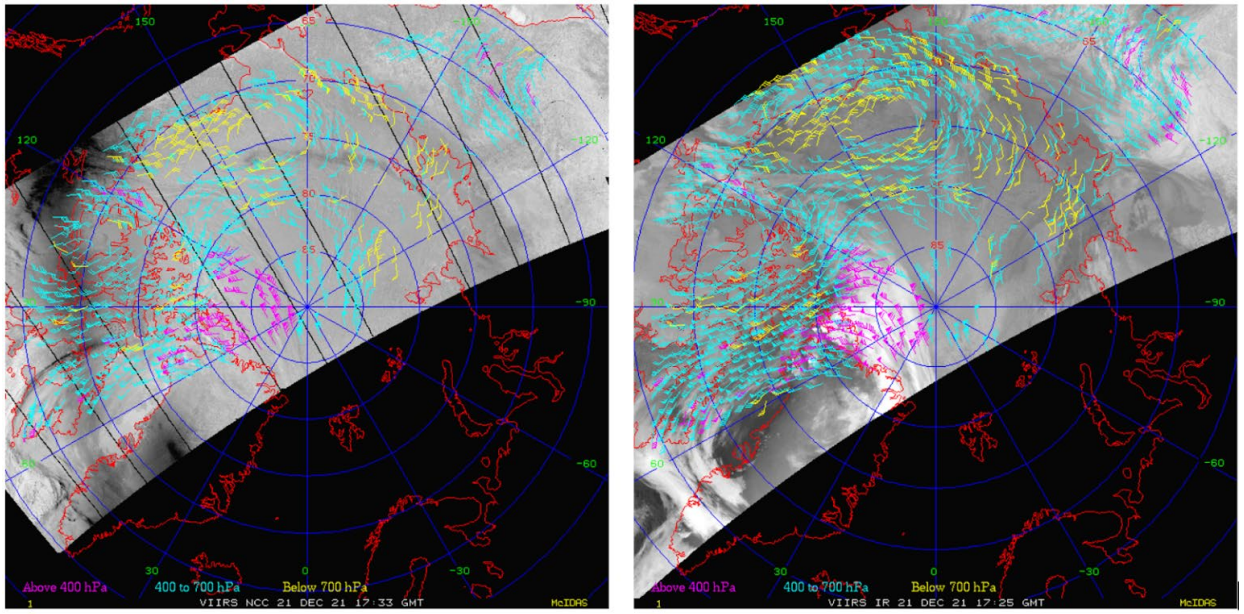
AMP/STAR FY22 TTA

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

May, 2022

Highlights from the Science Teams (April)

JPSS Day Night Band Winds Comparable to IR or better



Left (Right) are DNB (IR) SNPP VIIRS AMVs for 21-Dec 17:30 UTC.

Since 1 June 2021, the polar winds team at CIMSS has generated JPSS VIIRS S-NPP DNB Atmospheric Motion Vectors (AMV) routinely with the heritage (not Enterprise) algorithm, providing cloud motion winds over both the Arctic and Antarctic in near real-time. This product uses the Near-Constant Contrast (NCC) Level-2 product.

The results show that IR winds have better statistics at middle and upper layers. Noteworthy is the much-improved statistics at low levels of the DNB product compared to IR. It is observed that the Vector Normalized RMS is reduced by 11%, with vector accuracy and speed RMS reduced by roughly 0.3 m s^{-1} and precision improved by nearly 0.9 m s^{-1}.

Highlights from the Science Teams (April)

Aerosols team creates PM 2.5 climatology for SNPP era

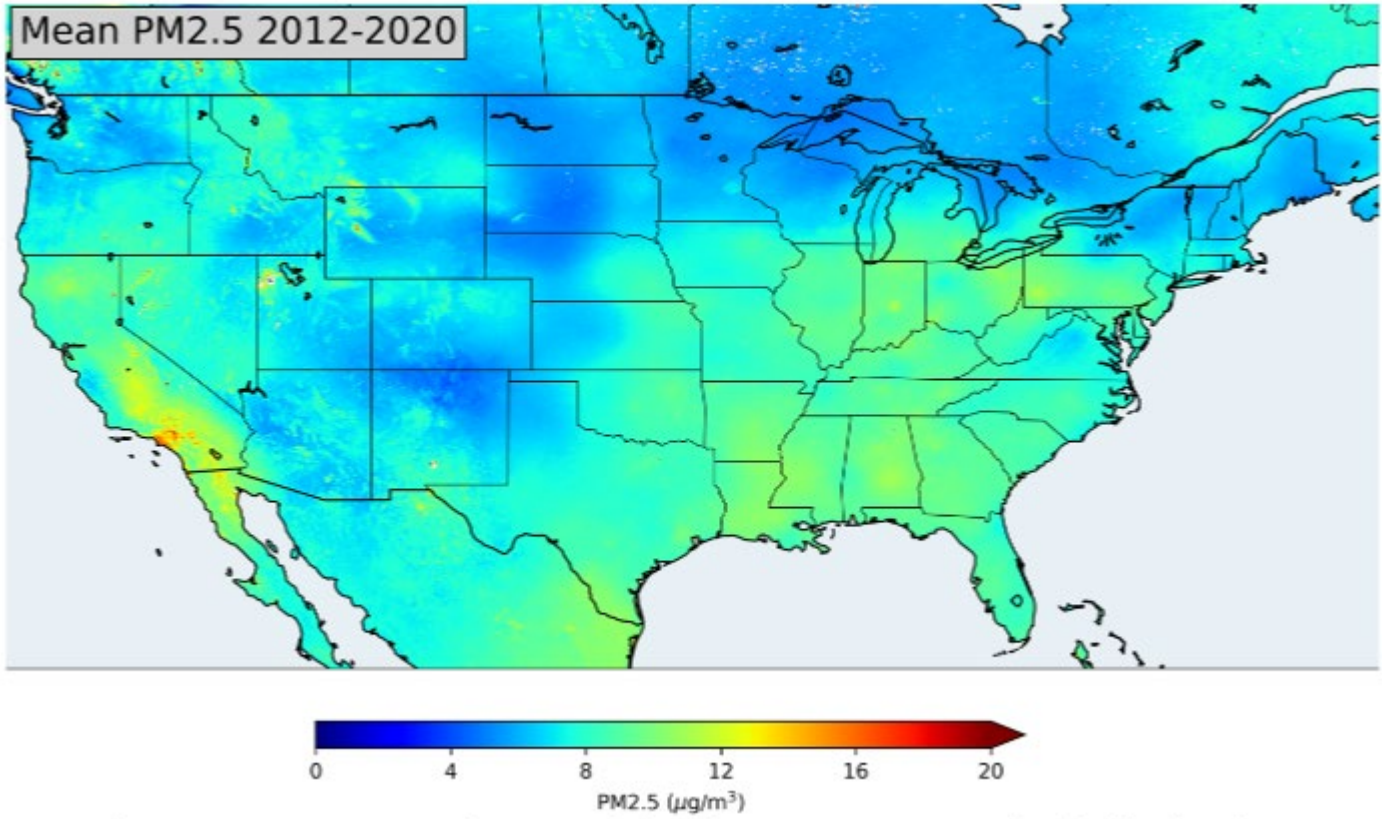


Figure. The mean PM2.5 values for the US and shows large swaths of the western US with PM2.5 concentrations greater than the EPA standard (12 μg/m^3). These products are valuable to state and local governments to use in justifying PM2.5 standard violations associated with natural events.

As part of NOAA-wide COVID-19 research activities, STAR aerosol team reprocessed nine years of Suomi NPP aerosol optical depth product on the Amazon Web Services Cloud. The reprocessed aerosol optical depth data were used as input to a Geographically Weighted Regression (GWR) algorithm to generate surface PM2.5 values. Surface PM2.5 (mass in μg/m^3 of particles smaller than 2.5 μm in median diameter) are harmful to human health and is designated as a criteria pollutant by the United States Environmental Protection Agency (US EPA).

Accomplishments

- Delivery Algorithm Packages (DAPs) - Mission Unique Products:
  - 4/04/2022 STAR delivered VIIRS code change package (ADR9903/CCR5939, VIIRS SDR Not Produced as Expected for Defective Data Packets) to DPMS. *List of changed code files*: ProCmnViirsPacketInfo.h, ViirsAppPacket.h, ViirsHrdAppPacket.h, ProViirsVerifiedRDRConverter.cpp, ViirsHrdAppPacket.cpp
  - 4/27/2022 STAR re-delivered VIIRS DAP (ADR9903/CCR5939) to DPMS (the new delivery includes a J01 case)
- DAPs – Enterprise Products:
  - 4/07/2022: STAR delivered VIIRS Offline LSA DAP to NDE (J2 update for Offline LSA)
    Changes: Snow/Snow-free observations separation in offline temporal filtering; updated climatology files
  - 4/08/2022: STAR delivered J2 HEAP (algorithm version: v3r0, DAP version: v4r0) final DAP to NDE (maintenance delivery for NPP and N20)
    Changes: compiling the code now uses the ASSISTT build scripts
  - 4/08/2022: STAR delivered J2 NVPS (v2r2) final DAP (VI & GVF, data only) to NDE (code & documentation packages delivered on 3/29/2022)
  - 4/14/2022: STAR delivered updated test cases for the J2 MiRS final DAP (v11.8, with valid SFR output) to NDE (DAP was delivered on 3/31/2022)
  - 4/15/2022 Ozone team provided OMPS LP J2 Cal/Val timeline
  - 4/25/2022 STAR delivered VIIRS Offline LSE DAP to NDE (maintenance delivery for J1/NPP and a final delivery for J2)
    Changes: New build scripts for using GCC 8.3 compiler; support longer path names; J2 compatibility
  - 4/26/2022 STAR delivered VIIRS ACSPO SST (v2.80) patch DAP to NDE (to resolves the issue of processing ACSPO SST for VIIRS over the Great Lakes region)
  - 4/29/2022 NUCAPS team delivered NUCAPS Averaging Kernels code package to ASSISTT team
    1. averaging kernel related source code (new sub-directory "averaging_kernel")
    2. code & script & template changes/updates for Averaging Kernels processing
    3. test example (one test focus day, 20210720)
  - 5/04/2022 STAR delivered J2 Final DAP for V8TOz (OMPS TC) to CSPP
  - 5/13/2022 STAR delivered VIIRS Gridded Land DAP to NDE (final delivery for NOAA-21 and a maintenance delivery for NOAA-20 and NPP)
    Changes: new LUT for LSA; new view angle variables for LST (daytime/nighttime); changed intermediate output files in NetCDF format (instead of Binary); updated gridding tool to read/write intermediate NetCDF files; updated code to be able to handle longer file paths

Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	04/06/22, 04/12/22, 04/19/22, 04/26/22, 05/03/22, 05/10/22
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	04/06/22, 04/12/22, 04/19/22, 04/26/22, 05/03/22, 05/10/22
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	04/12/22, 04/26/22, 05/10/22
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	04/06/22, 04/19/22, 05/03/22
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	04/06/22, 05/04/22
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	04/06/22, 05/04/22

- Transition of the reprocessed SDRs to CLASS/NCEI:
  - The transition of the reprocessed SNPP VIIRS started on March 15, 2022
  - The reprocessed SNPP VIIRS SDR data from 1/2/2012 to 9/19/2012 (135.28T, 8.28% of total) has been completed as of April 30, 2022
  - It's expected that the VIIRS data transition will complete in October, 2023
- IDPS Builds Checkouts / JPSS-2 Pre-Launch Testing events:
  - 5/04/2022 OMPS SDR team provided review/checkout report for JCT3-AMB DSE part2 (OMPS Science RDRs Not Timeshifted)
  - 5/11/2022: STAR teams start check the J2 data files from JCT3-TVAC Segment 1 testing (IDPS J2 RDRs/SDRs/Imagery-EDRs from GRAVITE, and NDE J2 EDRs from PDA-I&T). JSTAR submitted summary report on 5/15/2022
    - 5/11/2022 VIIRS, and OMPS teams submitted initial report
    - 5/12/2022 SST team submitted report
    - 5/13/2022 OMPS Ozone, AOD, ADP, MiRS, and NUCAPS teams submitted report
  - Block 2.3 Mx7 SOL STAR review/checkout:
    - 5/11/2022 VIIRS SDR team submitted review/checkout report
    - 5/13/2022 VIIRS SDR team submitted revised report (IDPS reprocessed geolocation using the spacecraft diary data)

Upcoming Milestones/Deliveries

- JSTAR Code/LUT/Product Deliveries:

  DAP to DPMS:
  - Jun-22: Final launch-ready JPSS-2 PCT/MM-coef DAP (ATMS & CrIS)
  - Jun-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:
  - May-22: Final J2 OMPS Ozone V8Pro DAP
  - May-22: Final J2 Super DAP (Clouds, Aerosol, Volcanic Ash, Cryosphere, VPW, LST, LSA)
  - Jun-22: J2-ready OMPS LP DAP
  - 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	Jun-22	Jun-22	**Pre-dynamic MM: 03/08/22**	**02/25/22 to ASSISTT**
Final launch-ready JPSS-2 CrIS PCT/MM-coef DAP	Jun-22	Jun-22	**Pre-dynamic MM: 03/11/22**	**03/07/22 to ASSISTT**
Final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP	Jun-22	Jun-22	**Pre-dynamic MM: 02/24/22**	**02/18/22 to ASSISTT**
Final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP	Jun-22	Jun-22	**Pre-dynamic MM: 03/08/22**	**03/02/22 to ASSISTT**
Final J2 ready Super DAP (include NPP/N20 updates), Clouds/Aerosol/VolcanicAsh/Cryosphere/LST/LSA/VPW	Mar-22	May-22	**12/06/21 v3.1 patch** **02/24/22 XML cnf file to NDE**	
Final J2 ready Active Fires DAP (include NPP/N20 updates, I-Band)	Mar-22	Mar-22	03/17/22	
Surface Reflectance: Final J2 ready DAP	Oct-21	Oct-21	10/07/21 02/02/22 (patch DAP)	
NVPS (VI & GVF): Final J2 ready DAP	Mar-22	Mar-22	03/29/22 (code & docs) 04/08/22 data only	
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	Mar-22	Mar-22	04/08/22	
MiRS & SFR: Final J2 ready DAP	Mar-22	Mar-22	03/31/22	12/30/21 v11.6 patch
OMPS Ozone V8Pro: Final J2 ready DAP	Mar-22	May-22		**02/17/22 to ASSISTT**
OMPS Ozone V8TOz: Final J2 ready DAP	Jan-22	Jan-22	02/03/22 V8TOZ: v4r2; V8TOS: v5r0	11/26/21 to ASSISTT
L3 Global Gridded LST/LSA (J2 DAP)	Mar-22	May-22	12/30/21 Prelim J2 DAP 05/13/22 Final J2 DAP	
Reformatting Toolkit	Mar-22	May-22		
AMSR-3 ready DAP (include AMSR-2 updates)	Sep-22	FY23		NCCF schedule

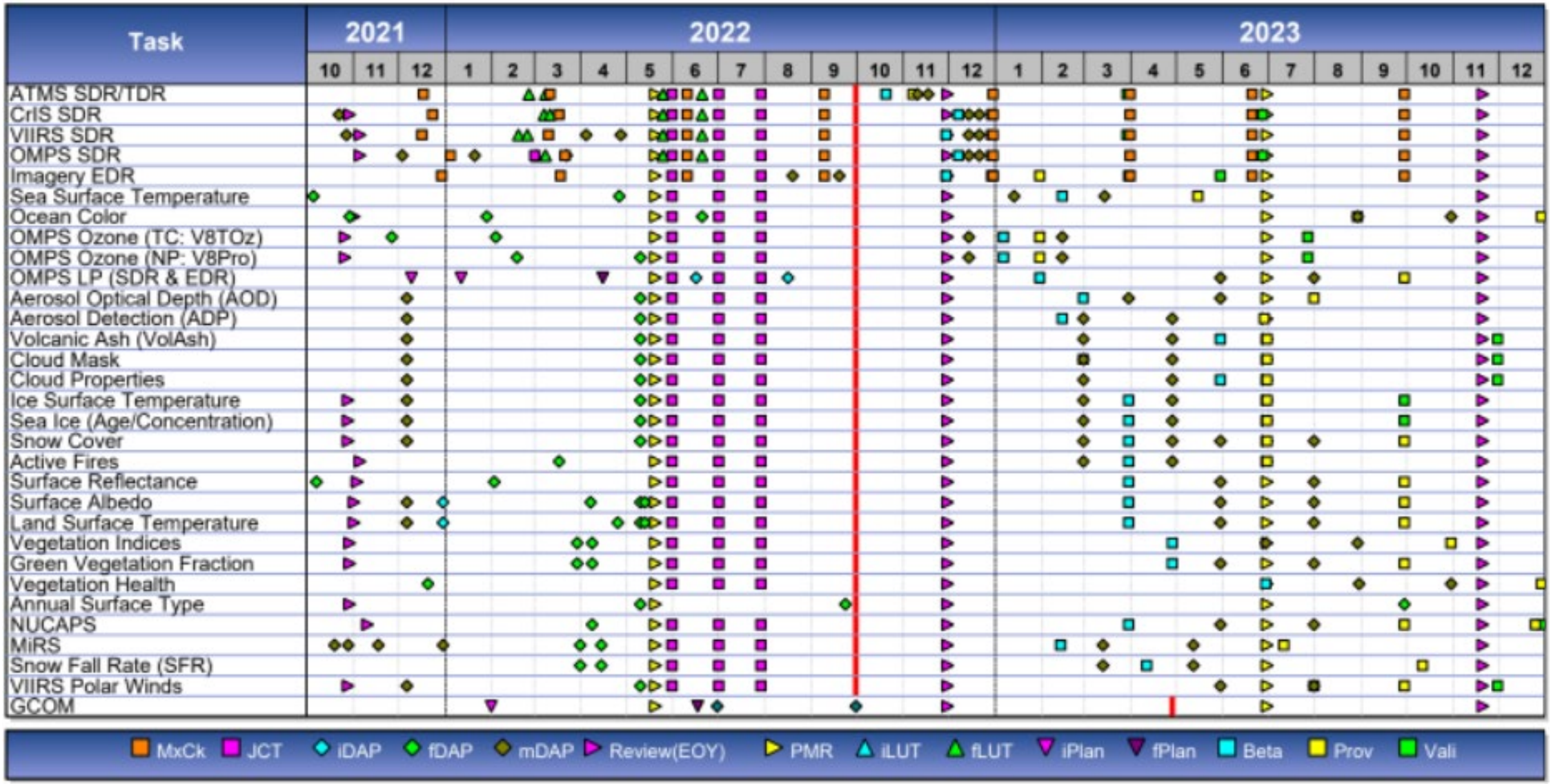
FY22 STAR JPSS Milestones

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	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)	Sep-22	Sep-22	Oct-21: JCT2a-DSE Feb-22: one-orbit J2 data May-22: JCT3-TVAC	
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, 01/18/22, 01/25/22, 02/01/22, 02/08/22, 02/15/22, 02/22/22, 03/01/22, 03/08/22, 03/15/22, 03/22/22, 03/29/22, **04/06/22, 04/12/22, 04/19/22, 04/26/22, 05/03/22, 05/10/22**
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, 01/18/22, 02/01/22, 02/15/22, 03/01/22, 03/15/22, 03/29/22, **04/12/22, 04/26/22, 05/10/22**
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, 02/08/22, 03/08/22, **04/06/22, 05/04/22**
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, 01/18/22, 01/25/22, 02/01/22, 02/08/22, 02/15/22, 02/22/22, 03/01/22, 03/08/22, 03/15/22, 03/22/22, 03/29/22, **04/06/22, 04/12/22, 04/19/22, 04/26/22, 05/03/22, 05/10/22**
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, 01/25/22, 02/08/22, 02/22/22, 03/08/22, 03/22/22, **04/06/22, 04/19/22, 05/03/22**
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, 02/08/22, 03/08/22, **04/06/22, 05/04/22**
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: 01/06/22** **Mx6 I&T: 03/22/22**
Participant/support JPSS-2 pre-launch testing events (**Mar-22 JCT3-Ambient;** May-22 JCT3-TVAC; Maybe: Jul-22 JCT4; Jul-22 JCT4-DSE)	Sep-22	Sep-22	**03/01/22: JCT3-Ambient (OMPS J2 RDRs)** **05/10-14/22: JCT3-TVAC Segment 1**

STAR JPSS Schedule: TTA Milestones



Color code:

Green: **Completed Milestones**

Gray: **Non-FY22 Milestones**

ATMS SDR

April, 2022

Accomplishments / Events:

- Analyzed the JPSS-4 ATMS instrument TVAC thermal cycle data sets to check the data quality and scan angle accuracy.
- Updated ATMS thermal vacuum test data analysis package to improve the data quality control accuracy.
- Kept updating ATMS Calibration ATBD to include operational NEDT calculation algorithm description and recommended scan level NEDT algorithm, as well as the chronology of major ATMS operational calibration algorithm updates in IDPS.
- Reviewed the JPSS-2 ATMS calibration data book (Rev C) to ensure the description matches to the operational calibration processing.
- Kept discussing the derivative of ATMS beam alignment error correction coefficients. Started working on the NPP and N20 pre-launch data to derive new set of correction coefficients so as to compare to current operational one.
- Evaluated the bias between uncorrected and corrected beam alignment error coefficients using NOAA-20 operational data.
- Discussed the implementation of ATMS scan level NEDT calculation algorithm in ADL

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			

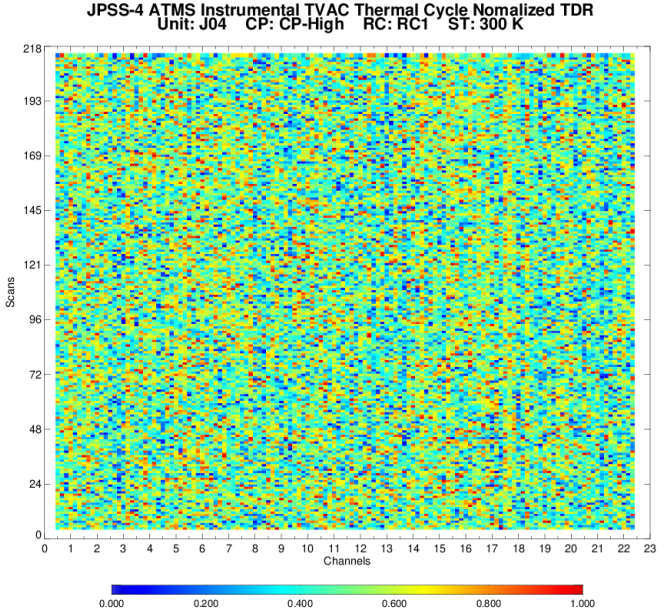
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

