NOAA JPSS Monthly Program Office

AMP/STAR FY24 TTA

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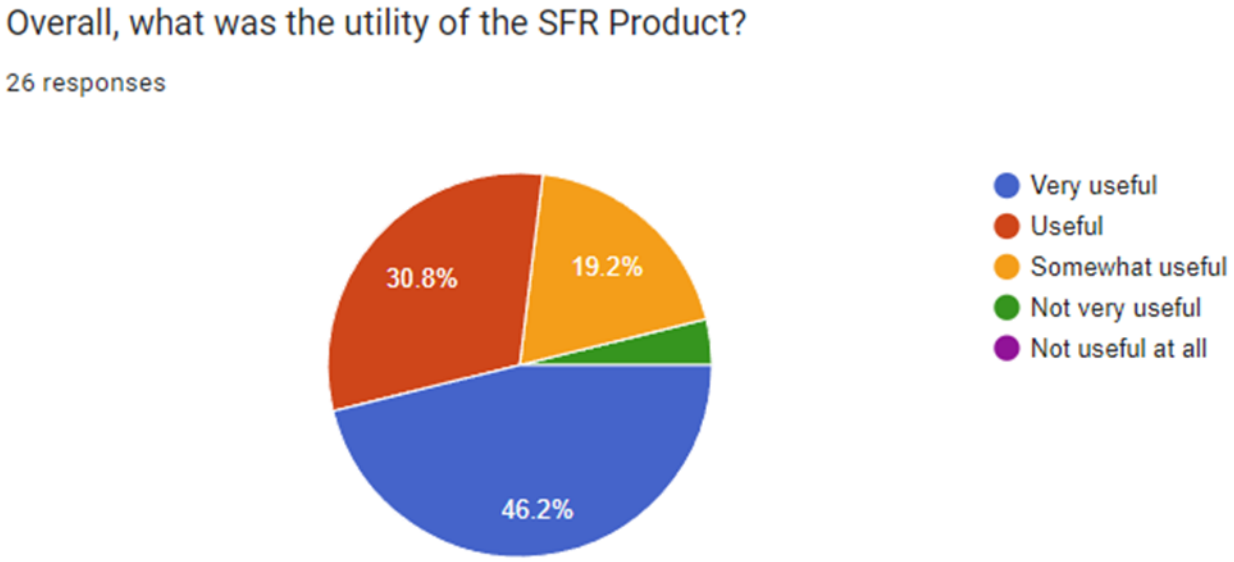
August, 2024

Highlights from the Science Teams (June/July 2024)

Alaska Snowfall Project Completion

The STAR Snowfall Rate (SFR) team has successfully completed the "Development and Assessment of Alaska Regional Snowfall Rate Product" project. This is a three-year project supported by the JPSS PGRR Program. Some of the major accomplishments are: i) developed SFR over ocean algorithms (the operational SFR is land-only), ii) extended SFR retrieval to extremely cold conditions using ML so the algorithm is applicable even in Polar Regions, iii) built an SFR retrieval system for the Alaska region including the surrounding oceans, and installed the AK-SFR system on a virtual machine at Geographic Information Network of Alaska (GINA) at University of Alaska Fairbanks; this system produces the SFR product from the Direct Broadcast (DB) data received locally at GINA which disseminates the product to NWS Alaska Weather Forecast Offices in near real-time, and iv) supported SFR assessment at NWS Alaska in operational environment. Forecasters submitted 26 Google Form responses with 77% of them ranked SFR as Useful or Very Useful (figure below). User feedback is especially valuable in helping developers understand user needs and plan for future development.



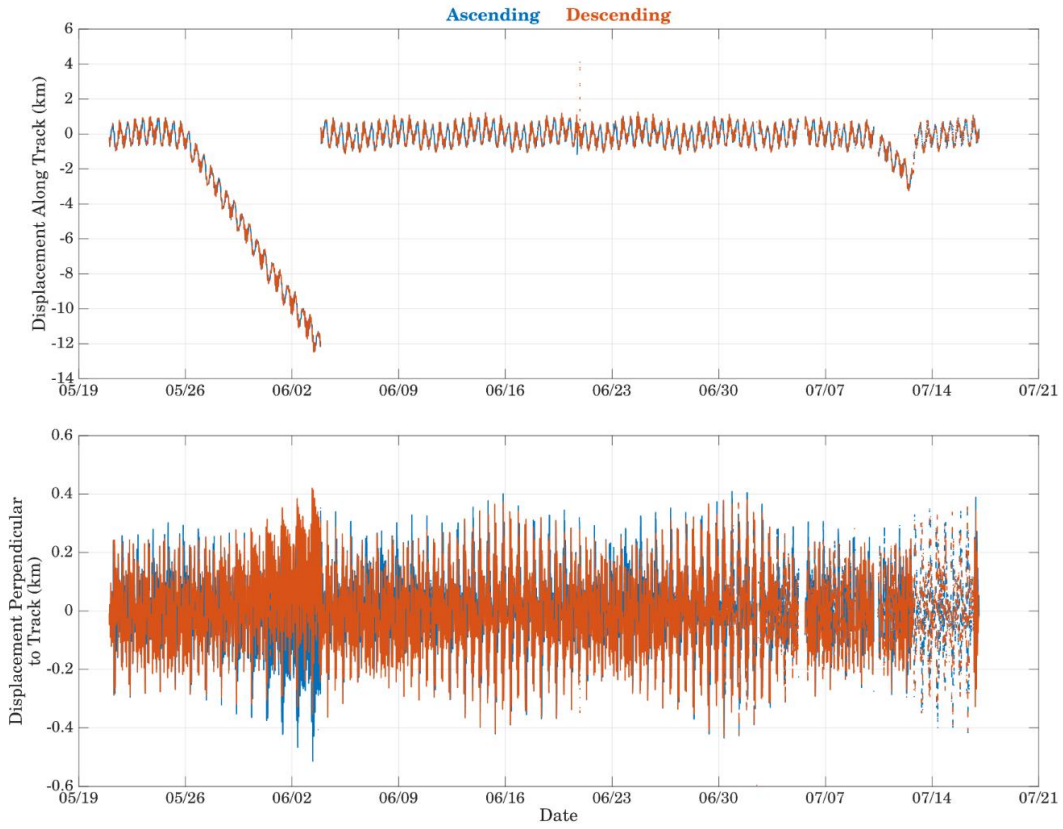
Highlights from the Science Teams (June/July 2024)

Figure. Example of nearly completed web-tool to classify VIIRS scenes as containing or not containing volcanic ash. The web-tool and associated database will allow for rapid and efficient classification of many scenes needed to train the AI/ML model.

VOLCAT VIIRS volcanic ash plume identification and extraction work is an enhancement to the VOLCAT methodology. The most recent research focus has been developing a web-page based tool to manually classify VOLCAT volcanic cloud objects by a science team expert (as yes (containing volcanic ash) or no (not containing volcanic ash)). This will enable a full training database to be generated for ash and non-ash clouds for training the AI/ML methodology, including both detected and missed volcanic clouds by the current VOLCAT algorithm. The included figure shows an example of the nearly finalized web-tool that will allow the VOLCAT science team to quickly classify VIIRS scenes and store the information in a database to be used to train the AI/ML methodology.

Highlights from the Science Teams (June/July 2024)

VIIRS satellite recovering monitoring



The STAR VIIRS SDR team supported recovery from several JPSS satellite anomalies: S-NPP GPS on May 26-June 3 and July 9-16, NOAA-21 GPS on 7/20/20n July 20-24, and S-NPP CDP reset with the sun-pointing safe mode on July 24.

Figure. Predictions of the Suomi NPP VIIRS along-track geolocation errors during the recent GPS anomalies: good agreement with observed errors during the anomaly in June 2024, but not during the one in July 2024, indicating another source of the navigation errors (resolved by 7/16/2024)

Highlights from the Science Teams (June/July 2024)

NOAA-21 ATMS Geolocation Error Tracking

Evaluated the ATMS geolocation accuracy impact due to the NOAA-21 GPS issue. It was found that the geolocation of the NOAA-21 spacecraft entered a degraded state causing the data to be inaccurate and out of mission specifications on July 20, 2024. Operations was able to recover the NOAA-21 spacecraft to a valid Geolocation state later on July 20, 2024. Based on the ATMS independent geolocation accuracy evaluation results, NOAA-21 ATMS in-track geolocation has shown up to 1 km error due to this event compared to previous days, as shown in the figure.

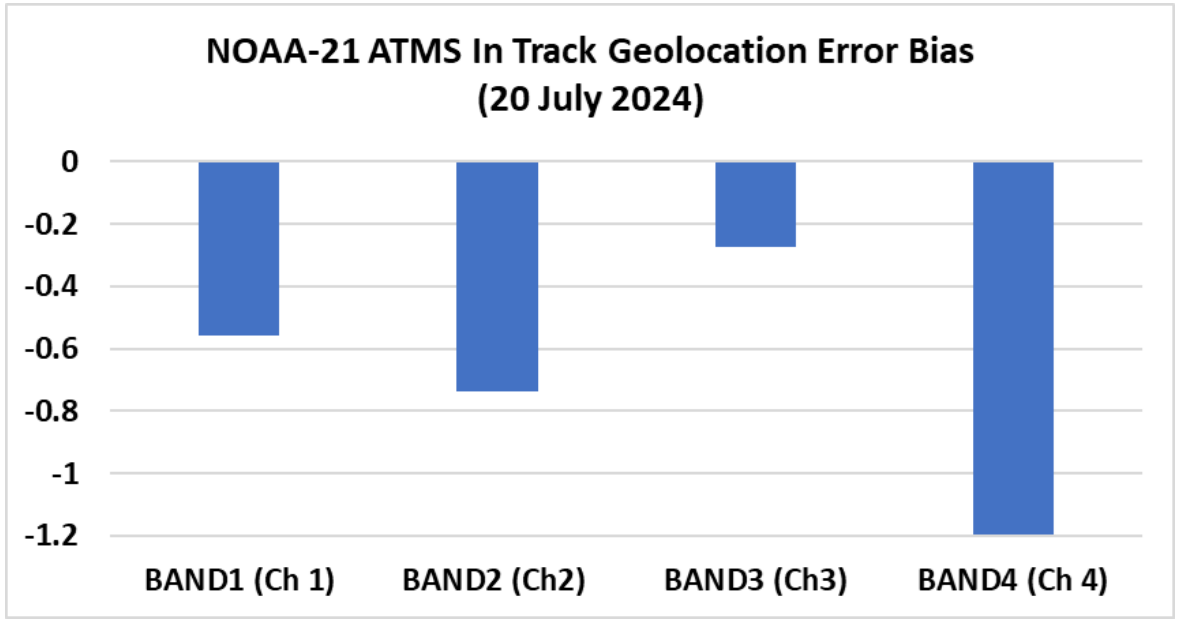


Figure 1. NOAA-21 ATMS in-track geolocation error bias relative to 18-19 JUL 2024

Highlights from the Science Teams (June/July 2024)

S-NPP ATMS Scan Drive Anomaly Impact Monitoring

S-NPP ATMS scan drive motor current events were observed around June 2 and 16. Both main motor and compensator motor currents showed large variations. Due to the increase of scan drive motor current, other instrument temperatures of S-NPP ATMS also increased significantly. As a result, calibration parameters also demonstrated a large variation, such as the calibration gain. Several instrument health status quality flags in SDR data were triggered as the consequence of the scan drive motor currents, which indicates that those health status index has been out of their engineering yellow limits. A significant impact was also observed from the daily global mean TDR. A systematic lower global mean values are found on both days, indicating the scan drive motor current impact on science data quality. This is the first time that the scan drive motor current anomaly caused the science data quality degradation. The ICVS and ATMS SDR team will continue to monitor the S-NPP ATMS instrument health status and science data quality.

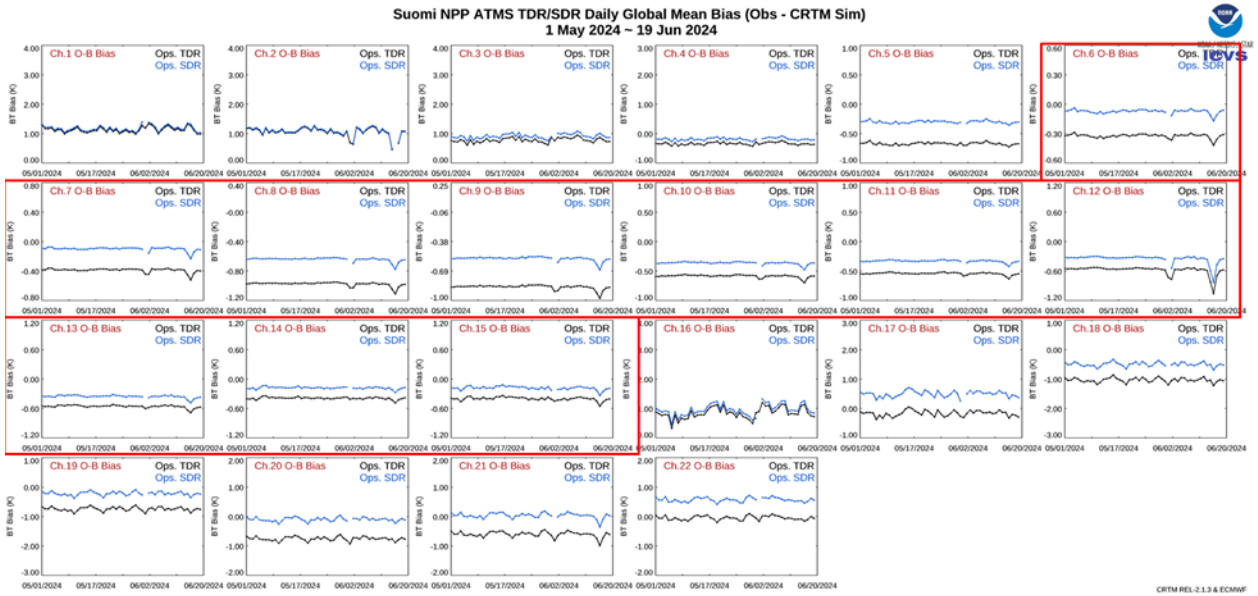


Figure. S-NPP ATMS 22-channel daily global mean TDR/SDR vs. CRTM simulation from May 1 to June 20, 2024

Accomplishments (1 of 2)

Delivery Date	Delivery Algorithm Packages (DAPs) – Enterprise Products:	Recipient
6/4/2024	Veg Health v1-1 Patch CCAP to NCCF for integration. Update was to version/revision numbers of the file names from v2r01 to v2r02.	NCCF
06/14/24	Final delivery of the GAASP SeaIce v1-0 CCAP to NCCF for integration.	NCCF
6/20/24	Preliminary delivery of the OMPS LP CCAP for OSPO code review.	NCCF
6/21/24	Final delivery of the ADT v2-0 (Advanced Dvorak Technique) CCAP. This version has the AiDT upgrade.	NCCF
6/27/24	Delivery of the v2-1 patch CCAP for JPSS LST. This patch removes Fractional Snow Cover as an input for LST for nighttime granules.	NCCF
6/28/24	Delivery of the v3-2 EN-Fire patch to CSPP. The VIIRS portion of this package replaces the "Active Fires (AF) I-band" algorithm. The SEVIRI processing capability is not operational at the NCCF as far as I know, and may not be of interest to the CSPP.	NCCF
6/28/24	Patch delivery of the LAI v1-1 CCAP to NCCF for integration. This patch adds additional product monitoring variables and otherwise remains unchanged.	NCCF
6/29/24	Delivery of the ACSPO-JPSSSST v2-2 and MetopSST v2-1 CCAP to CSPP.	NCCF
7/5/24	Patch delivery of the eTRaP v3-2 CCAP to NCCF for integration. This patch includes further changes to the production rules and several small bug fixes.	NCCF
7/12/24	Patch delivery for the Blended Hydro CCAP to NCCF for integration. This patch contains a minor fix that was causing NPP input to not be processed in the b_tpw_stats and the b_rr_stats units. A test case for this unit is included, the others have not changed.	NCCF

Accomplishments (2 of 2)

Delivery Date	Delivery Algorithm Packages (DAPs) – Enterprise Products:	Recipient
7/12/24	Delivery of the v1-3 patch CCAP for JPSS LSA. This patch fixes the fill values for several variables in the Level 2 LSA product.	NCCF
7/18/24	EN-Cloud DCOMP Preliminary CCAP delivery for software code review by OSPO.	NCCF
7/19/24	This delivery represents the final delivery of the RAVE v2-2 CCAP to NCCF for integration. This version of RAVE updates the table of coefficients. This is a minor update to avoid artifacts that have a big impact on emissions results.	NCCF
7/25/24	This is a Patch CCAP Delivery of ADT to NCCF that disables AiDT when the storm is located over land.	NCCF
8/2/24	This delivery is the second preliminary delivery of the Blended Flood Mapping CCAP (also known as Enterprise Flood Mapping, CCAP version 3.0).	NCCF
8/2/24	Patch Delivery for Ocean Color v1-3 to NCCF is now available on the S3 bucket. This patch includes an update to the output filenames for the Daily and Weekly Assembly units.	NCCF
8/6/24	Patch delivery of the VegHealth v1-2 CCAP to NCCF for integration. This patch fixes a log being overwritten. The DATA tarball is not being redelivered as no changes occurred.	NCCF
8/6/24	This delivery is a full CCAP intended to become a part of the Community Satellite Processing Package (CSPP). This delivery is supposed to be functionally identical to the delivery of ACSPO SST L3S supplied to NCCF on April 17, 2024.	NCCF

Accomplishments – JPSS Cal Val Support

NOAA-20/21/S-NPP Operational Calibration Support:

S-NPP	Weekly OMPS TC/NP Dark Table Updates	10/3/23, 10/11/23, 10/17/23, 10/24/23, 10/31/23, 11/7/23, 11/14/23, 11/21/23, 11/28/23, 12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24,02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, **06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24**
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	10/3/23, 10/11/23, 10/17/23, 10/24/23, 10/31/23, 11/7/23, 11/14/23, 11/21/23, 11/28/23**,** 12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, **06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24**
NOAA-21	Weekly OMPS TC/NP Dark Table Updates	10/3/23, 10/11/23, 10/17/23, 10/24/23, 10/31/23, 11/7/23,11/14/23, 11/21/23, 11/28/23, 12/5/23, 12/12/23, 12/19/23**,** 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, **06/11/24, 06/18/24, 06/25/24,, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24**
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	9/12/23, 9/26/23, 10/11/23, 10/24/23, 11/21/23, 12/05/23, 12/19/23, 01/03/24, 01/17/24, 01/30/24, 02/13/24, 02/27/24**,** 03/12/24, 03/26/24**,** 04/08/24, 04/23/24,, 05/07/24, 05/21/24, 06/04/24, **06/18/24, 07/02/24, 07/16/24, 07/30/24**
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	10/3/23, 10/17/23, 10/31/23, 11/14/23, 11/28/23, 12/12/23, 01/03/24, 01/10/24, 01/23/24, 02/06/24, 02/21/24**,** 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24,05/14/24, 05/28/24**, 06/11/24, 06/25/24, 07/09/24, 07/23/24, 08/06/24**
NOAA-21	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	10/3/23, 10/17/23, 10/31/23, 11/14/23, 11/28/23, 12/12/23, 01/04/24, 01/10/24, 01/23/24, 02/06/24, 02/21/24**,** 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24,05/14/24, 05/28/24**, 06/11/24, 06/25/24, 07/09/24, 07/23/24, 08/06/24**
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	10/23/23, 11/21/23**,** 12/18/23, 01/22/24**,** 02/15/24, 03/18/24, 4/15/24, 5/13/24**, 6/11/24, 7/16/24**
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	10/23/23, 11/21/23**,** 12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24, **6/11/24, 7/16/24**
NOAA-21	Monthly VIIRS LUT Update of DNB Offsets and Gains	10/23/23, 11/21/23**,** 12/18/23**,** 01/22/24**,** 02/15/24, 03/18/24, 4/15/24, 5/13/24**, 6/11/24, 7/16/24**
NOAA-21	Monthly VIIRS DNB Straylight correction update	10/23/23, 11/21/23, 12/18/23, 01/22/24**,** 02/15/24, 03/18/24, 4/15/24**,** 5/14/24**, 6/11/24, 7/16/24**

NOAA-21 Cal/Val Maturity Reviews

June 2024 Maturity Reviews			
Product	Maturity Review	Review Date	Review Panel Recommendations
VIIRS Annual Surface Type	Beta/Provisional	06/13/24	Beta and Provisional approved with an effective date 11/30/2023. Validated after final AST2023 delivery on 9/30/2024

Remaining Maturity Reviews			
Product	Maturity Review	Review Date	Review Panel Recommendations
OMPS TC Ozone EDR (V8TOz)	Validated	9/19/24	
OMPS NP Ozone EDR (V8Pro)	Validated	TBD - awaiting data from latest OMPS SDR LUTs to generate coefficients for V8Pro	
OMPS LP (SDR & EDR)	Validated	9/19/24	

JSTAR Code/LUT/Product Deliveries

Date	Remaining J2-Ready DAPs to NCCF
March, 2023 (Delayed to January 2024)	Ancillary data preprocessing • ASSISTT delivered LP preliminary pre-processor CCAP for SCR (Delivered to OSPO) on 9/29. • NDE Migration & J2 Provisional final CCAP for Ancillary Data Preprocessor (miniDAP) is scheduled for February 20, 2024. However, pushed to May 16, 2024 to align with RDR to L2 final CCAP. As of June 2024 pIPT meeting notes, the ASSISTT team intends to combine science algorithm and ancillary data processor deliveries, and include GFS to binary processing into the final CCAP (initially set for August 1, 2024, but now pushed to September 27,2024). • Science Team Deliveries ○ Science team V2.7LIMB for SNPP was delivered to ASSISTT on December 19, 2023 ○ Science team delivered for NOAA-21 (2.7LIMB N21 delivery to ASSISTT) March 18, 2024. • ASSISTT Deliveries ○ NDE Migration & J2 Provisional RDR to L2 CCAP Preliminary CCAP delivered on June 20, 2024 (software code review) ○ Final CCAP target date pushed to September 27, 2024.

FY24 STAR JPSS TTA Milestones

Algorithm Updates DAPs/CCAPs	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
OMPS-NP (J2 LUT Delivery)	Jan-24	Jan-24	Delivered on January 4, 2024.	
ACSPO SST_v2 release version + patch to CCAP for MetOP	Jan-24	Jan-24	Delivered on January 16, 2024	
GBBEPx (Enterprise Fires I-Band update)	Jan-24	Jan-24	Delivered on January 19, 2024	
RAVE (Science bug fix)	Jan-24	Jan-24	Delivered on January 29, 2024	
Vegetation Health	Jan-24	Jan-24	Delivered on January 30, 2024	
GCOM RDR to ASD Converter (GRAC) - includes JAXA executable (AMSR-3)	Feb-24	Feb-24	Delivered February 02, 2024	
LST EDR J2 Provisional (updates to LSE)	Dec-23	Feb-24	Delivered on February 12, 2024.	
Ozone Mapping and Profiler Suite (OMPS) - V8TOs	Mar-24	Feb-24	Delivered on February 13, 2024.	
Multi-platform Tropical Cyclone Surface Winds Algorithm (MTCSWA)	Feb-24	Feb-24	Delivered on February 16, 2024.	
Land Surface Albedo	Mar-24	Mar-24	Delivered on March 6, 2024.	
Hyperspectral Enterprise Algorithm Package (HEAP) updated to NOAA-21	Mar-24	Mar-24	Delivered on March 11, 2024.	
LAI Initial Delivery	Feb-24	Apr-24	Delivered on March 28, 2024	
VOLCAT (Phase 1) NCCF implementation	Dec-23	May-24	SCR: August 17, 2023 Target CCAP Final:Sep 12, 2024	
Cloud Mask J2 Validated; Separate unit for Ancillary files to be included	Jan-24	Aug-24	Moved to **September 20,** 2024	

FY24 STAR JPSS Milestones

Milestones (Algorithm Cal/Val and LTM)	Original Date	Forecast Date	Actual Date of Completion	Variance Explanation
JPSS-3/JPSS-4 Data System Event	Jan-24	Jan-24 (early 2024)	JPSS-3 JCT1 Dry Run (11/2/2023); JCT1 Event (01/01/2024)	Science teams are not expected to process or perform analysis on this JPSS-3/JPSS-4 test data made from JPSS-2 (Mary Hunter)
FY24 Program Management Review (all teams)	Jun-24	Jun-24	**On-going**	PMRs completed for SDR teams and EDR PMRs are ongoing
GOSAT-GW End to End	Aug-24	Aug-24		
AST-2023 (VIIRS Annual Surface Type)	Sep-24	Sep-24		Maturity Review held on June 13, 2024**.** Beta and Provisional approved. Effective date 11/30/2023. Validated after final AST2023 delivery on 9/30/2024
Reprocessing and transfer of EDRs to CLASS	Sep-24	Sep-24		JSTAR Team is coordinating with the EDR teams
JPSS-3 pre-launch test data review/analyze (SDR teams); JPSS-3/JPSS-4 activities/reviews support	Sep-24	Sep-24	On-schedule and on-going following JPSS-3 and JCT schedules	
Maintain / Update ICVS (develop ICVS modules to support various activities: monitoring, inter-sensor comparison, …)	Sep-24	Sep-24	On-schedule and additional improvements are on-going	ICVS has implemented modules for NRT monitoring of NOAA-21 ATMS. OMPS-NM, OMPS-NP, CrIS, and VIIRS. ICVS demonstrated basic functions for LP using SNPP data as a proxy and is waiting to receive NOAA-21 LP data.
Maintain / Expand (to include JPSS-2 products) JSTAR Mapper	Sep-24	Sep-24	On-schedule and on-going; will be completed based on NOAA-21 EDR Products Provisional Maturity (March-24)	Currently NOAA-21 AF (EFIRE), MiRS, VIIRS I5 and True Color images are in JSTAR Mapper. Some of the NOAA-21 EDRs are unavailable in the SCDR, and once available after Provisional Maturity, JSTAR Mapper will assimilate them
Images of the Month	Monthly	Monthly	On-schedule and on-going	

