



## NOAA JPSS Monthly Program Office

# AMP/STAR FY25

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April, 2025

# Highlights from the Science Teams (March)

## ICVS alert to CrIS data anomaly

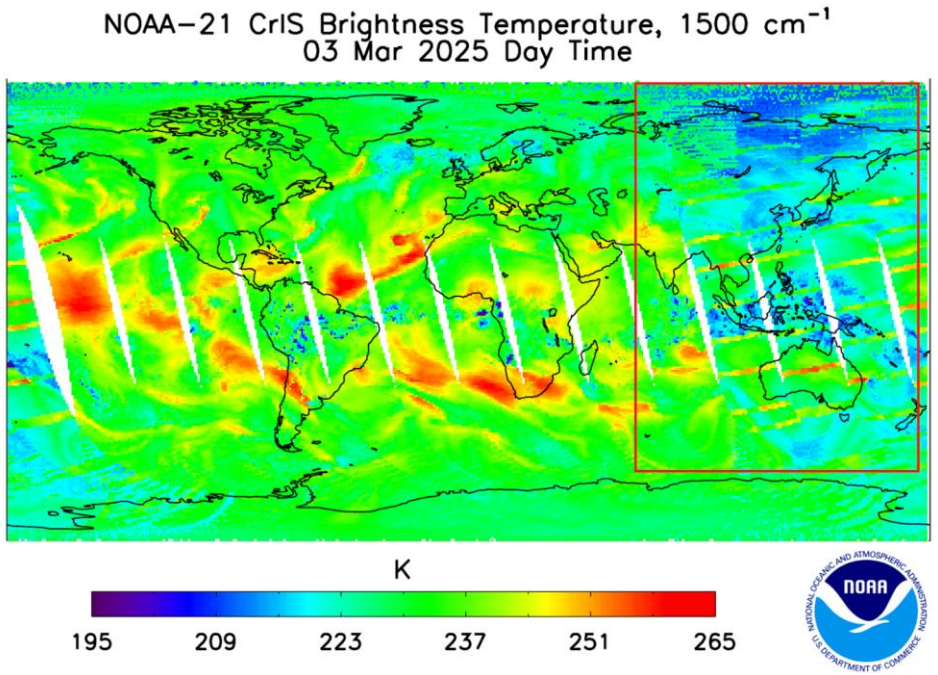



**Figure.** NOAA-21 CrIS observations during the on-orbit spectral calibration anomaly on 3 March 2025. The highlighted region on the right side of the map indicates discontinuities in the NOAA-21 CrIS sensor observations caused by the instrument.

On 2 March 2025, the ICVS team detected a NOAA-21 CrIS data quality anomaly caused by a misfired neon lamp. The neon lamp serves as the spectral calibration reference for CrIS sensors. This issue led to seven orbits of miscalibrated data being released, with radiometric biases reaching up to 3 K. To minimize the impact on users, SDR data release was temporarily halted. The neon lamp resumed normal operation at 06:35 UTC on 3 March 2025, resolving the anomaly. From the start, the CrIS Cal/Val team coordinated closely with OSPO, NASA, UW, and L3Harris to monitor and evaluate the situation.

Thanks to the STAR CrIS Cal/Val Team's rapid response and data analysis, the quality assessment was completed just hours after the issue was resolved, allowing SDR product operations to resume swiftly. To prevent future misfire events, recommendations include increasing the neon lamp's warm-up time and extending calibration measurement periods. Additionally, calibration algorithm updates are under consideration to further mitigate potential impacts from similar anomalies.

# Highlights from the Science Teams (March)

## SST Team upgrades to CRTM 3.1.1

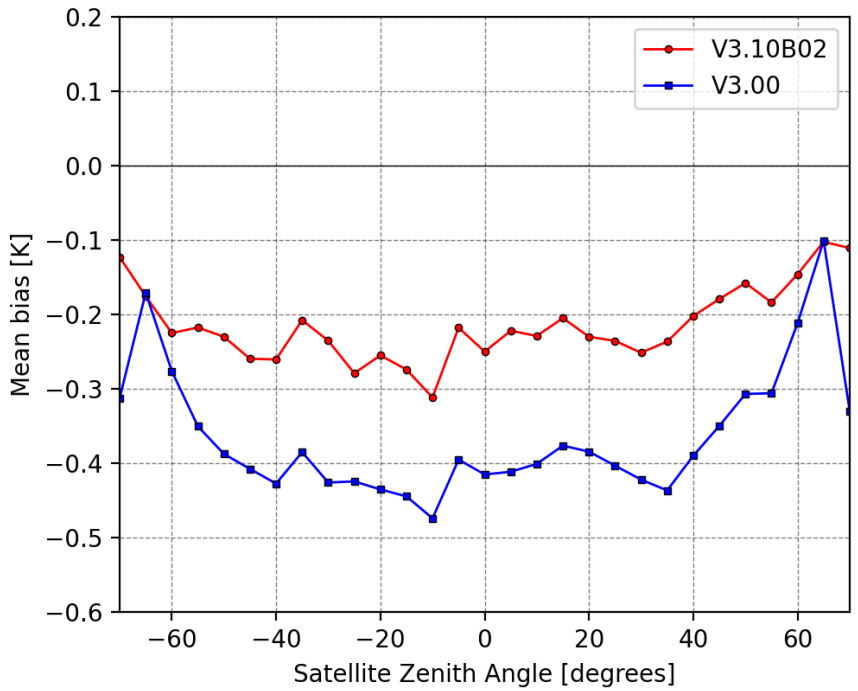



**Figure.** Mean bias between observed and modeled brightness temperatures for N20 VIIRS channel M15. Bias is stratified by satellite view zenith angle (VZA; negative values correspond to beginning of scan). Red curve shows ACSPO V3.10B02 results using CRTM 3.1.1 with new emissivity model and revised ACSPO pressure level interpolation. Blue curve shows ACSPO V3.00.

The SST team updated the Community Radiative Transfer Model (CRTM) library from V2.3.0 to V3.1.1. This update enables iy to include atmospheric aerosols in the forward RTM, paving the way for corrections of aerosol-induced SST biases.

As a part of the CRTM 3.1.1 update, the team also completed an overhaul of the ACSPO codebase involved with CRTM. They updated the scheme for interpolation of physical quantities between pressure levels according to recommendation of CRTM team members and observed noticeable improvements in mean bias between observed and modeled brightness temperatures.

A second advantage to the CRTM V3.1.1 update is the availability of an improved ocean surface emissivity model, which improved scan-angle-dependent differences between observed and modeled brightness temperatures.

# Highlights from the Science Teams (March)

**MIRS integrates QuickSounder ATMS EDU data (Reported by NOAA STAR MIRS Team)**

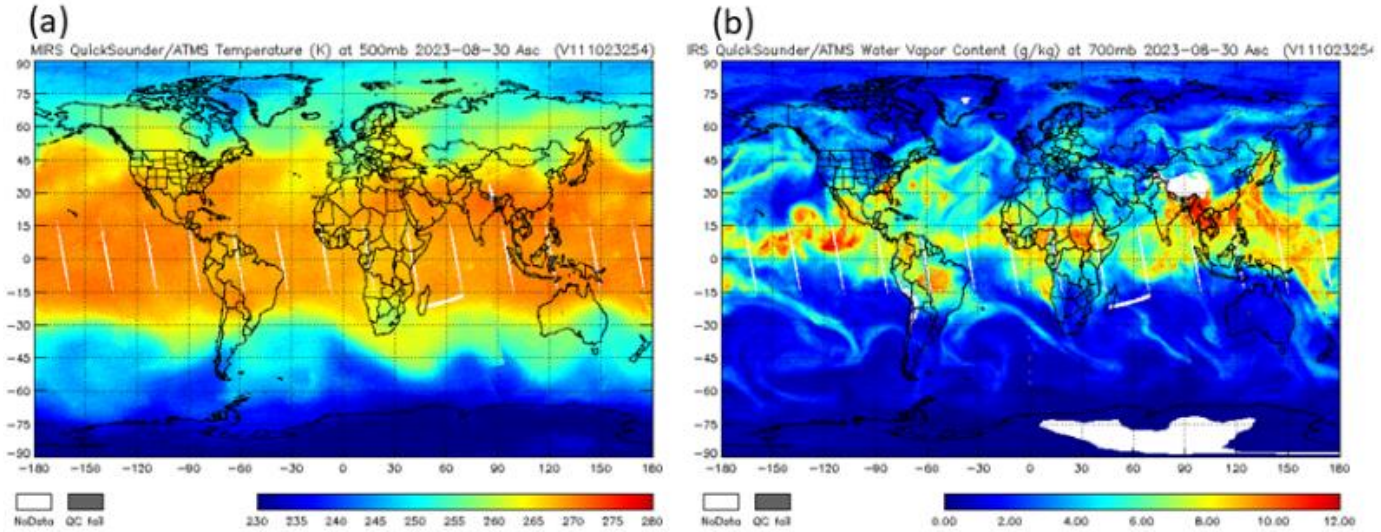



**Figure.** MiRS results using ATMS EDU proxy data on August 30, 2023. (a) MiRS retrieved temperature (K) at 500 hPa and (b) MiRS retrieved water vapor (g/kg) at 700 hPa.

The MiRS team successfully implemented QuickSounder ATMS Engineering Development Unit (EDU) in MiRS and the package has been shared with the ASSISTT team. The ATMS EDU is a prototype ATMS instrument developed while preparing the launch of the initial ATMS instrument on board the SNPP satellite in 2011. ATMS EDU proxy data also have been generated for 30 August 2023 assuming that ATMS EDU measurements have the same structure as the current JPSS ATMS measurements. Since ATMS EDU was designed and built using older technology, in order to maximize the benefit of the anticipated QuickSounder mission, extensive work is necessary to properly anticipate the instrument characteristics and adapt science algorithms so that the resulting data products are as accurate as possible. The efforts will include MiRS software adjustments, algorithm assessment and ATMS EDU instrument characterization and noise mitigation with real measurements. The current tentative launch date is planned for May 2026. After launch, the MiRS retrieval products from QuickSounder mission will be evaluated to determine performance relative to current environmental data product standards for mission.

# Highlights from the Science Teams (March)

## VIIRS records several severe weather events in southern Great Plains

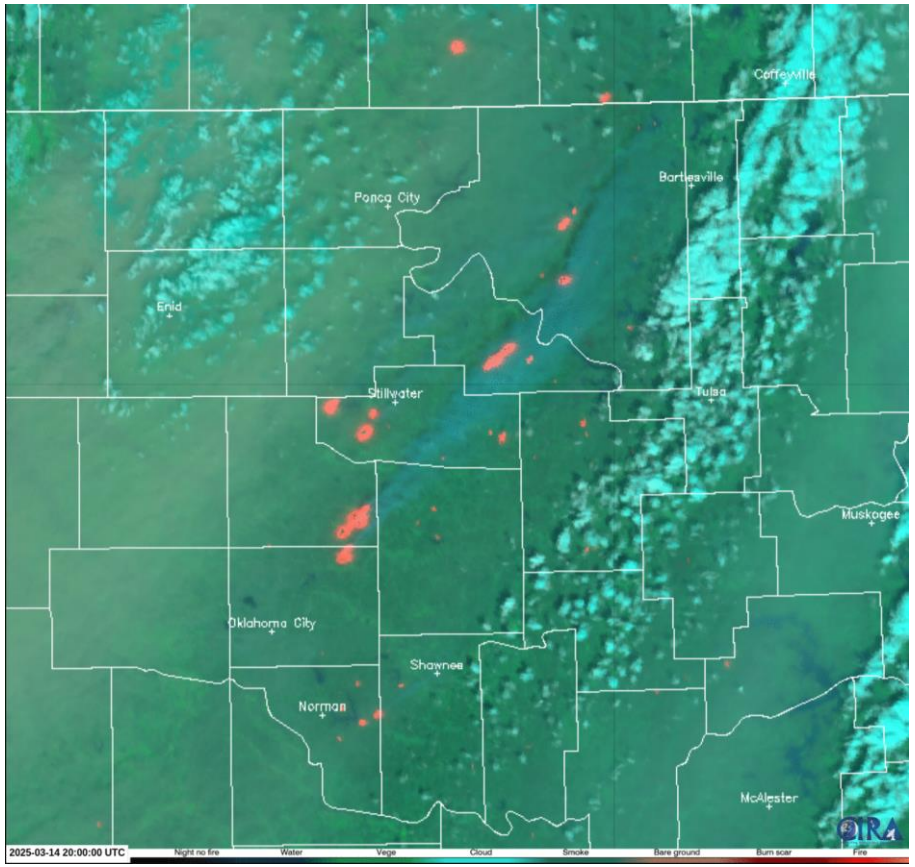



**Figure.** VIIRS 375-m Day Fire RGB over central Oklahoma on 13 March 2025, captures wildfires, smoke plumes ,and blowing dust.

Mid-March was very active in the southern Great Plains region – with a large outbreak of wildfires, blowing dust, and severe thunderstorms.

The Bill Line's Satellite Liaison blog detailed these events in a series of posts showing how VIIRS can be used to forecasters to aid in forecasting these events.

https://satelliteliaisonblog.wordpress.com/2025/03/18/mid-march-2025-active-us-weather-wildfires/

https://satelliteliaisonblog.wordpress.com/2025/03/17/mid-march-2025-active-us-weather-dust/

https://satelliteliaisonblog.wordpress.com/2025/03/19/mid-march-2025-active-us-weather-severe-thunderstorms/

# Accomplishments

| Delivery Date | Cloud Containerized Algorithm Packages (CCAPs) – Enterprise Products: | Recipient |
|---|---|---|
| 3/5/2025 | **EN-DynAncil_v1:** This Enterprise Dynamic Ancillary (EDA) project contains multiple algorithms to produce the dynamic ancillary data for ABI, AHI, AVHRR, FCI, SEVIRI and VIIRS sensors. | NCCF |
| 3/11/2025 | **OMPS-NP_v2:** This final CCAP includes new calibration tables for NOAA-21 and minor modification to a program file to include the quality_flag variable as well as eliminate compliance check errors. It also includes modified scripts to accommodate future calibration table updates as well as production of log files with information about the running process. | NCCF |
| 3/11/2025 | **MTCSWA: (Add NOAA-21 Capability):** The purpose of this final CCAP for MTCSWA v2 CCAP is to provide a new version of MTCSWA that can access Himawari-9 Derived Motion Winds files, Meteosat Third Generation radiance files, has improved trajectory calculations, and has implemented data quality checks for the GOES and MSG/MTG series. Additionally, the OSCAT reader is included and will be incorporated into the science algorithm in a future delivery | NCCF |
| 3/25/2025 | **IceAge_v2-1:** This is a patch delivery of the Ice Age CCAP to CSPP to upgrade the file version number from v3r2 to v3r3. This document contains information for Enterprise Ice Age/Thickness. Ice Age/Thickness consists of 1 processing unit that generates the Enterprise Ice Age/Thickness (AITA) product. This package can use data from NOAA20, NOAA21, or NPP. The product version is upgraded to v3r3 in the configuration file and in the product file name. | NCCF |
| 3/31/2025 | **VegHealth_v1-3:** This is a patch delivery of the Vegetation Health v1-3 Patch CCAP to NCCF. This fixes the use of the water masking ancillary data. It was previously not being accessed correctly due to an incorrect directory being used. | NCCF |

# Accomplishments – JPSS Cal Val Support

| | | |
|---|---|---|
| S-NPP | Weekly OMPS TC/NP Dark Table Updates | 09/3/24, 09/10/24, 09/17/24, 09/24/24, 10/1/24, 10/8/24, 10/16/24, 10/22/24, 10/29/24, 11/5/24, 11/12/24, 11/19/24, 11/26/24, 12/03/24, 12/10/24, 12/17/24, 12/30/24, 01/7/25, 1/13/25, 1/22/25, 1/28/25, 2/4/25, 2/10/25, 2/18/25, 2/26/25, **3/4/25, 3/11/25, 3/18/25, 3/25/25, 4/1/25, 4/8/25** |
| NOAA-20 | Weekly OMPS TC/NP Dark Table Updates | 09/3/24, 09/10/24, 09/17/24, 09/24/24, 10/1/24, 10/8/24, 10/16/24, 10/22/24, 10/29/24, 11/12/24, 11/19/24, 11/26/24, 12/03/24, 12/10/24, 12/17/24, 12/30/24, 01/7/25, 1/13/25, 1/22/25, 1/28/25, 2/4/25, 2/10/25, 2/18/25, 2/26/25, **3/4/25, 3/11/25, 3/18/25, 3/25/25, 4/1/25, 4/8/25** |
| NOAA-21 | Weekly OMPS TC/NP Dark Table Updates | 09/3/24, 09/10/24, 09/17/24, 09/24/24, 10/1/24, 10/8/24, 10/16/24, 10/22/24, 10/29/24, 11/12/24, 11/19/24, 11/26/24, 12/03/24, 12/10/24, 12/17/24, 12/30/24, 01/7/25, 1/13/25, 1/22/25, 1/28/25, 2/4/25, 2/10/25, 2/18/25, 2/26/25, **3/4/25, 3/11/25, 3/18/25, 3/25/25, 4/1/25, 4/8/25** |
| S-NPP | Bi-Weekly OMPS NP Wavelength & Solar Flux Update | 09/10/24, 09/24/24**,** 10/8/24, 10/22/24, 11/5/24, 11/19/24**,** 12/3/24, 12/17/24, 12/31/24, 1/13/25, 1/28/25**,** 2/11/25, 2/26/25, **3/11/25, 3/25/25, 4/8/25** |
| NOAA-20 | Bi-Weekly OMPS NP Wavelength & Solar Flux Update | 09/03/24, 09/17/24, 10/1/24**,** 10/16/24, 10/29/24, 11/12/24, 11/26/24, , 12/10/24, 12/31/24, 1/8/25, 1/22/25, 2/4/25, 2/18/25, **3/4/25, 3/18/25, 4/1/25, 4/8/25** |
| NOAA-21 | Bi-Weekly OMPS NP Wavelength & Solar Flux Update | 09/03/24, 09/17/24, 10/1/24**,** 10/16/24, 10/29/24**,** 11/12/24, 11/26/24, 12/10/24, 12/31/24, 1/8/25, 1/22/25, 2/4/25, 2/18/25, **3/4/25, 3/18/25, 4/1/25** |
| S-NPP | Monthly VIIRS LUT Update of DNB Offsets and Gains | 9/9/24, 10/9/24, 11/7/24, 12/6/24, 1/7/25, 2/4/25, 3/7/25, **4/8/25** |
| NOAA-20 | Monthly VIIRS LUT Update of DNB Offsets and Gains | 9/9/24, 10/9/24, 11/7/24, 12/6/24, 1/7/25, 2/4/25, 3/7/25, **4/8/25** |
| NOAA-21 | Monthly VIIRS LUT Update of DNB Offsets and Gains | 9/9/24, 10/9/24, 11/7/24, 12/6/24, 1/7/25, 2/4/25, 3/7/25, **4/8/25** |
| 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, 8/13/24 (Further updates reuse earlier correction LUTs based on the month) |

# FY25 STAR JPSS Milestones (1 of 4)

| Milestones/Algorithm Updates | Original Date | Forecast Date | Actual Completion Date | Variance Explanation | Status |
|---|---|---|---|---|---|
| VOLCAT (Phase 1) NCCF implementation | Dec-23 | Apr-25 | SCR: August 17, 2023<br>Target CCAP Moved from Jan 9 to Jan 30, then to Feb 26, 2025, then to March 18, and now **moved to April 17** | Received MSG/HRIT code and test case from science teams on Dec 22, and final CCAP planned for 2/26/2025. Verification runs necessitated a move to April 17. **Other Issues include, Intel Compiler availability and Docker containers.** | Tracked as part of FY25 Maintenance |
| NetCDF4 Reformatting Toolkit (N4RT) to include Quick Sounder | Feb-25 | Apr-25 | ASSISTT to NCCF CCAP delivery moved from March 17, **to April 29th.** | Integrator's time adjustment to accommodate Quick Sounder as a priority caused a slight delay. **Schedule rigidity lowered since the end-to-end testing has been pushed to Nov. 2025.** | |
| Hurricane Intensity and Structure Algorithm (HISA) maintenance CCAP (uses MiRS from S-NPP/NOAA-20/21, MetOp-B/C | Mar-25 | Apr-25 | Science team delivered the code updates to ASSISTT on December 16, 2024. | MiRS v11.10 test case data sent to science teams, and expecting a code update by April 7th. **Possible delay of CCAP delivery to May 21st.** | |
| TOAST update : LTOAST for the new OMPS LP inputs. | May-25 | May-25 | On-track, **CCAP delivery expected on May 1st.** | N/A | |
| AWIPS Converter | May-25 | May-25 | SCR moved to Jun 18, and final CCAP delivery moved from May 20 to August 21st. | Integrators need to discuss with the science team in documenting and tailoring requirements. CCAP delivery slipped to August 21st. | |
| Flood Mapping | May-25 | May-25 | Verify the ASSISTT Table and fix changes from UTC to local time for VIIRS daily composites | 4/10/2025: Negotiating due date based on integrator knowledge for making the fix. | |

# FY25 STAR JPSS Milestones (2 of 4)

| Milestones/Algorithm Updates | Original Date | Forecast Date | Actual Completion Date | Variance Explanation | Status |
|---|---|---|---|---|---|
| Cloud Mask J2 Validated; No code updates needed only maintenance CCAP (we can keep it as FY25 milestone). Tracked as FY25 maintenance releases | Feb-25 | Jun-25 | ASSISTT to NCCF target CCAP delivery moved from Feb 6 to March 18. **Moved to June 25 for AO architecture.** | Maintenance updates (separate unit for Ancillary files to be included) as well as solving for latency issues, and implementation on AO architecture, all culminated into moving different cloud products into June/July<br><br>CBH, CCL, Cloud Height pushed to June 3, Cloud Phase and cloud type **pushed to July** due to other priority and to account for AO architecture. | Tracked as part of FY25 Maintenance release |
| Cloud Base Height (CBH), Cloud Cover Layer (CCL), Cloud Height, Phase and Type: (Different CCAPs for Cloud implementation) J2 Validated: No code updates, only maintenance CCAPS. Tracked as FY25 maintenance release | Jan-25 | Jul-25 | SCR pushed for April 24th.Target CCAP (ASSISTT to NCCF) pushed one month from January to Feb 6, 2025, **and now moved to July 24 for AO architecture.** | | |
| Surface Particulate Matter (PM2.5) **(new product)** | Jun-24 | Jun-25 | New implementation following AO architecture | CCAP SCR planned for May 22, and final CCAP delivery on June 25. | |
| Aerosol Detection Product (ADP) Updates | Jan-25 | Jul-25 | SCR moved from 1/27 to 3/6 to 4/23; Target CCAP (ASSISTT to NCCF) expected on July 31st since the CCAP will be implemented in Algorithm Orchestration (AO) architecture | Updates to use Volcanic ash input. Removes dependency on volcanic ash product. Implementation in AO architecture. ASSISTT team working on integrating MetOp-SG code. | |
| Ocean Color (v2.1) (Gulf of Mexico to Gulf of America change in the outputs) | Jul-25 | Jul-25 | On-track for July 30 delivery | N/A | |
| MiRS upgrade for Quick Sounder | Aug-25 | Aug-25 | Science team delivered updates on March 31st. CCAP delivery plans are on track. | N/A | |
| SFR upgrade to include GOSAT-GW AMSR3, MetOp-SG MWS, ocean coverage (the current SFR is land only). Also upgrades needed for Quick Sounder. | Aug-25 | Aug-25 | On-track. | Teams are reviewing requirements with the addition of ocean coverage, and Quick Sounder updates. | |

# FY25 STAR JPSS Milestones (3 of 4)

| Milestones/Algorithm Updates | Original Date | Forecast Date | Actual Completion Date | Variance Explanation | Status |
|---|---|---|---|---|---|
| ACSPO (update ACSPO 3.0 for VIIRS), update to CentOs9. | Aug-25 | Aug-25 | CCAP for SCR expected June 5, and final CCAP on August 29. | N/A | Tracked as part of FY25 Maintenance release |
| Green Vegetation Fraction (GVF): 1 Km GVF update for existing products. | Sep-25 | Sep-25 | SCR expected on Jul 21 followed by CCAP on Sept. 1st | N/A | |
| Vegetation Index (VI): 1 Km update for existing products | Sep-25 | Sep-25 | SCR expected on June 19th followed by CCAP on Sept. 12. | N/A | |
| Bidirectional Reflectance Distribution Function (BRDF) (New Product) | Sep-25 | Sep-25 | SCR expected on July 24 followed by CCAP on Sept. 25 | New implementation followed through AO architecture. | |
| Soil Moisture Operational Product System (SMOPS) | Oct-25 | Oct-25 | Maintenance updated with migration to AO. | N/A | |
| AST-2024 (VIIRS Annual Surface Type) | Sep-25 | Sep-25 | On-track | N/A | Ongoing as part of FY25 |
| Reprocessing and transfer of EDRs to CLASS | Sep-24 | May-25 | Continue as part of FY25 milestones | JSTAR Team submitted a request to CLASS to archive reprocessed AOD/ADP. CLASS is working on Engineering Assessment. | Ongoing as part of FY25 |

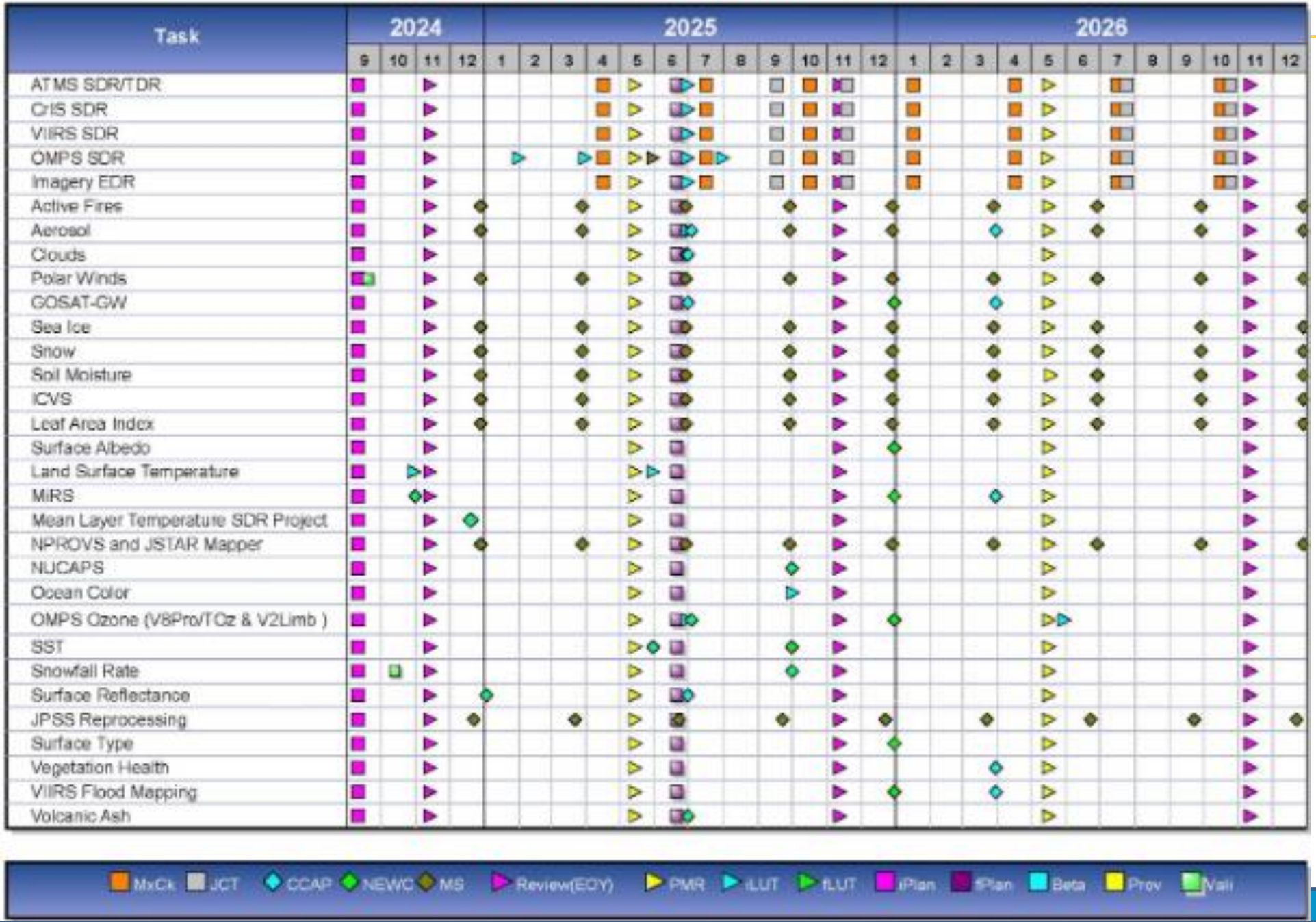
# FY25 STAR JPSS Milestones (4 of 4)

| Milestones (Algorithm Cal/Val and LTM) | Original Date | Forecast Date | Actual Date of Completion | Variance Explanation | Status |
|---|---|---|---|---|---|
| NEON (Quick Sounder pre-launch and post-launch Cal/Val Plan) | Dec-24 | Dec-24 | | Two CCRs already approved. Cal/Val Document released in MIS. 471-CCR-24-0069 471-CCR-24-0070 | Completed |
| FY26 Program Management Review (all teams) | Jun-25 | Jun-25 | Follow as FY25 milestones | N/A | On-track |
| Maintain / Update ICVS (develop ICVS modules to support various activities: monitoring, inter-sensor comparison, …) | Sep-25 | Sep-25 | Follow FY25 PMR schedules | N/A | Ongoing |
| Maintain / Expand (to include JPSS-2 products) JSTAR Mapper, adopting to STEMS | Sep-25 | Sep-25 | Follow FY25 PMR milestones | N/A | Ongoing |
| Images of the Month | Monthly | Monthly | Follow FY25 PMR | N/A | Ongoing |
| SDRs and VIIRS Imagery Cal/Val Plans finalized for J4 | Jun-25 | Jun-25 | Ongoing | All teams delivered drafts, JSTAR reviewing. | Ongoing |
| SDR and VIIRS Imagery Look-Up Table Deliveries for J4 | Jun-25 | Jun-25 | Ongoing | ATMS delivered the PCT. | Ongoing |
| JPSS-3/JPSS-4 pre-launch test data review/analysis and activity support (SDR teams); | Sep-25 | Sep-25 | Ongoing | FY24 milestones for J3 JCT1/JCT2, J3 Spacecraft TVAC, and J4 instrument TVAC completed as part of FY24 milestones. Science team efforts will continue in FY25. | Continuing as part of FY25 milestones |
| JPSS-3/JPSS-4 Pre-launch characterization reports for all SDRs: December 30, 2024 | Dec-24 | Mar-25 | On-going | J3 ATMS: Team delivered pre-launch report in Dec 2024<br>J3 CrIS: Team delivered J3 pre-launch report in June 2024.<br>J4: CrIS team delivered pre-launch characterization report<br>J4: ATMS team delivered in June 2024.<br>J4: OMPS team delivered in Jan 2025.<br>J4: VIIRS:team delivered in March 2025. | Completed |
| GOSAT-GW End to End | Aug-24 | Apr-25 | Ongoing | GOSAT launch: **June 24, 2025** and NCCF plans to get the test data and will send the data to PDA and STAR. The data flow is expected for 24 hours and data will be placed on STAR SCDR. ASSISTT will work with the AMSR3 delivered product algorithms(e.g. SFR) and plan to update the CCAP with the new product algorithms as and when available from the STAR science teams. There is no hard deadline as of now from the STAR science teams to deliver product algorithms to the ASSISTT. | Ongoing as part of FY25 |

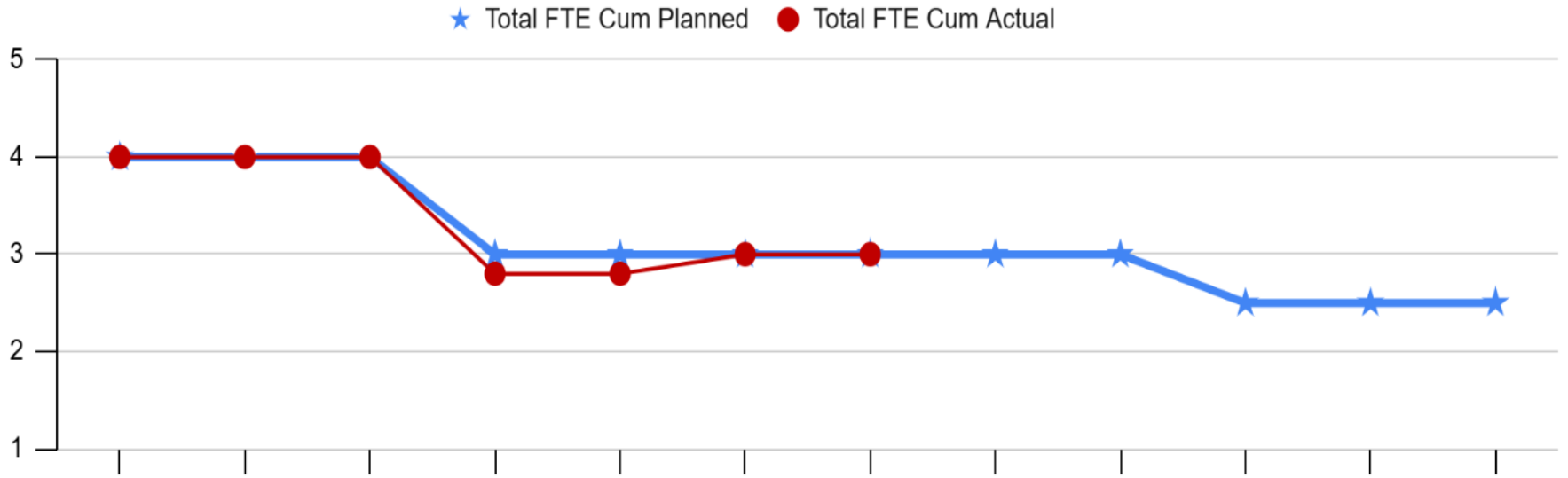
# FY 25 IDPS Mx Build Review/Checkout

| IDPS Mx Schedule | Mx13 | Mx14 | Mx15 |
|---|---|---|---|
| SOL (DP_FE) regression test | Feb. 18 - Mar. 18, 2025 | May 15 – Jun. 17, 2025 | Aug. 7 – Sep. 9, 2025 |
| STAR SOL review/checkout feedback (Go/No-Go & Report) | Mar. 18, 2025 (VIIRS team verified M13 changes) and final STAR Go/No-Go report completed. | Jun. 17, 2025 | Sep 9, 2025 |
| I&T (DP-TE) regression test | Apr. 10 – May 1, 2025 | Jul. 3 – Jul. 18, 2025 | Sep. 25 – Oct. 17, 2025 |
| STAR I&T review/checkout feedback (Go/No-Go & Report) | May 1, 2025 | Jul. 18, 2025 | Oct. 17, 2025 |
| TTO | May 19, 2025 | Aug 5, 2025 | Nov. 4, 2025 |

# STAR JPSS Schedule: TTA Milestones



# J-STAR FY25 Planned Program Management Staffing Plan v Actuals




| J-STAR FTEs | Oct'24 | Nov '24 | Dec '24 | Jan '25 | Feb '25 | Mar'25 | Apr'25 | May'25 | Jun'25 | Jul '25 | Aug '25 | Sep '25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cum Planned (CS) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Cum Actual (CS) | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | |
| Cum Planned (WYE) | 4.00 | 4.00 | 4.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 2.50 | 2.50 | 2.50 |
| Cum Actual (WYE) | 4.00 | 4.00 | 4.00 | 2.80 | 2.80 | 3.00 | 3.00 | | | | | |
| Total FTE Cum Planned | 4.00 | 4.00 | 4.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 2.50 | 2.50 | 2.50 |
| Total FTE Cum Actual | 4.00 | 4.00 | 4.00 | 2.80 | 2.80 | 3.00 | 3.00 | | | | | |

CS: Vacant (prev. Alisa Young)

WYE: *Prasanjit Dash, Murty Divakarla, Tom Atkins, Jeffrey Weinrich, Wei W. Li , Tess Valenzuela*

**Color code**:

**Green:** **Completed Milestones**

**Gray:** **Ongoing FY24 Milestones**

# JPSS Monthly Expenditures as of end March 2025

| Plan\Actual Expenditures | Oct-24 | Nov-24 | Dec-24 | Jan-25 | Feb-25 | Mar-25 | Apr-25 | May-25 | Jun-25 | Jul-25 | Aug-25 | Sep-25 | FY Payments | UDO Balance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plan FY23 ORF Contract | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 12 | | | | 172 | 2,551 |
| FY23 ORF Contract | 0 | 26 | 27 | 21 | 52 | 0 | | | | | | | 125 | 2,598 |
| Plan FY23 ORF Grant | 100 | 100 | 100 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 750 | 355 |
| FY23 ORF Grant | 54 | 5 | 199 | 47 | 15 | 423 | | | | | | | 742 | 363 |
| Plan FY23 PAC Contract | 100 | 90 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 40 | 37 | 667 | 0 |
| FY23 PAC Contract | 0 | 0 | 0 | 0 | 0 | | | | | | | | 0 | 667 |
| Plan FY23 PAC Grant | 200 | 150 | 150 | 150 | 55 | | | | | | | | 705 | 18 |
| FY23 PAC Grant | 195 | 75 | 194 | 240 | 0 | 0 | | | | | | | 704 | 18 |
| Plan FY22 | 100 | 50 | 28 | | | | | | | | | | 178 | 0 |
| FY22 | 0 | 0 | 6 | 147 | 0 | 0 | | | | | | | 153 | 25 |
| Plan FY21 | 80 | 50 | 50 | 50 | 50 | 51 | | | | | | | 331 | 0 |
| FY21 Grant | 89 | 13 | 139 | 48 | 0 | 0 | | | | | | | 289 | 42 |

***UDO: UNDELIVERED ORDERS - OBLIGATIONS, UNPAID***

- FY21 Grant UDO Balance from CIMSS $42K has Expired Fund Status in the BAS/EDW accounting system and the same with FY22 UDO Balance from Aerospace $24K.
- FY23 PAC Grant UDO Balance from Univ. of Colorado $18K - Unexpired Fund;
- FY23 ORF Grant invoice spiked due to a six months invoice from CISESS;
- FY23 PAC UDO Balance of $667K and FY23 ORF IMSG Contract UDO Balance of $1,100K as part of the Total FY22 to FY24 ORF and PAC UDO on IMSG Balance is equal to $4K; BAS/EDW accounting system on IMSG included Project Codes for Satellite Products, JPSS STAR Activities and Science STAR; ***This notes can remove rows on FY23 PAC Contract in this (or the next) report;***
- FY23 ORF Contract UDO Balance of $2,598K includes GST balance of $1,451K remaining UDO has Expired Fund Status in BAS/EDW accounting system. ***This notes together with the IMSG data validation will adjust the UDO Balances to $47K in this (or the next) report;***

# Active Fires

*March 2025*

## *Accomplishments / Events:*

- The team continued cross-evaluation of the operational eFire and NGFS VIIRS I-band data from the GINA Direct Readout processing
  - developed procedure to exactly match data from the GINA DB and NCCF eFire output
  - statistics are stratified according to fire mask classes
  - preparations for global intercomparison are underway
- Analyzed thermal anomaly frequencies towards improved identification of persistent anomalies
  - days of occurrence over a global 0.01 grid were recorded to analyze temporal persistence

## *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 | | | |

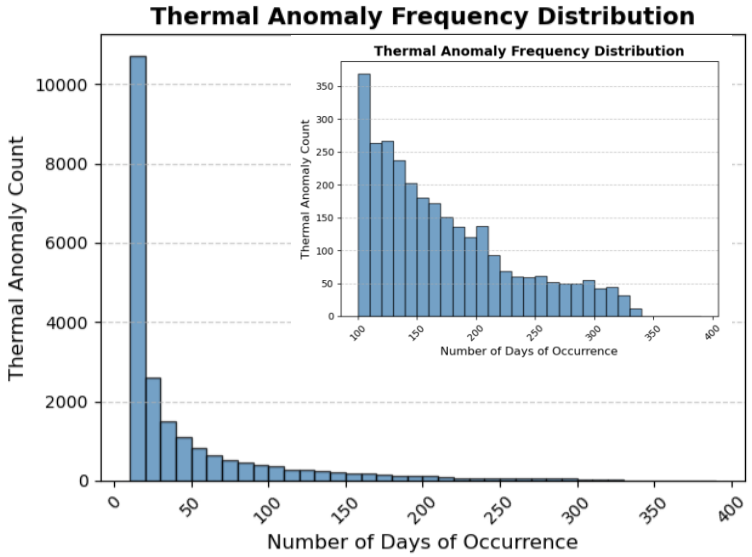
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

***Issues/Risks:***

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Subtask 1.1: Evaluate Suomi NPP and NOAA-20 reprocessed data record* | Mar-25 | Mar-25 | Jan-25 | |
| *Identify environmental and observing conditions with inferior algorithm performance* | Jun-25 | Jun-25 | | |
| eFire cal/val | Sep-25 | Sep-25 | | |
| eFire – NGFS cross-verification | Sep-25 | Sep-25 | | |
| Direct Broadcast support | Sep-25 | Sep-25 | | |
| Maintenance, LTM and anomaly resolution | Sep-25 | Sep-25 | | |

## *Highlight: global frequency distribution of VIIRS I-band EFIRE detections*

*Frequency distribution of eFire Suomi NPP thermal anomalies over a 0.01 degree grid for January 1 – December 15, 2023*



# Active Fires FY 25 Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 1: eFire cal/val* | Sep-25 | Sep-25 | | |
| *Subtask 1.1: Evaluate Suomi NPP and NOAA-20 reprocessed data record* | Mar-25 | Mar-25 | Jan-25 | |
| *Subtask 1.2: Identify environmental and observing conditions with inferior algorithm performance* | Jun-25 | Jun-25 | | |
| *Subtask 1.3: Create science code update for algorithm improvements* | Sep-25 | Sep-25 | | |
| *Task 2: eFire – NGFS cross-verification* | Sep-25 | Sep-25 | | |
| *Subtask 2.1: Generate cross-verification datasets, including opportunistic in-situ reference data* | Dec-24 | Jun-25 | | This is closely related to 2.2. Additionally, we are working on implementing NGFS on premise to be able to run the NGFS VIIRS I-band algorithm to generate additional cross-reference data. |
| *Subtask 2.2: Generate / update opportunistic in-situ reference data* | Mar-25 | Jun-25 | | |
| *Subtask 2.3: Generate statistical analysis for eFire – NGFS detection performance* | Sep-25 | Sep-25 | | |
| *Task 3: Direct Broadcast support* | Sep-25 | Sep-25 | | |
| *Subtask 3.1: Feasibility analysis for CSPP update* | Dec-24 | Jul-25 | | There need to be strategic decisions whether to go forward with eFire implementation for DB at all, or we jump ahead to use NGFS. GINA in Alaska is already running a containerized version of NGFS on VIIRS DB data. |
| *Subtask 3.2: Implementation of science code updates as determined by Task 4.2* | Sep-25 | Sep-25 | | |
| *Subtask 3.3: CSPP user support as needed for transition* | Sep-25 | Sep-25 | | |
| *Task 4: Maintenance, LTM and anomaly resolution* | Sep-25 | Sep-25 | | |
| *Subtask 4.1: Reactive maintenance of Suomi NPP, NOAA-20 and NOAA-21 I-band NCCF products* | Sep-25 | Sep-25 | | |
| *Subtask 4.2: Sensor anomaly resolution support* | Sep-25 | Sep-25 | | |
| *Subtask 4.3: Suomi NPP, NOAA-20 NOAA-21 data analysis and feedback* | Sep-25 | Sep-25 | | |

# Aerosol

*March 2025*

## *Accomplishments / Events:*

- Evaluated AOD retrieved from proxy VIIRS data generated from OCI observations. This a proof-of-concept step for generating proxy METImage data.
- Derived spectral surface reflectance over bright land using combined S-NPP, NOAA-20 and NOAA-21 VIIRS data and retrieved AOD applying different approaches regarding the relationship and reference channel used.
- Reviewed first demonstration of using a simultaneous multi-spectral reflectance fitting (AI/ML) for AOD retrieval.

