NOAA JPSS Monthly Program Office

AMP/STAR
FY25

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November, 2024

Highlights from the Science Teams (October 2024)

STAR CrIS Imagery Monitoring the Development of Hurricane Milton

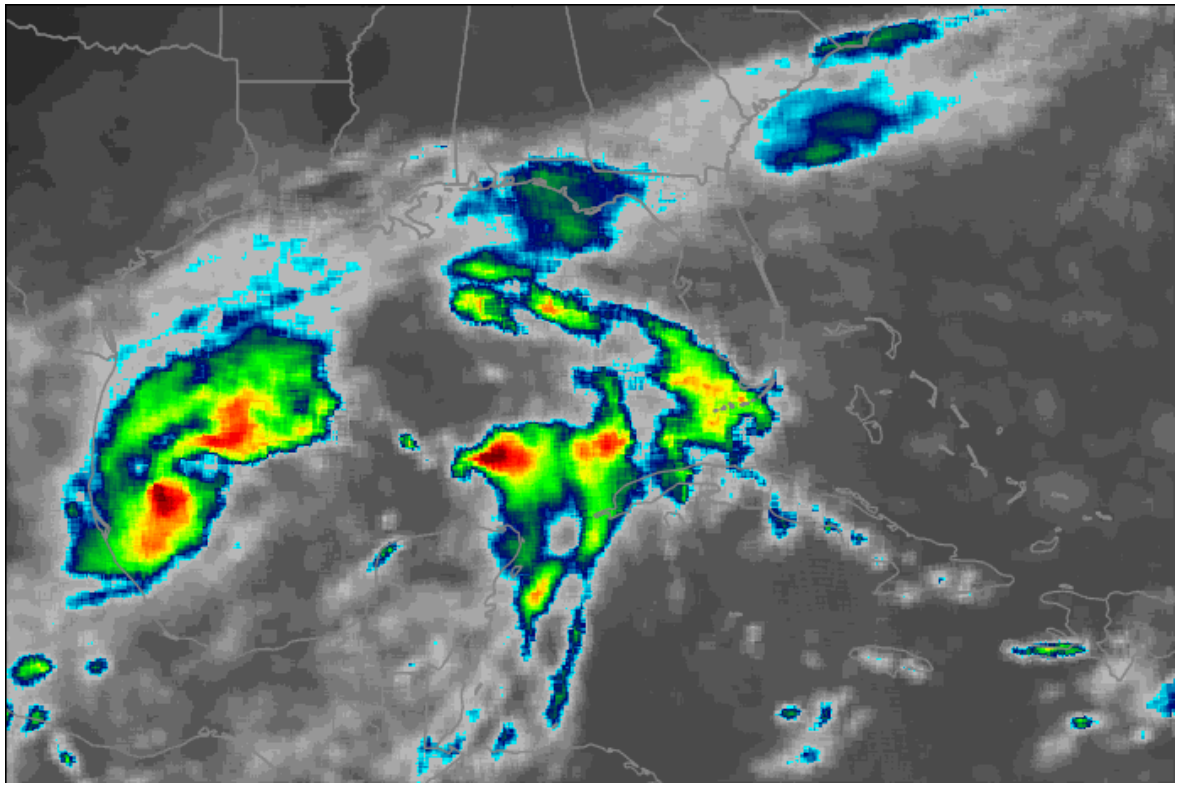


Figure. Composite image of emulated ABI Band #13 using data from CrIS Observations from NOAA-20 and NOAA-21. Left image is ~2024-10-09 18:00. Right images are ~2024-10-06 18:00, 2024-10-07 18:00, and 2024-10-08 18:00

CrIS imagery is being developed to enhance the capabilities of the GOES ABI infrared sensors. As a hyperspectral infrared sensor, CrIS offers unique imaging capabilities that are further enhanced by integrating data from the three on-orbit units. The value of CrIS imagery is expected to grow in high latitudes, where the spatial resolution of GOES ABI significantly degrades beyond 65°N/S. In these regions, CrIS imagery from the three on-orbit units is abundant and maintains high spatial resolution. The STAR CrIS Calibration and Validation Team created animations of Hurricane Milton for public release and sharing by the JPSS Social Media Team. These images were generated from NOAA-20 and NOAA-21 CrIS instruments, emulating GOES ABI Band #13 (10.2 - 10.5 μm).

Highlights from the Science Teams (October 2024)

Surface Type team captures rare Sahara flooding event

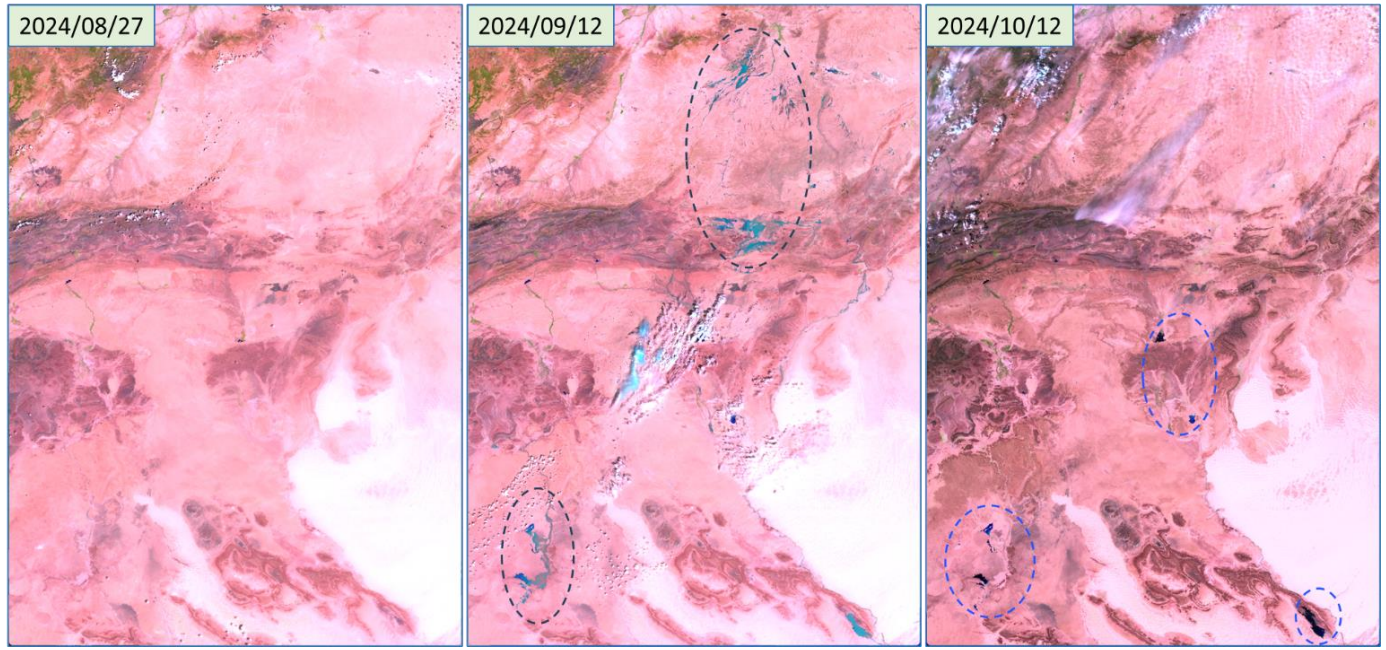


Figure. These NOAA-21 images were created with VIIRS bands I3, I2, and I1 in red, green, and blue. They cover an area of approximately 900 km x 1200 km over eastern Morocco and northwest Algeria.

An extratropical cyclone brought more rainfall to many areas over the Sahara Desert in 2 days (September 7 and 8, 2024) than the annual averages in those areas, causing rare flooding in those areas while bringing life to many dried lakes. While most of the flood water (middle, highlighted in the black ellipsoids) disappeared by October, the revived lakes remained inundated. Their dark or dark blue color tones (right, highlighted in blue) indicate that the water turbidity likely decreased substantially following the settle down of the sediments.

Accomplishments

Delivery Date	Cloud Containerized Algorithm Packages (CCAPs) – Enterprise Products:	Recipient
10/02/24	Preliminary delivery of EN-AOD (Enterprise Aerosol Optical Depth) CCAP v1 for OSPO software code review (SCR).	ASSISTT to NCCF
10/04/24	Patch delivery of version 4-1 of the final CCAP package of MiRS. Provided within this delivery is an updated code base that contains fixes for the problems with the MetOp-B and MetOp-C AMSUA/MHS input data problems. It also turns off MetOp-B AMSUA Channel 6 completely.	NCCF
10/09/24	Enterprise Flood Mapping CCAP version 3 delivered to CSPP which includes the new blended flood products (joint VIIRS/ABI) in addition to the VIIRS and ABI flood mapping products.	NCCF/CSPP
10/11/24	ADR-10912/CCR-7301 Initial J3 VIIRS SDR LUTs Based on Prelaunch Test Data. 10/11/2024 science team delivered the package to ASSISTT 10/30/2024 ASSISTT delivered the DAP to IDPS AIT	**IDPS**
10/16/24	Delivery of JPSS-LSA v1-3 CCAP to CSPP.	CSPP
10/16/24	Delivery of JPSS-LST v2-1 CCAP to CSPP.	CSPP
10/18/24	Delivery of the HEAP v4-1 patch to CSPP.	CSPP
10/24/24	Patch CCAP delivery of En-V8TOz-GOME v1r2 (algorithm version v1r1) to the NCCF S3 bucket. This patch updates two calibration tables, one for MetOp-B and one for MetOp-C.	NCCF
10/30/24	Final delivery of the EN-Cloud DCOMP v1-0 CCAP to the NCCF S3 bucket.	NCCF
10/31/24	Patch CCAP delivery of OceanColor v1-4 (algorithm version v1r61) to the NCCF S3 bucket. This Patch included removing the h5repack softlink that caused granule process failure, etc.	NCCF
10/31/24	GAASP-Precip v1-1 Patch delivery of the GAASP-Precip v1-1 CCAP to the NCCF s3 bucket. This patch includes an update to a Python script to account for non-0 value in the in L1B input files.	NCCF
11/01/24	Final patch delivery of the JPSS Ice Concentration and Extent v2-1 CCAP to the NCCF S3 bucket. This patch delivery is to fix the change of year bug encountered in operations.	NCCF

Accomplishments – JPSS Cal Val Support

NOAA-20/21/S-NPP Operational Calibration 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**	✔ **Routine, Ongoing**
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, 11/5/24**	✔ **Routine, Ongoing**
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, 11/5/24**	✔ **Routine, Ongoing**
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**	✔ **Routine, Ongoing**
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**	✔ **Routine, Ongoing**
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**	✔ **Routine, Ongoing**
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	**9/9/24, 10/9/24, 11/7/24**	✔ **Routine, Ongoing**
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	**9/9/24, 10/9/24, 11/7/24**	✔ **Routine, Ongoing**
NOAA-21	Monthly VIIRS LUT Update of DNB Offsets and Gains	**9/9/24, 10/9/24, 11/7/24**	✔ **Routine, Ongoing**
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)	✔ **Routine, Ongoing**

NOAA-21 Cal/Val Maturity Reviews

November 2024 Maturity Reviews			
Product	Maturity Review	Review Date	Review Panel Recommendations
OMPS NP Ozone EDR (V8Pro)	Validated	11/21/24	Validated Maturity upon implementation of latest tables in operations

FY24/25 STAR JPSS Milestones (1 of 2)

Algorithm Updates DAPs/CCAPs	Original Date	Forecast Date	Actual Completion Date	Variance Explanation	Status
OMPS-NP (J2 LUT Delivery)	Jan-24	Jan-24	Delivered on January 4, 2024.		✔ Good
ACSPO SST_v2 release version + patch to CCAP for MetOP	Jan-24	Jan-24	Delivered on January 16, 2024		✔ Good
GBBEPx (Enterprise Fires I-Band update)	Jan-24	Jan-24	Delivered on January 19, 2024		✔ Good
RAVE (Science bug fix)	Jan-24	Jan-24	Delivered on January 29, 2024		✔ Good
Vegetation Health	Jan-24	Jan-24	Delivered on January 30, 2024		✔ Good
GCOM RDR to ASD Converter (GRAC) - includes JAXA executable (AMSR-3)	Feb-24	Feb-24	Delivered February 02, 2024		✔ Good
LST EDR J2 Provisional (updates to LSE)	Dec-23	Feb-24	Delivered on February 12, 2024.		✔ Good
Ozone Mapping and Profiler Suite (OMPS) - V8TOs	Mar-24	Feb-24	Delivered on February 13, 2024.		✔ Good
Multi-platform Tropical Cyclone Surface Winds Algorithm (MTCSWA)	Feb-24	Feb-24	Delivered on February 16, 2024.		✔ Good
Land Surface Albedo	Mar-24	Mar-24	Delivered on March 6, 2024.		✔ Good
Hyperspectral Enterprise Algorithm Package (HEAP) updated to NOAA-21	Mar-24	Mar-24	Delivered on March 11, 2024.		✔ Good
LAI Initial Delivery	Feb-24	Apr-24	Delivered on March 28, 2024		✔ Good
VOLCAT (Phase 1) NCCF implementation	Dec-23	May-24	SCR: August 17, 2023 **Target CCAP Final : January 9, 2025.** (ASSISTT to NCCF)	Updating Science team delivery of a new HRIT reader	**Moved to FY25**
Cloud Mask J2 Validated; No code updates needed only maintenance CCAP (we can keep it as FY25 milestone)	Jan-24	Aug-24	CCAP SCR :**September 20,** 2024 **Target CCAP Final: Pushed one month from January to Feb 6, 2025**	Maintenance updates for CCAP as well as a new integrator on the project	**Moved to FY25**
Cloud Base Height (CBH), Cloud Cover Layer (CCL), Cloud Height, Phase and Type (different CCAPs for Cloud implementation) Maintenance CCAP (No code updates, will be continued as FY25 milestone)			Target CCAP Final : **Pushed one month from January to Feb 6, 2025.**		
OPS LP Final CCAP (Continue tracking as FY25 milestone)	Jan-24	Nov-24	Final CCAP: **Target date pushed from October 31 to November 15.**	ASSISTT team incorporating additional updates	**Moved to FY25**

FY24/25 STAR JPSS Milestones (2 of 2)

Milestones (Algorithm Cal/Val and LTM)	Original Date	Forecast Date	Actual Date of Completion	Variance Explanation	Status
FY25 Program Management Review (all teams)	Jun-24	Jun-24	**Successfully completed for FY24** Will be continued as part of FY25 milestones		✔ Good
GOSAT-GW End to End	Aug-24	Aug-24	Follow pre-launch operations schedules. GOSAT launch: April 2025. Will be continued as part of FY25 milestones	Segment Integration Working Group (SIWG) meeting (9/10) mentioned that execution window for end-to-end test and pre-launch operations has been moved from October 14–25 to Jan/Feb 2025.	Ongoing **Moved to FY25**
AST-2023 (VIIRS Annual Surface Type)	Sep-24	Sep-24	Delivered 09/26/24 **Successfully completed for FY24**	Attained validated status with theAST2023 delivery on 9/30/2024. AST-2024 will be produced as FY25	✔ Good
Reprocessing and transfer of EDRs to CLASS	Sep-24	Sep-24	Ongoing collaborations between STAR, CLASS and NCEI resulted in fruitful path forward Will be continued as part of FY25 milestones	JSTAR Team submitted a request to CLASS to archive reprocessed AOD/ADP. CLASS management approved Request For Work (RFW) for Engineering Assessment.	Ongoing **Moved to FY25**
JPSS-3 pre-launch test data review/analyze (SDR teams); JPSS-3/JPSS-4 activities/reviews support	Sep-24	Sep-24	On-schedule and on-going following JPSS-3 and JCT (1) Completed, JCT (2) Dry Run 1 Completed, JCT-2 Dry Run 2 (Nov. 6); Run for Record (ROR): Waived Will be continued as part of FY25 milestones	ATMS, CrIS, VIIRS, OMPS submitted Cal/Val plan for J4/J3. ATMS, VIIRS, and CrIS team delivered J3 sensor characterization report. OMPS J3 sensor characterization moved to the end of the year.	✔ Good
Maintain / Update ICVS (develop ICVS modules to support various activities: monitoring, inter-sensor comparison, …)	Sep-24	Sep-24	**Successfully completed for FY24** Will be continued as part of FY25 PMR	ICVS has implemented modules for NRT monitoring of NOAA-21 ATMS. OMPS-NM, OMPS-NP, CrIS, and VIIRS. ICVS demonstrated basic functions for LP using SNPP data as a proxy and is waiting to receive NOAA-21 LP data.	✔ Good
Maintain / Expand (to include JPSS-2 products) JSTAR Mapper	Sep-24	Sep-24	**Successfully completed for FY24** Will be continued as part of FY25 PMR	Currently all NOAA-21 products (except those which are not operationally available: Albedo, Snow Cover, Land Surface Temperature) are being generated/visualized in the JSTAR Mapper. The team will continue to monitor the operational availability of NOAA-21 products and begin production as they come online.	✔ Good
Images of the Month	Monthly	Monthly	**Successfully completed for FY24** Will be continued as part of FY25 PMR		✔ Good

Additional FY25 STAR Milestones are in works and will be reported in the next NJO monthly meeting

FY24 STAR JPSS Cal/Val Maturity Reviews

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation	Status
OMPS SDR (NP & TC Validated)	Mar-24	Mar-24	**Attained Validated status – effective date depends on ADR10825 Solar Flux implementation planned for April 2024**		✔ Good
Clouds (V: Mar-24)	Mar-24	Mar-24	Provisional Review held (except for DCOMP and NCOMP): October 26, 2023; Attained Provisional effective March 30. **DCOMP and NCOMP Provisional Review occurred virtually on December 4, 2023,** and attained **Validated status** effective March 30.		✔ Good
Aerosol AOD (V: Jun-24)	Jun-24	Jun-24	Attained **Validated** status effective March 30, 2023		✔ Good
Aerosol ADP (V: Jun-24)	Jun-24	Jun-24	Attained **Validated** status effective March 30, 2023		✔ Good
Volcanic Ash (V: Mar-24)	Aug-23	Aug-23	Attained **Validated** status effective March 30, 2023		✔ Good
Cryosphere (B: May-23; P: Aug-23 for Sea Ice & Binary Snow; V: Feb-24 (SI & Binary Snow); V (other) :Jul-24	Jul-24	Jul-24	Ice Thickness/Age: Attained **Validated** status effective May 1, 2023. Snow Cover & Fraction: Attained **Validated** status effective May 1, 2023. IST and Ice Concentration: Attained **Validated** status effective May 1, 2023.		✔ Good
Active Fires (V: Jul-24)	Jul-24	Jul-24	Attained **Validated** status effective March 30,2023.		✔ Good
LST/LSA/SR/GVF/VI (P: Jan-24; V: Jul-24 to Jan-25 FY25)	Sep-24	Sep-24	LST: Attained **Validated** status effective June 23, 2023. Surface Albedo: Attained **Validated** status effective August 30, 2023. Surface Reflectance: Attained **Validated** status effective Nov. 1, 2023. GVF, VI: Attained **Validated** status effective June 23, 2023.		✔ Good
Vegetation Health (V: Apr-25 FY-25)	FY-25	FY-25	Attained **Validated** status effective March 30, 2023		✔ Good
Ocean Color (B/P: Jan-24; V:Jul-25 FY25)	Jan-24	Sep-23	Attained **Validated** status effective March 1, 2024, to coincide with data availability from the NOAA CoastWatch program and MSL12 version 1.61 algorithm LUTs		✔ Good
SST (V: Aug-24)	Aug-24	Aug-24	Attained **Validated** status effective March 20, 2023		✔ Good
VPW (B/P: Jan-24; V: Mar-24)	Mar-24	Mar-24	**Attained Validated status effective November 16, 2023.**		✔ Good
VFM (V: Jan-25)	FY-25	FY-25	Attained **Validated** status December 14, 2023.		✔ Good
NUCAPS P: Jan-25; V: Mar-Jun-24)	Jun-24	Jun-24	Attained **Validated** status effective September 26, 2023.		✔ Good
MiRS (V:Oct-24)	Oct-24	Oct-24	Attained **Validated** status effective May 12, 2023		✔ Good
SFR (P: Feb-24; V: May-24)	May-24	May-24	Attained **Provisional status- effective** upon v2r0 algorithm currently planned for July 2024. **Validated maturity** is expected (in May 2025) after collecting more data in the spring. However, based on the material presented and considering the fact that the NOAA-21 SFR already meets the requirement, the JPSS Program is considering approving validated maturity.		✔ Good
OMPS NP EDR V8Pro & V8TOz & V8TOS (V: Mar-24)	Mar-24	Mar-24	Validated review successfully completed for for V8TOz TC and V8TOS on 09/19/24. **Validated review for OMPS NP V8Pro is planned for November, 2024.**		✔ Good
OMPS LP (B: Jan-24; P: Feb-24; V:Sep-24	Sep-24	Sep-24	**Validated** maturity review successfully completed on 9/19/24..		✔ Good

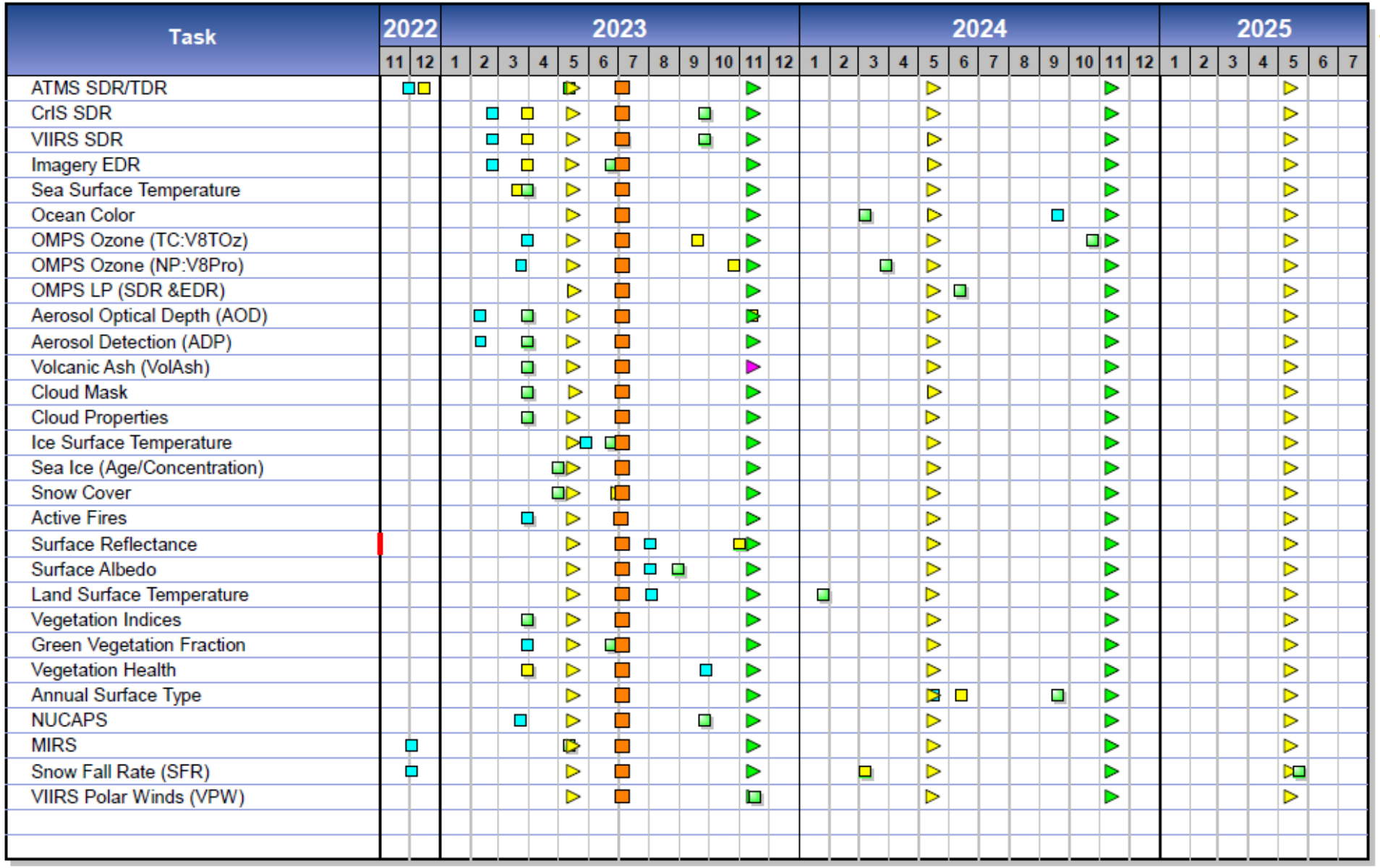
FY24/25 STAR JPSS Milestones

Operational/Program Support	Original Date	Forecast Date	Actual Completion Date	Status
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	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**	✔ **Routine, Ongoing**
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	09/10/24, 09/24/24**, 10/8/24, 10/22/24, 11/5/24**	✔ **Routine, Ongoing**
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	**9/9/24, 10/9/24, 11/7/24**	✔ **Routine, Ongoing**
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	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**	✔ **Routine, Ongoing**
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	09/03/24, 09/17/24, 10/1/24**, 10/16/24, 10/29/24**	✔ **Routine, Ongoing**
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains,	Monthly	Monthly	**9/9/24, 10/9/24, 11/7/24**	✔ **Routine, Ongoing**
NOAA-21: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	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**	✔ **Routine, Ongoing**
NOAA-21: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	09/03/24, 09/17/24, 10/1/24**, 10/16/24, 10/29/24**	✔ **Routine, Ongoing**
NOAA-21: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	**9/9/24, 10/9/24, 11/7/24**	✔ **Routine, Ongoing**

