NOAA JPSS Monthly Program Office

AMP/STAR FY22 TTA

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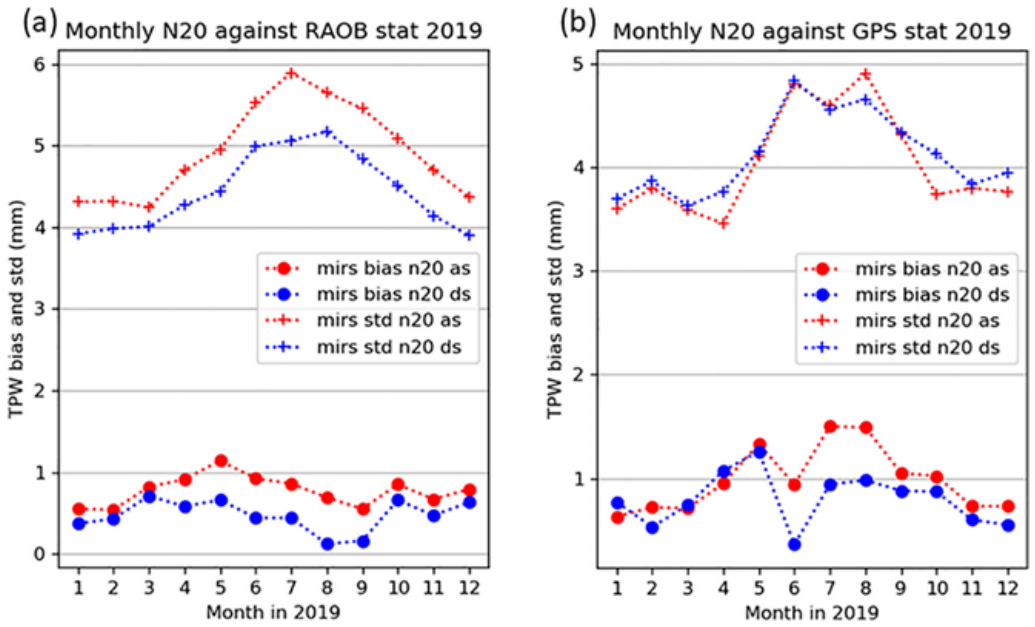
February, 2022

Highlights from the Science Teams (February)

MIRS TPW Comparison paper

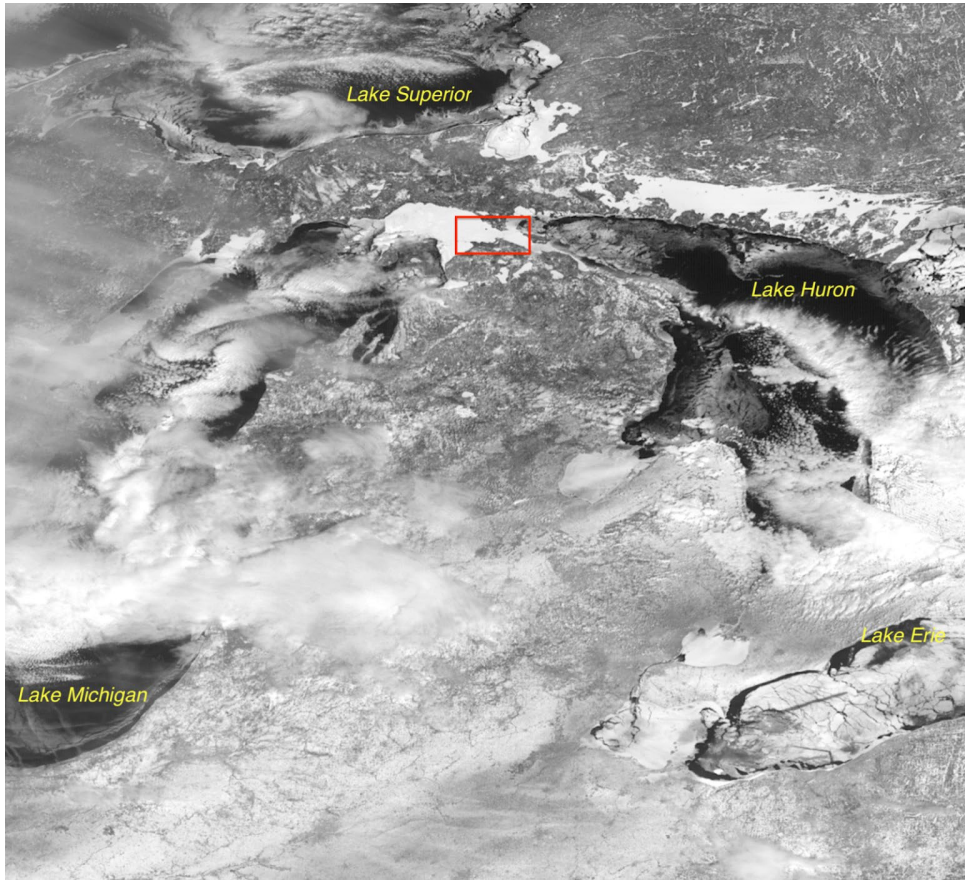


Monthly statistics of MiRS NOAA-20 ATMS TPW against (a) GPS and (b) radiosonde for ascending and descending orbits separately for 2019. The numbers of collocated samples for each month are between 4,000 and 7,000 for GPS estimates and between 4,500 and 9,000 for radiosonde observations.

An article written by the MiRS Science Team has been published this week. The article titled “In-Depth Evaluation of MiRS Total Precipitable Water From NOAA-20 ATMS Using Multiple Reference Data Sets” by CISESS scientist Yong-Keun Lee and co-authors appears in Earth and Space Science (http://doi.org/10.1029/2021EA002042). In the study one full year (2019) of MiRS total precipitable water (TPW) retrievals from NOAA-20/ATMS measurements were subjected to a detailed validation effort, including comparisons to GDAS and ECMWF analyses, radiosonde measurements, and ground based GPS estimates. Since the MiRS TPW estimates from multiple satellite measurements are a major component of the operational blended (and advected) TPW products, the study can serve as a benchmark for both developers and users of the product in their own applications.

Highlights from the Science Teams (February)

UAS Validation Experiment in the Straits of Mackinac



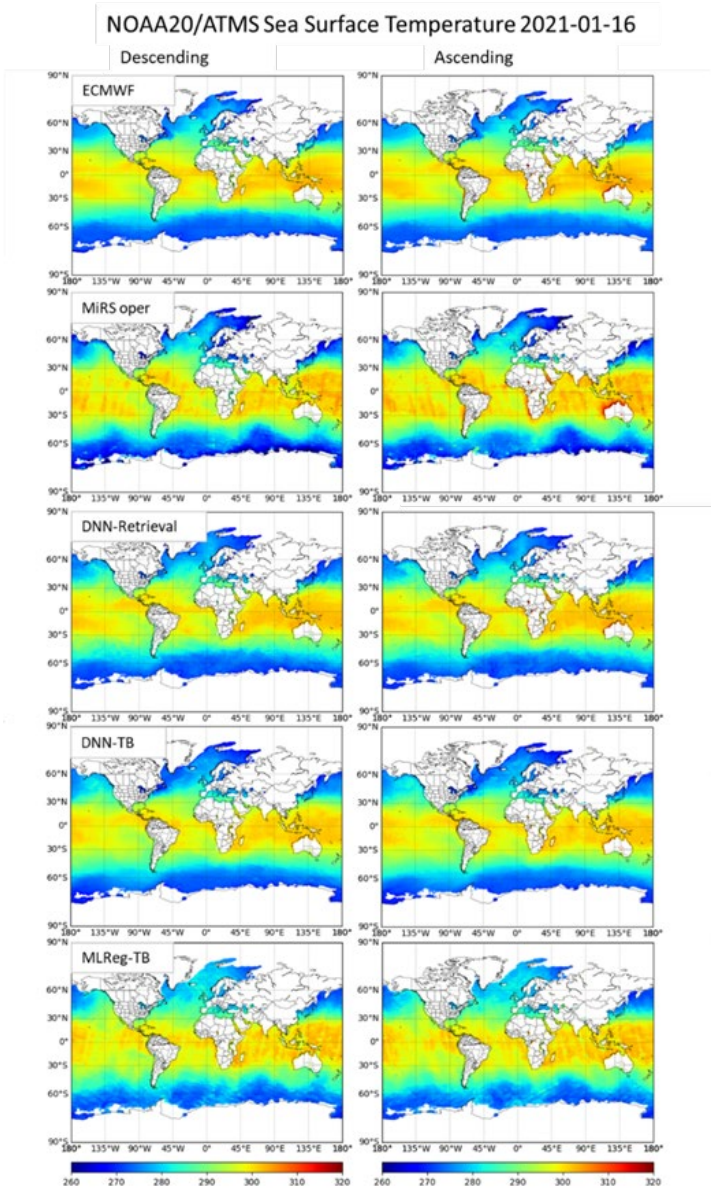
GOES-16 ABI band 2 image of the Great Lakes on 15 February 2022 at 16:12 UTC. Measurements were made on the south side (bottom left) of the red box.

Scientists from STAR participated in UAS (Uncrewed Aircraft System) Sea Ice Retrieval for Calibration/Validation Experiment (USIR-CV EX) in the Straits of Mackinac, Michigan, 14-18 February 2022. The experiment used advanced hybrid quadrotor UAS platforms with customized multispectral payloads to gather critical data for validation of NESDIS' GOES-R and JPSS operational ice products and experimental ice products from Synthetic Aperture Radar (SAR), CryoSat-2, and ICESat-2. While NESDIS products have been validated globally, there remains little understanding of local performance in the Arctic or Great Lakes. The USIR-CV EX provides a new data source to understand ice algorithm performance for key parameters needed in navigation and ice modeling, such as ice concentration, ice surface temperature, and ice thickness. The experiment will contribute knowledge on UAS operations over the Great Lakes and, next year, the Arctic.

Highlights from the Science Teams (February)

MIRS SST Improvement Paper Published

The MiRS Team has published a paper in JSTARS titled “Improvement of MiRS Sea Surface Temperature Retrievals Using a Machine Learning Approach”. In the study, various approaches were tested to improve SST retrievals from NOAA-20/ATMS measurements. These included a deep neural network (DNN) that used MiRS operational retrievals along with ATMS measurements and other metadata such as location and satellite observation zenith angle (DNN-Retrieval), a DNN that used satellite data alone (DNN-TB), and a multilinear regression that used satellite data (MLReg-TB). In all cases tested, the DNN-Retrieval approach yielded the best performance relative to ECMWF analyses, both in terms of overall statistics, but also in terms of lack of spatial artifacts and reduced scan angle dependence. The figure below shows results from one of the testing days. The goal of the effort is not simply to improve the SST estimate, but to potentially incorporate the correction into the variational retrieval process itself within MiRS. Since the 1DVAR method simultaneously retrieves the atmospheric and surface state, optimizing the surface temperature specification may result in improved retrieval of the temperature and water vapor profiles, for example.



Accomplishments

- Delivery Algorithm Packages (DAPs) - Mission Unique Products:
  - **Delivery of J2 Mounting Matrix Coefficients PCT/LUTs updates based on the Pre-Dynamic alignment measurement report**:
    - **ATMS SDR**: 2/25/2022: ATMS SDR team delivered J2 ATMS PCT with Pre-Dynamic Mounting Coefficients DAP package (ADR8814/CCR5909) to ASSISTT team; 3/08/2022: ASSISTT team delivered the DAP to DPMS. *List of updated tables*: ATMS-SDR-CC_j02 (for SIDE-A and SIDE-B)
    - **CrIS SDR**: 3/07/2022: CrIS SDR team delivered JPSS-2 CrIS PCT with Pre-Dynamic Mounting Matrix for ADR8762/CCR5910 to ASSISTT team; 3/11/2022: ASSISTT team delivered the DAP to DPMS. *List of updated tables/cfg*: 1) CrIS-FS-SDR-CC_j02; 2) PRO_CFG.xml
    - **VIIRS SDR**: 2/18/2022: VIIRS SDR team delivered Launch-Ready J2 VIIRS SDR LUTs Update DAP (ADR8822/CCR5512) to ASSISTT team; 2/24/2022: ASSISTT team delivered the DAP to DPMS. *List of updated tables*: 1) VIIRS-SDR-DELTA-C-LUT_j02; 2) VIIRS-SDR-DNB-LGS-GAINS-LUT_j02; 3) VIIRS-SDR-DNB-STRAY-LIGHT-CORRECTION-LUT_j02; 4) VIIRS-SDR-GEO-DNB-PARAM-V2-LUT_j02; 5) VIIRS-SDR-GEO-IMG-PARAM-V2-LUT_j02; 6) VIIRS-SDR-GEO-MOD-PARAM-V2-LUT_j02
    - **OMPS SDR**: 3/02/2022: OMPS SDR team delivered J02 OMPS mounting matrix updates package (ADR9905/CCR5513) to ASSISTT team; 3/08/2022: ASSISTT team delivered the DAP to DPMS. *List of updated tables*: 1) OMPS-NP-SDR-CC_j02; 2) OMPS-TC-SDR-CC_j02
- DAPs – Enterprise Products:
  - 2/02/2022: STAR delivered J2 Final Patch DAP for Surface Reflectance (v1r2) to NDE (maintenance delivery for NPP and N20)
    List of Code Changes: Removed the \0 characters from meta files; Changed NDE GFS file pattern in configuration file; Reverted the day_night_data_flag from 0/1/2 back to night/day/both
  - 2/03/2022: STAR delivered J2 Final DAP for V8TOz (v4r2) to NDE (maintenance delivery for NPP and N20)
    List of Scientific Changes: Added process of medium/high resolution OMPS J02 retrievals; Switched to using broader bandpass for the six longest channel wavelengths; Updated LUTs; Applied new radiance adjustments (soft-calibration); Solved the dimension issue (for Mx4 SDR); Added 4 corners geo-location information in the product outputs; Added timestamp and SDR source info in lookup tables and output file names
  - 2/03/2022: STAR delivered J2 Final DAP for V8TOs (v5r0) to NDE (maintenance delivery for NPP and N20)
    List of Scientific Changes: Variables/attributes/metadata name changes; One line code change; Modified postprocessing testing scripts
  - 2/17/2022: OMPS Ozone team delivered V8PRO_v4r2 to ASSISTT team
    Main updates: Modified scripts and codes for adding more source info into the metadata; Updated soft-calibration adjustments for both S-NPP and N20 with new generated LUTs, which using interpolated bandpasses plus weight in stead of using weight-only bandpasses
  - 2/24/2022: STAR delivered updated XML file to NDE (Super DAP patch for Dec-2021 delivery): An updated metadata file to fix the issue with JRR products missing the final geographic point

Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	02/01/22, 02/08/22, 02/15/22, 02/22/22, 03/01/22, 03/08/22
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	02/01/22, 02/08/22, 02/15/22, 02/22/22, 03/01/22, 03/08/22
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	02/01/22, 02/15/22, 03/01/22
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	02/08/22, 02/22/22, 03/08/22
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	02/08/22, 03/08/22
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	02/08/22, 03/08/22

- Recent VIIRS imagery blog posts:
  - 2/10/2022: VIIRS Snowmelt RGB Use in Operations
  - 2/11/2022: More Northern Plains Blowing Snow!
  - 2/16/2022: Southwest US Blowing Dust – 15 Feb 2022

- Transition of the reprocessed SDRs to CLASS/NCEI:
  - The transition of the reprocessed SNPP CrIS data to CLASS/NCEI completed on February 25, 2022

- IDPS Builds Checkouts / JPSS-2 Pre-Launch Testing events:
  - Feb/Mar-2022: STAR SDR/Imagery/ICVS/EDR (NUCAPS & MiRS) teams checked one-orbit J2 Proxy test data set
  - 3/01/2022: OMPS SDR team checked J2 OMPS RDRs from JCT3-Ambient IDPS data flow
  - Block 2.3 Mx6 I&T STAR review/checkout:
    - 3/10/2022: VIIRS SDR team submitted review/checkout report (no issue)
    - 3/11/2022: ATMS SDR team submitted review/checkout report (no issue)

Upcoming Milestones/Deliveries

- JSTAR Code/LUT/Product Deliveries:

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

  NOAA-20/JPSS-2 Algorithm DAP to NDE/CoastWatch:
  - Mar-22: Final J2 NUCAPS DAP (include NPP/N20 updates) - Now Expected in April
  - Mar-22: Final NVPS J2 DAP (VI & GVF) - delivered 3/29/2022, code & documents
  - Mar-22: Final J2 Active Fires DAP (include NPP/N20 updates) - delivered 3/17/2022
  - Mar-22: Final J2 Global Gridded LST/LSA DAP Now Expected in April
  - Mar-22: Final MiRS J2 DAP (include SFR) - delivered 3/31/2022
  - Mar-22: Final J2 Super DAP (Clouds, Aerosol, Volcanic Ash, Cryosphere, VPW, LST, LSA) - Now Expected in April
  - Mar-22: Final OMPS Ozone V8Pro DAP Now Expected in April
  - May-22: J2-ready OMPS LP DAP
  - Mar-22: J2-ready Ocean Color DAP to ASSISTT (CoastWatch □ ASSISTT) - Complete
  - Jun-22: J2-ready Ocean Color DAP to Cloud (ASSISTT □ NCCF)

Variance Explained: L. Zhou and A. Young (JSTAR) met with W. Wolfe on March 8 and confirmed end of March deliveries from ASSISTT to NDE for J2 SuperDAP and other algorithms. On 3/29 ASSISTT informed JSTAR that a few DAPs o NDE would be pushed to April. Schedule change was due to issues with regression testing (Winds Code). ASSISTT is now waiting for the science teams to validate data from regression tests. Slide updated 4/1/22

FY22 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates DAPs				
Final launch-ready JPSS-2 ATMS PCT/MM-coef DAP	May-22	May-22	**Pre-dynamic MM: 03/08/22**	**02/25/22 to ASSISTT**
Final launch-ready JPSS-2 CrIS PCT/MM-coef DAP	May-22	May-22	**Pre-dynamic MM: 03/11/22**	**03/07/22 to ASSISTT**
Final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP	May-22	May-22	**Pre-dynamic MM: 02/24/22**	**02/18/22 to ASSISTT**
Final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP	May-22	May-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	Mar-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		
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		
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		
MiRS & SFR: Final J2 ready DAP	Mar-22	Mar-22	**12/30/21 v11.6 patch**	
OMPS Ozone V8Pro: Final J2 ready DAP	Mar-22	Mar-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	Mar-22	**12/30/21 Prelim J2 DAP**	
Reformatting Toolkit	Mar-22	Mar-22		
AMSR-3 ready DAP (include AMSR-2 updates)	Sep-22	Sep-22		

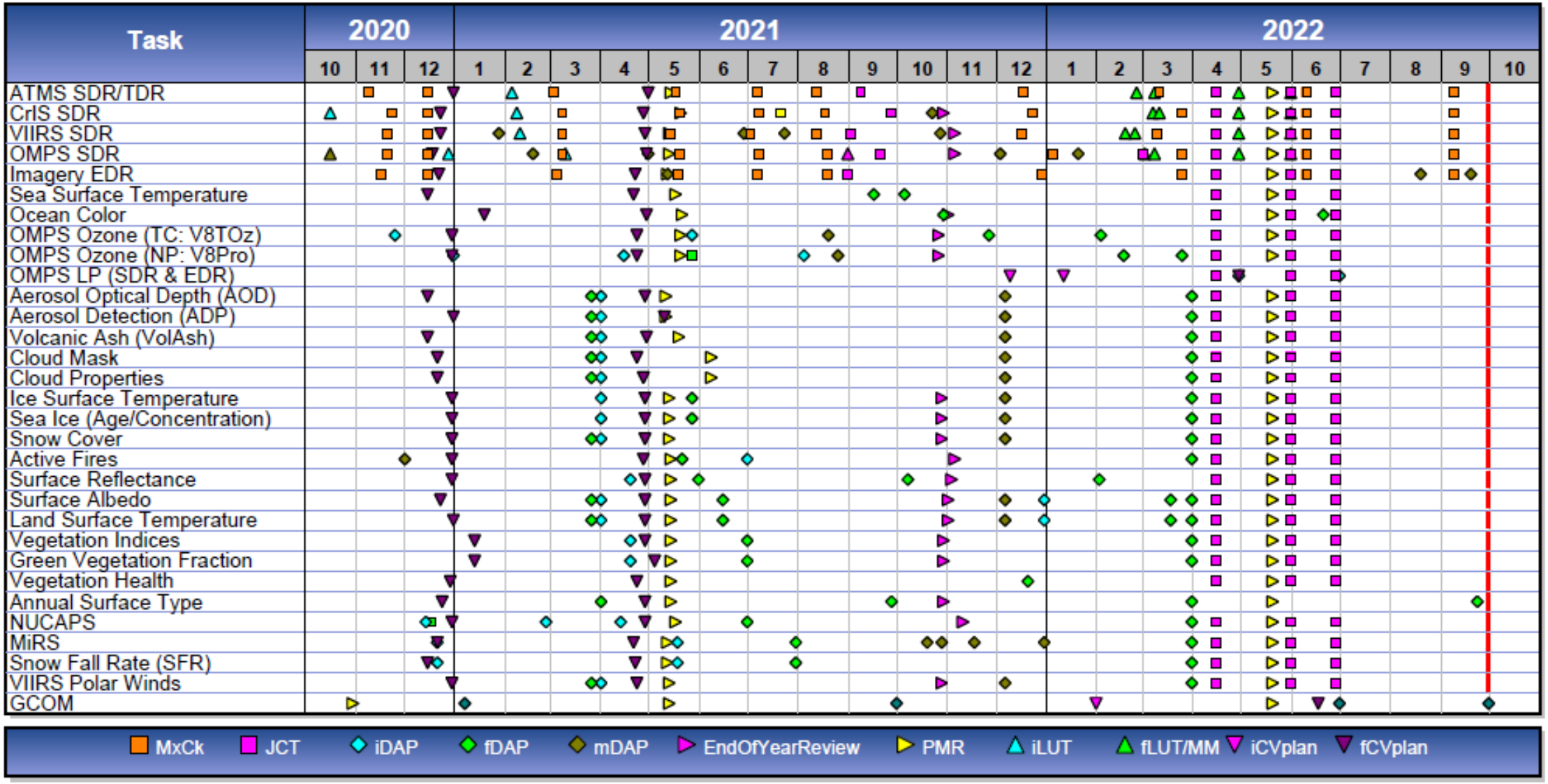
FY22 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
Algorithm Cal/Val/LTM				
FY21 End of Year Science Team Presentations (all teams)	Oct-21	Oct-21	Oct/Nov-2021	
FY23 Program Management Review (all teams)	Jun-22	Jun-22		
Enterprise Cal/Val plan for J2 OMPS LP SDR & EDR	Dec-21	Dec-21	12/09/21	
GCOM: AMSR-3/Enterprise Cal/Val Plan - draft delivery	Jan-22	Jan-22	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	
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**
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**
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**
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**
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**
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**
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**
Participant/support JPSS-2 pre-launch testing events (**Mar-22 JCT3-Ambient;** Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22	**03/01/22: JCT3-Ambient (OMPS J2 RDRs)**

STAR JPSS Schedule: TTA Milestones



Color code:

Green: **Completed Milestones**

Gray: **Non-FY22 Milestones**

ATMS SDR

February, 2022

Accomplishments / Events:

- Derived the JPSS-2 ATMS instrument to spacecraft mounting matrix from pre-dynamic alignment measurement data sets from NG-Gilbert. Updated J2 ATMS PCT using the newly derived coefficients and ran PCT functional testing using JCT2 DSE science RDR data successfully.
- Verified JPSS-2 ATMS simulated science RDR, telemetry RDR, and TDR/SDR/GEO granule data sets. Prepared data analysis report for STAR JPSS program.
- 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.
- Attended GSICS microwave subgroup annual meeting. Presented the inhouse developed Microwave Instrument Calibration Processing System (MICalPS, previously known as ARTS) to international attendees.
- Kept updating JPSS-2 spacecraft telemetry and diary RDR data decoder using the latest format change with NASA Flight Project POC. Tested the updated J2 spacecraft telemetry data decoding program using JCT2 DSE data to verify ATMS related spacecraft telemetry parameters

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.*

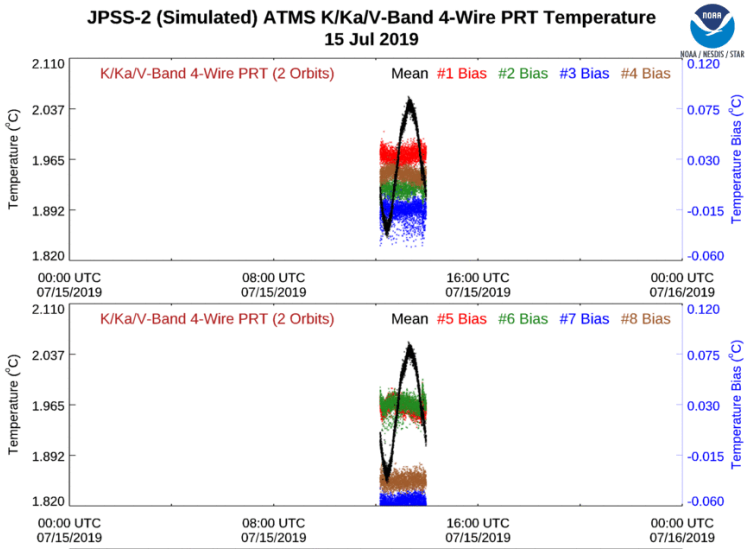
Issues/Risks:

None

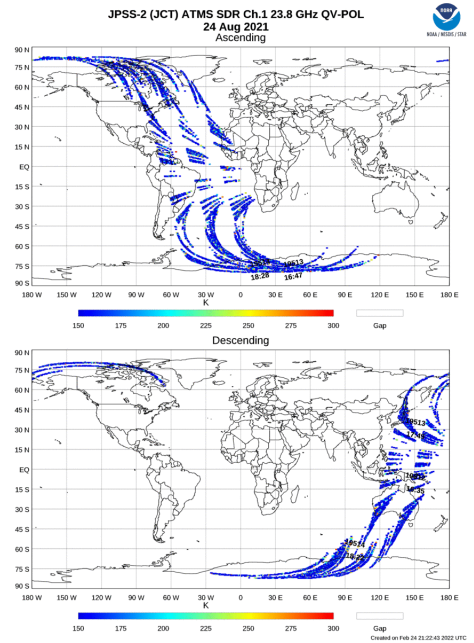
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Generate JPSS-2 ATMS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22		
Update of ATMS non-linearity correction coefficients after applying TVAC target thermal gradient correction	Mar-22	Mar-22		
Verify and finalize JPSS-2 ATMS processing coefficients table (PCT) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	Mar-22	Mar-22		
Deliver final launch-ready JPSS-2 ATMS PCT/MM-coef DAP to ASSISTT	Apr-22	Apr-22	02/25/22	pre-dynamic
Deliver final launch-ready JPSS-2 ATMS PCT/MM-coef DAP to DPMS	May-22	May-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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8)	Sep-22	Sep-22	12/17/21 Mx5 03/11/22 Mx6	

Highlights:

JPSS-2 ATMS Simulated Science RDR K/Ka/V band warm target temperature



JPSS-2 ATMS SDR channel 1 map generated from latest PCT and JCT2 DSE science RDR



CrIS SDR

February, 2022

Accomplishments / Events:

- Starting from February 12, 2022, an anomaly on the NOAA-20 CrIS sensor was identified caused by an intermittent electrical failure in the scan baffle temperature that produces false alarms in the quality of the CrIS observations **(Fig.1)**. These false indications have impacted up to ~30% of the calibrated data generated from NOAA-20 CrIS. Quality assessment of the SDR data during these periods have shown that the SDR data has not been affected. No major impact has been identified by the NCEP and NUCAPS team. The NWP community has also been informed and reach via the ITWG NWP Working Group. No negative impact has been reported since February 23, 2022. Two solutions were proposed to the management for final decision.
- Performed a diagnostic assessment of the NOAA-20 CrIS MW FOV5 noise events. The PCA radiometric noise difference between the noise surge and nominal was computed across the spectrum **(Fig.2)** and compared to various known noise sources. Tentatively, it is believed that the noise increase has a white noise signature.
- Performed an assessment of the potential options for changing the neon lamp activation interval time including an assessment of the spectral deviation compared to neon lamp lifetime usage for each option **(Fig.3)**.
- STAR CrIS SDR has independently calculated the mounting matrix for J-2 CrIS using the Northrop Grumman observation input values. The CrIS team concurs with the CrIS values provided by Northrop Grumman. The PCT LUT table is being generated using the Northrop Grumman values and will provide an independent assessment of the derived J-2 mounting matrix.
- Tested the NPP Granule Aggregation and Packaging Utility (NAGG) package v1.6.2 using CrIS SDR NSR and FSR data. The original software can aggregate and de-aggregate the SNPP and NOAA-20 NSR data, but not FSR data due to the missing product ID. The team identified a solution. A modification of the JPSS product table in the NAGG package allows for the aggregation and de-aggregation of S-NPP and NOAA-20 FSR data.
- The Publication "*Validation of CrIS Radiometric Performance through its Comparison to ABI*" has been published in the journal *MDPI Remote Sensing*.

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		Anomaly Resolution
Support and participate in the J3 CrIS Pre-ship Review	Mar-22	Mar-22		
Generate JPSS-2 CrIS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22		
Verify and finalize JPSS-2 CrIS processing coefficients table (PCT) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	Apr-22	Apr-22		
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to ASSISTT	Apr-22	Apr-22	03/07/22	pre-dynamic
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to DPMS	May-22	May-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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8)	Sep-22	Sep-22	12/23/21 Mx5	

Overall Status:

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

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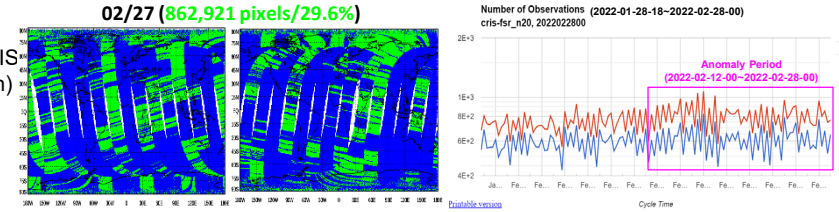
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

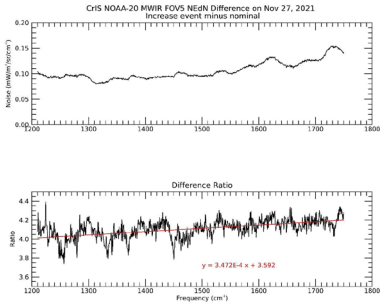
Dr. Lin Lin has joined the CrIS Team to provide support at 0.8 FTE starting on Jan 24, 2022. Dr. Arun Ravindranath has joined the CrIS Team to provide support at 1.0 FTE starting on March 1, 2022. This is helping to mitigate the workforce reduction experience in last months.

Highlights:

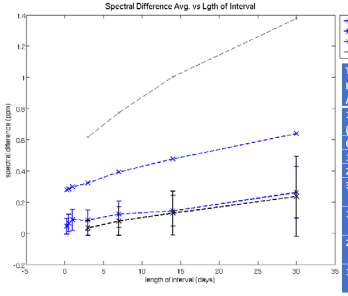
(1) (Left and Middle) Impacted NOAA-20 CrIS calibrated data on February 27, 2022 (green) and (Right) Number of NOAA-20 CrIS assimilated observations at NWS/NCEP during January 22-February 21, 2022.



(2) (Top) CrIS NOAA-20 radiometric noise difference (surge minus nominal) and (Bottom) noise ratio ((surge – nominal) / nominal)) using the example noise event on November 27, 2021.



(3) (Left) Spectral deviation of changing the neon lamp activation interval time for neon lamp mitigation. (Right) Tabulated spectral deviation assessment results compared to expected neon lamp life usage per proposal



Time Interval Between Activations	Mean Spectral Degradation (ppm)	Max Spectral Degradation (ppm)	Net hours of bulb activation over 7 year mission
109 minutes (current)	(nominal)	(nominal)	~281 hours
6 hours	0.0445 ± 0.0499	0.2798	~85 hours
12 hours	0.0638 ± 0.0574	0.2839	~43 hours
24 hours	0.0860 ± 0.0677	0.2977	~21 hours
3 days	0.0832 ± 0.0651 (test 1) 0.0339 ± 0.0476 (test 2)	0.3217 (test 1) 0.6149 (test 2)	~7 hours
1 week	0.1212 ± 0.0849 (test 1) 0.0780 ± 0.0916 (test 2)	0.3922 (test 1) 0.7742 (test 2)	~3 hours
2 weeks	0.1432 ± 0.0982 (test 1) 0.1286 ± 0.1417 (test 2)	0.4761 (test 1) 1.0028 (test 2)	~1.5 hours
1 month	0.2613 ± 0.1656 (test 1) 0.2356 ± 0.2551 (test 2)	0.6383 (test 1) 1.3778 (test 2)	~0.71 hours

VIIRS SDR

February, 2022

Accomplishments / Events:

- Generated and documented the updated JPSS-2 VIIRS SDR Geolocation LUTs that include the mounting matrix derived from the pre-dynamic instrument-to-satellite alignment report provided by the satellite manufacturer: submitted the updated Geo and 3 other LUTs for deployment in IDPS, particularly on the I&T system (DP-TE), before start of JCT-3 TVAC, after functional testing by ASSISTT and DPMS is completed
- 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 Feb. 1, 2022
- Assisted in scheduling NOAA-20 and Suomi NPP VIIRS lunar calibration on Feb. 12, 2022, (without roll maneuvers) and analyzed the collected data to monitor radiometric response of the reflective solar bands

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
DAP delivery (ADR9760/CCR5724, N20 VIIRS-SDR-F-PREDICTED-LUT Update #7)			10/27/21	
Generate JPSS-2 VIIRS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	Feb-22	
Verify and finalize JPSS-2 VIIRS lookup tables (LUTs) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	Mar-22	Apr-22		
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to ASSISTT	Apr-22	May-22	02/18/22	pre-dynamic
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to DPMS	*May-22*	*May-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		
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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8)	Sep-22	Sep-22	12/16/21 Mx5 03/10/22 Mx6	
Operational Support: VIIRS LUT update of DNB Offsets and Gains (S-NPP & NOAA-20)	Monthly	Monthly		

Overall Status:

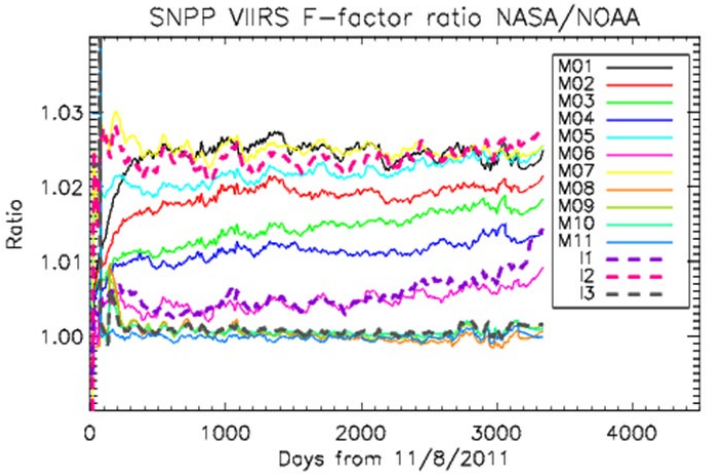
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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:



Comparison of the Suomi NPP VIIRS reflective solar band radiometric calibration scaling coefficient (F factor) time series from NOAA Reprocessing Ver. 2 and NASA Collection 2 processing: mainly due to various interpretations of the lunar calibration measurements, differences of up to ~2.5% can be seen while the expected calibration uncertainty is 2%

OMPS SDR

February, 2022

Accomplishments / Events:

- Delivered OMPS biweekly NP solar irradiance bi-weekly LUTs.
- Continued preparing the J2 launch-ready OMPS LUTs. Analyzed the cross-compared changes in the BPS FWHMs for three different OMPS-NPs/NMs from SNPP, NOAA-20, and J2.
- Completed a beta version of the OMPS NM/NP x-sensor comparison code development via the VCRTM, although further improvement is needed to improve the accuracy (see Fig. 1a)
- Prepared the day-1 solar code for J2 OMPS, where the impact of the J2 solar synthetic data is analyzed due to different solar reference data (GSICS recommended) (see Fig. 1b)
- Continued efforts to develop the raw solar flux and dark calibration processing code.
- Started initializing the J2 OMPS mounting matric coefficients.
- Provided update on the off-line NOAA-20 OMPS-NM medium resolution data from ADL MX4 to support the J2 NM high resolution risk analysis.
- Re-processed the one and half months of the SNPP OMPS NP data for the reprocessing.
- Continued to update and refine the SNR analysis process for OMPS SDR data.
- Completed a draft of the manuscript about the SNPP OMPS SDR reprocessing and will start a internal review within the SDR team before sharing it with all co-authors.

Overall Status:

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

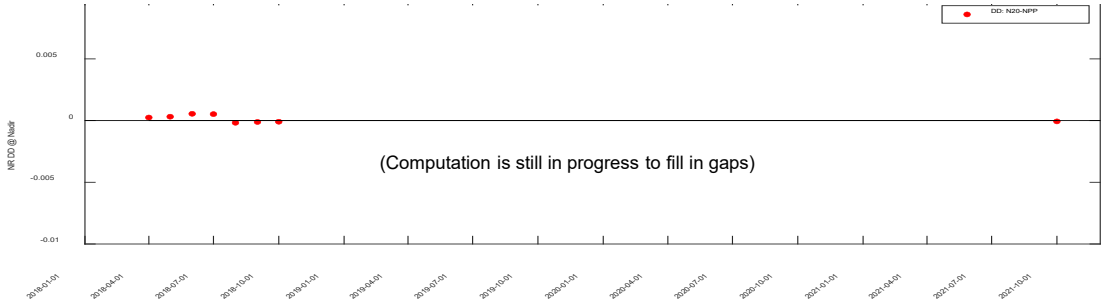
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

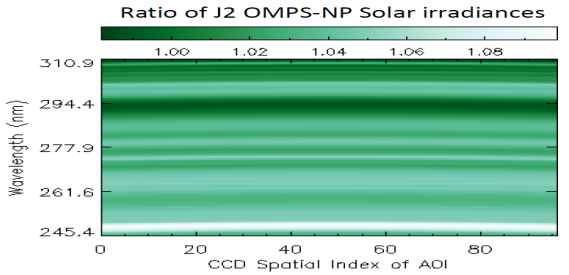
None

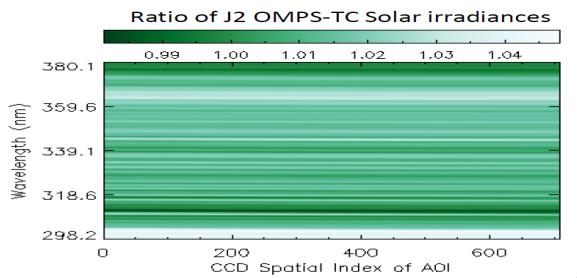
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
DAP (ADR9633/CCR5577 OMPS TC geolocation code change for off-nadir geolocation error correction)			12/03/21	
Generate JPSS-2 OMPS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	In progress	
Verify and finalize JPSS-2 OMPS lookup tables (LUTs) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	Mar-22	Mar-22		
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to ASSISTT	Apr-22	Apr-22	03/02/22	pre-dynamic
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to DPMS	May-22	May-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)	Apr-22	Apr-22		
1) OMPS Wavelength registration change investigation from ground to flight 2) J2 High resolution risk mitigation algorithm development update in support to J2 3) J2 OMPS pre-launch straylight correction analysis 4) OMPS SDR quality validation baseline tool prototype developments (e.g., RTM-DD, SNO-DD, NM (VIIRS)-DD, 32D-AD) 5) NM/NP SDR re-processing and data stability analysis update 6) Assess impact of a new solar reference data on OMPS NM/NP SDR data quality	Sep-22	Sep-22		
Sustainment, monitoring, maintenance S-NPP & NOAA-20 in flight performance	Sep-22	Sep-22		
JPSS-3 OMPS pre-launch measurement and test data review/analyze	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Mar-22 JCT3-Ambient; Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 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	
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) VCRTM-DD Radiance Difference Time Series @306 nm for SNPP and NOAA-20 NP



(a) Ratio of J2 OMPS NM and NP Synthetic Solar Spectra (Current/New Synthetic Solar Spectrum)





SDR Reprocessing

February, 2022

Accomplishments / Events:

- The official transition of the reprocessed SDRs to CLASS/NCEI started on December 1, 2021 and the transition of the reprocessed SNPP ATMS V1 and V2 data was completed in December 2021.
- The transition of the reprocessed SNPP CrIS data to CLASS/NCEI started on January 3, and completed on February 25, 2022.
- The post-processing of the OMPS V1 and V2 data is completed.
- Due to the STAR Linux server maintenance and CLASS maintenance and COOP event, the transition of OMPS V1 NP data will start on March 3, and it's estimated that the transition of the reprocessed SNPP OMPS data will be completed in two weeks.
- The transition of the reprocessed VIIRS data to CLASS/NCEI is scheduled to follow the completion of the OMPS data transition.

Overall Status:

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

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY23 Program Management Review	Jun-22	Jun-22		
Complete planning and testing on transition of S-NPP reprocessed SDR data to CLASS	Oct-21	Oct-21	Oct-21	
Complete transition of 1000 Tb of reprocessed S-NPP SDR data to CLASS	Sep-22	Sep-22		

Highlights: Status of the Reprocessed SNPP Data Transition

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

ICVS

February, 2022

Accomplishments / Events:

- Updated the ICVS JPSS instrument life time performance statistic information associated with the ICVS-Vector with a new format towards operation (https://www.star.nesdis.noaa.gov/fst/icvs-update/metrics.php; still in progress)
- Kept updating the git repository by adding newly developing ICVS monitoring functions (ICVS tool software version control).
- Reported the NOAA-20 CrIS scan baffle temperature anomaly in near real time to CrIS SDR team and participated in the preliminary data quality impact study
- Started processing N20 vs. NPP ATMS inter-sensor bias using double difference w.r.t. RO simulations.
- Generated N20 and NPP OMPS NM vs.NP earth view radiance relative difference trending products to support OMPS SDR data quality monitoring
- Generated N20 vs. NPP OMPS NM and NP 32-day mean normalized radiance difference trending products to support OMPS SDR data quality monitoring
- Provided near real time S-NPP and NOAA-20 spacecraft and instrument status and data quality

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		
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.*

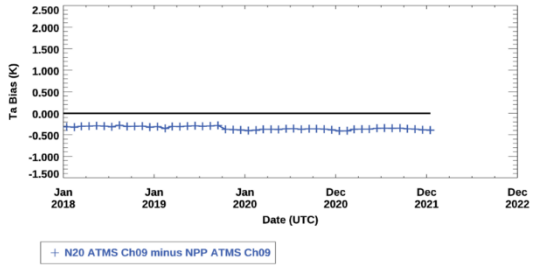
Issues/Risks:

None

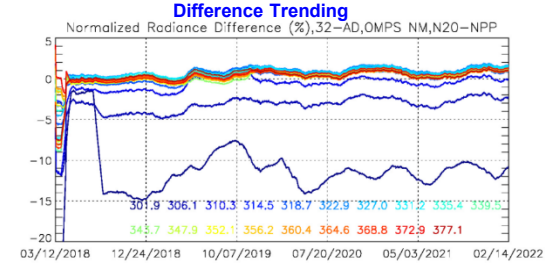
Highlights:

Significantly contribute to STAR SDR Teams

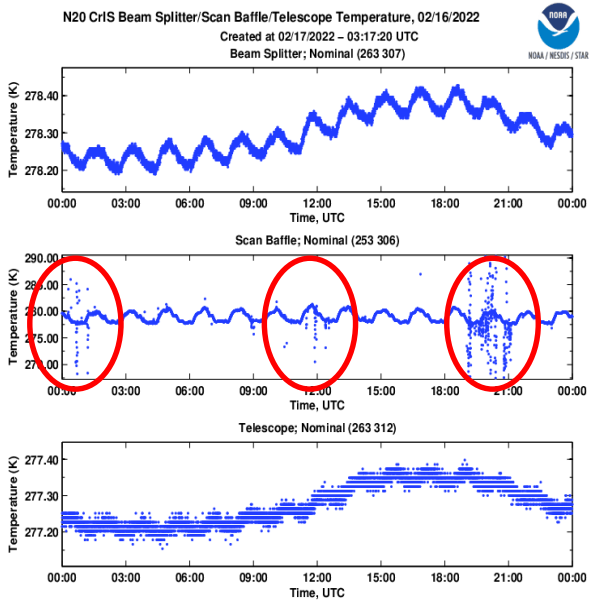
N20 vs. NPP ATMS Inter-sensor Bias by DD w.r.t. RO Simulation Bias



N20 vs. NPP OMPS NM 32-day Mean Normalized Radiance Difference Trending



NOAA-20 CrIS Scan Baffle Temperature Anomaly



VIIRS Imagery

February, 2022

Accomplishments / Events:

- Recent changes proposed to DRAT
  - DR10869 - Update VIIRS Imagery EDR DQTT (S-NPP and JPSS-1)
  - DR9904 - VIIRS SDR Excessive Reflectance Values - NPP/J1/J2
- Initiated plans to implement a new “CONUS VIIRS” display on SLIDER
- NWS AWIPS recently updated to have capability to process/display all VIIRS EDR bands
  - Preparations for when those data may become available in the future
- Recent blog posts containing VIIRS imagery:
  - VIIRS Snowmelt RGB Use in Operations
  - More Northern Plains Blowing Snow!
  - Southwest US Blowing Dust – 15 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:

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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		
Block 2.3 Mx builds deploy regression review/checkout (**Dec-21 Mx5**; Mar-22 Mx6; Jun-22 Mx7; Sep-22 Mx8)	Sep-22	Sep-22	11/23/21 Mx5 SOL 12/29/21 Mx5 I&T	

Highlights: Image of the Month

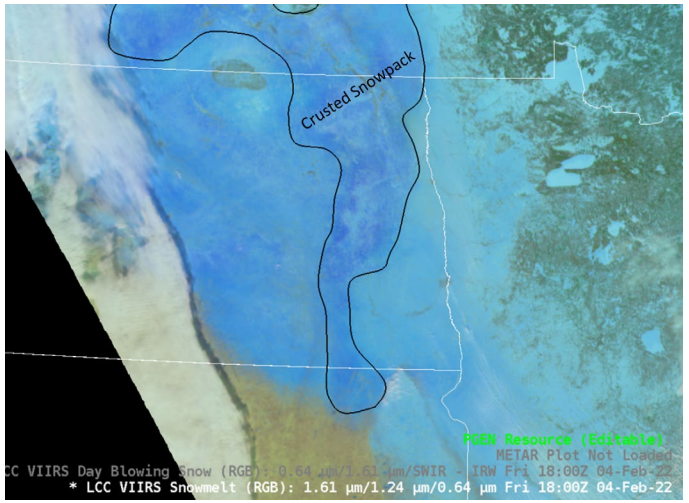


Figure: 04 Feb 2022 VIIRS Snowmelt RGB. Imagery was used by NWS to assess local snowpack blowability.

Clouds

February, 2022

Accomplishments / Events:

- The CIRA team delivered an updated CBH ATBD (V.2.3) to ASSISTT. We completed python codes to perform comparisons of CBHs with METAR, and continue to work on creating a translation function based on “ray matching” between VIIRS and ABI to transition a machine learning model to VIIRS for improved multilayer clouds. In support of the Aviation Initiative, we continue to collect user feedback from forecasters and pilots aiming toward developing user-oriented satellite cloud products for aviation applications. As part of the AK cloud demo, a new 6-month collaborative evaluation of cloud cross-sections in collaboration with the Aviation Initiative participants was planned. These research and user-engagement efforts were presented at AMS (two oral talks).
- The CIMSS Cloud Team is working on ECM2 performance over very cold cloud-free surfaces (Alaska) at night where ECM2 marks pixels as False Clouds. The main false cloudiness is coming from the BTD1112 classifier. We are exploring an idea to turn off this test with the minimum surface temperature threshold. The preliminary results are encouraging (see Figure 1.). Applying the Minimum Surface Temperature threshold to turn off the classifiers that are using BTD1112 reduces false clouds over the area of interest.

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.*

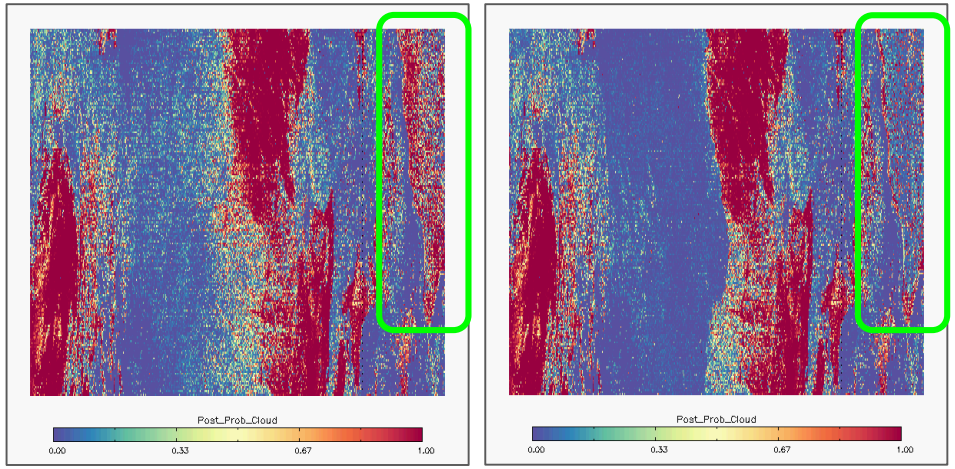
Issues/Risks:

None

Milestones:

- ***See next slides***

Highlights:



Cloud Probability No Limit Cloud Probability Tsfc Limit

Figure 1. VIIRS NOAA-20, 2021-12-13 17:24 - 17:25 UTC, ECM2 No Limits applied (left) and ECM2 with Tsfc_min = 240K (right). Area of interest (Alaska land) is on the right side of the images marked with the green box. Applying the Minimum Surface Temperature significantly reduces False Clouds (less red).