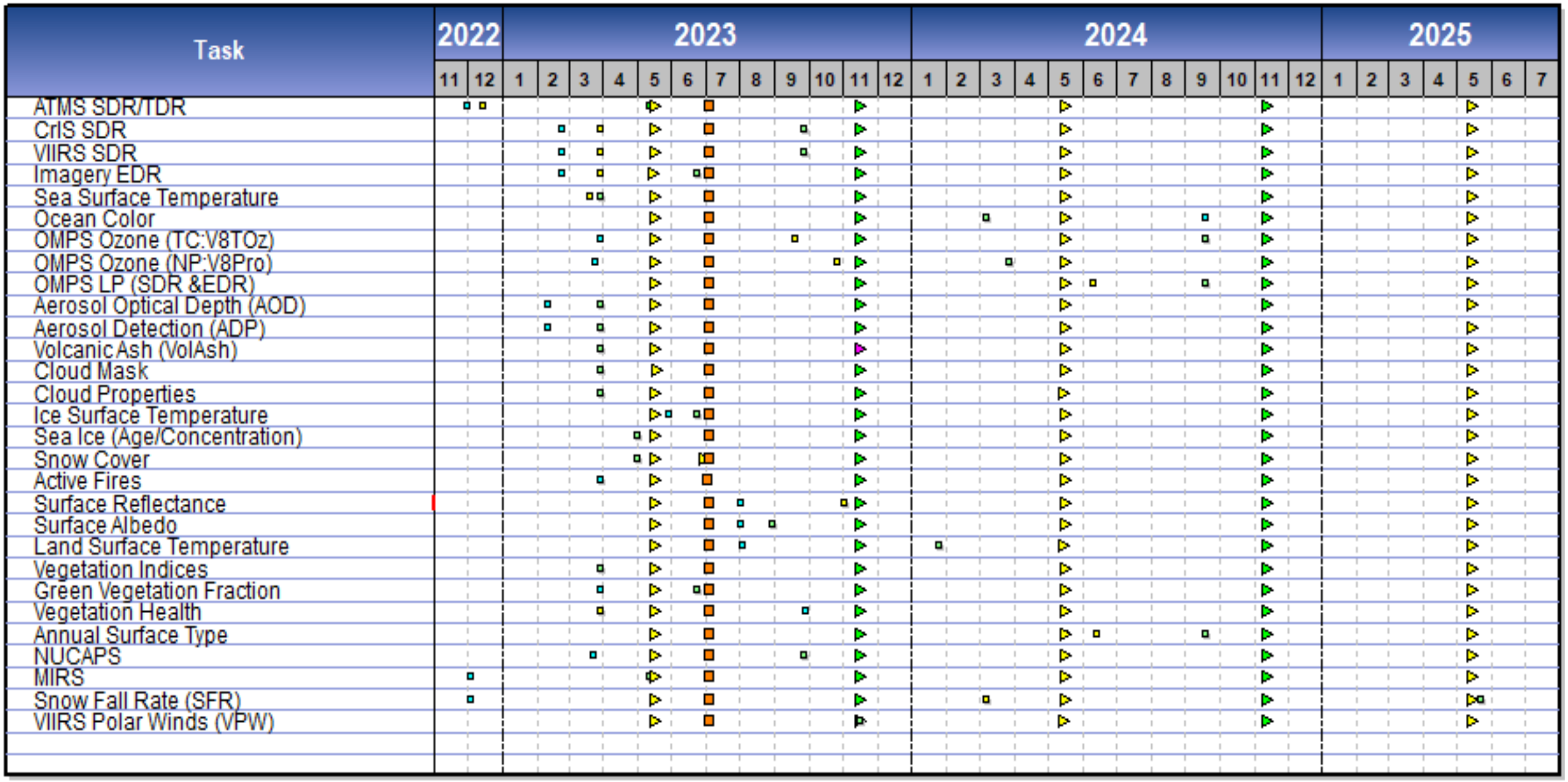
FY24 STAR JPSS Cal/Val Maturity Reviews

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
OMPS SDR (NP & TC Validated)	**Mar-24**	**Mar-24**	**Attained Validated status – effective date depends on ADR10825 Solar Flux implementation planned for April 2024**	
Clouds (V: Mar-24)	**Mar-24**	**Mar-24**	Provisional Review held (except for DCOMP and NCOMP): October 26, 2023; Attained Provisional effective March 30. **DCOMP and NCOMP Provisional Review occurred virtually on December 4, 2023,** and attained **Validated status** effective March 30.	
Aerosol AOD (V: Jun-24)	**Jun-24**	**Jun-24**	Attained **Validated** status effective March 30, 2023	
Aerosol ADP (V: Jun-24)	**Jun-24**	**Jun-24**	Attained **Validated** status effective March 30, 2023	
Volcanic Ash (V: Mar-24)	**Aug-23**	**Aug-23**	Attained **Validated** status effective March 30, 2023	
Cryosphere (B: May-23; P: Aug-23 for Sea Ice & Binary Snow; V: Feb-24 (SI & Binary Snow); V (other) :Jul-24	**Jul-24**	**Jul-24**	Ice Thickness/Age: Attained **Validated** status effective May 1, 2023. Snow Cover & Fraction: Attained **Validated** status effective May 1, 2023. IST and Ice Concentration: Attained **Validated** status effective May 1, 2023.	
Active Fires (V: Jul-24)	**Jul-24**	**Jul-24**	Attained **Validated** status effective March 30,2023.	
LST/LSA/SR/GVF/VI (P: Jan-24; V: Jul-24 to Jan-25 FY25)	**Sep-24**	**Sep-24**	LST: Attained **Validated** status effective June 23, 2023. Surface Albedo: Attained **Validated** status effective August 30, 2023. Surface Reflectance: Attained **Validated** status effective Nov. 1, 2023. GVF, VI: Attained **Validated** status effective June 23, 2023.	
Vegetation Health (V: Apr-25 FY-25)	**FY-25**	**FY-25**	Attained **Validated** status effective March 30, 2023	
Ocean Color (B/P: Jan-24; V:Jul-25 FY25)	**Jan-24**	**Sep-23**	Attained **Validated** status effective March 1, 2024, to coincide with data availability from the NOAA CoastWatch program and MSL12 version 1.61 algorithm LUTs	
SST (V: Aug-24)	**Aug-24**	**Aug-24**	Attained **Validated** status effective March 20, 2023	
VPW (B/P: Jan-24; V: Mar-24)	**Mar-24**	**Mar-24**	**Attained Validated status effective November 16, 2023.**	
VFM (V: Jan-25)	**FY-25**	**FY-25**	Attained **Validated** status December 14, 2023.	
NUCAPS P: Jan-25; V: Mar-Jun-24)	**Jun-24**	**Jun-24**	Attained **Validated** status effective September 26, 2023.	
MiRS (V:Oct-24)	**Oct-24**	**Oct-24**	Attained **Validated** status effective May 12, 2023	
SFR (P: Feb-24; V: May-24)	**May-24**	**May-24**	Attained **Provisional status- effective** upon v2r0 algorithm currently planned for July 2024. Validated maturity is expected (in May 2025) after collecting more data in the spring. However, based on the material presented and considering the fact that the NOAA-21 SFR already meets the requirement, the JPSS Program is considering approving validated maturity.	
OMPS NP EDR V8Pro & V8TOz & V8TOS (V: Mar-24)	**Mar-24**	**Mar-24**	OMPS NP EDR V8Pro Attained Provisional Effective June 20, 2023. OMPS NP EDR V8Toz Attained Provisional September 19, 2023. **Validated review for V8TOz TC is planned for 9/19/2024. Validated review for OMPS NP V8Pro is planned for 9/19/24 awaiting majority of personnel from the Contract Bridge.**	

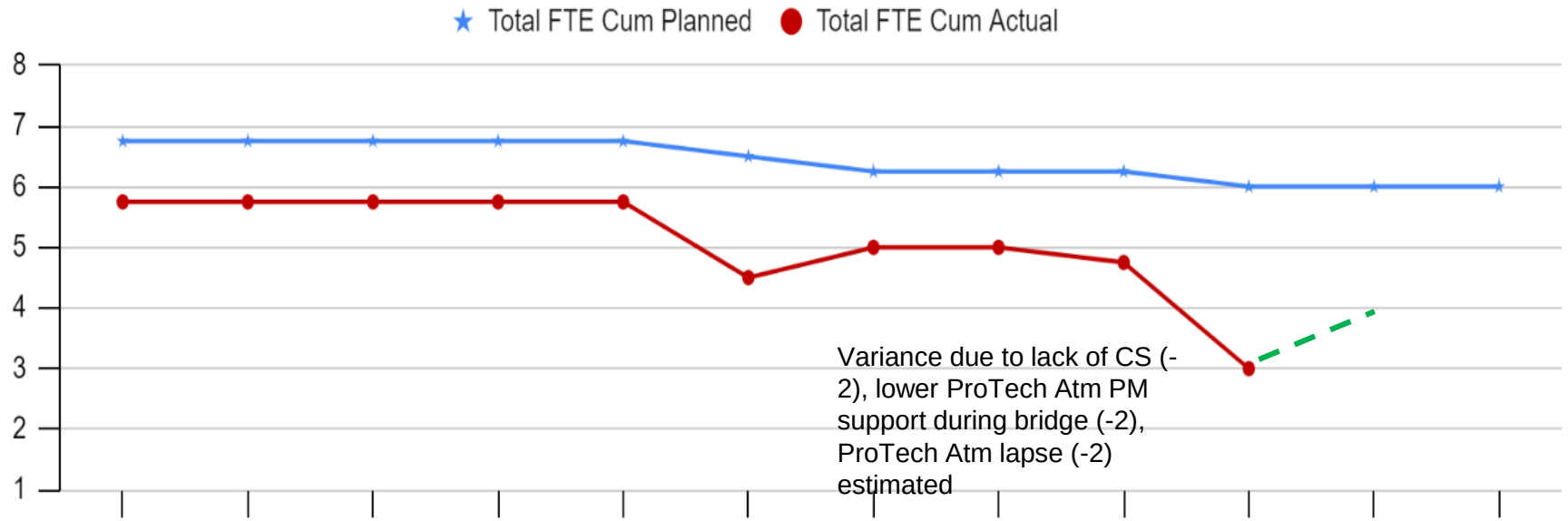
FY24 STAR JPSS Milestones

Operational/Program Support	Original Date	Forecast Date	Actual Completion Date
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, **06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24**
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	12/05/23, 12/19/23, 01/03/24, 01/17/24, 01/30/24, 02/13/24, 02/27/24, 03/12/24, 03/26/24, 04/08/24, 04/23/24, 05/07/24, 05/21/24, 06/04/24, **06/18/24, 07/02/24, 07/16/24, 07/30/24**
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24 **6/12/24, 7/12/24**
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, **06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24**
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	11/28/23, 12/12/23, 01/03/24, 01/10/24, 01/23/24, 02/06/24, 02/21/24, 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24, 05/14/24, 05/28/24, **06/11/24, 06/25/24, 07/09/24, 07/23/24, 08/06/24**
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains,	Monthly	Monthly	12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24 **6/12/24, 7/12/24**
NOAA-21: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/23/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, **06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24**
NOAA-21: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	11/28/23, 12/12/23, 01/04/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24, 05/14/24, 05/28/24, 05/28/24, **06/11/24, 06/25/24, 07/09/24, 07/23/24, 08/06/24**
NOAA-21: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24, **6/12/24, 7/12/24**
Mx builds deploy regression review/checkout (Mx9/MX10)			**Mx10: TTO Successfully Executed: May 23, 2024** MX11: STAR SOL Go/No-Go Report Due: August 23 MX11: STAR Reviews: for I&T Aug 30 ; OPS Sep 17 TTO: Sep 19, 2024

STAR JPSS Schedule: TTA Milestones



J-STAR FY24 Planned Program Management Staffing Plan v Actuals

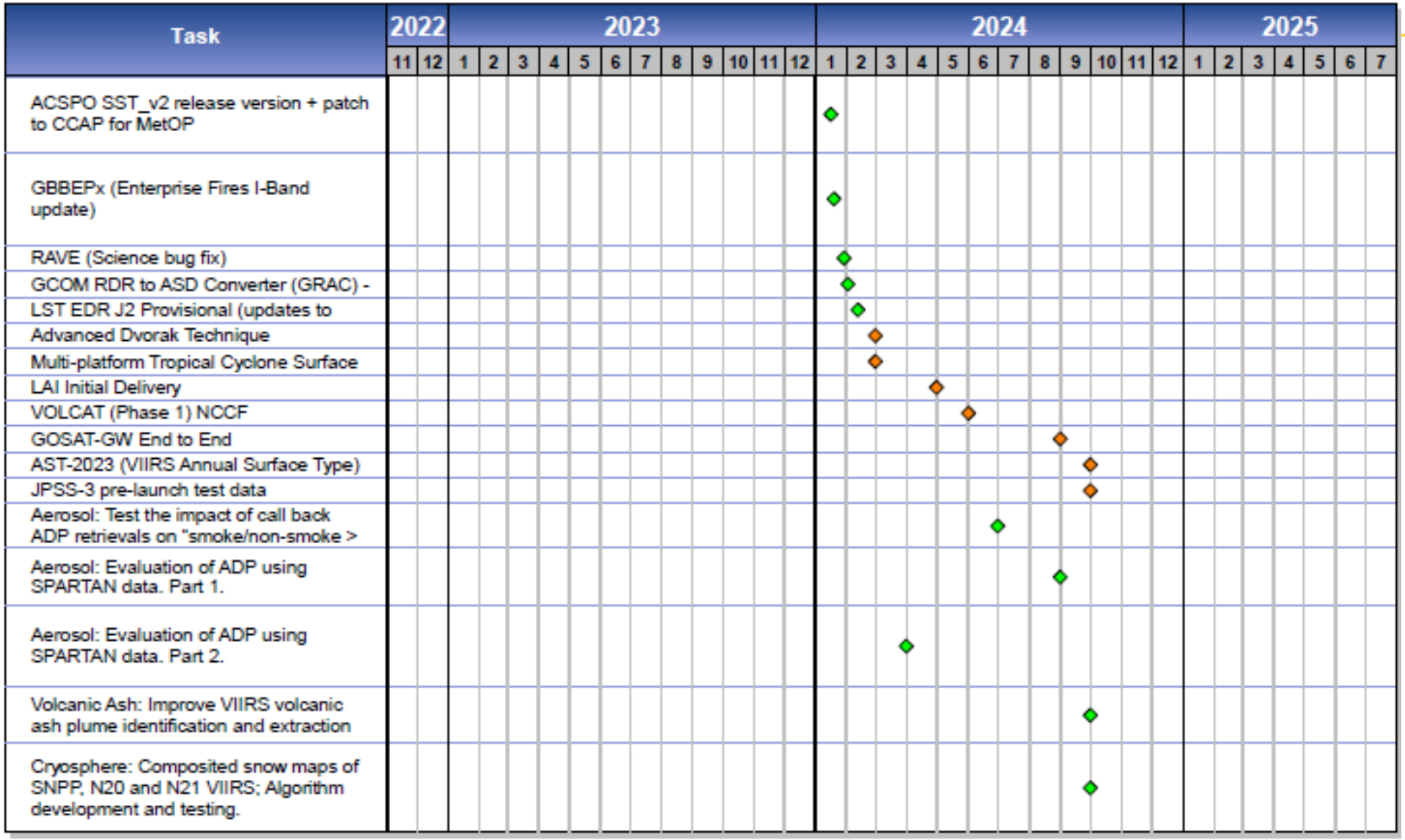


J-STAR FTEs	Oct'23	Nov '23	Dec '23	Jan '24	Feb '24	Mar'24	Apr'24	May'24	Jun'24	Jul '24	Aug '24	Sep '24
Cum Planned (CS)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Cum Actual (CS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cum Planned (WYE)	5.75	5.75	5.75	5.75	5.75	5.50	5.25	5.25	5.25	4.00	4.00	4.00
Cum Actual (WYE)	5.75	5.75	5.75	5.75	5.75	4.50	5.00	5.00	4.75	3.00		
Total FTE Cum Planned	6.75	6.75	6.75	6.75	6.75	6.50	6.25	6.25	6.25	6.00	6.00	6.00
Total FTE Cum Actual	5.75	5.75	5.75	5.75	5.75	4.50	5.00	5.00	4.75	3.00		

CS: Vacant (prev. Alisa Young)
WYE: Qingyuan Richard Zhang, Prasanjit Dash, Linden Wolf, *Murty Divakarla, Tom Atkins, Jeffrey Weinrich, Wei W. Li, Tess Valenzuela*

Backup/Additional milestones

STAR JPSS Schedule: TTA Milestones

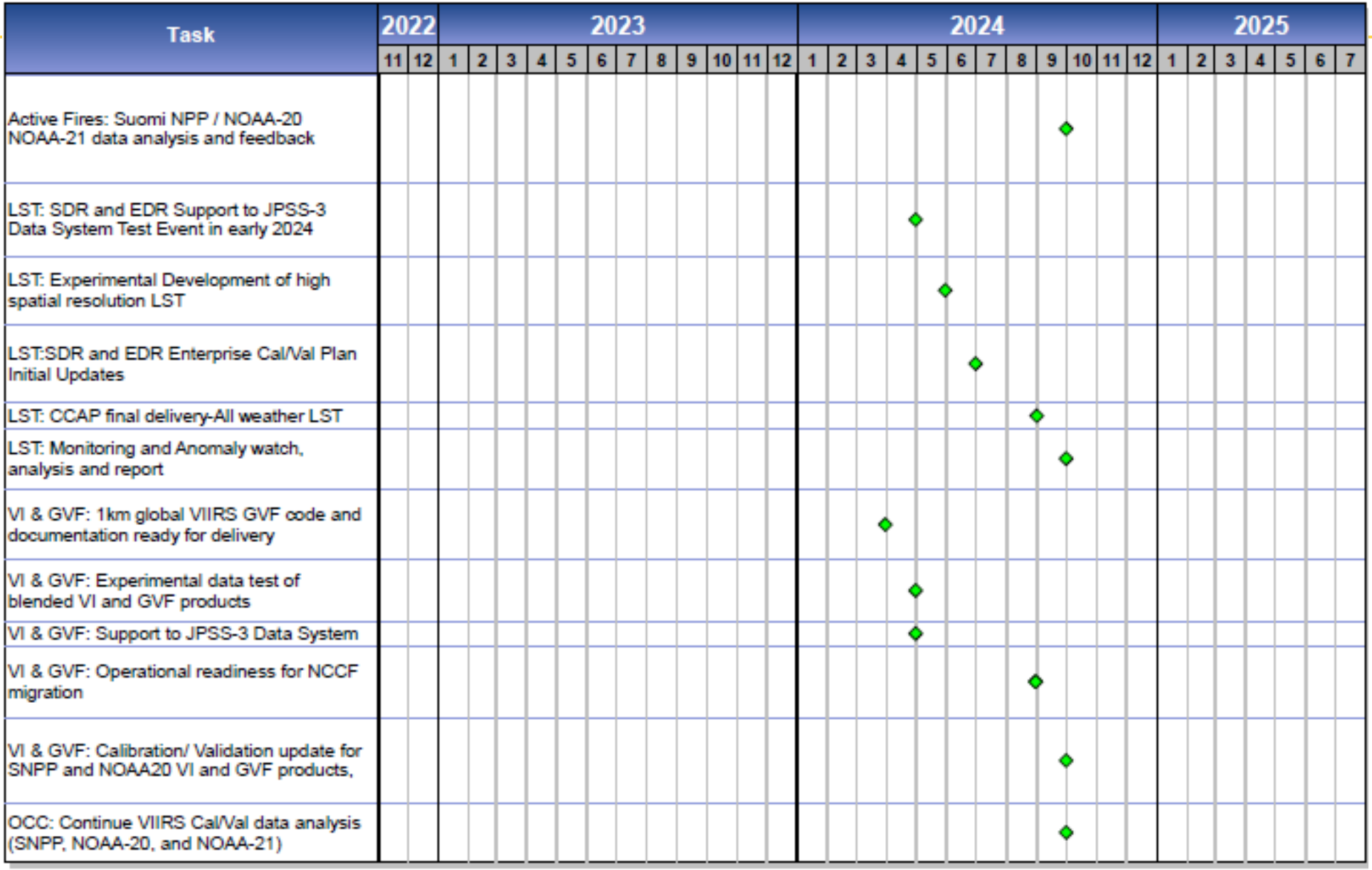


STAR JPSS Schedule: TTA Milestones

Task	2022		2023												2024												2025						
	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
Cryosphere: Blended VIIRS + microwave snow product: Add AMSR2 and GMI to the set of microwave sensors used																							◆										
Cryosphere: Physically-based snow and snow-free land BRDF models for snow fraction retrievals: Prepare for delivery																							◆										
Cryosphere: Supplemental cloud mask for daily VIIRS snow products: Compensate for cloud misses over snow by the NDE cloud																							◆										
Cryosphere: Ice concentration from Day-Night-Band																							◆										
Cryosphere: Put more ice products into RealEarth																							◆										
Cryosphere: Investigate the value added in including I-band product.																							◆										
Cryosphere: Make improvements to blended VIIRS + AMSR2 SIC product in Marginal Ice Zone.																							◆										
Active Fires: Baseline / eFire / NGFS cross verification and cal/val																							◆										
Active Fires: Reactive maintenance of Suomi NPP, NOAA-20 and NOAA-21 I-band NDE and NCCF products																							◆										

◆ Milestone Forecast ▶ Review(EOY) ◆ mDAP ▶ PMR ▶ ILUT ▶ fLUT ■ IPlan ■ fPlan ■ Beta ■ Prov ■ Val ◆ Milestone Complete

STAR JPSS Schedule: TTA Milestones

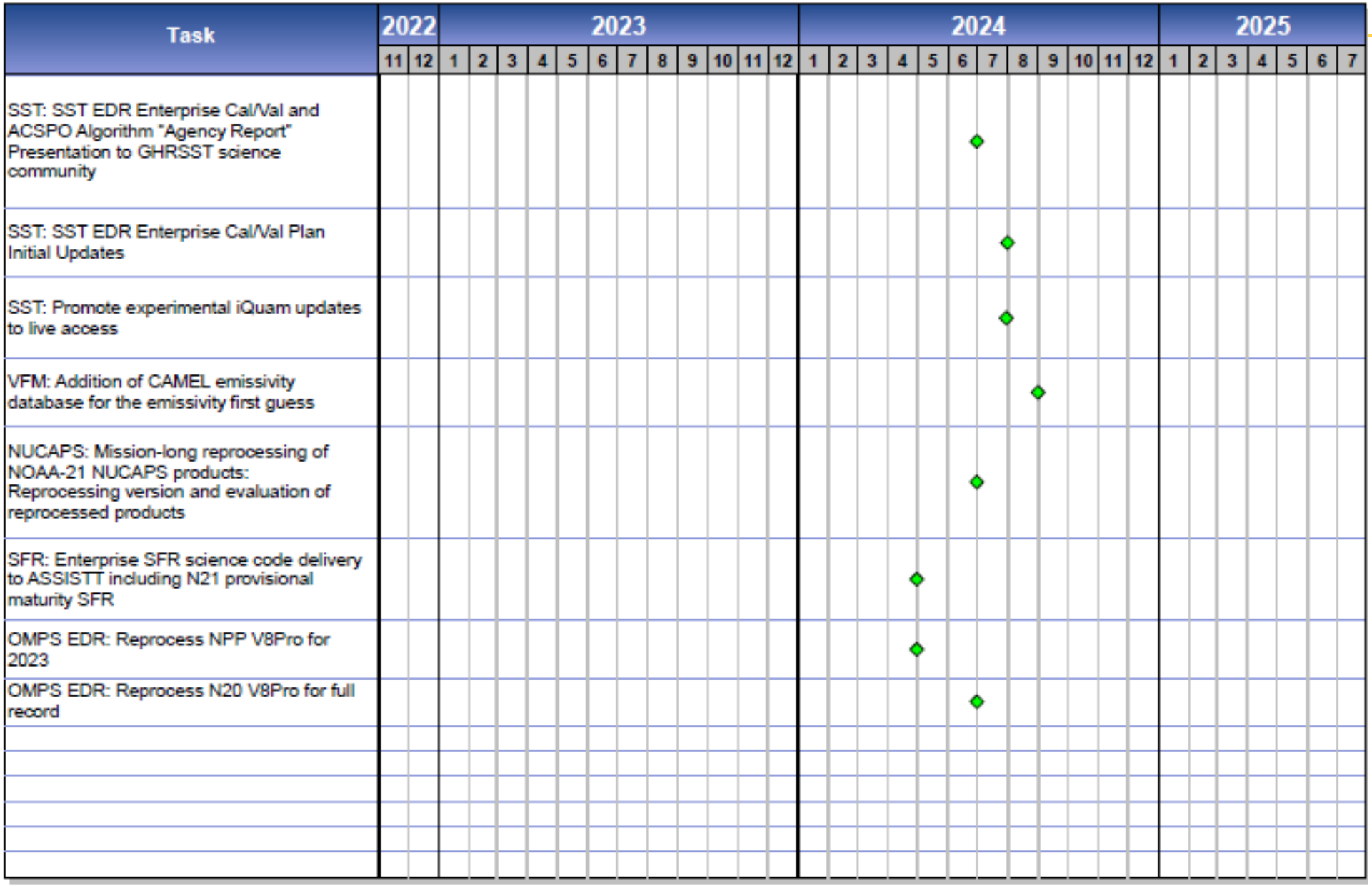


STAR JPSS Schedule: TTA Milestones

Task	2022		2023												2024												2025						
	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
OCC: Cal/Val team complete the 9th VIIRS ocean color dedicated cruise																						◆											
OCC: In situ data collections from OC Cal/Val team including NOAA dedicated cruise and other opportunities, particularly for NOAA-21 OC validation																							◆										
OCC: Improvement of the OCView tool for OC products monitoring																◆																	
OCC:Producing consistent VIIRS ocean color products																	◆																
OCC: Continue working on improvement of the ocean color data processing system (MSL12), particularly over global coastal and inland water regions																							◆										
OCC: Continue producing consistent VIIRS SNPP-NOAA-20 OC products and start to work on NOAA-21 OC data consistency with other two VIIRS sensors																								◆									
OCC: Updated DAP (MSL12) to CoastWatch, if needed																								◆									
SST: SST EDR Support to JPSS-3 Data System Test Event (Dependency on JPSS)																		◆															

◆ Milestone Forecast ▶ Review(EOY) ◆ mDAP ▶ PMR ▶ lLUT ▶ fLUT ■ lPlan ■ fPlan ■ Beta ■ Prov ■ Vail ◆ Milestone Complete

STAR JPSS Schedule: TTA Milestones



Backup/quad charts

Color code:

Green: **Completed Milestones**

Gray: **Ongoing FY24 Milestones**

Active Fires

July 2024

Accomplishments / Events:

- On July 18, Ivan Csiszar gave a Spanish-language lecture on Active Fire Detection and Characterization, including VIIRS capabilities and products, at the virtual session on fires of the AmeriGEO course “Multivariate Risk Analysis based on Earth Observations”
- On July 31, Ivan Csiszar participated in a discussion with representatives of Senegal’s Centre de Suivi Écologique (CEC; Ecological Monitoring Center) on NOAA’s VIIRS fire monitoring activities
- Ivan Csiszar worked on restoring the creation of tailored / reformatted VIIRS I-band data for external partners
    - production resumed on August 2

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Baseline / eFire / NGFS cross verification and cal/val	Sep-24	Sep-24		
eFire NOAA-21 validated maturity analysis	Jul-24	Jul-24		
ASSIST, NCCF and DB I&T support	Dec-23	Dec-23	Dec-23	
Reactive maintenance of Suomi NPP, NOAA-20 and NOAA-21 I-band NDE and NCCF products	Sep-24	Sep-24		
Suomi NPP / NOAA-20 NOAA-21 data analysis and feedback	Sep-24	Sep-24		

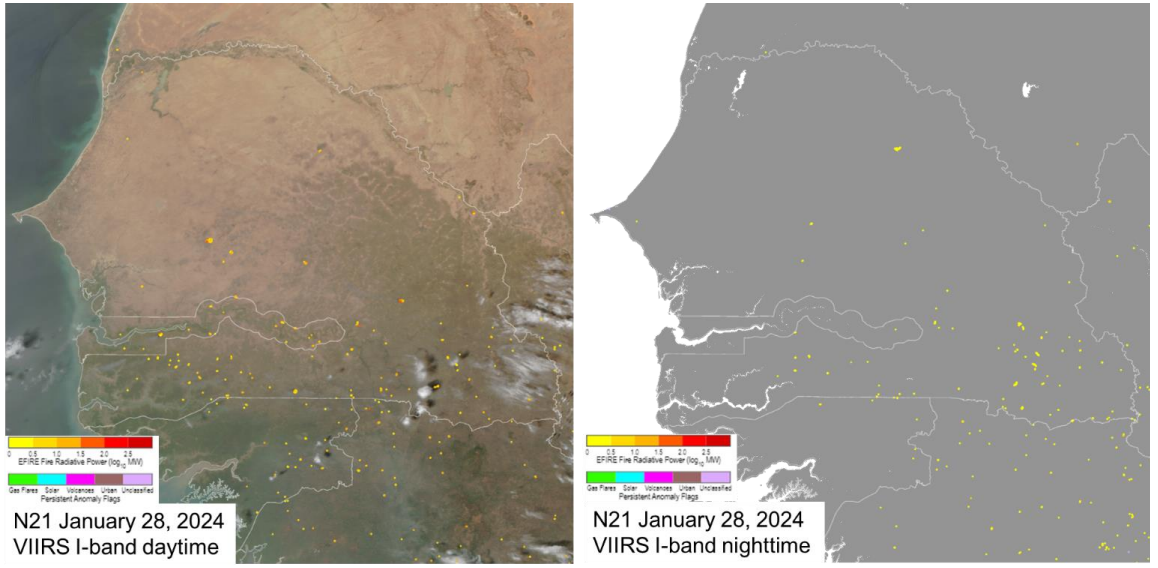
Overall Status:

	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:

Highlight: VIIRS fire detections in Senegal



An example of VIIRS fire data in Senegal, presented at the NOAA - CEC meeting on fire monitoring

Aerosol

February 2024

Accomplishments / Events:

- Work done by STAR aerosol team is featured in NESDIS Impacts Briefings in the article entitled “Pollution”. Team members Hai Zhang, Michael Cheeseman, and Pubu Ciren contributed to the work that is part of this article
- NOAA Greenhouse Gas (GHG) Team co-lead Kondragunta wrote the Impact Briefings article on GHGs. JPSS Program Scientist Kalluri and JSTAR manager Zhou and Jeff Privette (also NOAA GHG team co-lead) also contributed to the article on GHGs
- Team member Cheeseman has done a lot of analyses using reprocessed aerosol optical depth data to understand the Environmental Justice aspect of fine particle pollution. This work is informing that despite meeting the health standard, fine particle pollution disproportionately impacts racially and economically disadvantaged communities
- Team member Huff contributed to the writing of QuickGuide for VIIRS aerosol optical depth product. She also provided half-a-day training in Singapore on the use of JPSS fire and smoke products. JPSS Program Scientist Kalluri and AAC team lead Kondragunta also provided lectures on air quality products and their applications for Association of Southeast Nations (ASEAN).
- Team member Limbacher is developing a new aerosol optical depth algorithm that includes new aerosol models and numerical methods that is expected to speed up the enterprise algorithm and hopefully provide better retrievals as well.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Test the impact of call back ADP retrievals on “smoke/non-smoke > PM2.5” product	6/30/2024	6/30/2024		
Evaluation of ADP using SPARTAN data	8/31/2024	8/31/2024		
Evaluation of ADP using SPARTAN data	3/31/2024	3/31/2024		

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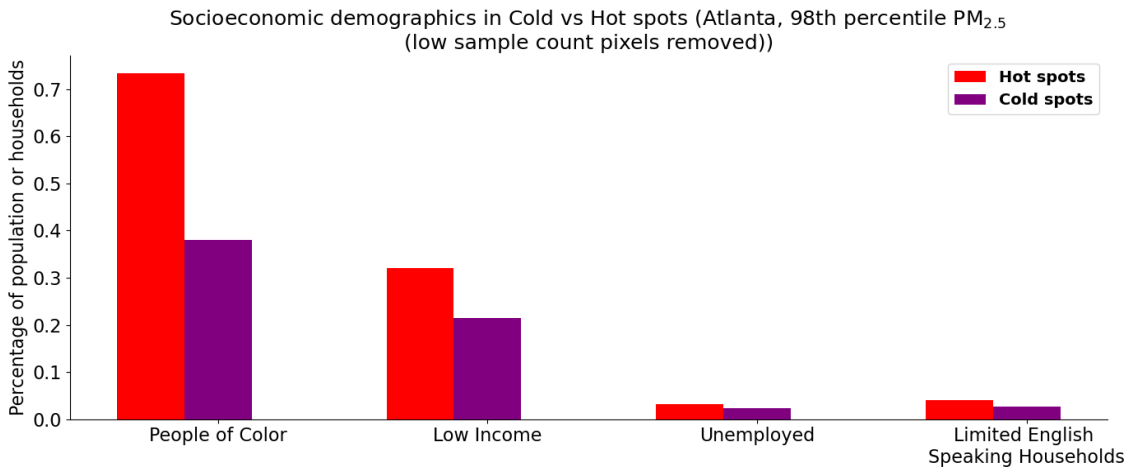
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

No risks. Issue: Developer of the ML-SFRA has left the team; date of milestone is TBD.