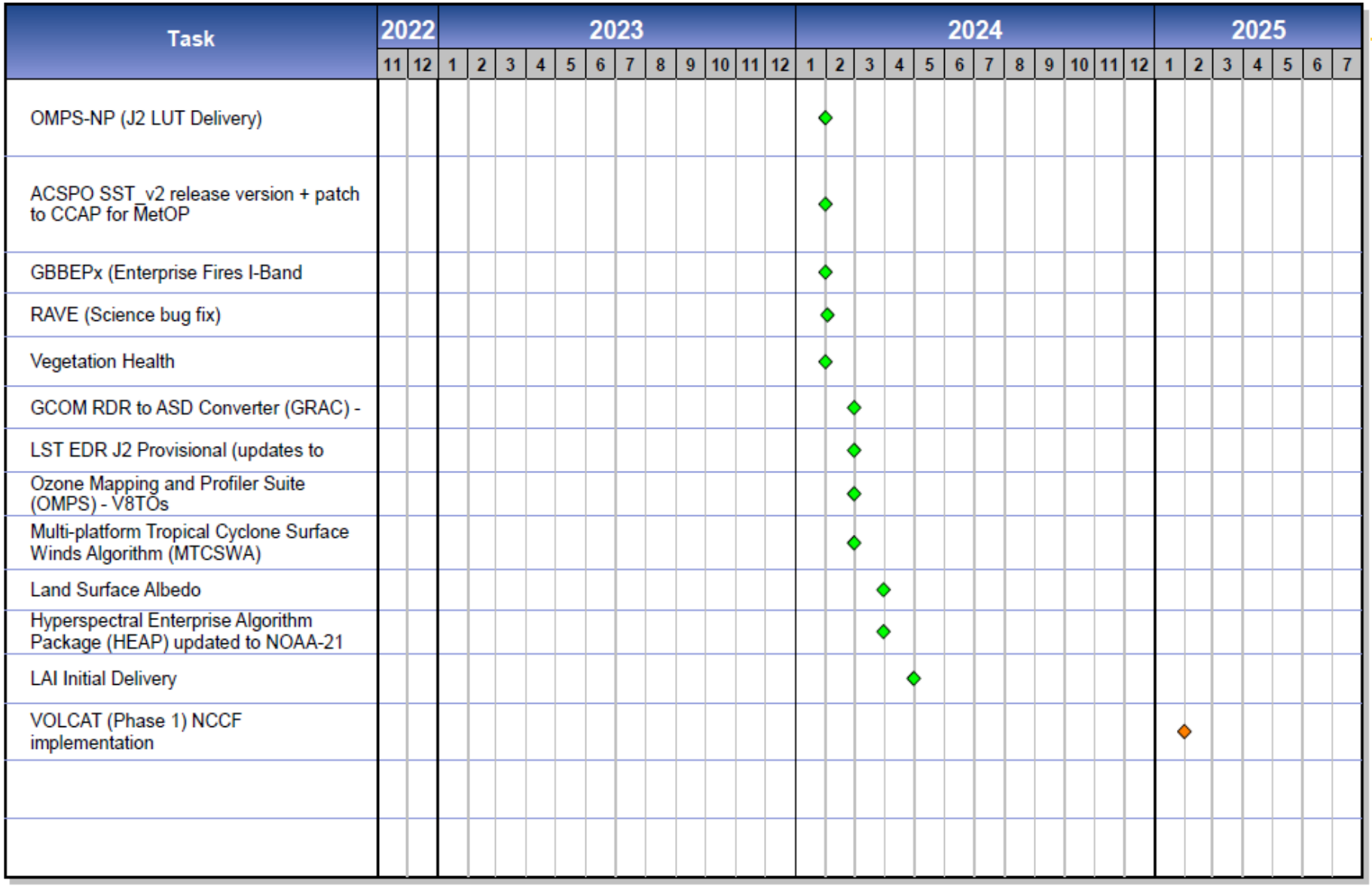
FY 25 IDPS Mx Build Review/Checkout

IDPS Mx Schedule	Mx12	Mx13	Mx14
SOL (DP_FE) regression test	Nov. 4 – Dec. 9, 2024	Feb. 18 - Mar. 18, 2025	May. 15 – Jun. 17, 2025
STAR SOL review/checkout feedback (Go/No-Go & Report)	NA	Mar. 18, 2025	Jun. 17, 2025
I&T (DP-TE) regression test	Dec. 19, 2024 - Jan. 23, 2025	Apr. 3 – Apr. 16, 2025	Jul. 3 – Jul. 18, 2025
STAR I&T review/checkout feedback (Go/No-Go & Report)	Jan. 23, 2025	Apr. 16, 2025	Jul. 18, 2025
TTO	Feb. 18, 2025	May. 6, 2025	Aug. 5, 2025

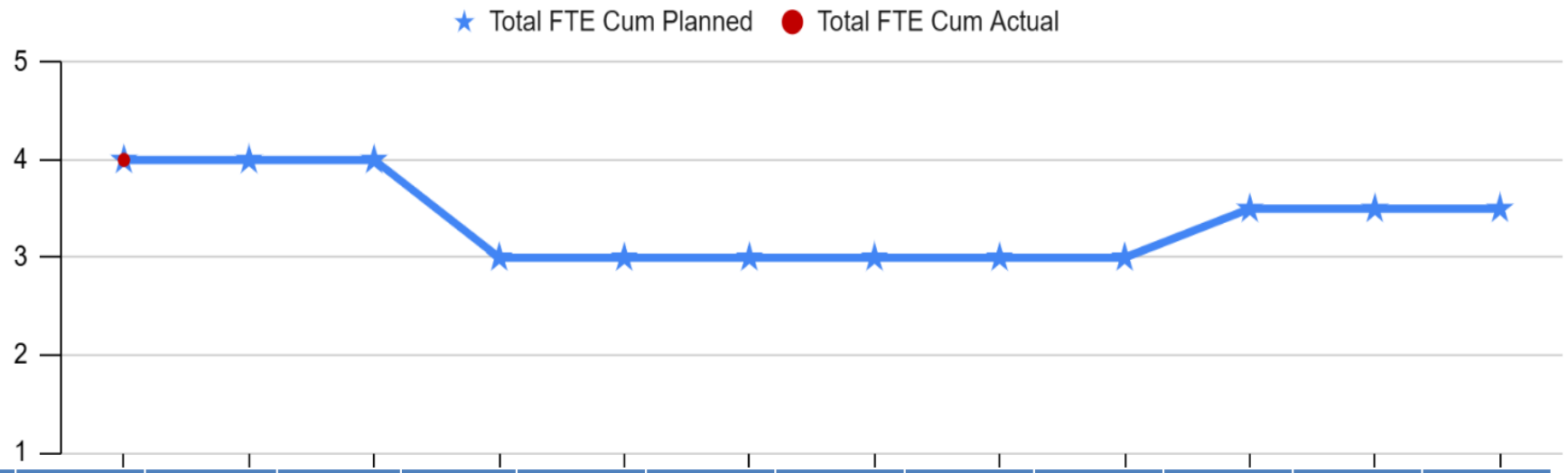
STAR JPSS Schedule: TTA Milestones Algorithm Updates DAPs/CCAPs



STAR JPSS Schedule: TTA Milestones Algorithm Updates DAPs/CCAPs



J-STAR FY25 Planned Program Management Staffing Plan v Actuals



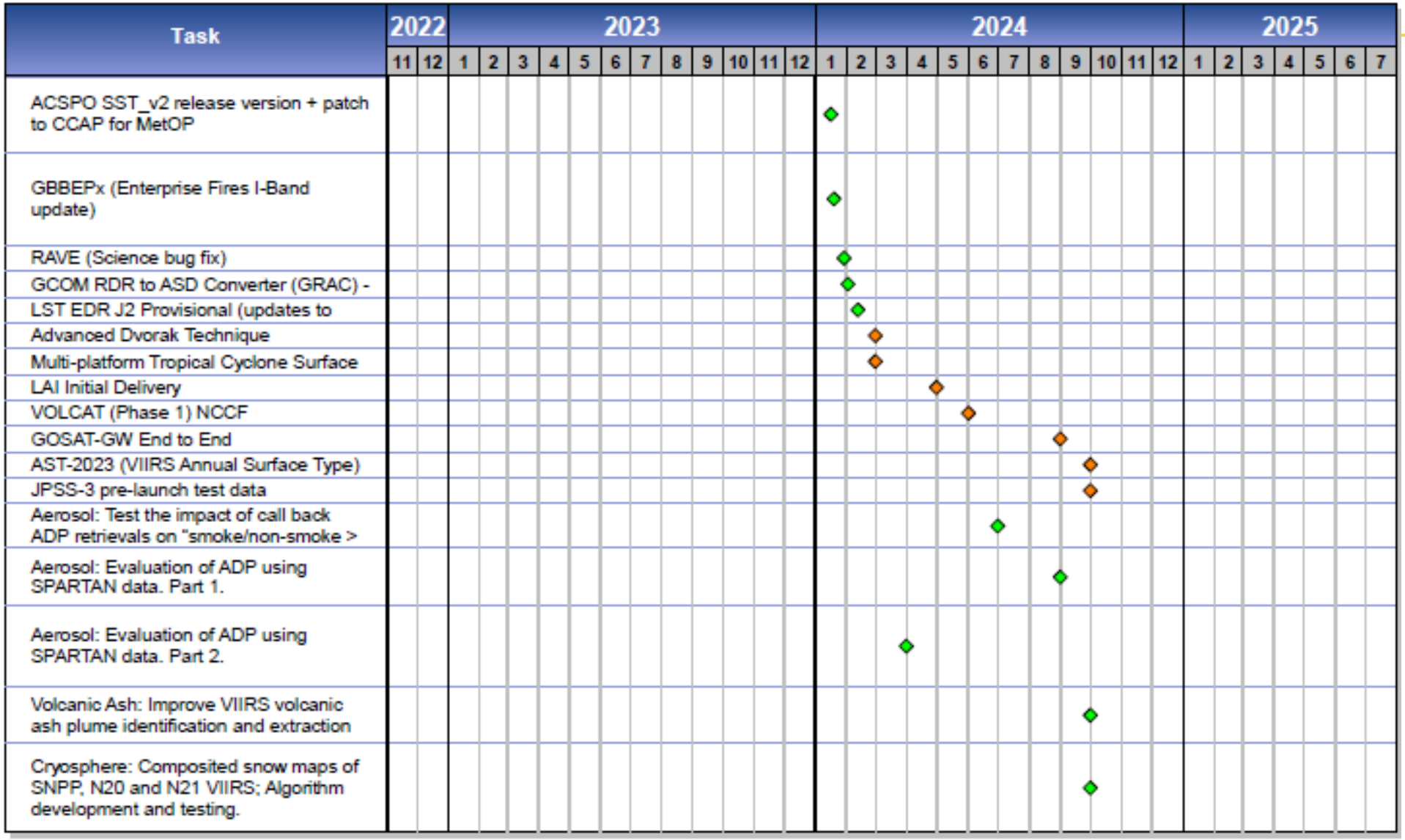
J-STAR FTEs	Oct'24	Nov '24	Dec '24	Jan '25	Feb '25	Mar'25	Apr'25	May'25	Jun'25	Jul '25	Aug '25	Sep '25
Cum Planned (CS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Cum Actual (CS)	0.00											
Cum Planned (WYE)	4.00	4.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00	2.50	2.50	2.50
Cum Actual (WYE)	4.00											
Total FTE Cum Planned	4.00	4.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00	3.50	3.50	3.50
Total FTE Cum Actual	4.00											

CS: Vacant (prev. Alisa Young)

WYE: Qingyuan Richard Zhang (through Dec), *Prasanjit Dash, Murty Divakarla, Tom Atkins, Jeffrey Weinrich, Wei W. Li , Tess Valenzuela*

Backup/Additional milestones

STAR JPSS Schedule: TTA Milestones

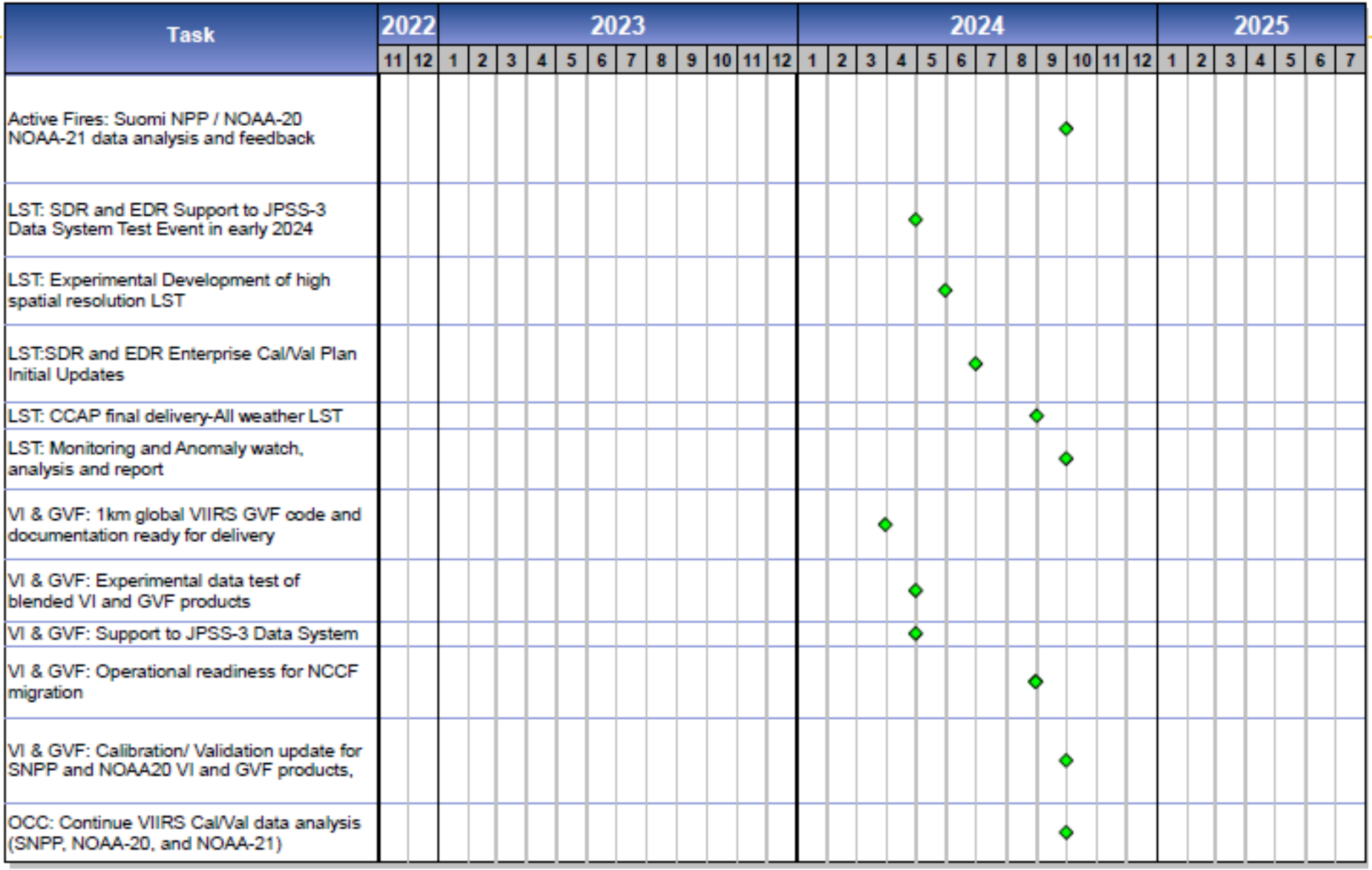


STAR JPSS Schedule: TTA Milestones

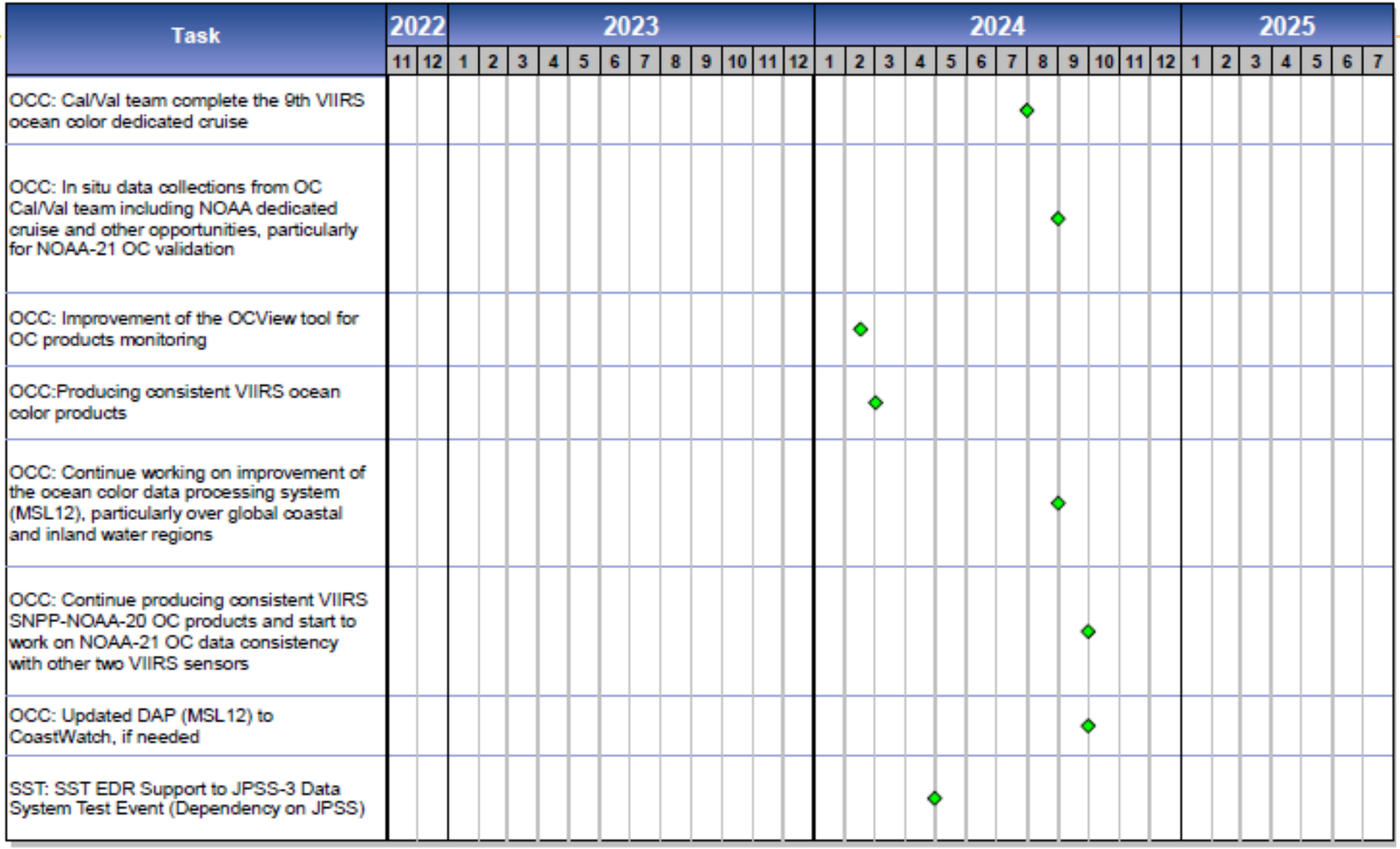
Task	2022		2023												2024												2025						
	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
Cryosphere: Blended VIIRS + microwave snow product: Add AMSR2 and GMI to the set of microwave sensors used																							◆										
Cryosphere: Physically-based snow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

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

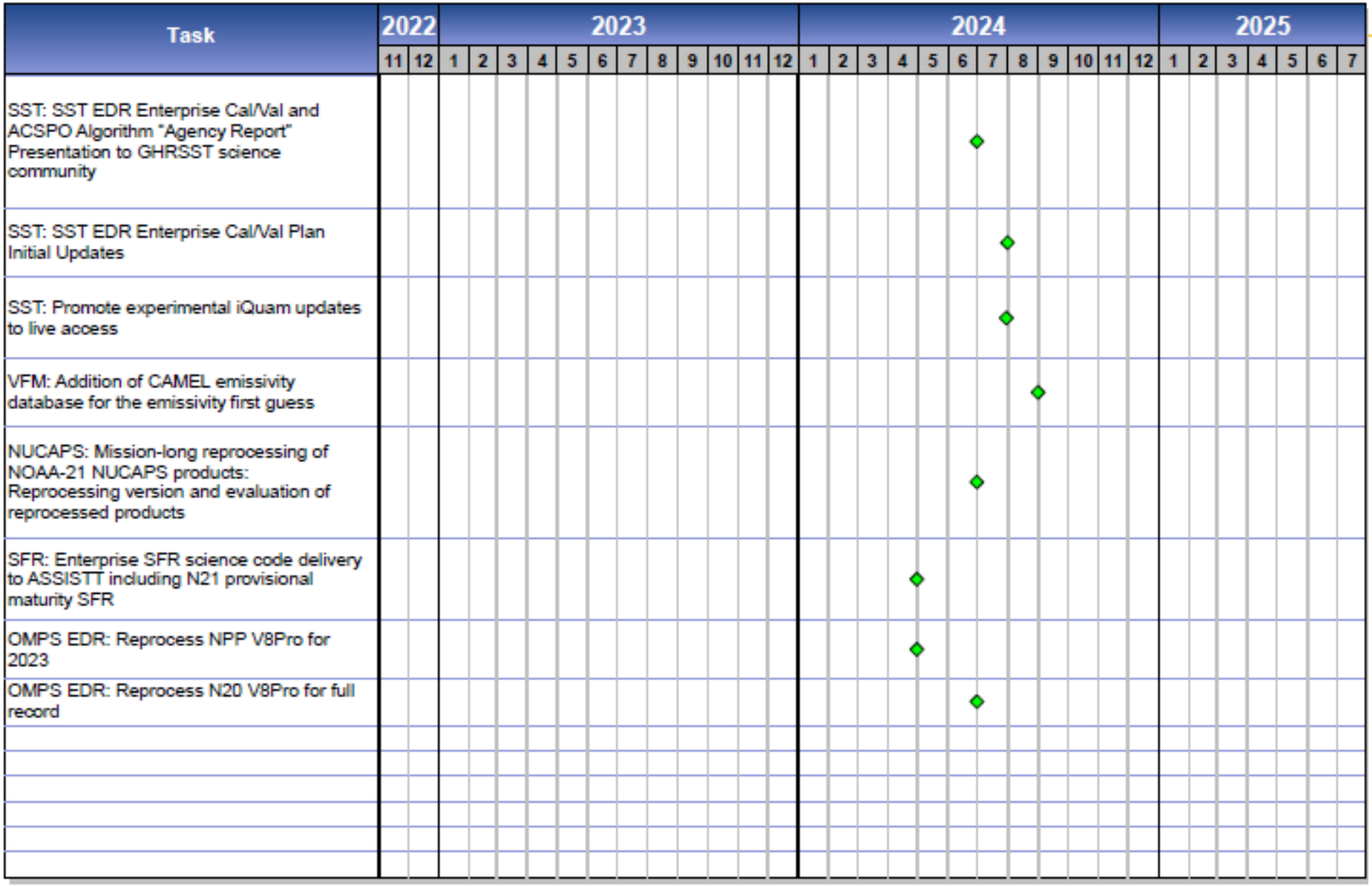
STAR JPSS Schedule: TTA Milestones



STAR JPSS Schedule: TTA Milestones



STAR JPSS Schedule: TTA Milestones



Color code:

Green: **Completed Milestones**

Gray: **Ongoing FY24 Milestones**

Active Fires

October 2024

Accomplishments / Events:

- Continued analysis of the EFIRE data record to evaluate algorithm performance for a wide range or observing and environmental conditions
  - Analyzed frequency of residual bowtie-related duplicate detections
- Worked with the NGFS development and GINA teams to resolve time stamp differences to enable NGFS vs. EFIRE comparisons

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			

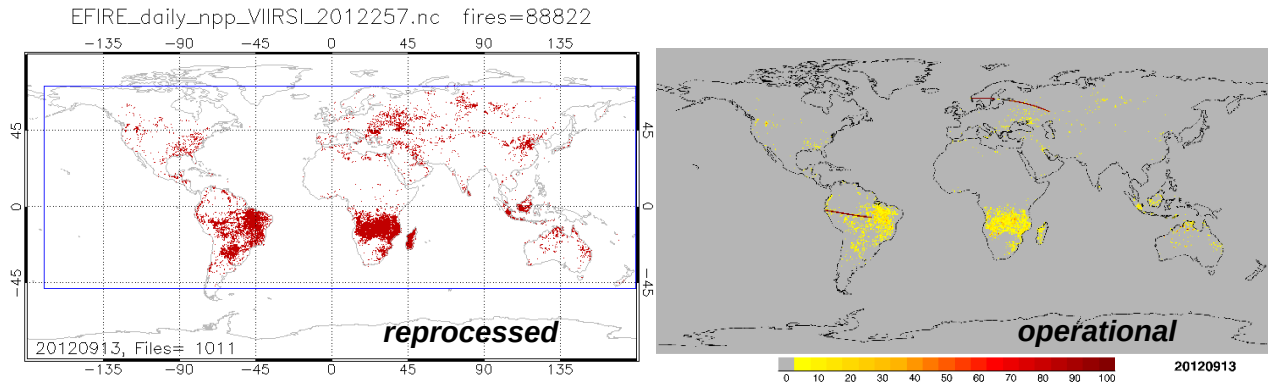
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

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

Highlight: long-term EFIRE VIIRS I-band data record

Suomi NPP, September 13, 2012



Left: Reprocessed VIIRS I-band product; right: operational VIIRS M-band product. Note the spurious scans in the operational product.

Aerosol

February 2024

Accomplishments / Events:

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

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

Overall Status:

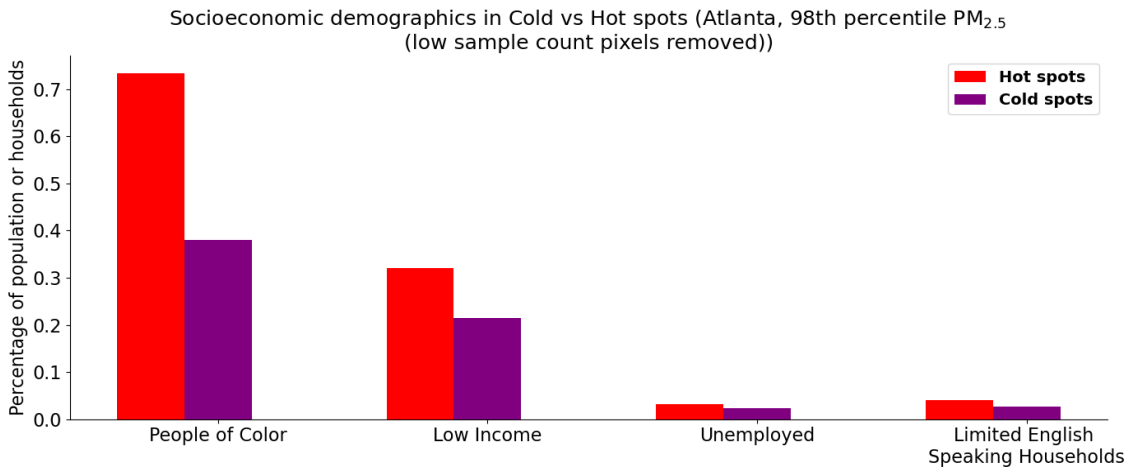
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
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. Issue: Developer of the ML-SFRA has left the team; date of milestone is TBD.

Highlight:



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

ATMS SDR

October 2024

Accomplishments / Events:

- Finish drafting the NEON QuickSounder ATMS Post-Launch Cal/Val Plan document based on the recently submitted JPSS-3 SN305 ATMS Cal/Val Plan and submit to ATMS science team for review. Due to the pre-launch data access restriction within STAR, QS ATMS Cal/Val plan only carries the post-launch activities. A clean draft revision for broader users' review will be submitted by mid of November.
- Provide striping index calculation method and PCT coefficients sources descriptions for JPSS-2 Gov't Calibration Data Book document preparation. Review several draft versions to provide the comments and additional data tables.
- Performed the PCA Analysis on Microwave Sounder Observations. Implemented the PCA method for microwave radiance decomposition in support of extracting the striping noise from Earth observations. Tested the PCA analysis on reprocessed ATMS data granules for February 24, 2012. Figure 1 shows the brightness temperature map of the selected segment of the ATMS channel 10 and the first two PCA components.
- Finish updating ATMS RO profile bias trending package. This package can provide an independent ATMS science data quality long term trending using daily RO profiles. The update includes the clean-up of main script and use environment setup file for data directory setting, which is a improvement for package transition among team members and users.

