM resolutions)	Jul-22	Jul-22		
ADL-OMPS diagnostic (>380 nm) offline code development for geolocation	Aug-22	Aug-22		
OMPS polarization impact and mitigation algorithm development	Aug-22	Aug-22		
1) J2 OMPS SNR calculation algorithm code update 2) J2 OMPS SDR solar intrusion detection code prototype	Jan-22	Jan-22		
1) J2 OMPS NM/NP Day-1 solar analysis code prototype using NOAA-20 as proxy 2) OMPS NM/NP x-sensor comparison code development (e.g., RTM/DCC methods)	Feb-22	Feb-22		
1) J2 OMPS geolocation error assessment code update using JCT3 OMPS SDR data and J2 mounting matric coef. 2) OMPS dark and solar raw flux processing code update 3) Inter-sensor code prototype development (e.g., SNPP/NOAA-20/J2 OMPS, OMPS-GOME-2)	Apr-22	Apr-22		
1) OMPS Wavelength registration change investigation from ground to flight 2) J2 High resolution risk mitigation algorithm development update in support to J2 3) J2 OMPS pre-launch straylight correction analysis 4) OMPS SDR quality validation baseline tool prototype developments (e.g., RTM-DD, SNO-DD, NM (VIIRS)-DD, 32D-AD) 5) NM/NP SDR re-processing and data stability analysis update 6) Assess impact of a new solar reference data on OMPS NM/NP SDR data quality	Sep-22	Sep-22		
Sustainment, monitoring, maintenance S-NPP & NOAA-20 in flight performance	Sep-22	Sep-22		
JPSS-3 OMPS pre-launch measurement and test data review/analyze	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Jan-22 JCT3-Ambient; Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8)	Sep-22	Sep-22	01/04/22 Mx5	
Operational Support: Weekly updates darks for NM and NP (S-NPP & NOAA-20)	Weekly	Weekly		
Operational Support: Bi-weekly update NP Wavelength and solar flux (S-NPP & NOAA-20)	Bi-Weekly	Bi-Weekly		

Understanding Spatial and spectral distributions of J2 OMPS NP FWHM

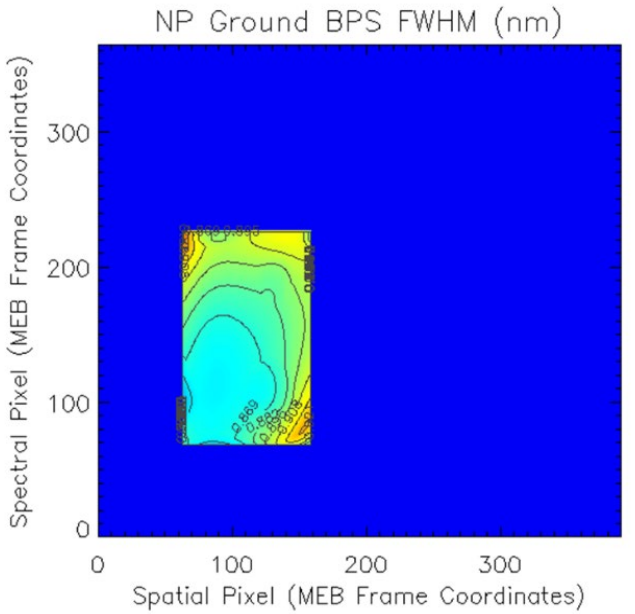


Fig. Full width at half maximum (FWHM) contour for the J2 OMPS NP. The FWHM vary gradually within the bounding box. The small box with numbers represents the "illuminated" region, the region of interest will be used for Earth science observation. The specification calls for bandpass to be between 0.9 nm and 1.2 nm for NP. The current best estimate is that this value is 0.85 nm to 0.95 nm. The concern for this inconsistency has been mitigated through a waiver that was made for the lower limit of the FWHM.

SDR Reprocessing

December, 2021

Accomplishments / Events:

- The official transition of the reprocessed SDRs to CLASS/NCEI started on December 1, 2021.
- The transition of the reprocessed SNPP ATMS V1 data to CLASS/NCEI was completed on December 20, 2021.
- The transition of the reprocessed SNPP ATMS V2 data to CLASS/NCEI was completed on December 30, 2021.
- The transition of the reprocessed SNPP CrIS data to CLASS/NCEI is ongoing.
- The transition of the reprocessed SNPP OMPS V1/V2 and VIIRS data to CLASS/NCEI is scheduled to follow the completion of the CrIS data transition.

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
FY23 Program Management Review	Jun-22	Jun-22		
Complete planning and testing on transition of S-NPP reprocessed SDR data to CLASS	Oct-21	Oct-21	Oct-21	
Complete transition of 1000 Tb of reprocessed S-NPP SDR data to CLASS	Sep-22	Sep-22		

Highlights: Status of the Reprocessed SNPP Data Transition

Sensor	Data Type (name)	Period	Notes	Volume (Tb)	Status
ATMS	TDR (TATMS)	2011-11-08 to 2019-10-15	V2	0.406	Completed on Dec. 20, 2021
	SDR (SATMS)	2011-11-08 to 2019-10-15	V2	0.431	
	GEO (GATMO)	2011-11-08 to 2019-10-15	V2	0.420	
ATMS	TDR (TATMS)	2011-11-08 to 2017-03-08	V1	0.273	Completed on Dec. 30, 2021
	SDR (SATMS)	2011-11-08 to 2017-03-08	V1	0.289	
	GEO (GATMO)	2011-11-08 to 2017-03-08	V1	0.283	
CrIS	GCRSO	2012-02-20 to 2020-01-29	V2	0.369	Ongoing
	SCRIS	2012-02-20 to 2020-01-29	V2	67.994	
	SCRIF	2014-12-04 to 2020-01-29	V2	74.455	
OMPS	TC (SOMTC, GOTCO)	2012-01-30 to 2018-09-30	V1	1.2	
	NP (SOMPS, GONPO)	2012-01-25 to 2017-03-08	V1	0.134	
OMPS	NP (SOMPS, GONPO)	2012-01-25 to 2021-06-30	V2	0.246	
	TC (SOMTC, GOTCO)	2012-01-30 to 2021-06-30	V2	1.695	
VIIRS	VIIRS ALL SDR	2012-01-02 to 2020-04-30	V2	1615	
Total				1764.65	

ICVS

December, 2021

Accomplishments / Events:

- Kept improving ICVS science data quality evaluation testbed by including CrIS anomaly detection and analysis modules. Integrated and updated ICVS CrIS internal science data quality evaluation functions, such as data quality degradation threshold adjustment tables and double difference time series using GEO data.
- Provided JPSS sensor data monitoring products for the Kentucky devastation tornado and a solar eclipse events.
- Updated and revised ICVS JPSS sensor data double difference modules to improve the monitoring product accuracy and reliability.
- Continued supporting the VIIRS SDR reprocessing data quality verification Python code development and update.
- Drafted multiple ICVS related journal manuscripts including the overview of ICVS, general double difference products in ICVS, and CrIS-ABI double difference products.
- Monitored NOAA-20 science data quality impact due to the event of NOAA-20 flying out of nominal ground track box from December 29, 2021. So far, no significant data quality impact has been observed. Further evaluation and monitoring are still ongoing until the event is over by February 1, 2022.
- Kept developing OMPS SDR data NM/NP difference time series product generation.
- Provided near real time S-NPP and NOAA-20 spacecraft and instrument status and data quality monitoring report to support SDR team activities.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Update ICVS JPSS-2 modules to support J2 pre-launch JCT verification (Jan-22 JCT3-Ambient; Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE) and on-orbit NRT monitoring	Sep-22	Sep-22		
Maintain the ICVS for SNPP and NOAA-20 including ICVS-GSICS Portal and provide anomaly reports	Sep-22	Sep-22		
Work closely with JPSS cal/val teams to facilitate the evaluations of SDR anomaly events	Sep-22	Sep-22		
Initialize a NRT geolocation accuracy monitoring module for SNPP/NOAA-20 OMPS NM in coordination with OMPS SDR team together	Nov-21	Nov-21	Nov-21	
Improve the ICVS SDR data quality evaluation testbed with more sensors	Dec-21	Dec-21	Dec-21	
Update the following sub-systems within the ICVS towards operations a) SNPP and NOAA-20 ICVS-Vector (dynamic visualization information) b) Git repository for ICVS software package version control	Feb-22	Feb-22		
Update the following sub-systems within the ICVS towards operation a) ICVS-Anomaly Impact Watch Portal (AWP) b) SNPP/NOAA-20 inter-sensor bias monitoring tool via the 32D-AD method	Mar-22	Mar-22		
Upgrade the ICVS-Vector (dynamic visualization information) for J2 using JCT as proxy data	May-22	May-22		
Initialize the instrument and data anomaly detection development using AI methods	Jun-22	Jun-22		
Initialize the S-NPP vs NOAA-20 ATMS inter-sensor bias trending product using double difference through RO profiles	Jul-22	Jul-22		
Initialize the cloud mask module for ICVS-OMPS (beta version)	Aug-22	Aug-22		
FY22 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/01/21	
FY23 Program Management Review	Jun-22	Jun-22		

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.*

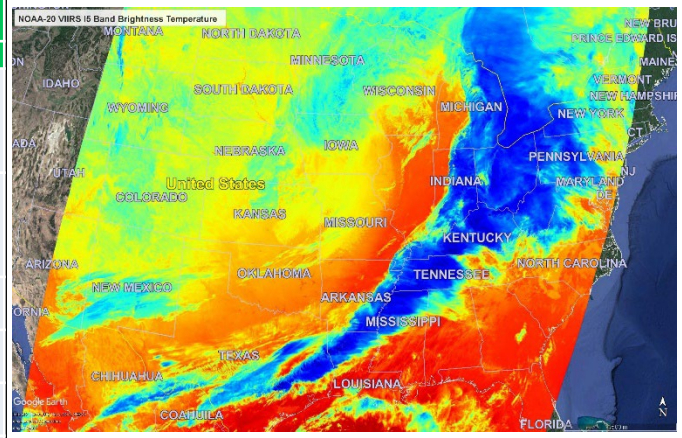
Issues/Risks:

None

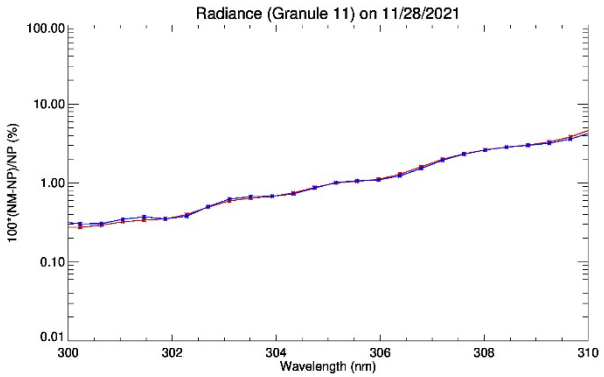
Highlights:

Significantly contribute to STAR SDR Teams

NOAA-20 VIIRS I5 band brightness temperature map over google earth for Kentucky tornado event on 12/11/2021



S-NPP OMPS NM vs. NP Daily Radiance Difference between 20 and 30 degree Latitude on 11/28/2021



VIIRS Imagery

December, 2021

Accomplishments / Events:

- Curtis Seaman and Steve Finley are still checking VIIRS Imagery for a **STAR Review/Checkout for Block 2.3 Mx 5 I&T Deploy Regression.** The following are PRELIMINARY results, before submitting a FINAL report (which is due 6 Jan 2022):

- **Bright pixels in SNPP M-6** (see the example in the lower right of this quad). The EDR Imagery Team is still analyzing these "speckles". This issue has not been seen for NOAA-20.

- Noticeable striping in M-1 and M-2, but we believe this is a known issue within the SDR team

- This is the last Quad Chart prepared by **Don Hillger**, as he is retiring from NOAA on 31 Dec 2021. His last VIIRS EDR Imagery meeting as Team Lead was held on 7 Dec 2021. Thanks to the JPSS Program for all the years of support for EDR Imagery. I will still remain minimally active at CIRA and can be reached at don.hillger@colostate.edu.
- **Bill Line** will be the **new StAR (and VIIRS) Imagery Team Lead** starting 1 Jan 2022. Be sure to direct all Team Lead correspondence and meeting notices to Bill.

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.*

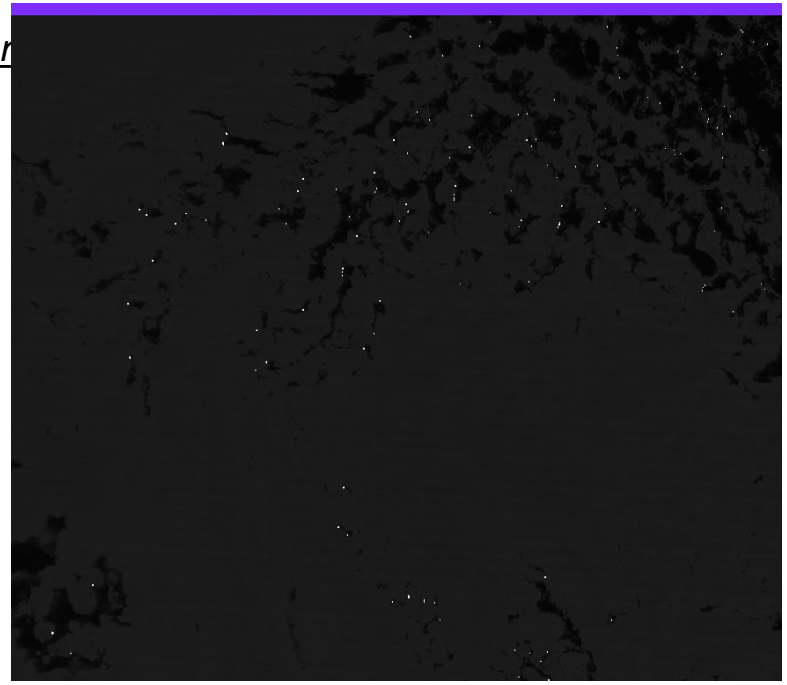
Issues/Risks:

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
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
N20 NCC LUT update DAP (to ASSISTT)	Aug-22	Aug-22		
N20 NCC LUT update DAP (to DPMS)	Sep-22	Sep-22		
New Imagery products or product enhancements (display on SLIDER)	Sep-22	Sep-22	continuing	
Realtime Imagery monitoring and display systems (SLIDER, etc.)	Sep-22	Sep-22	continuing	
Images of the Month to STAR JPSS Program/website and interesting Imagery to Social Media outlets	Monthly	Monthly	continuing	
Participant/support JPSS-2 pre-launch testing events (Jan-22 JCT3-Ambient; Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		
Block 2.3 Mx builds deploy regression review/checkout (**Dec-21 Mx5**; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8)	Sep-22	Sep-22	11/23/21 Mx5 SOL 12/29/21 Mx5 I&T	

Highlights: Image of the Mor

Figure: SNPP VIIRS M-6 EDR with bright pixels (speckles) in this cropped left edge of a granule (VM06O_npp_d20211214_t1902020_e1903541_b52499_c20211214195109503921_teic_int.h5.reflectance). The analysis continues, with the Imagery Team looking at the VIIRS M-6 SDRs from which this EDR granule was created.



Clouds

December, 2021

Accomplishments / Events:

- A manuscript titled “Low Cloud Detection in Multilayer Scenes using Satellite Imagery with Machine Learning Methods” (led by J. Haynes, CIRA) was accepted for publication (https://doi.org/10.1175/JTECH-D-21-0084.1), which describes machine learning methods to detect low-level clouds in multilayer scenes. The model data was trained using GOES-16 ABI and CloudSat data to obtain more matchup cases, and the CIRA team is working on the model transition to VIIRS by a channel histogram analysis.
- A manuscript title “False Alarms in Satellite Infrared-Based Detection of Low Clouds at Night” (led by S. Miller, CIRA with CIRA/NESDIS co-authors) was submitted to *Earth and Space Sci*. The study explores the physical basis for false alarms on nocturnal marine boundary layer clouds which causes false IR signatures from special atmos/surface conditions, including RTM simulations and comparisons of operational cloud masks (ECM/ACSPO) to DNB lunar reflectances.
- The CIMSS Cloud Team has discovered a bug in the ECM version 2 cloud probability calculation. The code is searching a bin index for each classifier in the LUT file. The calculation was off by 1 bin for some values because of the rounding error. Analysis showed small impact on the final ECM2 result. The fix will be implemented to the SAPF, the operational processing system in NDE, in the near future.

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 next slides***

Highlights:

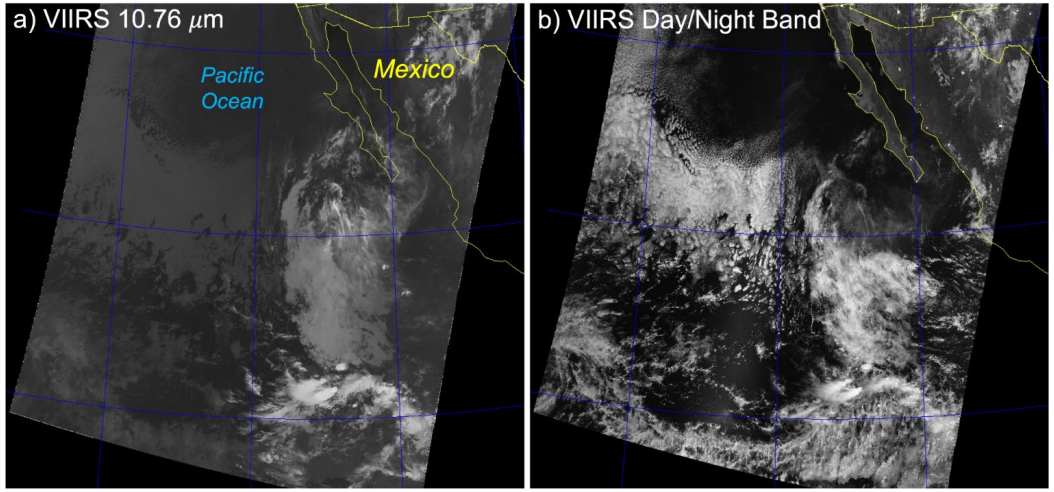


Figure 1. Comparison between S-NPP VIIRS M15 (10.76 μm) and DNB nighttime lunar reflectance (at 0930 UTC on 6 Oct 2017). Note that all the additional cloud details are shown by the DNB. A manuscript (*Miller et al.*) exploring the physical basis for false alarms on nocturnal marine boundary layer clouds was submitted to *Earth Space Sci.*