Highlight:



Statistics in the figure show analysis for Atlanta where hot spots and cold spots are those areas with high and low fine particle pollution respectively based on Moran’s I analysis

ATMS SDR

July 2024

Accomplishments / Events:

- Evaluated the ATMS geolocation accuracy impact due to the NOAA-21 GPS issue. It was found that the geolocation of the NOAA-21 spacecraft entered a degraded state causing the data to be inaccurate and out of mission specifications on July 20, 2024. Operations was able to recover the NOAA-21 spacecraft to a valid Geolocation state later on July 20, 2024. Based on the ATMS independent geolocation accuracy evaluation results, NOAA-21 ATMS in-track geolocation has shown up to 1 km error due to this event compared to previous days, as shown in Figure 1.
- Provide near real time ATMS instrument performance and science data quality evaluation support on the OSPO S-NPP ATMS safe mode recovery activities from July 24, 2024. Several daily status reports were shared with OSPO, JPSS and NASA teams to provide the latest data quality status. ATMS SDR team also gave the operational data resume time recommendations based on the calibration quality evaluation results.
- Attend IEEE IGARSS conference and present oral presentations titled “THE OPERATIONAL STATUS AND LONG-TERM ASSESSMENT OF THE NOAA-21 ATMS SENSOR DATA RECORD” and “IMPROVING THE CHARACTERIZATION OF ATMS ON-ORBT OBSERVATION BIAS USING MEASURED SPECTRAL RESPONSE FUNCTION IN RADIATIVE TRANSFER MODEL”
- The S-NPP ATMS End-of-Life (EOL) Test List contains contributions from NOAA, NASA and the ATMS vendor Northrop Grumman (NG). This is a contribution from the ATMS Cal/Val Science Team to support decision making of SNPP EOL activities. The recommended activities are expected to enhance the quality of current and future operational products derived from ATMS observations.

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
JPSS-3 ATMS preliminary analysis of calibration coefficients	Feb-24	Mar-24	Mar-24	
ATMS Spectral Response Function (SRF) evaluation report and dataset	Mar-24	Jun-24	Jun-24	QS TVAC
ATMS geolocation correction algorithm assessment	May-24	Aug-24		QS
Improvement for lunar intrusion correction model including LUT update	Jun-24	Aug-24		QS
ATMS cold bias dynamic correction assessment and algorithms update	Sep-24			
Review/Checkout of IDPS Mx Builds SOL and I&T Deploy Regression data	Sep-24			
Review of JPSS-3/4 ATMS pre-launch data to provide Ground support	Sep-24			
Conduct maintenance including anomaly resolution of on-orbit ATMS sensors	Sep-24			
Provide support to Metop-SG Joint Cal/Val Activities	Sep-24			

Overall Status:

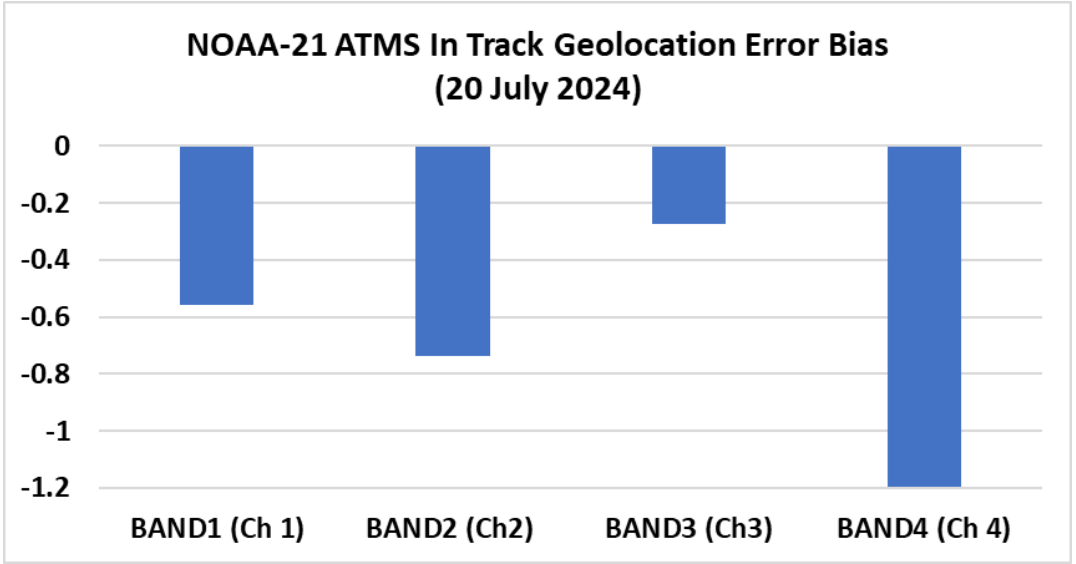
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

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:

Highlights:

Figure 1. NOAA-21 ATMS in-track geolocation error bias relative to 18-19 JUL 2024



Clouds

July 2024

Accomplishments / Events:

- The Cloud team continues to investigate the usage of the ACHA cloud optical depths as a replacement for NCOMP.
- The new ECM LUT for NPP/NOAA-20 and NOAA-21 as well as updated DCOMP LUTs for all sensors have been provided to ASSISTT. The cloud team is working on evaluating the output from the CCAP run to check the scientific integrity of the data.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Develop VIIRS/CALIOP validation tools for JPSS-2	Dec-22	TBD	Jun 23	Code completed but requires N21 data to test
Integrate latest Enterprise Cloud Mask (ECM) version within NDE	Dec-22	Dec-22	Mar-23	A future update will be made post Provisional
Prepare Cloud Base Height (CBH)/Cloud Cover Layers (CCL) algorithm transition and operation for JPSS-2	Jan-23	Apr-23		Algorithm is being evaluated for Prov maturity
Integrate new ECM lookup table to allow easier threshold changes	Mar-23	Sept-24		Validation of the new LUT is ongoing
JPSS-2 Beta Review (ECM)	Apr-23	Jun-23	June-23	Changed due to Transmitter issue
Validate CCL that was recently delivered, especially convective/supercooled layers as part of CCL Beta review	Jul-23	Dec-24		Ongoing
NOAA-21 Cloud Products Beta Maturity	Jul-23	Nov-23		COMP at end of Nov. Others Prov
NOAA-21 Cloud Products Provisional Maturity	Aug-23	Nov-23		COMP at end of Nov. Others Prov

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:

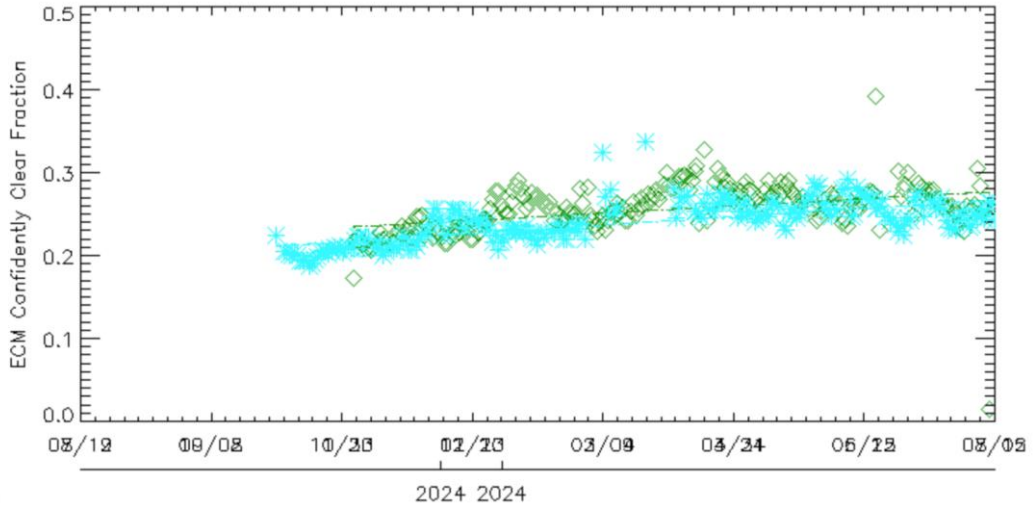


Figure 1.Example of the LTM trends of SNPP and NOAA-21 cloud mask for August 2023-August 2024 for the descending node. The deviations in SNPP (green) is due to geolocation errors, while the deviations in NOAA-21 is due to a data outage

CrIS SDR

July 2024

Accomplishments / Events:

- Delivered JPSS-4 CrIS CalVal Plan.
- Investigated and attempted to mitigate SCDR missing data and severe latency. Reliability of system is a growing concern. (**Fig. 1**)
- Improved latency of some CrIS web page maps by repeated re-processing. (**Fig. 2**).
- Completed initial prototype of CrIS/IASI-NG intercomparison software using in-house simulated (w/RT-TOV) data. (**Fig. 3**)
- Continued CrIS VIIS NOAA-20 CrIS/VIIRS comparisons. Mean trends are only several mK per decade, with uncertainties to be investigated. Small seasonal variations are similar to the SNPP behavior and possibly due to small signal level dependencies of the differences, most notable for band M13. (**Fig. 4**)
- Continued working on the task of the JPSS CrIS Spectral Calibration Methodology and Tool Development to perform the inter FOV analysis. (**Fig. 5**)
- Improved responsivity monitoring tool-set. (**Fig. 6**)
- Conducted analysis of the S/NPP GPS loss on 2024-07-09, and the recovery (**Figs. 7**)
- Participated at the 2024 IEEE IGARSS as oral presenters and session organizers. (**Fig. 8**)
- Provided analysis and support for the CrIS Instrument after the S/NPP outage on 2024-07-24 and the 2024-07-29 Instrument activation (**Figs. 9**)
- Updated system generating images for the RAMMB Slider to include IASI data. (**Fig. 10**)
- Presented plan to the 2024-07-31 DRAT on the NOAA-21 Eclipse Exit Imaginary Radiance Anomaly. ADR-10909 created.

Milestones	Category	Original Date	Actual Completion Date	Variance Explanation
New CrIS geolocation accuracy assessment using VIIRS terrain-corrected data	Sustain	Feb-24	Feb-24	
Participated in the JPSS-4 CrIS Pre-Ship Review (PSR)	Sustain	May-24	May-24	
Evaluate the long-term NOAA-21 CrIS spectral reference performance after increasing the calibration interval	Sustain	Jun-24	Jun-24	
Delivery of JPSS-4 CrIS Cal/Val Plan Draft	Sustain	Aug-24	Aug-24 JPSS-4	
Perform characterization and mitigation activities on elevated imaginary component of NOAA-21 CrIS radiance products	Sustain	Sep-24		
Review/Checkout of IDPS Mx Builds SOL and I&T Deploy Regression data	Maintain	Sep-24		
Perform the transition of Cal/Val activities to the Cloud environment	Maintain	Sep-24		
Conduct maintenance including investigation and anomaly resolution of on-orbit CrIS sensors	Maintain	Sep-24		
Provide Support to Metop-SG Joint Cal/Val Activities	Maintain	Sep-24		

Overall Status:

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

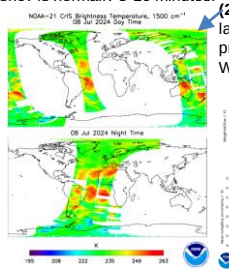
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

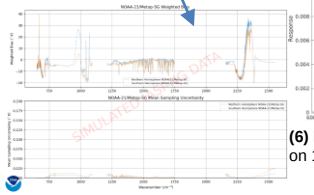
Red: It has been announced that JPSS-4 TVAC data and documents are now ITAR. STAR IT does not have a secured environment to host or process ITAR data.
Yellow: The CrIS Team is still in need of hardware resources. Presently, there is only two servers dedicated to 6 CrIS Team members. Access to additional servers is still desirable. There is a risk for the CrIS SDR Team to continue on such a dual-server environment for the operational CrIS Cal/Val activities that include 5 CrIS sensors (SNPP, JPSS-1 to -4). This may affect the timely completion of deliverables and program milestones. The recommendation is to have one additional server as soon as possible (< 2 months) and add another server in the next months. Corresponding hardware quotations and SNO have been submitted. Corresponding JSTAR CrIS Risk/Issue on Hardware and Software have been submitted for JSTAR interval review on Jan. 6, 2023. UPDATE: The purchasing of the corresponding hardware is currently in progress, in coordination with STAR IT. A new MATLAB license has been delivered and installed properly. There was a SCDR data disruption starting June 30 and ending July 11. Data gaps are unfilled 30 days later. This complicated S/NPP GPS Anomaly investigations. SCDR outages may be increasing.
Blue: ASSIST Team has agreed to accept ADL code change tested on CentOS 9.

Highlights:

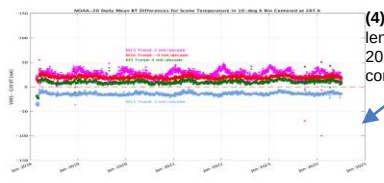
(1) SCDR Latency on JPSS data by satellite, 06/29 - 7/08. Latency is normally 5-10 minutes.



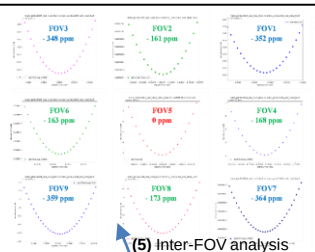
(2) showing low-latency map products for CrIS Web page.



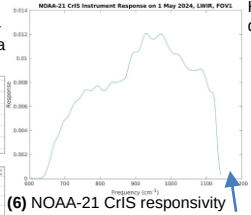
(3) Initial verification of CrIS/IASI-NG comparison using in-house simulated data



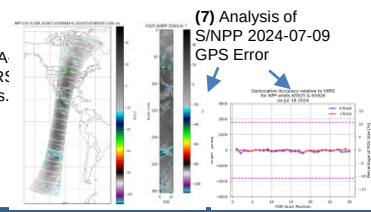
(4) Mission length NOAA-20 CrIS/VIIRS comparisons.



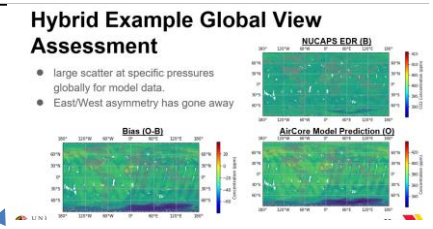
(5) Inter-FOV analysis with respect to FOV5



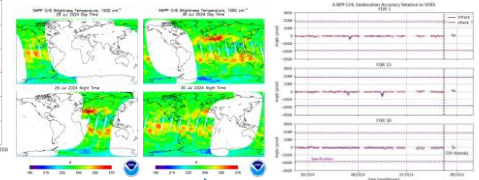
(6) NOAA-21 CrIS responsivity on 1 May 2024 for LWIR/FOV1



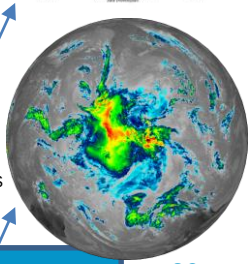
(7) Analysis of S/NPP 2024-07-09 GPS Error



(8) Sample slide from the IGARSS 2024 Presentation on the Hybrid NN CO2 Retrieval Algorithm to be used for CrIS SDR data Validation.



(9) Analysis of S/NPP CrIS activation on 2024-07-29 after 2024-07-24 S/NPP outage.



(10) Sample picture for RAMMB Slider with both CrIS and IASI images, South Pole view, Emulated 11.2 band, 2024-08-02T18:32

Cryosphere and Polar Winds

July, 2024

Accomplishments / Events:

- **Tandem JPSS winds for SWIR band are now generated:** Currently, VIIRS single band Atmospheric Motion Vectors (AMVs) from the shortwave-infrared band (SWIR, M11, 2.2 µm) is being prepared for operational implementation in the near future. The next logical step was to expand the use of SWIR band into the tandem orbit setting, where successive orbits of NOAA-20 and -21 satellites are used to develop AMVs with greater coverage and smaller time differences, which should result in a more accurate winds product. Recent examples of the experiment product are shown in Figure 1.
- The Tandem SWIR product does a good job in covering mid-upper-level wind motions associated with jet stream across northern Russia and mid-lower-level winds associated with polar cyclone over the central Arctic. Initial comparisons to single JPSS SWIR AMVs (either NOAA-20 or -21) show speed (direction) RMS of under 3 ms^{-1} (20 deg).

Task Category	Task/ Description	Start	Finish	Deliverable	Requirement (Dev Only)
Development (D)	Investigate the value added in including I-band product.	10/2023	9/2024	I-band ice products in ops	
Development (D)	Make improvements to blended VIIRS + AMSR2 SIC product in Marginal Ice Zone.	10/2023	9/2024	Daily blended Sea Ice Concentration Product	Same as VIIRS SIC EDR

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:

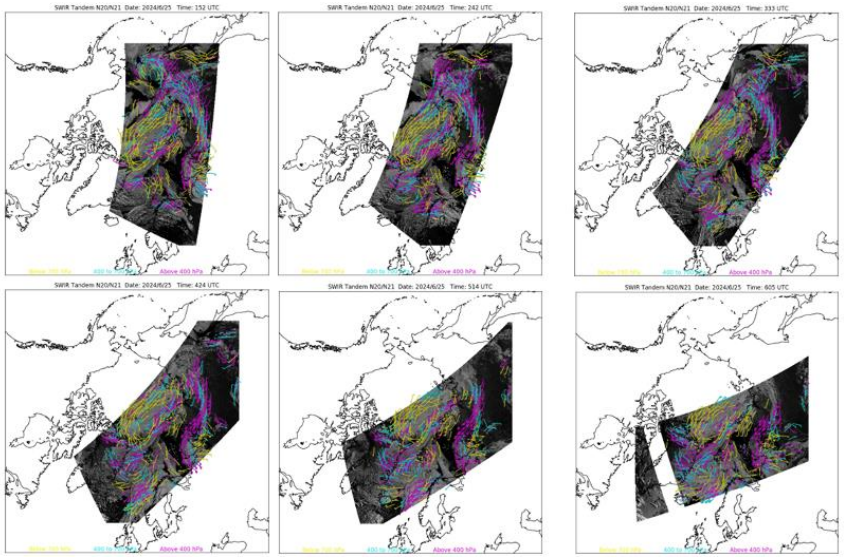


Figure 1: VIIRS JPSS (NOAA20/21) Tandem SWIR AMVs overlaid with 2.2 µm reflectances from 25 June 2024 over the Arctic region in polar stereographic projection. Near polar crossing times starting from upper-left and ending at lower-right: 01:52, 02:42, 03:33, 04:24, 05:14 and 06:05 UTC.

EDR Reprocessing

June 2024

Accomplishments / Events:

- The RWG continue to reprocess the cloud EDR products of Aug. 20, 2018~Jul. 10, 2019 on ESSIC Bamboo clusters, and transfer the results to STAR servers in a timely manner.
- Currently, the Bamboo clusters have been entirely terminated and all the data in the time range have been reprocessed except Oct. 29-31, Nov.23-30 and Dec. 24-31 of 2018. Due to the limited memory capacity of STAR servers which cannot afford the operation of the reprocessing programs, the RWG is working on making plans to transfer the procedure to other potential servers.
- With more operational VIIRS cloud EDR data downloaded, the RWG continue to assess the quality of reprocessed cloud EDRs against both the operational EDRs and corresponding combined CloudSat-CPR and CALIPSO-Lidar data.
- The following table shows the quantitative comparison of Cloud Base Height (CBH) accuracy between reprocessed and operational data against top-layer CBH derived from combined CloudSat-CPR and CALIPSO-Lidar data for May and April of 2019. Further quality control is applied to all dataset: if cloud optical thickness>1, CBH difference between VIIRS and CPR data should be<1km.

Top layer CBH (May and Apr.1~10, 28-30 of 2019)	All		Single-layer		Multi-layer	
	Repro	Opera	Repro	Opera	Repro	Opera
Valid pixel #:	560	560	297	297	263	263
Accurate pixel percentage (%)	12.86	14.12	14.48	17.17	11.03	10.64
R-square:	0.77	0.78	0.80	0.80	0.79	0.89

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Complete VIIRS EDR reprocessing for Clouds, polar wind, Ice Concentration; Ice Thickness; Snow Cover; and Ice Surface Temperature	02/2023	06/2024		1 month

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic			x		Execution delay is expected due to issues in STAR servers and UMD Bamboo system
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:

The VIIRS EDR reprocessing is now relying on the UMD Bamboo system. The system may not have sufficient disk storage to support the reprocessing. The RWG is currently doing the testing.

Accomplishments / Events:

- **AMSR2 vs Landsat sea ice concentration**: Comparison of Landsat sea ice concentration with AMSR2 concentration for spring and early summer scenes in 2014 shows a fair amount of scatter with AMSR2 generally overestimating concentration compared to Landsat. This appears to be due the proximity of the scenes to the ice edge where Landsat is detecting more open water due to its higher spatial resolution. Also, AMSR2 concentrations tend to saturate at or near 100% concentration while Landsat shows more variability of lower concentrations. Still, the AMSR2 performance is reasonable with a correlation of ~0.8.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
initiate and test processing changes in preparation for AMSR3 using AMSR3 proxy data	Sep-24	Sep-24		
Continue AMSR2 L1 monitoring; develop AMSR3 capabilities	Sep-24	Sep-24		

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.*
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Issues/Risks:

Highlights:

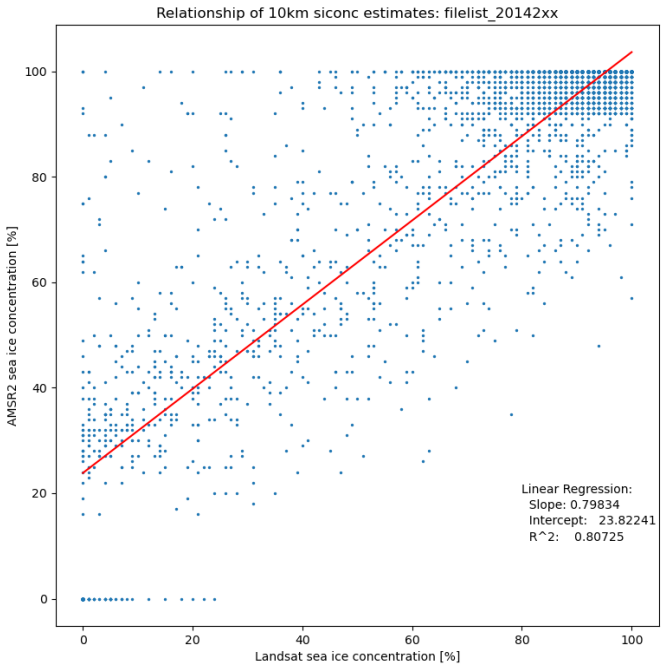

Figure: Scatterplot of Landsat (x-axis) and AMSR2 (y-axis) sea ice concentration (%) for Landsat scenes from April through June 2014. The red line is the linear regression fit and the regression coefficients (slope, intercept, and R^2) are annotated in the image.

ICVS

July 2024

Accomplishments / Events:

- Transition ICVS vector data display web page including NOAA-21 to public website, which provides the lifetime orbital mean data of selected key calibration and science data quality parameters in addition to the trending figures. Figure 1a is an example of NOAA-21 OMPS NP wavelength shift lifetime monitoring.
- Provide near real time instrument health status, performance, and science data quality monitoring and evaluation support to OSPO S-NPP safe mode recovery activities from July 24, 2024. Prepared daily instrument calibration parameter status and science data quality report and presented in STAR-OSPO joint meeting, as a critical location to collect JPSS instrument and science data quality information. List in Figure 1b is the S-NPP spacecraft attitude, indicating two major data outage during the CDP reset.
- Refined the new ICVS CrIS and OMPS inter-sensor comparison web designs and contents. OMPS portion has been promoted to the operational ICVS, while the CrIS portion is to be finalized.
- Investigated the impact of measured ATMS SRF data on CRTM simulations and CRTM-double differences (Presented an oral presentation at IGRASS meeting). An example is given in Figs. 1c and 1d
- Continue the ICVS VIIRS LTM module transition due to the change of team staff.
- Explore the OMPS independent GEO accuracy assessment using inter-sensor correlation variations

Overall Status:

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

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

Issues/Risks:

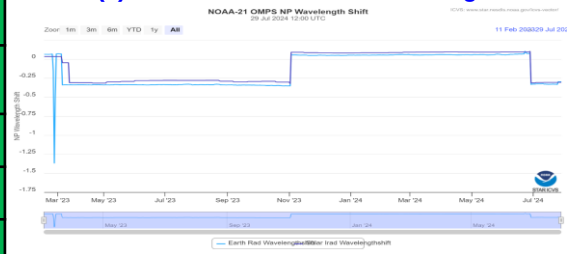
Retirement of three ICVS operational processing servers affects the refreshing rate

Milestones	Original Date	Actual Completion Date	Variance Explanation
Upgrade the 3D ATMS hurricane animation imagery package from Matlab to Python; initialize modules about NOAA21 NM DCC and comparison with VIIRS M1; Update the ICVS for N21 LP SDR monitoring (SNPP proxy data); fix the VIIRS-ABI inter-sensor processing package	Dec-23	Dec-23	
Promote the new ATMS inter-sensor web page to operational ICVS; Develop the processing code about NOAA21 NM DCC and NOAA-21 NM against VIIRS M1; support to the OMPS SDR team for verification of the OMPS-CRTM; Update the ICVS for N21 LP SDR monitoring to support the LP EDR review.	Feb-24	Feb-24	
Develop the new ICVS web page about NOAA21 NM DCC and NOAA-21 NM against VIIRS M1 and promote it to operational ICVS in support of N21 OMPS final review	Feb-24	Mar-24	
Initialize STAR2Cloud Initiative ICVS package transition discovery and assessment activities (preparation for JPSS ICVS website migration into the cloud environment)	Apr-24	May-24	
Develop new modules for monitoring of JPSS SDR data anomaly upon region or latitude	May-24	May-24	
Update ICVS vector modules (e.g., NOAA-21 dynamic visualization , data volume to support the cloud transition) and promote the web page to the operational ICVS; develop new modules in support to the J3/J4 testing by using N21 data as proxy data sets	Jun-24	Jul-24	
Promote the new ICVS CrIS and OMPS inter-sensor web page to public-accessible ICVS; Upgrade the ICVS ATMS inter-sensor CRTM double difference modules	Jul-24	Jul-24	
Upgrade ICVS user-friendly anomaly alert modules for more key parameters; update ICVS user manual	Aug-24		
Upgrade the ICVS Anomaly Watch portal with more monitoring analysis results to support OSPO and other users	Sep-24		
Initialize an ICVS core-function prototype in cloud environment	Sep-24		
Develop new ICVS modules to support J3/J4 prelaunch testing	Sep-24		
ICVS maintenance for SNPP/NOAA-20/NOAA-21 (including 3D-ATMD hurricane tool)	Sep-24		

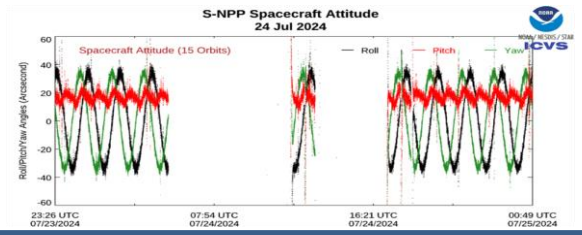
Highlights:

Significantly contribute to STAR SDR Teams

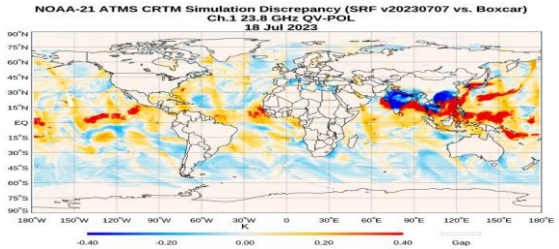
(a) NOAA-21 OMPS NP wavelength shift



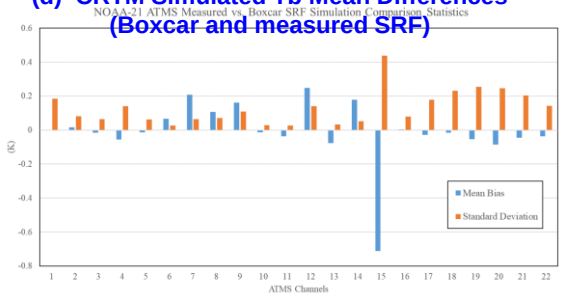
(b) S-NPP spacecraft attitude on July 24, 2024



(c) CRTM Simulated ATMS Tb Difference Image (Boxcar and measured SRF)



(d) CRTM Simulated Tb Mean Differences (Boxcar and measured SRF)



VIIRS Imagery

July 2024

Accomplishments / Events:

- Bill Line worked three midnight shifts at NWS Weather Forecast Office Cheyenne, WY 12-14 July
- Bill Line and Jorel Torres visited NWS Weather Forecast Office Riverton, WY, meeting staff learning about local office challenges, and sharing satellite products and best practices
- Published VIIRS Nighttime Microphysics RGB Quick Guide
- VIIRS NCC teletraining session
- Blog Posts with VIIRS Imagery
  - Hurricane Beryl (2024) Part 1 and Part 2
  - July 2024 Wildfire Smoke
  - July 2024 California Park Fire
- 26 VIIRS Imagery Posts on CIRA Social Media this Month. A few posts:
  - VIIRS IR Imagery of Hurricane Beryl (12.9K views)
  - VIIRS NCC Imagery of Houston area power outages caused by Beryl (13.7K views)
  - VIIRS NCC and MWIR imagery of Park Fire (10.9K views)
  - VIIRS NCC Imagery of Aurora (19.1K views)

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.*
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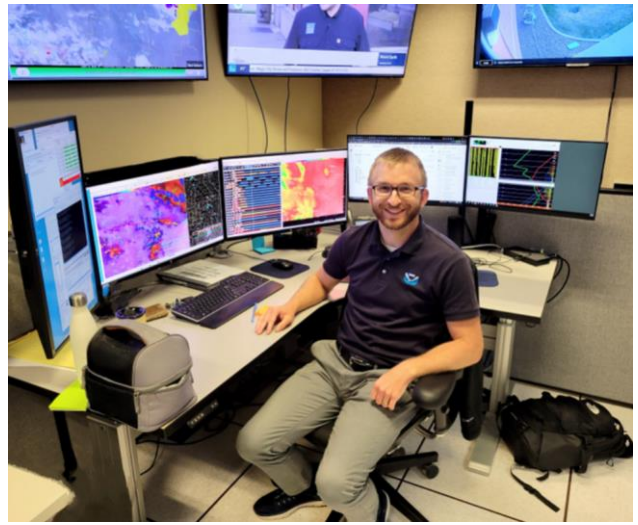
Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY25 Program Management Review	Jun-24	Jun-24	May-24	
Blowing Dust Climatology Paper Submitted (Includes VIIRS Imagery)	Jul-24	Jul-24		
Prepare and deliver the initial updates for the Imagery Cal/Val plan (updated for JPSS-3), ahead of PStR	Aug-24	Aug-24		
New ASF Tool code and updated NCC LUT – Test for 3 VIIRS	Sep-24	Sep-24		
New Imagery products or product enhancements (display on SLIDER)	Sep-24	Sep-24	continuing	
Realtime Imagery monitoring and display systems (SLIDER, etc.)	Sep-24	Sep-24	continuing	
Interesting VIIRS Imagery to Social Media and Blogs	Sep-24	Sep-24	continuing	
McIDAS-X/V Enhancements for processing/display of VIIRS Imagery	Sep-24	Sep-24	continuing	
Block 2.3 Mx builds deploy regression review/checkout (Mx9, Mx10, …)			Mx9: Jan-2024, Mx10: Apr-2024	

Highlights: Image of the Month

Figure: Bill Line worked three Midnight Shifts at NWS WFO Cheyenne, WY 12-14 July 2024. This interaction helps build relationships between NESDIS and NWS.