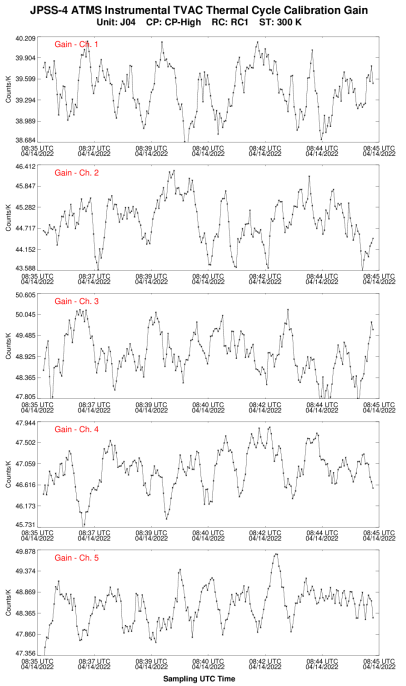
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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	02/25/22	pre-dynamic
Update of ATMS non-linearity correction coefficients after applying TVAC target thermal gradient correction	May-22	May-22		
Verify and finalize JPSS-2 ATMS processing coefficients table (PCT) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	May-22	May-22		
Deliver final launch-ready JPSS-2 ATMS PCT/MM-coef DAP to ASSISTT	May-22	May-22	**02/25/22**	**pre-dynamic**
Deliver final launch-ready JPSS-2 ATMS PCT/MM-coef DAP to DPMS	Jun-22	Jun-22	**03/08/22**	**pre-dynamic**
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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** **03/11/22 Mx6**	

Highlights:





CrIS SDR

April, 2022

Accomplishments / Events:

- The SNPP CrIS sensor experienced a single-event upset (SEU) on April 16, 2022 causing the sensor to enter into safe mode. The CrIS SDR team performed an extensive data quality assessment after the instrument recovered and demonstrated that its performance returned to its nominal levels **(Fig. 1)**.
- Participated in and supported the JPSS-3 Pre-ship Review held by the CrIS vendor L3-Harris on April 19-20. They demonstrated the successful completion of instrument-level environmental test and post-environmental test campaigns.
- Investigated the source of large brightness temperature differences between GOES-17 ABI and NOAA-20 CrIS at band 8 (6.18 μm) on Jan 23, 2022. Spatial plots show that it comes from the abnormally high BT in GOES-17 ABI band 8 (**Fig. 2**). It is also observed that the anomaly pixels mainly occur when CrIS BT is within 236-242K. (Fig. omitted)
- Extended the CrIS/IASI intercomparison analysis by showing the dependence of BT biases on scene temperature Investigation of the reason why the BT biases between SNPP NSR CrIS and MetOp-A IASI is larger in the southern hemisphere than that in the northern hemisphere is ongoing.
- CrIS STAR and UW performed an extensive assessments of proposed hybrid methods of CrIS PC score calculation. Local and global PC scores were generated using training datasets. Evaluation of the performance was carried out using select day(s). It is found that the noise performance is greatly improved over nominal values, and brightness temperature residuals are overall very low **(Fig. 3)**. Evaluation and development of CrIS PC scores is in progress.
- CrIS SDR Cal/Val team discussed the usage of the CrIS data at NCEP. In particular, discussed the areas that could improve the CrIS data assimilation potentially, looked at the effects of hamming apodization combined with neighboring channel selection (or omission) as well as the effect of how CrIS RTA error covariances play a role on CrIS radiances across NWP centers **(Fig. 4)**.

Overall Status:

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

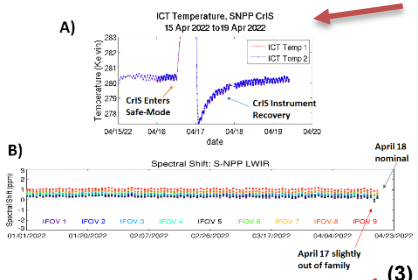
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

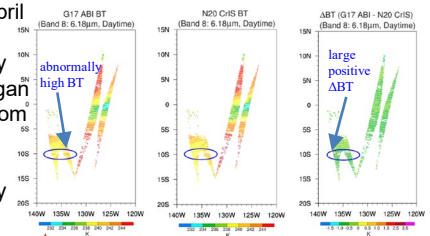
- The CrIS Team is in urgent need of hardware/software resources. Presently, there is only one server dedicated to 6 CrIS Team members. There is high risk for the CrIS SDR Team to continue on such a single server environment for the operational CrIS Cal/Val activities that includes 4 CrIS sensors (SNPP, JPSS-1 to -4). This may affect the timely completion of deliverables and program milestones. The recommendation is to have one additional server/storage as soon as possible (< 2 months) and add another server/storage in the next months, preferable before the launch of the J2 CrIS. A new Matlab license is also required. Corresponding hardware/software quotations have been submitted.

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	Mar-22	03/16/22	Anomaly Resolution
Support and participate in the J3 CrIS Pre-ship Review	Mar-22	Apr-22	04/19/22	Vendor Rescheduled
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	03/07/22	pre-dynamic
Verify and finalize JPSS-2 CrIS processing coefficients table (PCT) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	May-22	May-22		
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to ASSISTT	May-22	May-22	03/07/22	pre-dynamic
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to DPMS	Jun-22	Jun-22	03/11/22	pre-dynamic
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		
Participate/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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 03/17/22 Mx6	

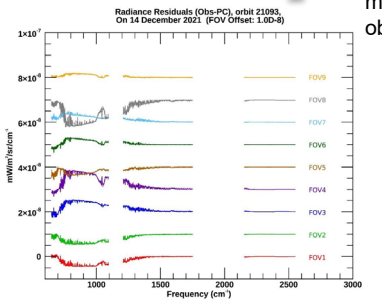
Highlights:



(1) A) SNPP CrIS entered Safe-Mode on April 16th, 2022, causing the ICT temperature to increase. The Instrument began its recovery on April 17th, when the ICT temperature began returning back to its nominal temperature from before the anomaly. **B)** Trending of the Longwave spectral performance of SNPP CrIS. The Spectral performance was slightly out-of-family on April 17th, but returned to nominal value on April 18th.

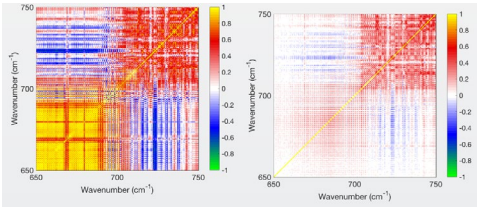


(2) Brightness temperature (BT) of G17 ABI (left), N20 CrIS (middle), and difference between G17 ABI and CrIS (ΔBT, right) at the G17ABI band 8 (6.18 μm) during daytime on January 23, 2022 for the SNO pixels.



(3) A depiction of the radiometric bias for orbit 21903 for Ops-PC and radiance mean. Exceptionally low values for all FOVs are observed from a total of 22,800 spectra.

(4) (Courtesy of UMBC) RTA Error Covariances. (Left) Raw Correlations (using fit σ's). (Right) Conversion to CrIS noise (inflate diagonals). Much of NWP "observation" off-diagonal error covariances are due to the RTA.



VIIRS SDR

April, 2022

Accomplishments / Events:

- In response to requests from NESDIS Chief Scientist, performed revisit time analyses for different configurations of three satellites (SNPP, NOAA-20 and NOAA-21) distributed over the 1:30 pm orbit in comparison with the current SNPP and NOAA-20 combination
- In support of the JPSS-2 IMT development, provided to NASA MOST preliminary predictions for VIIRS lunar calibration opportunities from Nov. 2022 to Apr. 2023 based on current Suomi NPP and NOAA-20 orbits
- Assisted in scheduling NOAA-20 and Suomi NPP VIIRS lunar calibration on 4/12/2022, (without roll maneuvers) and analyzed the collected data to monitor radiometric response of the reflective solar bands
- 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 4/1/2022

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	
ADR9903/CCR5939 VIIRS SDR Not Produced as Expected for Defective Data Packets			04/04/22	DAP to NDE
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	02/18/22	pre-dynamic
Verify and finalize JPSS-2 VIIRS lookup tables (LUTs) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	May-22	Jun-22		TVAC schedule
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to ASSISTT	May-22	May-22	02/18/22	pre-dynamic
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to DPMS	*Jun-22*	*Jun-22*	02/24/22	pre-dynamic
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	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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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** **03/10/22 Mx6**	
Operational Support: VIIRS LUT update of DNB Offsets and Gains (S-NPP & NOAA-20)	Monthly	Monthly		

Overall Status:

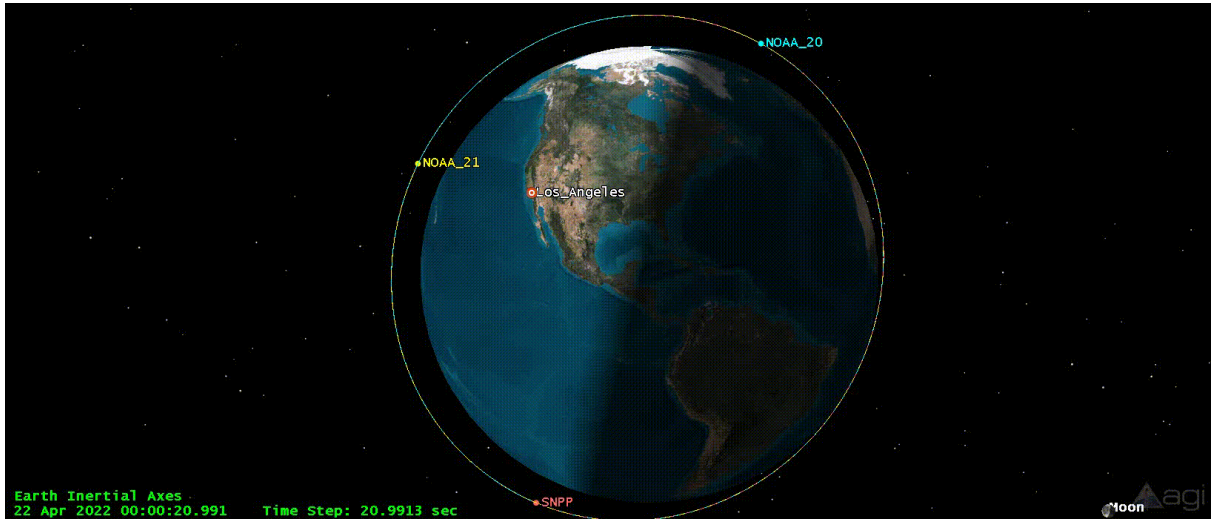
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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:



Animation of the anticipated JPSS-2/NOAA-21 orbit when the spacecraft is placed a quarter revolution apart from both NOAA-20 and Suomi NPP

OMPS SDR

April, 2022

Accomplishments / Events:

- Delivered OMPS biweekly NP solar irradiance bi-weekly LUTs.
- Continued the preparation for JPSS-02 launch calibration and validation; presented two ADR reports to resolve two detected J2 OMPS NM and NP irradiance (and albedo) coefficient issues.
- Analyzed the JCT3A RDR data with time-shift-issue-correction.
- Continued the preparation of J2 OMPS NM and NP inter-sensor (NOAA-20 med. data as proxy).
- Continued to make updates and improvements to the OMPS VCRTM interface package: the root-cause of the annual pattern in O – B is analyzed (see Fig. 1a).
- Completed a new, functional version of the OMPS DARK Calibration algorithm that can generate identical results as the NASA code (see Fig. 1b for demonstration)
- Compared the two OMPS NP solar wavelength shift and flux algorithms to understand the root cause of the differences to ensure the consistency of the new algorithm with the operational one.
- Continued efforts to develop the raw solar flux calibration processing code.
- Submitted a manuscript about the SNPP OMPS SDR reprocessing to Remote Sensing.
- Continued revising the manuscript about the SNPP OMPS NM and NP 10-year stability SNR performance upon the STAR FRC reviewers' comments.

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		

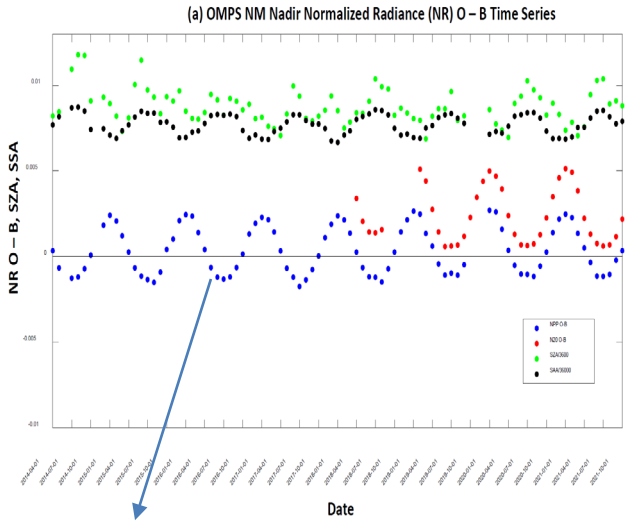
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

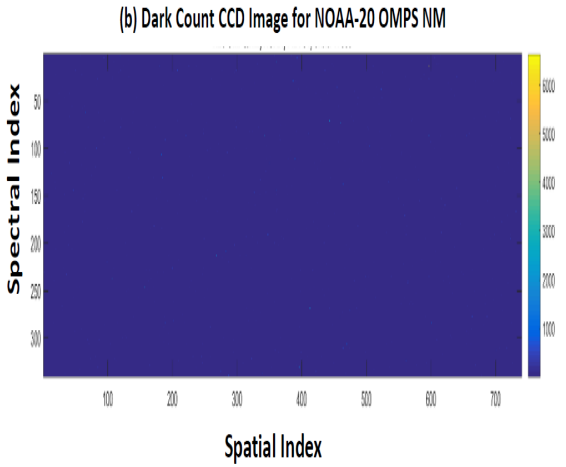
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
DAP (ADR9633/CCR5577 OMPS TC geolocation code change for off-nadir geolocation error correction)			12/03/21	
DAP (ADR9908/CCR5926 OMPS J02 Nadir Version LUT Update N_TIM_PAT_VER Value)			03/22/22	
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	03/02/22	pre-dynamic
Verify and finalize JPSS-2 OMPS lookup tables (LUTs) using JPSS-2 pre-launch JCT data (JCT-3 TVAC)	May-22	May-22		
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to ASSISTT	May-22	May-22	03/02/22	pre-dynamic
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to DPMS	Jun-22	Jun-22	03/08/22	pre-dynamic
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	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	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)	May-22	May-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 (Mar-22 JCT3-Ambient; May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22	03/01/22	JCT3-Ambient
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 03/21/22 Mx6	
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		

(a) The root cause analysis of VCRTM O – B annual pattern



The annual cycle of VCRTM NR O – B shows a strong correlation to that of Solar zenith angle (SZA) and azimuthal angle (SAA)

(b) NOAA Dark Calibration Processing



The NOAA dark calibration processing code is successfully developed for SNPP and NOAA-20 OMPS nominal data, having identical results to the NASA

SDR Reprocessing

April, 2022

Accomplishments / Events:

- The official transition of the reprocessed SNPP SDRs to CLASS/NCEI started on December 1, 2021.
- The transition of the reprocessed SNPP ATMS (V1 and V2), CrIS, and OMPS (V1 and V2) data was completed in December 2021, February 2022 and March 9, 2022, respectively. These data are available at CLASS website now.
- The transition of the reprocessed SNPP VIIRS started on March 15, 2022.
- The VIIRS data transition is ongoing with 6 parallel jobs with data volume control of a stable daily data transition speed of ~2.93T/day
- The reprocessed SNPP VIIRS SDR data from 1/2/2012 to 9/19/2012 (135.28T, 8.28% of total) has been completed as of April 30, 2022.
- It's expected that the VIIRS data transition will complete in October, 2023.

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		

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: 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	Completed on Feb. 25, 2022
	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	Completed on Mar. 4, 2022
	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	Completed on Mar. 9, 2022
	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	Completed 8.28%
Total				1764.65	

ICVS

April, 2022

Accomplishments / Events:

- Explored the possibility to improve current ICVS web site by adding high resolution interactive regional SDR maps to support JPSS Cal/Val team activities.
- Transferred the function about limb-correction ATMS TDR data monitoring from the EDR monitoring tool to the ICVS beta
- Identified data quality control deficiencies in NOAA-20 vs. S-NPP CrIS SDR inter-sensor bias using double difference technique through CrIS vs. ABI SNO bias due to G17 ABI IR channel issues.
- Identified and reported a NOAA-20 CrIS MWIR FOV5 noise anomaly.
- Added OMPS NM vs NP relative difference monitoring products to ICVS web site to support OMPS cal/val team activities.
- Continued developing the OMPS NM 380 nm and VIIRS M1 band inter-sensor comparison package.
- Kept updating NOAA-20 vs. S-NPP VIIRS RSB inter-sensor bias using double difference technique through VIIRS vs. ABI SNO bias.
- Improved and tested different schemes of ATMS scan drive mechanism maximum temperature prediction accuracy by multiple sensor health status parameters using AI technology

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Update ICVS JPSS-2 modules to support J2 pre-launch JCT verification (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	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	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			

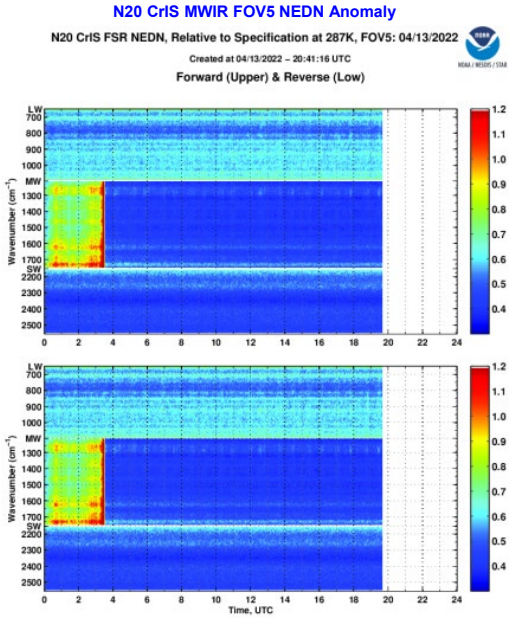
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

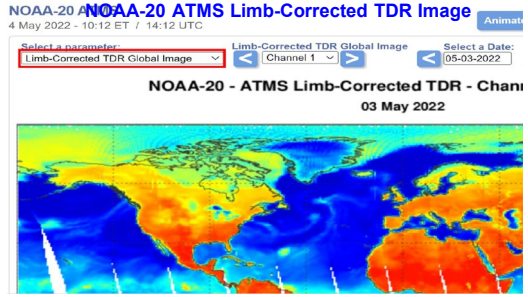
Issues/Risks:

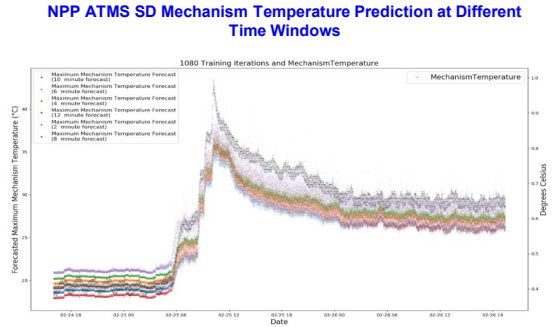
None

Highlights:

Significantly contribute to STAR SDR Teams







VIIRS Imagery

April, 2022

Accomplishments / Events:

- Jorel Torres gave Near-Constant Contrast teletraining to NWS WFO Phoenix, AZ on 4/11
- Bill Line presented at the Satellite Book Club Seminar on 4/21: "Using NOAA Satellite Data to Detect and Track Blowing Dust"
- Blog post: GOES-East and VIIRS Capture Frontal Passage
- Discovered and eventually pinpointed a "dark pixel" present in every scan of daytime DNB imagery. Communicated finding to SDR team, who are investigating further
- McIDAS-V developmental build now supports display of VIIRS EDR Imagery (all bands), and new VIIRS EDR functions and formulas
- Recent VIIRS Imagery publications
  - Yue, J., Miller, S. D., Straka III, W. C., Noh, Y.-J., Chou, M.-Y., Kahn, R., & Flower, V. (2022). La Soufriere volcanic eruptions launched gravity waves into space. Geophysical Research Letters, 49, e2022GL097952. https://doi.org/10.1029/2022GL097952
  - "A Physical Basis for the Overstatement of Low Clouds at Night by Conventional Satellite Infrared-Based Imaging Radiometer Bi-Spectral Techniques", was selected as an AGU Editor's Highlight. Authored by Steve Miller et al, published 14 Feb 2022

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:

N20 NCC LUT update

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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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 03/18/22 Mx6 I&T	

Highlights: Image of the Month

Figure: April 21 Tweet from the CIRA account highlighting features diagnosed in VIIRS Natural Fire Color RGB imagery over the Cooks Peak Fire in New Mexico.

Clouds

April, 2022

Accomplishments / Events:

- ASSISTT provided 21 “golden” days, split between NOAA-20 and SUOMI-NPP (SNPP) for the Cloud Team to verify that their algorithms have been properly integrated into the SAPF and are performing as expected in anticipation of the April 2022 DAP delivery to NDE. Overall the performance was similar to previous deliveries for all the algorithms. However, there is a bias between the ice cloud optical depths from NPP and N20 (image in highlights slide) which has been consistent for all delivered and is being investigated.
- The CIRA team updated the aviation site with several new features for direct user feedback on cloud cross-section products based on suggestions from Aviation Initiative participants, and discussed joint efforts to enhance satellite and NWP-based cloud layer products.
- A recent *ESS* paper, “A Physical Basis for the Overstatement of Low Clouds at Night by Conventional Satellite Infrared-Based Imaging Radiometer Bi-Spectral Techniques” (by S. Miller and CIRA/NOAA co-authors, *https://doi.org/10.1029/2021EA002137*), was selected as an AGU Editor’s Highlight: *https://eos.org/editor-highlights/when-less-is-more-the-moon-sheds-light-on-clouds-at-night*

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:

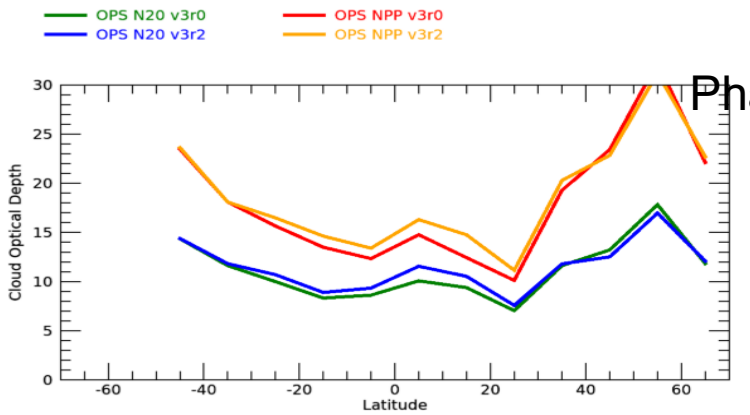


Figure 1.October 25, 2020 Cloud Optical Depth (COD) zonal plot showing the ascending data for that day. for the ice phase. This highlights the large bias between NPP and NOAA-20

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)	May-22	May-22		ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
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	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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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)	May-22	May-22		ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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)	May-22	May-22		ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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)	May-22	May-22		ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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)	May-22	May-22		ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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)	May-22	May-22		ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
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	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	Sep-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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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)	May-22	May-22		ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Aerosol

April, 2022

Accomplishments / Events:

Suomi NPP VIIRS Surface PM2.5 Climatology:

As part of NOAA-wide COVID-19 research activities, STAR aerosol team reprocessed nine years of Suomi NPP aerosol optical depth product on the Amazon Web Services Cloud. The reprocessed aerosol optical depth data were used as input to a Geographically Weighted Regression (GWR) algorithm to generate surface PM2.5 values. Surface PM2.5 (mass in $\mu g/m^3$ of particles smaller than 2.5 μm in median diameter) are harmful to human health and is designated as a criteria pollutant by the United States Environmental Protection Agency (US EPA).