Clouds (Cloud Mask)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Verify DNB and new ECM implementation within STAR Algorithm Processing Framework (SAPF) and adjust LUT based on feedback from teams	Jan-22	Apr-22		SAPF run delayed
Verify ECM LUT against J2 simulated data prior to J2 launch	Aug-22	Aug-22		
Support Alaska Demo and ESRL usage and reviews	Aug-22	Aug-22		
Work with NCEP on All Sky Radiance (ASR) assimilation. Adjust mask as necessary	Sep-22	Sep-22		
Apply CALIPSO tools to NDE Mask with Lunar Ref	Sep-22	Sep-22		
Continue collaboration wtith OAR/ESRL/GML on use of RadFlux Cloud Fraction for Verification including high-latitude sites	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Clouds (Cloud Phase/Type)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Optimize cloud phase thresholds for NOAA-21 and maintain code consistency with GOES-R deliveries	Aug-22	Aug-22		
Modify phase as needed based on height/winds interaction and development from GOES-R	Aug-22	Aug-22		
Support S-NPP and NOAA-20 EDR monitoring	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Clouds (ACHA)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Support NCEPs use for ASR assimilation	Jan-22	Sep-22		Making consistent with ECM date
Continue improving multilayer ACHA by analysis of CALIPSO and AEOLUS lidars and extend to level of best fit of Polar Winds	Jan-22	Sep-22		This is ongoing work
Verify extending the treatment of scattering to support 3.75 micron. Needed for NCOMP replacement	Aug-22	Aug-22		
Continue work on ACHA COMP and begin JPSS-2 ACHA COMP validation plan	Aug-22	Aug-22		
Continue working with FAA to adopt ACHA products instead of simplistic NCAR cloud heights. Continue support of Alaska Demo CTH requests	Aug-22	Aug-22		
Support Polar AMVs as needed including use of CrIS	Aug-22	Aug-22		
Continue to display ACHA products in CIMSS and STAR LTM site	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Clouds (DCOMP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Improve the performance of thin ice clouds by using ACHA COD and will work with the ACHA team on development and validation	Aug-22	Aug-22		
Validate DCOMP at night using DNB	Aug-22	Aug-22		
Incorporate method to identify pixels with potentially incorrect phase within DCOMP DQFs	Sep-22	Sep-22		
Inter-sensor calibration studies by using visible reflectance and cloud optical thickness from GOES, JPSS and MODIS. Use this to adjust VIIRS M5 and M7 as needed	Sep-22	Sep-22		
Consistency checks for day and night retrievals	Sep-22	Sep-22		
Continuous use of microwave-based LWP data for validation	Sep-22	Sep-22		
Develop collaboration with OAR/ESRL/GML on use of RadFlux Cloud Optical Depth for Verification	Sep-22	Sep-22		
Improving the near real-time monitoring tools with (simple) web application	Sep-22	Sep-22		
Support several projects (i.e., processing of data, visualization tools, & ATMS/VIIRS precip for Alaska Demo)	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Clouds (NCOMP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Consistency checks for day and night retrievals	Sep-22	Sep-22		
Continuous use of microwave-based LWP data for validation. (coordinate with DCOMP)	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Clouds (Cloud Base Height)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Verify DCOMP nighttime COD (DNB) improvement in Cloud Base for performance over NWP or IR-only	Jan-22	Apr-22		SAPF run delayed
Apply fix for SZA expansion of daytime DCOMP to 82º (degraded between 75-82º SZA)	Jan-22	Jan-22	Jan-22	
Implement low layer cloud confidence flags for multi-layer cloud systems, leveraging GOES-RR	Jan-22	Apr-22		This is ongoing work
Develop gridded products for vertical cross-sections and AWIPS-2	Sep-22	Sep-22		
Develop a new aviation website and incorporate feedback from NWS/AWC	Sep-22	Sep-22		
Support Alaska Demo and any necessary reviews	Sep-22	Sep-22		
Validate products from SAPF and continue data analysis using ARM, METAR, PIREPs, and CloudSat/CALIPSO	Sep-22	Sep-22		
Implement an updated lunar irradiance model in CLAVR-x for nighttime COD and compare products	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Clouds (CCL)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Continue CCL visualization and demo for the Aviation Weather Center, with focus on Alaska Region and Hawaii. Work directly with respective POC's and use feedback to improve CCL	Sep-22	Sep-22		
Support Alaska Demo and any necessary reviews	Sep-22	Sep-22		
Validate NDE CCL output, supercooled/convective probability layers for nighttime cases with lunar DCOMP included for Base	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Aerosol

December, 2021

Accomplishments / Events:

- Completed 9-year AOD climatology
- Completed compilation of regional and global AOD biases for NWS data assimilation experiments
- Completed CEOS white paper on surface PM2.5
- Completed development for gridded hourly surface PM2.5 product
- Completed development for blended ABI/VIIRS fire emissions product prototype (See Highlight)
- Super DAP-1 Patch Delivery

Overall Status:

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

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

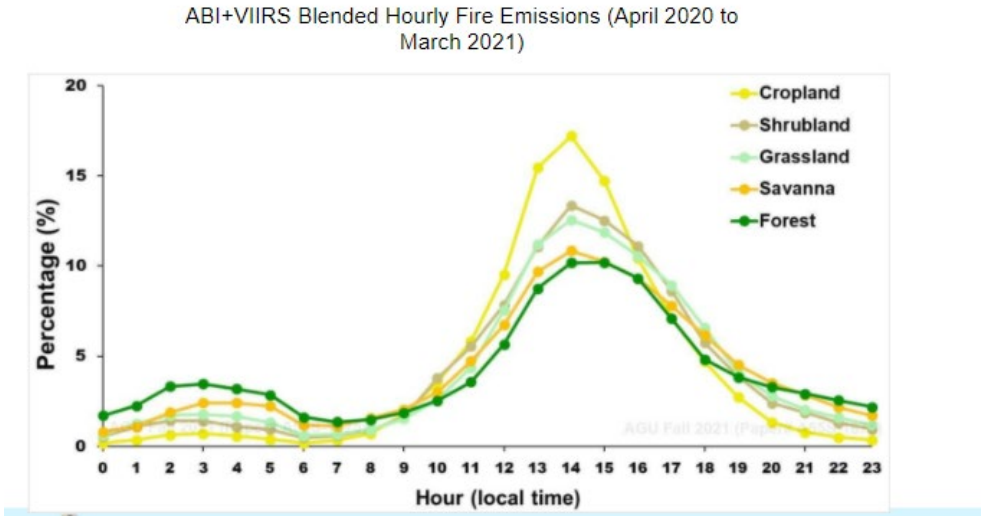
Issues/Risks:

No risks

Milestones:

- ***See next slides***

Highlights: Completed development for blended ABI/VIIRS fire emissions product prototype (image below)



Aerosol (AOD)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Evaluate robustness of method to determine AOD bias characteristics	May-22	May-22		
Complete implementation of AI-based surface reflectance relationship in VIIRS enterprise aerosol optical depth algorithm	Jun-22	Jun-22		
Extend record and evaluation of merged S-NPP/NOAA-20 and gridded global AOD products	Jul-22	Jul-22		
Based on latest J2 SRF update LUTs and other processing coefficients used in AOD algorithm	Aug-22	Aug-22		
Complete first assessment of multi-year VIIRS aerosol optical depth product (Summary report on accuracy and precision)	Aug-22	Aug-22		
Explore VIIRS AOD error characteristics for any relationship with aerosol model selection/residuals (Summary report identifying relationship between AOD error and retrieval residual, surface type)	Aug-22	Aug-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Aerosol (ADP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Exploring callback approach by including other bands for thick smoke/dust plumes, which are frequently missed due to cloud mask	Jun-22	Jun-22		
Further refining smoke detection over land in IR-Visible path by including more surface type from IGBP classifications to defining surface reflectance relationship, such as the approaches used in AOD algorithm. In addition, work will be carried out for reducing/eliminating the detected smoke plumes difference between two orbits	Jun-22	Jun-22		
Exploring regional thresholds for dust detection over land in deep-blue algorithm path	Jun-22	Jun-22		
Reprocess the entire SNPP and NOAA-20 VIIRS ADP and generate smoke and dust climatologies	Jun-22	Jun-22		
Analyze near real time aerosol optical depth and detection products for performance of quality flags and how to optimize the quality flags for a given scenario that can potentially lead to data artifacts	Jun-22	Jun-22		
Reducing false smoke detection for SO2 plumes over ocean from volcanic eruptions by including 8.4 μm band, which is SO2 absorption band	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Continue long-term validation of SNPP and NOAA-20 VIIRS ADP by comparisons with AERONET, CALIPSO, MISR, and IMPROVE	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Volcanic Ash

December, 2021

Accomplishments / Events:

- Maintained and verified quality of S-NPP and NOAA-20 Volcanic Ash products (JPSS EDR and VOLCAT)
- DAP Patch delivery
- Preparing for the VOLcanic Cloud Analysis Toolkit (VOLCAT) Critical Design Review (CDR)
- Paper accepted: “Progress in protecting air travel from volcanic ash clouds”
- Paper accepted: “Eruption dynamics leading to a volcanic thunderstorm – the January 2020 eruption of Taal volcano, Philippines”

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
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Development activities that support transition to VOLCAT	Sep-22	Sep-22		
Software and LUT updates for J2	Sep-22	Sep-22		
Update thresholds and LUT’s, if needed	Sep-22	Sep-22		
Routinely validate volcanic ash products	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: Paper accepted about January 2020 eruption of Taal volcano, Philippines

Image: Phreatic volcano explosion of Taal Volcano, 12 January 2020
https://upload.wikimedia.org/wikipedia/commons/b/b6/Taal_Volcano_-_12_January_2020.jpg

Cryosphere

December, 2021

Accomplishments / Events:

* Physically-based reflectance anisotropy models have been developed for the VIIRS snow fraction retrievals. Given a close match between the empirical reflectance anisotropy model and the physical-based reflectance prediction, we do not expect a substantial change in the derived values of the snow fraction and in the accuracy of snow fraction retrievals when the empirical model in the VIIRS snow fraction algorithm is replaced with the physical one. Once this happens the approach to the snow fraction retrieval implemented in the ABI and VIIRS data processing will be almost identical.
* Initial study indicates that VIIRS Ice Surface Temperature, whether it be single M15 or I5, outperforms MODIS in all metrics. The VIIRS M-band split-window IST produces a much low standard deviation than MODIS for both days in the initial study (see highlight)

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			

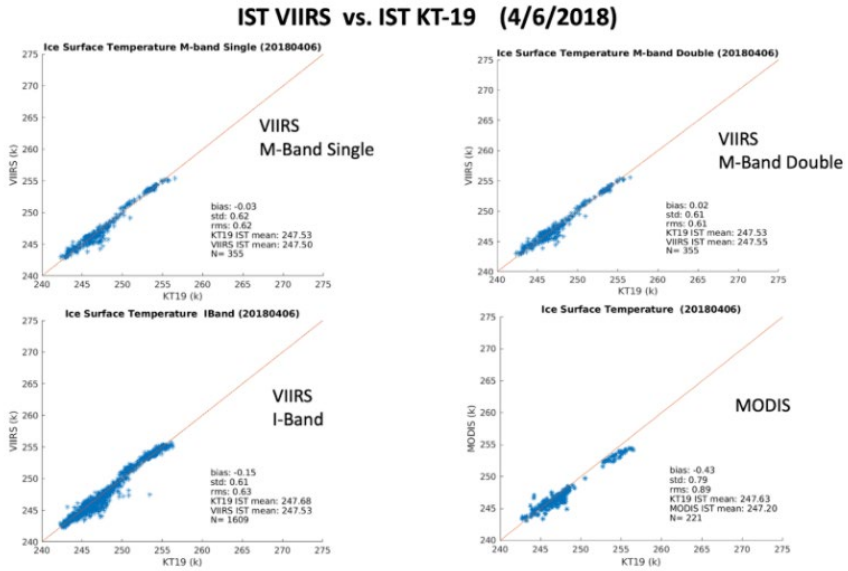
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/28/21	
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Incorporate passive microwave filter to improve ice products	Dec-21	Dec-21	Dec-21	
Cloud shadow flag, blended snow cover product	Sep-22	Sep-22		
New physically-based snow and snow-free land BRDF, algorithm to infer the snow fraction	Sep-22	Sep-22		
Generate new lookup tables, retrieval coefficients for JPSS-2 (all snow, and ice products)	Sep-22	Sep-22		
Weekly and monthly ice products composite	Sep-22	Sep-22		
Continuous monitoring of S-NPP and NOAA-20 products	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights Initial VIIRS vs MODIS Ice Surface Temperature (IST) comparisons show high quality VIIRS



Active Fires

December, 2021

Accomplishments / Events:

- Ivan Csiszar and Marina Tsidulko are among the co-authors of the new BAMS paper “High-resolution smoke forecasting for the 2018 Camp Fire in California”, which discusses results using VIIRS and MODIS FRP as input
- The JPSS-2 ready code with the update for VIIRS M13 Spectral Response Function, progressed through the ASSIST testing and delivery process
- The team continued working with the GBBEPx team and with external partners on the provision of tailored and/or pre-operational data for research and development
- The product continues to provide high quality observations of major fire events such as the Marshall fire near Boulder, CO (see highlight)

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.*

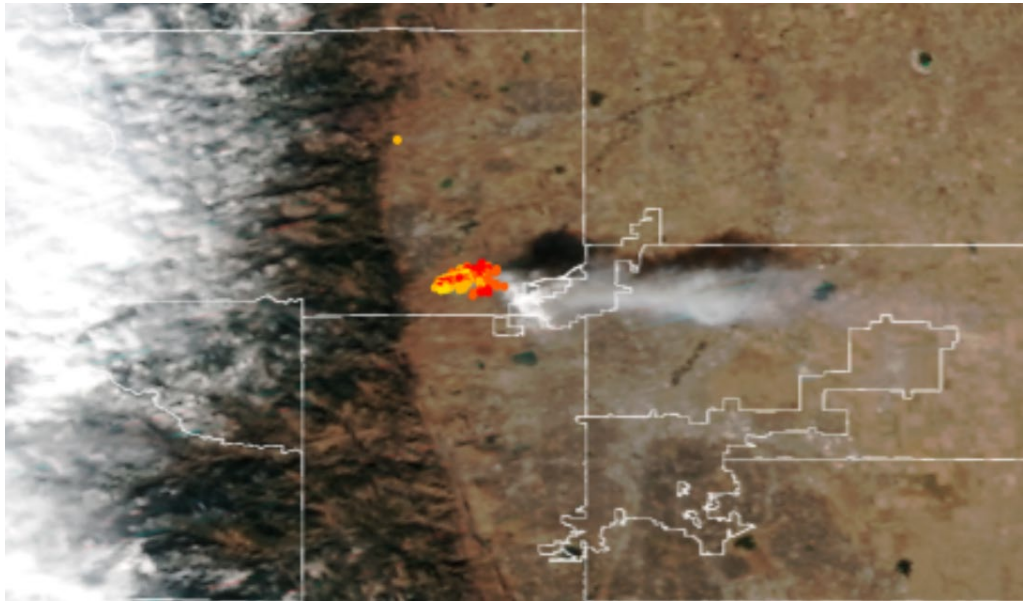
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
I-band algorithm improvements for non-optimal conditions	Sep-22	Sep-22		
J2 readiness and sensor performance evaluation	Sep-22	Sep-22		
Opportunistic validation using in-situ data (Error rates and FRP APU)	Sep-22	Sep-22		More limited validation
Persistent anomaly data files updates	Sep-22	Sep-22		Less frequent updates
Suomi NPP / NOAA-20 data analysis and feedback	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlight:

Suomi NPP VIIRSI-band FRP observations of the Marshall Fire



Suomi NPP VIIRS I-band FRP of the Marshall Fire on December 30, 2021. (https://www.star.nesdis.noaa.gov/jpss/mapper/)

Surface Type

December, 2021

Accomplishments / Events:

- STAR-UMD VIIRS Surface Type team has processed S-NPP and NOAA-20 VIIRS granule surface reflectance data acquired in December 2021 for the production of AST-2021.
- The team has generated monthly composites for most of the months of 2021 using VIIRS data acquired by both S-NPP and NOAA-20.
- The team used recent VIIRS images to examine the Marshall Fire burned at the end of 2021, which became the most destructive fire in Colorado history (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.*
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.*

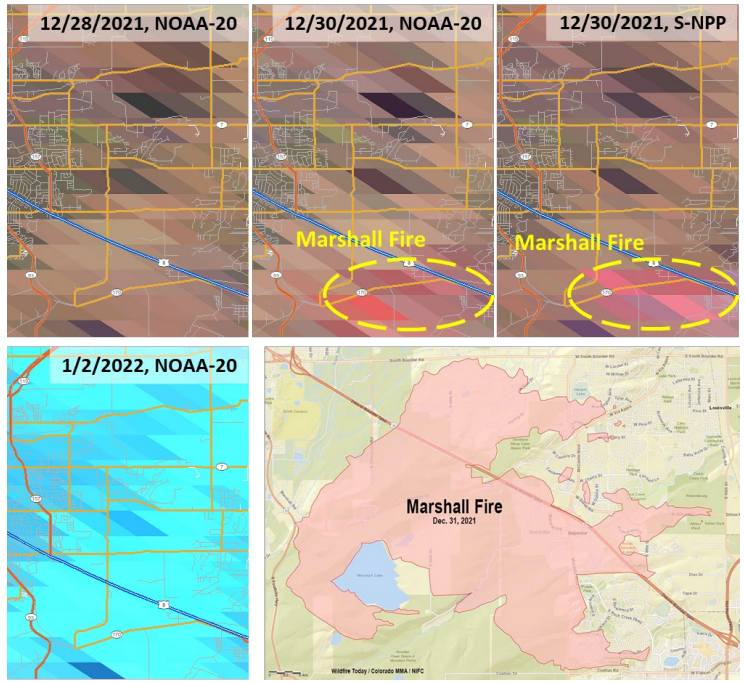
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/29/21	
FY23 Program Management Review	Jun-22	Jun-22		
Deliver AST-2020 to NDE (with JRR Super DAP)	Feb-22	Feb-22		
Complete global monthly composites based on 2021 VIIRS data	Apr-22	Apr-22		
Generate global annual classification metrics	May-22	May-22		
Develop approaches for using newly available high resolution global maps on urban and water	Sep-22	Sep-22		
Experiment methods for mapping surface type change	Sep-22	Sep-22		
Generate VIIRS AST21 based on 2021 VIIRS data using SVM algorithm	Aug-22	Aug-22		
Comparison of AST21 with surface type validation data	Sep-22	Sep-22		
Delivery of AST21 (made available for users through STAR FTP)	Sep-22	Sep-22		
Routinely monitor surface type changes in the training and validation data sets	Sep-22	Sep-22		
Improve and update training and validation data, ATBD and VIIRS AST web sites	Sep-22	Sep-22		

Highlights:

VIIRS imaged the Marshall Fire as it was burning: *First reported at 11 am on 12/30/2021, the Marshall Fire became the most destructive wildfire in Colorado history, destroying ~1000 structures in less than 2 days within its 6000-acre burned area. Clear view images captured by VIIRS show that the pixels affected by the fire had different shades of red colors (due to high reflectance values in the M10 band) as the fire was burning at its peak in the early afternoon of 12/30/2021 (upper middle and upper right). The burned area was completely covered by snow by 1/2/2022 (lower left, cyan color indicates snow cover). Notice that because NOAA-20 and S-NPP have slightly different local overpass time and very different viewing angles over the same area in the same day, the colors of the fire pixels as imaged by the two satellites are not exactly the same. All VIIRS images are shown with M10, M7, and M5 in red, green, and blue. The fire perimeter map (lower right) was produced by the Colorado MMA/NIFC.*



Surface Reflectance

December 2021

Accomplishments / Events:

- Evaluated the impact of spectral response function difference between SNPP VIIRS and NOAA20, JPSS-2 using real satellite and ground data at AERONET sites. Discussed with NASA science team and start to update the LUT of NOAA20 and JPSS-2.
- Continue to work on the AERONET validation tool improvement. The new AERONET SR is developed under NASA science team protocol, and store in well organized NetCDF format, the dataset is also under test for VIIRS vegetation index product validation.
- Continue to monitor the SR product using daily routine monitoring tool.
- Collected other SR product (MCD19) from different algorithm for the inter-comparison.