Leaf Area Index

July 2024

Accomplishments / Events:

- Prepare for the LAI operational readiness, clarify the product level definition, metadata and other information.
- Keep working the new LAI algorithm development, the new algorithm focus on using time series information to produce smoothed and gap-filled LAI, compared with current postprocessing (smoothing and gap filling).
- Generate the FCOVER data from the SR gridded data using a machine learning method which is trained by the ground measurements and matched VIIRS SR, the FCOVER will be used to derive annual vegetation fraction for LAI adjustment.
- Keep working on the LAI in-situ validation, analyze the current the SR performance at the NEON sites, and explore other data source for the validation.

Overall Status:

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

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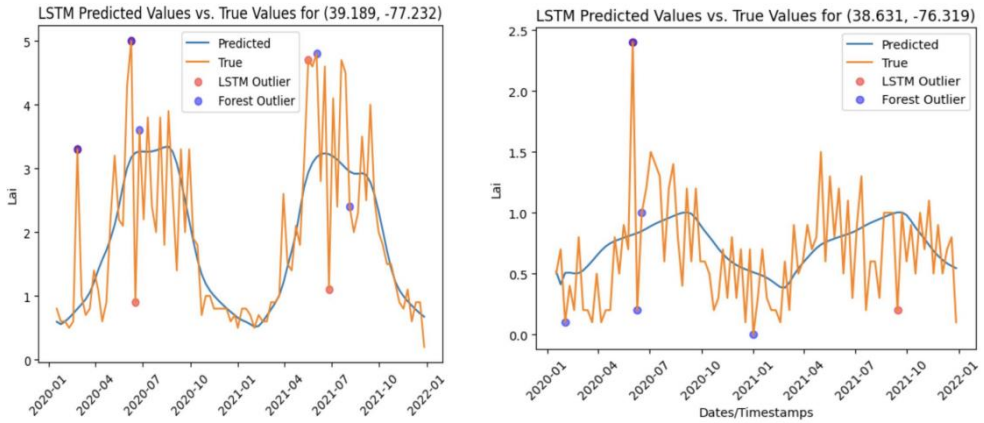
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
CCAP Initial Delivery	Sep-23	Sep-23	Sep 26, 2023	
LAI product preliminary in-situ validation and inter-comparison	Nov-23	Nov-23	Nov 25, 2023	
CCAP final Delivery	Feb-24	Feb-24	Apr 1, 2024	
Incorporate the LAI test data into the LSM model to evaluate the performance in the model	May-24	May-24	May 30, 2024	
Operational readiness	Jul-24	Jul-24	Expected in September 2024	ASSIST team postponed due to verification data preparation
Develop LAI routine monitoring and validation tool	Sep-24	Sep-24		

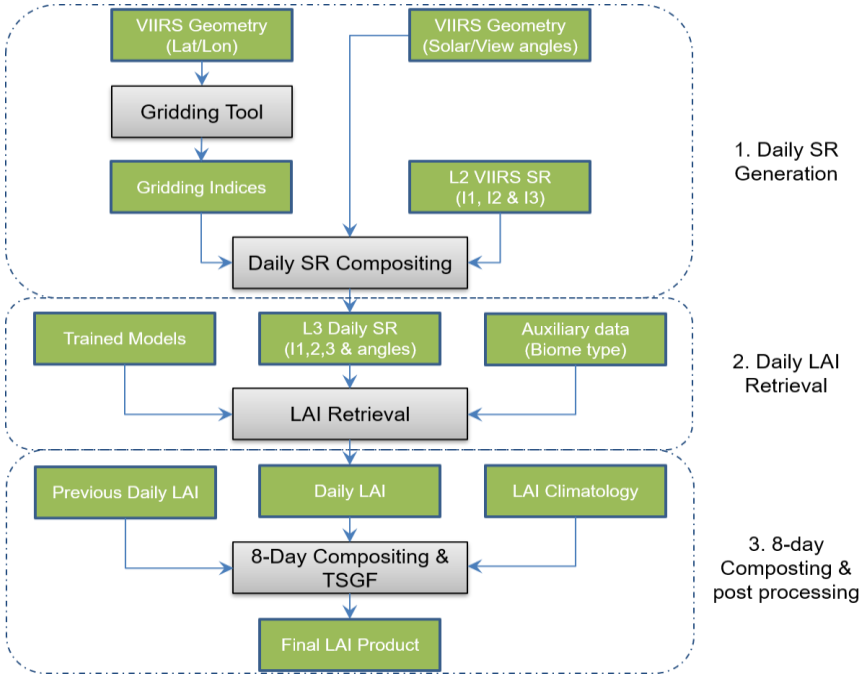
Highlights:



We investigate new LAI algorithm, which is based on time series data and deep learning, generate the smoothed and gap-free LAI, the figure shows two test cases at Baltimore, MD.

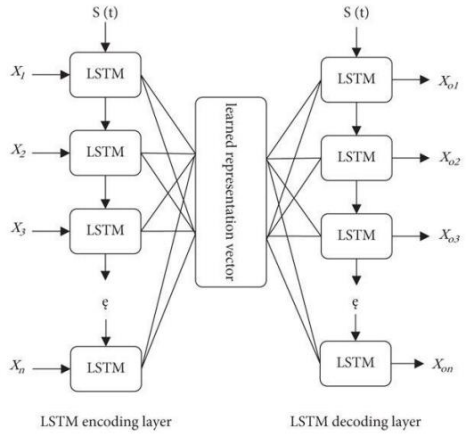
LAI algorithm Improvement Test

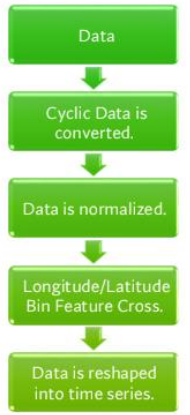
- Current algorithm (Traditional one)
  - ML method applied on daily retrieval.
  - Traditional method for compositing, smoothing and gap filling using retained previous LAI.

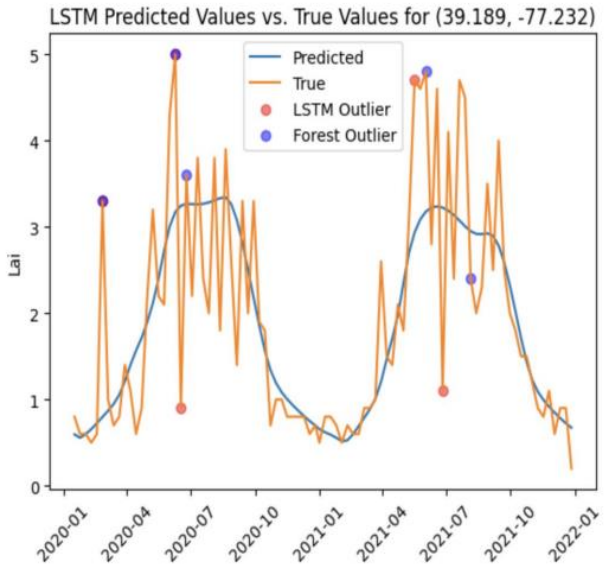


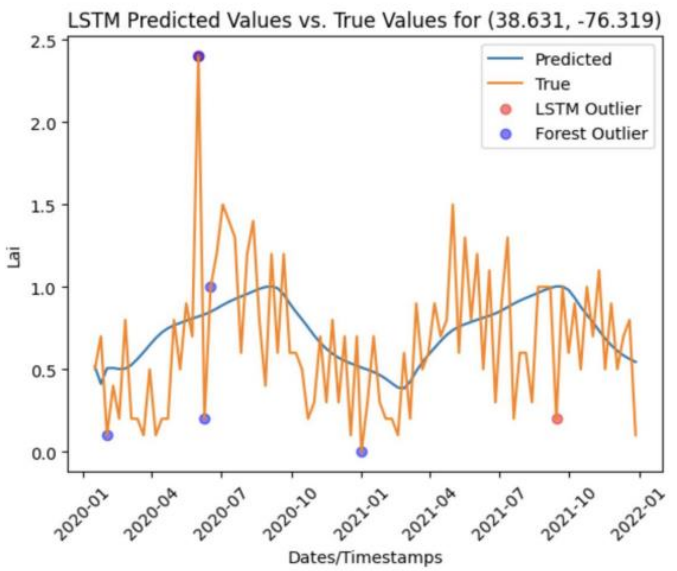
- Proposed one
  - Deep learning method to do the smoothing and gap filling using time series information.
  - Input: original retrieved LAI with possible gap, output: smoothed LAI without gap.
  - Test Long short-term memory (LSTM)

- The LSTM model structure and data preprocessing





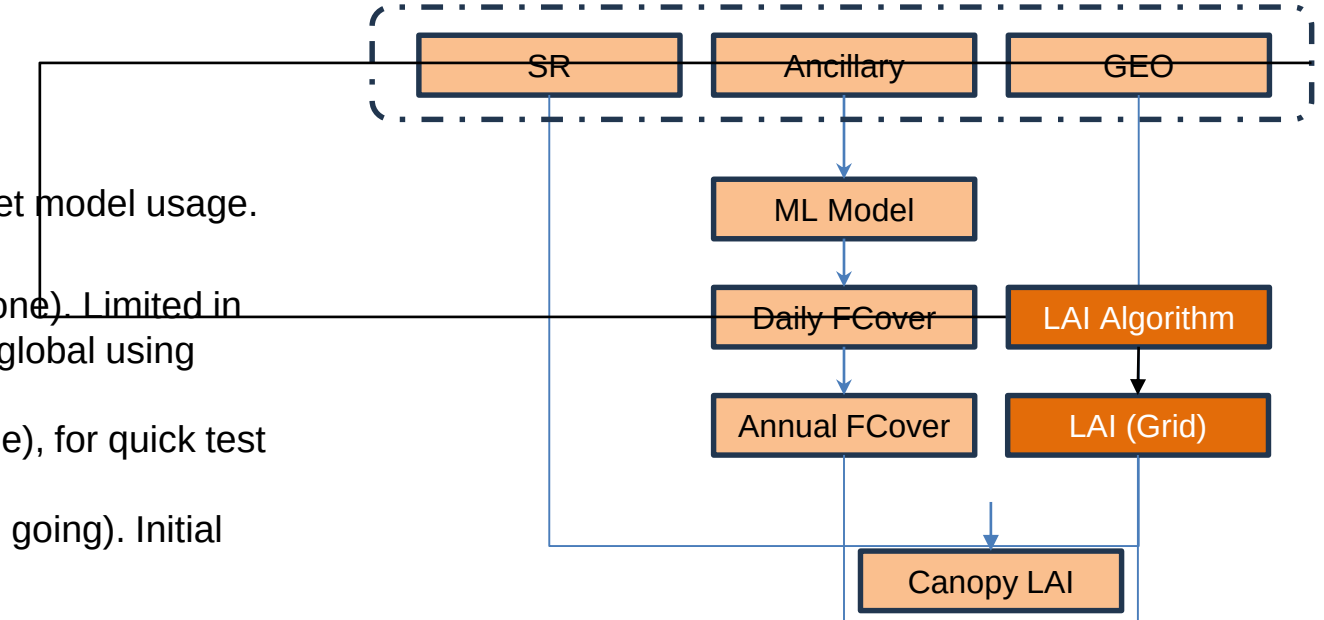


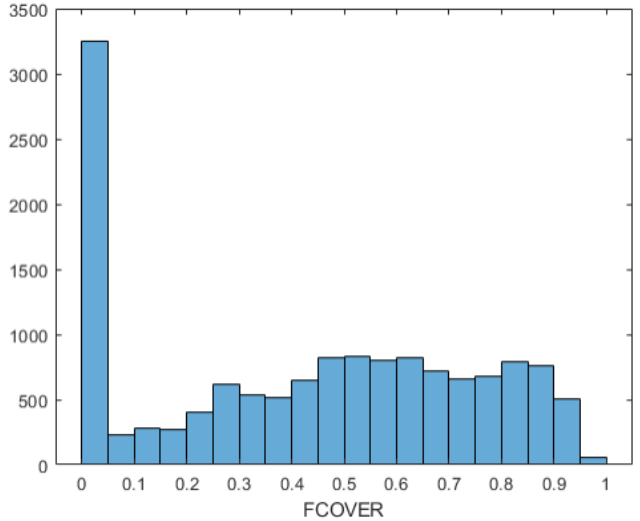


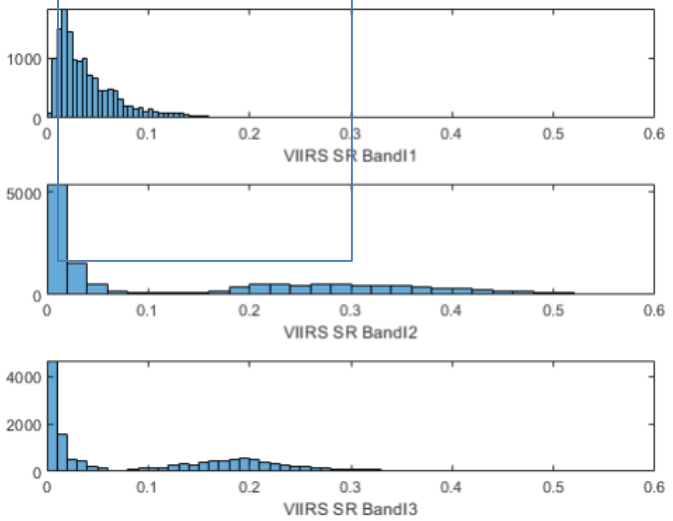
LSTM model test result (Baltimore, MD)

Annual FCOVER Retrieval

- Methodology
  - Use same input as LAI to ensure consistency.
  - Similar machine learning method to retrieval
  - Static data (annual) used for LAI adjustment to meet model usage.
- Progress
  - Collected and processed the ground FCOVER. (Done). Limited in CONUS, Europe and Australia, need to expand to global using satellite data such as Landsat.
  - Matched the FCOVER with VIIRS SR & GEO (Done), for quick test using NASA VNP09 instead.
  - Test the Random Forest Algorithm for retrieval (On going). Initial test using same algorithm as LAI retrieval.







Land Surface Temperature

July 2024

Accomplishments / Events:

- Further updated and finalized the PMR slide for JPSS VIIRS LST.
- Continued the development of a machine learning based method for all weather LST generation : added more parameters and more days of data into the training. The model performance has been further slightly improved. In addition, CDF Matching for Different LST range was also tested. A parameter importance assessment was conducted. (slide 2-5)
- Completed the annual CISESS task report and slide for VIIRS LST related projects.
- Resumed the broken cron jobs and fixed the code issue in the I-band subset data generation.
- Continued learning Google Earth Engine and explored the feasibility of the VIIRS LST downscaling using sentinel-2 data. Developed GEE code for building up the training dataset, linear regression and statistical analysis. (slide 6)
- Supervised a summer intern on cross comparison with Landsat-8 LST data. Held weekly meetings to discuss the progress and address questions and issues.
- Prepared and submitted two abstracts to AGU2024. One abstract is titled “Validation and Performance Evaluation of NOAA-21 VIIRS LST Product” and the other one is “All-weather LST: Methodology and Experiment on JPSS/VIIRS LST’.
- Continued to monitor the NOAA-21 LST dataflow. It was observed that there are many missing granules for each day since the end of February 2024. In addition, there has been no L3 NOAA-21 LST data available since then. Reported this issue to the operational team. (highlights)

Overall Status:

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

1. *Project has completed.*
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Issues/Risks:

None

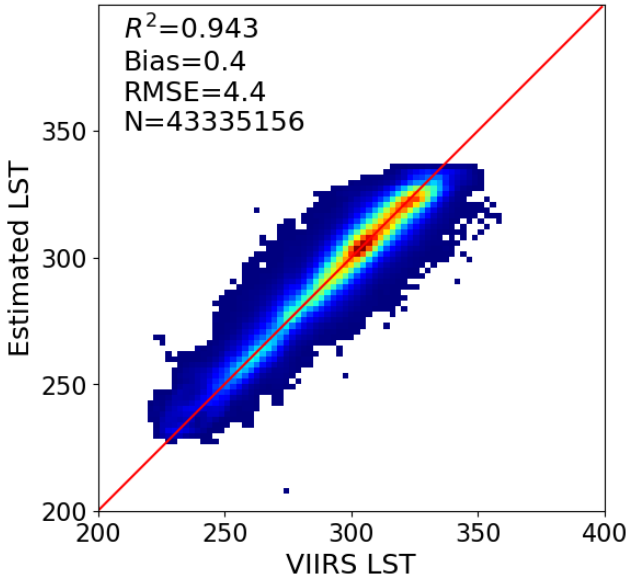
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
LSE update DAP delivery	**Aug-23**	**Oct-23**	**Oct-23**	
NOAA-21 data monitoring, evaluation and provisional maturity review	**Oct-23**	**Jan-24**	**Jan-24**	
CCAP Initial Delivery - All weather LST	**Oct-23**	**Feb-24**		deferred due to scientific R2O challenges
SDR and EDR Support to JPSS-3 Data System Test Event in early 2024	**Feb-24**	**Apr-24**		No testing is required this year. The JCT events for J3 don’t start until next year.
Experimental Development of high spatial resolution LST	**Oct-23**	**May-24**	**May-24**	
SDR and EDR Enterprise Cal/Val Plan Initial Updates	**Apr-24**	**Jun-24**	**Jun-24**	
CCAP final delivery-All weather LST	**Jan-24**	**Jul-24**		deferred due to scientific R2O challenges
SDR and EDR Enterprise Cal/Val Plan and Algorithm Update Peer Review Meeting	**Apr-24**	**Aug-24**		
Monitoring and Anomaly watch, analysis and report	**Oct-23**	**Sep-24**		

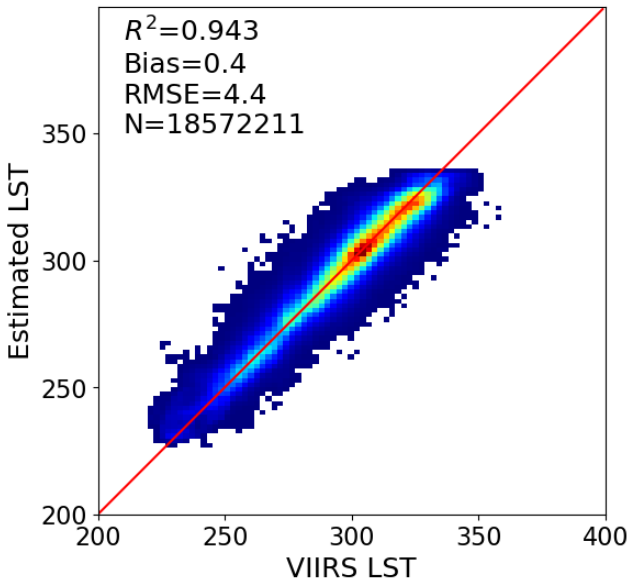
Highlights: Massive missing L2 and L3 NOAA-21 VIIRS LST Data

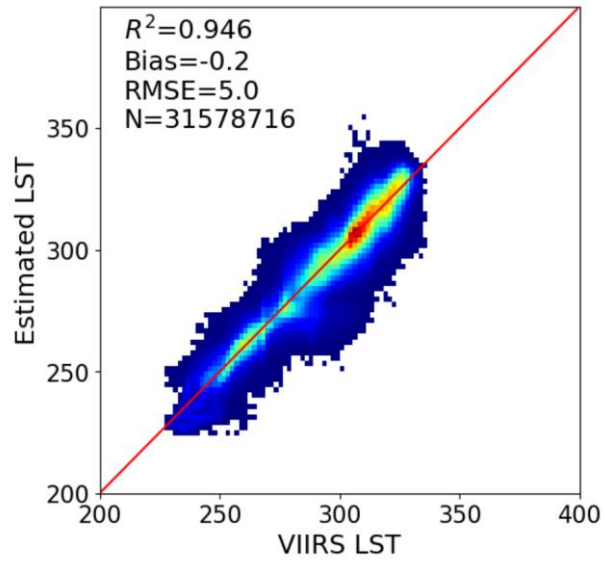
date	total granules
20240718	221
20240719	538
20240720	323
20240721	549
20240722	543
20240723	537
20240724	538
20240725	550
20240726	553
20240727	553
20240728	538
20240729	541
20240730	548

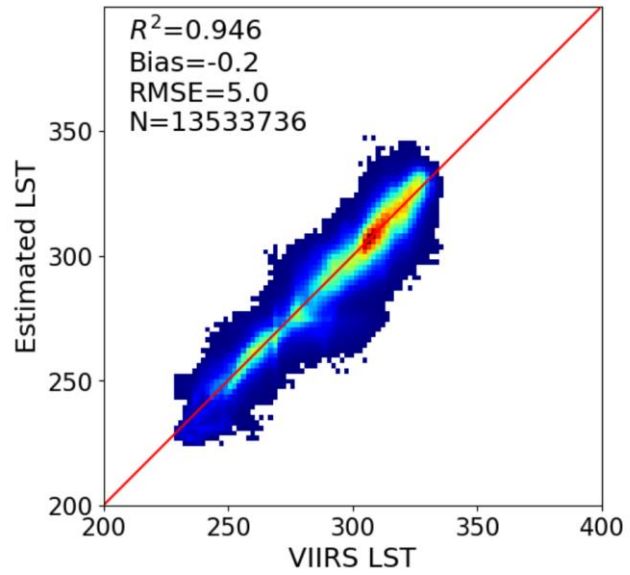
- The left table shows the L2 NOAA-21 VIIRS LST dataflow for recent days. It is similar for other days as well. For complete global coverage, there should be approximately 1010 granules per day.
- Additionally, there has been no L3 NOAA-21 LST data available since the end of February 2024.

Machine learning based all weather LST Development-Daytime



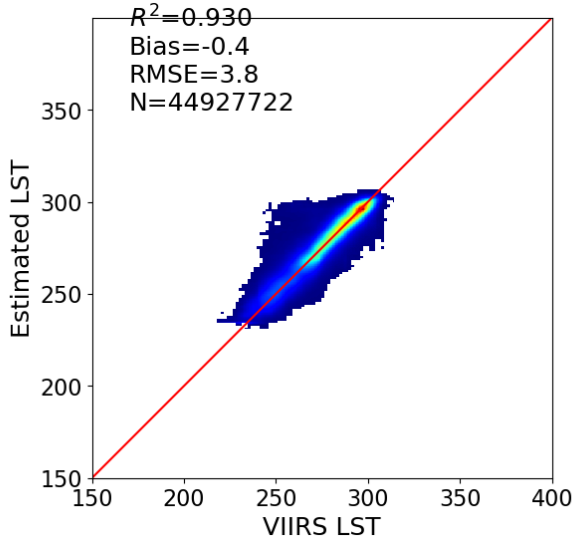


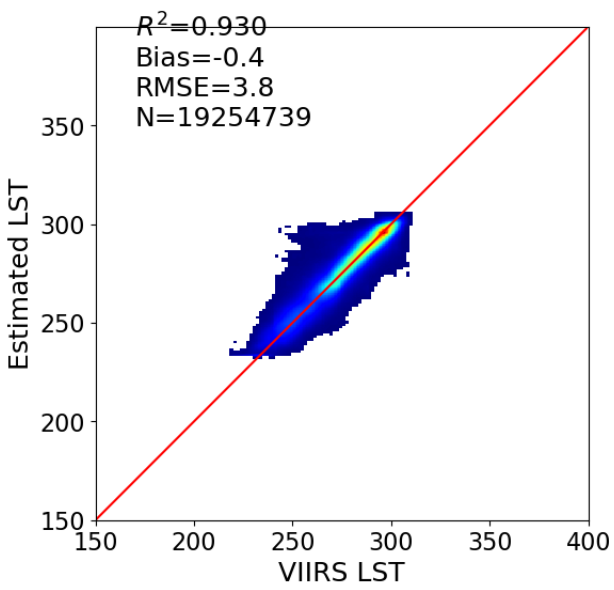


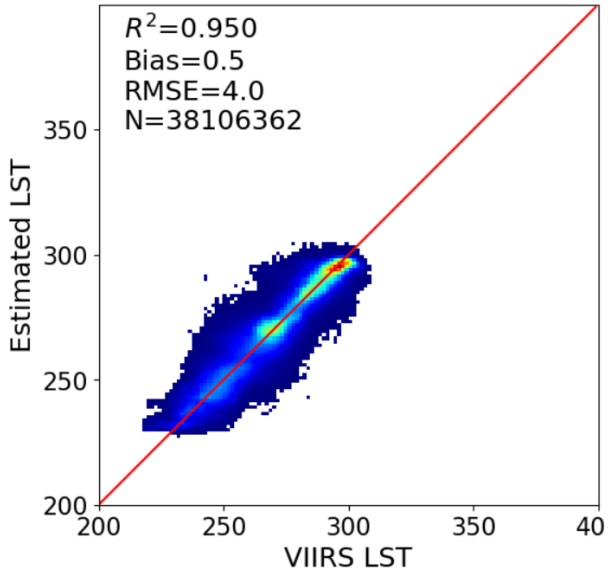


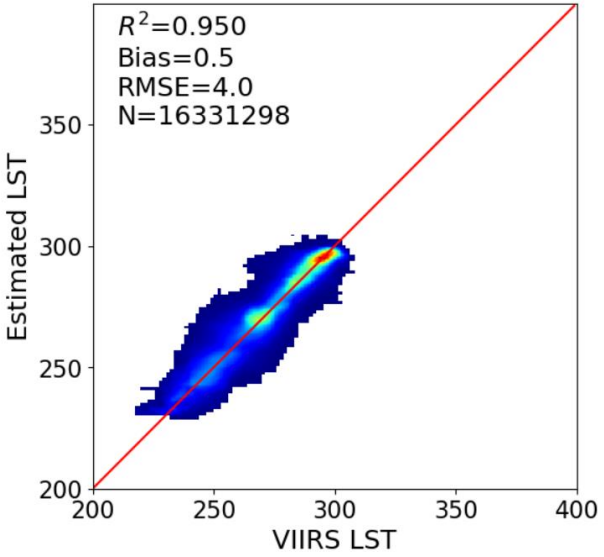
- Neural network method was used for all weather LST generation.
- Three types of training data were used, including original data, variations, and normalized data.
- More parameters were added into the training such as emissivity information, spatial information and temporal information.
- Top two figures show the models with 9 independent variables (MIRS LST, VIIRS NDVI, SRTM Slope, land cover types, emissivity mean and difference , longitude and latitude, month) and bottom two figures show the models with 8 parameters excluding the temporal parameter for training (left columns) and testing (right columns)
- Among these models, the models with 9 parameters in normalized type have the best accuracy with a bias of 0.4 K and RMSE of 4.4 K for daytime situations.