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
NOAA-20 ATMS Spectral Response Function (SRF) analysis/report to allow replacement of simulated NOAA-20 ATMS SRFs with measured values	Sep-25	Sep-25		
Improve the ATMS geolocation accuracy assessment tool timeliness by reducing the current time window from 30-day period to a shorter period	Sep-25	Sep-25		

Overall Status:

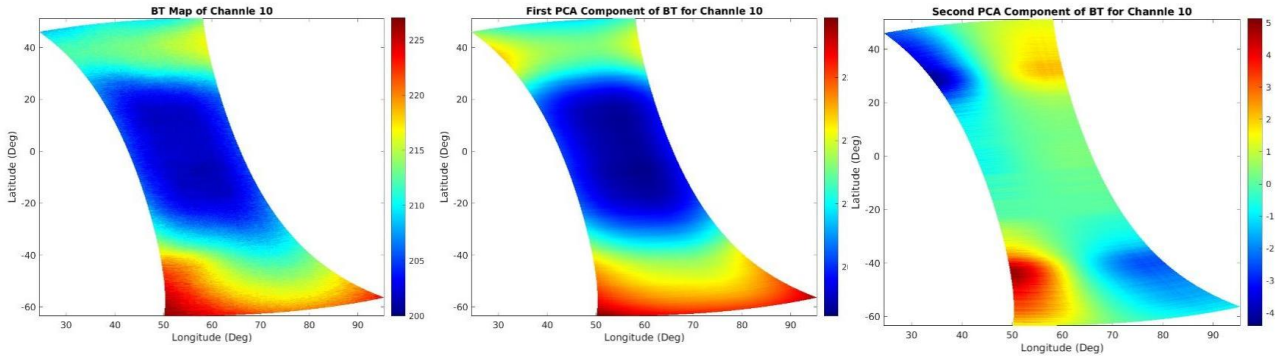
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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:

Highlights:

Figure 1. S-NPP ATMS channel 10 (left) and 1st (middle) and 2nd (right) PCA component map



Clouds

October 2024

Accomplishments / Events:

- The new ECM LUT for NPP/NOAA-20 and NOAA-21 as well as updated DCOMP LUTs for all sensors have been provided to ASSISTT in July 2024. We are awaiting a new code delivery for the SAPF as well as sample data from ASSISTT to do a final evaluation. Per ASSISTT, they are working on the merge of the code due to “an issue came to light at the end of last week, where the subpixels seem to be working for ABI and AHI and not for VIIRS.” ASSISTT delivered an updated processing system code at the end of October.

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

Overall Status:

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

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

Issues/Risks:

None

Highlights:

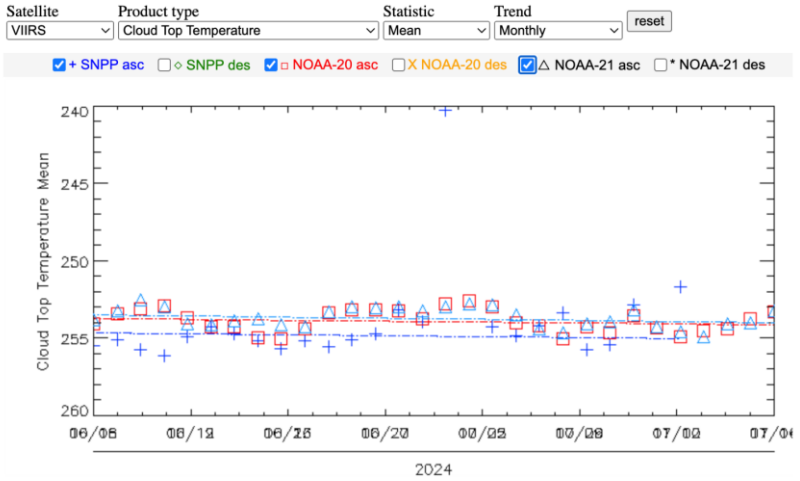


Figure 1.Example of the LTM trends of NPP, NOAA-20 and NOAA-21 CTT for October 2024 for the ascending node. Note the consistency of the data as seen in the plot, though there is variability due to the separation of NPP from the other two satellites

CrIS SDR

October 2024

Accomplishments / Events:

- Performed data analysis supporting launch side decision for CrIS JPSS-4 (**Figs. 1,2**)
- Completed the Checkout for the Mx11 regression. No significant discrepancies observed.
- Generated animations for JPSS Social Media Team of Hurricane Milton (**Fig. 3**)
- Made progress on CrIS Spike Algorithm testing (**Fig. 4**)
- Supported investigation of S-NPP errors on 2024-10-26. S-NPP CrIS performed as expected, consistent with past geolocation errors.
- Refactored portions of the CrIS ABI Intercomparison code to use FOSS (in this case, Python) instead of COTS (IDL). (**Fig. 5**)
- Continued monitoring of all CrIS instruments (**Fig. 6**)
- Developed early prototypes for direct CrIS pressure level imagery. (**Fig. 7**)

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

Overall Status:

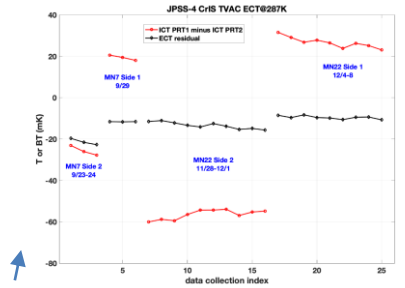
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X	X	X	See Issues/Risks
Schedule			X		See Issues/Risks

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.*

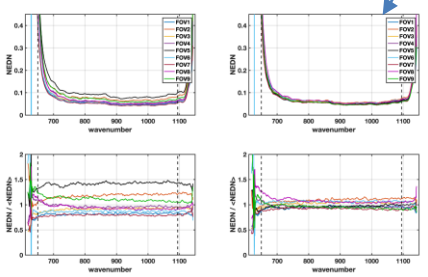
Issues/Risks:

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:

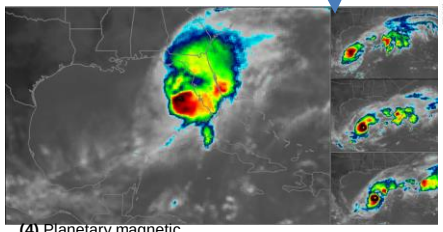


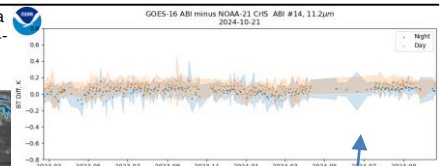
(1) JPSS-4 ICT PRT differences (PRT1 minus PRT2) and ECT BT residuals when viewing the ECT at 287K for Side 1 and Side 2 MN7 and MN22.



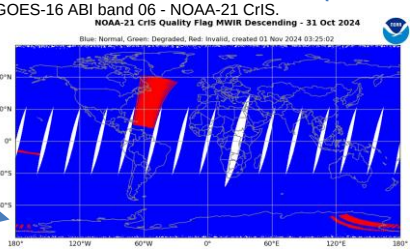
(2) JPSS-4 I Side 1 (left panels) and Side 2 (right panels) showing the Longwave band NEDN.

(3) Composite image of emulated ABI Band #13 using data from CrIS on NOAA-20 and NOAA-21. Left image is ~2024-10-09 18:00. Right images are ~2024-10-06 18:00, 2024-10-07 18:00, and 2024-10-08 18:00

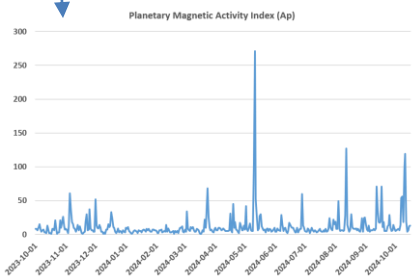




(5) Updated CrIS/ABI Intercomparison outputs. GOES-16 ABI band 06 - NOAA-21 CrIS.

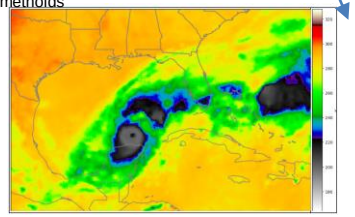


(4) Planetary magnetic activity index over the past 12 months, used to guide the selection of focus days for the CrIS spike algorithm parameter optimization.



(6) NOAA-21 CrIS overall DQF on 10/31/2024 showing a large number of invalid granules.

(7) Composite NOAA-20/NOAA-21 Image ~2024-110-08T18 at estimated 1028 hPa using prototype methoids



Cryosphere and Polar Winds

October, 2024

Accomplishments / Events:

- **Validation of VIIRS NOAA20 product with IceBridge KT-19 measurements:** To validate the VIIRS NOAA-20 product, the ice surface temperature (IST) is compared to airborne KT-19 observations during NASA's Operation IceBridge. This is a continuation of previous validation studies. The KT-19 is a nadir-pointing radiometer flown on the bottom of the NASA IceBridge aircraft. NASA's KT19 Version 2 data provide an improvement of the geolocation of the KT-19 footprints, due to replacing the coarse real-time GPS positions with post-processed differential GPS positions. In this comparison, the IceBridge P-3 aircraft flew at an altitude of 3000 ft. over sea ice off the North Greenland coast on April 6, 2019. At this altitude, the KT-19 spot size is ~100m. The KT-19 along this track is compared to collocated VIIRS NOAA20 data where available. Most unavailable NOAA20 data are where the product processing identifies intervening clouds using the VIIRS cloud mask). The VIIRS NOAA-20 Product shows good agreement with the KT-19 data along the flight track (Figure 1).
- **Test Case of Single Orbit Tandem VIIRS 3-JPSS Satellite Winds Product is Successful:** An experimental test case of running the JPSS Enterprise framework for a triplet of M15 (IR, 11 µm) overpasses from the combination of NOAA20, NPP, and NOAA21, in that order, was done for data at 08:57 UTC on 24 September 2024. The Atmospheric Motion Vector (AMV) output from this test case is shown in Figure 2. A qualitative assessment shows that there is good agreement between all wind outputs. For example, the upper-level southwest flow over Scandinavia ahead of a cyclone off the coast of Norway is evident, as is the mid-level northerly flow over Greenland. The importance of using three satellites is shown in the coverage of winds compared to the single NPP VIIRS. As seen in Figure 1 there is much greater coverage of winds in the 3-satellite tandem product. This is most noticeable at the swath edges over Russia, Scandinavia, far northern Quebec, and north-central Canada. The much greater coverage is most noticeable over low to mid-level winds over northeast Russia. Furthermore, winds coverage in the 3-satellite tandem winds product is shown to increase coverage further eastward when compared to the 2-satellite tandem winds product.

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

Overall Status:

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

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

Issues/Risks: None

Highlights:

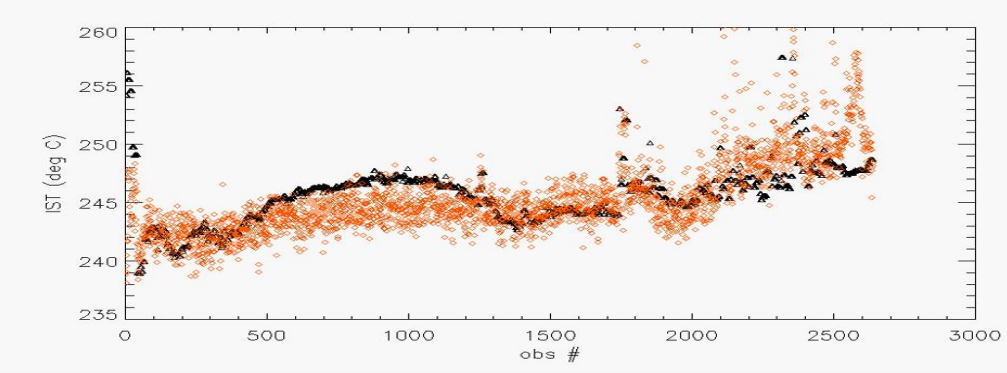


Figure 1. VIIRS NOAA-20 product (black) vs. IceBridge KT-19 IST measurements (red) along the April 6, 2019 flight track.

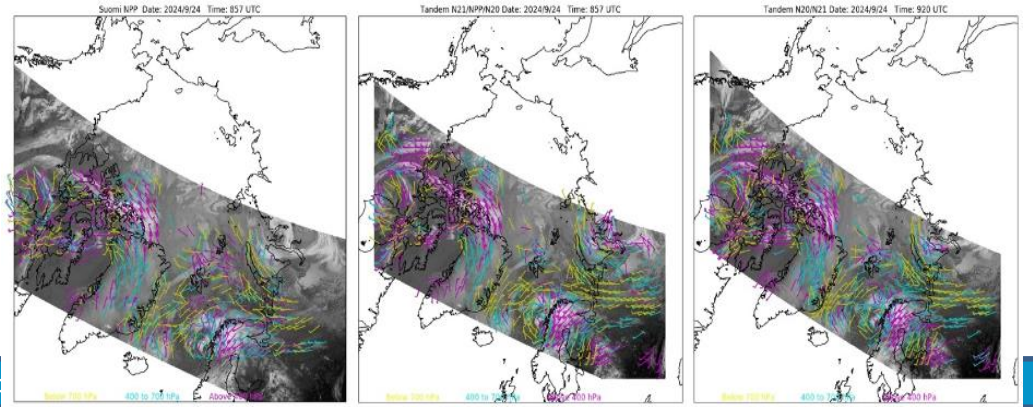


Figure 2: VIIRS IR AMV observations on 24 September 2024 of Single NPP at 0857 UTC on the left. Tandem NOAA21>NPP>NOAA20 at 0857 UTC in the middle. Tandem NOAA21>NOAA20>NOAA21 at 0920 UTC on the right. Note, all times are the polar crossing times of the middle overpass.

Accomplishments / Events:

- **Intercomparison of AMSR2 and VIIRS-AMSR2 Blended Sea Ice Concentration Monthly Composites:** An intercomparison of monthly composites of sea ice concentration (SIC) for April, May and June 2024 over the Arctic has been completed. The AMSR2 SIC product uses the NASA Team-2 algorithm, while the VIIRS SIC data that goes into the blend uses the Enterprise algorithm with the blending method discussed further in Dworak et al. 2021.
- Individual monthly composites for each product are shown in Figure 1. Visual comparison of the monthly composites for both AMSR2 and Blended (VIIRS+AMSR2) show little difference between them. A more detailed statistical analysis is shown in Table 1. The comparison (Blend-AMSR2) is only made when either product has an observable SIC greater than 0. Overall, the bias is miniscule; accuracies are within a few percentage points, standard deviations and root mean squared (rms) differences are in between 5-7%. Of note is the average SIC values over the Arctic being around 88% in April, 84% in May and 80% in June for both products, showing a similar decrease in SIC as we move further into the summer melt season. Next, the differences in SIC for each month are plotted in Figure 2 and show in detail, locations of disparities between the two SICs. Most noticeable are that larger differences in general tend to be located near the sea ice edge and coastlines. For example, in April AMSR2 produces larger SIC (as much as 20% higher) values across the northern Barents Sea, in between Novaya Zemlya and Svalbard near the sea ice edge (see Figure 1).
- Another example is across the southern Laptev Sea where the Blended produces larger SIC of about 5-10%. Also, of note is the area across the eastern Beaufort Sea in June, where AMSR2 produces 5-10% higher SIC. This area was observed to have a large break up of sea ice, producing a complex SIC field that was not well captured by the lower resolution AMSR2 data (see Figure 3). Further intercomparisons of the SICs are expected soon, with expanded analysis to include the Antarctic and autumn freeze up season over the Arctic.

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

Overall Status:

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

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

Issues/Risks:

Highlights:

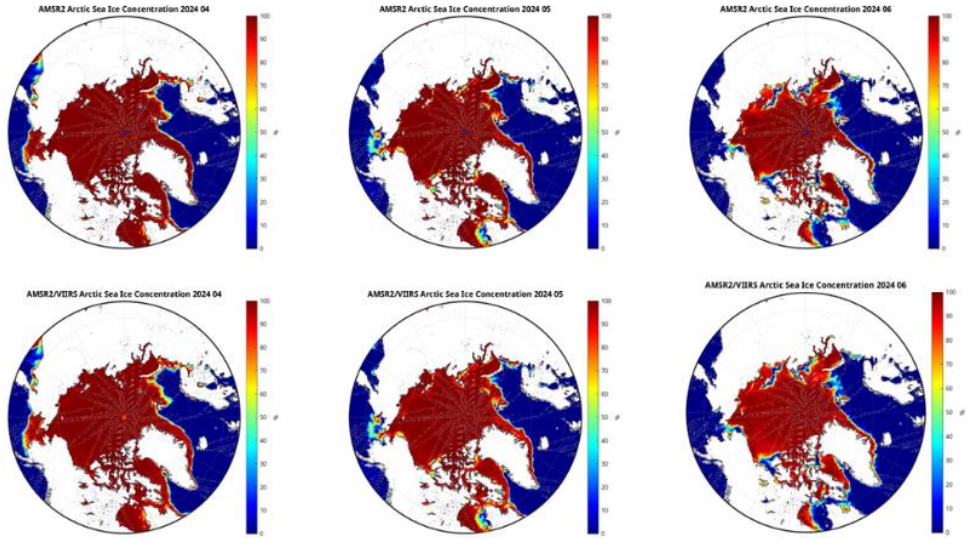


Figure 1. Top row Monthly average Sea Ice Concentration (SIC) from AMSR2 NASA Team-2 algorithm for April (left), May (middle) and June (right) 2024. Bottom is from the AMSR2+VIIRS blended sea ice concentration for the same months.

Statistic	Apr-2024	May-2024	June-2024
Bias (Blend-AMSR2)	+0.091	-0.0045	-0.2042
Accuracy	2.2303	1.9711	2.4211
Standard Deviation	6.5036	5.8114	5.8537
RMS	6.8754	6.1366	6.3347
Avg. Blend	88.9123	84.4858	80.6336
Avg. AMSR2	88.8214	84.4903	80.8378

Table 1: Statistical data comparison of Sea Ice Concentration (SIC) differences between Blended and AMSR2 product for each month. Note that a comparison is only made when either the Blended or AMSR2 have an observed ice pixel (SIC>0%).

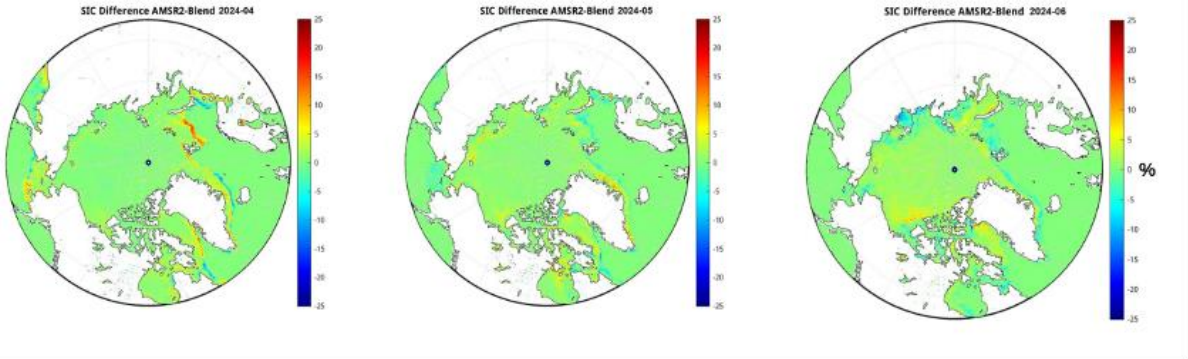


Figure 2. Differences in Monthly average Sea Ice Concentration (SIC) of AMSR2 versus AMSR2+VIIRS blended sea ice concentration for April (left), May (middle) and June (right) 2024.

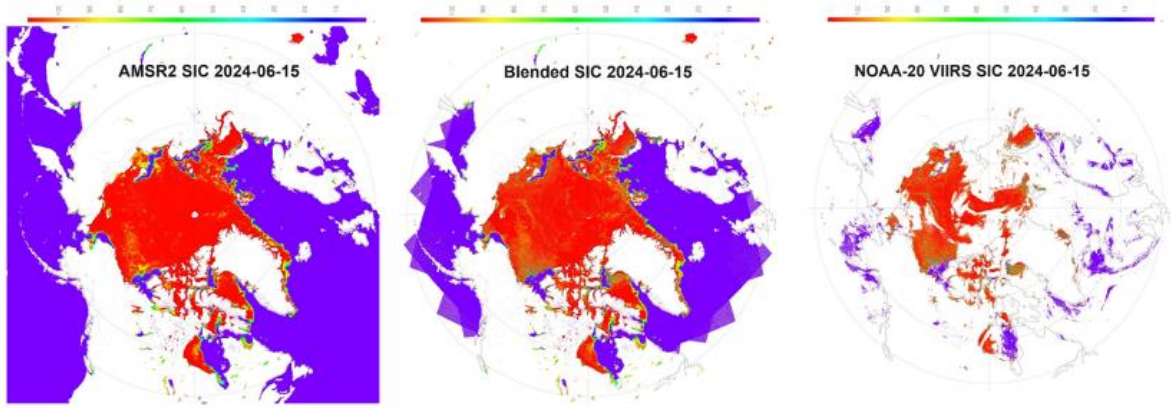


Figure 3. Daily composite SIC for 15 June 2024 from AMSR2 (left), Blend (middle) and NOAA-20 VIIRS (right).

ICVS

October 2024

Accomplishments / Events:

- Prepare the ICVS Lite version package introduction presentation to support proposed ICVS Lite transition to OSPO activities. Hold meeting to go through ICVS public website with OSPO PIs to collect users' comments and requirements for the preparation of the transition.
- Finish transitioning ATMS RO profile bias, ATMS geolocation accuracy, and ATMS vs. AMSU-A/MHS SNO bias monitoring packages from ATMS SDR team developer. Several major updates have been added to improve the portability and execution efficiency of these packages. The monitoring figures of NPP/N20/N21 have been generated in NRT and pushed to ICVS operational website to support user's community. The latest version of these packages have also been tracked in STAR Gitlab.
- Successfully transition the NPP/N20/N21 event log conversion package. This package uses the JPSS DPMS weekly event log spreadsheet submitted in google drive to generate web based json files for ICVS public website. The event log includes all JPSS satellite/instrumental and ground system update events.
- Applied HU's Angular Dependence Model to SNPP OMPS NM DCC reflectance in Aug. 2023. The PDF of OMPS NM DCC reflectance before (left) and after (right) ADM correction are shown in Figure 1 with different DCC detection temperature threshold.
- Start to plan the VIIRS ICVS-LTM module transition from a leaving team member. The CrIS/VIIRS and OMPS/VIIRS relative geolocation error monitoring and hurricane 3D warm core animation modules are included. Shown in Figure 2 is the Hurricane Dana warm core 3D animation on October 23, 2024

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

Overall Status:

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

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

Issues/Risks:

Leave of ICVS team member may cause some delay of fixing VIIRS LTM module errors;

FY25 milestones need to be refined, due to limited fund support and unclear priorities.

Highlights:

Figure 1 NPP OMPS NM DCC reflectance PDF before (top) and after (bottom) ADM correction

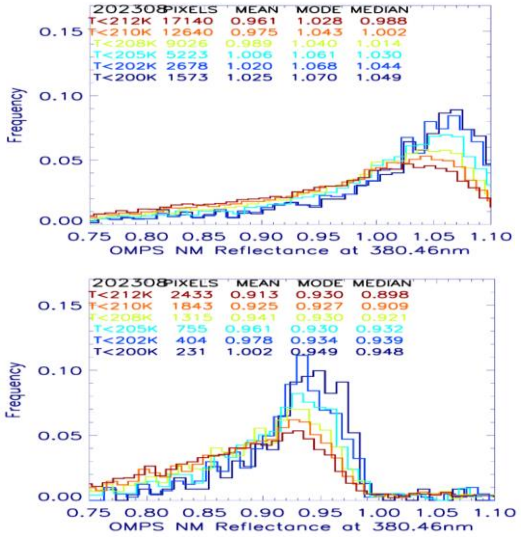
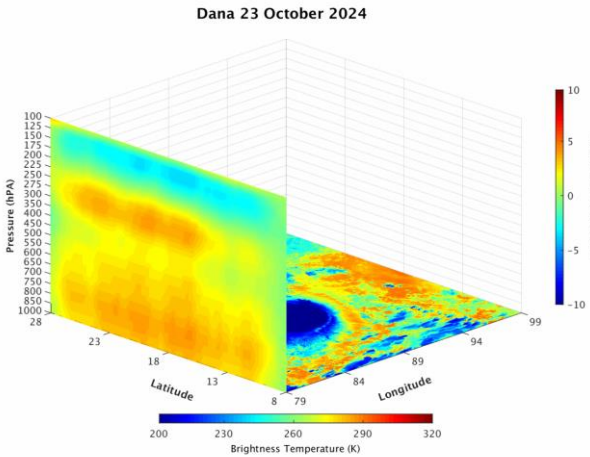


Figure 2 Hurricane Dana warm core 3D animation on October 23, 2024



VIIRS Imagery

October 2024

Accomplishments / Events:

- Visit to NWS/WFO Pueblo, CO on Oct 3
- Visit to NWS/WFO North Platte, NE on Oct 8
- Present at Rapid City, SD Winter Workshop on Oct 18
- Present at Anchorage, AK Winter Workshop on Oct 23
- Blog Posts with VIIRS Imagery
  - Hurricane Milton (Oct 2024)
- 29 VIIRS Imagery Posts on CIRA Social Media (X) this Month. A few posts:
  - VIIRS VIS and IR Imagery of Hurricane Milton (9.8K views)
  - VIIRS nighttime NCC Imagery of Aurora (33.3K views)
  - VIIRS Day Land Cloud RGB Imagery of New Mexico Flooding (9.9K views)
  - VIIRS True Color Imagery of Midwest browing (20.1K views)

Overall Status:

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

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Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Present on VIIRS Imagery at AMS Annual Meeting	Jan-25	Jan-25		
FY26 Program Management Review	Jun-25	Jun-25		
Submit for Publication – Blowing Snow Detection via Satellite Imagery	Jul-25	Jun-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				

Highlights: Image of the Month

Figure: Members of the VIIRS Imagery Team with NWS/WFO Pueblo, CO staff during the office visit.

