NOAA JPSS Monthly Program Office

AMP/STAR
FY25

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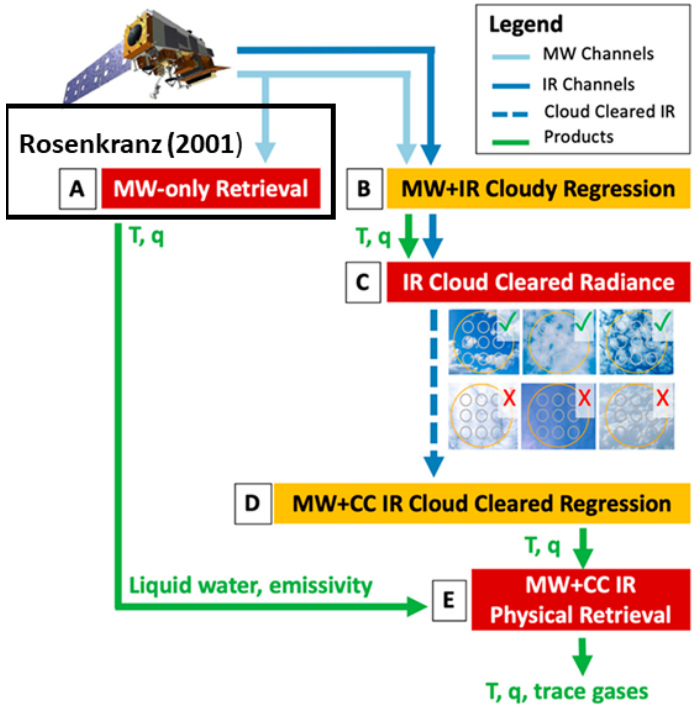
May, 2025

Highlights from the Science Teams (April)

Lecture Presentation for UMBC Graduate School Remote Sensing Course

NOAA Unique Combined Atmospheric Processing System (NUCAPS)



- High-level flow chart of the step-wise NOAA-Unique Combined Atmospheric Processing System (NUCAPS) retrieval algorithm that outputs temperature (T), moisture (q) and trace gases.
- NUCAPS retrievals of T, q and ozone (O3) are color-coded as red, yellow and green to indicate if and when they failed quality control checks.
- Steps B and D, which are yellow black text, are regression steps, and if they fail they will be flagged as yellow in AWIPS; these retrievals should be used with caution.
- Steps A, C, and E, which are red with white text, are cloud clearing or retrieval stages of the algorithm. If any of these fails, the retrieval is unlikely to yield meaningful results, and they will be flagged red in AWIPS.
- The entire algorithm runs regardless if any one step passes or fails.
- Courtesy Esmaili et al. (2020): https://doi.org/10.3390/rs12050886

Ken Pryor delivered a lecture titled “Practical Applications of Satellite-Derived Soundings: NPROVS ProfileDisplay and ODS” for a graduate course at UMBC. The lecture highlighted applications of microwave radiometry, including techniques for microwave sounding retrievals and structural aspects of the IASI and NUCAPS. The second part of the lecture included an operational demonstration of the NPROVS ProfileDisplay and Orbital Display System applications for recent high-impact severe thunderstorm events with instruction on sounding profile interpretation and detection and monitoring of severe mesoscale (regional scale) convective systems.

Highlights from the Science Teams (April)

VIIRS captures Ohio River Valley flooding

Bill Line published a blog post titled "Early April 2025 MS/OH River Valley Flooding". The post features GOES and VIIRS imagery of the persistent thunderstorms that led to widespread flooding, as well as post event imagery capturing the extent of the flooding. It also highlights examples of how NWS/WPC incorporated satellite imagery into their forecasts.

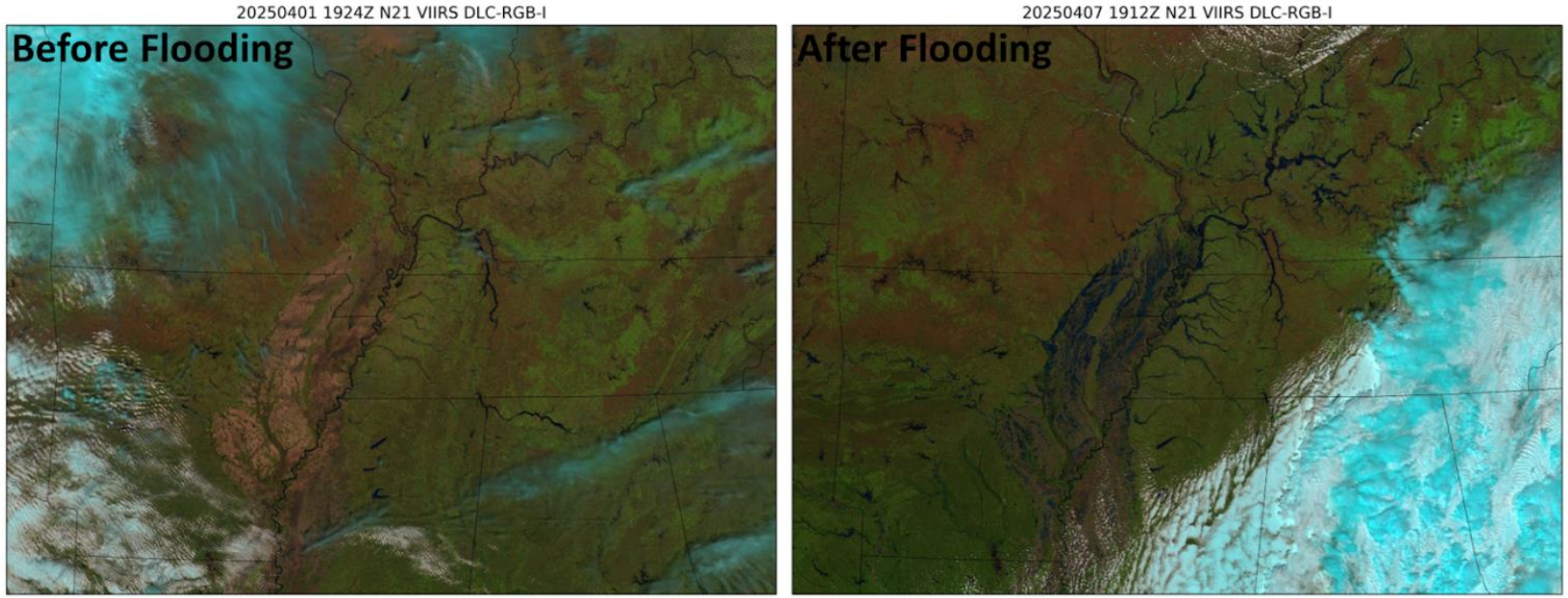


Figure. VIIRS Day Land Cloud RGB Imagery from 1 April 2025 (left) and 7 April 2025 (right). Bodies of water appear as dark blue in the imagery. The image on the right shows flooded croplands in the Mississippi Delta, particularly across eastern Arkansas and southeast Missouri, and the swollen surrounding rivers.

Highlights from the Science Teams (April)

North Water Polynya Observed by AMSR2/VIIRS Sea Ice Concentration Product

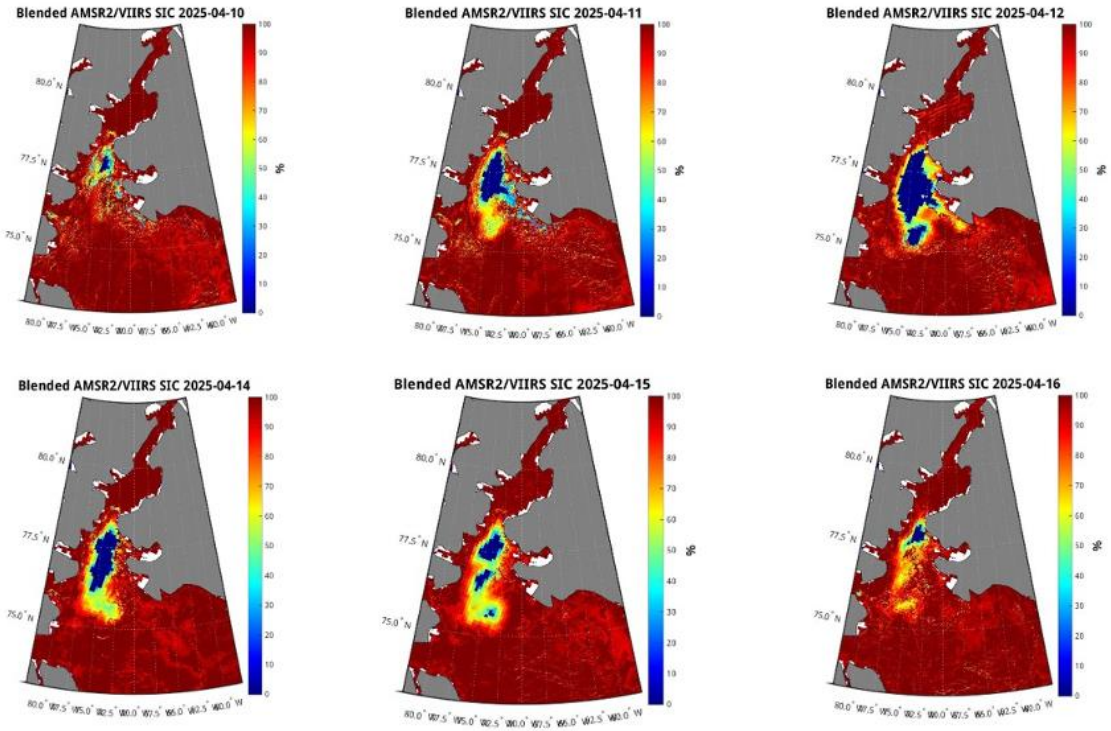


Figure. *SIC over Baffin Bay and Nares Strait from 11 April (upper-left) to 16 April 2025 (lower-right) from Blended AMSR2/VIIRS (Dworak et al 2022). Landmass to the east (west) is Greenland (Ellesmere Island) with water areas in between them being Nares Strait (north) and Baffin Bay (south).*

From 10-16 April 2025, the North Water Polynya (NOW) was observed by the blended AMSR2/VIIRS Sea Ice Concentration (SIC) product over northern Baffin Bay. This specific polynya had been observed in previous years and is most common during the mid-late winter into early spring due to the combination of ice blockage to the north in the Nares Strait, surface winds, and ocean currents to the south (Vincent, 2019). The significance of this particular NOW event was that it is first time that a polynya of this size was observed in April over northern Baffin Bay since 2017.

Highlights from the Science Teams (April)

Improved Reflectance Adaptive Test (RAT) in glint regions

The reflectance adaptive test (RAT) is a reflectance-based ACSM filter that relies on spatial patterns of VIIRS reflectance data to identify clouds. We revised the test to work in areas affected by sun glint. Previously, this test had to be turned off in glint regions due to frequent over screening.

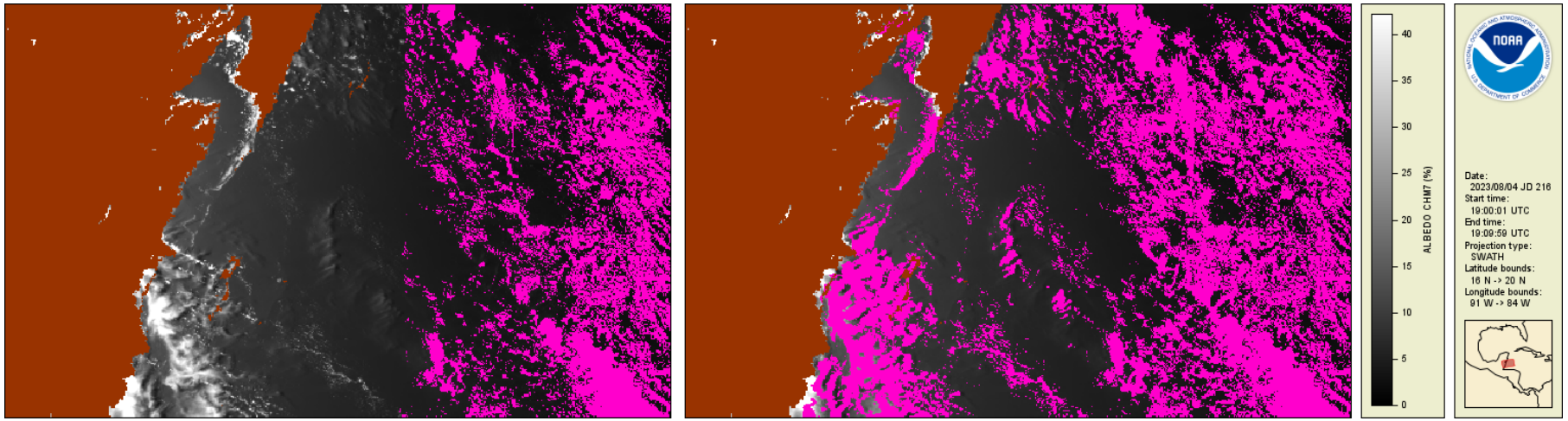


Figure. NPP VIIRS channel M7 reflectance from the Caribbean region. Purple overlay denotes pixels flagged as clouds by the RAT, which takes advantage of spatial context of VIIRS reflectance to identify clouds. Due to over screening in regions affected by sun glint, it was turned off for glint angles smaller than 25 degrees (left). In the current experimental ACSPO V3.10B02, the RAT has been improved and is applicable in glint regions (right).

Accomplishments

Delivery Date	Cloud Containerized Algorithm Packages (CCAPs) – Enterprise Products:	Recipient
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
4/24/2025	**GAASP-Precip_v1-1**: Delivery of the GAASP-Precip_v1-1 **CCAP to CSPP**. Updates in this patch from v1 include updating Python script to account for non-0 value in the tenths of a second in L1B input files.	CSPP
4/24/2025	**GAASP-Snow_v1**: Delivery of the GAASP-Snow_v1 **CCAP to CSPP.**	CSPP
4/25/2025	**GAASP-SeaIce_v1**: Delivery of the GAASP-SeaIce_v1 **CCAP to CSPP.**	CSPP

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, **4/15/25, 4/22/25, 4/29/25, 5/6/26**
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, **4/15/25, 4/22/25, 4/29/25, 5/6/26**
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, **4/15/25, 4/22/25, 4/29/25, 5/6/26**
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, 4/22/25, 5/6/25**
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, 4/15/25, 4/29/25**
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, 4/15/25, 4/29/25**
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, **5/6/25**
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, **5/6/25**
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**, 5/6/25**
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 Target CCAP Moved many times and currently pushed from April 29 to **June 18, 2025.**	Additional changes made by the science team for MSG/HRIT ingest necessitated the need to push the target CCR to **June 18, 2025.**	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, and now to **May 9, 2025.**	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 code updated received 4/28/2025. Target CCAP set to **June 4, 2025.**	Target delivery date moved since science team is still debugging.	
OMPS Ozone Mapping and Profiler Suite Limb Profiler Products (OMPS-LP)	May-25	May-25	CCAP delivery to NCCF expected on **May 21.**	Add graceful exit for higher zenith angles than 88. Fix for incomplete granules. Also require ATBD updates from the science teams.	
TOAST update : LTOAST for the new OMPS LP inputs.	May-25	May-25	On-track, CCAP delivery expected on **May 22, 2025.**	N/A	
AWIPS Converter	Feb-26	Feb-26	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. This is another patch delivery	
Flood Mapping	May-25	May-25	Final CCAP moved to **May 9.**	Finalizing documentation, and integrator has shared test case outputs with science team before delivery.	

FY25 STAR JPSS Milestones (2 of 4)

Milestones/Algorithm Updates	Original Date	Forecast Date	Actual Completion Date	Variance Explanation	Status
Blended SST	May-25	May-25	CCAP expected on May 29, 2025	N/A	Tracked as part of FY25 Maintenance release
Blended Hydro (uses NOAA-21)	Jun-25	Jun-25	This includes the latest version of MiRS 11.10. CCR delivery expected on June 4th.	N/A	
Cloud Mask J2 Validated; No code updates needed only maintenance CCAP	Feb-25	Jun-25	CCAP for SCR delivered on May 1st. Target CCAP delivery 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 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.	
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	CCAP for SCR delivered on May 1st. Target CCAP (ASSISTT to NCCF) moved to **July 10** for AO architecture.		
Surface Particulate Matter (PM2.5) **(new product)**	Jun-24	Jun-25	CCAP SCR planned for May 22, and final CCAP delivery expected on **June 25.**	New implementation following AO architecture.	
Derived Motion Winds (S-NPP, NOAA-20, NOAA-21, and GEO satellites	Jul -25	Jul-25	SCR expected on June 6 and final CCAP on **July 10.**		
Aerosol Detection Product (ADP) Updates	Jul-25	Jul-25	SCR moved from 1/27 to 3/6 to 4/23; Target CCAP (ASSISTT to NCCF) expected on **July 31st** for implementation in 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.	Shared implementation updates with v2-1 delivery with the **PG** team	

FY25 STAR JPSS Milestones (3 of 4)

Milestones/Algorithm Updates	Original Date	Forecast Date	Actual Completion Date	Variance Explanation	Status
MiRS upgrade for Quick Sounder **(252)**	Aug-25	Aug-25	Science team delivered updates on March 31st. CCAP delivery expected on **Aug 4, 2025**.	Implemented through AO plan	Tracked as part of FY25 Maintenance release
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. CCAP expected on **Aug 4, 2025.**	Integrators currently working on getting code compiled statically.	
ACSPO (update ACSPO 3.0 for VIIRS), for Ocean	Aug-25	Aug-25	SCR expected in June 30 and final CCAP on **Aug 14.**	N/A	
Green Vegetation Fraction: 1 Km GVF update for existing products.	Sep-25	Sep-25	SCR expected on Jul 21 followed by CCAP **on Oct. 8.**	N/A	
Vegetation Index (VI): 1 Km update for existing products	Sep-25	Sep-25	SCR moved to July 21 and final CCAP on **Nov 3.**	Team is working on running new test case.	
Bidirectional Reflectance Distribution Function (BRDF) **(New Product)**	Sep-25	Sep-25	SCR expected on June 20 and final CCAP on **Sept. 19.**	New implementation through AO Algorithm support documentation and demo scheduled 5/2	
Soil Moisture Operational Product System (SMOPS)	Oct-25	Oct-25	On-track. 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)

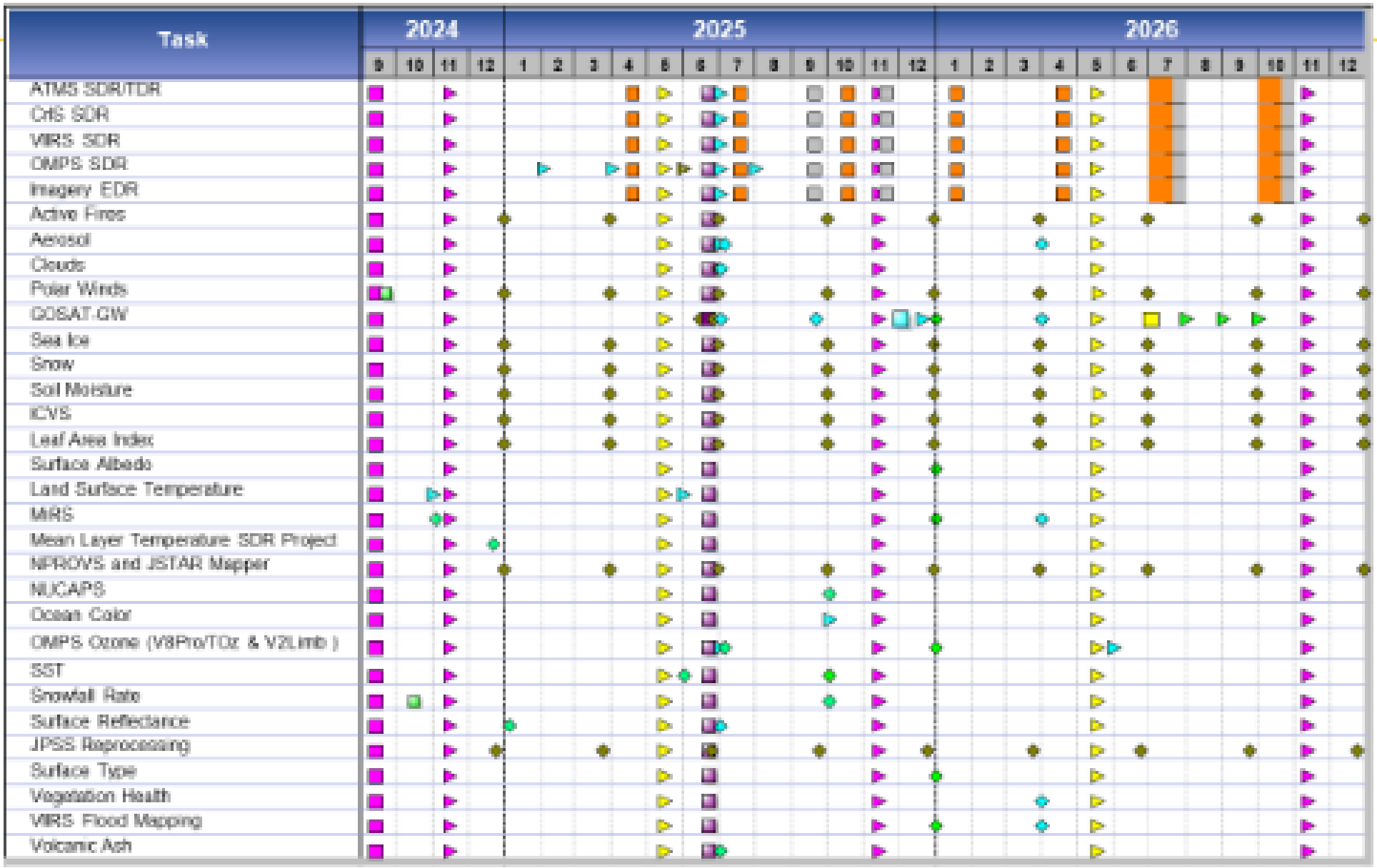
Milestones (Algorithm Cal/Val and LTM)	Original Date	Forecast Date	Actual Date of Completion	Variance Explanation	Status
NEON (Quick Sounder pre-launch and post-launch Cal/Val Plan)	Dec-24	Dec-24		Two CCRs already approved. Cal/Val Document released in MIS. 471-CCR-24-0069 471-CCR-24-0070	
FY26 Program 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	ATMS and CrIS delivered.	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 J3 CrIS: Team delivered J3 pre-launch report in June 2024. J4: CrIS team delivered pre-launch characterization report J4: ATMS team delivered in June 2024. J4: OMPS team delivered pre-launch characterization report (Jan) J4: VIIRS: Delivered pre-launch characterization report (March)	Completed
GOSAT-GW End to End	Aug-24	Apr-25	GOSAT launch: **June 2025**	GOSAT launch expected in June 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. Beta, Provisional, and Validated maturities as planned. Detail schedules and milestones in preparation	Ongoing as part of FY25

IDPS Mx Build Status

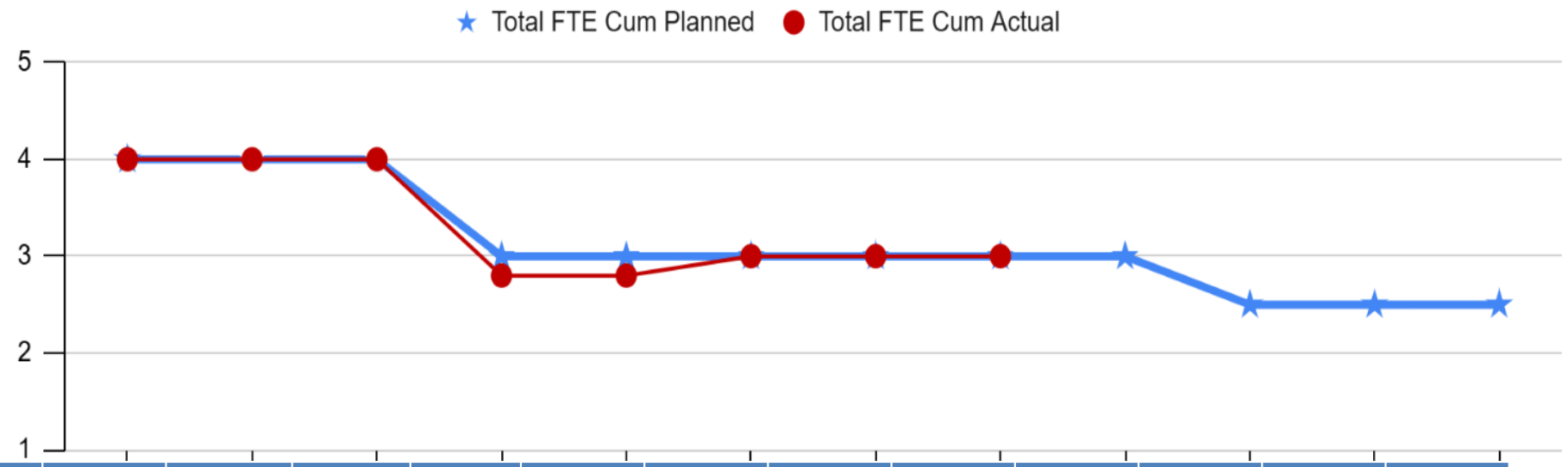
- Mx13 to Operational Configuration Control Board (OCCB): 4/10/2025
- Mx13 TTO: 5/19/2025

IDPS Mx Schedule	Mx13	Mx14	Mx15
Code change cutoff (STAR to ASSISTT) for all algorithm ch	Nov. 28, 2024	Feb. 12, 2025	May. 10, 2025
Code change cutoff (IDPS AIT to Peraton)	Jan. 14, 2025	Apr. 1, 2025	Jun. 24, 2025
SOL (DP_FE) regression test	Feb. 18 - Apr. 1, 2025	May. 30 – Jun. 27, 2025	Aug. 7 – Sep. 9, 2025
STAR SOL review/checkout feedback (Go/No-Go & Report)	Mar. 18, 2025 (Completed)	Jun. 27, 2025	Sep. 9, 2025
Handoff to OMS (taken to OCCB)	Apr. 10, 2025	Jul. 17, 2025	Sep. 25, 2025
I&T (DP-TE) regression test	Apr. 10 – May. 1, 2025	Jul. 17 – Aug. 8, 2025	Sep. 25 – Oct. 17, 2025
STAR I&T review/checkout feedback (Go/No-Go & Report)	May. 1, 2025	Aug. 8, 2025	Oct. 17, 2025
TTO	May. 19, 2025	Aug. 26, 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	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	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	3.00				

CS: Vacant (prev. Alisa Young)

WYE: *Prasanjit Dash, Murty Divakarla, Tom Atkins, Jeffrey Weinrich, Tess Valenzuela*

Color code:

Green: **Completed Milestones**

Gray: **Ongoing FY25 Milestones**

April 2025

Active Fires

April 2025

Accomplishments / Events:

- The team continued preparations for the global intercomparison of VIIRS I-band EFIRE and NGFS detections and fire radiative power
  - NGFS processing for this purpose is planned to be done at STAR
- Worked on preparing for the use of MASTER fire observations to support VIIRS I-band product evaluation
  - 2023-2025 data from the NASA FireSense campaign are evaluated
- Provided clarification of VIIRS I-band algorithm details to end users
- Continued global evaluation and analysis of persistent anomalies from Suomi NPP EFIRE 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			

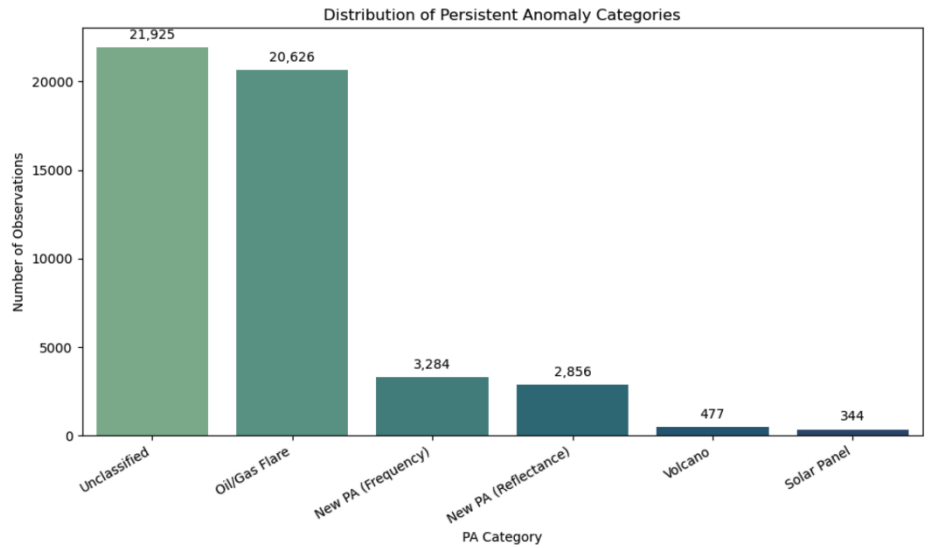
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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 persistent anomalies from Suomi NPP detections



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

April 2025

Accomplishments / Events:

- Developing Python code to evaluate GEO-LEO merged Level 3 aerosol optical depth product, developed for the NWS applications. Matchup dataset using AERONET as reference is being generated
- Conducting research work to generate a new aerosol optical depth look-up table using aerosol volume size distributions as an additional variable in anticipation of the availability of PACE data from NASA. The expectation is that having near real time information of PACE volume size distribution could enhance the aerosol optical depth retrievals
- Worked with EPA and NWS and received feedback on the relevance and significance of having near real time aerosol products for their applications. The feedback was provided to SAE to be folded into the white paper they are working on to document a prioritized product list
- Testing image enhancement approaches to display OMPS smoke and dust detection product
- Supported ASSIST team with the conversion of volcanic ash product from its native format (.csv) that is event based to JPSS VIIRS granule based format so it can be imported into the ADP files.

Milestones	Original Date	Forecast Date	Completion Date	Variance Explanation
Subtask 2.1: *Identify source of high latitude false dust detections, especially clouds mis-identified as smoke*	*Mar 2025*	*May 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 2025	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			

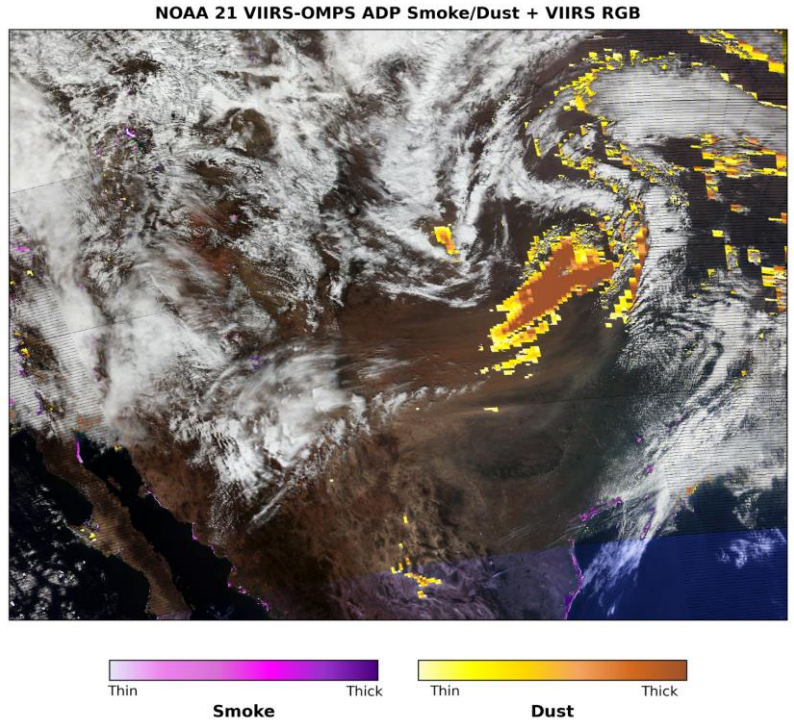
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

No risks.

Highlight:

An example image showing OMPS ADP product oversampled to VIIRS resolution for a dust event in the US



ATMS SDR

April 2025

Accomplishments / Events:

- Diagnose the root cause of the discrepancies between two sets of beam alignment error correction coefficients. It is found that the beam alignment error correction rotation matrix is transposed in the IDPS ATMS calibration program. After fixing this implementation bug, both sets of coefficients can generate consistent results, as expected. To evaluate the impact of such correction on geolocation accuracy, NOAA-21/NOAA-20/S-NPP ATMS geolocation data for March 2025 are reproduced using updated ADL package. The geolocation accuracy assessment results indicate that the overall geolocation error is reduced after the correction, particularly in the near limb FOVs. The impact on radiative transfer model simulations is also evaluated. The beam position dependent Obs vs. Sim bias also show significant change near both edges of scans, which indicates a potential impact on data assimilation in NWP after the correction. A ADR has been submitted to DRAT for IDPS code update process. Because this code update is for both JPSS and QuickSounder ATMS calibration algorithm, it is recommended to meet the submission deadline for Mx15, which is a dedicated version for QuickSounder ATMS. Shown in Figure 1 is the NOAA-21 ATMS geolocation error for different FOVs of K/Ka/V/W bands in current operational data (upper) and updated data (lower). K/Ka/V-band present a lower error pattern while W-band is comparable.
- Review/checkout NOAA-21/NOAA-20/S-NPP ATMS IDPS Block 2.3 Mx13 I&T data and prepare a comprehensive data quality assessment and comparison report for STAR JPSS and LEO DPMS to support the transition to operation activities.
- Continue to develop a PCA based ATMS on-orbit NEdT evaluation tool. The time series of the NOAA-21 ATMS NEdT calculated with the PCA methodology is presented in Figure 2 (upper). Figure 2 lower presents the NEdT change in percentage with respect to 2/1/2025.