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| ***Subtask 2.1:*** *Identify source of high latitude false dust detections, especially clouds mis-identified as smoke* | *Mar 2025* | *Mar 2025* | | |
| ***Subtask 2.2:*** *Work with Volcanic Ash team to import the ash detection into ADP* | *Jun 2025* | *Jun 2025* | | |
| ***Subtask 2.3:*** *Make code updates to ADP algorithm to implement "smoke call back"* | *Sept 2025* | *Sept 2025* | | |
| ***Subtask 2.4:*** *Adapt ADP algorithm to NOAA-21 OMPS* | *Dec 2025* | *Dec 2025* | | |
| ***Subtask 2.5:*** *Begin the process to transition VIIRS PM2.5 algorithm to operations* | Mar 2026 | Mar 2026 | | |
| *Adapt the VIIRS AOD algorithm to use PACE OCI data* | Feb 2025 | Feb 2025 | Feb 2025 | |
| *Develop new LUTs and PCTs for over bright-land retrieval June 2025* | Jun 2025 | Jun 2025 | | |
| *Evaluate Metop-SG AOD retrievals using seasonal samples of VIIRS proxy data* | Jul 2025 | Jul 2025 | | |
| *Complete design, coding and testing of simultaneous multi-spectral reflectance fitting for AOD retrieval* | Aug 2925 | Aug 2925 | | |
| *Complete assessment of a multi-year VIIRS EPS SNPP, NOAA-20 and NOAA-21 AOD* | Aug 2025 | Aug 2025 | | |
| *Deliver updated bright-land AOD algorithm to ASSISTT* | Sep 2025 | Sep 2025 | | |

## *Overall Status:*

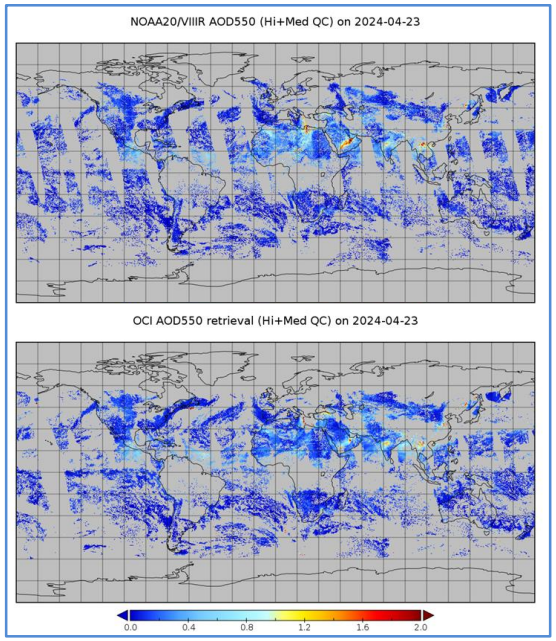
| | Green[1] (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| **Cost / Budget** | | X | | | |
| **Technical / Programmatic** | | X | | | |
| **Schedule** | | X | | | |

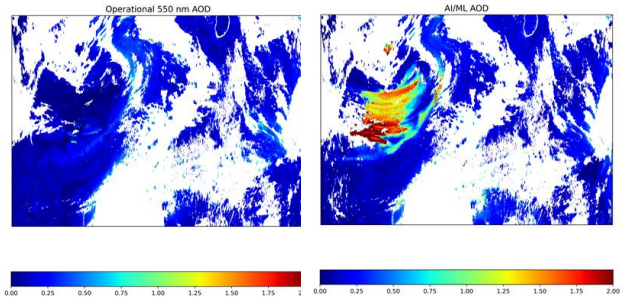
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

### ***Issues/Risks:***

No risks.

## *Highlight:*




Maps of operational NOAA-20/VIIRS (left) and AI/ML (right) AOD retrieval of an extreme dust event over central US on 3/15/2025. The AI/ML algorithm recovers the dust plume missing in the operational product.

Maps of operational NOAA-20/VIIRS AOD (top) and AOD retrieved by the VIIRS algorithm using proxy VIIRS data generated from OCI/PACE reflectances (bottom). AOD fields are visually similar.

# ATMS SDR

March 2025

***Accomplishments / Events:***

- Update JPSS ATMS SDR Calibration Algorithm Theoretical Basis Document (ATBD) to include the NOAA-21 ATMS operational parameters. The radiance based non-linearity correction coefficients generation method has been planned to be added in this revision. ATMS SDR team members are currently verifying the experimental coefficients and going to provide the step by step description of how the radiance based non-linearity correction coefficients are generated from TVAC data.
- Evaluate the NOAA-21 ATMS instrument mounting corrected beam alignment error coefficients supplied by NG ATMS team. Current PCT includes separated beam alignment error correction coefficients and instrument to spacecraft mounting matrix.The experiment is to directly use instrument mounting corrected beam alignment error coefficients with identity instrument to spacecraft matrix. The preliminary comparison results indicate that the application of separated correction coefficients has different result by only using corrected beam alignment error coefficients (fig 1). Further study is still ongoing to identify the root cause of such discrepancies.
- Assess the impact of NOAA-21 ATMS measured spectral response function (SRF) in CRTM simulations by comparing the boxcar SRF based CRTM simulation with measure SRF based CRTM simulations.The major discrepancies are observed in upper V-band temperature sounding channels, both in angular dependent bias patterns (fig 2) and systematic bias evaluations. A month of daily global mean bias time serie indicates the discrepancies are stable. The measured SRF also includes a noise floor adjustment based on the study of NOAA-20 and S-NPP ATMS SRF measurements. A longer time experiment has been planned to evaluate the annual variation impact.

## *Overall Status:*

| | Green1 (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| **Cost / Budget** | | X | | | |
| **Technical / Programmatic** | | X | | | |
| **Schedule** | | X | | | |

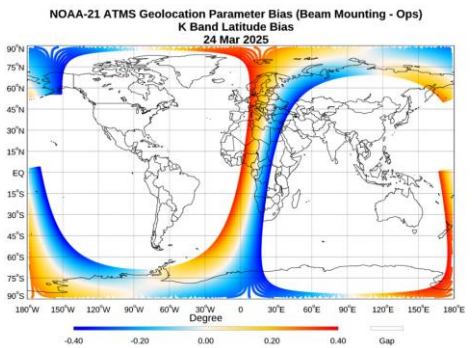
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

***Issues/Risks:***

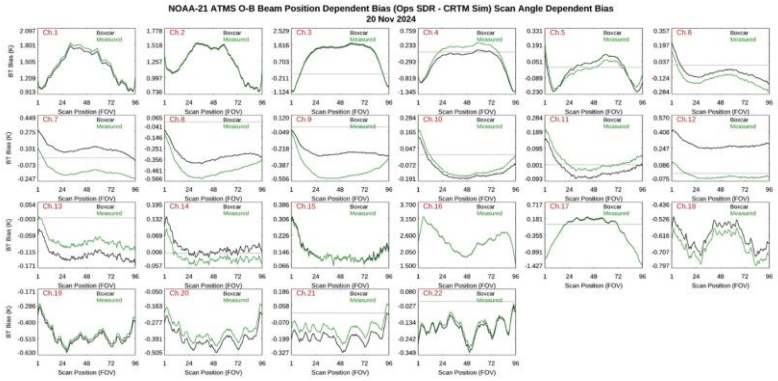
| Milestones | Original Date | Forecast Date | Actual Date | Variance Explanation |
|---|---|---|---|---|
| JPSS-3 SN306 ATMS Pre-launch Characterization Report | Dec-24 | Dec-24 | Dec-24 | |
| Update ATMS ATBD | Mar-25 | Mar-25 | Mar-25 | |
| ATMS beam alignment error correction evaluation | May-25 | May-25 | | |
| Final Version of the JPSS-4 SN305 ATMS Cal/Val Plan | Jun-25 | Jun-25 | | |
| Review/Checkout of IDPS Mx Builds SOL and I&T Deploy Regression data | Sep-25 | Sep-25 | | |
| Support JPSS-4/JPSS-3 JCT and Test events (J3 Pre-Storage TVAC, IDPS JPSS-3/JPSS-4 Test data Flow, etc.) | Sep-25 | Sep-25 | | |
| Radiometric inter-comparison of S-NPP, NOAA-20 and NOAA-21 ATMS SDR data against other LEO/GEO Microwave observations and GNSS-RO. | Sep-25 | Sep-25 | | |
| NOAA-21 ATMS Spectral Response Function (SRF) analysis/report to allow replacement of simulated NOAA-21 ATMS SRFs with measured values | Sep-25 | Sep-25 | | |
| Evaluate the ATMS Geolocation accuracy assessment tool and determine if the current sliding window can be reduced from 30-day period to a shorter period | Sep-25 | Sep-25 | | |
| Enhance the ATMS Calibration Website with new capabilities for rapid anomaly and SDR data evaluation response | Sep-25 | Sep-25 | | |

## *Highlights:*

**(1)** NOAA-21 ATMS channel 1 latitude bias between corrected and separated beam alignment error




**(2)** NOAA-21 ATMS channel dependent angular dependent bias by boxcar SRF based simulations (black) and measured SRF based simulations (green)



# ATMS SDR FY25 Milestones/Deliverables (1/2)

| Task Category | Task/Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Development (D) | *(1) Develop and test calibration algorithm for improvement of SDR data product.* | *10/1/2024* | *7/31/2025* | *Report* | |
| | *(2) Review and analysis of JPSS-3 and JPSS-4 ATMS pre-launch data to provide Flight and Ground support.* | *10/1/2024* | *9/30/2025* | *DAP/Report* | |
| | *(3) Support ATMS SDR processing system assessment and refinement.* | *10/1/2024* | *9/30/2025* | *DAP* | |
| Integration & Testing (I) | *(1) ATMS SDR code integration with ADL* | *10/1/2024* | *9/30/2025* | *ADL package* | |
| | *(2) Review/Checkout of IDPS Mx Builds SOL and I&T Deploy Regression data.* | *10/1/2024* | *9/30/2025* | *Report* | |
| Calibration & Validation (C) | *(3) Sustain the quality of SNPP, NOAA-20 and NOAA-21 ATMS SDR data products.* | *10/1/2024* | *9/30/2025* | *Report* | |
| | *(4) Support J4/J3 JCT and Test events (J3 Pre-Storage TVAC, IDPS J3/J4 Test data Flow, etc.)* | *10/1/2024* | *9/30/2025* | *Report* | |
| | *(5) Cal/Val planning of J3/J4 post-launch* | *10/1/2024* | *9/30/2025* | *Report* | |
| | *(6) Deliver J4 Pre-launch Characterization Report* | *10/1/2024* | *12/31/2025* | *Report* | |
| | *(7) Radiometric inter-comparison of S-NPP, NOAA-20 and NOAA-21 ATMS SDR data against other LEO/GEO Microwave observations and GNSS-RO.* | *10/1/2024* | *9/30/2025* | *Report* | |
| | *(8) Support new developments and studies align with NOAA' mission to improve value and usage of present and future satellite data* | *10/1/2024* | *9/30/2025* | *Report* | |

DAP: Delivery Algorithm Package. PCT: Processing Coefficient Table. LUT: Look-Up Table. JCT: Joint Compatibility Test. I&T: Integration and Test

# ATMS SDR FY25 Milestones/Deliverables (2/2)

| Task Category | Task/Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Management & Maintenance (M) | (1) ATMS SDR team day-to-day management and coordination. | 10/1/2024 | 9/30/2025 | Report | |
| | (2) Discrepancy and risk reports to inform present or potential departures from specifications due to the presence of anomalies. | 10/1/2024 | 9/30/2025 | Report | |
| | (3) Annual, quarterly, monthly and weekly ATMS SDR performance reports. | 10/1/2024 | 9/30/2025 | Report | |
| | (4) Update ATMS ATBD. | 10/1/2024 | 3/31/2025 | Report | |
| | (5) Support of ATMS SDR JPSS reviews and science meetings. | 10/1/2024 | 9/30/2025 | Report | |
| | (6) Report results in international conferences. | 10/1/2024 | 9/30/2025 | Presentation | |
| | (7) Submit manuscripts. | 10/1/2024 | 9/30/2025 | Manuscript | |
| LTM & Anomaly Resolution (L) | (2) Perform regular RDR and SDR data analysis for instrument and data health. | 10/1/2024 | 9/30/2025 | Reports | |
| | (3) Implement new or improved capabilities for LTM, after properly assessing the methodologies for the validation and monitoring of the ATMS instruments and SDR data. | 10/1/2024 | 9/30/2025 | Reports | |
| | (4) Support anomaly event investigation and resolution of SNPP, NOAA-20 and NOAA-21 ATMS sensors. | 10/1/2024 | 9/30/2025 | Reports and solutions | |

DR: Discrepancy Report. ATBD: Algorithm Theoretical Basis Document. RDR: Raw Data Record. SDR: Raw Data Record. LTM: Long Term Monitoring.

# Clouds

March 2025

## *Accomplishments / Events:*

- Continued evaluation of the replacement of the Cloud Mask Phase as a replacement for the Enterprise Phase algorithm. It was noted at the GOES-19 review that the Enterprise Phase algorithm suffers from a “ring of fire (ice)” along cloud edges, which is unrealistic, while the ECM Phase does not.

- Work continues on looking at the sensitivity to ice habit for the daytime and nighttime visible optical properties. This is important to produce more accurate cloud top optical depths and effective radii, which are used by downstream products, such as cloud base and CCL

| Milestones - 1-4Q in the above table denotes that the specific milestone listed is ongoing algorithm developmental work that will likely span the entire year. Quarterly updates will be provided as needed. | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Investigate DCOMP sensitivity to ice crystal habit and channel-set for cirrus clouds | Sep-25 | 1-4Q | | |
| Enhance and maintain websites as a public interface to access product imagery | Sep-25 | 1-4Q | | |
| In collaboration with Polar Winds team, investigate ACHA performance as it relates to Atmospheric Motion Vector (AMV) height assignment | Sep-25 | 1-4Q | | |
| **Prepare CLAVRx cloud top phase algorithm to replace current operational cloud phase algorithm** | Sep-25 | 1-4Q | | |
| **Investigate new AI/ML techniques to improve multiple products (e.g., ECM, DCOMP/NCOMP)** | Sep-25 | 1-4Q | Mar-25 | |
| Investigate DCOMP precipitation applications | Sep-25 | 1-4Q | | |
| **Prepare tools that leverage new datasets for algorithm development and validation (e.g., EarthCARE)** | Sep-25 | 1-4Q | | |
| **Prepare CLAVRx cloud top phase algorithm to replace current** | Sep-25 | 1-4Q | | |

## *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:*

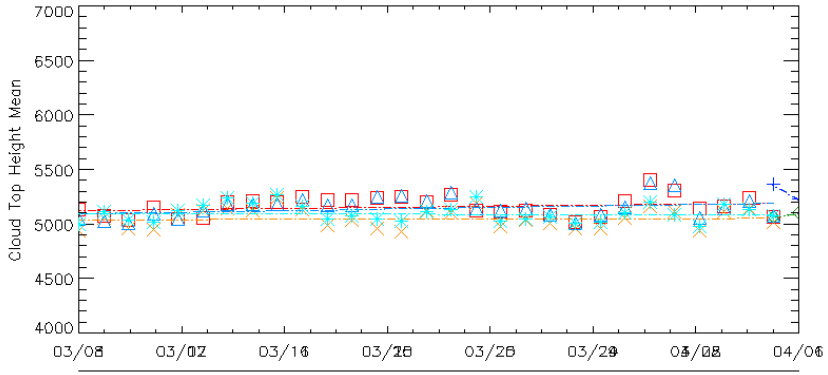



Figure 1.Long term monitoring of the Cloud Top Height from all VIIRS sensors

# Cloud Team FY25 Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| FY25 Mid-term Program Management Review | Dec-24 | Dec-24 | Nov--24 | |
| Assist with operational DAP deliveries, updates, and post-delivery product reviews | Sep-25 | 1-4Q | | |
| Conduct long term monitoring of all products | Sep-25 | 1-4Q | | |
| Investigate DCOMP sensitivity to ice crystal habit and channel-set for cirrus clouds | Sep-25 | 1-4Q | | |
| Enhance and maintain websites as a public interface to access product imagery | Sep-25 | 1-4Q | | |
| In collaboration with Polar Winds team, investigate ACHA performance as it relates to Atmospheric Motion Vector (AMV) height assignment | Sep-25 | 1-4Q | | |
| Prepare CLAVRx cloud top phase algorithm to replace current operational cloud phase algorithm | Sep-25 | 1-4Q | | |
| Investigate new AI/ML techniques to improve multiple products (e.g., ECM, DCOMP/NCOMP) | Sep-25 | 1-4Q | | |
| Investigate DCOMP precipitation applications | Sep-25 | 1-4Q | | |
| Prepare tools that leverage new datasets for algorithm development and validation (e.g., EarthCARE) | Sep-25 | 1-4Q | | |

# Cloud Team FY25 Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Continue evaluating all products using surface and satellite observations | Sep-25 | 1-4Q | | |
| Interact with operational users and obtain user feedback | Sep-25 | 1-4Q | | |
| Develop a test data package to help AWIPS-2 implementation and develop enhanced product displays based on user feedback | Sep-25 | 1-4Q | | |
| Provide algorithm cal/val documents and review materials | Sep-25 | 1-4Q | | |
| Continue product demonstration and public release for general users | Sep-25 | 1-4Q | | |
| Identify limitations of products through continued intensive validation and refine algorithms accordingly | Sep-25 | 1-4Q | | |
| Provide information on prospective algorithm refinements to improve operational algorithm performance | Sep-25 | 1-4Q | | |
| Support JPSS Aviation and Hydrology Initiatives | Sep-25 | 1-4Q | | |
| Update ATBD's as needed | Sep-25 | 1-4Q | | |

**1-4Q** in the above table denotes that the specific milestone listed is ongoing algorithm developmental work that will likely span the entire year. Quarterly updates will be provided as needed.

# Cloud Team FY25 Milestones

| Milestones | Original DateJ | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| New AI/ML techniques were applied to the Enterprise Cloud Mask (ECM) to improve cloud detection and accuracy. These techniques were applied in creating the ECM training dataset. This work will continue and will result in a new ECM algorithm delivery at some point in the near future. | Mar-25 | 1-4Q | Mar-25 | |
| Commenced routine downloads of EarthCARE products. EarthCARE is a spaceborne radar/lidar that will fill the void left by the CloudSat/CALIPSO satellites that were decommissioned in the past few years. EarthCARE products will be used as the primary independent cal/val dataset for many Enterprise cloud algorithms and will also be used to create updated training databases for cloud products created by current and future sensors. | Jun-25 | 1-4Q | | |
| Investigate DCOMP sensitivity to ice crystal habit and channel-set for cirrus clouds | Sep-25 | 1-4Q | | |
| Prepare CLAVRx cloud top phase algorithm to replace current operational cloud phase algorithm | Sep-25 | 1-4Q | | |
| Enhance and maintain websites as a public interface to access product imagery | Sep-25 | 1-4Q | | |
| In collaboration with Polar Winds team, investigate ACHA performance as it relates to Atmospheric Motion Vector (AMV) height assignment | Sep-25 | 1-4Q | | |
| Prepare CLAVRx cloud top phase algorithm to replace current operational cloud phase algorithm | Sep-25 | 1-4Q | | |
| Investigate new AI/ML techniques to improve multiple products (e.g., ECM, DCOMP/NCOMP) | Sep-25 | 1-4Q | | |

# CrIS SDR

March 2025

## Accomplishments / Events:

- NOAA-21 CrIS Neon Lamp bulb did not fire during normal activation time for calibration at 2025-03-02T17:52. (**Fig. 1**)
- This resulted in a significant number of granules with all data marked “Invalid” for MWIR and LWIR. (**Fig. 2**)
- Subsequent Analysis showed that the correct spectral unfolding was not being done by the CrIS SDR algorithm in this case. (**Fig. 3**)
- Performed analysis of remaining neon bulb lifetime expectations by changes to activation interval and warmup time. (**Fig. 4**)
- Provided a physics-informed empirical model of neon bulb lifetime as a function of warmup time based on TVAC and historical NOAA-21 CrIS on-orbit data for predicting subsequent lamp misfiring. (**Fig. 5**)
- The algorithm should use the last valid calibration values should be used in this case, but due to data load following, the previous value was not passed on to new processes. (**Fig. 6**)
- Analysis and fixes to ADR-11194 for the CrIS SDR Algorithm are ongoing. Presented changes to DRAT. Code change set is expected to be delivered to ASSISTT mid April.
- Improved long term geolocation accuracy reporting. (**Fig. 7**)
- Accessed EC2 NCCF instances created for CrIS SDR team for cloud transition. Presented various issues with available documentation to NCCF. NCCF provided fixes.
- Spectral correlation automated tool is under development for NOAA-21.

| Milestones | Category | Original Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Delivery of the JPSS-4 CrIS PreLaunch Characterization Report | Sustain | Dec-24 | Jan-25 | Needed NASA's Feedback |
| Implement and Test NOAA-21 Algorithm/PCT Calibration Updates to Mitigate the Impact of Neon Lamp Misfiring | Sustain | Apr-25 | | |
| Delivery of the Final JPSS-4 CrIS Cal/Val Plan | Sustain | Jun-25 | | |
| Delivery of the JPSS-4 CrIS Initial PCT LUT | Sustain | Jun-25 | | |
| Implement and Test Solutions of Calibration Error Reduction for JPSS-4 Launch Risk Mitigation | Sustain | Sep-25 | | |
| Delivery of the JPSS-4 CrIS Engineering Packet with New PRT Coefficients | Sustain | Sep-25 | | |
| Provide support to Metop-SG Joint Cal/Val Activities | Sustain | Sep-25 | | |
| Radiometric Intercomparison of the Operational CrIS SDR data against other LEO/GEO IR observations and GNSS-RO | Sustain | Sep-25 | | |
| Review/Checkout of IDPS Mx Builds SOL and I&T Deploy Regression data | Maintain | Sep-25 | | |
| Perform the transition of Cal/Val activities to the Cloud environment | Maintain | Sep-25 | | |
| Conduct maintenance including investigation and anomaly resolution of on-orbit CrIS sensors | Maintain | Sep-25 | NOAA-21 Neon lamp,, March 3 | |

## 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:

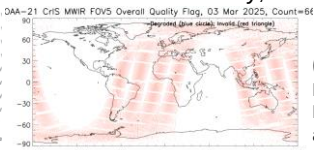
**Red:** It has been announced that JPSS-4 TVAC data and documents are now ITAR. STAR IT does not have a secured environment to host or process ITAR data.

**Yellow:** The CrIS Team is still in need of hardware resources. Presently, there is only two servers dedicated to 5 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.

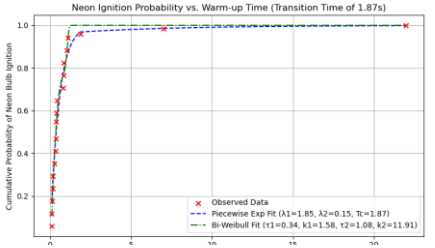
**Blue:** ASSIST Team has agreed to accept ADL code change tested on CentOS 9.

## Highlights:

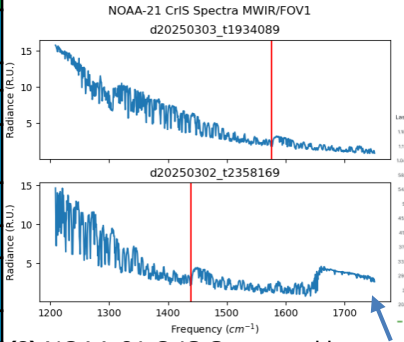

**(1)** NOAA-21 CrIS Neon Lamp activation and detection telemetry, 2025-03-02.



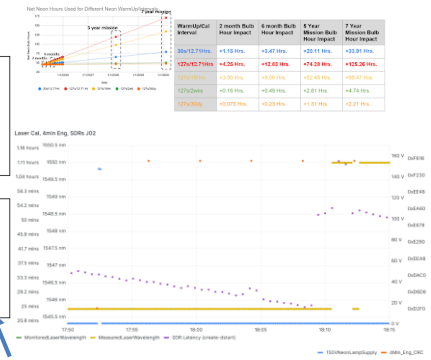
**(4)** Analysis of NOAA-21 Neon Bulb lifetime by activation time.




**(2)** NOAA-21 CrIS MWIR FOV5 QF 2025-03-03




**(3)** NOAA-21 CrIS Spectra without and with the neon lamp mis-fire values.

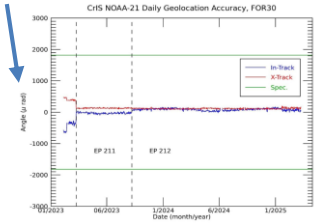



**(6)** Analysis of NOAA-21 CrIS tlm showing (blue) Neon Bulb activation, (red) EngPkt CRC, (yellow) Laser Wavelength, and (purple) Data latency.

$$P(T) = \begin{cases} 1 - e^{-\lambda_1 T}, & \text{for } T < T_c \\ 1 - (1 - P(T_c))e^{-\lambda_2 (T - T_c)}, & \text{for } T > T_c \end{cases}$$

**(5)** Analysis and generated model for likelihood of misfire of the NOAA-21 neon lamp.

**(7)** NOAA-21 Long term geolocation accuracy.



# CrIS SDR FY25 Milestones/Deliverables (1/2)

| Task Category | Task/Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Development (D) | (1) Implement and test calibration solutions for imaginary radiance reduction in the NOAA-21 CrIS SDR product. | 10/1/2024 | 6/30/2025 | Report | |
| | (2) Review and analysis of JPSS-3 and JPSS-4 CrIS pre-launch data to provide Flight and Ground support. | 10/1/2024 | 9/30/2025 | DAP/Report | |
| | (3) Support CrIS SDR processing system assessment and refinement. | 10/1/2024 | 9/30/2025 | DAP | |
| Integration & Testing (I) | (1) CrIS SDR code integration with ADL | 10/1/2024 | 9/30/2025 | ADL package | |
| | (2) Review/Checkout of IDPS Mx Builds SOL and I&T Deploy Regression data. | 10/1/2024 | 9/30/2025 | Report | |
| | (3) Sustain the quality of SNPP, NOAA-20 and NOAA-21 CrIS SDR data products. | 10/1/2024 | 9/30/2025 | Report | |
| | (4) Support J4/J3 JCT and Test events (J3 Pre-Storage TVAC, IDPS J3/J4 Test data Flow, etc.) | 10/1/2024 | 9/30/2025 | Report | |
| Calibration & Validation (C) | (5) Cal/Val planning of J3/J4 post-launch | 10/1/2024 | 9/30/2025 | Report | |
| | (6) Deliver J4 Pre-launch Characterization Report | 10/1/2024 | 12/31/2025 | Report | |
| | (7) Radiometric inter-comparison of S-NPP, NOAA-20 and NOAA-21 CrIS SDR data against other LEO/GEP IR observations and GNSS-RO. | 10/1/2024 | 9/30/2025 | Report | |
| | (8) Support new developments and studies align with NOAA' mission to improve value and usage of present and future satellite data | 10/1/2024 | 9/30/2025 | Report | |

DAP: Delivery Algorithm Package. PCT: Processing Coefficient Table. LUT: Look-Up Table. JCT: Joint Compatibility Test. I&T: Integration and Test

# FY25 Milestones/Deliverables (2/2)

| Task Category | Task/Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Management & Maintenance (M) | (1) CrIS SDR team day-to-day management and coordination. | 10/1/2024 | 9/30/2025 | Report | |
| | (2) Discrepancy and risk reports to inform present or potential departures from specifications due to the presence of anomalies. | 10/1/2024 | 9/30/2025 | Report | |
| | (3) Annual, quarterly, monthly and weekly CrIS SDR performance reports. | 10/1/2024 | 9/30/2025 | Report | |
| | (4) Update CrIS ATBD. | 10/1/2024 | 3/31/2025 | Report | |
| | (5) Support of CrIS SDR JPSS reviews and science meetings. | 10/1/2024 | 9/30/2025 | Report | |
| | (6) Report results in international conferences. | 10/1/2024 | 9/30/2025 | Presentation | |
| | (7) Submit manuscripts. | 10/1/2024 | 9/30/2025 | Manuscript | |
| LTM & Anomaly Resolution (L) | (1) Upgrade the JSTAR CrIS Website. | 10/1/2024 | 9/30/2025 | Website | |
| | (2) Perform regular RDR and SDR data analysis for instrument and data health. | 10/1/2024 | 9/30/2025 | Reports | |
| | (3) Implement new or improved capabilities for LTM, after properly assessing the methodologies for the validation and monitoring of the CrIS instruments and SDR data. | 10/1/2024 | 9/30/2025 | Reports | |
| | (4) Support anomaly event investigation and resolution of SNPP, NOAA-20 and NOAA-21 CrIS sensors. | 10/1/2024 | 9/30/2025 | Reports and solutions | |

DR: Discrepancy Report. ATBD: Algorithm Theoretical Basis Document. RDR: Raw Data Record. SDR: Raw Data Record. LTM: Long Term Monitoring.

# Cryosphere

March 2025

## Accomplishments / Events:

- **VIIRS Ice Surface Temperature and Thickness Products Detect a Very Large Sea Ice Lead in the Eastern Beaufort Sea:** VIIRS sea ice products detected a particularly large lead (a fracture of the sea ice) over the eastern Beaufort Sea on 13 February 2025. This lead extended from near the southern coast of Banks Island northward into the central Arctic northwest of Prince Patrick Island. The lead is roughly 700+ km long and 10-15 km wide (Figure 1). Sea ice leads tend to be under one hundred km in length and under 1 km in width. Therefore, the size of this lead is unusual. Figure 1 shows the VIIRS Ice Surface Temperature (IST) and Ice Thickness (ITK) products over the eastern Beaufort Sea. In Figure 1a, numerous smaller leads are observed to the west of the main feature. The main lead is much warmer than the surrounding ice due to the thinner ice within it, showing temperatures of 255-265 K compared to 235-245 K for the surrounding ice. The ice in the lead is significantly thinner than the surrounding ice, with thicknesses less than 1 m in the lead and thickness of 2-2.5 m elsewhere (Figure 1b). This lead was observed to be at its largest on 13 February, after which it gradually closes over next couple weeks.

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Updates on the ice surface temperature, including research on impacts of angular emissivity of snow and ice | *Mar 2025* | *June 2025* | | |
| Melting/frozen snow pack discrimination. Algorithm and software development | *Jun 2025* | *Jun 2025* | | |
| Blend AMSR2 into the VIIRS binary snow product, finalize the algorithm, Begin routine offline generation. | *Sept 2025* | *Sept 2025* | | |

## Overall Status:

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

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

### Issues/Risks:

No risks.

## Highlight:

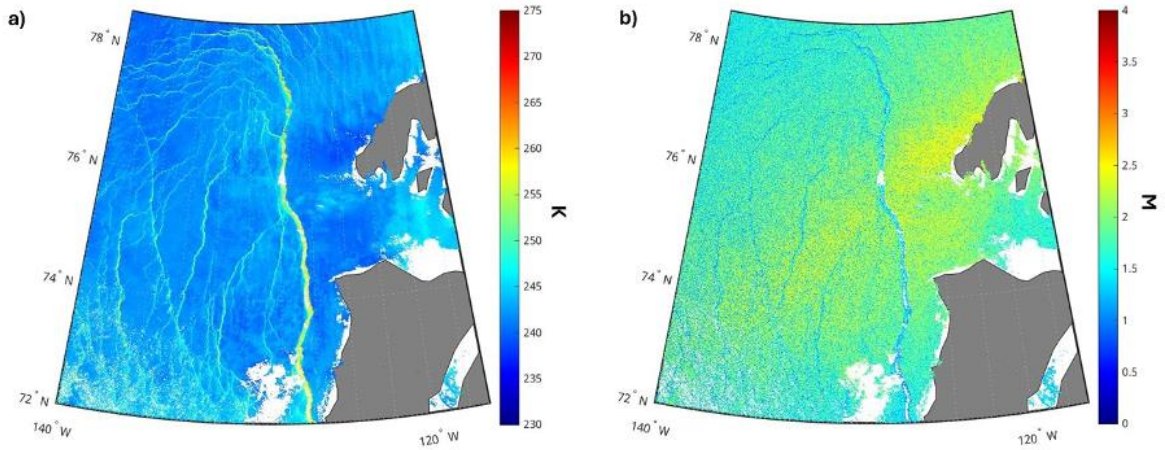



Figure 1: a) IST with 230 to 275 K and b) ITK with 0 to 4 meter range from 13 February 2025. Derived from NOAA-20 VIIRS Enterprise Algorithm.

