NOAA JPSS Monthly Program Office

AMP/STAR FY24 TTA

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October, 2024

Highlights from the Science Teams (September 2024)

Alaska NextGen Satellite Workshop

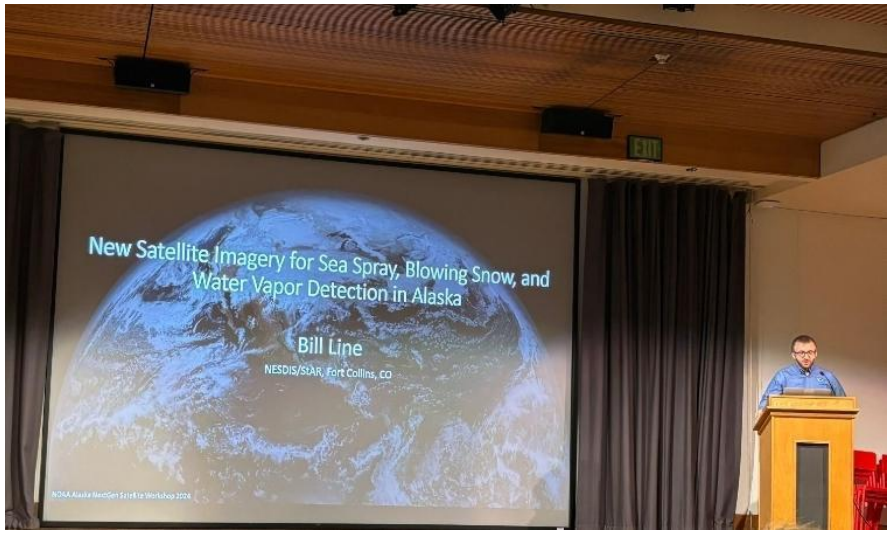

Figure. Bill Line giving presentation at NOAA Alaska NextGen Satellite Workshop

Huan Meng attended the Alaska NextGen Satellite Workshop on 10-12 September. Besides presenting the NESDIS Snowfall Rate product and its applications in Alaska, she met with three groups of Alaska users to discuss future collaborative activities. The users were from NWS Alaska Region Headquarters, Alaska-Pacific River Forecast Center (APRFC), Juneau Weather Forecast Office, and Geographic Information Network of Alaska at University of Alaska Fairbanks (GINA). The collaborations were established from two projects: one focused on developing and assessing an Alaska regional Snowfall Rate product, supported by JPSS Proving Ground and Risk Reduction, and the other on evaluating and applying the Snowfall Rate product (integrated in CMORPH2) in APRFC's hydrological models and Quantitative Precipitation Estimation. The latter is one of the Bipartition Infrastructure Law (BIL) projects. A follow-up meeting has been scheduled with Eugene Petrescu, the NWS Alaska Regional Scientist, and Crane Johnson, APRFC Hydrologist in Charge, to develop plans for APRFC to integrate SFR/CMORPH2 into operations. Bill Line also attended and presented on his sea spray, blowing snow, and CrIS Imagery research and development efforts as they relate to Alaska users

Highlights from the Science Teams (September 2024)

STAR Aerosol Team's Python Training Facilitates use of VIIRS Smoke Mask for Alaskan Fire Season:

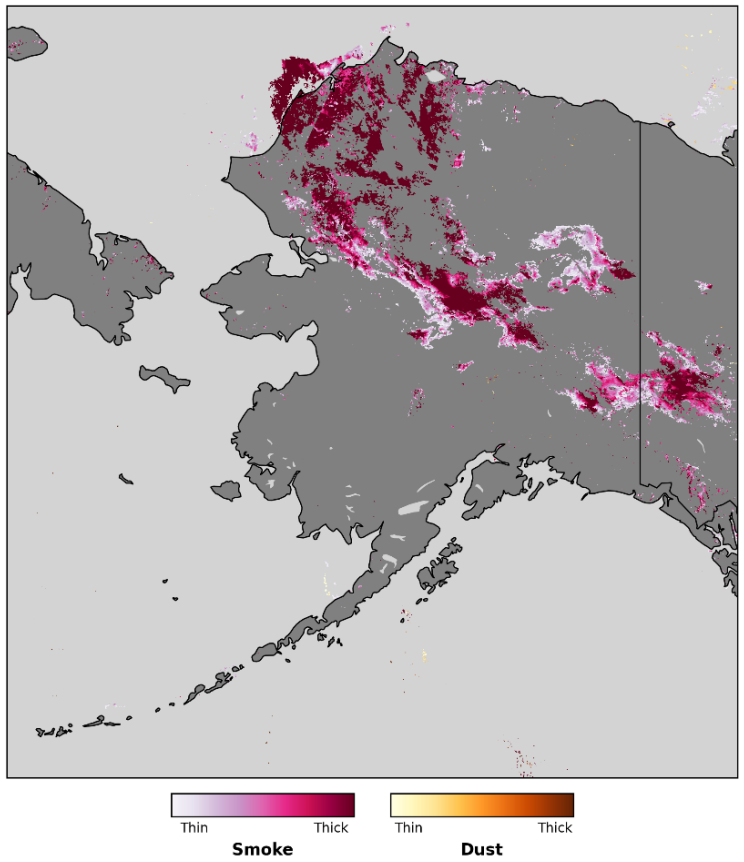

Figure. Visualization of NOAA-21 VIIRS Aerosol Detection Product (ADP) EDR data over Alaska on 27 June 2024 made by the training participants as a case study example.

Members of the Scenarios Network for Alaska & Arctic Planning (SNAP) group at the International Arctic Research Center at the University of Alaska Fairbanks participated in a virtual training course on 30 September 2024 to learn how to use the JPSS VIIRS Aerosol Detection Product (ADP) to highlight smoke in Alaska during the summer fire season. Amy Huff (SMCD/STAR Affiliate) conducted the training, featuring a hands-on Python notebook run on Google Colaboratory. The session covered how to 1) search for and download VIIRS ADP EDR granule files for Alaska from the NOAA Open Data Dissemination (NODD) cloud archive, 2) correctly process the ADP data with diagnostic flags, and 3) plot the processed data on a map. Special attention was given to showing participants how to avoid pitfalls for downloading & mapping VIIRS granules that cross the antimeridian (180° longitude). SNAP plans to utilize the VIIRS ADP data to add a "smoke layer" to their Alaska Wildfire Explorer website for end users.

Highlights from the Science Teams (September 2024)

Report on the Ozone Mapping and Profiler Suite (OMPS) Validated Maturity Review

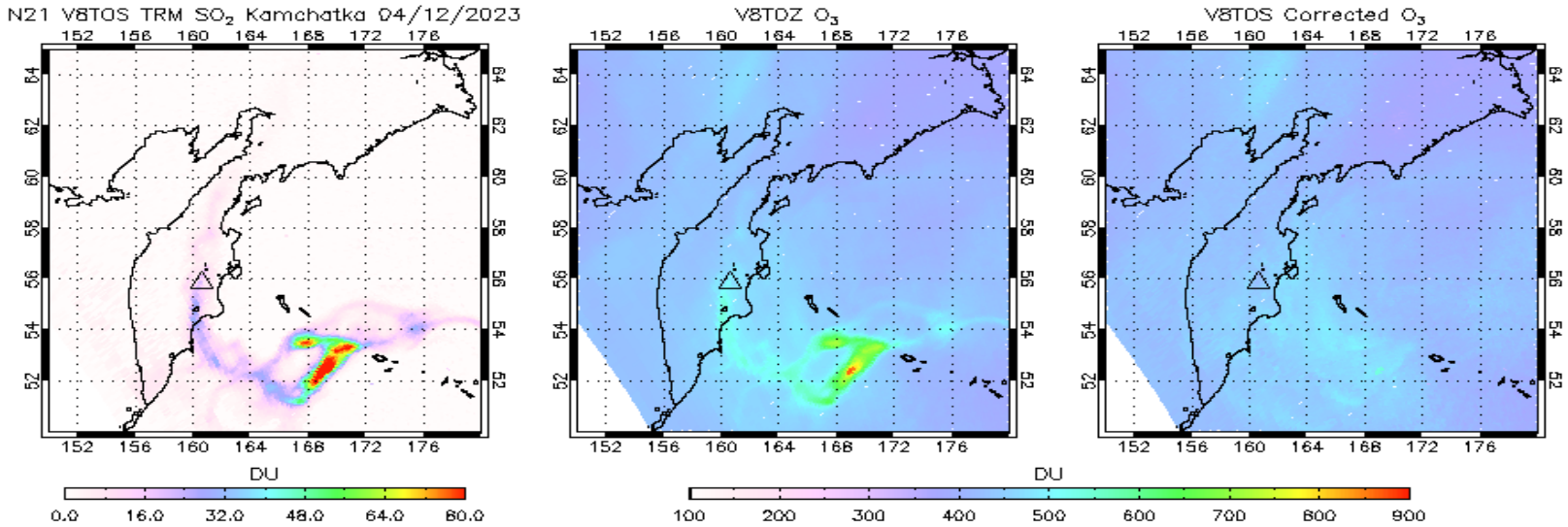

Figure. Sample SO_2 & O_3 estimates from NOAA-21 V8TOS for the Kamchatka volcanic eruption in April 2023.

The validated maturity review briefing for the Version 8 Total Column Ozone Algorithm (V8TOz) and the follow-on SO_2 Algorithm (V8TOS) was held on September 19, 2024. The latest deliveries for radiative transfer tables and soft calibration adjustments bring the performance of the NOAA-21 V8TOz total column ozone estimates to within ±0.5% of the corresponding results for NOAA-20 and S-NPP. The total column ozone, effective reflectivity, UV absorbing aerosol index, and volcanic SO_2 estimates are recommended for use in all applications pending the implementation of these tables at NCCF.

Highlights from the Science Teams (September 2024)

Report on the Ozone Mapping and Profiler Suite (OMPS) Validated Maturity Review

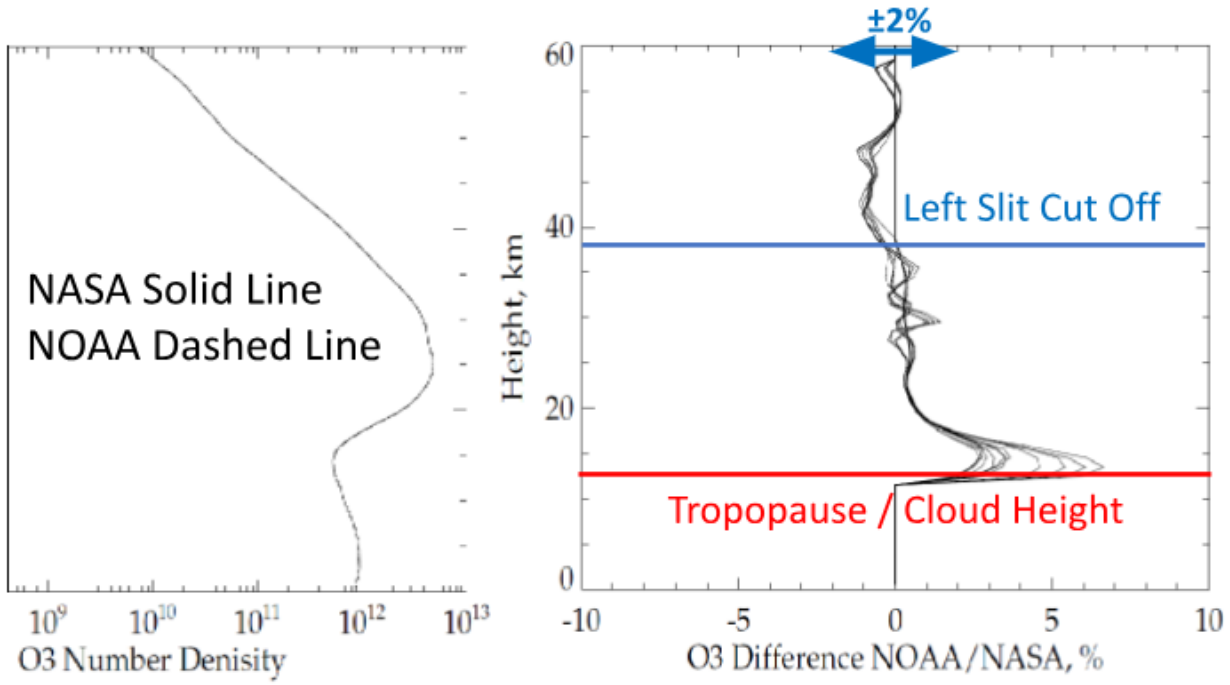

Figure. Sample comparison for one 30-Second granule between NASA GSFC and NOAA STAR Ozone Profile Retrievals from the Version 2.6 Limb Profiler retrieval algorithm.

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The validated maturity review briefing for the NOAA-21 V2.7Limb algorithm (Version 2.7 OMPS Limb Profiler Level 1 / SDR and the Version 2.6 OMPS Limb Profiler Ozone Profile Level 2 / EDR) was held on September 19, 2024. Once these algorithms are implemented at NCCF, the ozone profiles for the center and left slits will be fully validated and ready for use in all applications with caveats as noted in the review presentation and readme files at https://www.star.nesdis.noaa.gov/jpss/AlgorithmMaturity.php .

Highlights from the Science Teams (September 2024)

Satellite Laison blog post on Hurricane Helene.

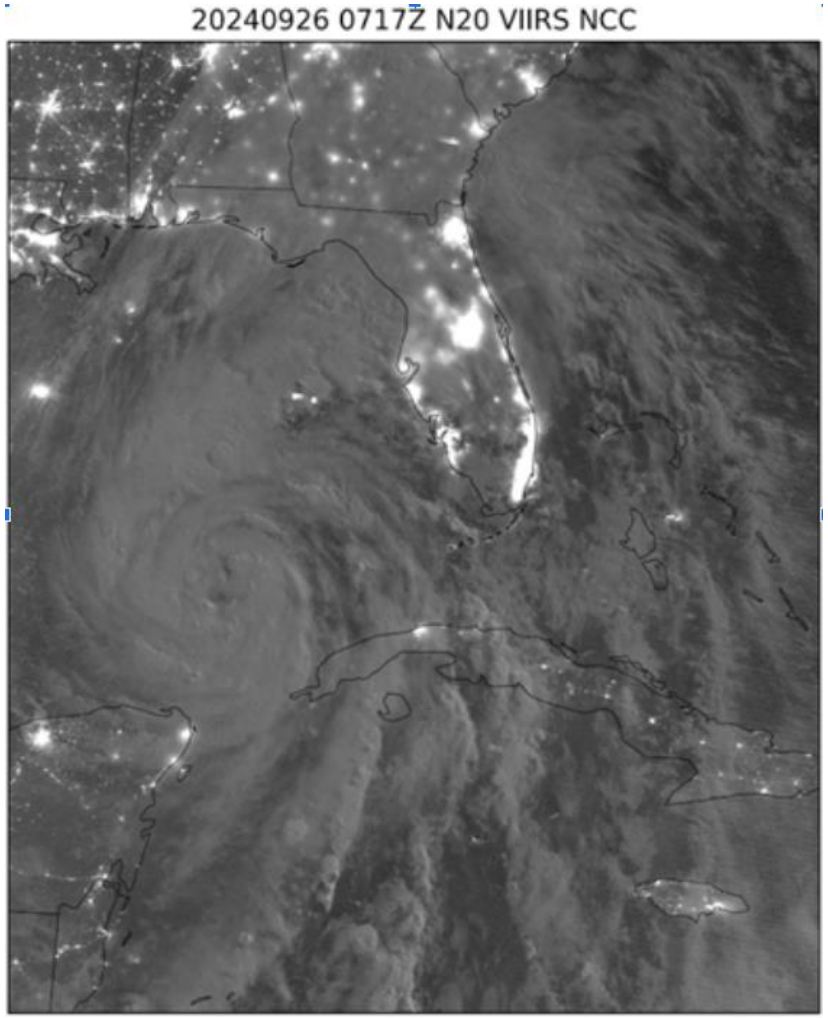


Figure. VIIRS Day Night Band Imagery of Hurricane Helene on Sep 26.

In late September Hurricane Helene strengthened into a major hurricane before striking the Florida Gulf Coast. The storm left a trail of destruction as it brought high winds and historic flooding to inland portions of Georgia and the Carolinas. Bill Line published a blog post titled “Hurricane Helene (Sep 2024) Evolution”. This post shares GOES and VIIRS Imagery, and how it was used by the NWS, from the development and evolution of Hurricane Helene through landfall. See Figure below (left). The link to the post can be found here.

Accomplishments

Delivery Date	Cloud Container Algorithm Packages (CCAPs) – Enterprise Products:	Recipient
09/04/24	Patch delivery for the Blended Hydro CCAP to NCCF for integration.	ASSISTT to NCCF
09/09/24	GAASP-Ocean (AMSR-2: SST, SSW, CLW, TPW) v1-0 NDE migration Final CCAP delivery to NCCF for integration.	ASSISTT to NCCF
09/10/24	Preliminary CCAP delivery of the Ocean Color v2 algorithm for software code review (SCR) by OSPO. This delivery includes NPP and N20, in addition to N21.	ASSISTT to NCCF
09/11/24	Science team delivered J2 LUTs and soft-calibration files for OMPS. This delivery will affect the retrievals for N21 V8TOz	Science teams to ASSISTT
09/18/24	Delivery of the GAASP-Preprocessor v1-0 CCAP to CSPP.	ASSISTT to NCCF
10/02/24	Preliminary delivery of EN-AOD (Enterprise Aerosol Optical Depth) CCAP v1 for OSPO software code review (SCR).	ASSISTT to NCCF

Accomplishments – JPSS Cal Val Support

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	10/3/23, 10/11/23, 10/17/23, 10/24/23, 10/31/23, 11/7/23, 11/14/23, 11/21/23, 11/28/23, 12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24,02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24, 8/13/24, 8/20/24, 8/27/24, **09/3/24, 09/10/24, 09/17/24, 09/24/24, 10/1/24**	✓ **Good**
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	10/3/23, 10/11/23, 10/17/23, 10/24/23, 10/31/23, 11/7/23, 11/14/23, 11/21/23, 11/28/23**,** 12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, **07/30/24, 08/06/24, 8/13/24, 8/20/24, 8/27/24, 09/3/24, 09/10/24, 09/17/24, 09/24/24, 10/1/24**	✓ **Good**
NOAA-21	Weekly OMPS TC/NP Dark Table Updates	10/3/23, 10/11/23, 10/17/23, 10/24/23, 10/31/23, 11/7/23,11/14/23, 11/21/23, 11/28/23, 12/5/23, 12/12/23, 12/19/23**,** 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, 06/11/24, 06/18/24, 06/25/24,, 07/02/24, 07/09/24, 07/16/24, 07/23/24, **07/30/24, 08/06/24, 8/13/24, 8/20/24, 8/27/24, 09/3/24, 09/10/24, 09/17/24, 09/24/24, 10/1/24**	✓ **Good**
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	9/12/23, 9/26/23, 10/11/23, 10/24/23, 11/21/23, 12/05/23, 12/19/23, 01/03/24, 01/17/24, 01/30/24, 02/13/24, 02/27/24**,** 03/12/24, 03/26/24**,** 04/08/24, 04/23/24,, 05/07/24, 05/21/24, 06/04/24, 06/18/24, 07/02/24, 07/16/24, 07/30/24, 08/13/24, 08/27/24**, 09/10/24, 09/24/24**	✓ **Good**
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	10/3/23, 10/17/23, 10/31/23, 11/14/23, 11/28/23, 12/12/23, 01/03/24, 01/10/24, 01/23/24, 02/06/24, 02/21/24**,** 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24,05/14/24, 05/28/24**,** 06/11/24, 06/25/24, 07/09/24, 07/23/24, 08/06/24, 08/20/24, **09/03/24, 09/17/24, 10/1/24**	✓ **Good**
NOAA-21	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	10/3/23, 10/17/23, 10/31/23, 11/14/23, 11/28/23, 12/12/23, 01/04/24, 01/10/24, 01/23/24, 02/06/24, 02/21/24**,** 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24,05/14/24, 05/28/24**,** 06/11/24, 06/25/24, 07/09/24, 07/23/24, 08/06/24, 08/20/24, **09/03/24, 09/17/24, 10/1/24**	✓ **Good**
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	10/23/23, 11/21/23**,** 12/18/23, 01/22/24**,** 02/15/24, 03/18/24, 4/15/24, 5/13/24**,** 6/11/24, 7/16/24, 8/12/24**, 9/9/24**	✓ **Good**
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	10/23/23, 11/21/23**,** 12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24, 6/11/24, 7/16/24, 8/12/24**, 9/9/24**	✓ **Good**
NOAA-21	Monthly VIIRS LUT Update of DNB Offsets and Gains	10/23/23, 11/21/23**,** 12/18/23**,** 01/22/24**,** 02/15/24, 03/18/24, 4/15/24, 5/13/24**,** 6/11/24, 7/16/24, 8/12/24**, 9/9/24**	✓ **Good**
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)	✓ **Good**

NOAA-21 Cal/Val Maturity Reviews

September 2024 Maturity Reviews			
Product	Maturity Review	Review Date	Review Panel Recommendations
OMPS TC Ozone EDR (V8TOz, V8TOS)	Validated	9/19/24	Review panel recommended effective validated maturity date to be upon successful implementation of the latest software (v4r5) and LUTs into NESDIS operations, tentatively in January 2025.
OMPS LP V2 (SDR & EDR)	Validated	9/19/24	Review panel recommended effective validated maturity date to be upon implementation of the latest software and tables into NCCF, tentatively in January 2025, and pending receipt of expected positive feedback from users associated with the NASA release of data, tentatively in October 2024.