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)	Mar-22	Mar-22		
Super DAP v3.1 patch delivery			12/06/21	
Verify DNB and new ECM implementation within STAR Algorithm Processing Framework (SAPF) and adjust LUT based on feedback from teams	Jan-22	Apr-22		SAPF run delayed
Verify ECM LUT against J2 simulated data prior to J2 launch	Aug-22	Aug-22		
Support Alaska Demo and ESRL usage and reviews	Aug-22	Aug-22		
Work with NCEP on All Sky Radiance (ASR) assimilation. Adjust mask as necessary	Sep-22	Sep-22		
Apply CALIPSO tools to NDE Mask with Lunar Ref	Sep-22	Sep-22		
Continue collaboration wtith OAR/ESRL/GML on use of RadFlux Cloud Fraction for Verification including high-latitude sites	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Clouds (Cloud Phase/Type)

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

Clouds (ACHA)

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

Clouds (DCOMP)

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

Clouds (NCOMP)

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

Clouds (Cloud Base Height)

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

Clouds (CCL)

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

Aerosol

February, 2022

Accomplishments / Events:

- Six VIIRS aerosol product related presentations at the AMS meeting
- Completed evaluation of VIIRS AOD product over ocean using Marine Aerosol Network for NWS Unified Forecast System AOD assimilation experiments
- Completed validation of reprocessed AOD product (nine years of data)
- Validation of aerosol detection product is ongoing. Specific studies related to crop burning in India using smoke mask product are being carried out
- Completed the generation of 10 years of surface PM2.5 product over CONUS for user applications
- Kondragunta co-authored a paper on 2020 Giga fire and air quality impacts where VIIRS fire emissions and AOD product were used. Li et al., GRL, 2021
- Kondragunta gave a presentation to an inter-agency GEOHealth working group on VIIRS surface PM2.5 product for health impact investigations. VIIRS and ABI PM2.5 products will be displayed on a portal being developed for a case study in Sonoma county for Walbridge fire in 2020
- Team member Amy Huff gave an AMS training to students on aerosol products and air quality applications
- Ciren and Kondragunta submitted a book chapter entitled “Heterogeneity of smoke from fires: evaluation of SNPP VIIRS smoke mas using FIREX-AQ data.

Milestones:

- ***See next slides***

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			

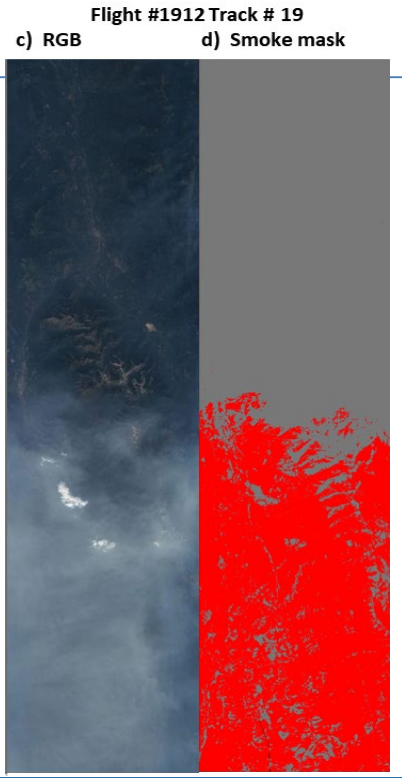
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

No risks

Highlight:

Adjacent figure shows enhanced MODIS Airborne Simulator (eMAS) observed RGB image of a smoke plume and the VIIRS aerosol detection algorithm applied to eMAS data. Most of the smoke plume visible to the eye in the RGB is retrieved (red contours) except for the thin plumes. Analysis of such 60+ smoke events sampled during FIREX-AQ field campaign showed that VIIRS smoke mask probability of correct detection (POCD) is > 80% for thick smoke plumes but for thin smoke plumes, POCD is between 33% and 75%



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)	Mar-22	Mar-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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Aerosol (ADP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Mar-22	Mar-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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Volcanic Ash

February, 2022

Accomplishments / Events:

- Maintained and verified quality of S-NPP and NOAA-20 Volcanic Ash products (JPSS EDR and VOLCAT)
- Key publications:
  - Mastin, L., Pavolonis, M., Engwell, S. et al., 2022: Progress in protecting air travel from volcanic ash clouds. Bull Volcanol 84, 9
  - Alexa R. Van Eaton, Cassandra M. Smith, Michael Pavolonis, Ryan Said, 2022: Eruption dynamics leading to a volcanic thunderstorm—The January 2020 eruption of Taal volcano, Philippines. Geology 2022; (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			

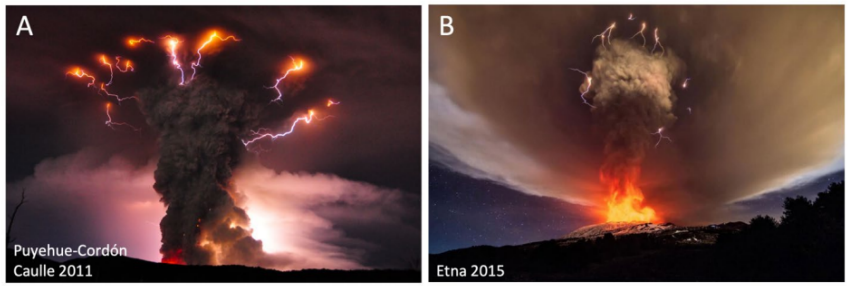
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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)	Mar-22	Mar-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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: Volcanic thunderstorms explored in Geology 2022 publication. Example photos of lightning activities shown below



Supplementary Fig. S6. Long-exposure photos of other eruptions showing lightning activity concentrated at the base of the umbrella cloud. In context with our analysis of Taal's lightning, the photos suggest that enhanced electrical activity at the umbrella cloud base may be a common phenomenon in large volcanic plumes. (A) Puyehue-Cordón Caulle, Chile, on 5 June 2011 by Daniel A. Basualto Alarcón (source: cover photo from the Oct 2018 issue of *Geology* https://pubs.geoscienceworld.org/geology/issue/46/10). (B) Etna, Italy, on 3 December 2015 by Marco Restivo (source: https://www.forbes.com/sites/trevornace/2015/12/05/fire-lightning-mt-etna-erupts-sicily-ejecting-lava-air/?sh=3a26735d318d).

Cryosphere

February, 2022

Accomplishments / Events:

*UAS Validation Experiment in the Straits of Mackinac: Scientists from the NOAA/STAR Advanced Satellite Products Branch (ASPB) and the Cooperative Institute for Meteorological Satellite Studies (CIMSS) participated in UAS (Uncrewed Aircraft System) Sea Ice Retrieval for Calibration/Validation Experiment (USIR-CV EX) in the Straits of Mackinac, Michigan, 14-18 February 2022. The experiment used advanced hybrid quadrotor UAS platforms with customized multispectral payloads to gather critical data for validation of NESDIS' GOES-R and JPSS operational ice products and experimental ice products from Synthetic Aperture Radar (SAR), CryoSat-2, and ICESat-2. (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)	Mar-22	Mar-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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights

While NESDIS products have been validated globally, there remains little understanding of local performance in the Arctic or Great Lakes. The USIR-CV EX study in Michigan provides a new data source to understand ice algorithm performance for key parameters needed in navigation and ice modeling, such as ice concentration, ice surface temperature, and ice thickness.

Figure: The Mackinaw Bridge over lake ice, the UAS vehicle, Yinghui Liu and Sean Helfrich (STAR) taking measurements, and a net radiometer (courtesy of Jonathan Thom, SSEC) on the ice.

Active Fires

February, 2022

Accomplishments / Events:

- Amy Huff and Ivan Csiszar were the instructors of the Fire and Smoke component of the AMS Short Course “Using GOES-R and JPSS Remote Sensing Capabilities to Enhance Weather, Climate, Water and Environmental Security” held virtually on February 16-17, 2022 (see highlights)
- Continued monitoring of missing granules of the VIIRS I-band product in the NDE operational processing
- Worked with ASSIST on JPSS-2 readiness
- Worked on additional material for upcoming IMET training
- Worked with Carl Dierking on narrated video training for Alaska users of the VIIRS Active Fire product

Overall Status:

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

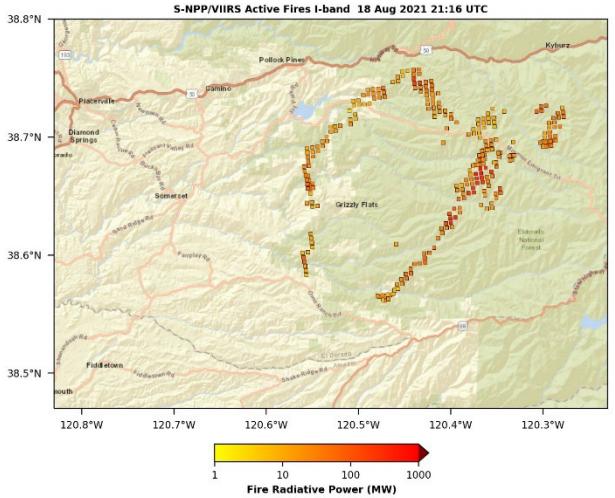
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

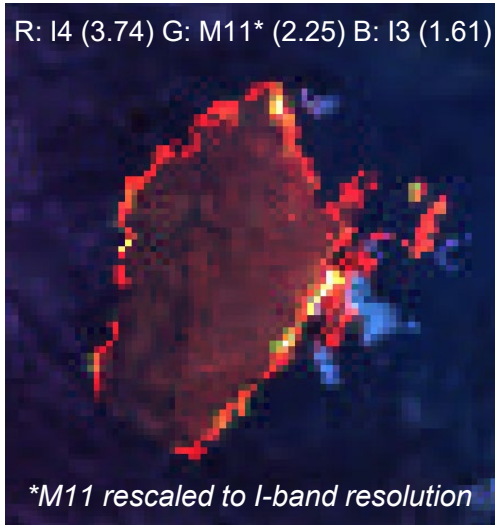
Issues/Risks:

None

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

Highlight: VIIRS observations of the Caldor Fire





The Caldor Fire seen by the NDE Suomi NPP I-band Active Fire FRP product (left) and the 375m Fire Temperature RGB (right) on August 18, 2021. Courtesy of Amy Huff (IMSG) and Curtis Seaman (CIRA).

Surface Type

February, 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 February 2022 for the production of AST-2022.
- The team continues to work on the development of the 2021 AST product using VIIRS data acquired by both S-NPP and NOAA-20.
- The team explored the use of forest structure samples collected by NASA's Global Ecosystem Dynamics Investigation (GEDI) mission and VIIRS annual metrics derived as part of the AST mapping process to produce annual forest canopy cover maps from 2012 to 2020:
  - The derived annual maps products can track many large scale forest cover changes that have occurred since 2012 (see highlights).

Overall Status:

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

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

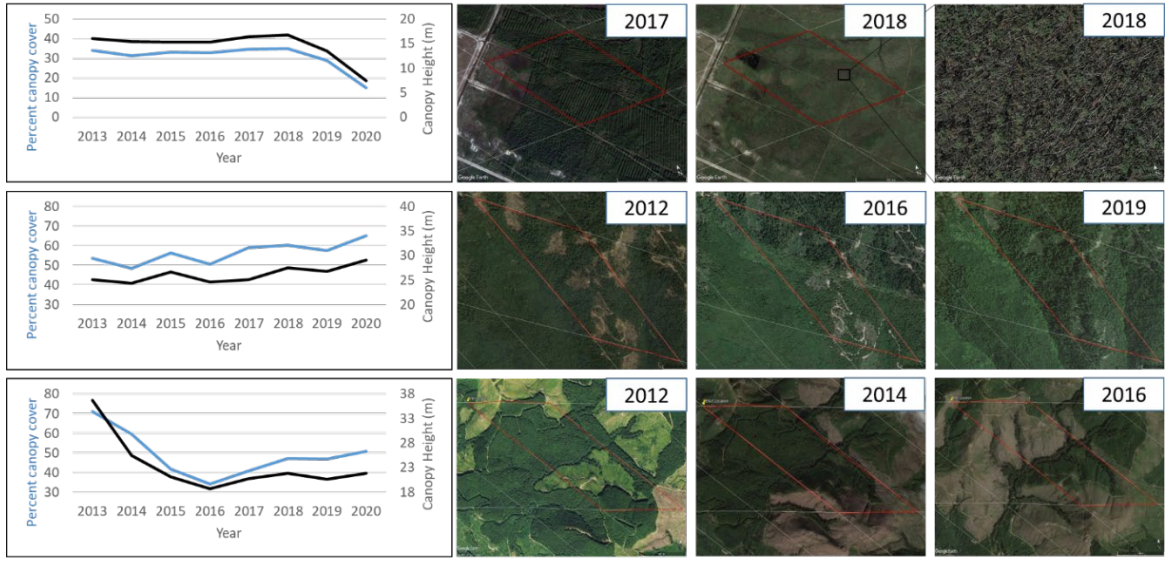
Issues/Risks:

None

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

Highlights:

VIIRS-based percent canopy cover data can track large scale forest cover change over time: *First row – trees overthrown by wind damage from Hurricane Michael in Florida. Second row – gradual increases in canopy cover associated with natural growth in northern California. Third row – forest thinning over multiple years (2013-2015) followed by recovery in Washington State.*



Surface Reflectance

February 2022

Accomplishments / Events:

- Test and improve the AERONET validation tool, mainly on the computing efficiency. Reprocessed the subset data since April, 2021 for both S-NPP and NOAA-20. Summarized the long term validation results.
- Routinely validate the latest VIIRS SR EDR using the AERONET based SR, demonstrate the most recent (one week latency) validation results on the website.
- Extensively test the SR transition from v1r1 to v1r2. including the SR AERONET validation, time series analysis and quality flags difference.
- Providing the AERONET based SR to vegetation team for vegetation index product validation.
- Keep working with NASA team for the SR look up table update.

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			

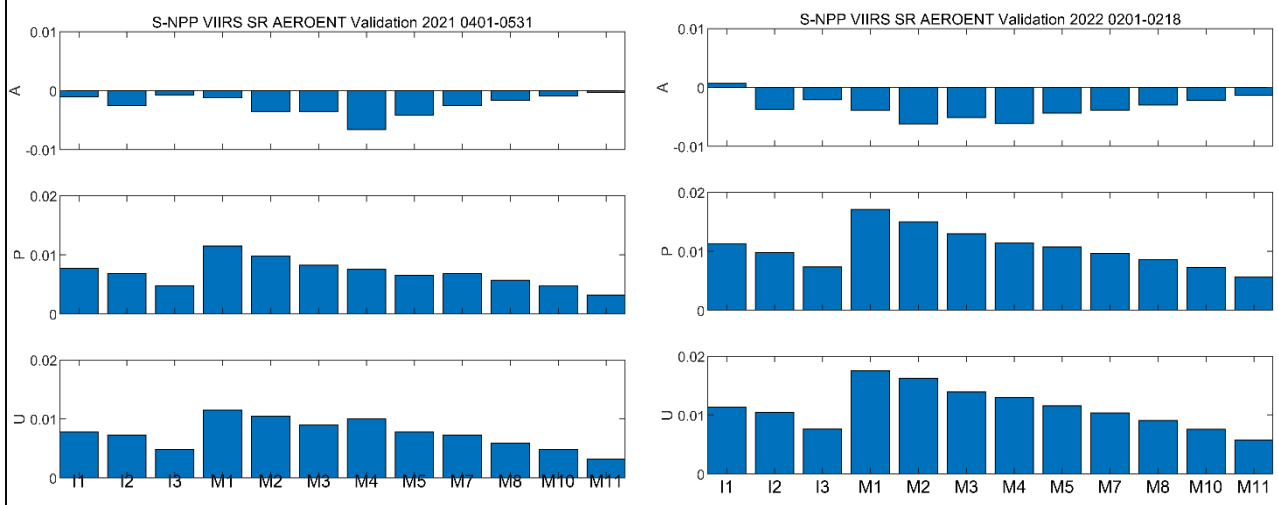
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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		
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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

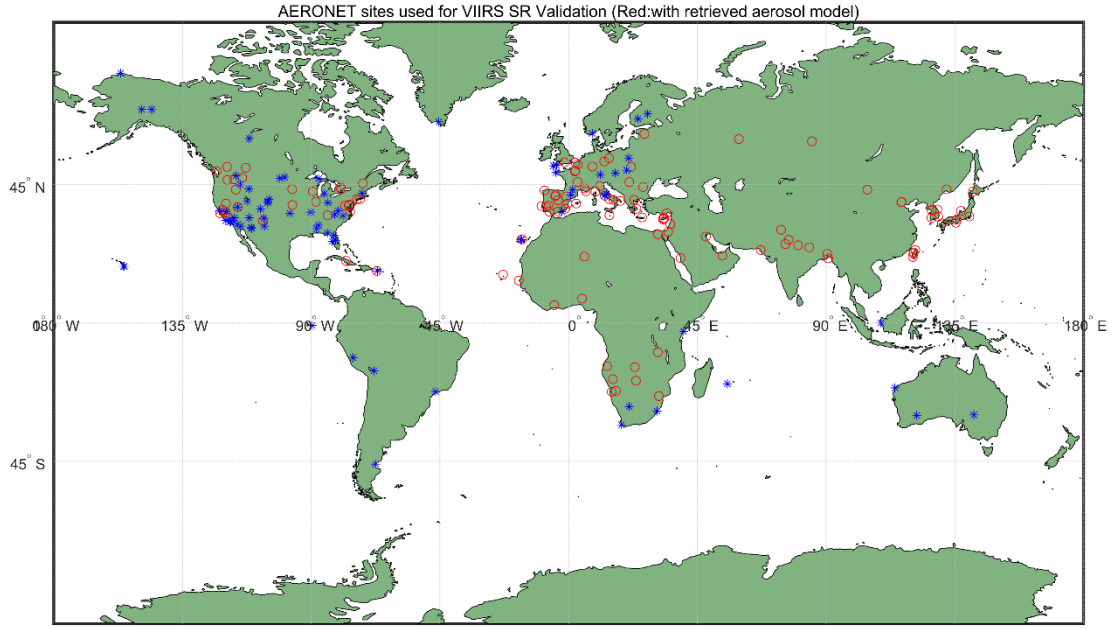
Highlights:



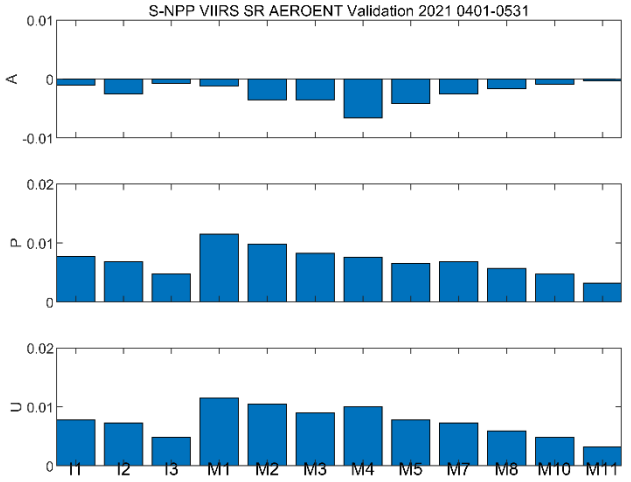
SNPP AERONET SR validation APU statistics comparison between v1r1 and newly updated v1r2

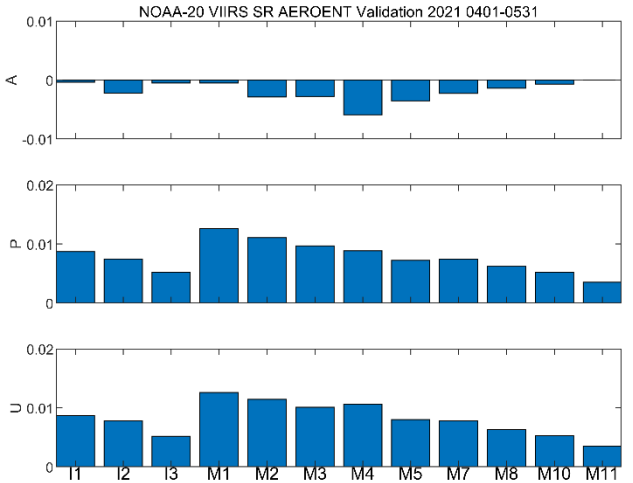
Surface Reflectance (Details)

- AERONET Level 1.5 data
  - AOD at 550nm (within 30 mins)
  - Total precipitable water
  - 9*9 M band (18*18 for I Band) pixels at AERONET sites
- Data filtering criteria
  - SR EDR within [0, 1]
  - Confidently clear
  - No cloud shadow or cirrus.
  - No snow
  - Not AOD climatology or high AOD
- 123 Sites used for SR Validation (with retrieved aerosol model parameters from JC. Roger)



- S-NPP and NOAA20 AERONET SR Validation Results



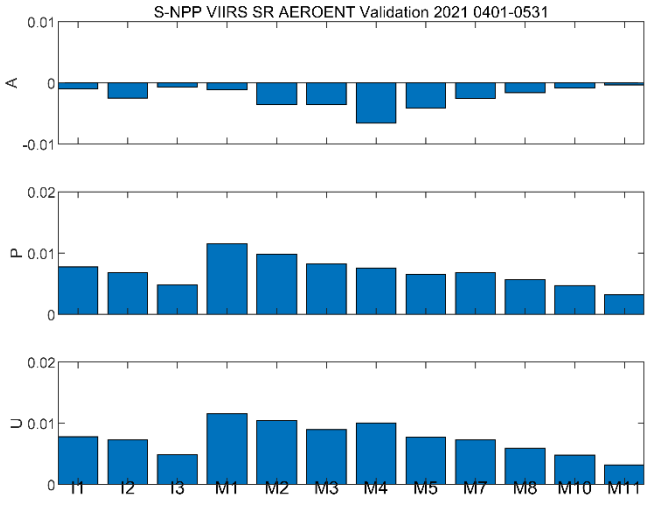


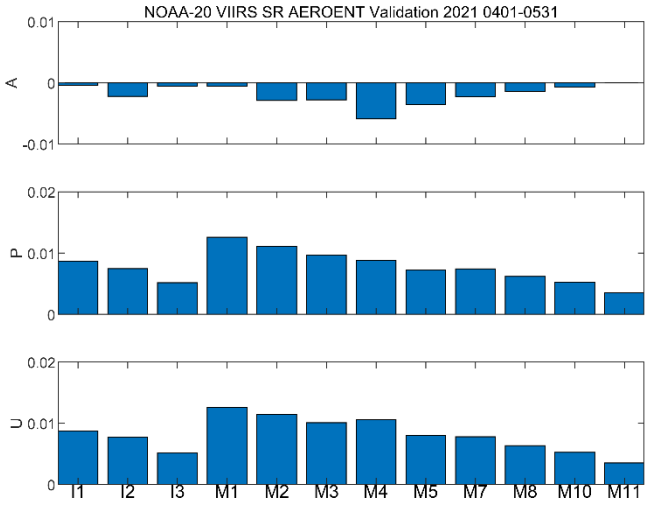
- Daily data of two months (April to May, 2021), with more than 10K matchups for M bands (>40K for I Band)
- Both product are meet the requirements
- Negative bias is found in most bands for both S-NPP and NOAA20
- S-NPP and NOAA20 got consistent results
- NOAA20 is a little big worse than S-NPP (Precision and uncertainty of 0.001 for some bands)

Surface Reflectance (Details)

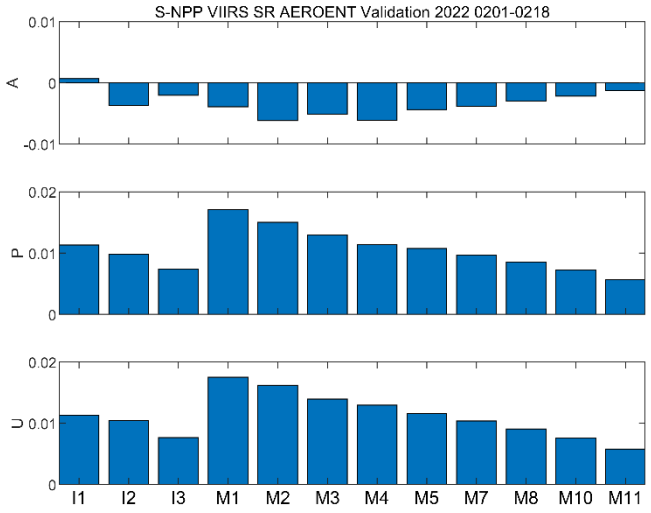
- Preliminary VIIRS SR v1r2 Evaluation shows some downgrade for v1r2

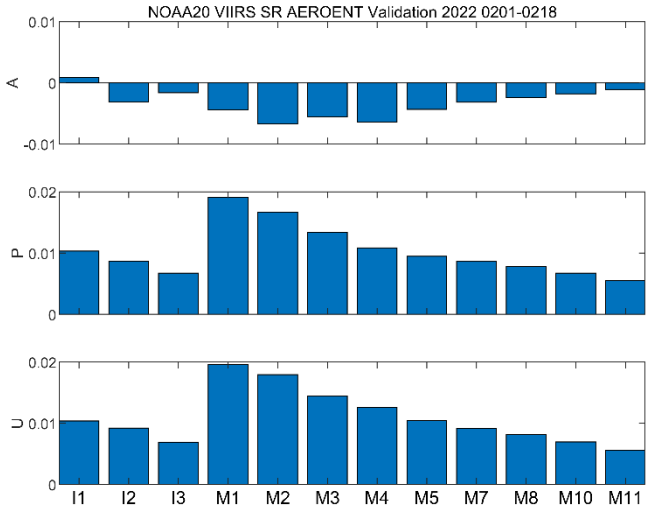
v1r1



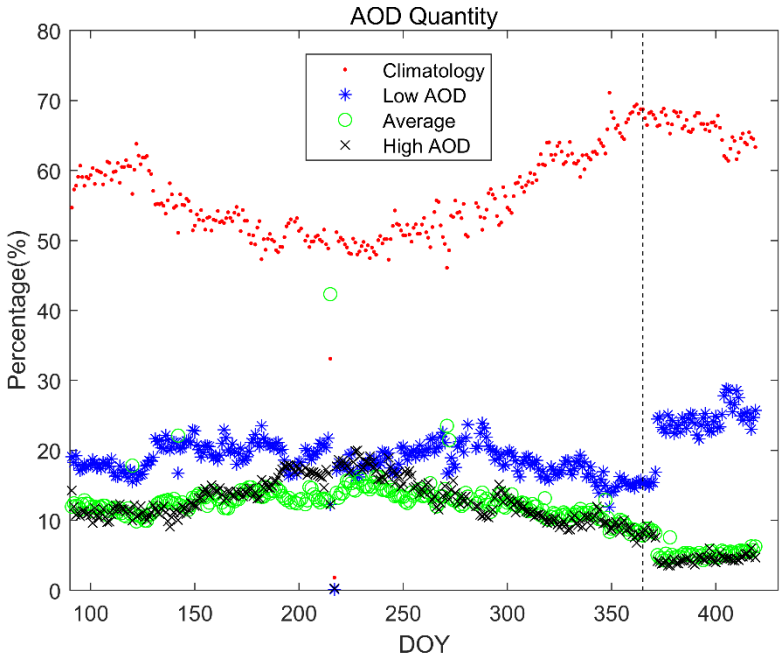


v1r2





- Algorithm change for v1r2:
- A main algorithm update is for the AOD quantity flag, in v1r2 new criteria is applied for AOD quantity (climatology, Low AOD, average AOD and high AOD) stratification.