# Cryo FY25 Milestones/Deliverables (in general)

| Task Category | Task/ Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Development (D) | Blend AMSR2 into the VIIRS binary snow product, finalize the algorithm, Begin routine offline generation. | 10/2024 | 9/2025 | Routinely generated daily blended gap-free snow map based on combined VIIRS and microwave data | Same as snow product EDRs |
| Development (D) | Melting/frozen snow pack discrimination. Algorithm and software development | 10/2024 | 6/2025 | Daily map of the snowpack state (melting/frozen) | Same as snow cover EDR |
| Development (D) | Upgrade web-page displaying VIIRS snow cover products. Enable viewing and analysis of gridded snow product at full (1km) spatial resolution | 10/2024 | 6/2025 | Enhanced web page | N/A |
| Development (D) | Finalize supplemental cloud mask for daily VIIRS snow products: Compensate for weaknesses of the cloud mask | 10/2024 | 9/2025 | Final algorithm and software to generate VIIRS supplemental cloud mask | N/A |
| Development (D) | Melt/freeze discrimination and degrees above melting.(Daytime only) | 10/2024 | 12/2025 | Expansion of IST product | Enhanced usability by analysts and forecasters. |

# Cryo FY25 Milestones/Deliverables (in general)

| Task Category | Task/ Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Development (D) | Updates on the ice surface temperature, including research on impacts of angular emissivity of snow and ice | 06/2024 | 03/2025 | IST surface temperature algorithm update | Improved accuracy for all users |
| Integration and Testing (I&T) | Improvements to the Sea Ice Concentration product. | 10/2023 | 09/2026 | Algorithm enhancements to improve SIC near sea ice edge | Same as ice concentration EDR |
| Integration and Testing (I&T) | Include Blended SIC and NOAA-21 ice products into RealEarth | 10/2024 | 06/2025 | Graphics | **Streamlined validation** |
| Integration and Testing (I&T) | Improvements to the Ice Thickness and age products. | 10/2024 | 09/2025 | Improved ice thermal and physical dynamic parameterizations (growing and melting processes), using ice-snow interface temperature product | IceAge EDR |
| Maintenance | Additions and Improvements to Blended Sea Ice Concentration product | 10/2024 | 06/2025 | Include observational weights into output Netcdf files. | **Request by users** |

# Polar Winds

*March 2025*

## *Accomplishments / Events:*

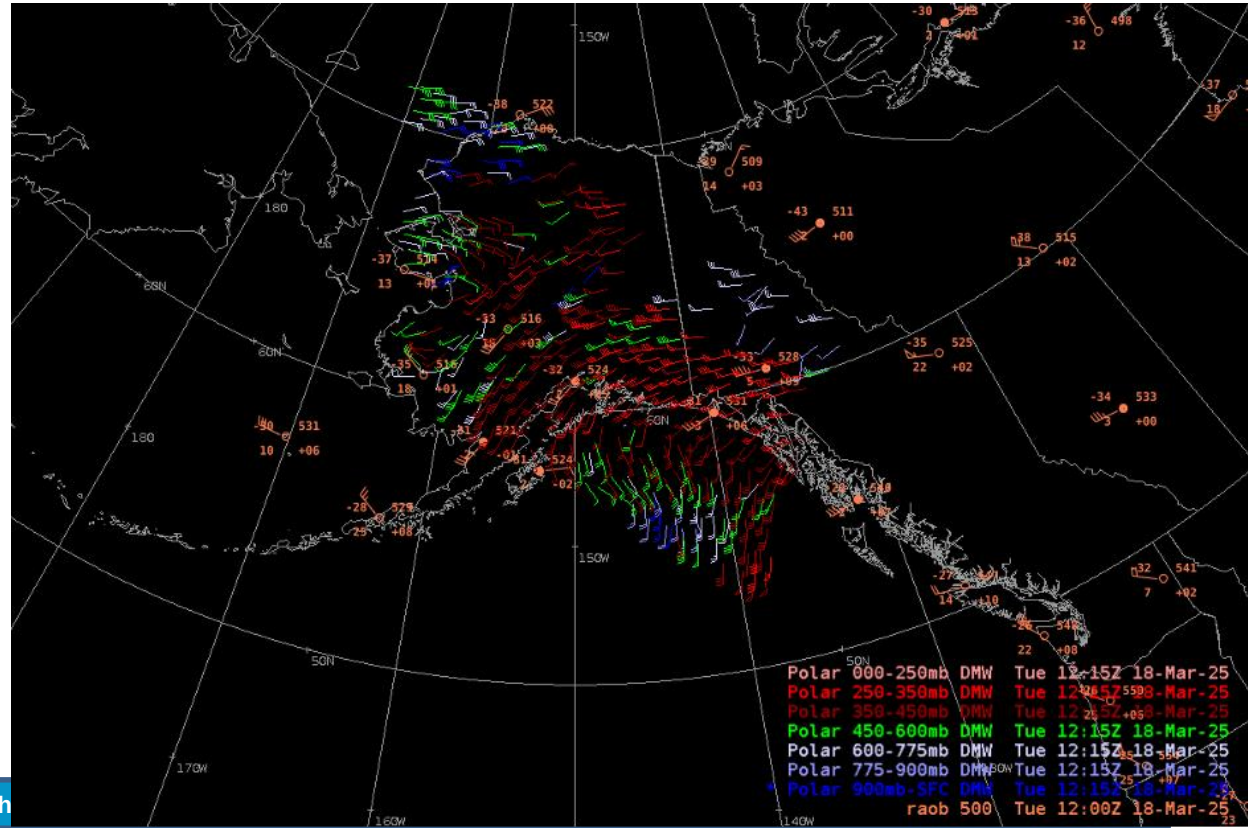
**Direct Broadcast VIIRS Winds Now Available in AWIPS at NWS Alaska Offices**: During discussions at the September 2024 Alaska Next Generation Workshop in Anchorage, Alaska, the idea of making Direct Broadcast (DB) winds from JPSS VIIRS available to NWS in Alaska was agreed upon. This was spearheaded by Carl Dierking at University of Alaska-Fairbanks Geographic Information Network of Alaska (UAF-GINA) and Richard Dworak at University of Wisconsin-Madison Cooperative Institute for Meteorological Satellite Studies (CIMSS). With only 13 weather balloon stations in Alaska launching weather balloons twice a day, which is insufficient for such a large area. Currently, VIIRS satellite data from Gilmore Creek, Alaska GINA DB antenna is sent directly to CIMSS to be processed in creating cloud tracking Atmospheric Motion Vectors (AMVs) from VIIRS on S-NPP, NOAA-20, and NOAA-21 satellites using the Enterprise framework. Output BUFR files are sent back to GINA, where they are immediately read into AWIPS to be displayed at NWS Alaska regional offices.

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Demonstration and validation of Polar ***"Tandem-Satellite"*** VIIRS SWIR & LWIR wind datasets over a 4-6 week time period and make them available to NWP Centers | *Jun 2025* | *Jun 2025* | | |
| *Support transition of "Single-Satellite" VIIRS SWIR winds into operations* | *Sept 2025* | *Sept 2025* | | |

## *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.*



# Polar Winds Status of FY25 Milestones/Deliverables *(1/2)*

| Task Category | Task/ Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Development (D) | Demonstration and validation of Polar ***"Tandem-Satellite"*** VIIRS SWIR & LWIR wind datasets over a 4-6 week time period and make them available to NWP Centers | Aug 2024 | Jun 2025 | Polar ***"Tandem-Satellite"*** VIIRS SWIR & LWIR wind BUFR datasets;<br><br>Wind validation results | Refer to IORD/L1RD; NESDIS priorities. |
| Development (D) | Incorporate VIIRS DNB (Near-Constant Contrast) updates from heritage to enterprise winds algorithm in FW2.x | Aug 2024 | Jun 2025 | Updated enterprise winds software. | INNOVATION |
| Development (D) | Develop and validate approaches to generate VIIRS winds from tandem-satellite pairs of images (enables global coverage) | Aug 2024 | Jun 2025 | Updated enterprise winds software<br><br>Validation study reports | INNOVATION |
| Development (D) | Feature tracking QC for VIIRS winds: Investigate scan angle diffs between successive orbits & impact on VIIRS winds quality; account for parallax | Aug 2024 | Jun 2025 | Informal/internal assessment report.<br><br>Updates to enterprise winds software | |
| Development (D) | Development of updated VPW Validation and monitoring system | Oct 2024 | Jun 2025 | Updated validation software<br><br>Updated winds monitoring web pages<br><br>Documentation | |

# Polar Winds Status of FY25 Milestones/Deliverables *(2/2)*

| Task Category | Task/ Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Integration & Testing (I) | Support transition of ***"Single-Satellite"*** VIIRS SWIR winds into operations | Oct 2024 | Sep 2025 (Est) | Validation reports | Refer to IORD/L1RD; NESDIS priorities |
| Integration & Testing (I) | Begin transition of ***"Tandem-Satellite"*** VIIRS LWIR and SWIR winds to operations *(if funded)* | Oct 2024 | Sep 2025 (Est) | Updated enterprise winds software & enterprise winds ATBD<br><br>Validation reports | Refer to IORD/L1RD; NESDIS priorities |
| Maintenance | Deliver enterprise winds algorithm updates, as needed | Oct 2024 | Sep 2025 | Updated software, as needed; Updated Enterprise Winds ATBD, as needed | |
| LTM & Anomaly Resolution (L) | Dev and testing of minor algorithm updates as needed.<br><br>Continued monitoring and validation of VPW winds;<br><br>Addition of ERA5 analysis to winds team's validation tool set | *Oct 2024* | *Sep 2025* | Graphics, statistics Webpage product monitoring graphics;<br><br>Updated winds validation/monitoring software, as needed | |

# GCOM-W/AMSR2 & AMSR3

*March 2025*

## *Accomplishments / Events:*

- Started the development of multi-ice-particle microphysics machine learning model for AMSR3 SFR using GPM data as proxy. Finished building the training dataset.
- Developing AMSR3 rainfall type (convective/stratiform) machine learning model using GMI data as proxy. Initial results suggest accuracy of 84-87%.
- Following the implementation of GPROF2017 AMSR2 rainfall algorithm into operations, a routine validation of its products against MRMS is established. Archived and near real time and validation products (over the CONUS) are now available through the CISESS portal at https://precip-val.umd.edu.

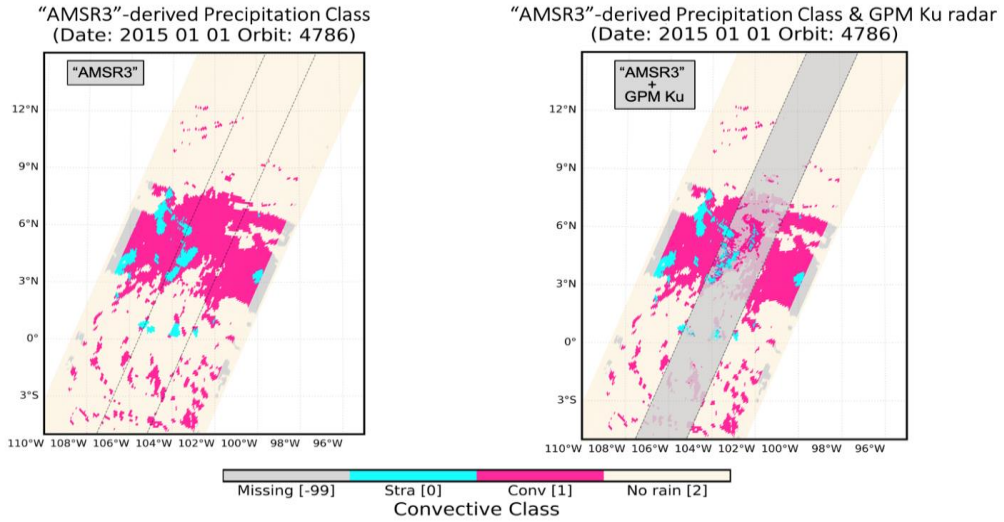
## *Overall Status:*

| | 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:*




Initial AMSR3 rainfall type (convective/stratiform) retrieval using GPM/GMI L1 data as input and GP Ku radar-observed rainfall class as target. Left: "AMSR3" rainfall type product with the outlined boundaries of the GPM Ku coverage (dashed lines); Right: Overlapped (semi-transparent) GPM Ku swath is added in the image on the right. Retrieval does not attempt to detect rain/no-rain flag.

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Assessment of all EDR's for AMSR2, initiate changes for AMSR3 | 6/2025 | | | |
| Reprocessing of L2 EDR's | 7/2025 | | | |
| Continue AMSR2 L1 monitoring; develop AMSR3 capabilities | 9/2025 | | | |
| Deliver any algorithm updates | 5/2025 | | | |

# GCOM-W/AMSR2 & AMSR3 Sea ice



## *Accomplishments / Events:*

- Code for AMSR3 being finalized for initial delivery
- Continued validation and maintenance of operational algorithm
  - 24-hour field, updated with most recent swath
  - Total and multi-year concentration
- Algorithm enhancements in development
  - Software rewritten from C/Fortran into Python
  - Refactored to be more modular
- Validation data collected for further studies
  - Landsat
  - ICESat-2 concentration
  - Mooring data
- Preparation for AMSR3
  - Algorithm modifications for easier intercalibration with AMSR2
  - Testing on AMSR3 proxy data

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Continuing assessment of AMSR2 | 12/2024 | | Ongoing | |
| Recoding/refactoring software | 9/2024 | | 9/2024 | |
| Initial software delivery for AMSR3 | 12/2024 | 2/2025 | | Minor delay in finishing up code change |
| Delivery of further algorithm updates | 5/2025 | 8/2025 | | |

## *Overall Status:*

| | Green[1] (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| Cost / Budget | | X | | | |
| Technical / Programmatic | | | x | | Slight delay in code delivery (delivered 10 March |
| Schedule | | X | | | |

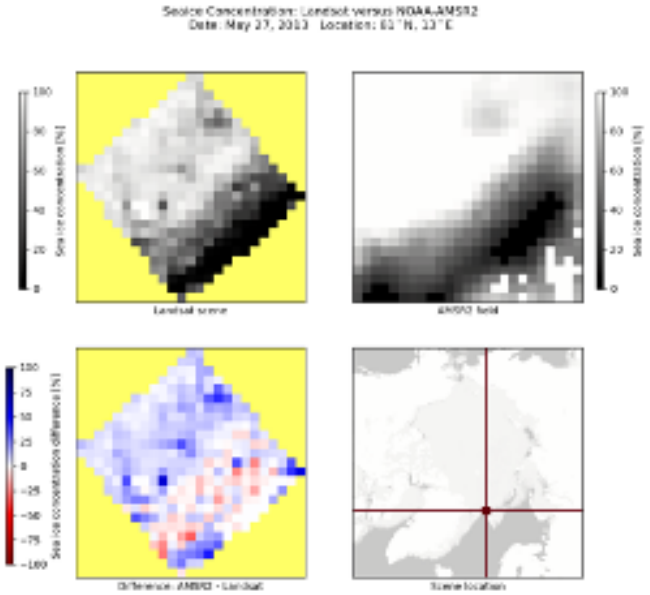
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

***Issues/Risks:***

## *Highlights:*

Comparisons with Landsat imagery show good agreement within the icepack.

Errors are higher near the ice edge, which is expected due to AMSR sensor resolution and ambiguities in the ice characteristics.



# GCOM-W/AMSR2 & AMSR3 Snow

*March 2025*

## *Accomplishments / Events:*

- **Completed**: Results of AMSR3-GFS study using AMSR2 data as proxies
- **Completed:** Collection of 10-km ECMWF ERA-LAND snow reanalysis dataset and code development to match it with satellite data

- **In-Progress:** Training a new snow depth algorithm using reanalysis snow data
- Testing of the new snow algorithms using in situ snow data
- Transitioning to ASSIST
- **2025-2026 plans:** New generation of SD/SWE algorithms based on a common development and evaluation strategy

| Major Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Testing of AMSR2/3 SD and SWE upgrades | **5/2025** | | | |
| Incorporation into operational system | **6/2025** | | | |
| New generation of algorithms, fist testing | **9/2025** | | | |
| AMSR2/3 Deliveries and updates | **6/2025** | | | |

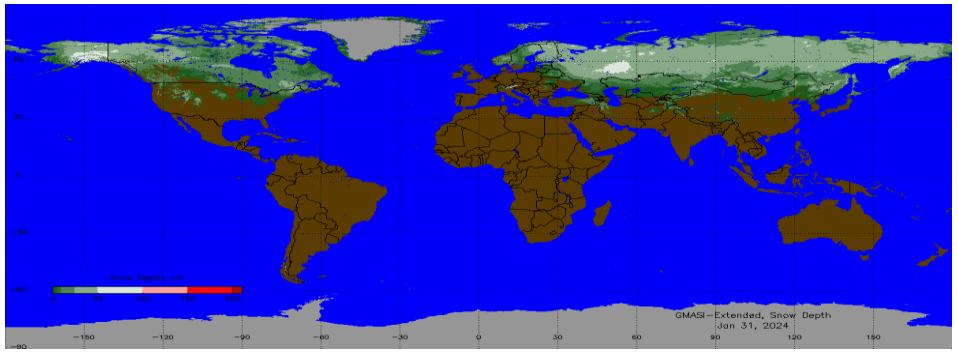
## *Overall Status:*

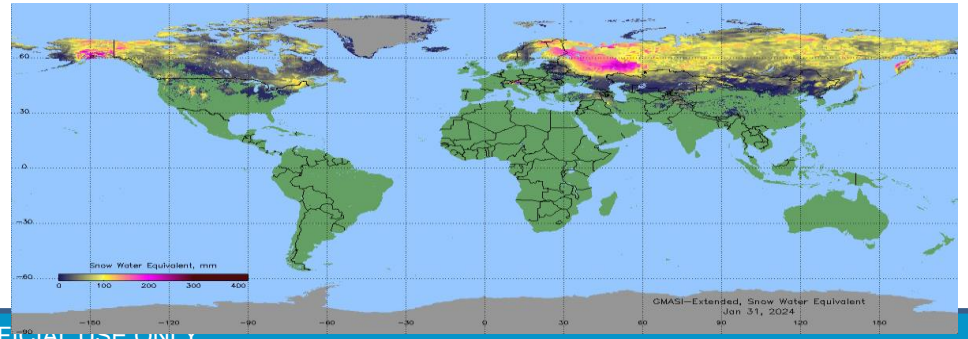
| | Green[1] (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| **Cost / Budget** | | X | | | |
| **Technical / Programmatic** | | X | | | |
| **Schedule** | | X | | | |

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:*



# GCOM-W/AMSR2 & AMSR3 Soil Moisture

March 2025

## Accomplishments / Events:

- Migration of GAASP AMSR2 Soil Moisture EDR algorithm software package to the NCCF production environment is in the final stage
  - Reviewed GAASP SM EDR System Maintenance Manual (SMM) and External User's Manual (EUM)
- AMSR2 soil moisture Machine Learning (ML) algorithm updates
  - Evaluated the difference between the newest version of SMAP soil moisture and the previous version, and found significant differences in some regions. Therefore, we decided to retrain the model using the newest version as the reference
  - Retrained the ML model using the newest version of SMAP soil moisture product (Version 9) as the reference (used Version 8 previously)
  - Generated historical AMSR2 soil moisture product using the new ML model and did the comparison between the old version using SMAP

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Migration of GAASP AMSR2 SM package to NCCF | 3/26/2025 | 3/26/2025 | On time | |
| NDE on-prem retirement and distribution cut-off | 4/4/2025 | 4/4/2025 | On Time | |
| AMSR2 SM EDR software package using ML algorithm | 6/2025 | | | |
| Reprocessing of L2 SM EDR's and its validations using in-situ soil moisture measurements | 7/2025 | | | |
| Evaluation of AMSR3 brightness temperature data – if available, and check the its consistency with AMSR2 brightness temperature data | 9/2025 | | | |
| Implementation of AMSR2 SM EDR algorithm using AMSR3 TB inputs | 10/2025 | | | |

## Overall Status:

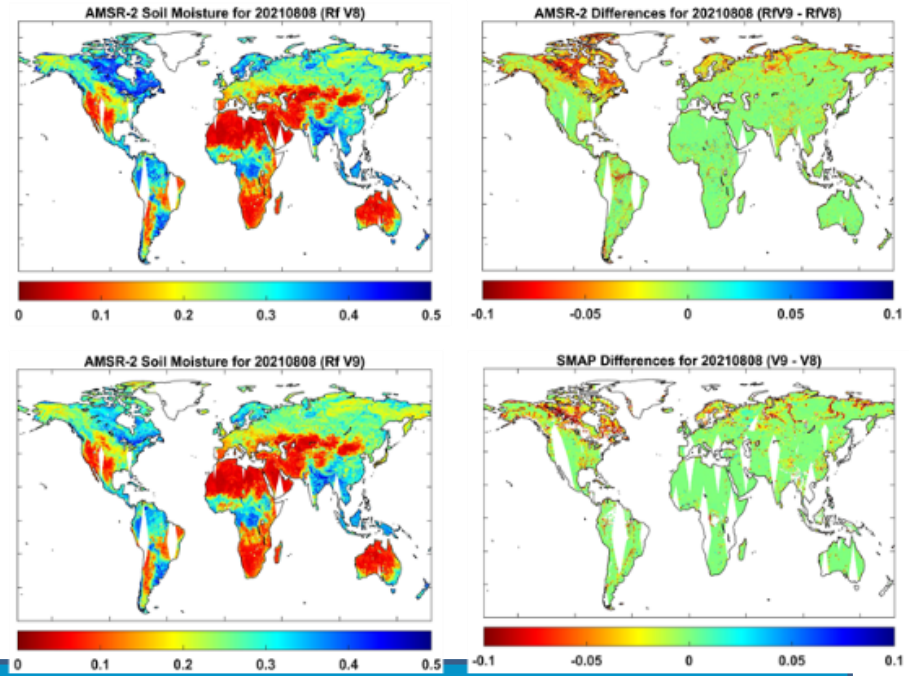
| | Green[1] (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| Cost / Budget | | X | | | |
| Technical / Programmatic | | X | | | |
| Schedule | | X | | | |

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

***Issues/Risks: None***

## Highlights:

Comparison between AMSR2 soil moisture products from old version and new version of ML models shows consistency with the difference map between SMAP reference products.



# GCOM-W/AMSR2 & AMSR3

*March 2025*

## Precipitation (Rain Rate and Snowfall Rate)

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Developing a neural network-based GPROF Precip retrieval for AMSR instrument series. Support transition of AMSR2 Precipitation package to operational NCCF. | 1/2025 | 1/2025 | 1/2025 | |
| Build an evaluation package to support development of ML-based products; evaluate the need for constructing a new a priori database to support GPROF algorithm. | 6/2025 | | | |
| Implement advanced microphysics in the preliminary AMSR3 SFR algorithm | 6/2025 | | | |
| Test and implement near real time validation for AMSR3 precipitation product; develop AMSR2 long-term validation. | 9/2025 | | | |
| Analyze AMSR3 measurements post-launch and perform radiometric bias correction | 9/2025 | | | |

## Soil Moisture

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| AMSR2 SM EDR software package using ML algorithm | 6/2025 | 6/2025 | | |
| Reprocessing of L2 SM EDR's and its validations using in-situ soil moisture measurements | 7/2025 | 7/2025 | | |
| Evaluation of AMSR3 brightness temperature data – if available, and check the its consistency with AMSR2 brightness temperature data | 9/2025 | 9/2025 | | |
| Implementation of AMSR2 SM EDR algorithm using AMSR3 TB inputs | 10/2025 | 10/2025 | | |

## Sea ice

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Further development and improvement of the AMSR2 sea ice products | 5/2025 | 5/2025 | | |
| Adapt the AMSR2 sea ice algorithm for AMSR3 with the AMSR3 proxy data | 6/2025 | 6/2025 | | |
| Continuing assessment of AMSR2 with in situ measurements and other satellite products | 9/2025 | 9/2025 | | |

## Snow

| Major Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Testing of AMSR2/3 Snow Depth and Snow Water Equivalent upgrades | 5/2025 | | | |
| Incorporate the upgrades into operational system | 6/2025 | | | |
| Development of new generation of algorithms and testing | 9/2025 | | | |

# GCOM FY25 Milestones/Deliverables (in general)

| Task Category | Task/ Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Development (D) | Assessment of all EDR's for AMSR2, initiate changes for AMSR3 | Oct 2024 | Sept 2025 | Beta versions of Pre-launch algorithms and LUTs | Refer to IORD/L1RD; NESDIS priorities; STAR-National Center User Engagements |
| Integration & Testing (I) | Reprocessing of L2 EDR's | Nov 2024 | July 2025 | Full L2 products from launch through July 2023 | |
| Calibration & Validation (C) | Continue AMSR2 L1 monitoring; develop AMSR3 capabilities | Oct 2024 | Sept 2025 | Annual cal/val report; AMSR3 prototype off-line system | |
| Maintenance | Deliver any algorithm updates | Jan 2025 | May 2025 | Updated code to ASSISTT | |

# ICVS

March 2025

*Accomplishments / Events:*

- Firstly observed NOAA-21 CrIS SDR data quality degradation issue on March 3 based on ICVS LTM NRT CrIS data quality monitoring suite. Due to the failure of neon lamp lite up, there are 7 orbits of NOAA-21 CrIS SDR data from March 2 to 3 data quality degradation by using predefined filled laser wavelength values. The neon fringe count error NRT notification function is also been added to ICVS LTM CrIS suite to notify users when the similar issue happens again in the future. Shown in Fig 1 is the NOAA-21 CrIS LWIR SDR vs. EC profile CRTM simulation on March 2, 2025.
- Provided NRT monitoring of NOAA-20 local time ascending node (LTAN) to support the study of satellite drift impact to SDR data quality. A drag make-up maneuver has been performed on April 2 to mitigate the drift. Shown in Figure 2 is the NOAA-20 ATMS LTAN long term trending figure.
- Updated VIIRS M-band SDR global map, RGB true color image, SDR data quality, and GEO data quality processing packages due to the change of M-band geolocation from non-terrain corrected to terrain corrected data types. Fixed VIIRS sync loss monitoring package series number error due to the false alarm.
- Continued working a new 1dar-based validation algorithm for OMPS SDR data towards direct uses of SDR in NWP, in coordination with OMPS SDR team.

## *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.*

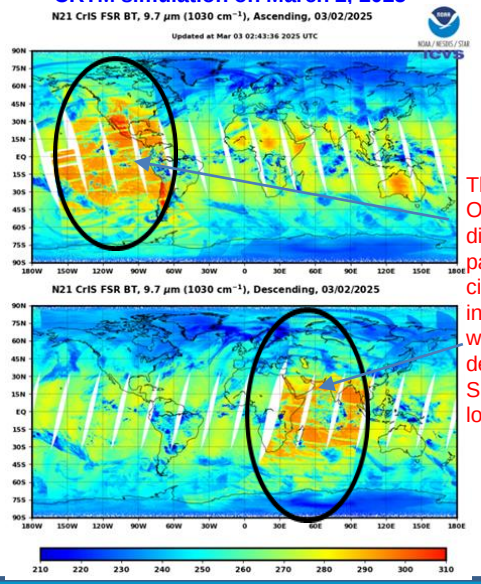
## ***Issues/Risks:***

None

| Task/Milestone Description | Original Date | Completion Date | Variance Explanation |
|---|---|---|---|
| Identify ICVS-lite modules for transition to OSPO operational environment in coordination with OSPO | Nov-24 | Nov-24 | |
| Initialize new algorithms/functions to monitor SDR data quality in terms of requirements using NOAA-21 SDR data as test data sets | Feb-25 | Feb-25 | |
| Develop a new monitoring framework to improve timeliness and performance in preparation of J3/J4 missions | May-25 | | |
| Initialize an algorithm for estimating OMPS NM geolocation errors in the absence of VIIRS data from the same satellite | Aug-25 | | |
| Continue supporting NCCF cloud migration discovery activity: test the ICVS functions in cloud as needed | Sep-25 | | |
| Develop new ICVS algorithms\modules in support of future JPSS-04/03 missions | Sep-25 | | |
| Support JPSS spacecrafts and instruments recovery activities, JPSS data anomaly analysis activities by STAR SDR and EDR teams, JPSS flight , OSPO and NWP | Sep-25 | | |
| Maintain and sustain the LT ICVS product monitoring performance for SNPP, NOAA-20, NOAA-21, including 3D-ATMS-VIIRS SDR hurricane core observations | Sep-25 | | |
| Support STAR SDR calibration/validation activities, including innovation idea test, and LEO program's ad hoc requests (e.g., SDR data impact demonstration) | Sep-25 | | |

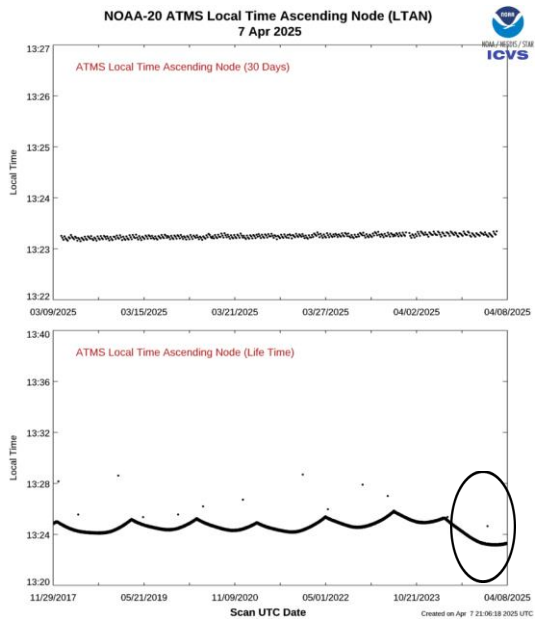
## *Highlights:*

**Figure 1 N21 CrIS LWIR SDR vs. EC profile CRTM simulation on March 2, 2025**




The unusual O-B distribution pattern in the circles indicate where the degraded SDR data are located.

**Figure 2 NOAA-20 ATMS LTAN lifetime trend**



# VIIRS SDR

March 2025

## Accomplishments / Events:

- Created, tested, and submitted to ASSISTT for implementation in IDPS the code change that corrects the build warning issue in VIIRS SDR Calibration (ADR 11192)
- Downloaded from GRAVITE the latest JPSS-4 VIIRS RDR files created with the updated RT-STPS software in March 2025 and verified that the correct granule size is used (85.0 s) and that no granule includes more than 48 scans
- Analyzed NOAA-21 VIIRS TEB performance using the March 25-27, 2025 WUCD data with no significant calibration offset or nonlinearity changes observed; Residual WUCD biases were small (~0.01 K) after the operational WUCD bias correction
- Assisted in scheduling and analyzed data from NOAA-21, NOAA-20, and Suomi NPP VIIRS lunar calibration on 3/9/2025: data aligns well with long-term trends and exhibits consistency

## 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 | | | |

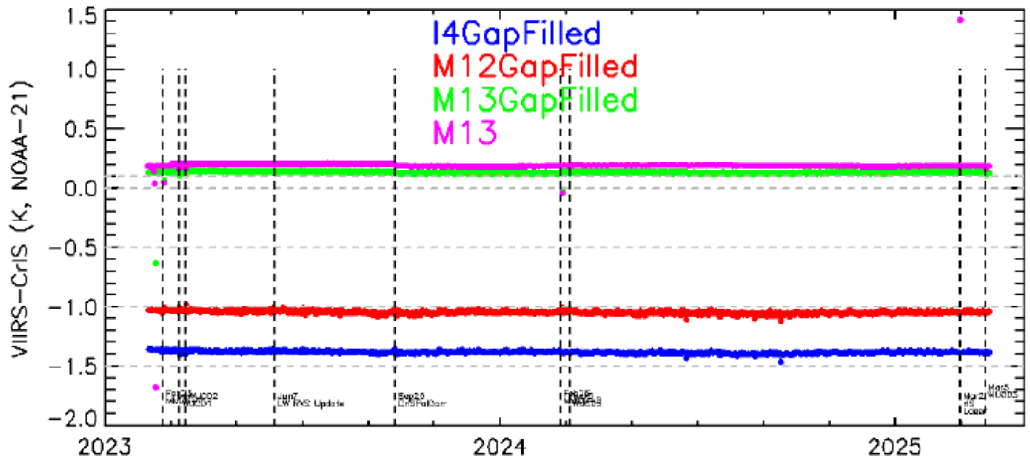
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

## Issues/Risks:

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| TSIS-1 solar spectrum application for JPSS-3/-4 VIIRS | Dec-24 | | 11/15/2024 | |
| JPSS-4 VIIRS pre-launch characterization report | Mar-25 | | 3/13/2025 | |
| JPSS-3/-4 VIIRS granule size change verification | Mar-25 | | 2/27/2025 | Mx13 SOL |
| VIIRS cross-calibration with hyperspectral measurements | Jun-25 | | | |
| Suomi NPP and NOAA-20 VIIRS intermediate recalibration | Jun-25 | | | |
| “Monthly” VIIRS lunar calibration predictions and analyses | Jul-25 | | | |
| JPSS-3/-4 VIIRS waiver impact studies report | Sep-25 | | | |
| Cross-calibration and comparison among NOAA-21, NOAA-20, and Suomi NPP VIIRS report | Sep-25 | | | |

## Highlights:

*Daily-Averaged VIIRS-CrIS Brightness Temperature Biases for NOAA-21 Mid-Wave Infrared (MWIR) Bands: “Gap Filled” to account for VIIRS/CrIS spectral coverage differences*



| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Task 1: Evaluate/validate VIIRS Imagery EDRs routinely and as part of JPSS ground systems tests. | Ongoing | | | |
| Task 2: Continue to pursue the development of new DNB-to-NCC LUTs using recently optimized DNB ASF tool code | Sep - 25 | | | |
| Subtask 2.1: Generate DNB-to-NCC LUTs specific to NOAA-20, NOAA-21, and S-NPP using new DNB ASF tool code | Mar - 25 | | | |
| Subtask 2.2: Use new DNB-to-NCC LUTs to produce NCC imagery for each VIIRS, and compare imagery to that using the operational LUT | Jun - 25 | | | |
| Subtask 2.3: Upon evaluation, if imagery has similar or better quality to that using operational LUT, then pursue operational implementation of new DNB-to-NCC LUTs for each VIIRS. | Sep - 25 | | | |
| Task 3: Support JPSS Program outreach efforts through the Image Production subgroup. | Ongoing | | | |
| Subtask 3.1: Assist the JPSS Program Office and the JPSS Imagery Cal/Val team lead through the production of VIIRS imagery examples | Ongoing | | | |
| Subtask 3.2: Distribute VIIRS Imagery examples for use in public relations materials, scientific presentations given by JPSS Program management, forecaster training materials, social media, and scientific blog posts, among others. | Ongoing | | | |
| Task 4: JPSS-3 and JPSS-4 Cal/Val preparation activities, as requested by the JPSS Program Office. | As Needed | | | |
| Subtask 4.1: Cal/val plans and maturity schedules | As Needed | | | |
| Subtask 4.2: Data systems test events | As Needed | | | |
| | | | | |

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 5: Continue to support development and production of VIIRS-related products for Polar SLIDER (https://rammb-slider.cira.colostate.edu/?sat=jpss), CIRA-produced VIIRS imagery products that are delivered to CIMSS' RealEarth website (https://realearth.ssec.wisc.edu), and similar products that are produced at UAF/GINA for distribution to NWS Alaska Region offices.* | Ongoing | | | |
| *Task 6: Coordinate with NESDIS/STAR/JPSS, NWS representatives, TOWR-S, and the JPSS Satellite Liaison on the delivery, display, and training of VIIRS imagery products to the NWS and solicit user feedback* | Ongoing | | | |
| *Subtask 6.1: Newly developed VIIRS Imagery Multispectral products* | Ongoing | | | |
| *Subtask 6.2: CrIS Imagery* | Ongoing | | | |
| *Subtask 6.3: VIIRS Imagery for CONUS users* | Ongoing | | | |
| *Task 7: Provide interesting VIIRS Imagery and Blogs on a regular basis throughout grant period, as well as provide presentations and publications where appropriate.* | Ongoing | | | |
| *Task 8: Contribute to monthly reports on the VIIRS Imagery EDR Team activities, and participate in Imagery Team meetings and relevant JPSS science meetings.* | Ongoing | | | |
| Task 9: Blowing Dust Climatology Paper submitted (includes VIIRS Imagery) | Sep - 25 | | | |
| Task 9: CrIS Imagery Paper submitted | Mar - 25 | | | |
| Task 9: Blowing Snow Paper submitted | Jun - 25 | | | |

# Leaf Area Index

March 2025

## *Accomplishments / Events:*

- Completed the LAI Algorithm/Operational Readiness Review. The science team presented the LAI algorithm validation, covering in-situ validation, cross-comparison, and model user feedback.
- Summarized key product highlights and emphasized the importance of LAI in land modeling, developing the monitoring tool and preparing for the public release of operational data.
- Engaged with model users to gather feedback and concerns, investigating specific issues such as high-latitude LAI and phenology transition dates based on the LAI time series.
- Continued development of improved temporal smoothing and gap-filling algorithms to enhance the LAI time series.

## *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 | | | |

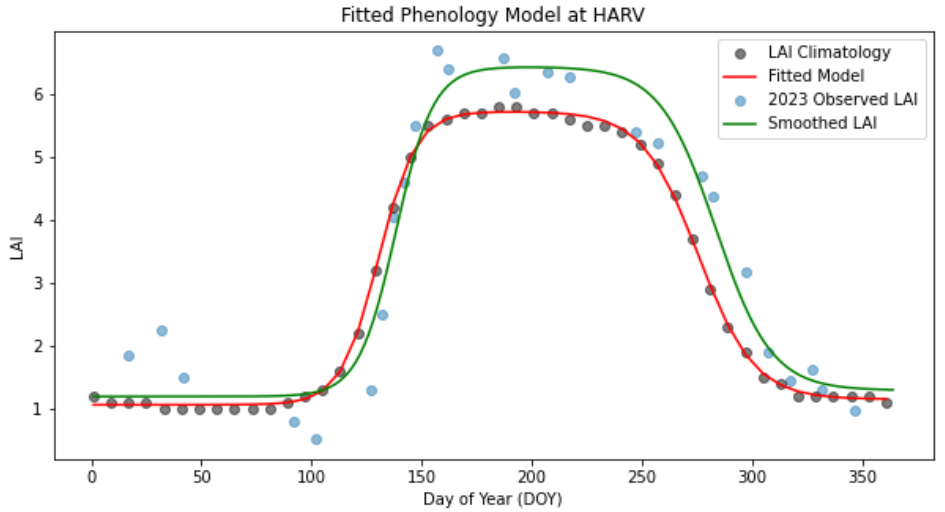
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

### ***Issues/Risks:***

None

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Develop LAI routine monitoring and validation tool | Sep-24 | Sep-24 | Sep 27, 2024 | |
| Apply the LAI routine monitoring and validation tool on the operational product | Dec-24 | Dec-24 | Jan 31, 2025 | Operational test data postponed |
| LAI operation data verification and adjustment | Mar-25 | Mar-25 | Mar 11, 2025 | |
| LAI product in-situ validation & inter-comparison with other products | Jun-25 | Jun-25 | | |
| Incorporate the LAI test data into the LSM model to evaluate the performance in the model | Jun-25 | Aug-25 | | |
| Algorithm & product improvement according to the validation and model test. | Sep-25 | Sep-25 | | |

## *Highlights:*

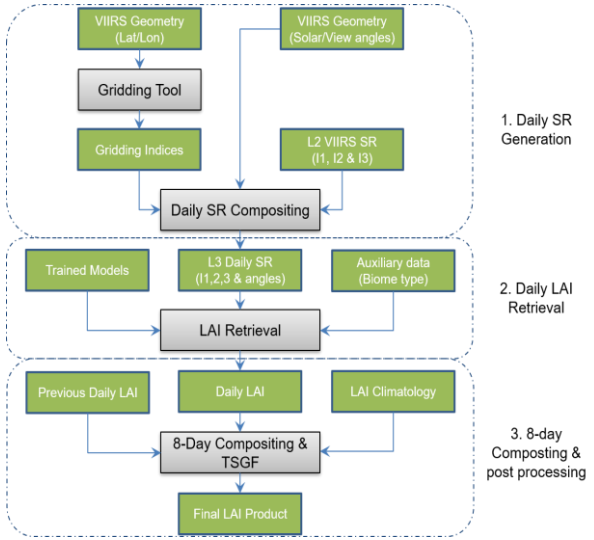



Improved the LAI temporal smoothing and gap filling method using the LAI climatology. Case show the data from Havard forest site

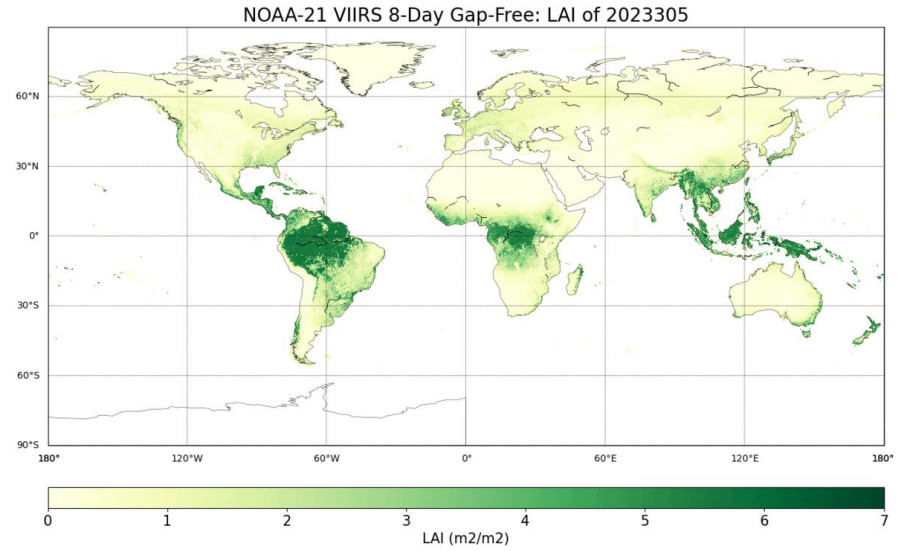
# LAI validation for the Operation Readiness

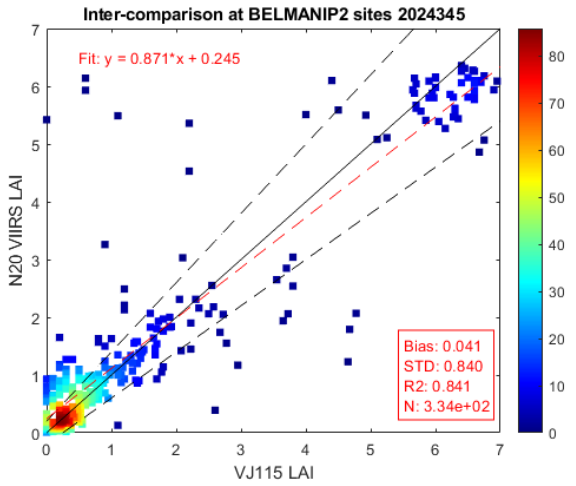
*March 2025*

- **Leaf Area Index product:** The LAI product development effort began with deriving LAI from the existing Green Vegetation Fraction (GVF) product using a semi-empirical algorithm. Building on the VI/GVF development and the evaluation of the existing LAI datasets such as MODIS, a data-driven method was developed to generate more reliable LAI in response to requests from EMC model users. The transition to operational status has been funded through the JPSS PSDI, with coordination from OCS/OSPO/STAR for efficient implementation within the NESDIS Common Cloud Framework (NCCF). This product directly supports NOAA's EMC land surface models and will significantly enhance numerical weather forecasting.