Machine learning based all weather LST Development-Nighttime









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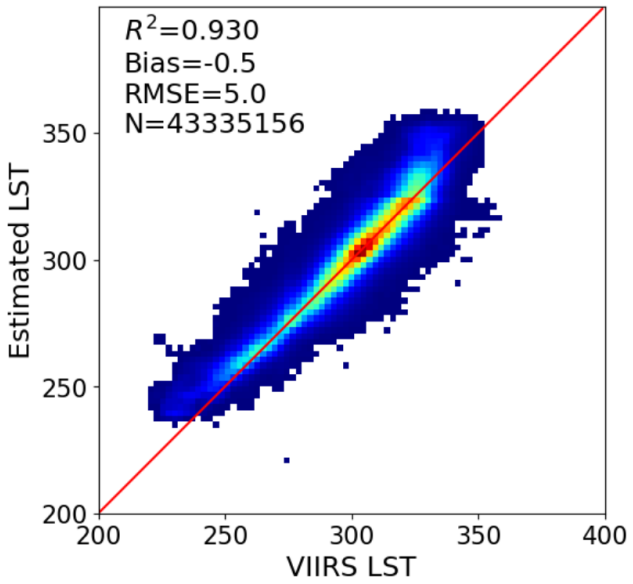
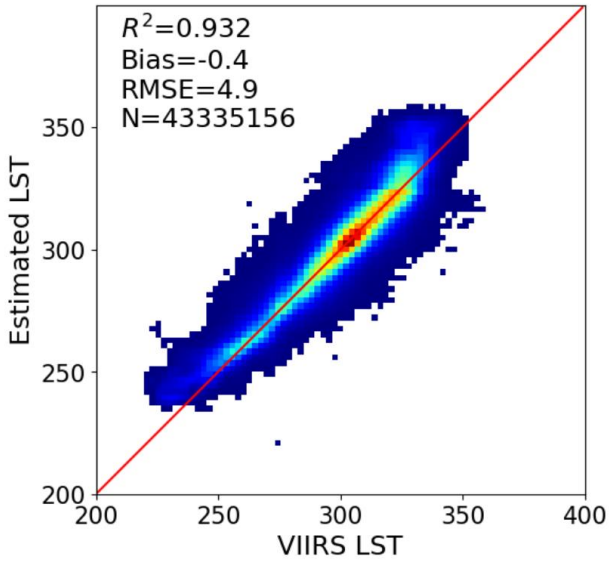
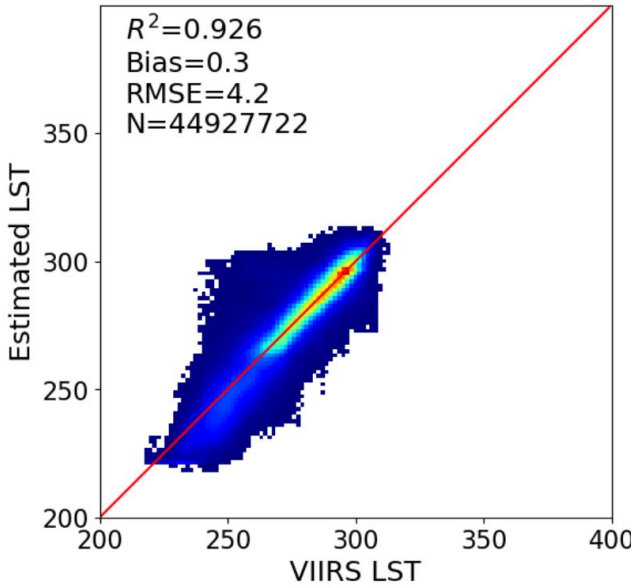
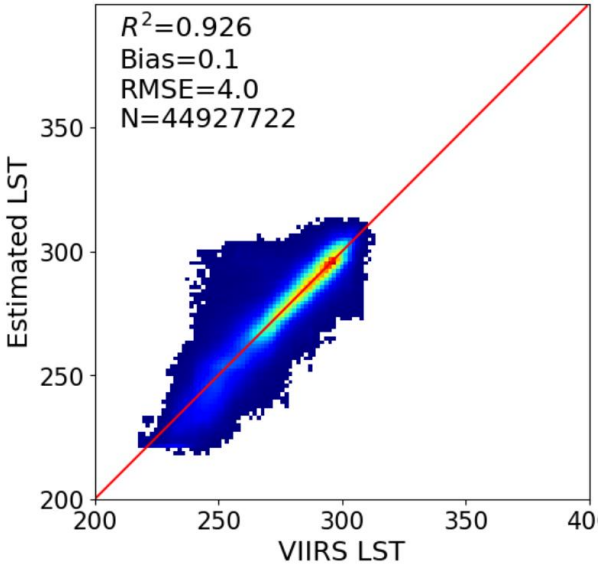
- Among these models, the models with 9 parameters in normalized type have the best accuracy with a bias of -0.4 K and RMSE of 3.8 K for nighttime situations.

CDF Matching Test for Different LST Range

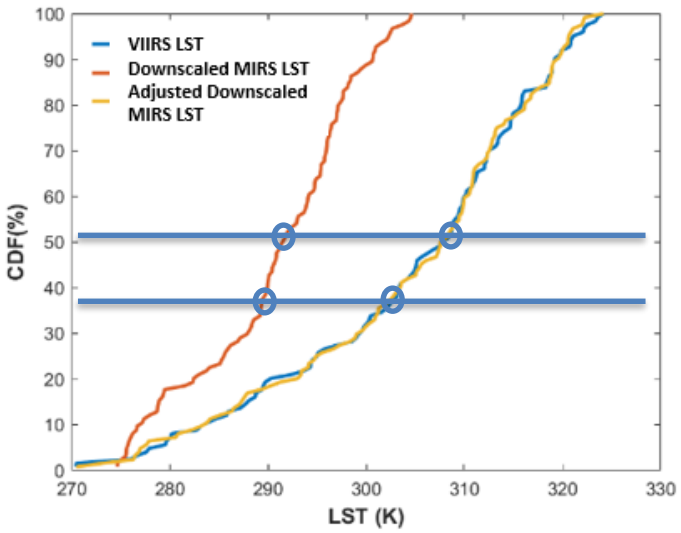








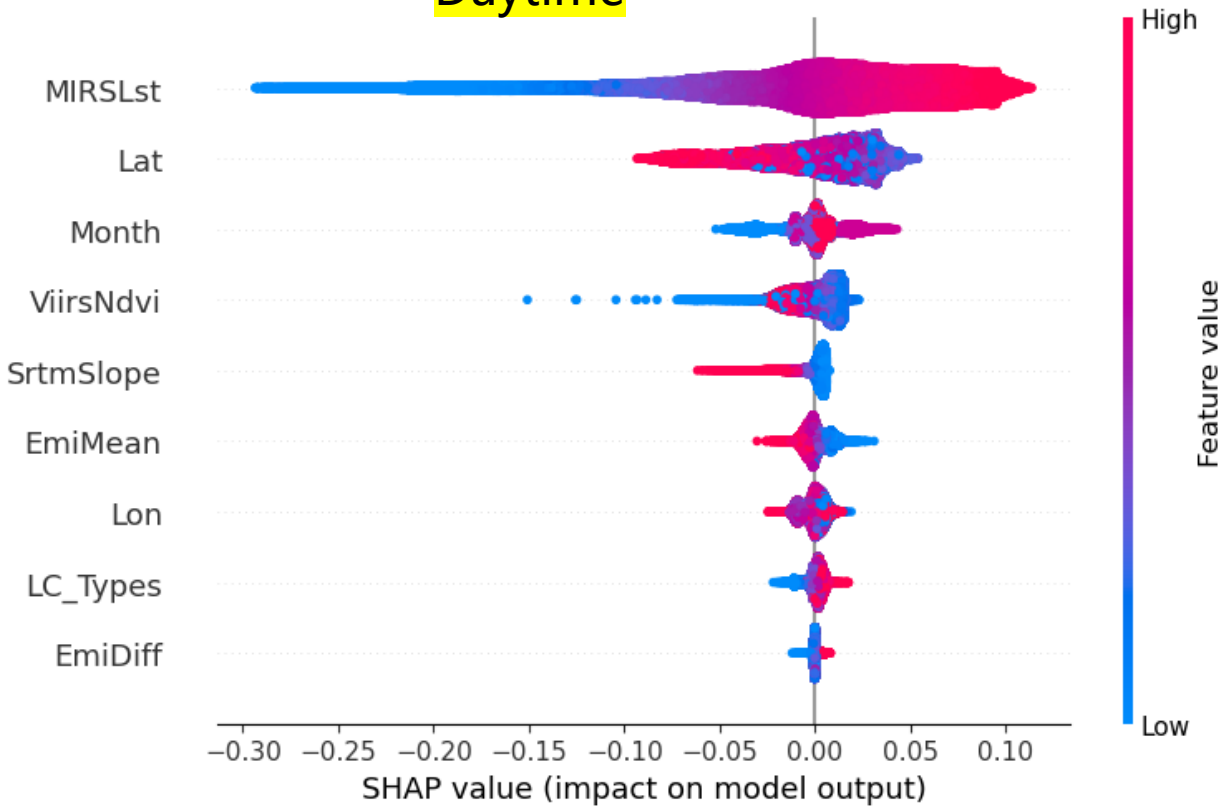
- CDF matching method was tested in model training. Two intervals are tested : a 6-interval set [0, 10, 30, 50, 70, 90, 100] and a 12 interval set [0, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
- The top figures show the test results for daytime, and the bottom figures show the results for nighttime, with the left column for training and the right column for testing.
- Compared to previous results, the CDF matching does not yield improvement according to the statistics.



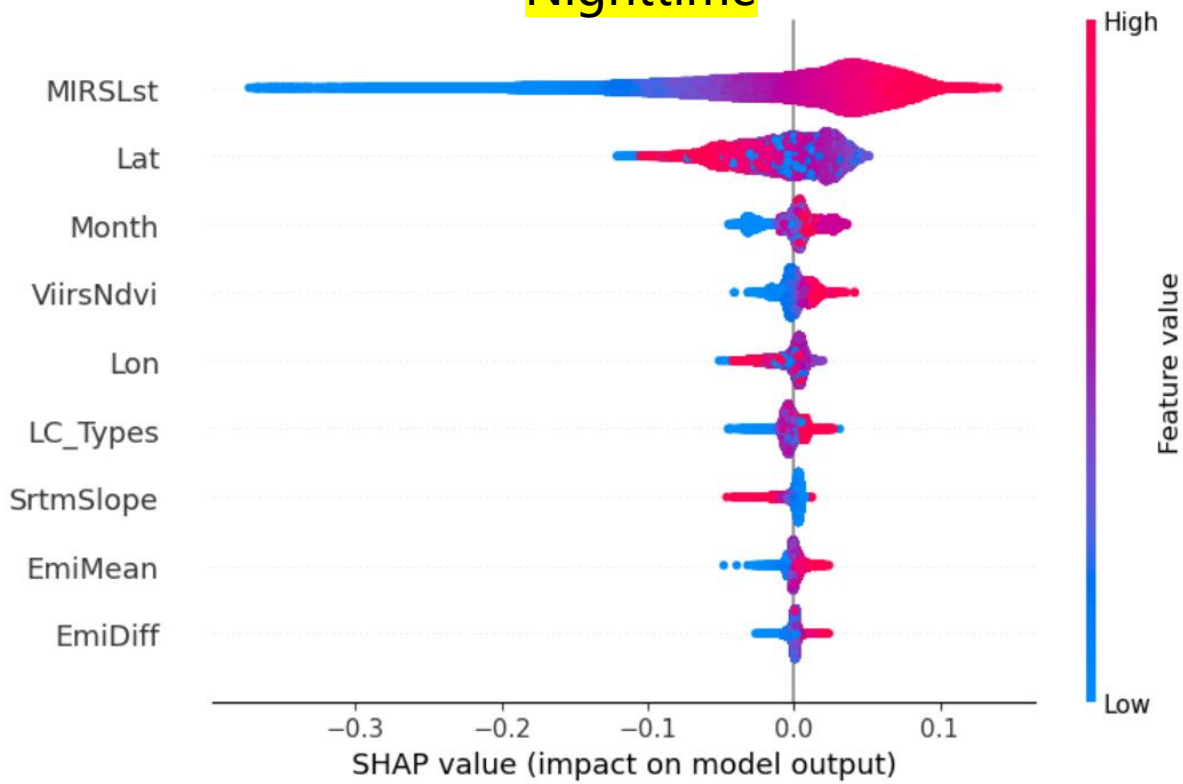
A sketch plot of CDF matching for model training

Parameter Importance Assessment in Model Training

Daytime



Nighttime



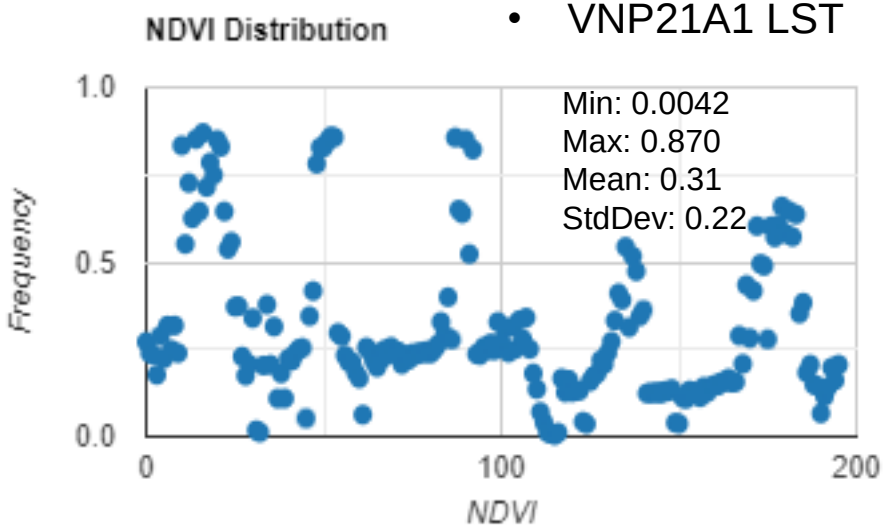
- SHAP (SHapley Additive exPlanations) tool is used for the parameter importance assessment in the training model. It provides a way to understand how each feature in the data contributes to the model's predictions. Color Coding: Red indicates higher feature values, and blue indicates lower feature values.
- MIRS LST has the most significant impact on the model output, followed by latitude and month.
- Other parameters shows different importance between daytime and nighttime case. Emissivity difference shows the least importance in the training model.

Feasibility Study on VIIRS LST downscaling Using Sentinel-2 Data

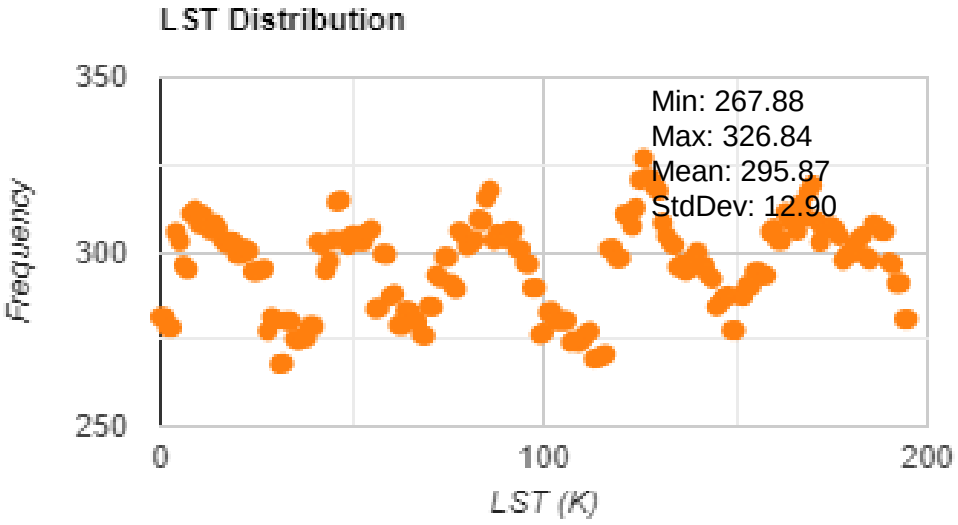
Data source at GEE:

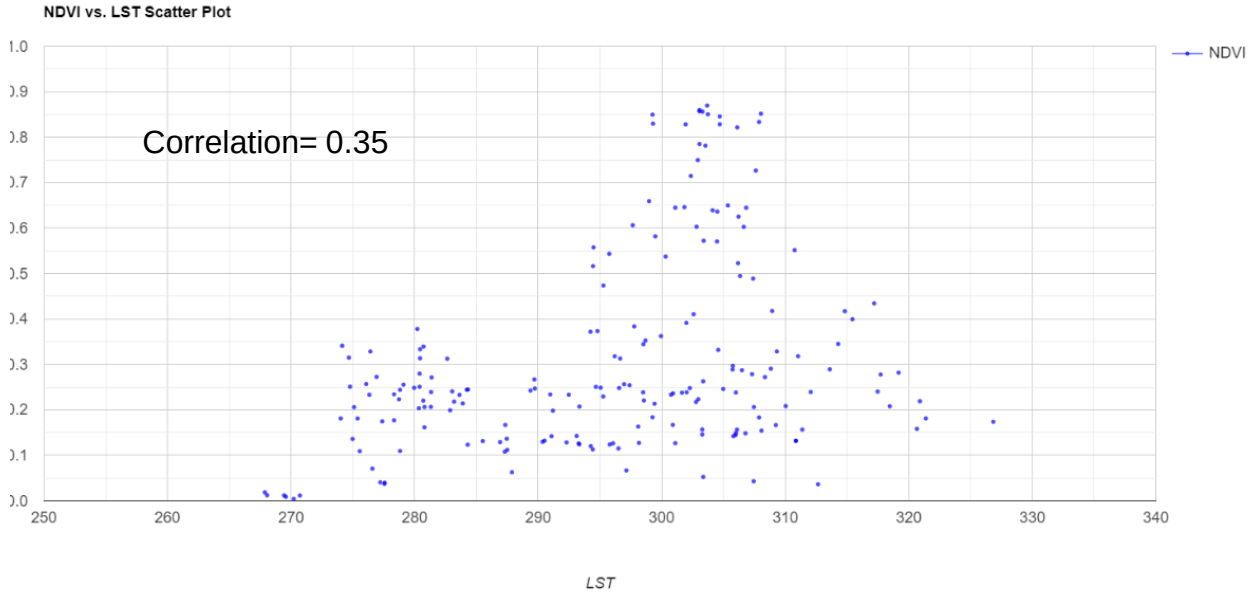
- Sentinel-2 surface reflectance
- VNP21A1 LST

- SNO availability of subpixel LST with high spatial resolution, such as Landsat LST, is very limited. The SNO is only available in high latitude area close to 70 degree in both the northern and southern hemisphere, making it unfeasible for VIIRS LST downscaling at a global scale.
- Sentinel-2 has no LST measurement due to lack of thermal infrared channels
- Sentinel-2 provides information on land cover, NDVI and other surface characteristics, which can be used for downscaling VIIRS LST



- NDVI is calculated using Sentinel-2 surface reflectance data (band B4 Red and B8 NIR) spanning from 12/15/2018 to 12/31/2023 for a geospatial area centered at SURFRAD Bondville Station
- Both sentinel-2 and VNP21A1 LST are cloud clear
- Temporally matched each date





MiRS Products

June 2024

Accomplishments / Events:

- As part of its participation in the JPSS Hydrology Initiative, a request was made to perform an analysis of a case study concerning a significant rain and flooding event that occurred in southern Brazil during late April and early May 2024. The MiRS science team analyzed several MiRS products from 5 different satellites (SNPP, N20, N20, MetopB, and MetopC) during this time period and showed that periods of heavy rainfall were observed by nearly all the satellites to varying degrees. Differences in daily and total accumulated rainfall were likely due to a combination of spatial sampling as the actual precipitation areas were observed at different viewing angles or, in some cases, not observed due to inter-swath spatial gaps. The highlight figure shows the accumulated rainfall for the 5 satellites.

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				

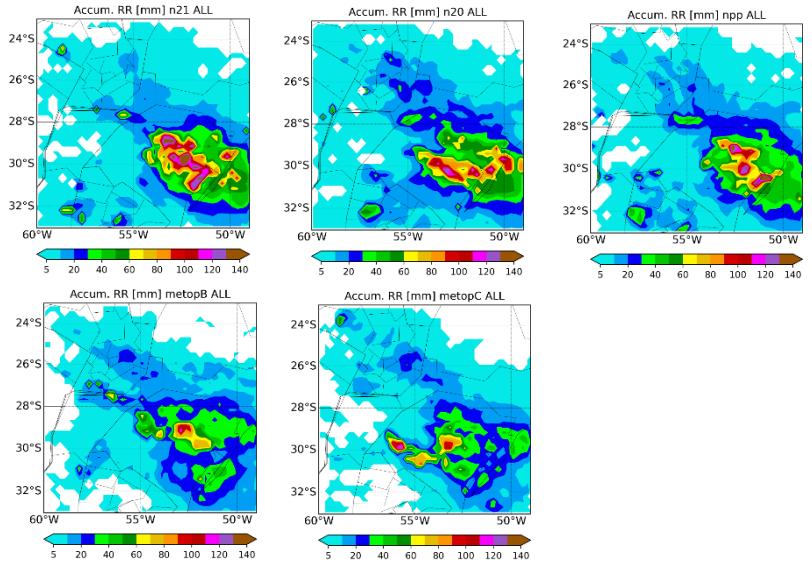
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NOAA-21 MiRS products from J2-Ready MiRS algorithm in support of ATMS TDR/SDR Beta Maturity	Nov-22	Nov-22	Nov-22	
NOAA-21 MiRS products from J2-Ready MiRS algorithm in support of ATMS TDR/SDR Provisional Maturity	Dec-22	Dec-22	Dec-22	
NOAA-21 MiRS product validations, Beta Maturity	Mar-23	May-23	Apr-23	Accelerated following JSTAR management request
NOAA-21 MiRS product validations, Provisional Maturity	Aug-23	Jun-23	Jun-23	Accelerated following JSTAR management request
MiRS DAP (v11.10): integrate SFR algorithm updates, code/science improvements, final J2 launch delivery	Feb-24	Feb-24	Mar-24	Delivered as per ASSISTT schedule.

Highlights:



Total MiRS accumulated rainfall (mm) over southeast Brazil during the period 23 April – 4 May, 2024 for 5 different satellites, N21, N20, SNPP, MetopB, and MetopC. Maximum accumulations exceeded 120 mm in some areas.

NOAA Products Validation System (NPROVS) and JSTAR Mapper/STEMS

July 2024

Accomplishments / Events:

.

- IMSG support contractors supporting JSTAR-Mapper / STEMS program were unavailable from June 26 through July 30 resulting in disruptions in Mapper operations, contractors returned on July 30 and restoral is underway; the site is currently operating at 85%.

- IMSG support contractors supporting NPROVS were unavailable from June 26 through July 30 and on June 30 the STAR FTP server used to transfers data files to NPROVS had a catastrophic failure, these events resulted in an effective shutdown of NPROVS during July. FTP was restored in mid-July and IMSG contractors returned on July 30, recovery and restoral of missed datasets is underway with full recovery anticipated by the end of August

- The JPSS / DOE InterAgency Agreement (IAA) for the dedicated radiosonde program was approved by NOAA and is now in the hands of DOE for their final approval; the FY24 purchase of JPSS dedicated radiosondes is expected before the September deadline

- The NPROVS team provided an assessment of “striping” occurrences in NUCAPS soundings observed over hot expansive terrains (ie desert) during daytime **(HIGHLIGHT)**

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
CPC Morphing (CMORPH) technique transferred from JSTAR Mapper to STEMS	Q2	Q2		
NPROVS Special expanded to integrate advanced GRUAN CFH moisture radiosonde	Q4	Q4		
JPSS Dedicated Radiosonde Programs expanded to include new Bankhead National Forest (BNF) ARM site in northwest Louisiana	Q3	Q3		
NPROVS User Support expanded to integrate new NWS NUCAPS–Forecast Product	Q3	Q3		IMSG Unavailable
NPROVS supports maturity review leading to operational NUCAPS for NOAA-21	Q2	Q2	Q2	

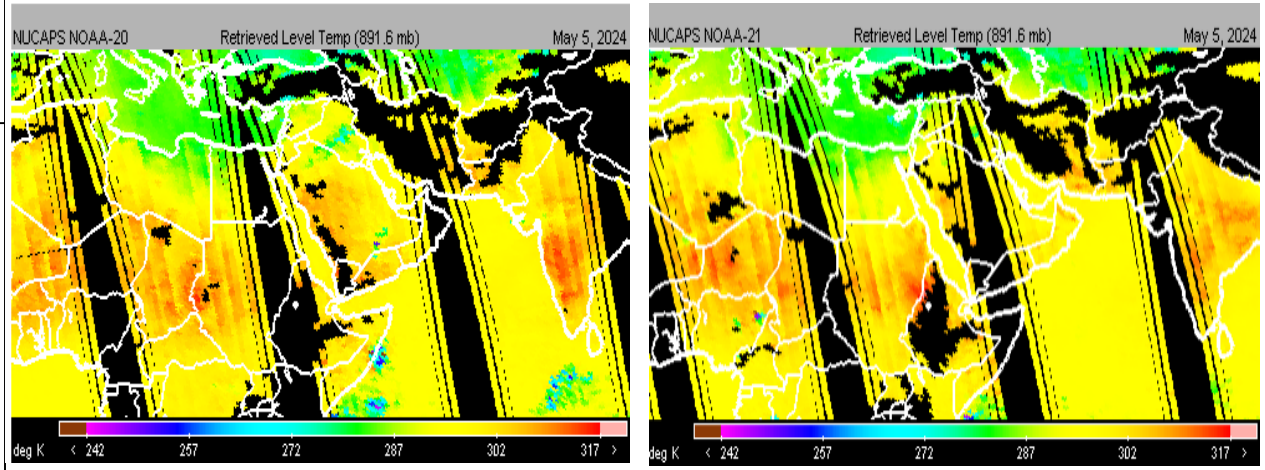
Overall Status:

	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



The above panels illustrate horizontal fields of NUCAPS temperature at 891 hPa (near the surface) on May 5 2024 for NOAA-20 (left) and NOAA-21 (right); data are for ascending node during the mid-afternoon. The region spans Africa to India which was undergoing a heat wave at this time with temperature at the surface in excess of 325K. Definitive striping can be observed for both satellites across the expansive desert regions of Africa (Sahara) and India (Thar). Preliminary investigation by the NPROVS team indicates that the striping is a daytime feature, lower troposphere, associated with the use IR channels; striping is not observed for NUCAPS Microwave-only soundings nor at night. The striping also appears in the first guess (not shown) and appears to originate in the NUCAPS cloud-clearing step. Investigation continues in coordination with the NUCAPS team.

Summary

- Striping evident during Daytime *when hot* … (*more for T than WVMR*)
- No striping evident at night
- No striping evident for MW-only
- Striping more evident for NOAA than for MetOp
- Striping more evident when IR+MW that fail QC are included

- *Striping evident in fgess*
- *Striping introduced via cloud clearing*

NUCAPS Products

July, 2024

Accomplishments / Events

- The ASTA contract lapse (July 2024) caused an unexpected pause to many ongoing activities and the NUCAPS team is currently gearing back to many of the validation and sustainment activities for the NUCAPS EDR products. These include:
  - Collection of validation data sets for the AVTP, AVMP, O3, OLR, CO, CH_4, and CO_2.
  - OLR product processing and continuation of validation exercises with NOAA-20 CERES
  - AEROSE-2024 data analysis adding the ECMWF analysis fields.
  - VALAR data processing and extending the VALAR data to April 2024.
  - TCCON measurements of CO, CH_4, and CO_2

•K. Pryor (SME) attended the inaugural Royal Meteorological Society (RMetS) Annual Weather and Climate Conference from July 8-10, 2024 and delivered the presentation titled "A Study of the 23 October 2022 Southern England Damaging MCS" during the High Impact Weather session on July 8, 2024 that highlighted innovative applications NUCAPS soundings.

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:

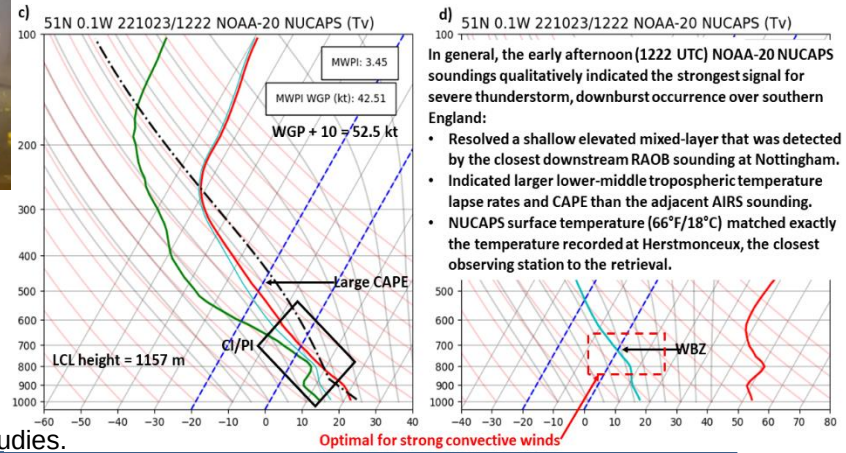
None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
DAP Delivery with updates related damping factor, surface corrections, MetOp-B/C Averaging Kernels	Oct-22	Oct-22	11/04/22	
NOAA-21 Ready NUCAPS product evaluations with the upcoming CrIS first light data and ATMS TDRs, and user support for the CrIS Beta Maturity Review	Feb-23	Feb-23	02/23/23	NOAA-21 K-band transmitter swap
NOAA-21 NUCAPS Product Beta Maturity	May-23	May-23	6/1/23	Beta attained effective 3/23
NOAA-21 NUCAPS T(p), q(p), O3(p), OLR, CO, CH4 and CO2 Provisional Maturity	Nov-23	Dec-23	Jan-24	Attained Validated Maturty
Implementing Validation Archive (VALAR) and focus-day data collections for NOAA-21 NUCAPS product validations	May-23	May-23	Mar-24	Continued updates to the data set
Addition of CAMEL emissivity database for the emissivity first guess	Mar-24	Jul-24	Delayed	Contract lapse and additional improvements
Mission-long reprocessing of NOAA-21 NUCAPS products: Reprocessing version and evaluation of reprocessed products	Jun-24	Jul-24	Delayed	Contract lapse and Additional improvements

- The ASTA contract lapse (July 2024) caused an unexpected pause to many ongoing activities and the NUCAPS team is currently gearing back to many of the validation and sustainment activities. sustainment activities for the NUCAPS EDR products. These

RMetS Weather and Climate Conference Presentation

Favorable outcomes of the Conference presentation:
U.K. Met Office invitation to present virtual seminars on NOAA-based satellite sounding applications; NUCAPS sounding delivery to WetterOnline, GmbH, for severe weather collaborative studies.