October 2024 Maturity Reviews			
Product	Maturity Review	Review Date	Review Panel Recommendations
OMPS NP Ozone EDR (V8Pro)	Validated	TBD	

JSTAR Code/LUT/Product Deliveries

Date	Remaining J2-Ready DAPs to NCCF
March, 2023 (Delayed to January 2024)	Ancillary data preprocessing • ASSISTT delivered LP preliminary pre-processor CCAP for SCR (Delivered to OSPO) on 9/29. • NDE Migration & J2 Provisional final CCAP for Ancillary Data Preprocessor (miniDAP) is scheduled for February 20, 2024. However, pushed to May 16, 2024 to align with RDR to L2 final CCAP. As of June 2024 pIPT meeting notes, the ASSISTT team intends to combine science algorithm and ancillary data processor deliveries, and include GFS to binary processing into the final CCAP (initially set for August 1, 2024, but now pushed to September 27,2024). • Science Team Deliveries ○ Science team V2.7LIMB for SNPP was delivered to ASSISTT on December 19, 2023 ○ Science team delivered for NOAA-21 (2.7LIMB N21 delivery to ASSISTT) March 18, 2024. • ASSISTT Deliveries ○ NDE Migration & J2 Provisional RDR to L2 CCAP Preliminary CCAP delivered on June 20, 2024 (software code review) ○ Science team delivered to ASSISTT on 25 September to replace negative values for the O3 Mixing Ratio Uncertainties to add proper negative fill values. ○ Final CCAP target date pushed to October 31, 2024. The ASSISTT team is incorporating most recent update from science team; waiting on additional updates that will be incorporated as they are received.

FY24 STAR JPSS Milestones

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)	Need for test case McIDAS Area files in NCCF	
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: Dec 18, 2024**	Maintenance updates for CCAP	
Cloud Base Height (CBH), Cloud Cover Layer (CCL), Cloud Height, Phase and Type (different CCAPs for Cloud implementation) Maintenance CCAP			Target CCAP Final : January 14, 2025		

FY24 STAR JPSS Milestones

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	Completed all PMRs	PMRs completed for all SDR and EDR teams 9/6/2024	✔ Good
GOSAT-GW End to End	Aug-24	Aug-24	On-check Follow pre-launch operations schedules. GOSAT launch: April 2025.	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.	Follow pre-launch schedules
AST-2023 (VIIRS Annual Surface Type)	Sep-24	Sep-24	Delivered 09/26/24	Maturity Review held on June 13, 2024. Beta and Provisional approved. Effective date 11/30/2023. Validated after final AST2023 delivery on 9/30/2024	✔ Good
Reprocessing and transfer of EDRs to CLASS	Sep-24	Sep-24	Discussions ongoing	JSTAR Team is coordinating with the EDR teams, CLASS and NCEI	Ongoing
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	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	On-schedule and additional improvements are ongoing	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	On schedule	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	Ongoing		✔ Good

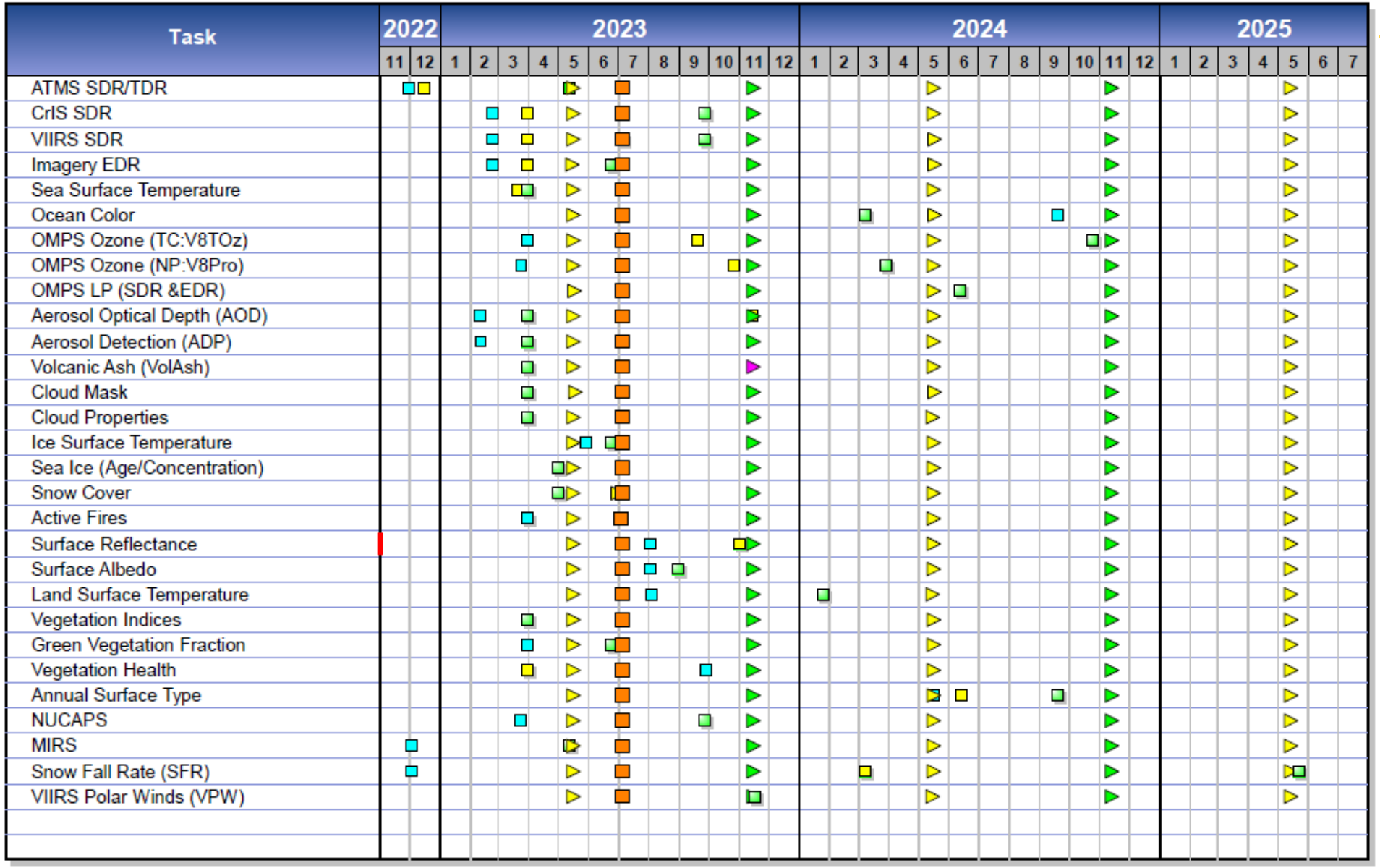
FY24 STAR JPSS Cal/Val Maturity Reviews

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 October, 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

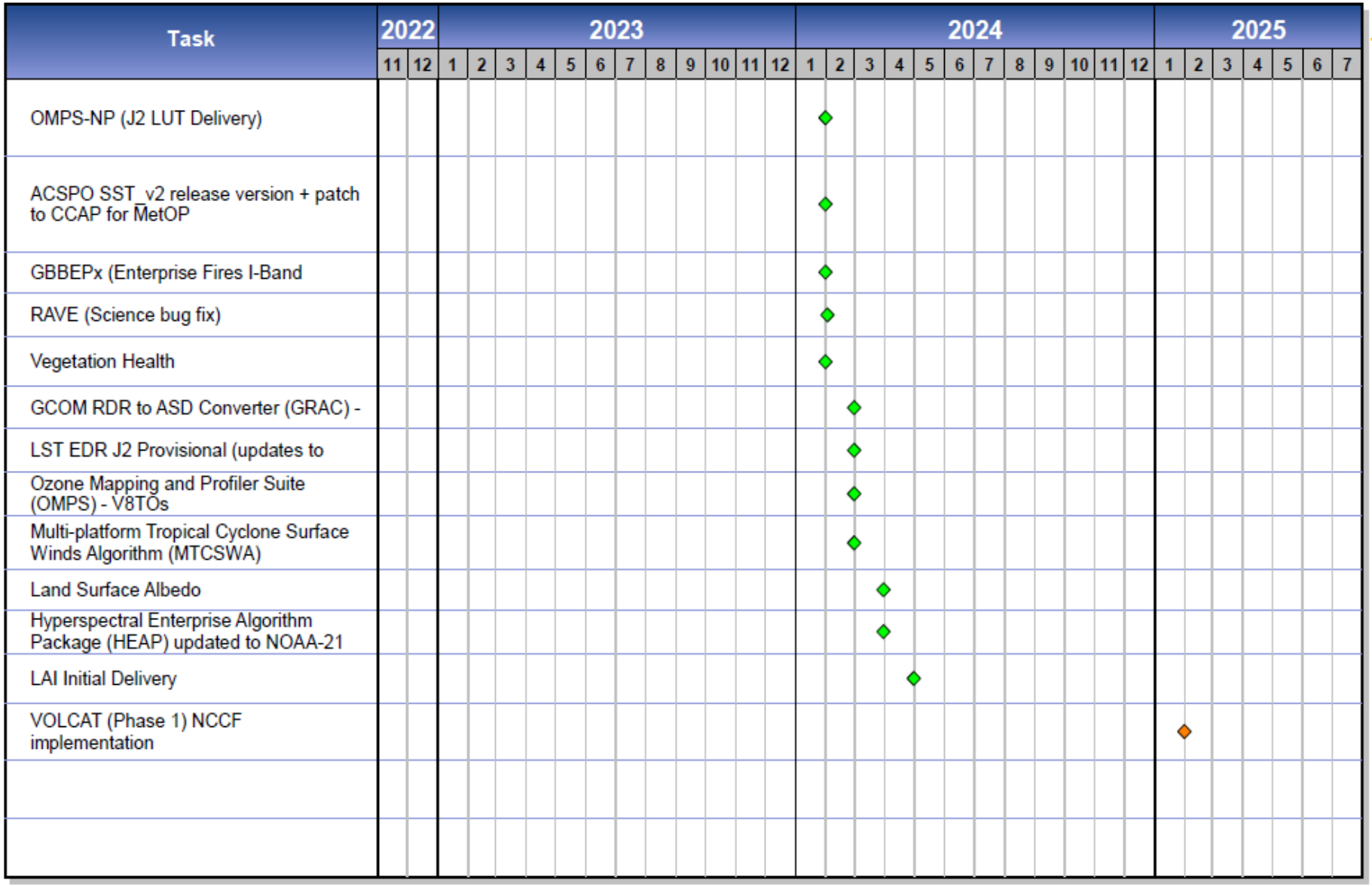
FY24 STAR JPSS Milestones

Operational/Program Support	Original Date	Forecast Date	Actual Completion Date	Status
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24, 8/13/24, 8/20/24, 8/27/24, **09/3/24, 09/10/24, 09/17/24, 09/24/24, 10/1/24**	✓ Good
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	12/05/23, 12/19/23, 01/03/24, 01/17/24, 01/30/24, 02/13/24, 02/27/24, 03/12/24, 03/26/24, 04/08/24, 04/23/24, 05/07/24, 05/21/24, 06/04/24, 06/18/24, 07/02/24, 07/16/24, 07/30/24, 08/13/24, 08/27/24, **09/10/24, 09/24/24**	✓ Good
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24 6/12/24, 7/12/24, 8/11/24, **9/9/24**	✓ Good
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24, 8/13/24, 8/20/24, 8/27/24, **09/3/24, 09/10/24, 09/17/24, 09/24/24, 10/1/24**	✓ Good
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	11/28/23, 12/12/23, 01/03/24, 01/10/24, 01/23/24, 02/06/24, 02/21/24, 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24, 05/14/24, 05/28/24, 06/11/24, 06/25/24, 07/09/24, 07/23/24, 08/06/24, 08/20/24, **09/03/24, 09/17/24, 10/1/24**	✓ Good
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains,	Monthly	Monthly	12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24 7/16/24, 8/12/24, **9/9/24**	✓ Good
NOAA-21: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/23/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, 07/30/24, 08/06/24, 8/13/24, 8/20/24, 8/27/24, **09/3/24, 09/10/24, 09/17/24, 09/24/24, 10/1/24**	✓ Good
NOAA-21: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	11/28/23, 12/12/23, 01/04/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24, 05/14/24, 05/28/24, 05/28/24, 06/11/24, 06/25/24, 07/09/24, 07/23/24, 07/30/24, 08/06/24, 08/20/24, **09/03/24, 09/17/24, 10/1/24**	✓ Good
NOAA-21: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24, 6/12/24, 7/12/24, 8/12/24, **9/9/24**	✓ Good
Mx builds deploy regression review/checkout (Mx9/MX10)			**Mx10: TTO Successfully Executed: May 23, 2024** **MX11: STAR SOL Go/No-Go Final Report Sent : August 25** **MX11: STAR Reviews Finalized and Submitted: for I&T September 9;** **MX11: STAR Report on DP-OE submitted on: Sep 13;** **MX11 TTO: Sep 30, 2024**	✓ Good

STAR JPSS Schedule: TTA Milestones Algorithm Updates DAPs/CCAPs

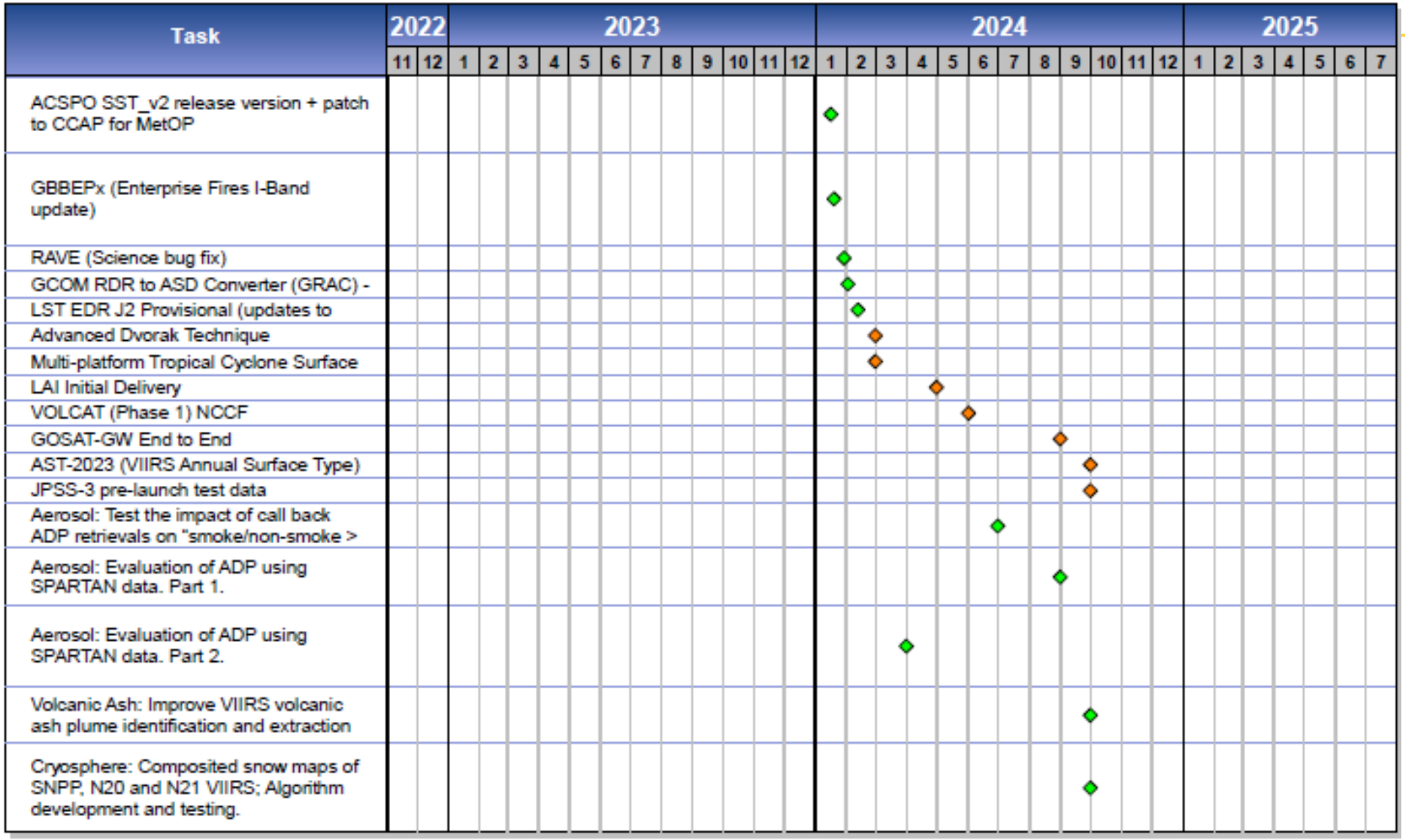


STAR JPSS Schedule: TTA Milestones Algorithm Updates DAPs/CCAPs



Backup/Additional milestones

STAR JPSS Schedule: TTA Milestones

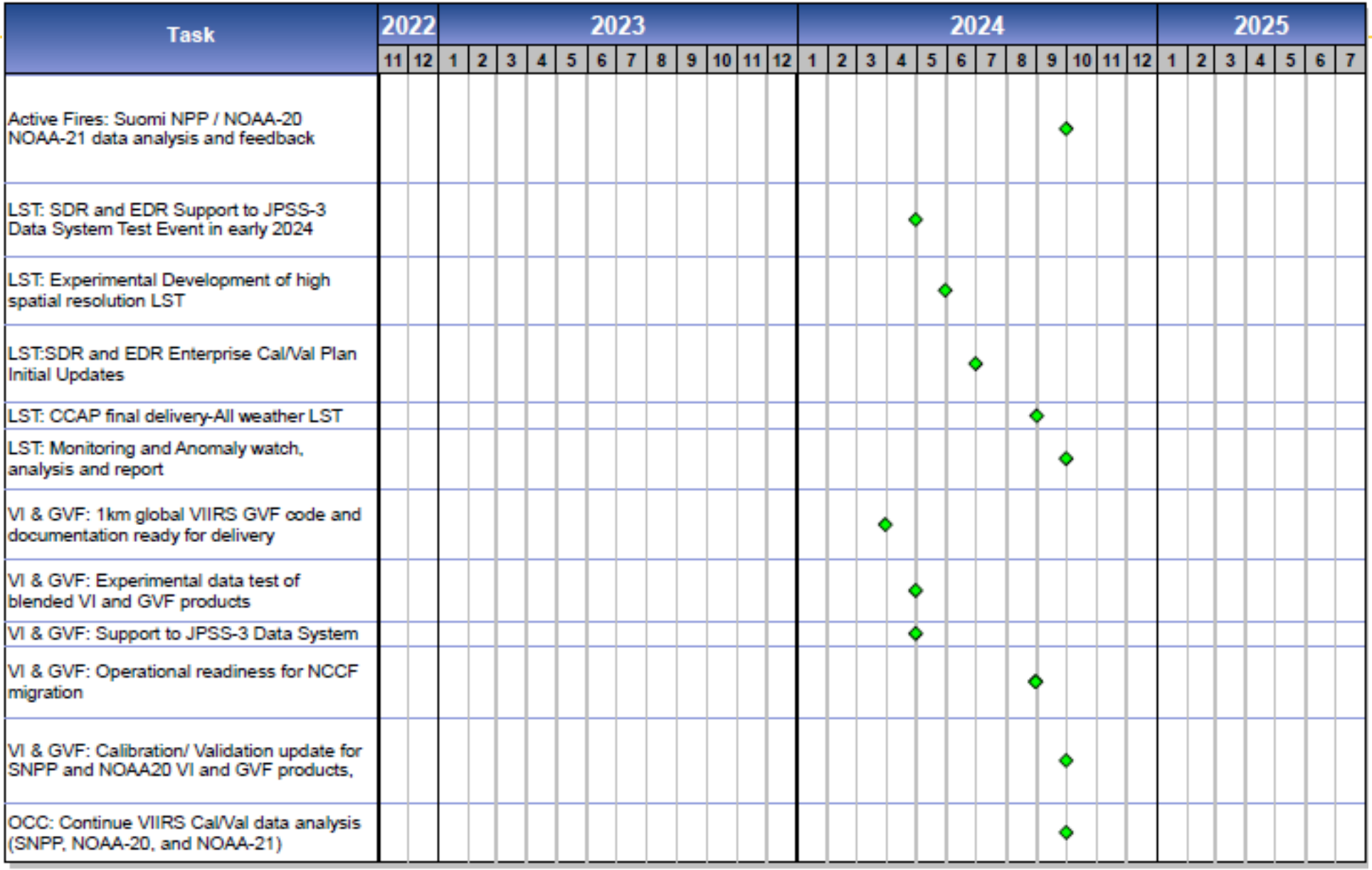


STAR JPSS Schedule: TTA Milestones

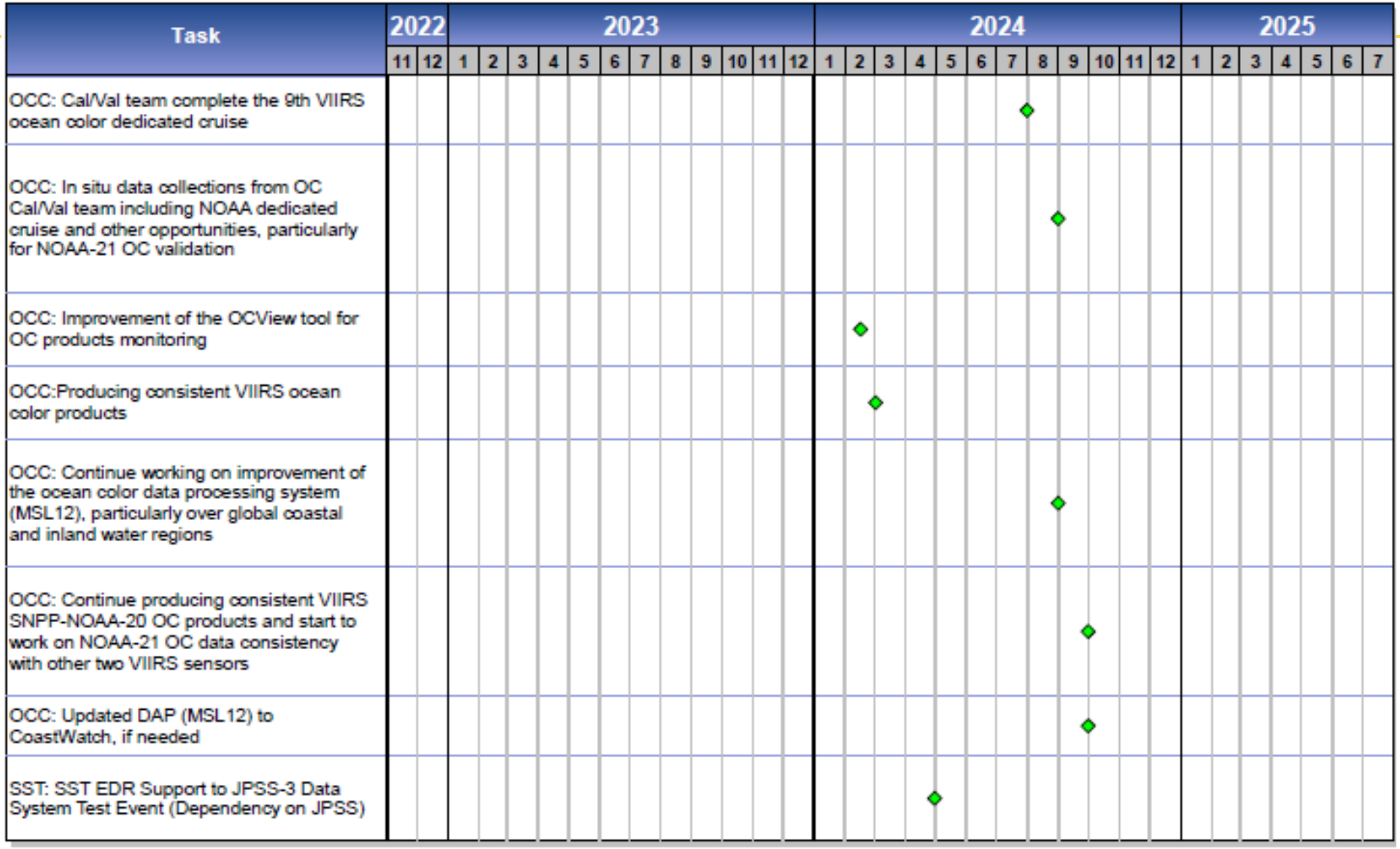
Task	2022		2023												2024												2025						
	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
Cryosphere: Blended VIIRS + microwave snow product: Add AMSR2 and GMI to the set of microwave sensors used												◆												◆									
Cryosphere: Physically-based snow 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 ■ Vail ◆ Milestone Complete