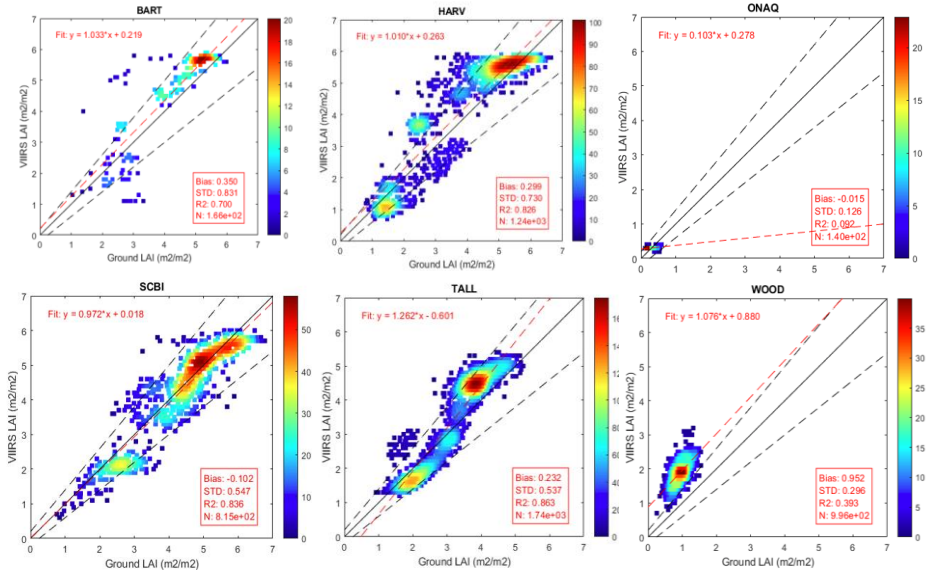



LAI algorithm flowchart




LAI inter-comparison with NASA LAI




LAI in-situ validation at NEON sites (using GBOV LAI)

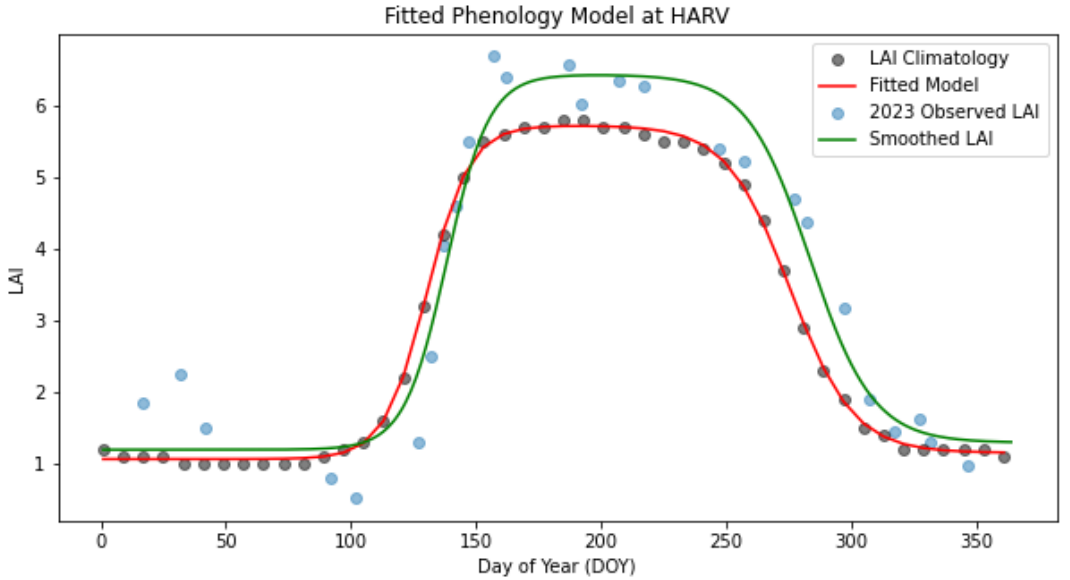
# LAI Temporal Smoothing and Gap Filling

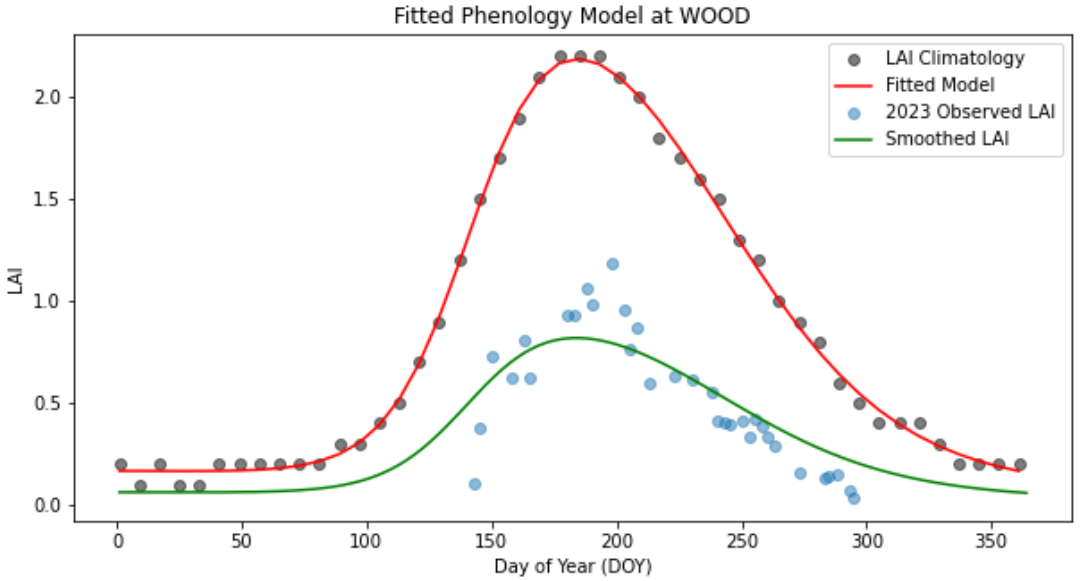


- Improved LAI temporal smoothing and gap filling

- Methodology
  - Use the LAI climatology (8-day fresh rate) derive the vegetation growth model. As the red curve shows, here double logistic model is used.
  - Based on the growth model, use available observed LAI to fit the model.
  - Optimizes two parameters—amplitude scale (f) and time shift (Δday)—to minimize residuals.
  - Get the smoothed and full time series LAI based on the optimized the model.

- Application
  - Use this model to screen suspicious ground-based LAI measurements that deviate significantly from the fitted model.
  - Improve the computing efficiency to apply on the operational LAI product.



# FY25 Milestones/Deliverables

| Task Category | Task/ Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| Development (D) | Algorithm & product improvement according to the validation and model test. | 7/1/2025 | 9/30/2025 | Algorithm test report | JPSS LAI product requirements |
| Integration & Testing (I) | LAI operational data verification and adjustment | 1/1/2025 | 3/31/2025 | | |
| Calibration & Validation (C) | LAI product in-situ validation & inter-comparison with other products | 3/1/2025 | 6/30/2025 | Validation report | |
| | Incorporate the LAI test data into the LSM model to evaluate the performance in the model | 1/1/2025 | 9/30/2025 | Model test report | |
| LTM & Anomaly Resolution (L) | Develop and apply LAI routine monitoring and validation tool | 10/1/2024 | 05/31/2025 | Monitoring tool package | |

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

# Surface Albedo (LSA)

March 2025

*Accomplishments / Events:*

- Supported the integration of VIIRS BRDF
  - Attended the weekly JIRA meeting
- Engaged users in VIIRS LSA/BRDF for the dust prediction model
  - Confirmed the need for NRT products
- Attended the kick-off meeting for METOP-SG LSA
  - METOP-SG LSA aims to provide L3 LSA
  - The delivered DAP generate L3 LSA from SDR, enhanced the quality of cloudy-sky pixels using the current day's offline output and ensuring a smooth workflow

*Overall Status:*

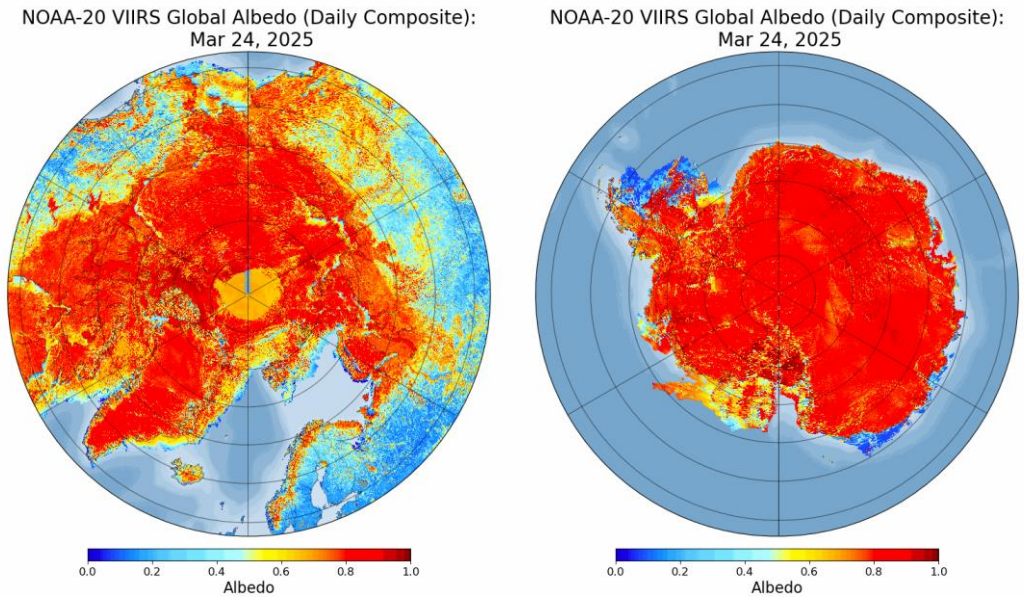
| | Green[1] (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| Cost / Budget | | x | | | |
| Technical / Programmatic | | x | | | |
| Schedule | | x | | | |

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 |
|---|---|---|---|---|
| Support the integration and cloud transition of the VIIRS BRDF | Dec-2024 | Dec-2024 | Sep-2024 | Delivered in Sep-2024. Integration in 2025 |
| Develop and assess blended VIIRS SURFALB albedo algorithm | Dec-2024 | Dec-2024 | Dec-2024 | |
| New Satellite Adaptation and algorithm performance improvement | Mar-2025 | Mar-2025 | Mar-2025 | |
| NBAR comparison between LEO and GEO satellites | Jun-2025 | Jun-2025 | | |
| Generate new VIIRS sea-ice albedo climatology | Jun-2025 | Jun-2025 | | |
| Exploring albedo applications in radiation force | Aug-2025 | Aug-2025 | | |
| VIIRS BRDF/albedo data verification, issue investigation and communication for product monitoring | Sep-2025 | Sep-2025 | | |
| VIIRS albedo data verification, issue investigation and communication for product monitoring | Sep-2025 | Sep-2025 | | |

*Highlights:* VIIRS albedo monitoring in LTM

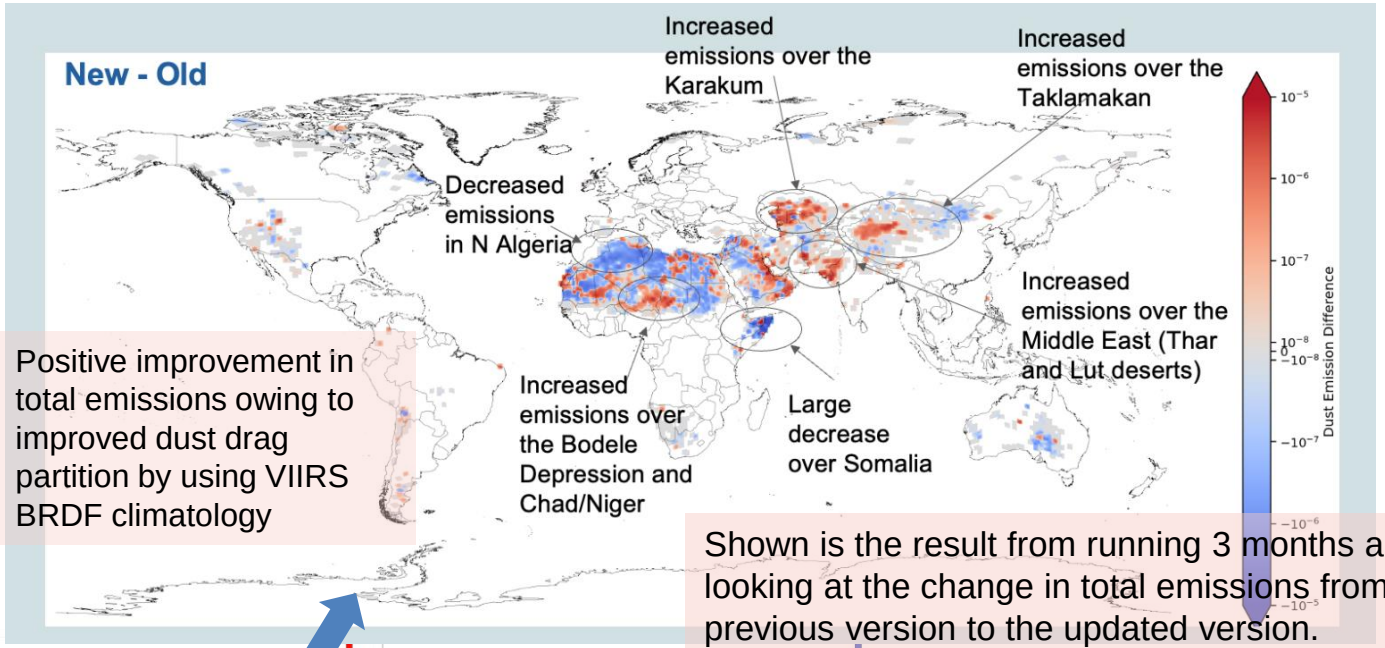



As the polar night season comes to an end, LSA coverage in the Arctic is becoming more complete.

# NOAA VIIRS BRDF/Albedo in Aerosol Prediction

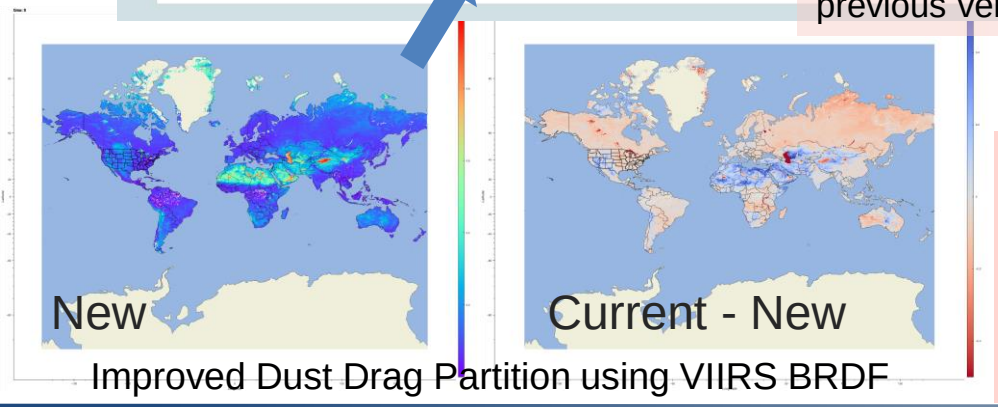
**Operational Uses of VIIRS BRDF Climatology and upcoming NRT product** :

The NOAA VIIRS BRDF/Albedo climatology has been integrated into the operational **NWS Air Quality model (AQMv7, North America Regional, 12 km resolution).** NRT BRDF is expected to replace the climatology data towards further model improvement. Additionally, VIIRS BRDF is also a part of the **GEFS-Aerosol v13 and RRFS-SD** implementations (3km resolution, to replace HRRR model).

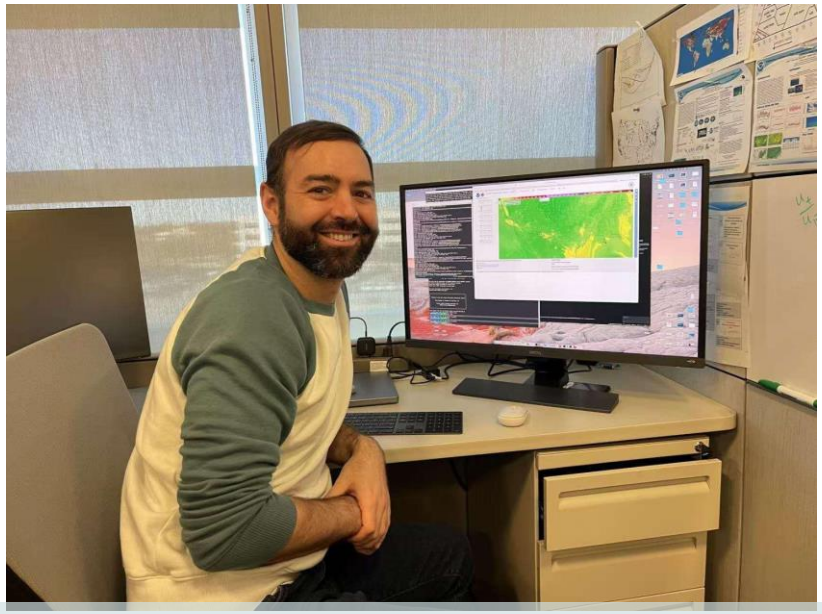



Positive improvement in total emissions owing to improved dust drag partition by using VIIRS BRDF climatology

Shown is the result from running 3 months and looking at the change in total emissions from the previous version to the updated version.




Improved Dust Drag Partition using VIIRS BRDF



*Dr. Barry Baker, Chemical Modeling and Emissions Group Leader in ARL, is showing the BRDF in aerosol prediction model, picture taken by Dr. Yunyue Yu*

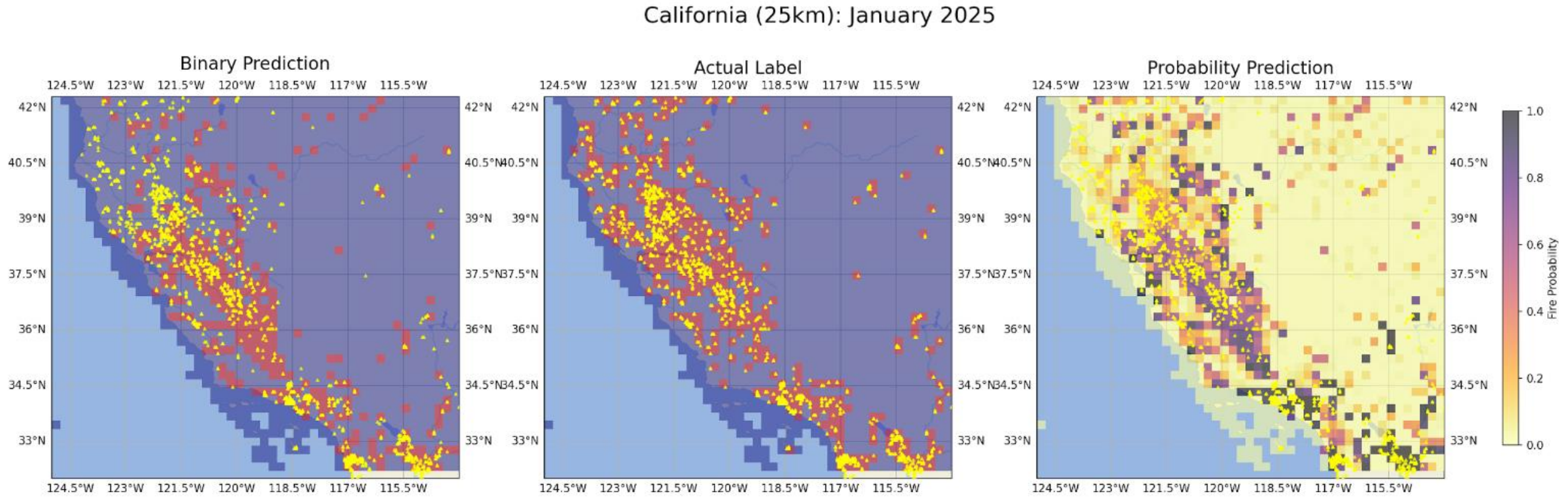
Acknowledge to the ARL team for integrating VIIRS BRDF into the aerosol prediction models, which especially contributes to dust predictions by modifying the threshold friction velocity and the drag partition. These adjustments led to positive results, addressing regions where dust levels were previously underpredicted or overpredicted. Specifically, the model now reduces overprediction in the Sahara while improving underpredictions from Asian sources, particularly in the Taklamakan, Thar and Lut deserts.

# Fire Risk Prediction using land products

25km resolution results

**Evaluation Metrics:**
Accuracy: 0.8390
Precision: 0.6655
Recall: 0.5324
F1 Score: 0.5916

**Prediction Statistics:**
Total samples: 1689
Positive predictions: 296
Actual positive samples: 370



# Surface Albedo FY25 Milestones/Deliverables

| | Milestone | Start | Finish | Deliverable | Requirement (Dev Only) | Project |
|---|---|---|---|---|---|---|
| 1 | Software package for blended SURFALB from all VIIRS sensors | Oct-24 | Dec-24 | L3 code package for using observations from three satellites in generating blended albedo | | JPSS-Albedo |
| 2 | Sea-ice albedo climatology dataset | Mar-25 | Feb-25 | VIIRS albedo climatology being updated over the sea-ice pixels and used in VIIRS albedo algorithm | | JPSS-Albedo |
| 3 | Application of albedo in radiation force report | July-25 | Sep-25 | A manuscript, or a memorandum | | JPSS-Albedo |
| 4 | LSA and other land anomaly monitoring interface | Oct-24 | Jul-25 | An interactive interface to observe the real-time albedo anomaly | | JPSS-Albedo |
| 5 | BRDF algorithm based on the joint of NPP, JPSS-1, and JPSS-2 | Jul-24 | Dec-24 | DAP: Software, documents, and test data | | PPM-BRDF |
| 6 | Scientific report of Albedo/BRDF validation and monitoring | Sep-24 | Jul-25 | A report | | PPM-BRDF |

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

# Land Surface Temperature

March 2025

## *Accomplishments / Events:*

- For the all weather LST, the available MIRS data in the new version has been added to the training database, completing the daily composition for the updated MIRS input. Investigated the availability of NDVI data and addressed the model training process for variable missing data situations. Completed the training code and compared the model results. (slide 2)
- Completed the L3 MetOp-SG science code modification and testing. Verified the LST output and prepared the README file. An issue with the surface type was identified.(slide 3- 6).
- Reviewed the gridding tool science code and tested it.
- Attended the Agile Project kick-off for L2 MetOp-SG LST and L3 All weather VIIRS LST.
- Attended the meeting for MetOp-SG LST/LSA discussion
- Completed the L2 MetOp-SG LST code demo slide
- Reviewed studies on TCI and VCI applications in crop yield prediction and the potential use of LST to replace brightness temperature in TCI.
- Engaged with the soil moisture and evapotranspiration teams regarding VIIRS LST updates and application details. (slide 7)

## *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.*
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.*

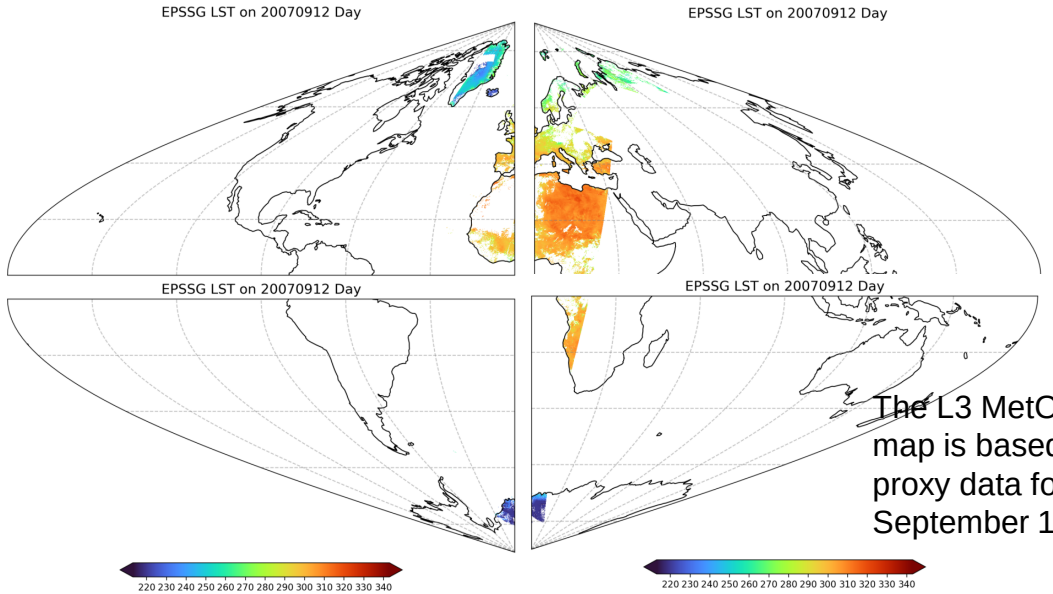
## ***Issues/Risks:***

None

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| **N-21 LST data monitoring, consistency and performance evaluation** | **Oct-24** | **Dec-24** | **Dec-24** | |
| **L2 & L3 SNPP, NOAA-20 annual validation practice** | **Dec-24** | **Jan-25** | **Jan-25** | |
| **Initial Delivery - All weather LST** | **Sep-24** | **Jan-25** | **Jan-25** | |
| **Support to JPSS-3 Data System Test Event** | **Jan-25** | **Apr-25** | | |
| **I-band LST validation and applications** | **Oct-24** | **May-25** | | |
| **All weather LST validation and improvement** | **Jan-24** | **Aug-25** | | |
| **Monitoring and Anomaly watch, analysis and report** | **Oct-24** | **Sep-25** | | |

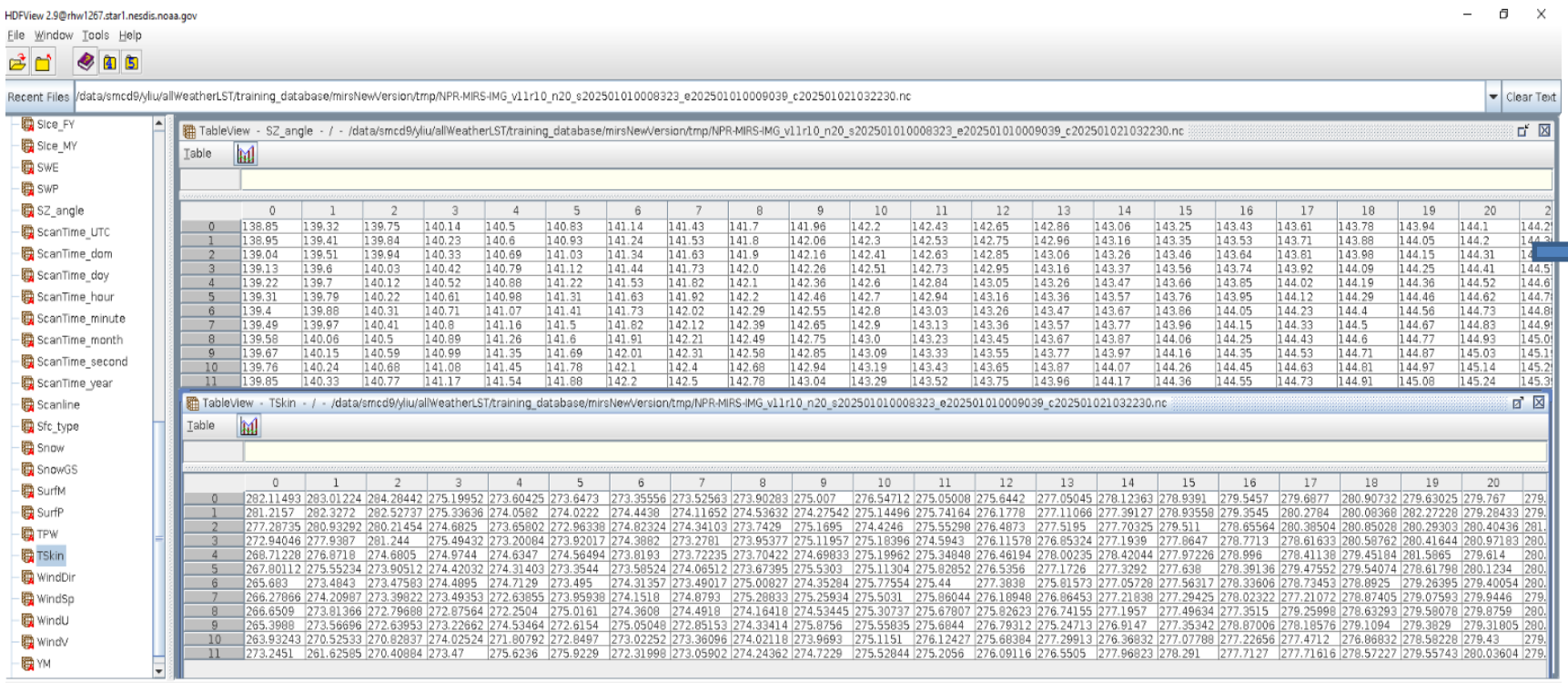
## *Highlights:*

L3 MetOp-SG LST




The L3 MetOp-SG LST map is based on limited proxy data for day September 12, 2007.

# MIRS Data: Tskin and Solar Angle Issues




**Surface temperature**
**Float type in v11r10**

**Surface temperature**
**Short type in v11r9, resulting in Tskin <= 327.67 K**

Ncdump –h filename

short TSkin(Scanline, Field_of_view) ;

TSkin:long_name = "Skin Temperature (K)" ;

TSkin:units = "Kelvin" ;

TSkin:coordinates = "Longitude Latitude" ;

TSkin:scale_factor = 0.01 ;

TSkin:_FillValue = -999s ;

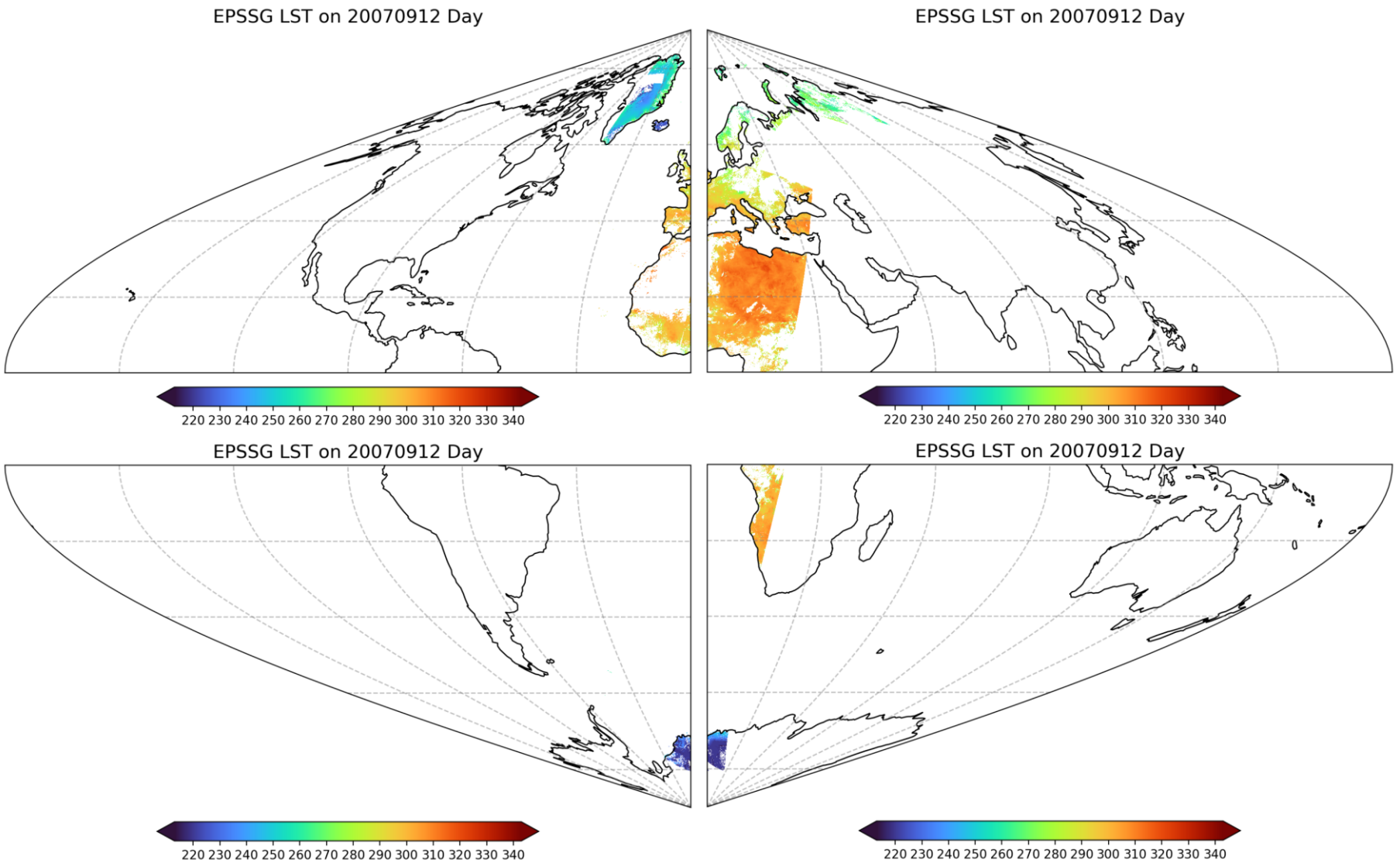
TSkin:valid_range = 0, 40000 ;

## Solar zenith angle (Float type)

SZ_angle (15297, 2)
32-bit floating-point, 12 x 96
Number of attributes = 6
DIMENSION_LIST = 4036,4360
_FillValue = -999.0
_Netcdf4Coordinates = 0,1
coordinates = Longitude Latitude
long_name = Solar Zenith Angle (-90,90) degree
units = degrees

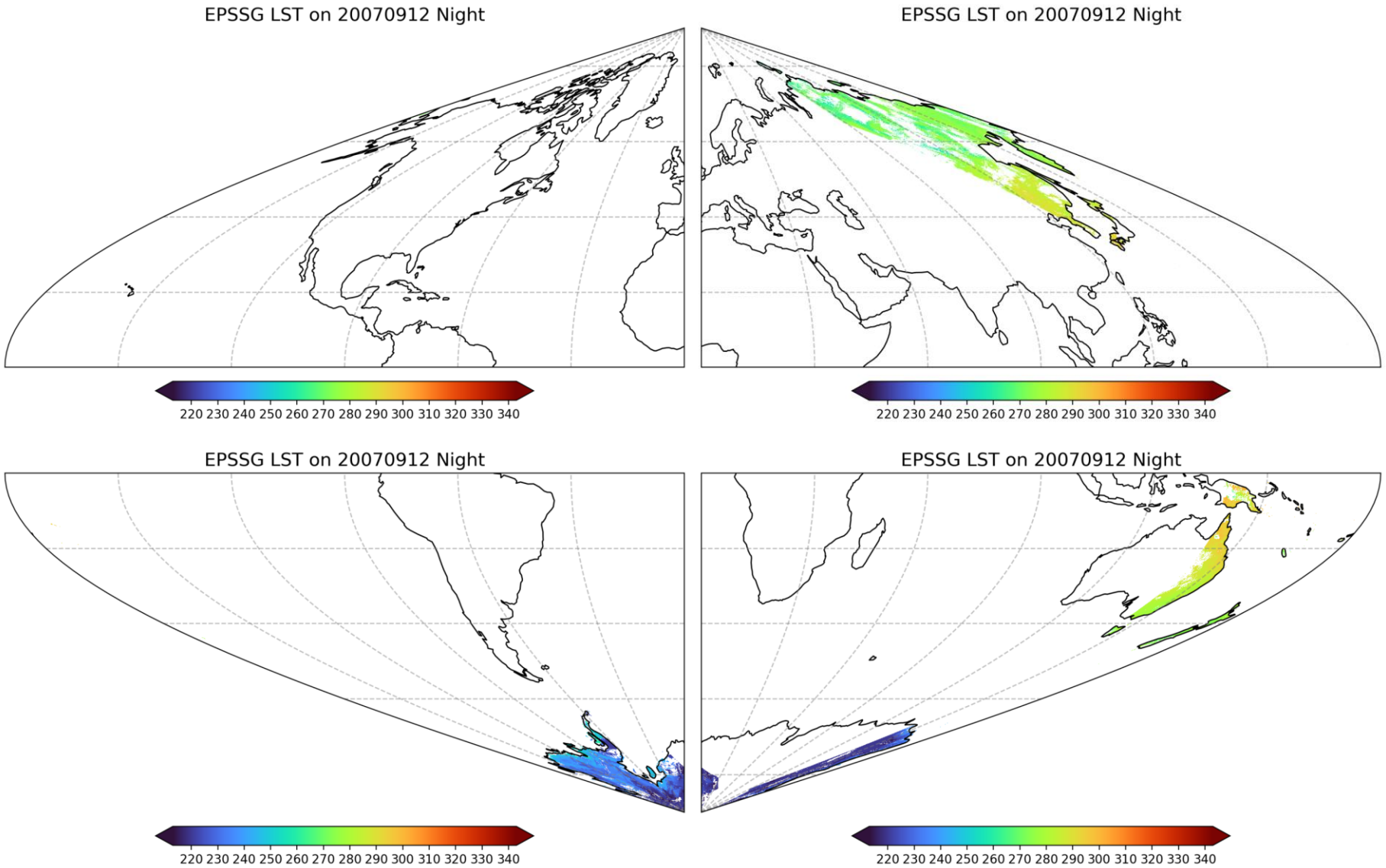
- TSkin temperature is in float type and the maximum is set to 400K in the valid range. Checked several granules in Australia with heat wave occurrence, the maximum LST is over 340K. It appears that the issue with Tskin is resolved.
- For SZ_angle, solar zenith angle, it is also in float type with value 0 to 180 degree. Randomly checked several granules for daytime and nighttime, the value range is found within 0 to 180. However, the attributes "long_name" describes the data within [-90,90], which has been confirmed with MIRS group. They are going to fix this in the next version

# L3 MetOp-SG LST Progress



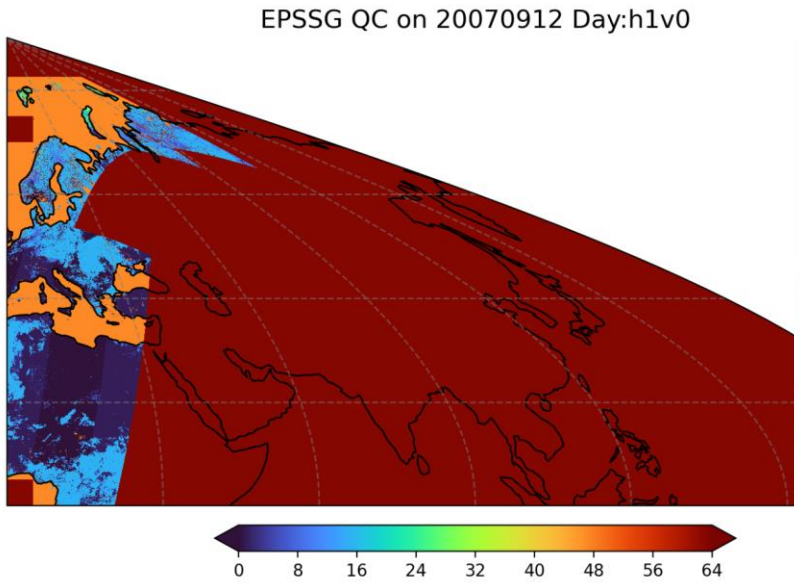

- Completed the L3 MetOp-SG science code modification and test.
- Verified the LST output. Note that the output is stored in four tiles per day, providing global coverage at a 500 m spatial resolution.
- The proxy data is very limited
- LST data range and distribution appears reasonable for daytime.