Leaf Area Index

October 2024

Accomplishments / Events:

- Collaborate with the operational team on the progress of the LAI transition from science to operation. Routinely generate local LAI datasets and prepare for upcoming operational data verification..
- Continue improving the LAI algorithm, focusing on using machine learning methods to enhance the LAI time series.
- Follow up on recent progress in LAI application within the Land Surface Model, particularly in Noah-MP, to understand the role of LAI in the model and its impact on model performance.
- Continue development of the annual static vegetation fraction, focusing on training data preparation using Landsat 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.*
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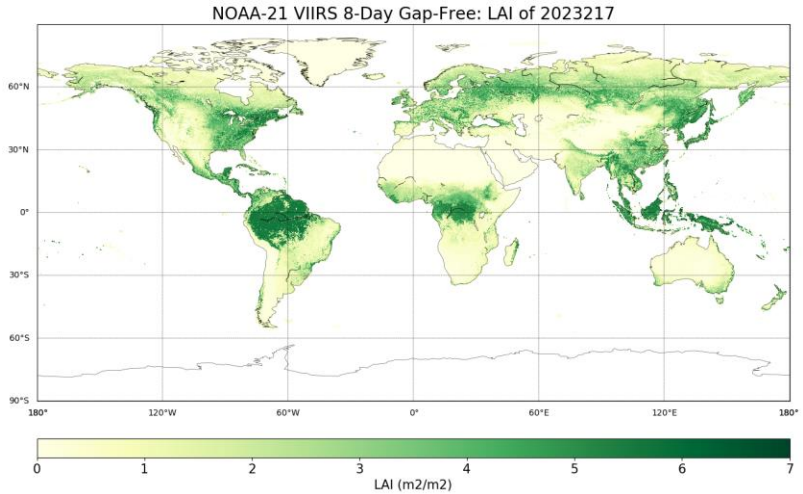
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
CCAP final Delivery	Feb-24	Feb-24	Apr 1, 2024	
Incorporate the LAI test data into the LSM model to evaluate the performance in the model	May-24	May-24	May 30, 2024	
Operational readiness	Jul-24	Jul-24	September 2024	ASSIST team postponed due to verification data preparation
Develop LAI routine monitoring and validation tool	Sep-24	Sep-24		
Apply the LAI routine monitoring and validation tool on the operational product	Dec-24	Dec-24		
LAI operation data verification and adjustment	Mar-25	Mar-25		

Highlights:



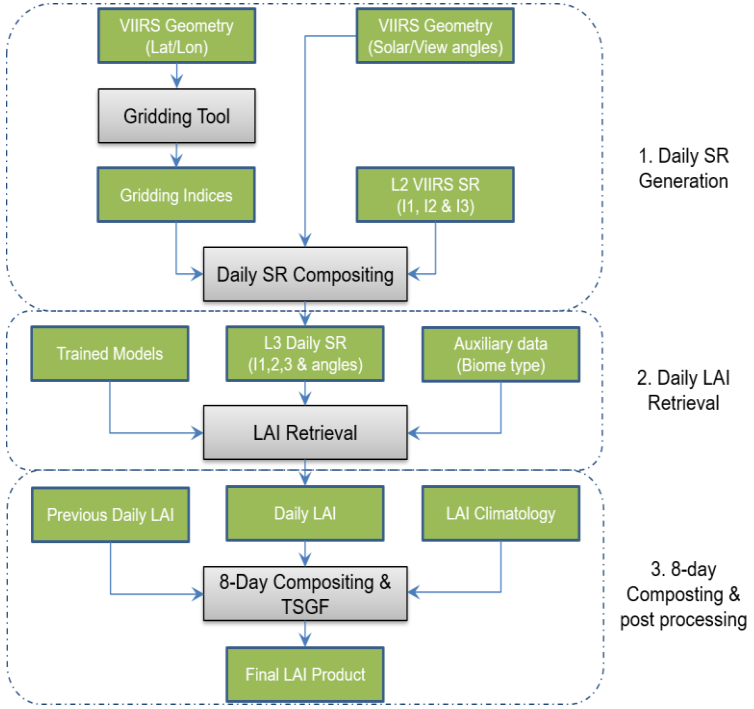
Local LAI dataset routinely generated and prepared for the upcoming operational product verification

LAI Verification and Validation

Verification: Local LAI dataset during same period

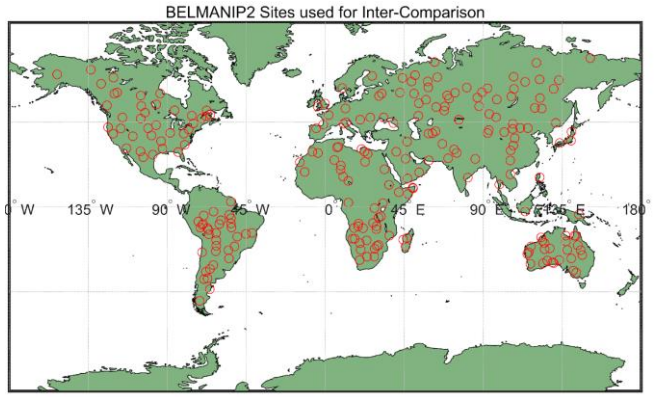
- The whole LAI package is routinely run at local machine using the same input data for LAI generation.
- The LAI product is under transition from science to operation.
- Local LAI dataset will be used for verification. This include the final LAI dataset and the IP data (gridding indices, gridded surface reflectance, daily LAI, original weekly LAI) for diagnose.

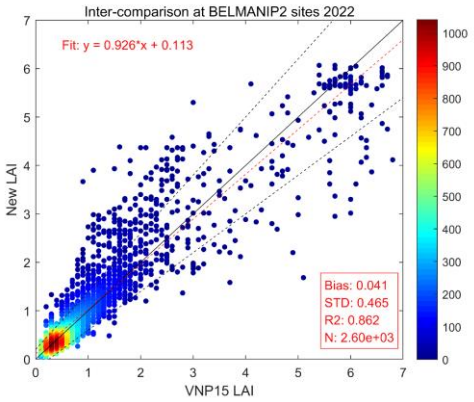
Output Datasets	Description	Dimension
Global LAI	LAI final product	[20000x40000]
Daily LAI	Intermediate data	[2400x2400] for each tile
Weekly LAI	Intermediate data	[2400x2400] for each tile



Validation: Inter-comparison

- Since the in-situ LAI measurement are with latency, the inter-comparison with existing product (e.g. VNP15) are the main approach for the validation.
- Global distributed BELMANIP2 sites (445) will be used for the inter-comparison.
- The widely used LAI products will be used as reference.





LAI Incorporation into Noah-MP model

- **Goal: Incorporating LAI product into the Noah-MP to improve the model performance.**

- **LAI adjustment (**Static Vegetation Fraction Development undergoing**)**
  - LAI product (Grid mean LAI) vs LAI required in the model (Vegetation part LAI)
  - Development of Annual static vegetation fraction
    - Daily GVF is based on same surface reflectance dataset and similar machine learning algorithm.
    - Develop annual static GVF based on the daily data.

- **LAI used in model (progress)**
  - Default LAI in Noah-MP: Biome dependent LAI (monthly)
  - LAI product test in Noah-MP
    - Monthly Climatology (Model test undergoing, Bias issue reported)
    - Dynamic LAI (on track)

- **LAI applied in Noah-MP (Literature review)**
  - Impact and Improvement
    - Impact on water and Carbon Fluxes. (Kumar et.al 2019)
    - Benefit on Land surface temperature simulation. (He et.al 2023)
  - Methodology
    - Bias-blind/bias-aware assimilation (Scherrer, 2023)

Long term validation at NEON sites (with latency)

Surface Albedo

October 2024

Accomplishments / Events:

- Monitored SNPP data anomalies and reported findings.
- Drafted an experimental plan to validate the quality and performance of blended albedo.
- Prepared drafts for FY25 proposals.
- Innovative activity 1: tested a wildfire prediction model using multi-parameter land surface anomalies.
- Innovative activity 2: collaborated on global land surface anomaly monitoring.

Overall Status:

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

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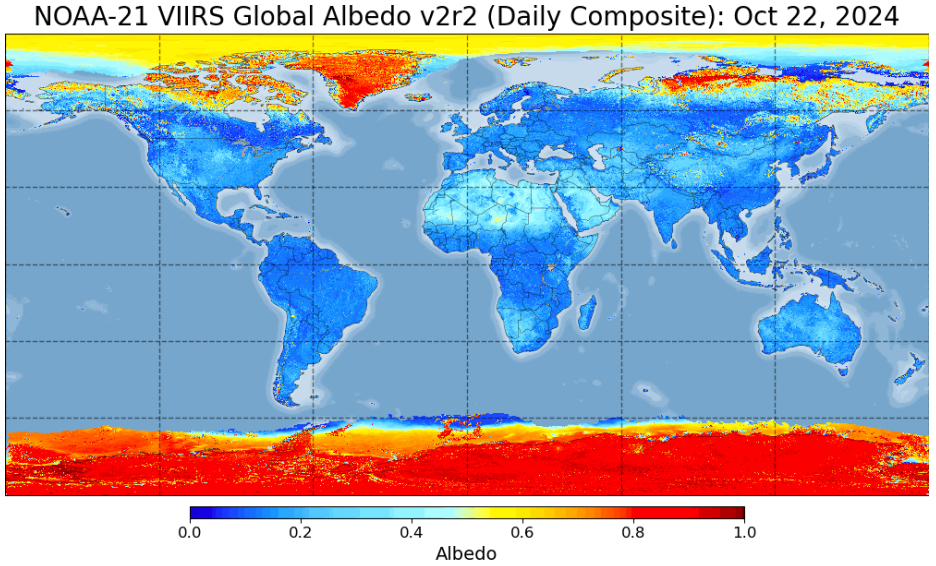
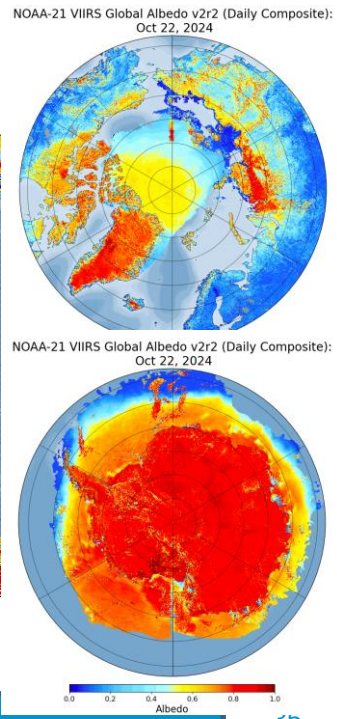
Issues/Risks:

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

Highlights:

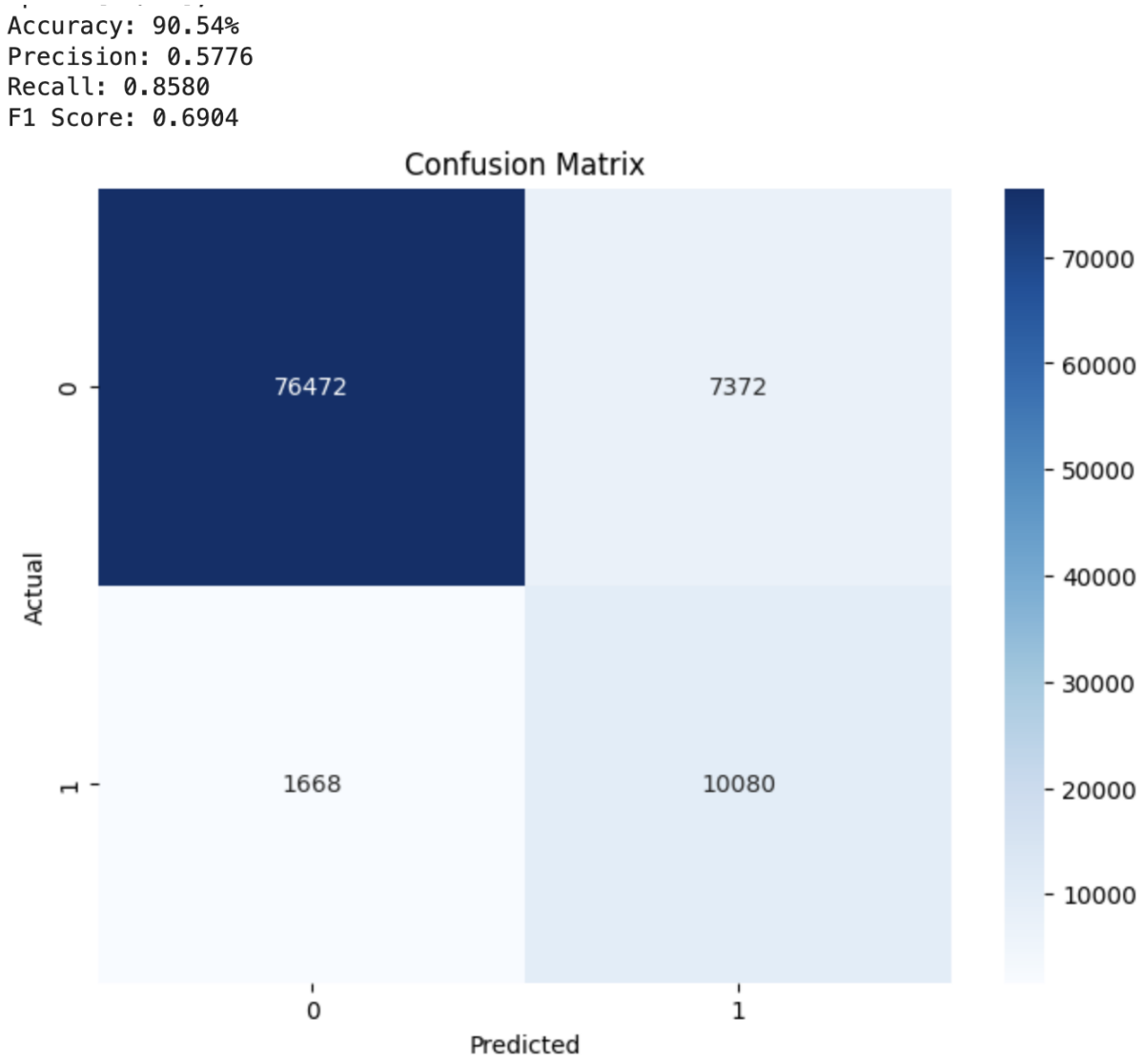
NOAA21 VIIRS albedo



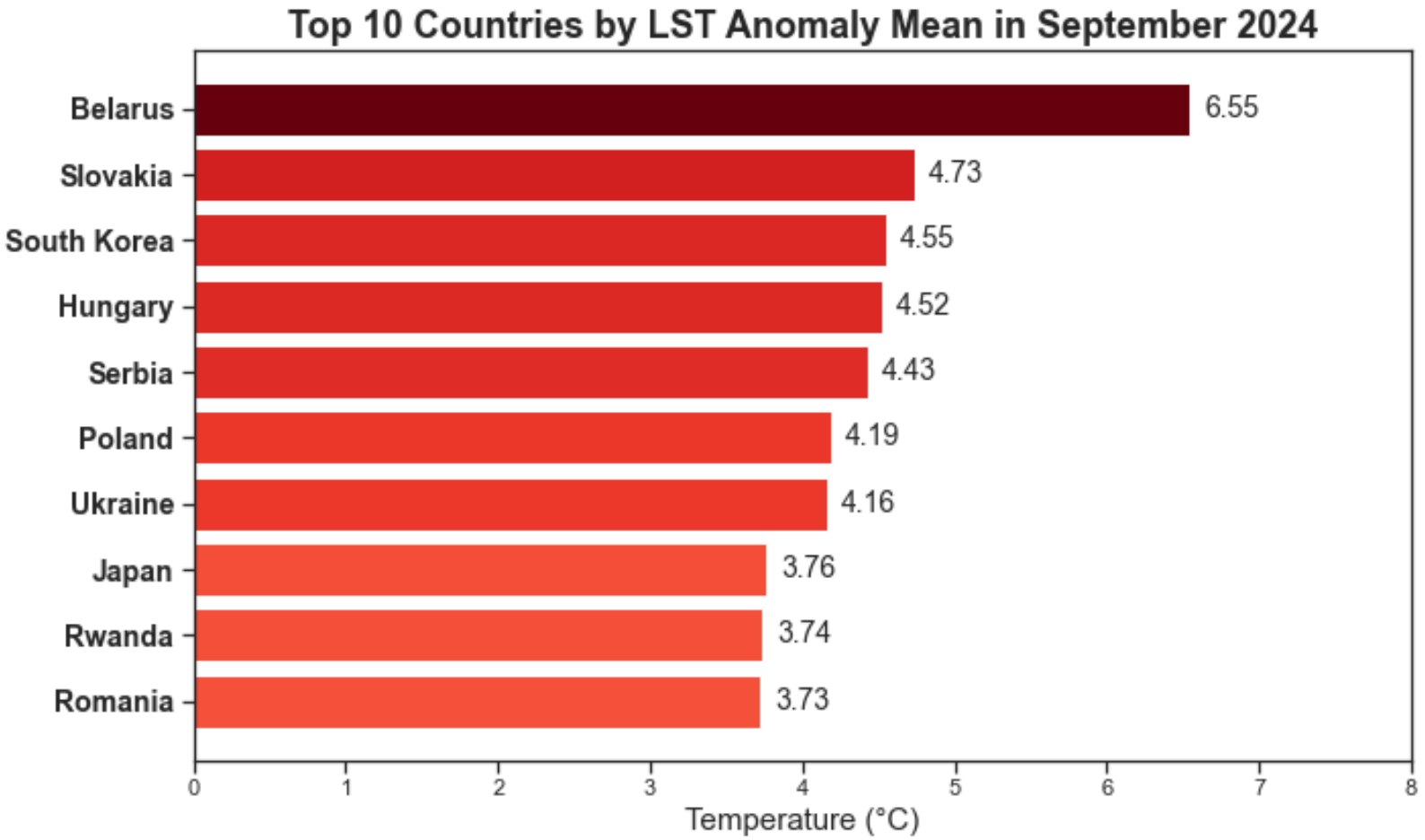


Wildfire prediction model tested over Africa

- This study developed an LSTM model to predict wildfire risk using multi-parameter land surface anomalies, incorporating datasets such as **NDVI**, **LST**, **PRCP**, **LSA**, and **DEM**.
- The model was trained on three consecutive years of data and tested on a separate year to evaluate its predictive capabilities.
- The confusion matrix shows the model's performance, with an accuracy of **90.54%**, precision of **0.5776**, recall of **0.8580**, and F1 score of **0.6904**. The high recall rate demonstrates the model's effectiveness in identifying wildfire occurrences, which is crucial for timely alerts and response. However, the lower precision indicates a relatively high rate of false positives, meaning the model occasionally predicts wildfires in areas where they do not occur. This is a trade-off that helps prioritize recall to avoid missing potential fire events, supporting early warning efforts despite some over-prediction.



Top 10 Countries by LST Anomaly Mean (Impacted Areas Only)



- In September 2024, Belarus exhibits the highest temperature anomaly with an average of 6.55°C, followed by Slovakia (4.73°C) and South Korea (4.55°C). Central and Eastern European countries dominate the list, with Hungary, Serbia, and Poland also showing significant positive anomalies. Japan and Rwanda also experience notable LST anomalies, reflecting localized temperature patterns.

Land Surface Temperature

October 2024

Accomplishments / Events:

- Further testing of the all weather LST science code focused on the projection conversion between sinusoidal and regular lat/lon grid. A projection conversion function was added to the science code package, addressing issues identified during testing such as incorrect attributes handling in the data reader, and double scaling in the LST output.
- An alternative approach for direct mapping using lat/lon information without relying on conversion indices was explored, and this remains an ongoing effort.
- The all weather LST experimental dataset was extended to cover January 2024 through September 2024 and validation was conducted using ground observations from SURFRAD, ARM and BSRN networks. (slide 2-3)
- For urban heat island studies, UrbanNet data was explored, and a time series of I-band VIIRS LST was generated over UrbanNet stations, effectively capturing the occurrence of heatwave in urban areas. (slide 4-6, highlights)

Overall Status:

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

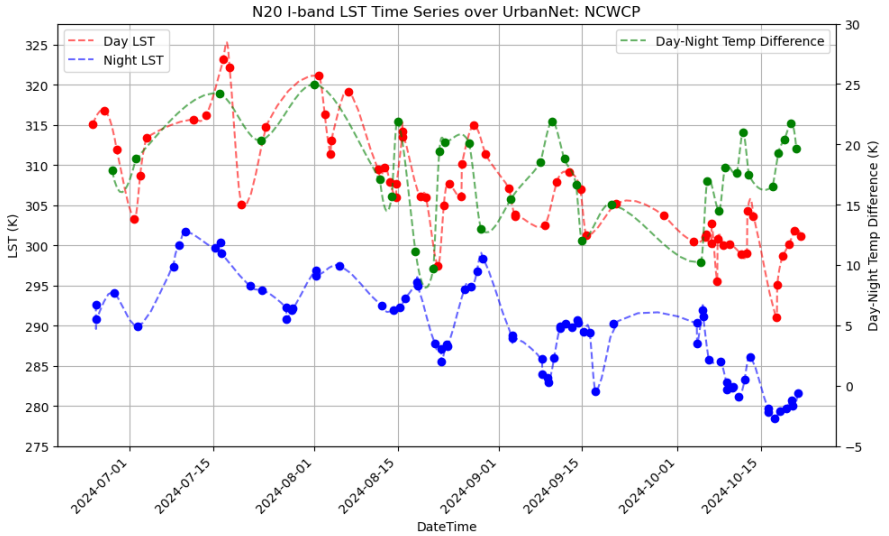
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

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

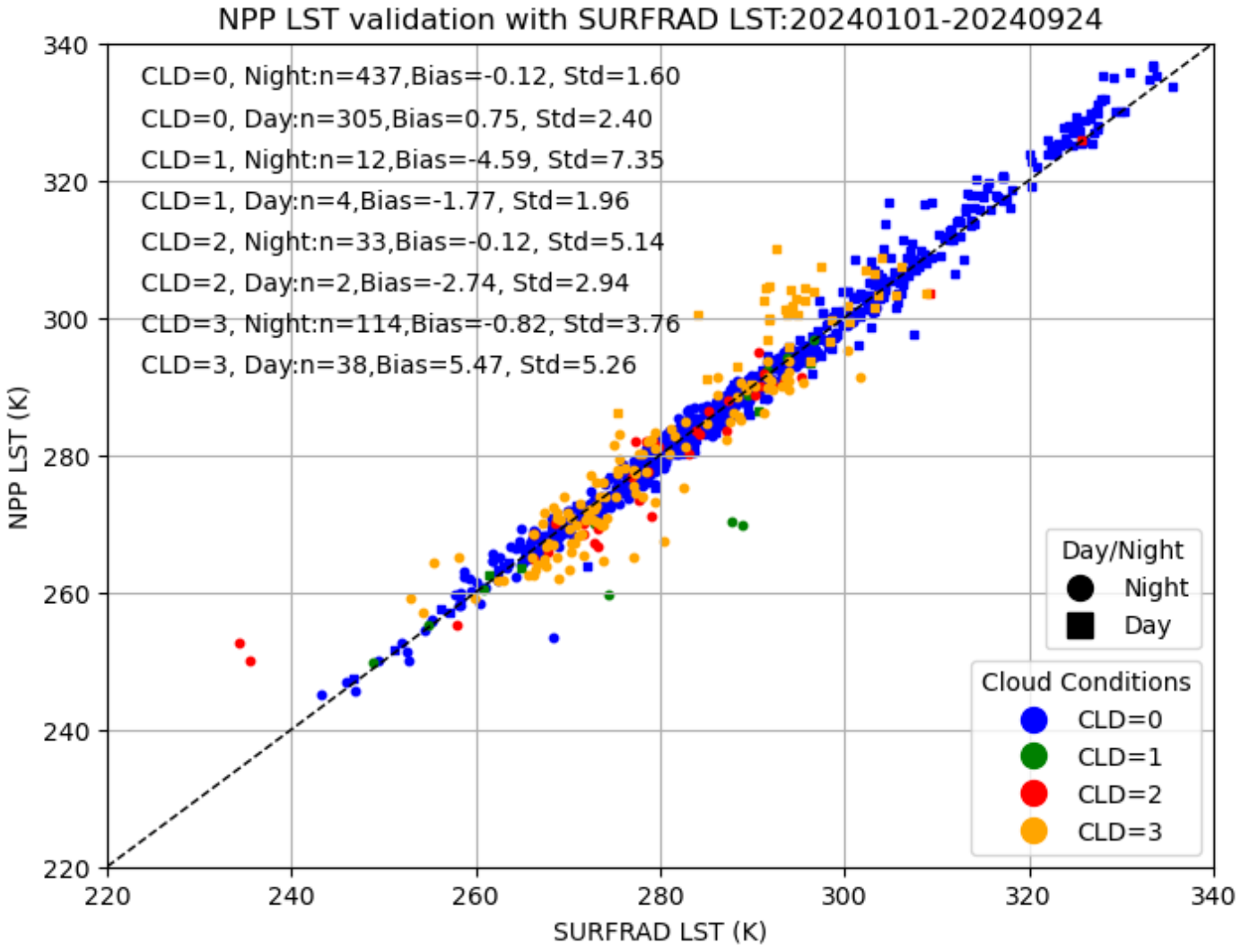
Highlights: I-band VIIRS LST Time Series Over UrbanNet Station at NCWCP

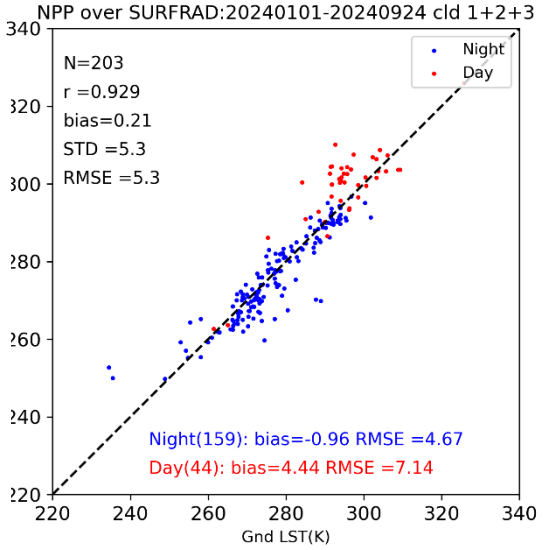


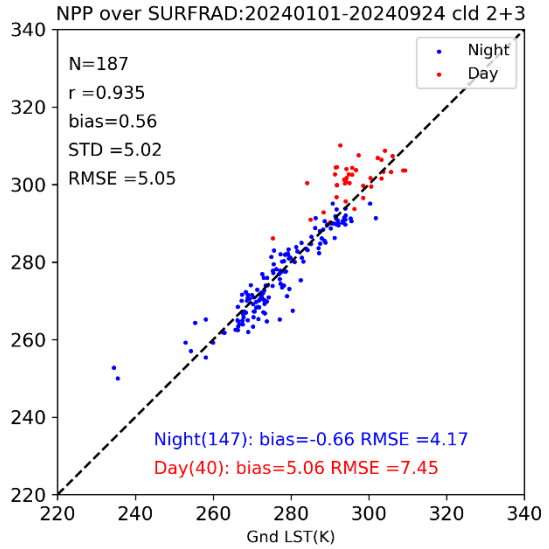
- I-band LST was generated over UrbandNet station at NCWCP.
- It captures a consecutive four-day period heatwave between July 14 and 17, marking the recorded instance of four consecutive days with triple-digit heat

- Red color shows the daytime LST time series
- Blue color shows the nighttime LST time series
- Green shows the diurnal temperature between maximum daytime LST and minimum nighttime LST