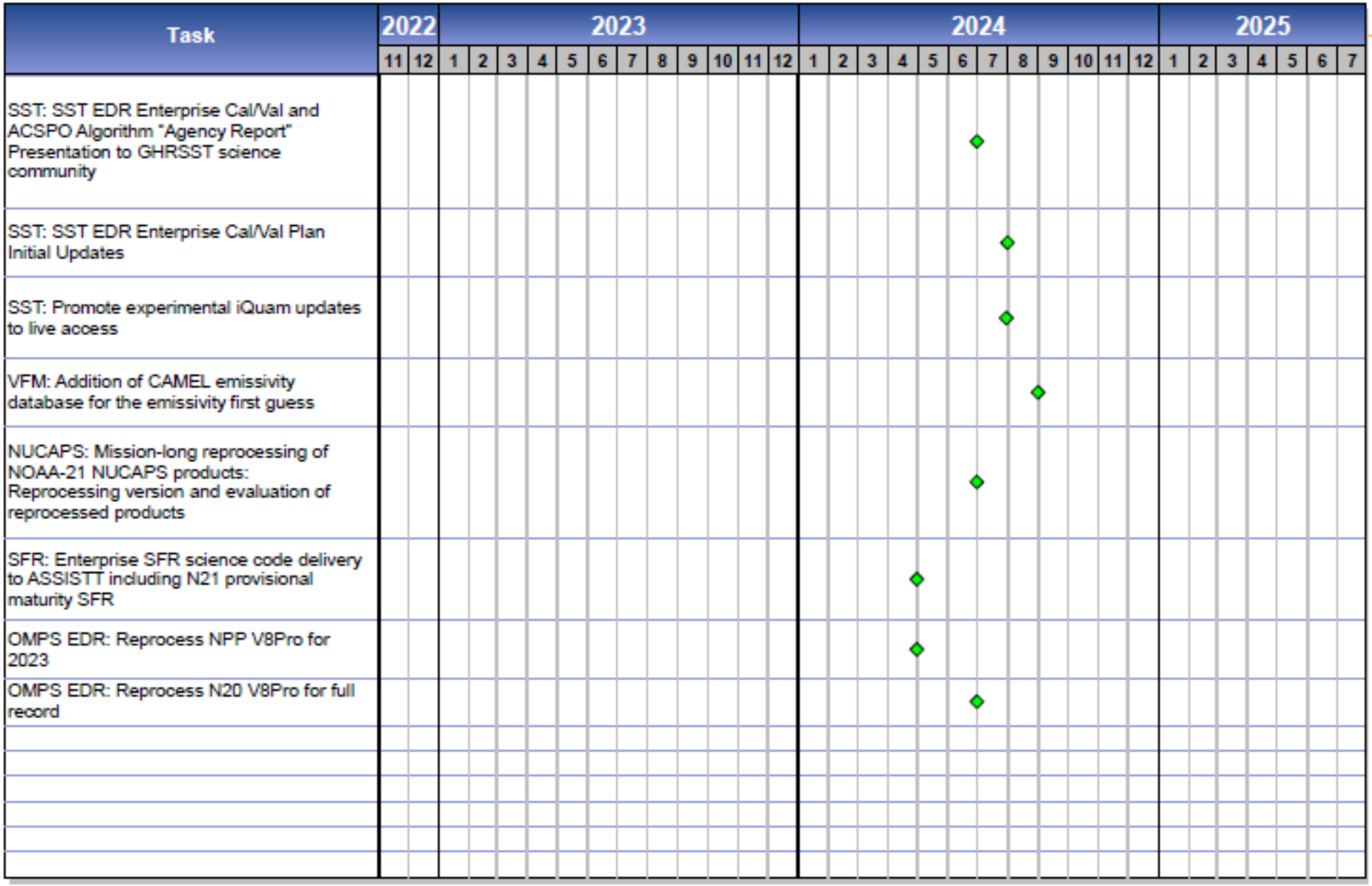
STAR JPSS Schedule: TTA Milestones



STAR JPSS Schedule: TTA Milestones



STAR JPSS Schedule: TTA Milestones



Color code:

Green: **Completed Milestones**

Gray: **Ongoing FY24 Milestones**

Active Fires

September 2024

Accomplishments / Events:

- Started analysis of the EFIRE data record to evaluate algorithm performance for a wide range or observing and environmental conditions
- Presented poster “The NOAA Reprocessed VIIRS Active Fire Data Record” at the 2024 EUMETSAT Meteorological Satellite Conference
- Continued work on NGFS vs. EFIRE comparisons based on GINA NGFS data

Overall Status:

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

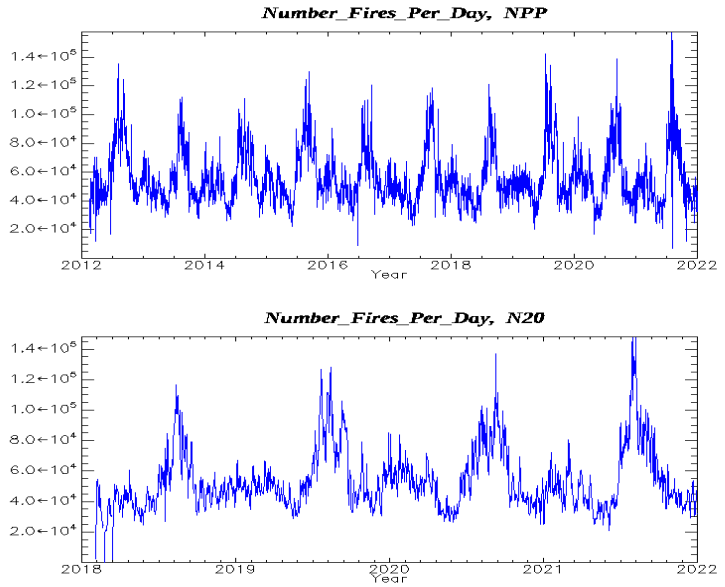
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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

Time series of total daily number of detected VIIRS I-band fire pixels in the reprocessed EFIRE data record



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:

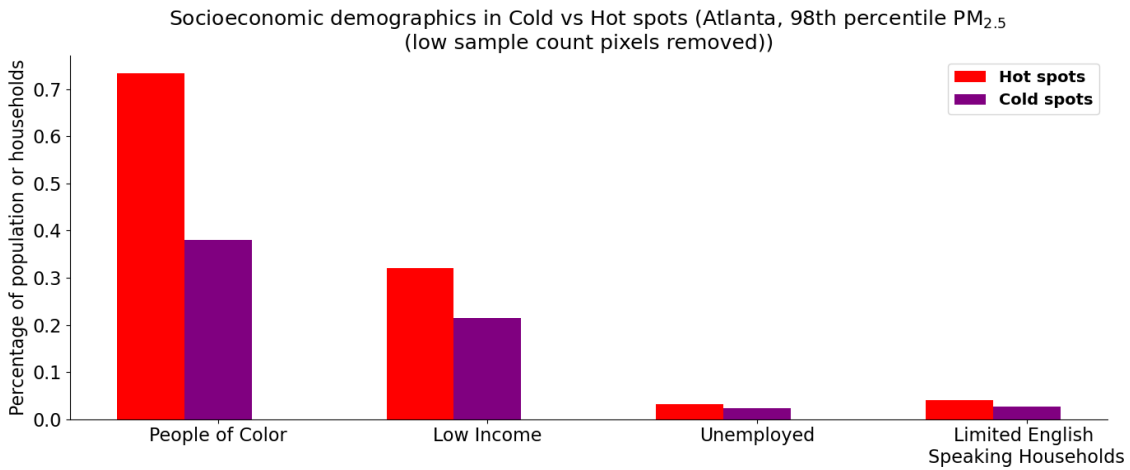
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

September 2024

Accomplishments / Events:

- Participate S-NPP spacecraft GPS invalid reset ATMS data quality evaluation activities. The GPS invalid status started from 22:44 on September 24, 2024 and was recovered to a valid geolocation state at 14:34 on September 27, 2024. There is a very small geolocation shift during that period of time based on the regional map, as shown in Figure 1. It can be seen that the coast line has recovered to what before the event. There is no channel radiance sensitivity (NEdT) variation during the event.
- Start drafting the NEON QuickSounder ATMS Post-Launch Cal/Val Plan document based on the recently submitted JPSS-3 SN305 ATMS Cal/Val Plan. Due to the pre-launch data access restriction within STAR, QS ATMS Cal/Val plan only carries the post-launch activities. The draft version will be shared within QS ATMS Cal/Val team for comments and revision. The final version is scheduled to be submitted by end of October.
- Attend the CUI Export-controlled EAR data access restriction training to learn the ATMS CUI data access restriction. Based on the train material, ATMS instrument and observatory TVac data are not allowed to be saved or processed in STAR IT environment. The CUI document can only be viewed in sharepoint by GFE.
- Conduct the IDPS B2.3Mx10 POP ATMS data quality evaluation and prepare the review report to support the Mx10 TTO pre-operational data evaluation activities.

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
JPSS-3 ATMS preliminary analysis of calibration coefficients	Feb-24	Mar-24	Mar-24	
ATMS Spectral Response Function (SRF) evaluation report and dataset	Mar-24	Jun-24	Jun-24	QS TVAC
ATMS geolocation correction algorithm assessment	May-24	Sep-24		QS
Improvement for lunar intrusion correction model including LUT update	Jun-24	Sep-24		QS
Preparation of S-NPP End-of-Life (EOL) test recommendation list	Jul-24	Jul-24		
Development of JPSS-3 SN305 pre-launch performance report	Jul-24	Jul-24		
ATMS cold bias dynamic correction assessment and algorithms update	Sep-24	Sep-24		
Review/Checkout of IDPS Mx Builds SOL and I&T Deploy Regression data	Sep-24	Sep-24		
Review of JPSS-3/4 ATMS pre-launch data to provide Ground support	Sep-24	Sep-24		
Conduct maintenance including anomaly resolution of on-orbit ATMS sensors	Sep-24	Sep-24		
Provide support to Metop-SG Joint Cal/Val Activities	Sep-24			

Overall Status:

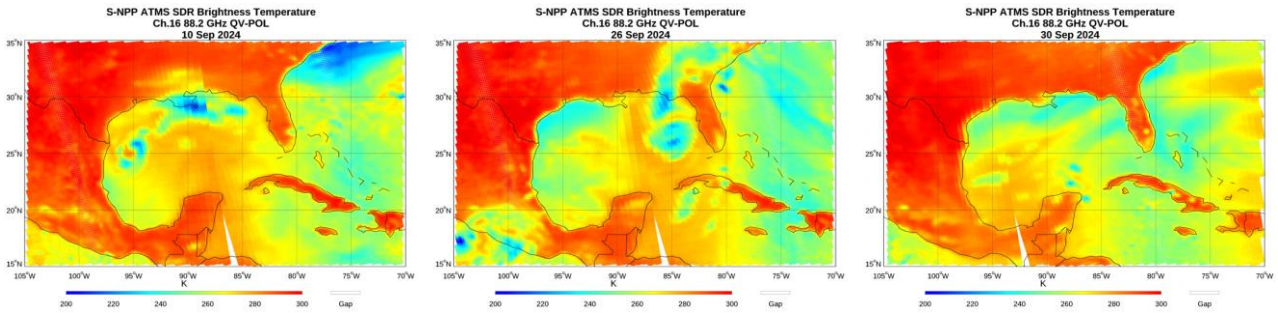
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

Highlights:

Figure 1. S-NPP ATMS channel 16 regional map on Sep. 10, 26, and 30, 2024 in dictating the GPS degradation impact before, during and after the event



Clouds

September 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 ASSISST to do a final evaluation. Per ASSISST, 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.” Once this is resolved, the cloud team will be able to do a validation of the output. Both the Cloud team and ASSISTT are working closely together to do this in an efficient and quick manne and the cloud team is still waiting to hear back from ASSISTT on any remaining questions.

- The replacement of the DCOMP tables was delivered to ASSISTT in July and we’re awaiting the updated code base for a final validation. The values are consistent with what is expected, but there is a need to validate for VIIRS

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:

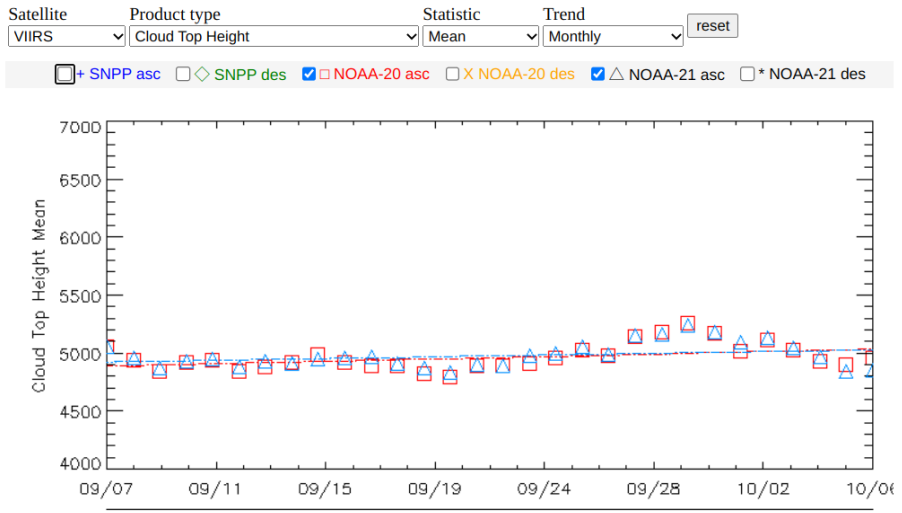


Figure 1.Example of the LTM trends of NOAA-20 and NOAA-21 cloud mask for September 2024 for the ascending node for the arctic. NPP is not shown due to the anomalies that have taken place.

CrIS SDR

September 2024

Accomplishments / Events:

- Developed a new tool to compare DS window size for Mx10 v. Mx11 Checkout. Window size changes will result in small radiances bias when comparing versions. (**Fig. 1**)
- Completed the Checkout for the Mx11 regression. No significant discrepancies observed.
- Developed tools to re-grid CrIS data into different projections for partner tool compatibility. (**Fig. 2**)
- Supported investigation of S-NPP geolocation errors for 2024-08-30 and 2024-09-24. S-NPP CrIS performed as expected, consistent with past geolocation errors. (**Fig. 3**) Also presented history of S-NPP CrIS synchronization errors, which correspond strongly with geolocation errors. (**Fig. 4**)
- Completing the editing of the Neon Mitigation plan paper. (**Fig. 5**)
- Completed evaluation of JPSS-3 and JPSS-4 XML databases. Developed work-around to allow JPSS-3 and JPSS-4 data to be read correctly UW RDR packet read tool.
- Performed characterization on the elevated imaginary component of NOAA-21 CrIS radiance product and proposed a mitigation plan.

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	
Perform 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:

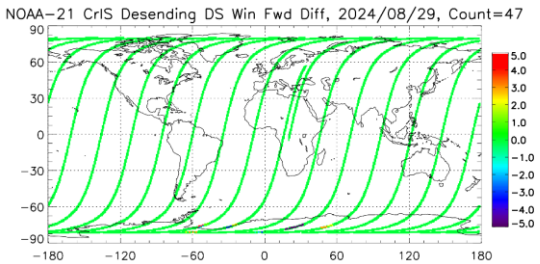
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X	X	X	See Issues/Risks
Schedule			X		See Issues/Risks

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.*

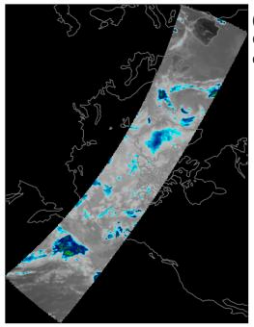
Issues/Risks:

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:

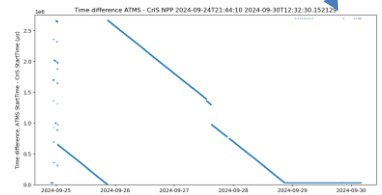


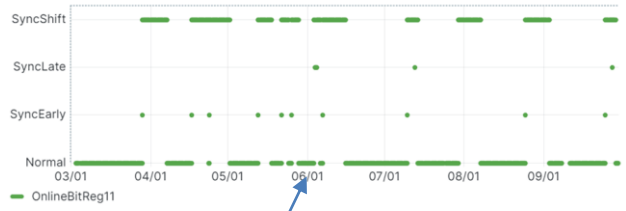
(1) NOAA-21 CrIS DS window size differences between the Mx11 I&T and Mx10 OPS SDR data.



(2) Gridded NOAA-20 CrIS data in EPSG:9810, emulated ABI 13

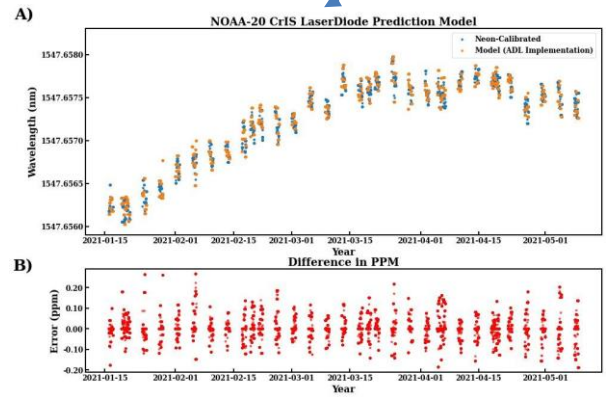
(3) S-NPP Scan Start Time, (ATMS - CrIS) mod 2 ⅔ s, for the 2024-09-24 geolocation anomaly.





(4) Recent history of S-NPP 8s pulse sync errors, which corresponds strongly with geolocation errors

(5) Time Series of ADL implementation of Neon Mitigation Plan Algorithm.



Cryosphere and Polar Winds

August, 2024

Accomplishments / Events:

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

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

Overall Status:

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

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

Issues/Risks:

None

Highlights:

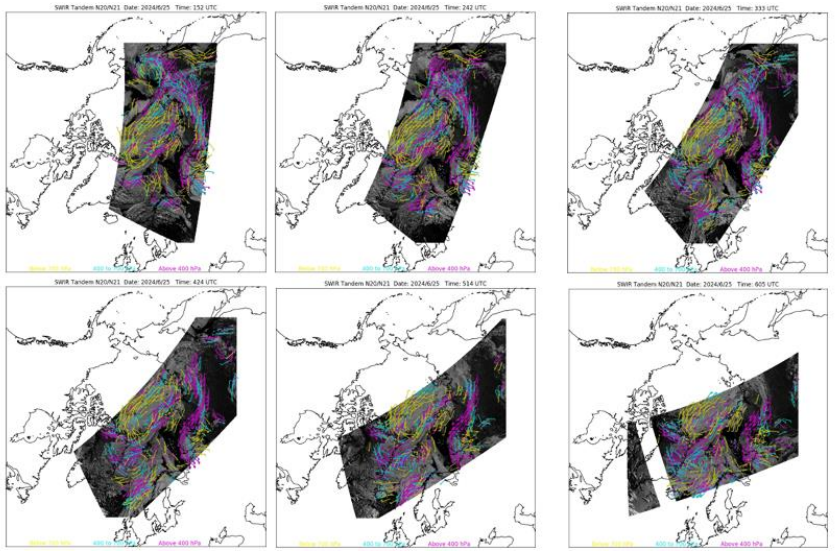


Figure 1: VIIRS JPSS (NOAA20/21) Tandem SWIR AMVs overlaid with 2.2 µm reflectances from 25 June 2024 over the Arctic region in polar stereographic projection. Near polar crossing times starting from upper-left and ending at lower-right: 01:52, 02:42, 03:33, 04:24, 05:14 and 06:05 UTC.