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			

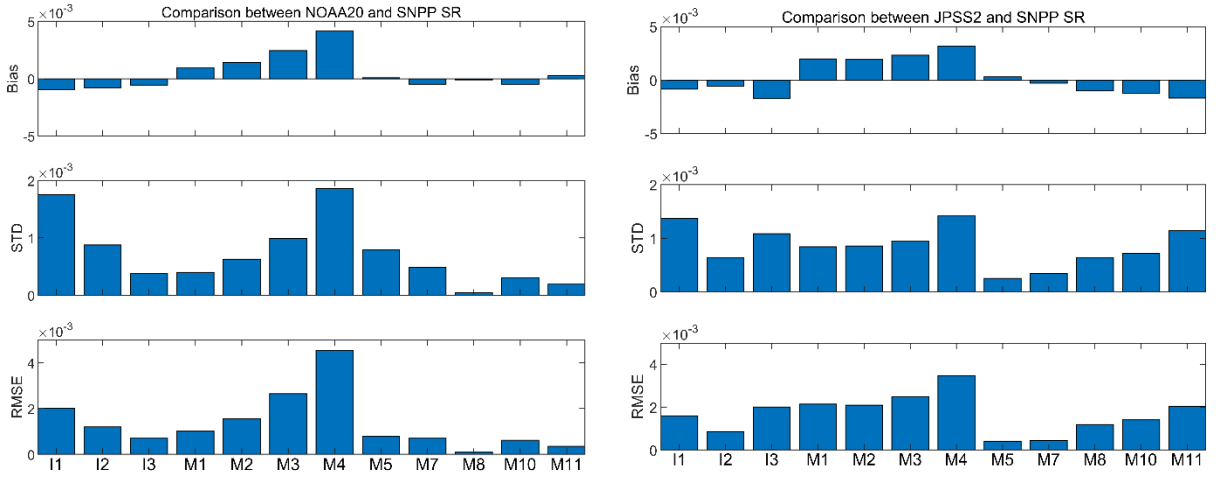
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/03/21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Oct-21	Oct-21	10/07/21	
Continue to validate against in-situ measurements and inter-comparison with other SR Products	Dec-21	Dec-21	12/15/21	
The SR Long-term monitoring improvement and perform the time-series analysis	Mar-22	Mar-22		
FY23 Program Management Review	Jun-22	Jun-22		
JPSS-2 pre launch readiness	Jun-22	Jun-22		
Cal/Val update for SNPP and NOAA20 SR product; Collect the vegetation product feedback of the impact of SR	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

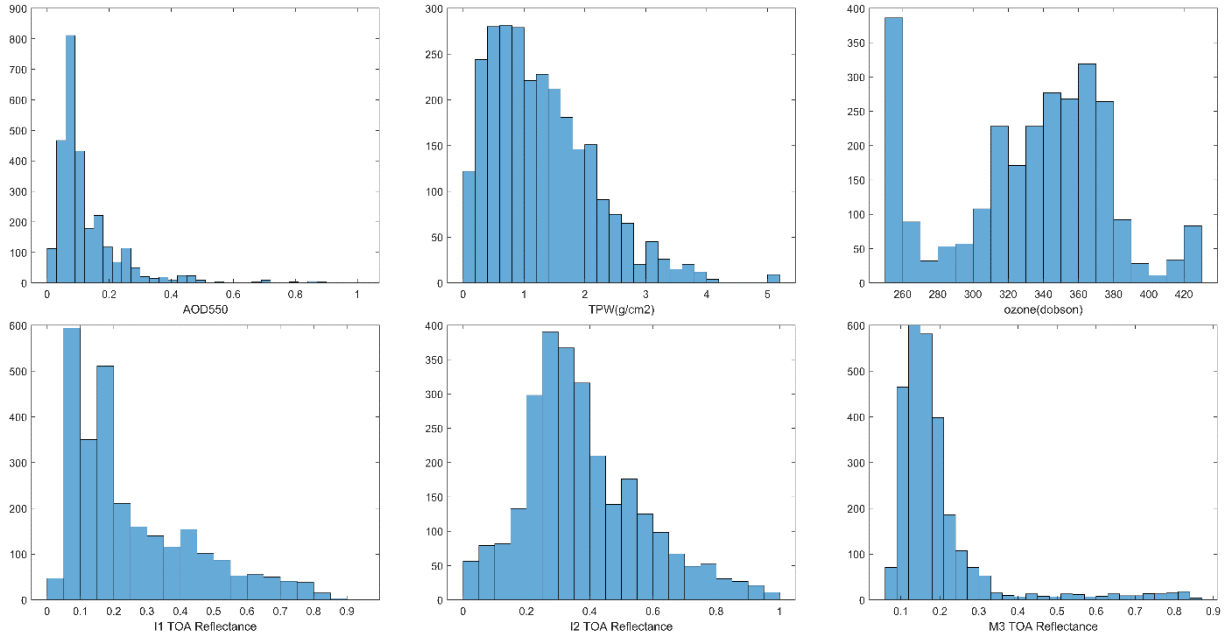
Highlights:



- VIIRS SR difference statistics. Left: difference between NOAA20 and SNPP, right: difference between JPSS2 and NPP.

Surface Reflectance (Details)

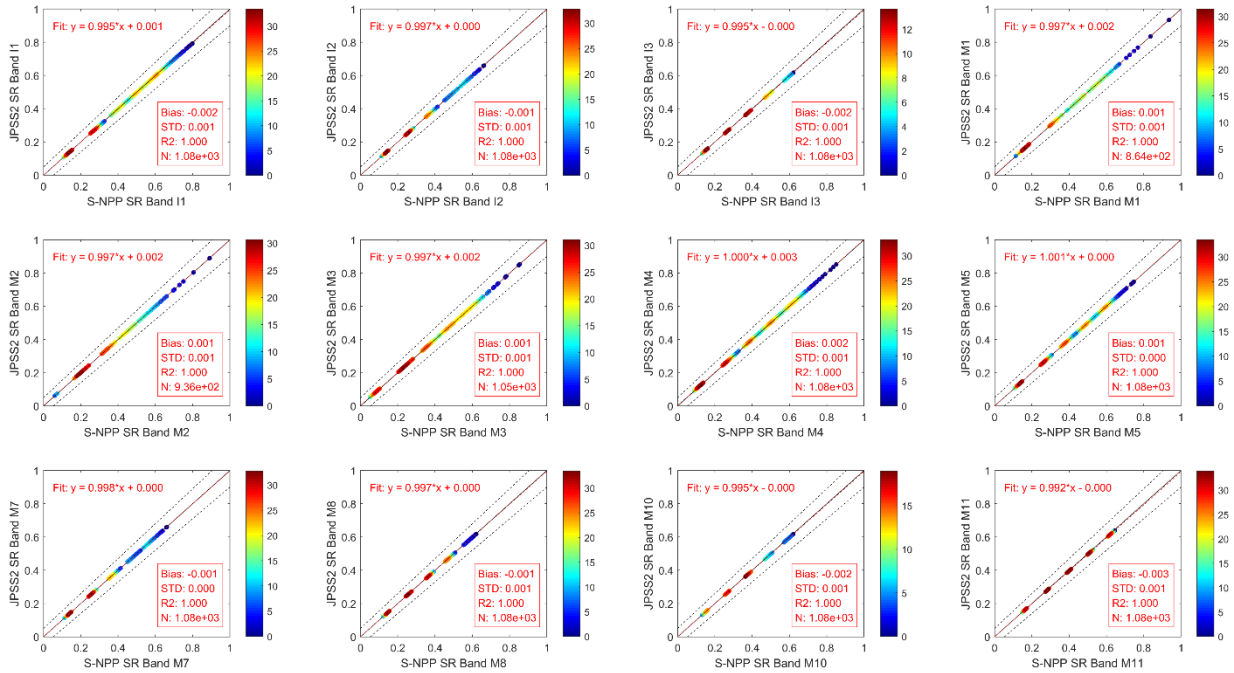
Spectral Response Function (SRF) impact on SNPP, NOAA20 and J2 VIIRS SR. Based on real data at AERONET.



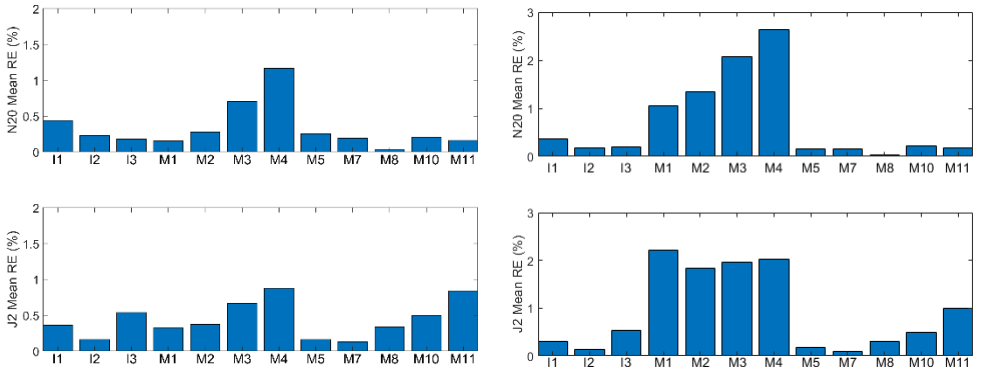
Evaluation dataset histograms

- Evaluation Method: Performing the Atmospheric Correction under various conditions using 6S
- Datasets:
  - AOD550, TPW, O3 from AERONET
  - TOA reflectance, satellite and solar angles from VIIRS SDR
  - Aerosol model from AOD EDR
  - Over 200 sites from April to June 2021

- SR evaluation results due to the SRF difference



Scattering plot between JPSS2 and S-NPP VIIRS SR



The relative SR difference (%) between N20, J2 and SNPP.
Left: simulated dataset
Right: real dataset.

Land Surface Temperature

December, 2021

Accomplishments / Events:

- Finalized the update of the L2 VIIRS LST ATBD.
- Finalized the update of the L3 VIIRS LST ATBD.
- Performed the validation of the VNP21A1 LST against the ground measurements from SURFRAD, BSRN and ARM, and compared the results with the validation of the L3 SNPP VIIRS LST. (Highlights, slide 2-5)
- Attended the python workshop and NOAA Infrared Sounder Workshop
- TPW dataset archive processing. Extract TPW data from GFS forecast with 0.5 degree spatial resolution and output the data into NetCDF format for LST validation use. (slide6)
- Explored the atmospheric sounding data over inland water body and prepared the input for the radiance based LST validation.
- About the all weather LST development, the data preprocessing such as land/sea mask processing, MIRS LST pixel selection, NDVI data extraction etc. is generally complete.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/01/21	
ATBD update	Oct-21	Dec-21	Dec-21	
Super DAP v3.1 patch delivery			12/06/21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
L3 Global Gridded LST/LSA DAP to NDE (Prelim J2 DAP)			12/30/21	
L3 Global Gridded LST/LSA DAP to NDE (final J2 DAP)	Feb-22	Feb-22		
Manuscript ready for Remote Sensing special issue “VIIRS 2011–2021: Ten Years of Success in Earth Observations"	Apr-22	Apr-22		
All weather LST generation based on the microwave LST and VIIRS LST: methodology development and experiment	May-22	May-22		
FY23 Program Management Review	Jun-22	Jun-22		
LUT interpolation method development and test	Jun-22	Jun-22		
Routine Validation Summary/report of LST product including L2 and L3	Jul-22	Jul-22		
LST uncertainty evaluation and calibration	Apr-22	Aug-22		
Routine monitoring tool and its update	Aug-22	Aug-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

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			

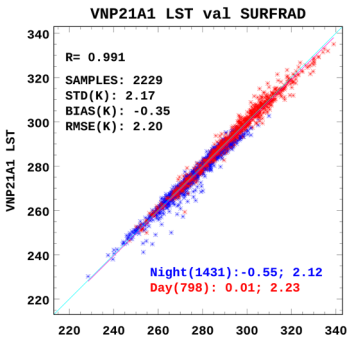
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

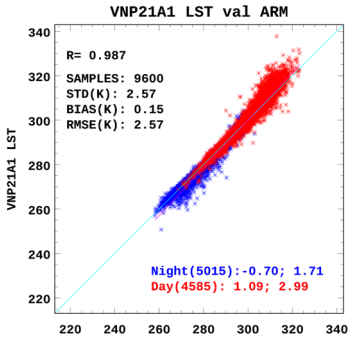
Issues/Risks:

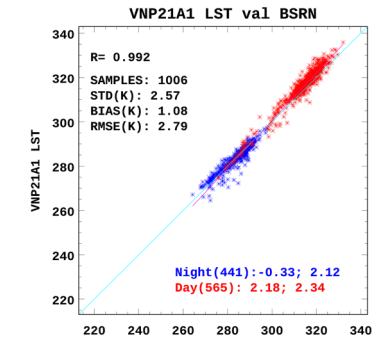
None

Highl

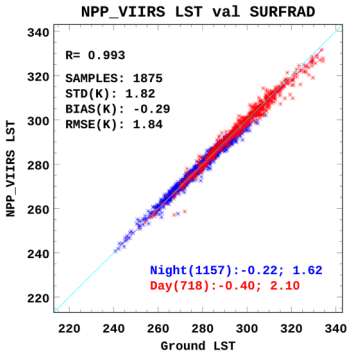
VNP21A1

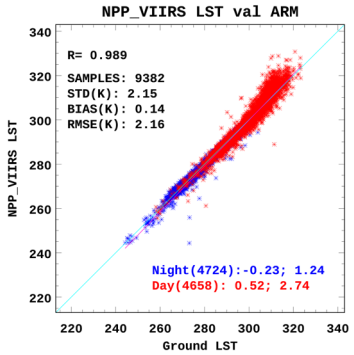


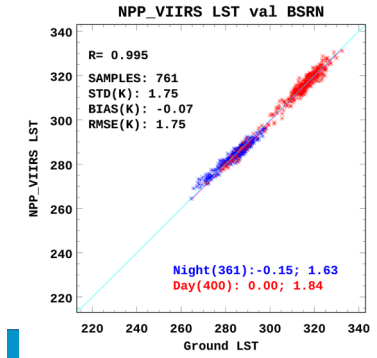




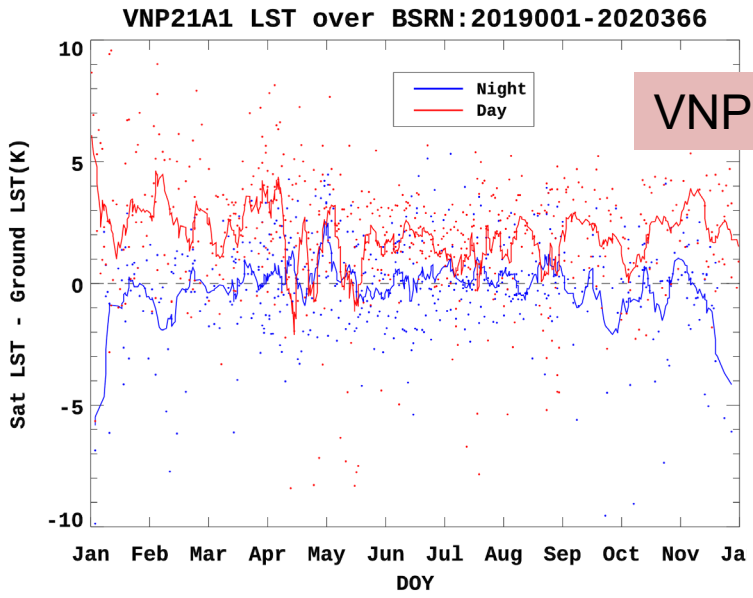
SNPP VIIRS LST

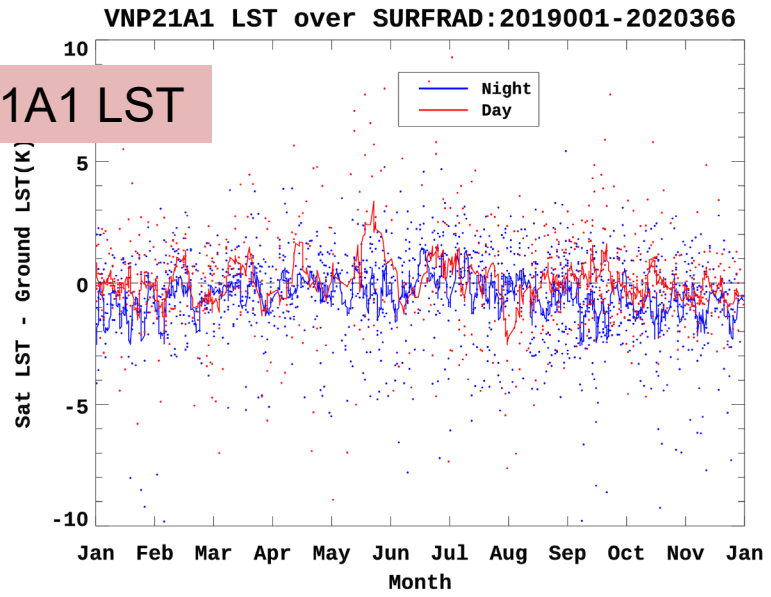




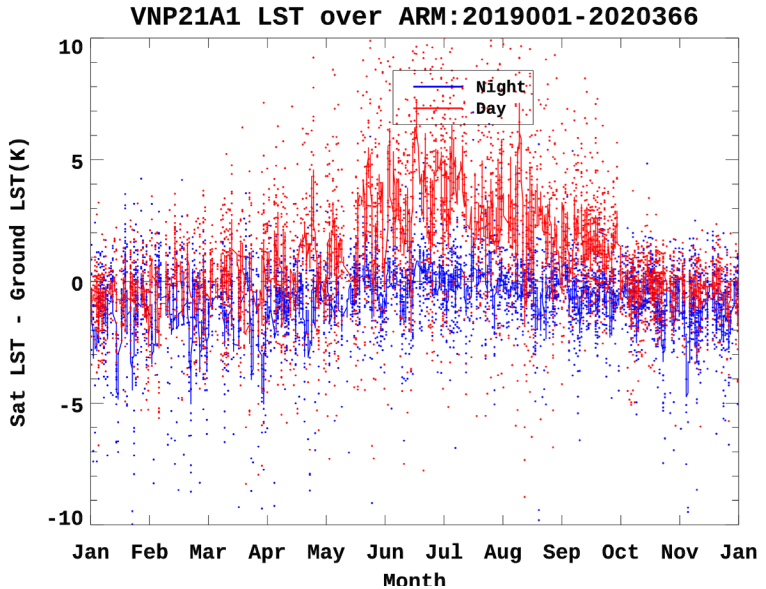


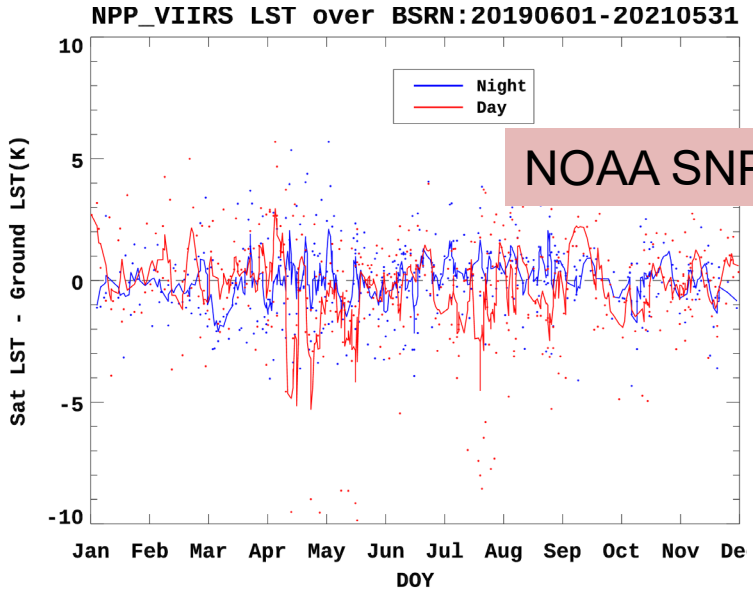
Time series analysis

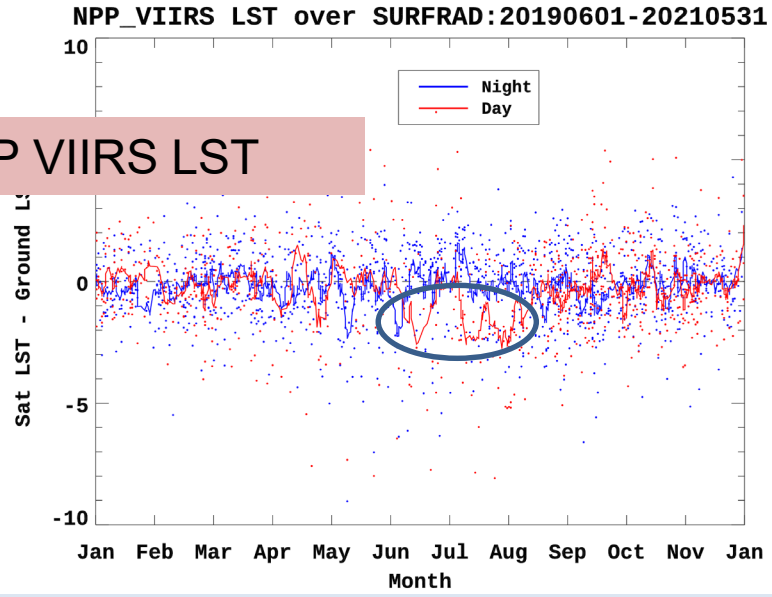




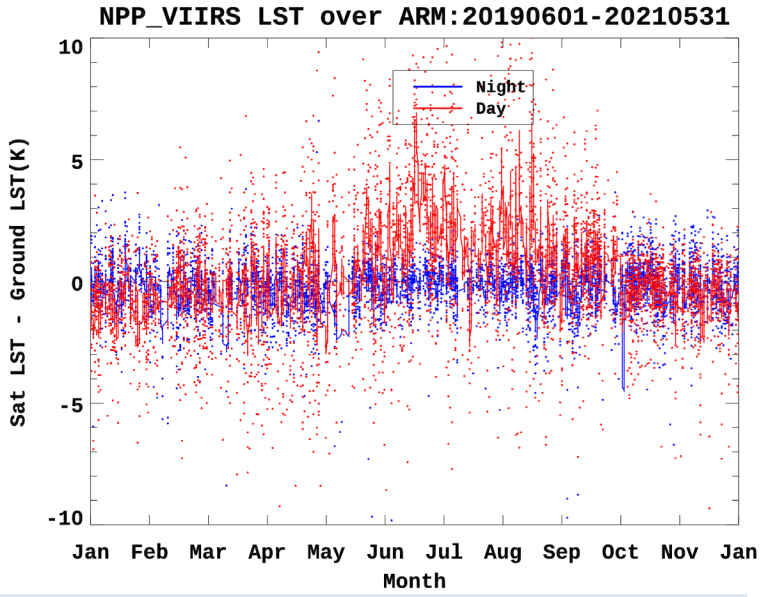
VNP21A1 LST







NOAA SNPP VIIRS LST



- The time series of the validation result is presented: top figures for VNP21A1 LST and the bottom figures for NOAA SNPP VIIRS LST.
- Summer daytime cold bias for SNPP VIIRS LST while insignificant for VNP21 LST (SURFRAD)
- Warm bias is observed in summer from both products against ARM observations(ARM)
- VNP21a1 shows obvious warm bias at daytime while NOAA SNPP VIIRS LST shows seasonal cold bias in Summer (BSRN)