The AOD quantity flag change:

- Statistics based on all land surface grid between 60N – 60S
- Obvious discontinuity found on Jan. 6-7, 2022
- Average and high AOD percentage drop by 3 percent, while low AOD percentage increase.
- NOAA20 has similar pattern.

Land Surface Temperature

February, 2022

Accomplishments / Events:

- Investigated the NDBC(national data buoy center) data over CONUS with a special focus on the great lake area and performed the LST validation over inland water body through the comparison with the surface temperature measured by buoys. 11 sites were selected for the preliminary evaluation.(slide 2 & 3)
- Cross comparison at granule level between L2 VIIRS LST and L2 SST over inland water for daytime and nighttime. SST(subskin) is found on average 0.9 K and 1.4 K warmer than LST for daytime and nighttime, respectively.
- Investigated the issue on surface type failure of degradation detection of the Aral Sea and conducted the analysis on the impact to downstream land surface temperature product. (Highlights & slide 4)
- Updated the L2 ground validation procedure and reprocessed the LST validation against ground measurements using the latest data available. Investigated the issue of increasing cold bias over DRA site. (slide 5)

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	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Mar-22	Mar-22		
Manuscript ready for Remote Sensing special issue “VIIRS 2011–2021: Ten Years of Success in Earth Observations"	Apr-22	Apr-22		
All weather LST generation based on the microwave LST and VIIRS LST: methodology development and experiment	May-22	May-22		
FY23 Program Management Review	Jun-22	Jun-22		
LUT interpolation method development and test	Jun-22	Jun-22		
Routine Validation Summary/report of LST product including L2 and L3	Jul-22	Jul-22		
LST uncertainty evaluation and calibration	Aug-22	Aug-22		
Routine monitoring tool and its update	Aug-22	Aug-22		
Participant/support JPSS-2 pre-launch testing events (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Overall Status:

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

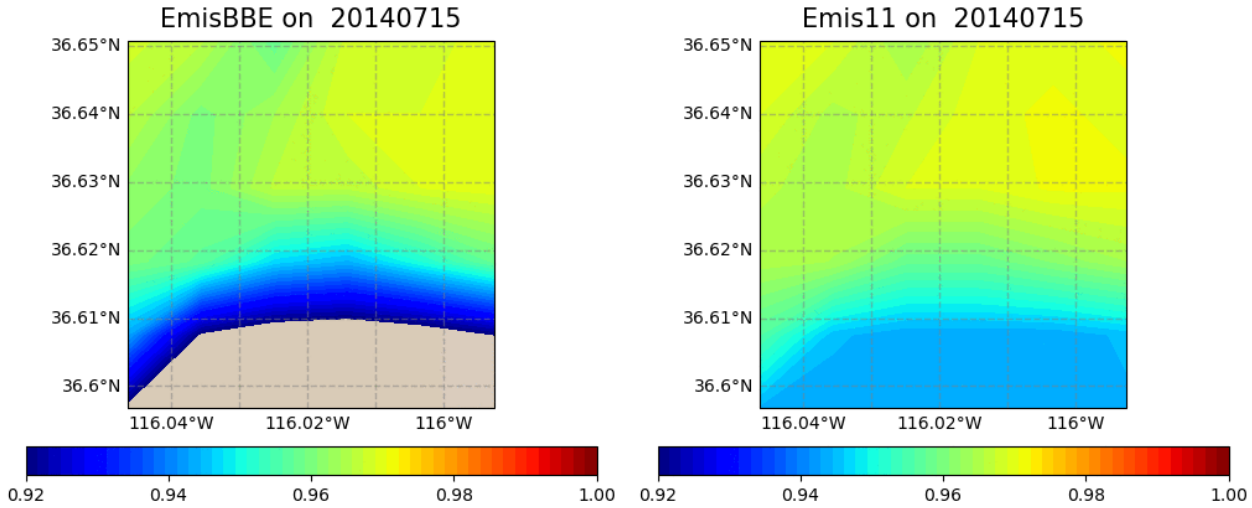
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

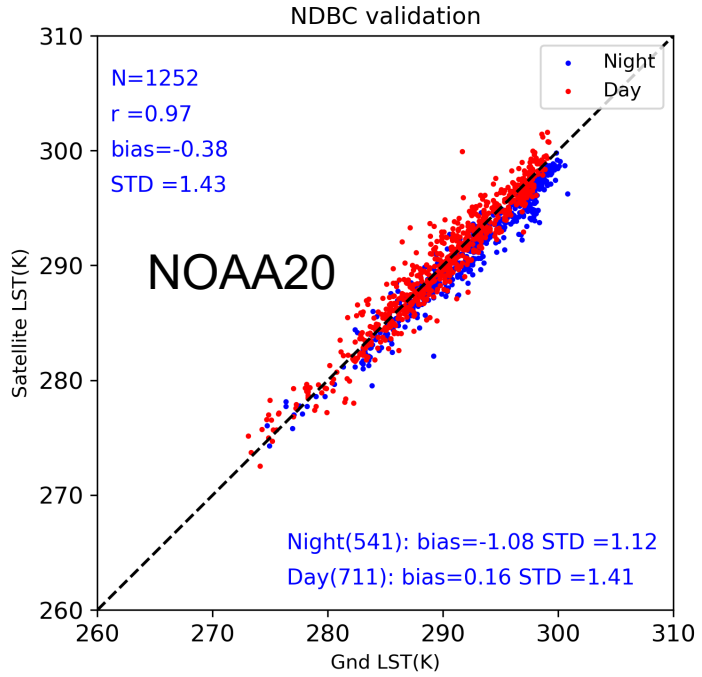
Highlights:

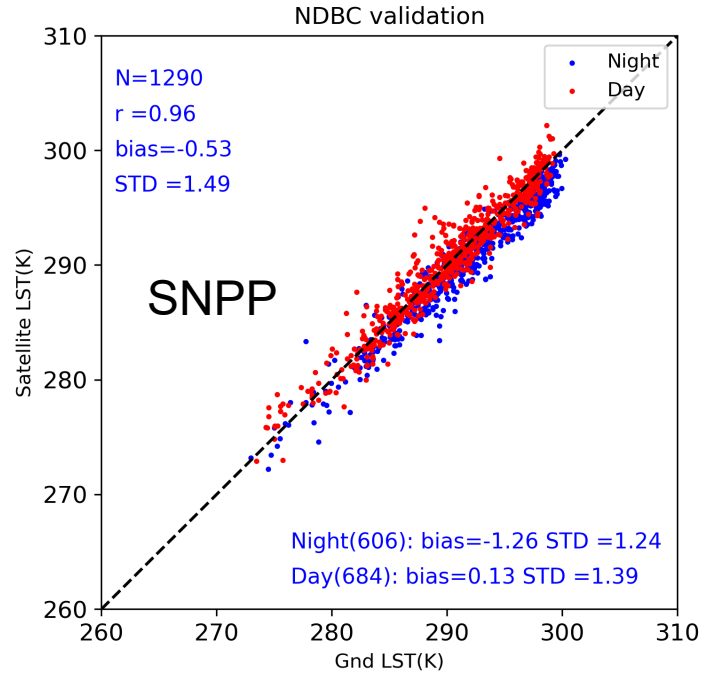
Emissivity around the SURFRAD Desert Rock station



EmisBBE represents the broadband LSE and Emis11 is the spectral LSE at 11micron. It demonstrates the abrupt variation of emissivity around the Desert Rock site. The center pixel LSE is recommended for LST validation.

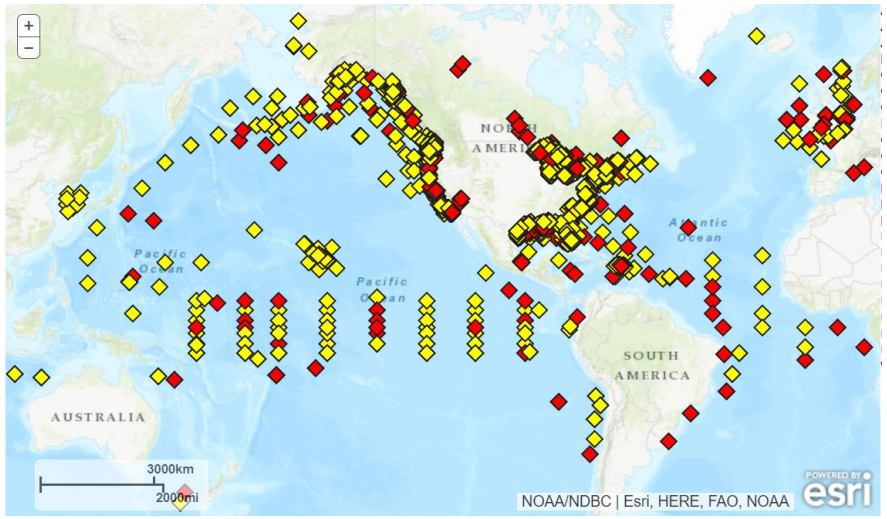
LST Validation over Inland water





- NDBC(national data buoy center) data were used as a reference to compare with the satellite LST for its quality validation over inland water body. 11 sites were selected for the preliminary evaluation.
- The time period varies over site but generally covers 2020 to 2021.
- Both L3 NOAA 20 LST and SNPP LST were evaluated in the study
- Cloud free in 3*3 of the match up pixel
- The STD of the 3*3 around the match up pixel less than 1.5 K

- A cold bias of 1.1 K and 1.3 K is found at nighttime for NOAA20 and SNPP LST, respectively while daytime bias is small.
- The STD is over 1K for both day and night
- Outlier is found for both daytime and night time validation



Stations with recent data
Stations with historical data only
Stations with no data in last 8 hours
(24 hours for tsunami stations)
Tsunami station in event mode
(within previous 24 hours)

1324 stations deployed
903 have reported in the past 8 hours

id	name	lon	lat
1	srlm4	-84.137	45.773
2	wslm4	-85.135	45.842
3	vbba3	-114.412	36.132
4	45012	-77.401	43.621
5	45001	-87.793	48.061
6	45003	-82.84	45.351
7	45006	-89.793	47.335
8	45164	-81.694	41.732
9	45169	-81.821	41.615
10	45176	-81.765	41.55
11	45180	-87.73	48.034

LST validation against NDBC measurements-Site wide results

site	samples	bias	std	Sample (n)	Bias (n)	Std (n)	Samples (d)	Bias (d)	Std (d)
45001	62	-0.16	1.27	25	-0.84	0.75	37	0.3	1.35
45003	87	-0.48	1.14	35	-1.11	0.74	52	-0.06	1.16
45006	68	-0.39	1.41	23	-0.88	0.85	45	-0.14	1.56
45012	220	-0.67	1.4	94	-1.35	0.93	126	-0.15	1.47
45164	256	-0.58	1.12	113	-1.24	0.82	143	-0.06	1.04
45169	127	-0.84	1.34	53	-1.68	1.07	74	-0.24	1.18
45176	63	-1.33	0.84	63	-1.33	0.84	0	nan	nan
45180	45	-0.69	0.77	18	-1.08	0.59	27	-0.43	0.77
srlm4	37	0.33	1.27	19	-0.14	1.13	18	0.83	1.22
vbba3	108	-0.41	1.36	21	-2.01	1.21	87	-0.02	1.08
wslm4	178	0.83	1.54	77	-0.01	1.36	101	1.47	1.35

← L3 NOAA20 LST

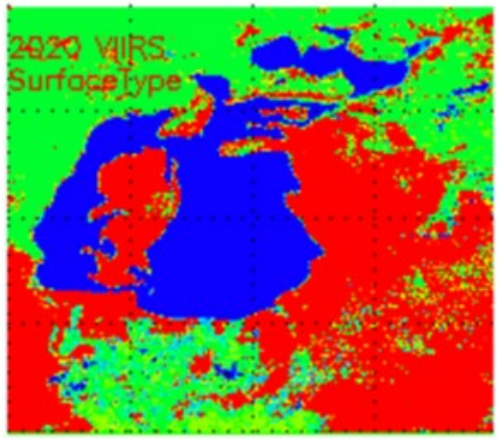
site	samples	bias	std	Sample (n)	Bias (n)	Std (n)	Samples (d)	Bias (d)	Std (d)
45001	64	-0.51	1.23	28	-1.15	0.76	36	-0.02	1.3
45003	93	-0.65	1.19	44	-1.38	0.83	49	0.01	1.08
45006	77	-0.58	1.14	33	-1.04	0.95	44	-0.23	1.16
45012	221	-0.67	1.34	95	-1.4	0.8	126	-0.13	1.41
45164	254	-0.79	1.33	116	-1.58	1.05	138	-0.13	1.16
45169	131	-0.97	1.54	54	-2	1.19	77	-0.25	1.34
45176	64	-1.71	1.09	64	-1.71	1.09	0	nan	nan
45180	45	-0.9	0.77	24	-1.27	0.57	21	-0.48	0.76
srlm4	41	0.09	1.44	20	-0.59	1.38	21	0.74	1.16
vbba3	107	-0.52	1.31	32	-1.84	1.07	75	0.04	0.95
wslm4	193	0.71	1.7	96	-0.02	1.45	97	1.44	1.61

← L3 SNPP LST

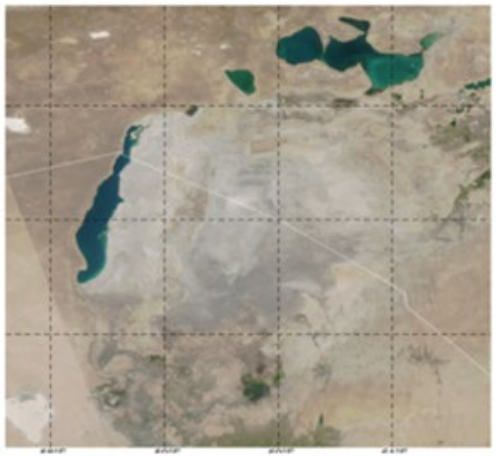
- The accuracy varies from -1.33 K to 0.84 K for NOAA20 and -1.71 K to 0.7K for SNPP LST
- The STD varies from 0.77 K to 1.54 K for NOAA20 and 0.77K to 1.7 K for SNPP LST
- Nighttime LST yields a cold bias up to 2K and 1.8 K for NOAA20 and SNPP, respectively

Surface Type Issue and Impact on Land Surface Temperature

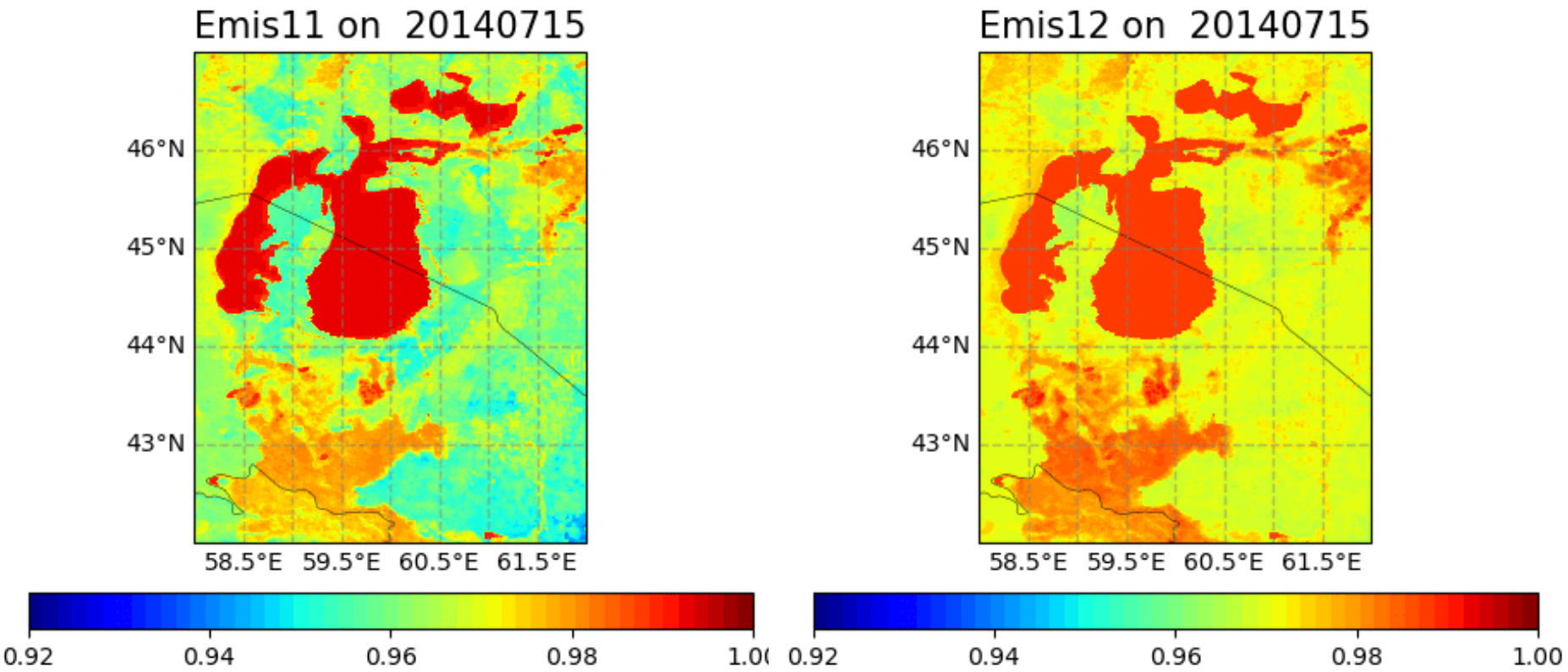
Emissivity time series over Aral Sea(2014-2021)



2020 VIIRS Surface Types



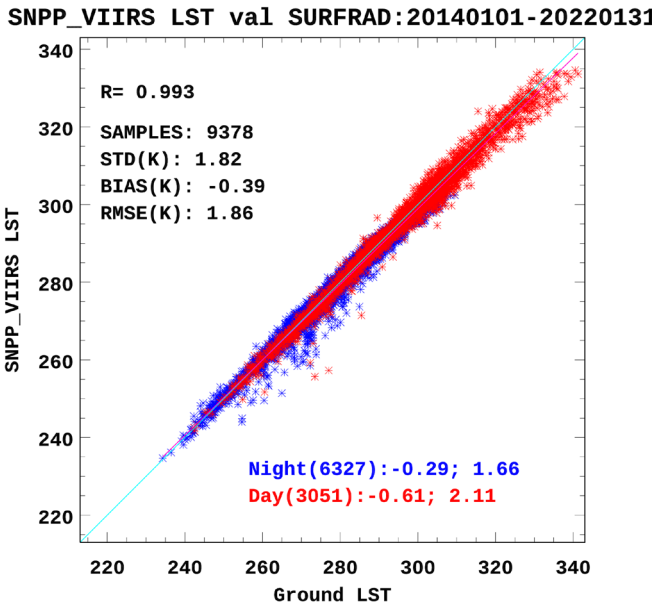
VIIRS True Color Image 8/17/2021

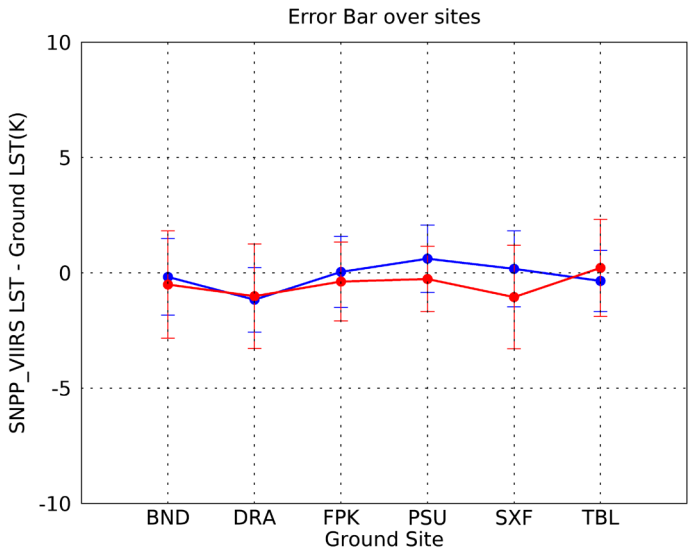


- **Top:** VIIRS surface type remains the same land-water fraction for years (not just for 2020)
- **bottom**: VIIRS true color image of Aug. 2021 shows significant difference of the land-water fraction to the VIIRS surface type data.

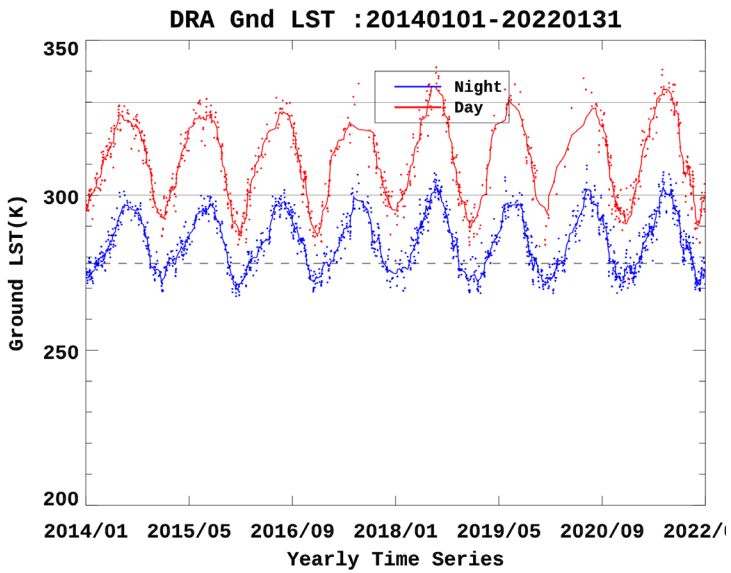
- Surface type fails to detect the degradation of the Aral Sea
- Land surface emissivity uses the VIIRS surface type as input
- LSE map does not catch the surface type change over the Aral Sea.
- Therefore, LST will be affected accordingly by taking LSE as input.