GCOM-W/AMSR2

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:

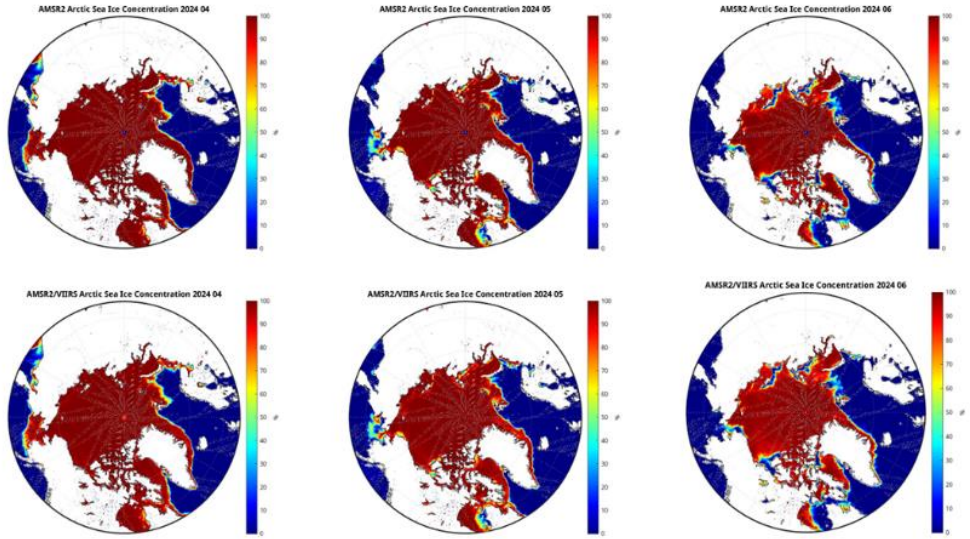


Figure 1. Top row Monthly average Sea Ice Concentration (SIC) from AMSR2 NASA Team-2 algorithm for April (left), May (middle) and June (right) 2024. Bottom is from the AMSR2+VIIRS blended sea ice concentration for the same months.

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%).

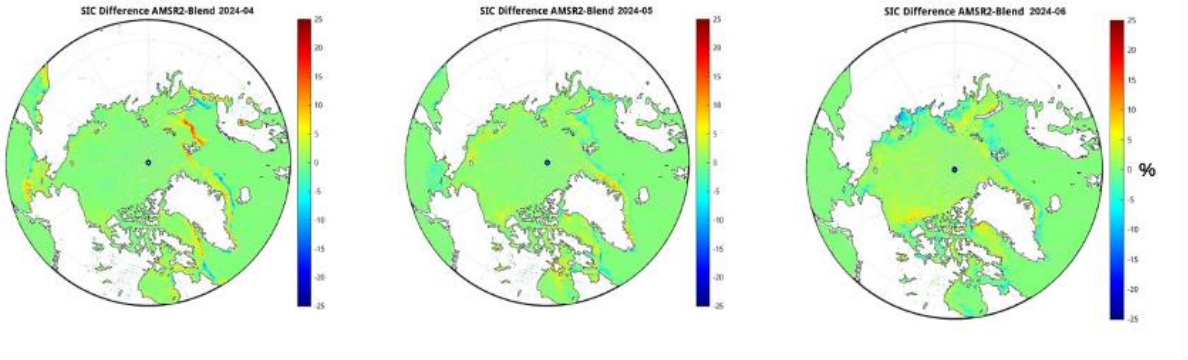


Figure 2. Differences in Monthly average Sea Ice Concentration (SIC) of AMSR2 versus AMSR2+VIIRS blended sea ice concentration for April (left), May (middle) and June (right) 2024.

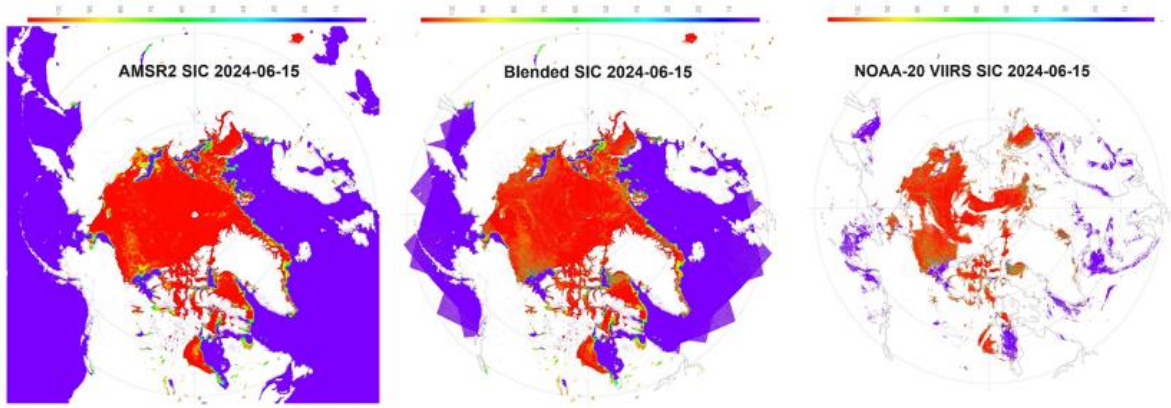


Figure 3. Daily composite SIC for 15 June 2024 from AMSR2 (left), Blend (middle) and NOAA-20 VIIRS (right).

ICVS

September 2024

Accomplishments / Events:

- Update ICVS anomaly watch portal to include the latest several major data outage and quality degradation events. The AWP is currently demonstrated in ICVS-beta shown in Figure 1 is the screenshot of the AWP with the latest S-NPP spacecraft GPS invalid event starting on September 24.
- Transition ATMS COSMIC RO profile bias trending, ATMS geolocation accuracy trending, and ATMS SNO bias trending packages to ICVS team (the package maintenance developer left STAR a few weeks ago). The TTO of ATMS geolocation accuracy trending packages has been successfully.
- Continue the OMPS geolocation accuracy degradation detection algorithm development using OMPS NM inter-sensor comparison correlation trending. Improve the reliability by adding more restricted SDR data quality control methods. Further study is ongoing to resolve the uncertainty caused by the daily correlation verification.
- Developed the inter-sensor comparison algorithm for NOAA-21 OMPS NM (380nm) and VIIRS M1 Band and applied it to a near-real time monitoring via beta ICVS website (see Fig. b)
- Support the S-NPP GPS invalid recovery activities by providing S-NPP instrument geolocation accuracy trending products.
- Continued monitoring the impact of solar contamination, which is expected to be the root cause to large biases between NOAA-20 and NOAA-21 inter-sensor biases at SW window channels (see Fig. c). Still in investigation.

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.*
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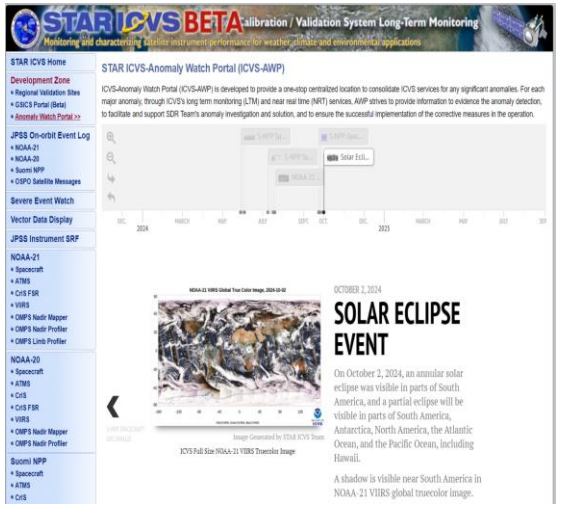
Issues/Risks:

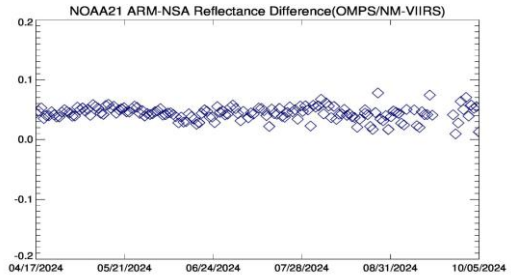
Frequent processing server NFS issues lead to the delay of NRT trending in ICVS website

Highlights:

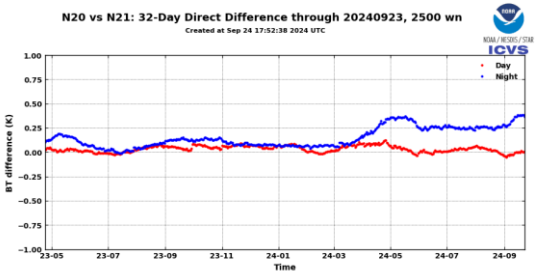
(a) Screenshot of ICVS AWP



(b) Time Series of Ratio of Reflectance between NOAA-21 OMPS 380nm and VIIRS M1 band



(c) Inter-sensor Radiance Biases between NOAA-20 and NOAA-21



VIIRS Imagery

September 2024

Accomplishments / Events:

- Download, creation, and analysis of Imagery EDR for IDPS Block 2.3 Mx11 I&T Review/Checkout. Recommendation to proceed with T2O
- Team Members attended and presented at the NOAA Alaska NextGen Satellite Workshop in Anchorage, AK
  - Bill Line – VIIRS Imagery for Sea Spray, Blowing Snow, and Water Vapor detection
  - Curtis Seaman – VIIRS Imagery on CIRA SLIDER
  - Jorel Torres – JPSS/VIIRS Training
  - Carl Dierking – Direct Broadcast and User/Developer Partnerships
  - Jen Delamere – Event Co-Organizer
- Blog Posts with VIIRS Imagery
  - Hurricane Helene (Sep 2024) Evolution
- Numerous high resolution VIIRS images and videos of Hurricane Helene are available on the CIRA Satellite Library page: https://satlib.cira.colostate.edu/event/hurricane-helene/
- 23 VIIRS Imagery Posts on CIRA Social Media (X) this Month. A few posts:
  - VIIRS nighttime NCC Imagery of LA area wildfires (22.9K views)
  - VIIRS VIS and IR Imagery of Hurricane Helene on Sep 26 (18.3K views)
  - VIIRS True Color Imagery of eastern Gulf of Mexico before and after Helene (102.5K views)
  - VIIRS nighttime NCC Imagery of southeast US city lights before and after Helene
- DNB-NCC LUT code updated. New LUTs under evaluation

Overall Status:

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

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

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY25 Program Management Review	Jun-24	Jun-24	May-24	
Blowing Dust Climatology Paper Submitted (Includes VIIRS Imagery)	Jul-24	Jul-24		Delayed to FY25 for other/higher priority items
Prepare and deliver the initial updates for the Imagery Cal/Val plan (updated for JPSS-3), ahead of PStR	Aug-24	Aug-24		
New ASF Tool code and updated NCC LUT – Test for 3 VIIRS	Sep-24	Sep-24	Sep-24	
New Imagery products or product enhancements (display on SLIDER)	Sep-24	Sep-24	continuing	
Realtime Imagery monitoring and display systems (SLIDER, etc.)	Sep-24	Sep-24	continuing	
Interesting VIIRS Imagery to Social Media and Blogs	Sep-24	Sep-24	continuing	
McIDAS-X/V Enhancements for processing/display of VIIRS Imagery	Sep-24	Sep-24	continuing	
Block 2.3 Mx builds deploy regression review/checkout (Mx9, Mx10, Mx11			Mx9: Jan-2024, Mx10: Apr-2024, Mx11: Sep-2024	

Highlights: Image of the Month

Figure: Members of the VIIRS Imagery Team together at the NOAA Alaska NextGen Satellite Workshop in Anchorage, AK

Leaf Area Index

September 2024

Accomplishments / Events:

- Keep working on the FCOVER derivation from surface reflectance using machine learning method, to improve the training data representativeness, bring the calibrated Landsat data as the complement.
- Test the method of derive initial FCOVER from Landsat data and calibrated using the ground measurements.
- Tested the LAI monitoring method for OSPO, verified the thresholds for the operational stage.
- Complete the preliminary LAI product monitoring tools, including the global LAI map for visual check, site time series, and inter-comparison with existing products (NASA VNP15).

Overall Status:

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

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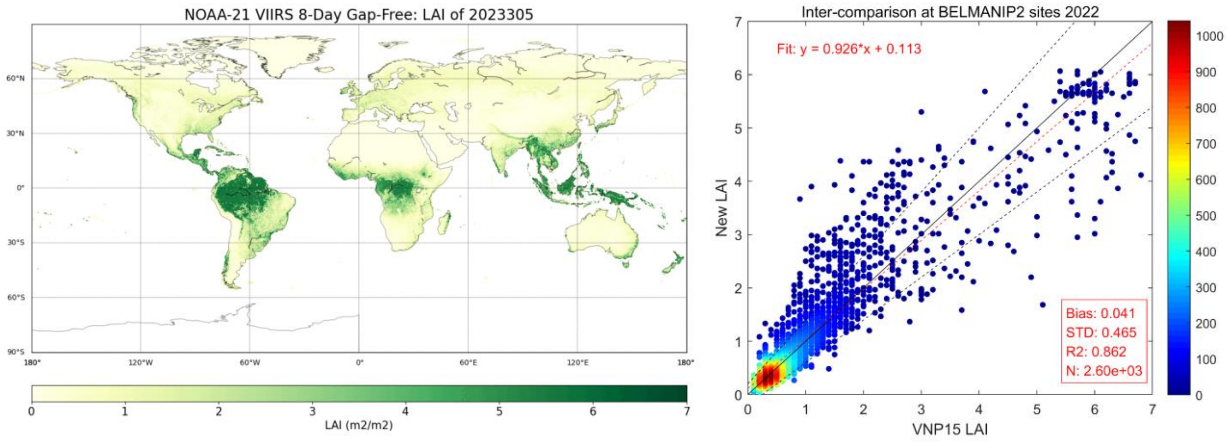
Issues/Risks:

None

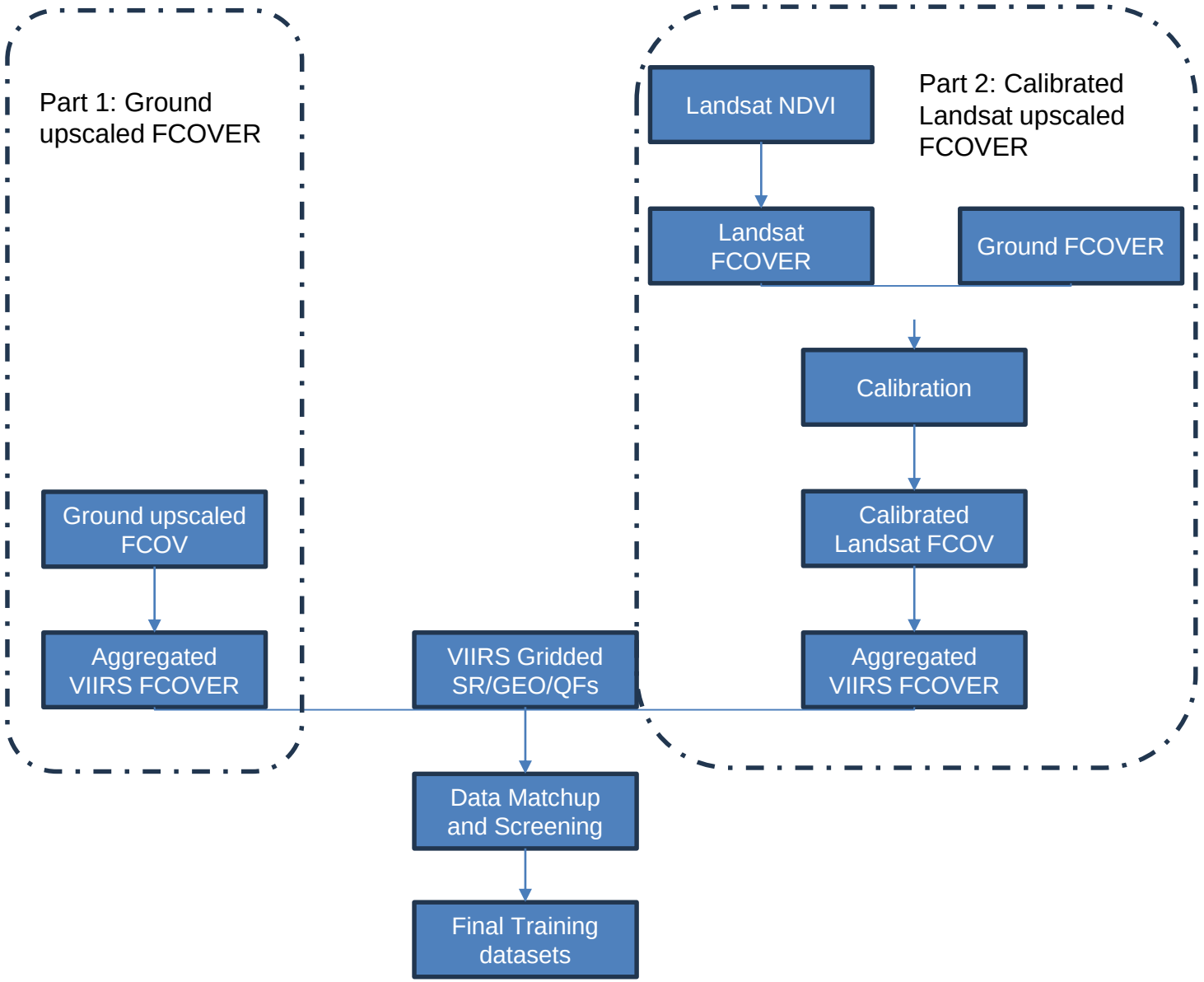
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
CCAP final Delivery	Feb-24	Feb-24	Apr 1, 2024	
Incorporate the LAI test data into the LSM model to evaluate the performance in the model	May-24	May-24	May 30, 2024	
Operational readiness	Jul-24	Jul-24	September 2024	ASSIST 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:



LAI Long term monitoring tool development: real time global map visual check (left figure), routine inter-comparison with VNP15 at BELMANIP2 sites (right figure).

FCOVER Training Data Expand

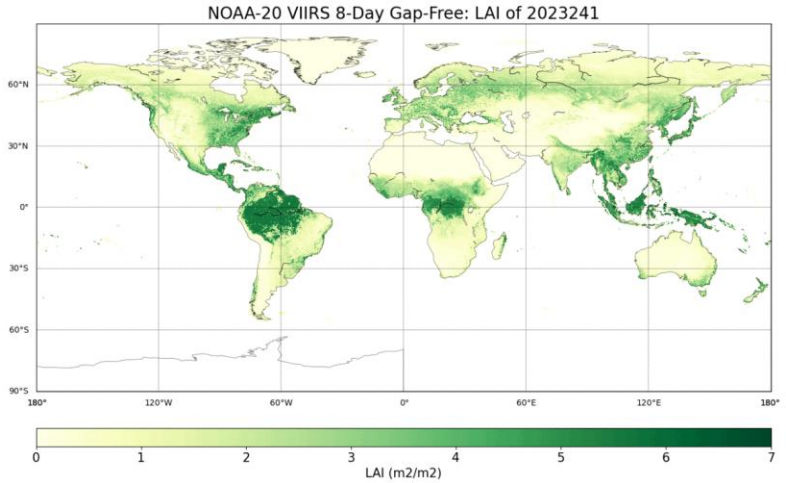


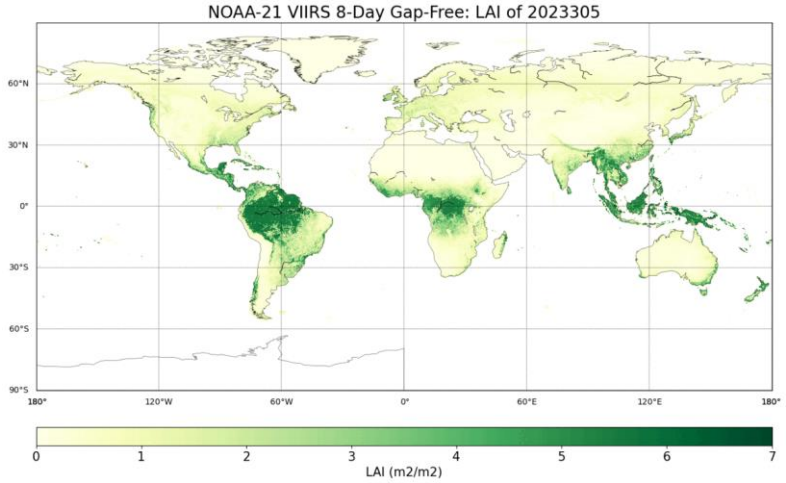
- Background
  - The current FCOVER training data are from GBOV ground measurement, mainly located in US, limited sites in Europe and Australia
  - Global Representativeness is not good
- Method (using GEE)
  - Match Landsat data with ground measurements
  - Roughly calculated the Landsat FCOVER using empirical method.
  - Perform the linear calibration/adjustment using ground data. (biome dependent)
  - Collect worldwide Landsat data and get calibrated FCOVER using the calibration coefficients.
  - Generate global distributed training FCOVER data matched with VIIRS SR.
  - Data screening and balance.