Summary – validation against SURFRAD observations

NOAA SNPP VIIRS LST

site	count	bias	std	count(day)	bias(day)	std(day)	count(night)	bias(night)	std(night)
BON	265	-0.09	1.83	56	1.34	1.61	180	-0.32	1.33
DRA	397	-1.3	1.87	156	-0.92	2.25	241	-1.55	1.53
FPK	279	-0.27	1.5	116	-0.86	1.68	163	0.15	1.2
PSU	198	0.62	1.27	64	-0.06	1.34	134	0.95	1.09
SXF	330	0.2	1.79	137	-0.36	1.92	193	0.59	1.59
TBL	406	-0.29	1.78	160	-0.18	2.21	246	-0.36	1.43

VNP21A1 LST

site	count	bias	std	count(day)	bias(day)	std(day)	count(night)	bias(night)	std(night)
BON	329	-0.37	2.45	55	1.57	2.68	230	-0.96	2.06
DRA	390	-1.84	1.84	150	-1.2	1.7	240	-2.24	1.82
FPK	392	-0.05	1.62	157	-0.03	1.69	235	-0.07	1.57
PSU	247	0.62	2.11	75	0.76	2.21	172	0.56	2.07
SXF	427	0.29	2.3	154	0.23	2.39	273	0.32	2.26
TBL	444	-0.44	1.87	163	0.01	2.17	281	-0.69	1.63

- The table summarizes the site wide validation against SURFRAD data with the top table for NOAA SNPP VIIRS LST and the bottom table for VNP21A1 LST
- Red color text indicates the greater absolute deviation of bias or std than VNP21 LST for each site
- The relatively worse absolute bias than VNP21: the daytime bias over FPK and nighttime bias over PSU
- The STD is better than VNP21 except over TBL for daytime case(2.21K vs 2.17K)

NOAA LST

e	count	bias	std	count(day)	bias(day)	std(day)	count(night)	bias(night)	std(night)
sgpsirsC1	318	0.13	1.87	158	0.34	2.34	160	-0.08	1.2
sgpsirsE11	609	0.26	1.99	316	0.64	2.32	293	-0.15	1.46
sgpsirsE12	595	-0.36	1.53	296	-0.55	1.89	299	-0.17	1.01
sgpsirsE13	597	-0.3	2.27	293	-0.24	2.99	304	-0.35	1.26
sgpsirsE15	664	0.2	1.92	335	0.63	1.87	329	-0.24	1.88
sgpsirsE31	621	0.66	2.27	321	1.24	2.75	300	0.04	1.37
sgpsirsE32	591	0	2.93	301	-0.01	3.98	290	0.01	1.06
sgpsirsE33	593	0.63	2.56	288	1.2	3.27	305	0.09	1.42
sgpsirsE34	515	0.45	1.97	250	1.47	2.25	265	-0.5	0.94
sgpsirsE35	592	0.16	1.65	286	-0.33	1.94	306	0.62	1.14
sgpsirsE36	618	-0.44	1.64	313	0.1	2	305	-0.99	0.87
sgpsirsE37	628	0.21	2.92	310	0.72	3.96	318	-0.29	1.06
sgpsirsE38	632	0.06	1.9	304	0.68	2.41	328	-0.52	0.94
sgpsirsE40	588	-0.11	1.62	296	0.28	2.05	292	-0.5	0.87
sgpsirsE41	603	0.76	2.31	299	1.79	2.73	304	-0.27	1.09
sgpsirsE9	618	0.02	1.82	292	0.36	2.39	326	-0.28	0.99

arm

VNP21A1 LST

	count	bias	std	count(day)	bias(day)	std(day)	count(night)	bias(night)	std(night)
sgpsirsC1	401	-0.23	2.75	195	0.2	3.4	206	-0.63	1.85
sgpsirsE11	620	0.2	2.26	310	1.04	2.65	310	-0.64	1.34
sgpsirsE12	587	-0.62	1.69	268	-0.32	1.93	319	-0.87	1.4
sgpsirsE13	615	-0.37	2.71	307	0.08	3.37	308	-0.81	1.73
sgpsirsE15	657	0.22	2.02	332	1.11	2.04	325	-0.69	1.56
sgpsirsE31	602	0.66	2.7	298	1.87	3.08	304	-0.53	1.51
sgpsirsE32	602	0.08	3.08	297	0.46	4.09	305	-0.29	1.49
sgpsirsE33	599	0.84	2.83	280	1.79	3.5	319	0	1.67
sgpsirsE34	514	0.47	2.57	240	2.19	2.33	274	-1.02	1.7
sgpsirsE35	629	0.03	1.9	276	0.11	2.06	353	-0.03	1.77
sgpsirsE36	641	-0.62	2.37	297	0.82	2.09	344	-1.87	1.83
sgpsirsE37	635	0.48	3.27	300	1.71	4.09	335	-0.62	1.65
sgpsirsE38	621	0.4	2.56	312	1.54	2.7	309	-0.75	1.77
sgpsirsE40	621	-0.02	1.98	287	1.17	1.7	334	-1.05	1.59
sgpsirsE41	619	0.77	3.11	293	2.48	3.26	326	-0.77	1.95
sgpsirsE9	637	0.11	2.21	293	0.97	2.53	344	-0.62	1.57

Summary - validation against BSRN observations

NOAA LST

03012019~02282021 all data included

siteName	count	bias	std	count(day)	bias(day)	std(day)	count(n)	bias(night)	std(night)
CAB	236	-0.3	3.26	96	-2.41	3.99	140	1.16	1.37
GOB	512	-0.1	1.7	281	0.35	1.83	231	-0.64	1.34

06012019~05312021 after removal of data between 20200401-20200831

siteName	count	bias	std	count(day)	bias(day)	std(day)	count(n)	bias(night)	std(night)
CAB	177	0.34	1.85	72	-0.92	1.59	105	1.19	1.50
GOB	584	-0.19	1.69	328	0.21	1.84	256	-0.7	1.33

VNP21A1 LST

siteName	count	bias	std	count(day)	bias(day)	std(day)	count(n)	bias(night)	std(night)
CAB	322	0.36	3.17	102	-1.18	3.85	220	1.07	2.51
GOB	781	1.27	2.51	494	2.5	2.14	287	-0.85	1.46

after removal of data between 20200401-20200831

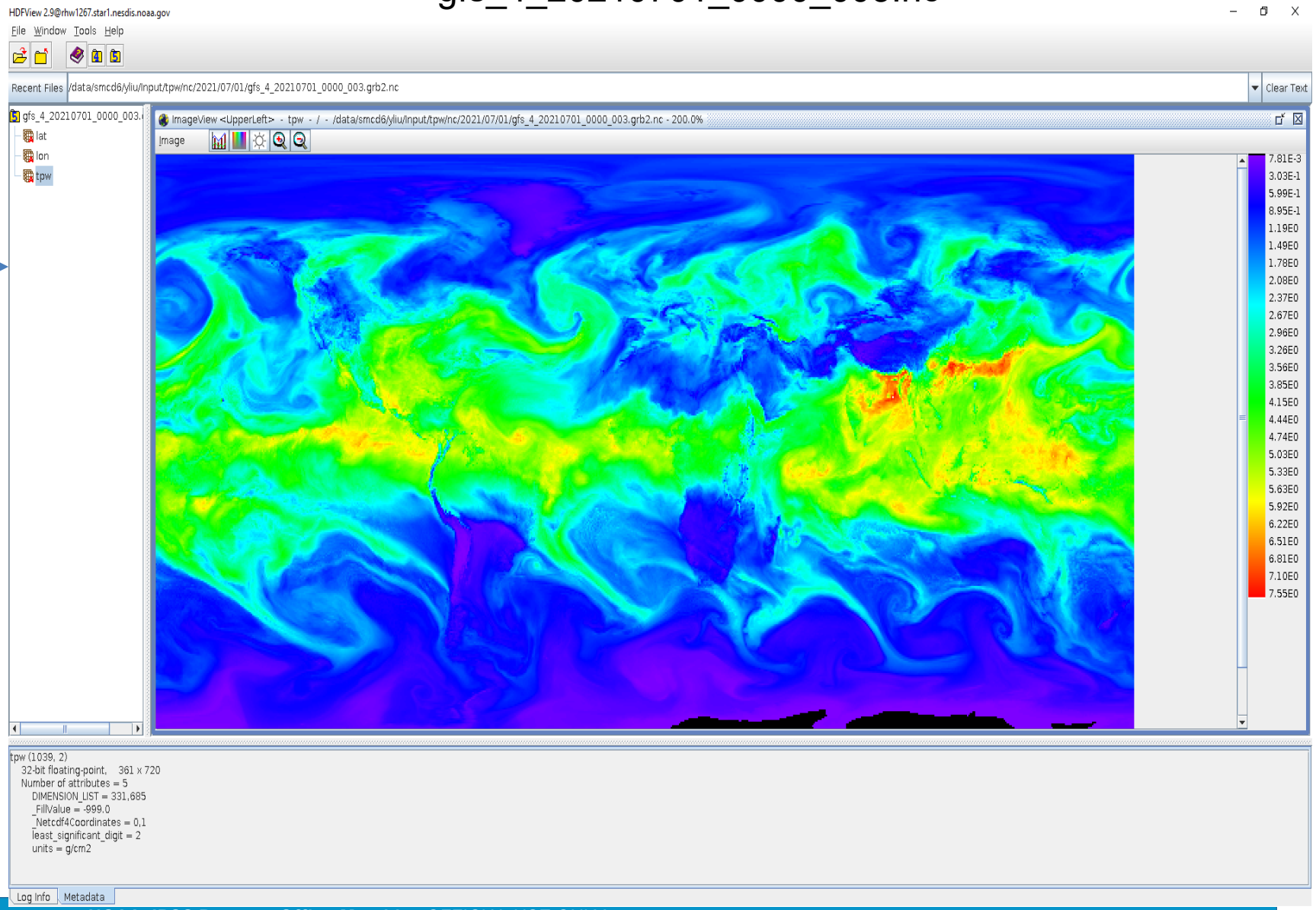
siteName	count	bias	std	count(day)	bias(day)	std(day)	count(n)	bias(night)	std(night)
CAB	225	0.42	2.67	71	-0.07	2.49	154	0.64	2.73

- The table summarizes the site wide validation against BSRN data with the top two tables for NOAA SNPP VIIRS LST and the bottom two tables for VNP21A1 LST
- Red color text indicates the greater absolute deviation of bias or std than VNP21A1 LST for each site
- The data between 20200401-20200831 is removed due to the site management activities conducted over CAB site which caused the mis-match of the site observation and the satellite observation.
- NOAA SNPP VIIRS LST presents larger bias for both daytime and nighttime over CAB site while smaller STD comparing to VNP21A1 LST.
- NOAA SNPP VIIRS LST yields a better agreement with ground observations over barren surface site at GOB for both daytime and nighttime.

TPW data processing

- TPW data is extracted from GFS (GFS_0P50) in grib2 format and output to NetCDF format
- The left corner is at [-180º,90º]
- Tpw unit is converted to g/cm2

gfs_4_20210701_0000_003.nc



Surface Albedo

December, 2021

Accomplishments / Events:

- Modify the data source of snow mask
  - The snow flag in surface reflectance has brought in big uncertainty to BRDF (#2)
  - Replace it using VIIRS snow mask, although which underestimate snow relative to NASA counterpart, but is the best choice in available datasets (#3)
- Further implement the gap filling subroutines and organize the code flow (#4-5)
  - Temporal filling using is the preferred method
  - Spatial filling using same-surface-type is the second choice
  - Climatology only is the last resort
- Generate global test data in four seasons (#6)
- validating the BRDF, albedo and NBAR performance using similar products (#7).

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			

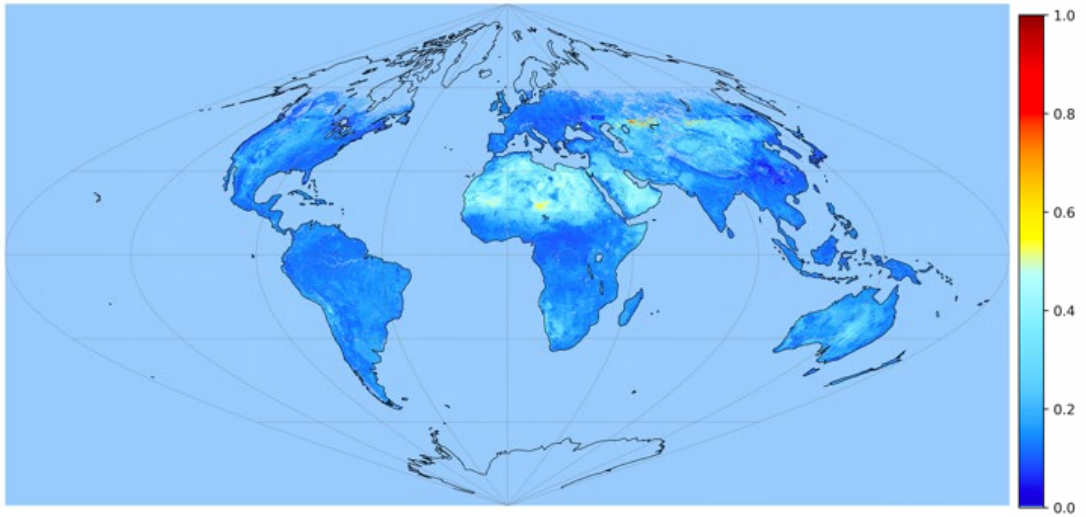
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End PMR	Oct-21	Oct-21	11/01/21	
Manuscript ready for Albedo Climatology update	Dec-21	Apr-22		More time needed
Generating the VIIRS BRDF climatology and real-time BRDF/Albedo test data generation	Jan-22	Jan-22		
Super DAP v3.1 patch delivery			12/06/21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
L3 Global Gridded LST/LSA DAP to NDE (Prelim J2 DAP)			12/30/21	
L3 Global Gridded LST/LSA DAP to NDE (final J2 DAP)	Feb-22	Feb-22		
BRDF data development plan ready	Mar-22	Mar-22		
VIIRS cloudy-sky albedo improvement	May-22	May-22		
FY23 Program Management Review	Jun-22	Jun-22		
Routine monitoring tool and its update	Aug-22	Aug-22		
NOAA-21 data test if provided	Aug-22	Aug-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights:



Global albedo generated from BRDF in four seasons

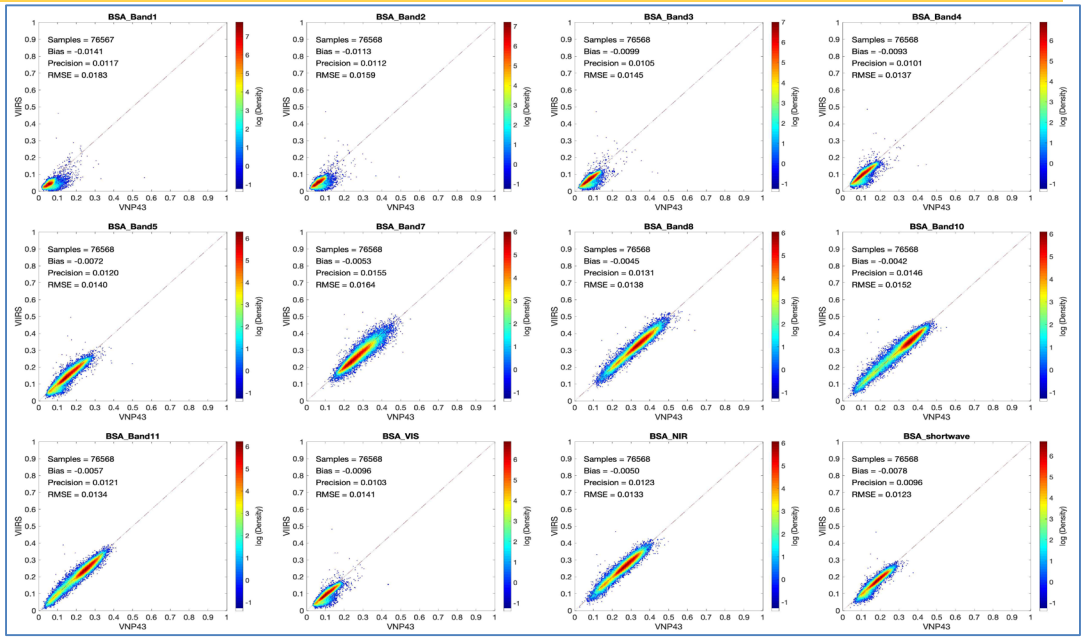
Evaluation of BSA using VNP43

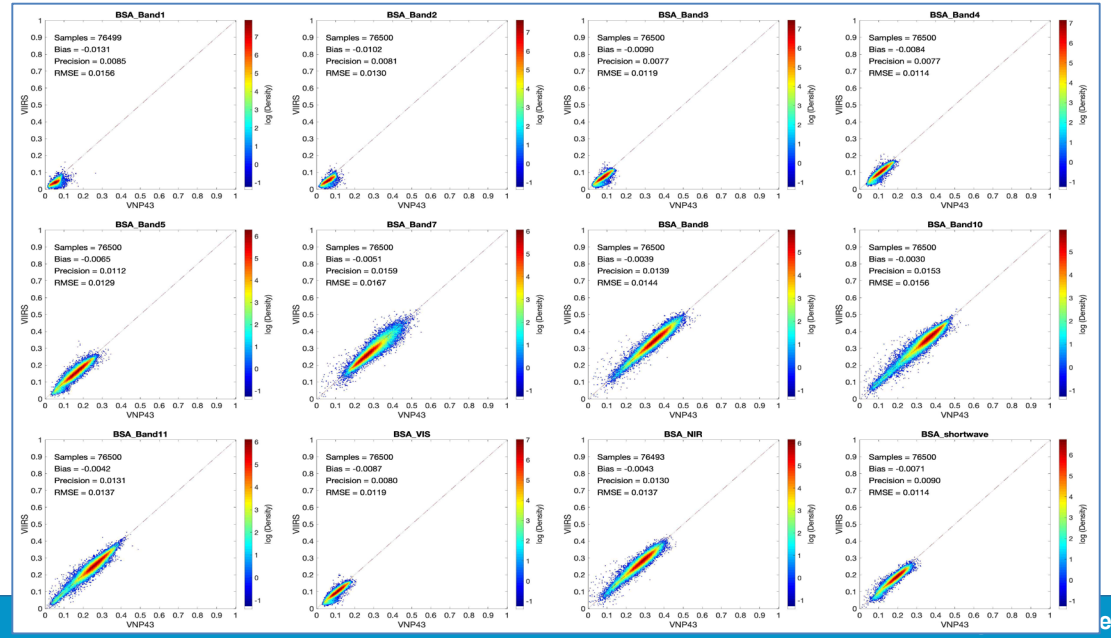
- When both NOAA VIIRS BRDF and VNP43 counterpart are snow-free, they are consistent (a)
- When VNP43 is snow-free and VIIRS is snow-covered, they are consistent, as they both provide snow-free BRDF (b)
- When VNP43 is snow-covered but VIIRS is snow-free, the difference is significant, as VNP43 provides snow BRDF but VIIRS provides snow-free BRDF under such case (c). This reveals the uncertainty from snow mask to BRDF. Here the snow flag in Surface Reflectance product was used.