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	
IDPS Block 2.3 Mx13 I&T Data Checkout/Review	Apr-25	Apr-25	Apr-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		

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			

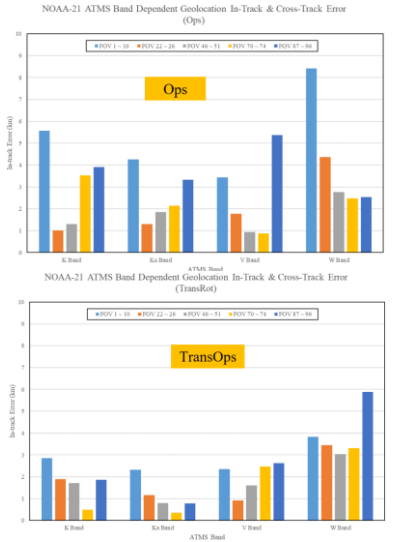
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

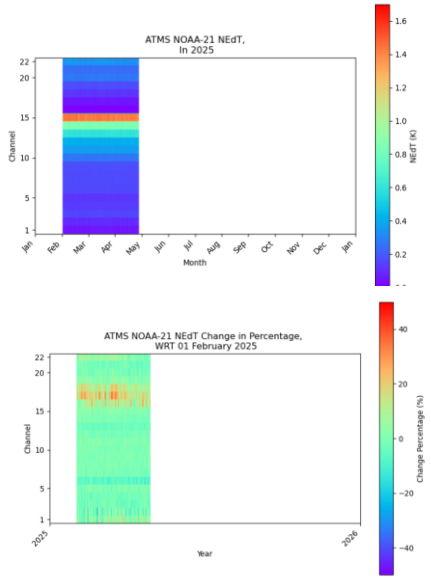
The decommission of GRAVITE may affect the ATMS ADL testing ANC data availability and delay the pre-operational data checkout/review submission

Highlights:

Figure 1 NOAA-21 ATMS geolocation error at different FOV sessions for K/Ka/V/W-band



(2) NOAA-21 ATMS on-orbit NEdT using PCA method (upper) and change w.r.t. Feb. 1 (lower)



ATMS SDR FY25 Milestones/Deliverables (1/2)

April 2025

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)

April 2025

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

April 2025

Accomplishments / Events:

- Continued evaluation of the replacement of the NCOMP as a replacement for the NCOMP algorithm.The NCOMP algorithm is currently in maintenance status with no active developer.
- The CBH algorithm was updated to incorporate NWP-based LCL data for pixels with invalid CWP input due to unsuccessful cloud optical property retrievals, in order to reduce missing CBH/CCL. Nighttime cloud base/geometric thickness improvements using machine learning (U-Net CWP input) are ongoing. A code implementation has been completed, and evaluation will continue.
- Work continues to prepare tools that leverage new datasets for algorithm development and validation (e.g., EarthCARE). For instance, the CIRA team is developing codes to discover EarthCARE data within a start/end time, reads L2 data, and resample data to given lat/lon points for comparison with other satellites.

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		

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:

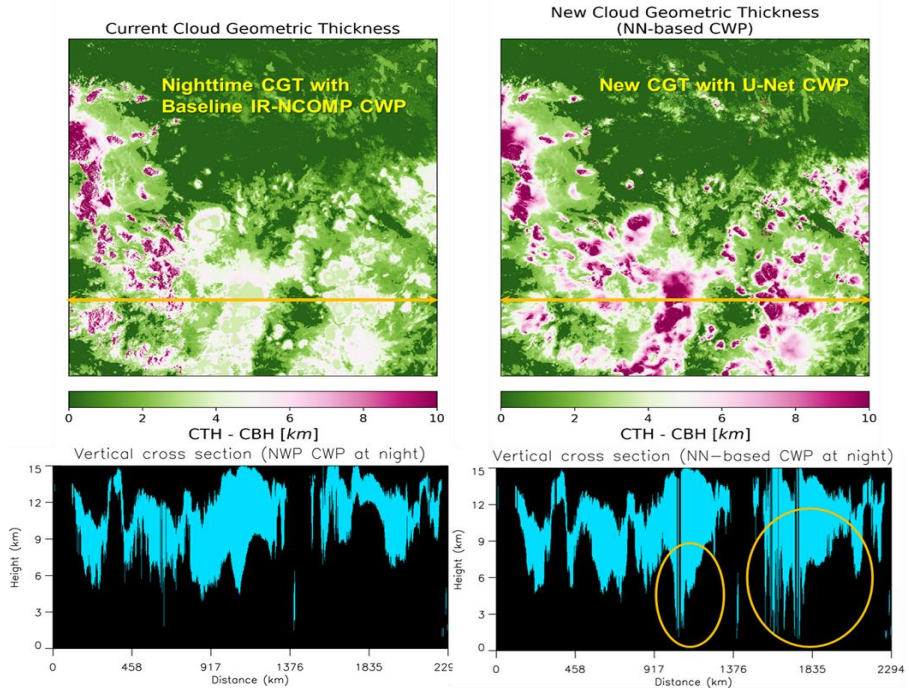


Figure 1. AI/ML-based improvements of nighttime Cloud Base Height / Geometric Thickness (CGT) and Cloud Vertical Cross-section (CVC) using U-Net CWP input. Compared with CGT and CVC using IR-only based CWP input (left), U-Net CGT (right) shows temporally consistent cloud fields throughout the day and night and produces deeper cloud depth (yellow circled).

Cloud Team FY25 Milestones

April 2025

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY25 Program Management Review	Aug-24	Aug-24	Aug-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		
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	Jun-25		

Cloud Team FY25 Milestones

April 2025

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.

CrIS SDR

April 2025

Accomplishments / Events:

- Implemented updates to CrIS SDR algorithm to correct spectral calibration errors in the Neon lamp misfiring incidents. (**Fig. 1**)
- Observed a long Neon Lamp firing time 8s<Firing time < 16s 2025-04-05T17:14 on NOAA-21. (**Fig. 2**)
- Monitored heavy storm activity in CONUS with CrIS March 31-April 3 (**Fig. 3**)
- Tested CrIS SDR algorithm fixes via spectral accuracy assessment. (**Fig. 4**)
- Implemented improved calibration monitoring via spectral correlation method vs neon lamp measurements automated reporting. (**Fig. 5**)
- Observed slightly higher than usual data latency (as measured by IDPS creation time minus observed data start time) for NOAA-21, likely related to ground antenna issues. (**Fig. 6**)
- Developed tools for SNO intercomparisons via NORAD Celestrak datasets. (**Fig. 7**)
- Reviewed IDPS Mx13 builds I&T deploy regression data.
- Delivered the package of CrIS algorithm enhancements to the ASSISTT team for ADR-11194.

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	Apr-25	
Offline calculation of laser wavelength based on spectral correlation method	Sustain	Apr-25	Apr-25	
IDPS Mx13 I&T Checkout	Maintain	May-25	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.*

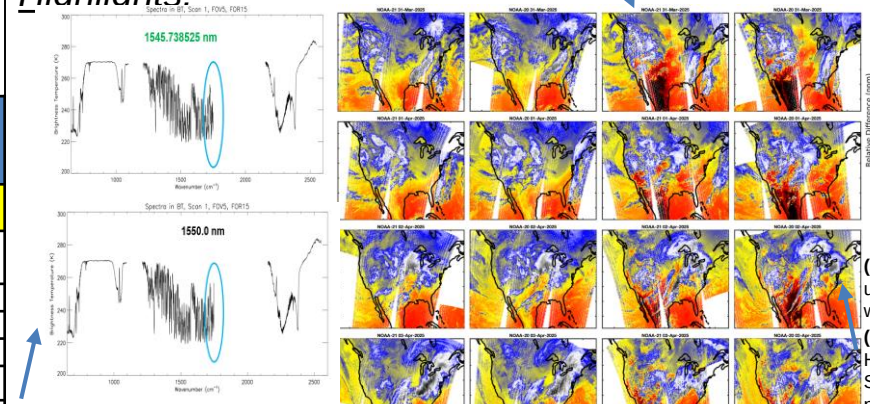
Issues/Risks:

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.

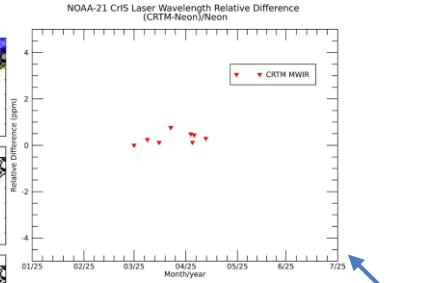
Blue: ASSIST Team has agreed to accept ADL code change tested on CentOS 9.

Highlights:



(1) Sample spectra of NOAA-21 CrIS using (a) median laser wavelength = 1545.738525 nm and (b) hard-coded default laser wavelength = 1550.0 nm.

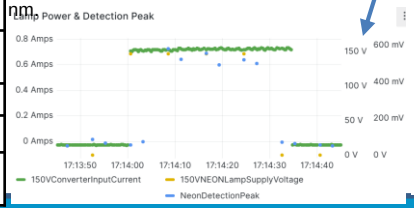
(3) NOAA-20 and NOAA-21, 900 cm^{-1}



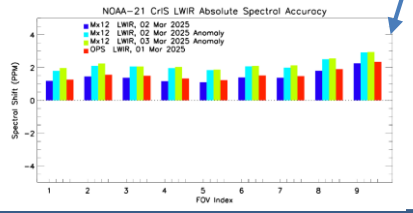
(5) NOAA-21 CrIS calculated laser wavelength using the spectral correlation method compared with the neon lamp measurements.

(6) NOAA-21 Higher than normal SDR latency in the past week.

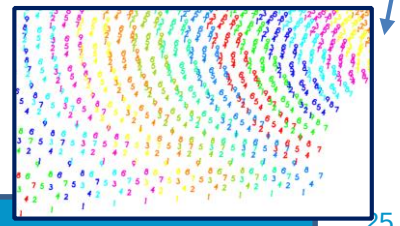
(2) NOAA-21 Neon Lamp tlm showing long firing time, April 5



(4) NOAA-21 Spectral Accuracy Assessment, LWIR, with fix



(7) Initial calculations and display of SNO calculations by FOV



FY25 Milestones/Deliverables (1/2)

April 2025

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	
Calibration & Validation (C)	(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	
	(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)

April 2025

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.

Accomplishments / Events:

VIIRS vs ICESat2 ice thickness comparison: The VIIRS sea ice thickness product is inter-compared with thickness estimated from NASA's ICESat2 ATLAS laser instrument. In this study, the ICESat2 freeboard product is converted to thickness using a linear formula based on a field experiment where both ice freeboard (i.e. height of sea ice only above the water line) and thickness were measured coincidentally. We use a freeboard product instead of thickness because the daily ICESat2 ice thickness product is currently only updated through May 1, 2022. On March 27, 2024, ICESat-2 acquired several tracks of freeboard data across the Arctic (Figure 1).

Figure 1. ICESat2 freeboard acquisition tracks on March 27, 2024.

VIIRS ice thickness product data that intersected the points on these tracks were identified for algorithm versions 6.6, 6.5 and 6.4. Histograms of the ice thickness distribution for each version are shown in Figure 2. The most notable difference in the histograms is the much thicker ice produced by the ICESat2 estimate. The conversion from ICESat2 freeboard to thickness for this report uses results from a field program where sea ice freeboard (i.e. not including snow) and concurrent sea ice thickness were measured. But the ICESat-2 ATLAS-10 lidar measures freeboard from near the top of the air-snow interface, so is effectively measuring a "snow/ice freeboard." Because ice is denser than snow, the use of a pure sea ice freeboard conversion to thickness will overestimate the sea ice thickness obtained from ICESat-2.

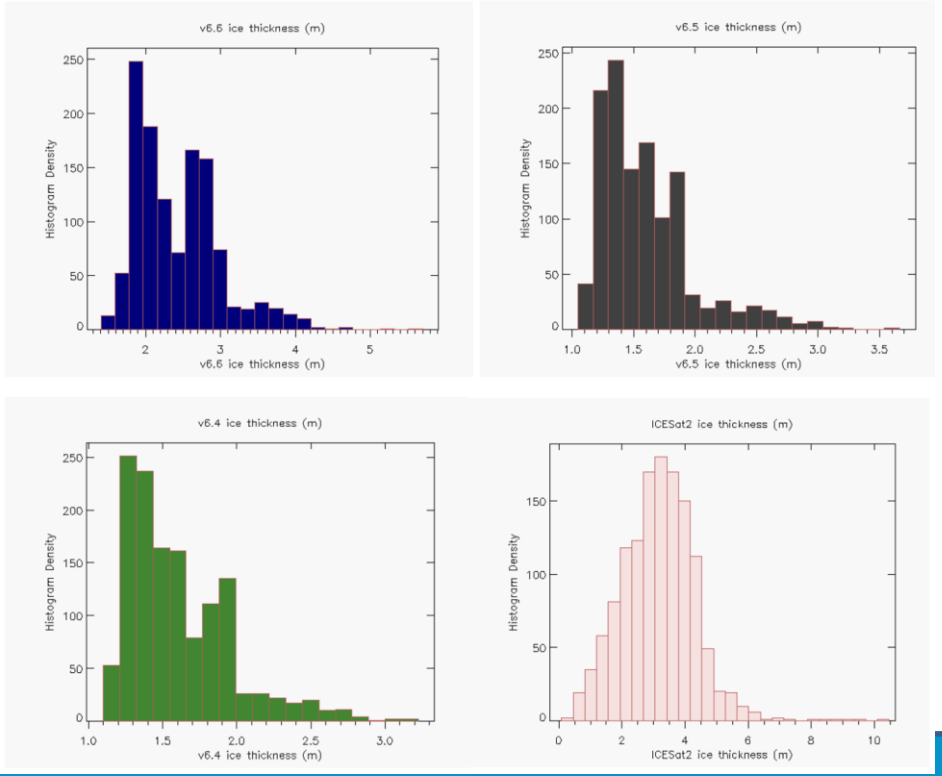


Figure 2. Ice thickness from: NDE versions 6.6 (top left), 6.5 (top right), 6.4 (bottom left), and as derived from ICESat2 freeboard (bottom right),

Cryosphere FY25 Milestones/Deliverables (in general)

April 2025

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	3/2025	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.

Cryosphere FY25 Milestones/Deliverables (in general)

April 2025

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**

VIIRS Polar Winds

April 2025

Accomplishments / Events:

- Progress has been made that enable the generation of polar winds by tracking cloud features using the VIIRS Day-Night Band (DNB) Near Constant Contrast (NCC) product
- Recent development involved the use NESDIS' Enterprise Framework and bringing in the VIIRS DNB NCC product as a pseudo-channel for the enterprise feature tracking algorithm
- Soumi-NPP DNB winds were successfully generated for a test case on 18 March 2025. Good DNB winds coverage is obtained over the sunlight portion of the image, however, the DNB winds coverage is much poorer over the image that is illuminated by moonlight. The first attempts at adjusting the reflectance gradient threshold have been made without much success at this time. More testing is underway with a more recent case over Antarctica in an effort to get retrieve more DNB winds over the moonlit part of the image
- Coordinated with NESDIS/OCS/PIB on the transition of the "Single-Satellite" VIIRS SWIR winds capability. Initial software delivery and code review is scheduled for June 10, 2025

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-25	Jun-25		
Incorporate VIIRS DNB (Near-Constant Contrast) updates from heritage to enterprise winds algorithm in FW2.x	Jun 25	Jun 25		
Develop and validate approaches to generate VIIRS winds from tandem-satellite pairs of images (enables global coverage)	Jun 25	Jun 25		
Feature tracking QC for VIIRS winds: Investigate scan angle diffs between successive orbits & impact on VIIRS winds quality; account for parallax	Jun 25	Jun 25		
Development of updated VPW Validation and monitoring system	Jun 25	Jun 25		
Support transition of "Single-Satellite" VIIRS SWIR winds into operations	Sep 25	Sep 25		
Begin transition of Tandem-Satellite" VIIRS LWIR and SWIR winds to operations (if funded)	Sep 25	Sep 25		
Addition of ERA5 analysis to winds team's validation tool set	Sep 25		Apr 25	
Deliver enterprise winds algorithm updates, as needed				
Dev and testing of minor algorithm updates as needed. Continued monitoring and validation of VPW winds;	Sep 25			

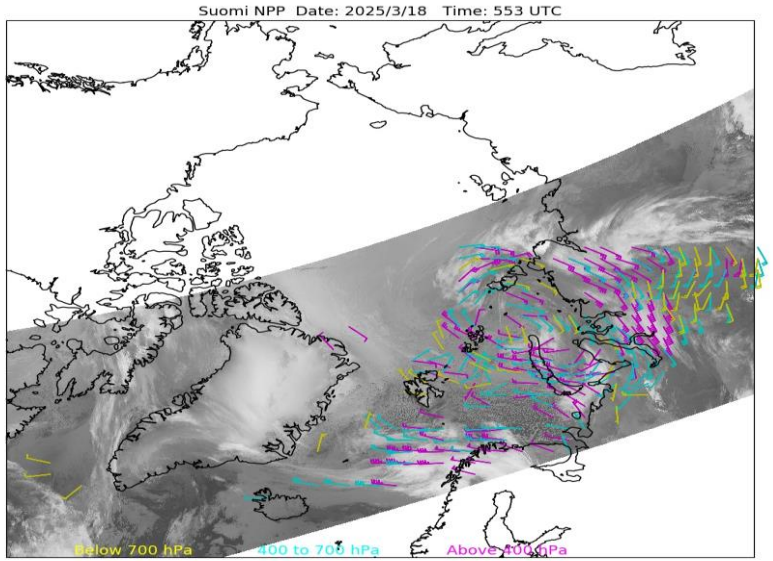
Overall Status:

	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:

Highlight: VIIRS DNB Winds from Soumi NPP



VIIRS DNB Winds from NPP using the NESDIS Enterprise Framework on 18 March 2025 05:53 UTC over the Arctic

GCOM-W/AMSR2 & AMSR3

April 2025

Accomplishments / Events:

- In preparation for processing GOSAT-GW observations, the existing AMSR2 rainfall algorithm input pipeline is updated to ingest the AMSR3 L1 proxy product. The new sensor data are adjusted to match the shape and format expectations. The IO module is also adapted to allow for any additional changes in L1 products as necessary (e.g., GAASP L1 product, once it becomes available). Testing against AMSR2 input confirms successful implementation despite the highly biased TBs in JAXA's proxy L1 file.
- Following the proposed schedule and in collaboration with Colorado State University (CSU), an ongoing effort to set a stage for building, training, and testing a machine learning-based AMSR2 rainfall continues. Early results presented at the GPM PMM Science Team meeting are confirmed to apply to AMSR2 GAASP products.

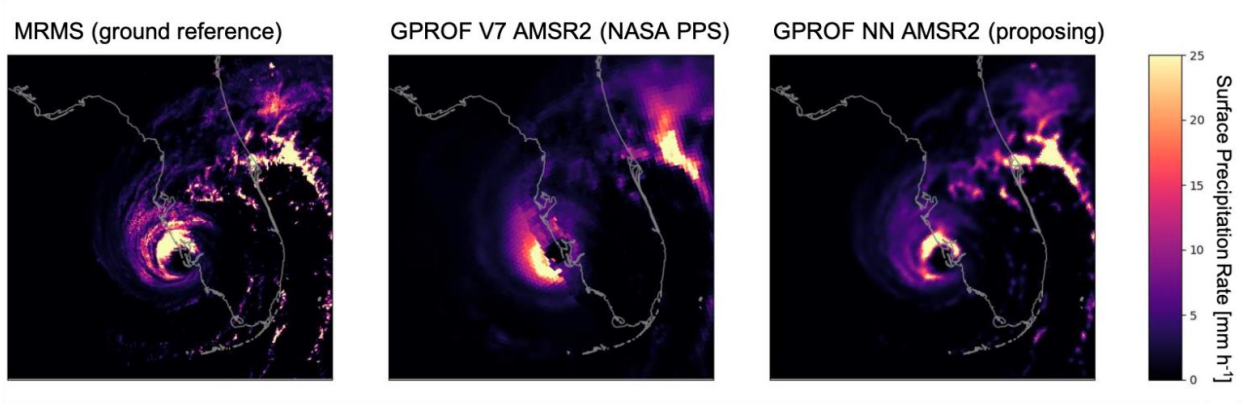
Overall Status:

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

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

Issues/Risks:

Highlights:



Left: MRMS as an independent ground-based reference; (middle) NASA's currently operational GPROF AMSR2 retrieval; Right: a demo AMSR2 GAASP ML-based retrieval. Hurricane Ian - Sep 28, 2022 18:33 UTC.

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

April 2025

Accomplishments / Events:

- AMSR3 code delivered
- 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:

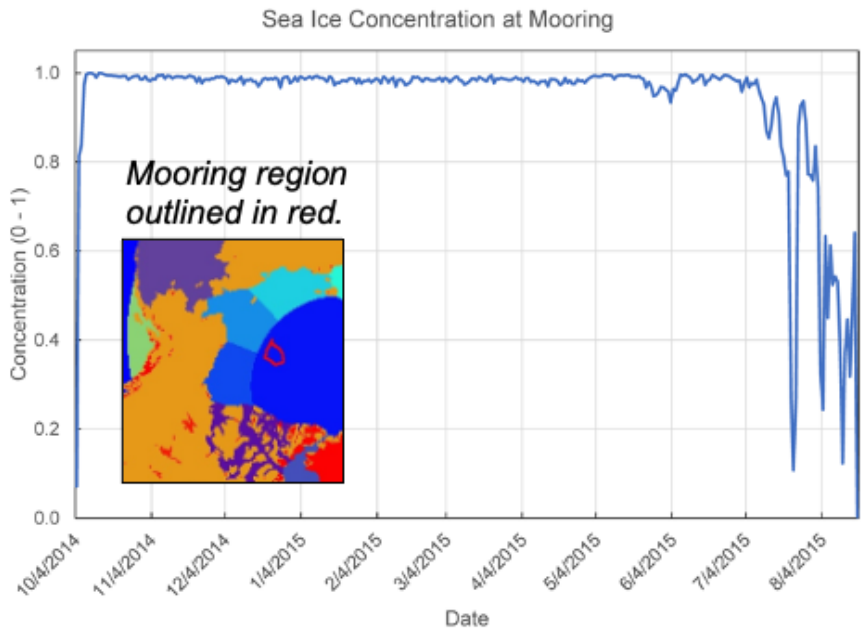
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic			x		Slight delay in code delivery (delivered 10 March
Schedule		X			

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:

New validation data obtained: mooring data in the Chukchi Sea. Data formatted and put onto AMSR3 grid. Comparisons will be made with AMSR2 concentration in the coming month.



GCOM-W/AMSR2 & AMSR3 Snow

April 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**			

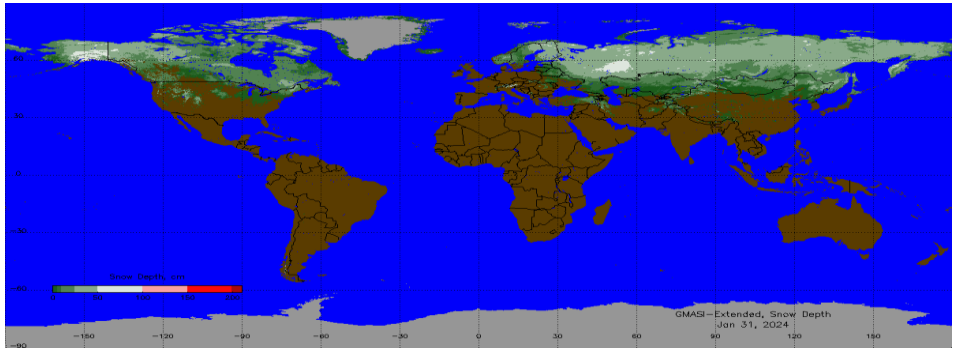
Overall Status:

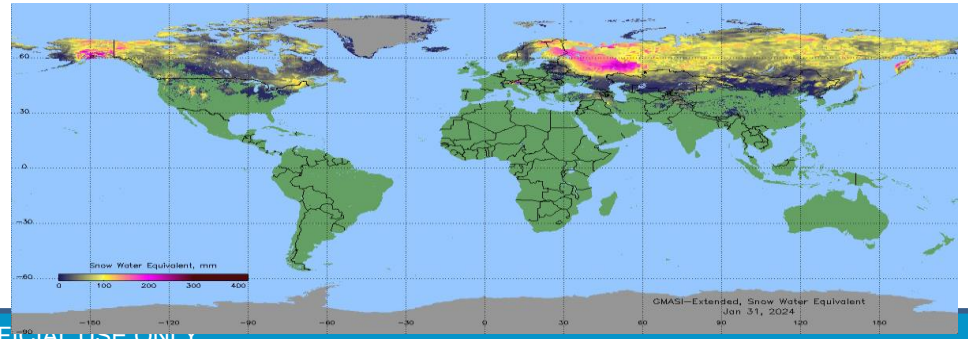
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

April 2025

Accomplishments / Events:

- GAASP AMSR2 Soil Moisture EDR algorithm software package started operational on NCCF production
- AMSR2 soil moisture Machine Learning (ML) algorithm updates
  - Applied ML model trained using the newest version of SMAP soil moisture product (Version 9) in the GAASP SM EDR package in python
  - Tested the package using individual AMSR2 orbital TB files as the input
  - Finished a python code for producing daily gridded SM product using all orbital outputs from SM EDR package (A/D separately)
  - Worked on importing VIIRS EVI product at 36km resolution into GAASP SM EDR package as one of the dynamic input data for the ML model

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**	**6/2025**	**Ongoing**	
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.*

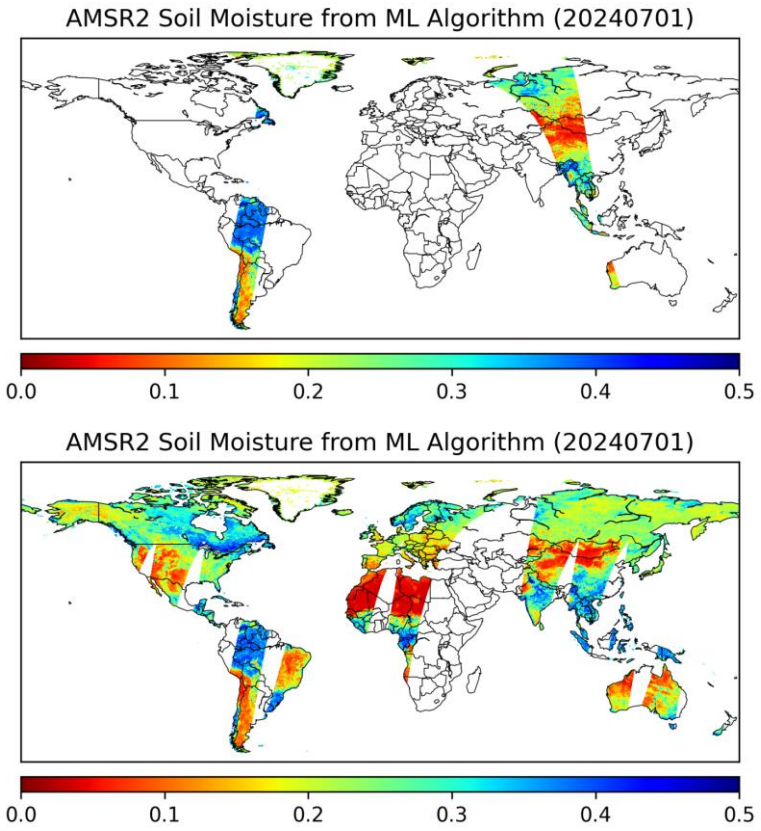
Issues/Risks: None

Highlights:

GAASP SM EDR products from updated software packages.

Upper: Orbital run result from one TB file at footprint level.

Lower: Gridded daily map at 0.25-degree resolution for all descending orbits



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/GOSAT-GW FY25 Milestones/Deliverables (in general)

April 2025

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	

Maturity Review Schedule for GOSAT-GW satellite which is currently targeted for Monday, June 23, 2025, at 4:33 PM UTC (1:33 AM JST on June 24).

Sensor	Algorithm	Beta	Provisional	Validated
AMSR-3	GOSAT-GW: Microwave Imagery	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW: Sea Surface Temperature	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Sea Surface Wind Speed	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Total Precipitable Water	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Precipitation Type/Rate	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Cloud Liquid Water	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Sea Ice Concentration	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Sea Ice Type	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Snow Cover/Depth	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Snow-Water Equivalent	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Soil Moisture	Nov-2025	June-2026	Jun-2027
AMSR-3	GOSAT-GW:Snowfall Rate-new	Nov-2025	June-2026	Jun-2027

GOSAT-GW Schedule

Date	Event
June 9-13, 2025	Pre-launch testing on ASSIST side with the JAXA Executable. *If time allows they will also run current AMSR2/3 code. Either way STAR will pull the pre-launch output from ASSIST to SCDR for testing offline with their AMSR2/3 code.*
June 24, 2025	Launch - *ASSIST will have a version of the JAXA executable running in real time with results available to pull over to SCDR for core cal/val team members.*
September 2025	AMSR3 starts nominal operational mode (3 month commissioning phase for GOSAT-GW)
October 2025	CCAP delivery from ASSISTT to NCCF. *This is the point where the JAXA Executable and current AMSR2/3 Code will be available on NCCF Dev to start the move to NCCF UAT. The process to finish the promotion could take 1-4 months (1 month if the new Algorithm Orchestration functionality is working as anticipated and longer if it is not - this is a new capability)*
November 2025	Algorithms expected to be declared Beta and products can be made available to a wider cal/val team if JAXA concurs (otherwise products will stay with original core cal/val team).
December 2025	Initial L1 (brightness temperature) characterization against AMSR2 and GMI complete - *this is required for L2 algorithms to generate high quality products*
June 2026	Provisional Review for GOSAT-GW continuity products and products can be made available to user community. *Any updated Executables/LUTs will be provided from STAR to ASSIST*
July 2026	Implementation of provisional executables/LUTs on NCCF DEV by ASSIST
Aug 2026	Implementation of provisional executable/LUTs on NCCF UAT
Sep 2026	Implementation of provisional executables/LUTs on NCCF Ops, products made available operationally to user community

ICVS

April 2025

Accomplishments / Events:

•Fully re-wrote the ICVS public website front page system introduction, publications,description, and schematic diagram to show the importance of ICSV near real time NOAA satellite and data quality monitoring functions in the support of NOAA numerical prediction core missions.

• Attended the QuickSounder science team meeting to introduce the ICVS spacecraft and JPSS ATMS monitoring modules and functions.

•Updated ICVS CrIS near real time monitoring package to add an automatic email notification function when there is error in NOAA-21 CrIS neon bulb lite issue.

•Continued to work the new algorithm about ATMS geolocation error detection using 2-element method.

• Worked on the R2O transition of VIIRS RSB striping detection algorithm from VIIRS SDR team, applicable for SNPP, NOAA-20, and NOAA-21

•Continued the CrIS-ABI inter-sensor bias algorithm to detect CrIS geolocation error by extending to G19 ABI to support CrIS data quality monitoring.