LAI Product Long term Monitoring and Validation

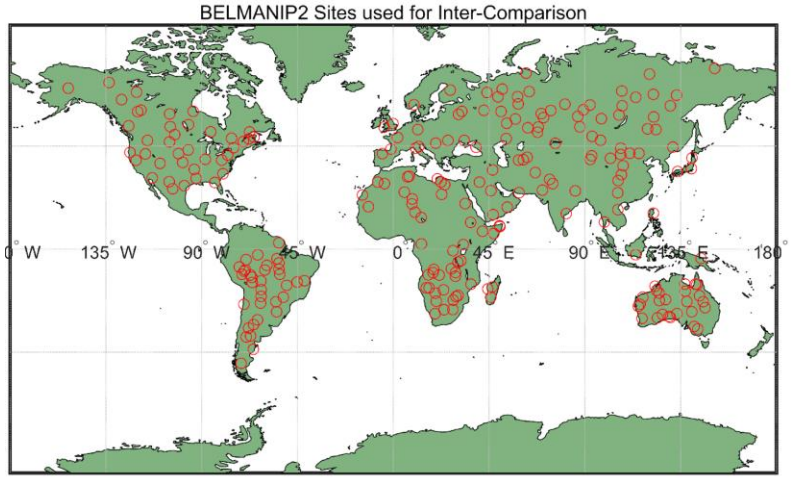
September 2024

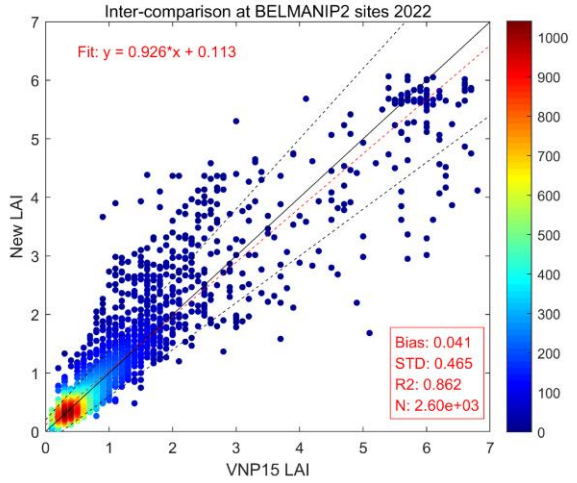
- Long term monitoring tool development
  - (1) Real time Global map visual check; (2) Near real time inter-comparison with VNP15, (3) in-situ validation (with latency)



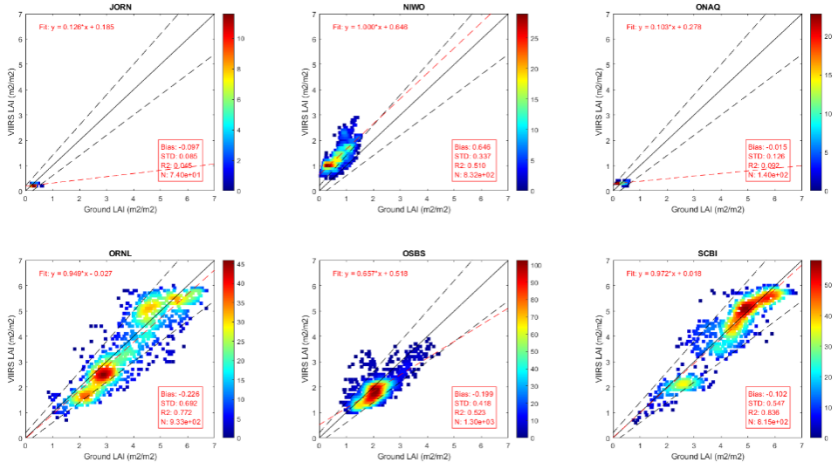


Real time global LAI map for visual check





Routine inter-comparison with VNP15 LAI



Long term validation at NEON sites (with latency)

Surface Albedo

September 2024

Accomplishments / Events:

- Delivered the VIIRS BRDF science code package
- Discussions on thresholds for monitoring albedo at OSPO side
- Fixed the issue in v2r2 data monitoring due to the disk issue
- Monitored the SNPP data anomaly and reported
- Cooperated on global LST anomaly monitoring
- Evaluated the NOAA-21 albedo generated from NCCF

Overall Status:

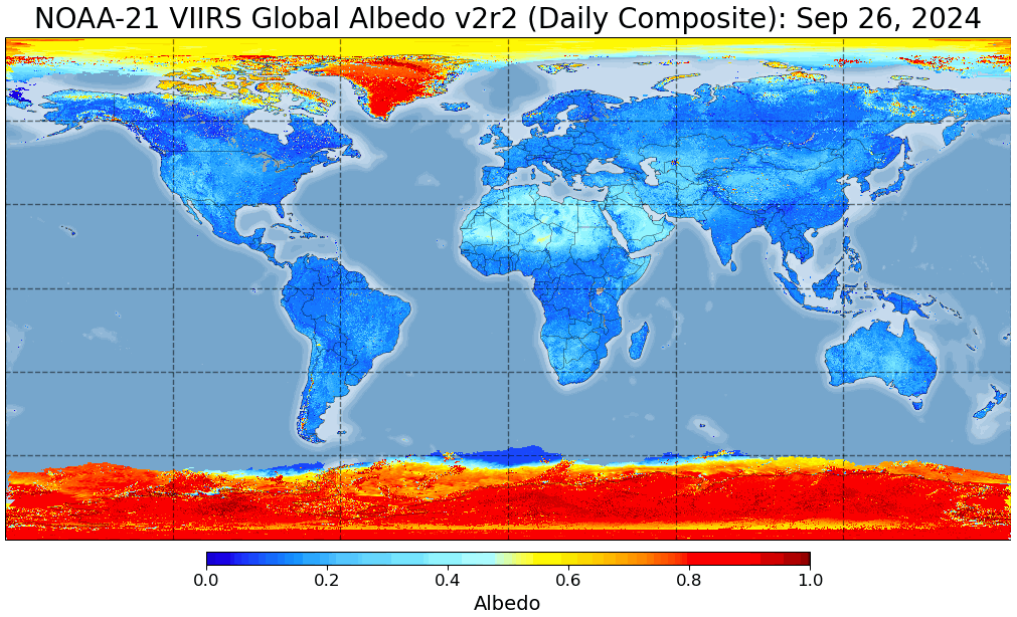
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		x			
Schedule		X			

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

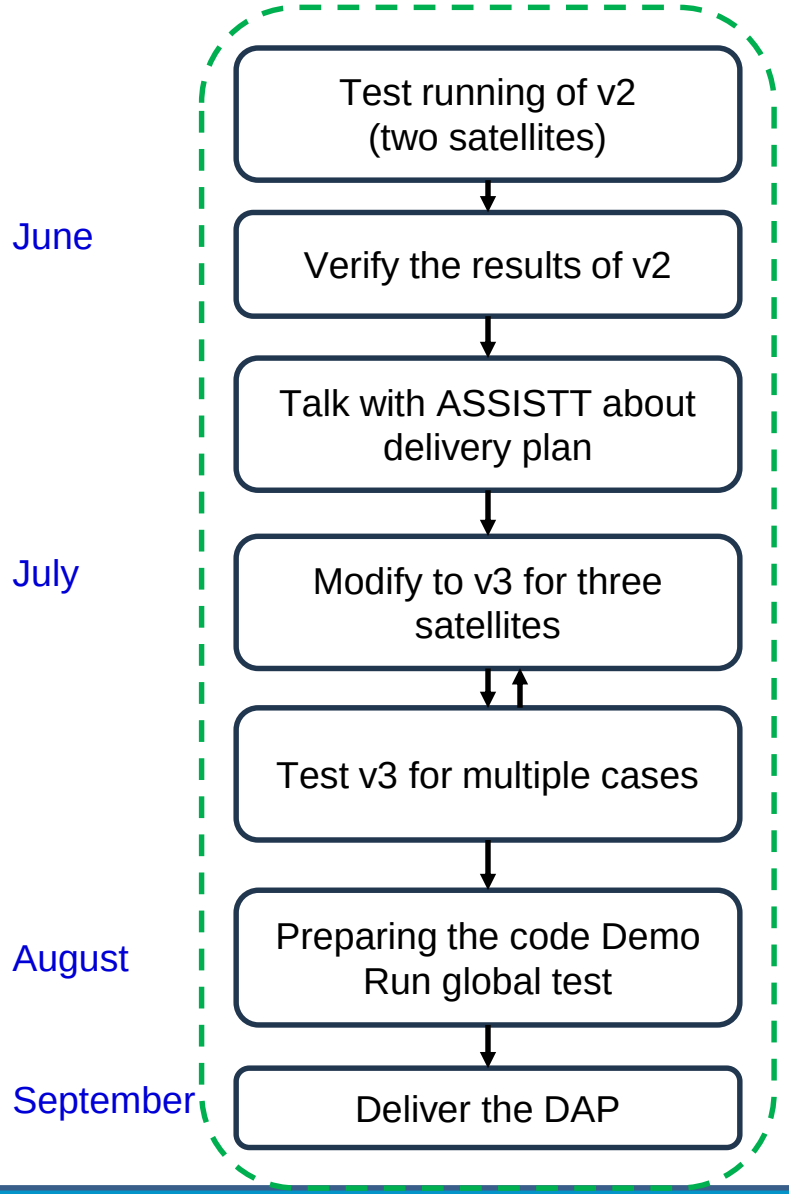
Issues/Risks:

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

Highlights: NCCF-generated VIIRS albedo data test



VIIRS BRDF program preparation



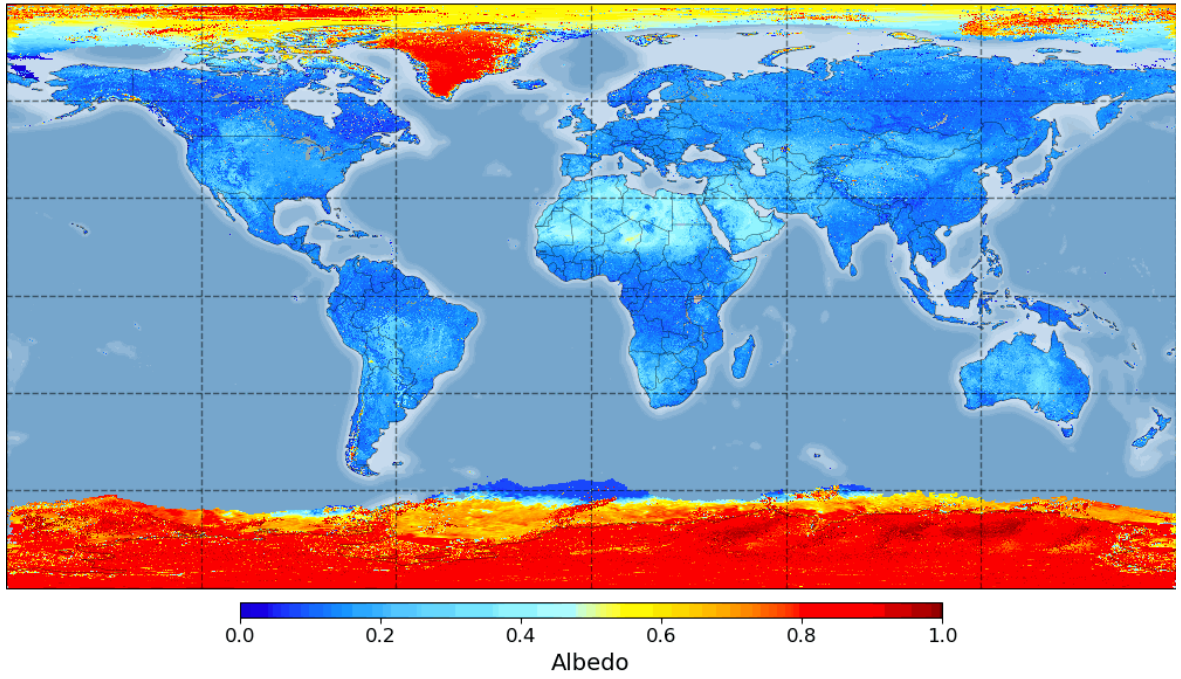
- Work plan done.
- The DAP package was delivered on time
- Highlights:
  - A Makefile is provided, covering all units.
  - There is a script py_scripts/example_run.sh to demonstrate a complete case.
  - All the required documents, including ATBD, DDD, and Science_Code_Demo, are provided.
  - All units have been tested on the Linux server in the current location.

Cross-comparison between VIIRS LSAs

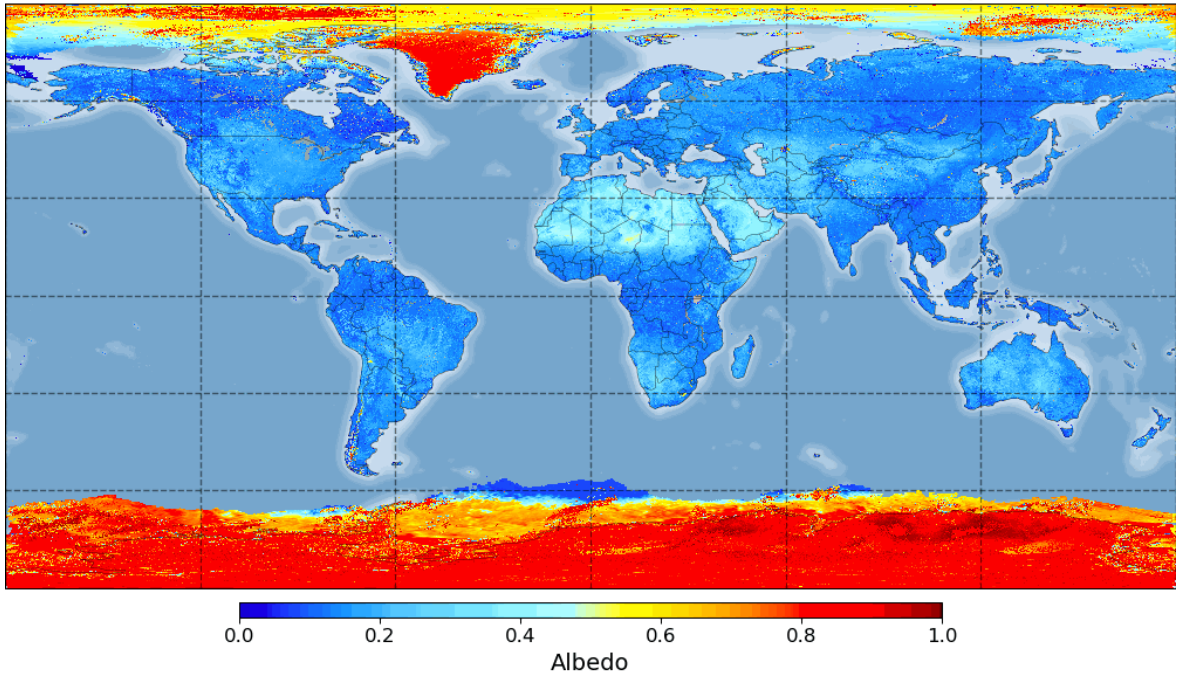
These are the L3 v2r2 VIIRS albedo products generated using the NCCF-provided L2 Land Surface Albedo (LSA) for NOAA-21 and NOAA-20 satellites on September 09, 2024.

The data appears consistent across NOAA-21 and NOAA-20, demonstrating a high level of agreement in global albedo patterns.

NOAA-20 VIIRS Global Albedo v2r2 (Daily Composite): Sep 09, 2024



NOAA-21 VIIRS Global Albedo v2r2 (Daily Composite): Sep 09, 2024



Cross-comparison between VIIRS LSAs

LSA-DLY-GLB_v1r0_N21_s202409060001000_e202409062359000_c202409101243431.nc
(VIIRS_Albedo_1km)
Mean : 0. 2890
Min, : 0.0
Max. : 0.9998
Std. Dev. : 0.2445

LSA-DLY-GLB_v1r0_J01_s202409060001000_e202409062359000_c202409092217175.nc
(VIIRS_Albedo_1km)
Mean : 0.2891
Min, : 0.0
Max. : 0.9998
Std. Dev. : 0.2438

NOAA20 vs. NOAA21:
absolute number of different elements : 80437115
absolute difference Mean,Min.,Max.,St. dev : 0.0184, 0.0, 0.9925, 0.0515
number of different elements from file1 - file2 : 80437115
difference from file1 - file2 Mean,Min.,Max.,St. dev : 0.00061, -0.9741, 0.9925, 0.0547

The pairwise statistics are within the acceptable tolerance, indicating that the NOAA-21 albedo closely matches its NOAA-20 counterpart.

Land Surface Temperature

September 2024

Accomplishments / Events:

- Updated the enterprise LST cal/val plan.
- Verified the NCCF LST and LSE, summarized the verification results and prepared the user feedback on LSE for OSPO. (slide 2 -4)
- Further testing of the all weather LST science code revealed several issues such as stripes in the surface type bits, view time not all weather dataset, and unprocessed data. The issues were investigated and fixed.
- Updated and further tested the indices file for projection conversion between sinusoidal and regular lat/lon projections. Pixel shifts were observed in the conversion process. (slide 5)
- Generated the all weather LST experimental dataset for the time period from June 10 to September 15, 2024 and conducted a preliminary validation using ground observations from SURFRAD, ARM and BSRN network. (slide 6)
- Converted and IDL code to python for BSRN data collection and improved the L3 LST validation code related to BSRN data processing.

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
LSE update DAP delivery	Aug-23	Oct-23	Oct-23	
NOAA-21 data monitoring, evaluation and provisional maturity review	Oct-23	Jan-24	Jan-24	
CCAP Initial Delivery - All weather LST	Oct-23	Feb-24		deferred: further improvement of the algorithm is needed
SDR and EDR Support to JPSS-3 Data System Test Event in early 2024	Feb-24	Apr-24		Deferred : no data available by the system
Experimental Development of high spatial resolution LST	Oct-23	May-24	May-24	
SDR and EDR Enterprise Cal/Val Plan Initial Updates	Apr-24	Jun-24	Jun-24	
CCAP final delivery-All weather LST	Jan-24	Jul-24		further improvement of the algorithm is needed
SDR and EDR Enterprise Cal/Val Plan and Algorithm Update Peer Review Meeting	Apr-24	Aug-24	Aug-24	
Monitoring and Anomaly watch, analysis and report	Oct-23	Sep-24	Sep-24	

Highlights:

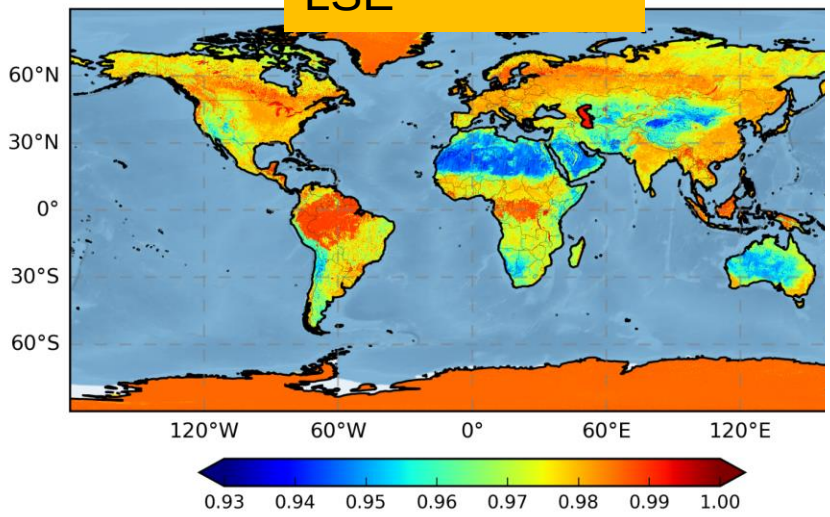
The all weather LST science code has been further improved with all previously identified issues corrected. The view time data is now complete and the problem with unprocessed data has also been resolved.

System Operational Readiness:

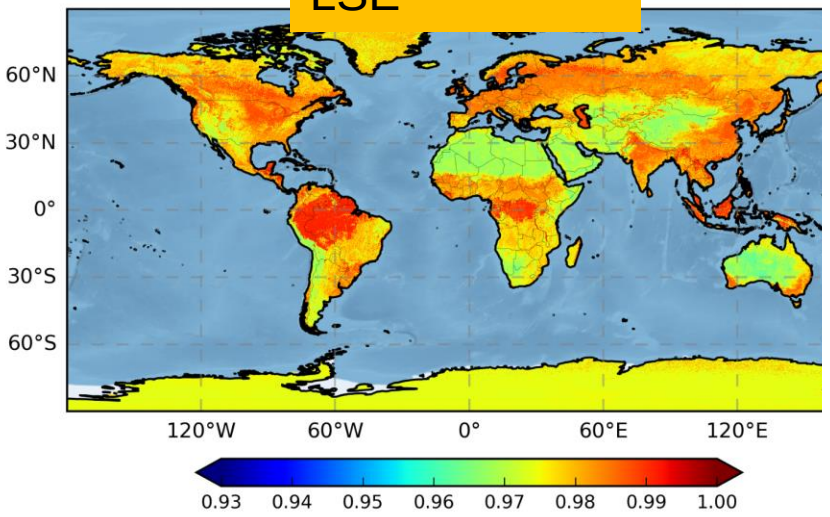
User Feedback ----- for Land Surface Emissivity

- **Key Input for JPSS VIIRS LST product:** The land surface emissivity is an essential input for the JPSS VIIRS Land Surface Temperature product, and its quality is crucial for the accurate estimation of LST **(by Yuling Liu)**
  - ➢ V2r2 LSE was verified and successfully applied in the v2r2 LST product
  - ➢ V2r2 LSE was compared with local LSE dataset and the results indicate good consistency.