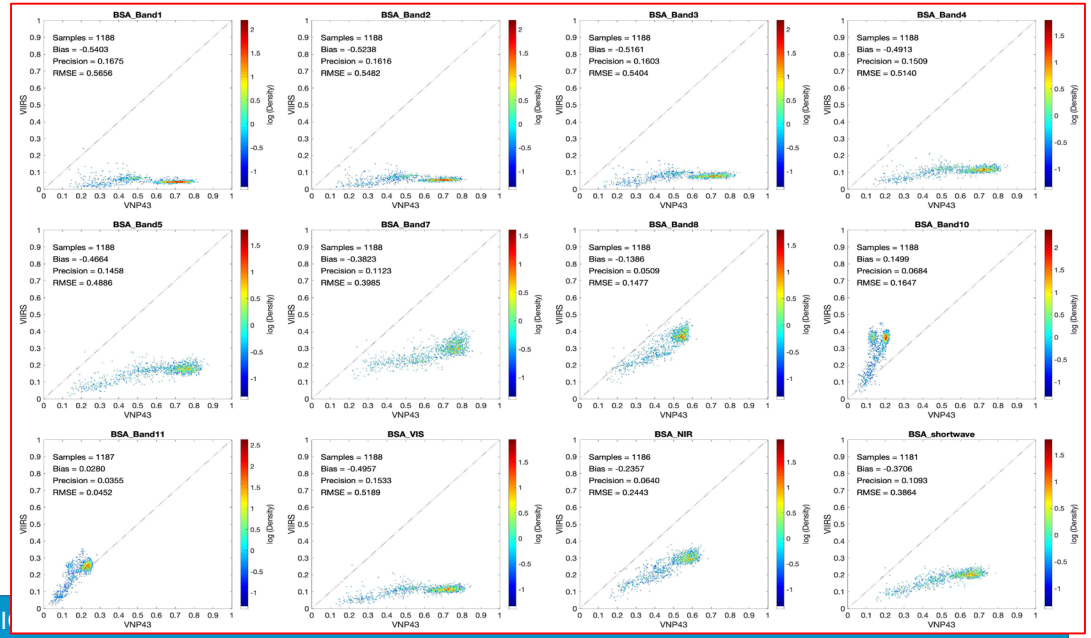
(a) Bottom: both valid value, both snow-free

(b) Top-right: both valid value, VNP43 snow-free, VIIRS snow-covered

(c) Bottom-right: both valid value, VNP43 snow-covered, VIIRS snow-free







Snow mask comparison case studies

Summary

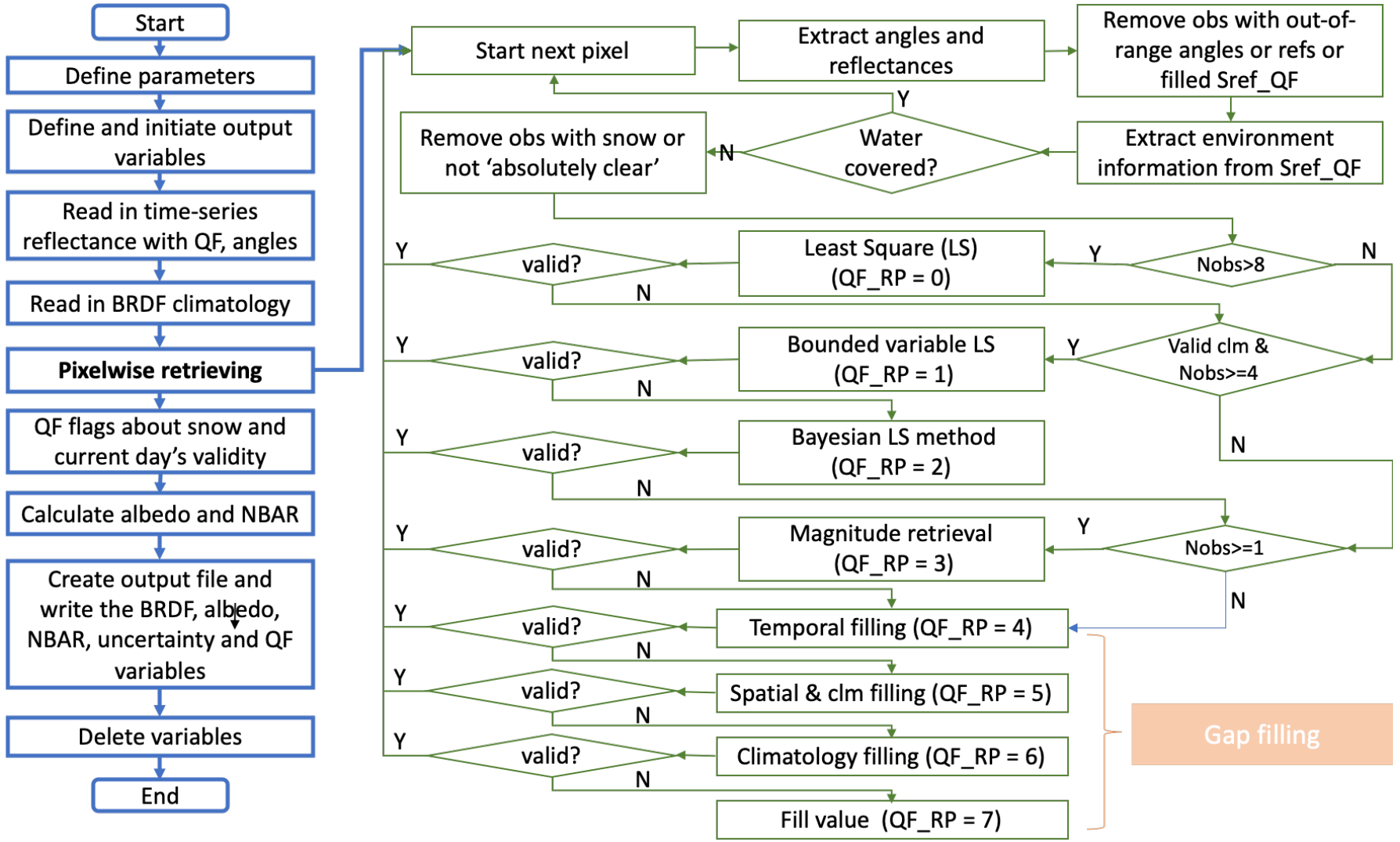
- The VIIRS snow cover EDR is largely different from the snow flag in SR
- The VIIRS snow cover EDR is similar but with a 2%~13% underestimation comparing to NASA counterpart (according to limited granule cases)
- When combining with cloudy pixels together, the VIIRS snow or cloudy pixels shows a 0~2% underestimation to NASA counterpart

Pixel Number under different conditions	Percentage (in total granule)						
	s202111182018540	s20211118202019	s20211118202019	s202111301530398	s202111301848239	s202111302033386	s202111302035040
Snow Pixel Num from EDR	13.24%	4.46%	5.02%	0.03%	1.82%	1.75%	2.00%
Snow Pixel Num from EDR but not from bit5	**2.05%**	**0.98%**	**1.48%**	**0.00%**	**0.26%**	**0.00%**	**0.00%**
Snow Pixel Num (clear-sky) from bit5 but not from snow EDR	**24.13%**	**5.45%**	**15.17%**	**1.40%**	**4.98%**	**4.44%**	**18.67%**
Snow Pixel Num from EDR and from bit5	11.18%	3.48%	3.54%	0.03%	1.56%	1.75%	2.00%
Clear-sky pixel number	47.69%	10.94%	23.05%	5.96%	16.12%	6.20%	20.61%
Snow Pixel Num from VIIRS but not from VNP10	**1.09%**	**0.35%**	**0.54%**	**0.03%**	**0.40%**	**0.87%**	**0.57%**
Snow Pixel Num from VNP10 but not from VIIRS	**7.41%**	**5.10%**	**4.56%**	**1.82%**	**3.36%**	**12.27%**	**3.91%**
Snow Pixel Num from both VIIRS and VNP10	12.15%	4.11%	4.48%	0.00%	1.42%	0.88%	1.43%
Snow and Cloudy Pixel Num from VIIRS but not from VNP10	**1.05%**	**0.29%**	**0.50%**	**0.03%**	**0.34%**	**0.76%**	**0.51%**
Snow and Cloudy Pixel Num from VNP10 but not from VIIRS	**2.79%**	**1.65%**	**1.96%**	**0.00%**	**0.85%**	**1.16%**	**1.22%**
Snow and Cloudy Pixel Num from both VIIRS and VNP10	64.28%	93.04%	81.33%	94.04%	85.21%	94.58%	80.70%

BRDF algorithm update by adding more subroutines to improve continuity and flexibility

Updates

- A hierarchy of gap filling subroutines are added to utilize all the prior information to fill BRDF gaps under none observation situations.
- Previous day's retrieval not older than 7 days are preferred
- Surrounding retrievals under same surface type is used with texture adjustment from climatology
- The climatology is the last resort to fill the remaining gaps



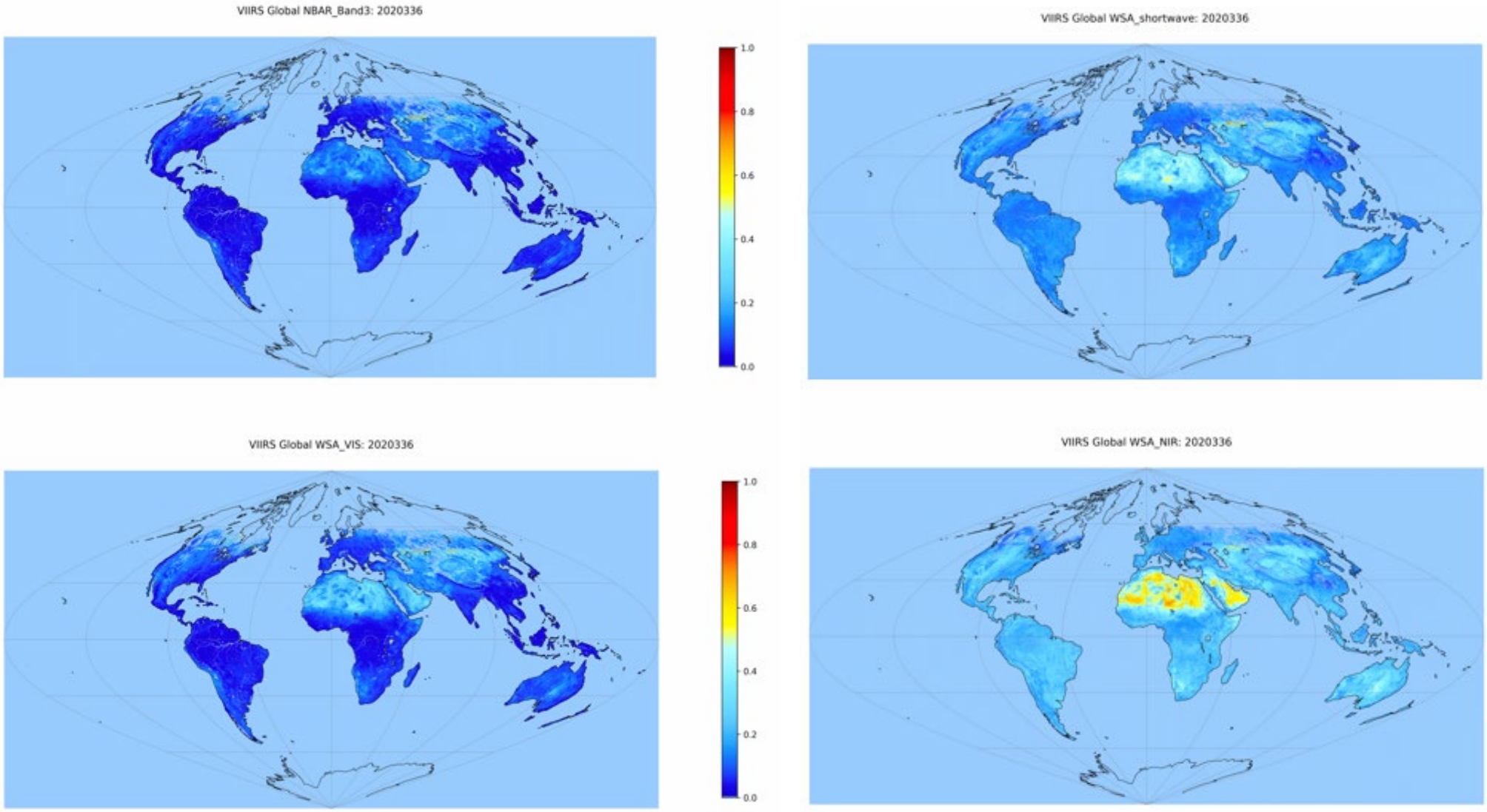
VIIRS BRDF algorithm QF implementation to reflect the algorithm improvement and include more information

Updates:

- The retrieval path flag in the QF has more values to indicate the added subroutines
- Land/water mask is added for convenience in analysis, visualization, and validation

Byte	Bit	Description	How flag is set
0	0~1	Overall Quality	00: High quality retrieval (sufficient observations with small RMSE) 01: Medium quality retrieval (sufficient observations with relatively large RMSE)) 10: Low quality but valid retrieval due to insufficient observations 11: fill value
	2~4	**Retrieval path**	000: Full retrieval using Least-square (LS) method 001: Full retrieval using Bounded variable least-squares (BVLS) 010: Full retrieval using Bayesian least-square 011: Degraded retrieval using magnitude algorithm 100: Time-series filled with recent preceding value 101: Spatial filled with neighboring same-surface-type value 110: Filled with climatology 111: Invalid retrieval
	5	Valid observations	0: With clear-sky observations in the current day 1: Without clear-sky observations in the current day
	6	Snow covered	0: Snow-free 1: Snow covered
	7	**Land/Water Mask**	0: Without water 1: Ocean or inland water

Sample global data generated for user test



- The batch of test data include 8 days' global data, evenly distributed in four seasons
- 4 of 66 variables are used as example in the following seasonal animation, including NBAR of Band 3, WSA of VIS, NIR and SW broad channels.

Validation of variables under varies surface type

- The variables are compared to counterpart product over globe. APU of various surface types suggest most satisfies the requirements
- The snow surface albedo are incomparable because we provide snow-free albedo value while they provide actual albedo
- Shrublands surface difference are in the high-latitude region, influenced by the snow mask difference
- Wetland surface difference is related to the water mask accuracy

	Band_Name	HighObs_Size	HighObs_Accuracy	HighObs_Precision	HighObs_Uncertainty
0	WSA_Band1_All_Type	4483383	-0.007	0.028	0.029
1	WSA_Band1_Evergreen_Needleleaf_Forests	148163	-0.019	0.033	0.038
2	WSA_Band1_Evergreen_Broadleaf_Forests	297969	-0.007	0.025	0.026
3	WSA_Band1_Deciduous_Needleleaf_Forests	87406	-0.001	0.019	0.019
4	WSA_Band1_Deciduous_Broadleaf_Forests	57865	-0.000	0.019	0.019
5	WSA_Band1_Mixed_Forests	318941	-0.008	0.025	0.026
6	WSA_Band1_Closed_Shrublands	14255	-0.002	0.021	0.021
7	WSA_Band1_Open_Shrublands	580609	-0.014	0.040	0.042
8	WSA_Band1_Woody_Savannas	366565	-0.005	0.024	0.025
9	WSA_Band1_Savannas	431902	0.004	0.014	0.014
10	WSA_Band1_Grasslands	502531	-0.000	0.020	0.020
11	WSA_Band1_Permanent_Wetlands	41602	-0.024	0.041	0.048
12	WSA_Band1_Croplands	528949	-0.003	0.023	0.023
13	WSA_Band1_Urban_and_Built-up_Lands	36104	-0.011	0.029	0.031
14	WSA_Band1_Cropland_Natural_Vegetation_Mosaics	188455	-0.001	0.022	0.022
15	WSA_Band1_Snow_and_Ice	1243	0.013	0.096	0.097
16	WSA_Band1_Barren	844454	-0.013	0.027	0.029
17	WSA_Band1_Water_Bodies	36370	-0.043	0.054	0.069

Vegetation Index and Green Vegetation Fraction

December 2021

Accomplishments / Events:

- Used VIIRS NOAA-20 observations in the period from July 15 of 2020 to July 15 of 2021 to test the most recently delivered GVF v3r0. Used statistical methods and visualization tools to compare GVF v3r0 with the current operational GVF v2r3. The scatterplots and time series analysis verified GVF v3r0 is consistent with the operational GVF v2r3 in NDE.
- A month of GVF v3r0 test data (July 2021) were produced and compared the GVF v2r2 data and found the difference between them is small (RMSE=0.03).
- A virtual poster presentation of GOES-R ABI Vegetation Index was made at the American Geophysical Union meeting.
- Naylah Perodin, the Lapenta intern from last summer, made an AGU poster presentation on GVF validation with PhenoCam data.
- Work on VI validation using Aeronet data was begun. When restricted to highest quality Aeronet and VIIRS data, not enough valid data are available to draw any conclusions. Work will continue with expanded data set.

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:

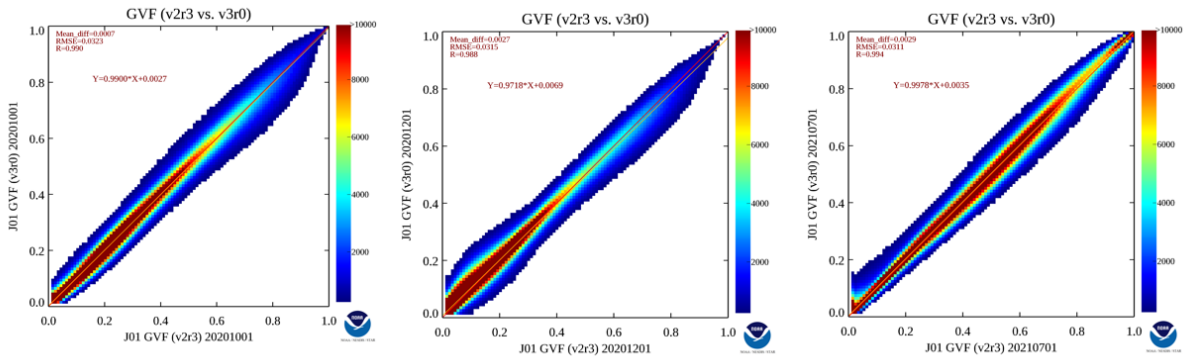
None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/29/21	
Prototype code of 1km global GVF product	Dec-21	Dec-21	Dec-21	
Prototype of VI generation using ABI data	Feb-22	Feb-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Jan-22	Jan-22		
LAI data development plan ready	Mar-22	Mar-22		
Technical readiness of 1km GVF development	May-22	May-22		
Operational support readiness of J2 VI and GVF products	Jun-22	Jun-22		
FY23 Program Management Review	Jun-22	Jun-22		
Ground measurements collection and processing. LAI experimental product preliminary in-situ validation and cross-comparison with other products.	Sep-22	Sep-22		
Calibration/Validation update for SNPP and NOAA20 VI and GVF products	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: Mayr-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights:

- A year of test data of GVF version v3r0 were produced from Jul 1, 2020 to Jul 31, 2021
- GVF v3r0 data were compared with the current operational GVF v2r3

20201001 **20201201** **20210701**

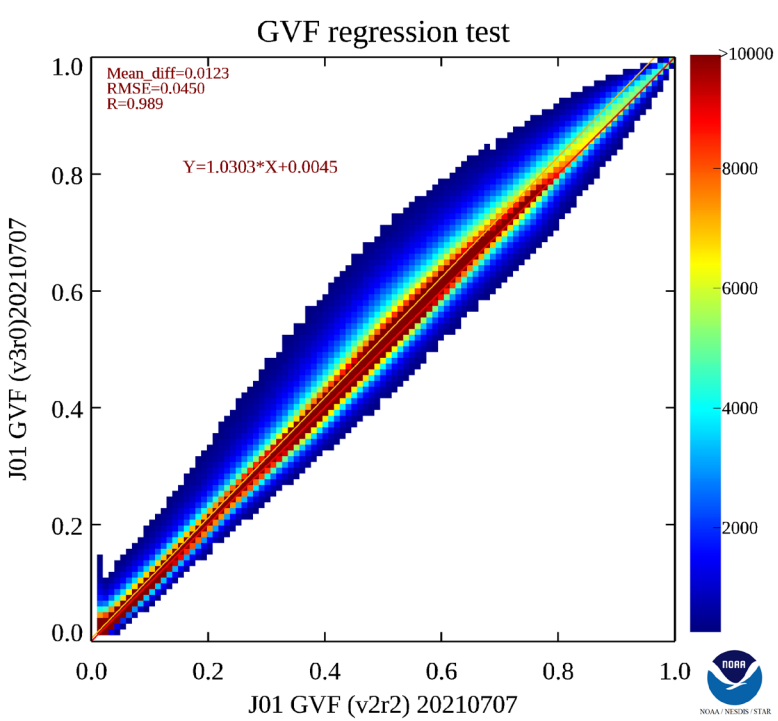


- The difference between v3r0 and v2r3 is small (R=0.99, RMSE=0.03).
- The slope between v2r3 and v3r0 is close to 1 (0.97-0.99)
- The GVF difference comes from the difference in the sequence of cloud filtering and gridding

GVF comparison (v2r2 vs v3r0)

- A month of test data of GVF version v3r0 and GVF version v2r2 were produced from Jul 1, 2021 to Jul 31, 2021 for verification of GVF v3r0