Ocean Color

July 2024

Accomplishments / Events:

- Continue working with the STAR IT team for the upgrade Linux to CenOS 9 for VIIRS global ocean color data processing.
- Worked with new ADL package for the CenOS 9 compatibility. We have now resolved the CenOS 7 to CenOS 9 issue.
- Routinely producing VIIRS (SNPP, NOAA-20, and NOAA-21) true color/false color images in OCView.
- Routinely producing VIIRS (SNPP, NOAA-20, and NOAA-21) global ocean color products.
- Started working on the mission-long VIIRS ocean color data reprocessing using the MSL12 ocean color data processing system.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Ocean Color J2 Provisional Code delivery to ASSIST	Apr-2024	Apr-2024		
Ocean Color Beta Maturity	Nov-2023	Mar-2023		
Ocean Color Provisional Maturity	Mar-2024	Mar-2024		
Ocean Color Validated Maturity	Jul-2025	Jul-2025	March 2024	

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

Issues/Risks: None

OMPS SDR

July 2024

Accomplishments / Events:

- Derived and delivered OMPS weekly dark LUTs for 3 NPs and NMs.
- Derived and delivered OMPS solar bi-weekly LUTs for 3 NPs.
- Completed a beta version of NOAA-21 OMPS NM/NP SL algorithm reports and ATBS, but the OMPS SDR ATBD is to be finalized (on-going work).
- Continued the ADR 10832 about degradation & solar activity impacts on 3NPs.
- Conducted the 07-09-GPS recovery analysis for SNPP OMPS SDR.
- Conducted the 07-25-CDP-reset recovery analysis for SNPP OMPS SDR.
- Improved the NOAA-21 OMPS NP wavelength shift estimate using a fitting algorithm.
- Work has been ongoing to update and refine the OMPS VCRTM package, along with a transition from J. Huang who left the team to X. Jin.
- Assessed NOAA-21 OMPS dark rate, gain and non-linearity trending and fixed a wrong dark table.
- Discovered an issue with the NOAA-21 OMPS NM ROTCC Calibration RDR

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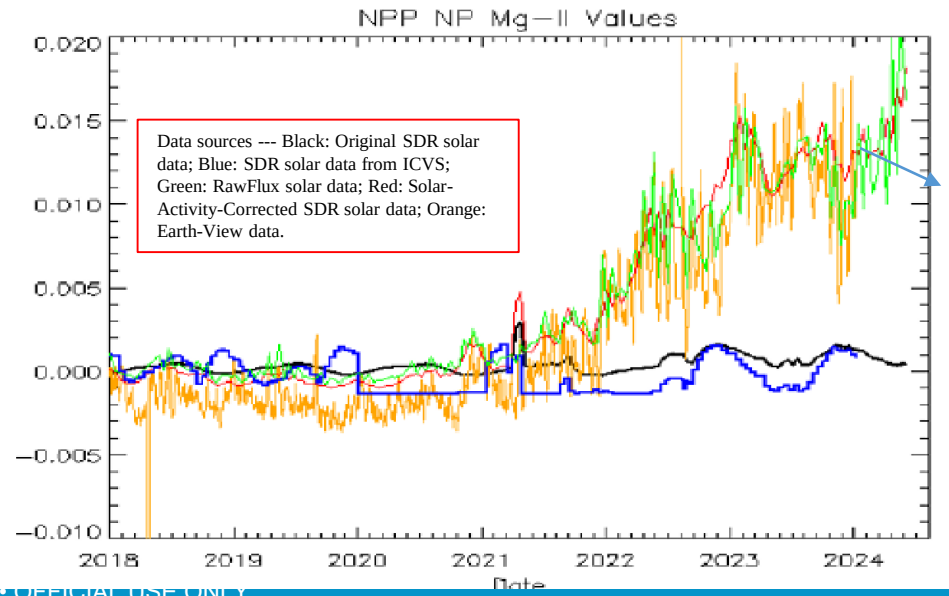
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Solar intrusion impact correction on NOAA-21 OMPS NP; OMPS solar activity impact analysis Note: The solar intrusion correction work is completed as far as deliveries and code changes go	Nov-23		Nov-23	
Investigation of the dark over-correction problem and an initial analysis of OMPS out-of-range of SL correction	Dec-23		Dec-23	
NOAA-21 solar day-1 improvement with solar activity impact correction; develop the out-of-range of SL table for N21 NM SDR; update the N21 NP ST LUT; compare with NASA datasets for NOAA-21 OMPS NM and NP SDR data (code is ready)	Jan-24	Feb-24		Day-1 improvement is on-going analysis
Improve latitude dependency of inter-sensor biases; reprocess (limited) N21 OMPS NM/NP SDR data sets (new dark LUTs); assess the consistency of N21 OMPS NM and NP at the dichroic range; conduct the inter-sensor comparison with Tropomi	Feb-24	Feb-24		
Finalize the NOAA-21 solar day-1 towards validated maturity; validate NOAA-21 OMPS SDR data quality using multiple ways (e.g., RTM, DCC, inter-sensor comparison with VIIRS); prepare NOAA-21 OMPS NM/NP SDR validated maturity review	Mar-24		Mar-24	
Reprocess the (SNPP, NOAA-20 and NOAA-21) OMPS NP SDR data by using the new dark, OSOL and SL tables; Initialize the OMPS and GEMS inter-sensor comparison analysis	May-24			
Document the technical reports (e.g., SL correction, solar intrusion correction, solar activity impact correction, NM along-track wavelength shift correction; update OMPS NM/NP SDR ATBD	Jul-24			
Develop new algorithm or code to support J3/J4 prelaunch testing and verification; analyze the pre-launch test data sets for J3 or J4 upon the availability of the data sets	Aug-24			
Pre-launch sensor characterization report upon available pre-launch instrument test data sets; reprocess SNPP, N20, and N21 OMPS NM SDR data using the updated LUTs; OMPS SDR enterprise Cal/Val plan updates	Sep-24			
Develop and deliver dark and OSOL LUTs for SNPP/NOAA-20/NOAA-21	Sep-24			
Maintain SNPP/NOAA-20/NOAA-21 OMPS SDR data quality	Sep-24			

SNPP OMPS NP Mg-II values Calculated Using Various Data Sources: Solar Activity Adjustment Impact



The solar activity correction (red) has had a distinct impact on resulting Mg-II values, changing from the Black curve to the Red curve, which matches the RawFlux and EV values much more closely.

OMPS Ozone (V8Pro, V2Limb & V8TOz)

March 2024

Accomplishments / Events:

- The Ozone Team provided evaluation of the NOAA-21 OMPS NM & NP SDRs for the Validated Maturity Review. The N21 SDR changes to reach validated maturity will require the development new V8TOz and V8Pro soft calibration adjustment tables. We are working with the SDR Team to obtain reprocessed data to make those changes.
- The NOAA-21 V2Limb Level 1 and Level 2 codes were delivered to ASSISTT as Beta Maturity codes. The Level 1 part of the codes will need some small revisions to correct the processing of the first of four scan for half of the granules. The other 7/8ths of the scans are processed correctly. There will also be a table update in April as NASA implements a planned change to the instrument sample table.
- The Ozone Team has provided detailed project and spending plans for FY24 support for JPSS and Metop funding.
- The Team supported the implementation of V8Pro at the provisionally validated status on the operational NCCF system effective March 21, 2024.
- The Team provided updates to the old operational TOAST codes following failures with the new NUCAPS algorithm implementation. These updates are already in the NCCF version. We had expected it to take over operational processing well before this NUCAPS update.

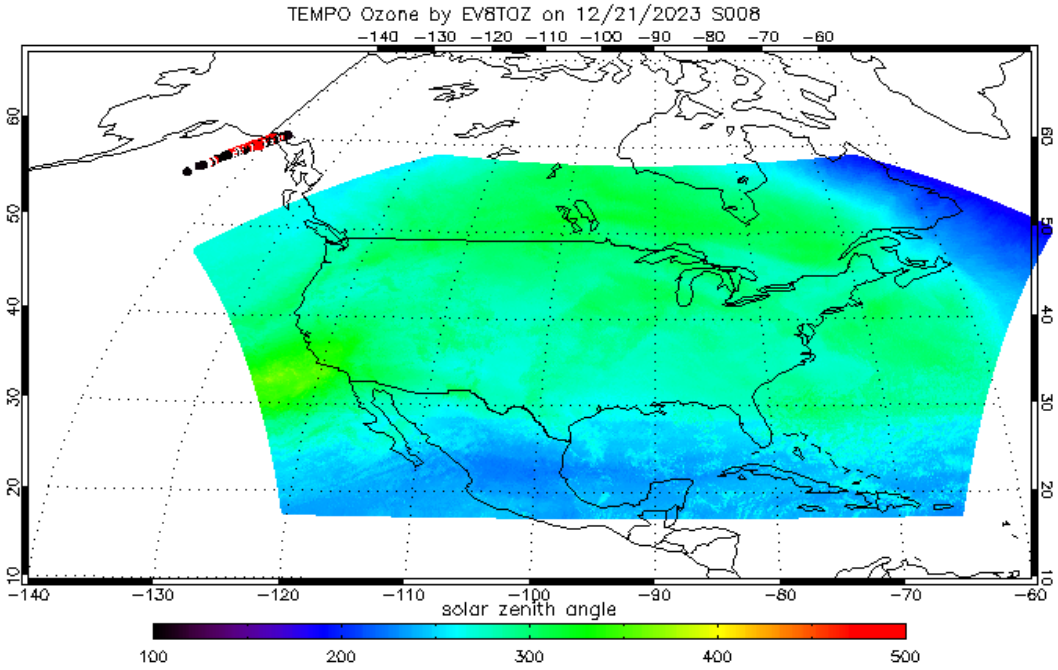
Milestones	Original / Current Date	Forecast Date	Actual Completion Date	Variance Explanation
Successfully complete GOME-2 NCCF ORR	Aug-23		Nov-23	
Provide new Level 1a, 1b & 1g for S-NPP OMPS V2Limb	Dec-22		Dec-23	NASA R&D
Provide Level 1a, 1b, 1g & 2 (aerosol and ozone) for NOAA-21 OMPS V2Limb to ASSISTT	Jan-23		Mar-24	NASA R&D
Update V8TOz and V8Pro tables for NOAA-21 Provisional	Feb-23 Mar-23		Aug-23 Dec-23	SDR Instability
Update V8TOz tables for Metop-B & -C	Apr-24	May-24		
N21 V2.7Limb to Beta	Jan-24	Apr-24		Timing Pattern
N21 V2.7Limb to Provisional	Feb-24	May-24		
N21 V2.7Limb to Fully Validated	Sep-24	Aug-24		
V8Pro to Fully Validated	Mar-24	Apr-24		SDR Progress
V8TOz & V8TOS to Fully Validated	Mar-24	Apr-24		SDR Progress
Reprocess NPP V8Pro for 2023	Apr-24		Mar-24	Dark Table
Reprocess N20 V8Pro for full record	Jun-24	TBD		SDR
J4 / N22 Revised Cal/Val Plan	Sep-24			

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		ProTech Follow-on, SDR instability, Limb Development

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: IMSG ProTech Contract follow-on Is still not in place.



Enterprise V8TOz Applied to TEMPO

Sea Surface Temperature

July 2024

Accomplishments / Events:

- We made progress towards migration of SST IT infrastructure from CentOS 7 (C7) to CentOS 9 Stream (C9S) and Red Hat Enterprise 9 (RHEL9). Several SST servers remain to be migrated from C7, but we have enough C9S servers to meet basic SST needs. For increased stability, we purchases RHEL9 licenses and are currently in the process of testing RHEL9 on the SST cluster. We expect all SST recent (purchase in last 5 years) servers to be converted to RHEL9.
- We presented the validation section of the ACSPO L3S Algorithm/Operational Readiness Review (ARR/ORR) meeting on July 2. Operational production and distribution of L3S-LEO PM and PM SST products is planned to commence on August 8. The figure in the lower right shows a slide from the presentation where imagery quality between the four L3S-LEO products (PM/AM; day/night).
- We made updates to ACSPO cloud mask filters based on comparison of modeled and measured reflectance in VIIRS M7 and M10 bands. We updated the model from a simple empirical regression formula to a lookup table based on solar zenith and glint angles. Improvement (reduced over screening) in glint and twilight regions is considerable.
- Delivered updated Cal/Val plan document to JPSS

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			

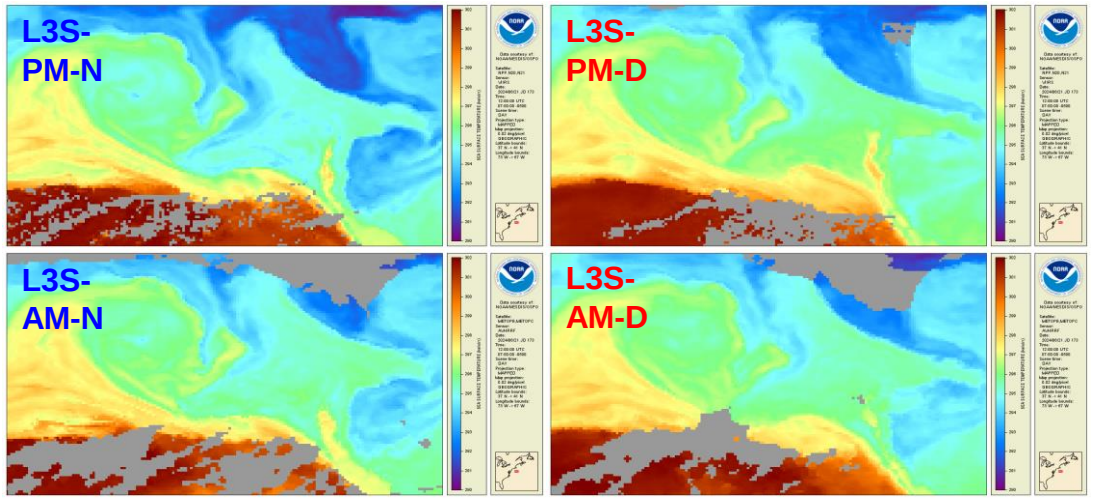
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Our FY24 hardware purchase request was denied, and we were instructed to prepare for migration to cloud. However, the viability of a path to cloud is uncertain, posing significant risk to future reprocessing efforts.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
SST EDR support to SDR team on Warm up - Cool down anomalies	Feb-24	Feb-24	Jan-22	
SST EDR Support to JPSS-3 Data System Test Event *(Dependency on JPSS)*	~~Apr-24~~	~~Apr-24~~		Delay due to dependency on JPSS test event; new timeline unknown
SST EDR Enterprise Cal/Val and ACSPO Algorithm "Agency Report" Presentation to GHRSST science community	Jun-24	Jun-24		
SST EDR Enterprise Cal/Val Plan Initial Updates	Jul-24	Jul-24		
Promote experimental iQuam updates to live access	Aug-24	Aug-24		
SST EDR Validated Maturity Review	22-Aug-24	22-Aug-24	Feb-20	

***Highlights*: L3S-LEO Algorithm/Operational Readiness Review (ARR/ORR)**



Example slide from L3S-LEO ARR/ORR review presented by the SST science team on July 2, 2024. Figure compares L3S-LEO PM/AM day/night SST imagery from the Gulf Stream on May 21, 2024.

Snowfall Rate

July 2024

Accomplishments / Events:

- The SFR team has completed cross calibrating SFR for all operational satellites: S-NPP, NOAA-20, NOAA-21, NOAA-19, Metop-B, Metop-C, and GPM. By histogram matching each satellite with “truth data” that’s composed of Stage IV (radar + gauge), CloudSat space-borne radar CPR, and ECMWF reanalysis ERA5 snowfall data, this effort significantly improved product inter-satellite consistency (Highlights).
- The updated SFR, v2r0, is currently running in NCCF UAT. This package includes the Validated NOAA-21 and GPM SFR. The SFR science team ran a validation study on the products produced in the UAT system and confirmed their validity. SFR v2r0 is scheduled to start operational production on Aug 8.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Enhance the machine learning snowfall detection model using N21 observations	Jan-24	Jan-24	Jan-24	
Enhance the machine learning models for 1DVAR initialization and SFR bias correction using N21 observations	Jan-24	Jan-24	Jan-24	
Validation of NOAA-21 snowfall detection and rate estimation algorithms	Feb-24	Feb-24	Feb-24	
NOAA-21 SFR provisional maturity review	Feb-24	Feb-24	Feb-24	
Enterprise SFR science code delivery to ASSISTT including N21 provisional maturity SFR	Feb-24	Feb-24	Feb-24	
Cross validation among NOAA-21, NOAA-20, and S-NPP SFR products	April-24	April-24	April-24	

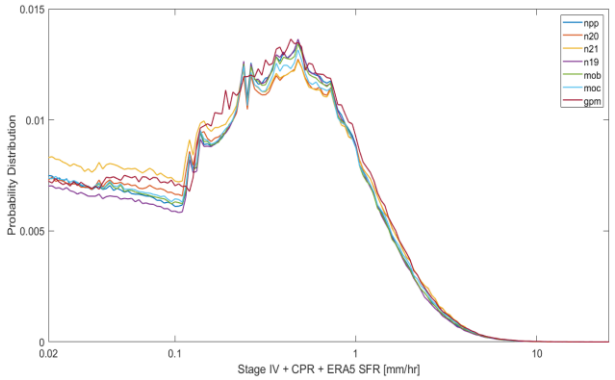
Overall Status:

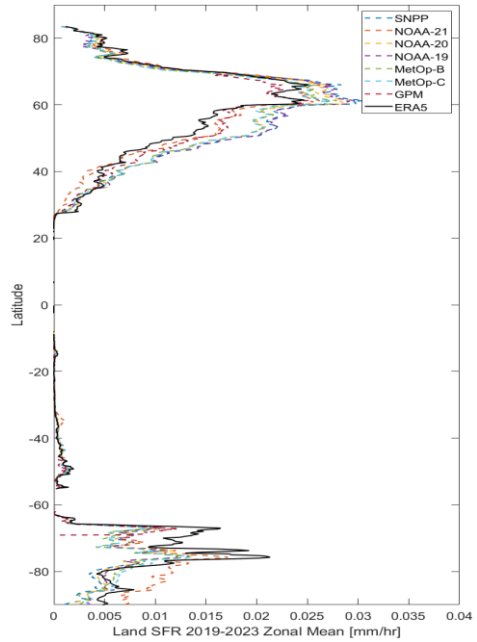
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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:





Left: Probability distribution of the “truth data” for histogram matching SFR in an effort to cross-calibrate the product. The similar distributions for all satellites indicate the consistency of the “truth data”.
Right: SFR zonal mean from all satellites and ERA5. There is an overall agreement among the satellites and ERA5.

Surface Albedo

July 2024

Accomplishments / Events:

- Finished the VIIRS Albedo PMR presentation
- VIIRS BRDF test and verification to prepare for the algorithm delivery (Slides **#2-3)**
- Cooperated on the monthly anomaly observation webpage (Highlights)
- Finished the CISESS annual reports
- Discussed the SNPP and JPSS-1 reprocessing plan

Overall Status:

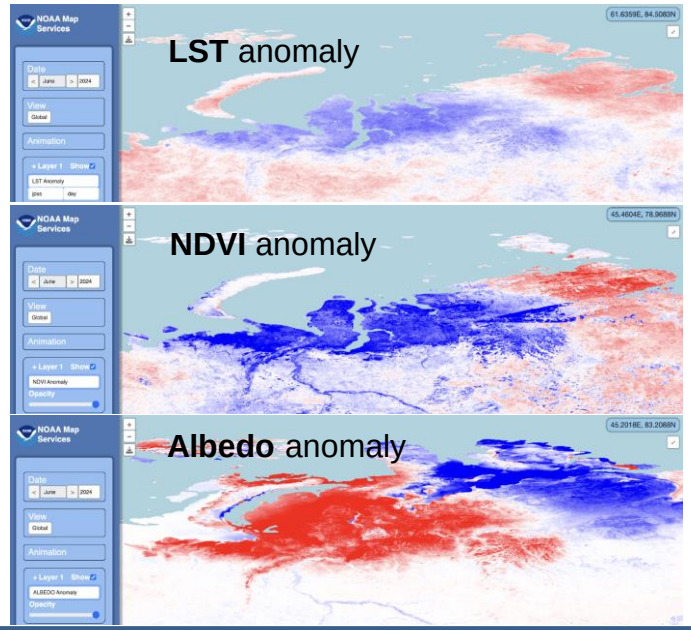
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

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

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion	Variance Explanation
Share the soil albedo dataset with model users	Dec-2023	Dec-2023	Dec-2023	
Multi-parameter anomaly analysis report	Jan-2024	Jan-2024	Oct-2023	
Provisional maturity of NOAA-21 Albedo	Feb-2024	Jan-2024	Jan-2024	
VIIRS BRDF/Albedo/NBAR Dataset to User	Oct-2023	May-2024	Oct-2023	
BRDF evaluation (manuscript)	Dec-2023	Feb-2025		Need some contents of the integrated output
Enterprise Cal/Val Plan Initial Updates	Jun-2024	Jun-2024	Apr-2024	
*NCCF Integration of BRDF/BSA/WSA/NBAR	May-2024	Aug-2024		Postpone to Sep-24
Software package ready of blended SURFALB from all VIIRS sensors	Jun-2024	Dec-2024		Team member change
NOAA-21 validated maturity review	May-24	Sep-24	Jan-2024	

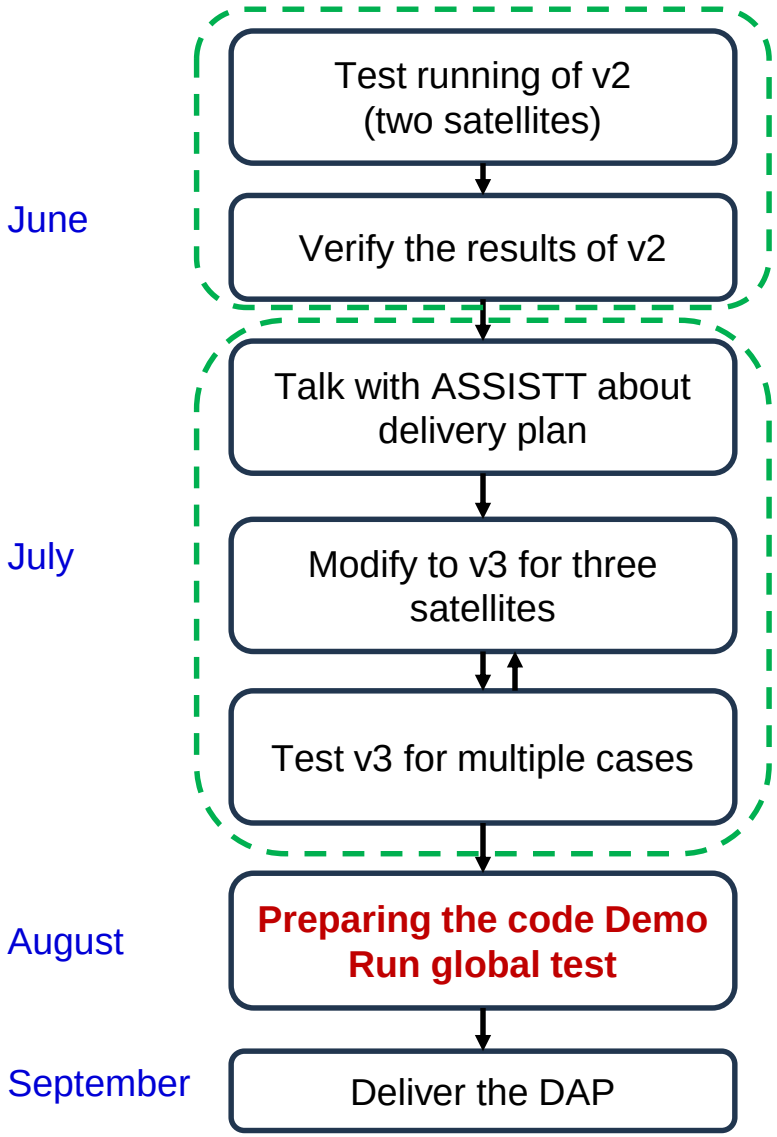
Highlights: Albedo anomaly with vegetation



Since May 2024, the lower temperatures (negative LST anomaly) in Northern Russian have led to:

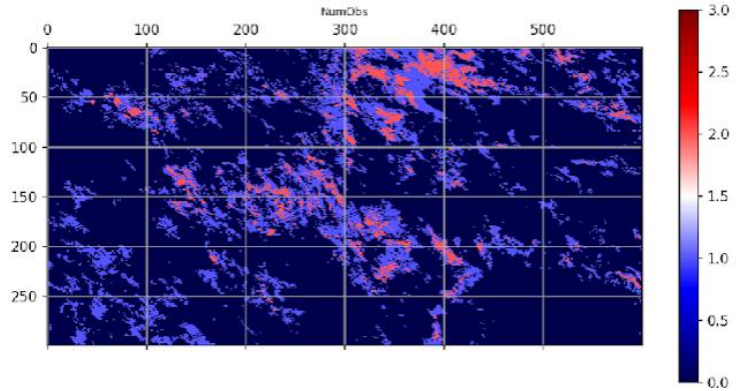
- Slow plant growth and delay the green-up, leading to lower NDVI.
- Less vegetation cover typically increases surface albedo, as bare ground or stressed vegetation often reflects more light than healthy, dense vegetation.

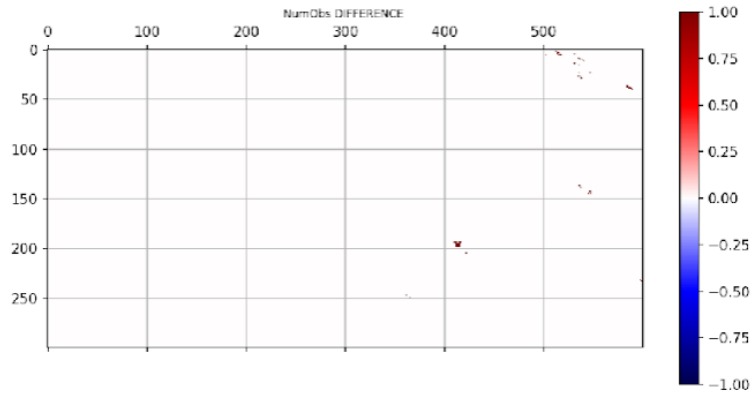
VIIRS BRDF program preparation



Last week, we have finished:

- Finished the test of v3 BRDF retrieving unit
- Compared the output from VIIRS snow mask and IMS snow mask

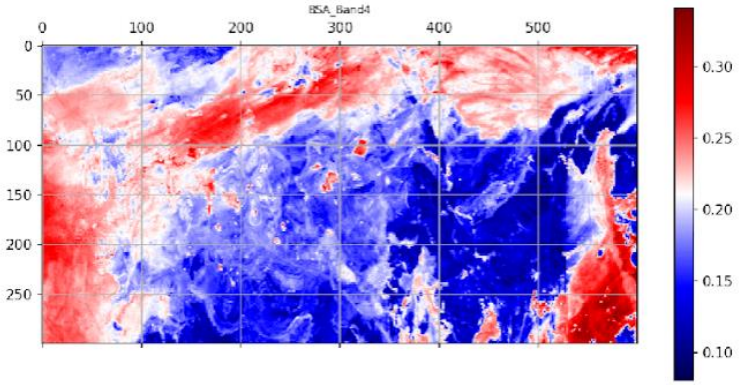




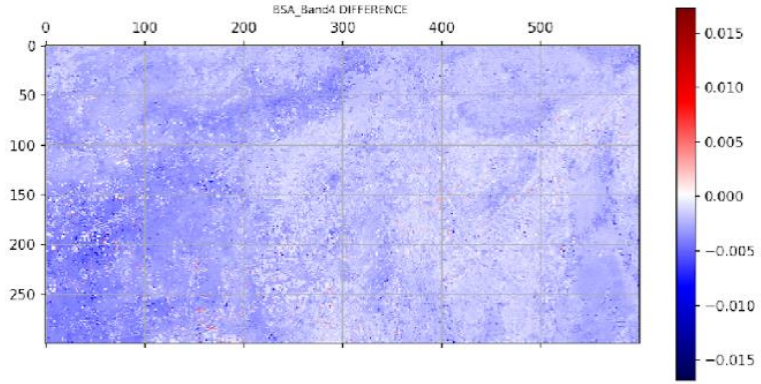
Test tile: h51v23 (in Asia)
Test timestamp: Jul 09, 2024
Data source: S-NPP, JPSS-1, JPSS-2
Results: The IMS shows a slightly more scattered snow distribution, which may slightly influence the availability of snow-free observations.
Proposed action: Global test is needed to assess the overall impact.