All Weather LST Validation against SURFRAD

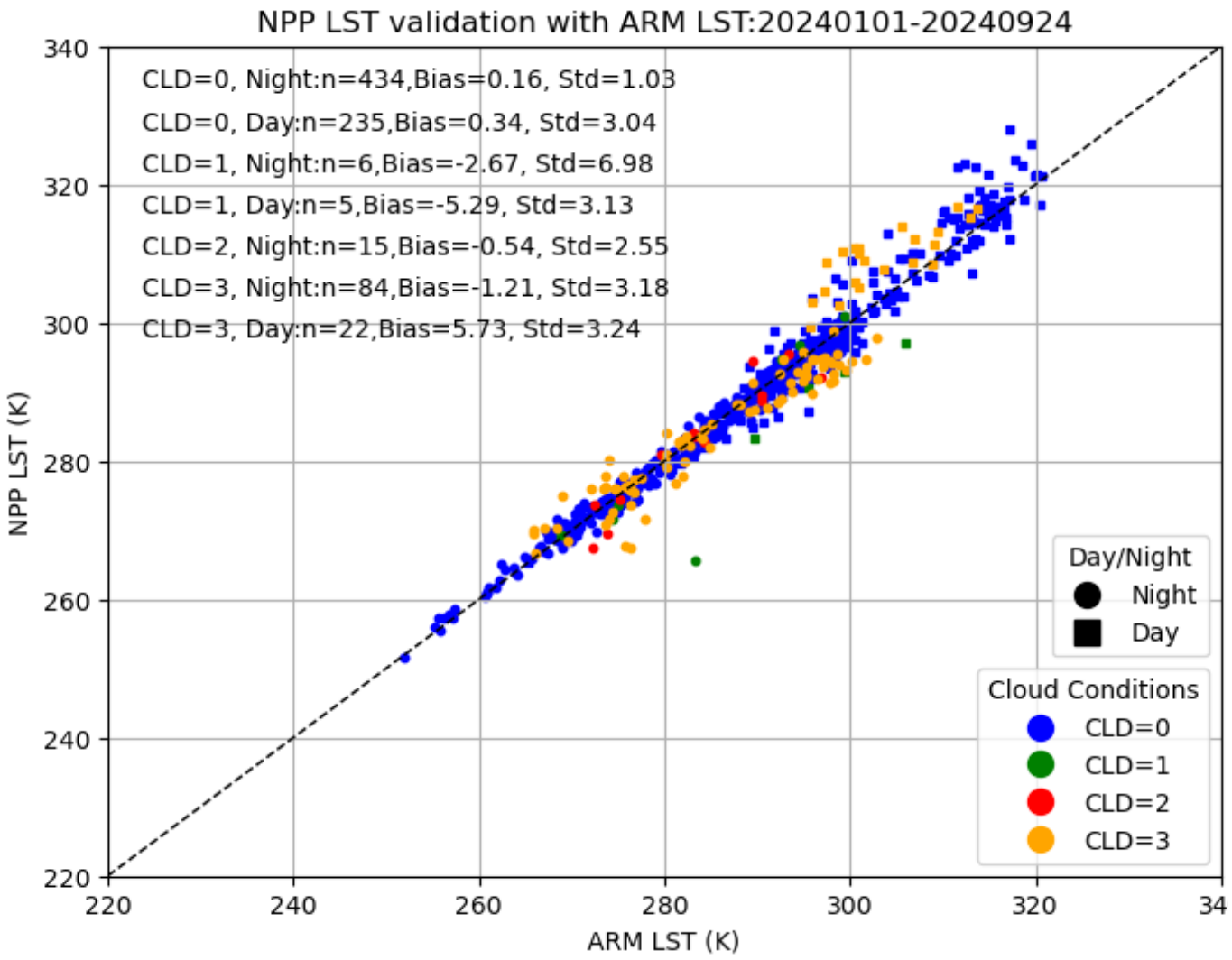


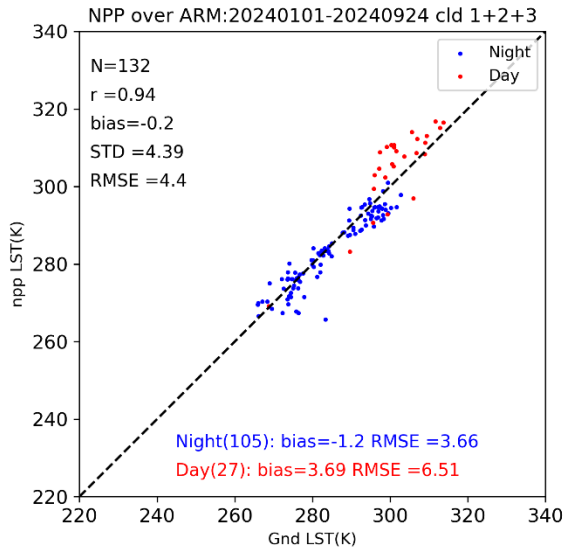


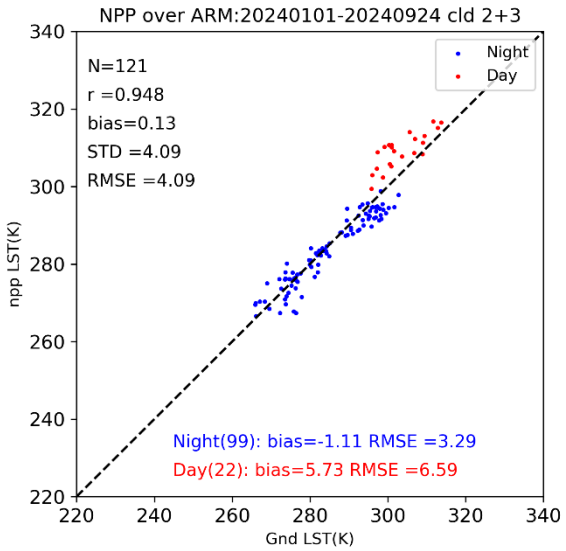


- All weather LST was validated against SURFRAD observations from six stations for period from January 1, 2024 to September 24, 2024
- The left figure shows the stratified results based on cloud conditions and day/night situations using the four level cloud mask with values of 0, 1,2, and 3, representing confidently clear, probably clear, probably cloudy and confidently cloudy conditions, respectively.
- The top right figure shows the results for a combination of probably clear, probably cloudy and confidently cloudy situations.
- The bottom right figure presents results for a combination of probably cloudy and confidently cloudy situations. Daytime shows a significant positive bias, while nighttime has a negative bias. Further investigation into the daytime bias is ongoing.

All Weather LST Validation against ARM

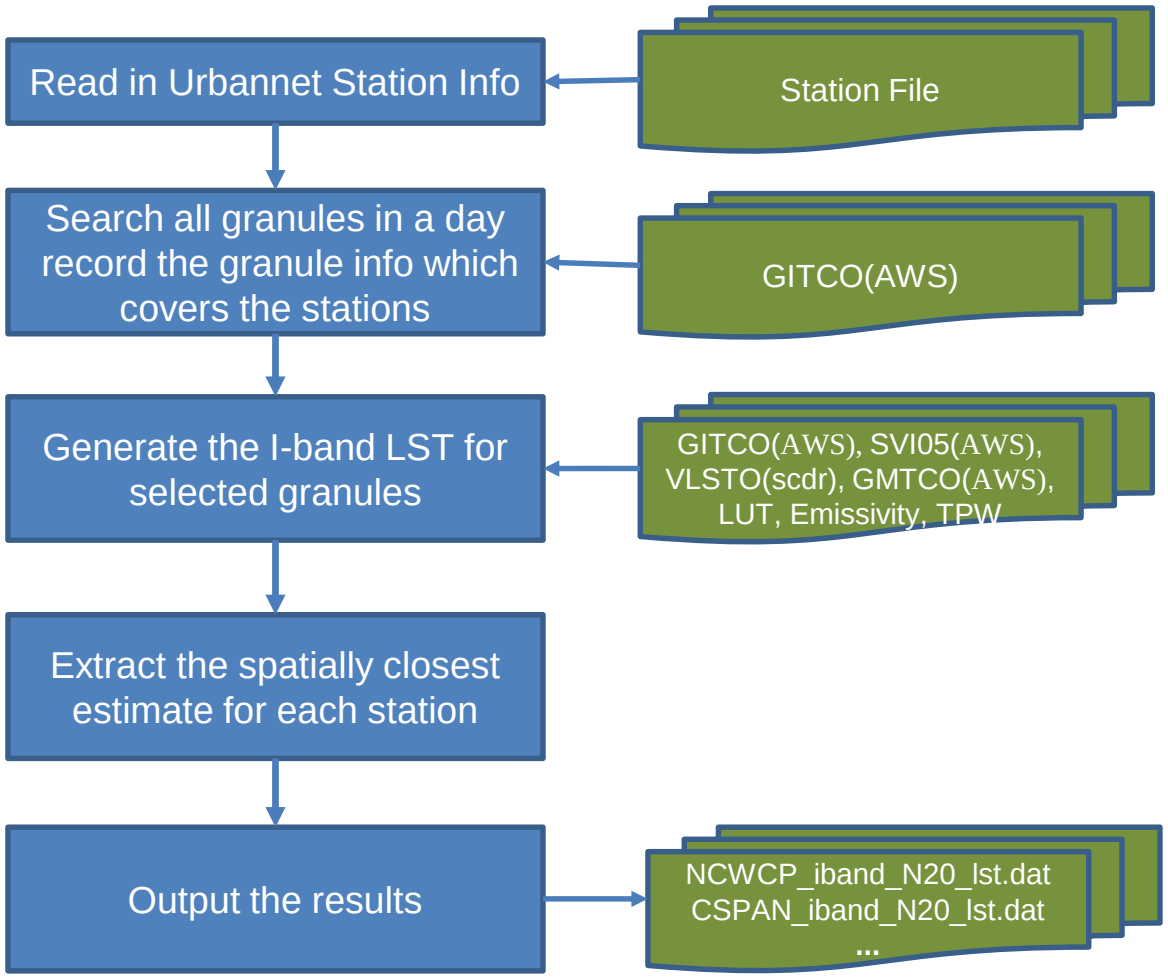






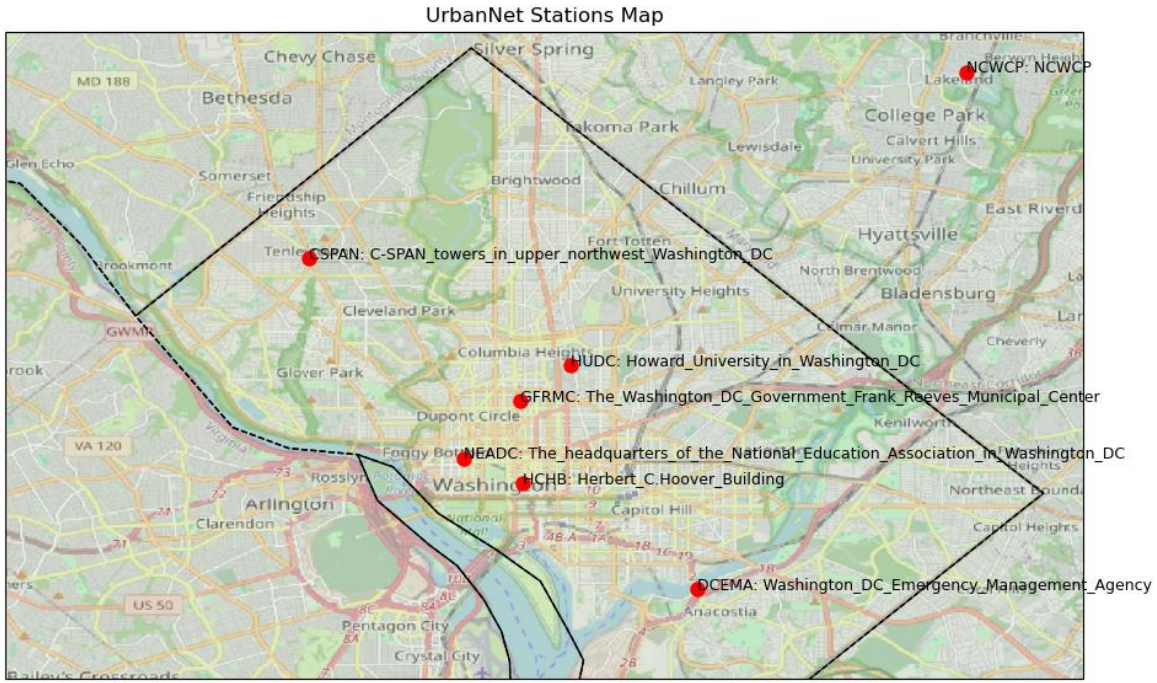
- All weather LST was validated against ARM observations from January 1, 2024 to September 24, 2024
- The left figure shows the stratified results based on cloud conditions and day/night situations using the four level cloud mask with values of 0, 1,2, and 3, representing confidently clear, probably clear, probably cloudy and confidently cloudy conditions, respectively.
- The top right figure shows the results for a combination of probably clear, probably cloudy and confidently cloudy situations.
- The bottom right figure presents results for a combination of probably cloudy and confidently cloudy situations. Daytime shows a significant positive bias, while nighttime has a negative bias. Further investigation into the daytime bias is ongoing.

I-band data generation over UrbanNet



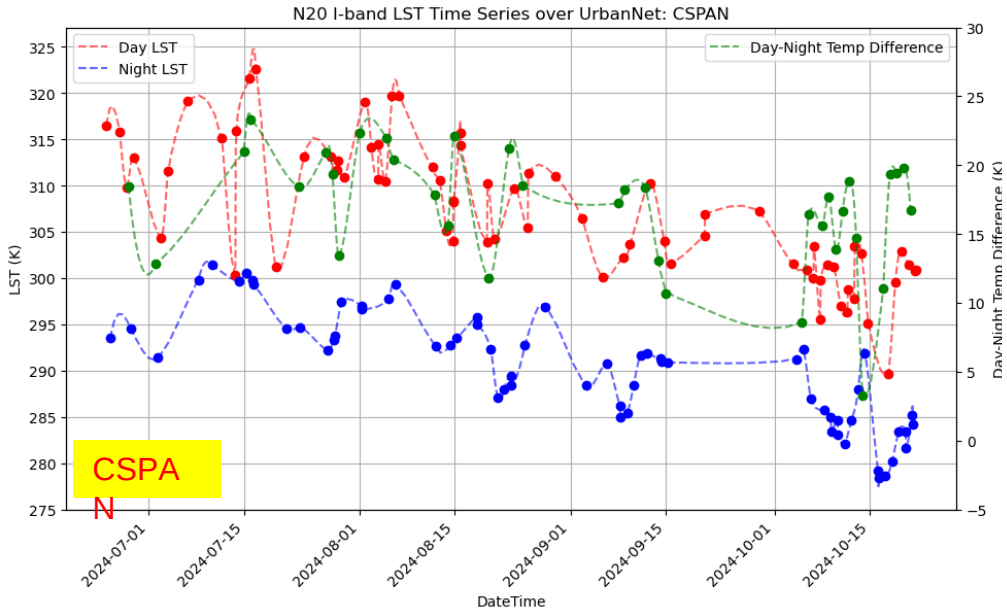
Data processing flowchart for I-band VIIRS LST retrieval over UrbanNet Stations

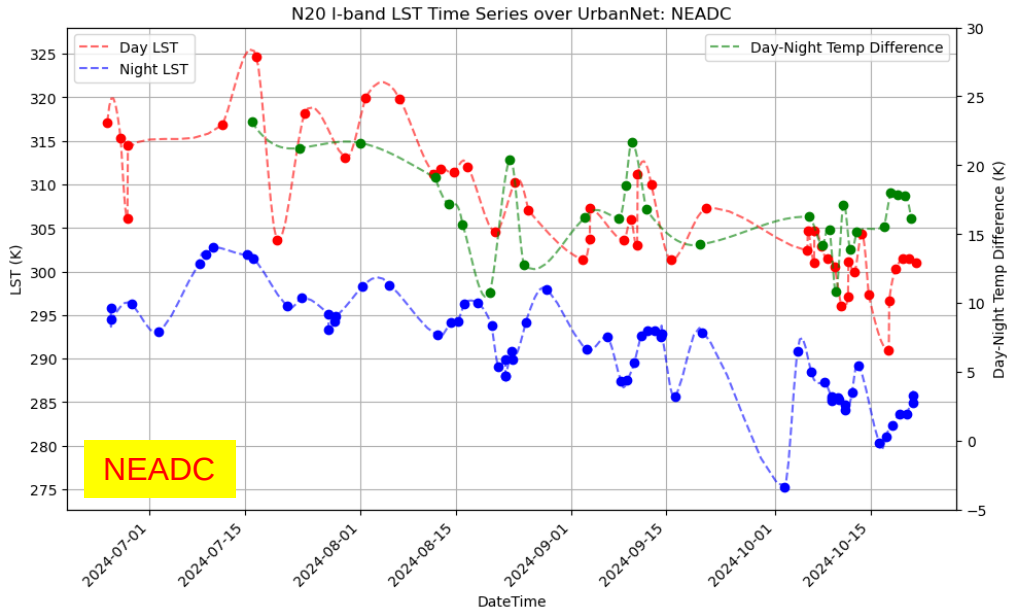
- There are a total of seven stations including stations from DCNet
- The data covers the time period from June 25, 2024, to the present and is limited by the availability of M-band VIIRS LST from SCDR, which is not yet available on AWS.
- SDR mending is not applied in the current version

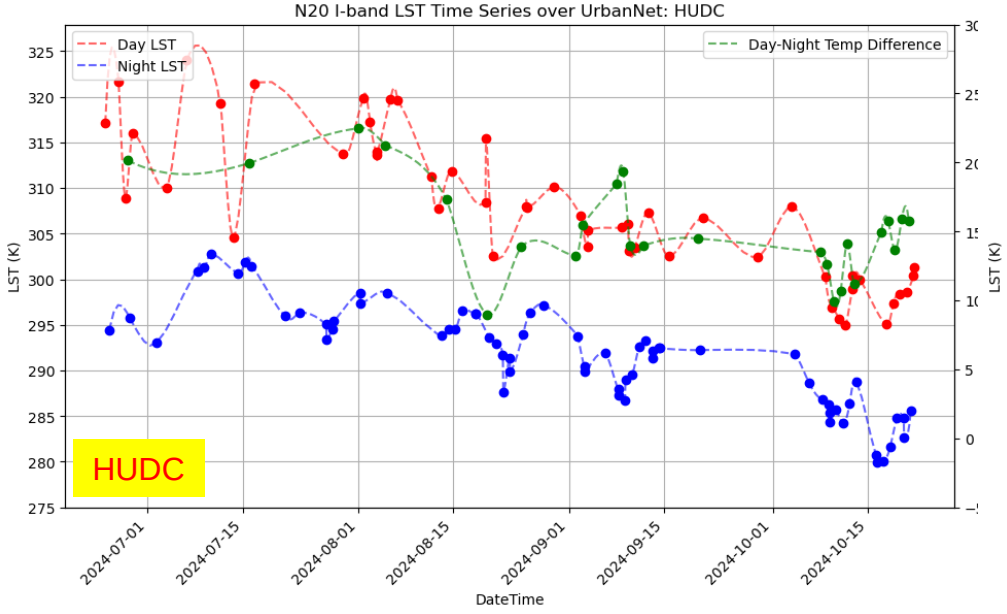


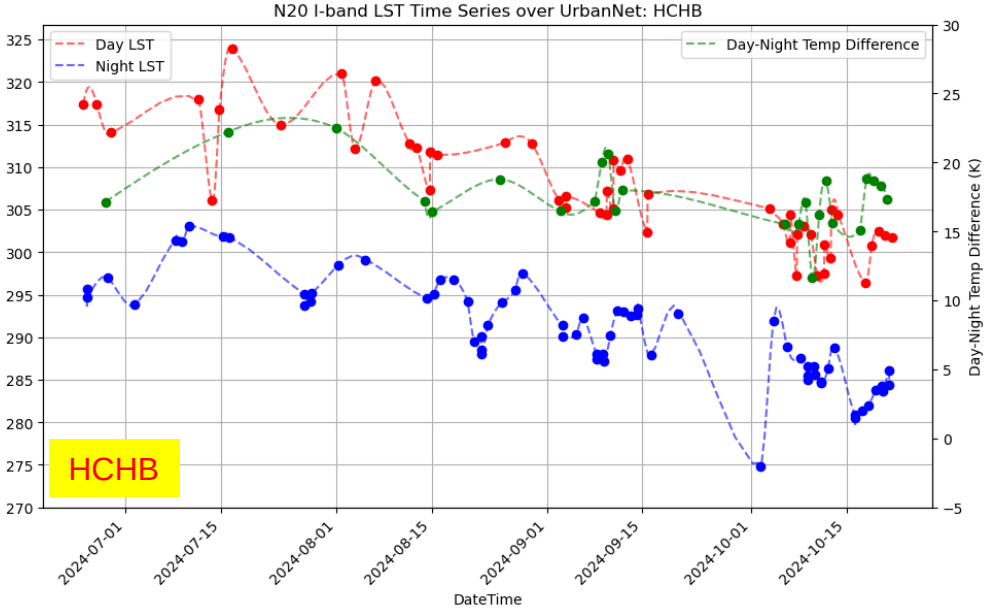
UrbanNet Stations Map

I-band VIIRS LST Time Series Over UrbanNet Stations





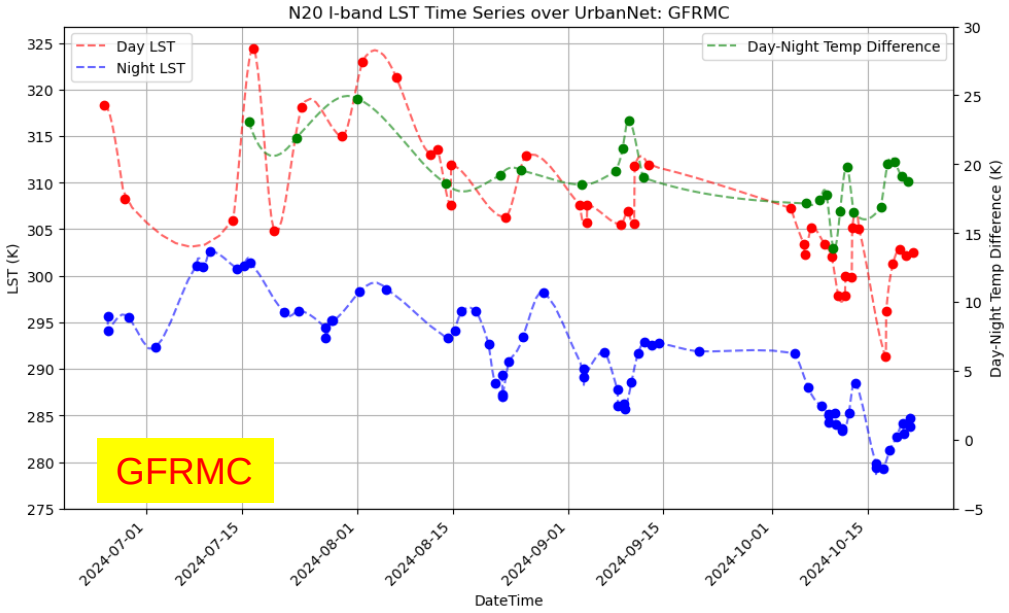


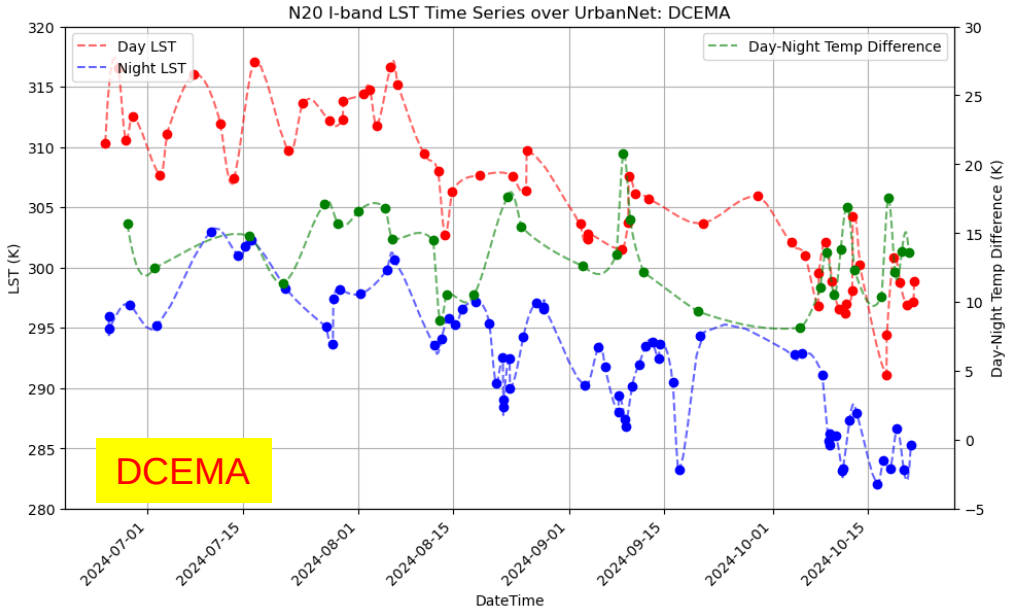


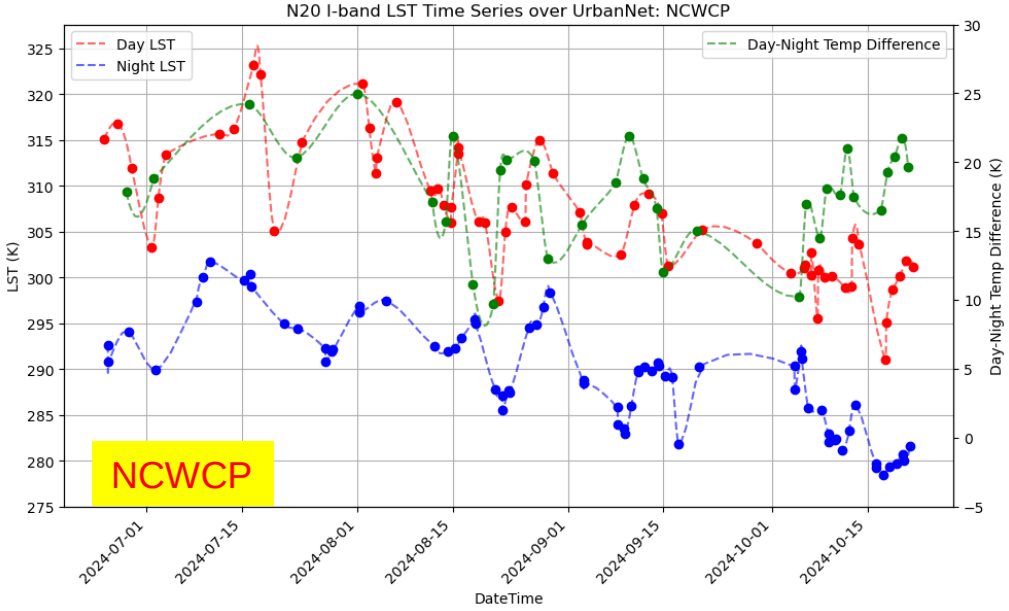
- The time series shows only cloud free LST estimates
- The time series separates the daytime, nighttime and diurnal LST calculated as the difference between maximum daytime and minimum nighttime LST, for urban heat island effect analysis.
- The LST time series captures a consecutive four-day period heatwave between July 14 and 17, marking the second recorded instance of four consecutive days with triple-digit heat

- Red color shows the daytime LST time series
- Blue color shows the nighttime LST time series
- Green shows the diurnal temperature difference

I-band VIIRS LST Time Series Over UrbanNet Stations







- The time series shows only cloud free LST estimates
- The time series separates the daytime, nighttime and diurnal LST calculated as the difference between maximum daytime and minimum nighttime LST, for urban heat island effect analysis.
- The LST time series captures a consecutive four-day period heatwave between July 14 and 17, marking the second recorded instance of four consecutive days with triple-digit heat

- Red color shows the daytime LST time series
- Blue color shows the nighttime LST time series
- Green shows the diurnal temperature difference

MiRS Products

October 2024

Accomplishments / Events:

- The MiRS science team participated in a recent LEO Science Seminar on 23 October presenting information on the case of the extreme rainfall/flood event that occurred over southern Brazil in late April and early May 2024. MiRS retrieved rainfall and atmospheric stability products were presented, and it was shown that the stability (equivalent potential temperature) products did show a distinct gradient across a stationary frontal zone along which heavy rain was produced. The MiRS stability retrievals were consistent with radiosonde profiles of temperature and water vapor valid at the same time (see highlights).