20210707



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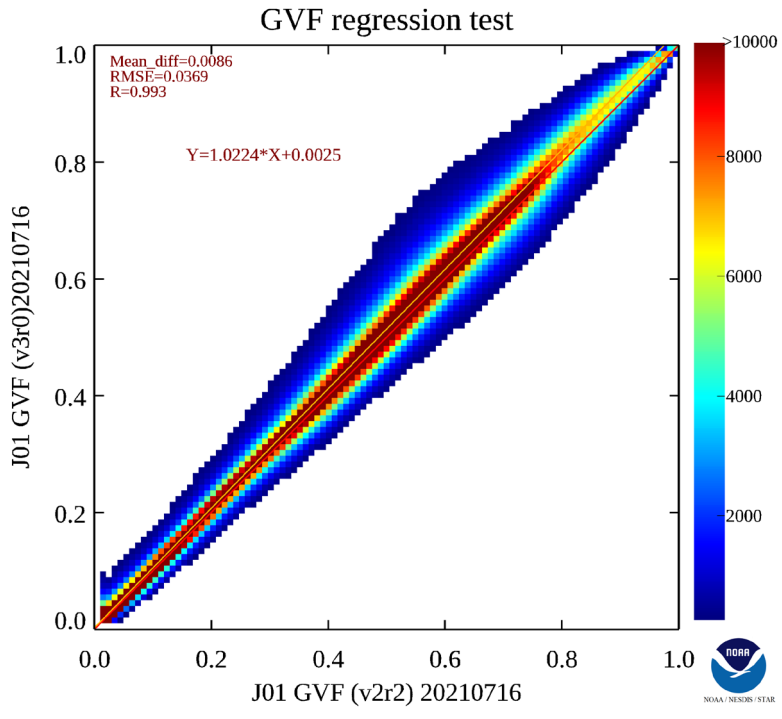

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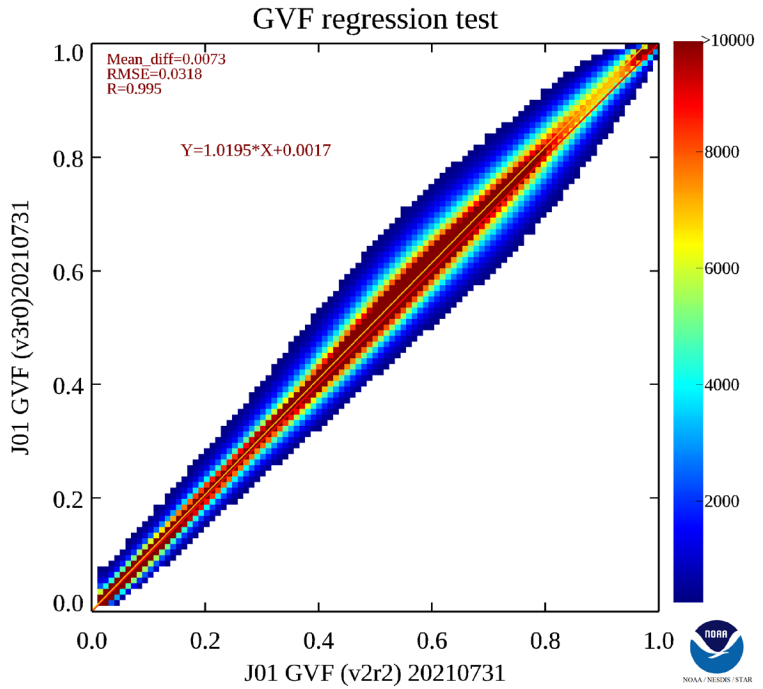
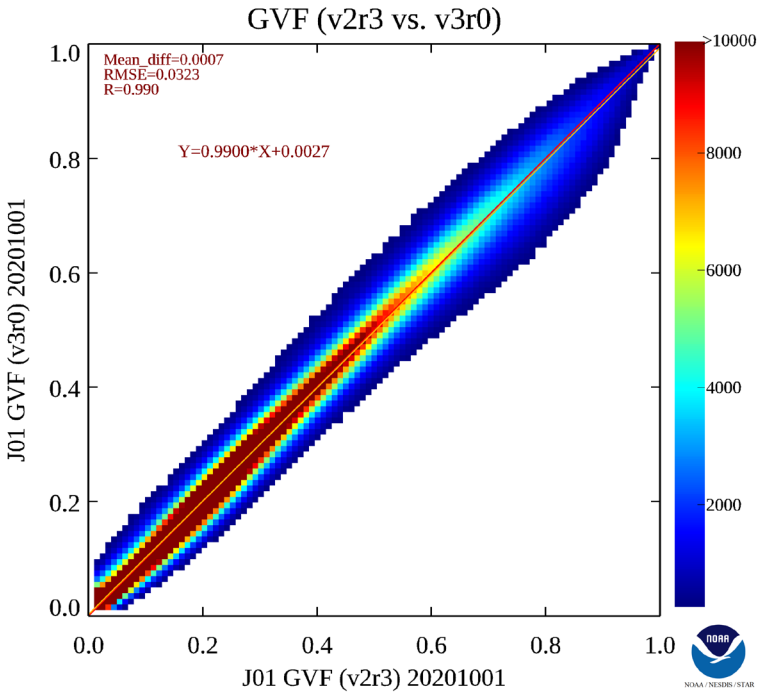


- The difference between v3r0 and v2r2 is small (R=0.99, RMSE=0.03).
- The slope between v2r2 and v3r0 is close to 1 (1.02)
- The GVF difference comes from the difference in the sequence of cloud filtering and gridding

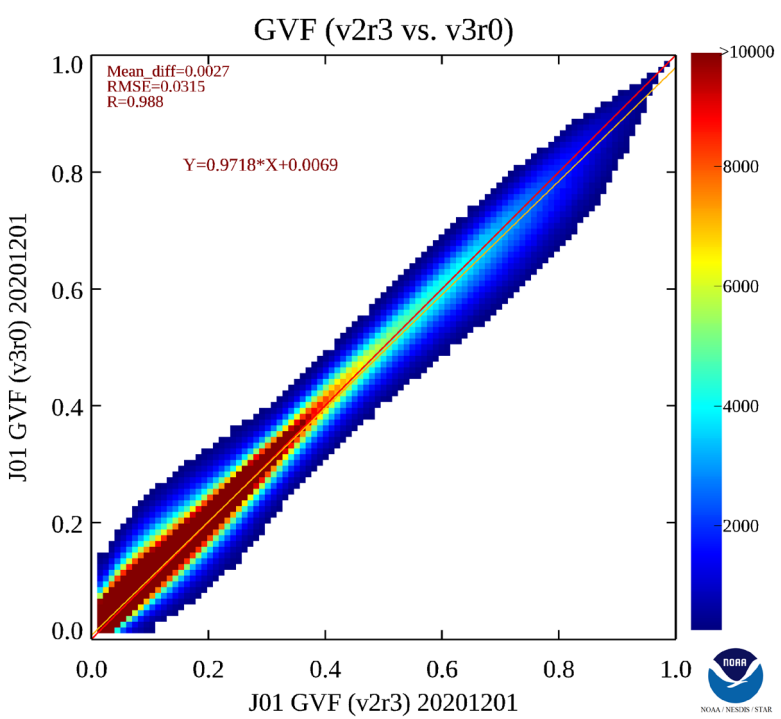
GVF comparison (v2r3 vs v3r0)

- A year of test data of GVF version v3r0 were produced from Jul 1, 2020 to Jul 31, 2021
- GVF v3r0 data were compared with the current operational GVF v2r3

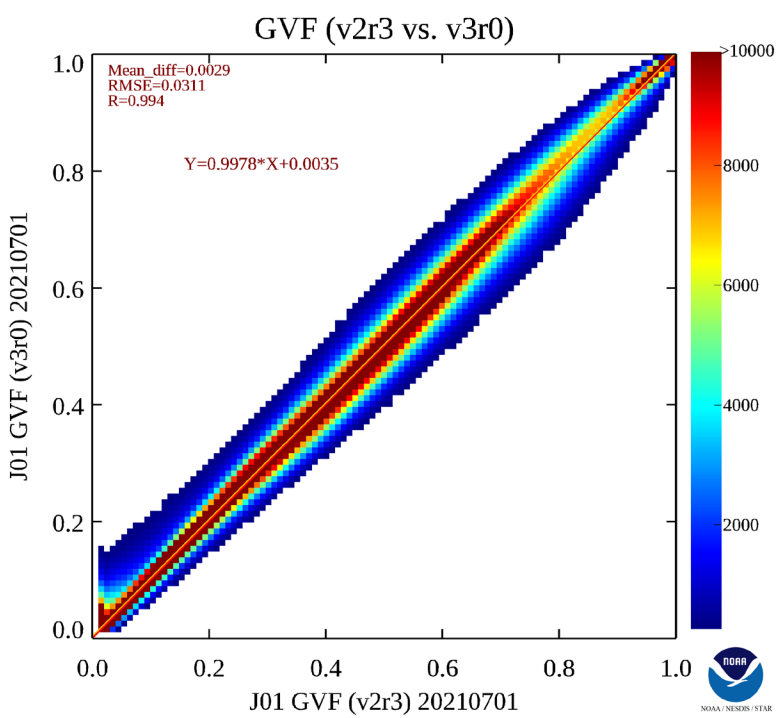
20201001



20201201

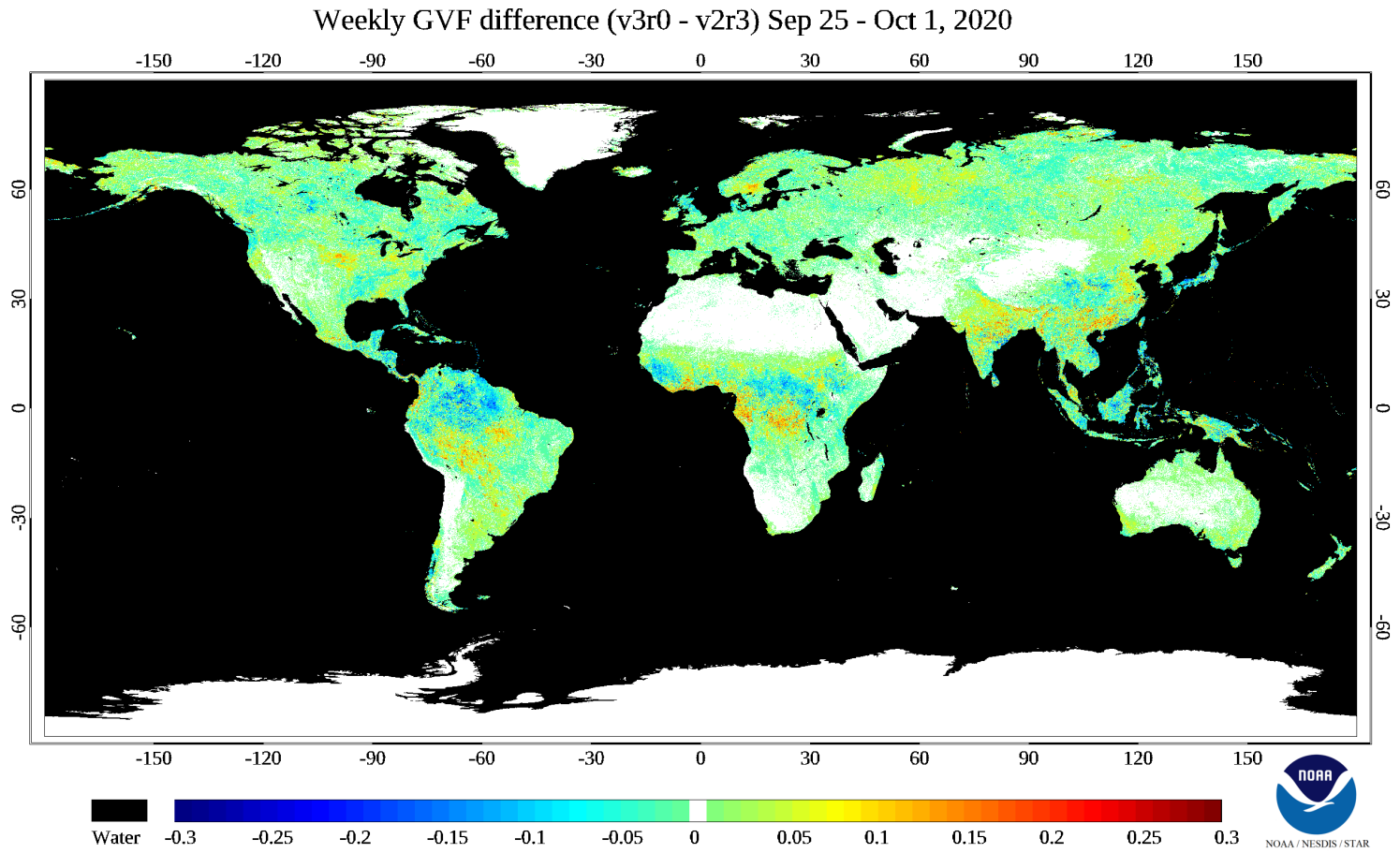


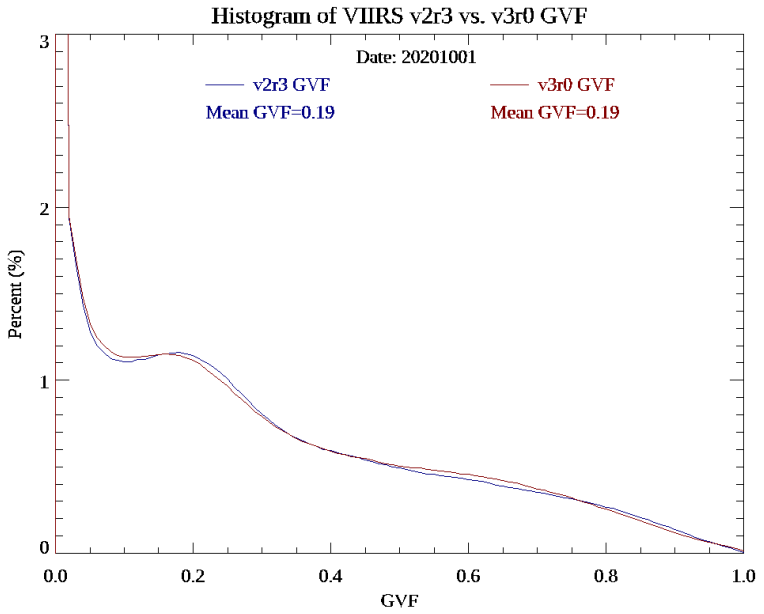
20210701

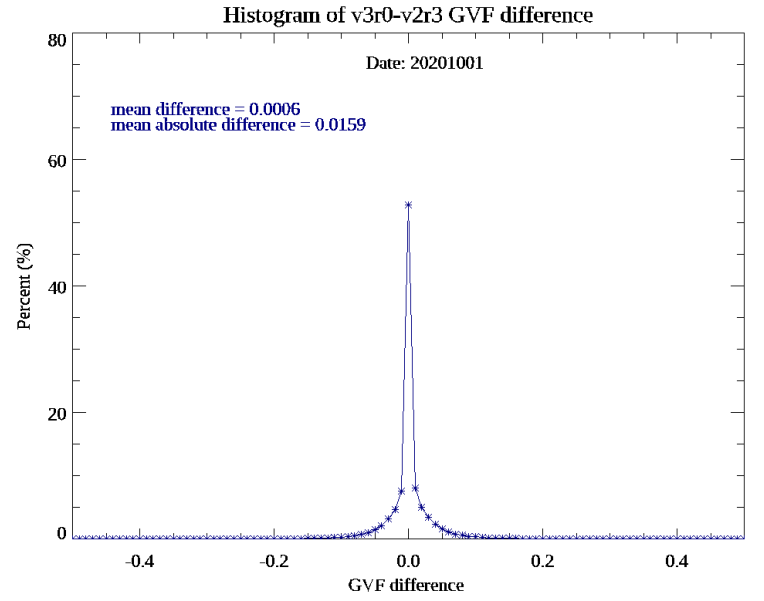


- The difference between v3r0 and v2r3 is small (R=0.99, RMSE=0.03).
- The slope between v2r3 and v3r0 is close to 1 (0.97-0.99)
- The GVF difference comes from the difference in the sequence of cloud filtering and gridding

GVF difference (v3r0 – v2r3)

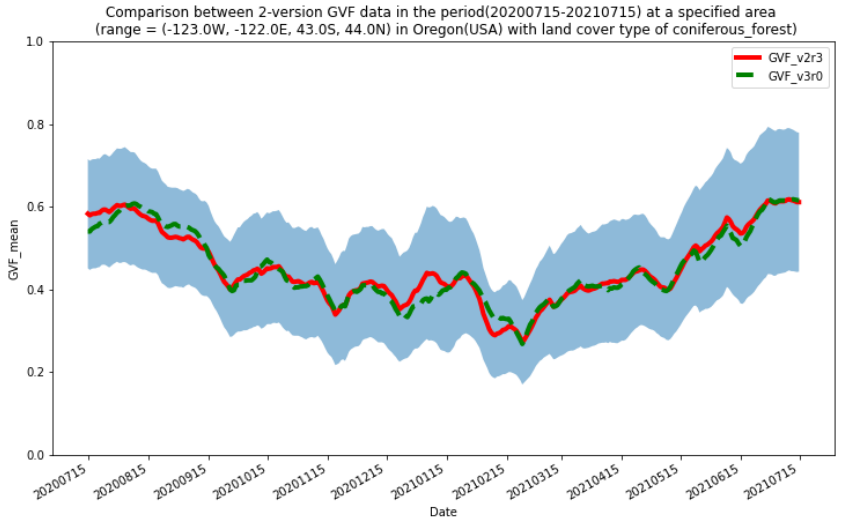


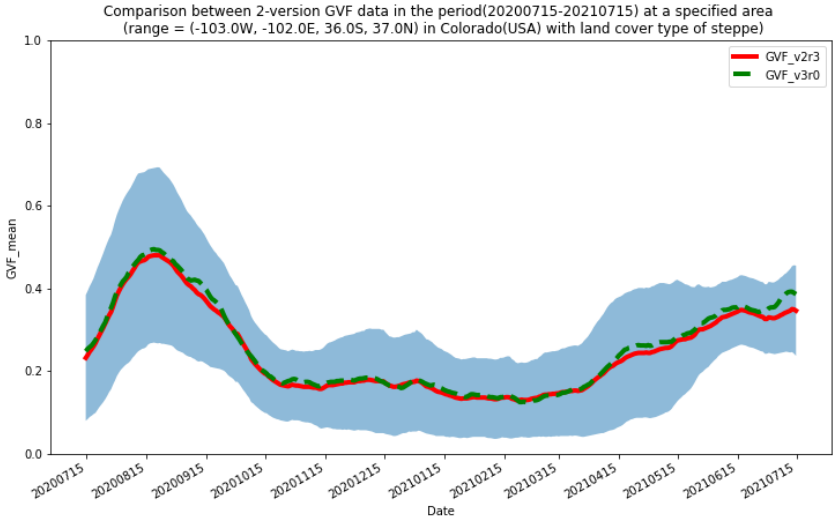


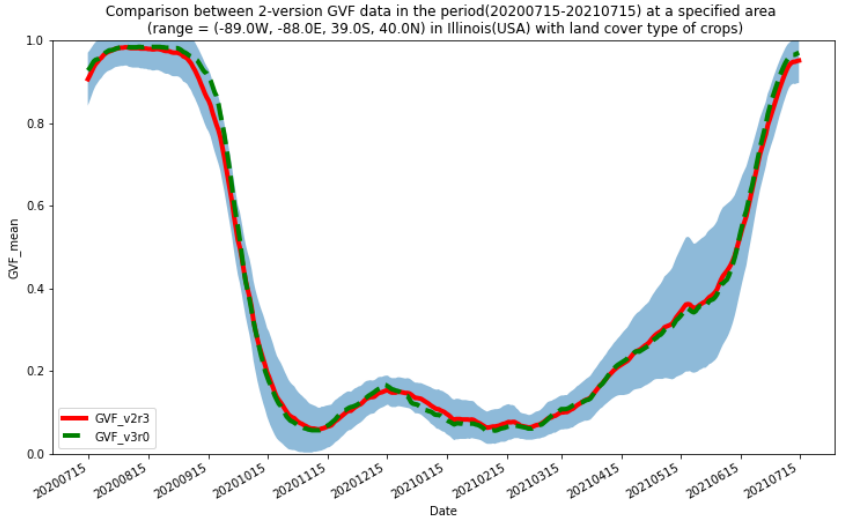


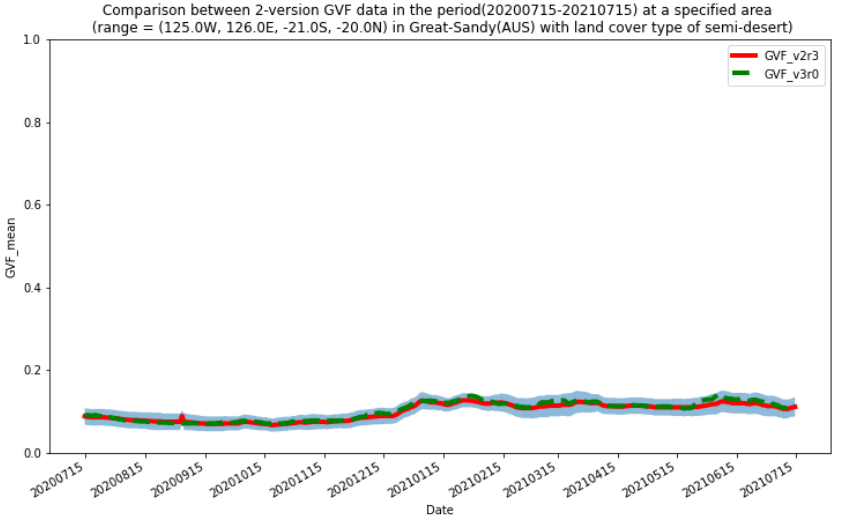
- The GVF difference map showed small difference between the two versions of GVF
- The histograms of the two versions of GVF matched very well
- The GVF difference histogram showed GVF difference within 0.05