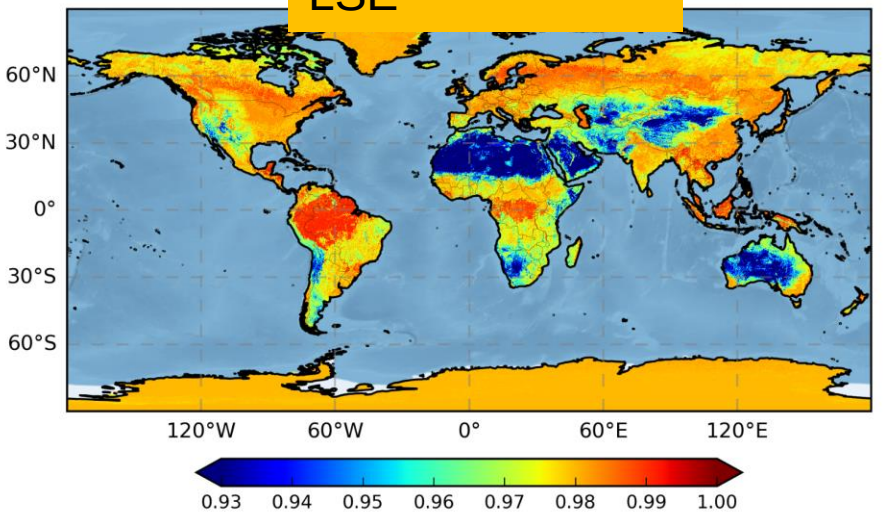
V2r2 Band 15 LSE



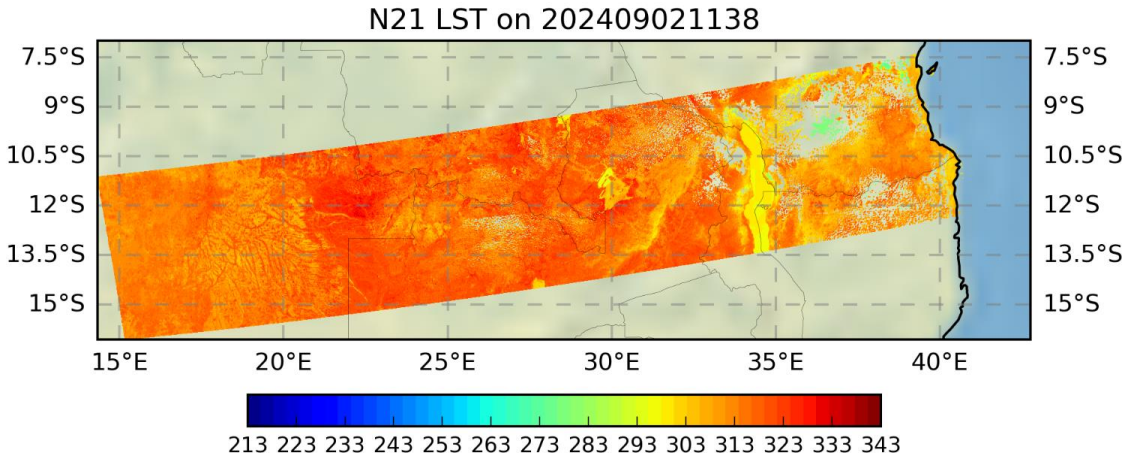
V2r2 Band 16 LSE

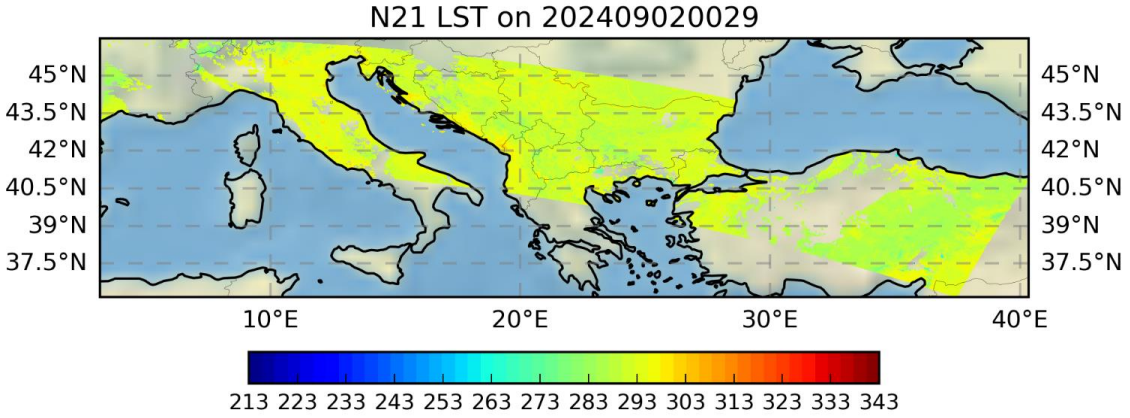


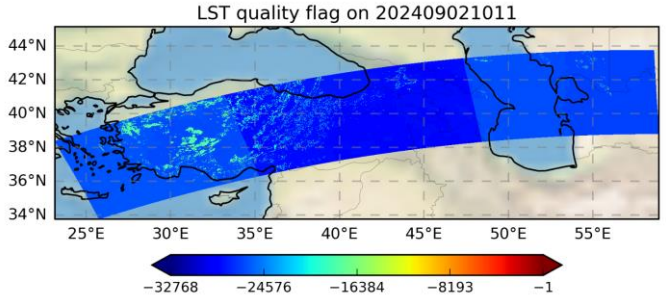
V2r2 Broadband LSE

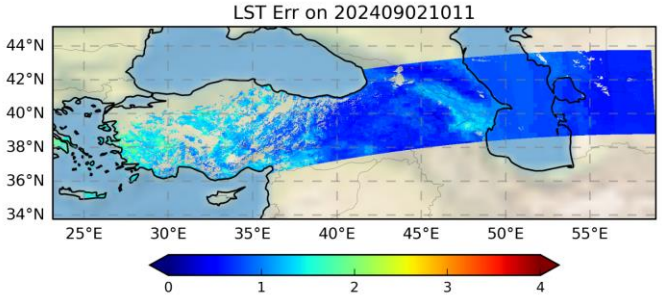


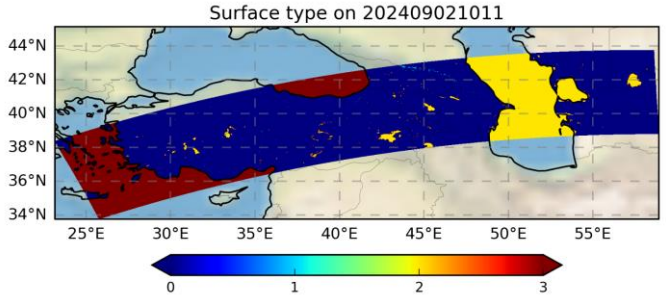
NCCF NOAA-21 Granule LST Verification

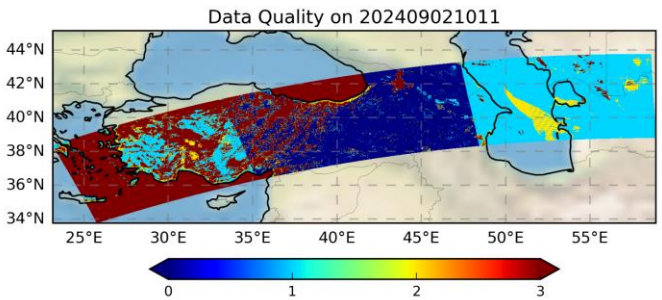


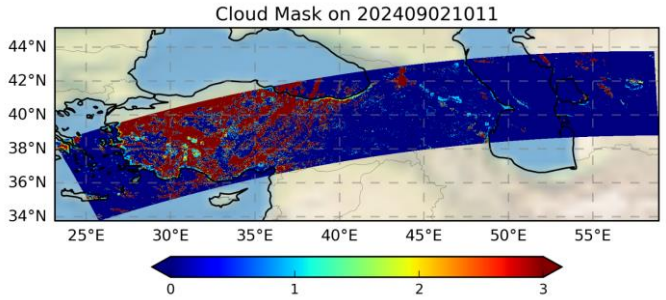


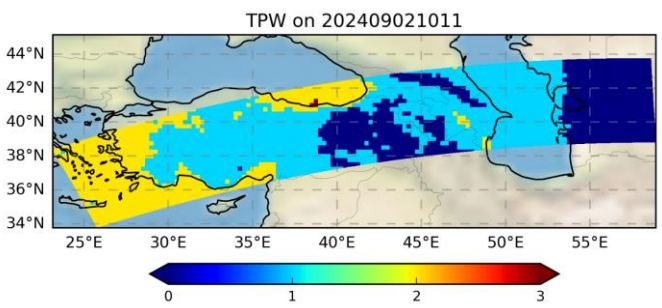






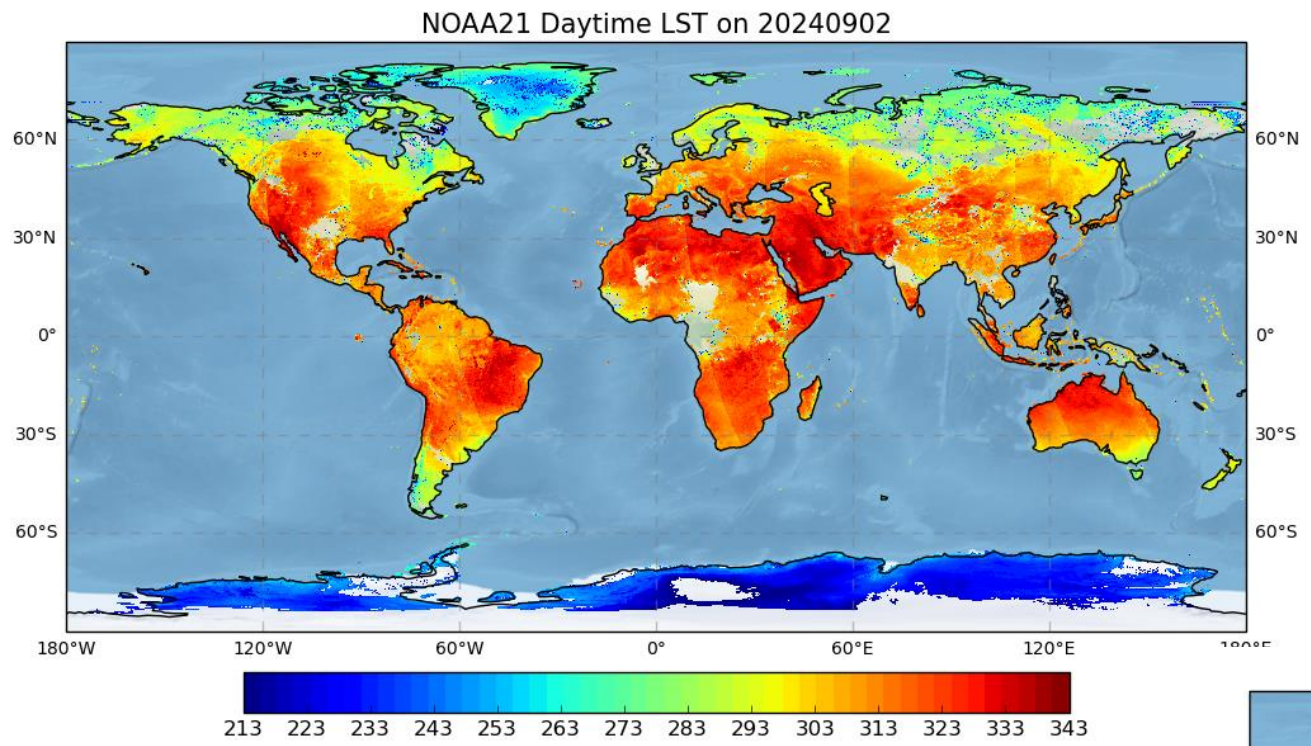


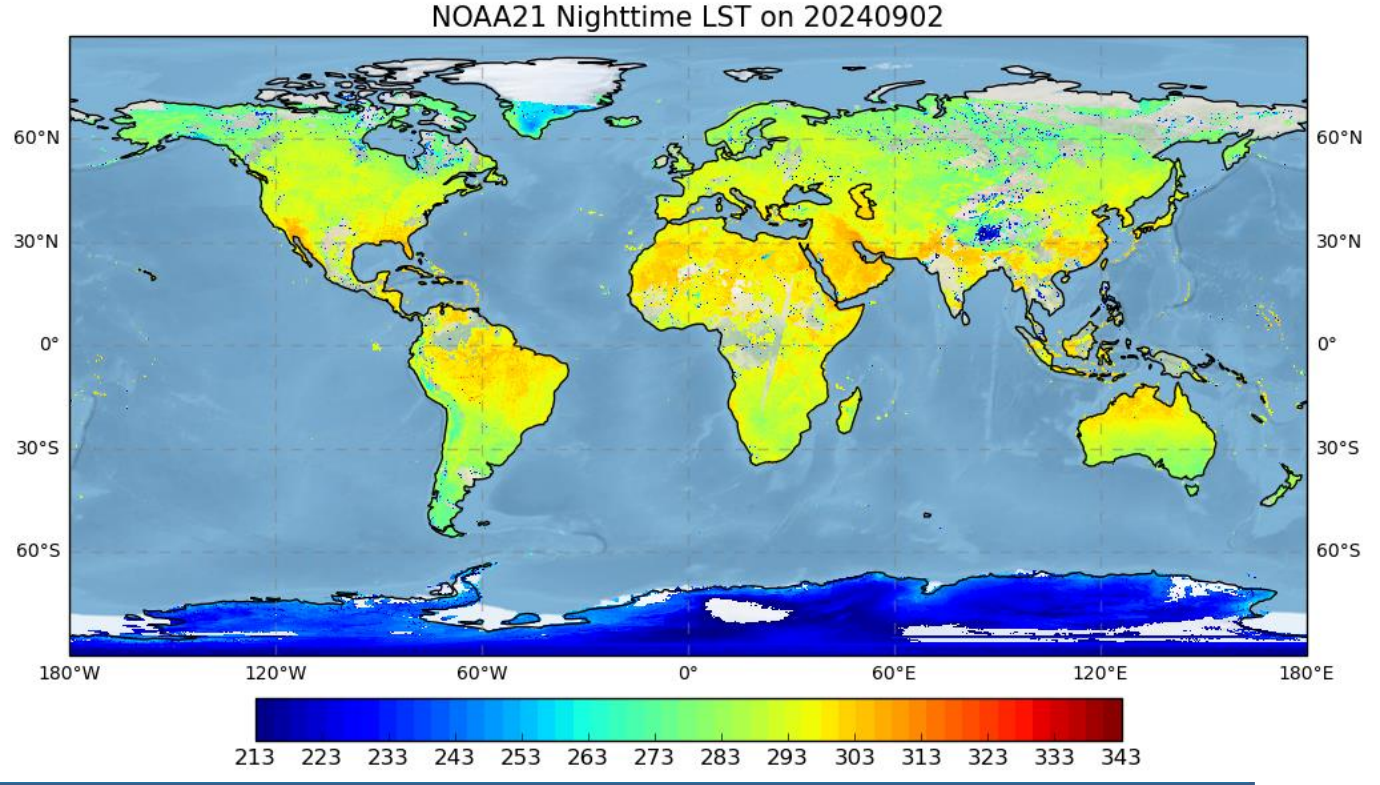




- The NOAA-21 LST in v2r2 version on NCCF was verified using randomly selected data from September 2, 2024. All data layers including LST(left two images in daytime(top) and nighttime(bottom), quality flag, LST uncertainty as well as its bit extraction have been verified.
- The LST data value range and distribution appear normal.

NCCF NOAA-21 LST Global Daytime and Nighttime LST Verification





- The global LST for daytime (top left) and nighttime(bottom right) is shown. The image was generated locally using granule overlays.
- The data range and distribution appear normal.

Indices Comparison for projection conversion

V0

Sinusoidal	Latlon	Sinusoidal
[964, 20098]	[893,10056]	[964, 20097]
[1897,24438]	[2049,23007]	[1897,24437]
[1897,24396]	[2049,22994]	[1897,24396]
[1897,24397]	[2049,22994]	[1897,24396]
[976,20061]	[1054,21610]	[976,20063]
[976,20062]	[1054,21610]	[976,20063]
[976,20063]	[1054,21610]	[976,20063]
[976,20064]	[1054,21610]	[976,20063]
[976,20065]	[1054,21610]	[976,20063]

V1

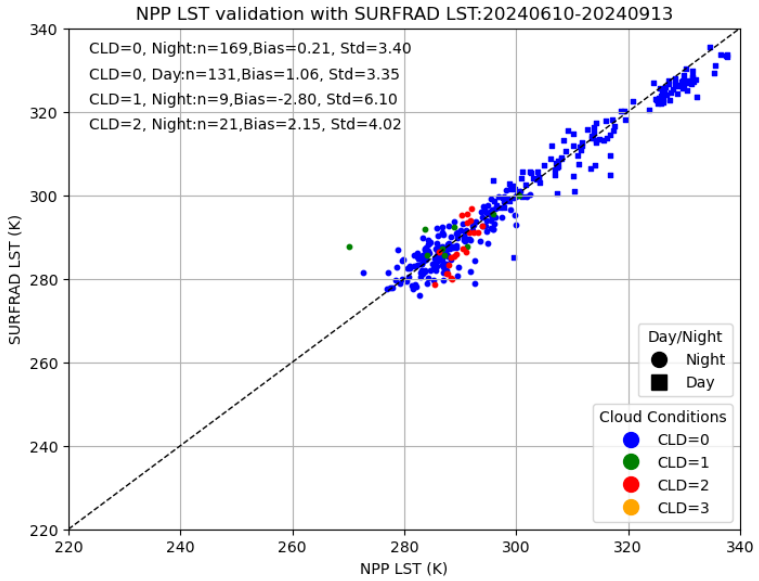
Sinusoidal	Latlon	Sinusoidal
[964, 20098]	[1041,21616]	[964, 20101]
[1897,24438]	[2049,23007]	[1897,24437]
[1897,24396]	[2049,22994]	[1897,24396]
[1897,24397]	[2049,22994]	[1897,24396]
[976,20061]	[1054,21610]	[976,20063]
[976,20062]	[1054,21610]	[976,20063]
[976,20063]	[1054,21610]	[976,20063]
[976,20064]	[1054,21610]	[976,20063]
[976,20065]	[1054,21610]	[976,20063]

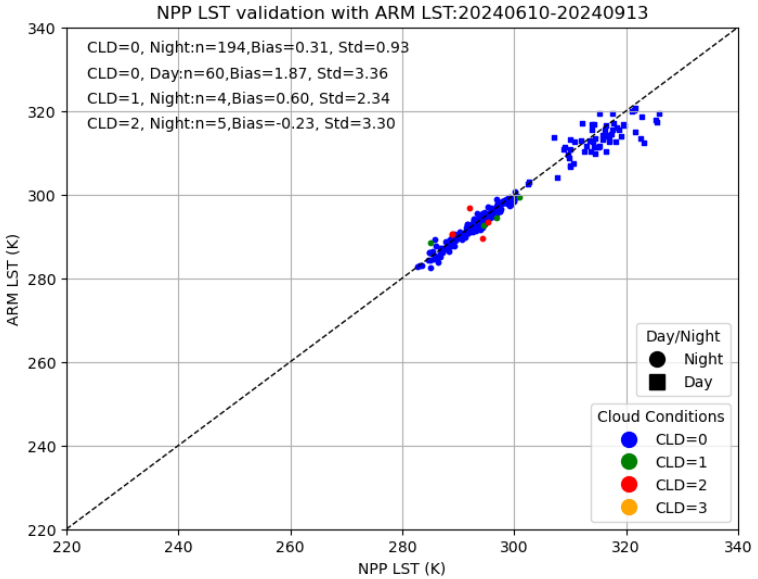
V2

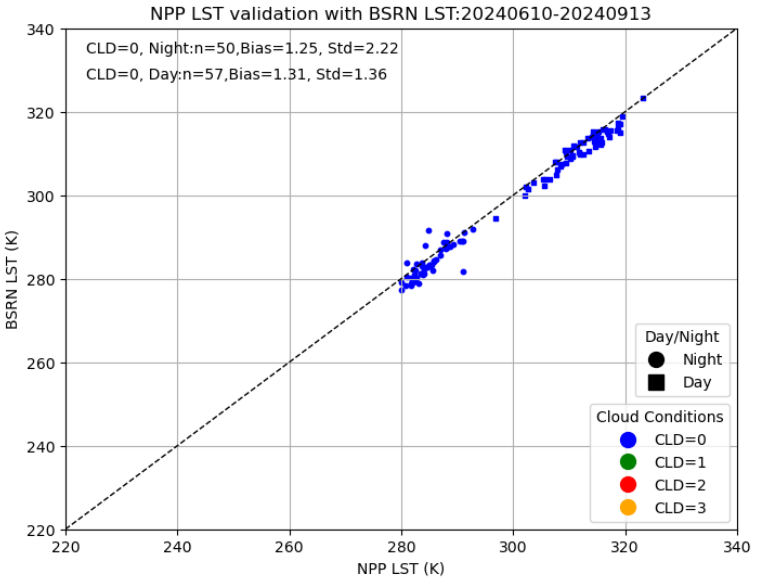
Sinusoidal	Latlon	Sinusoidal
[964, 20098]	[1041,21616]	[964, 20101]
[1897,24438]	[2049,23007]	[1897,24437]
[1897,24396]	[2049,22994]	[1897,24396]
[1897,24397]	[2049,22994]	[1897,24396]
[976,20061]	[904,9936]	[976,20060]
[976,20062]	[904,9942]	[976,20061]
[976,20063]	[904,9949]	[976,20062]
[976,20064]	[904,9955]	[976,20063]
[976,20065]	[904,9962]	[976,20064]

- Indices files were generated for the conversion between sinusoidal and regular latlon projection data.
- Three versions of the projection conversion indices were compared. The table listed some examples for the difference among the three versions, and a pixel shift was observed during the conversion. The shift mainly occurs in the column indices.

Preliminary All weather LST validation







- The experimental all-weather LST for the period from June 10, 2024, to September 15, 2024, was validated against ground measurements from six SURFRAD stations (left), four ARM stations (middle), and one BSRN station (right). The validation results are shown accordingly.
- The combination of cloud and day/night conditions was stratified, and statistics were calculated. The results are constrained by some issues, such as incomplete view time datasets, unprocessed data and pixel shifts in the projection conversion. Additionally, the cloud categories that are not confidently clear (i.e., cloud = 1, 2, 3) only have small sample sizes, making the statistics insignificant for cloudy situations.

MiRS Products

September 2024

Accomplishments / Events:

- The MiRS science team recently investigated the rain rates from Hurricane Helene which affected the U.S. quite severely causing many casualties and social/economic damages in September 2024. SNPP, NOAA-20, and NOAA-21 are carrying the same instrument, ATMS, and their observation time difference is about 25 minutes (NOAA-20 leading, NOAA-21 in the middle, and SNPP following). The narrow observation time gap between these satellites provides advantage to closely observe the sequential development of a weather system. Helene is a good example to see how the polar orbiting satellite measurements with narrow observation time gap could be applied.