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:

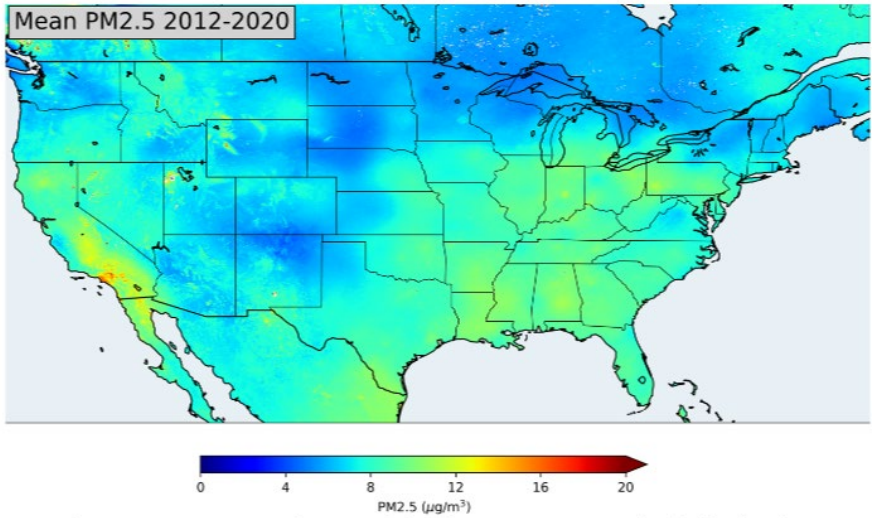
No risks

Milestones:

- ***See next slides***

Highlight:

Mean PM2.5 studied



The mean PM2.5 values for the US and shows large swaths of the western US with PM2.5 concentrations greater than the EPA standard (12 $\mu g/m^3$). These products are valuable to state and local governments to use in justifying PM2.5 standard violations associated with natural events.

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)	May-22	May-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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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)	May-22	May-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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Volcanic Ash

April, 2022

Accomplishments / Events:

•Continued to ensure high quality Volcanic Ash retrievals from EDR algorithms and VOLCAT. VOLCAT is long-term plan.

•New GRL Publication:

Citation: Yue, J., Miller, S. D., Straka III, W. C., Noh, Y.-J., Chou, M.-Y., Kahn, R., & Flower, V. (2022). La Soufriere volcanic eruptions launched gravity waves into space. *Geophysical Research Letters*, *49*, e2022GL097952. https://doi.org/10.1029/2022GL097952

Short Summary: Atmospheric gravity waves can be excited by explosive volcanic eruptions and may reach Earth's upper atmosphere. This publication reports on mesoscale concentric gravity waves observed in the mesopause airglow layer following the La Soufriere volcano eruption in April 2021. (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		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlights:

Launch of gravity waves found to be highly correlated with the elevated ash plume from explosive eruptions.

Table 1
Chronicles of Important Events Observed During the La Soufriere Volcanic Eruptions in April 2021

Events/Observations	Time/Date (UT)	Measurements	Height
First explosion	1240, 9 April	Ground	Surface, troposphere
Second explosion	1845, 9 April	Ground	Surface, troposphere
Third explosion	2245, 9 April	Ground	Surface, troposphere
Elevated plume	1435, 10 April	MISR	Tropopause
One explosion	0300–0320, 11 April	ABI	Troposphere
Another explosion	0500–0530, 11 April	ABI	Troposphere
Lightning	0510, 11 April	GLM	Troposphere
Nightglow gravity wave 1	0516, 11 April	VIIRS on SNPP	Mesopause
Nightglow gravity wave 2	0606, 11 April	VIIRS on NOAA20	Mesopause
CVIDs	0605–0702, 11 April	GNSS TEC	Ionosphere

Cryosphere

April, 2022

Accomplishments / Events:

Physically-based reflectance anisotropy models incorporated in the VIIRS snow fraction algorithm. Accurate characterization and parameterization of the atmosphere reflectance of the snow-free land and of the completely snow-covered land reflectances with changing observation geometry is critical for accurate snow fraction retrievals. The ABI physically-based reflectance models were tested in the VIIRS snow fraction algorithm to move closer to an enterprise approach for improved maintenance and sustainment. The results were promising (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			

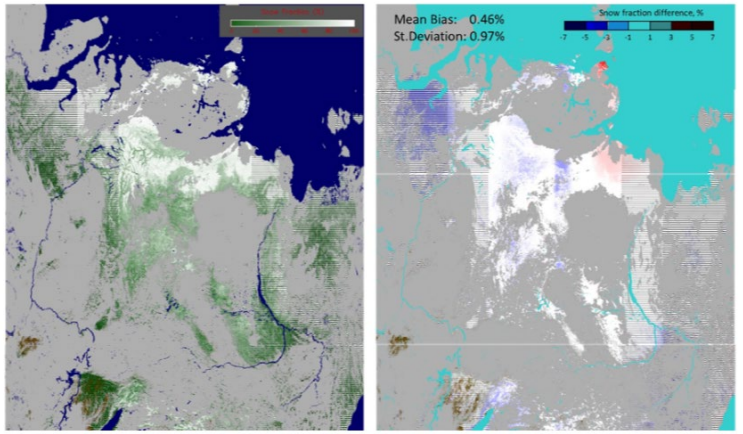
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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)	May-22	May-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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlight: Advanced, physically-based atmospheric reflectance for snow fraction algorithm used successfully for VIIRS and can improve consistency with GOES-R retrievals.



VIIRS snow fraction derived with the new physically-based snow fraction retrieval approach (left) and the difference of snow fraction estimated with the current algorithm based on empirical kernel-driven BRDF models and the new algorithm based on physical BRDF models. VIIRS SNPP granules on 04/25/2022 at 04:40 – 04:46 UTC.

Active Fires

April, 2022

- ***Accomplishments / Events:***

- On April 20 Ivan Csiszar presented the seminar “The NOAA VIIRS Active Fire Product” as part of the Virtual Alaska Weather Symposium (VAWS) a collaboration between the Alaska Center for Climate Assessment and Policy (ACCAP), the Geographic Information Network of Alaska (GINA) and the National Weather Service.
- The team evaluated the JPSS-2 proxy data provided by the Test Data Working Group. The current baseline algorithms were able to process the data without any issues. Testing of the Enterprise Fire package is ongoing

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			

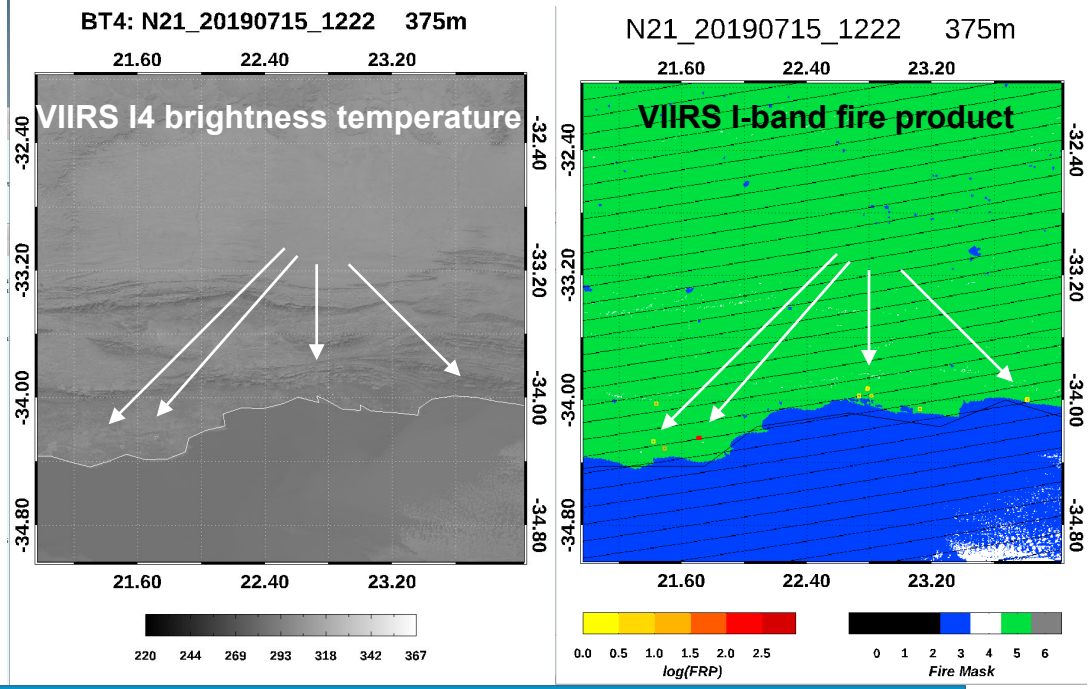
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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)	Mar-22	Mar-22	03/17/22	
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlight: Active Fire Mask from JPSS-2 proxy data



Surface Type

April, 2022

Accomplishments / Events:

- STAR-UMD VIIRS Surface Type team has downloaded and processed S-NPP and NOAA-20 VIIRS granule surface reflectance data acquired in April 2022 for the production of AST-2022.
- The team is on track towards developing the AST-2021 product:
  - The team has completed the production of global monthly composites based on 2021 VIIRS data
  - A thorough examination of these monthly composites revealed that except for a few extremely cloudy regions (e.g., see highlight), these composites are free from cloud/shadow contamination.
  - The team continue to improve and update the training samples needed to produce the AST-2021 product based on available Google Earth and other high resolution image sources .

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

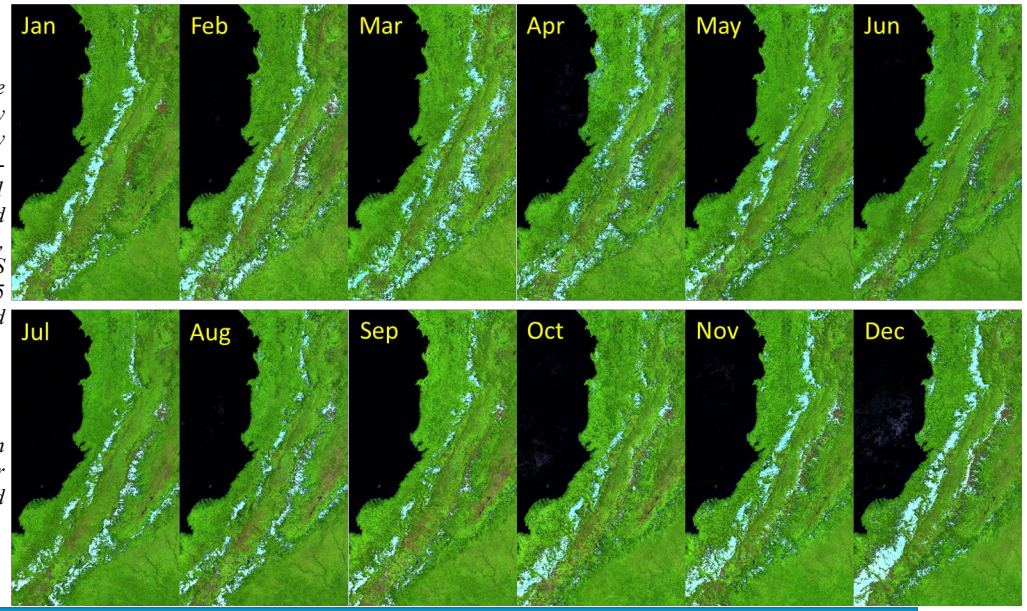
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/29/21	
FY23 Program Management Review	Jun-22	Jun-22		
Deliver AST-2020 to NDE (with JRR Super DAP)	May-22	May-22		
Complete global monthly composites based on 2021 VIIRS data	Apr-22	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:

The Andes Mountains along the Pacific coast of Colombia and Ecuador are probably the cloudiest regions in the world. These clear view monthly composites show that some pixels in this region had no clear view observations throughout the year. Other data sources will be used to mitigate the impact of these cloudy pixels.

Each monthly composite was created from daily observations acquired by both S-NPP and NOAA-20 in one month in 2021 to minimize cloud and shadow contamination, and is shown with VIIRS M10, M07, and M05 bands in red, green, and blue.

Key colors:
Green – vegetation
Black – water
Cyan – cloud



Surface Reflectance

April 2022

Accomplishments / Events:

- Evaluation of the SR using whole year's data (April, 2021 to March, 2022), performed deep analysis about the the validation results, evaluate SR APU in each reflectance brackets, AOD and TPW level.
- Preliminary validation of AOD product used for VIIRS SR using AERONET observation, analyzed the impact of AOD550 and aerosol model uncertainty on SR performance.
- Continue to monitoring SR product by daily global true color image and weekly updated AERONET validation results.
- Developed the gridded SR dataset (I1, I2 and I3 band) for the Leaf Area Index product which is under development.

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			

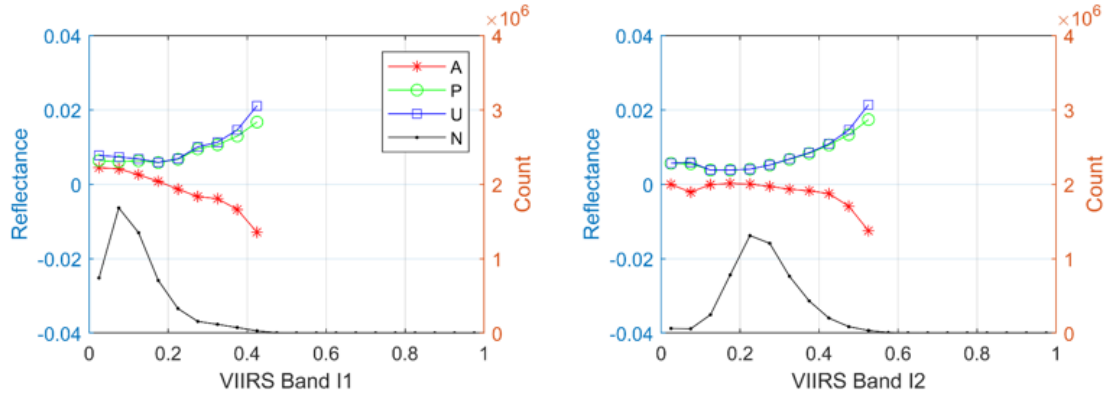
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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	
J2 final patch DAP to NDE			02/02/22	
The SR Long-term monitoring improvement and perform the time-series analysis	Mar-22	Mar-22	03/15/22	
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlights:

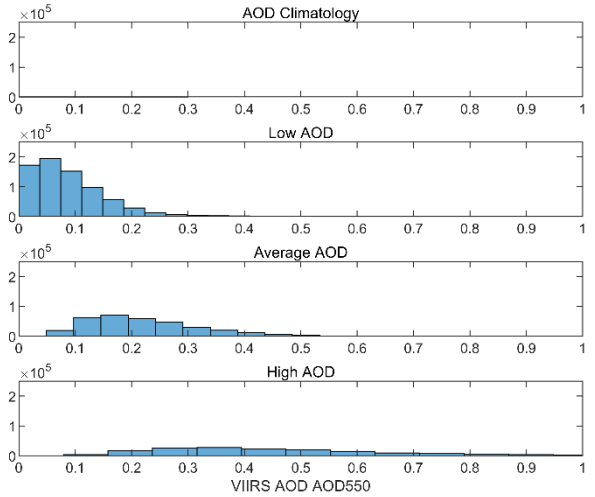


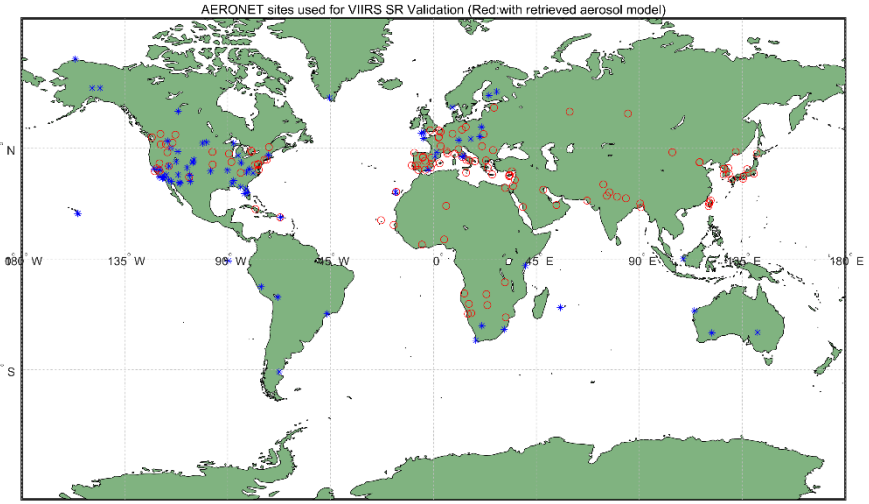
Whole year's NOAA20 SR validation (April, 2021 to March, 2022) using global AERONET sites (123 sites)

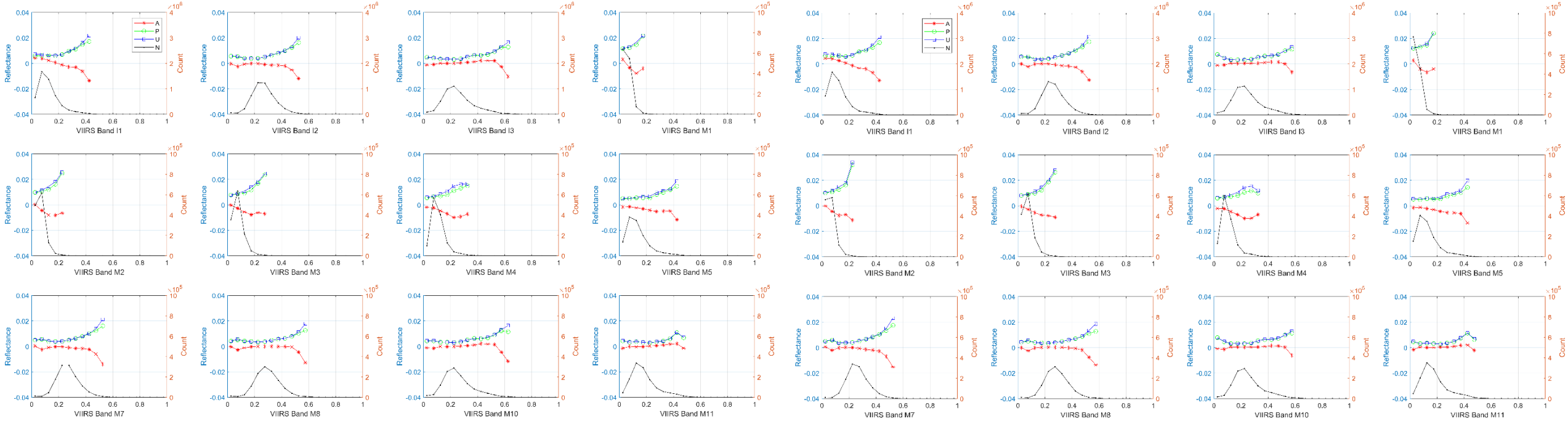
Long term Surface Reflectance validation

April 2022

- Whole year's (April 21 to March 22) S-NPP (bottom left) and NOAA20 (bottom right) AERONET SR Validation Results
- 9*9 M band (18*18 for I Band) pixels at 202 AERONET sites (Right map shows)
- The AOD550 histogram for each AOD quantity level are shown in right figure.
- All validation SR under clear sky condition are used for the validation (except the high AOD)