•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.*
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Issues/Risks:

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		

Figure 1 Updated ICVS system schematic diagram

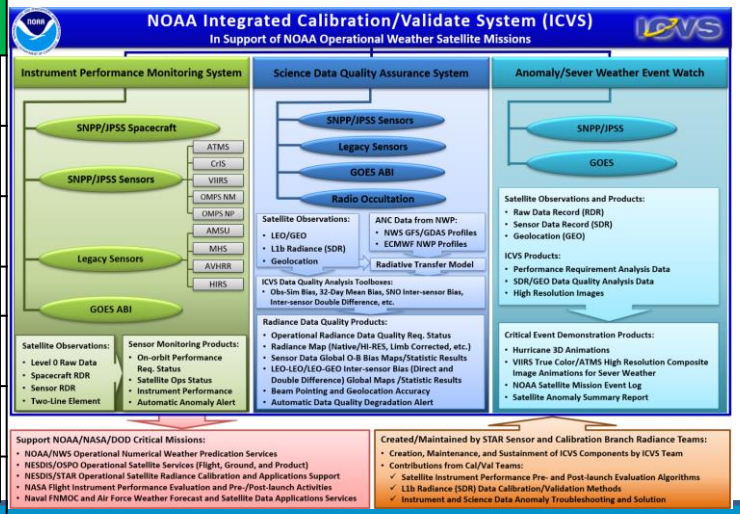
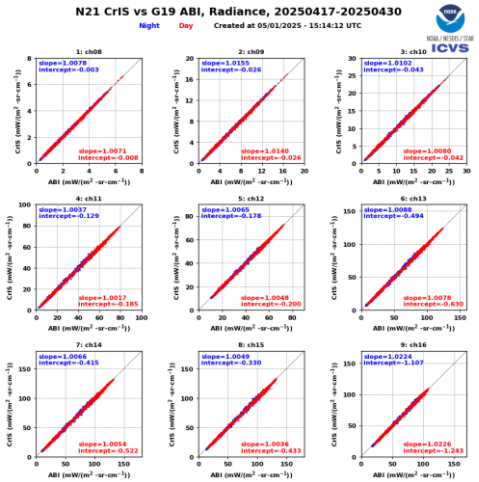


Figure 2 NOAA-21 CrIS vs. GOES-19 ABI intersensor comparison products



VIIRS Imagery

April 2025

Accomplishments / Events:

- Downloaded files, generated imagery, and reviewed VIIRS Imagery EDR products for B2.3 Mx13 I&T review; recommended to proceed with TTO.
- Curtis Seaman participated in the 2025 WMO RGB Workshop held at the headquarters of the Swedish Meteorological and Hydrological Institute (SMHI) in Norrköping, Sweden (1-3 April 2025)
- Developed a Python script that uses the VIIRS TLE files to identify satellite overpasses and automatically retrieve relevant VIIRS granules based on a user-specified date and location, resulting in more efficient imagery generation.
- McIDAS-V Updates: VIIRS Sandwich formulas and VIIRS Raleigh Correction capabilities added to nightly build. Will be included in a version update later this year.
- Bill and Jorel each provided guest lectures to CSU ATS 737 course on satellite meteorology. Their lectures included discussion of VIIRS imagery applications.
- Blog Posts with VIIRS Imagery
  - Early April 2025 MS/OH River Valley Flooding
- 25 VIIRS Imagery Posts on CIRA Social Media (X) this Month. A few posts:
  - VIIRS Day Land Cloud RGB Imagery shows OH/MS Valley Flooding (12K views)
    - VIIRS NCC Imagery overnight captures moonglint off floodwaters (11K views)
  - VIIRS Day Fire RGB Imagery of New Jersey Wildfire (2.3K views)
  - VIIRS NCC Imagery of Spain/Portugal power outages (3.5K views)

Overall Status:

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

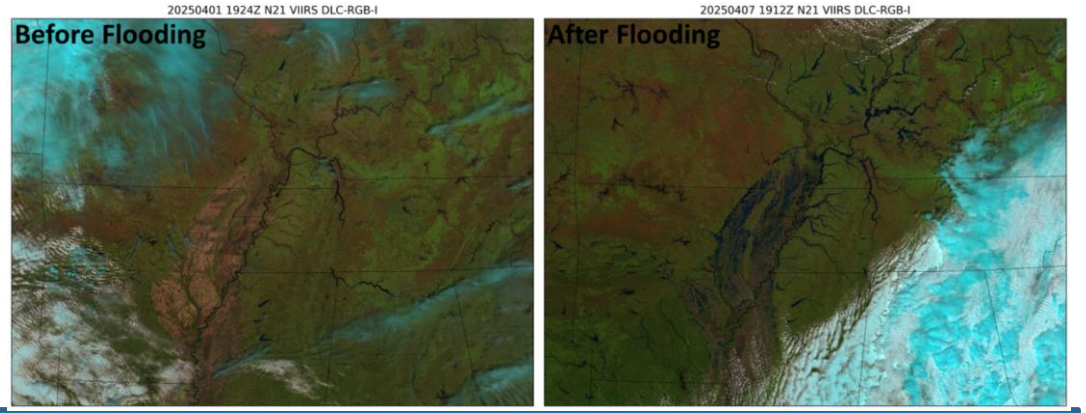
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY26 Program Management Review	Jun-25	Jun-25		
Submit for Publication – CrIS Imagery	Mar-25	Mar-25	Mar-25	
Submit for Publication – Blowing Dust Climo	Jun-25	Jun-25	Mar-25	
Submit for Publication – Blowing Snow Detection via Satellite Imagery	Sep-25	Sep-25		
Completed new DNB-to-NCC LUTs for S-NPP, NOAA-20, and NOAA-21	Sep-25	Sep-25		
New Imagery products or product enhancements (display on SLIDER)	Sep-25	Sep-25	continuing	
Realtime Imagery monitoring and display systems (SLIDER, etc.)	Sep-25	Sep-25	continuing	
Interesting VIIRS Imagery to Social Media and Blogs	Sep-25	Sep-25	continuing	
McIDAS-X/V Enhancements for processing/display of VIIRS Imagery	Sep-25	Sep-25	continuing	
Block 2.3 Mx builds deploy regression review/checkout (Mx12, Mx13, Mx14			Mx12-Jan25, Mx13-May25	

Highlights: Image of the Month

Figure: VIIRS 375-m Day Land Cloud RGB before (left) and after (right) heavy rains that resulted in historic flooding in the region shown. The imagery reveals flooded croplands and swollen rivers as dark blue. From Early April 2025 MS/OH River Valley Flooding.



Leaf Area Index

April 2025

Accomplishments / Events:

- Verify and monitor the operational LAI product, including both visual inspection and quantitative analysis.
- Collect additional LAI products—such as the updated GLASS LAI and Sentinel-3 LAI—along with matched surface reflectance and relevant auxiliary data to refine the training dataset.
- Process ground-based LAI measurements and match them with historical surface reflectance and LAI data, ensuring rigorous data quality assurance and screening. Conduct in-situ validation of the LAI product.
- Perform phenological inter-comparison of LAI among existing products. Continue developing improved temporal smoothing and gap-filling algorithms to enhance the consistency and completeness of 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			

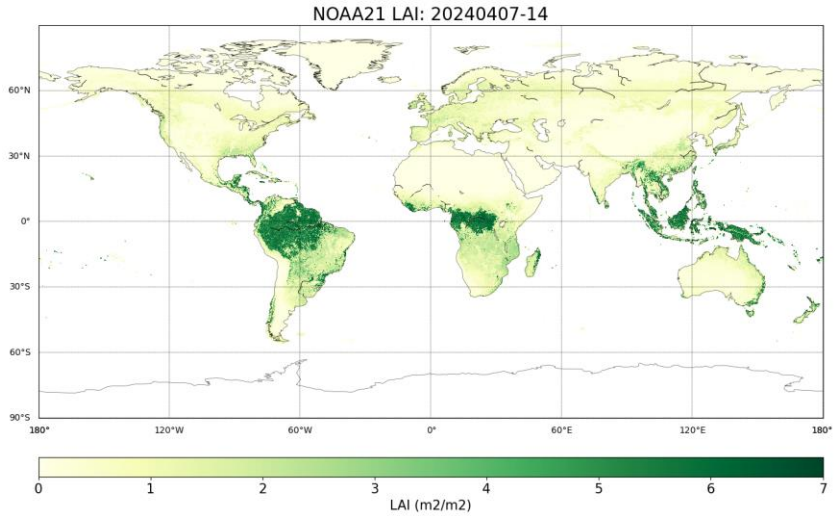
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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:

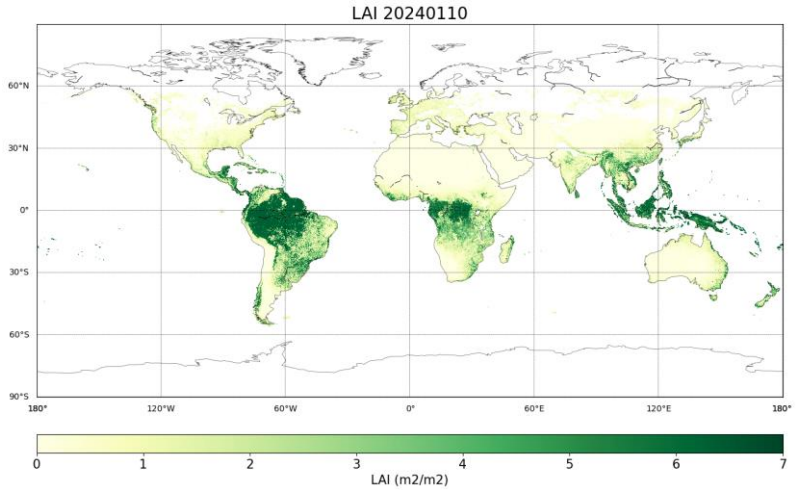


LAI products have been operational and publicly available at NOAA CLASS

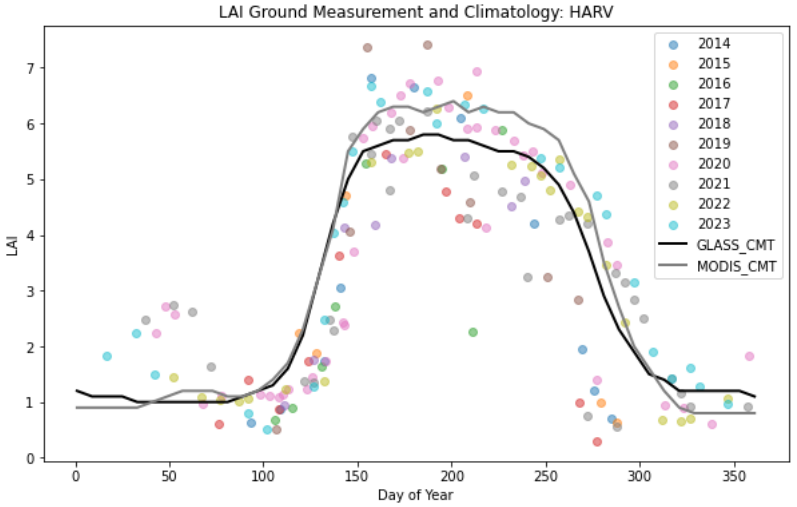
LAI Products Evaluation for Training Data Refinement

April 2025

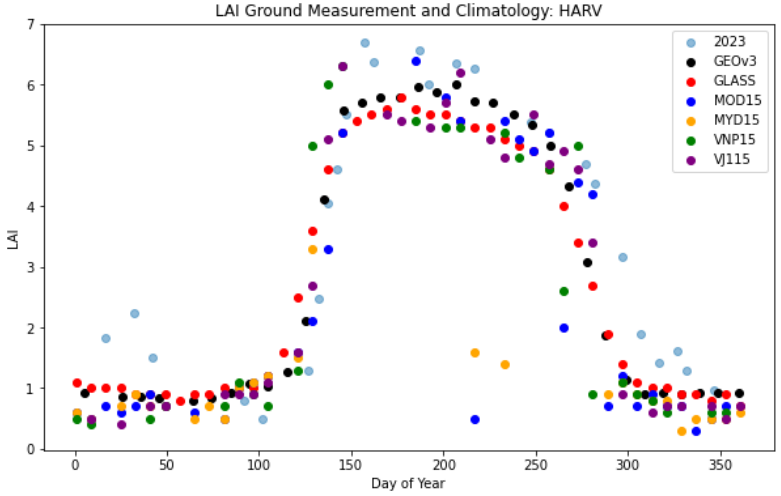
- Objective
  - To deal with the issues found in the validation.
  - Improve the LAI product by refining the training LAI dataset.
- Methodology
  - Include the sentinel-3 LAI as the additional reference, along with current MODIS ang GLASS LAI. S3 LAI will be served as a third data source with high resolution and not derived from MODIS observation.
  - Ground measurement also used as the quality control, for the data fusion. Ground LAI will not directly be used for training but for data selection and fusion.
  - Reprocess the training surface reflectance to use updated algorithm and be consistent with operational product.



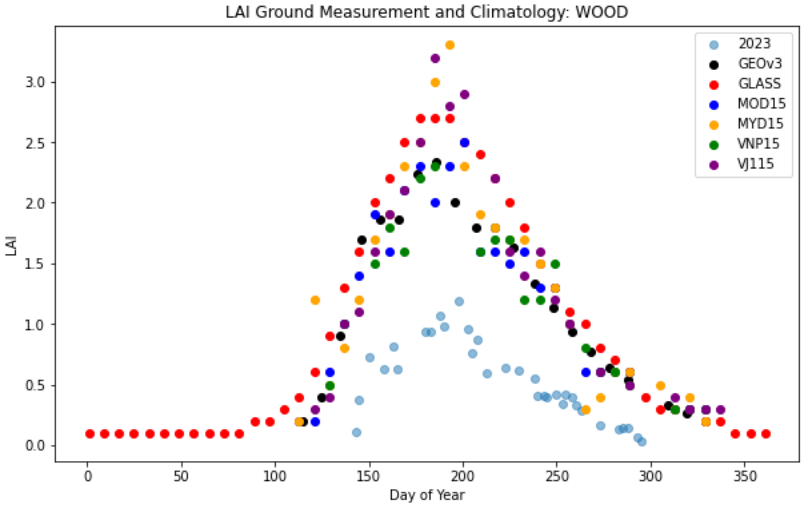
Sentinel-3 300m LAI product (10-day refresh rate)



Long term ground measurement and LAI climatology, ground LAI outliers will be identified and double check.

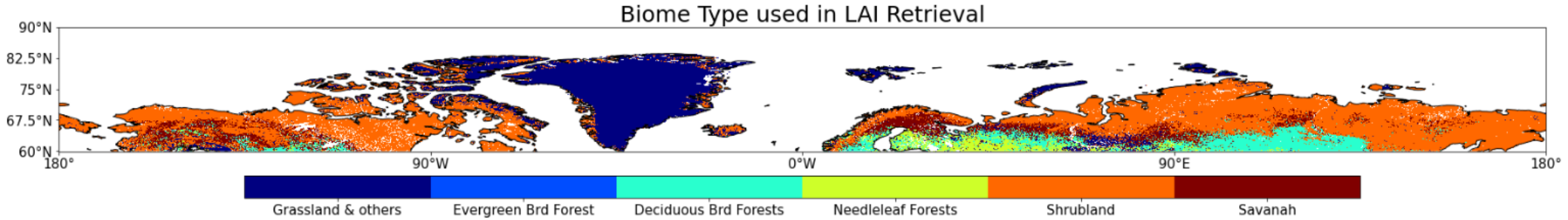


Ground measurements and existing LAI products, data fusion method will be used to get best LAI estimation (Site: Harvad Forest).



For some sites like WOOD (grassland), the satellite LAI and ground LAI with significant difference, site will be further evaluated.

High Latitude LAI Analysis



- **Background**
  - According to model team feedback, high latitude LAI show overestimated seasonal variation, particularly for the evergreen needleleaf forest.
- **Summary**
  - Evergreen needleleaf forest is not the dominant biome type beyond 60°N; shrubland is more prevalent.
  - Winter LAI Climatology is inferred from growth models primarily based on summer data, with limited ground measurements available for validation.
  - During the polar night, LAI is less sensitive to the model due to the absence of photosynthesis.
  - In this region/period, snow plays a more dominant role in energy balance than vegetation.
  - For evergreen needleleaf forests, large seasonal variations are observed, need more evaluation.

Boreal forest covered by snow

LAI 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	

NUCAPS Products

April, 2025

Accomplishments / Events

- 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; MetOp-C vs Terra CERES) are meeting the requirements extremely well (see Figure).
- Two abstracts submitted for IGARSS-2025 were accepted, one for oral and the other for a poster presentation. Team members are looking for guidance with respect to registration deadline.
- The AWS COVID-19 server access was abruptly closed on April 3. Datasets as well as scripts and configuration files were downloaded to minimize the impact. The AWS account was reinstated as the PWS cluster once again and NUCAPS team accounts as well as necessary functions to run NUCAPS reprocessing efforts were resumed (May 5). NUCAPS team has been working diligently invoking all the server scripts and validated S-NPP runs with reprocessed (RP2 version) SDRs.
- 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 in progress.
Mission-long reprocessing of NOAA-21 NUCAPS products: Reprocessing version and evaluation of reprocessed products	Jun-24	Jul-24	Delayed but on-going	AWS COVID-19 server abruptly closed on 4/3 and reinstated as PWS on May 5. This has caused a 4 week delay of processing.

Overall Status:

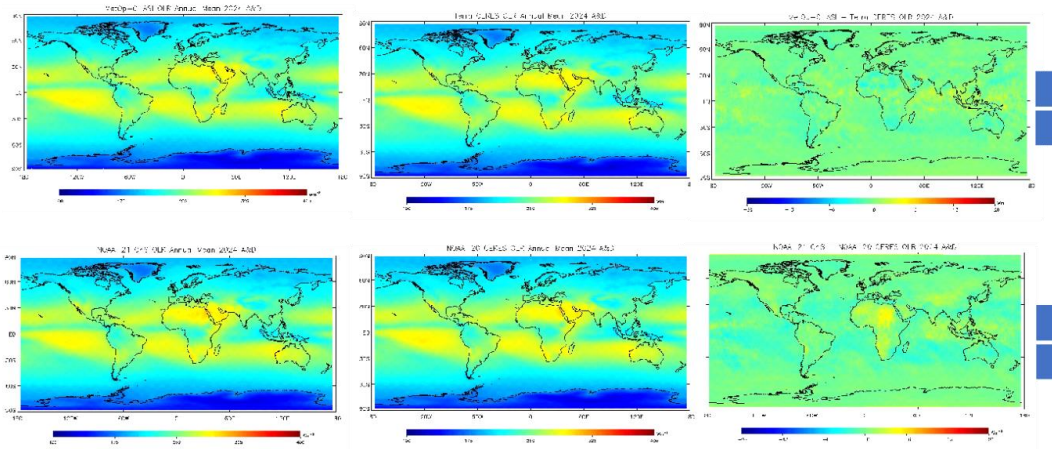
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic			X		
Schedule		X			

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:

See variance explanation in the milestone table.

MetOp-C (10:30 AM) and NOAA-20/21 (1:30 PM) OLR product validations Annual Mean and STDEV of Differences with NOAA-20 and Terra CERES



Annual mean and standard deviation differences of OLR product with the CERES (NOAA-20/21 vs NOAA-20 CERES; MetOp-C vs Terra CERES) are meeting the requirements extremely well.

NUCAPS FY25 Milestones/Deliverables
Path Forward ~ High priority tasks/milestones

April, 2025

	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		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		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		

Surface Albedo

April, 2025

Accomplishments / Events:

- Supported the integration of VIIRS BRDF
  - Attended the weekly JIRA meeting
  - Document Demo revision
- Engaged users in VIIRS LSA/BRDF for the dust prediction
  - Delivered historical and near-real-time (NRT) data to users
- Sea-ice albedo climatology enhancement plan
  - Collected L3 VIIRS LSA data
- Analyzed yearly North America Albedo to 10 yeas ago
- Explained the rationale for promoting direct use of L3 LSA for METOP LSA

Overall Status:

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

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Issues/Risks:

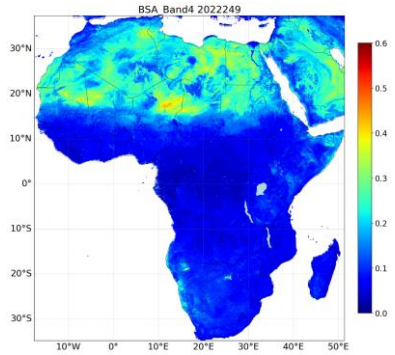
Milestones	Original Date	Forecast Date	Actual Completion	Variance Explanation
Support the integration and cloud transition of the VIIRS BRDF	Dec-2024	Dec-2024	Sep-2024	Delivered in Sep-2024. Integration in 2025
Develop and assess blended VIIRS SURFALB albedo algorithm	Dec-2024	Dec-2024	Dec-2024	
New Satellite Adaptation and algorithm performance improvement	Mar-2025	(Dec-2025)		Deferred due to unavailability of JPSS-3 proxy data
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:

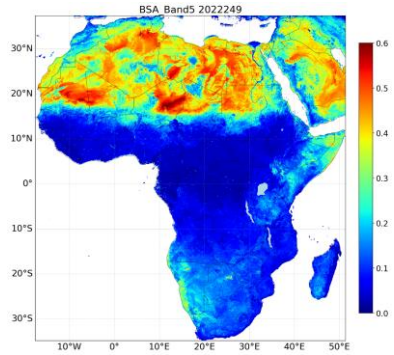
VIIRS BRDF Test Data

We developed local execution capability to generate near-real-time VIIRS BRDF products and delivered them to users.

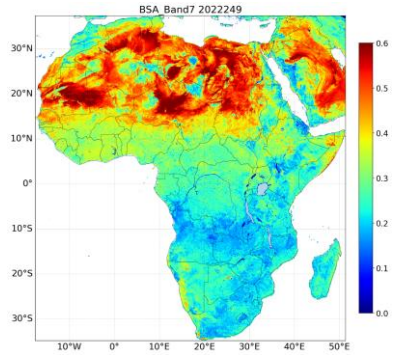
Band 4 BSA



Band 5 BSA

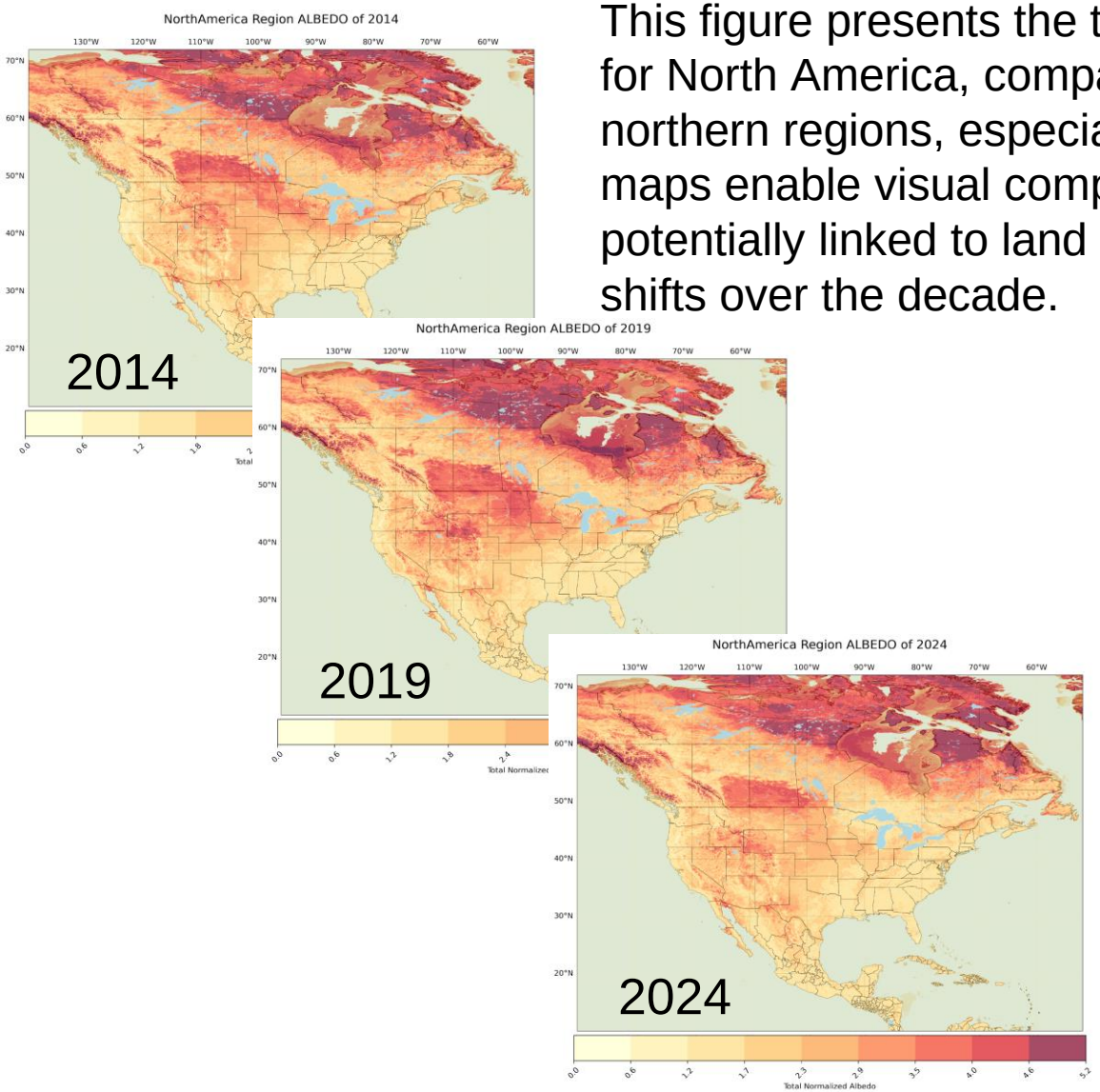


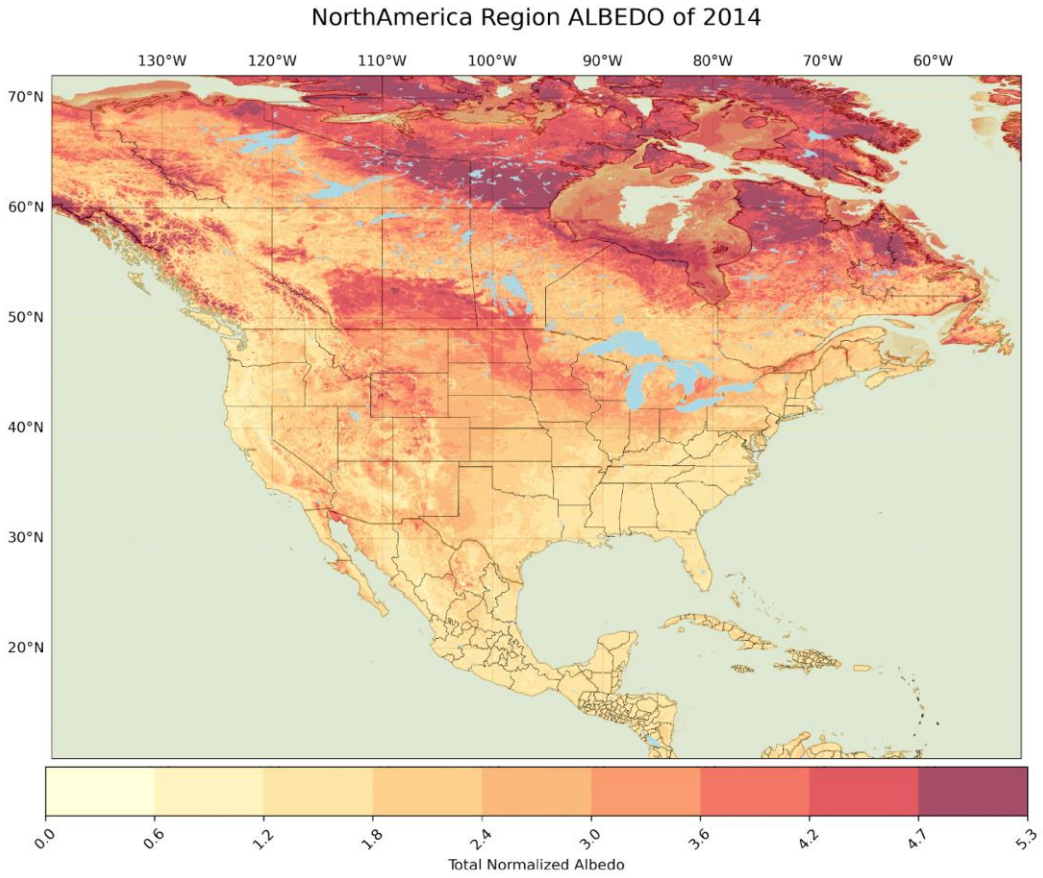
Band 7 BSA



The total sum of albedo values over 12 months after normalization

This figure presents the total sum of normalized albedo values over a 12-month period for North America, comparing the years 2014, 2019, and 2024. Across the three years, northern regions, especially in Canada, reflecting seasonal snow and ice effects. These maps enable visual comparison of interannual variability in surface albedo patterns, potentially linked to land cover changes, wildfire events, or climate-driven snow cover shifts over the decade.





Land Surface Temperature

April 2025

Accomplishments / Events:

- For the all weather LST, a new training model was developed incorporating the NDVI data availability flag. Cross-testing was conducted using both training dataset and real satellite data with different gap filled NDVI values, showing improved performance in scenarios with missing NDVI. Deeper models with more hidden nodes (e.g., 32/6 configuration) were also tested, but they did not yield significant improvement in fitting statistics.(slide 2-4)
- The L3 VIIRS LST code update demo slide was completed and shared with the ASSISTT integration team. (slide 5)
- Presented the talk “Satellite LST Monitoring Over UrbanNet Stations Using VIIRS I-band Observations” at the Quarterly NOAA heat convening on April 10, 2025.
- Obtained one year of UrbanNet ground observations from data provider, conducted quality checks and performed validation against L3 VIIRS LST (Highlights, slide 6-8) and GOES-R LST products (slide 9-12).
- For subset data generation to support long-term monitoring of L2 VIIRS LST, UrbanNet stations were added to the monitoring list. The code for daily satellite data extraction was completed and tested, and historical datasets are processed using available data from SCDR. The subset is now being generated on a daily basis.

Overall Status:

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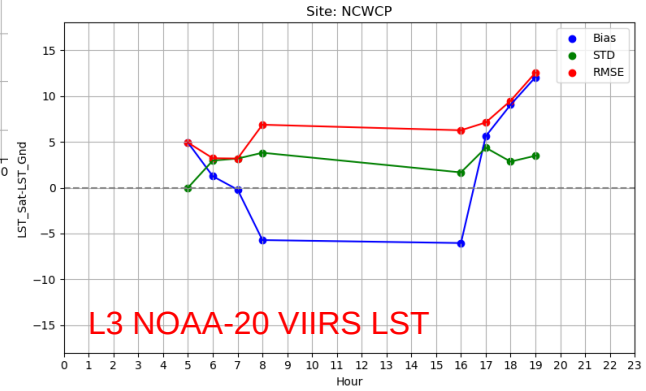
Issues/Risks:

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		Upon the availability of J-3 proxy data
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: UrbanNet Observations for Satellite LST Validation

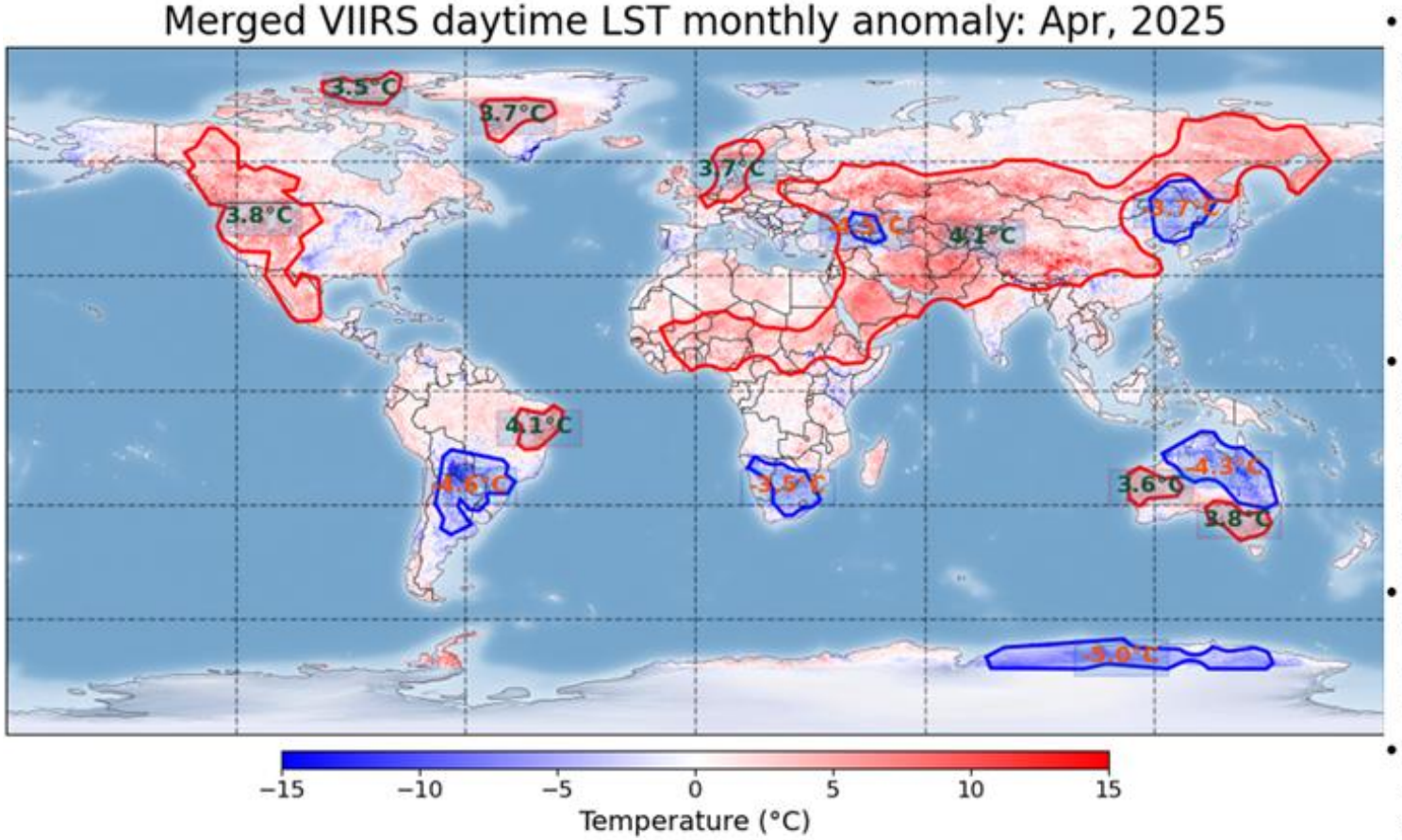
Hourly analysis is conducted between satellite and ground observations.