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				

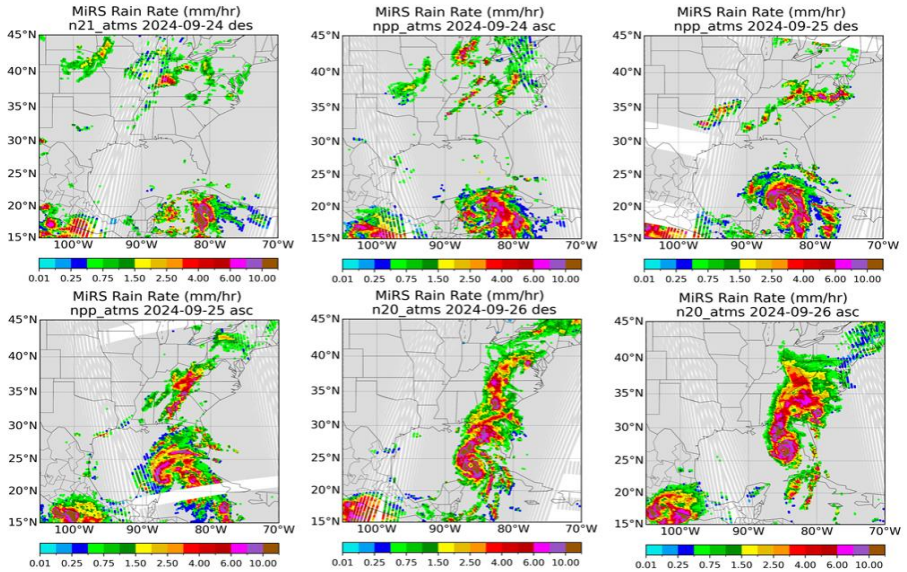
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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:



The evolution of Hurricane Helene in September 2024. The MiRS rain rates are based on SNPP, NOAA-20 and NOAA-21 ATMS measurements. The narrow observation time gap (about 25 minutes) between the satellites made it possible to observe the hurricane development more closely with polar orbiting satellites.

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

September 2024

Accomplishments / Events:

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- JSTAR mapper staff deployed a method that uses Amazon Web Services (AWS) SDR data as a fallback when SCDR is incomplete resulting in solid improvements in VIIRS imagery reliability going forward for all 3 polar satellites, and potentially other products as well if we can mimic this method as a backup data source for tile production **(Highlight).**

- NPROVS staff continue to restore sounding data (radiosonde, forecasts, satellite) that were not stored during (and prior to) the IMSG support gap (June 26 to July 31) and also to debug procedures to replace FTP by "https" data services (per STAR IT recommendation) to provides data transfer / input to NPROVS; the use of AWS data as a backup when data (ie SCDR) are not available is under consideration.

- The purchase of radiosondes (by DOE) under the JPSS / DOE InterAgency Agreement (IAA) for the Dedicated (satellite synchronized) Radiosonde Program is in progress; a new FY25 funding request ($35K) to provide dedicated radiosondes in coordination with an upcoming AEROSE campaign (April) was submitted (Ryan Kelley) to the Financial Management Branch.

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

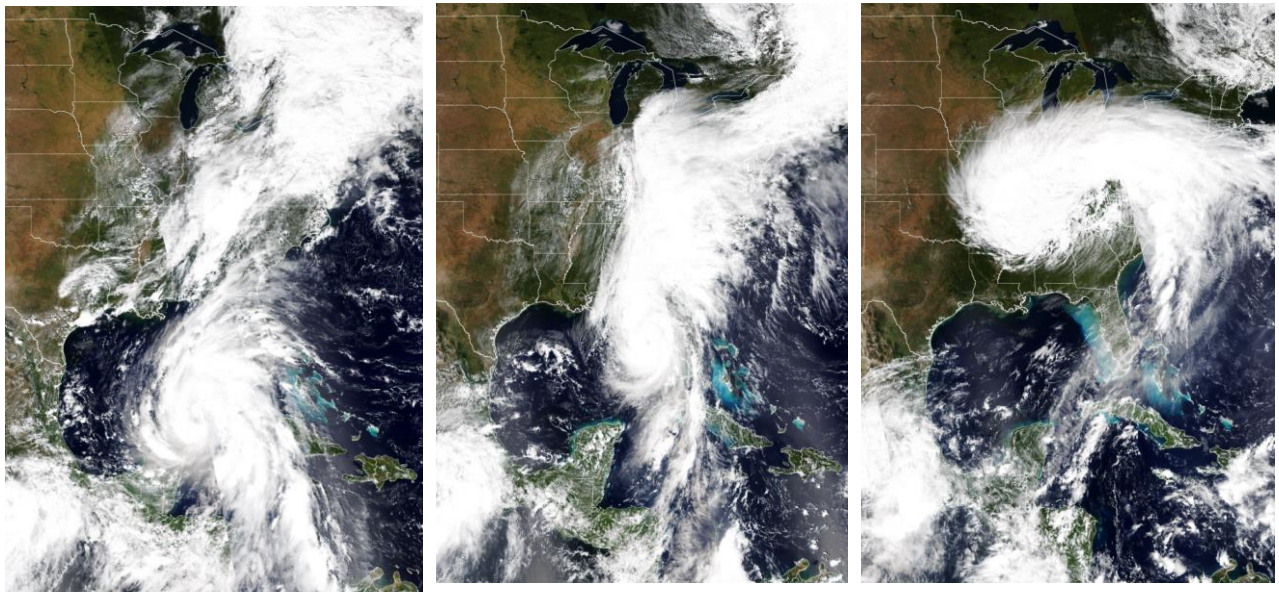
Overall Status:

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

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

Issues/Risks: None

Highlights



JSTAR Mapper provides near-real-time tracking of Hurricane Helene on September 25th , 26th (landfall) and 27th using NOAA-21 VIIRS True Color Imagery

NUCAPS Products

September, 2024

Accomplishments / Events

- Continued validation and sustainment activities for the NUCAPS EDR products. These include:
  - Collection of validation data sets for the AVTP, AVMP, O3, OLR, CO, CH_4, and CO_2.
  - OLR product processing and continuation of validation exercises with NOAA-20 CERES.
  - AEROSE-2024 data analysis adding the ECMWF analysis fields. Converted, processed, and compared generated ECMWF temperature profiles with the AEROSE 2024 radiosonde data.
  - Extension of VALAR dataset generation to August 2024 including new GRUAN sites.
  - Trace gases validation of CO, CH4, and Co2 for NOAA-20 and NOAA-21 based on TCCON measurements.
- Continued AWS NUCAPS mission-long reprocessing plan and pilot data processing.
- Fixed library and code errors for running offline HEAP retrievals under the new CentOS9 environment.
- Continued MetOp-B cloudy and clear regression updates removing AMSU-A channels whose on-orbit noise values exceeded the specifications.

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		

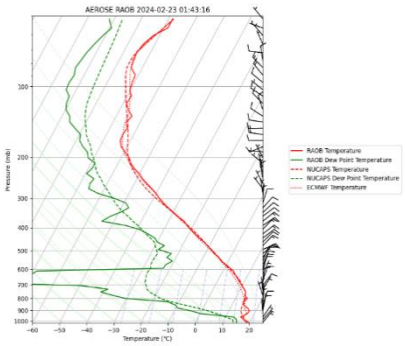
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

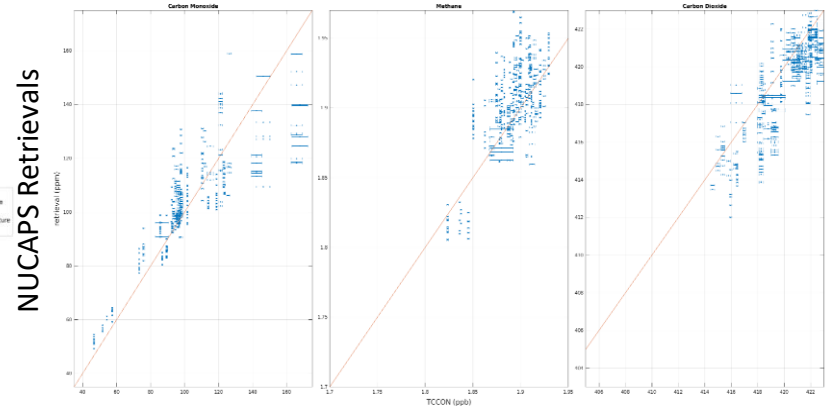
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
DAP Delivery with updates related damping factor, surface corrections, MetOp-B/C Averaging Kernels	Oct-22	Oct-22	11/04/22	
NOAA-21 Ready NUCAPS product evaluations with the upcoming CrIS first light data and ATMS TDRs, 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	On-going

AEROSE-2024 temperature and dew point profiles. The newly added ECMWF temperature profiles very closely resemble the NUCAPS and RAOB ones.



Scatterplots of trace gases validation for NOAA-21/NUCAPS_V3.2 (12 focus days) with newest TCCON GGG2020 dataset; the correlation coefficients for the 3 gases are RCO = 0.84, RCH4 = 0.61, and RCO2 = 0.79.

Carbon Monoxide (CO) Methane (CH_4) Carbon Dioxide (CO_2)



Ocean Color

September 2024

Accomplishments / Events:

- A Scientific Paper Published in Marine Pollution Bulletin: Qi, L., M. Wang, C. Hu, J. Jiao, and Y-J. Park, "Marine debris induced by the Great East Japan Earthquake and Tsunami" *Mar. Pollut. Bull.*, **207**, 116888, 2024. https://doi.org/10.1016/j.marpolbul.2024.116888
- 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
- Started working on the mission-long VIIRS ocean color data reprocessing using the MSL12 ocean color data processing system.
- Completed on re-derive the vicarious gains for VIIRS-SNPP and NOAA-20 using the MOBY in situ data.
- Routinely producing VIIRS (SNPP, NOAA-20, and NOAA-21) true color/false color images in OCView.
- Routinely producing VIIRS (SNPP, NOAA-20, and NOAA-21) global ocean color products.

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

Sept 2024

Accomplishments / Events:

- Derived and delivered OMPS weekly dark LUTs for 3 NPs and NMs.
- Derived and delivered OMPS solar bi-weekly LUTs for 3 NPs.
- Completed the OMPS NM and NP SDR cal/val plan update for J3 and J4.
- Completed reprocessing of NOAA-21 OMPS SDR data sets with SDR-validated-algorithms in support of OMPS EDR review.
- Continued the ADR 10832 to apply solar activity impact adjustments to generate new solar flux tables for all days of data for 3 NPs (an example in Fig. 1). Reprocessing of NP SDRs is in process.
- Explored the potential of deriving wavelength shift using OMPS housing temperature data (an example in Fig. 2).
- Improved the OMPS dark calibration codes to tolerate more missing data that happened frequently to avoid delay of routine dark tables.
- The analysis of J3.J4 OMPS pre-launch data sets is delayed due to STAR's security computing requirements

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		

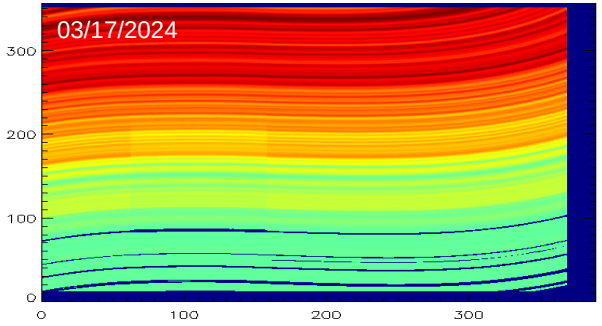
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

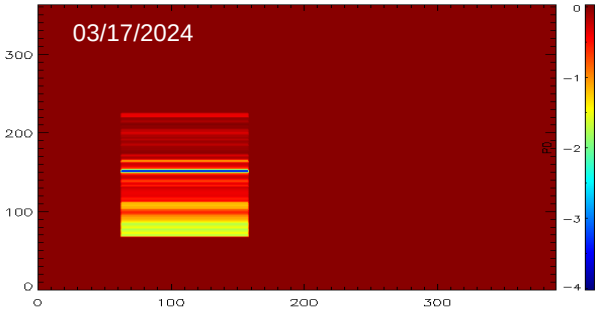
None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Solar intrusion impact correction on NOAA-21 OMPS NP; OMPS solar activity impact analysis Note: The solar intrusion correction work is completed as far as deliveries and code changes go	Nov-23		Nov-23	
Investigation of the dark over-correction problem and an initial analysis of OMPS out-of-range of SL correction	Dec-23		Dec-23	
NOAA-21 solar day-1 improvement with solar activity impact correction; develop the out-of-range of SL table for N21 NM SDR; update the N21 NP ST LUT; compare with NASA datasets for NOAA-21 OMPS NM and NP SDR data (code is ready)	Jan-24	Feb-24	Feb.-24	Day-1 improvement is on-going analysis
Improve latitude dependency of inter-sensor biases; reprocess (limited) N21 OMPS NM/NP SDR data sets (new dark LUTs); assess the consistency of N21 OMPS NM and NP at the dichroic range; conduct the inter-sensor comparison with Tropomi	Feb-24	Feb-24	Feb.24	
Finalize the NOAA-21 solar day-1 towards validated maturity; validate NOAA-21 OMPS SDR data quality using multiple ways (e.g., RTM, DCC, inter-sensor comparison with VIIRS); prepare NOAA-21 OMPS NM/NP SDR validated maturity review	Mar-24		Mar-24	
Reprocess the (SNPP, NOAA-20 and NOAA-21) OMPS NP SDR data by using the new dark, OSOL and SL tables; Initialize the OMPS and GEMS inter-sensor comparison analysis	May-24		May-24	
Document the technical reports (e.g., SL correction, solar intrusion correction, solar activity impact correction, NM along-track wavelength shift correction; update OMPS NM/NP SDR ATBD	Jul-24		Jul-24	
Develop new algorithm or code to support J3/J4 prelaunch testing and verification; analyze the pre-launch test data sets for J3 or J4 upon the availability of the data sets	Aug-24		Aug-24	J4 TVAC data is not available
Pre-launch sensor characterization report upon available pre-launch instrument test data sets; reprocess SNPP, N20, and N21 OMPS NM SDR data using the updated LUTs; OMPS SDR enterprise Cal/Val plan updates	Sep-24			J3/J4 prelaunch task delay
Develop and deliver dark and OSOL LUTs for SNPP/NOAA-20/NOAA-21	Sep-24			
Maintain SNPP/NOAA-20/NOAA-21 OMPS SDR data quality	Sep-24			

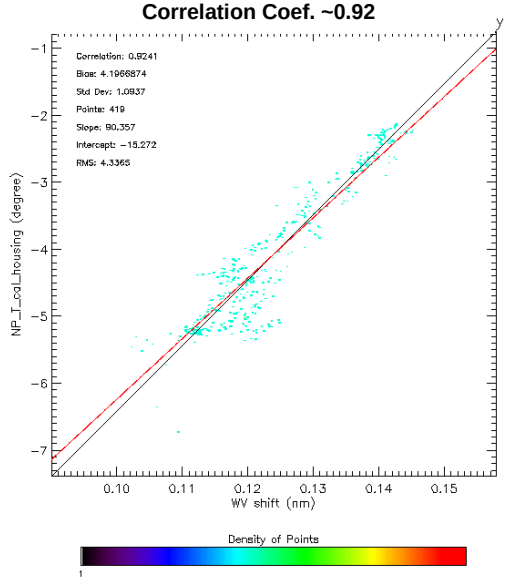
N21 NP Solar Flux Distribution with Solar Activity Adjustment



N21 NP Solar Activity Adjustment Percent



SNPP OMPS NP Housing Temperature vs. Wavelength Shift: Correlation Coef. ~0.92



OMPS Ozone (V8Pro, V2Limb & V8TOz)

March 2024

Accomplishments / Events:

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

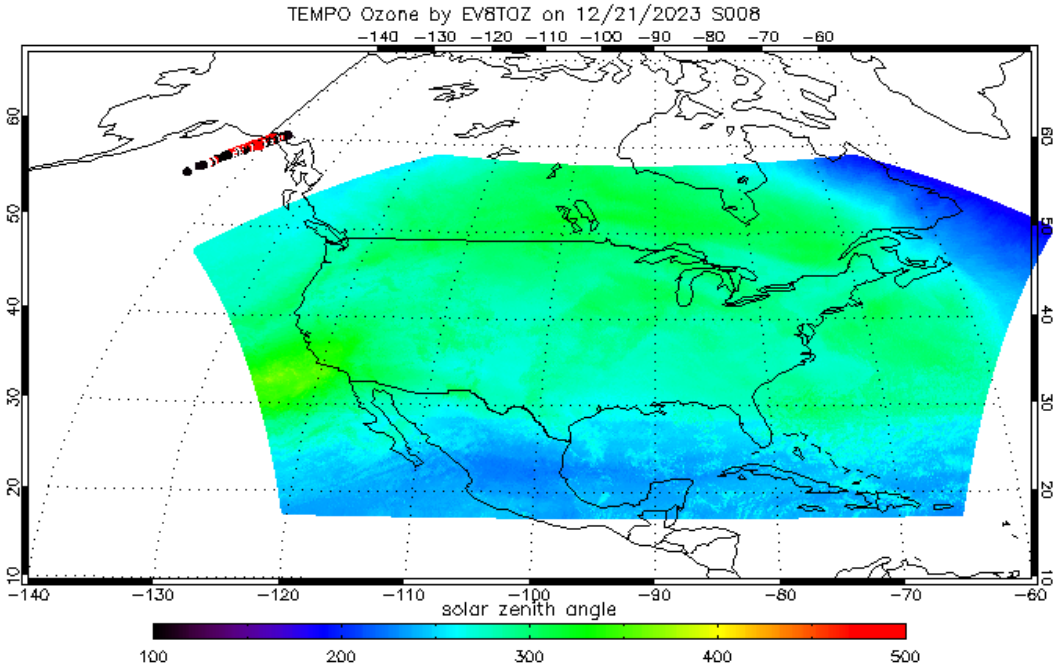
Milestones	Original / Current Date	Forecast Date	Actual Completion Date	Variance Explanation
Successfully complete GOME-2 NCCF ORR	Aug-23		Nov-23	
Provide new Level 1a, 1b & 1g for S-NPP OMPS V2Limb	Dec-22		Dec-23	NASA R&D
Provide Level 1a, 1b, 1g & 2 (aerosol and ozone) for NOAA-21 OMPS V2Limb to ASSISTT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

Overall Status:

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

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

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



Enterprise V8TOz Applied to TEMPO

Sea Surface Temperature

September 2024

Accomplishments / Events:

- Due to instabilities with the CentOS 9 Stream operating system, we are in the process of migrating as many CentOS 9 Stream servers to Red Hat Enterprise 9 (RHEL9) as we have licenses for (25). For the remaining (15) servers, we hope to (STAR IT permission pending) install a free RHEL clone such as Alma or Rocky Linux.
- We continued development of the ACSPO VIIRS reflectance-based clear-sky mask filters. There are two flavors of the reflectance filters: The Reflectance Threshold Test (RTT) described in the last months' quad chart (August) and the Reflectance Adaptive Test (RAT) that is based on spatial uniformity of measure reflectance instead of its absolute value. Previous version of the ACSPO clear-sky mask (ACSM) used only the NIR M7 channel. However, we have found that the SWIR M10 channel has improved contrast between clouds and ocean. However, the M10 channel is not applicable (too noisy) under twilight conditions and cannot detect sea-ice effectively. For this reason, for ACSPO V3.00 we went with a hybrid approach that applies the RTT and RAT filters for both channels (see figure in lower right).

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			

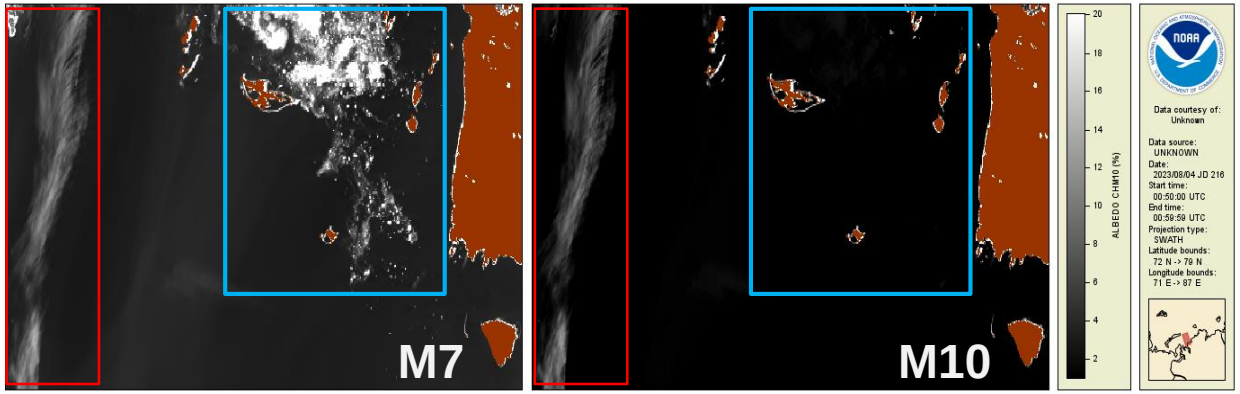
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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*: Updates to ACSPO clear-sky mask**



NPP VIIRS M7 (left) and M10 (right) reflectance (%). Imagery is from northern Norway on August 4, 2023. Note improved contrast between ocean and cloud (red rectangle) for M10 channel. However, contrast between sea-ice (light blue rectangle) and ocean is minimal for M10 channel, so M7 is better suited for identifying ice.

Snowfall Rate

September 2024

Accomplishments / Events:

- Heather Kenyon, the Aviation Team Lead at the Buffalo WFO, sent a request to the SFR team through the NWS TOWR-S. At her request, the SFR team generated videos of the merged satellite and radar snowfall rate product, mSFR, for several lake effect snow events. The Buffalo WFO has a radar gap in their county warning area. Here is one of the animations. The satellite-based SFR can fill in radar gaps and provides situational awareness to forecasters. The link for the CISESS-based SFR page (sfr.umd.edu) was also provided to Ms. Kenyon who commented that she will continue to use the website in the future.
- An Europe SFR page has been set up to show the product over Europe in near real-time. The website was developed as a result of user engagement with European forecasters by Seldon Kusselson. The website was promoted in a presentation on SFR at the EUMETSAT conference recently.