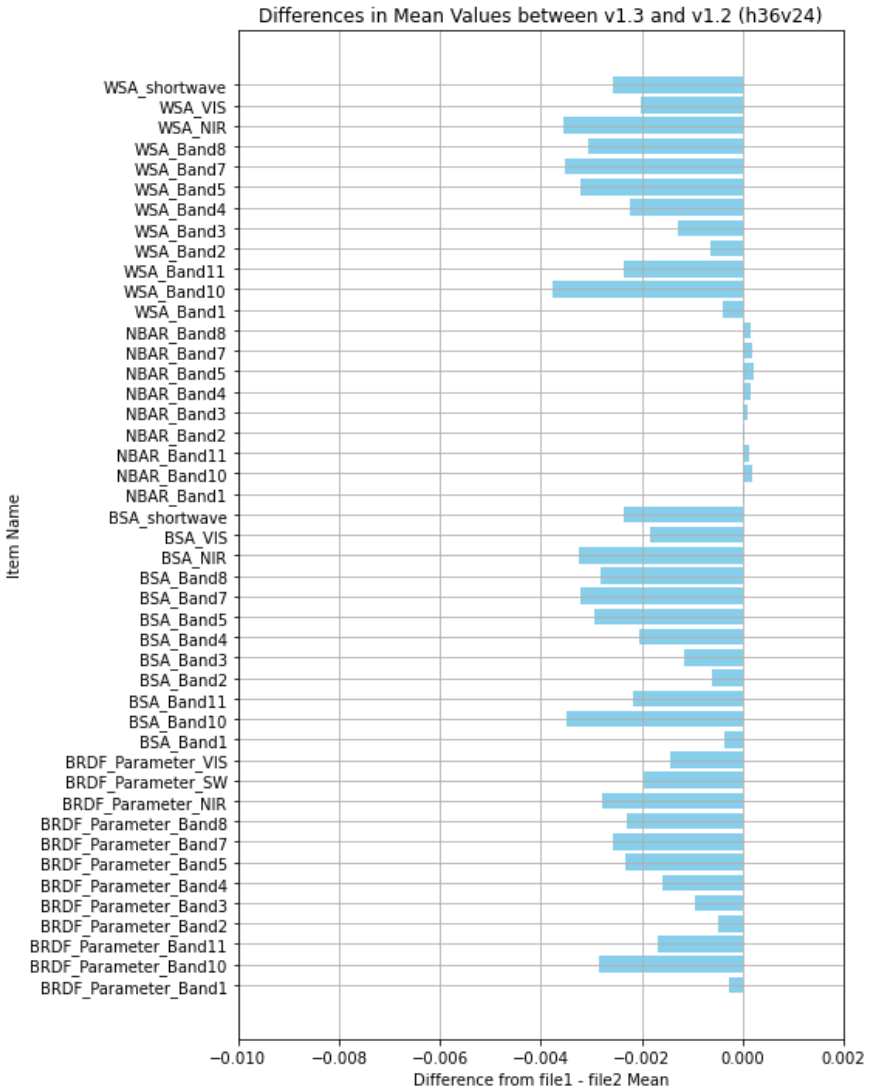
VIIRS BRDF Algorithm Unit Test

BSA_Band4



V1.3 – V1.2





Test tile: h36v24 (in Asia)
Test time: Mar 01, 2023
Data source: S-NPP, JPSS-1, JPSS-2
Cause: The BRDF kernel model was modified by adding the hotspot factor and shade factor restriction.
Results: The BSA, WSA, BRDF decrease by <0.004 in all bands, and NBAR does not change much.
Proposed action: Global test is needed to assess the overall impact.

VIIRS albedo and BRDF Reprocessing

Product	Input	Data source	Concern	Feasibility
Shortwave Albedo	Reprocessed SDR	AWS	SNPP data lacks nearly two years.	A new server and corresponding labor will be planned
	GMTCO	AWS		
	GFS	Team		
	SSMI	Server		
	IMS Snow	Server		
BRDF and spectral albedo	Surface Reflectance	Team		
	GMTCO	AWS		
	IMS Snow	Server		

Surface Reflectance

July 2024

Accomplishments / Events:

- Keep work on the reprocessed surface reflectance to address the inconsistence issue in JPSS satellites, evaluated the two approaches (NOAA reprocessed SDR and NASA re-calibration coefficients).
- Prepare for the SR reprocessing, include investigating the data dependence and availability, reprocessed algorithms and the approaches.
- Explore the new SR measurements for the validation, the NEON airborne SR datasets are investigated, the data coverage, spectral and spatial features, and the calibration and atmospheric correction method and performance.
- Working on the diagnose of the OSPO SR monitoring about the warning data, verify the data quality and the monitoring criteria.

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			

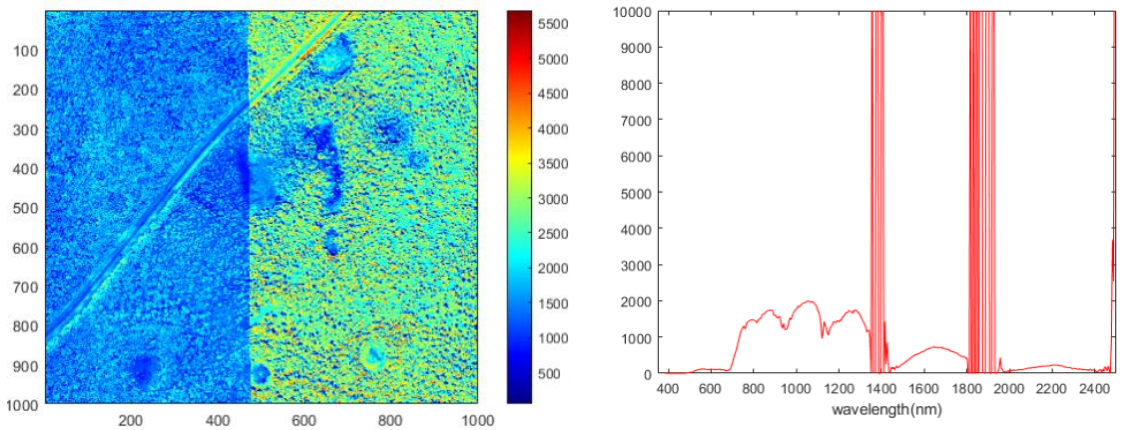
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NCCF SR DAP redelivery and verification	Sep-23	Sep-23	Sep 20, 2023	
Mitigation algorithm development for the dust aerosol model	Dec-23	Dec-23	Dec 19, 2023	
Provional Maturity of NOAA-21	Feb-24	Feb-24	Jan 25, 2024	
The JPSS (SNPP, N20, N21) SR consistency evaluation and correction	Mar-24	Mar-24	Mar 28, 2024	
GOES-R enterprise SR algorithm development and experimental product	Jun-24	Jun-24	Jun 28, 2024	
Operational Readiness Review (ORR) for NDE Migration to NCCF	Aug-24	Aug-24		

Highlights:



Explore the ground measurement for SR product validation, The NEON Image Spectrometer data is investigated, as the figure show the image and spectral.

VIIRS Reprocessed SDR

SR Reprocess objective:

- Use latest and unified the Algorithms and LUTs (v1r3 correct the I1 band issues)
- Try to use the reprocessed SDR to handle the inconsistence issue among JPSS satellites.
- Generate long term consistent data record.

SR Product dependence:

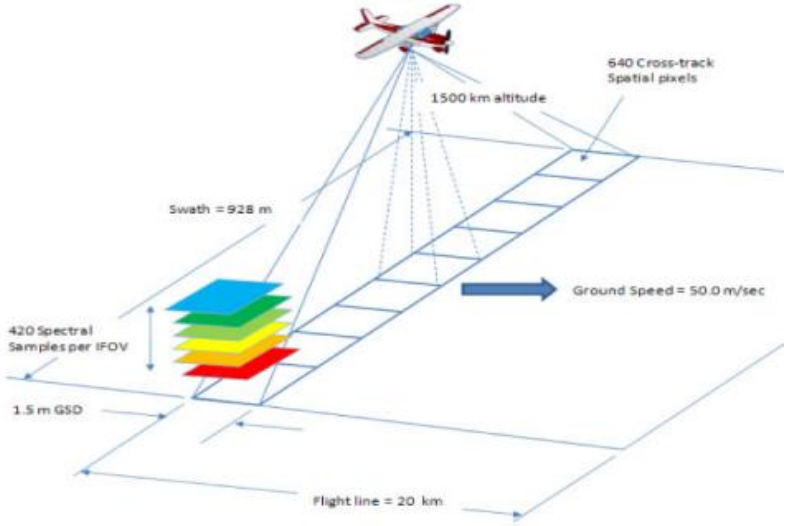
- SDR & GEO (operational one, and reprocessed one)
  - 2014/04-2020/04, SNPP
  - 2018/01-2022/12, N20
- AOD (AOD550, aerosol model), Reprocessed data available
  - 2012/01-2022/12, SNPP
  - 2021/01 N20
- Cloud Mask and Cloud Height
  - Not found yet
- GFS data (surface pressure, TPW, O3)
  - Available

•Downstream products need reprocess

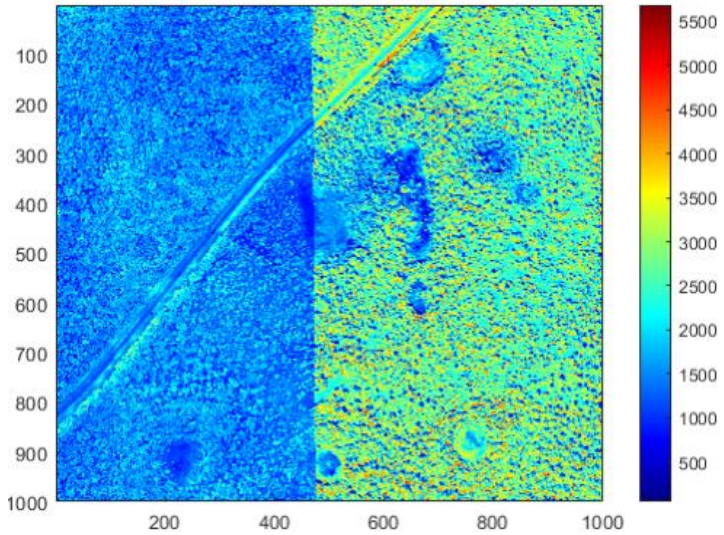
- VIIRS VI/GVF

SR Ground Measurements For Validation.

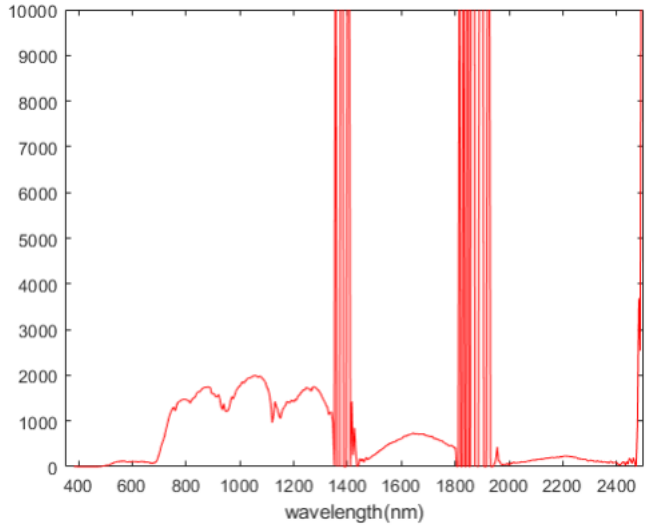
- To complement the AERONET validation, in-situ validation is investigated for the SR product.
  - Background: the current primary approach is AERONET validation, however, this method is based on same TOA reflectance but atmospheric measurements, so it is not independent validation.
  - Ground measurements: The RadCalNet ground Reflectance are widely used for calibration and validation, however, the data is limited. Other high-quality measurements are limited. The NEON sites with regular airborne image spectrometer measurements.
  - Data: the NEON image spectrometer (NIS) data collect in a yearly campaigns over NEON sites in the CONUS area, with 426 bands from 0.38 to 2.5 um, the flight cover an area of 5-20km by 0.6km, with ground resolution of 1m.
  - NIS derived surface reflectance through calibration and atmospheric correction.



Flight Geometry of NEON image spectrometer



NIS image of NEON site (DSNY)



NIS spectral of NEON site (DSNY)

Surface Type

July 2024

Accomplishments / Events:

- STAR-UMD VIIRS Surface Type team has downloaded and processed S-NPP, NOAA-20, and NOAA-21 VIIRS daily granule surface reflectance data acquired in July of 2024 for the production of AST-2024.
- The team prototyped a surface type dataset updated for monthly H_2O (including surface water, snow/ice, and sea ice) cover change at the global scale (see highlights). The results were presented at the 2024 Asia Oceania Geosciences Society (AOGS) Annual Meeting with the following title:
  - Towards Monthly Data Product of H_2O Cover of the Earth's Surface for Global Surface Type Mapping.
- The team is working on the following towards completing the production of AST2023 to be delivered to STAR JPSS and users: Post-processing of AST2023, updating the training and validation polygons, and updating the surface type ATBD.

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.*

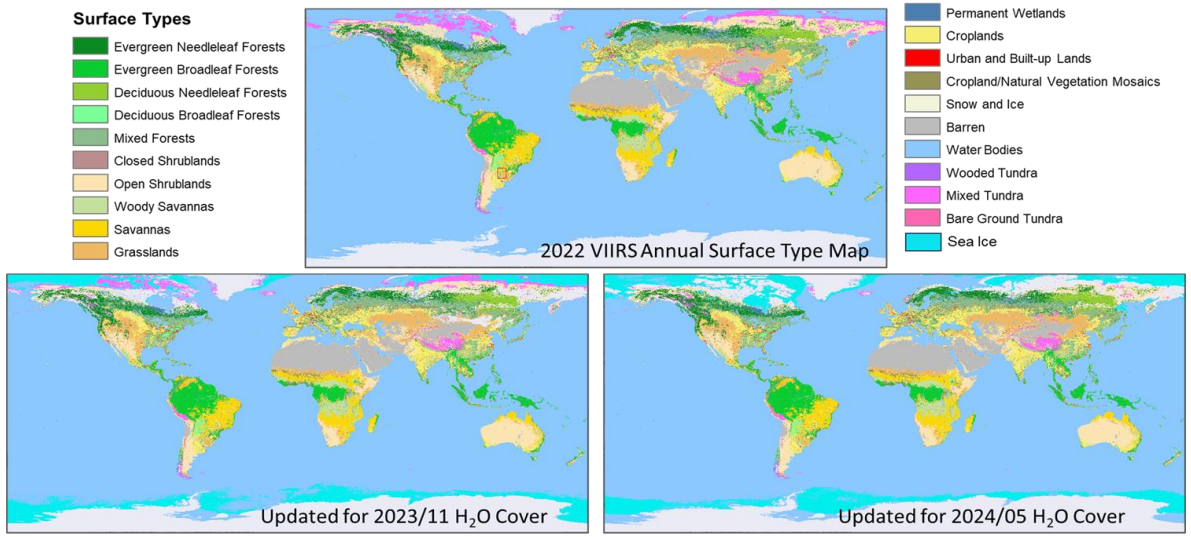
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Monthly update of the 250m global water surface fraction product	Each M.	Each M.	Each M.	
Complete global monthly composites for each of 2024 months	Each M.	Each M.	Each M.	
Generate global annual classification metrics for 2023	May-24	May-24	May-24	
AST23 of IGBP 17 type map	Aug-24	Aug-24		
AST23 for EMC 20 type map	Aug-24	Aug-24		
AST23 Validation Statistics and delivery to JSTAR and users	Sept-24	Sept-24		

Highlights:

Annual Surface Type Product Updated for Monthly H_2O Cover Captures Large Changes in Snow and Sea Ice Cover



Globally, the most dramatic surface type changes on a monthly basis are the seasonal changes in H_2O cover (including water, snow cover, and sea ice). A prototype global monthly H_2O dataset made it possible to update the AST data for H_2O changes on a monthly basis. This illustration highlights the large seasonal changes in snow cover and sea ice in the north and south pole regions.

Vegetation Health

May 2024

Accomplishments / Events:

- Continued monitoring of vegetation health as indicated by publications of weekly vegetation health products (VHP) from currently operational NOAA-20 VIIRS observations via STAR webpage at https://www.star.nesdis.noaa.gov/smcd/emb/vci/VH/vh_browse.php
- Continued the development of the new code for 500m NOAA-20/21 VIIRS VHPs production/operation;
- Continued monitoring the heat wave development in southern Asia using VIIRS Vegetation Health Indices data products and found the regions suffering severe heat wave have shifted from Southeast Asian countries (e.g. Vietnam, Thailand, Cambodia, Laos and Myanmar) to India and Pakistan within the past month from early May to early June as shown in the maps of Thermal Stress derived from Temperature Condition Index (TCI). The severe heat wave in northwestern India has caused more than 50 deaths as reported by many major media news (e.g. https://www.eastmojo.com/features/2024/06/04/map-record-breaking-heat-in-india).

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NOAA-21 Vegetation Health Beta Maturity	Sep-23	Sep-23	Sept-23	
NOAA-21 Vegetation Health Provisional Maturity	Apr-24	Apr-24	Sept-23	Maturity reached before plan
NOAA-21 Vegetation Health Validated Maturity	Apr-24	Apr-24	Sept-23	All VIIRS EDRs declared Validated Maturity

Overall Status:

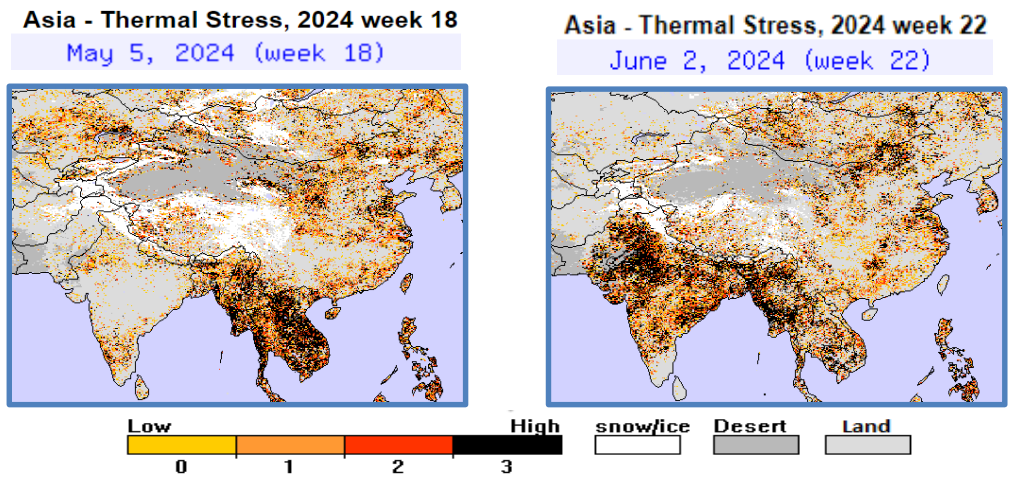
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

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

Highlight: Southern Asia heat wave regions have shifted from southeastern Asian countries in early May to India and Pakistan in early June. More than 50 deaths caused by the heat waves in India in early June, 2024.



Vegetation Index and Green Vegetation Fraction

June 2024

Accomplishments / Events:

- Intern started, obtained Sentinel 2, MODIS and VIIRS data and started making subsets.
- Completed PMR slides.
- Preparing high resolution VI manuscript for journal submission
- Finished 15 week EVI production and produced experimental blended GVF product
- Finished 1 month test run of producing VI and GVF from Vegetation Health module

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.*

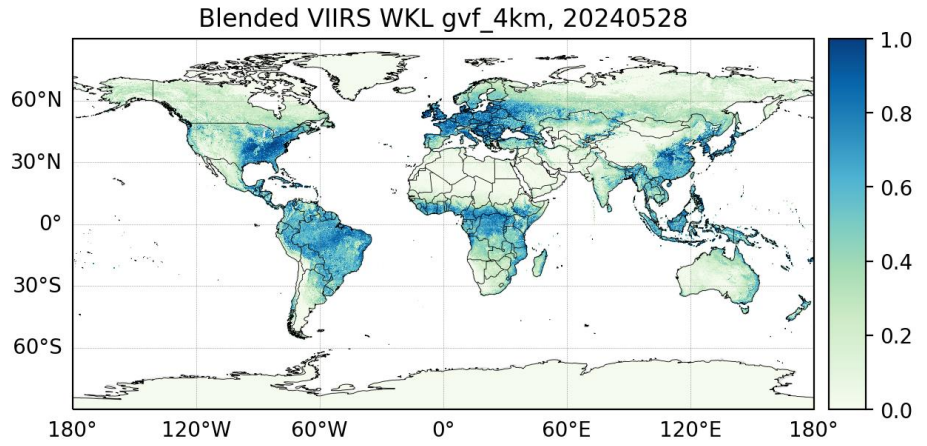
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
1km global VIIRS VI code and documentation ready for delivery	Oct-23	Nov-23	Nov-23	Personnel access to NOAA systems issues
NOAA-21 VI and GVF provisional maturity review	Jan-24	Jan-24	Jan-24	
Higher-resolution regional VI and GVF domain extended to global	Feb-24	Apr-24		On hold pending PCR
Experimental data test of blended VI and GVF products	Apr-24	Jul-24		Delays to previous milestone and personnel departure
Support to JPSS-3 Data System Test	Apr-24	Apr-24		No J03 test data will be available this year
Readiness for NCCF migration	Aug-24	Aug-24		
Annual algorithms/ products performance report	Aug-24	Aug-24		
Calibration/ Validation update for SNPP and NOAA20 VI and GVF products,	Sep-24	Sep-24		

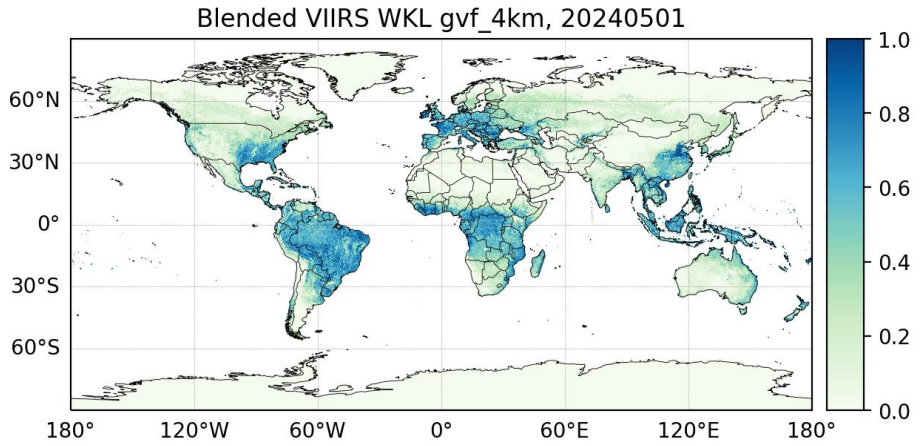
Highlights:

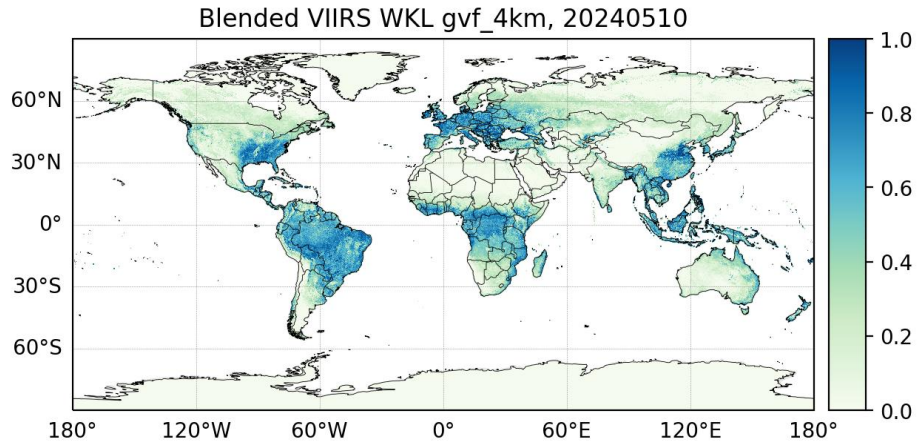
Experimental global GVF product for 7 day period ending May 28, 2024