Overall Status:

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

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

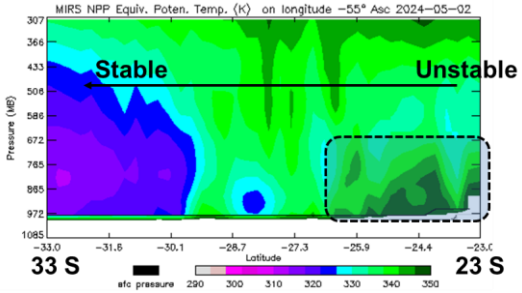
Issues/Risks:

None

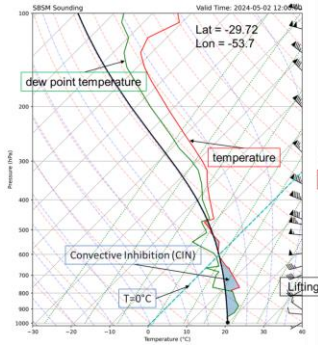
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NOAA-21 MiRS products from J2-Ready MiRS algorithm in support of ATMS TDR/SDR Beta Maturity	Nov-22	Nov-22	Nov-22	
NOAA-21 MiRS products from J2-Ready MiRS algorithm in support of ATMS TDR/SDR Provisional Maturity	Dec-22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

Highlights:

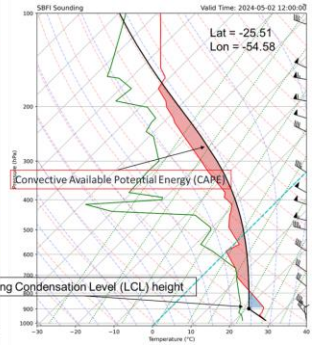
MiRS Retrieved Theta-e



South of front (stable)



North of front (unstable)



Analysis of atmospheric stability over southern Brazil during the severe rainfall and flooding event in early May 2024. At left is MiRS SNPP/ATMS retrieved north-south vertical cross-section of equivalent potential temperature, spanning a stationary frontal zone that separated an unstable atmosphere to the north and a more stable one to the south.. Radiosonde profiles (right) from north and south of the front confirm the differences in stability.

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

October 2024

Accomplishments / Events:

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- JSTAR mapper staff recently deployed a method to use Amazon Web Services (AWS) SDR data as a fallback resulted in solid improvements in VIIRS imagery product coverage for all 3 polar. Also changed processing scripts and added a backfill scripts to improve JSTAR Mapper / STEMS image tile production reliability.

- NPROVS staff continue to make progress in restoring atmospheric sounding data (radiosonde, forecasts, satellite) beginning June 26 and also successfully replaced FTP by "https" data services to provide routine data transfers to NPROVS; current activities are now focused on re-processing high-resolution conventional radiosonde that was unexpectedly introduced by NWS back in June **(HIGHLIGHT).**

- The purchase of radiosondes (by DOE) under the JPSS / DOE InterAgency Agreement (IAA) for the Dedicated (satellite synchronized) Radiosonde Program is ongoing; plans to pursue FY25 funding request ($35K) to provide dedicated radiosondes in coordination with an upcoming NOAA AEROSE campaign (April) were forwarded to the Financial Management Branch.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Restore high-resolution conventional radiosonde observations in NPROVS	**Q1**	**Q1**		
JSTAR mapper evolution to STEMS	**Q4**	**Q4**		
Dedicated Radiosonde Programs: 1) DOE/ARM and new BNF site in Alabama, 2) AEROSE 2025 campaign support	**Q2**	**Q2**		
NPROVS-Special Reprocessing	**Q3**	**Q3**		
NUCAPS Severe weather case studies	**Q2**	**Q2**		

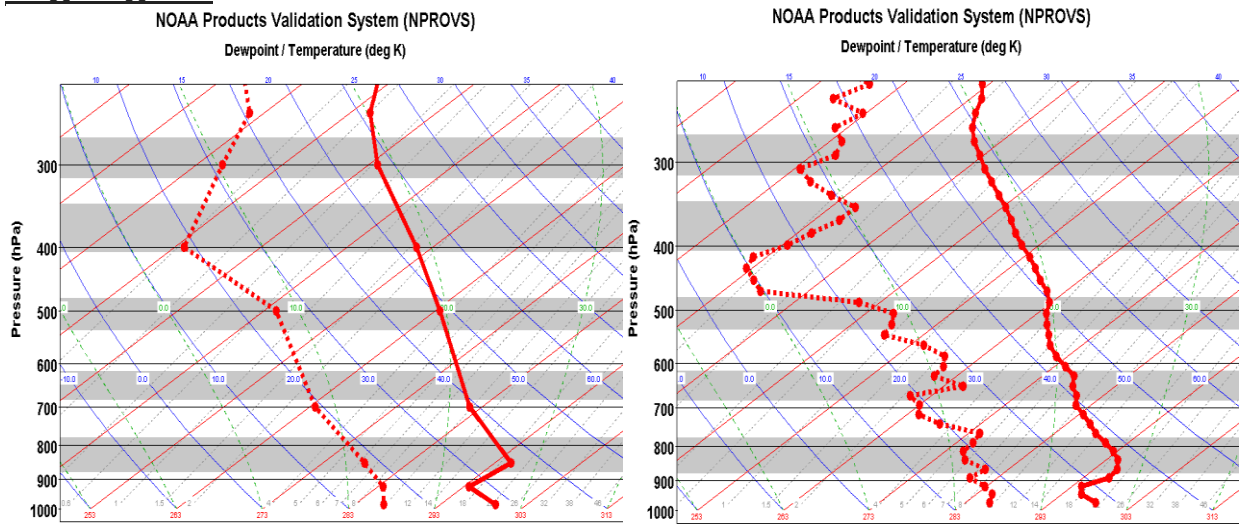
Overall Status:

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

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

Issues/Risks: None

Highlights



The introduction (on May 22nd) of hi-resolution radiosonde data in NWS buffer files routinely accessed by NPROVS resulted in a systematic "decrease" in the vertical resolution (left) of radiosondes compared to the actual hi-resolution observations (right); dots indicate vertical spacing for the respective Temperature (solid) and Dewpoint Temperature (dashed) profiles. Software development is underway to restore the radiosondes input to NPROVS to the desired hi-resolution and reprocess all the radiosonde data beginning late June.

NUCAPS Products

October, 2024

Accomplishments / Events

- Continued validation and sustainment activities for all the NUCAPS EDR products. These include collection and processing of validation data sets for AVTP, AVMP, O3, OLR, CO, CH4, and CO2.
- Completed the AWS trial of cloud-based NUCAPS product reprocessing using AWS team's guidance for NOAA-20 and NOAA-21. Evaluated AWS NUCAPS retrieval products with the offline focus day datasets as a sanity check in moving forward for S-NPP mission long reprocessing plans.
- Completed an annual analysis of NOAA-21/20 CrIS and MetOp-C IASI against CERES OLR.
- Continued the NUCAPS carbon trace gases validations based on the newest TCCON datasets for both NOAA-20/NOAA-21. Results of evaluation revealed very good correlation between the NUCAPS retrievals and the TCCON measurements.
- Conducted case studies of validation for AVTP/AVMP of NOAA-20 based on the newest (~20240430) VALAR dataset and RAOBs at different GRUAN sites of ENA, NSA, SGP and LIN. Results of evaluation show reasonable statistics. Further evaluation is in progress.
- Continued MetOp-B cloudy and clear regression updates removing AMSU-A channels whose on-orbit noise values exceeded the specifications.
- Participated in the PNE/AEROSE 2025 cruise plan discussions. Requested and received a Vaisala quote for radiosondes.

Overall Status:

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

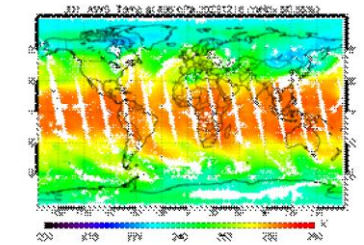
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

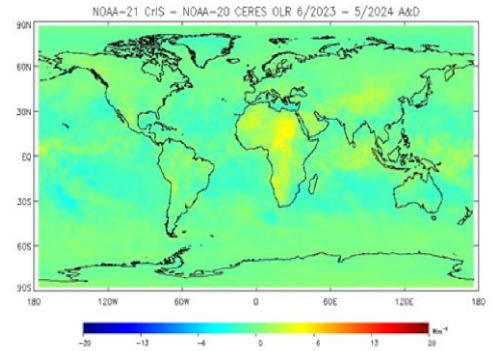
Issues/Risks:

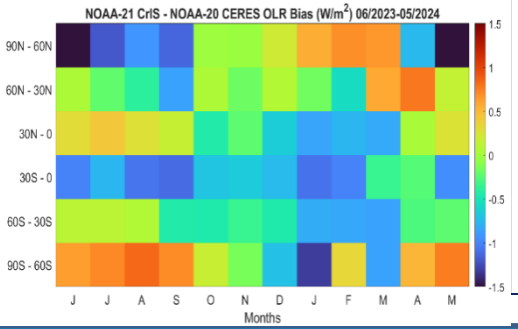
NOAA-21 mission-long reprocessing and validation activities are currently in progress.

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

Evaluation of the NOAA-20 NUCAPS retrievals generated through AWS for the focus day 18 Dec 2023. Shown here is the temperature field at 496 hPa and the difference histogram between the AWS and offline run.







Annual analysis of NOAA-21/20 CrIS and MetOp-C IASI against CERES OLR.

Top Figure: OLR difference map between averaged annual data of NOAA-21 and NOAA-20 CERES

Bottom Figure: Latitudinal bias between NOAA-21 CrIS and NOAA-20 CERES OLR through the months 06/2023 – 05/2024. The biases are well within the requirements

Ocean Color

Accomplishments / Events:

- A Scientific Paper Published in GIScience & Remote Sensing: Shi, W. and M. Wang, "Monitoring the Amazon River plume from satellite observations," *GISci. Remote Sens.*, **61**, 2416725, 2024. https://doi.org/10.1080/15481603.2024.2416725
- VIIRS OC Cal/Val team members (M. Ondrusek, E. Stengel, C. Kovach) participated the NASA PACE Cal/Val field campaign, Sep. 5-27, 2024.
- Continue working with the STAR IT team for the upgrade Linux to CenOS 9 for VIIRS global ocean color data processing, including dealing with various IT issues for the Linux system.
- Continue working on the mission-long VIIRS ocean color data reprocessing using the MSL12 ocean color data processing system.
- Routinely producing VIIRS (SNPP, NOAA-20, and NOAA-21) true color/false color images in OCView.
- 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

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

Overall Status:

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

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

OMPS SDR

October 2023

Accomplishments / Events:

- Derived and delivered OMPS NM/NP weekly dark LUTs for SNPP, NOAA-20 and NOAA-21.
- Derived and delivered SNPP/NOAA-20/NOAA-21 OMPS NP solar irradiance bi-weekly LUTs.
- Standardized the computation method for the N21 NP wavelength registration to mitigate the discrepancy of the wavelength scale (DR10365).
- Derived and delivered all updated OSOL tables and reprocessed the N21 OMPS SDR data.
- Work continues on updating and improving the NOAA-20 and NOAA-21 OMPS NP stray light intrusion correction (ADRs 10550 and 10552), with the delivery of the DR10550 package
- Work continues on analyzing the impact of updated wavelength and stray-light tables on NOAA-20 and NOAA-21 OMPS NP radiance values.
- Conducted an intensive assessments for the N21 OMPS SDR recovery (new dark and OSOL LUTs).
- Investigated the solar activity impact for SNPP OMPS for the sensor degradation correction.
- Work continues on updating and refining the OMPS SDR VCRTM package.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Solar intrusion impact correction on NOAA-21 OMPS NP; OMPS solar activity impact analysis	Nov-23			
NOAA-21 solar day-1 improvement; improve CRTM performance for NP simulation;	Dec-23			
Update the ST LUTs; consistency improvement of J2 OMPS NM and NP at the dichroic range; NOAA-21 OMPS SDR data quality validations using CRTM (global and LTM);	Jan-24			
NOAA-21 OMPS SDR data quality validations in comparison with NOAA-20 and SNPP; polarization impact assessment; OMPS and GEMS inter-sensor comparison	Feb-24			
Finalize the NOAA-21 solar day-1; prepare NOAA-21 OMPS SDR validated maturity review	Apr-24			
Document the technical reports, e.g., SL correction solar intrusion correction, solar activity impact correction; update OMPS NM/NP SDR ATBD	May-24			
Develop new algorithm or code to support J3/J4 prelaunch testing and verification	Jun-24			
Initialize the OMPS solar flux calibration algorithm from radiometric counts to flux	Aug-24			
Prepare all LUTs for the NOAA-21 OMPS NM/NP SDR reprocessing: e.g., all dark LUTs, updated NP/NM OSOL and wavelength LUTs, updated SL LUTs	Sep-24			
NOAA-21 OMPS calibration algorithm integration with SNPP/NOAA-20	Sep-24			
Develop and deliver dark and OSOL LUTs for SNPP/NOAA-20/NOAA-21 OMPS	Sep-24			
Maintain SNPP/NOAA-20/NOAA-21 OMPS SDR data quality	Nov-23			

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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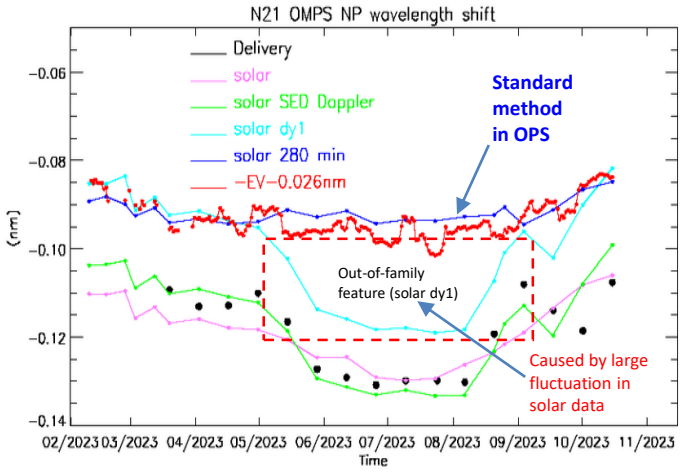
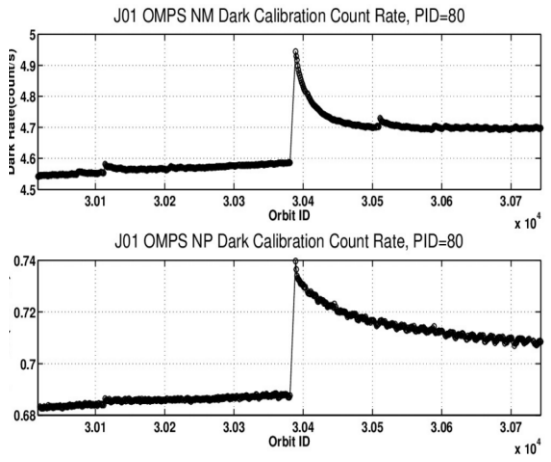
Issues/Risks:

None



Left panel: NOAA-21 OMPS NP wavelength shift values derived using different methods. Wavelength shift values were derived using solar data (pink), solar data with Sun-Earth distance corrections (green), solar day-1 data (cyan), solar using the 280nm minimum method (blue), and Earth-View data (red).



Right Panel: NOAA-20 OMPS NM (top) and NP (bottom) dark calibration count rates up through orbit 30743. A large spike can be seen in the rate values for both sensors following the gap in data from the Spacecraft anomaly.

OMPS Ozone (V8Pro, V2Limb & V8TOz)

March 2024

Accomplishments / Events:

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

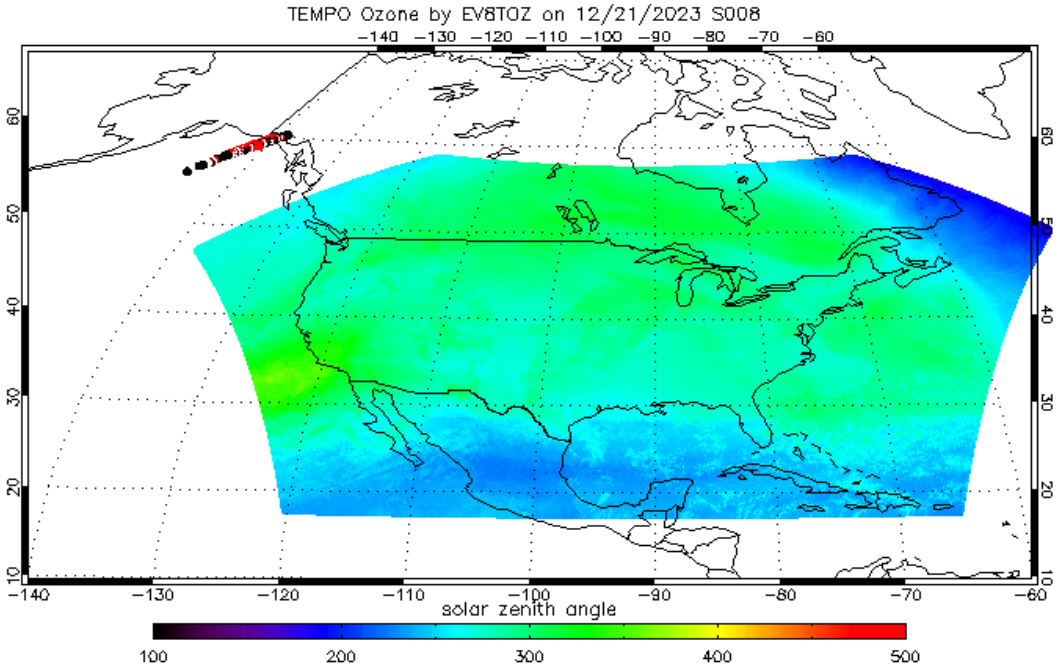
Milestones	Original / Current Date	Forecast Date	Actual Completion Date	Variance Explanation
Successfully complete GOME-2 NCCF ORR	Aug-23		Nov-23	
Provide new Level 1a, 1b & 1g for S-NPP OMPS V2Limb	Dec-22		Dec-23	NASA R&D
Provide Level 1a, 1b, 1g & 2 (aerosol and ozone) for NOAA-21 OMPS V2Limb to ASSISTT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

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule			X		ProTech Follow-on, SDR instability, Limb Development

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

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



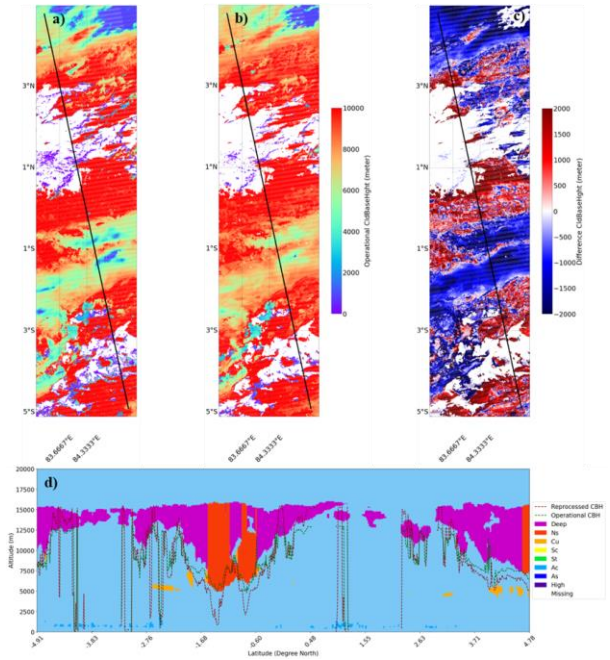
Enterprise V8TOz Applied to TEMPO

SNPP VIIRS EDR Reprocessing

October 2024

Accomplishments / Events:

- The RWG continue to assess the quality of reprocessed cloud EDRs against both the operational VIIRS EDRs and corresponding CloudSat-CALIPSO cloud products.
- During this reporting period, more case studies are conducted over different time and cloud type scenarios.
- The RWG continue to work on drafting quality assessment paper on VIIRS CTH and CBH EDR reprocessing.
- The following figure shows the comparison among reprocessed, operational VIIRS CBH estimations and corresponding CloudSat-CALIPSO measurements for 06/08/2019 UTC 08:11:27~08:14:06 :



Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Complete the reprocessing of SNPP VIIRS EDRs for all the cloud properties over , Aug. 20, 2018 ~ Jul. 10, 2019	02/2024	06/2024		5 month
Assess the quality and accuracy of reprocessed cloud base height and cloud top height EDRs	07/2024	09/2024		3 month
Draft data assessment paper	10/2024	12/2014		3 month
Assess the quality of other cloud EDRs	12/2024	06/2025		6 month
Continue to reprocess SNPP VIIRS EDRs for the whole mission period	01/2025	12/2015		12 month

Overall Status:

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

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

Issues/Risks:

The VIIRS EDR reprocessing was relying on the UMD Bamboo system previously. However, the system had officially retired in July 2024. Mitigation plan is being developed by using GMU cluster computer system for continued reprocessing of VIIRS EDRs

Sea Surface Temperature

October 2024

Accomplishments / Events:

- We migrated additional 3 SST servers from CentOS 9 Stream to Red Hat Enterprise (RHEL). The migration process is slow because each server takes about one day, and STAR IT time is limited.
- We reprocessed over a year of NPP, N20 and N21 VIIRS SST (Jan' 2023 - Mar' 2024) data using ACSPO V3.00 beta 1 (B01). Using matchups between VIIRS and in-situ SST we recalculated SST retrieval lookup tables (LUTs) for all three VIIRSs. The existing V2.80 LUTs were trained on 2018 data and NPP and N20 thermal IR calibration has drifted a small amount since then, but enough to cause a negative 0.10 K change in mean bias. New LUTs (see figure) mitigate the effects of the bias drift.
- We started testing internal release ACSPO V3.00B02. This task involved updating our VIIRS and L3S-LEO experimental dataflows to use V3.00B02. The B02 release is the last V3.00 release with science algorithm changes. Any further changes prior to V3.00 ASSISTT delivery (planned for Dec) will be bug fixes and potential lookup table updates. Over the next month or so we will perform extensive testing of V3.00B02 by reprocessing and validating a long time period (~1 year) for all three VIIRSs, as well as L3S-LEO.

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			

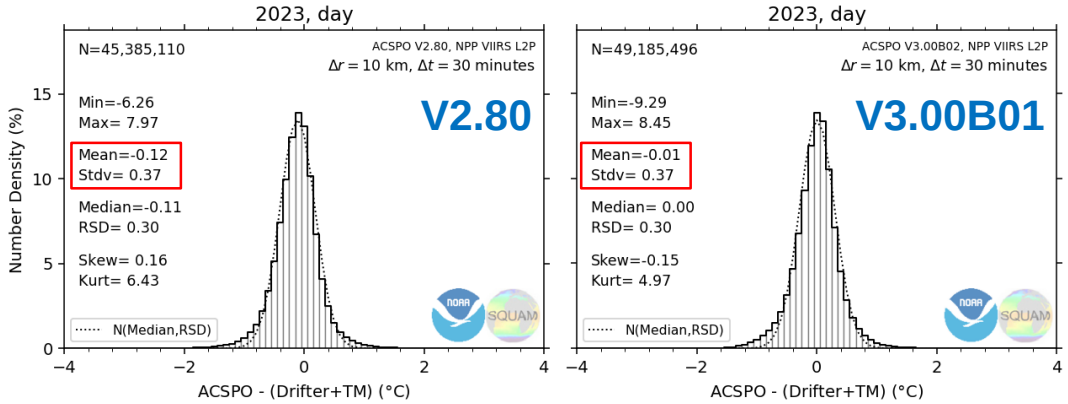
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Stability of STAR IT infrastructure has degraded severely over the last 6 months due to SCDR and CentOS 9 Stream instabilities. The situation is exacerbated by our inability to buy new hardware and uncertain future of cloud migration, which is likely to be delayed due to unfavorable audit report for the NCCF.

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

Highlights: SST retrieval lookup tables (LUTs) were recalculated



Histograms of bias between ACSPO NPP VIIRS daytime SST and in-situ SST from drifters and tropical moorings for the year 2023. Left panel shows results for ACSPO V2.80 (current version) and right panel shows results for V3.00B01. Red rectangle highlights improvements to mean bias, which is closer to zero in V3.00B01.

Snowfall Rate

October 2024

Accomplishments / Events:

- Several tasks were carried out in support of the GINA SFR system including system backup, data format, and data display etc. This system produces SFR in near real-time from Alaska direct broadcast data and the product is distributed to NWS Alaska. GINA requested assistance from the SFR team to ensure reliable SFR data support for NWS.
- The team has developed SFR ocean (including sea ice and coast) algorithms for the operational satellites (JPSS, POES, and GPM) and is conducting validation studies. The plan is to include the ocean algorithms in the next SFR delivery to ASSISTT. This fulfill the JPSS requirements for SFR with global coverage.

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

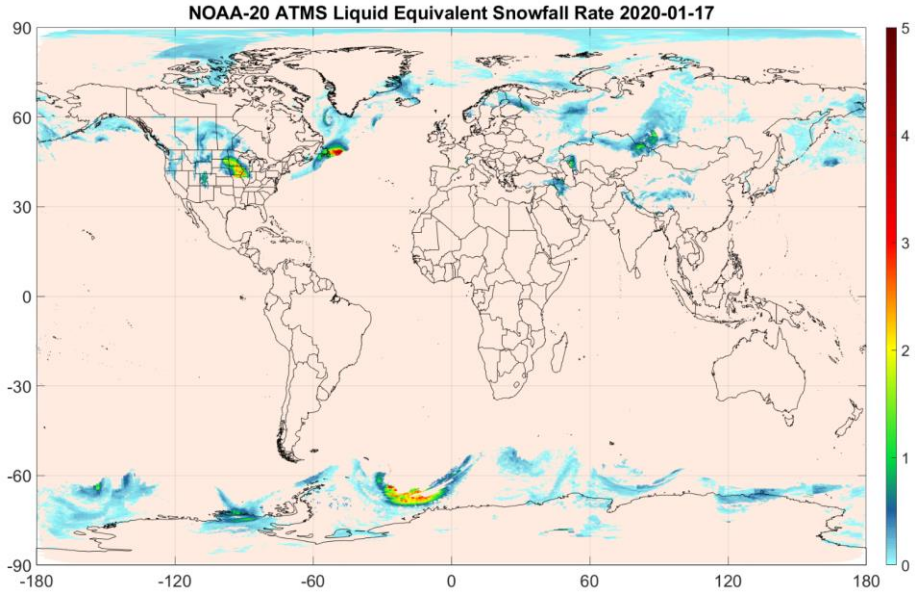
Overall Status:

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

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

Issues/Risks: None

Highlights:



NOAA-20 global SFR product from January 17, 2020

Surface Reflectance

October 2024

Accomplishments / Events:

- Prepare the updated DAP for next delivery, the new updates include the mitigation algorithm dealing with the bias caused by the misclassified dust aerosol model; the updated metadata for better monitoring and the output data format with reduced storage.
- Keep working on collecting the ground measurements for the validation, include the RadCalNet sites data and NEON airborne data.
- Continue to work on the SR reprocessing, compared two approaches of TOA reflectance re-calibration and generated test data for evaluation.
- Keep working on long term SR monitoring via daily gridded SR dataset and global mapping. routine validation at AERONET sites.