The plots show the analysis results from the NCWCP station of UrbanNet.

Highlights from the Science Teams (April)

Global Monthly LST Anomaly Overview (April 2025)



- The widespread warm anomaly that covered most of Europe, northern Africa, and South Asia last month persisted and extended further east into Russia's Far East. Affected areas experienced temperatures around **4.1°C** above average, with the highest anomaly recorded in Afghanistan at **6.1°C**.
- In North America, two warm anomalies along the west coast merged, while separate warm anomalies over the Canadian Arctic Archipelago and Greenland continued.
- Northern Australia saw a rapid shift from a heatwave to a cold anomaly, with temperatures dropping **4.3°C** below average.
- In South America, the cold anomaly expanded, displacing the warm anomaly toward the northeastern Brazil.

The Land Product Development team has generated a monthly report of global LST anomaly in April 2025. The report shows global and regional differences of the satellite observed LSTs in the month, compared to a previous 12-year average LST data set. It helps tracking the LST deviations and providing critical insights into climate trends. The satellite LSTs are from NOAA operational JPSS.

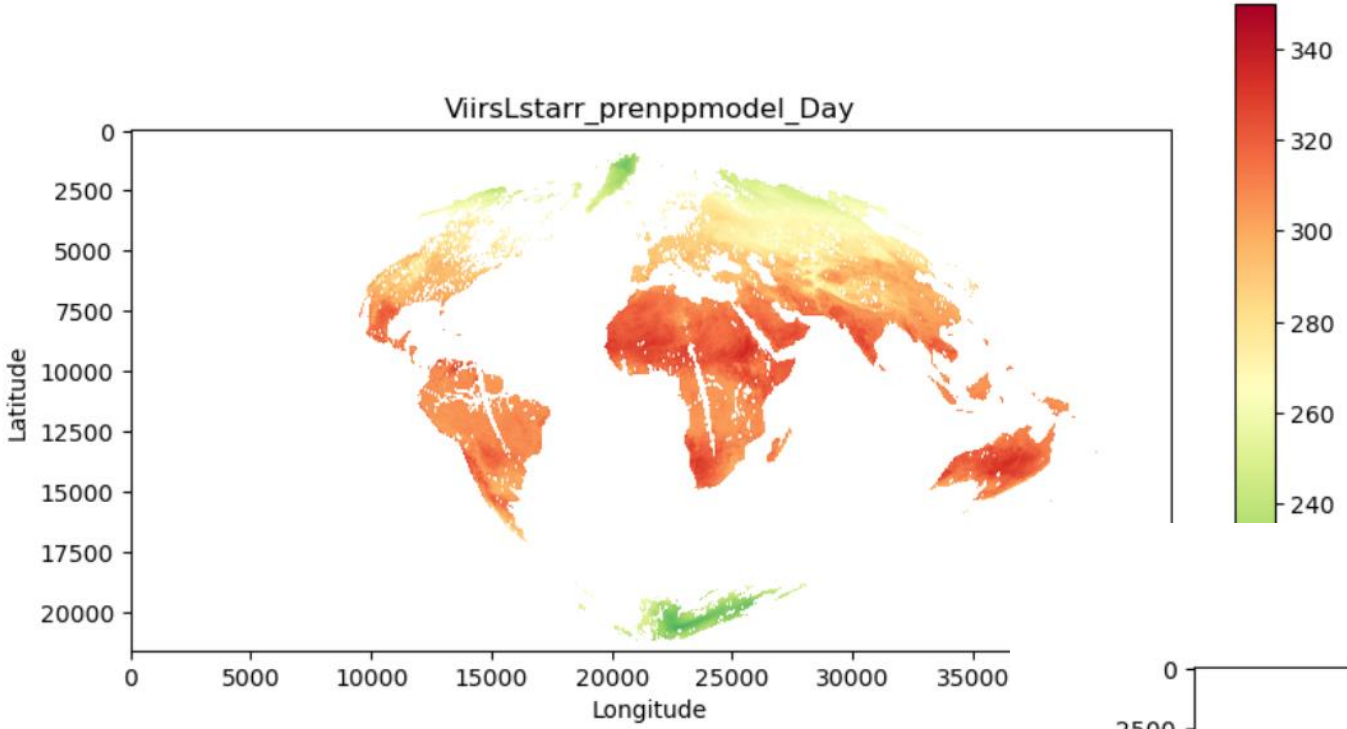
All-Weather LST Training Model Test

					Day			Night	
	Model	Fill Value	Parameters	Bias	RMSE	STD	Bias	RMSE	STD
Model 1	NDVI missing flag	0	25,5	0.7	4.4	4.4	0.2	3.6	3.6
			16,6	-0.7	4.5	4.5	0.7	3.8	3.7
Model 2									
		Median	25,5	0.4	4.3	4.3	-0.3	3.6	3.6
Model 3									
Model 4			16,6	0.6	4.5	4.5	0.5	3.7	3.7
Model 5	NDVI available only		25,5	0.5	4.4	4.4	0.3	3.5	3.5
Model 6		Median	32, 6	0.6	4.4	4.3	0.1	3.5	3.5

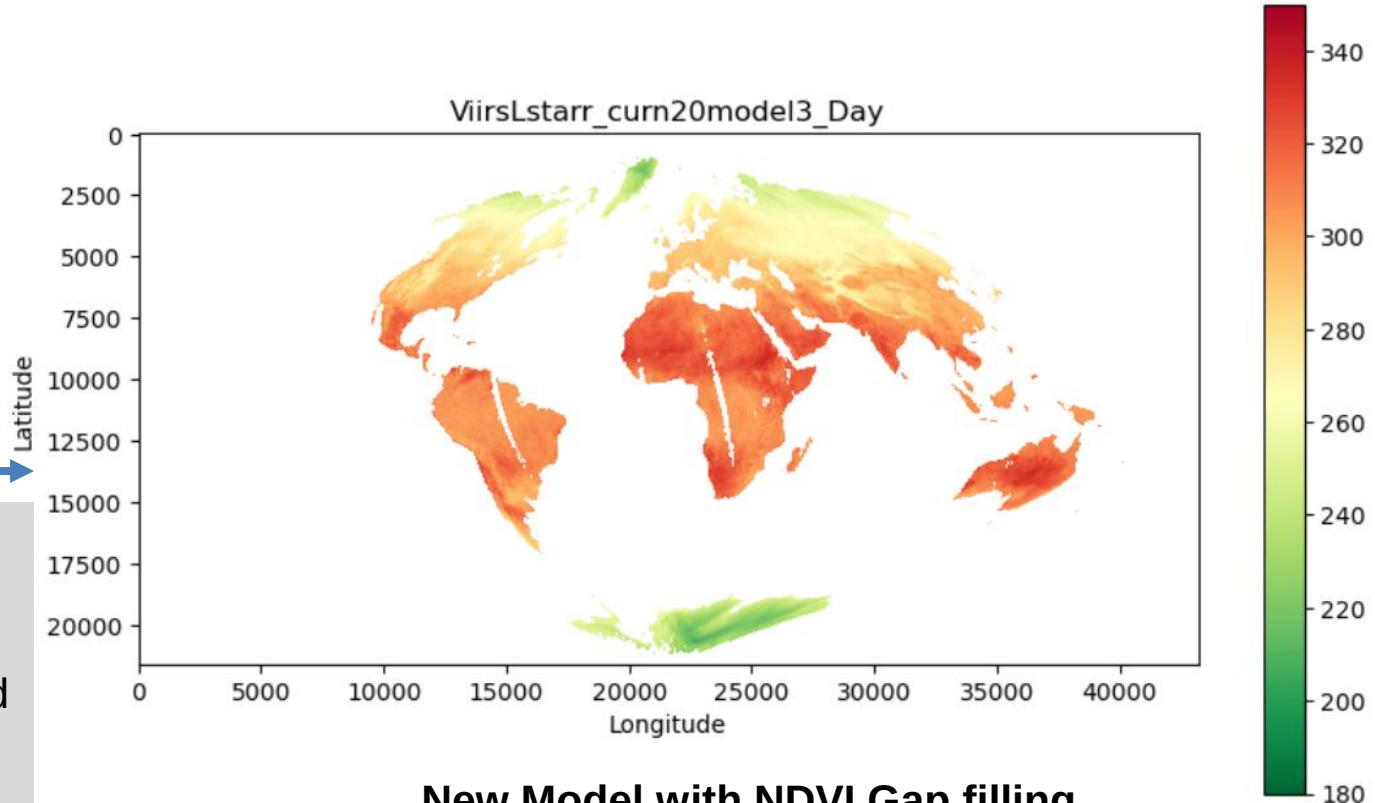
- The slide presents various training models tested under different scenarios, focusing on NDVI data availability and the depth of neural network model nodes
- Model 1 to 4 are newly developed models that incorporate an NDVI data availability flag and use gap filled NDVI values (either 0 or the median value)
- Model 5 is the current model, which only uses data where NDVI is available in the training.
- Model 6 corresponds to model 3 but uses a deeper neural network architecture.

All-weather Daytime LST Training Model Update and Test

The NOAA-20 daytime L3 VIIRS LST on March 15, 2024 was used for the test.



Previous Model with NDVI Data Missing

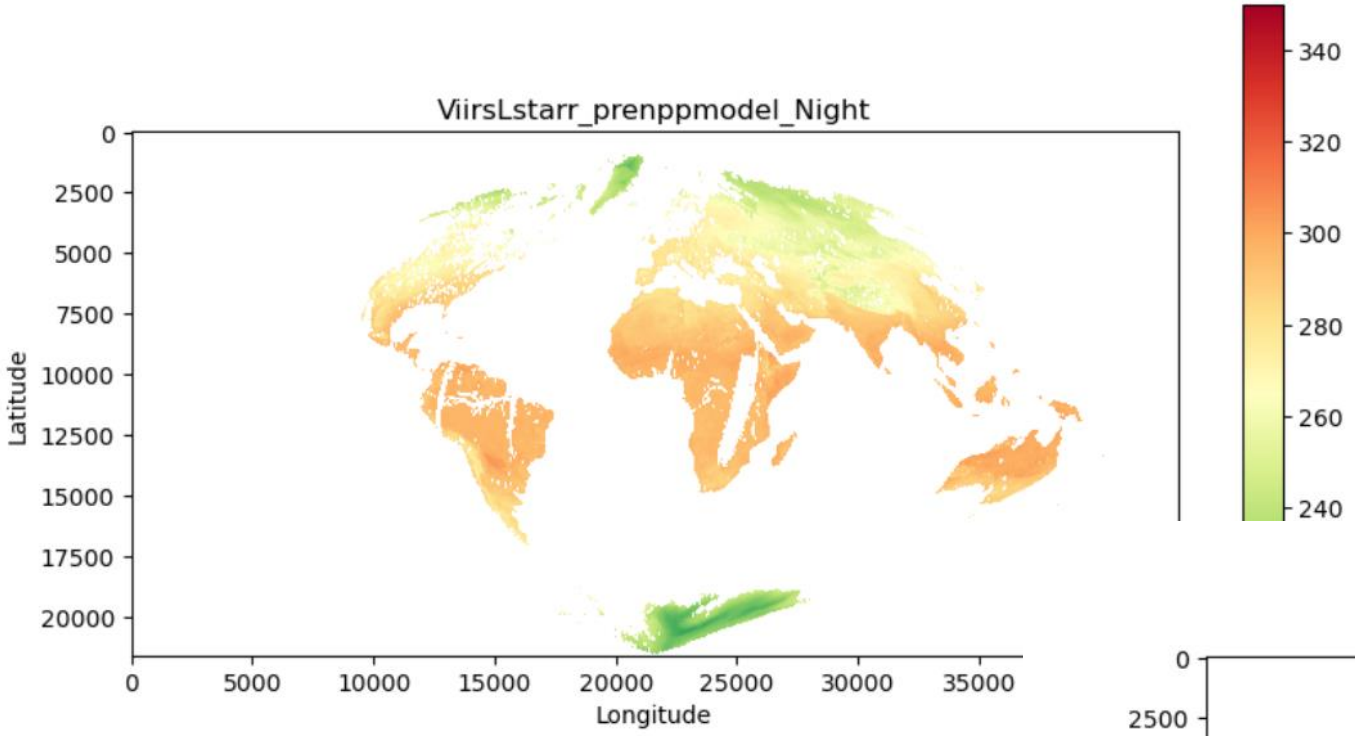


New Model with NDVI Gap filling

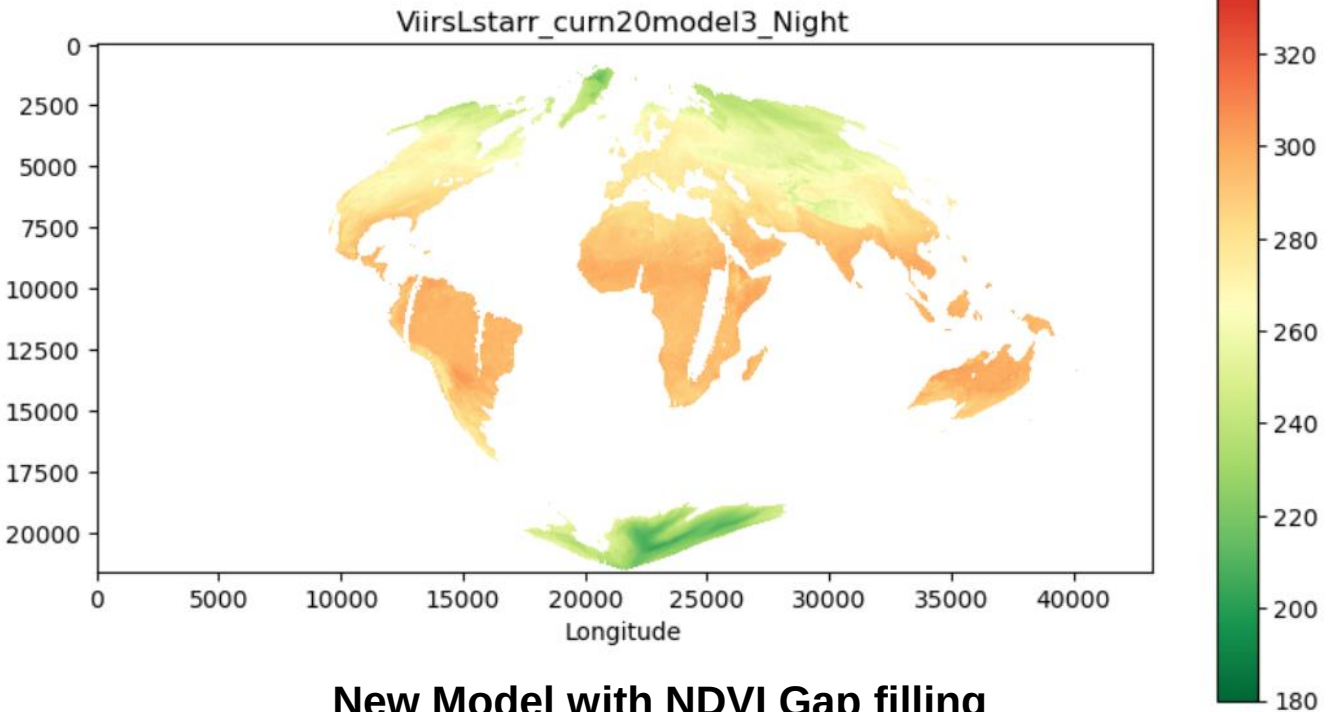
- Previous model suffered from the LST gap due to the input NDVI data missing (top left figure)
- A new training model was developed incorporating the NDVI data availability flag. Different values were tested for the gap filling. Bottom right figure shows the result for Median value filling.

All-weather Nighttime LST Training Model Update and Test

The NOAA-20 daytime L3 VIIRS LST on March 15, 2024 was used for the test.



Previous Model with NDVI Data Missing



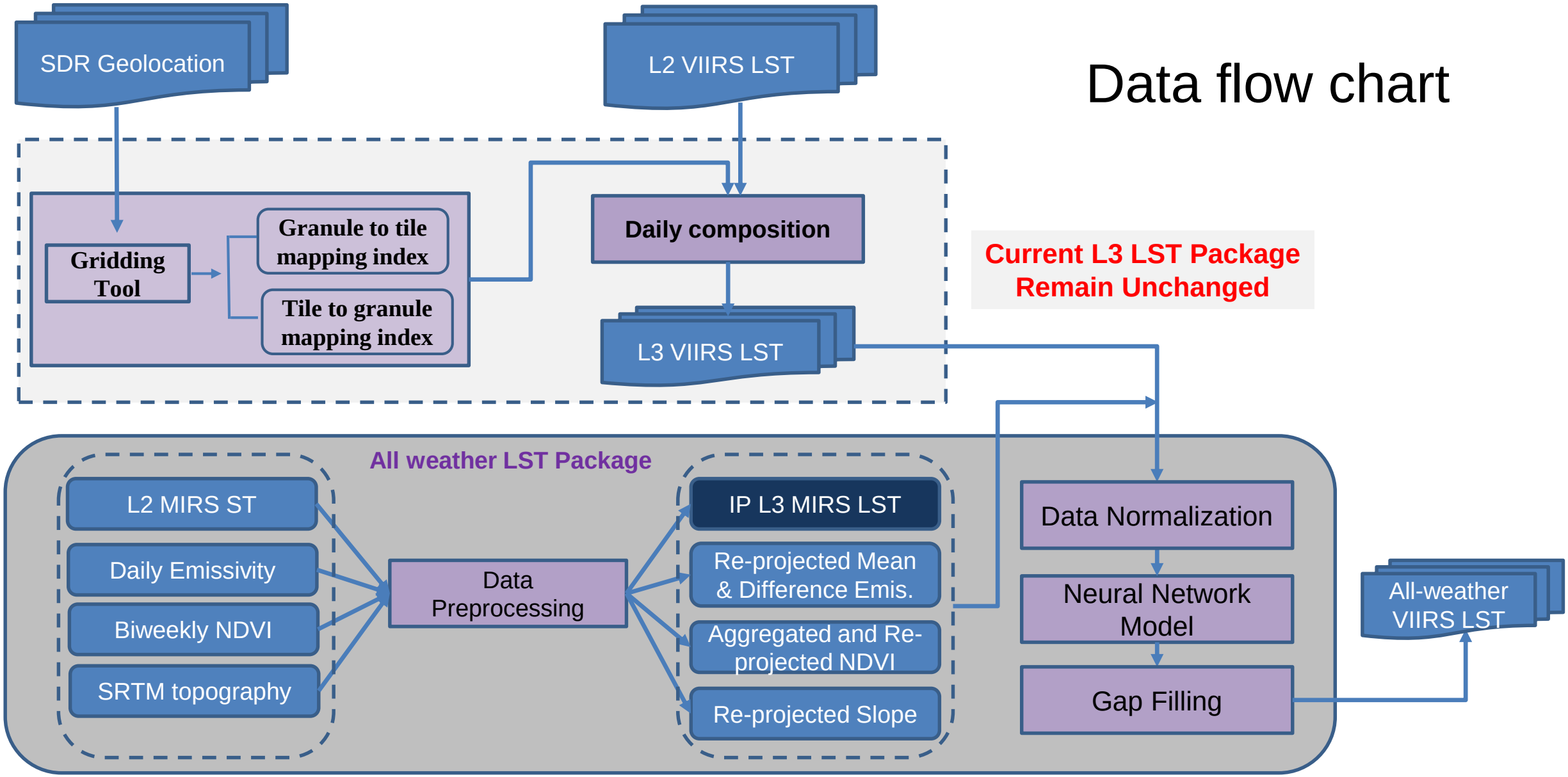
New Model with NDVI Gap filling

- Previous model suffered from the LST gap due to the input NDVI data missing (top left figure)
- A new training model was developed incorporating the NDVI data availability flag. Different values were tested for the gap filling. Bottom right figure shows the result for Median value filling.

L3 VIIRS All-Weather LST Science Code Demo

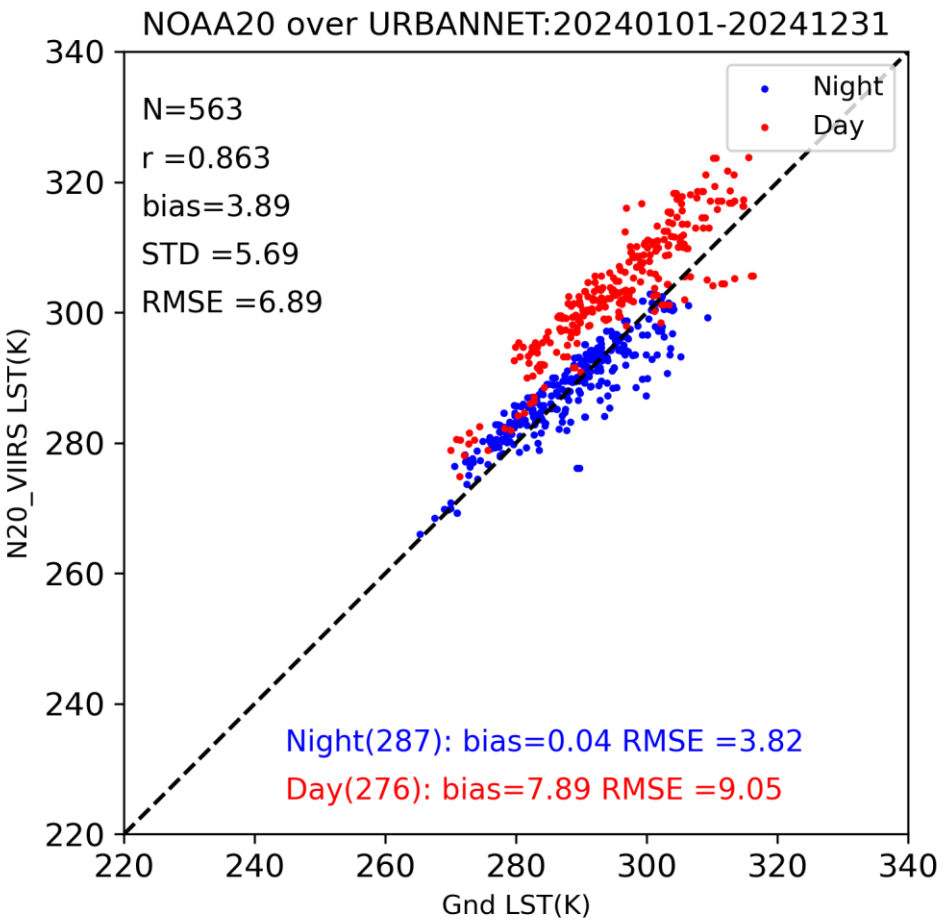
April 2025

Data flow chart



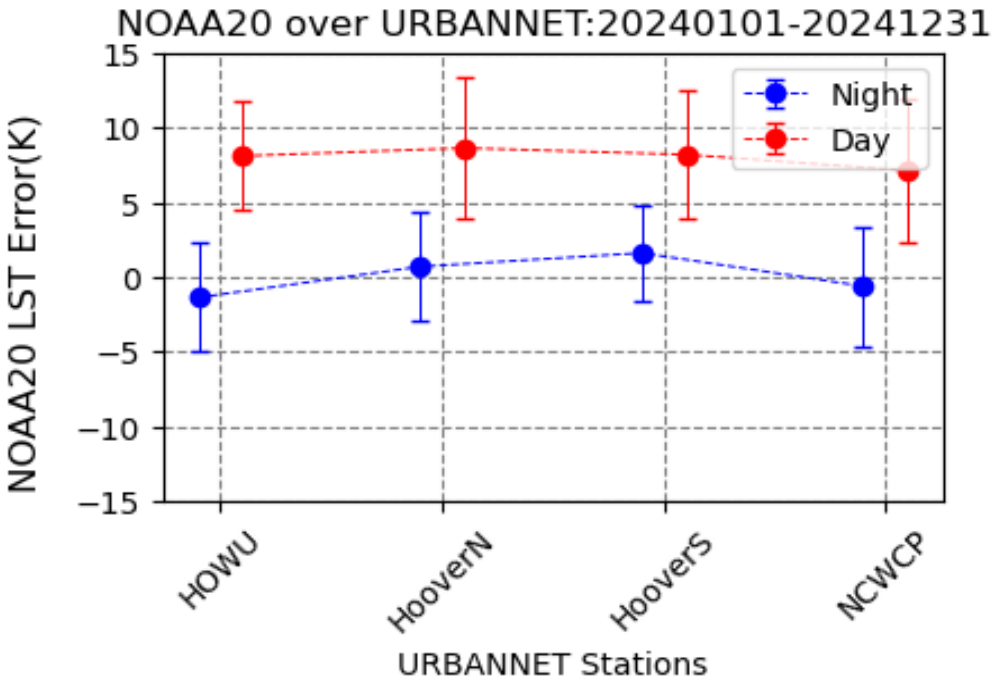
L3 VIIRS LST Validation against UrbanNet Observations

April 2025



Combined results from all four stations for both daytime and nighttime

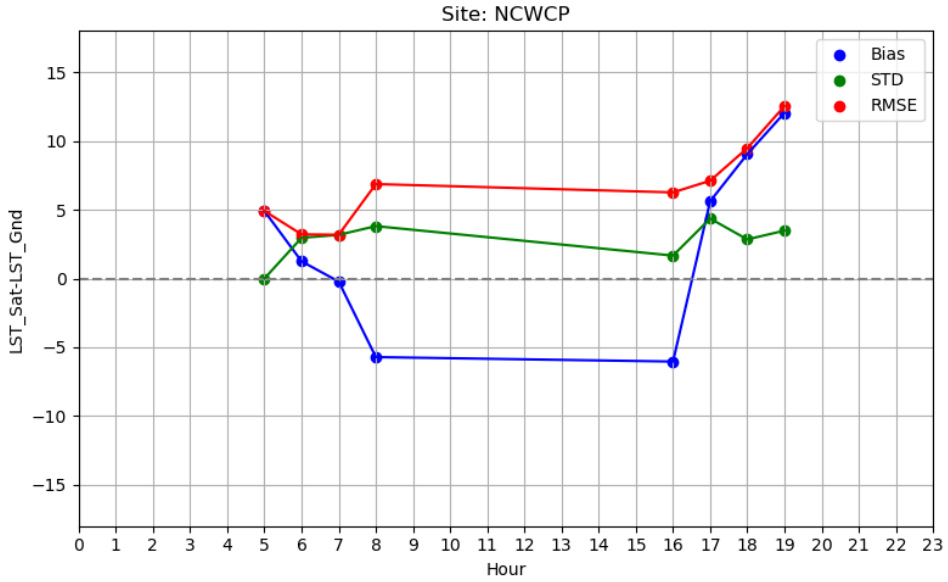
Site wide validation results

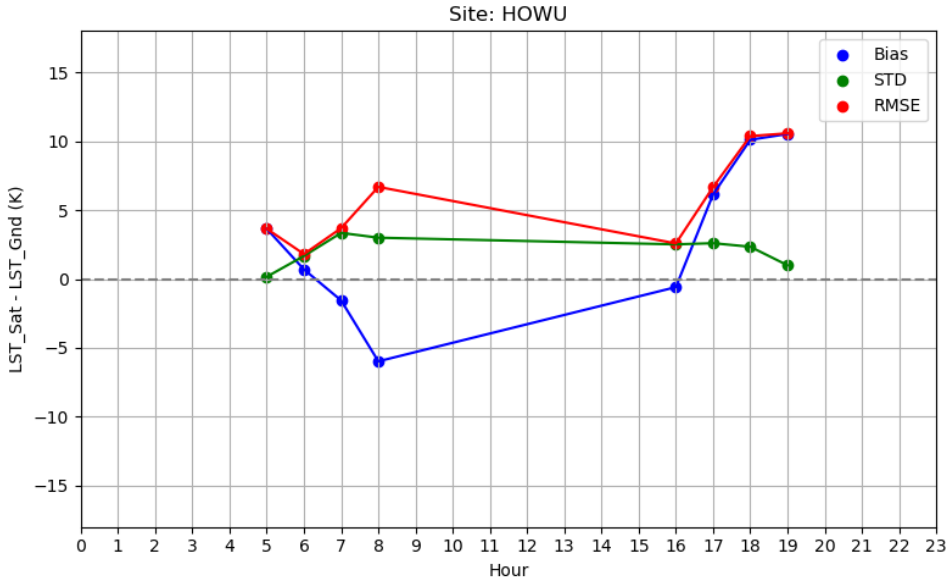


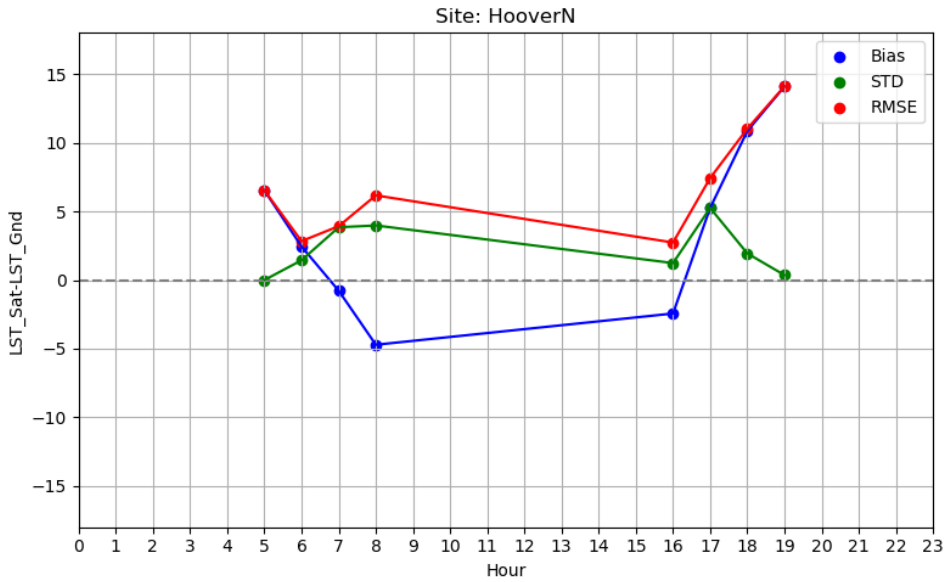
- The ground observations from UrbanNet were used to validate the L3 VIIRS LST product. The data cover four stations: NCWCP, Howard University, Hoover South, and Hoover North. The temporal coverage spans varies among stations, generally from early June to December, 2024.
- The overall validation results show a significant deviation of 7.9 K during the daytime, resulting in a RMSE of 9 K for the combined data. In contrast, the nighttime results exhibit nearly zero bias with a RMSE of 3.8 K.
- Sitewide results indicate a consistent positive bias of around 8 K across all four stations, while nighttime bias fluctuate slightly between positive and negative values within a narrow range.