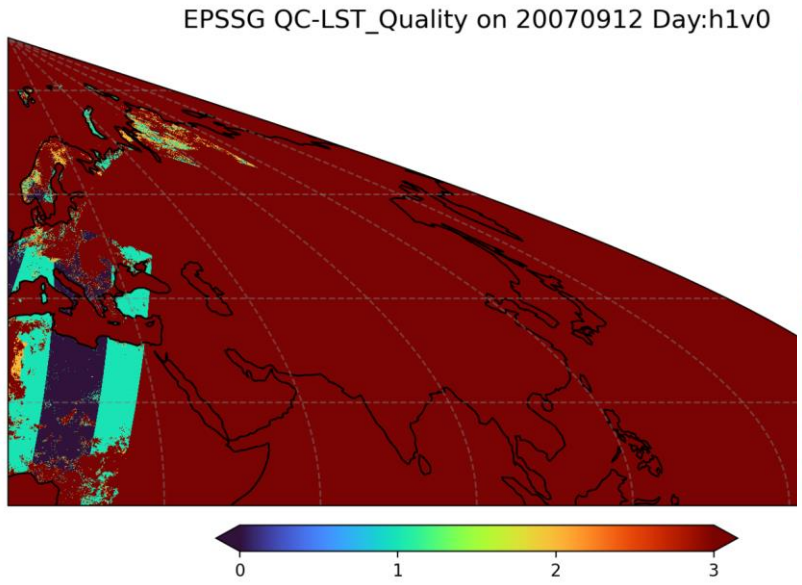
# L3 MetOp-SG LST - Nighttime

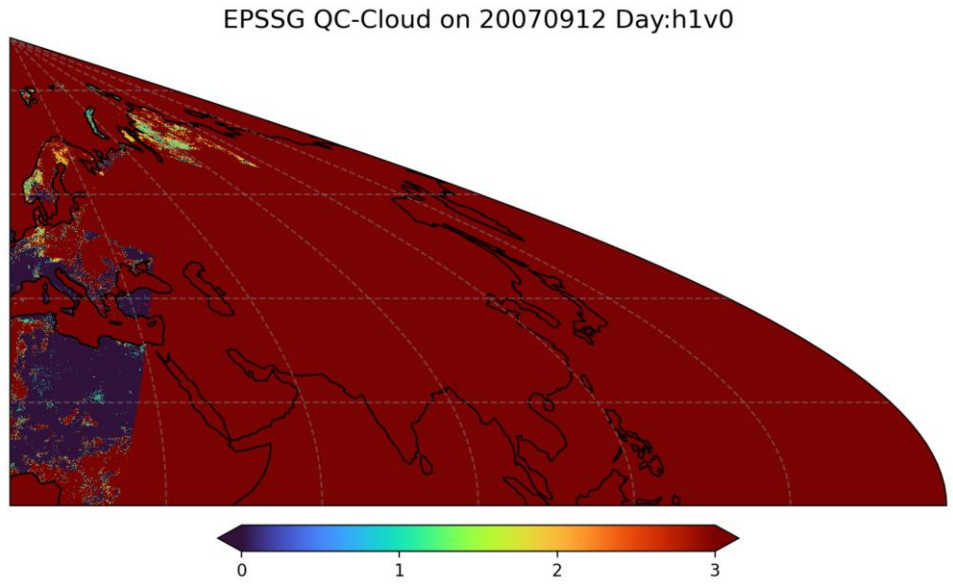


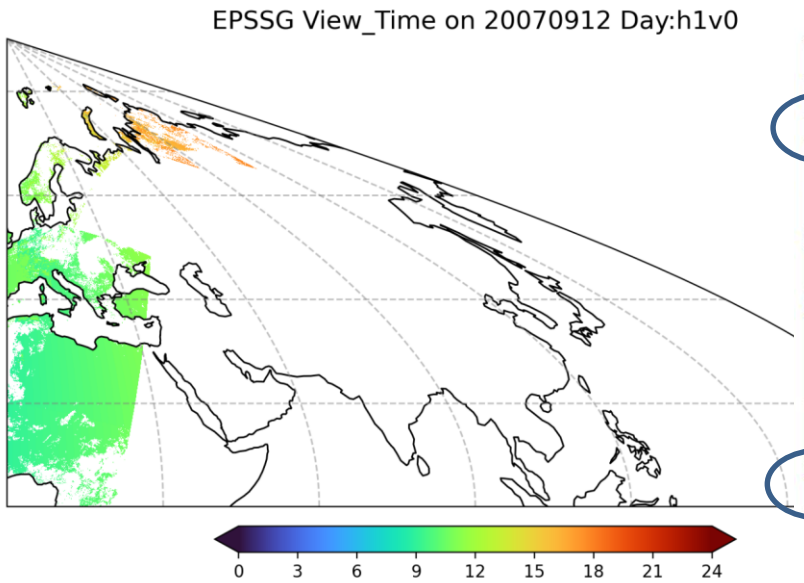

- Completed the L3 MetOp-SG science code modification and test.
- Verified the LST output. Note that the output is stored in four tiles per day, providing global coverage at a 500 m spatial resolution.
- The proxy data is very limited
- LST data range and distribution appears reasonable for nighttime

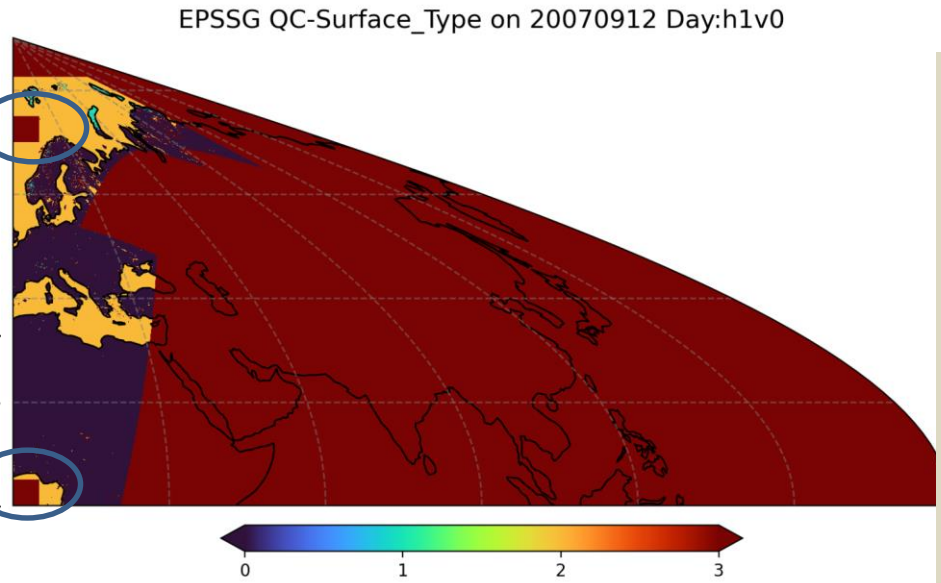
# L3 MetOp-SG LST Output Verification-Daytime



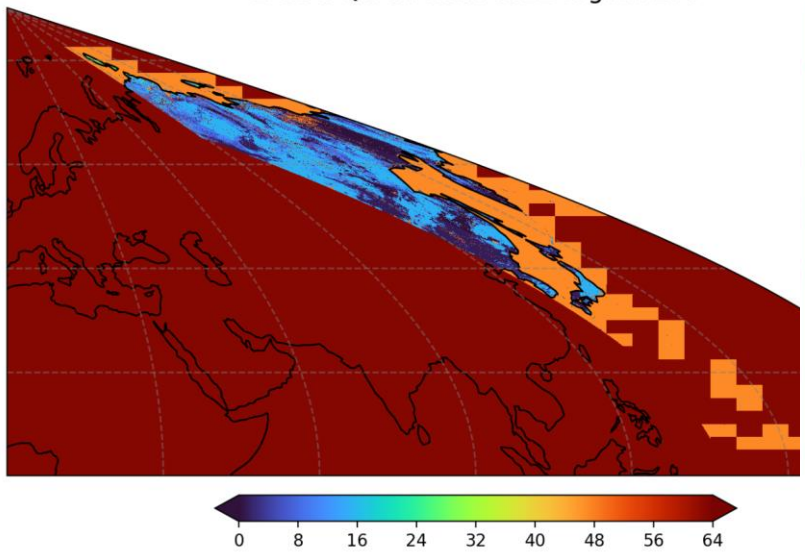



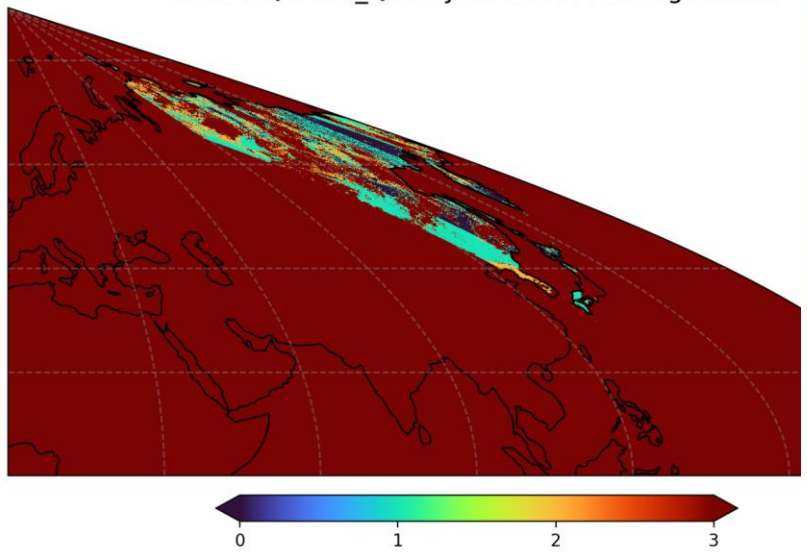

- View Time presents a reasonable data range and distribution
- Quality flag:
  - ❖ LST quality and Cloud show reasonable data range and distribution
  - ❖ Surface type: There are some issues, particularly between the inland water and ocean water. This issue was caused by the proxy surface type input.

# L3 MetOp-SG LST Output Verification-Nighttime

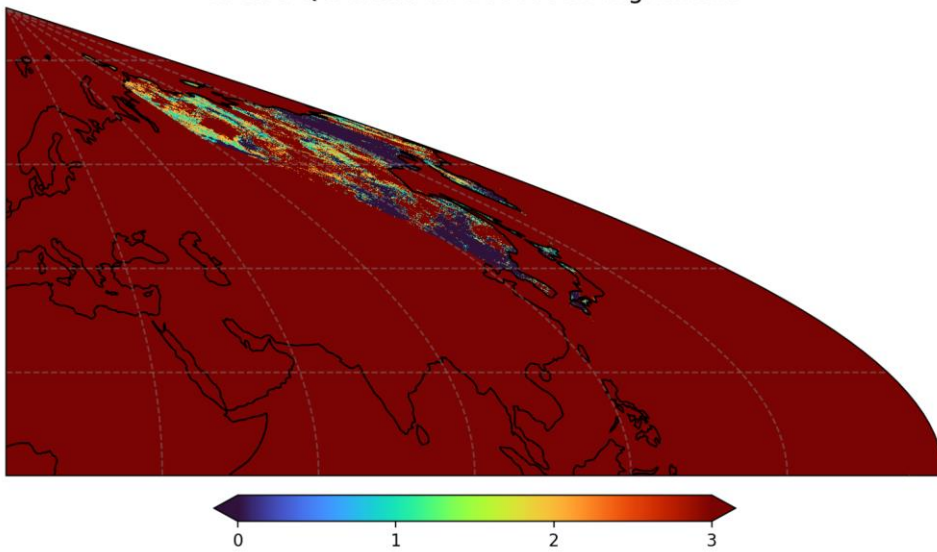
EPSSG QC on 20070912 Night:h1v0



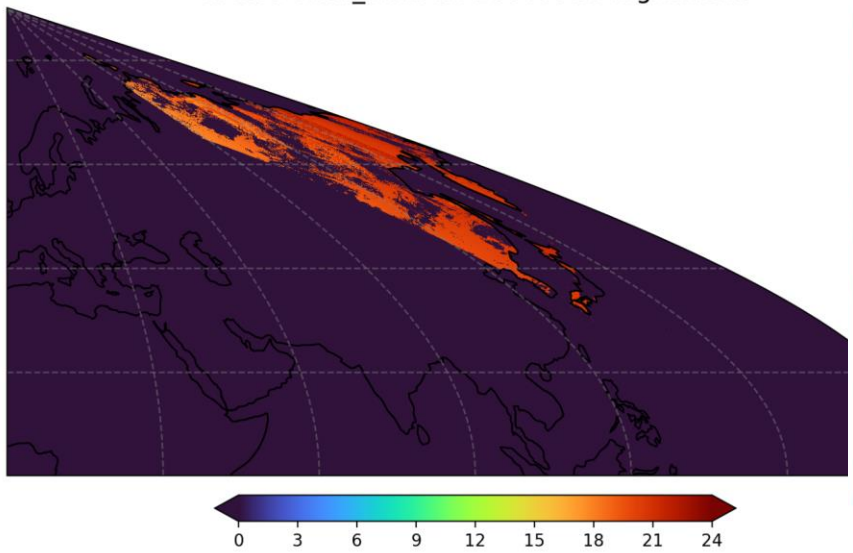

EPSSG QC-LST_Quality on 20070912 Night:h1v0



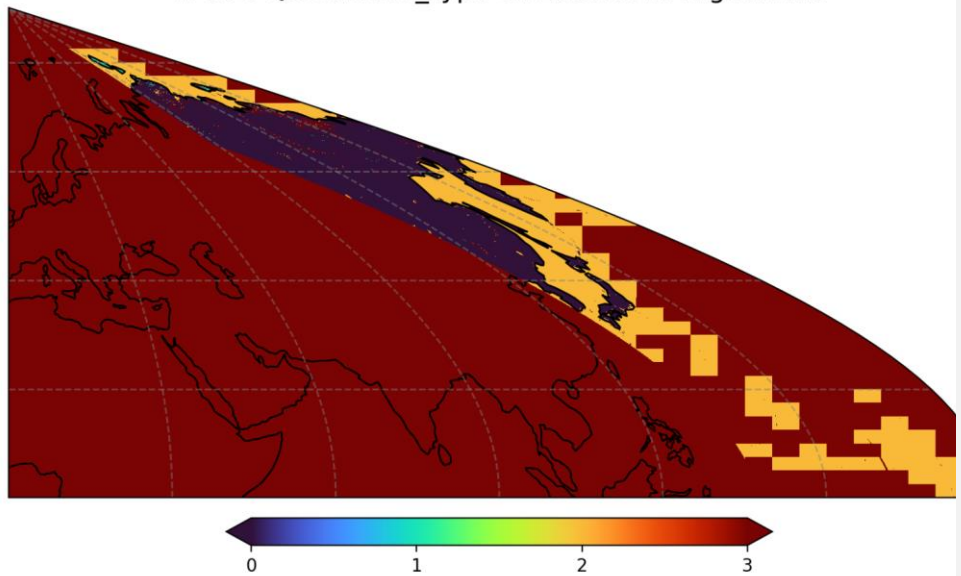

EPSSG QC-Cloud on 20070912 Night:h1v0




EPSSG View_Time on 20070912 Night:h1v0




EPSSG QC-Surface_Type on 20070912 Night:h1v0




0:Land 1: snow/ice 2: inland water 3: coastal/ocean water

- View Time presents a reasonable data range and distribution
- Quality flag:
  - ❖ LST quality and Cloud show reasonable data range and distribution
  - ❖ Surface type: an issue is clearly observed between the inland water and ocean water. This issue was caused by the proxy surface type input.

# VIIRS LST-Enabling Applications in Soil Moisture and Beyond

## Soil moisture Application:

- The daily gridded VIIRS LST data is used to downscale the coarse resolution SMAP soil moisture (SM) product from 25 km to 1 km.
  The system runs in experimental mode. It is currently applied in CONUS domain and is planed to be extended to a global domain.
- Compared to the original coarse resolution SMAP, the downscaled SM data presents much more spatial details. Particularly, while agreements between the 1 km SM and in situ SM observations are comparable to the 25 km SM, the accuracy level is significantly improved with the advance of the downscaled satellite SM product.
- All-weather (VIIRS) LST will further enhance the downscaled soil moisture product.

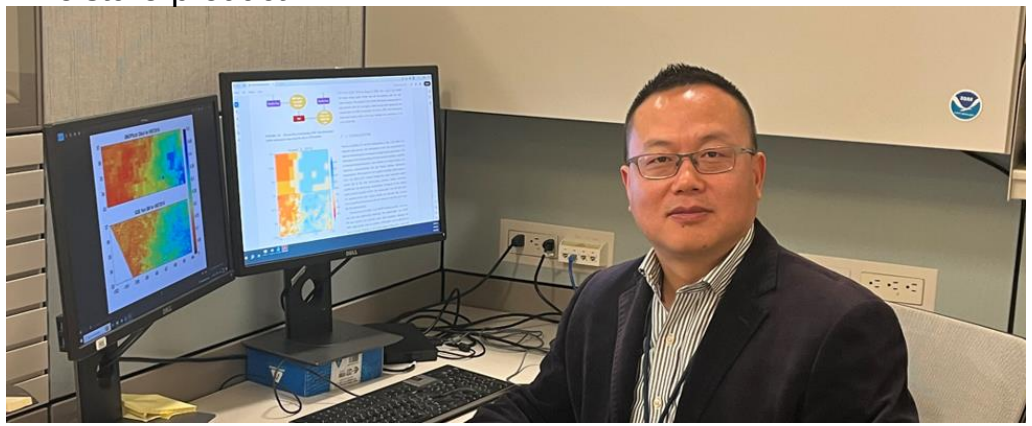


*Figure above was taken by Yuling Liu and illustrates an example of LST application in downscaled soil moisture.*

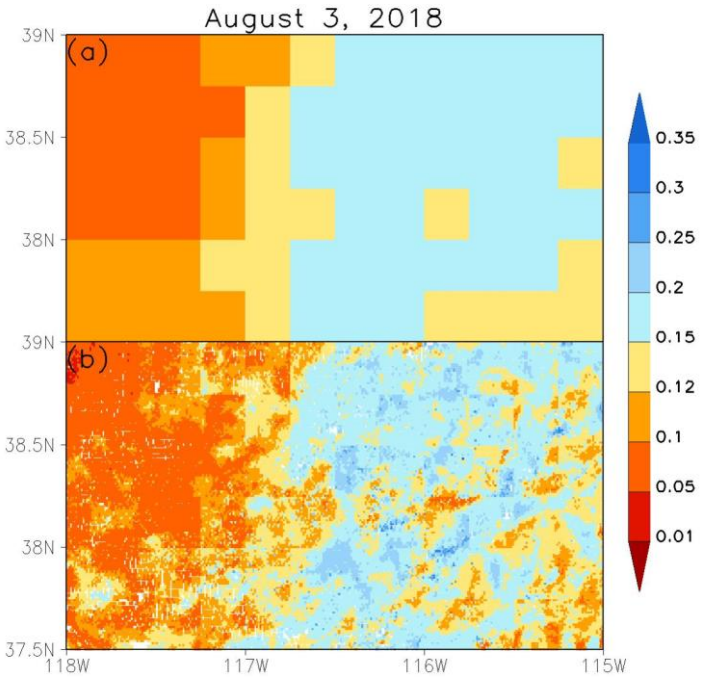



*Fig.1 Sample maps for (a) SMAPV5 25 km and (b) the downloaded 1 km SMAP SM retrievals on August 3, 2018.*

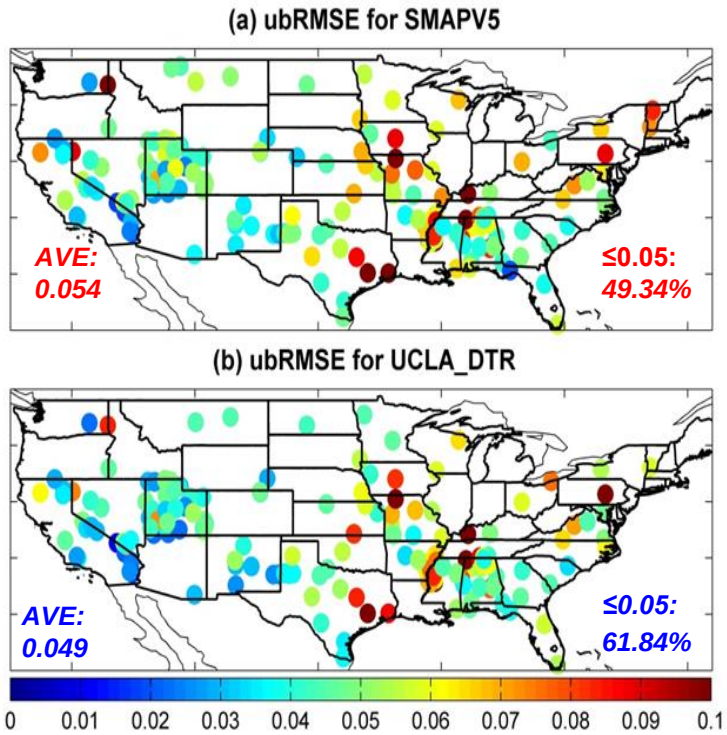



*Fig. 2 With respect to the quality controlled in situ observations, ubRMSE (Unit: $m^3/m^3$) for (a) SMAPV5 25 km and (b) UCLA_DTR 1 km SM estimations over the 3 May 2017 to 30 April 2019 period.*

***All figures are credited to Jifu Yin (Jifu.Yin@noaa.gov, NOAA/NESDIS/STAR)***

# LST FY25 Milestones/Deliverables

| | Milestone | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| 1 | Annual report of L2 and L3 VIIRS LST validation | Nov-24 | Dec-24 | PowerPoint presentation of the validation results | |
| 2 | I-band LST LUT improvement and validation | Oct-24 | May-25 | Presentation slides of algorithm development and validation results | |
| 3 | LST reprocessing preparation | Ocr-24 | Sep-25 | Progress report | |
| 4 | JPSS-3 pre-launch test and evaluation | Jan-25 | Apr-25 | Presentation slides and LUT (rely on the availability of the sensor response function) | |
| 5 | All weather LST scientific readiness and availability | Oct-24 | Aug-25 | Experimental data and evaluation results | Collaborative works with PPM and EMC |
| 6 | Monitoring and Anomaly watch, analysis and report | Oct-24 | Sep-25 | Report as the cases come up | |

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

# MiRS Products

March 2025

## Accomplishments / Events:

- The MiRS team successfully implemented QuickSounder ATMS Engineering Development Unit (EDU) in MiRS and the package has been shared with the NOAA/NESDIS ASSISTT team. QuickSounder is the first project in NOAA's Near Earth Orbit Network (NEON), a new generation of polar-orbiting weather satellites after JPSS (Joint Polar Satellite System) era. ATMS EDU is a prototype ATMS instrument developed while preparing the launch of the initial ATMS instrument on board the SNPP satellite in 2011. ATMS EDU proxy data also have been generated for August 30, 2023 assuming that ATMS EDU measurements have the same structure as the current SNPP/NOAA-20/NOAA-21 ATMS measurements. Since ATMS EDU was designed and built using older technology, in order to maximize the benefit of the anticipated QuickSounder mission, extensive work is necessary to properly anticipate the instrument characteristics and adapt science algorithms so that the resulting data products are as accurate as possible. The efforts will include MiRS software adjustments, algorithm assessment and ATMS EDU instrument characterization and noise mitigation with real measurements. The current tentative launch date is planned for April, 2026. After launch, the MiRS retrieval products from QuickSounder mission will be evaluated to determine performance relative to current environmental data product standards for mission.

## 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 | | | | |

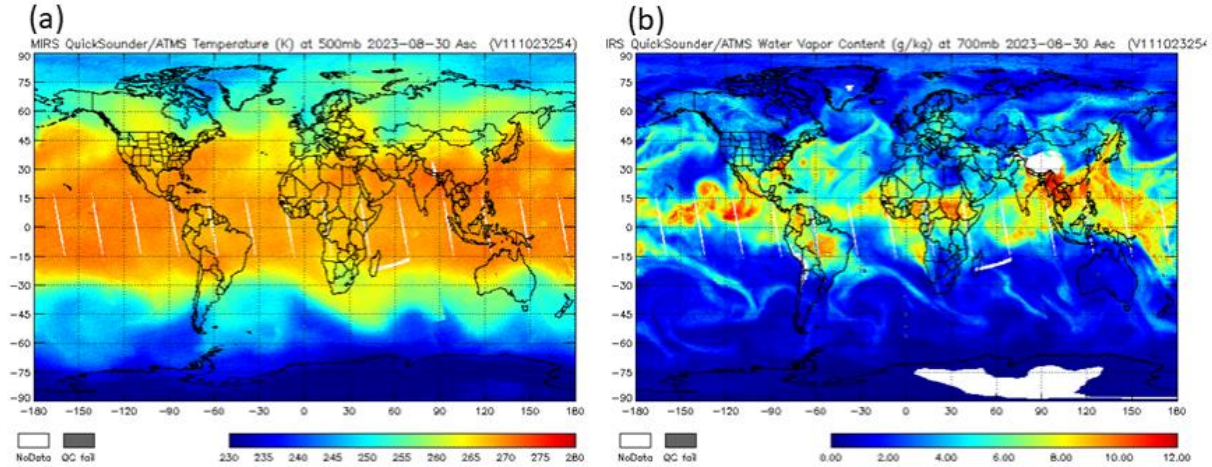
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

### Issues/Risks:

None

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Prepare and deliver MiRS pre-launch capability for QuickSounder ATMS operational processing to ASSISTT.* | *Apr-2025* | *Apr-2025* | *Mar-2025* | |
| *The MiRS system currently uses the CRTM version 2.1.1 forward operator in its physical retrievals. The CRTM version was released 10 years ago. The newly released CRTM version 2.4.0 includes the new science improvement. However, the CRTM version doesn't have the jacobian for the surface emissity which is specific component for the MiRS. The team will add the specific part to the CRTM for the MiRS.* | *Jul--2025* | | | |
| *Develop and evaluate AI/ML MiRS post-processing for precipitation over CONUS and global SST retrieval improvement* | *Sep-2025* | | | |

## Highlights:




MiRS results using ATMS EDU proxy data on August 30, 2023. (a) MiRS retrieved temperature (K) at 500 hPa and (b) MiRS retrieved water vapor (g/kg) at 700 hPa.

# FY 25 MiRS Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 1:* MiRS Development Algorithm Package (DAP) version 12.0 delivery | *October 2024 to September 2025* | | | |
| *Subtask 1.1:* Preparation of the MiRS DAP 12.0<br>*Two key updates: 1) upgrade the CRTM version 2.1.1 to the latest 2.4.0 in the MiRS DAP; The CRTM version 2.1.1 was released 10 years ago. New sciences and new capabilities have been implemented in the version 2.4.0.*<br>*2) Some' values are stored as integer values in the MiRS EDRs files for saving the storage space and users read the files and converted back to floating values. The process caused the loss of numerical precision that affects the trend study in climate change. Today's data storage is much powerful than previous so that we can directly store the floating values.* | *October 2024 to July 2025* | | | |
| *Subtask 1.2: The DAP testing and delivery* | *October 2024 to September 2025* | | | |
| *Task 2:* MiRS EDRs Reprocessing and data analysis | *October 2024 to September 2025* | | | |
| *Subtask 2.1:* Data Reprocessing<br>*SNPP MiRS EDRs data are reprocessed till December 2021 and NOAA-20 MiRS EDRs data are reprocessed till December 2020. The team will reprocess the NOAA-18 MiRS EDRs data..* | *October 2024 to July 2025* | | | |
| *Subtask 2.2: Reprocessed Data Analysis*<br>*The MiRS reprocessed EDRs provided consistent long data records for study climate changes. The MiRS team will analyze the trends of total precipitable water (TPW) and rain rate at the surface.* | *October 2024 to September 2025* | | | |
| *Task 3:* MiRS EDRs Maintenance and Monitoring | *October 2024 to September 2025* | | | |
| *Subtask 3.1:* Maintenance<br>*MiRS team is responsible for debug and upgrades of the MiRS system. The team is response for any issues reported by OSPO, Community Satellite Processing Package (**CSPP**) and other users.* | *October 2024 to September 2025* | | | |
| *Subtask 3.2: Monitoring*<br>*The MiRS team maintains a visualization system to display daily images of global and CONUS distributions of MiRS 11 EDRs. The system also displays time series of statistical errors (biases and standard deviations) those EDRs.* | *October 2024 to September 2025* | | | |

# FY 25 MiRS Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 4: Implementing new CRTM version into MiRS System* | *September 2025* | | | |
| *Subtask 4.1: Implementation*<br>*The MiRS system currently uses the CRTM version 2.1.1 forward operator in its physical retrievals. The CRTM version was released 10 years ago. The newly released CRTM version 2.4.0 includes the new science improvement. However, the CRTM version doesn't have the jacobian for the surface emissity which is specific component for the MiRS. The team will add the specific part to the CRTM for the MiRS.* | *July 2025* | | | |
| *Subtask 4.2: Testing and Assessment of the Performance*<br>*After the implementation of the CRTM new version, the team will test and evaluate the performance of the new implementation in terms of the accuracy and efficiency.* | *September 2025* | | | |
| *Task 5:* Develop and evaluate AI/ML MiRS post-processing for precipitation over CONUS and global SST retrieval improvement | *September 2025* | | | |
| *Subtask 5.1: Develop AI/ML MiRS post-processing*<br>*AI/ML algorithm can greatly improve the accuracy of MiRS EDRs. For a low cost, we first proposed AI/ML post-processing system without changing MiRS. The MiRS EDRs will be inputs to a deep-learning system to improve the accuracy of EDRs.* | *July 2025* | | | |
| *Subtask 5.2: Demonstrate the improvement for precipitation and sea surface temperature*<br>*The AI/ML MiRS post-processing system will be evaluated the improvements for two candidate EDRs: surface rain rates and the sea surface temperatures.* | *September 2025* | | | |
| *Task 6:* Framework for MiRS JPSS-3/4 ATMS<br>MiRS is an enterprise algorithm. However, the bias correction and tuning still exist deficiency. The MiRS applies the bias correction over oceans to both lands and oceans. Over land, snow and ice surfaces, the bias correction is very challenge because of large uncertainties in the surface emissivity models. The new framework *aims to overcome the difficulties.* | *September 2025* | | | |

# FY 25 MiRS Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| MiRS Development Algorithm Package (DAP) version 12.0 delivery | *Oct 2024 to Sep 2025* | | | |
| MiRS EDRs Reprocessing and data analysis | *Oct 2024 to Sep 2025* | | | |
| MiRS EDRs Maintenance and Monitoring | *Oct 2024 to Sep 2025* | | | |
| Implementing new CRTM version into MiRS System | *Sep 2025* | | | |
| Develop and evaluate AI/ML MiRS post-processing for precipitation over CONUS and global SST retrieval improvement | *Sep 2025* | | | |
| Framework for MiRS JPSS-3/4 ATMS | *Sep 2025* | | | |
| MiRS Development Algorithm Package (DAP) version 12.0 delivery | *Oct 2024 to Sep 2025* | | | |

# FY25 Microwave Sounding Temperature Reprocessing Project

*March 2025*

## ***Accomplishments / Events:***

- Completed March monthly updates and delivery of MLT-SDR Products to NCEI
- Continued working on reprocessing the S-NPP and N20 ATMS measurements into the daily gridded data for NCEI delivery
- Continued investigating the applications of the reprocessed ATMS TDR data for SSW monitoring to provide valuable information to NWP forecaster. Figure 1 shows the updated daily time series data of the S-NPP ATMS channel 13 regional averages for the latitudinal range between 60°N and 90°N, indicating SSW event in 2025.

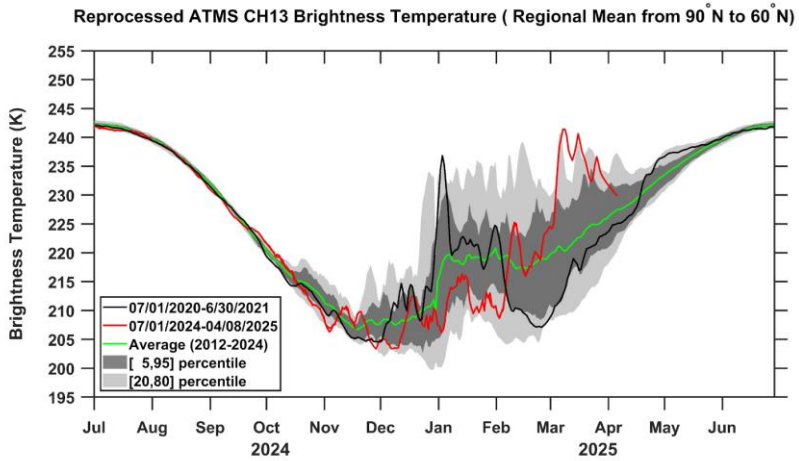



*Figure 1. Daily regional mean of the S-NPP/N20 ATMS channel 13 for the latitude range from 60°N to 90°N. The red line represents the daily mean from July 1, 2024 to April 8, 2025. The green line depicts the average annual cycle of ATMS channel 13 over the study area.*

| Milestones | Original Date | Forecast Date | Actual Completion Date |
|---|---|---|---|
| Monthly processing and update of microwave sounding CDR products | Sep-25 (Monthly Update) | | |
| Explore impacts of reprocessed SDR products in observing severe weather/climate events | Apr-25 | Apr-25 | |
| Evaluate bias drifts and inter-sensor biases in SNPP and NOAA-20 ATMS fundamental CDR (FCDR) to produce long-term quality-consistent CDR data set, in coordination with SDR/ICVS teams; perform recalibration, if necessary | Jul-25 | Jul-25 | |
| Maintain and sustain the Microwave Sounding Assessment System for CDR Development (MSASCD) website (https://www.star.nesdis.noaa.gov/smcd/emb/mscat/msascd.php) | Sep-25 | Sep-25 | |

## *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

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

*March 2025*

## *Accomplishments / Events:*

- The latest version of STEMS was presented at the bi-weekly Sensor Radiance Science Team (Changyong Cao) on March 5th and was favorably received by ICVS and CrIS team members. Additionally, several problem areas with STEMS were identified and are progressively being moved to the live site; review is ongoing.

- Work continued with the NOAA Financial Management Branch to procure FY25 funding for the purchase of radiosondes in support of 1) JPSS / Department of Energy (DOE) Atmospheric Radiance Measurement (ARM) and 2) NOAA AERosols and Ocean Science Expeditions (AEROSE) Atlantic Basin scientific campaign activities.