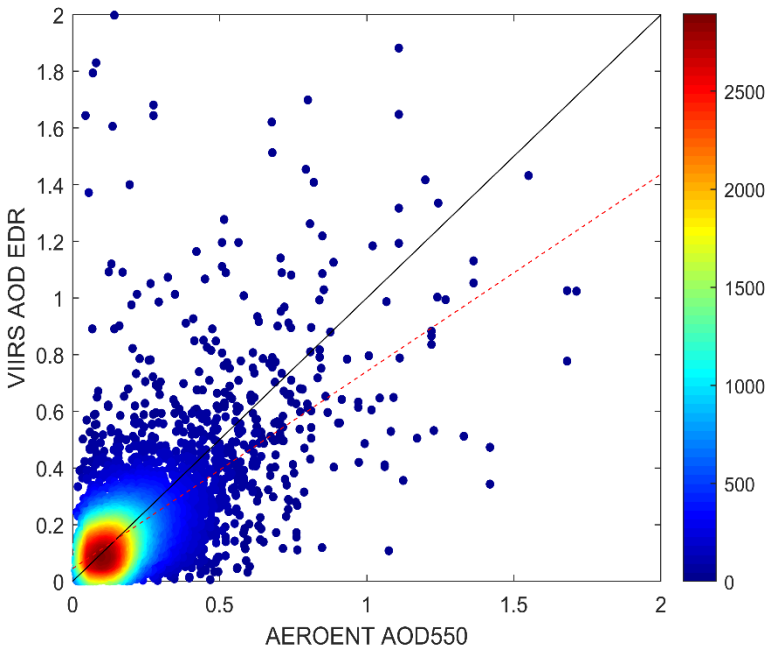




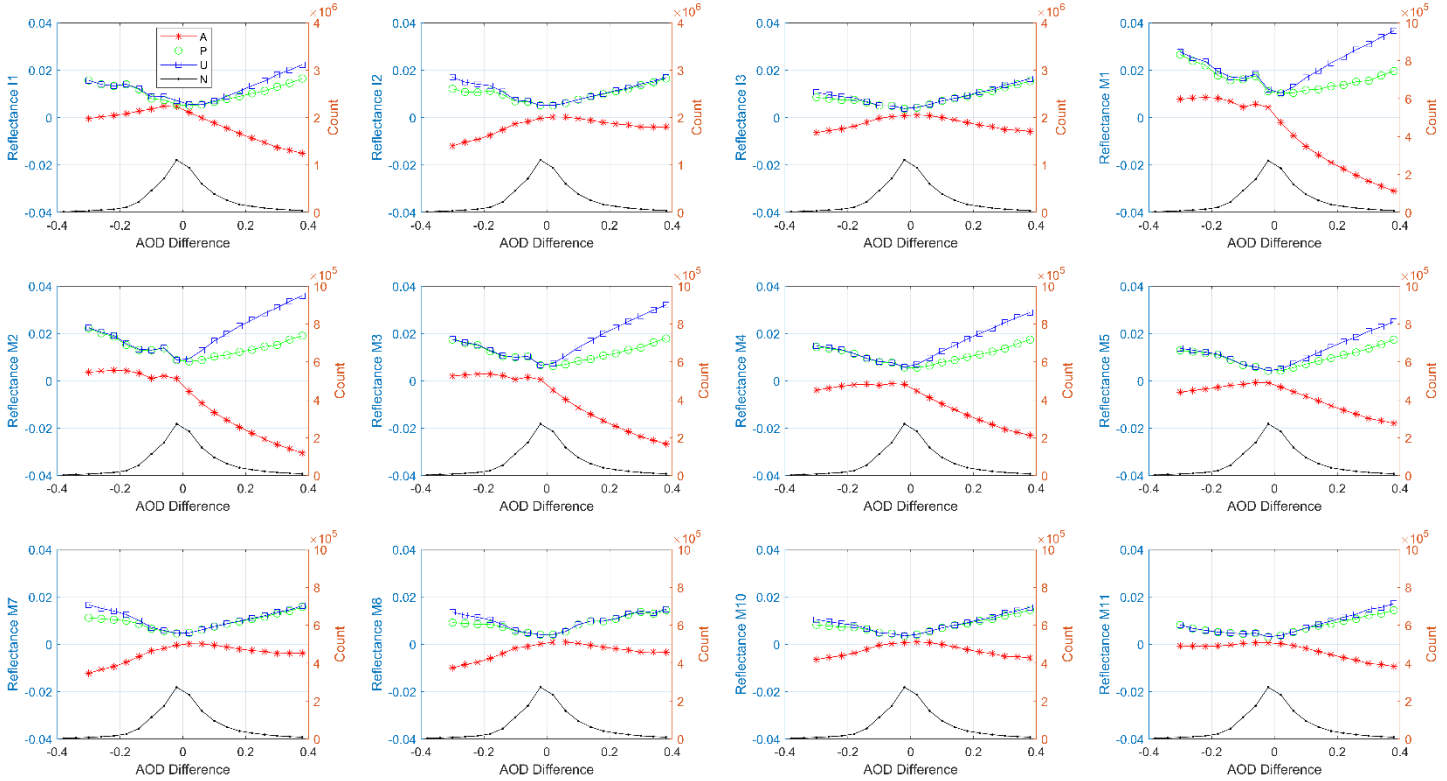


Surface Reflectance Validation (AOD)

- The AOD is the most critical factor for the SR performance, the impact of AOD uncertainty on VIIRS SR performance (APU) is shown as bottom right figure.
- The VIIRS AOD product is evaluated using AERONET observation. The pixel level AOD550 validation results are as bottom left figure shows. The validation verified the granule AOD product is a little bit noisy with larger standard deviation compared with the gridded aggregated ones.



Good AOD quality (QF4 Bit4 = 0)
N = 610K; A = -0.006
P = 0.148; U = 0.148

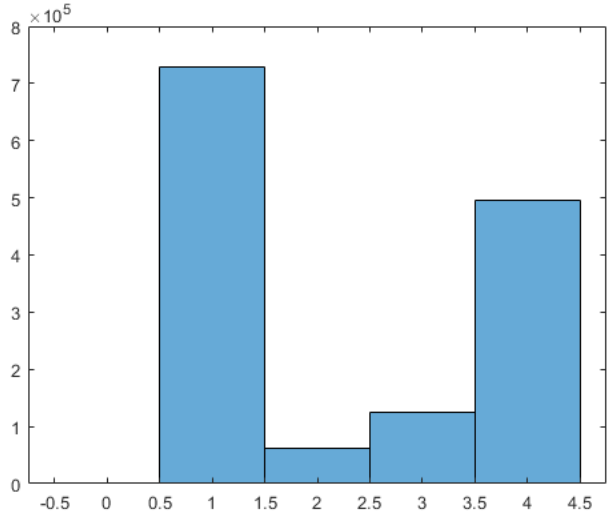


The AOD550 uncertainty impact on VIIRS SR APU for each band

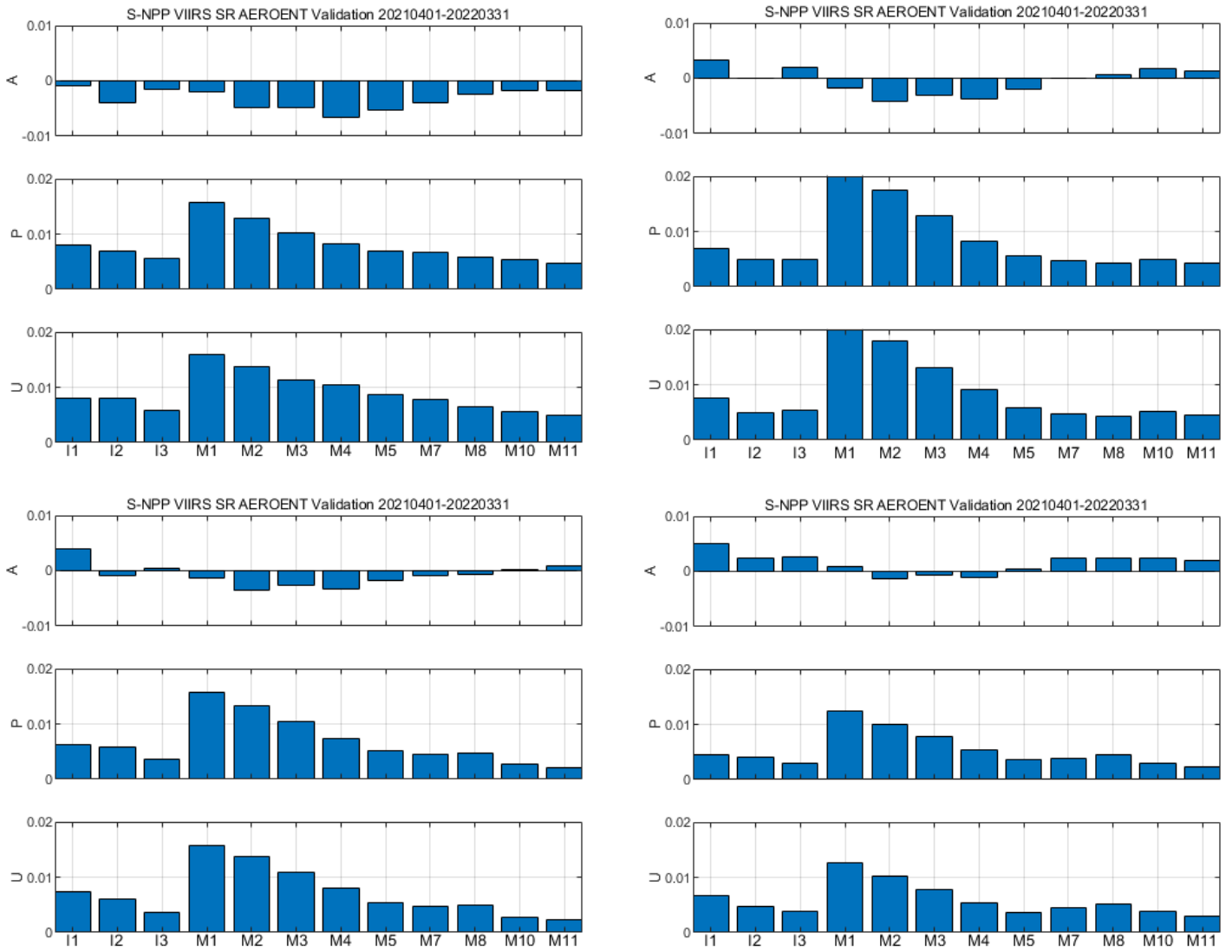
Surface Reflectance Validation (Aerosol model)

April 2022

- Aerosol model is another important parameters in SR validation.
- For the AERONET ground measurements, a set of retrieved aerosol model for each site based on long term observation is used (JC. Roger, 2021).
- The SR validation results for each aerosol model are listed as right figures show.
- The generic type with smallest matchups but with largest uncertainty, while the smoke type with best agreements with AERONET.



The VIIRS AOD product aerosol model distribution for the whole year's data



The VIIRS SR APU for each aerosol model (1:Dust, 2:Generic, 3:Urban, 4:Smoke

Land Surface Temperature

April, 2022

Accomplishments / Events:

- Completed the super DAP data verification including L2 and L3 VIIRS LST from SNPP and NOAA20. A minor issue has been observed in L2 VIIRS LST, and no issue observed in L3 VIIRS LST. The findings have been summarized into a report and submitted to ASSISTT team. (Highlights, slides 2 &3)
- Explored the ground data from Programme for Monitoring of the Greenland Ice Sheet (PROMICE) and conducted preliminary evaluation through the comparison with L3 SNPP VIIRS LST. (slides 4 &5)
- Finished the preliminary evaluation of all weather LST using ground measurements from SURFRAD.
- Finalized the manuscript. The comments and suggestions have been addressed in the revised version. It has been submitted to RPTS for approval.
- Submitted the abstract titled “Quantifying the uncertainty of VIIRS LST Product ” to the Collective Madison Conference

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	
L3 Global Gridded LST/LSA DAP to NDE (Prelim J2 DAP)			12/30/21	
Offline LSE DAP delivery (J2)			04/25/22	
Manuscript ready for Remote Sensing special issue “VIIRS 2011–2021: Ten Years of Success in Earth Observations"	Apr-22	Apr-22	Apr-22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22		
L3 Global Gridded LST/LSA DAP to NDE (final J2 DAP)	May-22	May-22	05/13/22	
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	Aug-22	Aug-22		
Routine monitoring tool and its update	Aug-22	Aug-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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.*

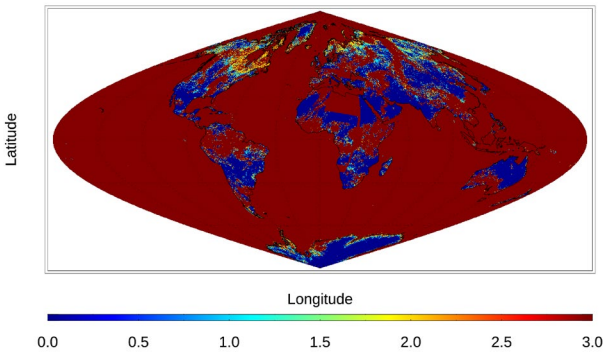
Issues/Risks:

None

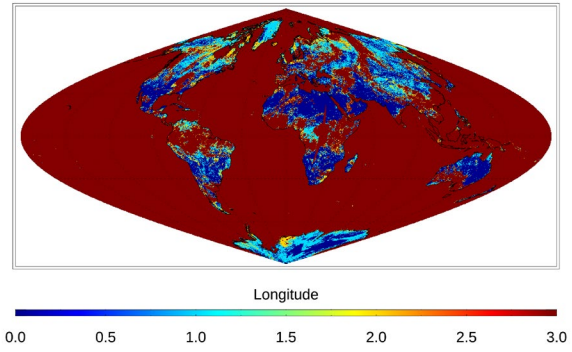
Highlights:

Dark blue-confidently clear
Light blue-probably clear
Yellow-probably cloudy
Red-confidently cloudy

DAP cloud mask



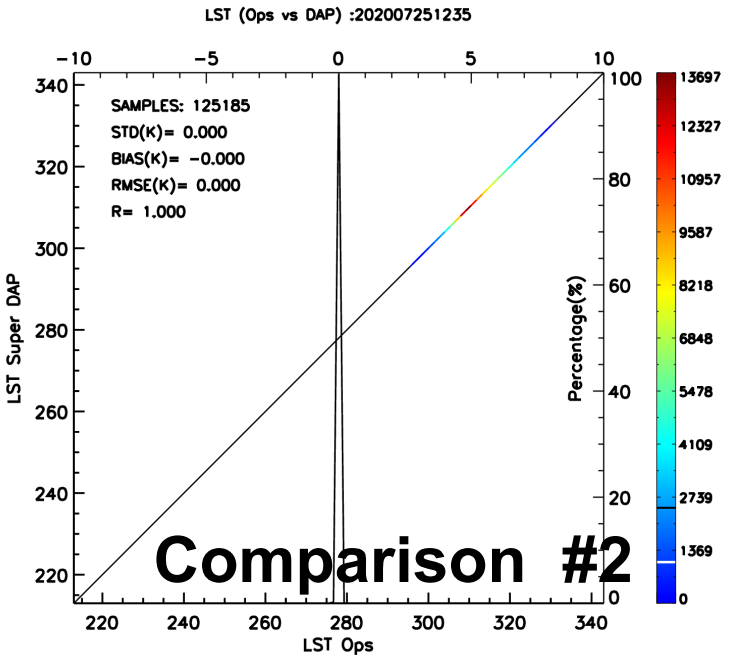
Operational Cloud Mask



The verification result of L3 VIIRS LST in the DAP package indicates that the cloud mask in the super DAP has obviously more confidently clear pixels than that in the operational L3 VIIRS LST product. The same findings have been confirmed in the L2 VIIRS LST verification.

DAP Verification-SNPP L2 LST

- Comparison #1: all inclusive with identical spectral emissivity, satellite zenith angle, tpw greater than 4.5, same day/night flag, both are valid LST retrievals under confidently clear condition
- Comparison #2: bowtie pixels removed using the data in corresponding brightness temperature for Band 15 and Band 16.



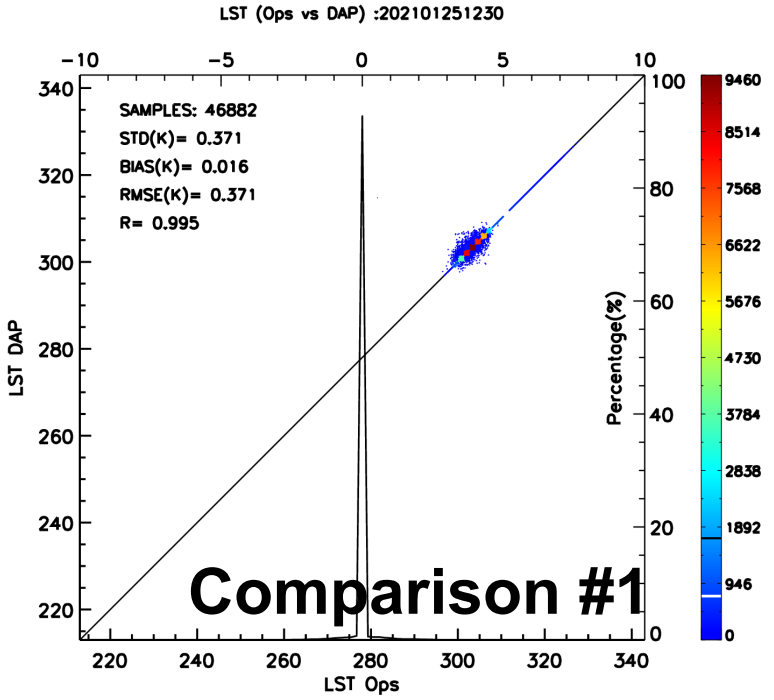
Without bowtie pixels

Test	Bias	Std	Min	Max
1	0.04	0.974	-14.545	14.465
2	0.000	0.000	-0.005	0.005

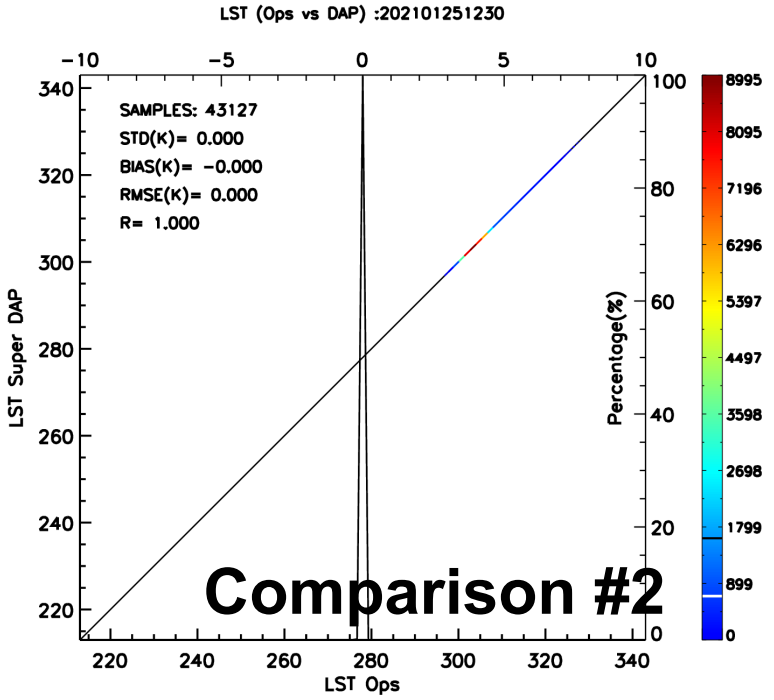
The difference between test 1 and test2 are the impact from bowtie mending process which suggests that there are some differences in operational NDE run and ASSISSTT DAP test.

DAP Verification-NOAA-20 L2 LST

Data source:
Ops LST='LST_v1r4_j01_s202101251230346_e202101251231592_c202101251309420.nc'
Dap LST:denc_ndeLST_v2r0_j01_s202101251230346_e202101251231592_c202203181632157.nc'
Under
/data/data517/eric.buzan/data/VIIRS_superdap_validation_Mar2022/VIIRS/N20/LAND_LST_VIIRS/20210125/



With bowtie pixels

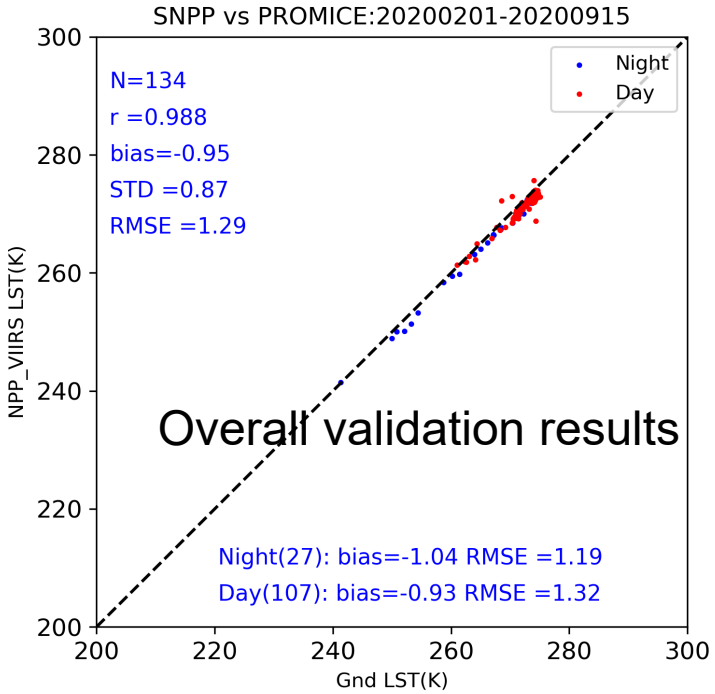


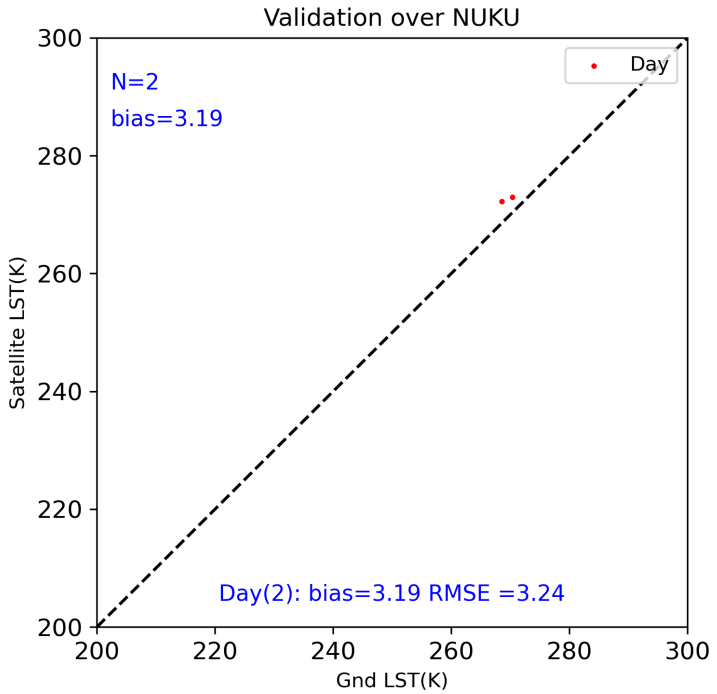
Without bowtie pixels

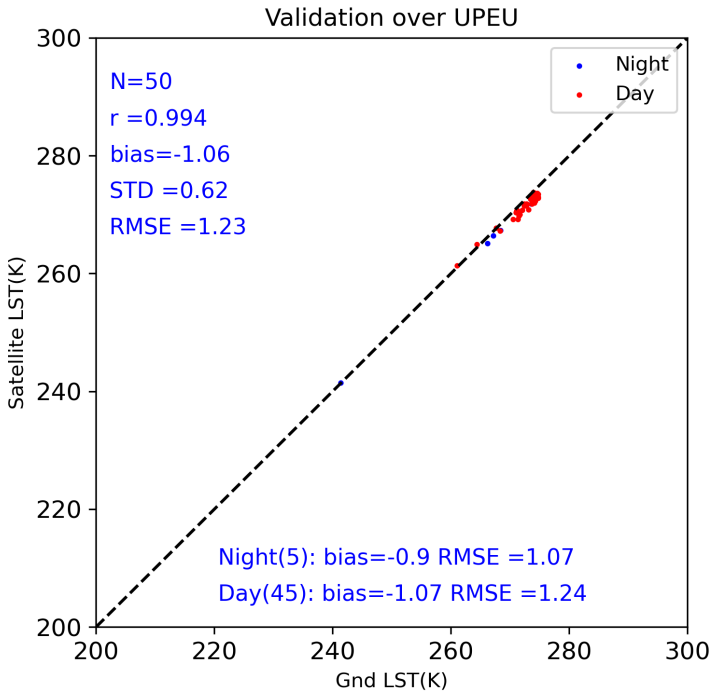
Test	Bias	Std	Min	Max
1	0.02	0.37	-6.97	6.91
2	0.000	0.000	-0.005	0.005

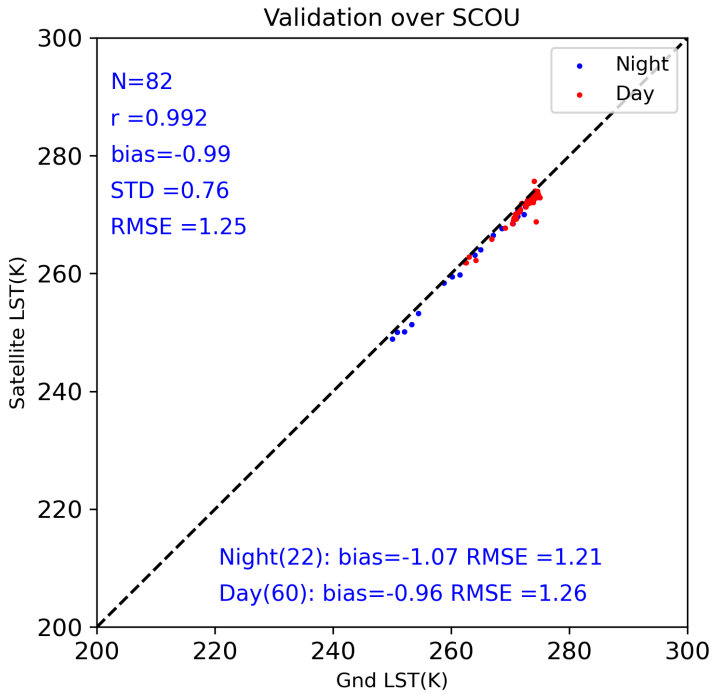
Similar to SNPP, the comparison results suggest that there are some differences in bowtie mending process between the operational NDE run and ASSISSTT DAP test.