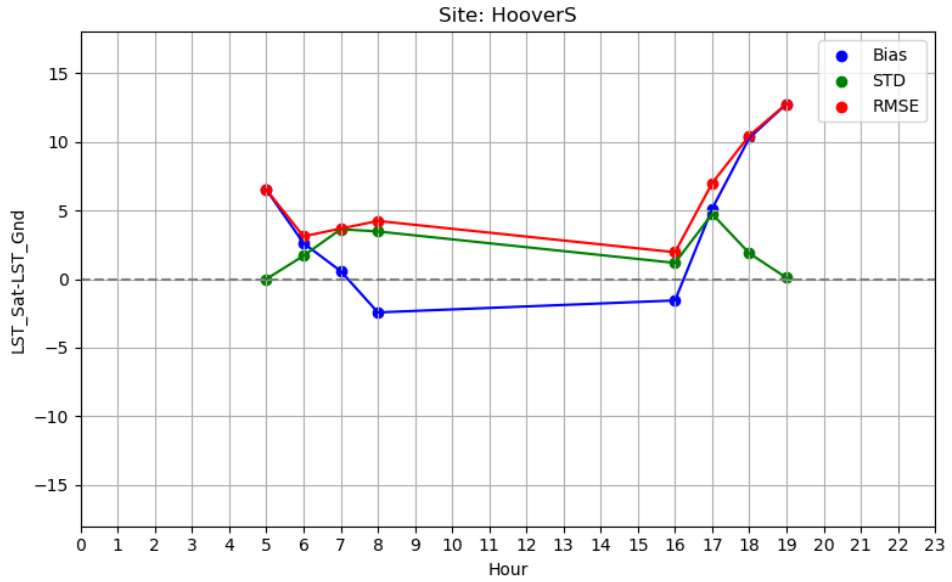
Hourly Analysis between Satellite LST and Ground LST

April 2025







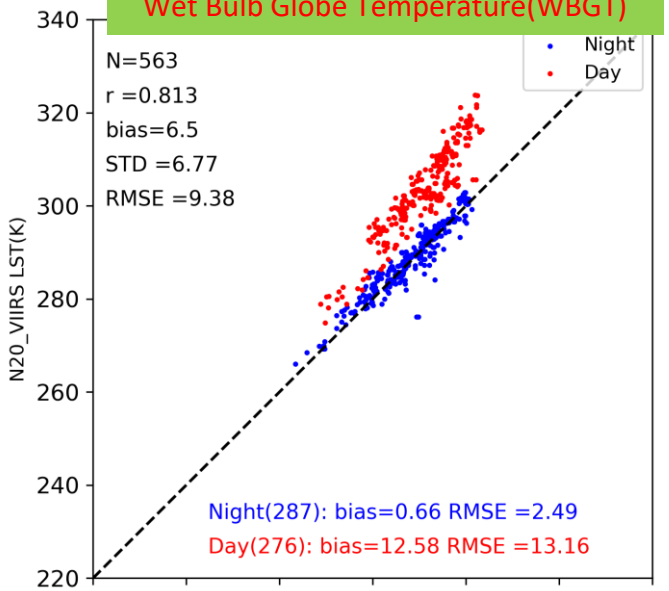


- Hourly analysis is conducted between satellite LST and ground observations.
- The matchup hours concentrated between UTC 05:00 to UTC 08:00 for nighttime, and UTC 16:00 to UTC 19:00 for daytime.
- The bias is generally decreasing with hour at nighttime from ~5K to about -5 K, whereas the daytime bias is increasing with hour from negative to positive 10 K.
- STD varies at a smaller magnitude between 2 K to 5 K.

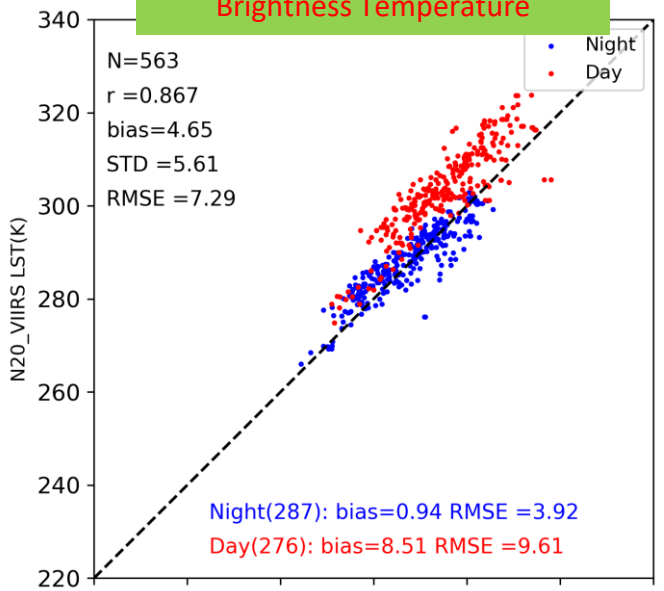
Correlation with Other Temperature Observations

April 2025

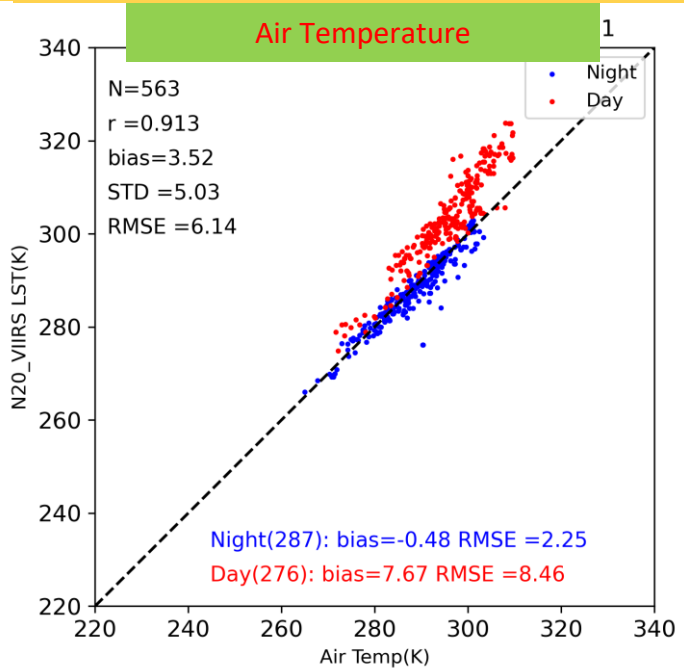
Wet Bulb Globe Temperature(WBGT)



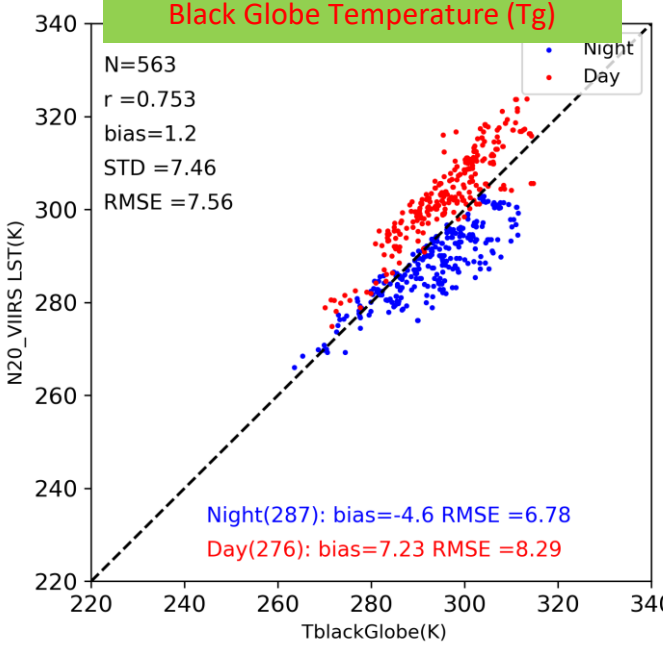
Brightness Temperature



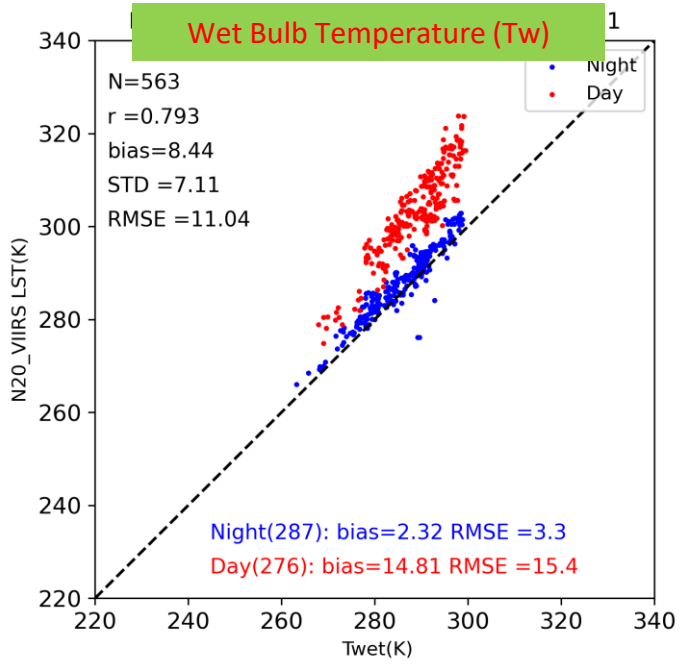
Air Temperature



Black Globe Temperature (Tg)



Wet Bulb Temperature (Tw)

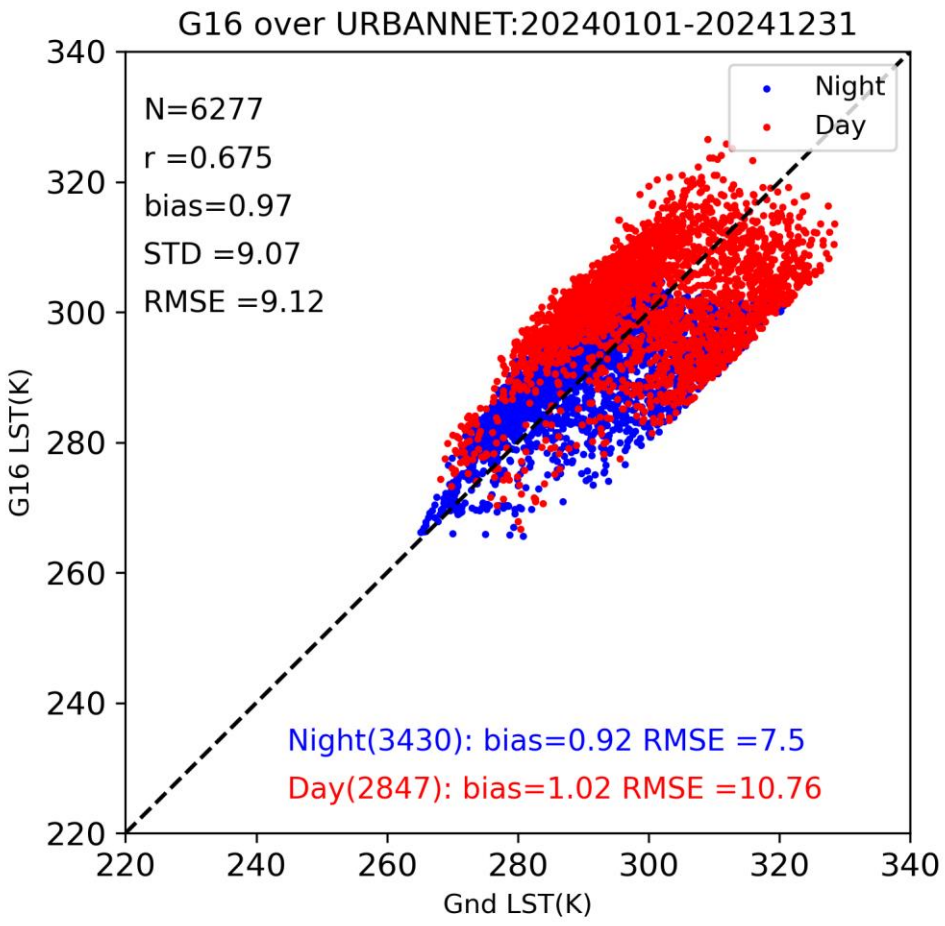


Correlation analyses were conducted between satellite-derived LST and UrbanNet ground observations, including air temperature, brightness temperature, black globe temperature, wet bulb temperature, and WBGT.

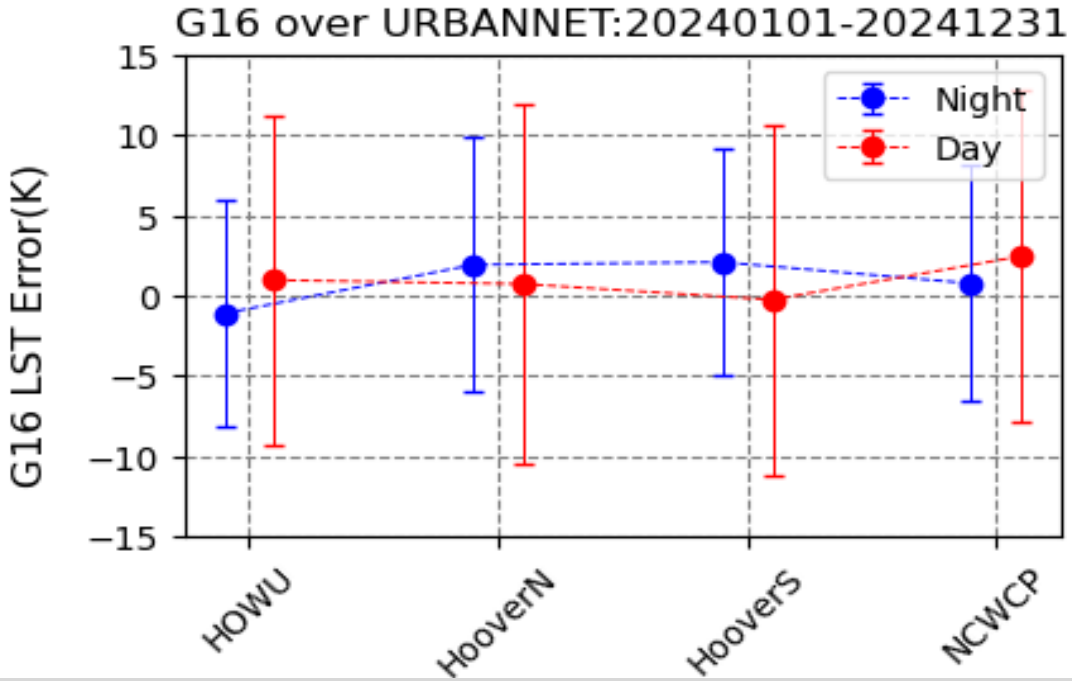
- VIIRS LST had the highest correlation with air temperature, followed by black globe temperature, WBGT, Tw, and Tg.
- Daytime difference analysis revealed that VIIRS LST most closely matched Tg, while Tw showed the largest positive bias. At night, VIIRS LST was most closest to air temperature, with Tg exhibiting the highest bias of -4.6 K.
- Notably, at higher temperature ranges, NOAA-20 VIIRS LST and WBGT displayed a parabolic relationship, where increasing satellite LST values corresponded to a plateau in WBGT, suggesting saturation of heat stress indicators under extreme conditions.

GOES-R LST Validation against UrbanNet Observations

Combined results from all four stations for both daytime and nighttime



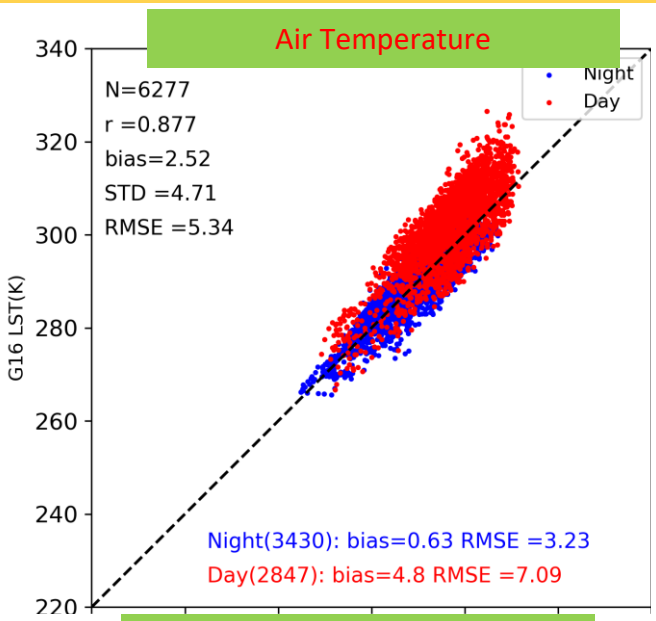
Site wide validation results

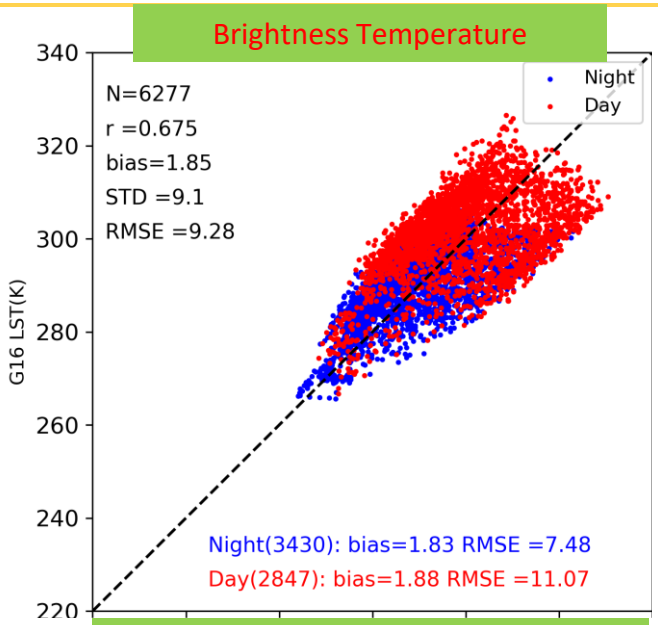


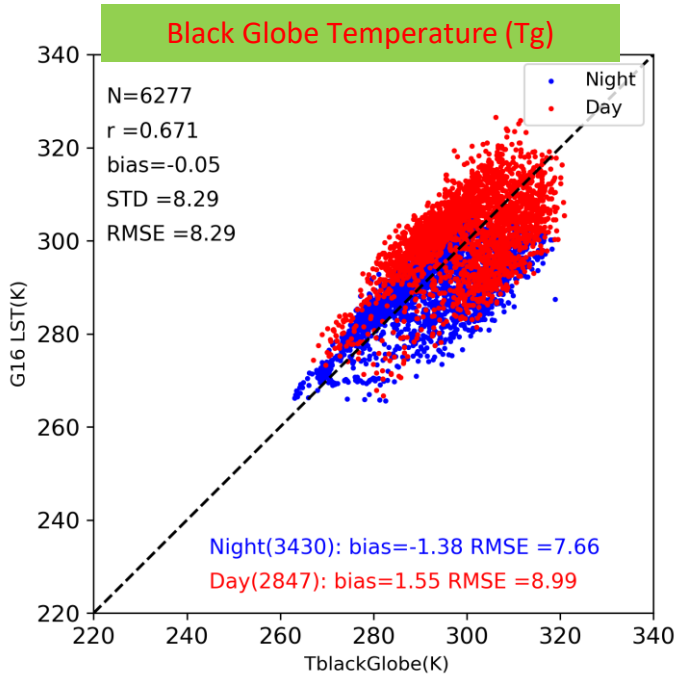
- The ground observations from UrbanNet were used to validate the GOES-R LST product, which was obtained from AWS and processed on the fly. The UrbanNet data cover four stations: NCWCP, Howard University, Hoover South, and Hoover North. The temporal coverage spans varies among stations, generally from early June to December, 2024.
- Compared to the validation results of the VIIRS LST, the GEOS-R daytime bias is much smaller- around 1 K, whereas the STD is larger; for nighttime, the bias is about 0.9 K, but the RMSE is significantly higher at 7.5 K.
- The sitewide results indicate a small bias but larger STD for both daytime and nighttime.

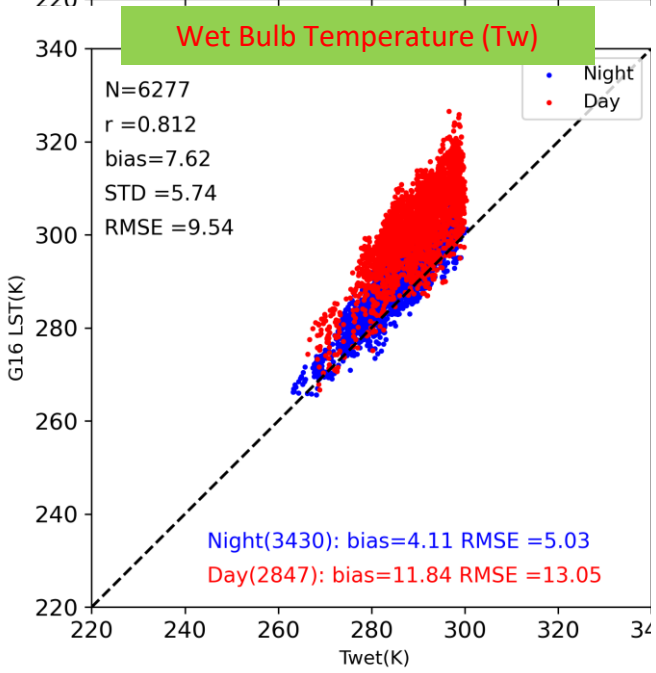
Correlation with Other Temperature Observations

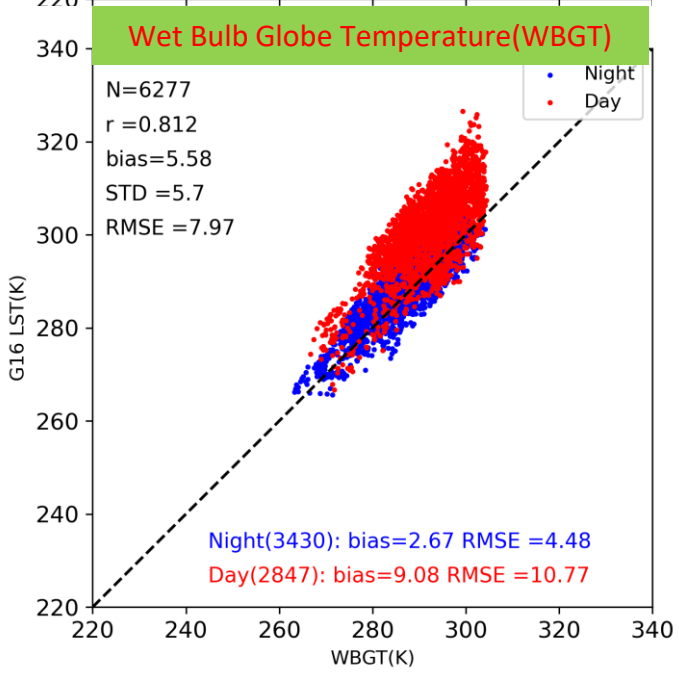
April 2025









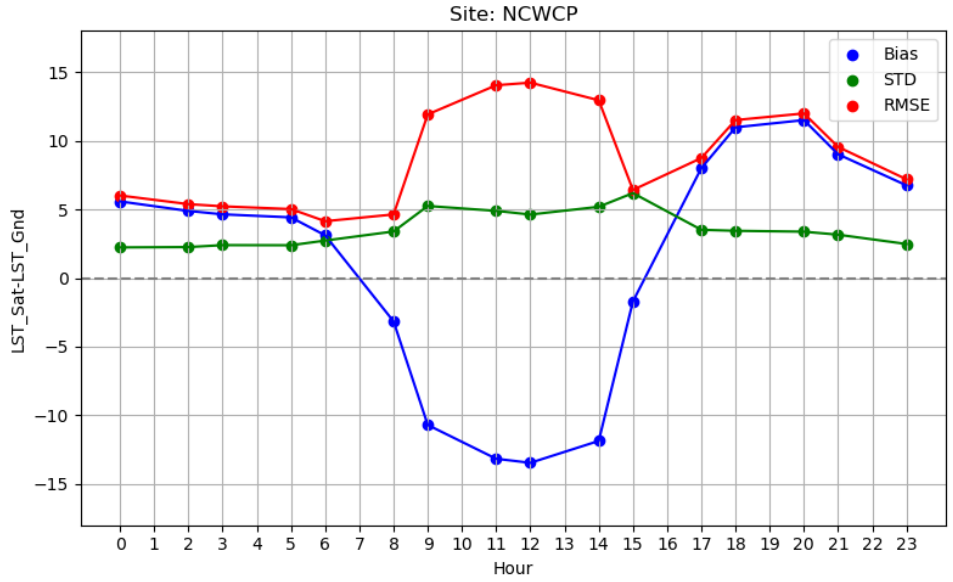


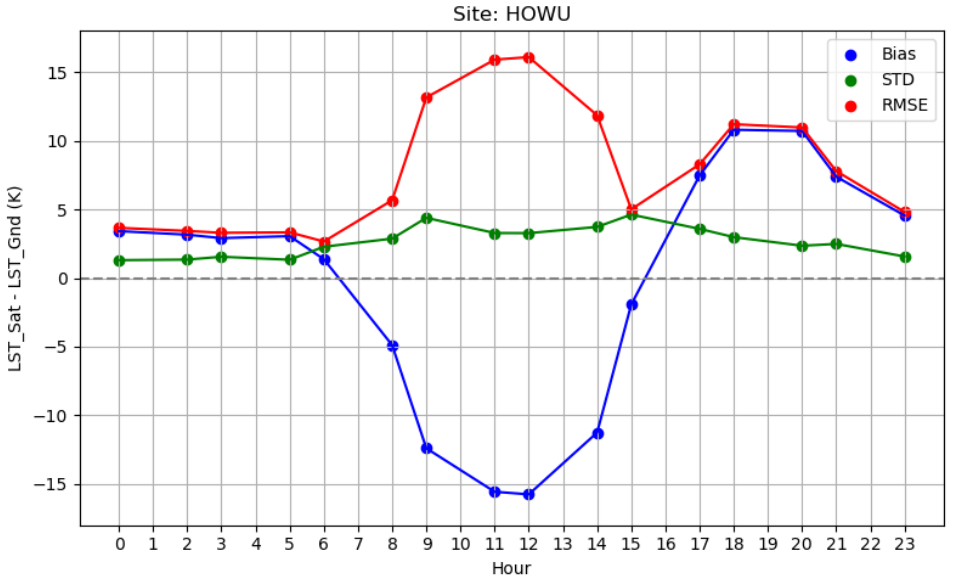
Correlation analyses were conducted between satellite-derived LST and UrbanNet ground observations, including air temperature, brightness temperature, black globe temperature, wet bulb temperature, and WBGT.

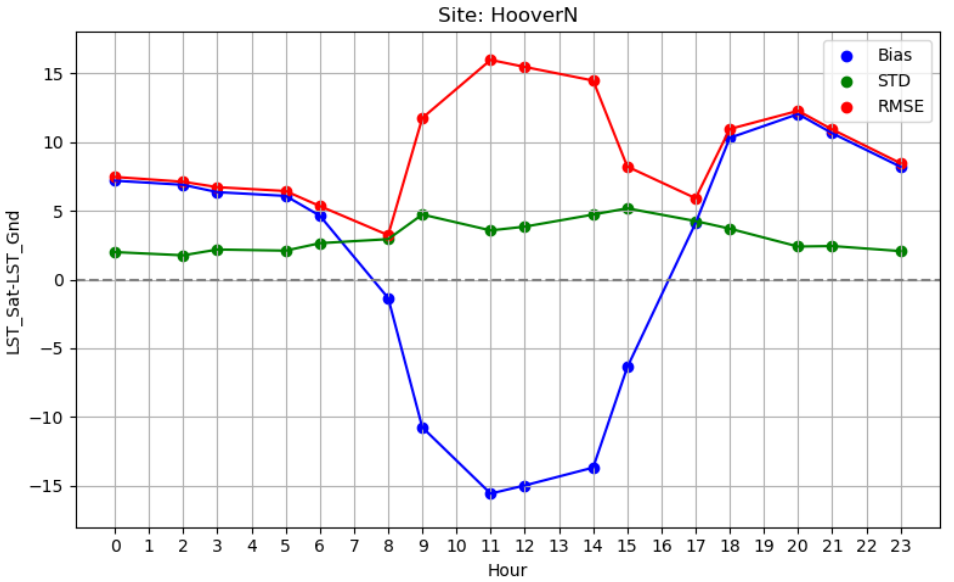
- GOES-R LST had the highest correlation with air temperature, followed by WBGT, Tw, BT and Tg.
- Daytime difference analysis revealed that GOES-R LST most closely matched Tg, while Tw showed the largest positive bias, the same pattern was observed at night.
- Notably, at higher temperature ranges, GOES-R VIIRS LST and WBGT exhibited a more pronounced parabolic relationship, where increasing satellite LST values corresponded to a plateau in WBGT, suggesting saturation of heat stress indicators under extreme conditions.

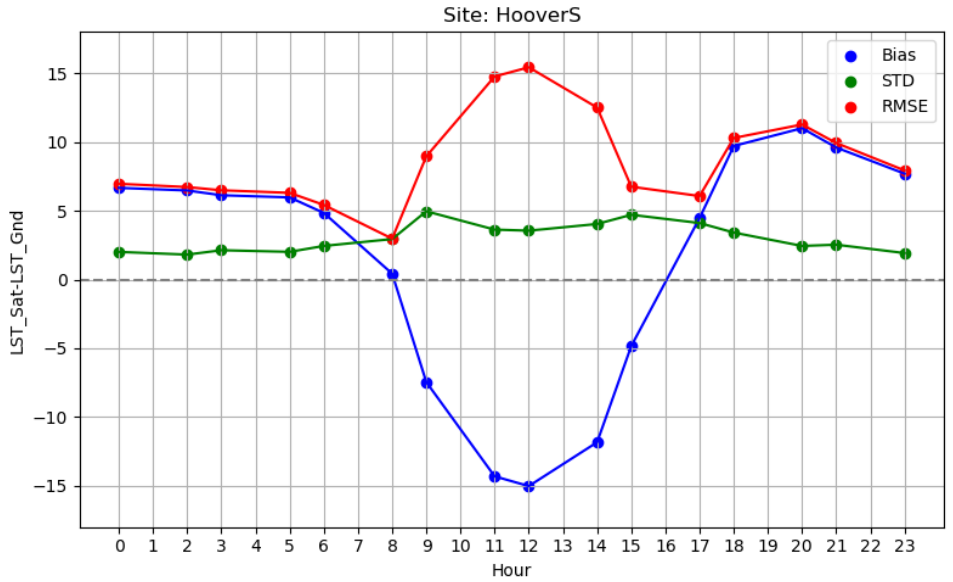
Hourly Analysis between Satellite LST and Ground LST

April 2025





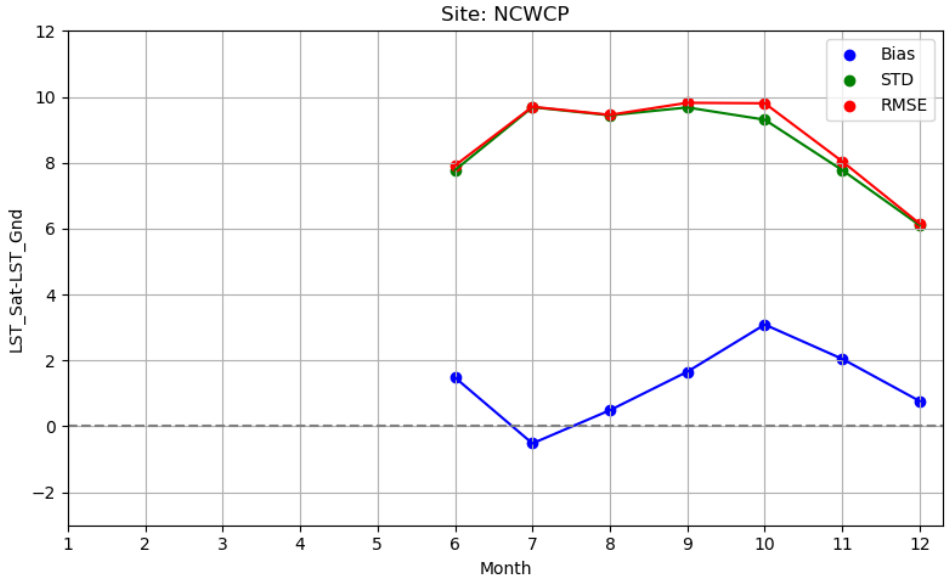


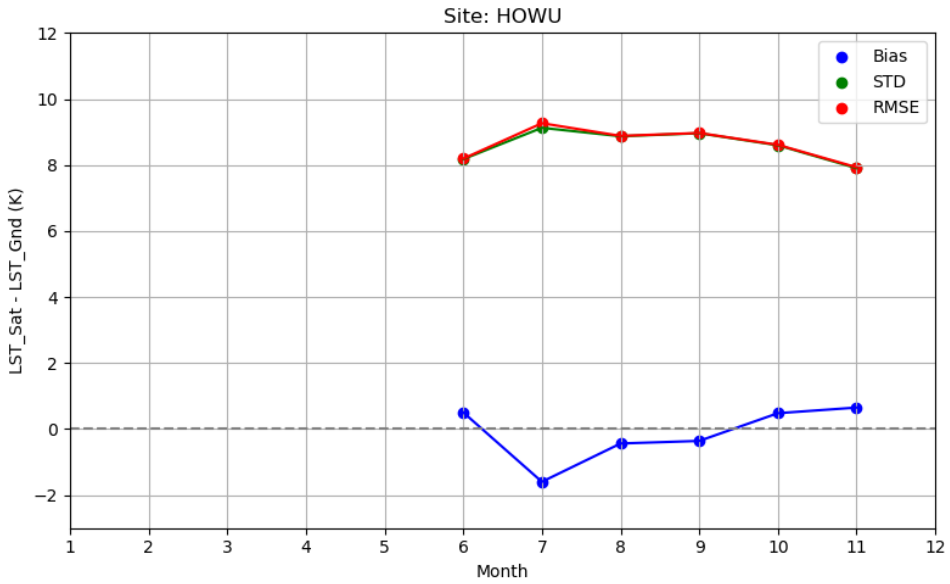


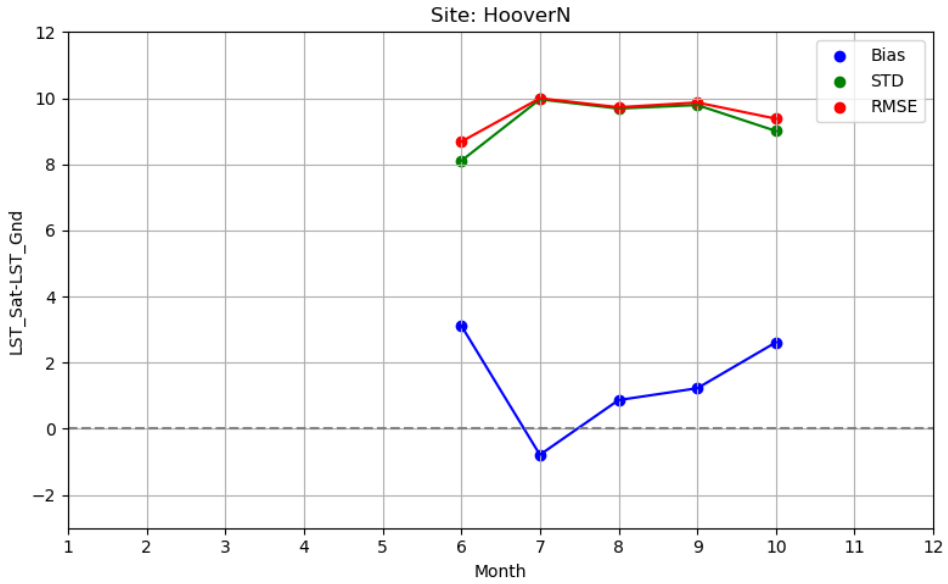
- Hourly analysis is conducted between satellite LST and ground observations.
- The bias is positive from UTC 00:00 to UTC 06:00, gradually decreasing from above 5 K to zero, and then decreasing dramatically until reaching the largest negative bias of more than -15 K around UTC 12:00. The bias then rapidly increases back to 0 K around UTC 15:00 or UTC 16:00, continuing to increase above 10 K at UTC 20:00, which represents the highest positive bias, and then decreases slowly thereafter.
- STD varies at a smaller magnitude between 2 K to 5 K.