- NPROVS staff deployed new procedures which "optimally" reduces the number of vertical levels stored for high resolution conventional radiosondes, which comprise about 60% of the global radiosonde population, from 250 to 120 levels; the remaining radiosondes (40%) still report mandatory and significant levels (typically up to 100 levels). The optimization provides a more uniform global distribution in the context of "radiosonde vertical density", more suitable for satellite product (and sensor) cal/val **(HIGHLIGHT)**

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| **Integrate high-resolution conventional radiosonde observations in NPROVS** | **Q2** | **Q2** | Q2 | |
| **JSTAR mapper review and evolution to STEMS** | **Q4** | **Q4** | | |
| **Dedicated Radiosonde Programs: 1) DOE/ARM to include new BNF site in Alabama, 2) AEROSE 2025 campaign support** | **Q3** | **Q3** | | |
| **Cal/Val including NUCAPS / MiRS 1) routine monitoring and 2) severe weather case studies** | **Q4** | **Q4** | | |

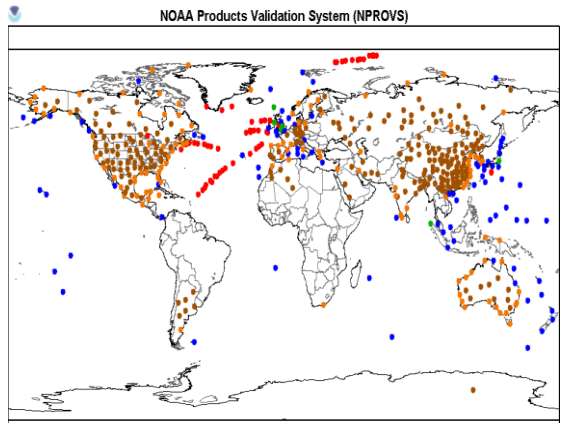
## *Overall Status:*

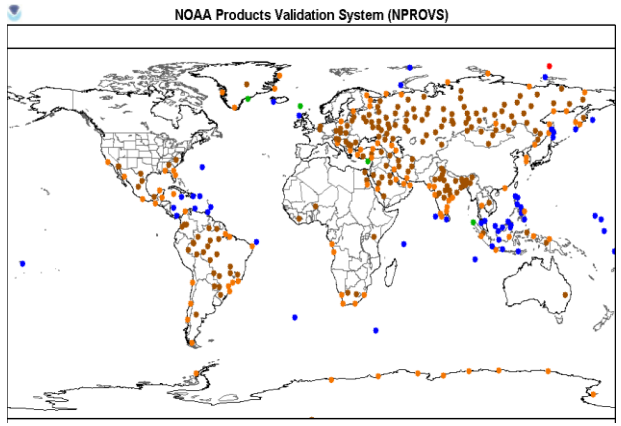
| | Green[1] (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| **Cost / Budget** | | x | | | |
| **Technical / Programmatic** | | x | | | |
| **Schedule** | | x | | | |

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 typical global distributions of conventional radiosonde observations, as received form NWS PREPBUFR files which are routinely input into NPROVS, which now contain a mix of high vertical density (50-100m vertical resolution, left panel) versus those that continue to report the nominal mandatory and significant levels (variable resolution, right panel). NPROVS was modified to retain approximately 120 levels of geophysical data using a subsampling approach (originally 250 levels are available) that varies with atmospheric (geopotential) height consistent with the scale of vertical weather features and typical satellite sensor sensitivity, optimizing their use in satellite derived geophysical profile (EDR) and satellite sensor (SDR) cal/val.

# NUCAPS Products

March, 2025

## Accomplishments / Events

- Two abstracts submitted for IGARSS-2025 were accepted for presentation. More details expected in April.
- Continued validation and sustainment activities for the NUCAPS EDR products. These include VALAR datasets and processing GRUAN RAOBs (AVTP, AVMP), trace gases (CO, $CO_2$, and $CH_4$) validation with TCCON measurements, and collection and processing of validation datasets for $O_3$ and OLR. Annual mean and standard deviation differences of OLR product with the CERES (NOAA-20/21 versus NOAA-20 CERES) are meeting the requirements extremely well.
- Continued the AWS trial of cloud-based NUCAPS product reprocessing. Updated AWS python script changes to generate SNPP NUCAPS products. Updated necessary configuration changes to produce all the output files in the same format as offline version to facilitate validation statistics with ECMWF and other in-situ measurements. The NCIS AWS server access was abruptly closed on April 3 due to a government mandate on the usage of funds. Datasets as well as scripts and configuration files were downloaded to minimize the impact and continue this effort on the on-premises servers using reprocessed CrIS/ATMS SDRs (RP2 version).
- Continued NUCAPS preprocessor and the retrieval system augmentation and testing with the EUMETSAT synthetic data for EPS-SG. IASI-NG/MWS. Testing of the science code changes are in progress.

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| NUCAPS Augmentation EPS-SG IASI/NG | Jan-25 | Jan-25 | April, 2025 | Testing the retrieval science code updates |
| Mission-long reprocessing of NOAA-21 NUCAPS products: Reprocessing version and evaluation of reprocessed products | Jun-24 | Jul-24 | Delayed but on-going | NCIS AWS access abruptly closed on 4/3. Alternate plans for reprocessing on on-premises servers initiated. |

## 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

## NOAA-20/21 OLR Product Validations with NOAA-20 CERES

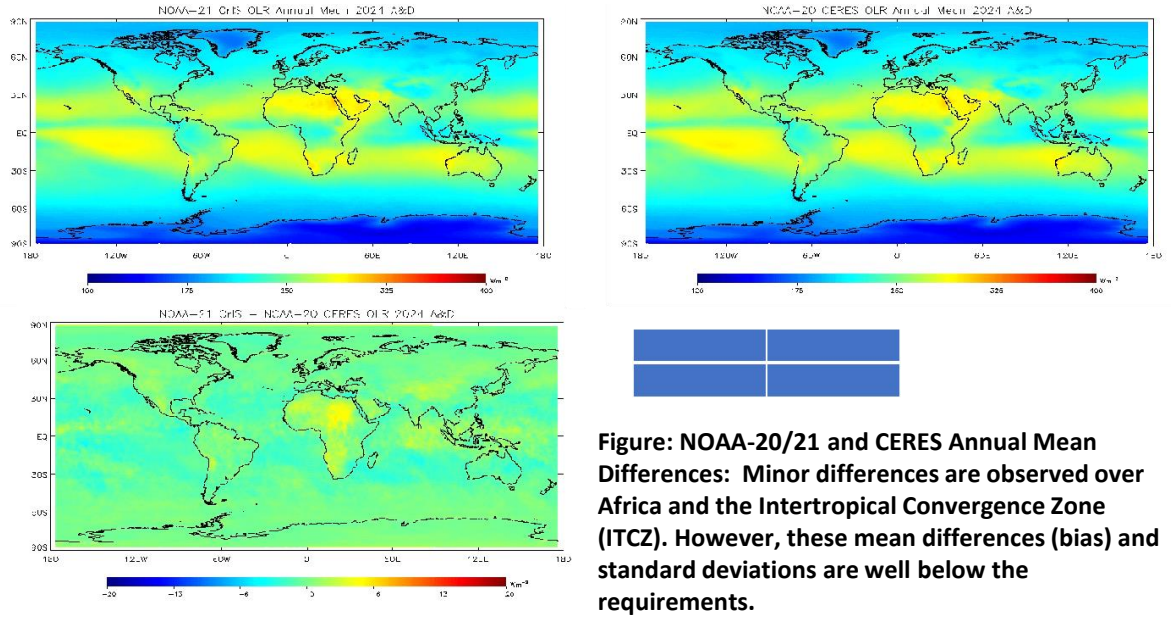


**Figure: NOAA-20/21 and CERES Annual Mean Differences: Minor differences are observed over Africa and the Intertropical Convergence Zone (ITCZ). However, these mean differences (bias) and standard deviations are well below the requirements.**

# NUCAP FY25 Milestones/Deliverables
# Path Forward ~ High priority tasks/milestones

| | Milestones | Type | Original Date | Forecast Date | Variance Explanation |
|---|---|---|---|---|---|
| **Task 1** | Routine and reactive maintenance support for the NUCAPS JPSS (NOAA-20/21) and MetOp (C/B) series enterprise version (HEAP4.0)* | R&D, I&T, CV | Sep-25 | | |
| | Subtask 1.1 Generation of MetOp-B cloudy and clear regression updates removing faulty AMSU-A channels | | Oct-24 | Dec-24 | Regression updates appears to work alright. However, requires additional patches for AMSU Brightness temperature adjustments. |
| **Task 2** | Intensive validation activities using a collection of a hierarchy of validation data sets, processing and intensive validation activities are planned for all of the NUCAPS products (AVTP, AVMP, O3, CO, CO2, CH4, and OLR). Validation of algorithm updates and improvements | R&D, I&T, CV | Sep-25 | | **Ongoing and on-time** |
| | Subtask 2.1 Continued generation of matched data sets, NUCAPS product generation and validation with collocated data sets to evaluate product performance over different seasons and regions. | R&D, I&T, CV | Mar-25 | | |
| | Subtask 2.2 Algorithm improvements and operational feasibility/implementation of new products | R&D, I&T, CV | Jun-25 | | |
| | Subtask 2.3 Coordination and collaboration with NOAA – GML (Theme 1 & 2) validation activities; Support for Greenhouse Gases (GHG) initiatives; Environmental events | R&D, I&T, CV | Jun-25 | | |
| | Subtask 2.4: Validation of NUCAPS products with Single Field-of-view Sounding Atmospheric Product (SIFSAP, LaRC) and matched RAOB measurements | R&D, I&T, CV | Sep-25 | | |
| **Task 3** | Mission-long reprocessing of NUCAPS EDR products | R&D, I&T, CV | Mar-25 | | Ongoing |
| | Subtask 3.1 Pilot study on NCIS reprocessing of NUCAPS EDRs | | Oct-24 | Dec-24 | Verified NOAA-20/21 AWS runs with offline runs and found them good. Working on S-NPP focus day evaluations. |
| | Subtask 3.2 Mission-long S-NPP NUCAPS product reprocessing using reprocessed SDRs and with NUCAPS HEAP 4.0 followed by NOAA-20. | R&D, I&T, CV | Mar-25 | | Delays due to AWS team funding, and due to contract discontinuity for a month that has ripple effects |
| | Subtask 3.3 Mini-validation review of reprocessed NUCAPS products | R&D, I&T, CV | Apr-25 | | |

# Ocean Color

March 2025

## Accomplishments / Events:

- Published a paper (significantly improved VIIRS cloud masking over highly turbid waters and intensive algae):
  Wang, M., L. Jiang, "Recovery of pixels with extremely turbid waters and intensive floating algae from false cloud masking in satellite ocean color remote sensing," *Int. J. Appl. Earth Obs. Geoinf.*, **137**, 104408, 2025. https://doi.org/10.1016/j.jag.2025.104408
- Continue working on mission-long OC data reprocessing for three VIIRS sensors (SNPP, NOAA-20, and NOAA-21).
- Hosted two Bi-weekly Cal/Val telecoms with progress reports from 4 teams (CCNY, Columbia U., MOBY, and STAR).
- Routinely producing VIIRS (SNPP, NOAA-20, and NOAA-21) true color/false color images in OCView.
- Routinely Producing global VIIRS (SNPP, NOAA-20, and NOAA-21) ocean color products and showing in OCView routinely : https://www.star.nesdis.noaa.gov/socd/mecb/color/index.php
- VIIRS OC data are being distributed through NOAA CoastWatch, including global gap-free ocean color products, i.e., Chl-a, $K_d$(490), and SPM.

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Ocean Color Validated Maturity | Jul-2025 | Jul-2025 | March 2024 | |
| Cal/Val team complete the 10th VIIRS ocean color dedicated cruise | Aug-2025 | Aug-2025 | | |
| NOAA-21 OC EDR Cal/Val evaluations using refreshed/new MOBY data | Sep-2025 | Sep-2025 | | |

## 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

# Ocean Color FY25 Milestones/Deliverables

| Task/Milestone | Planned Completion Date | Fiscal Quarter | Comments |
|---|---|---|---|
| **NOAA-21 OC data processing** | | | |
| NOAA-21 OC EDR Cal/Val evaluations using refreshed/new MOBY data | Sep-25 | Q4 FY25 | |
| **VIIRS calibration/validation** | | | |
| Continue VIIRS Cal/Val data analysis (SNPP, NOAA-20, and NOAA-21) (using new MOBY data) | Sep-25 | Q4 FY25 | |
| Cal/Val team complete the 10th VIIRS ocean color dedicated cruise | Aug-25 | Q4 FY25 | |
| In situ data collections from OC Cal/Val team including NOAA dedicated cruise and other opportunities, particularly for NOAA-21 OC validation | Aug-25 | Q4 FY25 | |
| **VIIRS algorithm refinement (Maintenance DAP)** | | | |
| Improvement of the OCView tool for routine global VIIRS true color & OC products monitoring | Aug-25 | Q4 FY25 | |
| Continue working on improvement of the ocean color data processing system (MSL12), particularly over global coastal and inland water regions | Sep-25 | Q4 FY25 | |
| **VIIRS OC data processing/reprocessing** | | | |
| Mission-long OC data reprocessing for VIIRS-SNPP | Sep-25 | Q4 FY25 | |
| Mission-long OC data reprocessing for VIIRS-NOAA-20 | Sep-25 | Q4 FY25 | |
| Mission-long OC data reprocessing for VIIRS-NOAA-21 (depending on evaluation results from refreshed MOBY data) | Sep-25 | Q4 FY25 | |
| Producing consistent VIIRS SNPP, NOAA-20, and NOAA-21 OC products from reprocessed OC data | Sep-25 | Q4 FY25 | |
| Updated DAP (MSL12) to CoastWatch, if needed | Sep-25 | Q4 FY25 | |

# OMPS Ozone (V8Pro, V2Limb & V8TOz)

*March 2025*

*Major Accomplishments / Last Month:*

- Tested and perfected single granule processing for the NOAA-21 OMPS Limb Profiler.
- Provided weekly Limb Table deliveries for Orbital Definition, Wavelength Monitoring and Dark Current tables for NPP and N21.
- Provided monthly updates of overpass comparisons with ground-based assets.
- Identified a precision error in NOAA-20 OMPS NM SDR Wavelength Scale Table.
- Made initial assessments of NOAA-21 OMPS NP Solar measurements to characterize degradation, wavelength shifts and solar activity.
- Reprocessed multiple years of S-NPP OMPS V8Pro EDRs and provided them for trend analysis work.
- Began work on VLIDORT to use as the forward radiative transfer model for DOAS trace gas retrievals.
- Provided some sample days of V2.7Limb files for testing.

Milestones on the next two slides.

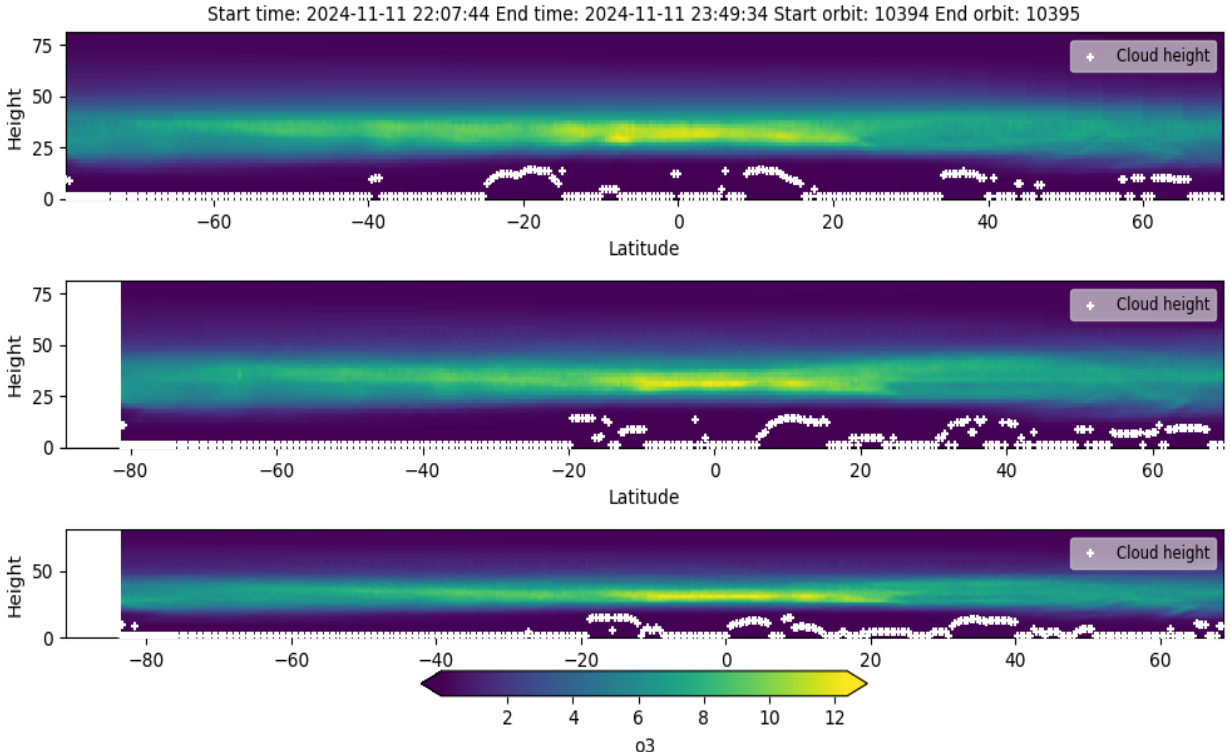
*Overall Status:*

| | Green[1] (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| **Cost / Budget** | | X | | | |
| **Technical / Programmatic** | | X | | | |
| **Schedule** | | | X | | 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: ASTA 2.0 is just spinning up. Three incumbents have moved over to STC. A fourth contractor is in the badging queue. Funding remains TBD.***

Ozone Mixing Rations for NOAA-21 V2.7Limb



# FY25 Milestones: JPSS Ozone EDRs and Level 3 from OMPS Nadir Instruments

| Tasks/Deliverables/Milestones | Estimated Completion |
|---|---|
| Task 1: *Maintain, Sustain, Validate, Improve and Reprocess OMPS V8Pro Ozone Profile EDRs, V8TOz Total Column Ozone EDRs, V8TOS Total Column Ozone and SO2 EDRs.* | May 2026 |
| Subtask 1.1: *Monitor and validate operational OMPS products by using ground-based assets and time series analysis and comparisons. Create and deliver (Monthly) regular overpass datasets for NOAA ground-based networks. Maintain STAR internal monitoring pages (Monthly) and work with the STAR IT group to help coordinate resources for the ozone team. Keep STAR Linux Cluster OMPS databases up to date.* | Monthly Updates |
| Subtask 1.2: *Construct, improve and deliver tables and codes, and perform validation studies. Make changes to V8Pro soft calibration adjustment tables as the OMPS SDR Team implements solar calibration changes. Provide presentation of results to maintain and demonstrate Ozone EDR Maturity and Improvements.* | As Needed<br>June 2025 |
| Subtask 1.3: *Reprocess the full V8Pro records for NPP and N20 after developing soft calibration adjustments to create a homogenized Climate Data Record. Reprocess the full V8TOz record with time dependent soft calibration adjustments to account for degradation. Provide presentations validating and document each set of results.* | NPP V8Pro April 2025<br>N20 V8Pro May 2025<br>NPP V8TOz June 2025 |
| Subtask 1.4: *Maintain, monitor, trouble-shoot all NOAA OMPS Nadir Ozone and $SO_2$ products.* | Ongoing |
| Subtask 1.5: *Test and implement approaches to improve SNR for small-FOV N21 OMPS V8TOS EDRs. Coordinate OMPS Processing capabilities with Enterprise DOAS Trace Gas EDR advances.* | July 2025 |
| Subtask 1.6: *Support preparation, testing, table development and code changes for J04 OMPS Nadir Products. Deliver initial instrument and soft calibration tables.*<br>Subtask 1.7: *Modify and deliver V8TOs and V8Pro for application to higher resolution NOAA-20 OMPS NM SDRs.* | August 2025<br>July 2025 |
| Task 2: *Maintain, Sustain, Validate and Improve the Nadir Total Ozone Analysis using Stratospheric and Tropospheric sources (NTOAST) products.* | Sept 2025 |
| Subtask 2.1: *Validate operational NTOAST processing and help to prepare the Algorithm / Operational Readiness Reviews and associated documents (ATBD, UMM, SMM)* | March 2025 |
| Subtask 2.2: *Monitor operational implementation and performance and provide expertise to resolve any issues.* | Ongoing |
| Task 3: *Transition research DOAS trace gas retrieval algorithms (NO2 and HCHO) applied to OMPS measurements to STAR. Convert output generating code to provide NOAA-standard NetCDF EDR files. Provide a report confirming duplication of research processing results and as a preliminary Algorithm Readiness Review.* | July 2025 |

# JPSS Ozone EDRs & Level 3 from OMPS Limb Profiler Instruments

| Tasks/Deliverables/Milestones | Estimated Completion |
|---|---|
| Task 1: *Maintain, Sustain, Validate, Update, and Improve OMPS V2Limb codes, calibration tables, monitoring systems and overpass data.* | May 2026 |
| Subtask 1.1: *Provide delta-DAPs to ASSISTT as NOAA implements improved temperature logic and NASA provides improved Level 1 corrections and aerosol retrievals, or makes other tables, corrections or code modifications.* | May 2025<br>July 2025 |
| Subtask 1.2: *Provide weekly table deliveries for Darks, Wavelengths and Orbital Definition files.* | Weekly |
| Subtask 1.3: *Complete NOAA-21 V2Limb validation and move to operations. Validate operational LTOAST processing and help to prepare the Algorithm / Operational Readiness Reviews and associated documents (ATBD, UMM, SMM). Provide guidance on OSPO Limb Monitoring.* | April 2025 |
| Subtask 1.4: *Monitor and validate operational products by using ground-based assets and time series analysis and comparisons. Create and deliver (Monthly) regular overpass datasets for NOAA ground-based networks. Maintain STAR internal monitoring pages (Monthly) and work with the STAR IT group to help coordinate resources for the ozone team. Keep STAR Linux Cluster OMPS databases up to date.* | Monthly Updates |
| Subtask 1.5: *Provide sample days of N21 and NPP V2Limb NetCDF files to teams working on LTOAST, BUFR, and Monitoring.* | April 2025 |
| Subtask 1.6: *Support Cal/Val Plan preparation, testing, table development and code changes for J04 OMPS Limb Products. Deliver initial instrument, timing pattern and soft calibration tables.* | Plan May 2025 Tables Dec 2025 |

# FY25 Milestones: JPSS Ozone EDRs and Level 3 from OMPS Nadir Instruments

| Tasks/Deliverables/Milestones | Estimated Completion |
|---|---|
| Task 1: *Maintain, Sustain, Validate, Improve and Reprocess OMPS V8Pro Ozone Profile EDRs, V8TOz Total Column Ozone EDRs, V8TOS Total Column Ozone and SO2 EDRs.* | May 2026 |
| Subtask 1.1: *Monitor and validate operational OMPS products by using ground-based assets and time series analysis and comparisons. Create and deliver (Monthly) regular overpass datasets for NOAA ground-based networks. Maintain STAR internal monitoring pages (Monthly) and work with the STAR IT group to help coordinate resources for the ozone team. Keep STAR Linux Cluster OMPS databases up to date.* | Monthly Updates |
| Subtask 1.2: *Construct, improve and deliver tables and codes, and perform validation studies. Make changes to V8Pro soft calibration adjustment tables as the OMPS SDR Team implements solar calibration changes. Provide presentation of results to maintain and demonstrate Ozone EDR Maturity and Improvements.* | As Needed<br>June 2025 |
| Subtask 1.3: *Reprocess the full V8Pro records for NPP and N20 after developing soft calibration adjustments to create a homogenized Climate Data Record. Reprocess the full V8TOz record with time dependent soft calibration adjustments to account for degradation. Provide presentations validating and document each set of results.* | NPP V8Pro March 2025<br>N20 V8Pro April 2025<br>NPP V8TOz June 2025 |
| Subtask 1.4: *Maintain, monitor, trouble-shoot all NOAA OMPS Nadir Ozone and $SO_2$ products.* | Ongoing |
| Subtask 1.5: *Test and implement approaches to improve SNR for small-FOV N21 OMPS V8TOS EDRs. Coordinate OMPS Processing capabilities with Enterprise DOAS Trace Gas EDR advances.* | July 2025 |
| Subtask 1.6: *Support preparation, testing, table development and code changes for J04 OMPS Nadir Products. Deliver initial instrument and soft calibration tables.*<br>Subtask 1.7: *Modify and deliver V8TOs and V8Pro for application to higher resolution NOAA-20 OMPS NM SDRs.* | August 2025<br>July 2025 |
| Task 2: *Maintain, Sustain, Validate and Improve the Nadir Total Ozone Analysis using Stratospheric and Tropospheric sources (NTOAST) products.* | Sept 2025 |
| Subtask 2.1: *Validate operational NTOAST processing and help to prepare the Algorithm / Operational Readiness Reviews and associated documents (ATBD, UMM, SMM)* | March 2025 |
| Subtask 2.2: *Monitor operational implementation and performance and provide expertise to resolve any issues.* | Ongoing |
| Task 3: *Transition research DOAS trace gas retrieval algorithms (NO2 and HCHO) applied to OMPS measurements to STAR. Convert output generating code to provide NOAA-standard NetCDF EDR files. Provide a report confirming duplication of research processing results and as a preliminary Algorithm Readiness Review.* | July 2025 |

| Tasks/Deliverables/Milestones | Estimated Completion |
|---|---|
| Task 1: *Maintain, Sustain, Validate, Update, and Improve OMPS V2Limb codes, calibration tables, monitoring systems and overpass data.* | May 2026 |
| Subtask 1.1: *Provide delta-DAPs to ASSISTT as NOAA implements improved temperature logic and NASA provides improved Level 1 corrections and aerosol retrievals, or makes other tables, corrections or code modifications.* | May 2025<br>July 2025 |
| Subtask 1.2: *Provide weekly table deliveries for Darks, Wavelengths and Orbital Definition files.* | Weekly |
| Subtask 1.3: *Complete NOAA-21 V2Limb validation and move to operations. Validate operational LTOAST processing and help to prepare the Algorithm / Operational Readiness Reviews and associated documents (ATBD, UMM, SMM). Provide guidance on OSPO Limb Monitoring.* | March 2025 |
| Subtask 1.4: *Monitor and validate operational products by using ground-based assets and time series analysis and comparisons. Create and deliver (Monthly) regular overpass datasets for NOAA ground-based networks. Maintain STAR internal monitoring pages (Monthly) and work with the STAR IT group to help coordinate resources for the ozone team. Keep STAR Linux Cluster OMPS databases up to date.* | Monthly Updates |
| Subtask 1.5: *Provide sample days of N21 and NPP V2Limb NetCDF files to teams working on LTOAST, BUFR, and Monitoring.* | April 2025 |
| Subtask 1.6: *Support Cal/Val Plan preparation, testing, table development and code changes for J04 OMPS Limb Products. Deliver initial instrument, timing pattern and soft calibration tables.* | Plan May 2025 Tables Dec 2025 |

# OMPS SDR

*February 2025*

***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 and presented the delta review for J4 OMPS NM SDR algorithm.
- Started to work on the stray light table and new solar table for high resolution (135CT) of NOAA-20 OMPS NM SDR data.
- Continued to compare JPSS-04 OMPS Bandpass, Channel Band Center, and Synthetic Solar data with values from SNPP, NOAA-20, and NOAA-21 (see Fig. 1).
- Work is currently ongoing to further update and refine the OMPS NM CRTM package to generate OMPS NM O – B to support the feasibility analysis of assimilating OMPS NM SDR data to improve NWP ozone forecast.
- Started to initialize a validation algorithm to explore feasibility of assimilating OMPS NM SDR data

*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:***

| | Milestone | Finish | Deliverable |
|---|---|---|---|
| 1 | Complete the JPSS-4 OMPS SDR calibration plan | Oct-24 | JPSS-4 OMPS SDR calibration plan |
| 2 | Complete the solar activity adjustment analysis for SNPP, NOAA-20 and NOAA-21 OMPS NP (part of DR10832) | Dec-24 | Software; new OSL tables; reprocessed OMPS NP SDR test data sets; |
| 3 | Complete beta version of JPSS-04 OMPS nadir sensor pre-launch analysis report | Jan-25 | JPSS-04 OMPS analysis report |
| 4 | Complete delta review for J4 OMPS NM SDR algorithm | Feb-25 | J4 OMPS NM SDR algorithm report |
| 5 | Derive new wavelength and stray light LUTs for NOAA-20 medium resolution SDR data, including verification and validation of the LUTs | Apr-25 | New LUTs to generate NOAA-20 NM SDR high resolution of test data sets |
| 6 | Complete test and verification of 139CT-NOAA-20 OMPS NM SDR data sets using new NOAA-20 OMPS SDR LUTs (e.g., WV and SL LUTs) | May-25 | 139CT-NOAA-20 OMPS NM SDR test data sets |
| 7 | Validate 139CT-NOAA-20 OMPS NM SDR data towards validated maturity review | Jun-25 | A delta validated maturity review |
| 8 | Develop proxy calibration coefficient LUTs to support JPSS-4 OMPS NM SDR processing with a new wavelength range from 380 to 439nm | Jul-25 | Various proxy calibration coefficient LUTs for JPSS-04 OMPS NMs |
| 9 | Complete the degradation analysis for SNPP, NOAA-20 OMPS NP (part of DR10832) and NM (a new DR is needed) | Jul-25 | New solar wavelength and flux tables; reprocessed test data sets for OMPS EDR team |
| 10 | New (3rd) reprocessing of SNPP OMPS NP SDR data, by implementing new dark correction, solar activity adjustment, and degradation correction | Aug-25 | Mission-long calibration-improved SNPP OMPS NP SDR data sets |
| 11 | Establish an off-line OMPS SDR processing package in order to meet new requirements in future JPSS-03 and JPSS-04 missions | Aug-25 | An off-line OMPS SDR processing ADL package applicable for future JPSS-03 and JPSS-04 |
| 12 | Continuous radiometric data quality stability validation analysis across SNPP/NOAA-20/NOAA-21 OMPS NM and NP instruments: e.g., SL correction model standardization/accuracy improvements; wavelength shift gradient impact mitigation; new validation methods; new inter-sensor comparison methods/assessments | Sep-25 | New/improved calibration methods; new/improved validation methods; Quality-improved OMPS SDR data |
| 13 | Support CRTM-VLIDORT project for OMPS radiance simulations | Sep-25 | Test results |

Comparisons of Bandpass Full-Width Half-Max values among 4 OMPS NMs

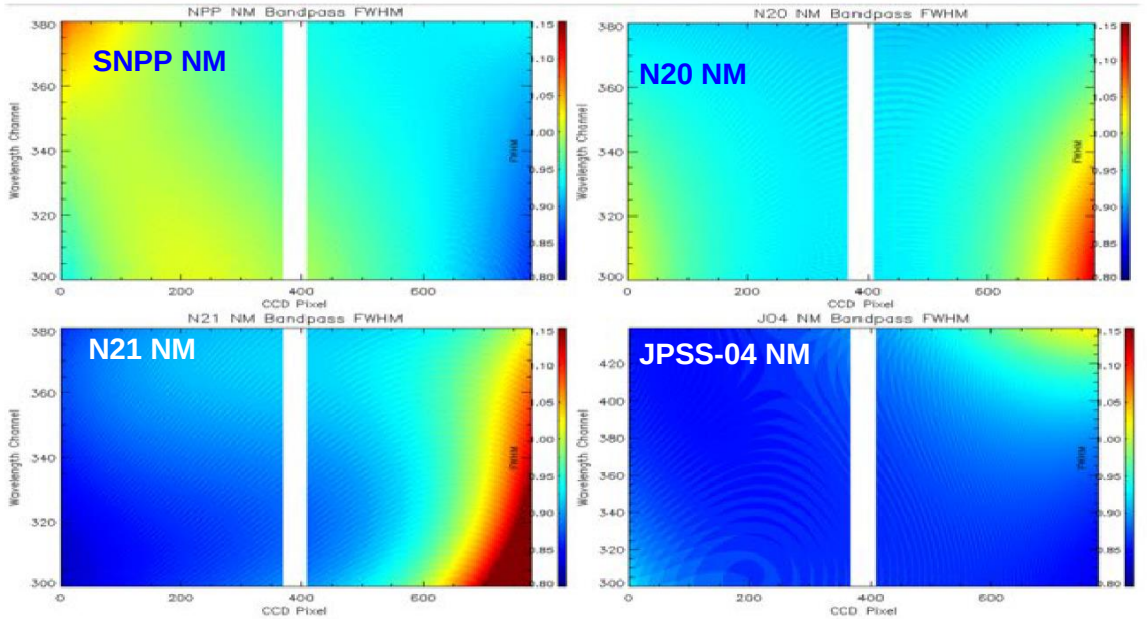



Figure 1: These figures show the Bandpass Full-Width Half-Max values for each of the OMPS NM sensors.

# FY25 OMPS SDR Milestones/Deliverables

| | Milestone | Start | Finish | Deliverable |
|---|---|---|---|---|
| 1 | Complete the JPSS-4 OMPS SDR calibration plan | Sep-24 | Oct-24 | JPSS-4 OMPS SDR calibration plan |
| 2 | Complete the solar activity adjustment analysis for SNPP, NOAA-20 and NOAA-21 OMPS NP (part of DR10832) | Jun-24 | Dec-24 | Software; new OSL tables; reprocessed OMPS NP SDR test data sets; |
| 3 | Complete beta version of JPSS-04 OMPS nadir sensor pre-launch characterization analysis report | Sep-24 | Jan-25 | JPSS-04 OMPS nadir sensor pre-launch characterization analysis report |
| 4 | Complete the degradation analysis for SNPP, NOAA-20 OMPS NP (part of DR10832) and NM (a new DR is needed) | Dec-24 | Mar-25 | New solar wavelength and flux tables; reprocessed test data sets for OMPS EDR team |
| 5 | Develop various proxy calibration coefficient LUTs to support JPSS-3/4 OMPS NM SDR processing with a new wavelength range from 380 to 439nm | Jan-25 | May-25 | Various proxy calibration coefficient LUTs for JPSS-03/04 OMPS NMs; various proxy calibration coefficient LUTs for SNPP, NOAA-20 NMs (code compliance) |
| 6 | Continuous radiometric data quality stability validation analysis across SNPP/NOAA-20/NOAA-21 OMPS NM and NP instruments: SL correction model standardization/accuracy improvements; wavelength shift gradient impact mitigation | Feb-25 | Jul-25 | Quality-consistent OMPS SDR radiometric data across NM and NP, SNPP/NOAA-20/NOAA-21; better validation/calibration algorithms applicable for existing and future JPSS missions |
| 7 | Establish an off-line OMPS SDR processing package in order to meet new requirements from EDR in retrieving NO2 in future JPSS-03 and JPSS-04 missions (NM wavelength range: from 300-380 nm to 300-430nm) | Feb-25 | Aug-25 | An off-line OMPS SDR processing package applicable for future JPSS-03 and JPSS-04; ADL code change package for operational processing |
| 8 | Complete beta version of JPSS-03 OMPS nadir sensor pre-launch characterization analysis report | Jun-25 | Sep-25 | JPSS-03 OMPS nadir sensor pre-launch characterization analysis report |
| 9 | Continuous radiometric data calibration algorithm accuracy and consistency improvements across SNPP/NOAA-20/NOAA-21 OMPS NM and NP instruments: NM and NP inconsistency in the dichroic, SDR inconsistency across 3 OMPS sensors | Mar-25 | Sep-25 | Quality-consistent OMPS SDR radiometric data across NM and NP, SNPP/NOAA-20/NOAA-21; better validation/calibration algorithms applicable for existing and future JPSS missions |
| 10 | Support CRTM-VLIDORT project for OMPS radiance simulations | Oct-24 | Sep-25 | Test results |
| 11 | Derive and deliver OMPS NM/NP dark and solar calibration tables for SNPP, NOAA-20, and NOAA-21 OMPS SDR data, including recovery activities | Oct-24 | Sep-25 | Dark, solar SOL LUTs |

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

# QuickSounder ATMS SDR

March 2025

***Accomplishments / Events:***

- Reviewed the QS ATMS proxy data provided by the NASA ATMS team. Preliminary checkout of the data indicates that one of the data is converted from JPSS-1 ATMS operational data and the other set is from QS ATMS TVac data **(1 &2)**. A Full reports on the telemetry, SDR, and geolocation information have been presented in the QS ATMS team meeting.
- Continued effort to produce the non-linearity corrections coefficients for QuickSounder ATMS. As part of this effort, along with contingency plans, and data access plans are being explored. The current strategy involves the full radiance calibration to recreate nonlinearity values in the PCT, including terms such as the Reflector emissivity. **(3)**
- Developed a plan for the potential impact of ADL Mx15, with QuickSounder support, release date on Cal/Val team working schedule. the NASA ATMS team presentation on QuickSounder ATMS SRF development status and correction scientific rationale was provided. The measured SRF is to be converted to CRTM coefficients to support QS ATMS post-launch cal/val and characterization activities.

## *Overall Status:*

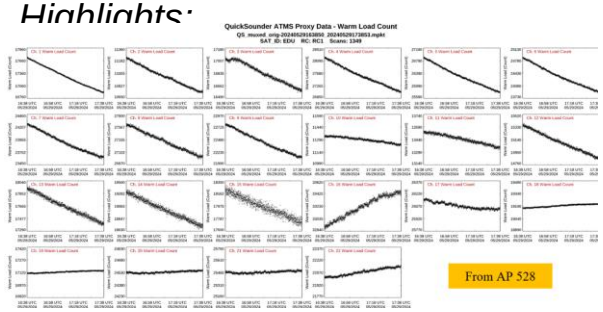
| | Green1 (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| **Cost / Budget** | | X | | | |
| **Technical / Programmatic** | | | x | | See Issues/Risks |
| **Schedule** | | | x | | See Issues/Risks |

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

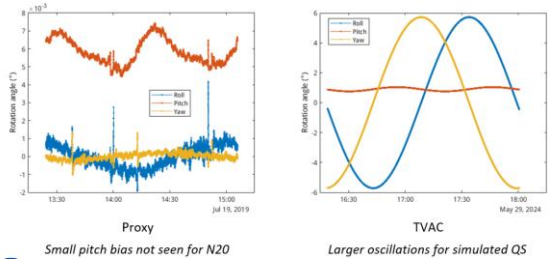
***Issues/Risks:*** **The lack of a computer environment that can handle CUI information and the need of ADL with QS restricts STAR's ability to support QS pre-flight activities. Options are being explored, including a potential CUI server that has an ETA of August.**

| Milestones | Original Date | Actual Date | Variance Explanation |
|---|---|---|---|
| Provide QuickSounder Algorithm Updates assessment summary | Jun-24 | Jun-24 | |
| QS Algorithm Package Delivery #1 to LEO Ground (post Instrument-Level TVAC assessment) | Nov-24 | Nov-24 | |
| QS Pre/Post-launch Cal/Val Plan | Jan-25 | Jan-25 | |
| Identify updates to the web-based Integrated Calibration and Validation System (ICVS) and provide scheduled to perform the updates | Apr-25 | | |
| QS Algorithm Package Delivery #2 to LEO Ground (post Observatory Environmental Testing assessment) | Jul-25 | | |
| Instrument-Level TVAC assessment to process the TVAC data, generate the calibration parameters, and develop and test calibration updates | Sep-25 | | |

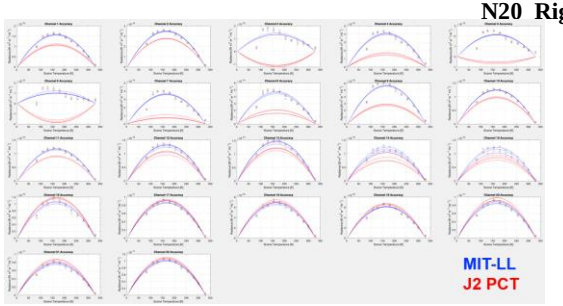
## *Highlights:*




**(1) Sample QS ATMS Warm Load Count Proxy Data. From AP 528**




**(2) QS Spacecraft Attitude Data. Left: Proxy Roll Pitch and Yaw data. Small pitch bias not seen for N20 Right: TVAC Roll Pitch Yaw Data Larger oscillations for simulated QS**




**(3) Nonlinearity BT component using full radiance model (MIT-LL) vs J2 PCT. Regression fit from TVAC data**

# Sea Surface Temperature

March 2025

## *Accomplishments / Events:*

- We updated the Community Radiative Transfer Model (CRTM) library from V2.3.0 to V3.1.1. This update enables us to include atmospheric aerosols in the forward radiative transfer model (RTM), paving the way for corrections of aerosol-induced SST biases. The first step was to simply reproduce previous V2.3.0 results using identical inputs and RTM settings. This was nontrivial due to changes in CRTM code interfaces and ancillary data formats.
- As a part of the CRTM 3.1.1 update, we did a complete overhaul of the ACSPO codebase involved with CRTM. We updated the scheme for interpolation of physical quantities between pressure levels according to recommendation of CRTM team members and observed noticeable improvements in mean bias between observed and modeled brightness temperatures (see figure).
- A second advantage to the CRTM V3.1.1 update is the availability of an improved ocean surface emissivity model, which should improve scan-angle-dependent differences between observed and modeled brightness temperatures. We verified this by reprocessing 6 months of N20 VIIRS SST data with the previous and new emissivity models and found significant improvement (see figure).