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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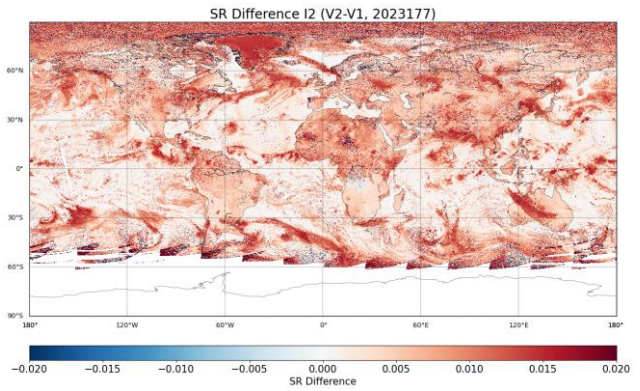
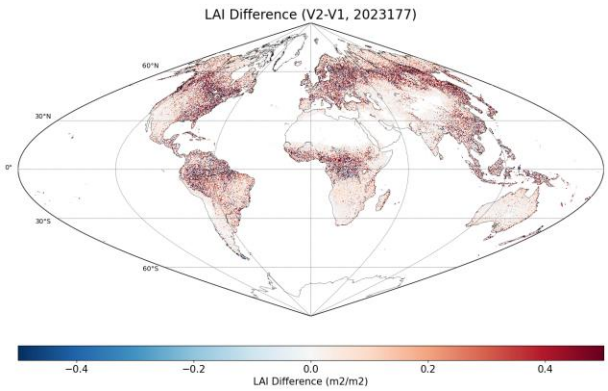
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Provional Maturity of NOAA-21	Feb-24	Feb-24	Jan 25, 2024	
The JPSS (SNPP, N20, N21) SR consistency evaluation and correction	Mar-24	Mar-24	Mar 28, 2024	
GOES-R enterprise SR algorithm development and experimental product	Jun-24	Jun-24	Jun 28, 2024	
Operational Readiness Review (ORR) for NDE Migration to NCCF	Aug-24	Aug-24	Nov 13, 2023	Completed ahead of schedule
Develop SR software package using the reprocessed SDR to reduce the inconsistency	Nov-24	Nov-24		
The reprocessed SR consistency evaluation	Dec-24	Dec-24		

Highlights:

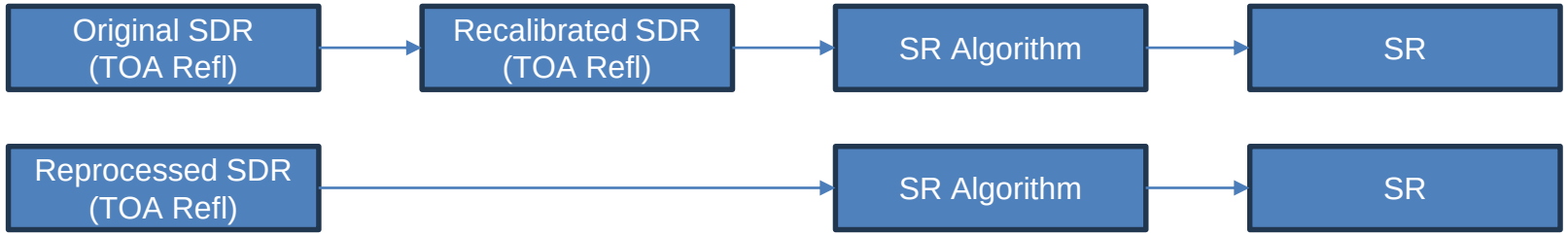




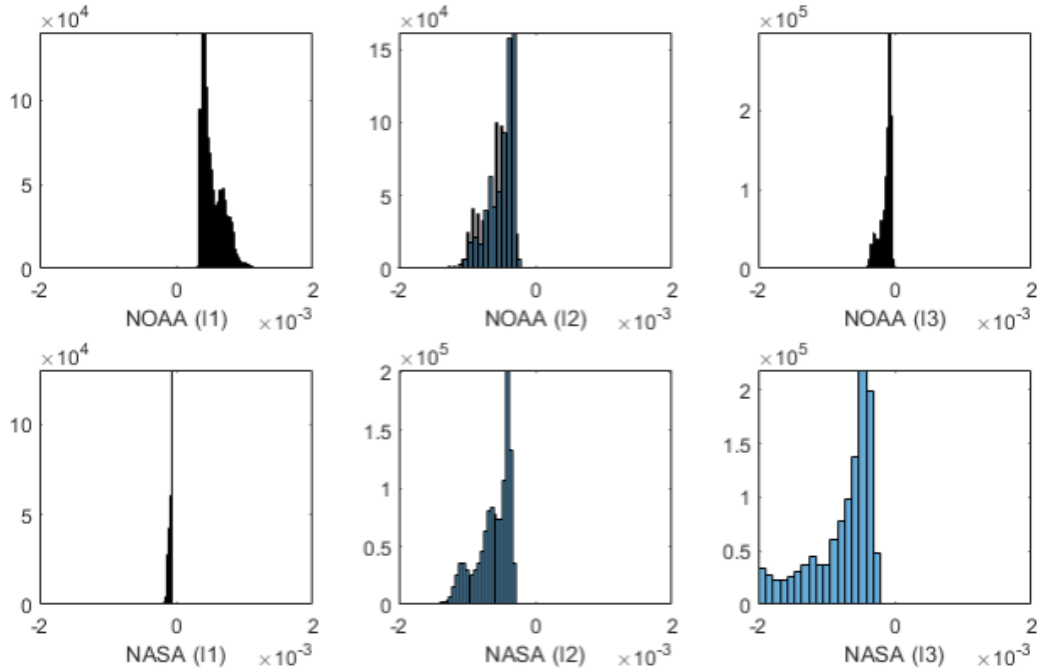
The significant difference between original and reprocessed SNPP TOA reflectance is the NIR band, which results in downstream product difference, such as LAI, around 5% uncertainty. Reprocessed dataset is under processing.

SR Reprocessing Test Datasets

- SR Reprocess Approaches: NOAA reprocessed SDR and NASA recalibrated TOA reflectance.



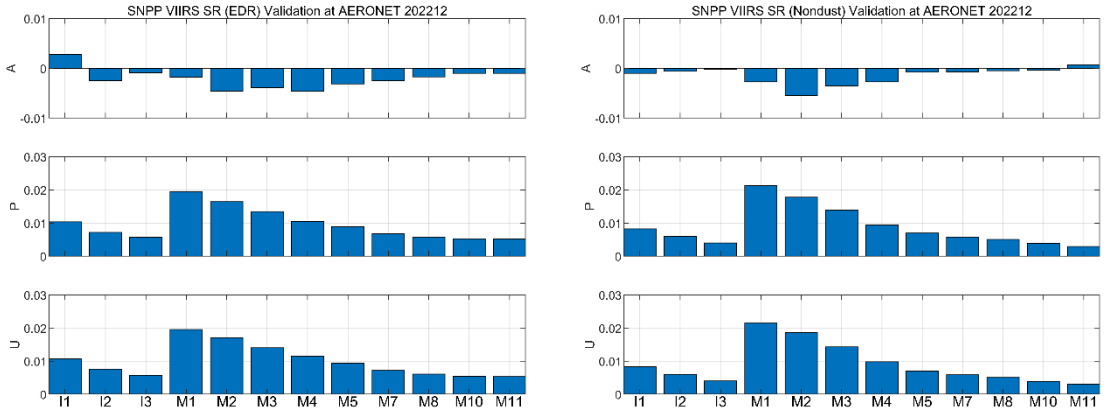
- The reprocess SDR (TOA reflectance) comparison between two approaches.



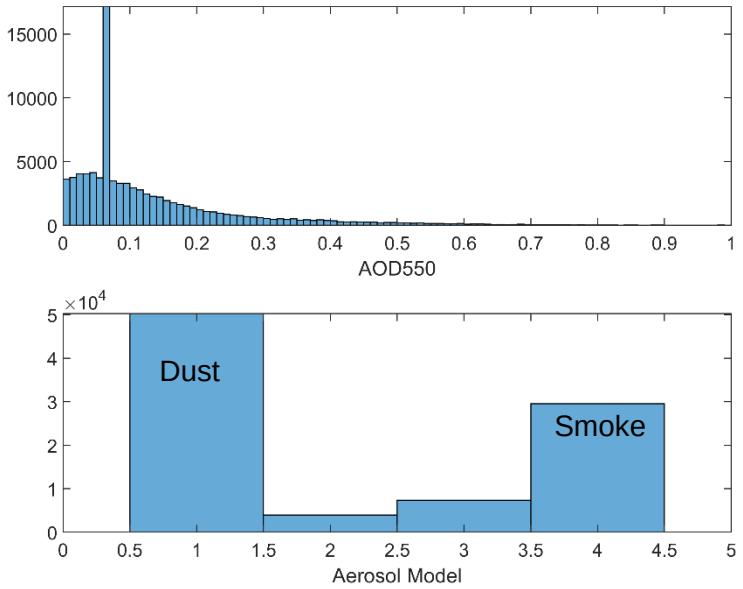
- NOAA reprocessed SDR based on Kalman filter method combining multiple approaches, including the ground measurement, the deep convective cloud.
- NASA recalibration method, using Aqua/MODIS as reference, using deep convective cloud, sun glint as target for the calibration.
- The results show I2 band with pretty good agreements, while I1 and I3 band are different. More evaluations are needed.

Surface Reflectance Updated Package

- Solution: for the dust model, reselect the best match from Generic, Urban and Smoke
  - AOD product provide AOD550 value for each model and the residual.
- Pros: Improve the AOD accuracy for misclassified aerosol model
- Cons: the true dust is ignored
  - Dust aerosol most time with high AOD, will be exclude when multi data available.
  - Dust aerosol more often in desert area, will have less impact on vegetation product.



Test data: Clear sky data at global sites of a whole month (Dec,2022)
Result: shorter wavelength bands a little bit worse (M1, M2 band), M3 is comparable, other bands improved



AOD 550 and aerosol model distribution

- In the redefined “Bad Retrieval Percentage”, we revised two conditions marked in Red Color
- Redefined Bad Retrieval
  - Solar zenith angle >= 85 (night) □ Remove this scenario.
  - SDR Filled value (Need monitoring)
  - GEO Filled value (Need monitoring)
  - AOD or GFS (tpw, p0, o3) out of range. (Need monitoring)
  - Band M1 Results out of range (-0.01, 1.6) (Need monitoring) □ Only under Non confident cloudy condition.
  - Moon in the sight (very rare case)

Surface Type

October 2024

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 October of 2024 for the production of AST-2024.
- The team is developing new Python/C++ programs for improving surface type reference data collection using best available data sources, including:
  - LiDAR vegetation height metrics provided by GEDI and ICESAT-2
  - High resolution satellite images available from Planet Lab, Google, and ESRI
  - Newly available fine resolution land cover maps at regional to global scales
- The team continue to examine VIIRS' capability for monitoring surface type dynamics caused by flooding and other impactful disturbance events (see highlights).

Overall Status:

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

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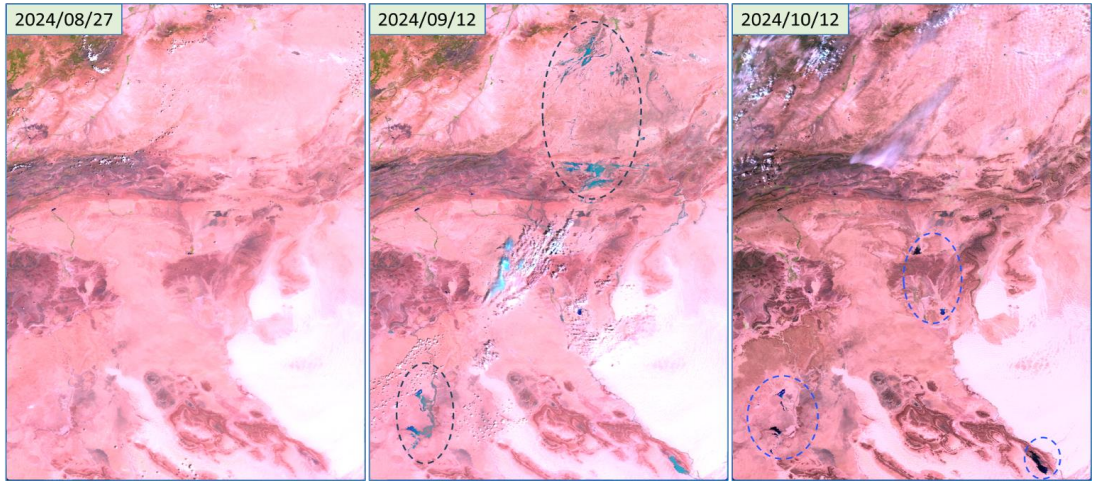
Issues/Risks:

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	Each M.	Each M.	Each M.	
Generate global annual classification metrics for 2023	May-24	May-24	May-24	
AST23 of IGBP 17 type map	Aug-24	Aug-24	Aug-24	
AST23 for EMC 20 type map	Aug-24	Aug-24	Aug-24	
AST23 Validation Statistics and delivery to JSTAR and users	Sept-24	Sept-24	Sept-24	

Highlights:

Rare Desert Flooding Imaged by VIIRS



An extratropical cyclone brought more rainfall to many areas over the Sahara Desert in 2 days (September 7 and 8, 2024) than the annual averages in those areas, causing rare flooding in those areas while bringing life to many dried lakes. While most of the flood water (middle, highlighted in the black ellipsoids) disappeared by October, the revived lakes remained inundated. Their dark or dark blue color tones (right, highlighted in blue) indicate that the water turbidity likely decreased substantially following the settle down of the sediments. These NOAA-21 images were created with VIIRS bands I3, I2, and I1 in red, green, and blue. They cover an area of approximately 900km by 1200km over eastern Morocco and northwest Algeria.

Vegetation Health

October 2024

Accomplishments / Events:

- Continued monitoring of vegetation health as indicated by publications of weekly vegetation health products (VHP) from currently operational NOAA-20 VIIRS observations via STAR webpage at https://www.star.nesdis.noaa.gov/smcd/emb/vci/VH/vh_browse.php. Moved the major dataset to the VHP project dedicated disk 'data710' and created a backup version of VHP web data to maintain a reliable and consistent VHP database.
- Communicated with USDA and CPC users about three days delay of STAR VHP production due to the network issues between STAR SCDR and GRAVITE. Users understood the three days delay and made adjustments on their end. The team also developed a tool to monitor dynamic SCDR data delays since it is uncertain when the network issues will be resolved.
- Continued the development of the new code for 500m NOAA-20/21 VIIRS VHPs production/operation and started VPH code refinement and database updates for potential transition of STAR VHP production to OSPO operation. A fix to the C++code for a rare error in VIIRS SDR data, which resulted in false missing data in daily map, has

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

Overall Status:

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

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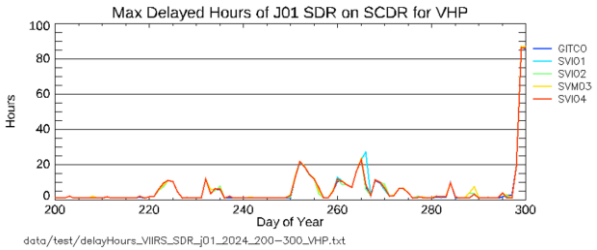
Issues/Risks:

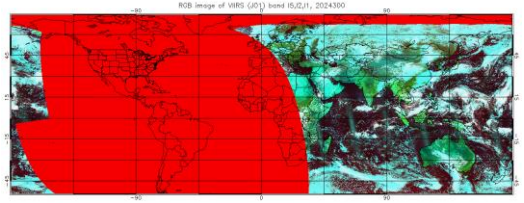
None

Highlight A: *A tool has been developed to monitor the time evolution of maximum delayed hours of SDR on SCDR along with day of year. The SDR are required inputs for SNPP, J01, and J02 VHP. See the right figure for J01 as an example. This tool can support decisions on real-time VHP production to ensure timely product delivery with the best possible data quality.*

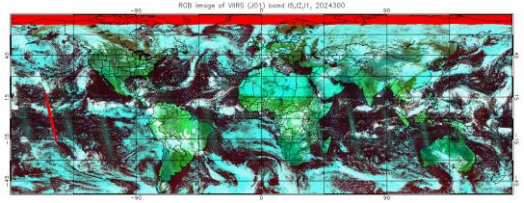


Highlight B: *An error in the VIIRS SDR GITCO orbit number for day 300 was discovered, causing widespread missing data in the J01 daily map (left map). The C++ code was modified to fix this issue, and the reprocessed map now looks good (right map).*

J01 Daily map, 2024300 from scheduled run



J01 Daily map, 2024300 reprocessed with a fix



Vegetation Index and Green Vegetation Fraction

October 2024

Accomplishments / Events:

- Designed the AI-based GVF algorithm upgrade
  - High-level algorithm framework design
  - Preliminary evaluation of HLS GVF test data
- VI/ GVF integration with Vegetation Health progress:
  - Comparison between current NVPS VI and VI from the redesigned framework
  - Ongoing programming on the modified algorithm framework

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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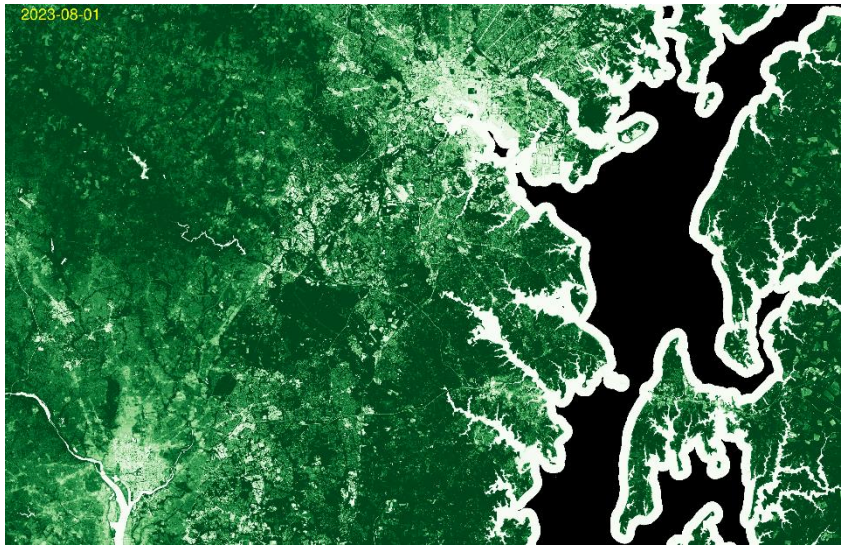
Issues/Risks:

None

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

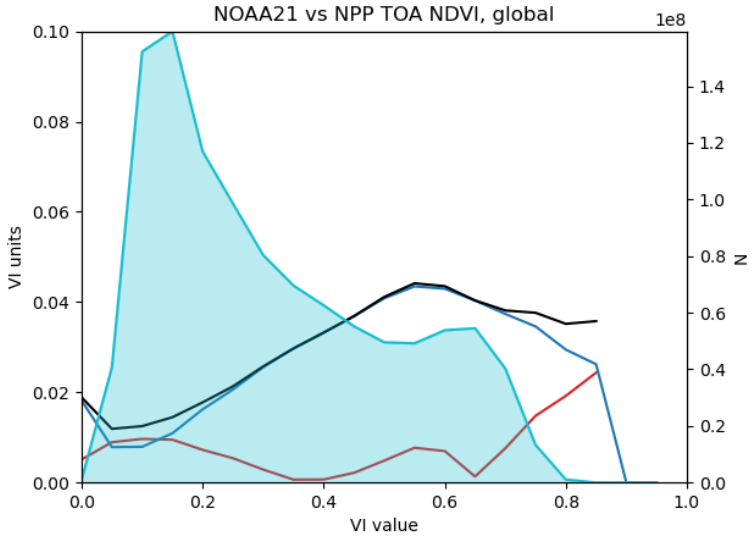
Highlights:

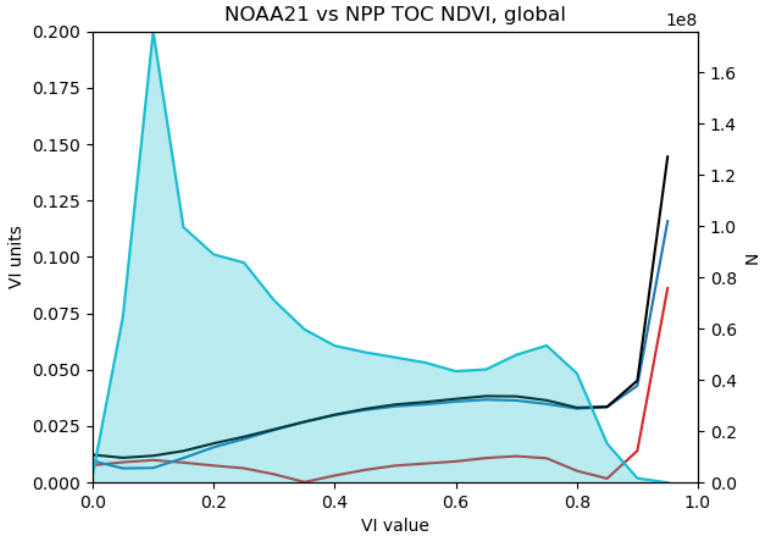
High resolution GVF from HLS data to be used for VIIRS GVF model training

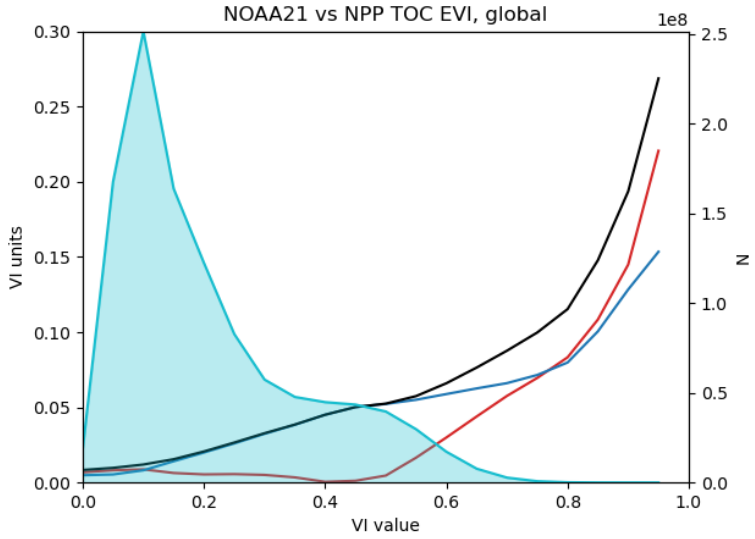


SNPP vs. NOAA-20 Vegetation Index for 2023 and 2024: Stratified by VI value

All statistics (mean difference, standard deviation, and RMS difference are less than 0.05, except for the highest values of TOC NDVI and TOC EVI, where there are few pixels.
This indicates continued consistent performance between SNPP and NOAA-20.







Mean difference
Standard deviation
RMS difference
Number of pixels

AI-based GVF algorithm upgrade

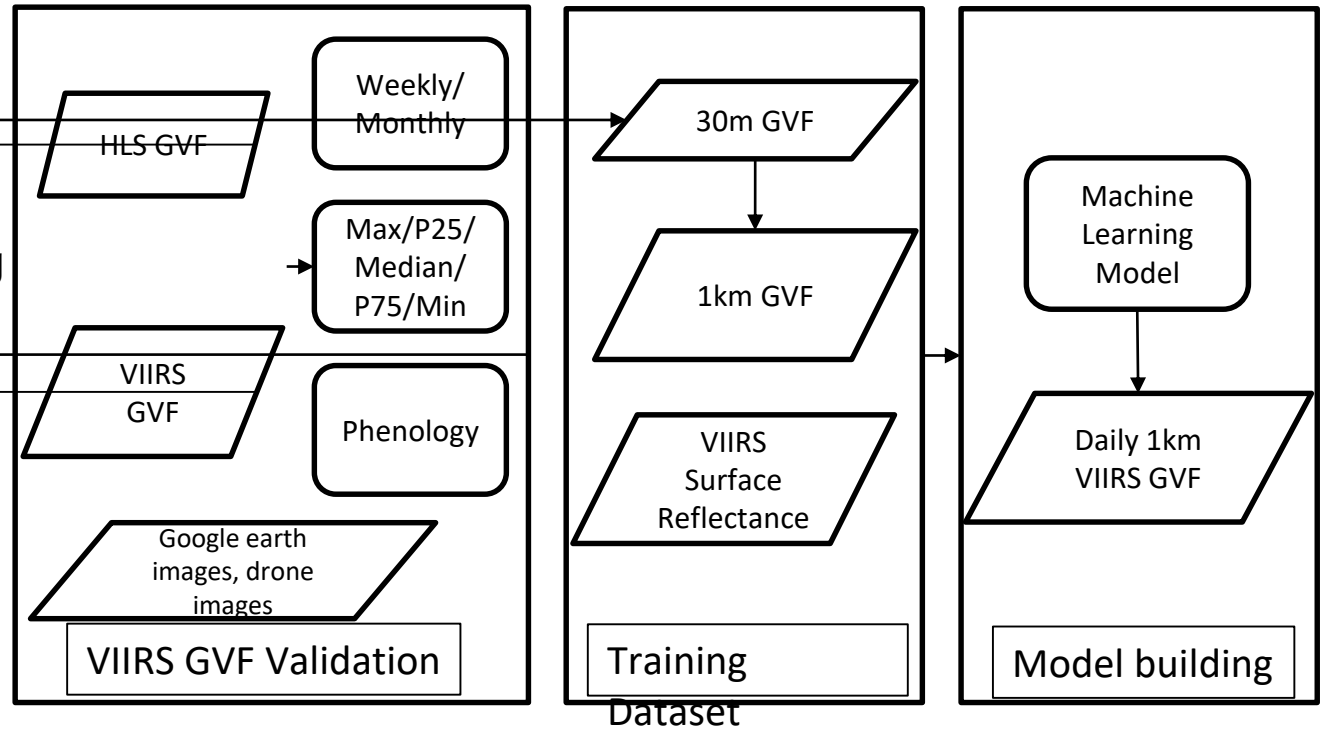
Work plan:

GVF algorithm upgrade:

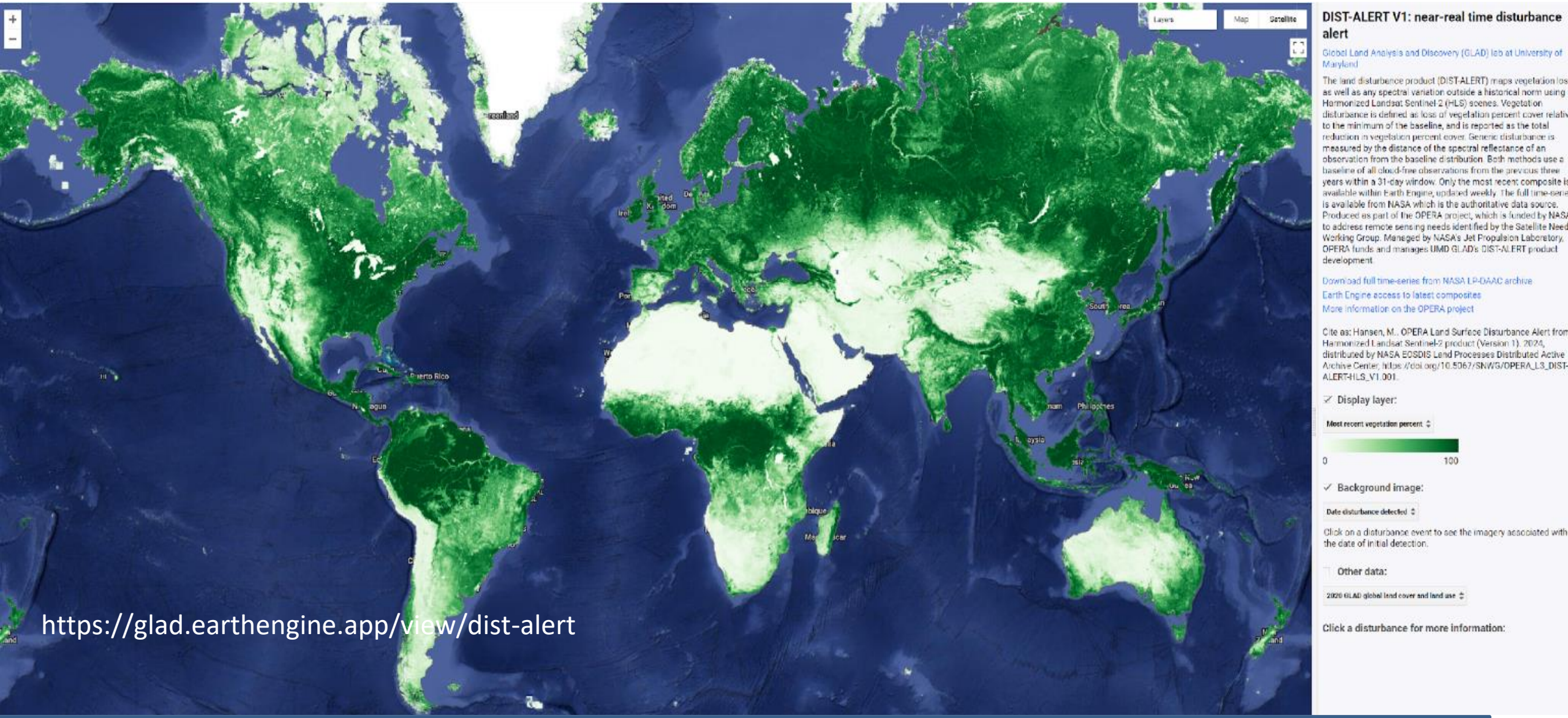
- Comparison and validation of VIIRS GVF (Ongoing)
- Collect training dataset
- Develop updated GVF algorithm using machine learning model