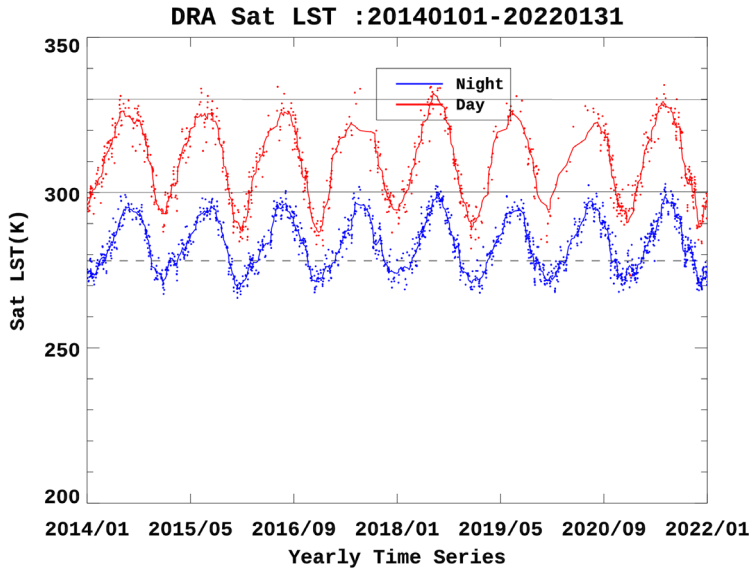
Updated SNPP VIIRS LST validation against SURFRAD

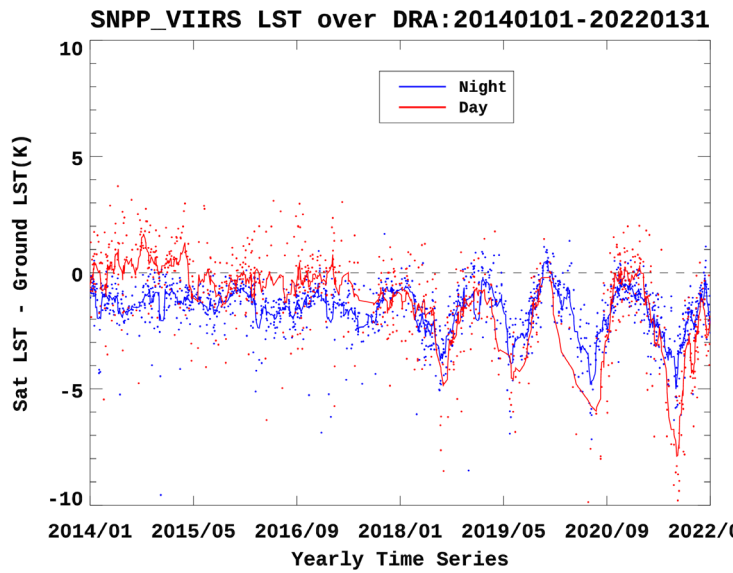




- The LST validation procedure is updated and the satellite LST and ground LST is recalculated using the latest land surface emissivity data set.
- It overall yields a close agreement with the ground measurements (top left over six sites of SUFRAD) using over eight years of data.
- Increasing cold bias is observed for the validation over Desert Rock Station since 2018. Investigation suggests that it is mainly caused by the increasing ground LST (bottom left) for both daytime and nighttime.







Surface Albedo

February, 2022

Accomplishments / Events:

- VIIRS albedo monthly anomaly study plan
  - Monthly albedo anomaly (e.g., albedo in Jan 2022 – Long-term average albedo in January) is supposed to reflect surface variation along with time
  - It could use real-time albedo from NOAA VIIRS and albedo climatology from NASA MODIS albedo, but mix with algorithm difference
  - It also could use NOAA VIIRS albedo only but needs albedo reprocessing
- VIIRS cloudy snow albedo algorithm test
- VIIRS BRDF algorithm improvement in high latitudes
- Coordinate with ASSISTT about the DAP package integration

Overall Status:

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

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

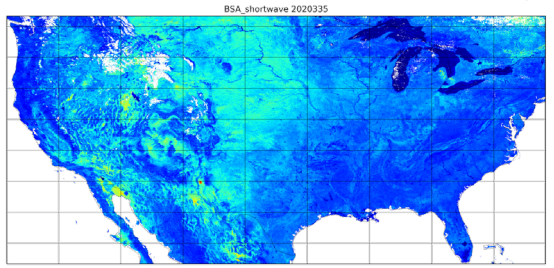
Issues/Risks:

None

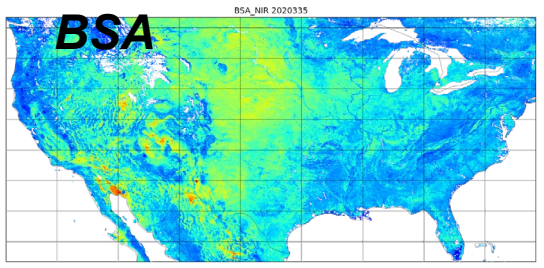
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End PMR	Oct-21	Oct-21	11/01/21	
Manuscript ready for Albedo Climatology update	Dec-21	Apr-22		More time needed
Generating the VIIRS BRDF climatology and real-time BRDF/Albedo test data generation	Jan-22	Jan-22	Jan-22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

Highlights:

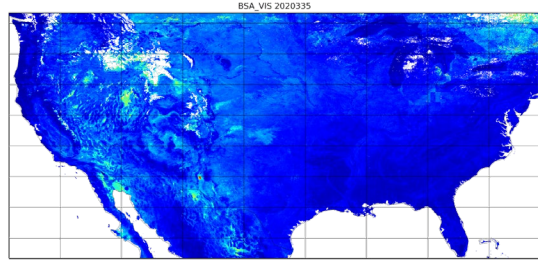
Nov 30, 2020 *CONUS VIIRS BSA*



Shortwave BSA



NIR BSA



VIS BSA

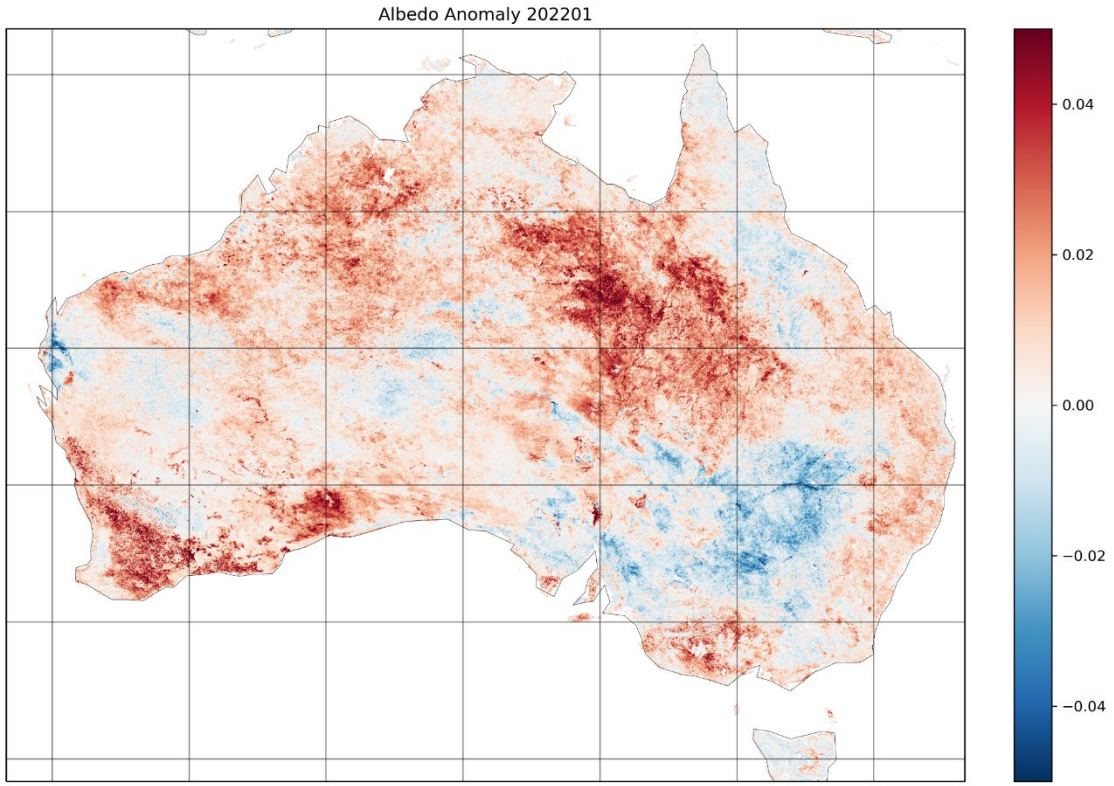
Improvements could be observed in the v2 BRDF test data: 1) inland water coverage; 2) less snow influence

Sample result of albedo anomaly from VIIRS

The figure on the right illustrates example albedo anomaly for January 2022 vs. January 2019–2022, meaning that:
albedo anomaly = 2022 albedo in January - long-term average albedo in January from 2019–2022

- An albedo anomaly of 0 means that in a particular place, the albedo in January 2022 was the same as the average January 2019–2022 albedo and is shown using pale white on the map.
- A positive albedo anomaly, illustrated using gradient red, means that for the area in question, the albedo in January 2022 was higher (in other words, more reflective) than the average January 2019–2022 albedo.
- A negative albedo anomaly, illustrated using gradient blue, indicates that the albedo in the area in question was lower (in other words, less reflective) in January 2022 than the average January 2019–2022 albedo.

Australia

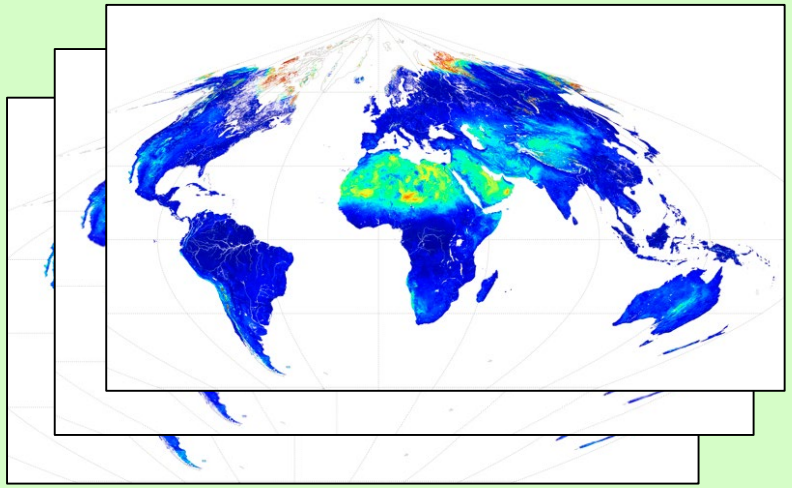


Issues: VIIRS operational albedo data record has several upgrades in the input data; thus, the high-latitude assessment result is questionable. A reprocessing is needed before using only VIIRS albedo product for anomaly assessment.

Applying VIIRS BRDF in Aerosol Prediction

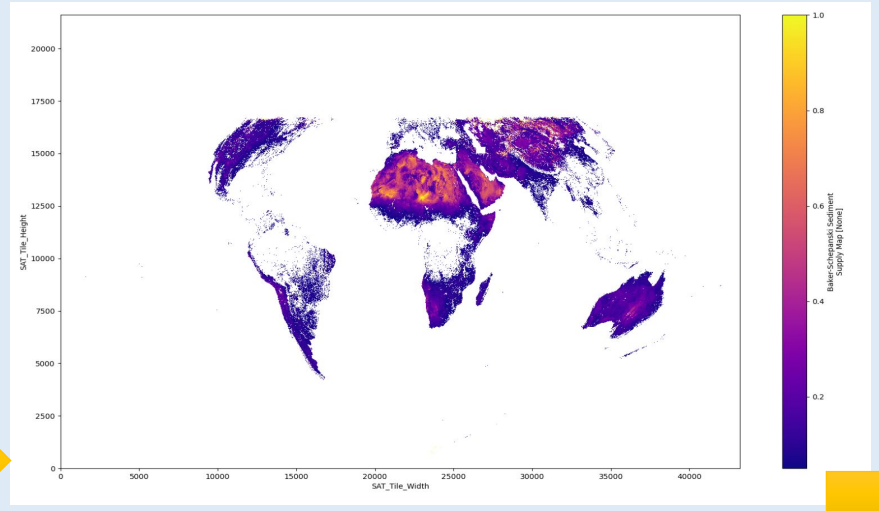
- **NOAA VIIRS BRDF/Albedo/NBAR series data measures snow-free surface reflectance anisotropy, albedo (including BSA and WSA in both spectral and broad channels), and nadir adjusted reflectance over global land surface.**
- **Eight days of test data, two days in each season, has been provided to the use.**
- **The test data has gained positive feedback from our user. Following on actions to improve to second version data.**

Applying BRDF and albedos to model

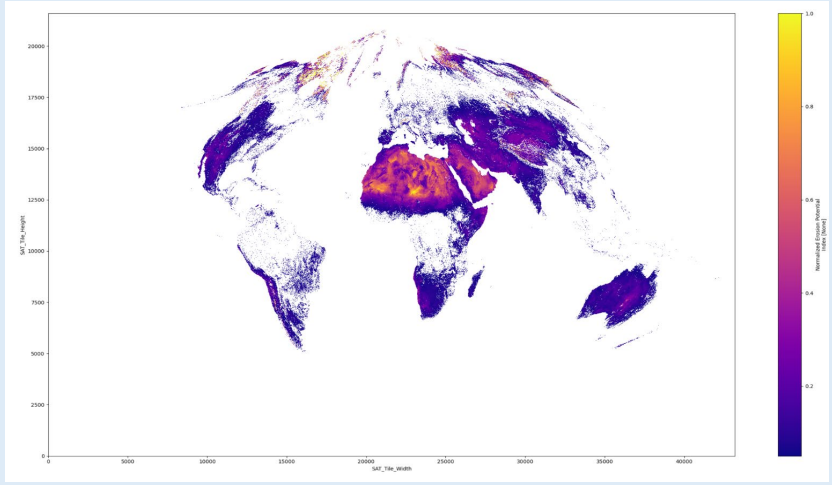


Normalized Erosion Potential Index (from Barry Baker, ARL, NOAA)

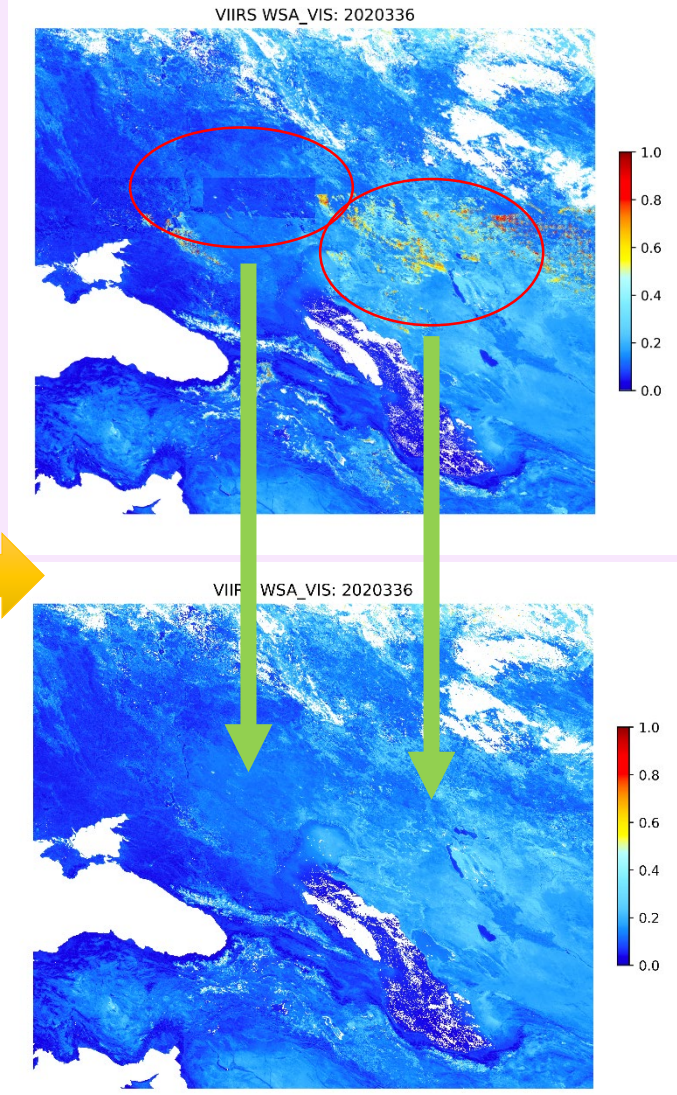
December



June



Further improvements in BRDF to user's comments



VIIRS BSA map from BRDF algorithm

Shortwave BSA

CONUS

November 30, 2020 | **March 6, 2021** | **June 4, 2021** | **August 14, 2021**

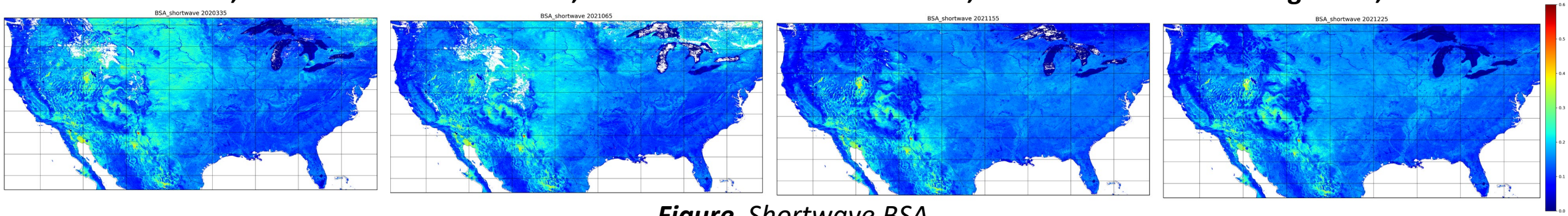


Figure *Shortwave BSA*

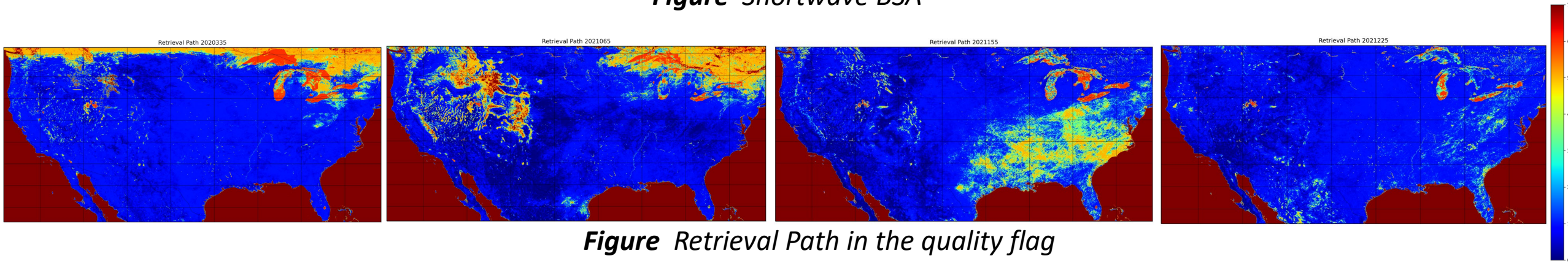


Figure *Retrieval Path in the quality flag*

Albedo shows a clear seasonal variation over CONUS especially with the vegetation growth status. e.g., Over the croplands, shrublands, or grassland surface types, albedo value is lower in summer and higher in winter.

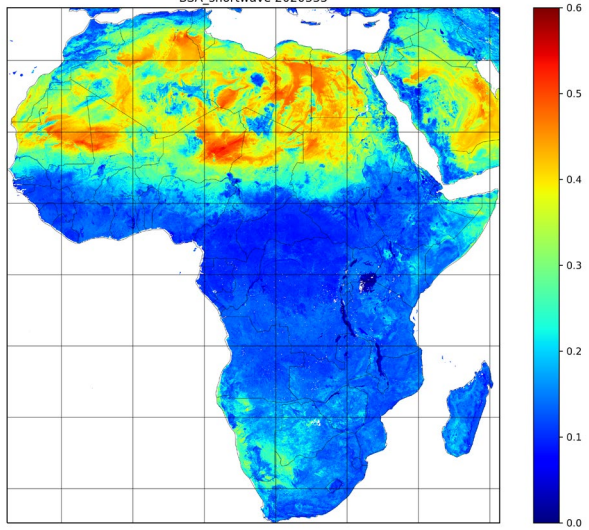
The snow presence would influence the snow-free clear-sky observations availability; thus, the high latitudes (red or orange color) retrievals are mainly from gap filling retrieval paths while most low-latitude regions are retrieved from high-quality methods (blue color). The persistent cloud condition in southeast CONUS in June 2021 also cause a regional degradation of the retrieval quality (shown as yellow color).