## *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.*

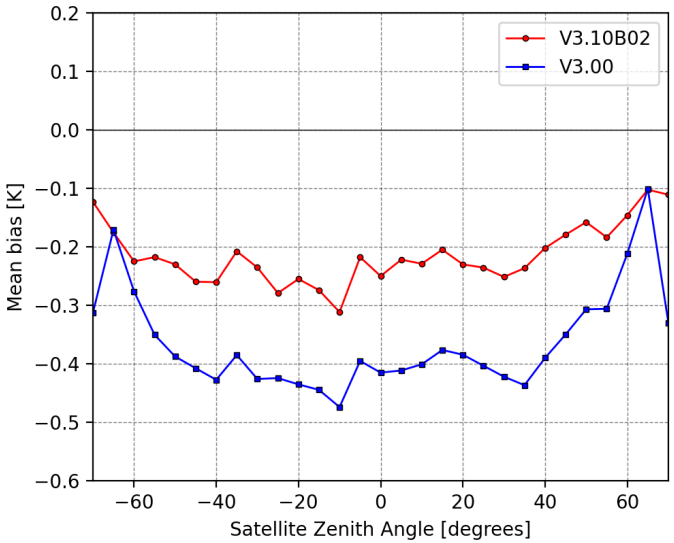
## ***Issues/Risks:***

Delays with STAR cloud migration combined with our inability to buy computer hardware makes the viability of future reprocessing efforts uncertain

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Promote experimental iQuam updates to live access | Aug-24 | Dec-24 | Dec-24 | |
| Deliver ACSPO VIIRS V3.00 package to ASSISTT | Jan-25 | Jan-25 | Jan-25 | |
| Migrate legacy IDL iQuam codebase to python | Jun-25 | Jun-25 | | |
| Reprocess historical iQuam SST data using iQuam v2.3 | Sep-25 | Sep-25 | | |
| Update CRTM library from v2.3 to 3.0 (needed for inclusion of aerosols in radiance simulations). | Mar-25 | Mar-25 | Mar-25 | |
| Investigate how inclusion of aerosol information in simulated radiances can be used to improve ACSPO SST and clear-sky mask algorithms. | Aug-25 | Aug-25 | | |
| Reprocess VIIRS SST using ACSPO V3.00 | Dec-25 | Dec-25 | | |

## ***Highlights*: Improvements to radiative transfer in ACSPO V3.10B02**

**Mean bias between observed and modeled brightness temperatures for N20 VIIRS channel M15. Bias is stratified by satellite view zenith angle (VZA; negative values correspond to beginning of scan). Red curve shows ACSPO V3.10B02 results using CRTM 3.1.1 with new emissivity model and revised ACSPO pressure level interpolation. Blue curve shows ACSPO V3.00 results using previous emissivity model and interpolation scheme. Both mean bias and "flatness" of the bias dependency on VZA is noticeably improved in ACSPO V3.10B02.**



# SST FY 25 Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 1: Deliver L3S-LEO Daily to ASSISTT/OSPO; contingency on non-JPSS and non-NOAA data inputs* | *June 2025 (FY25)* | | | |
| *Subtask 1.1: Created and test Delivered Algorithm Package (DAP), containing L3S Daily code along with required libraries, ancillary data, and sample files* | *May 2025 (FY25)* | | | |
| *Subtask 1.2: Deliver L3S Daily DAP to ASSISTT and work with ASSISTT on troubleshooting and validation* | *June 2025 (FY25)* | | | |
| *Task 2: Full-mission Reanalysis (RAN) of VIIRS SST data from NPP, N20 & N21 using the latest version of ACSPO (Version 3.00)* | *September 2025 (FY25)* | | | |
| *Subtask 2.1: Recruit and familiarize staff* | *October 2024 (FY25)* | | | |
| *Subtask 2.2: Evaluate long term stability of VIIRS SST and compare with stability of VIIRS thermal bands.* | *April 2025 (FY25)* | | | |
| *Subtask 2.3: Investigate stabilization (de-trending) of long-term SST bias drift to create a maximally stable, long-term VIIRS SST dataset.* | *July 2025 (FY25)* | | | |
| *Subtask 2.4: Perform reprocessing using on-premise NOAA STAR compute hardware* | *August 2025 (FY25)* | | | |
| *Subtask 2.5: Deliver RAN data sets to PODAAC, CoastWatch & NCEI* | *September 2025 (FY25)* | | | |
| *Task 3: Continue improvements, validation of thermal fronts; shore up processing to use fronts to improve the ACSPO clear sky mask* | *September 2025 (FY25)* | | | |
| *Subtask 3.1: Support for using position and strength of thermal fronts to improve ACSPO clear-sky mask will be included in the ACSPO VIIRS 3.00 DAP delivery (see Task 5) to ASSISTT.* | December 2024 (FY25) | | | |
| *Subtask 3.2: Investigate viability of validating accuracy of thermal fronts using in situ SST from Sail Drones.* | September 2025 (FY25) | | | |

# SST FY 25 Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 4: Collaborate across NESDIS and NOAA on "next generation SST product suite" , including exploring ACSPO L4* | *September 2025* | | | |
| *Subtask 4.1: Identify best way forward towards creating a STAR L4 SST product that covers the 1981-on era. Two viable approaches are (1) Extend the ACSPO L3S-LEO Daily product to fill in data gaps due to clouds. (2) Use existing Geo-Polar Blended L4 SST algorithm using reprocessed ACSPO SSTs from AVHRR, MODIS, VIIRS, ABI, and AHI sensors.* | September 2025 | | | |
| *Subtask 4.2: Perform full-mission reprocessing of all ACSPO SST datasets to improve SST quality and uniformity* | September 2025 | | | |
| *Task 5: Continue refining ACSPO Clear Sky Mask to reduce over screening and residual cloud leakages. The overarching goal is improving both quantity (number of clear sky pixels) and quality (accuracy/precision).* | *Ongoing; target next update for delivery of ACSPO 3.00 (FY25)* | | | |
| *Subtask 5.1: Create and test Delivered Algorithm Package (DAP) for ACSPO V3.00 VIIRS. ACSPO version 3.00 contains substantial improvements to the VIIRS clear-sky mask in terms of reduced cloud leakages and improved coverage in dynamic regions.* | *November 2024 (FY25)* | | | |
| *Subtask 5.2: Deliver DAP to ASSISTT and work with ASSISTT on troubleshooting and validation* | December 2024 *(FY25)* | | | |

# Snowfall Rate

March 2025

## Accomplishments / Events:

- Completed several tasks in preparation for updating SFR and mSFR in TOWR-S future RPM release: a new colorbar to improve the display of moderate snowfall, added 3 additional snow-to-liquid ratios based on user request, generated 14 new colormap files and delivered to NASA SPoRT for testing. The SFR and mSFR AWIPS display at NWS Weather Forecast Offices will be updated with the new display design after the TOWR-S release.
- Finalizing the multi-ice-particle microphysics algorithms for all satellites. Ice particle properties are determined by environmental conditions. The advanced algorithms include ML models to derive the weights for different ice particles. They can better represent the snow microphysics and lead to more accurate snowfall rate estimates than the current single-ice-particle models.

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *SFR delivery including ocean coverage* | 12/2024 | 12/2024 | 12/2024 | |
| *Development of NPreciSe web-portal and archive* | 12/2024 | 12/2024 | 12/2024 | |
| *Cross calibration for NOAA-21, NOAA-20, S-NPP, Metop-B, Metop-C, and GPM* | 4/2025 | 4/2025 | | |
| *Extending the study to include climatology in NPreciSe* | 6/2025 | 6/2025 | | |
| *Advanced microphysics for NOAA-21, NOAA-20, S-NPP, Metop-B, Metop-C, and GPM* | 6/2025 | 6/2025 | | |
| *2D SFR bias correction for NOAA-21, NOAA-20, S-NPP, Metop-B and Metop-C* | 6/2025 | 6/2025 | | |

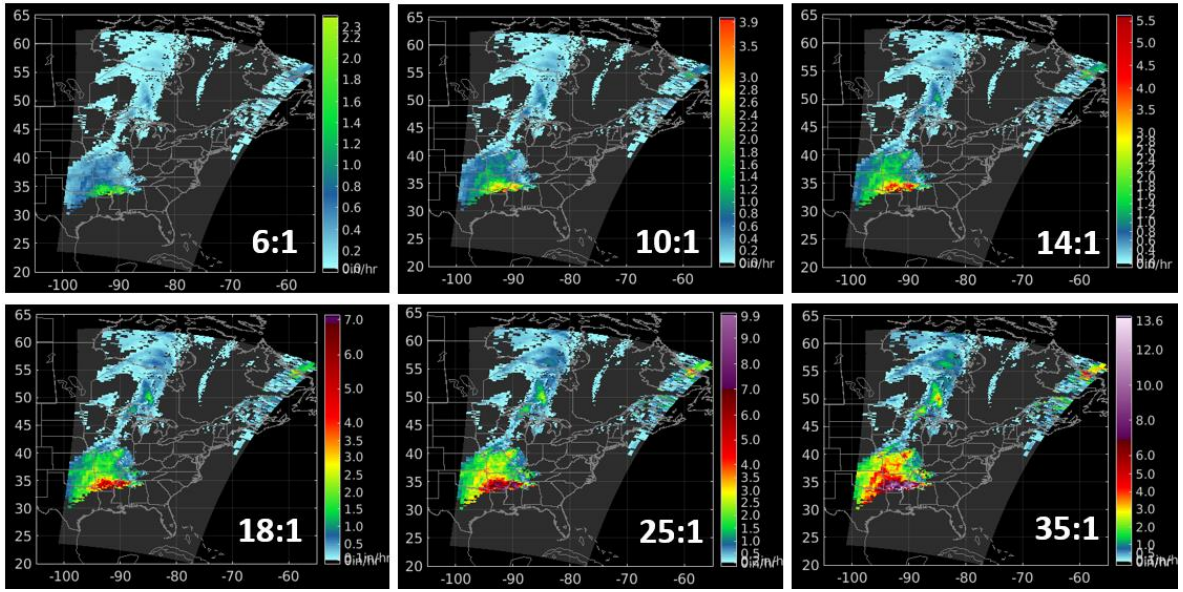
## Overall Status:

| | 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:




SFR displays with different snow-to-liquid ratios (SLR) as noted in the images. The new colorbar design is shown in the 35:1 SLR. The display is similar to what forecasters will see in AWIPS once the new design is implemented in AWIPS.

# Snowfall Rate FY 25 Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 1: Advanced microphysics for NOAA-21, NOAA-20, S-NPP, Metop-B, Metop-C, and GPM* | *June 2025* | | | |
| *Subtask 1.1: Study scattering properties of various ice habits and their impact on S-NPP snowfall rate retrieval* | *December 2024* | | | |
| *Subtask 1.2: Develop AI/ML-based optimal combination scheme for multiple ice habits to improve S-NPP SFR 2/2025* | *February 2025* | | | |
| *Subtask 1.3: Develop advanced microphysics for the other satellites* | *June 2025* | | | |
| *Task 2: Cross calibration for NOAA-21, NOAA-20, S-NPP, Metop-B, Metop-C, and GPM* | *April 2025* | | | |
| *Subtask 2.1: Select reference satellite* | *October 2024* | | | |
| *Subtask 2.2: Create collocated datasets for all satellites with the reference satellite* | *January 2025* | | | |
| *Subtask 2.3: Perform cross satellite calibration and derive correction model for each satellite* | *April 2025* | | | |
| *Task 3: 2D SFR bias correction for NOAA-21, NOAA-20, S-NPP, Metop-B and Metop-C* | *June 2025* | | | |
| *Subtask 3.1: Feature analysis and construction of training datasets for 2D ML models* | *March 2025* | | | |
| *Subtask 3.2: Train 2D bias correction models* | *June 2025* | | | |
| *Task 4: Development of NPreciSe web-portal and archive* | *December 2024* | | | |
| *Subtask 4.1: Develop and implement new webpage interface to enable hosting the NPreciSe web portal* | *September 2024* | | | |
| *Subtask 4.2: Migrate the processing and archiving system to a new server* | *December 2024* | | | |
| *Task 5: Extending the study to include climatology* | *June 2025* | | | |
| *Subtask 5.1: Add monthly statistics of detection and estimation errors of the MiRS product to the NPreciSe system* | *June 2025* | | | |

# Surface Reflectance

March 2025

## *Accomplishments / Events:*

- Completed the RadCalNet data collection and processing, aligning it with VIIRS SDR (TOA reflectance and geolocations) and surface reflectance, along with NASA VIIRS data for inter-comparison.
- Analyzed TOA reflectance differences between NASA and NOAA to understand calibration discrepancies, contributing to surface reflectance differences. Initiated long-term in-situ validation at RadCalNet, assessing the impact of VNP09 recalibration on key sites (Railroad Valley, Gobabeb, and Lacrau).
- Updated the surface reflectance algorithm by refining the dust aerosol model, replacing it with a more representative model to mitigate bias.
- Maintained the SR monitoring tool, routinely tracking data completeness and validation performance.

## *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 | | | |

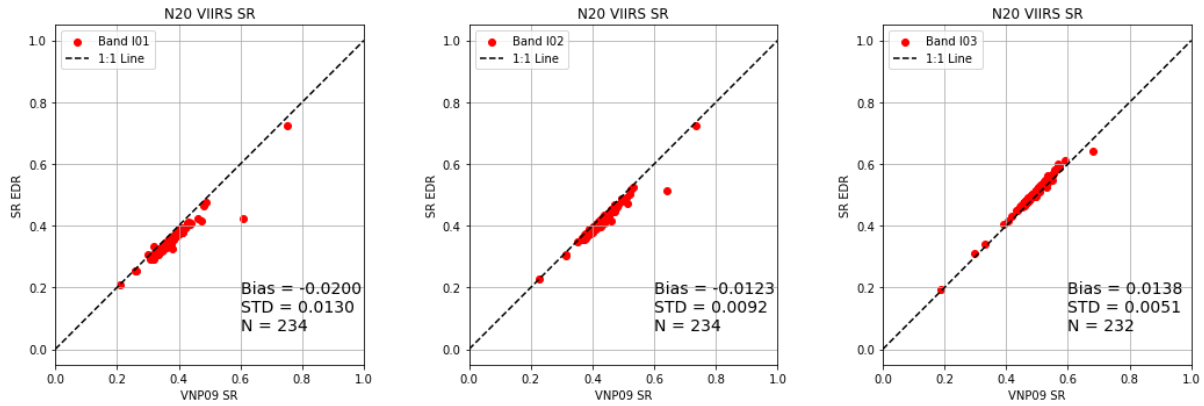
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

### ***Issues/Risks:***

None

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Develop SR software package using the reprocessed SDR to reduce the inconsistency | Nov-24 | Nov-24 | Nov 25, 2024 | |
| The reprocessed SR consistency evaluation | Dec-24 | Dec-24 | Dec 20, 2024 | |
| SR Algorithm improvement to address the issues found in validation | Mar-25 | Mar-25 | Mar 25, 2025 | |
| updated DAP delivery (include the mitigation algorithm) | Jun-25 | Jun-25 | | |
| SNPP, N20 & N21 monitoring and validation and user feedback & response | Sep-25 | Sep-25 | | |

## *Highlights:*

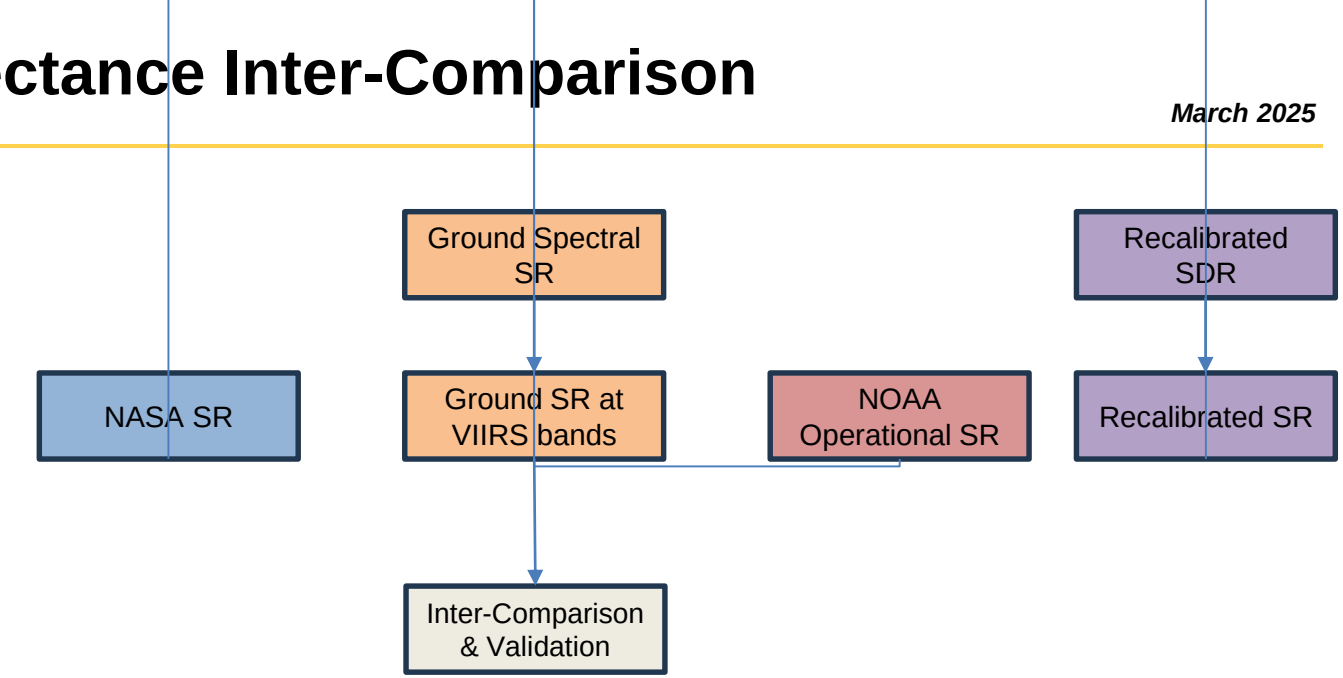


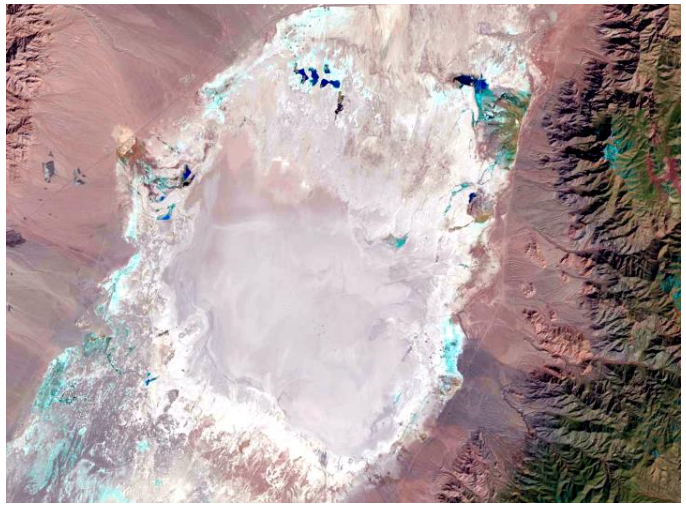

The recalibrated NASA SR (VNP09 v2, current operational) introduces a noticeable bias compared to NOAA SR EDR, with differences of up to 4% in the I1 band and around 2% in the I2 and I3 bands at RadCalNet Gobabeb site.

# TOA Reflectance Inter-Comparison



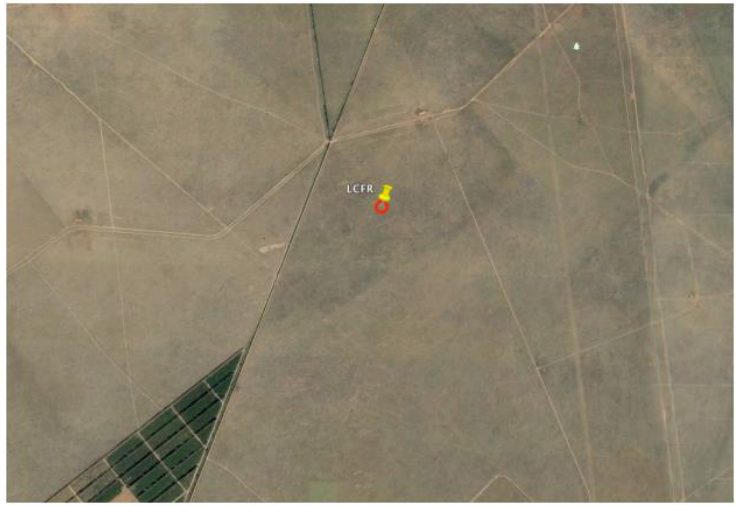
- Background: Evaluate the VIIRS SDR (TOA Reflectance) and SR at the RadCalNet sites (Railyroad Valley, Gobabeb and LaCrau) which are stable, homogeneous and with in-situ measurements.
- The evaluation include:
  - TOA reflectance with NASA VNP02
  - Surface reflectance with ground & VNP09
  - Recalibration impact.



Railroad Valley, NV, US

Gobabeb, Nambia

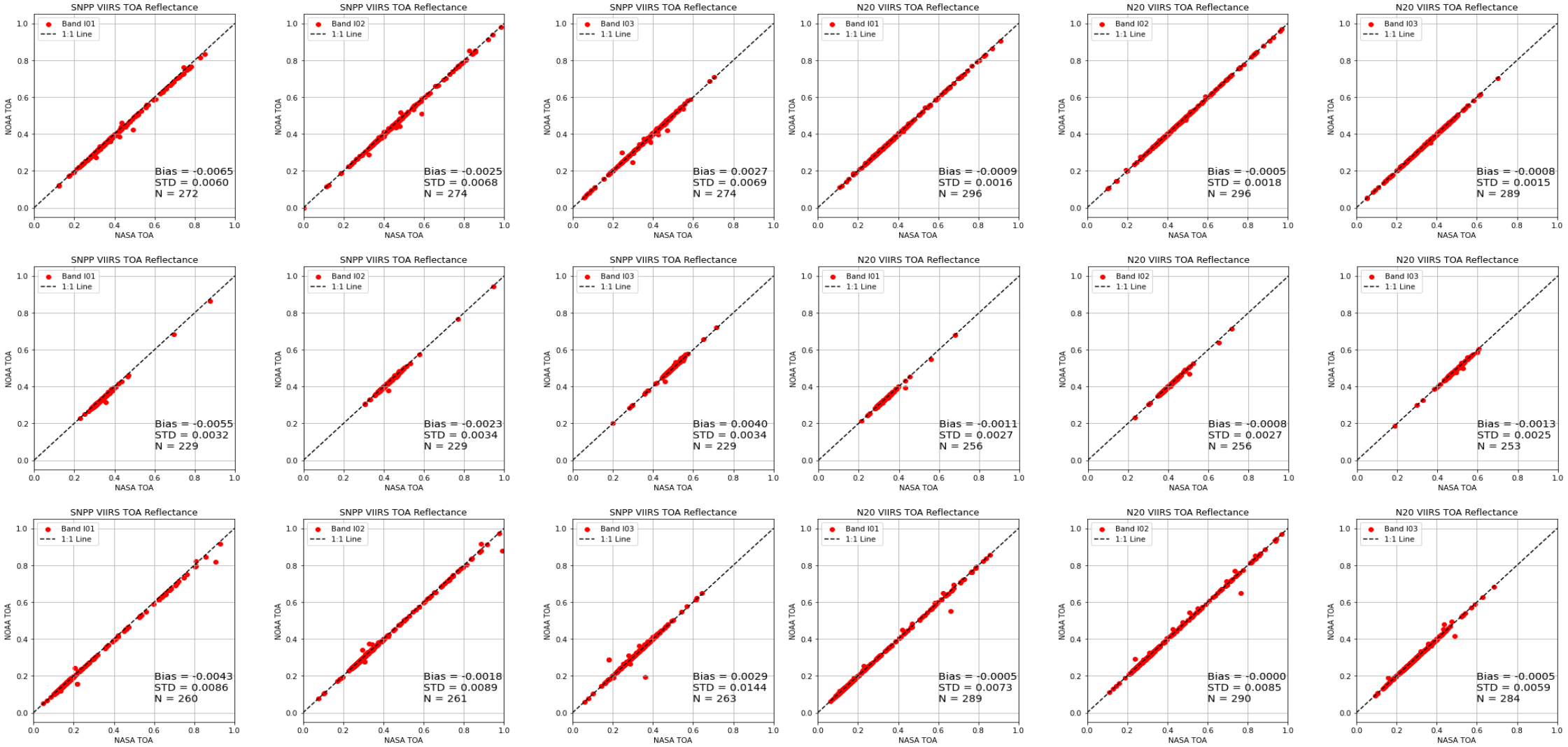


LaCrau, France

# TOA Reflectance Inter-Comparison

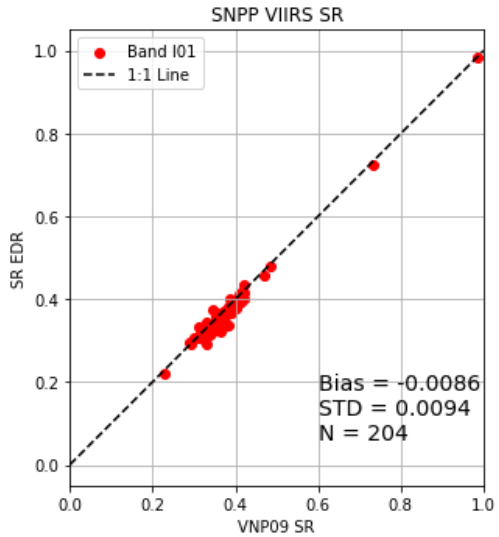


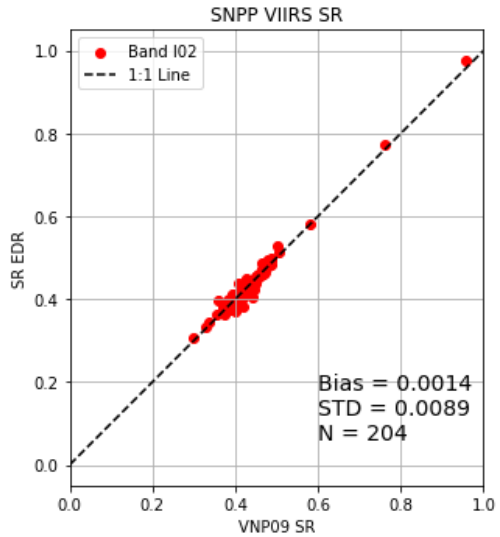
- TOA reflectance inter-comparison between VNP02 and NOAA SDR (From Top to bottom, Railroad valley, Gobabeb and Lacrau), for SNPP (left) and N20 (right). TOA reflectance do have some difference, with SDR slight smaller than VNP02 for both SNPP and N20, but overall agree well with difference within 0.5%)

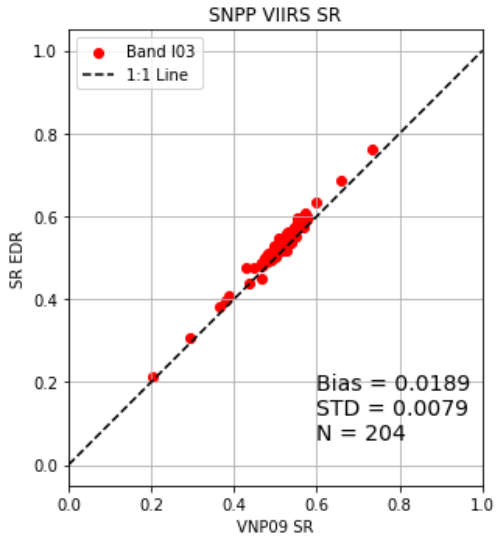


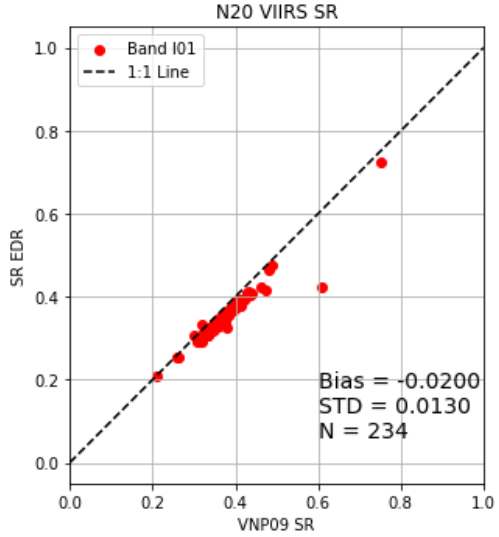
# SR Preliminary Inter-Comparison

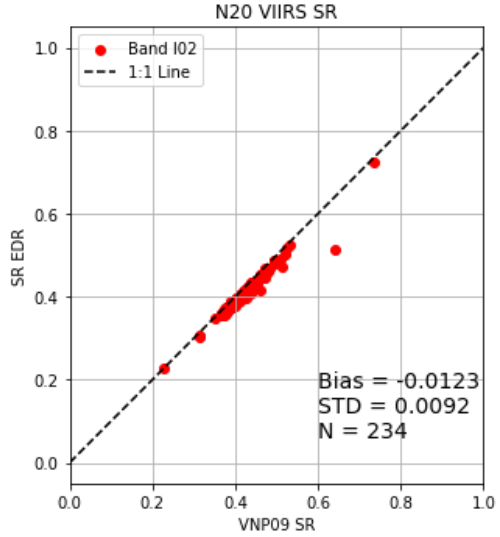
- SR comparison at Gobabeb site shows good agreement, to be noted, VNP09 (version 2) is recalibrated, for VIIRS I1-I3 band, the bias is obvious for N20, whose coefficients is (4%, 2% and -2%), for SNPP the recalibration is within 1.5% for Image bands, the difference is smaller.

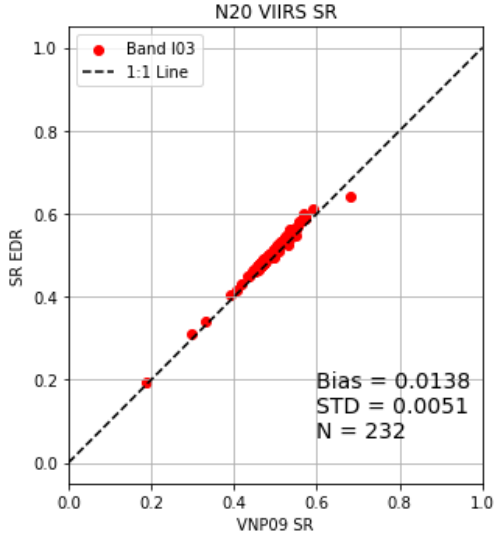


# Surface Reflectance FY25 Milestones/Deliverables

| Task/ Description | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|
| Develop SR software package using the reprocessed SDR to reduce the inconsistency. | 10/1/2024 | 12/31/2024 | New test datasets | |
| SR Algorithm improvement to address the issues found in validation. | 04/1/2025 | 06/30/2025 | Algorithm test report. | JPSS L1RD requirement |
| updated DAP delivery (include the mitigation algorithm) | 01/01/2025 | 03/31/2025 | mDAP delivery to ASSIST | |
| The reprocessed SR consistency evaluation | 10/1/2024 | 12/31/2024 | Validation report | |
| SNPP, N20 & N21 monitoring and validation and user feedback & response | 7/1/2025 | 9/30/2025 | Analysis reports | |

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

# JPSS SDR and VIIRS Cloud EDR Reprocessing Project

*March 2025*

- Revised and published a manuscript about reprocessed VIIRS cloud product quality assessment in Remote Sensing.
- Completed a beta version of plan about reprocessing, post-processing and archival of SNPP and NOAA-20 SDR data (briefed to the JSTAR/JPSS board).
- Developed a DNN model to visually detect radiometric features of large wildfires using OMPS NM radiance data above 310 nm (reprocessed and operational SDRs). The results are used to validate the calibration quality of mission-long reprocessed OMPS NM SDRs. Figure 1 is an example about direct observations of NOAA-21 OMPS NM SDR data for 2024 Canadian wild fire.

**Monitoring of Canadian Wild Fire Aerosol Radiometric Features in 2024 Using Direct NOAA-21 OMPS NM Radiance Observation Data above 310nm**

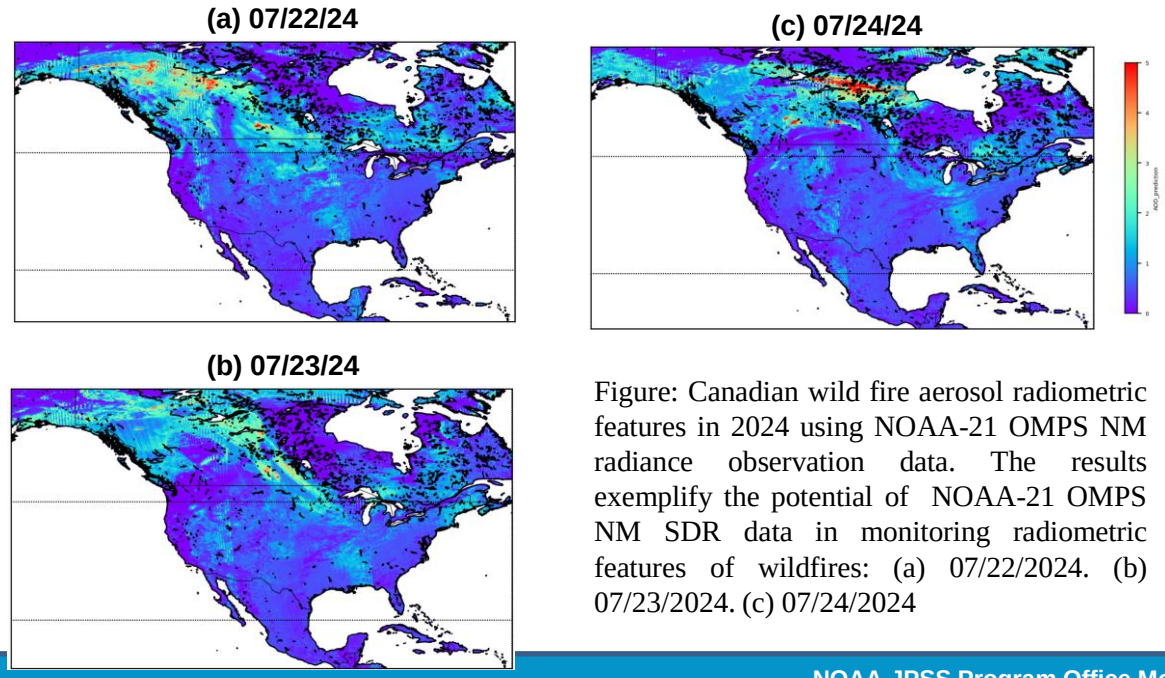



Figure: Canadian wild fire aerosol radiometric features in 2024 using NOAA-21 OMPS NM radiance observation data. The results exemplify the potential of NOAA-21 OMPS NM SDR data in monitoring radiometric features of wildfires: (a) 07/22/2024. (b) 07/23/2024. (c) 07/24/2024

Table 1. Milestones of JPSS SDR and VIIRS EDR reprocessing project for FY25

| Milestones | Original Date | Forecast Date | Variance Explanation |
|---|---|---|---|
| Assess the quality and accuracy of one-year reprocessed cloud base height and cloud top height EDRs | Dec-24 | Dec-24 | |
| In coordination with STAR SDR and IT teams, work out a plan about reprocessing (SDR team), post-processing and archival of SNPP and NOAA-20 SDR data, computing resource, data storage, etc. | Mar-25 | | |
| Complete post-processing for available newly reprocessed SNPP (e.g., OMPS NP SDR with new cal. Alg. improvements) and 1st reprocessed NOAA-20 SDR data, including coordination with the CLASS team for (new) requirements in meta data, file naming convention, format, delivery schedule, etc. | Jun-25 | | |
| Develop assessment methods for LTM calibration-consistent SDR data sets (e.g., OMPS NM SDR), including discovering scientific value of the data sets | Aug-25 | | |
| Work out an archival working plan for (newly) reprocessed SNPP (if applicable) and NOAA-20 SDR data, in coordination with the CLASS team | Sep-25 | | |
| Technical analysis and reports per ad hoc request from JPSS and STAR management, including monthly report | Sep-25 | | |

*Overall Status: the FY25 milestones have been updated to focus on SNPP (if necessary) and NOAA-20 SDR reprocessing and archival in CLASS, subject to changes due to a delta PMR review on Feb. 12th, 2025.*

| | 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.*

# FY25 Microwave Sounding Temperature Reprocessing Project

*March 2025*

## ***Accomplishments / Events:***

- Completed March monthly updates and delivery of MLT-SDR Products to NCEI
- Continued working on reprocessing the S-NPP and N20 ATMS measurements into the daily gridded data for NCEI delivery
- Continued investigating the applications of the reprocessed ATMS TDR data for SSW monitoring to provide valuable information to NWP forecaster. Figure 1 shows the updated daily time series data of the S-NPP ATMS channel 13 regional averages for the latitudinal range between 60°N and 90°N, indicating SSW event in 2025.