Global Weekly GVF from recently delivered DAP v3r0 vs operational GVF v2r3







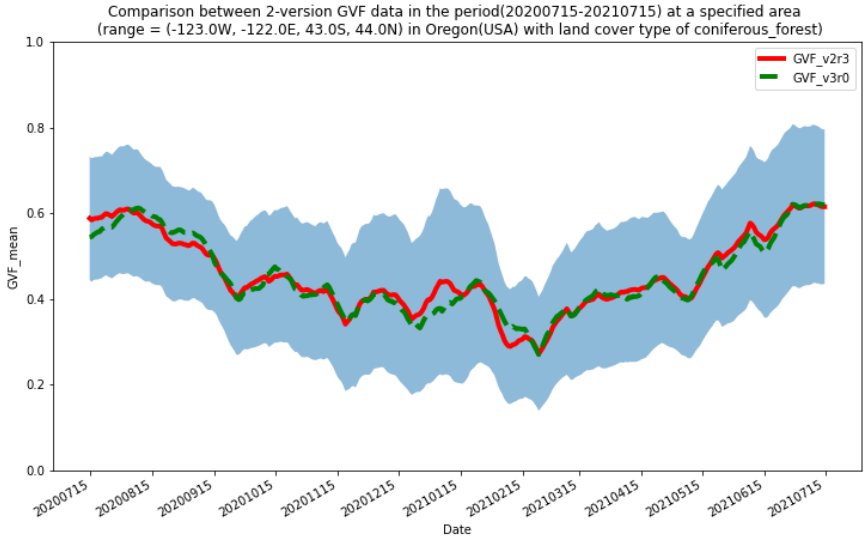


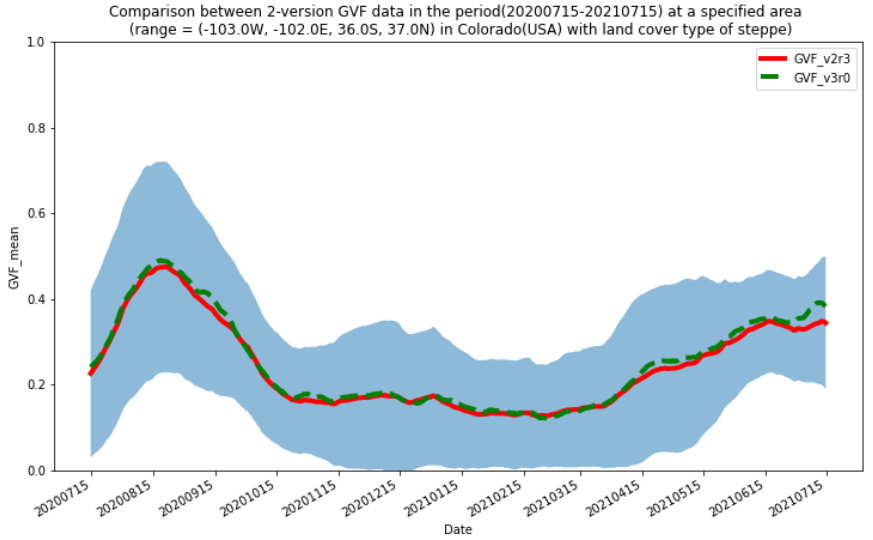
The plots on this slide and the following slide show time series of the mean (lines) and variance (gray area) of v3r0 and v2r3 Green Vegetation Fraction between July 2020 and July 2021, for various regions with different land cover types.

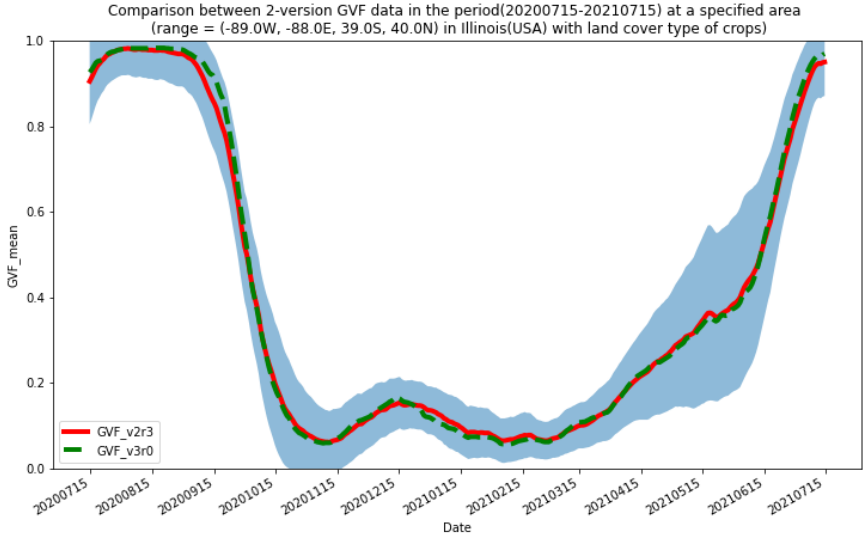
v3r0 is the most recently delivered GVF, while v2r3 is the current operational version.

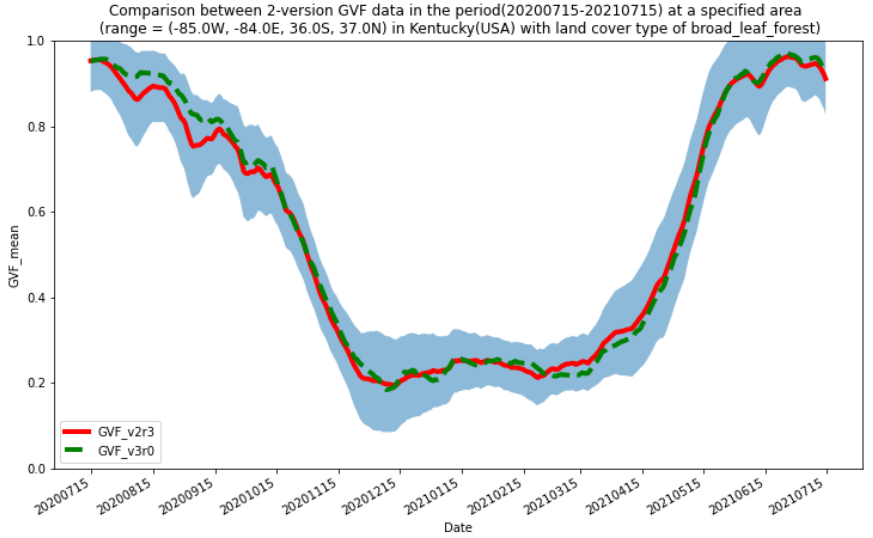
This slide shows the global GVF results, while the next slide shows the regional GVF results. There is good consistency in all cases.

Regional Weekly GVF by recently DAP GVF-v3r0 vs operational GVF v2r3









Vegetation Health

December, 2021

Accomplishments / Events:

- Derived smoothed radiation (SMR) and RCI data from the Breathing Earth System Simulator (BESS) radiation dataset, extracted their time series averaging from whole land and cropland from selected countries, and compared them with SMN/SMT, and VH indices (Highlighted);
- Downloaded crop production and harvest area data; and conducting correlation analysis between RCI and crop yield, similar to those have done for VH and crop yield, still on-going;
- Calculated the admin-averaged SMR and RCI;
- Updated the ATBD of VIIRS VH products;
- Generated a series of data and figures of VIIRS/VHP-1 and -4, -16 km resolution products, covering December 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			

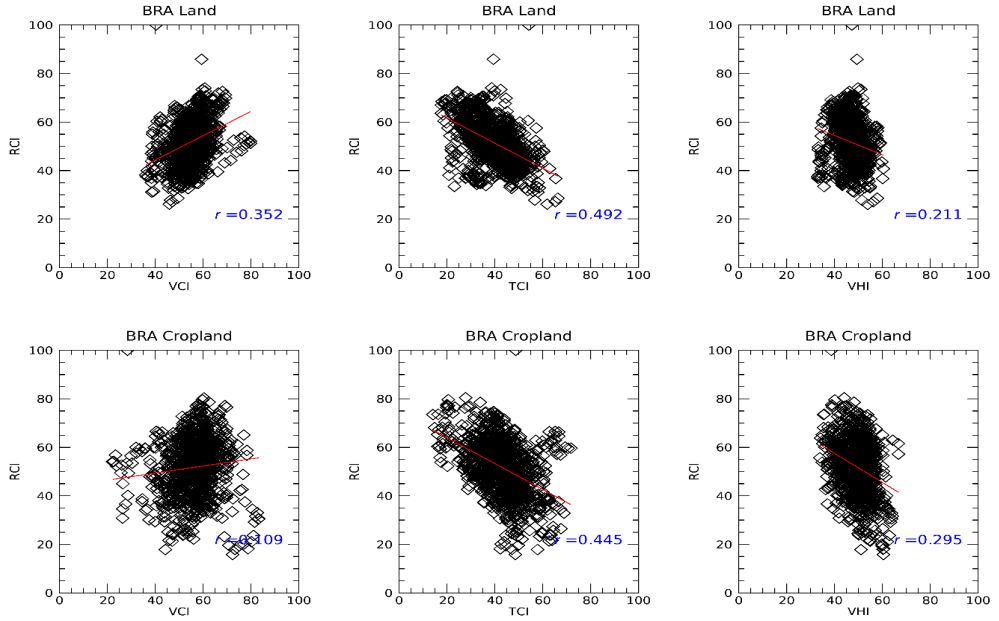
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		Not needed
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates, initial/final DAPs combined)	Dec-21	Dec-21	12/20/21	
Algorithm: VHindices-Malaria (South America)	Sep-22	Sep-22		
VIIRS-0.5 km SMN & SMT (8-year Max-Min Climatology)	Sep-22	Sep-22		
40-year Vegetation Greenness (MDVI) & Global warming	Sep-22	Sep-22		
Climate warming & temperature (SMT) in agricultural regions	Sep-22	Sep-22		
FAO locust activity vs VHindices in 2021	Sep-22	Sep-22		
NDVImax/min & BTmax/min: 0.5 and 1 km correlation	Sep-22	Sep-22		
Regional drought and global warming trends	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: RCI vs VCI/TCI/VHI over Land/Cropland of Brasil



Ocean Color

December, 2021

Accomplishments / Events:

- Radiometric measurements from VIIRS CalVal cruise on NOAA's Gordon Gunter, 19-30 April 2021 (GU21-01) (reported by our Cal/Val collaborator from University of South Florida: David English, Jen Cannizzaro, and Chuanmin Hu)
  - Comparison of reflectance measurements from the white-reference plaques used for above-water measurements during the cruise (NOAA's Labsphere spectralon® plaque and USF's Avian Technologies Fluorilon™ plaque) were consistent with their certified calibrations.
  - Results indicate consistency between above-water and light profiling measurements. More importantly, from their agreement, confidence is gained on both measurements as well as the data reduction technique, from which these field-collected data can be used to evaluate VIIRS Rrs(λ) data products in future efforts.

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
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/01/21	
FY23 Program Management Review	Jun-22	Jun-22		
J2 ready DAP to CoastWatch (include NPP/N20 updates)	Dec-21	Dec-21	10/29/21	cc ASSISTT
J2 ready DAP to ASSISTT (include NPP/N20 updates)	Mar-22	Mar-22		CoastWatch delivery
J2 ready DAP to Cloud (include NPP/N20 updates)	Jun-22	Jun-22		ASSISTT delivery
Support CoastWatch/ASSISTT for J2 OC MSL12 testing/verification, if needed	Sep-22	Sep-22		
J2 OC data processing (MSL12) ready for J2 launch	Sep-22	Sep-22		
Start mission-long VIIRS OC data reprocessing	Mar-22	Mar-22		
Evaluation of MSL12 ver 1.51 performance over global ocean	Sep-22	Sep-22		
Producing consistent VIIRS SNPP and NOAA-20 ocean color products	Sep-22	Sep-22		
Cal/Val team complete the 7th VIIRS ocean color dedicated cruise	Jul-22	Jul-22		
Improvement of the OCView tool or web presentation	Aug-22	Aug-22		
Continue working on improvement of the ocean color data processing system (MSL12), particularly over global coastal and inland water regions	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: Early results from Cal-Val Cruise

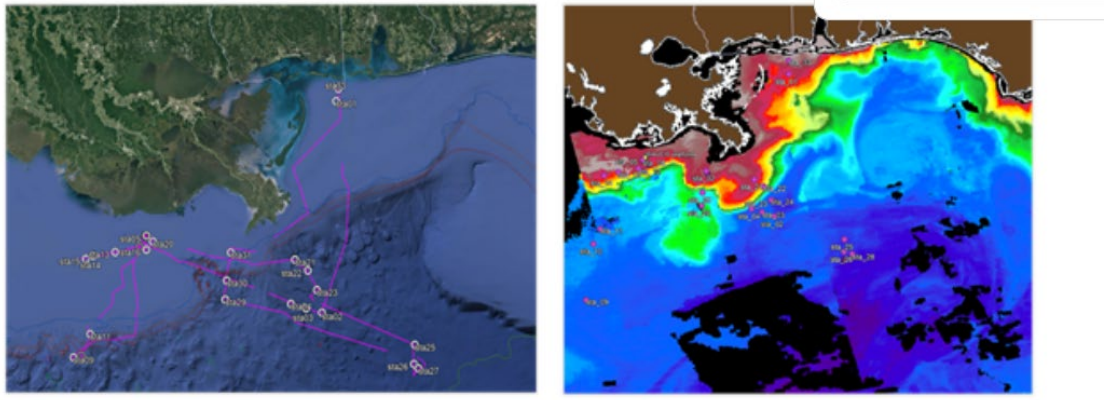


Fig. 1. GU21-01 cruise track and stations, with station number annotated. The image to the right is satellite-derived chlorophyll concentration, where green-yellow-red colors indicate river plume.

Sea Surface Temperature

December, 2021

Accomplishments / Events:

- Monitoring of NPP/N20/L3S-LEO SSTs continues in the NOAA SST Quality Monitor (SQUAM; www.star.nesdis.noaa.gov/socd/sst/squam/) and ACSPO Regional Monitor for SST (ARMS; www.star.nesdis.noaa.gov/socd/sst/arms/). No significant anomalies identified except two 10-min NPP granules on 18 Nov 2021 (1800UTC and 1810UTC) that occurred during the Inclination Adjust Maneuver. The information was communicated to the archives (PO.DAAC) and the bad granules removed from their holdings (see Figure)
- 3rd reprocessing (Reanalysis; RAN3) of VIIRS SST from NPP (1 Feb 2012-on) and N20 (5 Jan 2018-on) continues. PO.DAAC agreed to archive the reprocessed 2.80 data. NCEI-AMS will be populated from PO.DAAC. The plan is to reprocess full time series with 2.80 before it is operational in NDE.
- The 2.80 is J2-ready. It will be initially used to process N21 data, once J2/N21 is launched in Sep 2021. Look-up-table may need to be updated for N21 once sufficient match-up statistics are collected.

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:

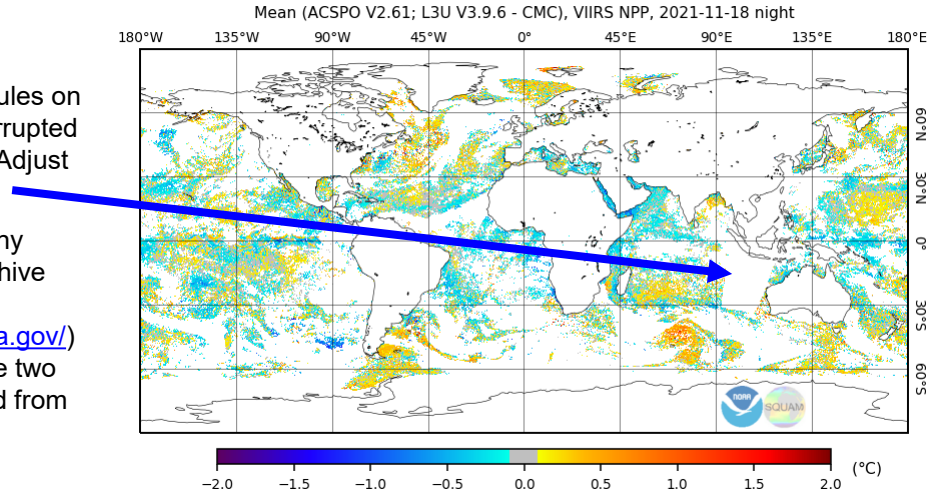
CAC badges of 4 main SST developers were let expired by the STAR Resource Management Division. Two were badged 3 weeks later, and two 6 weeks later. This delays deliverables by at least a month

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (no science code update: initial/final combined)	Dec-21	Dec-21	12/15/21 SPSRB docus (EUM, SMM)	if needed (e.g., update for Intel 19.0.5, filename change, etc)
Continue development of ACSPO 2.90. Improve Clear-Sky Mask & SST Algorithms. Focus on NPP/N20 SST consistency	Aug-22	Aug-22		
Integrate in ACSPO. Test in STAR environment. Include N21 functionalities in NOAA Match-Up code/Monitoring	Aug-22	Aug-22		
Continue NOAA SQUAM and ARMS monitoring & validation against iQuam. Provision for N21 infrastructure	Aug-22	Aug-22		
Maintain ACSPO, SQUAM, iQuam, ARMS, match-up & RAN infrastructure & codes. Improve/optimize/add N21	Sep-22	Sep-22		
Monitor SST performance online. Identify anomalies. Work w/SST Algorithms & SDR Team and archives to address	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights:

Two NPP 10min granules on 18 Nov 2021 were corrupted during the Inclination Adjust Maneuver.

Physical Oceanography Distributed Active Archive Center (PO.DAAC; https://podaac.jpl.nasa.gov/) was contacted and the two bad granules removed from their holdings.



The NOAA SST Quality Monitor (SQUAM; www.star.nesdis.noaa.gov/socd/sst/squam/) proved very efficient at capturing data anomalies, and identifying their extent and root cause. Communication with the archives is well established and which greatly facilitates post-archival QC and making changes to holdings (removing bad data, or their reprocessing and repopulation, if practical).

VIIRS Polar Winds

December, 2021

Accomplishments / Events:

- Improved speed statistics for experimental VIIRS Tandem Winds
  - Generated using rawinsonde data from the NOAA Integrated Radiosonde Global Archive (IGRA)
  - Over the Arctic there were 60347 samples for NOAA-20 and 47522 for NPP. The speed root mean squared (rms) difference is reduced from 4.3 ms-1 (4.4 ms-1) for single-satellite NOAA-20 (NPP) winds to 3.9 ms-1 (4.1 ms-1) for tandem winds. (See Highlight)
  - the overall improvement in the statistics is the positive impact of the time delay between overpasses being reduced from 101 to 50.5 minutes. This allows for better tracking of cloud features in the VIIRS M15 IR band.