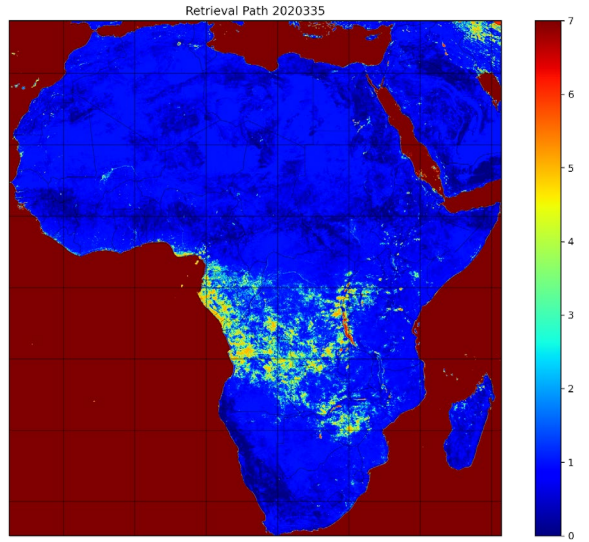
VIIRS BSA map from BRDF algorithm

Shortwave BSA

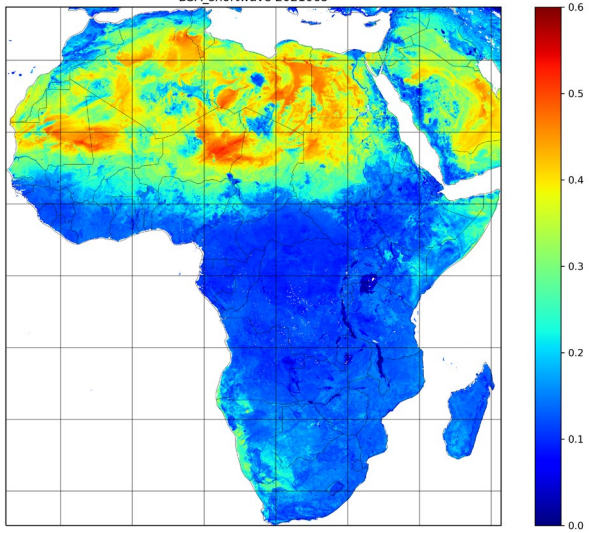
Africa

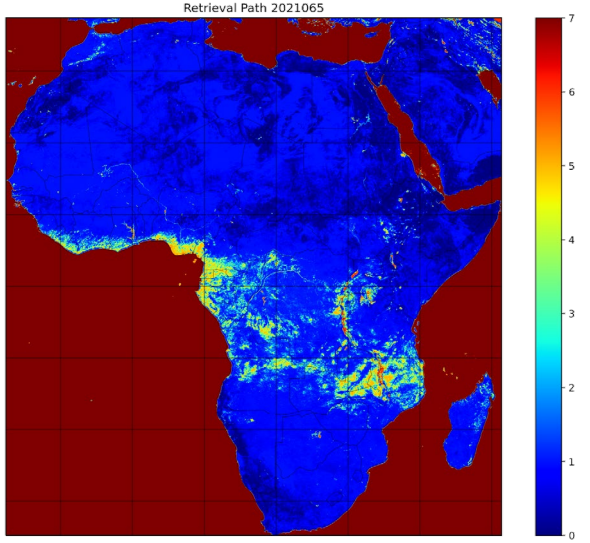
November 30, 2020



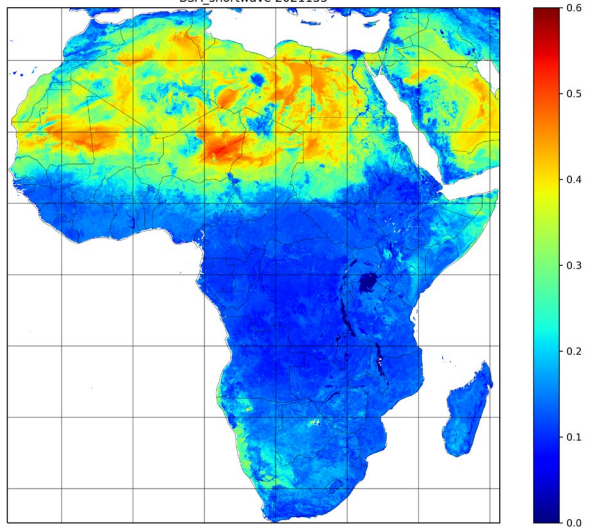


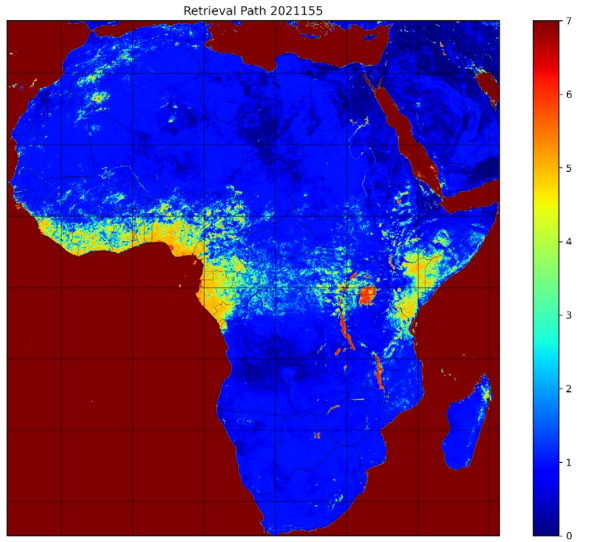
March 6, 2021



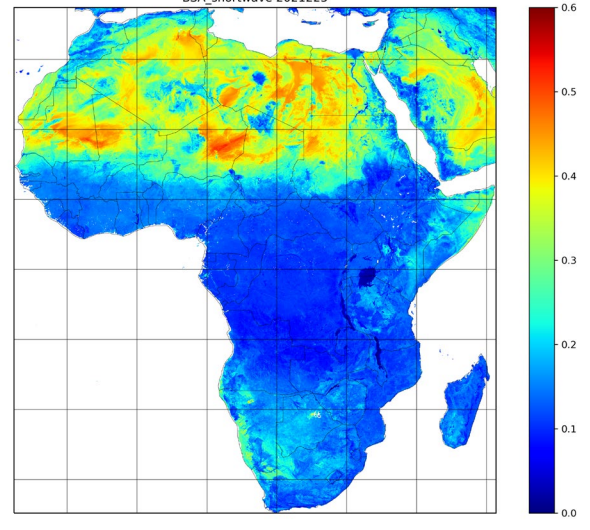


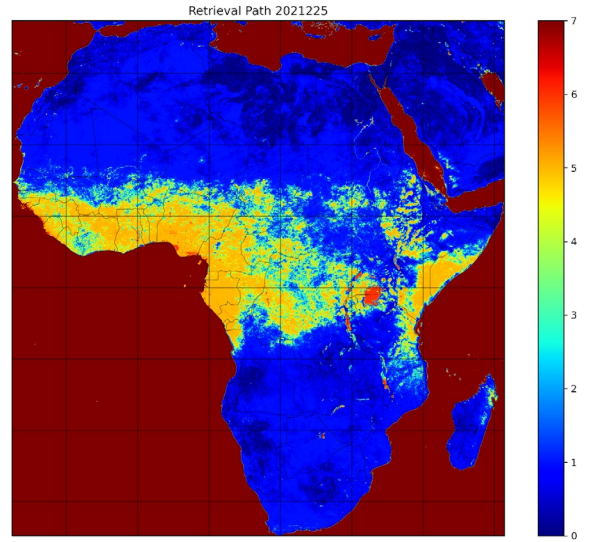
June 4, 2021





August 14, 2021





Africa is an important area for dust prediction. The albedo shows continuous coverage even during cloudy seasons.

Vegetation Index and Green Vegetation Fraction

February 2022

Accomplishments / Events:

- Performed validation of NDVI, EVI, and associated reflectances against Aeronet-corrected reflectance data.
- Generated and evaluated vegetation index with GOES-R ABI data taken at 1 hour and 10 minute intervals.
- Generated global monthly GVF climatology data based on 9 years of local run GVF data from 2013 to 2021
- Produced missing GVF browse images in the first week of 2022 for JPSS EDR LTM website
- Investigated and fixed a GVF code error in reading in multiple versions of Surface Reflectance (SR) data
- One-year time series tests from VIIRS NOAA-20 observations in the period from July 15, 2020 to July 15, 2021 verified global 1km weekly GVF data is consistent with the GVF data from DAP GVF v3r0 delivered in 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:

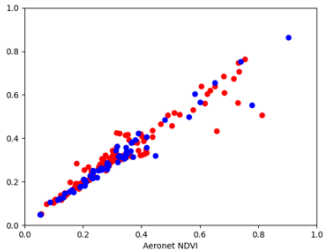
None

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

Highlights:

VIIRS Vegetation Index validation using Aeronet-corrected surface reflectances

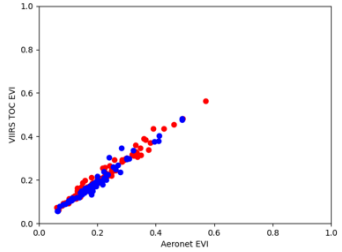
NDVI



SNPP r = 0.9608, A = -0.0045, P = 0.0473, U = 0.0475

NOAA-20 r = 0.9774, A = -0.0108, P = 0.0347, U = 0.0363

EVI



SNPP r = 0.9879, A = -0.0013, P = 0.0141, U = 0.0141

NOAA-20 r = 0.9816, A = -0.0063, P = 0.0169, U = 0.0180

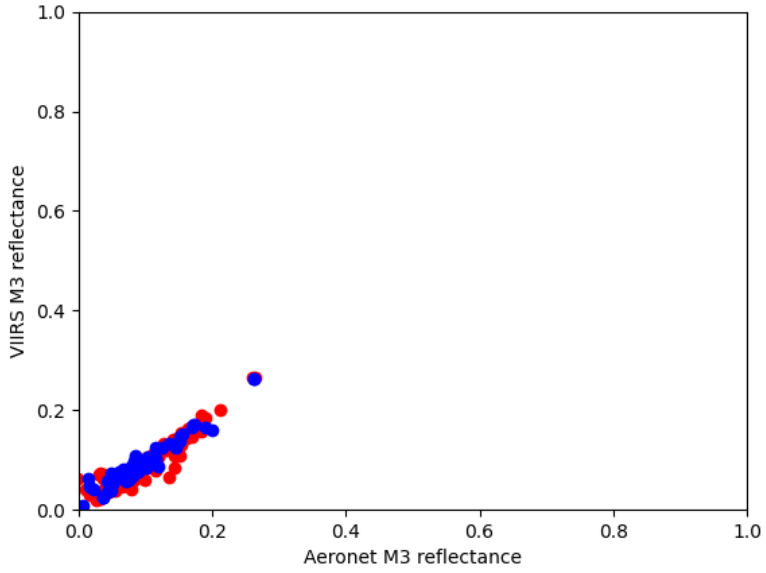
r: Correlation coefficient
A: Accuracy (mean bias)
P: Precision (standard deviation)
U: Uncertainty (RMS difference)

VI validation from Aeronet-corrected reflectances: Procedure and results

- Surface reflectances were calculated using Aeronet atmospheric parameters to correct VIIRS swath pixel TOA reflectances. This data set was originally generated to validate the VIIRS reflectance algorithm, but it can be used for VIs since the bands used in NDVI and EVI (M3, I1, and I2) are included.
- Gridded VIIRS reflectances and VIs at grid cells closest to Aeronet sites were extracted for comparison
- Only Aeronet reflectances within VIIRS 4km grid cell were kept
- Only VIIRS gridded data from confident clear conditions were kept
- Only Aeronet sites where about 2/3 or more of moderate-resolution (M3) data are good quality were kept
- This resulted in about 100 valid matchups each for SNPP and NOAA-20 VIIRS
- Results showed strong correlations (scatterplots near 1:1 line and $r > 0.9$) for all variables
- Other statistics calculated were mean bias (Accuracy, A); standard deviation (Precision, P), and RMS difference (Uncertainty, U)
- EVI statistics met VIIRS product specifications
- NDVI accuracy met specifications, but precision exceeded specifications slightly
- This is probably due to incomplete spatial coverage of VIIRS grid cells. Additional Aeronet data is now available and comparisons restricted to more complete coverage should be possible

VIIRS VI bands reflectance validation using Aeronet-corrected surface reflectances

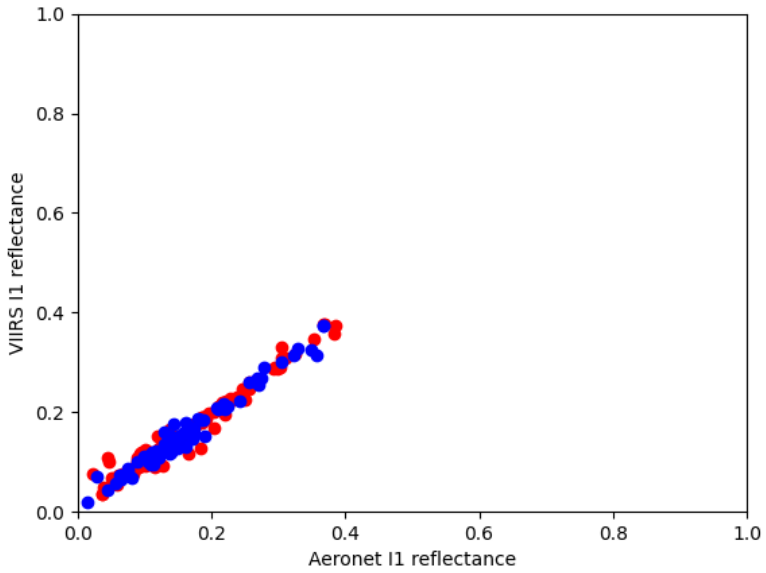
M3



SNPP r = 0.9123
A = -0.0030, P = 0.0199,
U = 0.0201

NOAA-20 r = 0.9511
A = -2.69e-05, P = 0.0158,
U = 0.0158

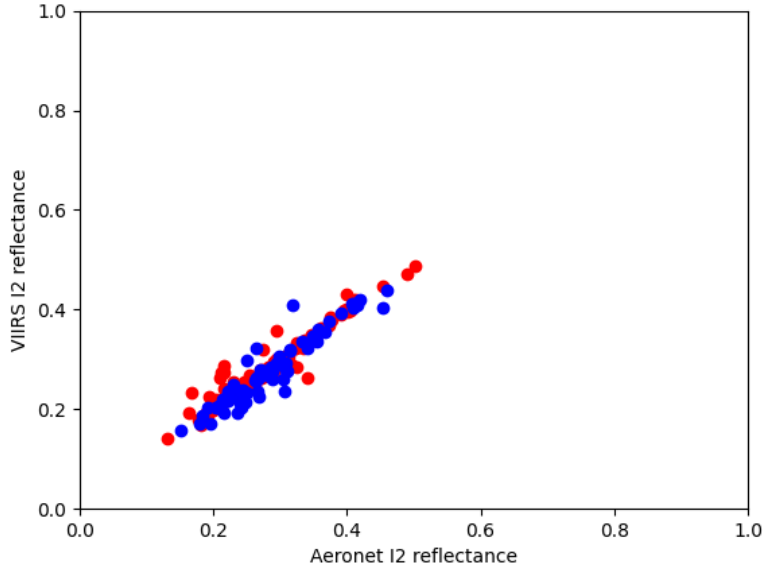
I1



SNPP r = 0.9826,
A = 0.0011, P = 0.0149,
U = 0.0150

NOAA-20 r = 0.9842
A = -0.0020, P = 0.0143,
U = 0.0144

I2

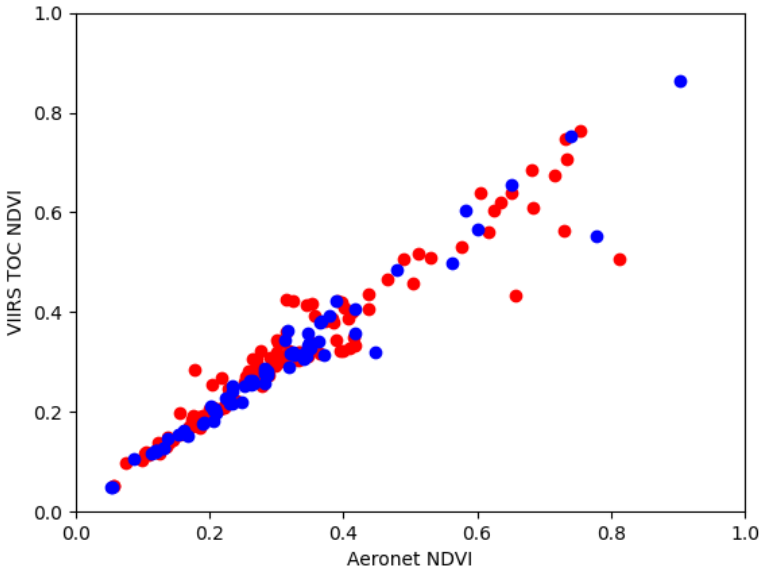


SNPP r = 0.9654
A = 0.0025, P = 0.0178,
U = 0.0180

NOAA-20 r = 0.9475
A = -0.0067, P = 0.0225,
U = 0.0234

VIIRS Vegetation Index validation using Aeronet-corrected surface reflectances

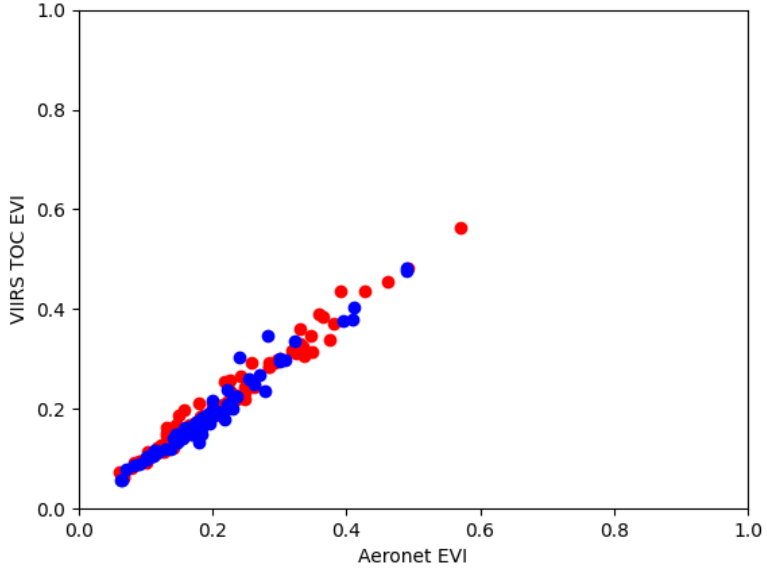
NDVI



SNPP r = 0.9608, A = -0.0045,
P = 0.0473, U = 0.0475

NOAA-20 r = 0.9774,
A = -0.0108, P = 0.0347,
U = 0.0363

EVI



SNPP r = 0.9879, A = -0.0013,
P = 0.0141, U = 0.0141

NOAA-20 r = 0.9816,
A = -0.0063, P = 0.0169,
U = 0.0180

VI generation from GOES-R ABI data: Procedure and results

- Compositing was performed using maximum VI and maximum view zenith angle adjusted SAVI methods, for 1 day, 7 day, and 14 day periods
- Data set intervals of 10 minutes and 1 hour were tested, as run time for multi-day periods and 10 minute intervals is long
- Results differed between 10 minute and 1 hour interval data, and between compositing methods
- 10 minute interval data produced greater clear/ probably clear sky coverage than 1 hour interval data, but this difference was less significant in multi-day compositing periods
- Compositing methods had same clear/ probably clear sky coverage of land areas. Fraction of land areas with clear or probably clear retrievals are shown in the table below:

	1 hr	10 min
1 day	49.89%	58.60%
7 day	85.43%	87.96%
16 day	87.86%	88.65%

- NDVI was higher when compositing 10 minute interval data than 1 hour interval data. NDVI saturation is an issue which is being investigated
- EVI is more similar between 1 hour and 10 minute interval data than NDVI

GOES-R ABI VI 16 day solar zenith angle adjusted SAVI composite (20211102 - 20211117)

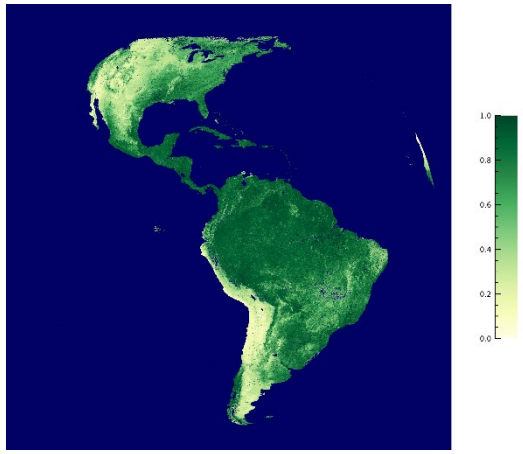
1 hour

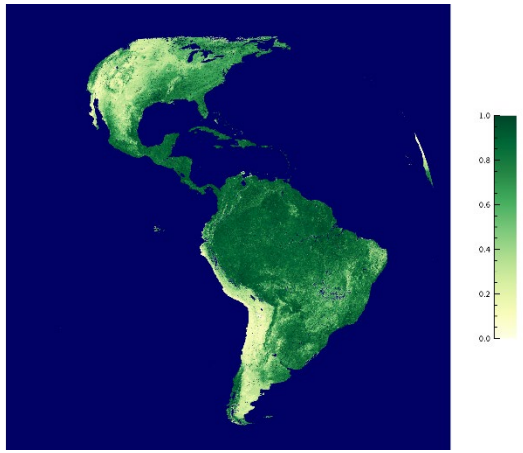
10 minutes

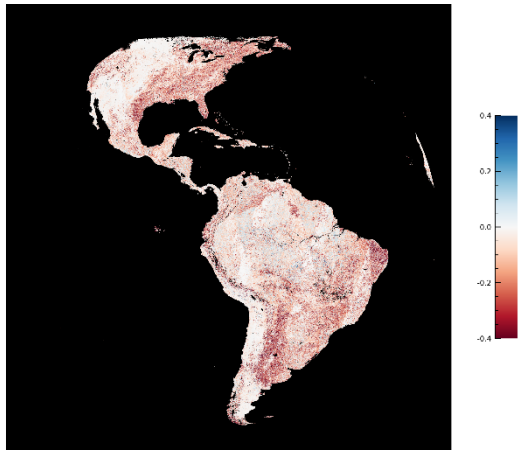
1 hr – 10 min

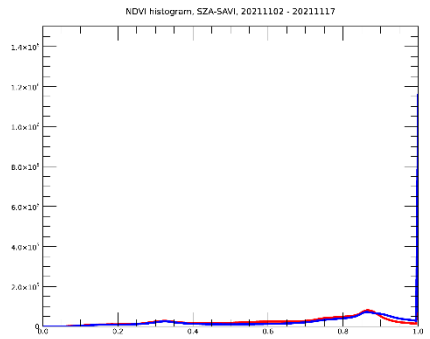
Histogram

NDVI

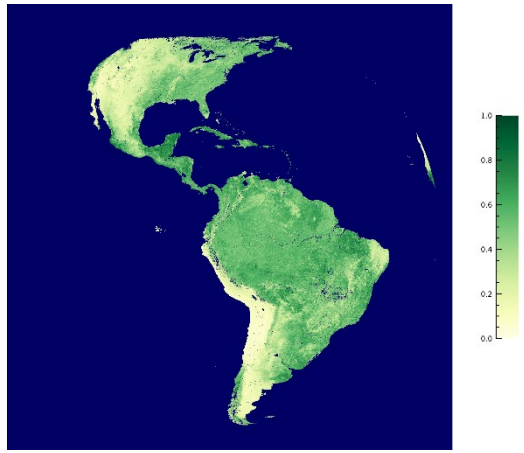


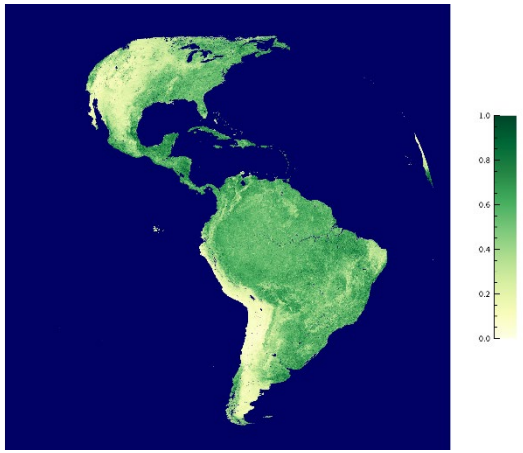


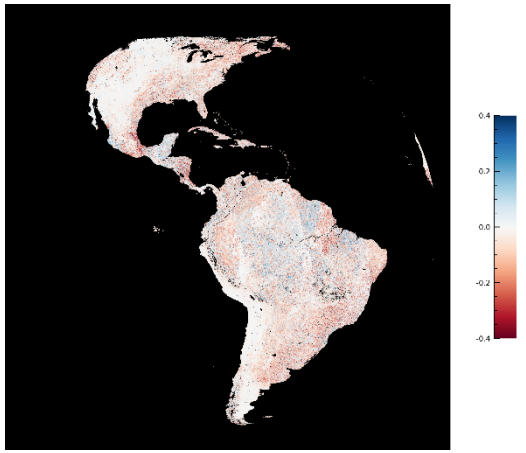


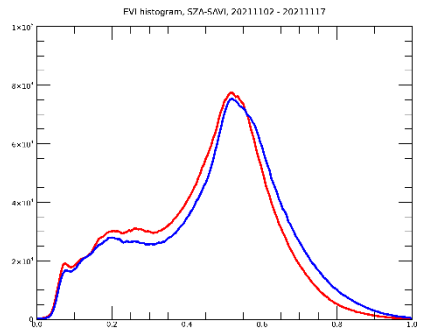


EVI









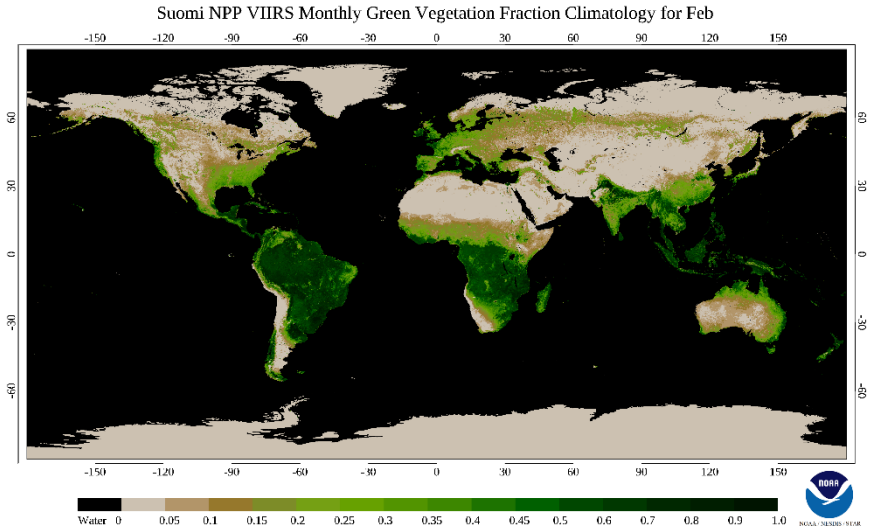
1 hour

10 minutes

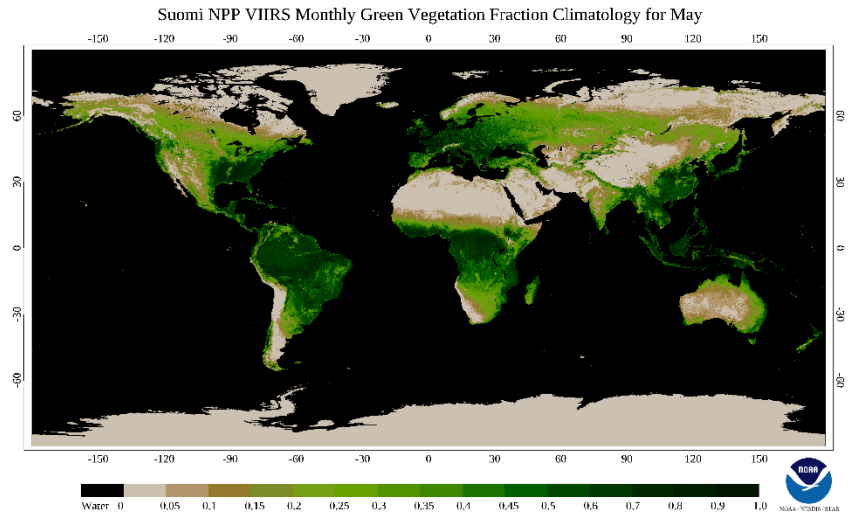
Generation of global monthly GVF climatology