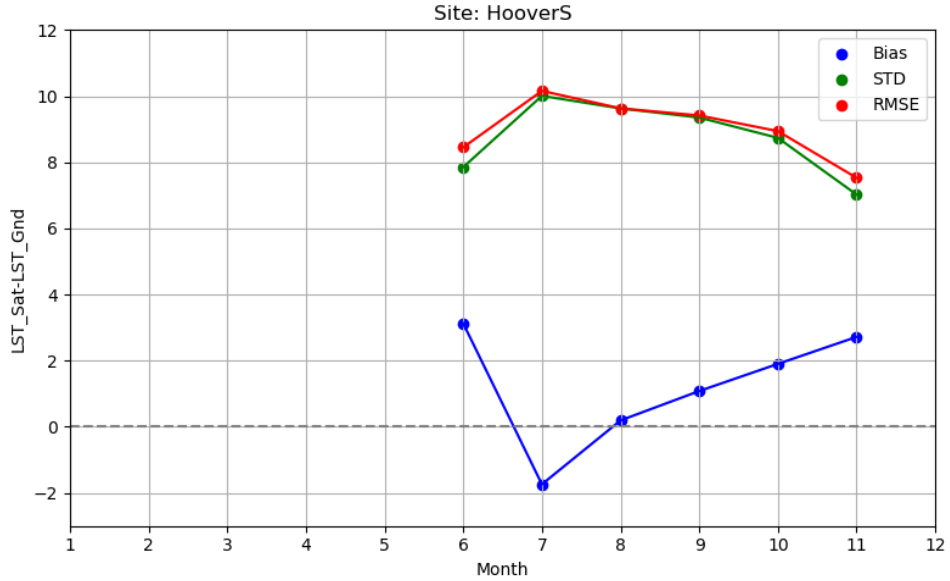
Monthly Analysis between Satellite LST and Ground LST

April 2025









- A monthly analysis was conducted between GOES-R LST and ground observations.
- The bias was consistently positive in June, became negative in July, and gradually increased thereafter, except at NCWCP, where the bias decreased after October.
- A significant STD was observed for each month across all four stations, with the highest STD occurring in July, reaching nearly 10 K.

MiRS Products

April 2025

Accomplishments / Events:

- Since the initial capability delivered in 2007, the MiRS team has successfully implemented many satellite microwave instruments including AMSU-A/MHS on NOAA-18, NOAA-19, Metop-A, Metop-B, and Metop-C, SSMIS on F-16, F-17, F-18, and F-19, GMI on GPM, and ATMS on SNPP, NOAA-20, and NOAA-21, and etc. With the era of new satellite microwave measurement (traditional or unique channel selections: additional frequencies or different polarization) coming such as Metop-SGA1 MWS, QuickSounder ATMS EDU and many smallsats, it would be necessary and interesting to investigate how much information content is included for each satellite microwave instrument. The efforts will include the Averaging Kernel calculation. Averaging Kernel quantifies the information content of optimal estimation retrieval systems and are key in understanding retrieval uncertainty and error which would be beneficial for the NWP data assimilation and the weather forecast. As one of the efforts, an example of the Averaging Kernel for SNPP ATMS is included and the diagnostic analysis will be extended to more satellites and instruments.

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				

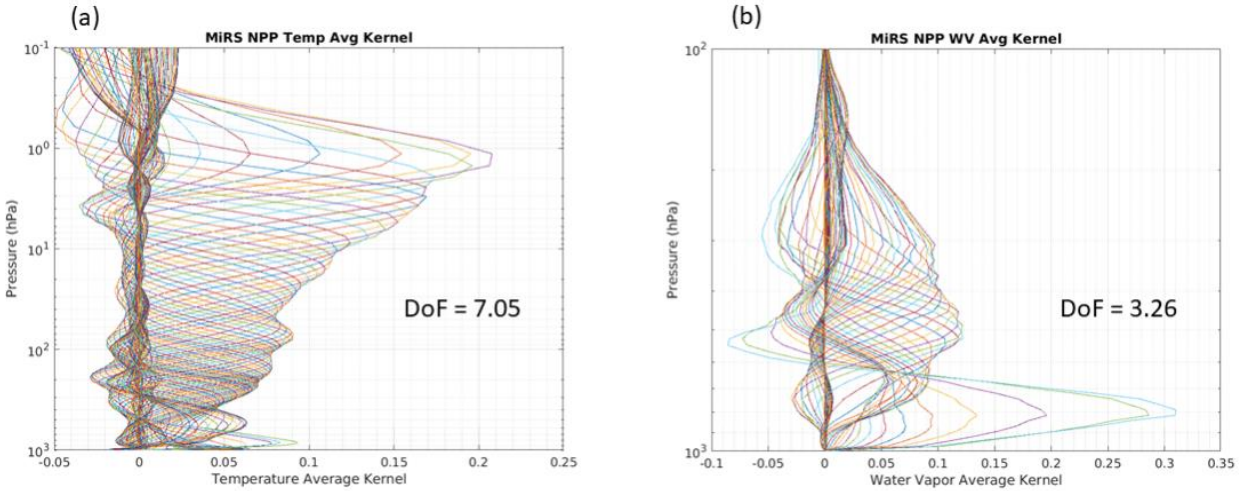
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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:



An example of Averaging Kernel of (a) temperature and (b) water vapor using the MiRS SNPP ATMS retrieval. Y-axis is in log-scale.

MiRS Products

April 2025

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 *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.* *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 *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 *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 *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 *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*			

MiRS Products

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 *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 *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 *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 *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 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*			

MiRS Products

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*			

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

April 2025

Accomplishments / Events:

- The JSTAR Mapper team completed it review of existing EDR image tile production and has fixed all known bugs and production issues. All products are now being produced on daily basis including several persistent bugs with the mapping of NUCAPS and MIRS Soundings products.
- The JSTAR Mapper team began the process of refactoring the code base for image tile generation. The new code will be python based and will eliminate the many redundant pieces of code in the current image processing system.
- The NPROVS team tested a new method for thinning high-definition radiosonde profiles.
- The NPROVS team began investigating the addition of GOES data in NPROVS.

Overall Status:

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

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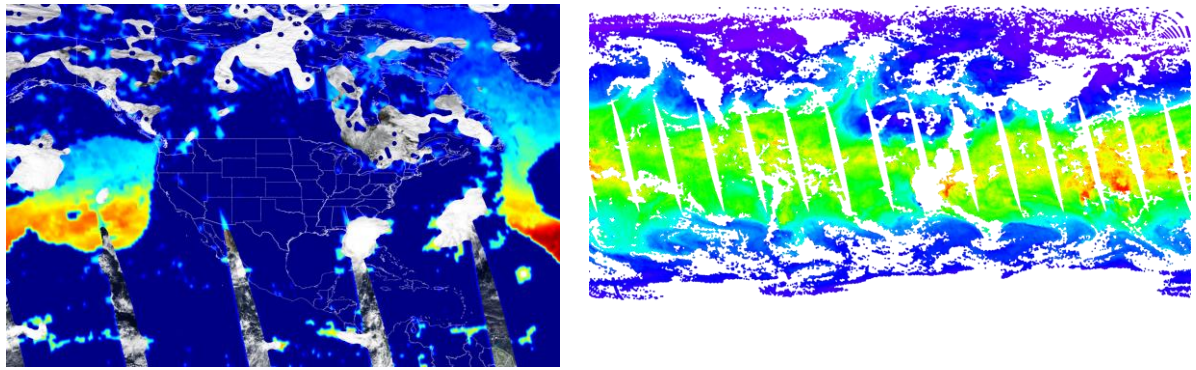
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks: None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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**		

Highlights



A sample day (Jan 12, 2025) showing the impact of the changes to the NUCAPS 1000 mb water vapor imagery. The left panel shows the old system which had incorrect color settings and data coverage in areas where 1000 mb is below ground level (higher elevations). As part of the comprehensive review of JSTAR Mapper imagery, these changes were applied to Temperature and Water Vapor soundings for NUCAPS and MIRS at 1000 (changed to 950 mb), 850, 700, 500, and 200 mb, and the color bars for these products aligned with the data fields.

FY25 Microwave Sounding Temperature CDR Project

	Milestone	Start	Finish	Deliverable
1	Monthly processing and update of microwave sounding CDR products	Oct-24	Sep-25	Deliver monthly microwave sounding CDR Products to NCEI
2	Explore impacts of long-term fundamental CDR products in observing severe weather/climate events	Dec-24	Apr-25	Demonstrate values and impact of long-term (F)CDR data sets in observing severe weather/climate events such as Sudden Stratospheric Warming events
3	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	Feb-25	Jul-25	Analysis report (ppt) and/or correction algorithm; long-term quality-consistent CDR data sets
4	Maintain and sustain the Microwave Sounding Assessment System for CDR Development (MSASCD) website (https://www.star.nesdis.noaa.gov/smcd/emb/mscat/msascd.php)	Oct-24	Sep-25	A timely updated MSASCD CDR website

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

Ocean Color

April 2025

Accomplishments / Events:

- Published a paper (derived vicarious gains for three VIIRS sensors): Wang, M. and L. Jiang, "On-orbit system vicarious calibrations for three VIIRS sensors using the NIR-SWIR ocean color data processing approach," *IEEE Trans. Geosci. Remote Sens.*, 63, 4203416, 2025. https://doi.org/10.1109/tgrs.2025.3542331
- Published a new NOAA Ocean Color Cruise Report: Ondrusek, M., J. Wei, M. Wang, E. Stengel, C. Kovach, A. Gilerson, J. I. Goes, C. Hu, S. Ladner, N. Tufillaro, K. J. Voss, A. Bailess, A. Barnard, R. Blocker, S. Bunson, J. Cannizzaro, D. English, H. do Rosario Gomes, E. Herrera, J. Jordan, M. Kavanaugh, M. Malinowski, W. Moretto, and S. Sullivan, "Report for Dedicated JPSS VIIRS Ocean Color Calibration/Validation Cruise: U.S. West Coastal Ocean in March 2023," *U.S. Dept. of Commerce, NOAA Technical Memorandum NESDIS-163*, 60 p., Silver Spring, Maryland, April 2025. https://doi.org/10.25923/r4zh-xs14
- Continue working on mission-long OC data reprocessing for three VIIRS sensors (SNPP, NOAA-20, and NOAA-21).
- 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.

Overall Status:

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

1. *Project has completed.*
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Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Ocean Color Validated Maturity	Jul-2025	Jul-2025	March 2024	

Issues/Risks: None

Ocean Color FY25 Milestones/Deliverables

April 2025

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)

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

April 2025

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 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 N20 V8Pro May 2025 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.* Subtask 1.7: *Modify and deliver V8TOs and V8Pro for application to higher resolution NOAA-20 OMPS NM SDRs.*	August 2025 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 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.*	May 2025 - Will be finalized this month.
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

April 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 a new version of the wavelength and solar flux tables for high resolution (139CT) of NOAA-20 OMPS NM SDR data.
- Conducted recovery assessment for NOAA-20 OMPS NM and NP data quality following the spacecraft anomaly that occurred on Friday April 4, 2025. An example of NOAA-20 NP dark rate time series is shown in Fig. a)
- Explored value of OMPS NM radiance data in NWP weather forecast model by using two different methods. An example is shown in Fig. b, which uses a random forest method.
- Analyzed the SNPP OMP NM solar flux data sets to quantify the degradation feature of the instrument.

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		

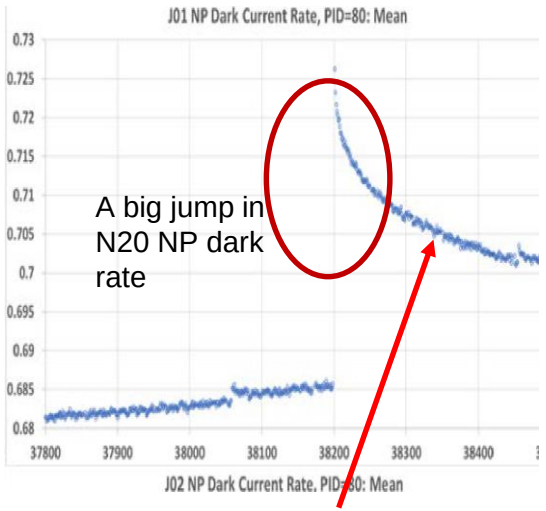
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Approximately 0.5 FTE might be cut soon due the STAR sensor contract budget issue, likely delaying some upcoming milestones.

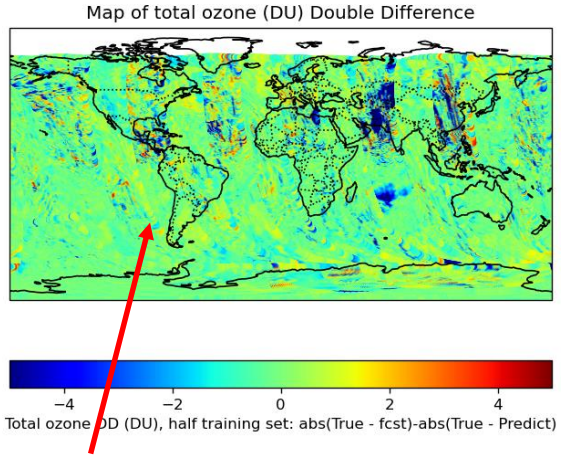
	Milestone	Finish	Deliverable
1	Complete the JPSS-4 OMPS SDR calibration plan	Oct-24	JPSS-4 OMPS SDR calibration plan
2	Complete the solar activity adjustment analysis for SNPP, NOAA-20 and NOAA-21 OMPS NP (part of DR10832)	Dec-24	Software; new OSL tables; reprocessed OMPS NP SDR test data sets;
3	Complete 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

(a) N20 NP dark rate time series



NOAA-20 OMPS NP SDR data was claimed for operation since 04/18/2025

(b) Impact of N21 OMPS NM SDR data on ECMWF forecast



Positive values indicates that the direct assimilation of NOAA-21 OMPS NM radiance data can improve ECMWF ozone forecast performance

LEO QuickSounder ATMS SDR

April 2025

Accomplishments / Events:

- Making progress in developing tools needed to estimate the QS ATMS band correction coefficients. Figure 1 shows sample plots of SRF Profiles for NOAA-21 ATMS channels 16 and 17 used as validation data of the tool being developed.
- Making progress in the development of tools used to produce the Antenna Pattern Correction for the SDR to TDR conversion. Fig 2 shows an example of the antenna data extraction, where the main beam efficiency was computed at 77.07%
- Made improvements in the computation of the nonlinearity coefficients while developing the Full radiance algorithm development (Fig 3, courtesy of MIT LL)
- Confirmed that the ATMS Geolocation mismatch is caused by the beam alignment correction rotation matrix implementation error in IDPS. It is recommended to update the source code to correct the error.
- Continued the development of ATMS On-orbit NEdT monitoring tools using Principal Component Analysis
- Identified updates to the web-based Integrated Calibration and Validation System (ICVS) and provide scheduled to perform the updates, particularly the Geolocation.

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	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		

Overall Status:

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

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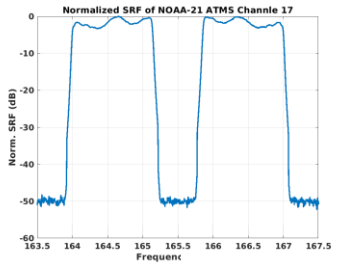
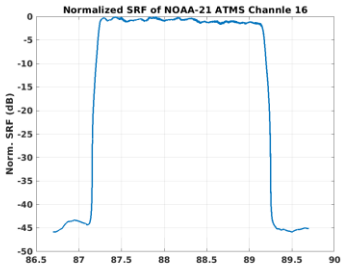
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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.**

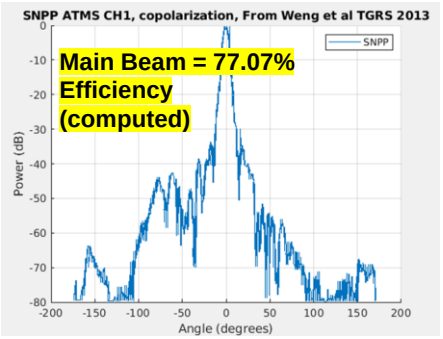
Highlights:

(1) SFR Profiles used for Band Correction Coefficient Calculation Tool.



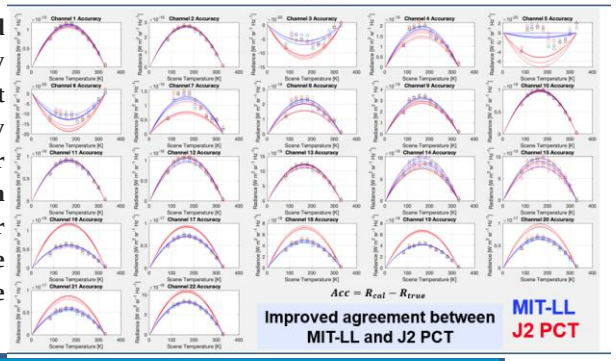


(1) Antenna Pattern used for TDR to SDR conversion coefficient calculation tool



Nonlinearity Results CP Mid

(1) Improved Nonlinearity Coefficient computation by correcting for antenna pattern and proper weighting of the ECT scene



Sea Surface Temperature

April 2025

Accomplishments / Events:

- We added support in ACSPO to read and process information about surface shortwave radiation flux. Shortwave flux is an important variable (along with wind speed) to estimate magnitude of diurnal warming. We plan to use shortwave flux information to adjust ACSPO Clear-Sky Mask (ACSM) thresholds for cloud test that depend on comparison of retrieved SST to first guess SST, which does not include diurnal warming. We also plan to use shortwave flux information to estimate the thermocline between skin SST and temperature reported by drifting buoys at a depth of ~20 cm.
- We added support in ACSPO for using ECMWF Reanalysis v5 (ERA5) for atmospheric profiles as input to the CRTM forward model. The accuracy of modeled brightness temperature using ERA5 compares favorably to MERRA-2 and is being considered for future ACSPO reanalysis efforts.
- The reflectance adaptive test (RAT) is a reflectance-based ACSM filter that relies on spatial patterns of VIIRS reflectance data to identify clouds. We revised the test to work in areas affected by sun glint. Previously, this test had to be turned off in glint regions due to frequent over screening (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.*

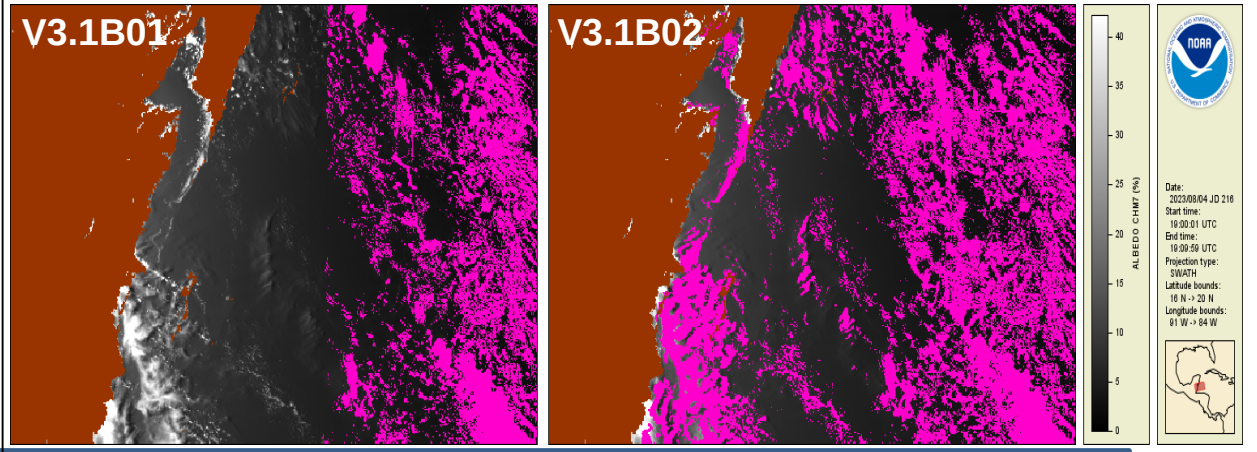
Issues/Risks:

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: Improved Reflectance Adaptive Test (RAT) in glint regions

NPP VIIRS channel M7 reflectance from the Caribbean region. Purple overlay denotes pixels flagged as clouds by the RAT, which takes advantage of spatial context of VIIRS reflectance to identify clouds. Due to over screening in regions affected by sun glint, it was turned off for glint angles smaller than 25 degrees (left). In the current experimental ACSPO V3.10B02, the RAT has been improved and is applicable in glint regions (right).



Sea Surface Temperature

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)			

Sea Surface Temperature

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

April 2025

Accomplishments / Events:

- Completed cross-calibration of SFR for all satellites through histogram matching using consistent reference data, which is composed of Stage IV, CloudSat CPR, and ERA5 snowfall rate estimates. The calibration significantly improves SFR consistency across satellites.
- The SFR team has set up a South America SFR page here. The NWS forecasters at the WPC International Desk have expressed strong interest in the SFR product due to the lack of observations in this region.

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	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.*
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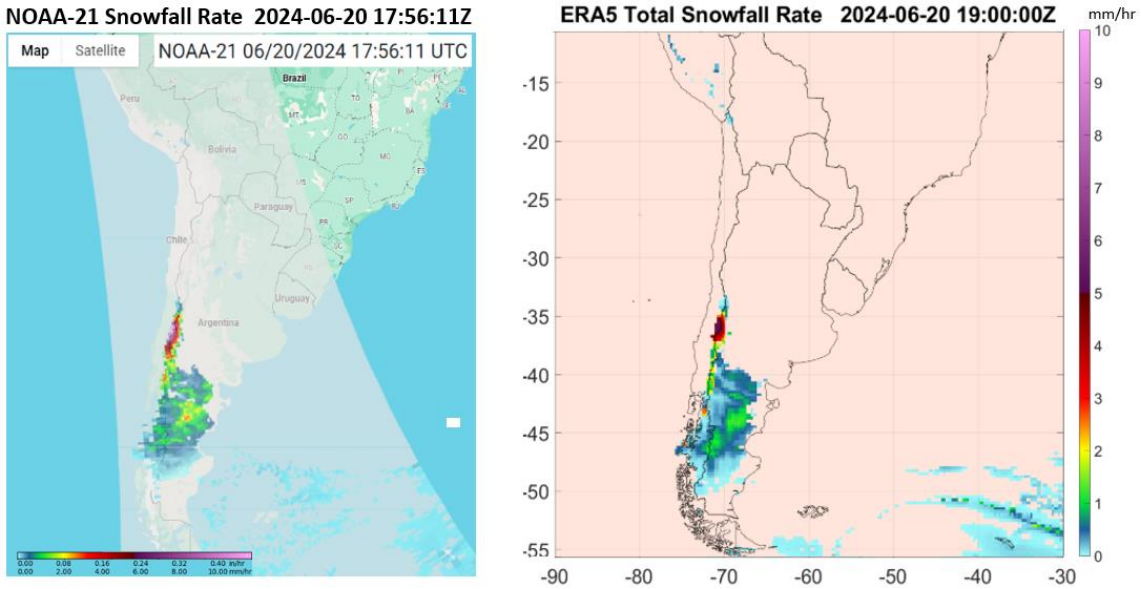
Issues/Risks: None

Highlights:



A snowstorm in Argentina and Chile on June 20, 2024. Left: NOAA-21 derived snowfall rate; right: the ERA5 hourly snowfall rate an hour later

Snowfall Rate

April 2025

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

April 2025

Accomplishments / Events:

- Conduct in-situ validation of surface reflectance using RalCalNet data and analyze the differences between the SR EDR and the NASA VNP09 product (v2).
- Extract matching NASA VNP43 BRDF data to perform data matching and screening for VIIRS surface reflectance angular adjustment. Use the BRDF-adjusted SR to expand the ground measurement matchup dataset.
- Investigate the recalibration performance by applying NASA VNP09 coefficients to the NOAA reprocessed SDR. Compare the results for bands I1 and I2, which show good agreement, while band I3 exhibits significant discrepancies.
- Summarize the AERONET-based SR validation for 2024, focusing on uncertainties caused by misclassified aerosol models and evaluating the effectiveness of the mitigation algorithm.

Overall Status:

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

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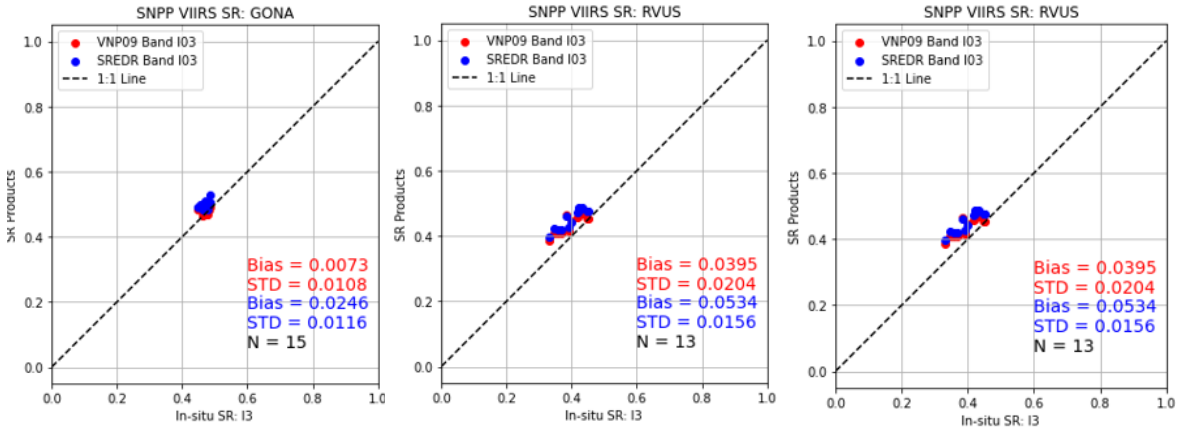
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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:



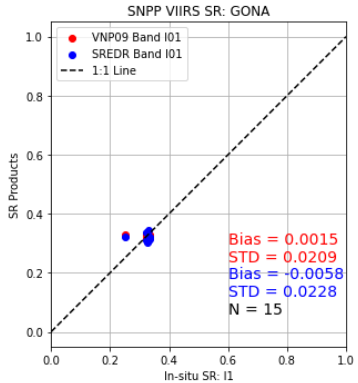
The SR in-situ validation at RadCalNet results shows The VNP09 (recalibrated) has smaller bias at all three sites (GONA, RVUS, LCFR), the recalibration for SNPP should be considered.