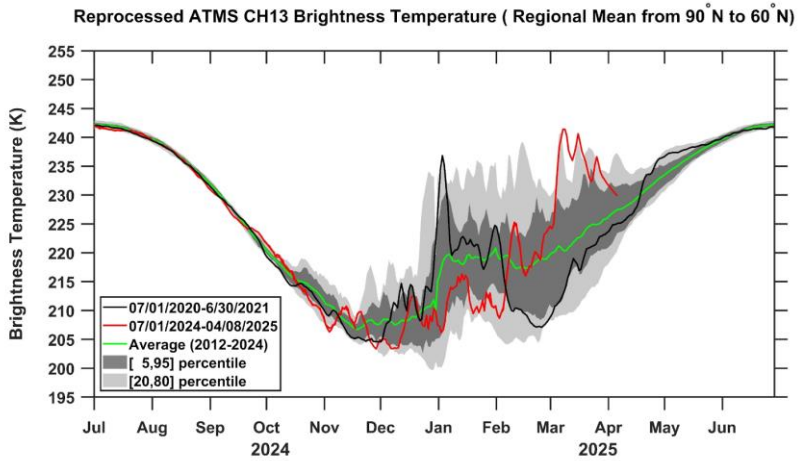



*Figure 1. Daily regional mean of the S-NPP/N20 ATMS channel 13 for the latitude range from 60°N to 90°N. The red line represents the daily mean from July 1, 2024 to April 8, 2025. The green line depicts the average annual cycle of ATMS channel 13 over the study area.*

| Milestones | Original Date | Forecast Date | Variance Explanation |
|---|---|---|---|
| Monthly processing and update of microwave sounding CDR products | Sep-25 (Monthly Update) | | |
| Explore impacts of reprocessed SDR products in observing severe weather/climate events | Apr-25 | Apr-25 | |
| Evaluate bias drifts and inter-sensor biases in SNPP and NOAA-20 ATMS fundamental CDR (FCDR) to produce long-term quality-consistent CDR data set, in coordination with SDR/ICVS teams; perform recalibration, if necessary | Jul-25 | Jul-25 | |
| Maintain and sustain the Microwave Sounding Assessment System for CDR Development (MSASCD) website (https://www.star.nesdis.noaa.gov/smcd/emb/mscat/msascd.php) | Sep-25 | Sep-25 | |

## *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

# FY25 VIIRS EDR Reprocessing Milestones/Deliverables

| | Milestone | Start | Finish | Deliverable |
|---|---|---|---|---|
| 1 | Assess the quality and accuracy of one-year reprocessed cloud base height and cloud top height EDRs | Jun-24 | Dec-24 | One year of quality-assured SNPP VIIRS cloud base height and cloud top height EDR products; one manuscript draft about the work |
| 2 | Making plans for on-demand reprocessing based on GMU supercluster computer, including setting up server environments for testing, computation efficiency comparison for options, cost comparison, etc. | Dec-25 | Mar-25 | Optical reprocessing plan; well-setting up processing package |
| 3 | Assess the quality and accuracy of one-year reprocessed other cloud EDRs (e.g., Cloud layers, cloud phase, cloud optical depth) | Jan-25 | Apr-25 | One year of quality-assured SNPP VIIRS cloud layers, cloud phase, cloud optical depth EDR products |
| 4 | Continue to reprocess SNPP VIIRS EDRs (target: finish ~2.5 years of data), as long as the new on-demand reprocessing is well determined | Mar-25 | Sep-25 | New SNPP VIIRS cloud reprocessed products |
| 5 | Work out a plan for transferring reprocessed VIIRS cloud products to CLASS or a Cloud platform | Aug-25 | Sep-25 | A plan for transferring reprocessed VIIRS cloud products to CLASS or a Cloud platform |
| 6 | Technical analysis and reports per ad hoc request from JPSS and STAR management, including monthly report | Oct-24 | Sep-25 | Analysis reports |

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

# Surface Type

March 2025

## Accomplishments / Events:

- STAR-UMD VIIRS Surface Type team has downloaded and processed NOAA-21, NOAA-20, and S-NPP VIIRS daily granule surface reflectance data acquired in March of 2025 for the production of AST-2025.
- The surface type team presented an update on the surface type and monthly $H_2O$ product suite to the STAR JPSS Leads Meeting.
- The team delivered the 250m water surface fraction (WSF) data to the Vegetation Health Product (VHP) group and supported its use of this dataset to improve the VHP product.
- The team continue to produce monthly WSF data updated for the first three months of 2025. These monthly updates show extensive flooding along the northwest coast of Queensland in February of both 2024 and 2025 (see the Highlights section) .

## 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

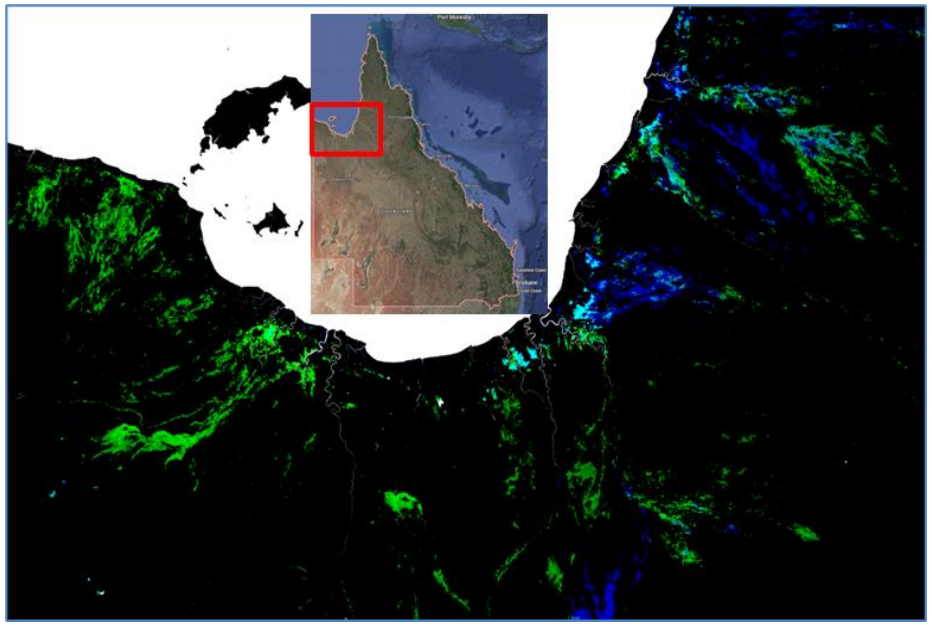
| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Monthly update of the 250m global water surface fraction product | Each M. | Each M. | Each M. | |
| Complete global monthly composites for each of 2024 months | Feb-25 | Feb-25 | Feb-25 | |
| Generate global annual classification metrics for 2024 | May-25 | May-25 | | |
| AST24 of IGBP 17 type map | Aug-25 | Aug-25 | | |
| AST24 for EMC 20 type map | Aug-25 | Aug-25 | | |
| AST24 Validation Statistics and delivery to JSTAR and users | Sept-25 | Sept-25 | | |

## Highlights:

***Extensive Flooding Along the Northwestern Coast of Queensland, Australia***

*Unseasonally heavy rains during the first quarter of 2025 caused widespread flooding across Queensland, Australia. While most reports focused on flooding in the more populated coastal cities in the east, the monthly WSF products show that sustained flooding with a duration of at least two weeks was more pervasive along the less populated northwestern coast.*

*This image shows monthly WSF for March 2025, Feb. 2024, and Feb. 2025 in red, green, and blue. Blue and green color scales indicate flooding in February of 2025 and 2024, respectively, while areas flooded in both years have cyan colors. The red box over the Queensland map (the insert in the middle) shows the approximate location of the study area.*



# Surface Type FY 25 Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 1: Improving and updating the surface type training and validation polygons* | | | | |
| *Subtask 1.1: Update training polygons where the surface type label has changed* | *Sept-25* | | | |
| *Subtask 1.2: Add new training polygons where existing training data are not enough* | *Sept-25* | | | |
| *Subtask 1.1: Update validation polygons where the surface type label has changed* | *Sept-25* | | | |
| *Task 2: Processing VIIRS surface reflectance data acquired during this funding year for surface type mapping* | | | | |
| *Subtask 2.1: Map VIIRS SR data from satellite swath to the global 1 km grid to create global daily mosaic* | *Each day* | | | |
| *Subtask 2.2: Create cloud free monthly composites from the daily mosaics* | *Each month* | | | |
| *Subtask 2.3: Generate annual classification metrics using the 12 monthly composites of 2024* | *Apr-25* | | | |
| *Task 3: Producing AST24* | | | | |
| *Subtask 3.1: Develop the SVM model and use the model to classify the 2024 VIIRS annual metrics* | *May-25* | | | |
| *Subtask 3.2: Post-process the SVM classification to produce the final AST24 product* | *Aug-25* | | | |
| *Subtask 3.3: Validate AST24 to generate accuracy statistics* | *Sept-25* | | | |
| *Subtask 3.4: Deliver AST24, update ATBD and the surface type webpage* | *Sept-25* | | | |

# Vegetation Health

*March 2025*

## *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. Updated the cronjob settings to ensure timely VIIRS SDR data ingestion with minimal delays while maintaining VHP data quality and enabling earlier delivery.
- The team conducted a TCI vs LST anomaly comparison study in a collaboration with the LST team. The goal of study is to investigate the differences between TCI and LST anomalies and their root causes. A complete set of weekly TCI histograms of six ecosystem locations has been created, analyzed and shared with the LST team.
- Continued the development of the new code for 500m NOAA-20/21 VIIRS VHPs production/operation and the VPH code refinement and database updates for potential transition of STAR VHP production to OSPO operation. Developed C++ code to plot RGB image for job monitoring. Started exploring whether using the UMD 250m global ~~cover and water surface fraction (WSF) data to replace current 1km IGBP land mask in~~ the VHP processing.

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Hire staff member to lead work* | Mar-25 | Mar-25 | Mar-25 | |
| *Deliver CCAP for VIIRS 500m global Vegetation Health Products* | Sep-25 | Sep-25 | | |
| *Develop CCAP for value-added and science-enhanced ASCII and Geotiff data files of regional Vegetation Health Products* | Sep-25 | Sep-25 | | |

## *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 | | | |

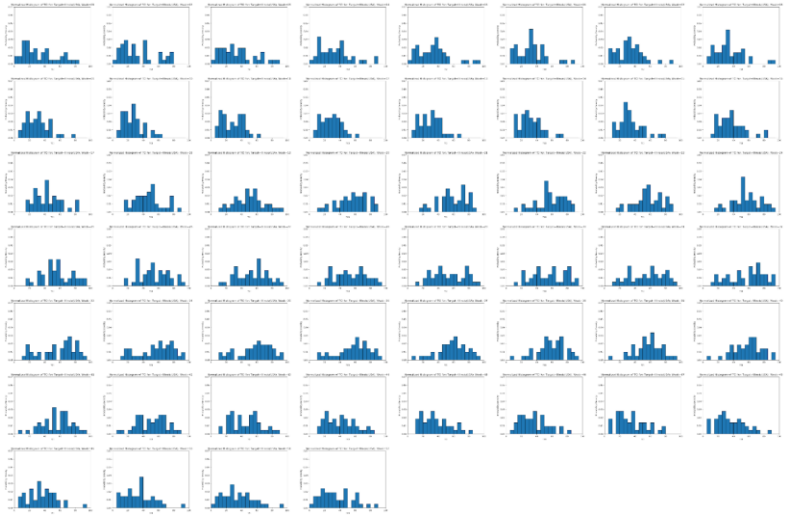
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

***Issues/Risks:***

None

***Highlight:*** *A complete set of weekly TCI histograms of six ecosystem locations has been created and analyzed. All results indicated that TCI does not have a Gaussian distribution for most of the weeks. For example, the 52 plots of weekly TCI histograms shown on the right represent Illinois, USA, an example of crop ecosystem.*

Crops Illinois(USA), weeks 1-52



# Vegetation Health FY 25 Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 1: Deliver CCAP for VIIRS 500m global Vegetation Health Products* | *September 2025* | | | |
| *Subtask 1.1: Hire staff member to lead work* | *March 2025* | | | |
| *Subtask 1.2: Reconfigure computer code for 500m products using NOAA-20/21 I-bands observations* | *June 2025* | | | |
| *Subtask 1.3: Create and validate CCAP and deliver to ASSISTT* | *September 2025* | | | |
| *Task 2: Develop CCAP for value-added and science-enhanced ASCII and Geotiff data files of regional Vegetation Health Products* | *September 2025* | | | |
| *Subtask 2.1: Confirm staff member to lead the task* | *March 2025* | | | |
| *Subtask 2.2: Restructure compute code/scripts and ancillary data base for the VHP tailored for major crop regions* | *June 2025* | | | |
| *Subtask 2.3: Create and validate CCAP and deliver to ASSIST* | *September 2025* | | | |

# Vegetation Index and Green Vegetation Fraction

*March 2025*

## *Accomplishments / Events:*

- Generated timeseries of the blended VI/GVF products for comprehensive evaluation.
- Setup the reprocessing for VI/GVF for a certain period for evaluation.
- Diagnosing the GVF phenological lag problem raised by EMC modeler.
- Conducted inter-comparisons between VIIRS GVF and Harmonized Landsat-Sentinel-2 (HLS) GVF data.
- Data collection and preprocessing for the AI-based GVF algorithm upgrade.

## *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

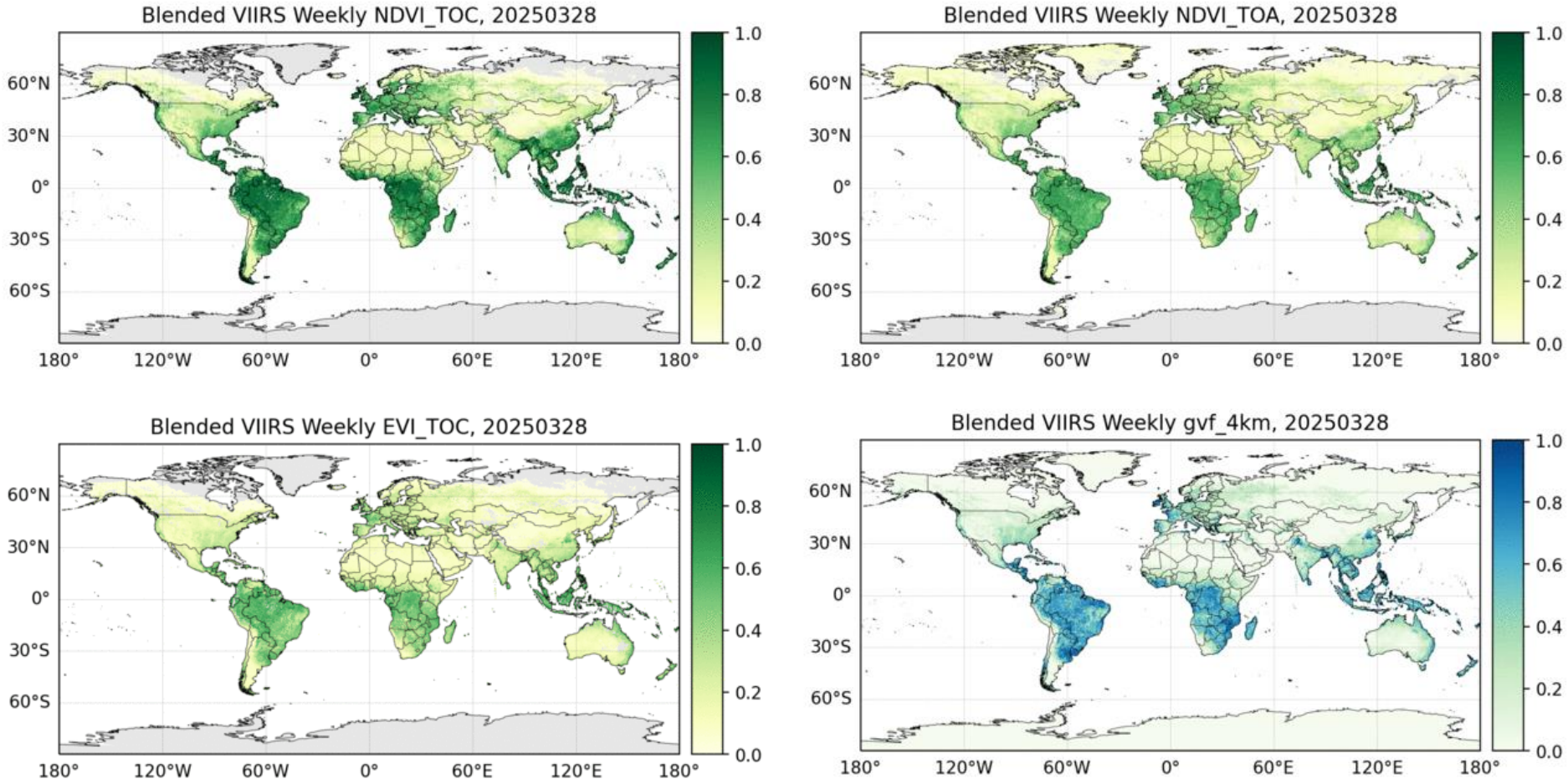
| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Calibration/ Validation update for SNPP and NOAA20 VI and GVF products, | Sep-24 | Sep-24 | Oct-24 | Comparison with other data sets necessary |
| Test blended VI and GVF products for suitability for operational production | Jan-25 | Jan-25 | Feb-25 | Supplemental evaluations conducted in Feb-25 |
| High resolution satellite data collection including Landsat and Sentinel-2 to establish the training datasets for AI-based GVF algorithm upgrade | Feb-25 | Feb-25 | Feb-25 | |
| Reprocessing of SNPP and NOAA-20 VI and GVF data records | May-25 | May-25 | | |
| AI-based GVF model training, tuning, and validation | May-25 | May-25 | | |
| Further development of 20m VI downscaling | June-25 | June-25 | | |
| Experimental version of VI and GVF production combined with Vegetation Health | Sep-25 | Aug-25 | | |
| NVPS product annual validation report | Sep-25 | Sep-25 | | |

## *Highlights:*

Global GVF map from Harmonized Landsat-Sentinel-2 (HLS) data

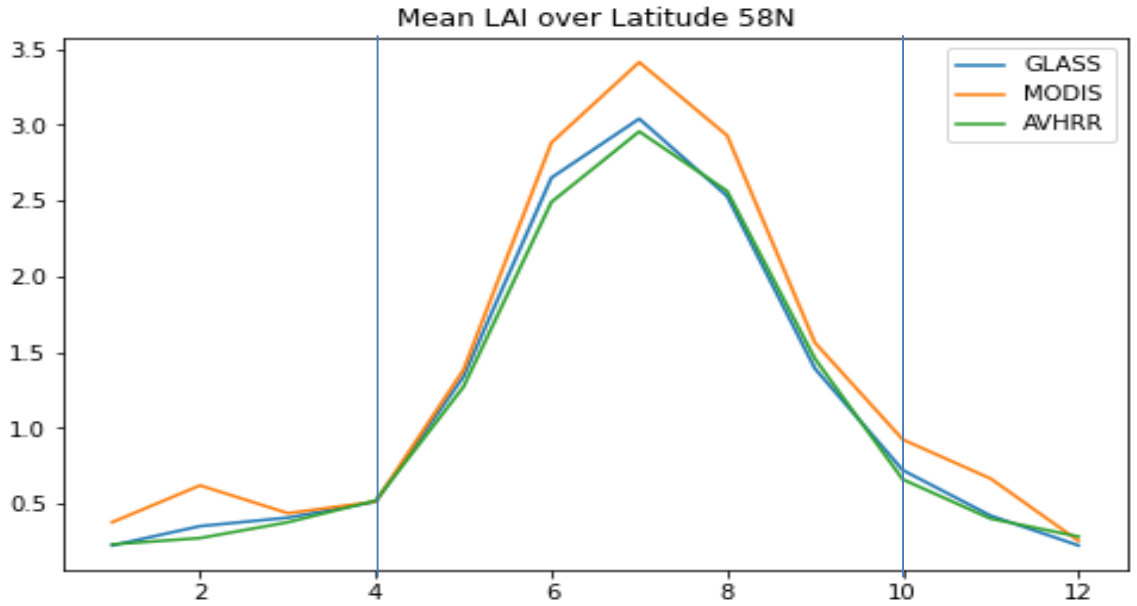
# Timeseries of the blended NVPS products

- For further evaluation on the blended NVPS products combining the three satellites (SNPP, N20, N21), a timeseries blended data was generated, as the animation figures shown below.
- Next step will be conducting timeseries-based inter-comparisons of the blended products with other satellite product such as MODIS, and other related analysis.



# Diagnosis of GVF phenological lag

- A meeting was held between STAR science team and NCEP/EMC model users. The feedback is that the VIIRS GVF, to some extent, shows phenological lags in the greenness season.
- Accordingly, we are looking into the issue, starting with diagnosing the root cause, which might be due to the temporal composite of weekly EVI, or the 15-week EVI smoothing using historical data.
- The comparison will be performed among GVF derived from daily EVI, weekly EVI, and smoothed weekly EVI.
- Since the phenological analysis requires GVF data covering a full year, we are yet to finishing the data collection.
- The figure below is the phenological comparison in LAI among GLASS, MODIS, and AVHRR data, and similar experiments will be conduct for GVF as the next step.



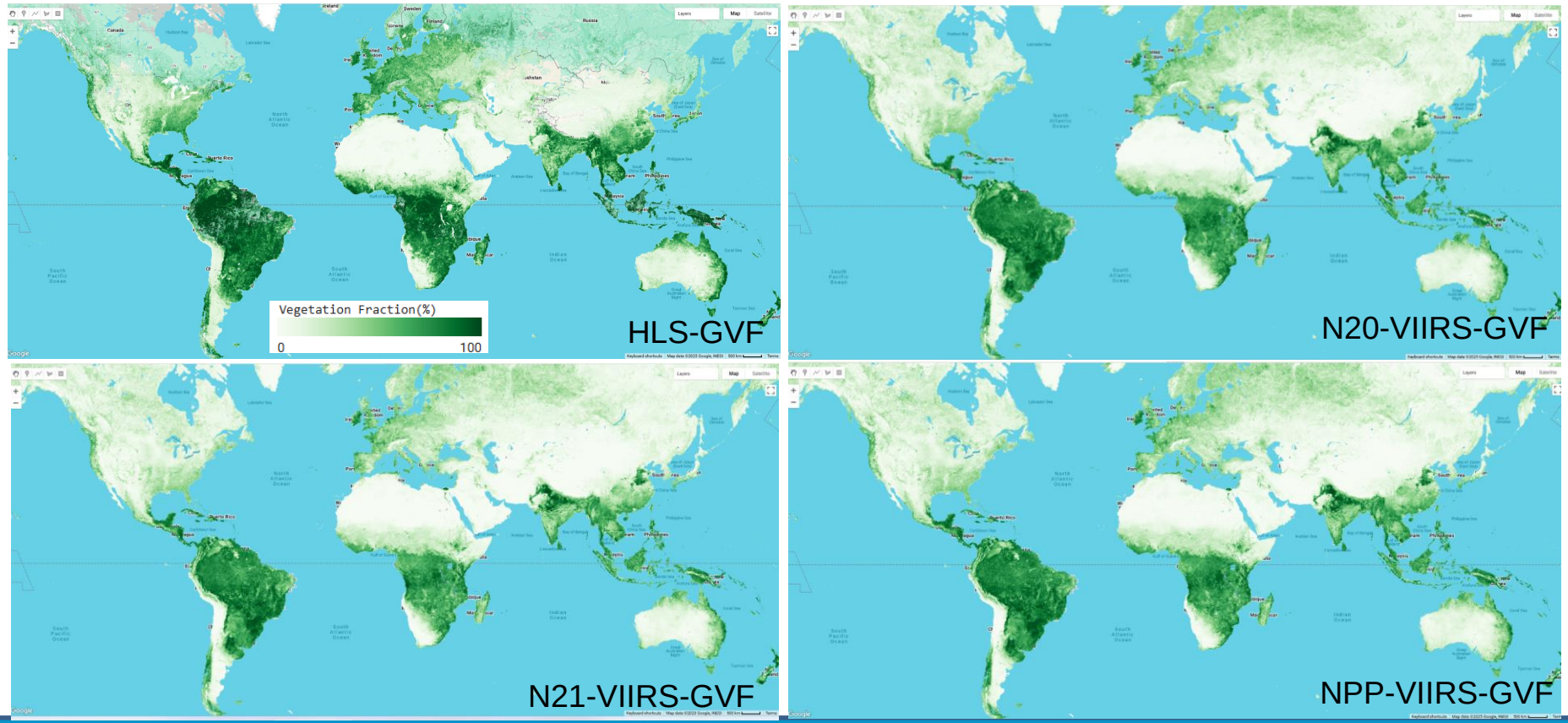
# Inter-comparison between VIIRS GVF and HLS GVF

**Background**:

- It's hard to find in-situ GVF data for validation. To get a full validation picture, other data source from higher spatial resolution data is a good source.

**Recent Progress:**

- Collect 30m GVF data from Harmonized Landsat Sentinel-2 dataset.
- Compare the monthly maximum GVF between HLS and VIIRS from N20, N21 and NPP in 2025.Jan (shown as below).
- General spatial consistency was found. Further investigation on the inconsistency regions is ongoing.



# Vegetation Indices and Green Fraction FY25 Milestones/Deliverables

| | Milestone | Start | Finish | Deliverable | Requirement (Dev Only) |
|---|---|---|---|---|---|
| **1** | Final report of blended VI and GVF products; for suitability of operational production | Oct-24 | Jan-25 | Code and test data | |
| **2** | Reprocessing readiness of SNPP and NOAA-20 VI and GVF data records | Jan-25 | May-25 | Software readiness | |
| **3** | Evaluation of methods for handling data gaps in GVF 15 weeks of historical data | Oct-24 | Jan-25 | | GVF requirements |
| **4** | Further development of 20m VI downscaling | Jan-25 | Jun-25 | Code and examples | VI requirements |
| **5** | AI/ML based algorithm development for the vegetation product derivation and validation | Feb-25 | Aug-25 | Experimental code and test data | GVF requirements |
| **6** | 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 |

# VIIRS SDR

March 2025

## Accomplishments / Events:

- Created, tested, and submitted to ASSISTT for implementation in IDPS the code change that corrects the build warning issue in VIIRS SDR Calibration (ADR 11192)
- Downloaded from GRAVITE the latest JPSS-4 VIIRS RDR files created with the updated RT-STPS software in March 2025 and verified that the correct granule size is used (85.0 s) and that no granule includes more than 48 scans
- Analyzed NOAA-21 VIIRS TEB performance using the March 25-27, 2025 WUCD data with no significant calibration offset or nonlinearity changes observed; Residual WUCD biases were small (~0.01 K) after the operational WUCD bias correction
- Assisted in scheduling and analyzed data from NOAA-21, NOAA-20, and Suomi NPP VIIRS lunar calibration on 3/9/2025: data aligns well with long-term trends and exhibits consistency

## 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 | | | |

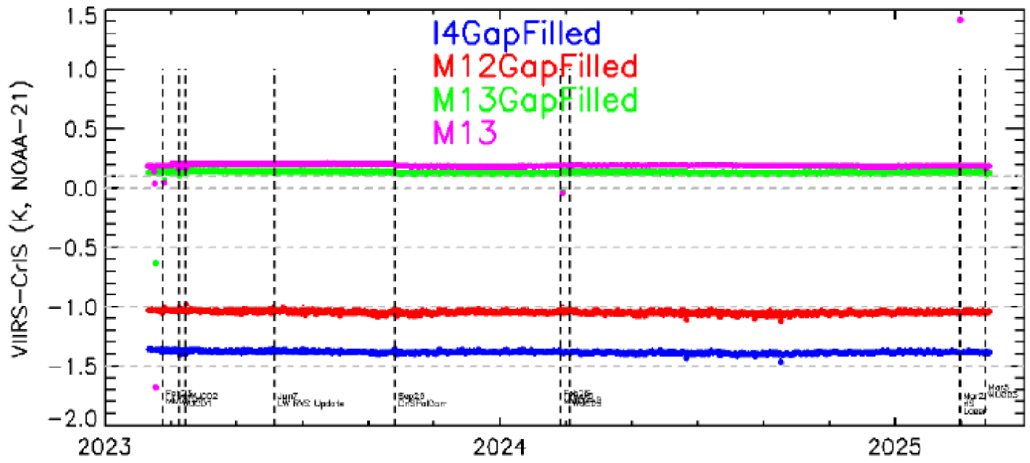
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

## Issues/Risks:

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| TSIS-1 solar spectrum application for JPSS-3/-4 VIIRS | Dec-24 | | 11/15/2024 | |
| JPSS-4 VIIRS pre-launch characterization report | Mar-25 | | 3/13/2025 | |
| JPSS-3/-4 VIIRS granule size change verification | Mar-25 | | 2/27/2025 | Mx13 SOL |
| VIIRS cross-calibration with hyperspectral measurements | Jun-25 | | | |
| Suomi NPP and NOAA-20 VIIRS intermediate recalibration | Jun-25 | | | |
| “Monthly” VIIRS lunar calibration predictions and analyses | Jul-25 | | | |
| JPSS-3/-4 VIIRS waiver impact studies report | Sep-25 | | | |
| Cross-calibration and comparison among NOAA-21, NOAA-20, and Suomi NPP VIIRS report | Sep-25 | | | |

## Highlights:

*Daily-Averaged VIIRS-CrIS Brightness Temperature Biases for NOAA-21 Mid-Wave Infrared (MWIR) Bands: “Gap Filled” to account for VIIRS/CrIS spectral coverage differences*



# VIIRS SDR FY25 Milestones/Deliverables (in general)

| Task Category | Task/Description | Start | Finish | Deliverable |
|---|---|---|---|---|
| Maintenance | • Monthly lunar calibration (precision prediction delivered to flight operations; analysis on acquired lunar data) | 10/2024 | 7/2025 | • Lunar roll prediction monthly for lunar (to OSPO) |
| | • Monthly delivery of VIIRS DNB calibration LUTs; | 10/2024 | 9/2025 | • Monthly LUT updates (to OSPO) |
| | • Delivery of VIIRS RSB and TEB calibration LUTs to mitigate degradation; | | | • LUT delivery as needed |
| | • Delivery of VIIRS DNB straylight LUTs; | | | • LUT delivery as needed |
| | • Maintain the performance trending at vicarious sites | 10/2024 | 5/2025 | • Sustained validation website for the G20+ vicarious sites |
| | • Geolocation monitoring using CPM (Applicable to SNPP, NOAA-20 and NOAA-21) | | | • CPM geolocation monitoring (report) |
| LTM & Anomaly Resolution (L) | • Instrument parameter performance trending | 10/2024 | 09/2025 | • Report on instrument parameter performance trending (in collaboration with ICVS) |
| | • Participate in anomaly investigations | 10/2024 | 09/2025 | • Anomaly report |

Please document requirements for developmental work.

# VIIRS Flood Mapping

March 2025

## Accomplishments / Events:

- The downscaled product is currently still in development, but pre-operational estimates can be found at the JPSS Flood Proving Ground (http://floods.ssec.wisc.edu/?products=VIIRS-3Dflood).
- Updated code mitigating the NCCF VIIRS year transition bug was delivered.

## 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:

If the ProTech/OSTA option year 3 is not allowed to be executed, then FY25 funded milestones for the POP of 1 June 2025 - 31 May 2026 will not be accomplished.

## Highlights:

# Volcanic Ash

*February, 2025*

*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 will replace volcanic ash EDRs upon successful completion of VOLCAT transition to operations within NCCF.
- VOLCAT VIIRS volcanic ash plume identification and extraction work is an enhancement to the VOLCAT methodology. The science team completed identifying and classifying scientifically interesting cases (e.g., volcanic clouds, VOLCAT false alarms, etc.) for over three years of data (2020-2023, early 2024)). The figure included shows the distributions for YES (ash cases) and NO (not ash cases) for the VOLCAT metric known as 'BTD 12-11µm Mean' and represents the VOLCAT object mean BTD 12-11µm values for YES and NO classes. Given the qualities of the distributions (small sample size and non-normally distributed), the science team is evaluating various statistical tests, including the Kolmogorov-Smirnov test (KS-test) to gauge uniqueness of the two distributions, which will be used to select metrics for developing and testing a random forest model to improve VOLCAT detection. For this metric, the KS-test yielded a D statistic of 0.2344 with a p-value of < 0.0001, suggesting that this metric would be a good discriminator between ash and non-ash clouds in a random forest model. This distribution is consistent with physics-based assumptions (the YES class skewed toward negative BTD and NO class skewed to positive BTD for ash and non-ash cases, respectively). The research focus will now shift to determining which VOLCAT metrics will be used in developing a random forest model.

## *Overall Status:*

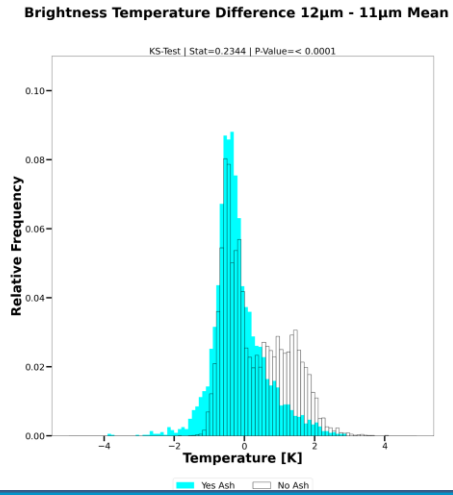
| | Green[1] (Completed) | Blue[2] (On-Schedule) | Yellow[3] (Caution) | Red[4] (Critical) | Reason for Deviation |
|---|---|---|---|---|---|
| **Cost / Budget** | | X | | | |
| **Technical / Programmatic** | | X | | | |
| **Schedule** | | x | | | |

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

***Issues/Risks:***

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| Develop updated user training material | Jun-25 | Jun-25 | | |
| Improve VIIRS volcanic ash plume identification and extraction | Mar-25 | Mar-25 | | |
| Integration of VIIRS I-bands in VOLCAT workflow | May-25 | May-25 | | |
| Imaging capabilities of VIIRS I-bands in VOLCAT end-user web graphics | Nov-24 | Nov-24 | Nov-24 | |
| Quantify added value of VIIRS I-bands | Sept-25 | Sep-25 | | |
| Update VOLCAT code to ingest any JPSS-3 proxy data if becomes available | Sep-25 | Sep-25 | | |

***Highlights:*** *Distribution for ash and non-ash data using the VOLCAT metric 'Object Brightness Temperature Mean 12-11µm Difference'. The plots and KS-tests (text) suggest this metric will be a useful discriminator in a random forest model to improve VOLCAT detection skill.*



# Volcanic Ash FY 25 Milestones

| Milestones | Original Date | Forecast Date | Actual Completion Date | Variance Explanation |
|---|---|---|---|---|
| *Task 1: VOLCAT enhancements* | *September 2025* | | | |
| *Subtask 1.1: Fully integrate VIIRS I-band into VOLCAT workflow* | *May 2025* | | | |
| *Subtask 1.2: Assess impact of I-band enhancements* | *Sept 2025* | | | |
| *Subtask 1.3: Implement and test improvements to gridded composites of volcanic cloud properties* | *September 2025* | | | |
| *Task 2: Preparation for JPSS-3/4* | *March 2025* | | | |
| *Subtask 2.1: Initial development for JPSS-3 cal/val plan* | *March 2025* | | | |
| | | | | |
| | | | | |
| | | | | |

# Highlights from the Science Teams (March)

## Observations of Sudden Stratospheric Warming Using Reprocessed AMSU-A/ATMS Data

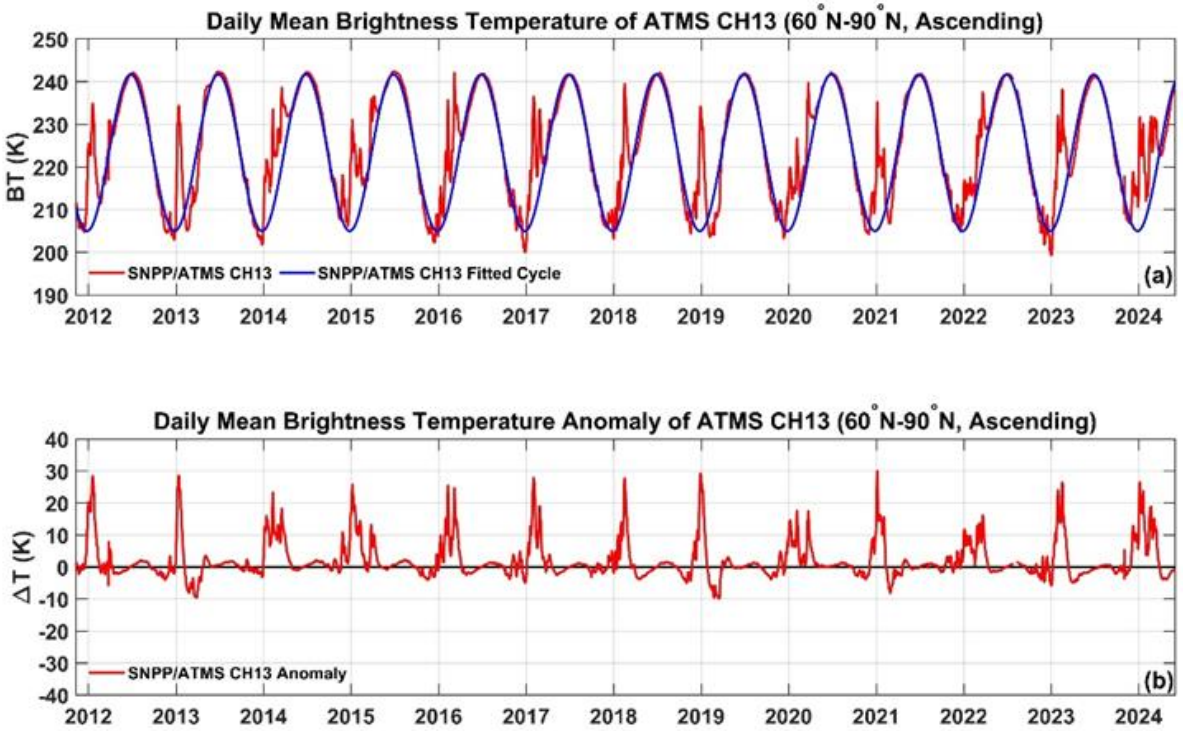



**Figure.** (a) Time series of the daily mean brightness temperature of the region from 60°-90° N. The red line represents the daily mean brightness temperature of S-NPP ATMS channel 13, the blue line indicates the fitted temperature seasonal change cycle based on long term measurements. (b) Time series of the daily mean brightness temperature anomaly

A sudden stratospheric warming is an event causing rapid warming in the stratosphere. It can disrupt the polar vortex and often leads to dramatic reductions in surface temperature in the Northern Hemisphere. The STAR Reprocessing team reprocessed ATMS and AMSU-A SDR datasets in order to capture radiometric features of this phenomenon. The reprocessed ATMS/AMSU-A SDR data sets offer valuable information for numerical weather prediction users in improving forecast quality about SSW events to save people life and property.