- Calculated the monthly mean GVF using 9 years of local run GVF data (2013 – 2021)
  - A monthly GVF climatology value is the mean GVF over the month in the 9 years
  - Used SNPP GVF data (Jan 2013 - Sep 2019) and NOAA-20 GVF data (Oct 2019 - Dec 2021)
  - Calculated the global monthly mean GVF for the 9 years

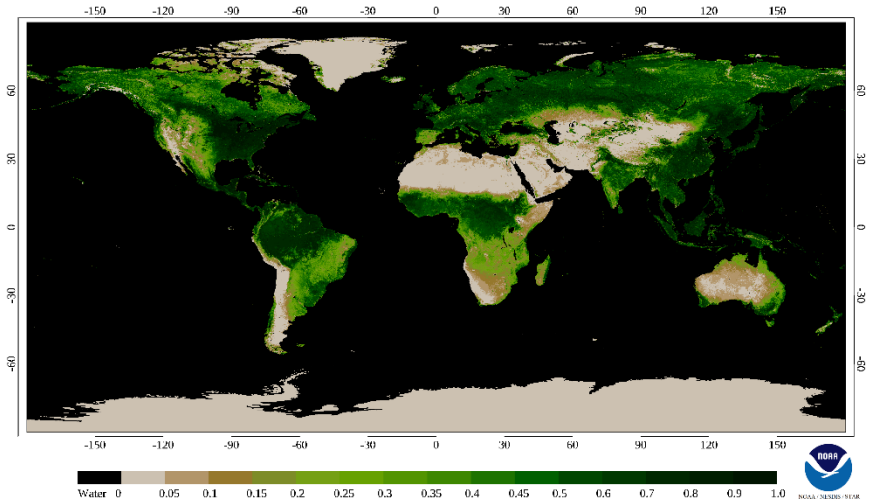
February



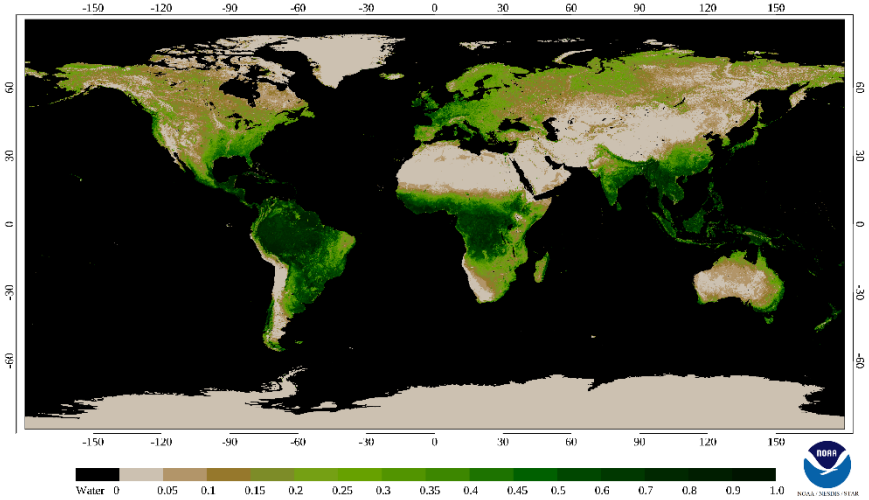
May



August

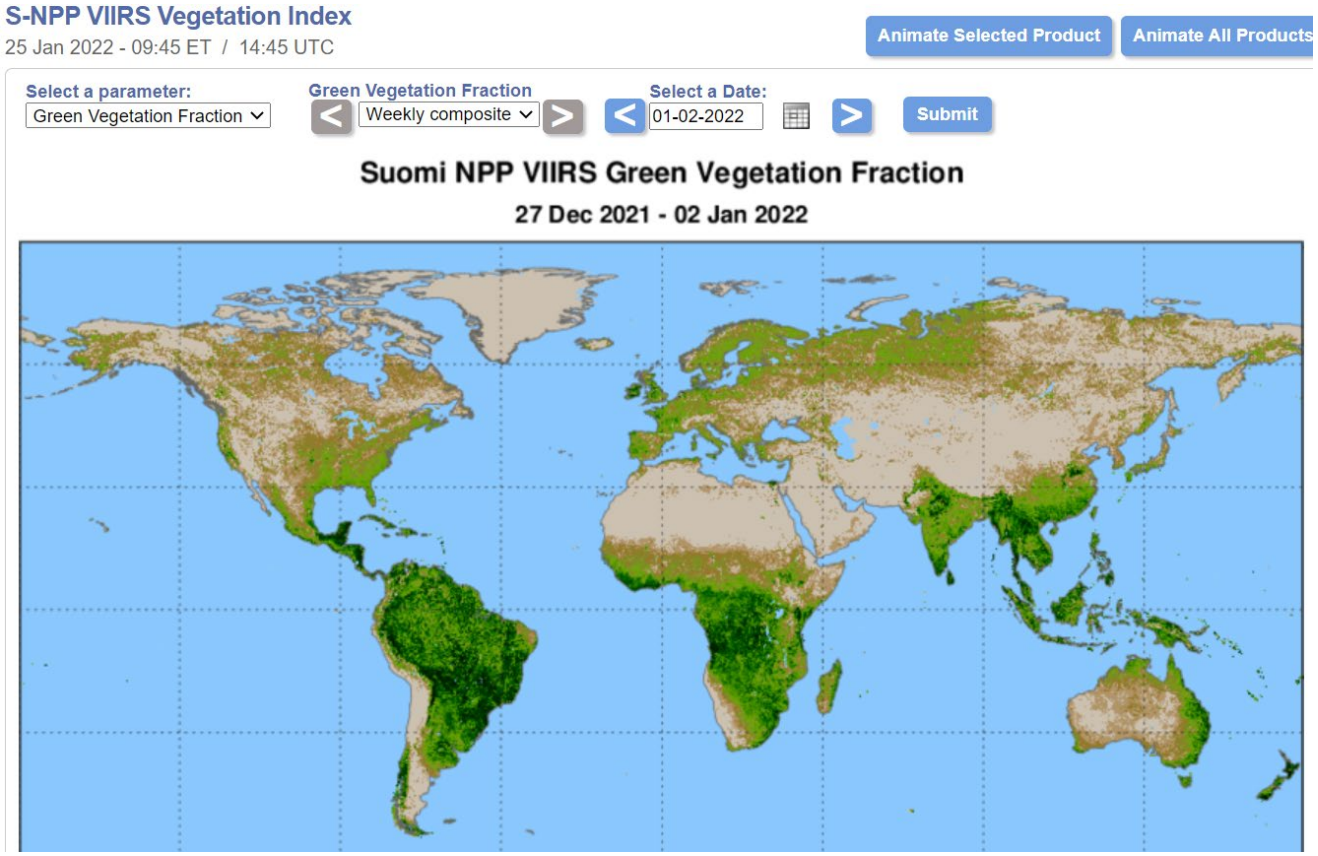


November



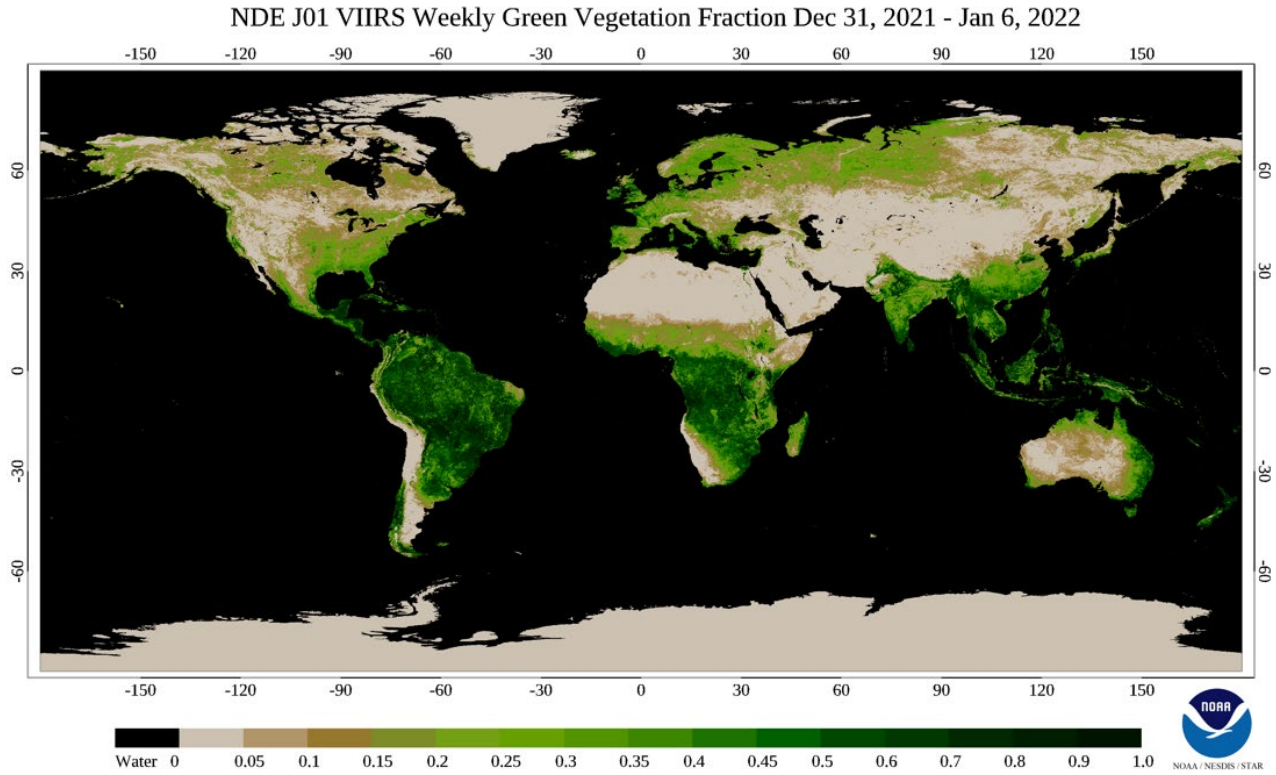
Produced missing GVF browse images for JPSS EDR LTM website

- Resolved issue of missing GVF browse images in the first week of 2022 for JPSS EDR LTM website
  - Example file name: GVF-WKL-GLB_v2r3_npp_s20211227_e20220102_c20221030712170.nc
  - The SCDR file searching command uses the starting date (green) to identify a GVF file, whereas the JPSS EDR LTM uses the ending date (red) to identify GVF browse images
  - The shell script code failed to get the operational GVF file from SCDR when the starting date and the ending date are in different years
  - The shell script code was debugged to handle the crossing year issue
  - Generated missing NPP and NOAA-20 GVF browse images for the JPSS EDR LTM website

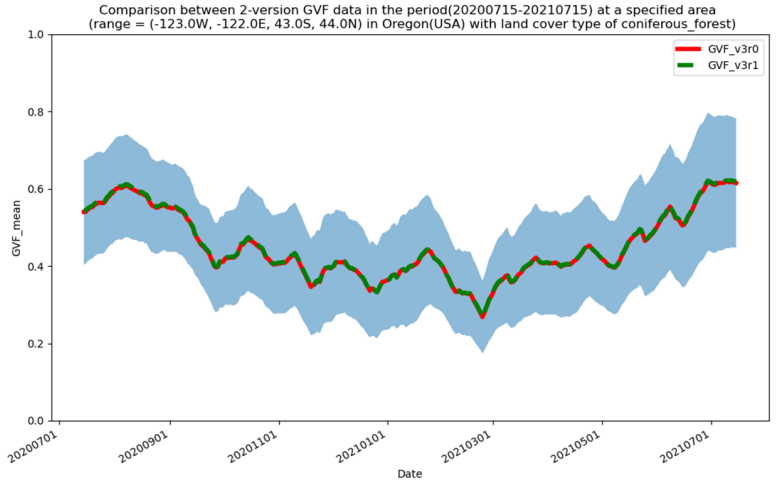


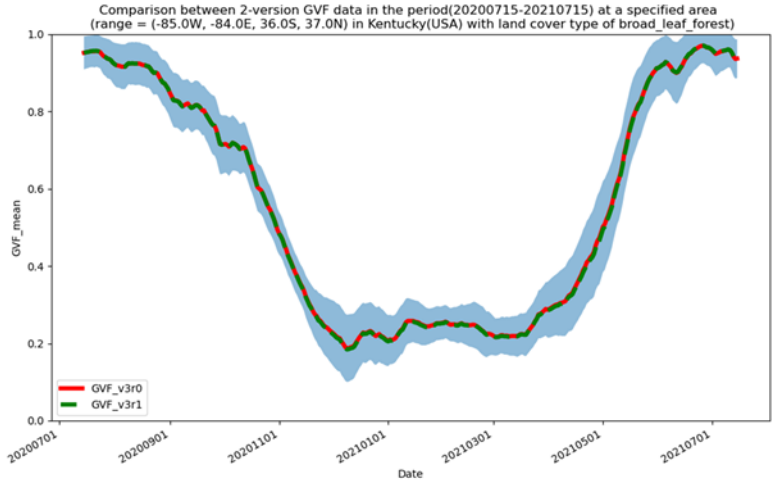
Investigation of a GVF code error

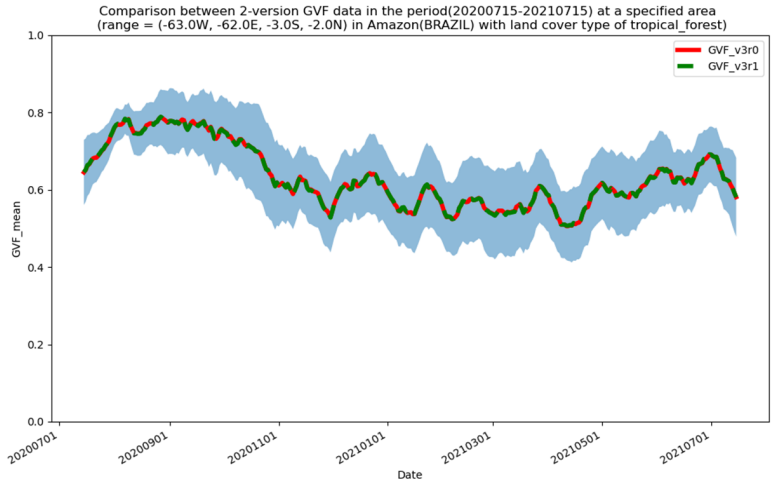
- GVF code error in reading in multiple versions of Surface Reflectance (SR) data was investigated and resolved
  - NDE reported that GVF operational run failed when multiple versions of SR input data were ingested on Jan 6, 2022
  - The local GVF run also failed on Jan 6, 2022 due to the same issue
  - It was found that there were two versions of SR data for Jan 6, 2022 (323 v1r1 SR granules and 223 v1r2 SR granules)
  - It was found that the version number of the first SR file was extracted as the SR base name and the code cannot read in other versions of SR data
  - Debugged the GVF code to exclude the version number of the SR file in the SR base name
  - Generated GVF for Jan 6, 2022 after the debug

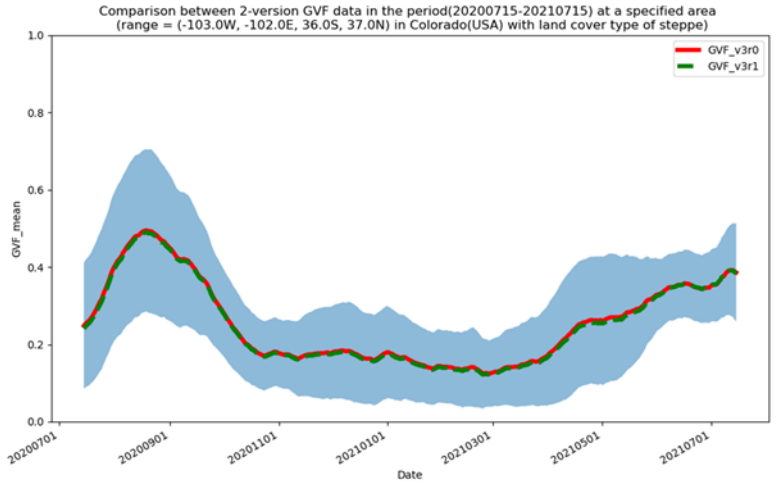


Recent experimental global 1km weekly GVF vs global 4km weekly GVF from DAP v3r0 delivered in 2021



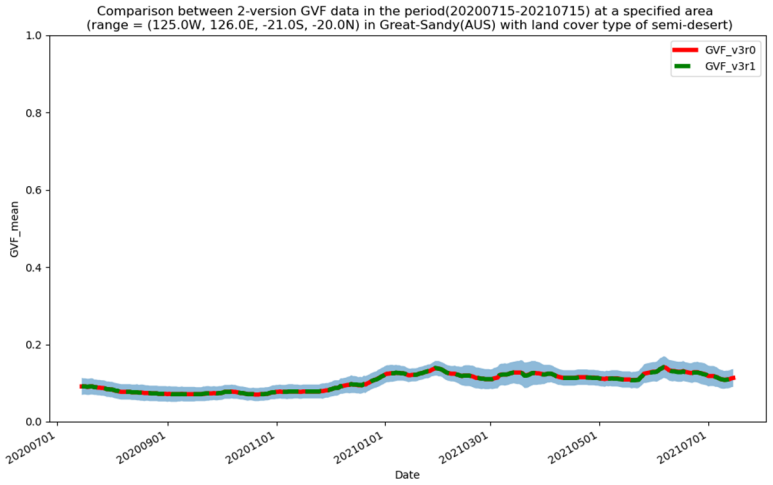


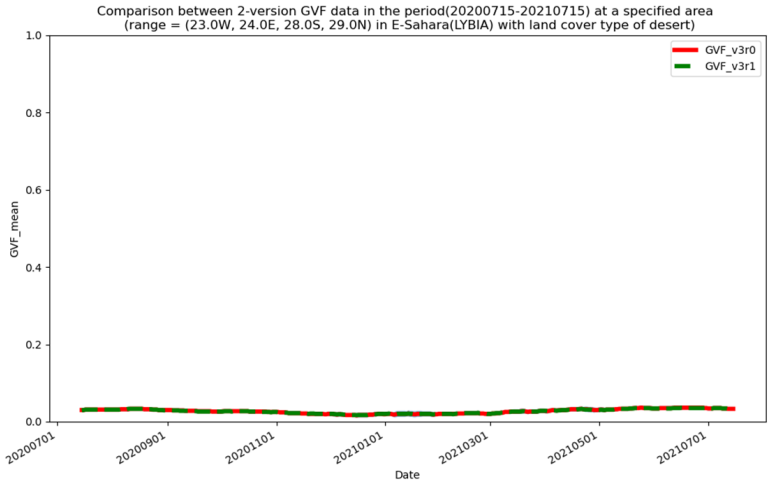


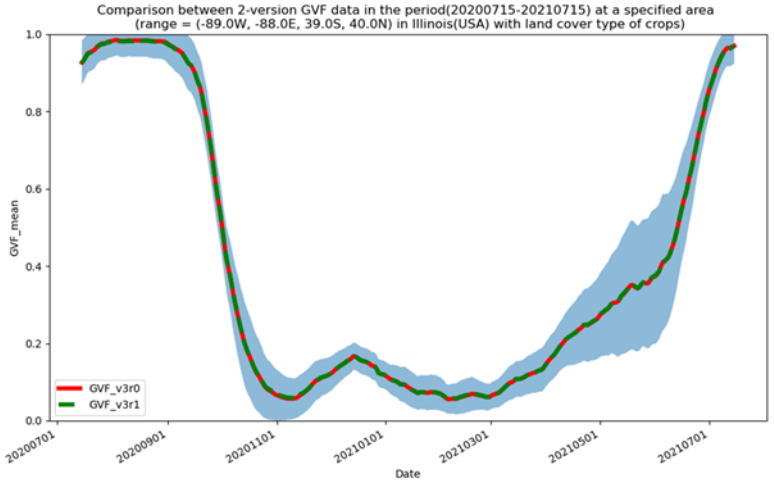


The plots on this slide and the following slide show time series of the mean (lines) and variance (blue area) of 4 km and 1 km Green Vegetation Fraction with NOAA-20 observations between July 2020 and July 2021 for the specified regions in various ecosystems such as coniferous forest, tropical forest, broad leaf forest, steppe, crops, desert, and semi-desert.

Recent experimental global 1km weekly GVF vs global 4km weekly GVF from DAP v3r0 delivered in 2021







Conclusion:

These time series plots verify the experimental global 1km weekly GVF results are quite consistent with the global 4km weekly GVF from DAP GVF v3r0 in all cases.

Vegetation Health

February, 2022

Accomplishments / Events:

- Closely reviewed RCI time series, and found exceptional values, traced back to the origin of the issues, and estimated the necessity if a reprocess was needed;
- Reprocessed the radiation dataset from aggregation temporally and spatially, to smoothed data, climatology, and RCI, and re-generated time series using a suite of masks; compared later and former results to make sure the reprocessing was correct;
- Drafting a manuscript on our research on the radiation product and crop yield (highlighted);
- 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 February 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			

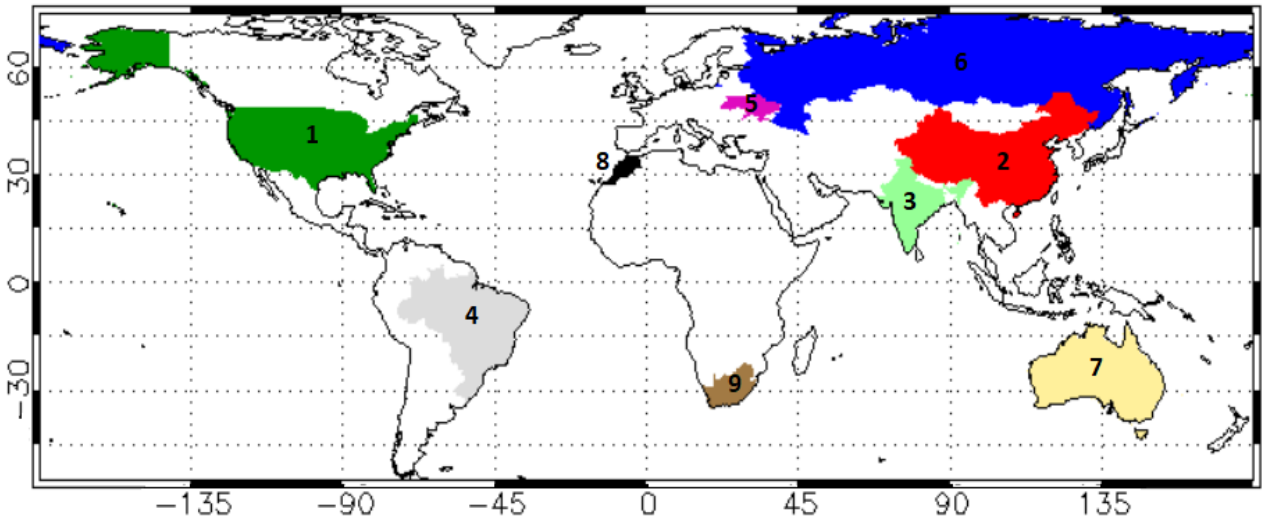
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: Research Areas (9 Countries) in the Preparing Manuscript



Ocean Color

February, 2022

Accomplishments / Events:

- Preparations for March 2022 NOAA CalVal cruise support at the Hawaii MOBY site
- Answered questions regarding NMFS/NOS requirement change request
- Working with VIIRS SDR team regarding striping in S-NPP discrepancy report – will recommend it be closed with no action
- Continued to monitor quality and performance of VIIRS Ocean Color products

Overall Status:

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

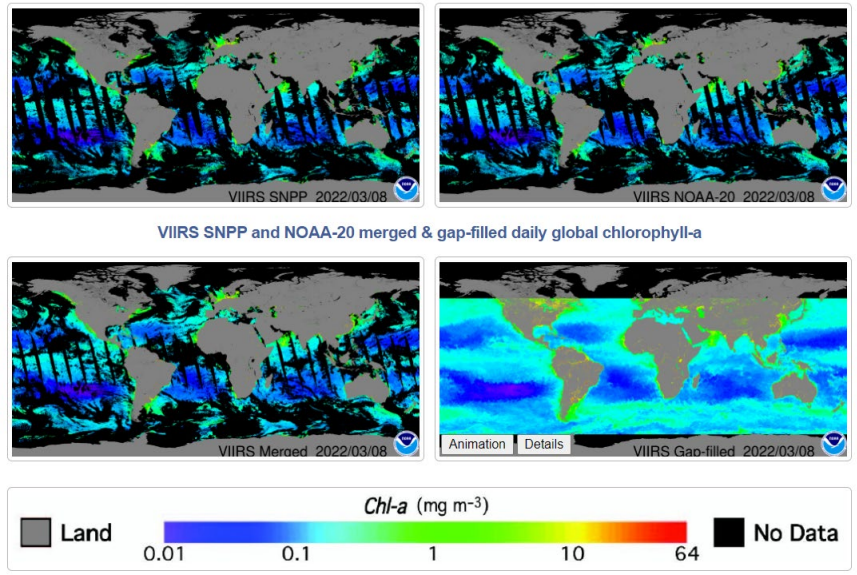
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

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

Highlights: Daily Ocean Color products from NESDIS/STAR website include SNPP, N20, Merged and Gap=Filled Chla Concentration



Sea Surface Temperature

February, 2022

Accomplishments / Events:

- The NOAA ACSPO enterprise SST system was upgraded from the current v2.61 to v2.80. V2.80 was publicly released in Physical Oceanography Distributed Active Archive Center (PO.DAAC; https://podaac.jpl.nasa.gov/) on 27 Jan 2022. 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).
- Compared to 2.61, v2.80 features (1) two thermal front layers (location of fronts, and intensity in unit of kelvin/km); (2) Reduced L2P data size by a factor of ×4 (from ~10TB/sensor/yr to ~2.5TB); (3) Using improved ACSPO SST algorithm to mitigate warm biases in the high latitudes (up to several tenths of a degree Kelvin); and (4) Improved clear-sky mask (reduced number of false alarms in dynamic and coastal areas, and minimized dependency on simulated brightness temperatures).
- In Feb 2022, the focus was on communicating with users and facilitating readiness for transition to 2.80, including international (Canadian Met Centre, CMC L4; UK Met Office OSTIA L4; and Australian Bureau of Meteorology GAMSSA, RAMSSA and other blended/fused products), and domestic users (including NESDIS Geo-Polar Blended and OISST L4 analyses).