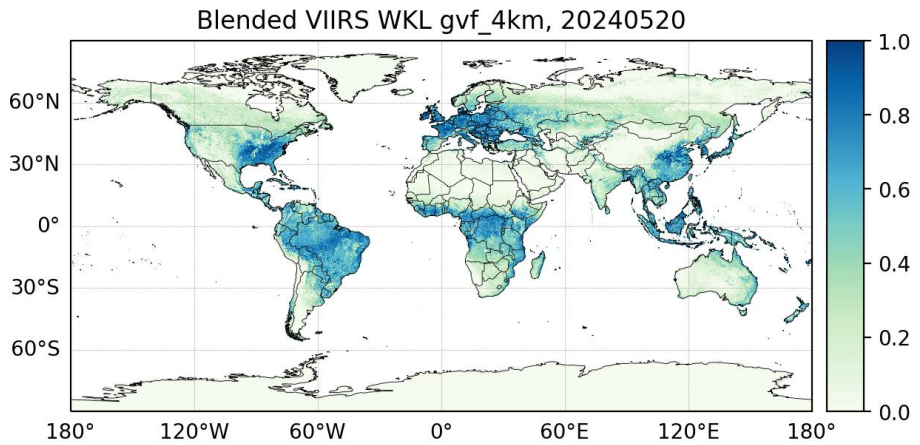


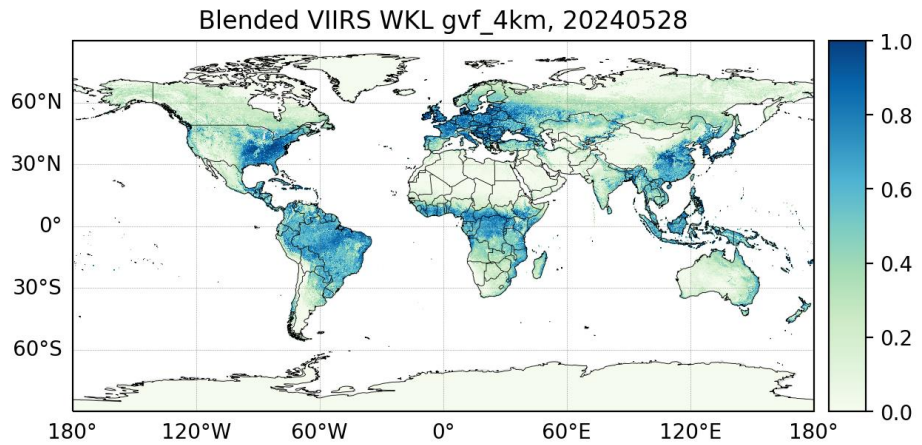
Blended global GVF product

- Experimental blended global GVF product in May 2024



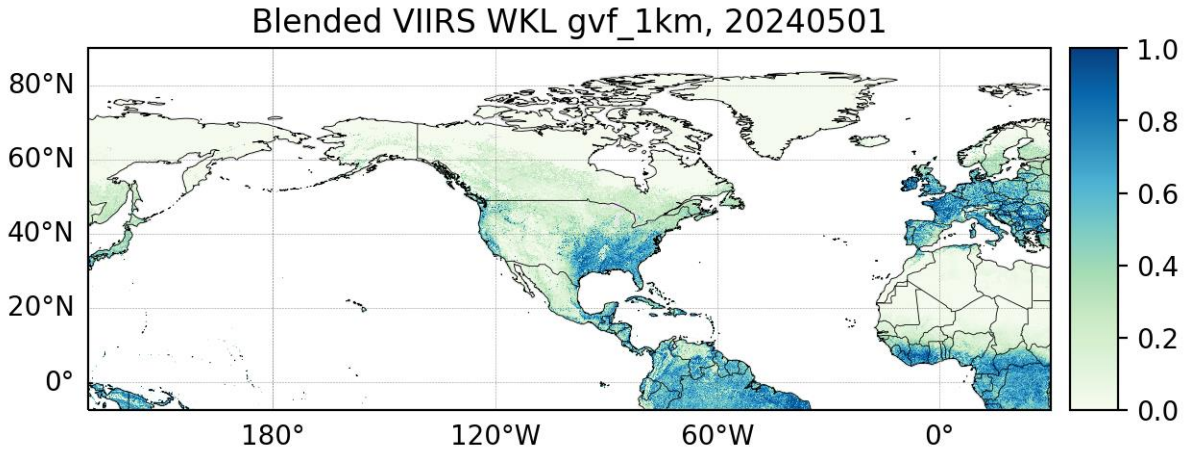


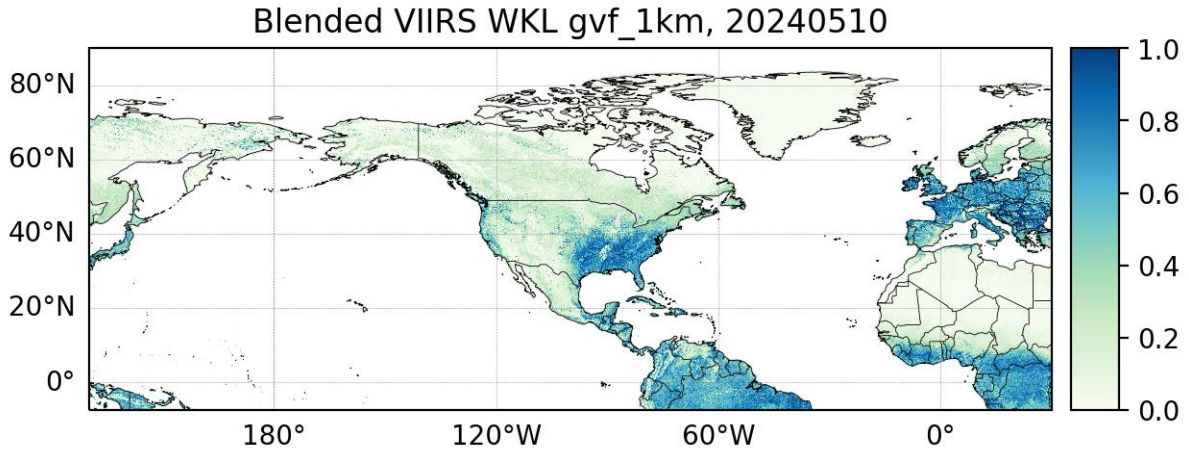


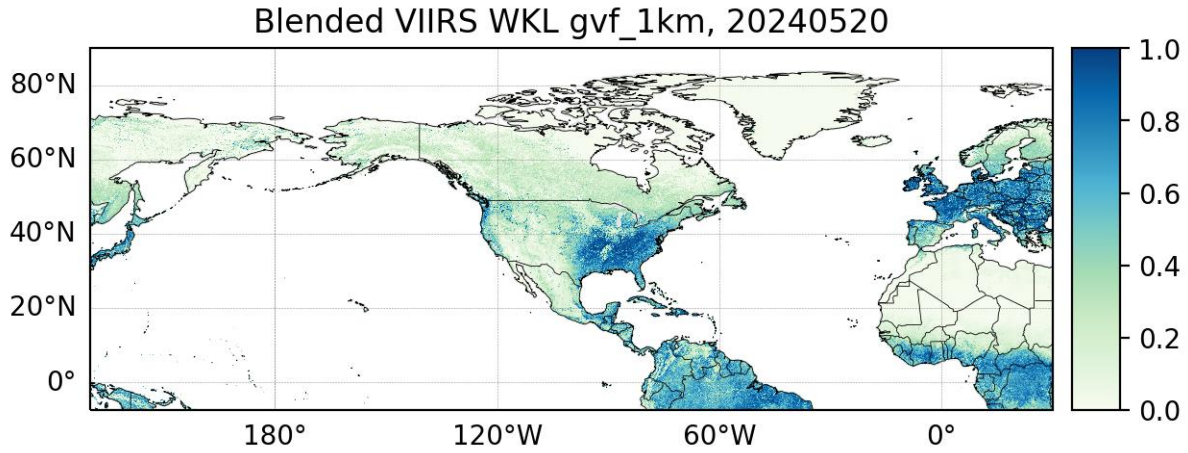


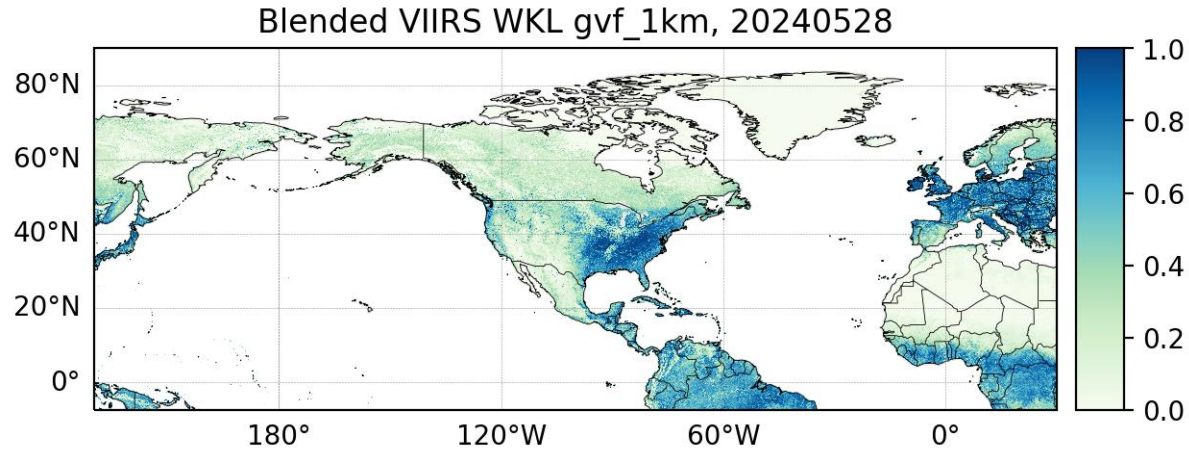
Blended regional GVF product

- Experimental blended regional GVF product in May 2024









FY25 Milestones/Deliverables

	Milestone	Start	Finish	Deliverable	Requirement (Dev Only)
1	Problem find/solve, Responses to OSPO and users	Aug-25	Sep-25	Reports as needed	
2	Product Annual Validation Report	Aug-25	Sep-25	Slides	
3	Test blended VI and GVF products for suitability for operational production	Oct-24	Jan-25	Code and test data	
4	Anomaly watch, analysis and report	Oct-24	Sep-25	Report as the cases come up	
5	Reprocessing readiness of SNPP and NOAA-20 VI and GVF data records	Jan-25	May-25	Reprocessed data	
6	Evaluation of methods for handling data gaps in GVF 15 weeks of historical data	Oct-24	Jan-25		GVF requirements
7	Further development of 20m VI downscaling	Jan-25	Jun-25	Code and examples	VI requirements
8	Algorithm development for AI-based GVF derivation and validation	Feb-25	Aug-25	Experimental code and test data	GVF requirements
9	Experimental version of VI and GVF production combined with Vegetation Health	Apr-25	Sep-25	Experimental code and test data	VI and GVF requirements

D	I	C	M	L
Development	Integration &Testing	Calibration & Validation	Maintenance	LTM & Anomaly Resolution

Vegetation Index and Green Vegetation Fraction

July 2024

Accomplishments / Events:

- Evaluation of blended VI and GVF products complete. GVF product was similar to both SNPP and NOAA-20 GVF, which were also very similar to each other.
- Working on integration of vegetation health product.
- Completed CISESS annual report.
- Working on algorithms/ products performance report
- Intern continued making subsets of Sentinel 2 and MODiS data and began preparing final presentation

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.*

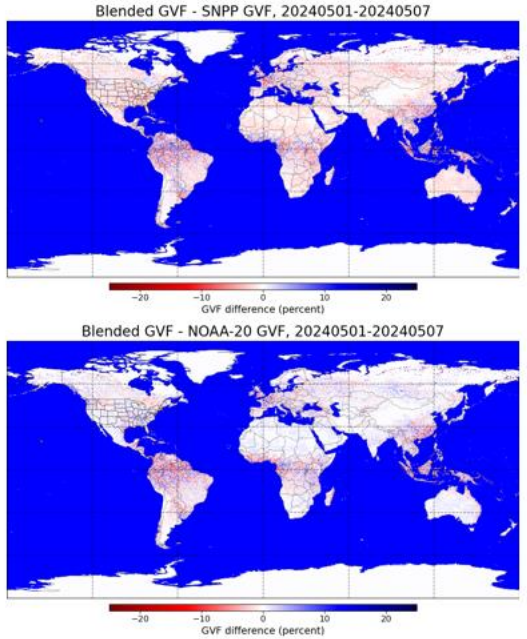
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
1km global VIIRS VI code and documentation ready for delivery	Oct-23	Nov-23	Nov-23	
NOAA-21 VI and GVF provisional maturity review	Jan-24	Jan-24	Jan-24	
Higher-resolution regional VI and GVF domain extended to global	Feb-24	Apr-24		On hold pending PCR
Experimental data test of blended VI and GVF products	Apr-24	Jul-24	Jul-24	
Support to JPSS-3 Data System Test	Apr-24	Apr-24		No J03 test data will be available this year
Readiness for NCCF migration	Aug-24	Aug-24		
Annual algorithms/ products performance report	Aug-24	Aug-24		
Calibration/ Validation update for SNPP and NOAA20 VI and GVF products,	Sep-24	Sep-24		

Highlights:

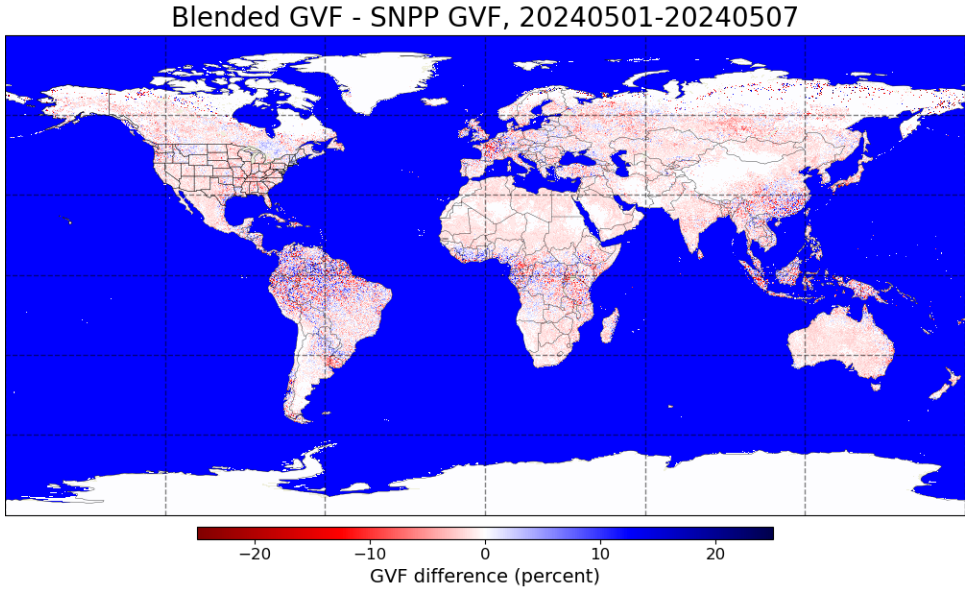
- Difference images of blended GVF vs. SNPP and NOAA-20 GVF are shown.
- Blended GVF tends to be slightly less than SNPP values and slightly greater than NOAA-20 values
- Differences are small (not very visible on scatterplot and in histograms).

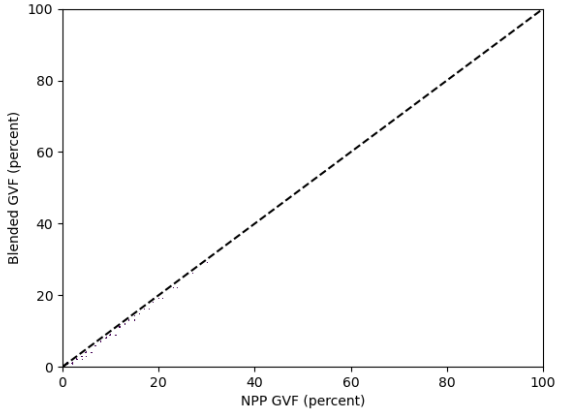


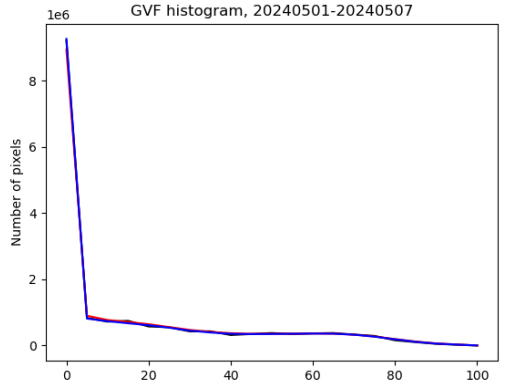
Blended GVF evaluation procedure and results

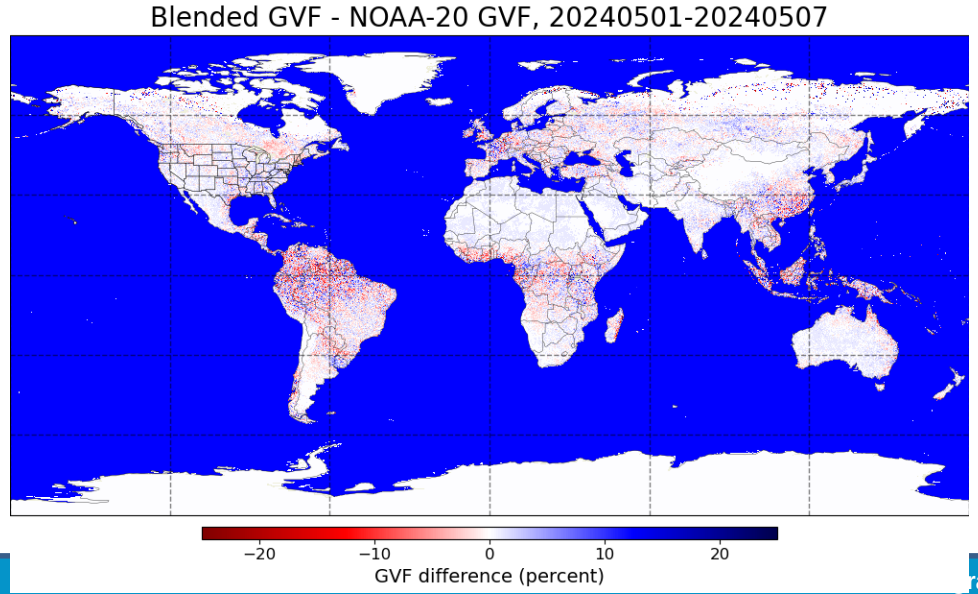
- Blended global GVF was compared to SNPP and NOAA-20 GVF for two time periods, 20240501-20240507 and 20240520-20240526
- Images, difference images, scatterplots, and histograms were made
- Blended data tended to be slightly less than SNPP values and slightly greater than NOAA-20 values
- Differences were small
- It is recommended that blended product replace single-satellite products for ease of use, once more analysis has been done to verify blended product quality and consistency over longer time periods

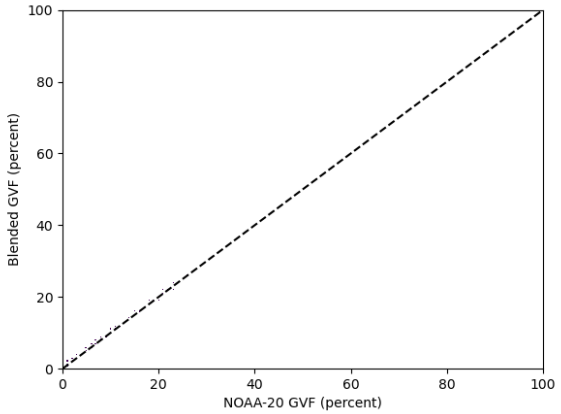
20230501-20230507 blended vs. SNPP and NOAA-20 GVF difference images, scatterplots, and histograms

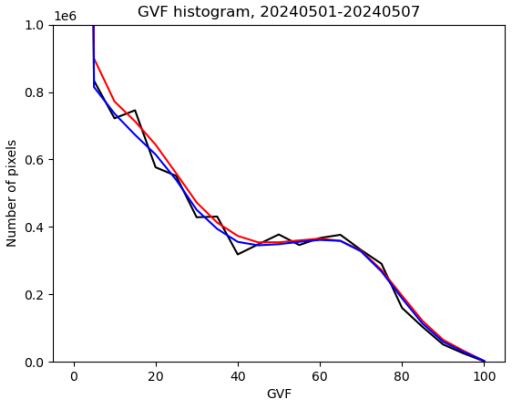






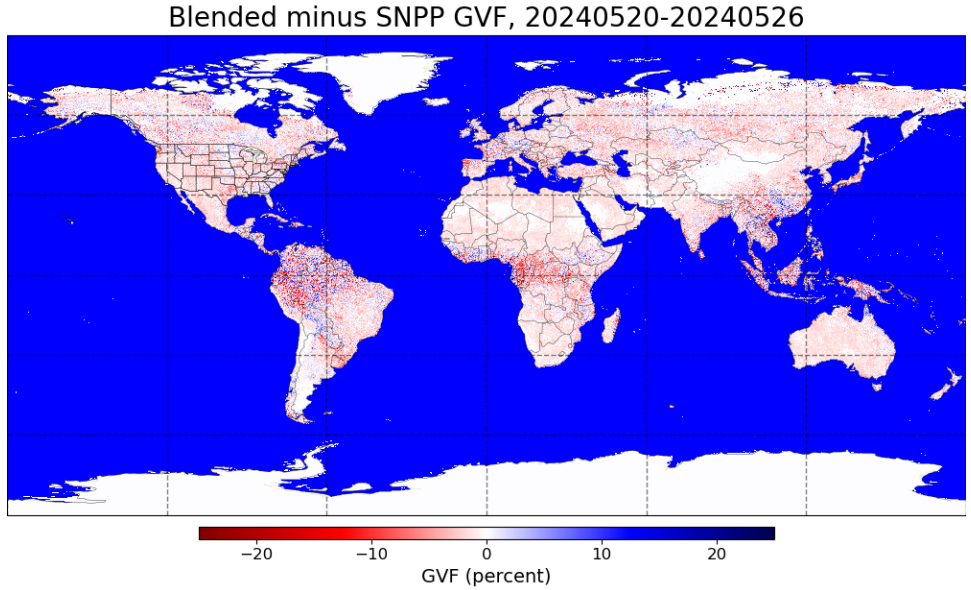


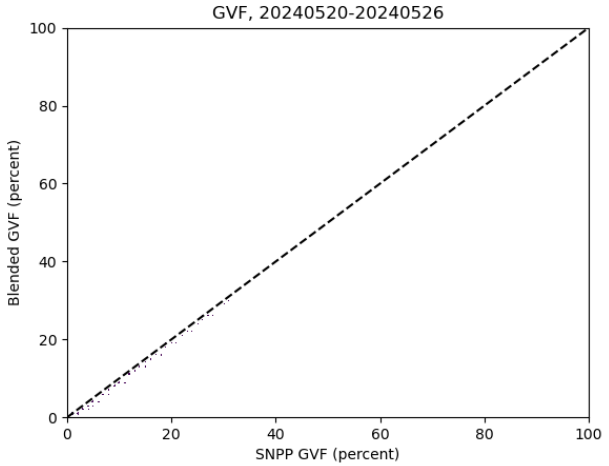


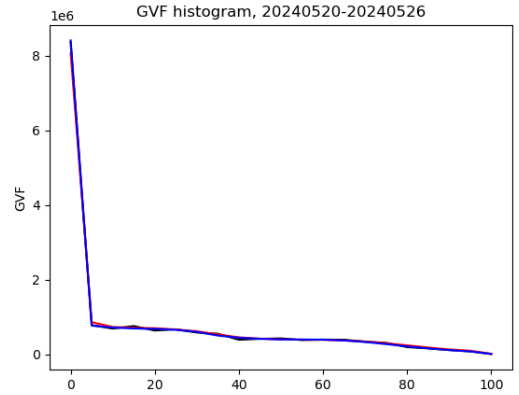


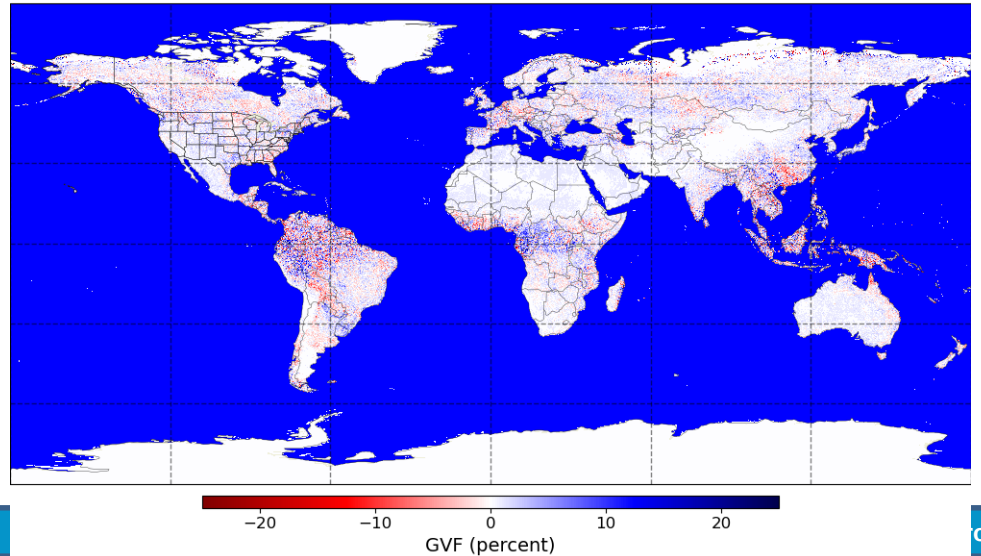
Blended
SNPP
NOAA-20

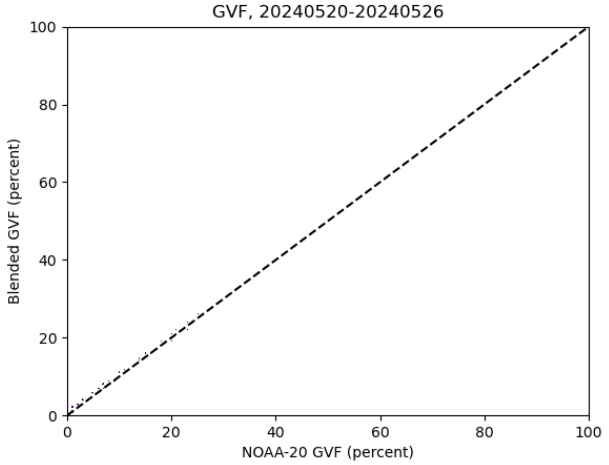
20230520-20230526 blended vs. SNPP and NOAA-20 GVF difference images, scatterplots, and histograms

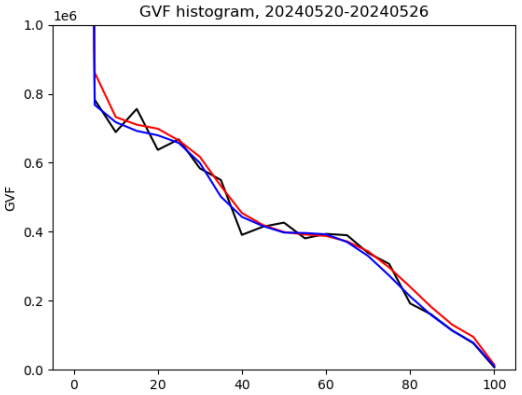












Blended
SNPP
NOAA-20

VIIRS SDR

July 2024

Accomplishments / Events:

- Supported recovery from several JPSS satellite anomalies: S-NPP GPS on 7/9/2024-7/16/2026, NOAA-21 GPS on 7/20/2024, and S-NPP CDP reset with the sun-pointing safe mode on 7/24/2024
- Generated and began testing about 30 (out of 44) initial pre-launch JPSS-3 VIIRS SDR LUTs
- Began monitoring progress of the JPSS-3 satellite (observatory) TVAC tests and processed with ADL the generated VIIRS data to identify datasets for development of the IDPS granule-size code change and the initial pre-launch VIIRS SDR LUTs
- Generated and delivered for deployment in the IDPS operations the updated NOAA-21, NOAA-20 and S-NPP VIIRS SDR DNB DN0 and GAIN-RATIOS LUTs that were created based on data acquired around the new moon on 7/5/2024
- Paper "Preliminary Assessment of On-Orbit Radiometric Calibration Challenges in NOAA-21 VIIRS Reflective Solar Bands" was published in the peer-reviewed *Remote Sensing* journal (https://www.mdpi.com/2072-4292/16/15/2737)

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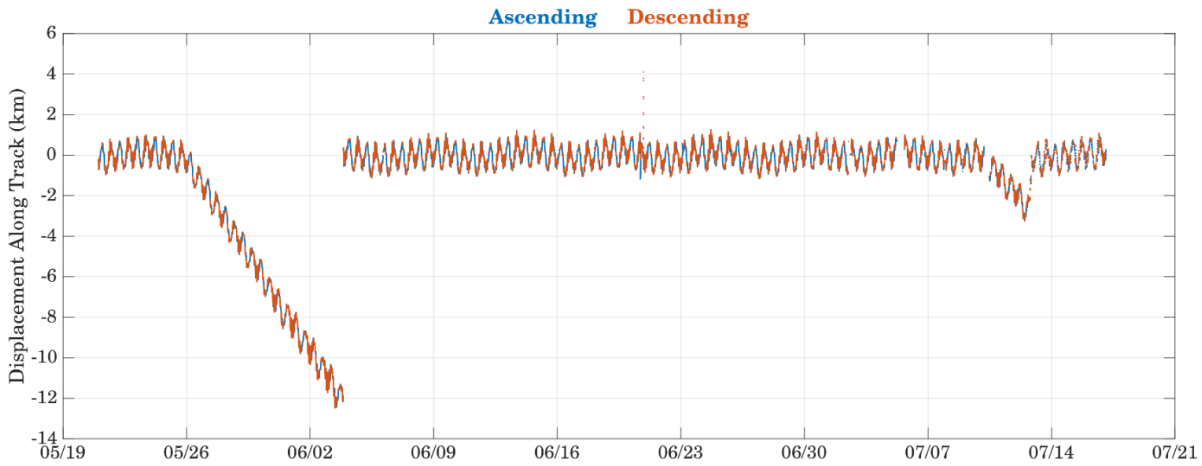
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

J3/J4 VIIRS granule size change test data for IDPS

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Complete SNPP VIIRS SDR 2012-2020 reprocessing delivery to CLASS	Dec-23	Dec-23	Oct-23	
SNPP and NOAA-20 VIIRS intermediate recalibration	Sep-24	Sep-24		
JPSS-3 VIIRS pre-launch characterization report	Apr-24	Jun-24	6/28/2024	
JPSS-3 VIIRS SDR initial pre-launch LUTs	Jun-24	Sep-24		J3 Obs. TVAC
Monthly lunar calibration (predictions and analyses)	Jul-24	Jul-24	6/18/2024	
Monthly delivery of VIIRS DNB calibration LUTs	Sep-24	Sep-24		
Monthly delivery of N21 VIIRS DNB straylight LUTs	May-24	May-24	5/16/2024	
Geolocation monitoring using CPM (NPP, N20, N21)	Sep-24	Sep-24		
N21 on-orbit calibration LUT development	Sep-24	Sep-24		
Delivery of VIIRS SDR RSB and TEB calibration LUTs to mitigate degradation	Sep-24	Sep-24		

Highlights:



Predictions of the Suomi NPP VIIRS along-track geolocation errors during the recent GPS anomalies: good agreement with observed errors during the anomaly in June 2024, but not during the one in July 2024, indicating another source of the navigation errors (resolved by 7/16/2024)

Volcanic Ash

July, 2024

Accomplishments / Events:

- Quality/Oversight Continued to ensure high quality Volcanic Ash retrievals from EDR algorithms and VOLCAT. Routine validation of existing JPSS volcanic ash EDRs from current sensors will continue as needed, including support for ASSISTT/NDE evaluations. VOLCAT is long-term plan.

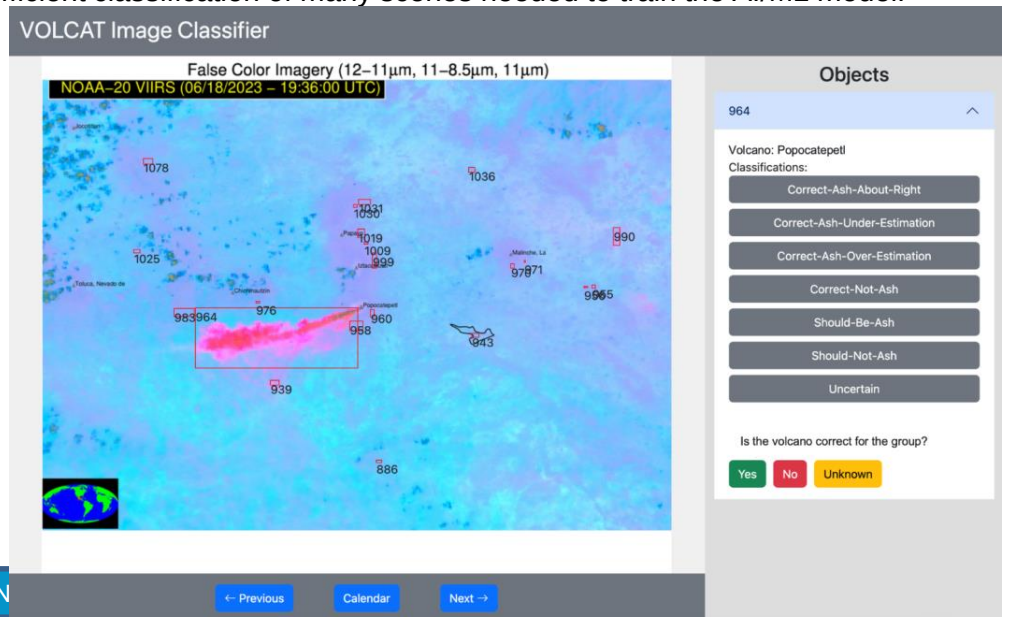
- VOLCAT VIIRS volcanic ash plume identification and extraction work is an enhancement to the VOLCAT methodology. The most recent research focus has been developing a web-page based tool to manually classify VOLCAT volcanic cloud objects by a science team expert (as yes (containing volcanic ash) or no (not containing volcanic ash)). This will enable a full training database to be generated for ash and non-ash clouds for training the AI/ML methodology, including both detected and missed volcanic clouds by the current VOLCAT algorithm. The included figure shows an example of the nearly finalized web-tool that will allow the VOLCAT science team to quickly classify VIIRS scenes and store the information in a database to be used to train the AI/ML methodology.

Overall Status:

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

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

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Develop updated user training material	May-23	May-23	May-23	
Improve VIIRS volcanic ash plume identification and extraction	Jun-23	Sep-24		
Improve near source VIIRS volcanic ash height information	Jul-23	Jul-23	Jul-23	
NOAA-21 Volcanic Ash Beta Maturity	Sept-23	Aug-23	Aug-23	
NOAA-21 Volcanic Ash Provisional Maturity	Oct-23	Aug-23	Aug-23	
Maintain and monitor quality of volcanic ash EDR and JPSS-based products in VOLCAT	Sep-23	Sep-23	Sep-23	
NOAA-21 Volcanic Ash Full Maturity	Mar-24	Mar-24	Feb-24	

Highlights: Example of nearly completed web-tool to classify VIIRS scenes as containing or not containing volcanic ash. The web-tool and associated database will allow for rapid and efficient classification of many scenes needed to train the AI/ML model.