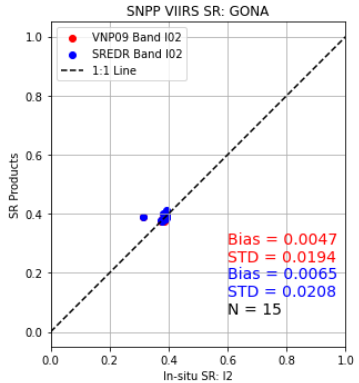
SR In-situ Validation at RadCalNet

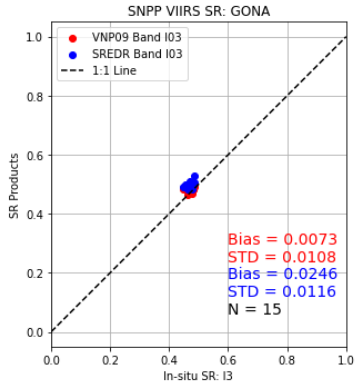
April 2025

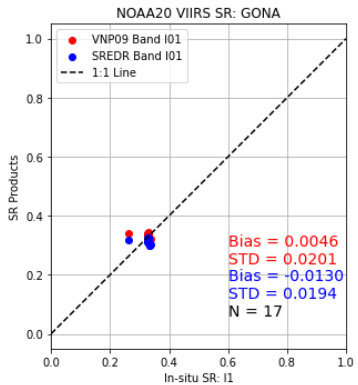
- Validation method
  - Data (year of 2024):
    - NOAA SR EDR (NPP & N20)
    - NASA VNP09 (recalibrated, 2-4% scaling factor)
    - Ground measurements
  - Satellite zenith angle < 15 degree (in-situ is nadir view).
  - Time difference < 15 min
  - Confidently clear, no high AOD

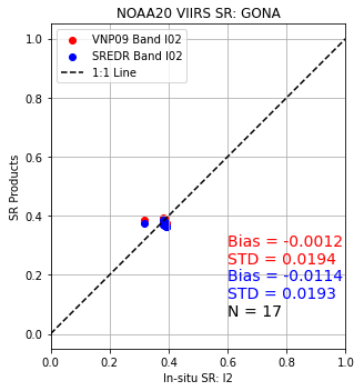
- Validation results
  - For Gobabeb (bottom left) and La Crau the satellite SR agree well with ground. But Railroad Valley (Bottom Right) with larger STD, mainly due to AOD uncertainty, Ground AOD (~0.06) vs VIIRS AOD (NPP: 0.43, N20: 0.29).
  - For I1 and I2 bands, SR EDR with similar performance with VNP09, but VNP09 with better results for SNPP I3 bands, SR EDR with better N20 I3 bands (here VNP09 seems overcorrected)

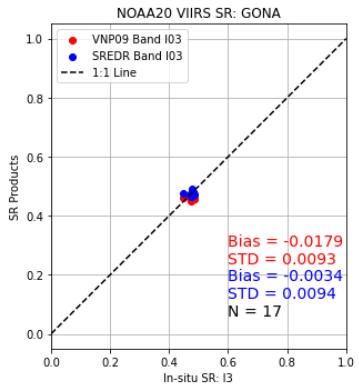


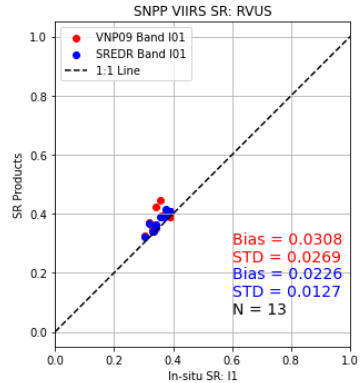


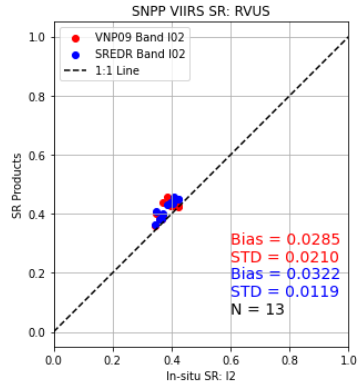


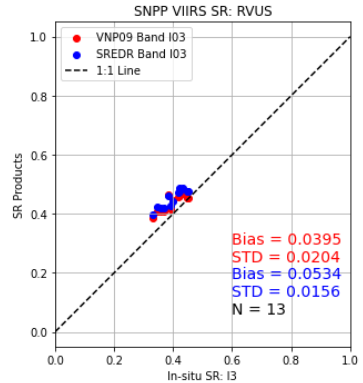


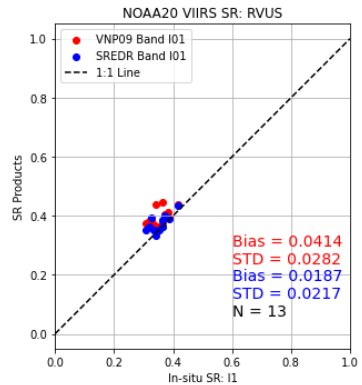


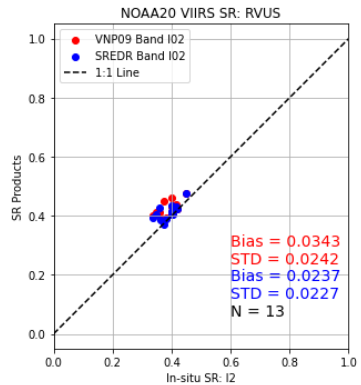


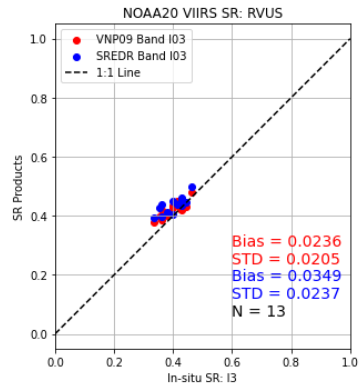






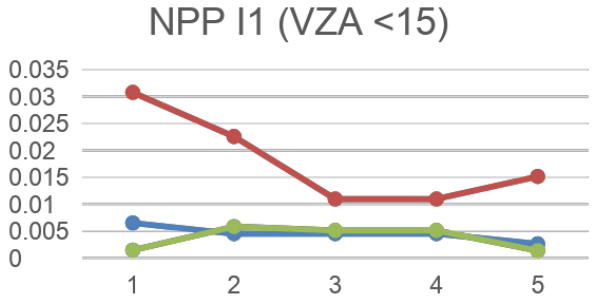


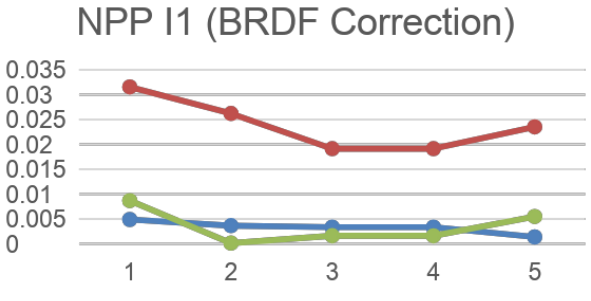


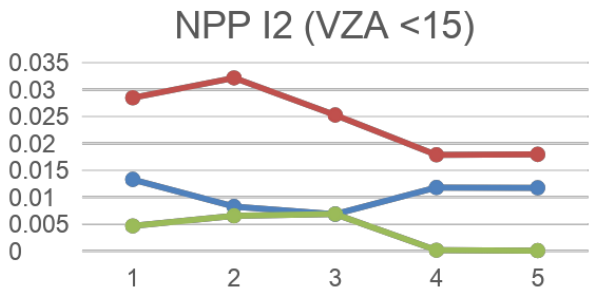


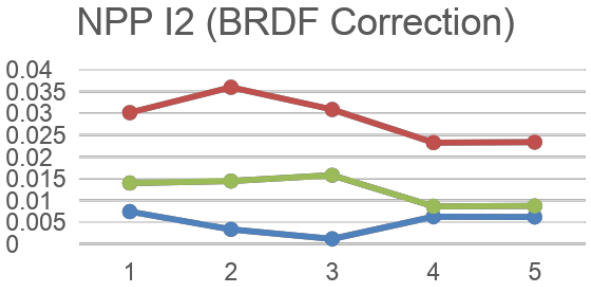
SNPP SR Validation Summary (Absolute Bias)

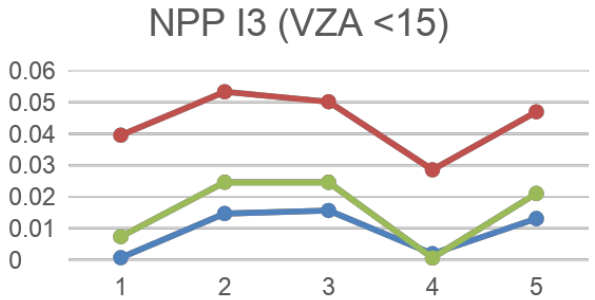
- 5 datasets validation comparison (in term of bias)

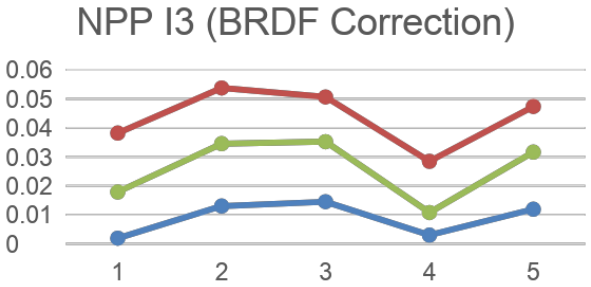












Methodology:

- Column 1: Only SR with VZA < 15 degree are used
- Column 2: BRDF corrected SR, here VNP43IA1 products is used for correction.

Datasets (X axis):

1. NASA VNP09
2. NOAA SR EDR
3. NOAA SR using ground AOD
4. recalibrated SR using ground AOD (NASA coef)
5. recalibrated SR using ground AOD (NOAA coef)

Sites (Y Axis):

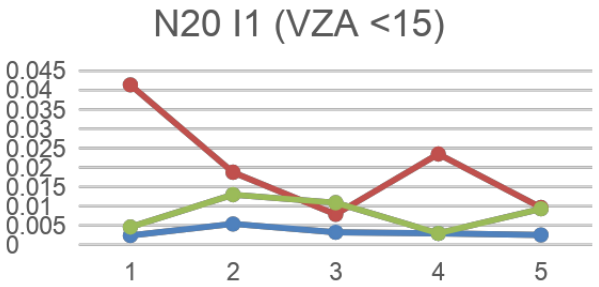
1. Series 1: LCFR site
2. Series 2: RVUS site
3. Series 3: GONA site

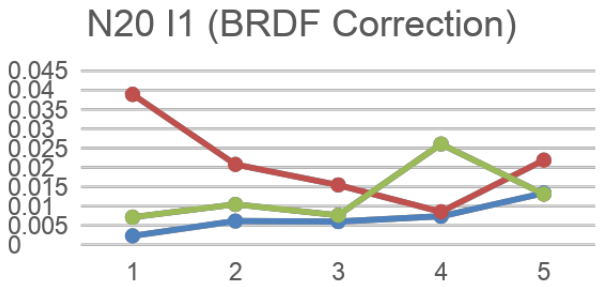
Results:

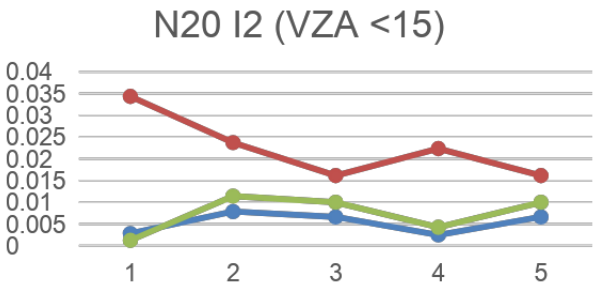
- Generally, For SNPP, NASA recalibration coef. perform best (I1 & I2 similar, but I3 much better)
- If I3 band used in the downstream product (such as LAI), recalibration should be considered.

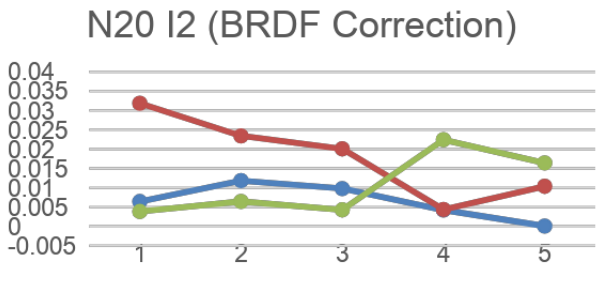
N20 SR Validation Summary (Absolute Bias)

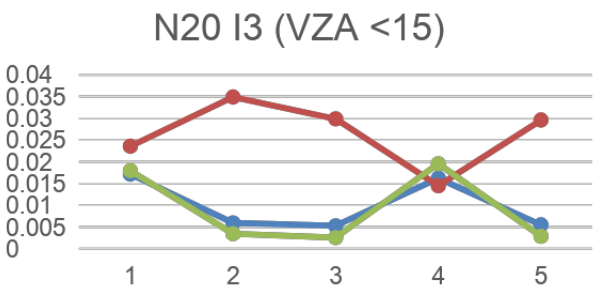
- 5 datasets validation comparison (in term of bias)

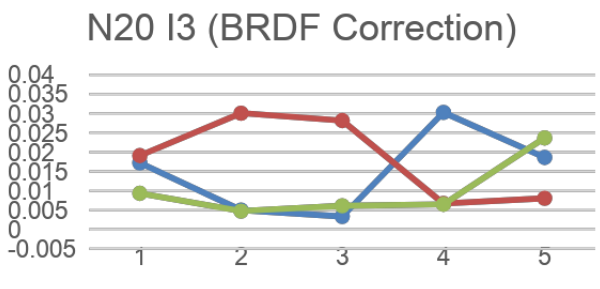












Methodology:

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- Column 2: BRDF corrected SR, here VNP43IA1 products is used for correction.

Datasets (X axis):

1. NASA VNP09
2. NOAA SR EDR
3. NOAA SR using ground AOD
4. recalibrated SR using ground AOD (NASA coef)
5. recalibrated SR using ground AOD (NOAA coef)

Sites (Y Axis):

1. Series 1: LCFR site
2. Series 2: RVUS site
3. Series 3: GONA site

Results:

- For N20, NOAA recalibration (very slight adjustment) works well. But more data needed to confirm
- NASA recalibration take Aqua/MODIS as reference, but for NOAA20, the impact is limited.

JPSS SDR and VIIRS Cloud EDR Reprocessing Project

April 2025

- Continued to improve the performance of DNN model to visually detect radiometric features of aerosols in the presence 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.
- Shown in the next slide is an example about observations of NOAA-21 OMPS NM SDR data for the 2024 July Canadian wild fire. The VIIRS results are included for a comparison.

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	Aug-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	Jun-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 milestone in June was delayed per the sensor branch Chief's request. So, the milestones in June and August are suggested to be exchanged

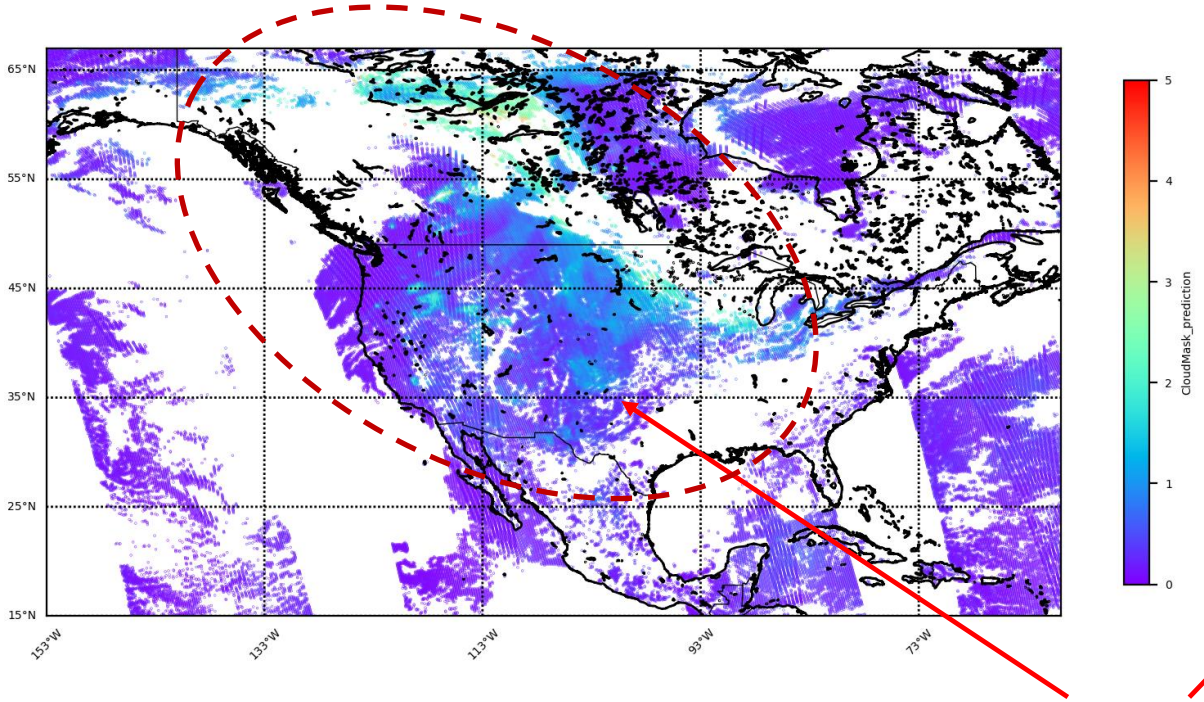
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic				X	
Schedule			X		

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.*

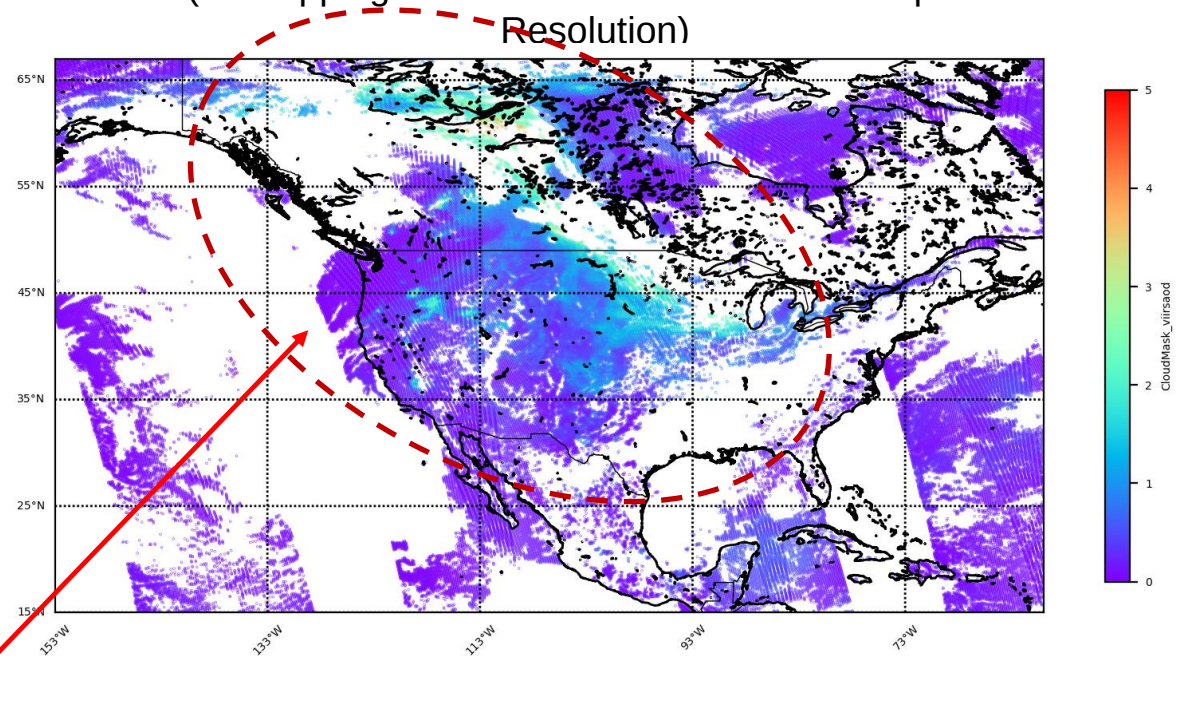
Test case on 07/22/2024

Comparison of Observed 2024 July California Wildfire Aerosol Radiometric Features (Aerosol Optical Depth or AOP) between VIIRS and OMPS Radiance Data

(a) NOAA-21 OMPS NM AOD Predicted by DNN



(b) Remapping VIIRS Operational AOD (Remapping to NOAA-21 OMPS NM Data Spatial Resolution)



Similar aerosol radiometric features in the presence of large wild fires were observed by NOAA-21 OMPS NM radiance data to those by VIIRS data

FY25 Microwave Sounding Temperature Reprocessing Project

April 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, data quality check and data analysis.
- Conducted active discussions with EMC and CPC users to explore uses of rMST data sets in NWP models
- Investigated machine learning method to explore value of ATMS rMST data sets in NWP weather forecast model during severe weather events such as SSW. Figure shows a good correlation between ATMS channel 13 Tb and ECMWF reanalysis air temperature.

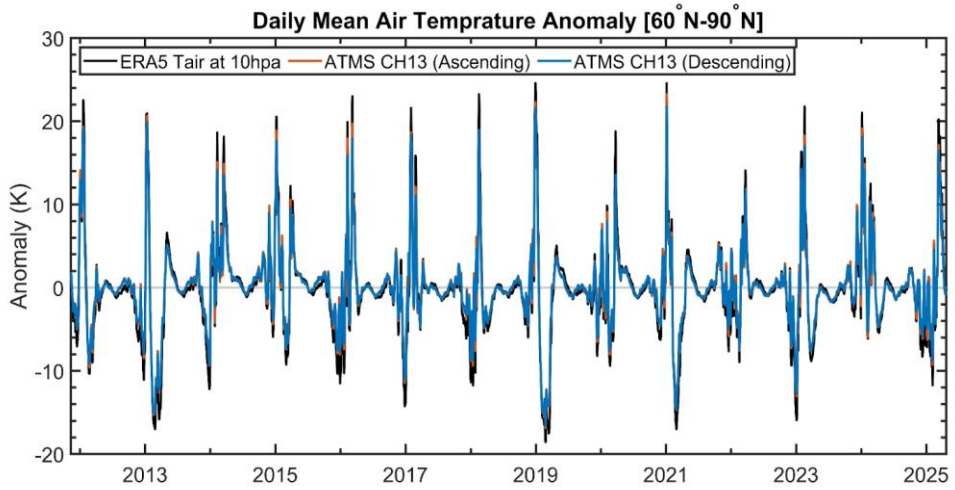


Figure Time series of temperature anomaly against the average for SNPP ATMS channel 13 brightness temperature and ECMWF reanalysis air temperature.

Milestones	Original Date	Forecast Date	Variance Explanation
Monthly processing and update of reprocessed ATMS microwave sounding temperature (rMST) data products	Sep-25		
Explore impacts of ATMS rMST products in observing severe weather events	May-25		
Evaluate bias drifts and inter-sensor biases in SNPP and NOAA-20 ATMS TDR/SDR data sets to produce quality-consistent rMST data set, in coordination with SDR/ICVS teams; perform recalibration if necessary	Aug-25	Aug-25	
Maintain and sustain the website titled with NOAA Satellite ATMS/AMSU-A Reprocessed Microwave Sounding Temperature Quality Assessment System (rMST-QAS)' (https://www.star.nesdis.noaa.gov/smcd/emb/msas/msas.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

Surface Type

April 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 April of 2025 for the production of AST25.
- The team continues to produce WSF data on monthly and sub-monthly bases. A 10-day WSF product for mid-April shows the extent of flood water that sustained at least 5 days along the lower Ohio/Mississippi valleys from April 6 to 15, 2025 (see the Highlights section).
- The team is on track in developing the AST24 product. Training of the SVM model for 2024 is completed. That model is being used to classify the annual classification metrics calculated based on all VIIRS observation acquired in 2024.
- The team continues to update the surface type validation dataset over areas where surface type changes occurred during 2023/2024. The updated dataset will be used to validate the AST24 product being developed.

Overall Status:

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

1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
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Issues/Risks:

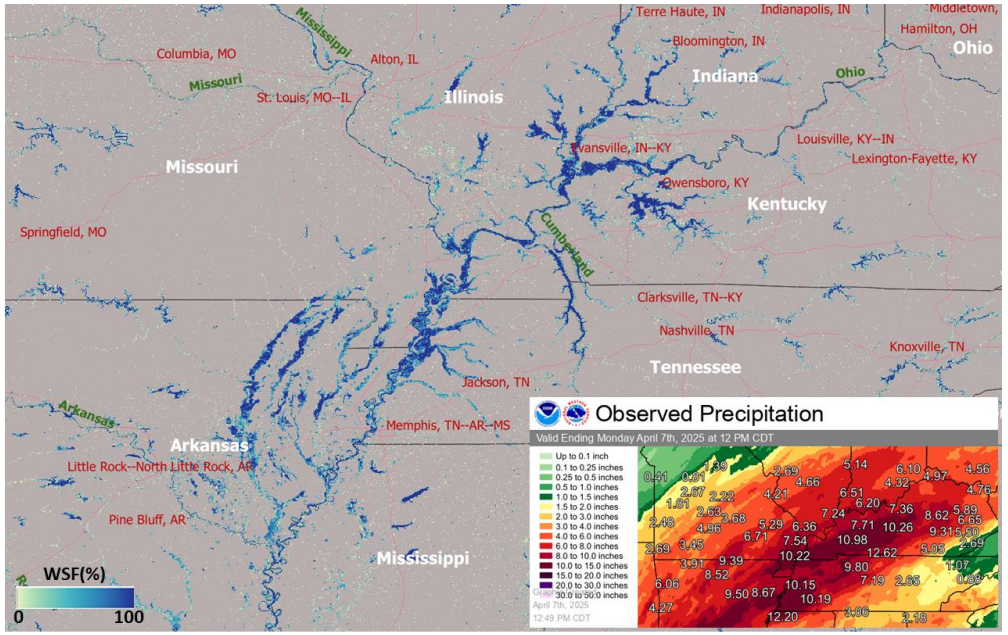
None

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:

The lower Ohio Valley had multiple rounds of heavy rains in early April 2025 (see the insert to the lower right), resulting in historic and near-record breaking flooding along many river basins in Indiana, Illinois, Kentucky, Tennessee, and Arkansas. A 250m Water Surface Fraction (WSF) product produced by the surface type team shows the extent of areas flooded for at least 5 days during April 6-15. The areas that were flooded for less than 5 days should be much larger than revealed by this map.

Extent of Sustained Flooding Along the Ohio/Mississippi Valleys during April 6-15, 2025



Surface Type

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Task 1: Improving and updating the surface type training and validation polygons	*Sept-25*	*Sept-25*		
Subtask 1.1: Update training polygons where the surface type label has changed	*Sept-25*	*Sept-25*		
Subtask 1.2: Add new training polygons where existing training data are not enough	*Sept-25*	*Sept-25*		
Subtask 1.1: Update validation polygons where the surface type label has changed	*Sept-25*	*Sept-25*		

Vegetation Health

April 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.
- Continued the development of the new code for 500m NOAA-20/21 VIIRS VHPs production/operation and the VHP code refinement and database updates for potential transition of STAR VHP production to OSPO operation. Developed C++ code to plot RGB image for cron job monitoring.
- Started exploration on how to use the UMD 250m water surface fraction (WSF) data set to replace current 1km IGBP land mask for the VHP reprocessing and routine/operational production by examining the differences of 500m land/water masks derived from the currently used "Global Cover" and the UMD 250m WSF data sets. The ~~difference map shown in the lower-right quad indicated that the "GlobalCover" data set~~ still has the outdated water surface in the Aral Sea in Central Asia.

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			

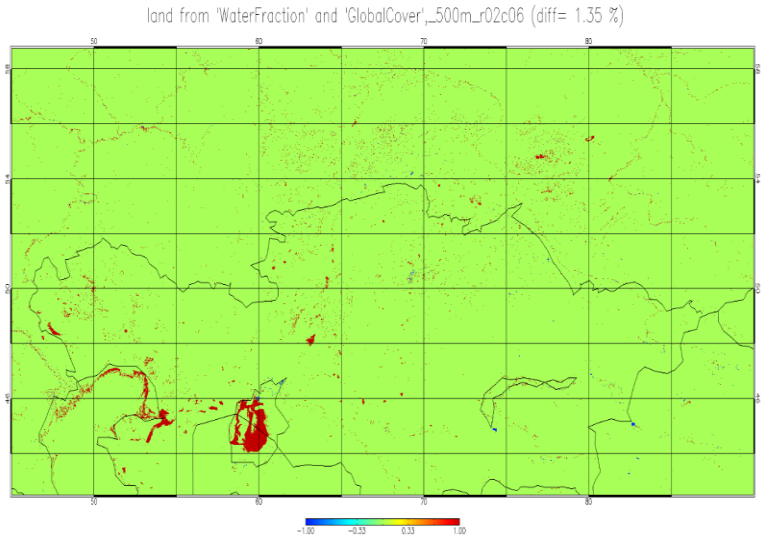
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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		

Highlight: *To update the land/water mask data set for upcoming 500m VHP production with the most recent water surface fraction (WSF) data product from the JPSS VIIRS Surface Type Team, the differences between the current "GlobalCover" and the new WSF data sets indicated significant changes of water surfaces in Aral Sea region.*



Vegetation Health

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

Vegetation Index and Green Vegetation Fraction

April 2025

Accomplishments / Events:

- Conducted inter-comparison between VIIRS and HLS GVF products.
- Generated and examined datasets for training GVF machine learning models.
- Diagnosed the GVF phenological lag issue reported from NCEP/EMC users.
- Generated timeseries of blended VI/GVF products for further evaluation.

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.*

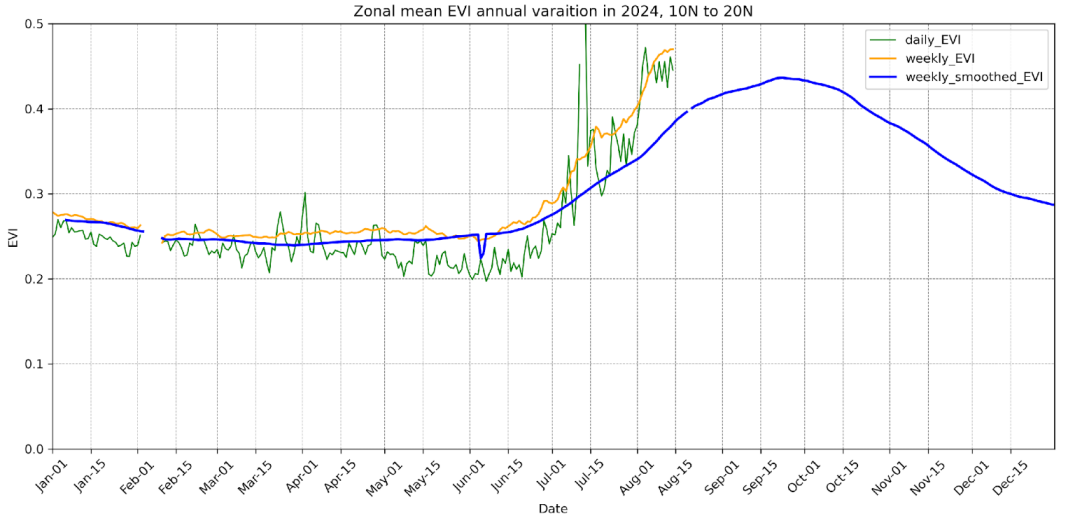
Issues/Risks:

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		

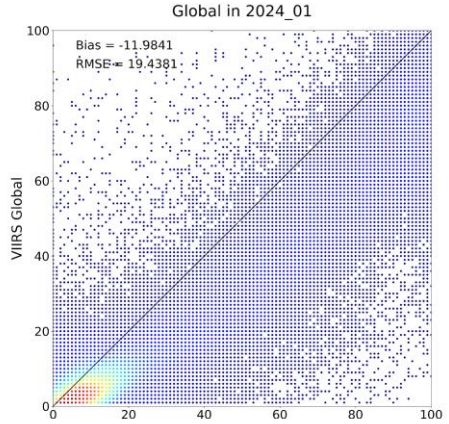
Highlights:

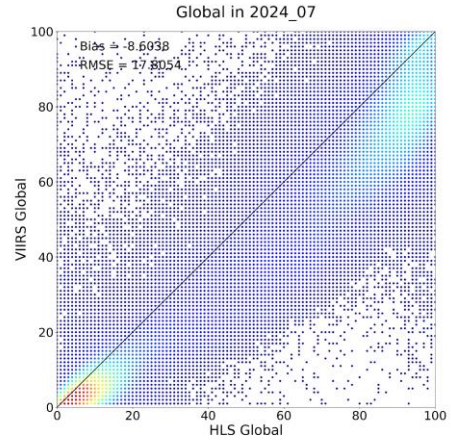
GVF-EVI phenology comparison between daily, weekly, and smoothed data



Inter-comparison between VIIRS GVF and HLS GVF

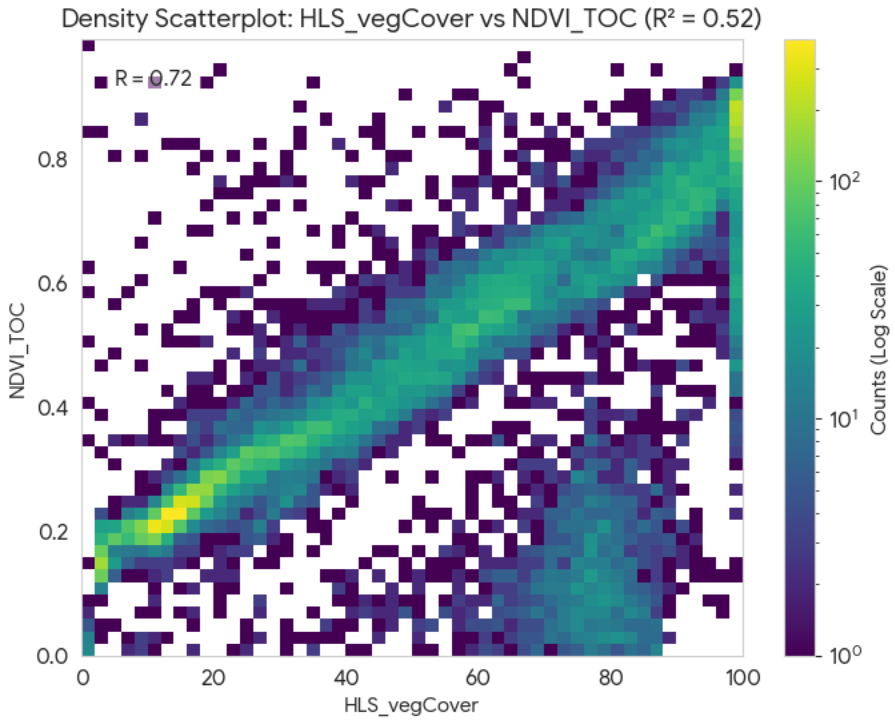
- Collect 30m GVF data from Harmonized Landsat Sentinel-2 dataset and VIIRS in 2024 and process to 4km global monthly composite for comparison.
- Compare the monthly maximum GVF between HLS and VIIRS, Jan and Jul maps are shown below:
  - VIIRS GVF is generally lower than HLS GVF in global region, different seasons have similar patterns
  - Forest region, especially evergreen broadleaf forest, evergreen needleleaf forest and mixed forest, has the weakest consistency
  - Cropland, urban/builtup area has the best agreement in different seasons

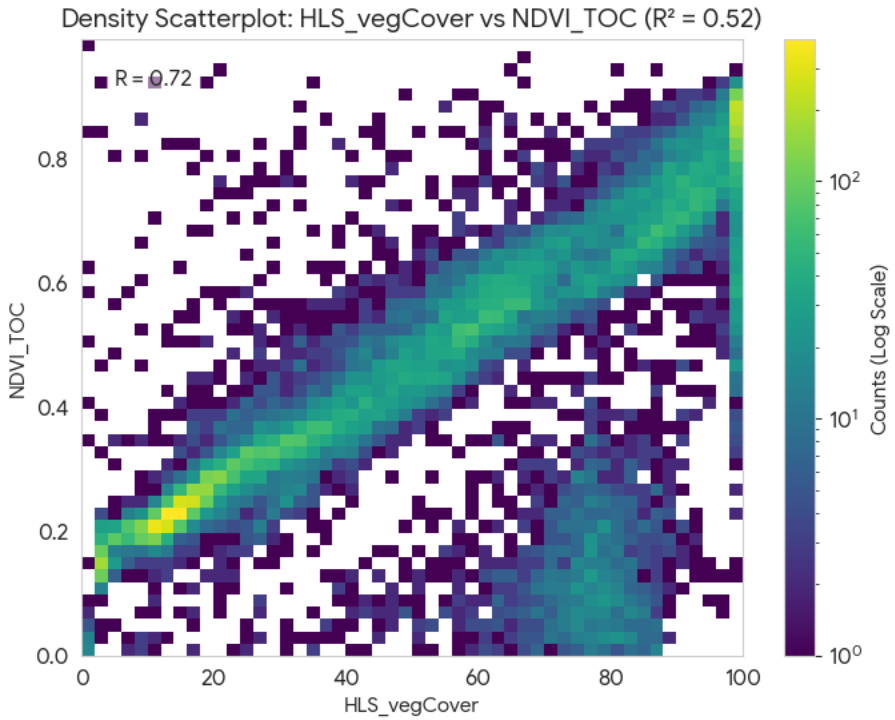




ML-based GVF algorithm upgrade

- Obtained HLS data tiles and resampled vegetation cover to 4km global and 1km CONUS grids matching our VI data for use in developing machine learning models
- Performed preliminary analysis of 4km global HLS vegetation cover against variables in VI data set. Strong correlations were seen with TOC NDVI and TOC EVI, as expected, but there are areas where HLS vegetation cover is high and VIs low. This will require further investigation.
- Correlations were weaker with other variables, but there are still relationships that could be picked up with ML models.