Overall Status:

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

1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
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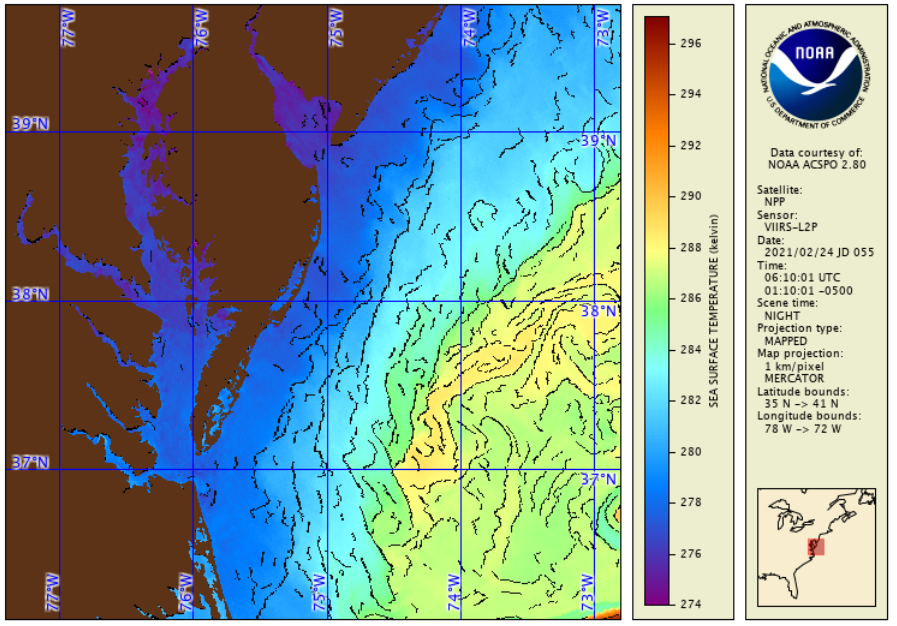
Issues/Risks:

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 2.90. Improve Clear-Sky Mask & SST Algorithms. Focus on NPP/N20 SST consistency	Aug-22	Aug-22		
Integrate in ACSPO. Test in STAR environment. Include N21 functionalities in NOAA Match-Up code/Monitoring	Aug-22	Aug-22		
Continue NOAA SQUAM and ARMS monitoring & validation against iQuam. Provision for N21 infrastructure	Aug-22	Aug-22		
Maintain ACSPO, SQUAM, iQuam, ARMS, match-up & RAN infrastructure & codes. Improve/optimize/add N21	Sep-22	Sep-22		
Monitor SST performance online. Identify anomalies. Work w/SST Algorithms & SDR Team and archives to address	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights:



Example SST imagery produced with ACSPO v2.80 for Chesapeake Bay on 24 Feb 2021. New thermal fronts product is overlaid on the top of SST.

VIIRS Polar Winds

February, 2022

Accomplishments / Events:

- Continued making progress characterizing tandem wind accuracy. An initial comparison for seven days in September 2021 yielded a vector root-mean-square error (RMSE) of 5.11 m/s and vector accuracy of 4.45 m/s, which are similar to that of more traditionally triplet derived winds. Tandem winds use successive orbits of Visible Infrared Imaging Radiometer Suite (VIIRS) images from two satellites (Suomi-NPP and NOAA-20) that fly in tandem, separated by approximately 50 minutes.

Overall Status:

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

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Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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)	Mar-22	Mar-22		
Super DAP v3.1 patch delivery			12/06/21	
Implement VIIRS tandem winds	Mar-22	Mar-22		
Generate new lookup tables, retrieval coefficients for JPSS-2	Sep-22	Sep-22		
Continuous monitoring of S-NPP and NOAA-20 products	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: Further analysis of Tandem Wind Accuracy shows reasonable bias/rms compared with rawinsondes

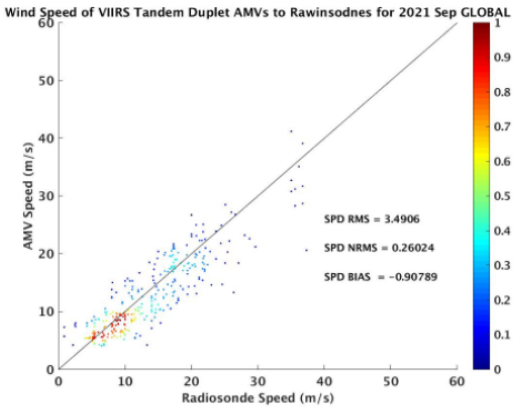

Figure: Scatter plot comparing global tandem winds for seven days in late September 2021 to rawinsondes. The sample size is 1500 matches.

NUCAPS Products

February, 2022

Accomplishments / Events

- Evaluated impacts on the NUCAPS EDR products due to the NOAA-20 CrIS sensor anomaly that flags 'Valid' data as 'Degraded' date due to the failure of a temperature sensor. The results of evaluation indicated that there is no apparent degradation in the NUCAPS EDR output products and the OLR product.
- Completed evaluation of MetOp-B/C NUCAPS products for a set of focus days from the NCCF DEV implementation and found them consistent with the offline runs. Waiting on receiving NCCF I & T string product subscriptions into the SCDR for further evaluations.
- Continued work on extending the AMS-presentations into journal article publications. In this context, the NUCAPS team initiated additional research efforts to substantiate the results presented in the AMS conference on, (1) damping factor optimizations, and (2) ozone a-priori improvements.
- Continued work on the NUCAPS implementation for the NCIS Cloud infrastructure; Continued work on three major updates, (a) averaging kernels, (b) ozone climatology improvements, and (c) surface corrections to the NUCAPS V3.1 for mission long reprocessing.
- 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.

Overall Status:

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

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	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		
NUCAPS Averaging Kernels (AK) and improved stability indices. S-NPP Mission long reprocessing version (NUCAPS v3.1)	Dec-21	Feb-22	Submitted User Request Form/Change Request	Waiting on OSPO Approvals
Addition of Ammonia product to NUCAPS operational retrievals (NUCAPS v3.2)	May-22	May-22		
NUCAPS augmentation for EPS-SG (NUCAPS v3.3)	Jul-22	Jul-22		
NUCAPS IR-only retrieval for risk mitigation and conceptual GEO-CrIS retrieval products (NUCAPS v3.4)	Jan-22	Jan-22	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		
Reactive maintenance and Improvements to surface emissivity first guess using CAMEL, temperature lower-tropospheric bias improvements over land, optimized cloud clearing and Local Angle Corrections (LAC) for S-NPP/NOAA-20 NUCAPS	Sep-22	Sep-22		
NOAA-GML Theme 1: NUCAPS trace gas product validation with corroborative data sets and collaboration with GML and other stakeholders in support of NOAA/NESDIS initiatives	Mar-22	Mar-22		
NOAA-GML Theme 2: NUCAPS ozone and water vapor products validations with CLIMCAPS and O3SNDS, and collaboration with GML and other stakeholders in support of NOAA/NESDIS initiatives	Mar-22	Mar-22		
Routine monitoring of trace gas products, T(p) and q(p) bias improvements	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (Apr-22 JCT3-TVAC;				

Highlights: NUCAPS MetOp-IASI vs. EUMETSAT Trace Gas Products

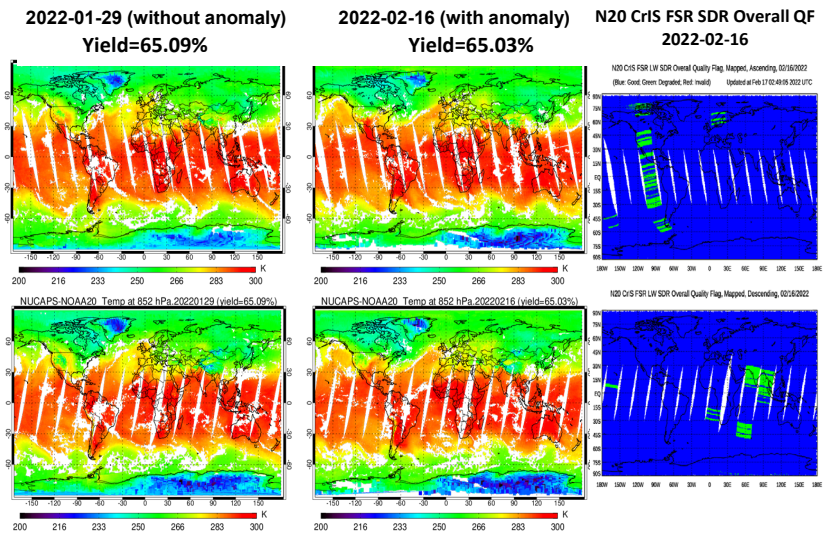

Figure. NUCAPS EDR product evaluations due to the NOAA-20 CrIS Sensor anomaly. Shown here are the NUCAPS temperature retrieval maps at 850 hPa for two days, one with no anomaly (2022-01-29), and the other with the anomaly (2022-02-16). The results of evaluation indicated that there is no apparent degradation in the EDR output products and the OLR product

MiRS Products

February, 2022

Accomplishments / Events:

- On 15 January 2022 at approximately 04:15 UTC, after several weeks of low-level volcanic activity, the submarine volcano of Hunga Tonga experienced a very large eruption – estimated to be the largest worldwide since the Mount Pinatubo eruption of 1991. Coincident observations indicated that the eruption reached well into the stratosphere. Satellite microwave observations from both NOAA-20 and SNPP ATMS were available that day from local overpasses at approximately 12:00 and 13:00 UTC, respectively. The figure shows the corresponding MiRS temperature retrievals at 1 hPa. The retrieved temperatures show very strongly the wave structure to the north and east of the eruption. There is also indication of lower magnitude perturbations well north and west of Tonga (e.g. approaching southeast Asia). If one accounts for the approximately 50-minute difference in time between NOAA-20 and SNPP observations, then it is also clear that the perturbation wave has propagated eastward about 5 degrees of longitude between 12:00 and 13:00 UTC.

Overall Status:

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

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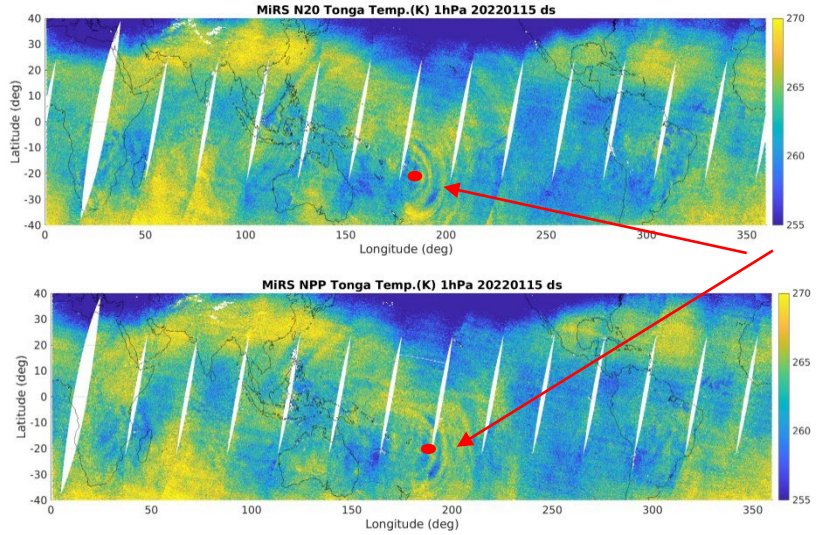
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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		
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		
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 (Apr-22 JCT3-TVAC; Maybe; May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights:



MiRS retrieved temperature at 1 hPa from NOAA-20 (top) and SNPP (bottom) on 15 January 2022. Observation times near Tonga are approximately 8 and 9 hours, respectively after the primary eruption. Red symbol denotes location of Tonga eruption. Arrows indicate location of apparent stratospheric waves emanating from the eruption and propagating eastward.

Snowfall Rate

February, 2022

Accomplishments / Events:

- Study the effect of adding some ERA5 reanalysis data in the development of snowfall rate algorithm, mainly in ice water path (IWP) initialization and bias correction to have improved coverage globally. The results show significant improvement in regions such as Eurasia and Southern Hemisphere.
- Study is ongoing to improve snowfall rate estimation using machine learning technique.
- The SFR team lead was invited to give a seminar to the Multi-Radar Multi-Sensor (MRMS) group at the NOAA National Severe Storms Laboratory. The MRMS product is widely used for weather forecasting. The SFR team also merges SFR with the MRMS snowfall rate estimate to produce a mSFR product. The seminar was well received and a long discussion followed the seminar. The MRMS group requested SFR data for their study to incorporate satellite precipitation data in MRMS. They also provided information on an experimental precipitation type product which could be a validation source for the SFR snowfall detection algorithm.

Overall Status:

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

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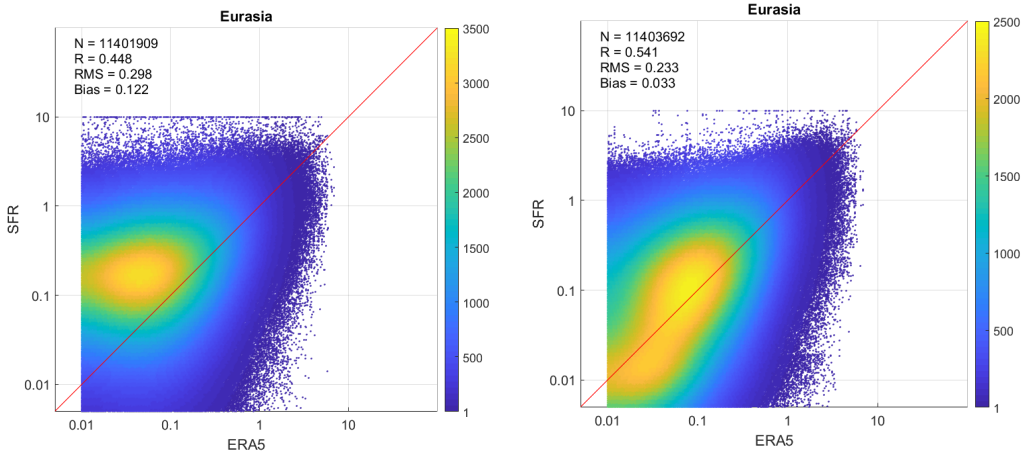
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
Final J2 ready DAP to NDE (include NPP/N20 updates)	Mar-22	Mar-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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		

Highlights: Improving SFR Performance with Reanalysis Data



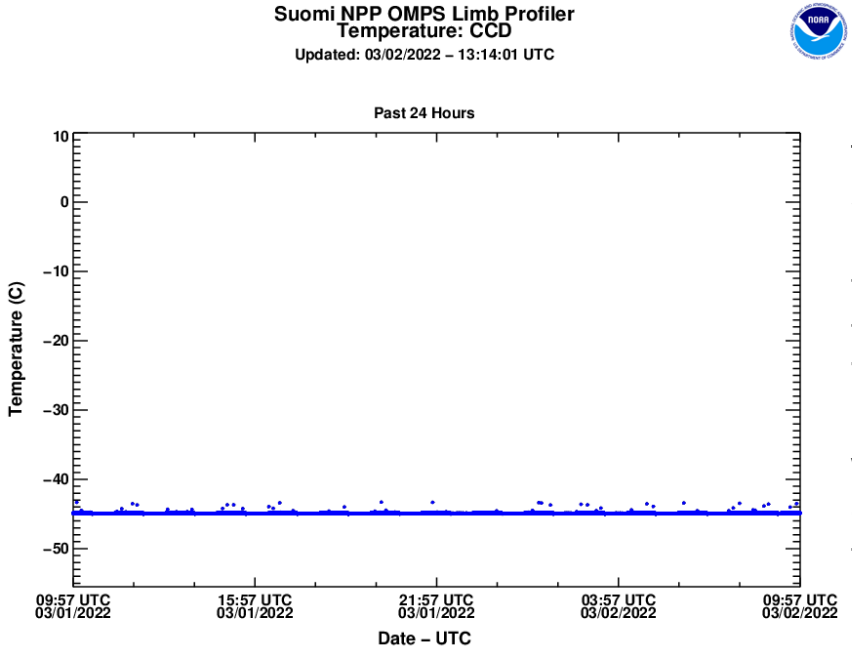
SNPP SFR performance in Eurasia using IWP initialization derived from Stage IV (left), using IWP initialization from Stage IV and ERA5 (right).

OMPS Ozone (V8Pro, V2Limb & V8TOz)

February, 2022

Accomplishments / Events:

- Final J2 V8TOz and V8TOS DAPs with tables using J02 OMPS NM on I&T system at NDE.
- Version 2.5Limb DAP with new climatologies and three-slit processing has been installed on the Development System at NDE.
- Began reprocessing S-NPP V8Pro record with interpolated bandpasses and improved soft calibation.
- Delivered the J2 V8Pro DAP to ASSISTT with updates to S-NPP and NOAA-20 soft calibration adjustments.
- Acquiring access (NASA Smart Card and Team Leader Computing Facility Account) to NASA OMPS Limb algorithm development areas.
- The OMPS Limb Instrument monitoring was added to the ICVS



Monitoring plot from the ICVS showing he OMPS LP CCD detector temperature for the past 24 hours. The value has been maintained with good control close to the -45C target.

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	Mar-22	Mar-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 (Apr-22 JCT3-TVAC; Maybe: May-22 JCT4; Jun-22 JCT4-DSE)	Sep-22	Sep-22		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

GCOM-W1 Products

February, 2022

Accomplishments / Events:

- Comparing and combining sea ice motion from VIIRS, AMSR2, and SAR: Recent ice motion in the Beaufort Sea derived from different satellite instruments was combined to generate an experimental "AMSR2+VIIRS+SAR" ice motion output during January 7-8, 2022 (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		
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		

Highlights:Initial results promising for multisensor sea-ice motion

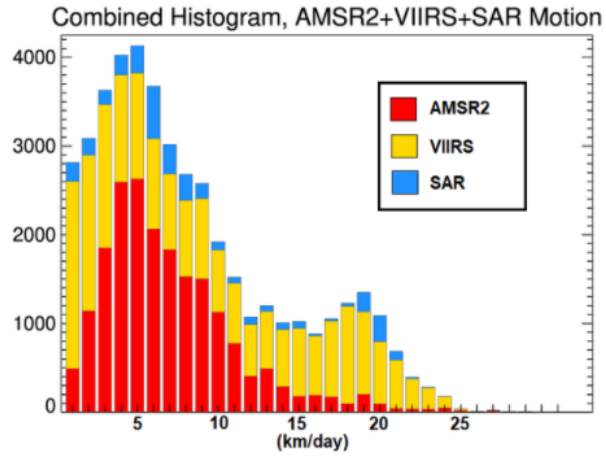


Figure 1. Stacked histogram plot showing AMSR2, VIIRS, and SAR ice motion speed distribution for January 7-8.

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

February, 2022

Accomplishments / Events:

- NPROVS and LTM processed normally during February.
- A. Reale briefed the NUCAPS All-Hands meeting (Feb 2) including results comparing NUCAPS soundings (v3) for MetOp-B,C and NOAA-20 satellites using a special 10-day (October 2021) dataset. **(HIGHLIGHT)**
- A. Reale briefed the STAR JPSS Leads meeting (Feb. 15) on "*GCOS Reference Upper Air Network (GRUAN) Impact on JPSS Cal/val Programs*".
- NPROVS staff demonstrated capability to ingest NWS High Resolution Rapid Refresh (HRRR) regional forecast data into the radiosonde, satellite and nwp collocation processing subsystem
- The LTM team has converted all EDR products to the JSTAR Mapper System ahead of the scheduled termination of the LTM site at the end of March

Overall Status:

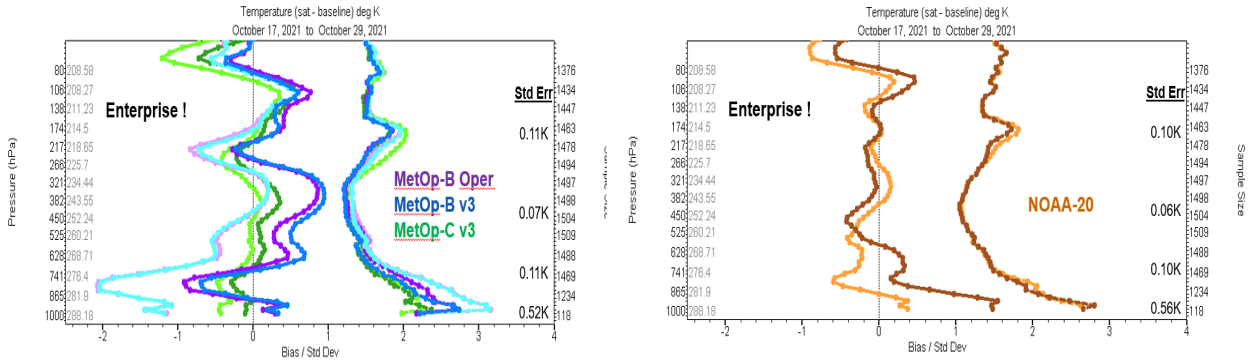
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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		
Maintain /expand NPROVS and support NUCAPS / MiRS EDR assessments for NPP, NOAA-20, JPSS-2 and MetOp-A,B,C; GNSS NESDIS-COSMIC-2	Aug-22	Aug-22		
Manage JPSS dedicated Radiosonde program (DOE-ARM), EDR/Raob collocations (Special), expand to store SDR (GSICS / GRUAN; 75TB)	Aug-22	Aug-22		
Support JPSS AWIPS (NUCAPS) and Hydrological (MiRS) Iniatives and Case Studies	Aug-22	Aug-22		

Highlight: NUCAPS Version-3 Results for MetOp-B and C



A Special 10-day "Test" dataset (October-2021) of NUCAPS version-3 (v3) EDR sounding products for **MetOp-B** and **MetOp-C** was integrated into NPROVS and compared against the operational **MetOp-B** and **NOAA-20** products. Vertical statistics of Mean (solid) and Standard Deviation (dash) differences (Sat-Raob) based on collocations with conventional radiosondes within 6-hours (and 100km) are shown above for MetOp satellites (left) and NOAA-20 (right). The collocation samples for assessing all the products are identical, referred to as *enterprise assessment,* lending high confidence to results; the lighter shades for each satellite correspond to the first guess profiles. **Results show increased "Bias" (approaching 1K) below 200 hPa (12km) for v3 MetOp-C vs v3 MetOp-B, with (surprisingly) little difference between operational MetOp-B and v3 MetOp-B. Bias differences for v3 NOAA-20 and MetOp-C begin to diverge below 500 hPa (6km) approaching 2K in near the surface.** Furthermore, the first guess (lighter shades) bias for the operational MetOp-B and v3 MetOp-B show appear "out of character" compared to v3 MetOp-C and NOAA-20. Approximate standard errors for bias, computed as the standard deviation divided by the square-root of sample size, are listed along the right side axis of each panel varying from 0.5K near the surface to 0.1K aloft, lending statistical confidence to bias curves. Coordination is underway with the NUCAPS to better understand these differences.