Applications:

- Explore the possible applications based on VIIRS GVF…, e.g., natural disaster monitoring

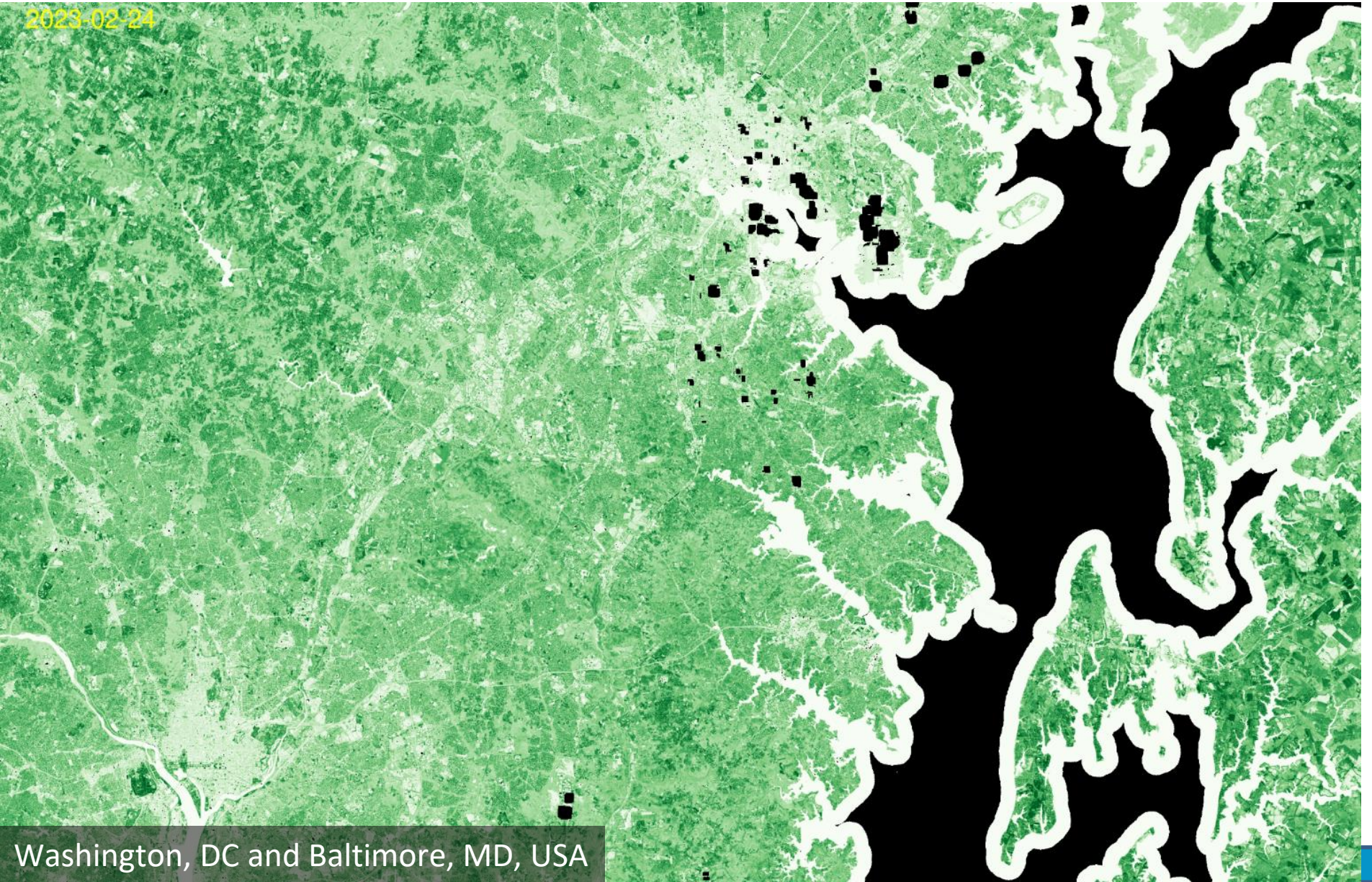


AI-based GVF algorithm upgrade



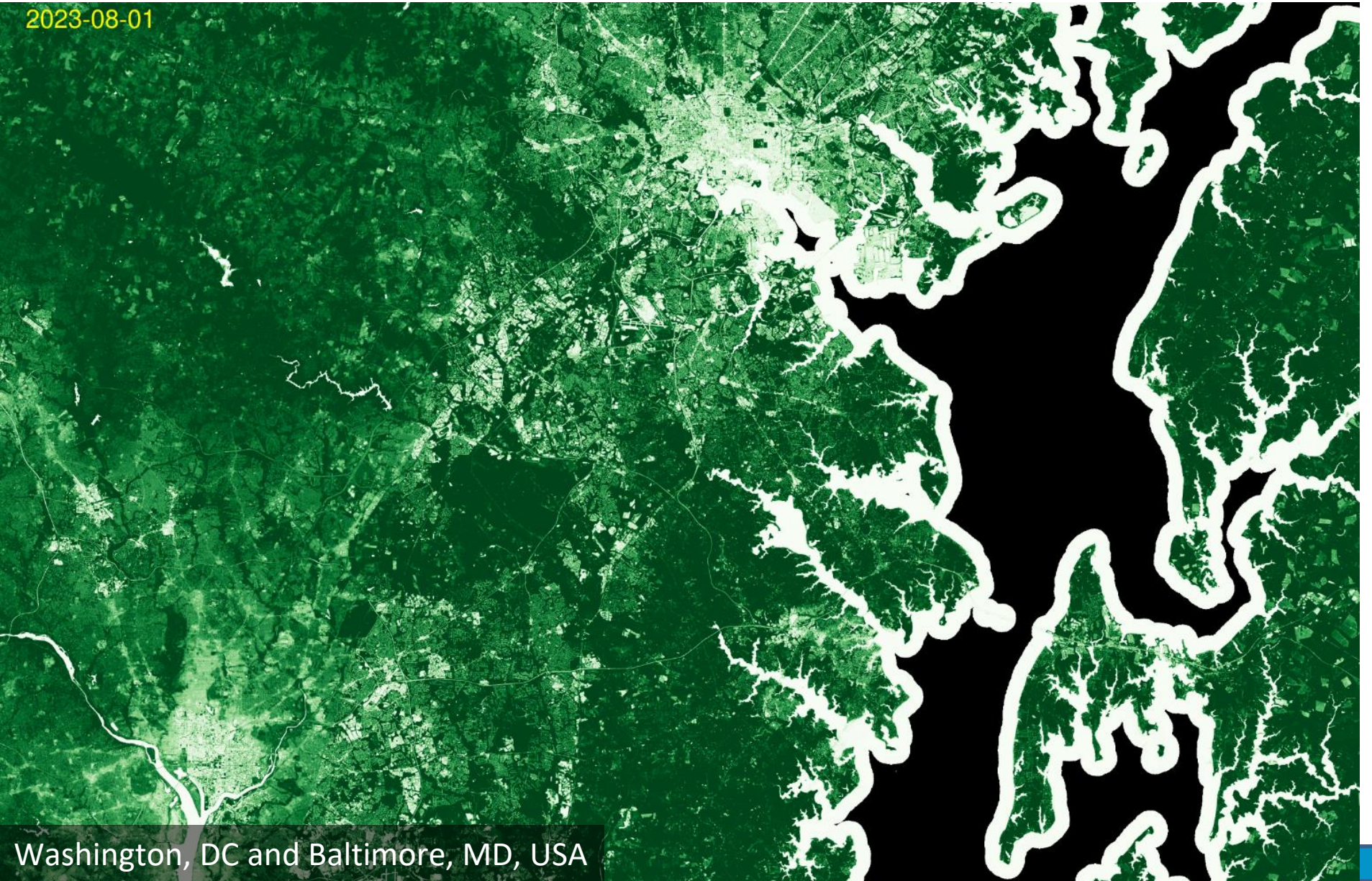
https://glad.earthengine.app/view/dist-alert

AI-based GVF algorithm upgrade



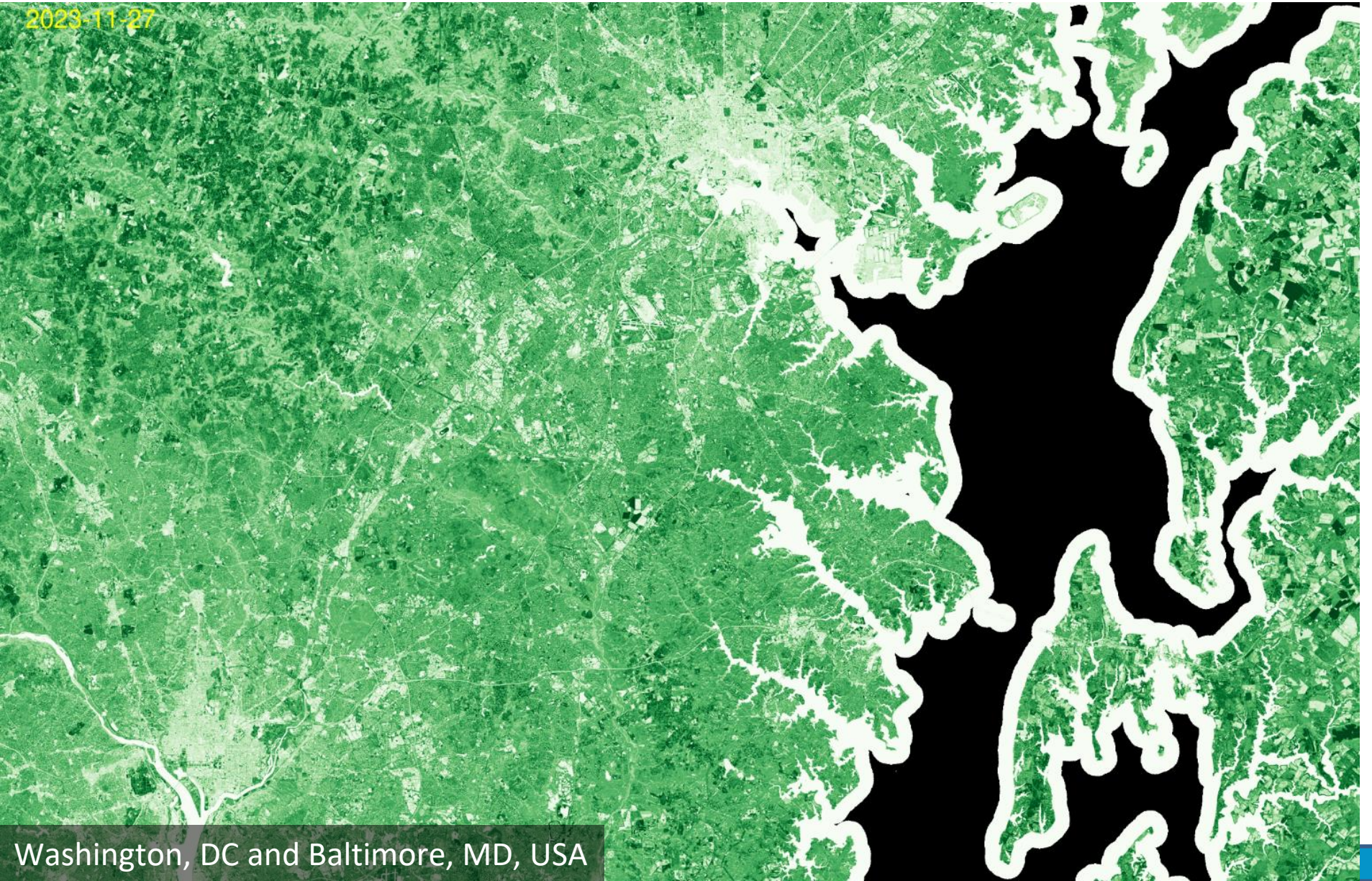
Vegetation cover percent is mapped per HLS pixel, defined as the amount of skylight orthogonal to the surface that is intercepted by vegetation.

AI-based GVF algorithm upgrade



Vegetation cover percent is mapped per HLS pixel, defined as the amount of skylight orthogonal to the surface that is intercepted by vegetation.

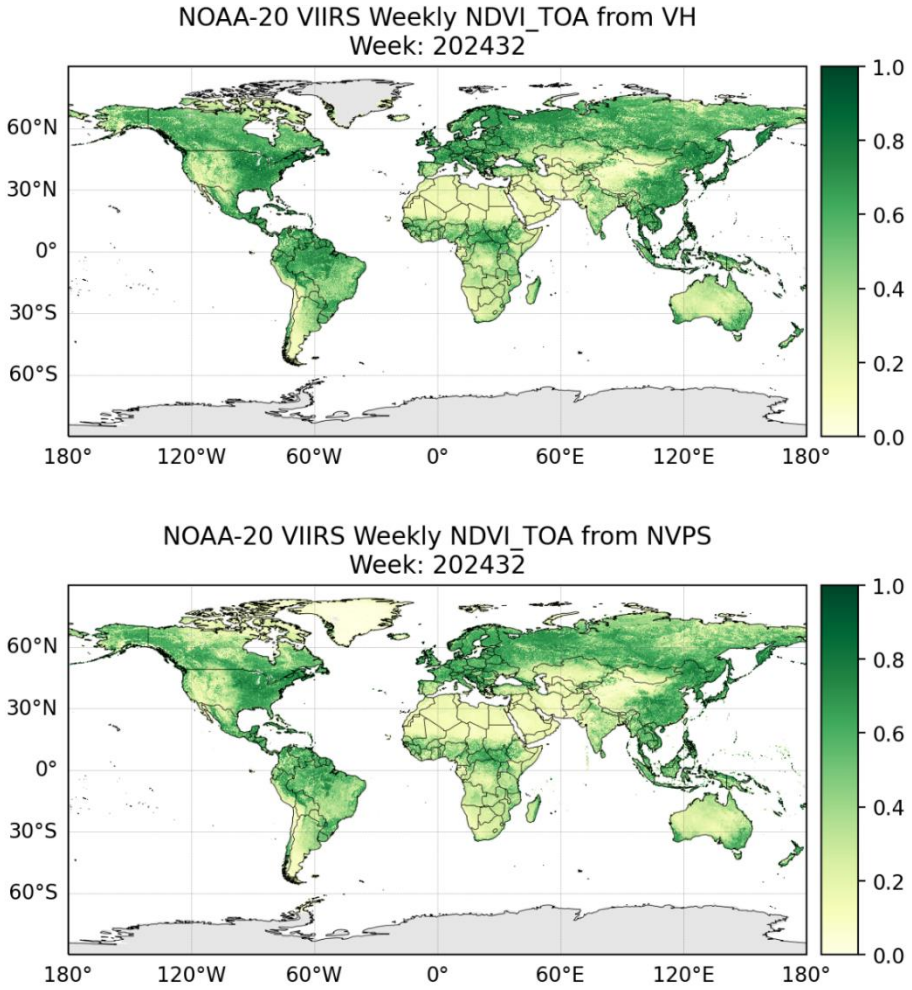
AI-based GVF algorithm upgrade

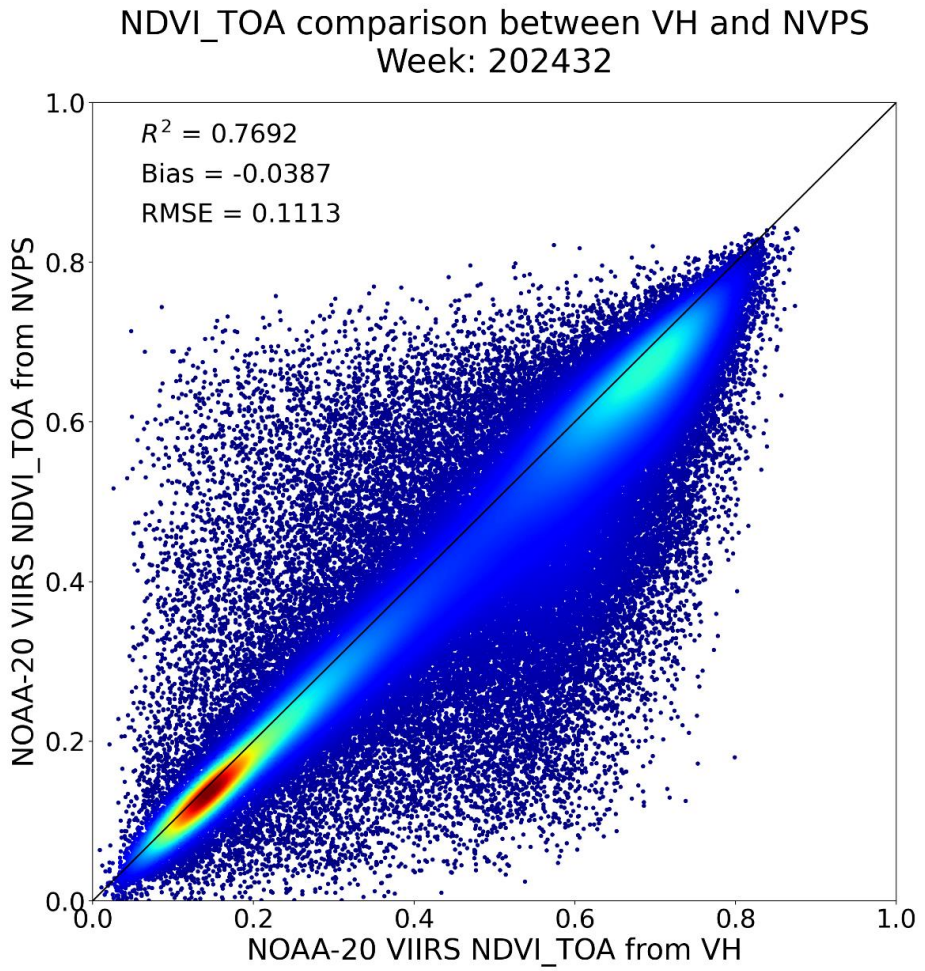


Vegetation cover percent is mapped per HLS pixel, defined as the amount of skylight orthogonal to the surface that is intercepted by vegetation.

Integration of NVPS with Vegetation Health processing

- Comparison shows general agreement between the original NVPS VI and the VI obtained from the redesigned framework, basically showing the effectiveness of the integrated framework.





VIIRS SDR

October 2024

Accomplishments / Events:

- Tested and submitted for deployment in the IDPS operations the initial JPSS-3 VIIRS SDR LUTs derived from the pre-launch calibration data: the LUTs are necessary for preparing and testing the IDPS code change with the JPSS-3 and JPSS-4 VIIRS granule size update
- Created, tested and submitted for deployment in the IDPS operations the updated NOAA-20 VIIRS SDR F-PREDICTED LUT that is based on the latest estimates of the mission-long reflective solar band (RSB) response degradation trends
- 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 10/2/2024
- Coordinated verification of an agreement between NOAA STAR and NASA VCST predictions of the NOAA-21, NOAA-20 and S-NPP VIIRS lunar calibration opportunities on 11/12/2024: provided to OSPO MOT the agreed-upon NOAA-21 and NOAA-20 schedules for the required spacecraft roll maneuvers and VIIRS Earth View sector rotations

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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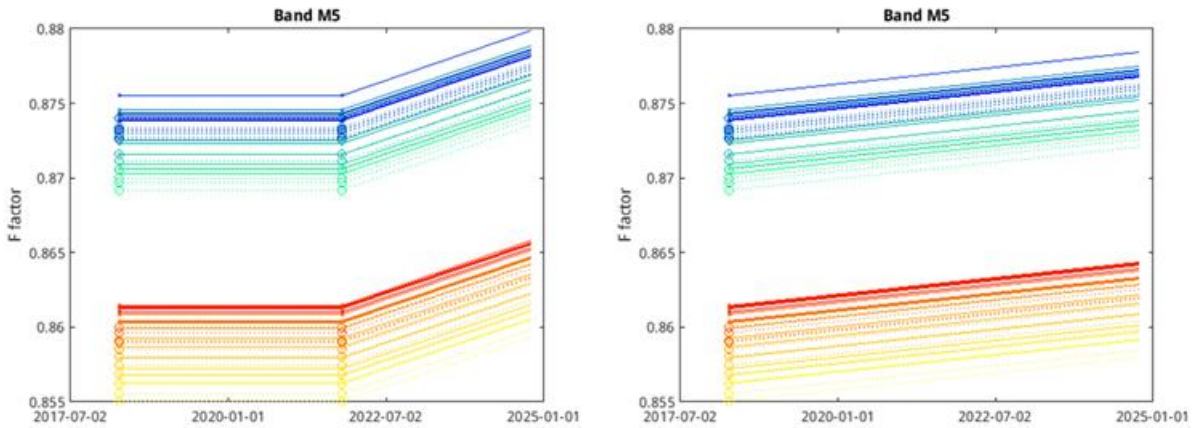
Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Complete SNPP VIIRS SDR 2012-2020 reprocessing delivery to CLASS	Dec-23	Dec-23	Oct-23	
SNPP and NOAA-20 VIIRS intermediate recalibration	Sep-24	Sep-24	10/25/2024	
JPSS-3 VIIRS pre-launch characterization report	Apr-24	Jun-24	6/28/2024	
JPSS-3 VIIRS SDR initial pre-launch LUTs	Jun-24	Oct-24	10/11/2024	
Monthly lunar calibration (predictions and analyses)	Jul-24	Jul-24	6/18/2024	
Monthly delivery of VIIRS DNB calibration LUTs	Sep-24	Sep-24	9/12/2024	
Monthly delivery of N21 VIIRS DNB straylight LUTs	May-24	May-24	5/16/2024	
Geolocation monitoring using CPM (NPP, N20, N21)	Sep-24	Sep-24	9/30/2024	
N21 on-orbit calibration LUT development	Sep-24	Sep-24	5/3/2024	
Delivery of VIIRS SDR RSB and TEB calibration LUTs to mitigate degradation	Sep-24	Sep-24	3/21/2024	

Highlights:



NOAA-20 VIIRS SDR RSB F factors defined in the F-PREDICTED LUTs #6 and #7 (current, left) and #8 (updated, right): band M5 is expected to have the largest calibration change when the updated LUT is deployed in IDPS, but the change will still be small (~0.15%)

VIIRS Flood Mapping

September 2024

Accomplishments / Events:

- JPSS Flood monitoring has captured multiple events this month. One example is the downscaled 30 meter resolution VIIRS flood depth estimates on Sept 17th, 2024 after historic rainfall occurred across the Cape Fear Region of southeastern North Carolina from Potential Tropical Cyclone Eight. Gauges and automated radar estimates showed that 12 to 20 inches of rain fell in only two days.
- NOAA Satellites posted the results from the JPSS downscaled flood depth (https://x.com/NOAASatellites/status/1836474846496330162).
- 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:

None

Highlights:

Volcanic Ash

October, 2024

Accomplishments / Events:

- Quality/Oversight Continued to ensure high quality Volcanic Ash retrievals from EDR algorithms and VOLCAT. Routine validation of existing JPSS volcanic ash EDRs from current sensors will continue as needed, including support for ASSISTT/NDE evaluations. VOLCAT is long-term plan.
- The VOLCAT science team continually assesses volcanic eruptions suitable for inclusion in VOLCAT validation datasets. The volcano Popocatepetl in Mexico produced sizable emissions in October 2024. The VOLCAT team is evaluating these for inclusion in the validation datasets, including inter-comparisons between VIIRS, new GOES-19 ABI and existing GOES-16 ABI instruments. An example of these emissions is included in the figure from the experimental processing system at UW-CIMSS. The example is using NOAA-21 VIIRS VOLCAT RGB imagery, annotated with VOLCAT ash alert polygon.

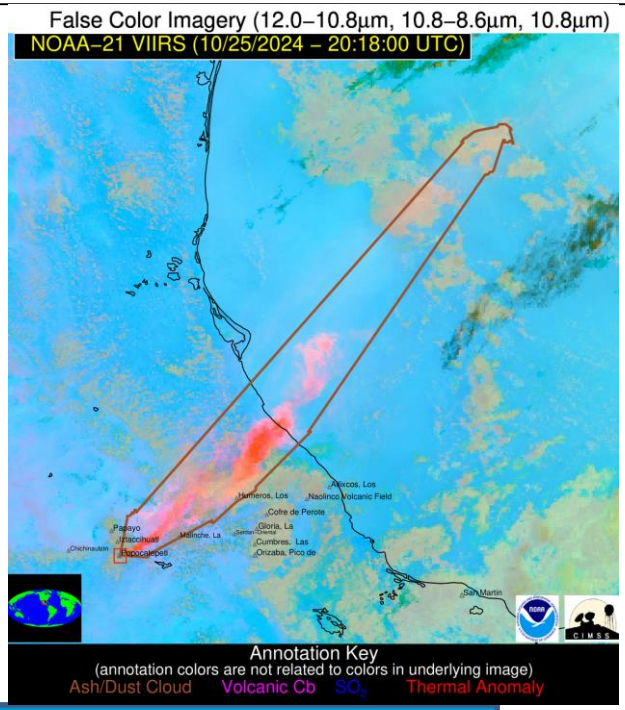
- VOLCAT VIIRS volcanic ash plume identification and extraction work is an enhancement to the VOLCAT methodology. The most recent research focus has been developing a web-page based tool to manually classify VOLCAT volcanic cloud objects by a science team expert (as yes (containing volcanic ash) or no (not containing volcanic ash)). This will enable a full training database to be generated for ash and non-ash clouds for training the AI/ML methodology, including both detected and missed volcanic clouds by the current VOLCAT algorithm. The science team completed identifying and reprocessing scientifically interesting cases (e.g., volcanic clouds, VOLCAT false alarms, etc.) and are currently classifying these reprocessed cases to be included in the AI/ML training dataset

Overall Status:

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

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

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Develop updated user training material	Jun-25	Jun-25		
Improve VIIRS volcanic ash plume identification and extraction	Mar-25	Mar-25		
Integration of VIIRS I-bands in VOLCAT workflow	May-25	May-25		
Imaging capabilities of VIIRS I-bands in VOLCAT end-user web graphics	Nov-24	Nov-24		
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: A NOAA-21 VIIRS example of recent sizable volcanic emissions from the Popocatepetl volcano in Mexico. The volcanic ash is denoted in this RGB imagery as the pink/magenta regions highlighted by the VOLCAT brown polygon. These emissions are being evaluated for inclusion of the VOLCAT validation dataset and will be used for satellite inter-comparisons.