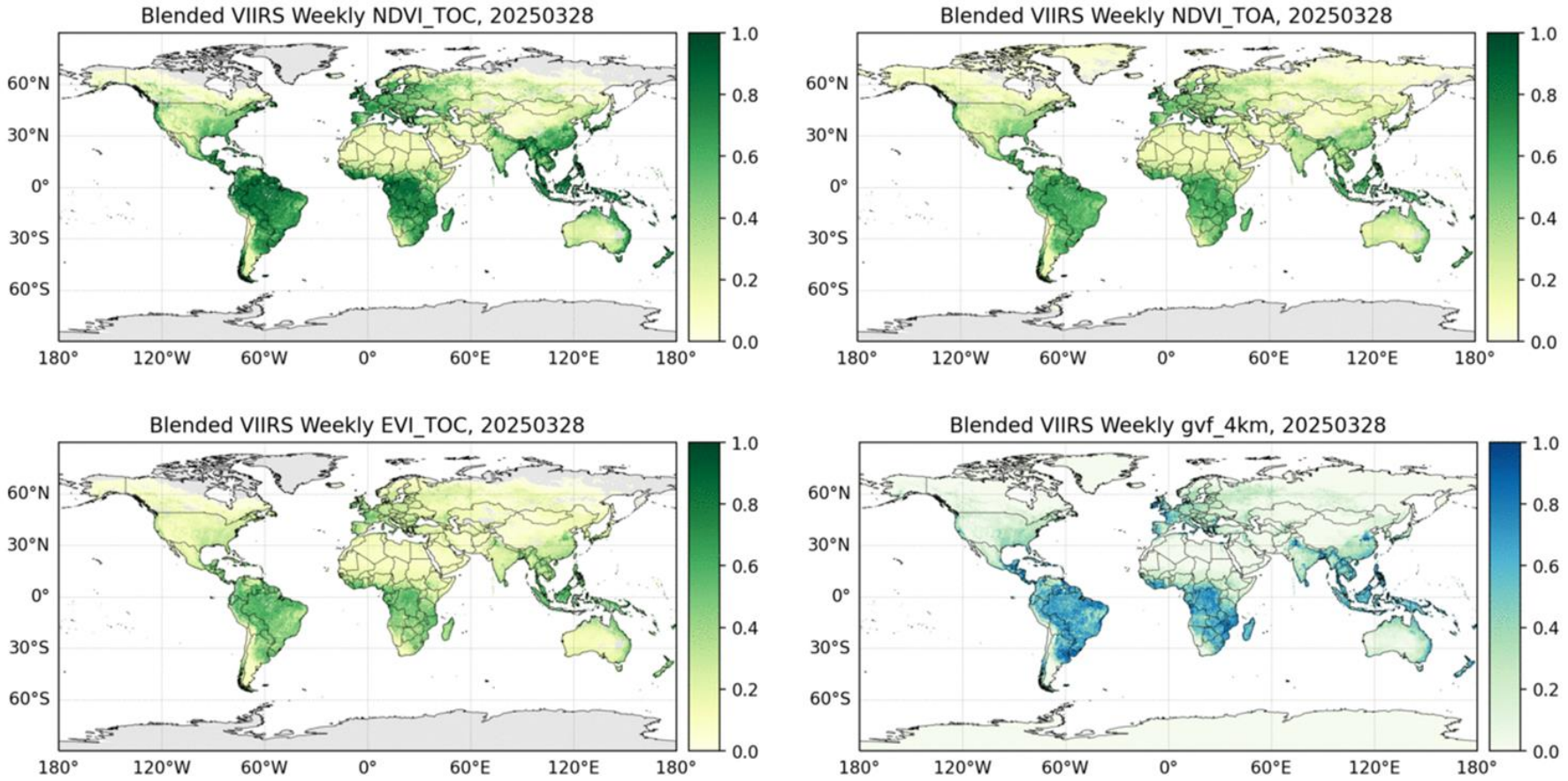




Scatterplots of VIIRS TOC NDVI (left) and TOC EVI (right) versus HLS vegetation cover on VIIRS pixels.
Correlations are strong, except for some points with high HLS vegetation cover but low VI values. This will require further investigation.

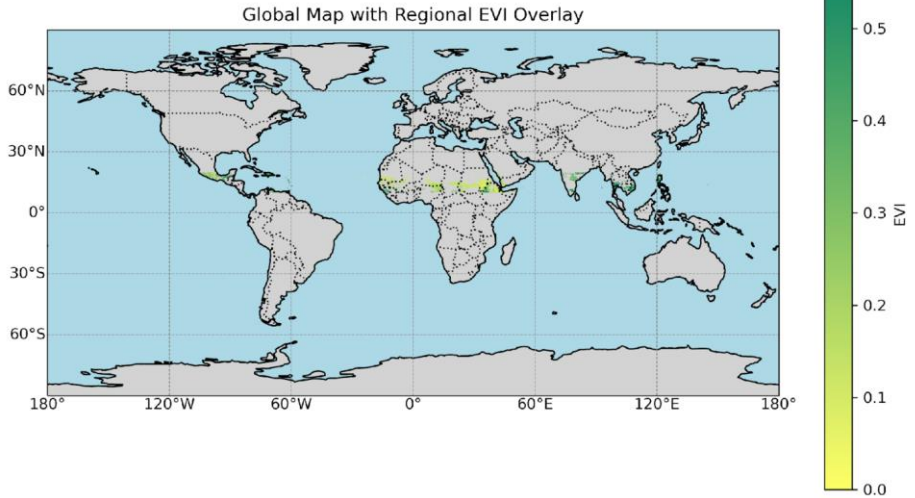
Timeseries of the blended NVPS products

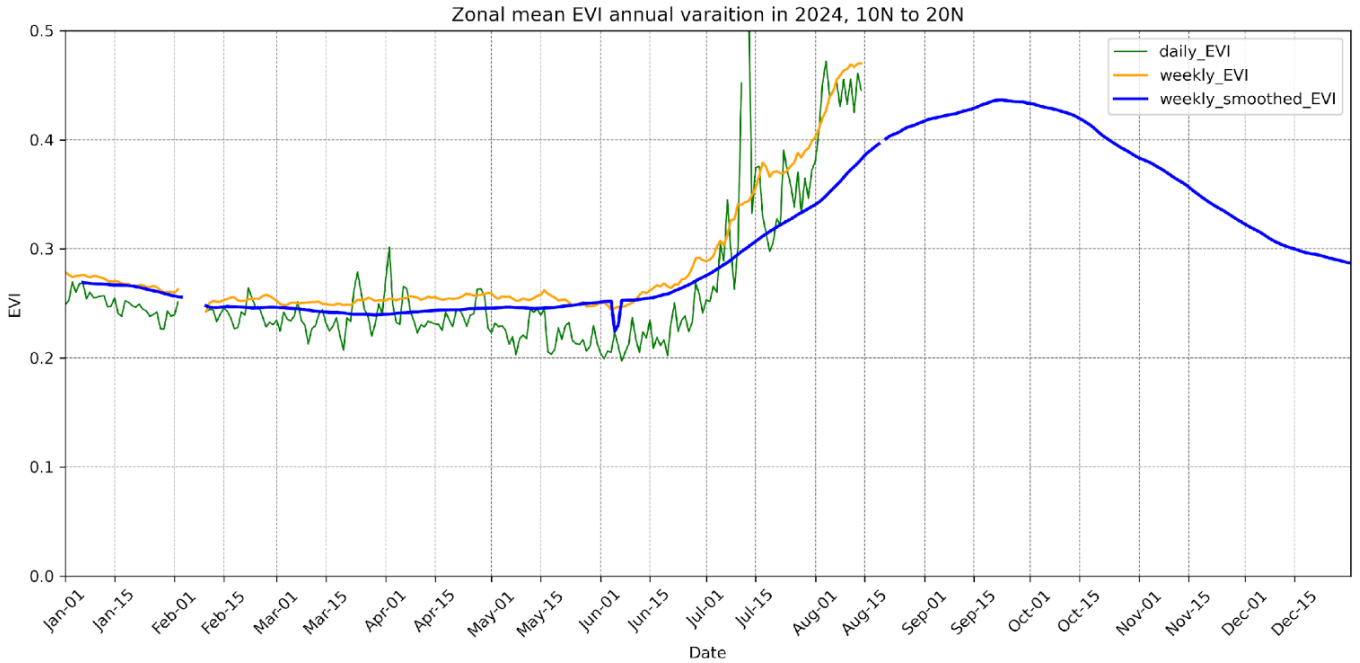
- For further evaluation on the blended NVPS products combining the three satellites (SNPP, N20, N21), a timeseries blended data was generated, as the animation figures shown below.
- Next step will be conducting timeseries-based inter-comparisons of the blended products with other satellite product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



GVF phenology analysis

- Background: EMC model users gives feedback that VIIRS GVF product shows phenological lag in the greenness season.
- Possible cause: algorithm flaw, weekly composite, or 15-week smoothing.
- Diagnosis: comparing EVI annual variation among daily, weekly composited, and smoothed data, for different latitude zone, and for global and CONUS respectively.
- Conclusion: 15-week smoothing turns out to be the major factor causing the lag.
- Resolution: Use unsmoothed weekly EVI to calculate GVF.

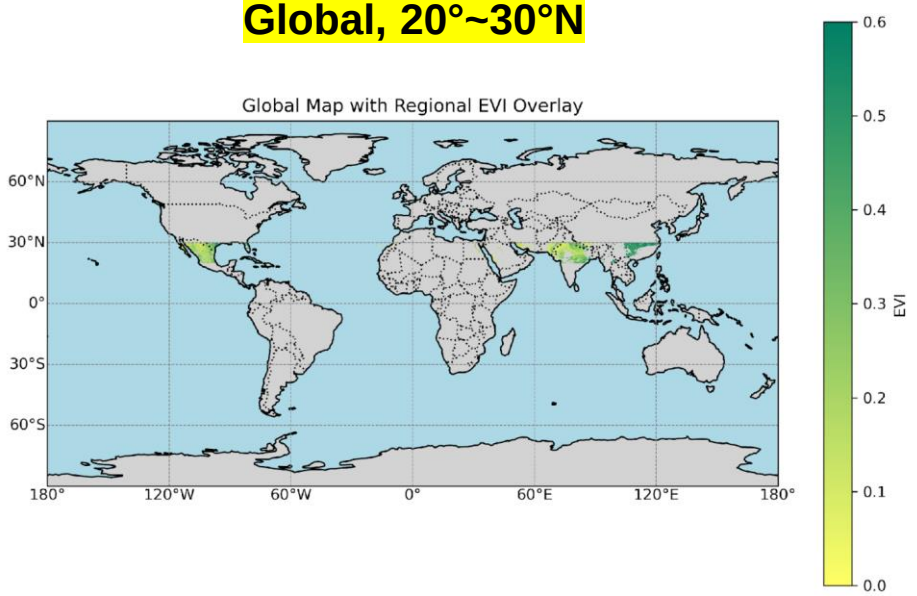


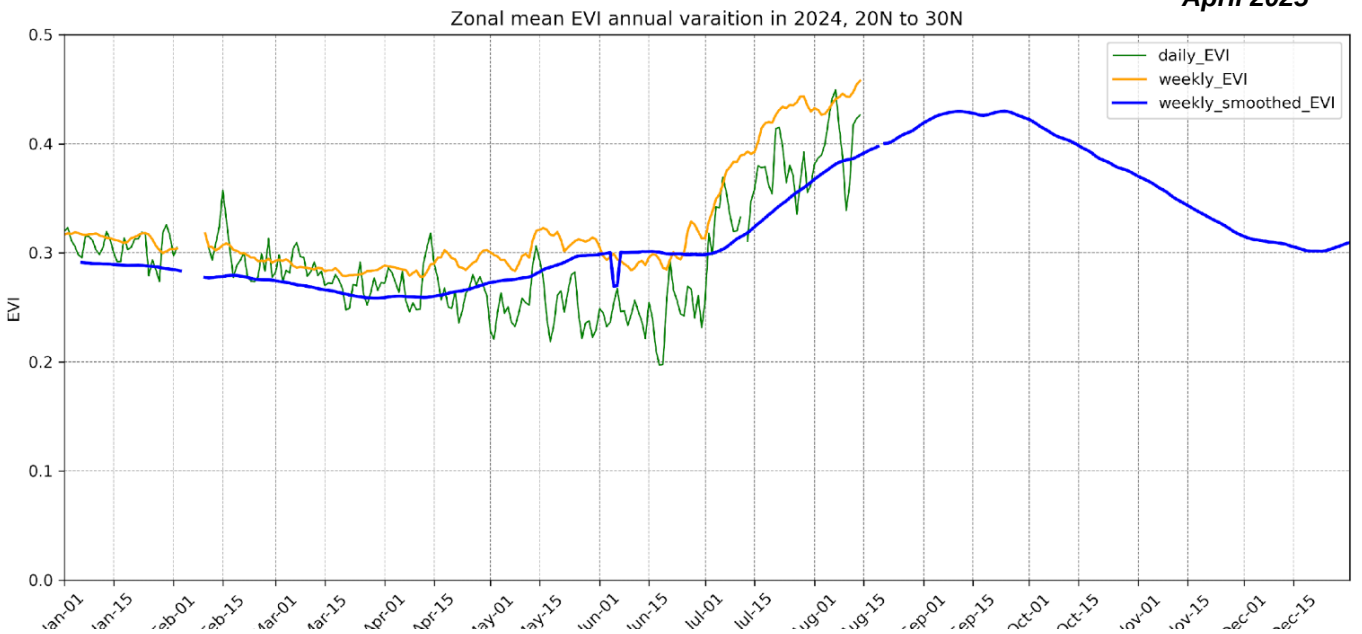


GVF phenology analysis

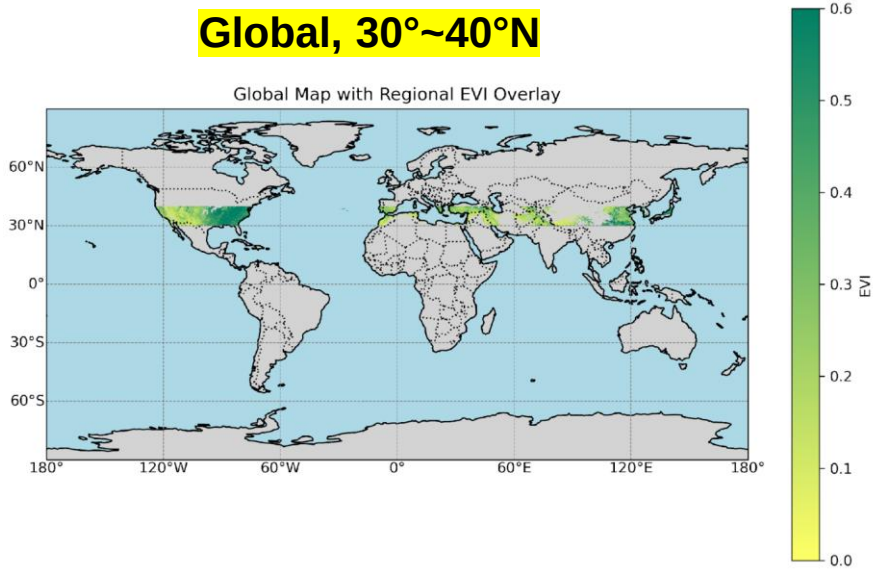
April 2025

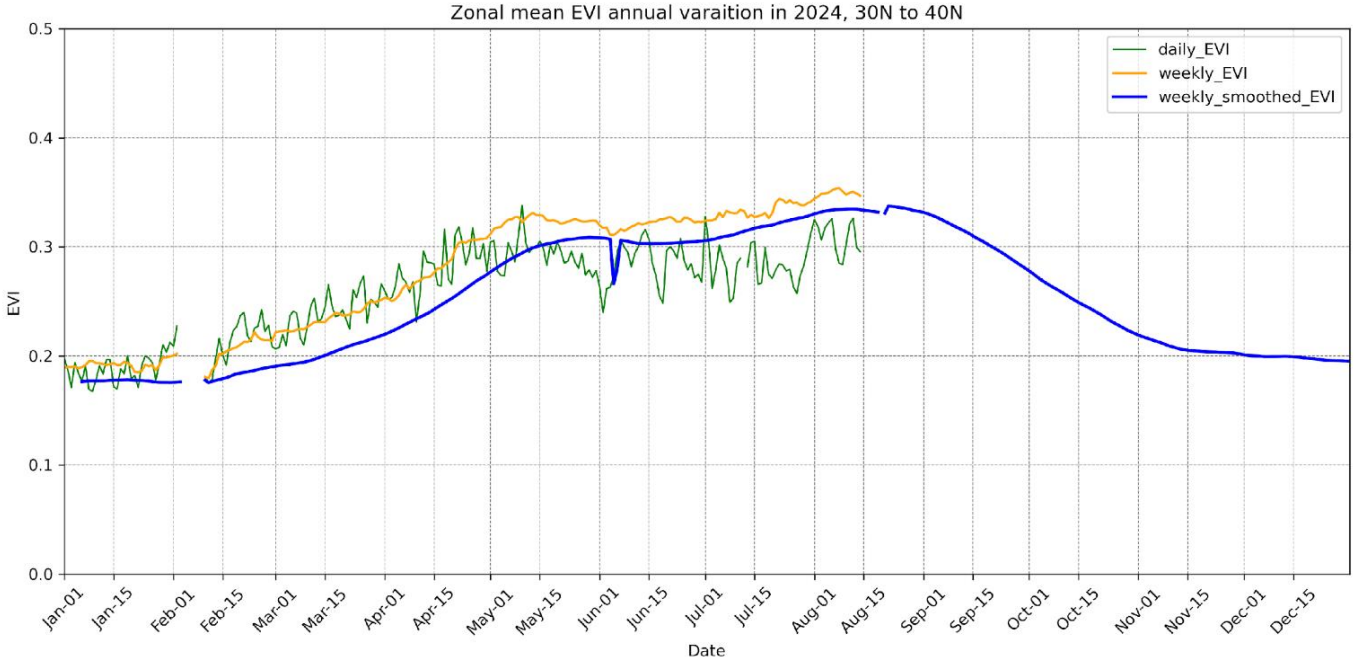
Global, 20°~30°N





Global, 30°~40°N

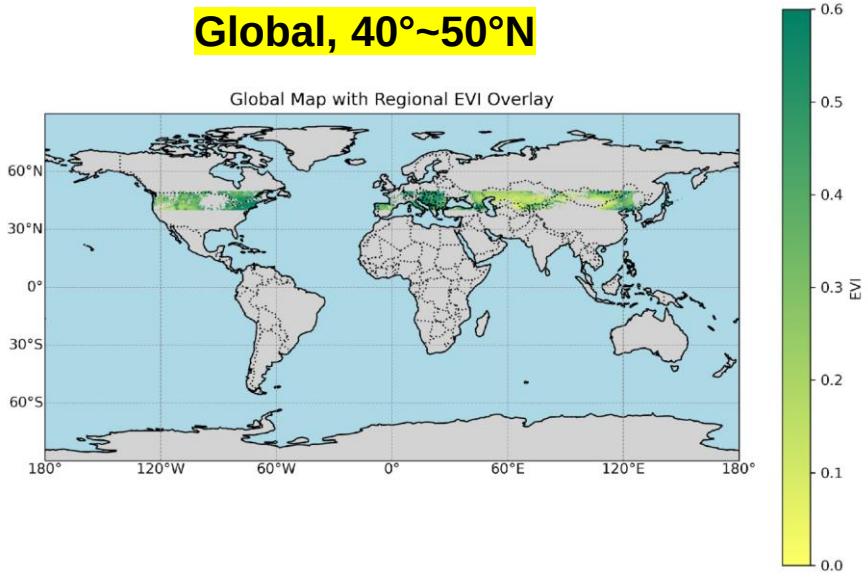


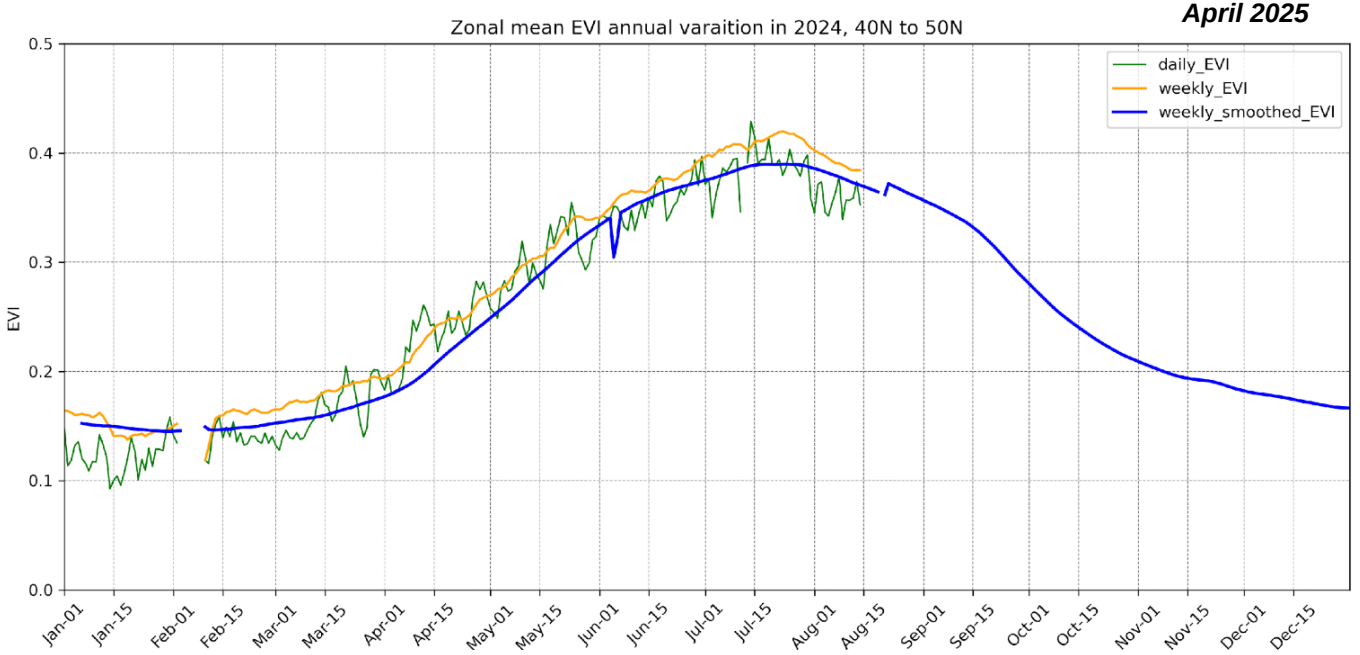


GVF phenology analysis

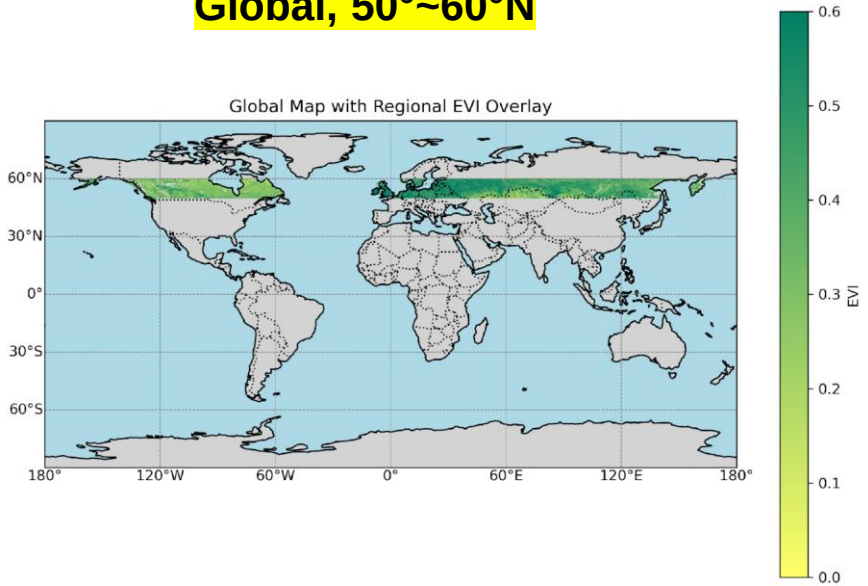
April 2025

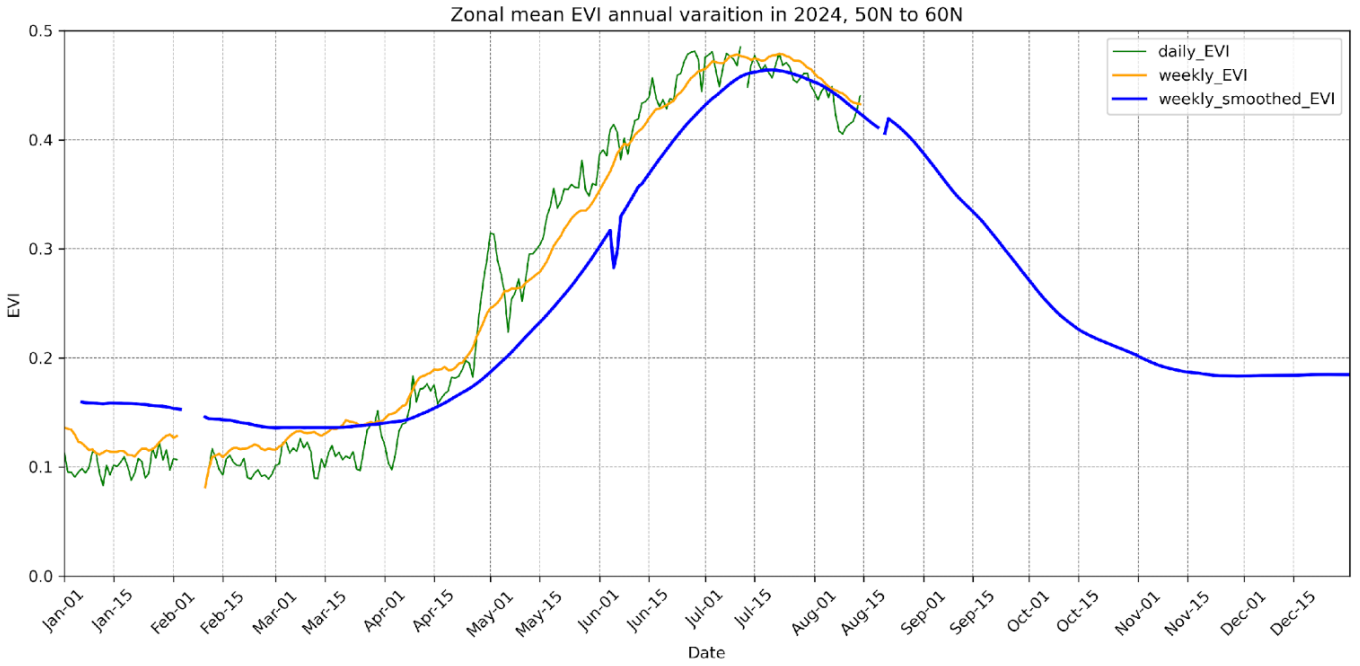
Global, 40°~50°N





Global, 50°~60°N





VIIRS SDR

April 2025

Accomplishments / Events:

- After downloading from GRAVITE the required VIIRS SDR products, conducted checkout of the IDPS Block 2.3 Release Mx13 software deployed on DP-TE: recommended to proceed with the Mx13 TTO
- Analyzed Suomi NPP and NOAA-20 VIIRS TEB performance using respectively the April 1-3, 2025 and April 15-17, 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
- Generated, tested and delivered for deployment in the IDPS operations the updated NOAA-21, NOAA-20, and Suomi NPP VIIRS SDR DNB DN0 and GAIN-RATIOS LUTs that were created based on data acquired during the new moon on 3/29/2025 and on 4/27/2025
- Assisted in scheduling and analyzed data from NOAA-21, NOAA-20, and Suomi NPP VIIRS lunar calibration on 4/8/2025: data aligns well with long-term trends and exhibits consistency
- A peer-reviewed journal paper entitled “Combined Use of Satellite Observations and the RIM for Assessing Recovery from Natural Disasters“ was published in *Photogrammetric Engineering & Remote Sensing* (https://doi.org/10.14358/PERS.24-00050R2)

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 verifXication	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			

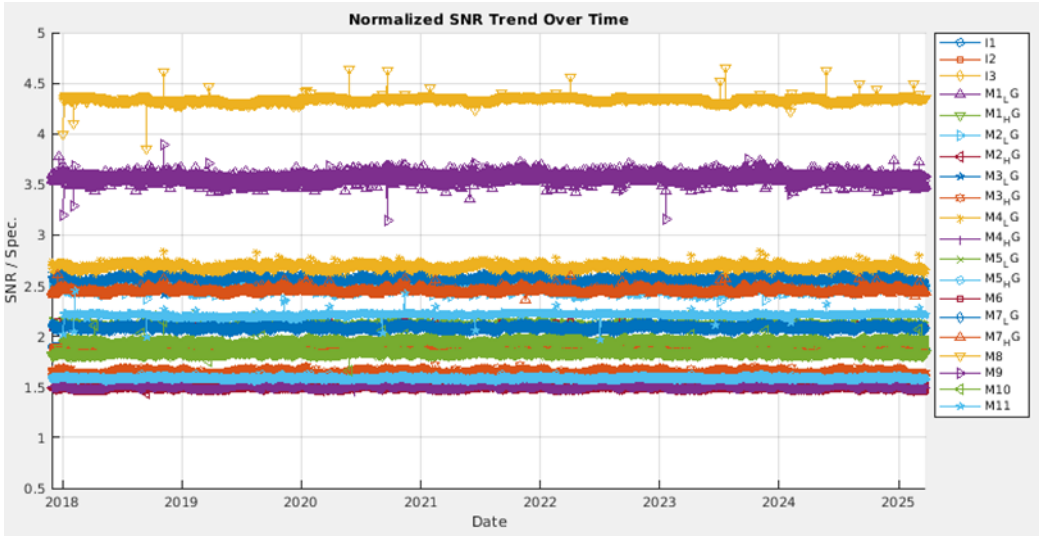
Overall Status:

	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:



NOAA-20 VIIRS RSB daily SNR trending since launch

VIIRS SDR 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

VIIRS Flood Mapping

April 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).

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

April, 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 transfer to operations within NCCF.
- VOLCAT VIIRS volcanic ash plume identification and extraction work is an enhancement to the VOLCAT methodology. The VOLCAT team has completed the initial version of training a random forest model to improve VOLCAT VIIRS-based ash plume detection and extraction. The initial version of the random forest (RF) was trained using the same metrics used in the current VOLCAT methodology to select/not select VOLCAT groups as volcanic ash events. The initial RF was scored using independent data from the data classification database (386 events or approximately 15% of the database, with the others used for training and validation). The initial results are very promising, the RF had a CSI of 0.678 compared to current VOLCAT methodology CSI of 0.597. The higher CSI was primarily driven by the RF having a lower FAR (0.172 vs. 0.333). However, the RF did exhibit a lower POD (0.790 vs. 0.851). The next focus will be two-fold: 1) assessing the RF on recent VOLCAT VIIRS results and 2) experimenting with adding additional metrics to the RF with the goals to increase POD, while maintaining the lower FAR. The highlight on the right shows an independent case used in the scoring. This example shows a current VOLCAT methodology false alarm that was eliminated in the initial version of the RF.

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	Apr-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: The figure on the right shows a VOLCAT false alarm from a SNPP observation on Feb 23 2022 near Central America. The initial version of the RF eliminated this false alarm.