Preliminary evaluation-L3 SNPP VIIRS LST







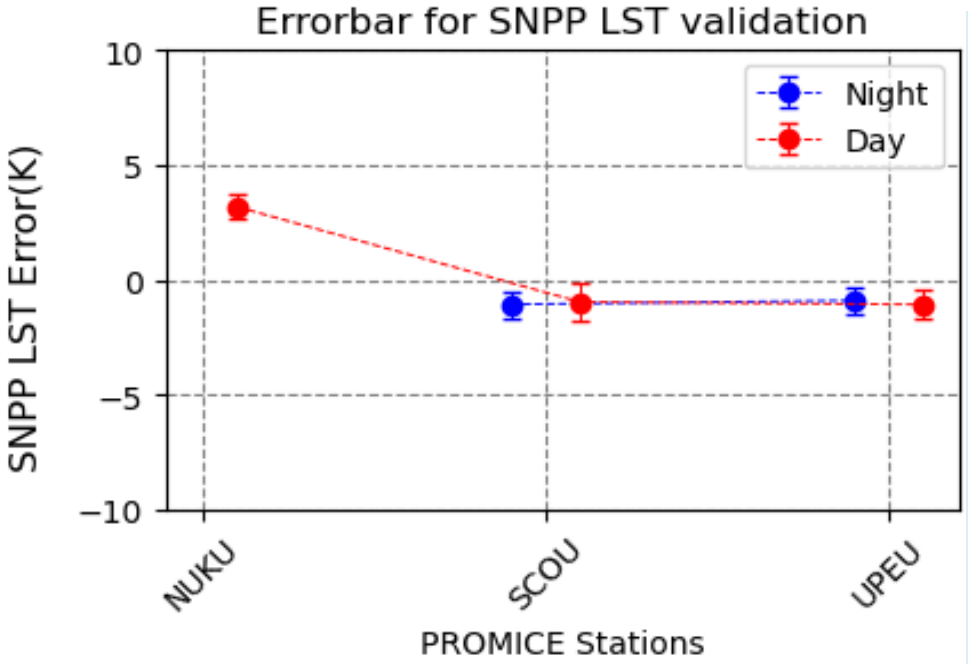


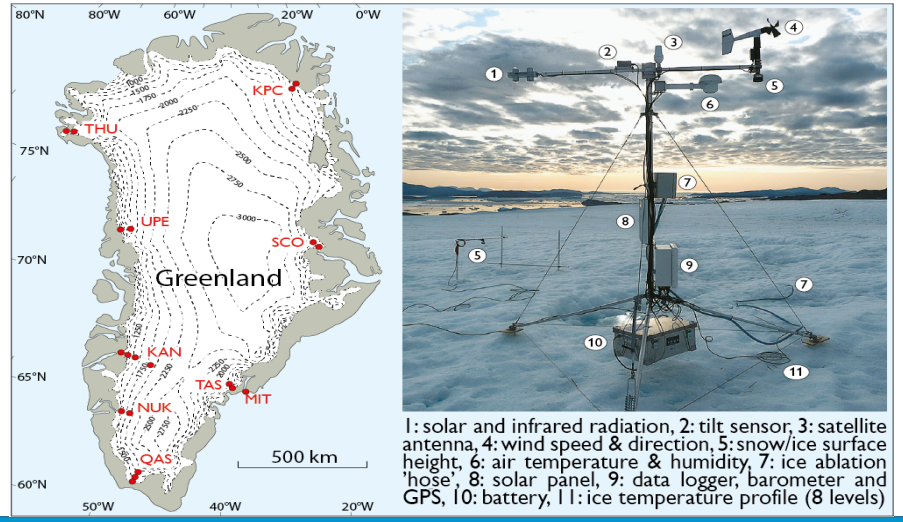
The L3 SNPP VIIRS LST is used in the preliminary evaluation

- Three PROMICE sites including NUKU, SCOU, and UPEU are found with both upwelling and downwelling radiation data available for ground LST calculation. Half year of data from March 2020 to Sep. 2020 was used in the validation.
- Besides the routine cloud filtering procedure, additional cloud filtering is used i.e. the estimated cloud cover fraction is less than 0.5
- All radiation value are positive
- The ground data standard deviation criteria is not applied because the temporal resolution is hourly.

- NUKU site has very limited matchups
- An underestimation of about 1 K is observed for both daytime and nighttime with small standard deviation less than 0.8 K for all sites
- Nighttime matchups are significantly less than daytime

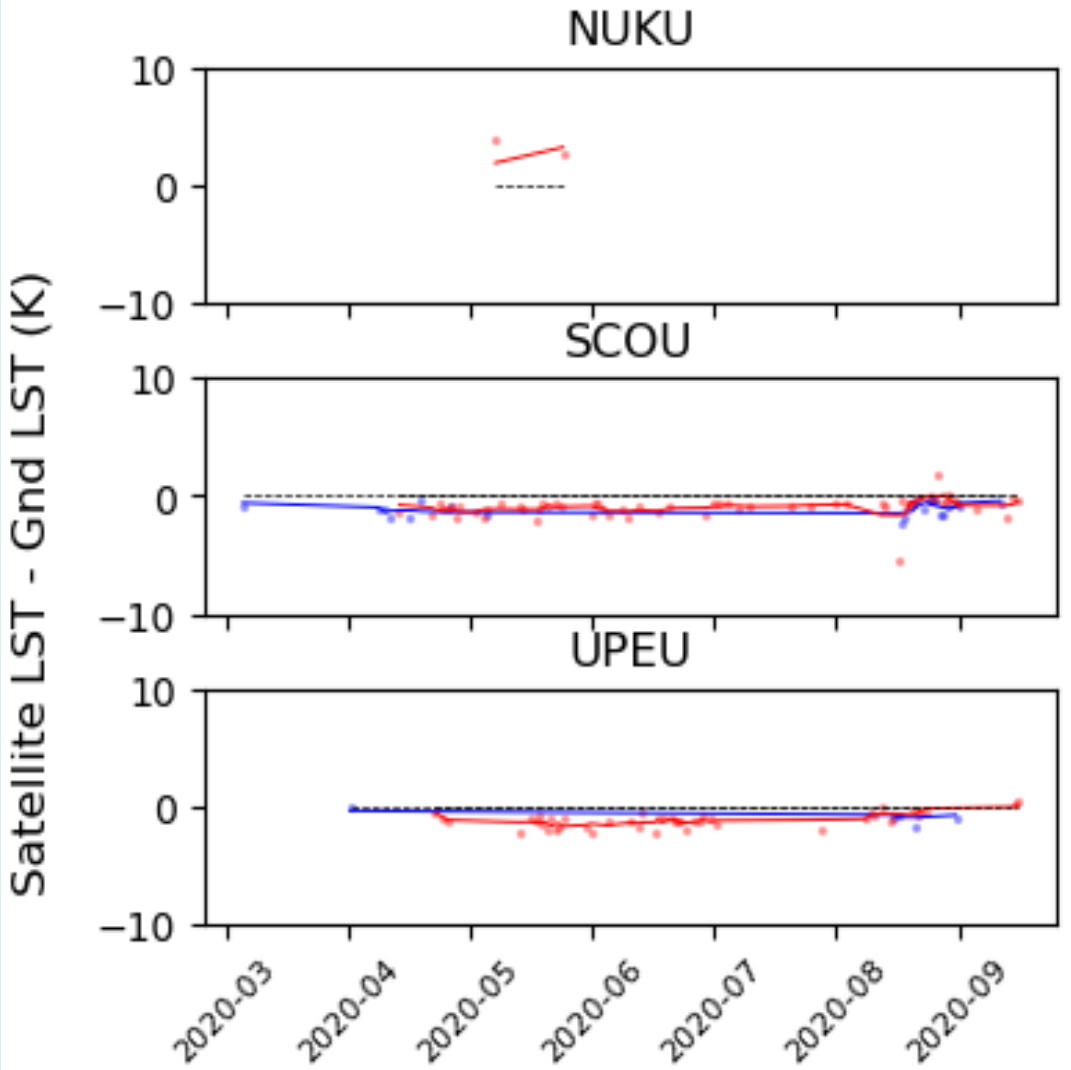
Preliminary evaluation-PROMICE data for L3 VIIRS LST Validation





1: solar and infrared radiation, 2: tilt sensor, 3: satellite antenna, 4: wind speed & direction, 5: snow/ice surface height, 6: air temperature & humidity, 7: ice ablation 'hose', 8: solar panel, 9: data logger, barometer and GPS, 10: battery, 11: ice temperature profile (8 levels)

- Top left figure shows the site wide validation results for daytime and nighttime
- Bottom left figure is the station map of PROMICE network
- Right figure shows the time series of the LST error for daytime(red) and nighttime(blue). The data availability varies over sites. It indicates the stable performance over time for both daytime and nighttime.



Surface Albedo

April 2022

Accomplishments / Events:

- Built the tool to assess the monthly albedo anomaly according to climatology in past ten years. Test February global albedo anomaly.
- Verified the DAP test result from new v2r2 version and compared the L3 result with v2r0 test result.
- Finished and submitted the CISESS annual project report
- Revisited the validation result using ground measurements and evaluated the influence from surface heterogeneity
- Learning about the albedo variation and climate change

Overall Status:

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

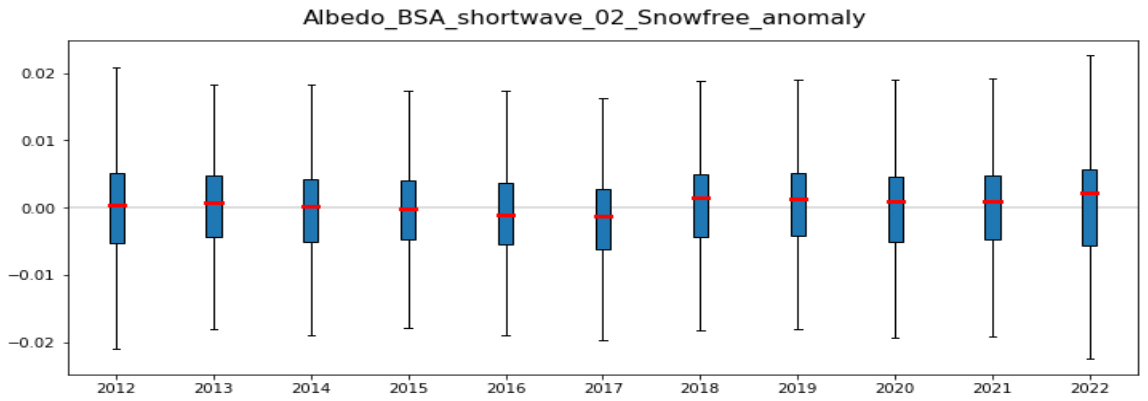
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End PMR	Oct-21	Oct-21	11/01/21	
Manuscript ready for Albedo Climatology update	Dec-21	Apr-22	Apr-22	More time needed
Generating the VIIRS BRDF climatology and real-time BRDF/Albedo test data generation	Jan-22	Jan-22	Jan-22	
Super DAP v3.1 patch delivery			12/06/21	
L3 Global Gridded LST/LSA DAP to NDE (Prelim J2 DAP)			12/30/21	
Offline LSA DAP delivery (J2, climatology files)			04/07/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22		
L3 Global Gridded LST/LSA DAP to NDE (final J2 DAP)	May-22	May-22	05/13/22	
BRDF data development plan ready	Mar-22	Sep-22		Ready in team, but Project Postponed
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlight

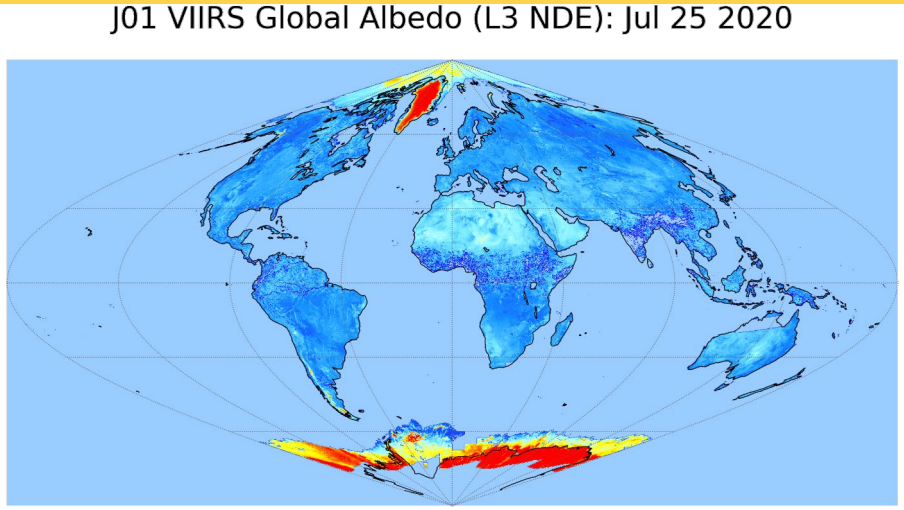
February Albedo Anomaly map of 2022

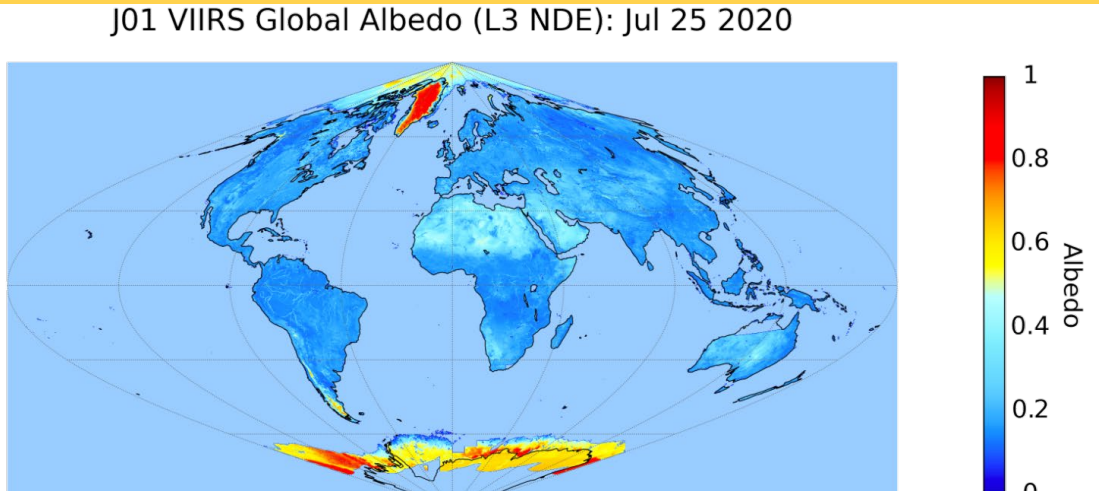


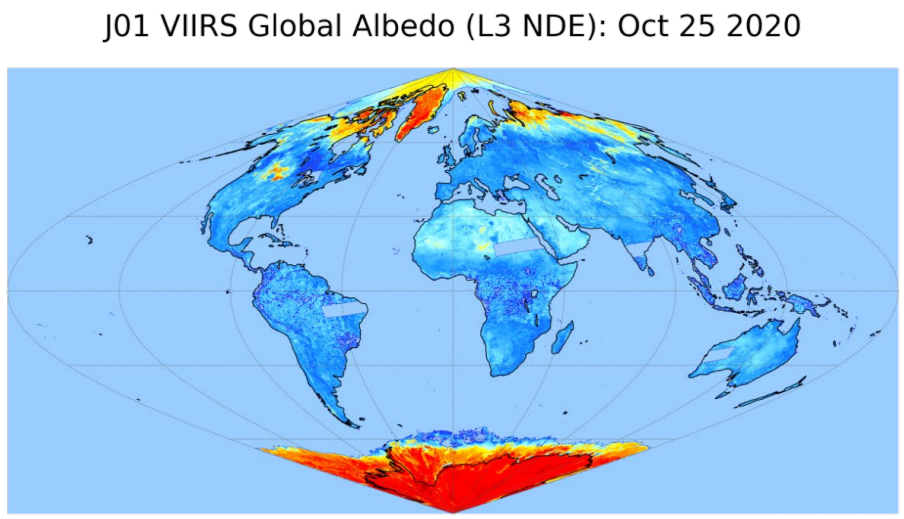
Assessment of Albedo anomaly:

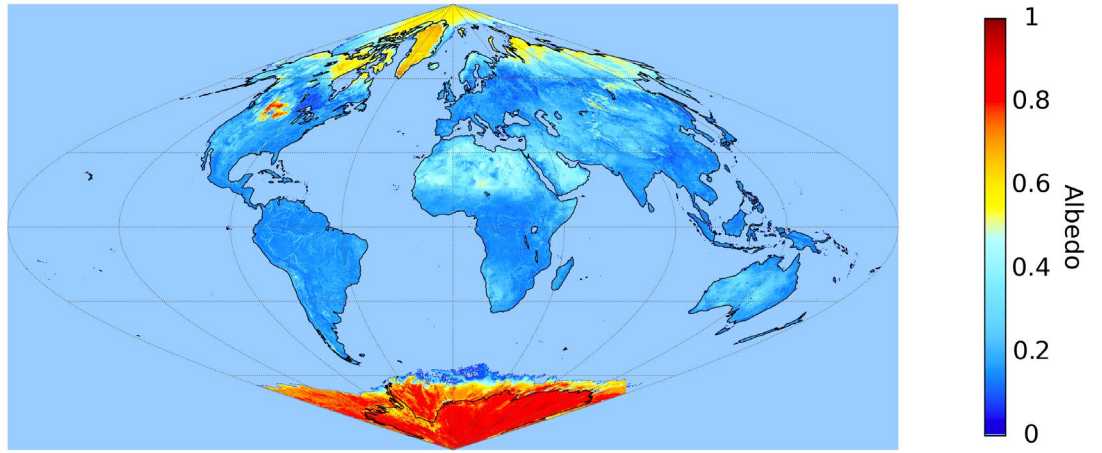
Monthly albedo anomaly assessed from comparing the current albedo with climatology from 2012~2021.

Comparison of v2r2 and v2r0 L3 NOAA20 albedo









v2r2 **v2r0**

The new result as expected. The difference between v2r2 and v2r0 results is more apparent over Antarctic, mainly because the climatology in our algorithm has been switched to a new version in v2r2.