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
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/28/21	
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Super DAP v3.1 patch delivery			12/06/21	
Implement VIIRS tandem winds	Mar-22	Mar-22		
Generate new lookup tables, retrieval coefficients for JPSS-2	Sep-22	Sep-22		
Continuous monitoring of S-NPP and NOAA-20 products	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: New wind statistics available for VIIRS Tandem winds

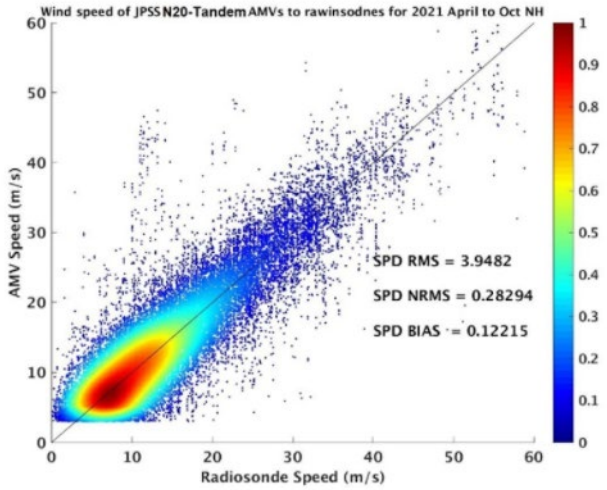


Figure: Density distribution (color bar) for wind speed (m/s), with the N20 VIIRS tandem winds on the vertical axis and rawinsonde winds on the horizontal axis.

NUCAPS Products

December, 2021

Accomplishments / Events

- The NUCAPS team submitted the S-NPP (LW/SW) mini-validation package to the JPSS Program. The JPSS program management lauded these efforts as 'excellent contribution', and recommended to keep the S-NPP(LW/SW) DAP 'Ready to Go but Hold' due to other NDE priorities on JPSS-2 launch readiness.
- The NUCAPS team performed an analysis of the western Kentucky tornado outbrek (December 10, 2021), and the utility of the NUCAPS soundings to confirm atmospheric instability and associated severe storm potential with the presence of a significant mid-tropospheric dry air layer and wet-bulb temperature depressions.
- Two papers co-authored by the NUCAPS team, (1) "Validation and Utility of Satellite Retrievals of Atmospheric Profiles in Detecting and Monitoring Significant Weather Events (Kalluri et al.) , and (2) "Exploration of Future NOAA Infrared Sounder in Geostationary Orbit" (Iturbide et al.) have been accepted for publication in BAMS and IEEE Journal, respectively.
- The NUCAPS team continued preparations for three oral and one poster presentations in the upcoming AMS-2022 (January 23-27) conference; Continued work on the Elsevier reference book on Field Measurements.
- Continued work on the NUCAPS implementation for the NCIS Cloud infrastructure; Continued work on three major updates, (a) averaging kernels, (b) ozone climatology improvements, and (c) surface corrections to the NUCAPS V3.1 for mission long reprocessing.

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			

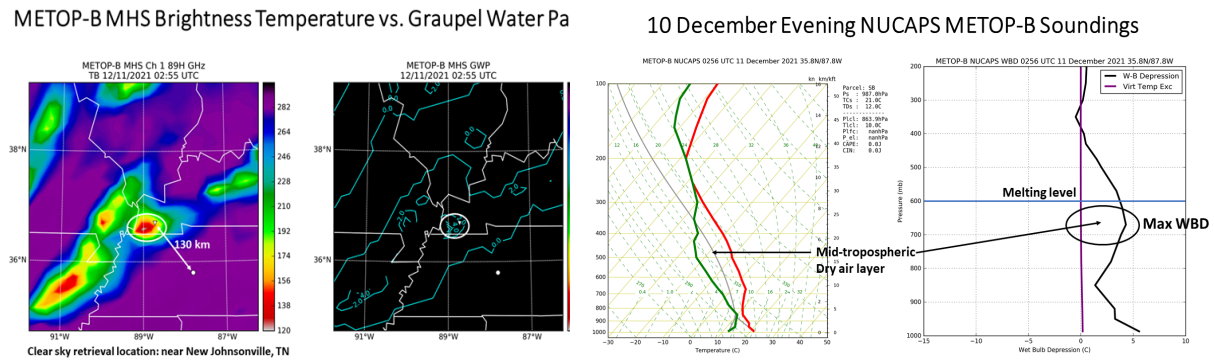
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/10/21	
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Jan-22	Jan-22		
NUCAPS Averaging Kernels (AK) and improved stability indices. S-NPP Mission long reprocessing version (NUCAPS v3.1)	Dec-21	Jan-22		Planned for 1/21/2022
Addition of Ammonia product to NUCAPS operational retrievals (NUCAPS v3.2)	May-22	May-22		
NUCAPS augmentation for EPS-SG (NUCAPS v3.3)	Jul-22	Jul-22		
NUCAPS IR-only retrieval for risk mitigation and conceptual GEO-CrIS retrieval products (NUCAPS v3.4)	Jan-22	Jan-22		
Land, Snow/Ice and Ocean Spectral Emissivity Improvements	Mar-22	Mar-22		
Reactive maintenance and Improvements to surface emissivity first guess using CAMEL, temperature lower-tropospheric bias improvements over land, optimized cloud clearing and Local Angle Corrections (LAC) for S-NPP/NOAA-20 NUCAPS	Sep-22	Sep-22		
NOAA-GML Theme 1: NUCAPS trace gas product validation with corroborative data sets and collaboration with GML and other stakeholders in support of NOAA/NESDIS initiatives	Mar-22	Mar-22		
NOAA-GML Theme 2: NUCAPS ozone and water vapor products validations with CLIMCAPS and O3SNDS, and collaboration with GML and other stakeholders in support of NOAA/NESDIS initiatives	Mar-22	Mar-22		
Routine monitoring of trace gas products, T(p) and q(p) bias improvements	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: *Analysis of western Kentucky tornado outbreak using MetOp-B MHS Sounder and NUCAPS retrievals*



Figure(s) Left: METOP-B Microwave Humidity Sounder (MHS) 89 GHz channel brightness temperature (TB, left) product image compared to a corresponding MHS graupel water path (GWP, right) product image at 0256 UTC December 11, 2021, nearly 30 minutes prior to tornado onset in Mayfield, Kentucky. Right: Comparison of METOP-B NUCAPS vertical sounding profile of temperature and dew point (skew-T, left) to a corresponding vertical profile of wet-bulb temperature depression (WBD, right) at 0256 UTC. Sounding retrieval location is 130 km southeast of Mayfield, over western Tennessee.

MiRS Products

December, 2021

Accomplishments / Events:

- Under JPSS PGRR funding, successfully reprocessed first full year of SNPP ATMS data (December 2011 – December 2012) using latest version (v11.8) of MiRS. No major issues encountered. Time series of convergence, chi-square, and comparisons with GDAS analysis indicate stable performance. 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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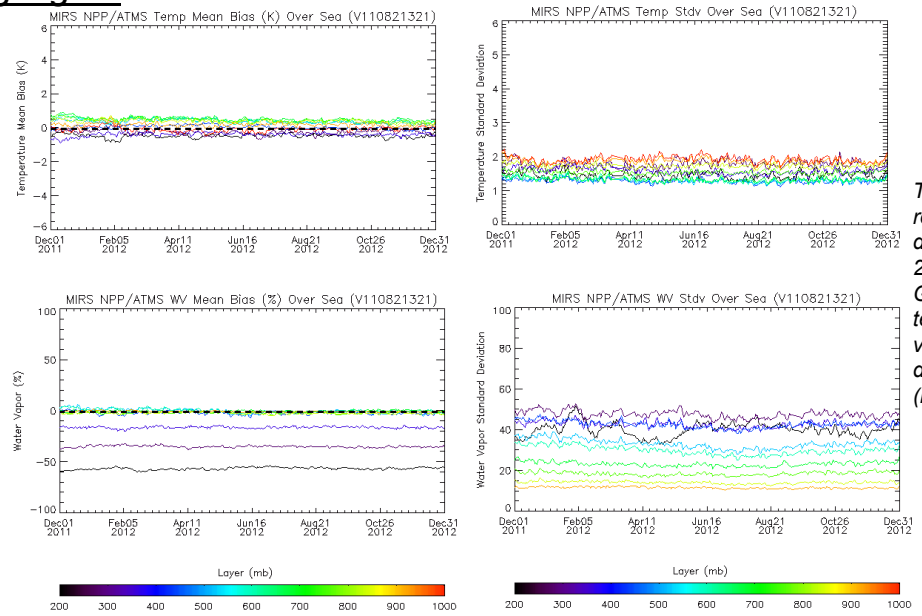
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required
FY23 Program Management Review	Jun-22	Jun-22		
Patch DAP delivery (to ASSISTT)			V11.6 10/19/21 V11.8 10/28/21 V11.8 11/17/21	
MiRS 11.6 Patch Delivery (Patch DAP for MiRS (J1, J2, S-NPP)			12/30/21	To NDE
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Complete collocation and evaluation of experimental MiRS-TC version for one year of Atlantic and Pacific basin TCs in 2020	Jan-22	Jan-22		
Update snow and ice emissivity catalogs (look-up tables) for EPS-SG/MWS to account for polarization differences at 23 and 31 GHz	Apr-22	Apr-22		
Develop AI (post processing) approaches to precipitation retrieval in MiRS, leveraging the collocated MiRS-MRMS datasets for training and validation	Jun-22	Jun-22		
MiRS DAP (v11.9 or v11.10): integrate SFR algorithm updates, code/science improvements, final pre-J2 launch delivery	Jul-22	Jul-22		
Begin reprocessing entire JPSS mission data for both SNPP and N20 using latest version of MiRS. Complete reprocessing for SNPP for the period 2011-2015	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe; May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights:



Time series of MiRS v11.8 reprocessed SNPP/ATMS data for Dec 2011 – Dec 2012. Comparisons with GDAS analyses shown for temperature (top) and water vapor (bottom) bias (left) and difference standard deviation (right).

Snowfall Rate

December, 2021

Accomplishments / Events:

- Implemented the XGB machine learning snowfall detection (SD) algorithms for CONUS and Alaska in the direct broadcast data-based SFR processing system maintained by CISESS.
- Studying XGB misclassification cases to improve the algorithms for global applications
- Meng gave a seminar about the SFR and the radar-satellite merged mSFR products in the Winter Weather Experiment seminar series organized by the Weather Prediction Center (WPC) Hydrometeorology Testbed (HMT).

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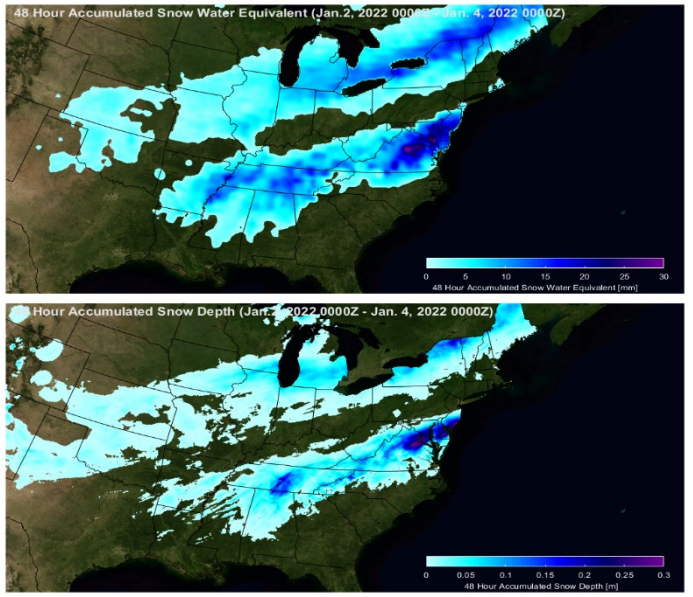
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
Final J2 ready DAP to NDE (include NPP/N20 updates)	Feb-22	Feb-22		
Patch DAP delivery (to ASSISTT)			V11.6 10/19/21 V11.8 10/28/21 V11.8 11/17/21	
MiRS 11.6 Patch Delivery (Patch DAP for MiRS (J1, J2, S-NPP)			12/30/21	To NDE
FY23 Program Management Review	Jun-22	Jun-22		
Develop NOAA-20 ML Snowfall Detection model. Improve SFR algorithm through ML	Jun-22	Jun-22		
NOAA-20 and S-NPP cross-calibration & comparison after algorithm update	Aug-22	Aug-22		
NOAA-20 and S-NPP stratified validation after algorithm update	Aug-22	Aug-22		
SFR near real-time webpage, operational monitoring	Sep-22	Sep-22		
Implement ML ATMS SD in the Enterprise SFR system	Sep-22	Sep-22		
Deliver ATMS SFR with ML SD to MiRS	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: SFR Captures the First Nor'easter of Winter 2021-2022



SFR performed well during the first nor'easter of the season on January 2-4, 2022. (Top) SFR 48-hour snowfall accumulation (liquid equivalent in mm); (bottom) NWS SNOWDAS snowfall analysis 48-hour accumulated snow depth (m); both ending at January 4, 2022 00UTC.

OMPS Ozone (V8Pro, V2Limb & V8TOz)

December, 2021

Accomplishments / Events:

- Final J2 ready DAP to NDE V8Pro 95% complete
- Updated Cal/Val plan to include tasks for J2 OMPS LP Cal/Val and associated JCT tests

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

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/26/21	
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates), V8TOz	Jan-22	Jan-22		
Final J2 ready DAP to NDE (include NPP/N20 updates), V8Pro	Mar-22	Mar-22		To ASSISTT: Feb-22
Revise Cal/Val Plan to include JPSS-2 Limb and draft schedule	Dec-21	Dec-21	12/09/21	
Update Versin 2.5Limb, three improved Climatologies, Cloud Top, Repaired	Jan-22	Jan-22		
Version 2.7 Limb Profile SDR and EDR (include J2 LP)	Sep-22	Sep-22		To ASSISTT: Apr-22
J2 Radiative Transfer & Bandpass Tables for V8Pro and V8TOz	Sep-22	Sep-22		
Soft calibration adjustments and reprocessing for V8Pro & V8TOz	Nov-21 May-22	Nov-21 May-22	11/26/21 (TC)	Nov-21 N20 May-22 NPP
Limb Darks and Orbital Definition files: Weekly ancillary file deliveries to PDA / NDE	Sep-22	Sep-22		ongoing
Overpass data sets and comparisons to GB and MERRA2	Sep-22	Sep-22		ongoing
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		As Needed
Participant/support JPSS-2 pre-launch testing events (Mar-22 & Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: Preparing for J2 OMPS-LP Calibration/Validation

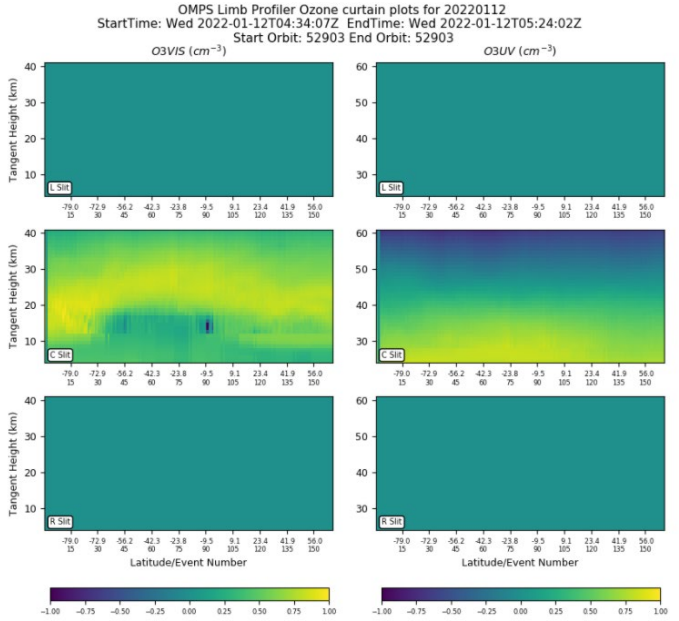


Figure: OMPS-LP EDR curtain plots from S-NPP, single orbit showing (top to bottom) Left, Center, Right slit measurements from VIS (left) and UV (right). X-Axis is latitude, Y-Axis is tangent height.

GCOM-W1 Products

December, 2021

Accomplishments / Events:

- V. Petkovic presented "A decade of GCOM-W1 AMSR2 rainfall record at NOAA," at the 2021 AGU Fall Meeting (see highlight)
- Finalizing AMSR3 Cal/Val Plan

Overall Status:

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

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

Issues/Risks:

None

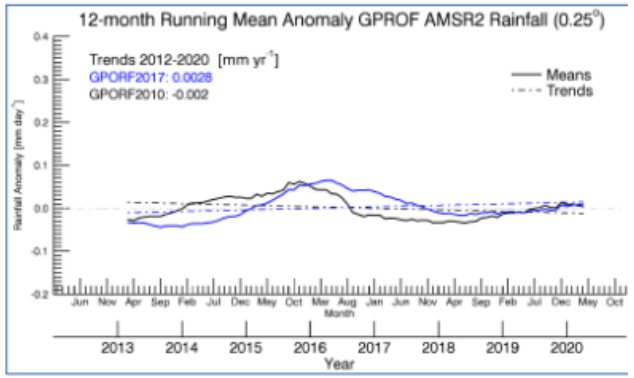
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
AMSR-3 Cal/Val Plan - draft delivery	Jan-21	Jan-22		
AMSR-3 Cal/Val Plan - final delivery	Jun-22	Jun-22		
AMSR-3 ready DAP to ASSISTT (include AMSR-2 updates)	Jun-22	Jun-22		
AMSR-3 ready DAP to NDE (include AMSR-2 updates)	Sep-22	Sep-22		
Algorithm Updates Review	Sep-22	Sep-22		
Assessment of new algorithms for enterprise algorithms for both AMSR2 and AMSR3	Jun-22	Jun-22		
Reprocessing of L2 EDR's (Full L2 products from launch through July 2022)	Jul-22	Jul-22		
Continue AMSR2 L1 monitoring; develop AMSR3 capabilities	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		

Highlights:

GCOM-W1 AMSR-2 Precipitation EDR

V. Petkovic, M. Arulraj, H. Meng

- Re-processing of AMSR2 rainfall EDR using the new algorithm version (GPROF2017) is performed at CISESS. 90% of AMSR2 record is successfully re-processed.
  Figure: rainfall anomaly and trend timelines for the current (GPORF2010v3) and the new version.
- As a part of the effort to complete re-processing, scripts have been developed to recover for corrupted level1b and ancillary data archives (archive has been corrupted by disk failures in late October).
- Future:
  - Complete the recovery of the remaining 10% of corrupted archive and complete re-processing
  - Set an on-demand limited near real-time production of rainfall product in CISESS computational environment



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

December, 2021

Accomplishments / Events:

- Participated in (virtual) the Global Energy and Water Exchanges (GEWEX) Global Water Vapor (GVAP) Working Group (WG) on December 7th and 9th. Exchanged information regarding instantaneous observations of satellite moisture products collocated with GCOS Reference Upper Air Network (GRUAN) radiosonde observations.
  - Sounding product suites of interest include NUCAPS (NOAA), MiRS (NOAA), AIRS (NASA-EOS) and EUMETSAT operational sounding products from hyper-spectral infra-red (IR) and/or advanced microwave (MW) sounders.
  - Report describing findings anticipated in June 2022
- Analyzed case studies of NOAA Unique Combined Atmospheric Product System (NUCAPS) performance during an extended period of numerous (and historic) flash flood thunderstorms in the southwest desert regions of Arizona, Nevada and New Mexico. (see highlight)

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.*
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
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Maintain / expand existing EDR LTM web pages and JSTAR Mapper web site	Aug-22	Aug-22		
Maintain /expand NPROVS and support NUCAPS / MiRS EDR assessments for NPP, NOAA-20, JPSS-2 and MetOp-A,B,C; GNSS NESDIS-COSMIC-2	Aug-22	Aug-22		
Manage JPSS dedicated Radiosonde program (DOE-ARM), EDR/Raob collocations (Special), expand to store SDR (GSICS / GRUAN; 75TB)	Aug-22	Aug-22		
Support JPSS AWIPS (NUCAPS) and Hydrological (MiRS) Iniatives and Case Studies	Aug-22	Aug-22		

Highlight: NUCAPS sounding type analysis for flash flood events

Example of NOAA-20 VIIRS cloud imagery (upper) and associated NOAA-20 soundings for afternoon overpass corresponding to numerous flash flood thunderstorms over the southwest US on July 27. The lower panel shows the NUCAPS sounding types with blue indicating hyperspectral infrared retrievals, yellow indicating Microwave-only retrievals (predominantly cloudy regions) and red showing contaminated soundings. Good agreement between the independent VIIRS cloud imagery and NUCAPS retrieval type is seen with ample areas of infrared retrieval useful for projecting regional flash flood storm alerts to the public.