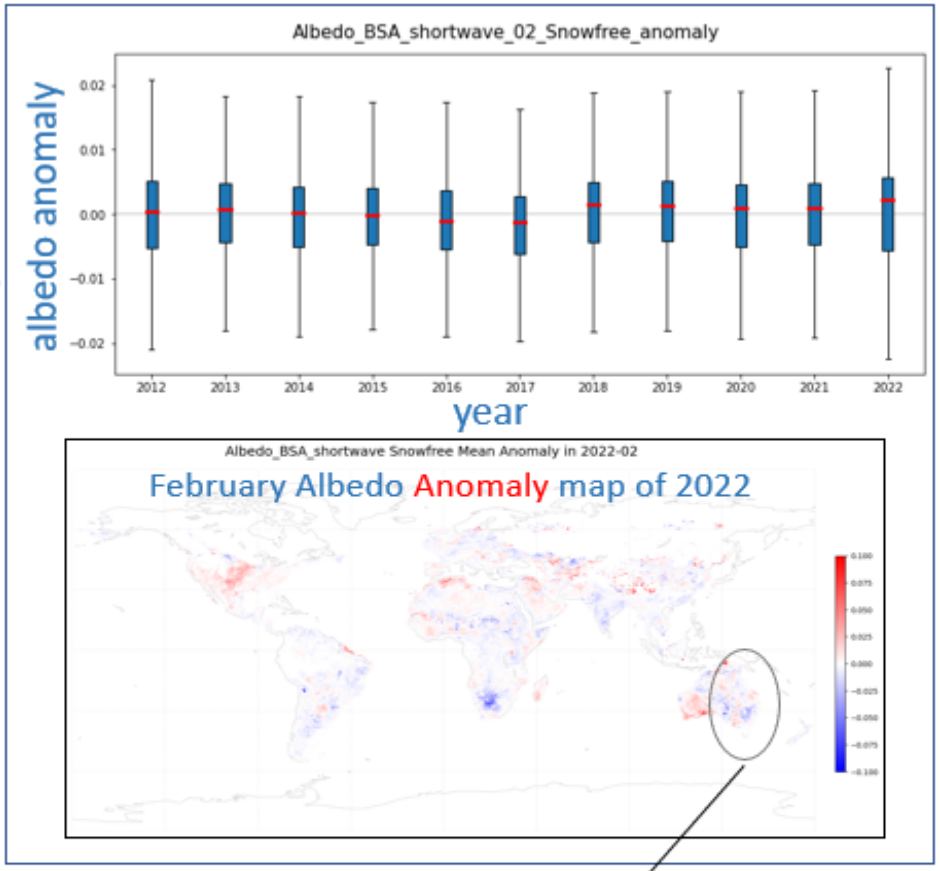
Albedo anomaly case: increase from drought and decrease from greener

Southeastern Australia Turns Green

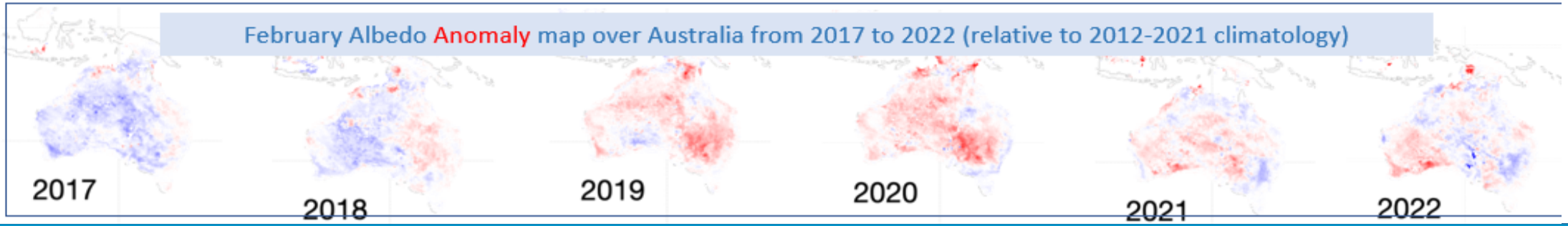
https://earthobservatory.nasa.gov/images/146863/southeastern-australia-turns-green

Similar report about the landscape greening in NASA .

Global albedo anomaly distribution shows an increase since 2018. One local case is southeastern Australia.

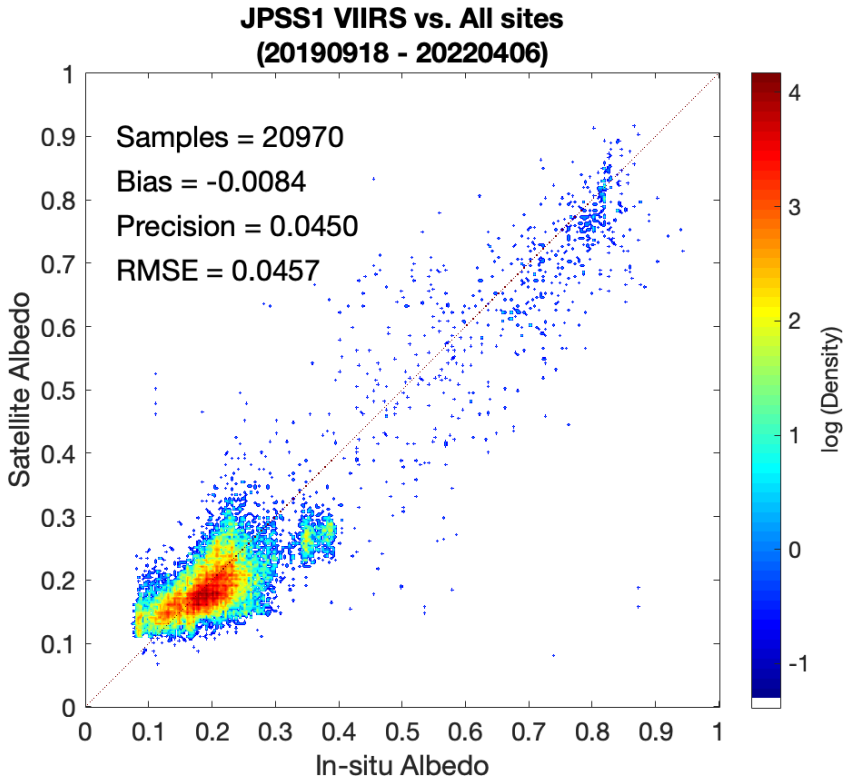


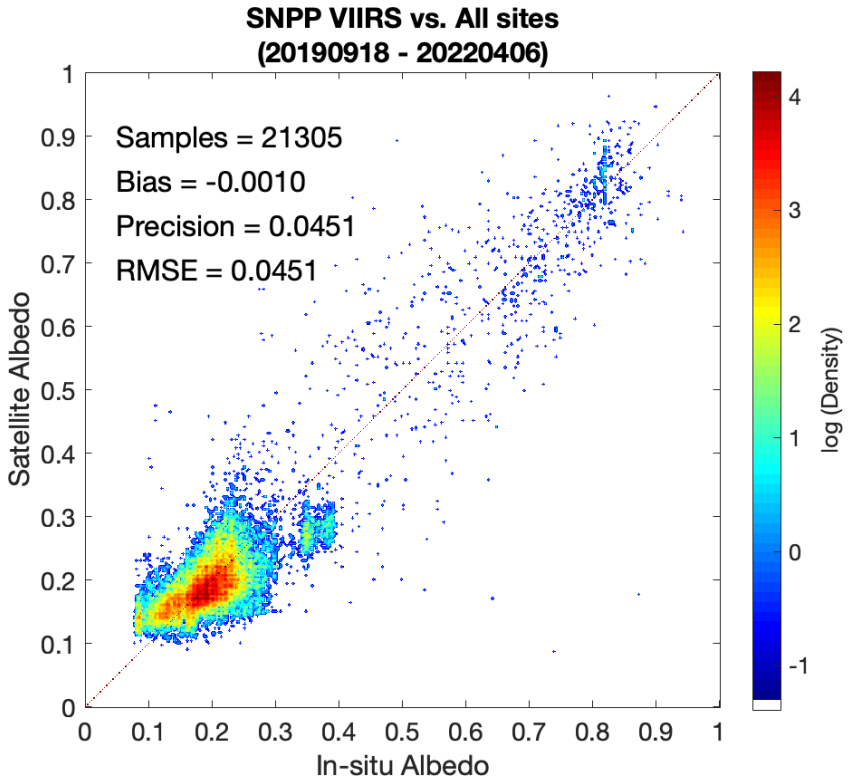
Positive albedo anomaly observed over Southeastern Australia since 2018, which is related to severe drought due to low precipitation. Since 2021, the albedo anomaly became negative, because the rainfall returned to average in 2020, and the whole area gradually turned to green, and the vegetation became healthier in 2021 and 2022.



Ground validation update using LTM matchups

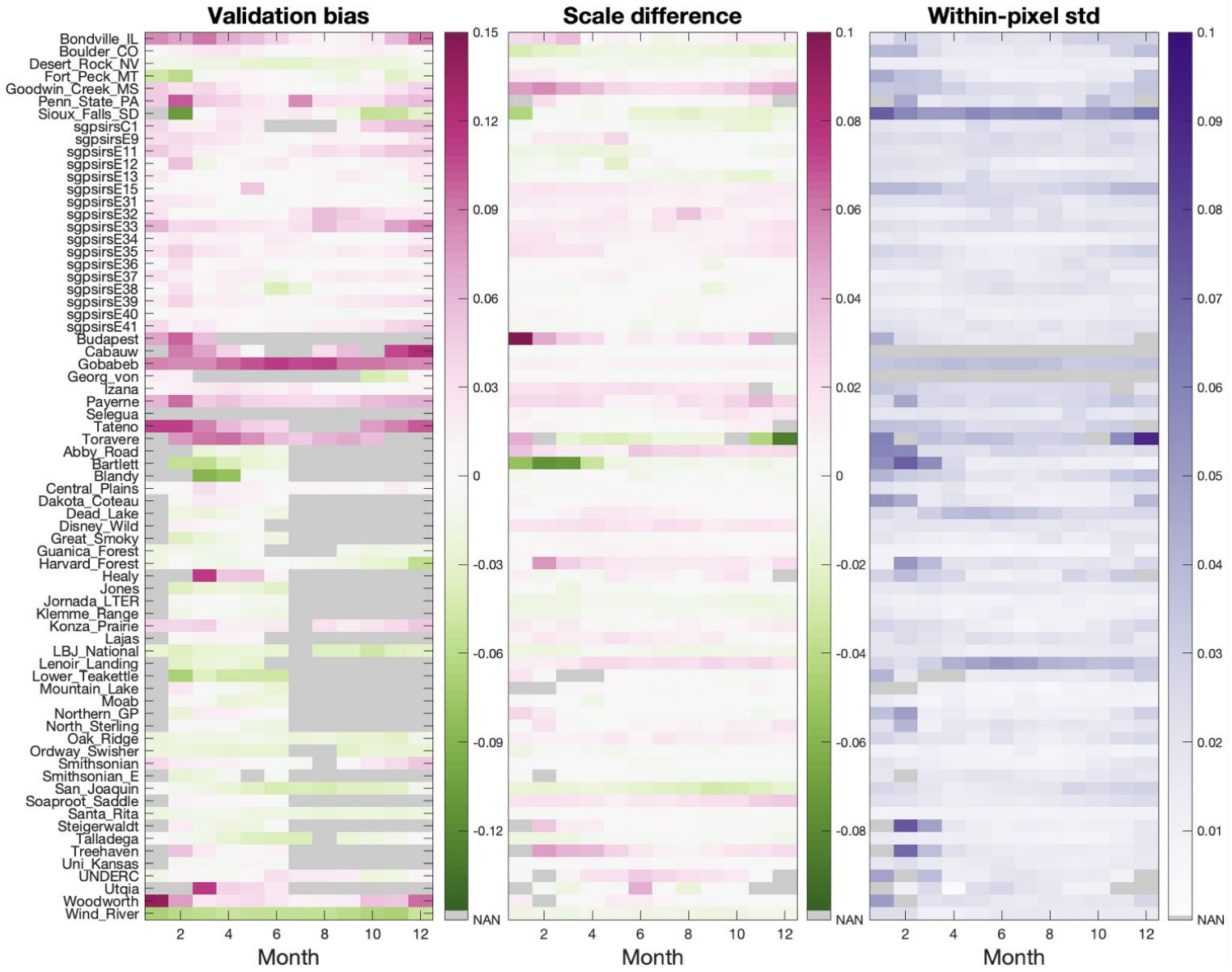
- Direct validation deploys ground measurements as an independent reference and the difference is commonly used to characterize the product accuracy and precision.
- The scatterplots present the overall scatterplots with all high-quality matchups between September 2019 and April 2022 for NOAA-20 and S-NPP, respectively.
- VIIRS albedos show a small negative bias less than -0.01 and a precision at around 0.04 compared with the in-situ measurements. The NOAA-20 and S-NPP VIIRS albedo retrievals are very consistent.





Influence of site-seasonal specific heterogeneity on validation results

- The heterogeneity condition of each site in each month could be checked out. It could be seen the scale difference and within-pixel std are generally larger in winter months, which leads to larger validation bias during this period.
- For snow surface in winter months, the impact of heterogeneity is more significant due to the uneven snow coverage between around-instrument area and the larger-pixel-area coupled with the more brighter snow surface.
- The sites with more deviated validation bias (y-value) usually have larger within-pixel std. Both the validation bias and within-pixel std are the largest in January and February.



Vegetation Index and Green Vegetation Fraction

April 2022

Accomplishments / Events:

- Conducted a study on comparison of smoothed NDVI (from vegetation health team) with our NVPS NDVI and found the smoothed NDVI is close to the NVPS TOA NDVI, but less than the NVPS TOC NDVI overall. This is as expected.
- Evaluated NOAA-20 GVF time series seasonality using AmeriFlux tower NDVI/EVI2 data and found the GVF time series mostly seasonality matched the in-situ NDVI/EVI2 seasonality. Further investigation with other data sets will be required.
- Made trials of transformation suggested by Obata et al. (2020, 2021) between GOESR ABI and NOAA-20 VIIRS NDVI. Results showed that this transformation did not improve consistency. Other methods will be tried instead.
- Began preparation for GEONetCast and PMR presentations.
- A replacement hire posted for the position/tasks left over by Mingshi Chen's leave

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			

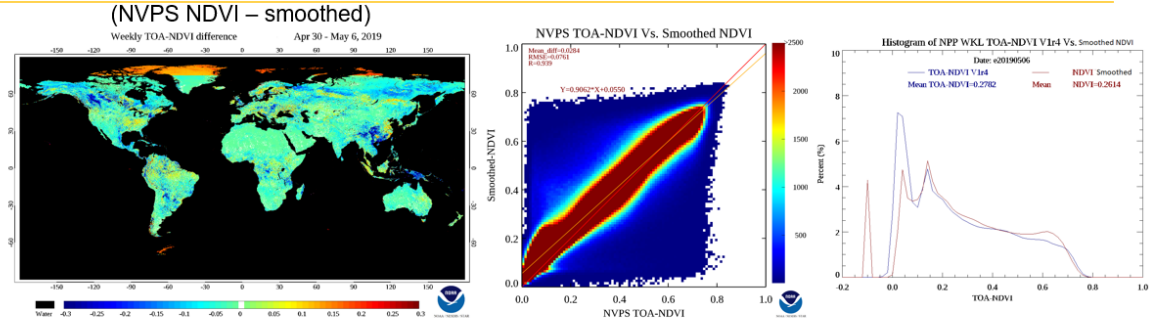
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

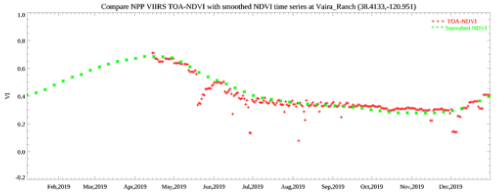
A replacement hiring Ad has been posted for over a month, but no appropriate candidate found yet. This will impact our milestone tasks in the rest of fiscal year.

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	Oct-21	Dec-21	Dec-21	
Prototype of VI generation using ABI data	Feb-22	Feb-22	Feb-22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Mar-22	Mar-22	03/29/22 (code & docs) 04/08/22 (data)	
LAI data development plan ready	Mar-22	Sep-22		NPPWG project rescheduled
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlights: VIIRS smoothed and non-smoothed TOA NDVI products show good consistency

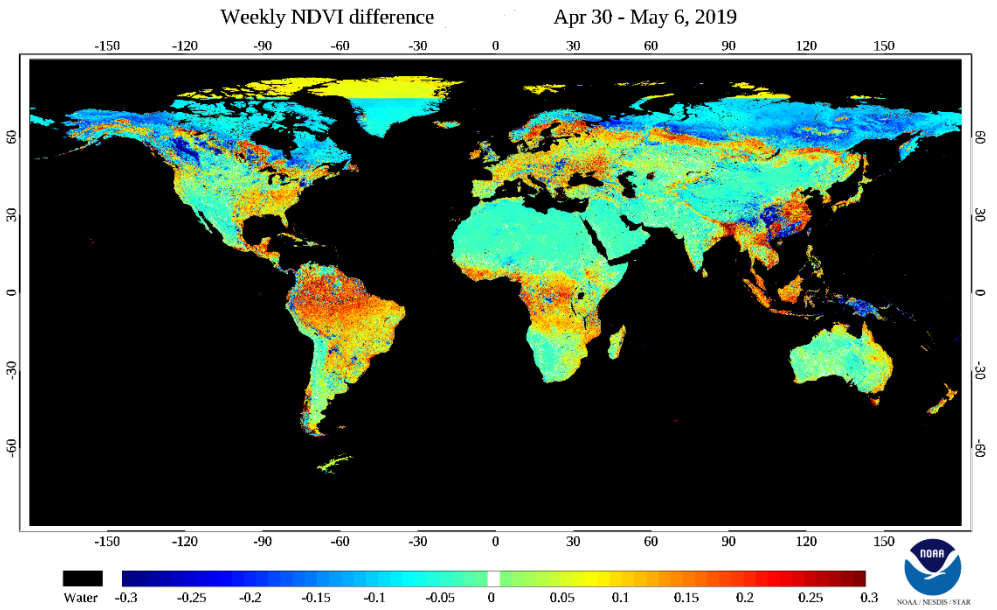


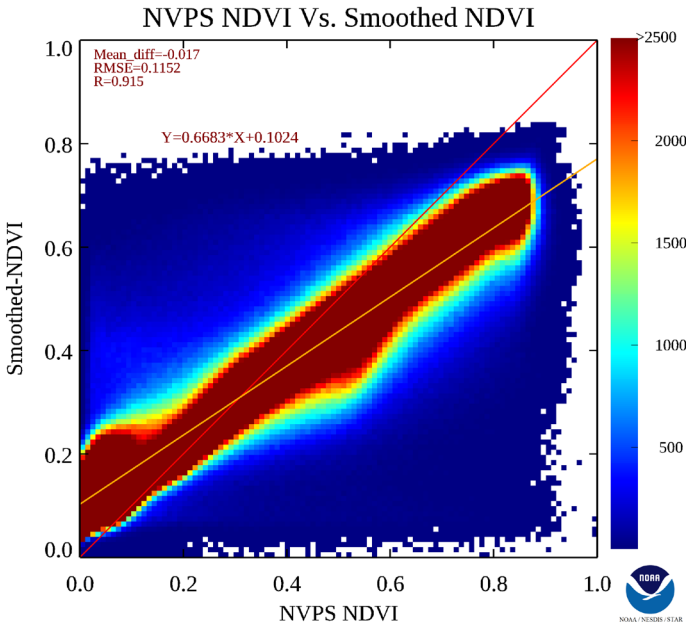
- These products show good consistency.
- The difference between the NVPS TOA NDVI and the smoothed NDIV is relatively small globally.
- The scatter plot and the histogram between them also showed TOA NDVI is close to the smoothed NDVI
- The TOC NDVI time series matched the smoothed NDVI time series. Since NVPS NDVI is not smoothed, it looks noisy when compared with the smoothed NDVI time series.
- This is all as expected when comparing smoothed TOA NDVI with non-smoothed TOA NDVI.

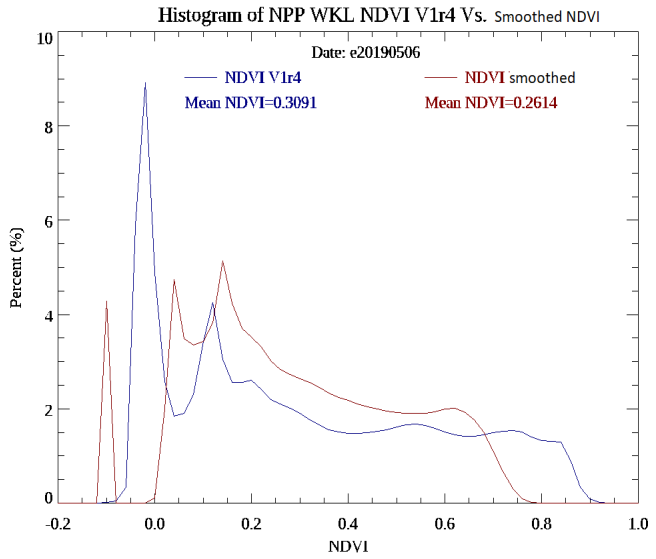


Smoothed NDVI compared with NVPS TOC NDVI

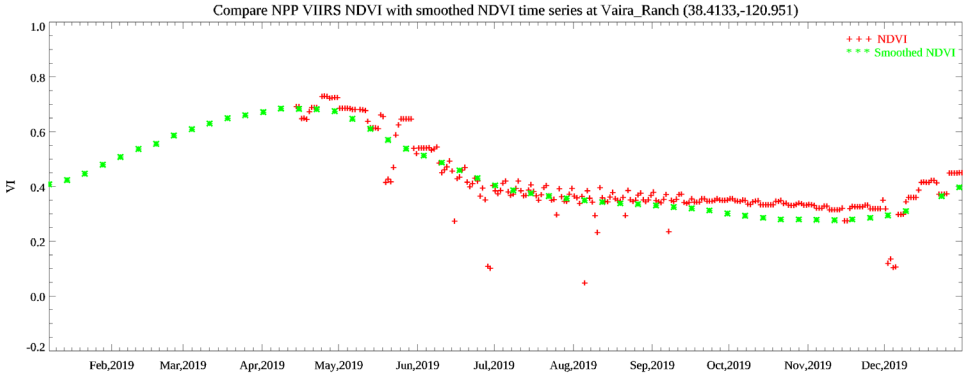
(NVPS NDVI – smoothed)





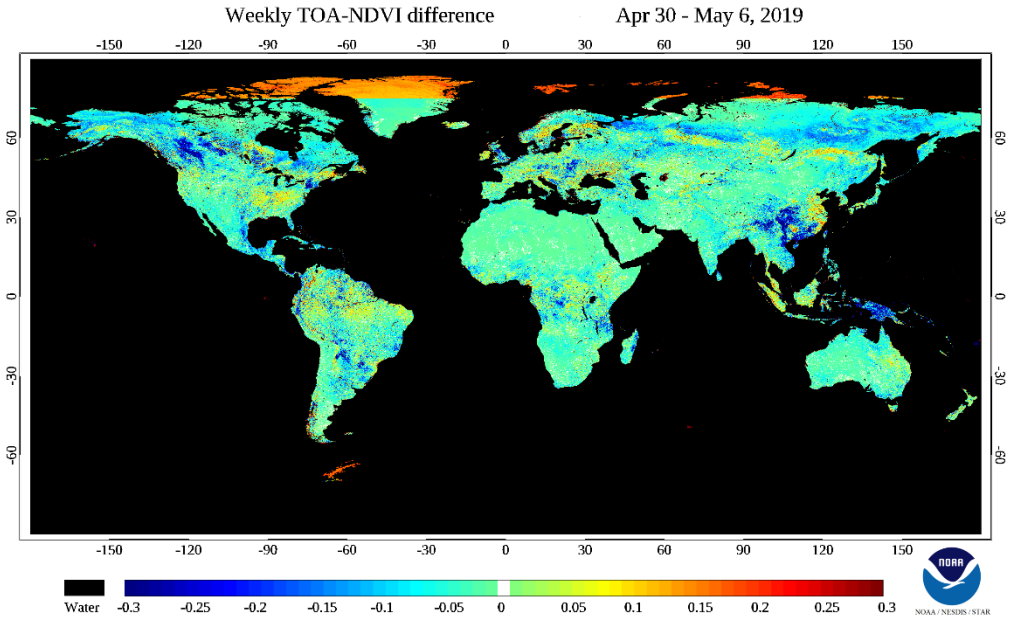


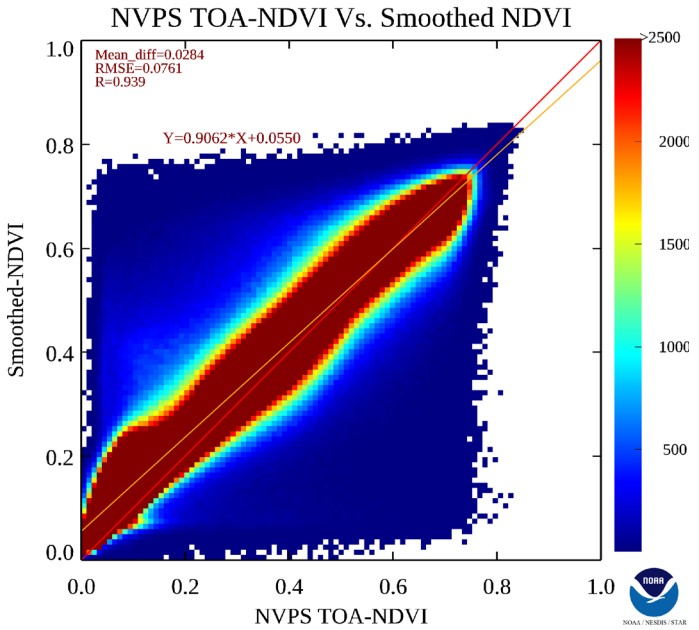
- The vegetation health team in STAR produced a smoothed TOA NDVI product
- The NVPS TOC NDVI is higher than the smoothed TOA NDVI, particularly at the amazon and the central Africa areas
- The scatter plot and the histogram between them also showed TOC NDVI is higher than the smoothed NDVI
- The TOC NDVI time series followed the smoothed NDVI time series, but slightly higher than the soothed NDVI time series.
- This is as expected, because the smoothed NDVI is a TOA NDVI and the NVPS NDVI checked is a TOC product.

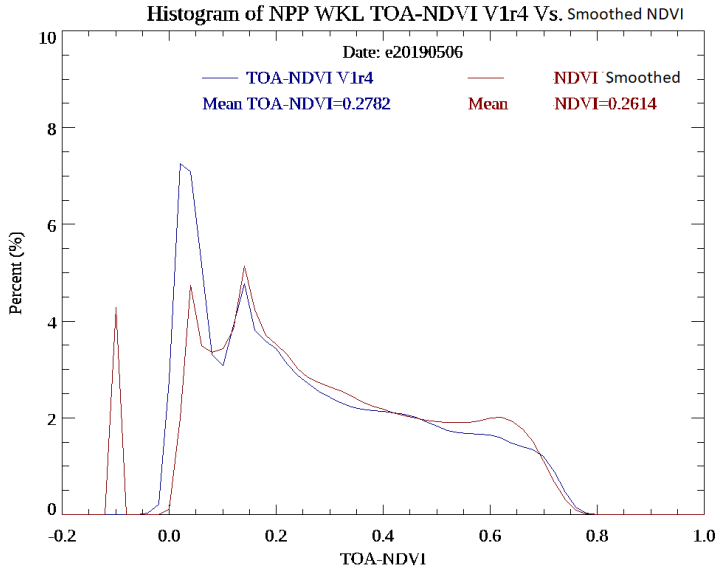


Smoothed NDVI compared with NVPS TOA NDVI

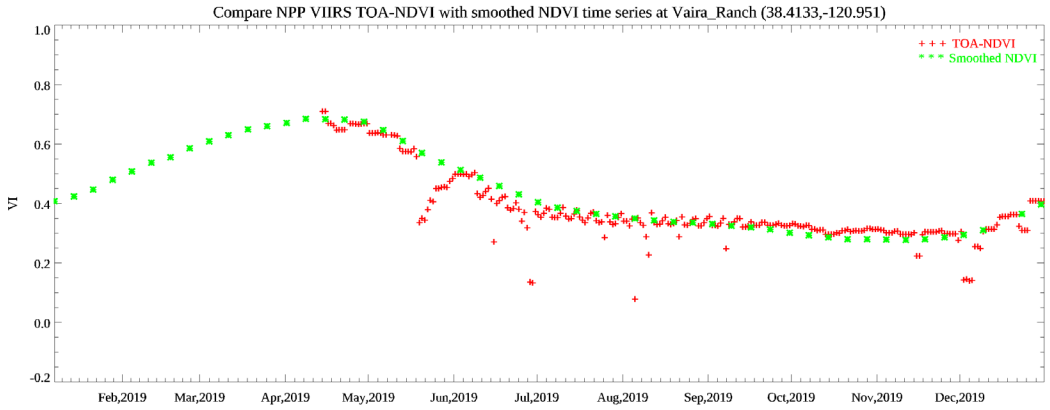
(NVPS NDVI – smoothed)



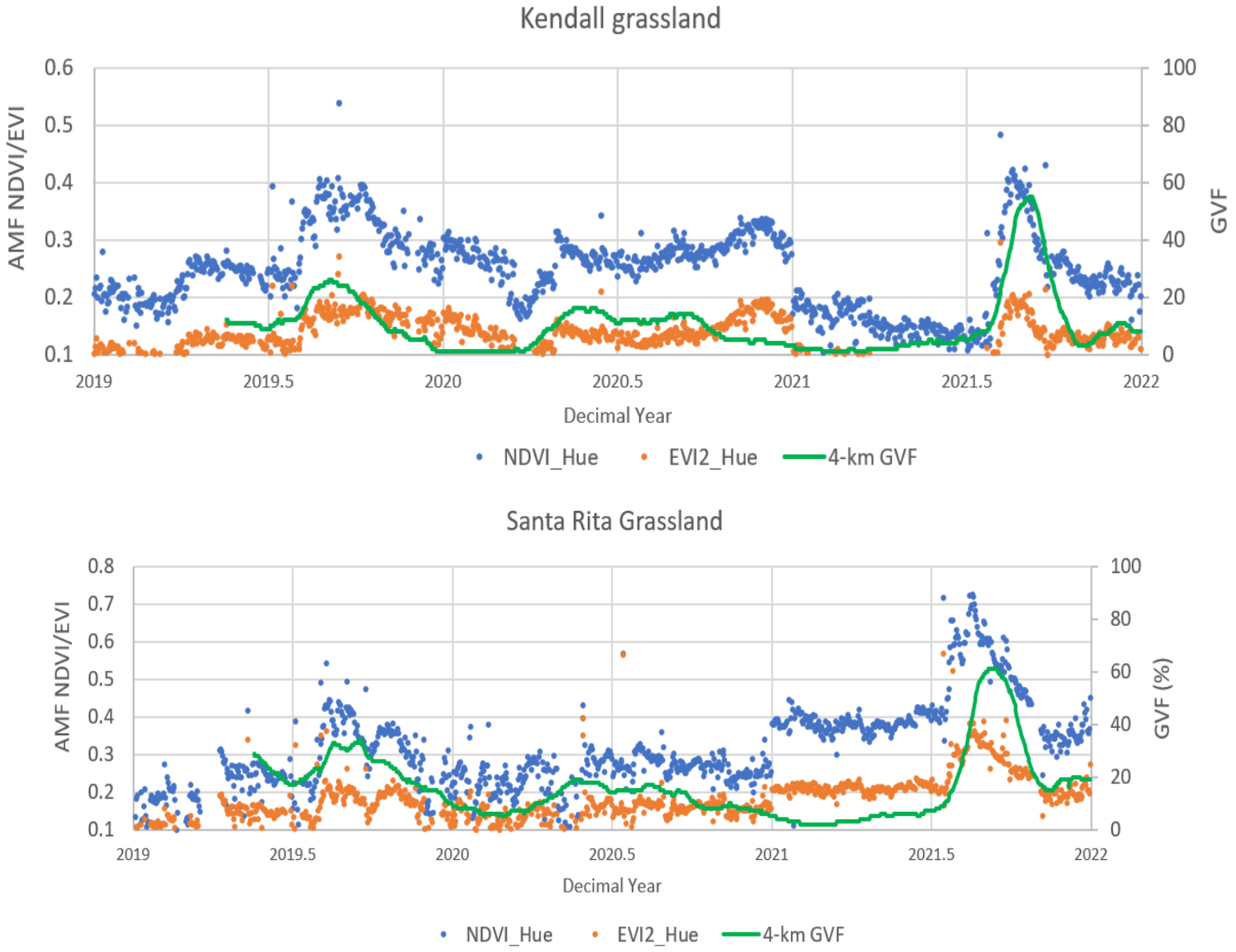




- These products show good consistency.
- The difference between the NVPS TOA NDVI and the smoothed NDIV is relatively small globally.
- The scatter plot and the histogram between them also showed TOA NDVI is close to the smoothed NDVI
- The TOC NDVI time series matched the smoothed NDVI time series. Since NVPS NDVI is not smoothed, it looks noisy when compared with the smoothed NDVI time series.
- This is all as expected when comparing smoothed TOA NDVI with non-smoothed TOA NDVI.



Evaluation of GVF time series seasonality



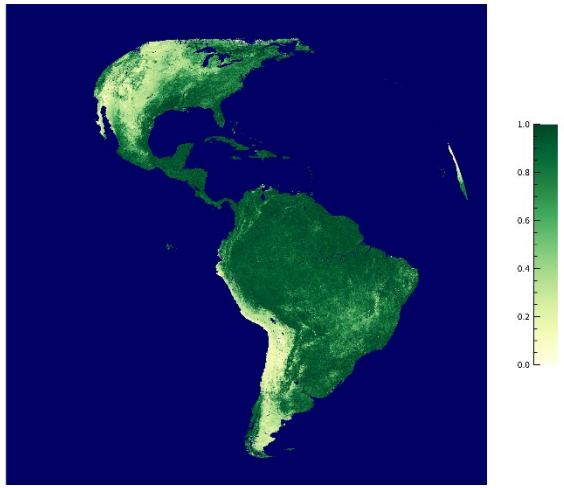
- AmeriFlux provides in-situ measurements of shortwave solar radiation and photosynthetically active radiation (PAR) above vegetation canopy throughout multiple years
- High-temporal resolution NDVI and EVI2 (2-band EVI) time series are computed from PAR & global radiation data (Wilson & Meyers 2007)
- The timing of GVF increase coincided with the timing of in-situ NDVI/EVI2 increase at the AmeriFlux sites in most cases
- The GVF time series seasonality matched the in-situ NDVI/EVI2 seasonality very well
- There are discontinuities in the AmeriFlux data near the beginning of 2021 that do not occur in the GVF product. This may be a data calibration issue. Comparison with other data shoud help to resolve the discrepancy.

Obata et al. NDVI transformation: Procedure and results summary

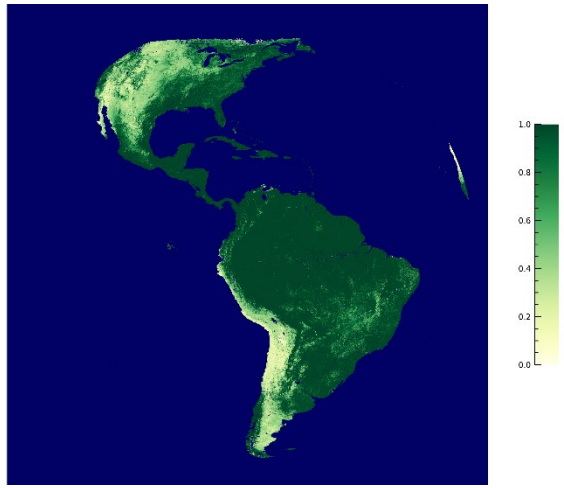
- Obata et al. (2021) method for transformation between geostationary and polar-orbiting NDVI relies on obtaining vegetation and soil tie points for each satellite, then using the reflectance values of those tie points in a formula for performing the transformation based on an assumption of fractional vegetation cover being equal between the satellites.
- Tie points were successfully found for GOES-R ABI and NOAA-20 VIIRS data for the global case and Amazon and Southwestern US subregions. (Tie point reflectance values were unrealistic for a North America subregion that was also tried.)
- Transformation of ABI data was performed using these tie point reflectance values and Obata et al. (2021) formulas
- Results showed worse match to VIIRS data than original ABI data. For example, transformed ABI NDVIs are generally greater than the original ABI NDVIs, while VIIRS NDVIs tend to be less than the original ABI NDVIs
- Other transformation formulas for VI intercalibration have been proposed in the literature, and experimentation with those formulas will continue.

Global transformation results: NDVI, 20211102-20211117

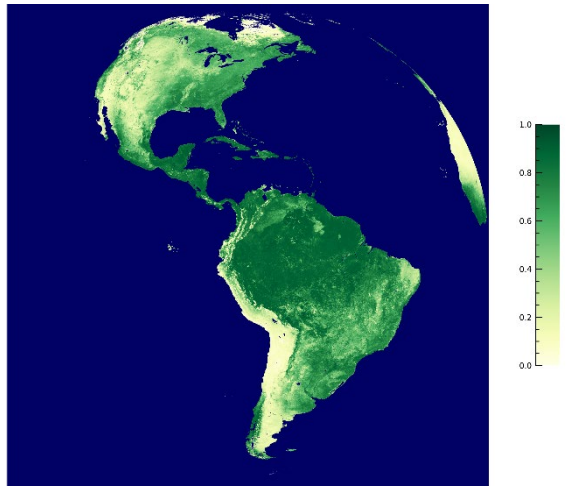
Original GOESR ABI



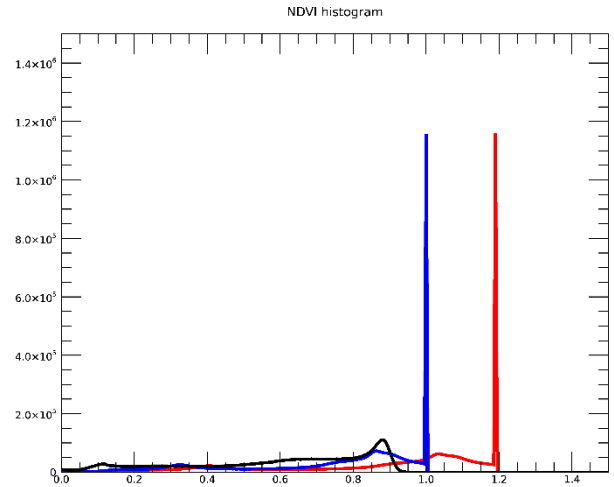
Transformed GOESR ABI



NOAA20 VIIRS



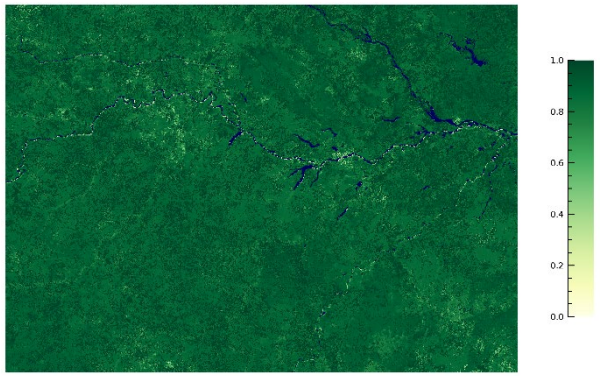
NDVI Histogram



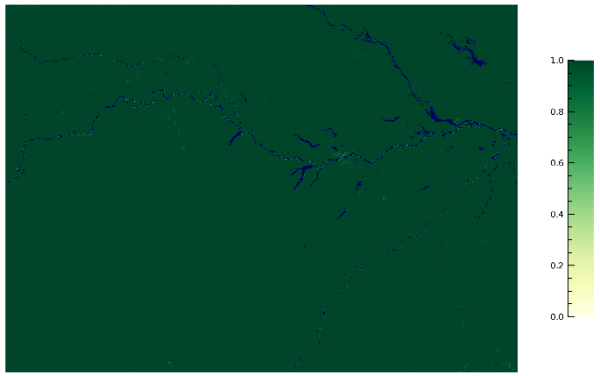
Original ABI
Transformed ABI
VIIRS

Amazon region transformation results: NDVI, 20211102-20211117

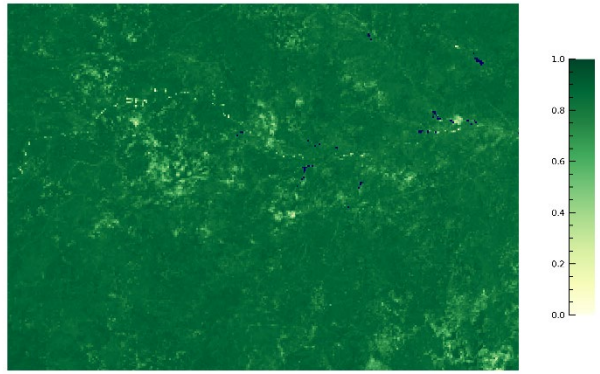
Original GOESR ABI



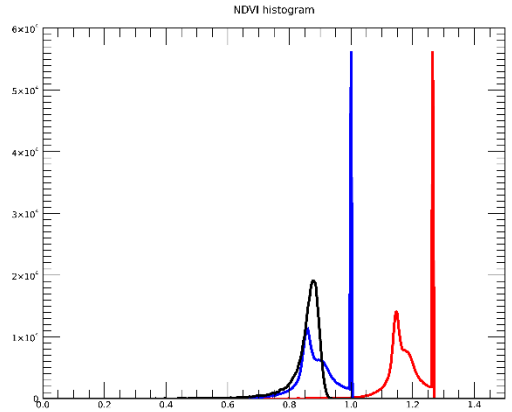
Transformed GOESR ABI



NOAA20 VIIRS



Histogram



Original ABI
Transformed ABI
VIIRS

Vegetation Health

April, 2022

Accomplishments / Events:

- Drafting a manuscript on our research on the radiation product and crop yield, kept on updating texts and tables (highlighted);
- Received invitation to be the Guest Editor of the Special Issue on Remote Sensing for Monitoring Vegetation Health;
- Communicated with users on various queries relating to VH Products;
- Generated a series of data and figures of VIIRS/VHP-1 and -4, -16 km resolution products, covering April 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		Not needed
40-year Vegetation Greenness (NDVI) & 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	01/12/22	
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlights: Table Showing Vegetation Health and New Indices Optimal Correlation with Wheat Yield

Country	VCI vs. Wheat		TCI vs. Wheat		VHI vs. Wheat		RCI vs. Wheat		VHI3 vs. Wheat	
	OW	CC	OW	CC	OW	CC	OW	CC	OW	CC
United States	28	0.614	51	0.361	24	0.481	31	0.353	30	0.581
China	19	0.556	35	0.224	21	0.373	34	0.376	23	0.365
India	46	0.334	34	0.261	46	0.050	11	**0.730**	8	**0.461**
Brazil	12	0.114	29	0.660	47	0.508	36	0.046	36	0.445
Ukraine	24	0.601	28	0.671	27	0.587	3	0.526	51	**0.699**
Russian	27	0.744	25	0.779	26	0.807	20	0.392	52	0.544
Australia	46	0.563	2	0.679	2	0.653	44	-0.090	35	0.516
Morocco	14	0.892	1	0.836	11	0.868	21	0.635	43	0.302
South Africa	13	0.142	52	0.198	28	0.020	8	**0.404**	30	**0.757**

Ocean Color

April, 2022

Accomplishments / Events:

- Completed an experimental evaluation of the temperature dependence of pure water absorption coefficient in the NIR domain.
  - Confirmed the spectrally opposite impact of temperature on the data processing. spectral absorption coefficient of pure water, which further provide confidence on using the temperature-correction coefficient, at least in the ~740-850 nm range, of Rottgers et al.in satellite ocean color (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	11/01/21	
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
Re-deliver the J2 DAP to CW			01/28/22	
J2 ready DAP to ASSISTT (include NPP/N20 updates)	Mar-22	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	Aug-22		J2 DAP issues
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

*Highlights e*xperimental evaluation of the temperature dependence of pure water absorption coefficient in the NIR domain *:*

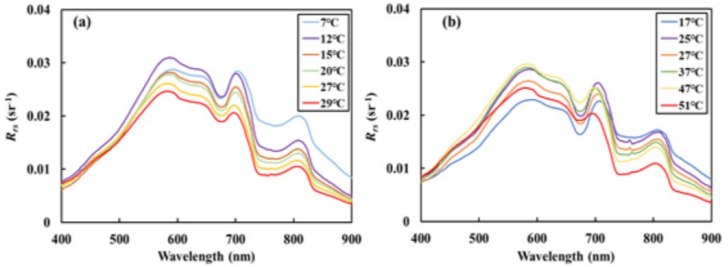


Fig. 3. The R_{rs} spectra at different temperatures obtained in this study. (a) Measured on December 4th. (b) Measured on December 13th.

Photo at left – water-filled tank along with radiometer taking measurements. The temperature of this water-sediment mixture was adjusted by adding a large number of crushed ice cubes and heating rods, which resulted in a temperature range of 7 to 51 °C. The temperature of the water body was measured simultaneously from five different spots near the surface when radiometric measurements were taken, where the temperature resolution is 0.1°C, which is sufficient for this study. An average of the temperature readings from the five spots was used to represent the temperature for each set of radiometric measurements (see charts at right). . The experiments were carried out on December 4th and 13th, 2021 between 10:00 am and 14:00 pm, under cloudless blue-sky day and low wind.

Sea Surface Temperature

April, 2022

Accomplishments / Events:

- Critical Design Review of the Gridded Supercollated SST products (L3S-LEO) will be held on 4 May 2022. Performance of the two products (PM, from 2 VIIRSs and AM from 2 Metop-FGs), and work towards Daily L3S-LEO which combines the two, will be presented at the Coast Watch Meeting from 9-12 May 2022. Work on ATBD is underway.
- Backfilling of VIIRS Reanalysis 3 (RAN3) dataset produced w/ACSPO v2.80 in Physical Oceanography Distributed Active Archive Center (PO.DAAC; https://podaac.jpl.nasa.gov/) continues. It will take ~2 months to fully populate the NPP (2012-on) and N20 (2018-on) archives. The links to landing pages and data are: NPP L2P: https://doi.org/10.5067/GHVRS-2PO28; N20 L2P: https://doi.org/10.5067/GHV20-2PO28; NPP L3U: https://doi.org/10.5067/GHVRS-3UO28; N20 L3U: https://doi.org/10.5067/GHV20-3UO28). Work is underway on RAN3 peer-reviewed pub. Figure shows nighttime validation against in situ data. Accuracy (global biases wrt in situ data) and precision (corresponding SDs) are well within specs and very consistent across NPP and N20.
- Work on preparation for N21 launch continues. SST online monitoring systems SQUAM, MICROS, ARMS are being updated to be ready for N21 Cal/Val.

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:

Tonga volcanic eruption may result in cold SST biases of unknown magnitude.

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 3.00. Improve Clear-Sky Mask & SST Algorithms. Focus on NPP/N20 SST consistency	Dec-23	Dec-23		
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

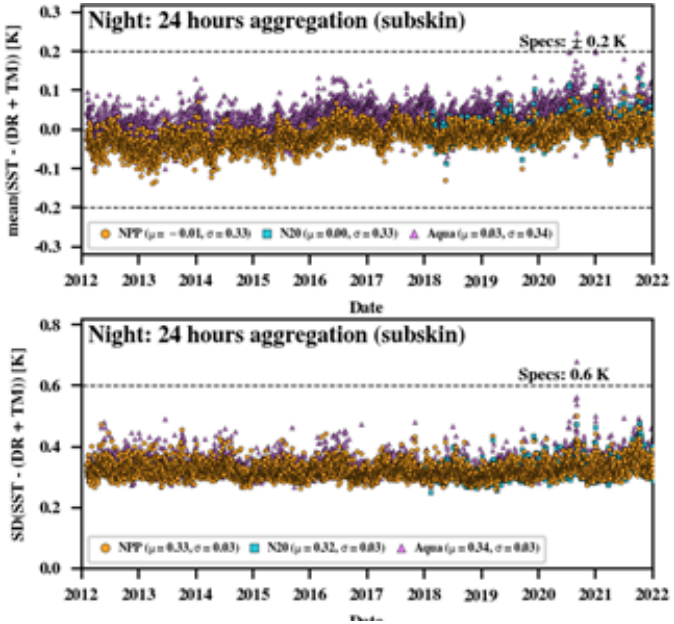
Highlights:

Global Validation statistics against in situ data for the VIIRS RAN3 produced with ACSPO v2.80 and currently archived in PO.DAAC.

Top: Accuracy (Global mean bias wrt in situ SST). NOAA specs ±0.2K are overlaid. VIIRS SSTs are well within specs and very consistent across NPP and N20.

Bottom: Precision (Global Standard Deviation wrt in situ SSTs). NOAA specs 0.6K are overlaid. VIIRS SSTs are well within specs and closely consistent across NPP and N20.

The RAN3 dataset is very high quality and is an important benchmark for the NOAA SST Team.



VIIRS Polar Winds

April, 2022

Accomplishments / Events:

Evaluation of VIIRS winds for SuperDAP. The polar winds team evaluated the quality of the NPP and N20 VIIRS wind datasets generated by the ASSISTT team in preparation for the delivery of the super DAP to NDE. Comparison statistics between the reprocessed VIIRS winds and spatially/temporally colocated rawinsondes showed that the VIIRS winds are of good quality and easily meet product performance specifications. Recall that we also uncovered an issue with the computed satellite zenith angle that resulted in a large reduction in good wind counts. For now, the new satellite zenith angle check is being disabled, but it can be reinstated in a future delivery.

JPSS Day Night Band Winds Comparable to IR or Better: Since 1 June 2021, the polar winds team at CIMSS has generated JPSS VIIRS S-NPP Day Night Band (DNB) Atmospheric Motion Vectors (AMV) routinely with the heritage (not Enterprise) algorithm, providing cloud motion winds over both the Arctic and Antarctic in near real-time. This product uses the Near-Constant Contrast (NCC) Level-2 product.. The results show that IR winds have better statistics at middle and upper layers, with vector accuracy of 5.14 m s-1 compared to 5.31 m s-1 for the DNB winds at upper levels. Noteworthy is the much-improved statistics at low levels of the DNB product compared to IR. It is observed that the Vector Normalized RMS is reduced by 11%, with vector accuracy and speed RMS reduced by roughly 0.3 m s-1 and precision improved by nearly 0.9 m s-1.

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			

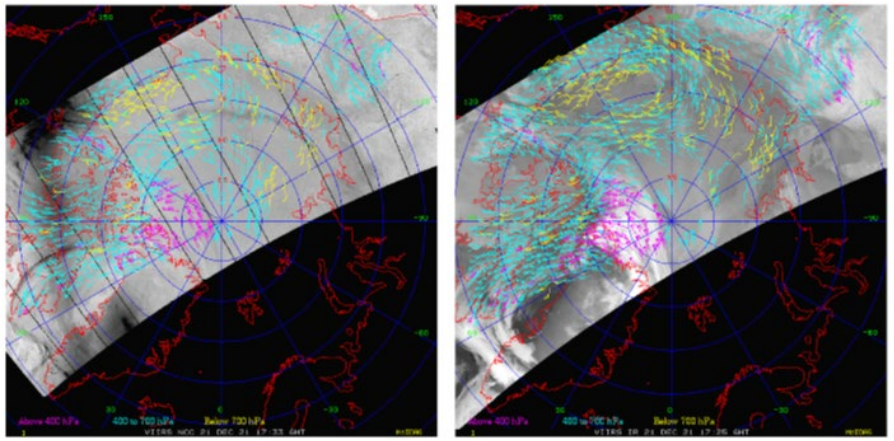
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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)	May-22	May-22		
Super DAP v3.1 patch delivery			12/06/21	
Implement VIIRS tandem winds	Mar-22	Mar-22	Dec-21	Running routinely at CIMSS
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlights: JPSS Day Night Band Winds Comparable to IR or Better



Left (Right) are DNB (IR) SNPP VIIRS AMVs for 21-Dec 17:30 UTC.

The IR AMV product produces more vectors overall, though where coverage is the same, the DNB AMVs are very similar to that in the IR image, with matching direction, speed and heights. Both exhibit polar cyclone circulation over the western (eastern) Beaufort (Chukchi) seas.

NUCAPS Products

April, 2022

Accomplishments / Events

- Following the PPM approval of the implementation of the NUCAPS averaging Kernels in the next version of the NUCAPS DAP delivery, the NUCAPS team delivered the DAP once again to the ASSISTT team. The NUCAPS team prepared a test data set that included averaging kernels and made it available to the users through NOAA FTP site.
- NUCAPS Team contributed manuscript by Kalluri: ""Validation and Utility of Satellite Retrievals of Atmospheric Profiles in Detecting and Monitoring Significant Weather Events", has been published in the BAMS journal https://journals.ametsoc.org/view/journals/bams/103/2/BAMS-D-20-0126.1.xml.
- NUCAPS team manuscript "Spatial and Temporal Variability of Global Atmospheric Methane Seen by Two Decades of U. S. Hyperspectral Infrared Sounders", has been submitted to Remote Sensing
- Continued evaluation of the MetOp-B/C NUCAPS with the EUMETSAT derived products using an ensemble of 12 focus days of NUCAPS products matched with truth data sets (ECMWF, TCCON, and Aircore data) spanned across a year covering different seasons.
- Continued optimization of Ammonia retrievals through development of parameters and thresholds specifically for CrIS and updates to the SARTA wrapper scripts needed for operational implementation.
- Completed research efforts on the (1) damping factor optimizations, and (2) ozone a-priori improvements and evaluations. The NUCAPS team is planning on implementing these improvements into the next NUCAPS operational version.

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)	Mar-22	Mar-22	04/08/22	
NUCAPS Averaging Kernels (AK) and improved stability indices. S-NPP Mission long reprocessing version (NUCAPS v3.1)	Dec-21	May-22	OSPO PPM approved AK implementation.	The NUCAPS DAP with AK is with the ASSISTT team for a delivery to the NDE
Addition of Ammonia product to NUCAPS operational retrievals (NUCAPS v3.2)	May-22	May-22		Optimized NH3 for CrIS
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	Results published in a joint paper with the CrIS SDR team	No plans yet for an operational DAP
Land, Snow/Ice and Ocean Spectral Emissivity Improvements	Mar-22	Mar-22	Mar-22	Paper accepted for publication
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	Sep-22	Sep-22		continuing
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	Sep-22	Sep-22		continuing
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, 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

NUCAPS vs. EUMETSAT Trace Gas Product Evaluations – Carbon Monoxide

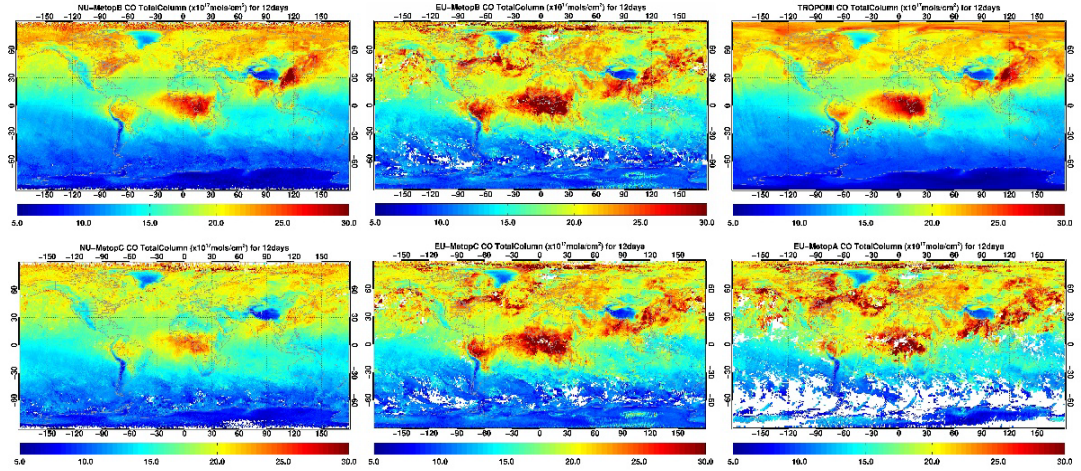


Figure shows an evaluation of the NUCAPS MetOp-B/C CO product (left column) vs. the EUMETSAT product (middle column) with the TROPOMI (right column) using an ensemble of 12 focus days spanned across an year covering different seasons. The NUCAPS MetOp-B/C trace gas products are as good as the EUMETSAT products (e.g. CO), and in fact shows a better promise for CH4 and CO2 products in comparison to the EUMETSAT products. The team is finalizing these results for a possible journal publication.

MiRS Products

April, 2022

Accomplishments / Events:

- In preparation for the planned launch of the next generation of European polar orbiting satellites (EPS-SG), preliminary work was done to update the sea ice emissivity look up tables to account for polarization differences with similar channels on ATMS. These polarization differences result in significantly different emissivity signatures in expected MWS measurements. Therefore, the emissivity look up tables need to be adjusted in order to optimize the ice concentration retrievals. The highlighted figures show an example intercomparison of N20/ATMS retrievals (left), MWS retrievals (based on simulated MWS brightness temperatures) using the original ATMS tables (center), and finally MWS retrievals using a preliminary adjustment to the table that accounted for the MWS polarization differences (right). Adjusting the table results in an improved total and multiyear sea ice retrieval (i.e. closer to the ATMS result). Since the results are based on simulated data, which has its own uncertainties, further progress on updating the cryospheric look up tables will require working with real data after the MWS launch.

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			

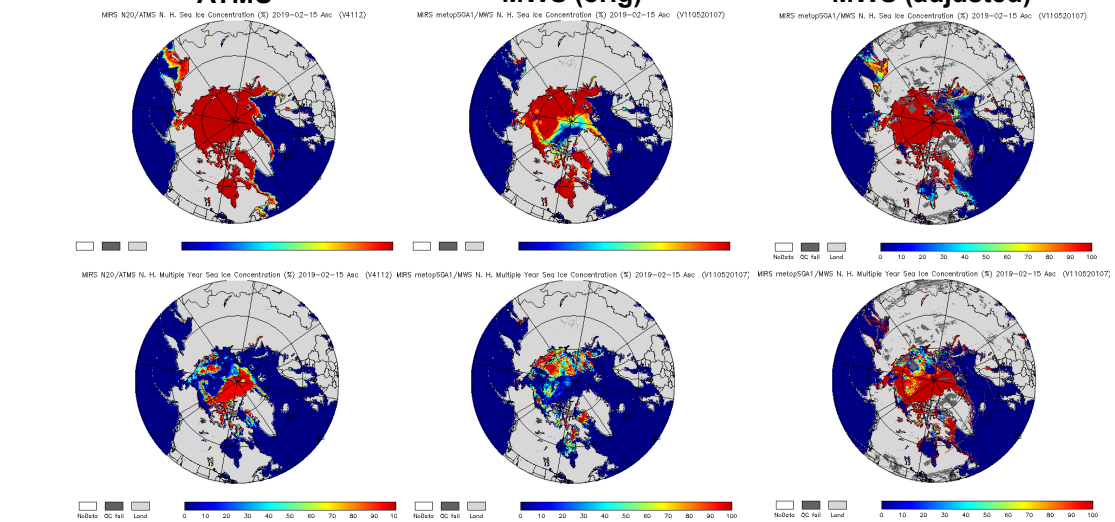
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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
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)	Mar-22	Mar-22	03/31/22	
Complete collocation and evaluation of experimental MiRS-TC version for one year of Atlantic and Pacific basin TCs in 2020	Jan-22	Jan-22	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	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 (May-22 JCT3-TVAC; Maybe; Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlights:



Intercomparison of MiRS total sea ice (top) and multiyear sea ice (bottom) concentration. Left: N20/ATMS operational retrieval. Center: MWS retrieval using original ATMS look up table. Right: MWS retrieval using updated table to account for polarization differences.

Snowfall Rate

April, 2022

Accomplishments / Events:

- The SFR team performed Metop-C SFR validation and Metop-B/-C validation studies in support of the MiRS NCCF Operational Readiness Review (ORR).
- The SFR team provided support to ASSISTT to diagnose an issue with SFR production within MiRS v11.8. The issue was preventing the MiRS update to be transitioned to NDE for operational implementation.
- To improve the skill of the snowfall detection model under cold conditions (2 m temperature < -15°C), the training datasets are being augmented with more no-snow ground observations in cold regions. This task involves updating the data extraction techniques for the complex and often inconsistent station reports. In addition, the team is exploring using additional features in the machine learning model.

Overall Status:

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

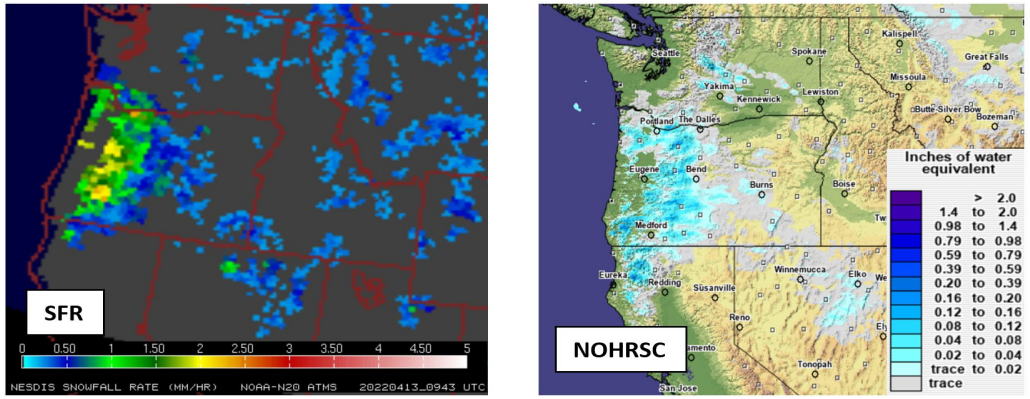
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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)	Mar-22	Mar-22	03/31/22	
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		

Highlights: Improving Metop-C SFR with Machine Learning



A late season snowstorm hit Washington and Oregon on April 13 and set record for most snow accumulations this late in the season in many local areas. NOAA-20 SFR captures the snowfall (left) and compares well with the corresponding National Operational Hydrologic Remote Sensing Center (NOHRSC) hourly snowfall (right).

OMPS Ozone (V8Pro, V2Limb & V8TOz)

April, 2022

Accomplishments / Events:

Finished reprocessing S-NPP V8Pro record with interpolated bandpasses and improved soft calibration; reviewing steps to get into CLASS

Overall Status:

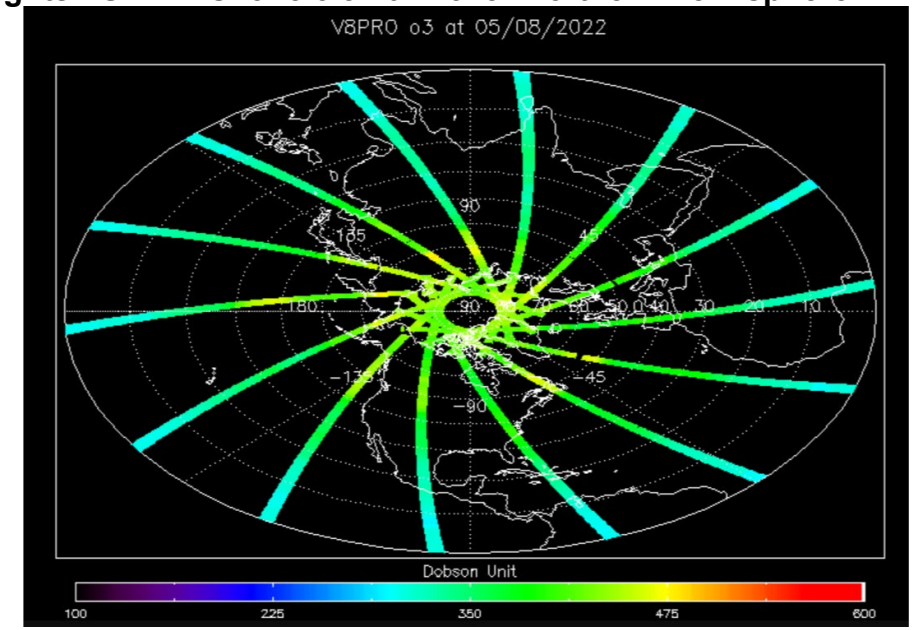
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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	10/26/21	
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates), V8TOz	Jan-22	Jan-22	02/03/22	
Final J2 ready DAP to NDE (include NPP/N20 updates), V8Pro	Apr-22	Apr-22		To ASSISTT: 02/17/22
Revise Cal/Val Plan to include JPSS-2 Limb and draft schedule	Dec-21	Dec-21	12/09/21	
Update Version 2.5Limb, three improved Climatologies, Cloud Top, Repaired	Jan-22	Jan-22	Jan 22*	*Cloud Top not resolved
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	Mar-22	Jan-22 (for V8TOz)	
Soft calibration adjustments for V8TOz (TC) and V8PRo (NP) NPP reprocessing for V8Pro & V8TOz	Nov-21 May-22	Feb-21 Apr-22	**11/26/21 (TC) 02/17/22 (NP)**	SDR Delays
N20 V8Pro and V8TOz reprocessing	May-22	May-22		
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 (May-22 JCT3-TVAC; Maybe: Jul-22 JCT4, JCT4-DSE)	Sep-22	Sep-22		Ongoing

Highlights: S-NPP Ozone 5/8/2022 over Northern Hemisphere



GCOM-W1 Products

April, 2022

Accomplishments / Events:

- NOAA AMSR2 AWS algorithm presented at the International Ocean Vector Winds Science Team
- A decision made outside of the project to target the planned update to GAASP this summer into NCCF instead of NDE will delay the implementation of the AWS wind speed algorithm, and the improved rain rate and soil moisture algorithms.

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			

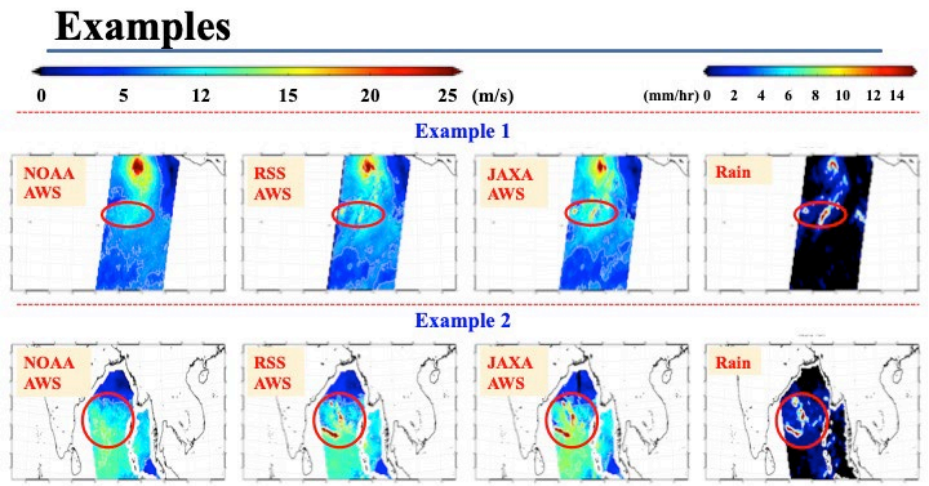
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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	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		

NOAA All-Weather AMSR2 Wind Speed Product for All Wind Regimes



The NOAA AWS algorithm has superior performance in rain regions as seen in the example above

JSTAR Mapper and NPROVS

April, 2022

Accomplishments / Events:

- Mapper
  - Converted EDR LTM ATMS Limb Correction images to format necessary for inclusion in ICVS and backfilled entire record.
  - Created Day/Night Band and Near Constant Contrast imagery for JSTAR Mapper"
- NPROVS
  - NWS High Resolution Rapid Refresh (HRRR) Regional Forecast Model integrated into the STAR NOAA Products Validation System (NPROVS). The HRRR is the first regional model implemented into NPROVS and will be used to assess NUCAPS atmospheric soundings across the continental U.S. (CONUS) in a planned NWS Hazardous Weather Test-Bed (HWTB) experiment planned in May.

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		
Maintain / expand existing ~~EDR LTM web pages and~~ JSTAR Mapper web site	Aug-22	Aug-22		Remove LTM
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		

Highlights:

Left: Sample ATMS data for ascending and descending nodes. The EDR LTM ATMS Limb Correction images were corrected to the format necessary for inclusion in ICVS.

Right: Enterprise Standard Deviation (SD) statistics for **NUCAPS, HRRR,** and **GFS (6-hr forecast)** baselined to Radiosonde; **HRRR** are those collocated to NUCAPS and their higher standard deviation reflects their increased time difference relative to the radiosonde. Statistics are for atmospheric H2O Vapor fraction (%).