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	

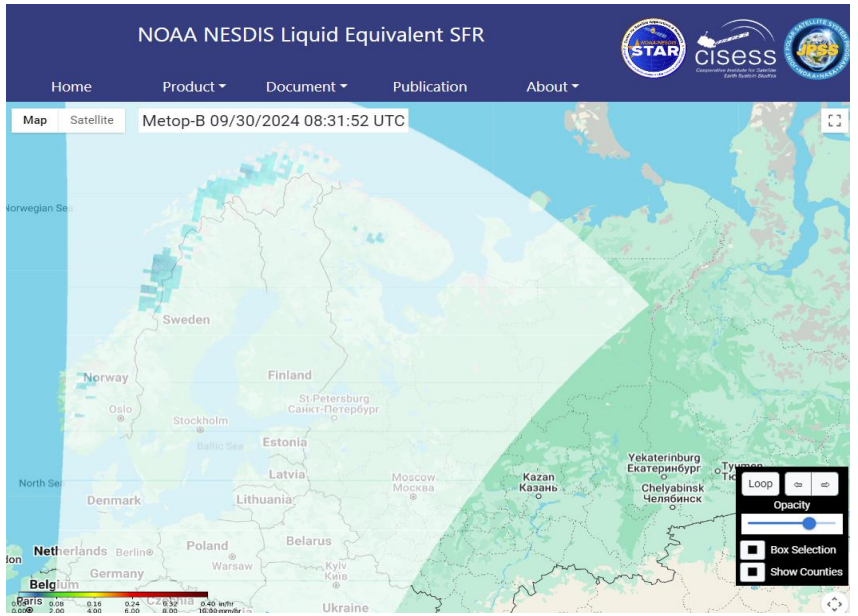
Overall Status:

	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:



Screenshot of the near real-time Europe SFR page

Surface Reflectance

September 2024

Accomplishments / Events:

- Keep working on the SR v1r2 and v1r3 LUT comparison, mainly focus on the issues arise in the monitoring, investigate the reason of more invalid pixels for the VIIRS M1 bands and develop the improvement method.
- Coordination with VIIRS SDR/EDR teams about the reprocessing strategy and planning, investigate the flowchart and computing consumption.
- Continue work on the SR recalibration software package using the re-calibrated SDR, compare two approaches: NOAA SDR and NASA recalibration TOA reflectance.
- Work on the updated DAP, including the mitigation algorithms for identified issues, new global attribute for monitoring and compressed output data format.

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			

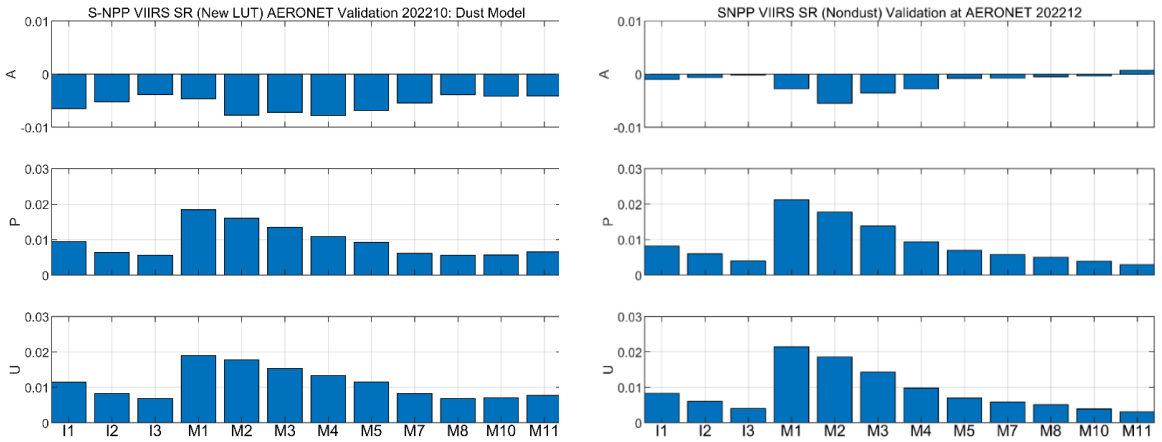
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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		

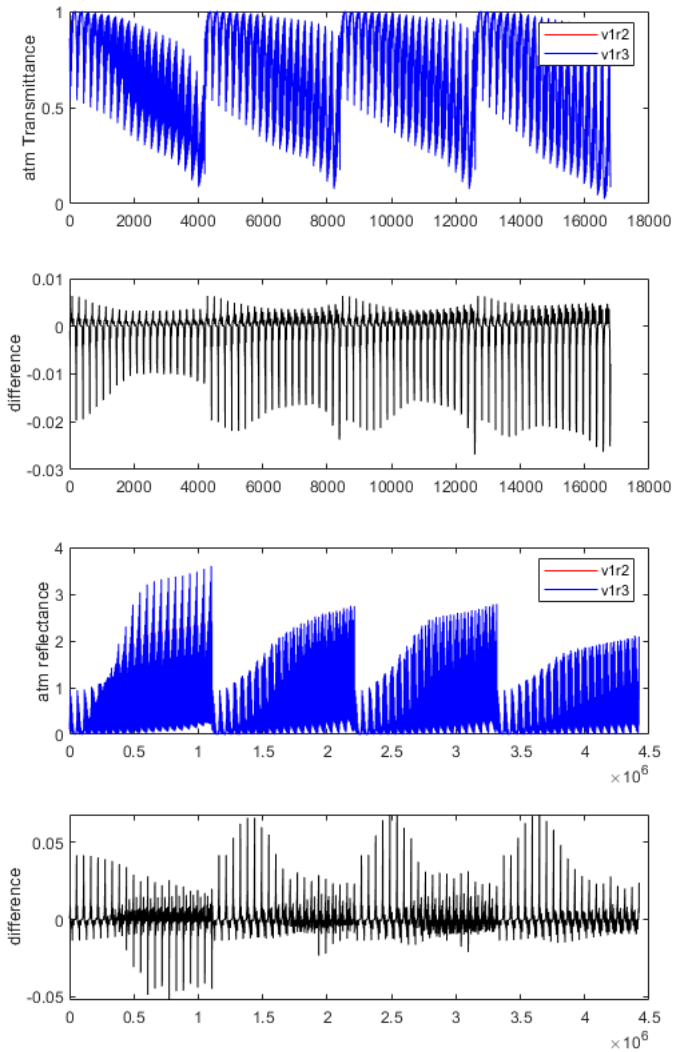
Highlights:



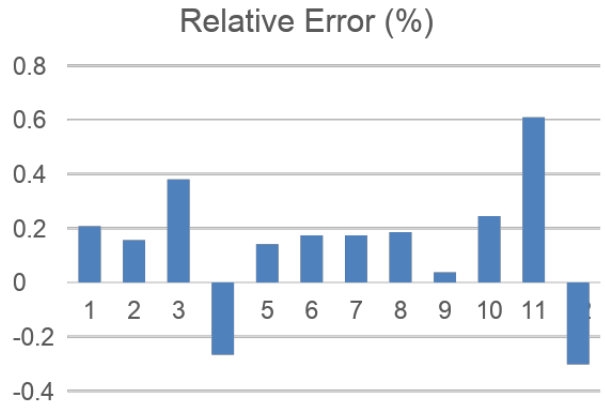
VIIRS SR mitigation algorithm: the dust aerosol model pixels with significant negative bias (left figure), the mitigation algorithm improve the consistency (right figure).

SR v1r2 and v1r3 (OSPO monitoring warning diagnose)

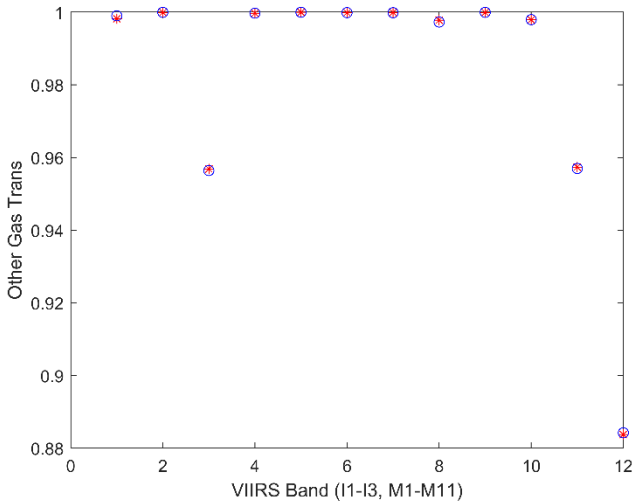
- Comparison v1r2 and v1r3 LUTs (atmospheric transmittance and reflectance: left column; Rayleigh optical depth: upper middle figure; gases transmittance, right column) to investigate the monitoring warning issue.

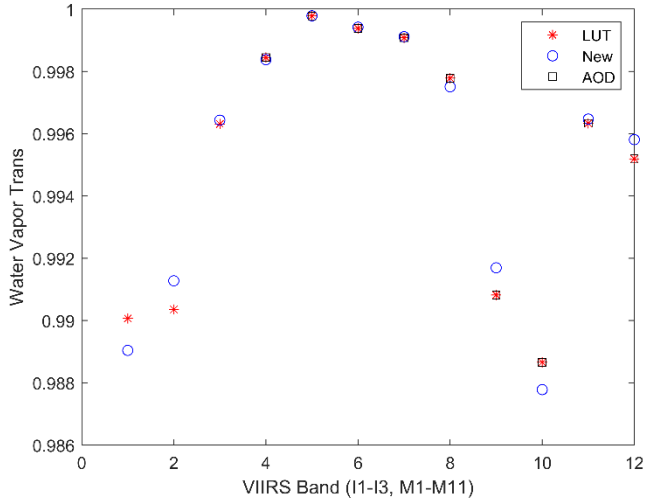


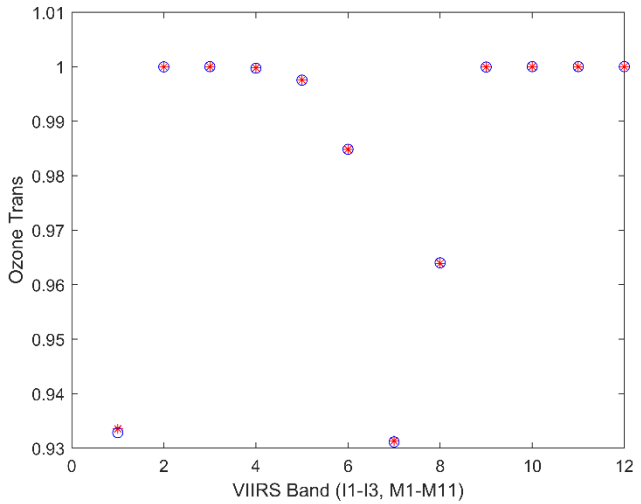
LUT comparison (all dimensions)



Rayleigh scattering optical depth relative bias between v1r2 and v1r3



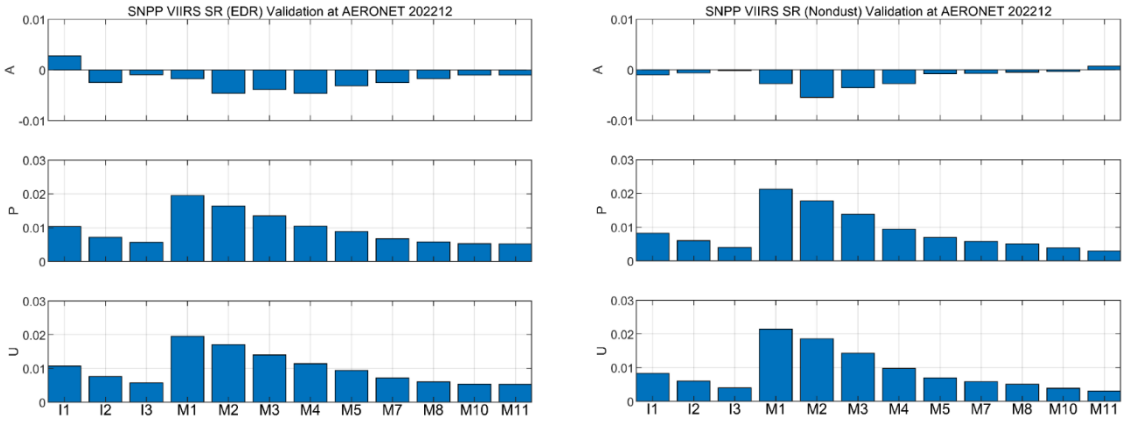




Gases (water vapor, ozone and others gas transmittance coefficients comparison

Surface Reflectance Software Package with Latest Updates

- New update of SR software package:
  - Mitigation algorithm to address the misclassified dust aerosol model. Abandon the original dust aerosol model, instead select the best suit model from the rest models.
  - New global attribute/variable for product monitoring. Exclude the low sun pixels and confidently cloudy pixels in the statistic of retrieval quality.
  - Compressed data format to reduce the storage.
  - Reorganize the quality flags to eliminate the redundant flags.



Current algorithm and mitigation algorithm APU statistics comparison, better bias performance for most channels.

- Current Bad Retrieval (Non optimal) Criteria
  - Solar zenith angle >= 85 (night)
  - 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)
    - High AOD (most common reason), v1r3 is more sensitive to the high AOD.
  - Moon in the sight (very rare case)

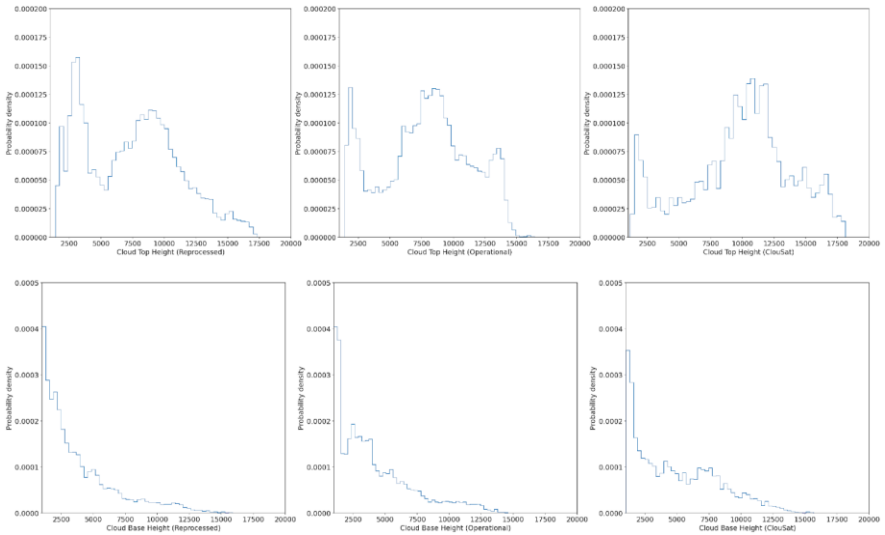
- Updated criteria
  - Exclude the low sun pixels (>=65)
  - Exclude the confidently cloudy pixels.

SNPP VIIRS EDR Reprocessing

Sept. 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, the histograms of reprocessed and operational Cloud Base Height (CTH) and Cloud Base Height(CBH) values for the matched pixels with CloudSat-CALIPSO data during March~June 2019 are compared; the differences from CloudSat-CALIPSO cloud measurements for both operational and reprocessed VIIRS CBH EDR are also calculated and visualized for different cloud optical depth (COT) ranges.
- The RWG start to work on drafting quality assessment paper for reprocessed VIIRS CTH and CBH EDR.
- The following figure shows the histograms of reprocessed (left), operational (middle) and CloudSat-CALIPSO (right) CTH (top) and CBH (bottom) data over April. of 2019:



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

Surface Type

September 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 September of 2024 for the production of AST-2024.
- The team has completed the development and validation of the AST2023 product:
  - This product has an overall accuracy of 78.1 ± 0.6%, which exceeded the 70% L1RD requirement (see highlights).
  - The AST23 product suite, which includes a 17-IGBP type map and a 20-EMC type map, has been delivered to JSTAR.
  - The surface type ATBD has been updated to reflect that NOAA-21 has reached validated maturity and has been integrated with NOAA-20 and S-NPP in the surface type mapping processing flow.

Overall Status:

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

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Monthly update of the 250m global water surface fraction product	Each M.	Each M.	Each M.	
Complete global monthly composites for each of 2024 months	Each M.	Each M.	Each M.	
Generate global annual classification metrics for 2023	May-24	May-24	May-24	
AST23 of IGBP 17 type map	Aug-24	Aug-24	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:

Accuracy Matrix of the AST2023 Product Derived Based on VIIRS Surface Reflectance Data Acquired in 2023

	Reference																		
AST	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	total	U Acc
1	2.10	0.03	0.06	0.05	0.28	0.00	0.01	0.23	0.03	0.00	0.03	0.01	0.01	0.03	0.00	0.00	0.01	2.86	73.25
2	0.00	8.46	0.00	0.08	0.12	0.00	0.00	0.39	0.09	0.03	0.00	0.05	0.02	0.05	0.00	0.00	0.00	9.28	91.15
3	0.04	0.00	1.09	0.00	0.11	0.00	0.04	0.11	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.41	77.48
4	0.00	0.00	0.01	0.95	0.07	0.00	0.00	0.09	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.14	82.94
5	0.19	0.12	0.33	0.74	3.65	0.00	0.00	0.62	0.07	0.00	0.04	0.02	0.00	0.17	0.00	0.00	0.00	5.95	61.34
6	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	51.79
7	0.17	0.07	0.11	0.07	0.17	0.09	11.18	0.71	0.37	1.64	0.26	0.34	0.04	0.11	0.00	0.65	0.04	16.00	69.89
8	0.25	0.19	0.04	0.28	0.15	0.03	0.28	5.27	0.56	0.10	0.07	0.04	0.03	0.22	0.00	0.00	0.01	7.50	70.23
9	0.03	0.20	0.00	0.08	0.05	0.25	0.48	1.18	4.67	0.25	0.05	0.35	0.00	0.50	0.00	0.00	0.00	8.08	57.76
10	0.06	0.01	0.00	0.01	0.06	0.08	0.88	0.30	0.31	6.29	0.00	0.49	0.03	0.10	0.00	0.27	0.01	8.90	70.62
11	0.01	0.00	0.00	0.00	0.01	0.00	0.08	0.04	0.08	0.01	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.73	68.42
12	0.01	0.01	0.01	0.02	0.05	0.02	0.07	0.06	0.17	0.43	0.02	7.06	0.07	0.44	0.00	0.00	0.01	8.44	83.64
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.38	0.01	0.00	0.00	0.00	0.42	89.23
14	0.00	0.13	0.02	0.09	0.06	0.02	0.07	0.43	0.45	0.17	0.00	0.23	0.02	2.64	0.00	0.01	0.01	4.35	60.78
15	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.17	0.00	0.00	0.00	0.00	10.02	0.00	0.00	10.36	96.72
16	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.14	0.00	0.05	0.00	0.00	0.00	12.80	0.10	13.37	95.71
17	0.02	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.00	0.00	1.03	1.13	90.77
total	2.87	9.21	1.66	2.37	4.80	0.53	13.55	9.44	6.82	9.24	1.00	8.67	0.60	4.28	10.02	13.72	1.22		
P Acc	72.97	91.86	65.74	39.94	76.04	6.88	82.52	55.81	68.43	68.04	50.13	81.45	62.11	61.77	100.00	93.26	84.13		

The values for the 17 IGBP classes and the row/column totals are area proportions in percentage (%). U Acc. and P Acc. are user's and producer's accuracies (%), respectively. The overall accuracy is 78.1 ± 0.6%, which exceeded the 70% L1RD requirement.

Vegetation Health

August 2024

Accomplishments / Events:

- After contractor work stoppage in July resulting from the STAR contract lapse, the team is back in August and 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
- Team back-tracked the VHP data for the past weeks when the user needed data and the webpage were stopped. Most missed data have been reprocessed with limited disk space on STAR servers. STAR weekly production of the value added data tailored for USDA users is still frequently interrupted because of either missing SDR granules or disk space shortage. A new 40TB disks has been granted by STAR IT team for the VHP project. Hopefully, the data stoppage issue will mitigated to some degree.
- 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.

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 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

Highlight: Comparison of Weekly VHP Data Files Generated from OSPO and STAR Productions.

		STAR				
year	week	SMN	SMT	VCI	TCI	VHI
2024	19	0.373	296.09	73.34	32.29	52.83
2024	20	0.392	296.91	70.15	35.22	52.7
2024	21	0.405	297.46	66.63	37.99	52.31
2024	22	0.414	297.79	62.57	40.81	51.69
2024	23	0.428	299	64.92	32.81	48.87
2024	24	0.435	299.33	65.55	32.52	49.04
2024	25	0.439	299.92	67.98	29.63	48.81
2024	26	0.438	300.42	68.31	27.1	47.71
2024	27	0.434	300.77	67.53	26.07	46.8
2024	28	0.427	300.93	66.9	26.9	46.9
2024	29	0.419	300.89	66.11	29.07	47.6
2024	30	0.41	300.7	65.99	32.35	49.18
2024	31	0.401	300.45	66.12	34.45	50.3
2024	32	0.392	300.22	66.95	34.57	50.77

		DIFF (OSPO-STAR)				
year	week	SMN	SMT	VCI	TCI	VHI
2024	19	-0.014	-0.94	-5.77	8.77	1.5
2024	20	-0.026	-2.02	-11.16	18.34	3.59
2024	21	-0.016	-0.18	-7.38	0.92	-3.22
2024	22	-0.007	0.65	-3.36	-6.69	-5.02
2024	23	-0.015	-0.73	-8.58	6.6	-0.99
2024	24	-0.024	-1.63	-13.29	15.87	1.29
2024	25	-0.013	-1.63	-7.86	15.91	4.02
2024	26	0.001	-0.87	0.26	7.71	3.98
2024	27	0.004	-0.09	2.05	0.63	1.34
2024	28	0.007	0.63	3.57	-6.36	-1.4
2024	29	0.004	0.51	2.07	-5.86	-1.9
2024	30	0.002	0.27	0.9	-3.01	-1.07
2024	31	0.002	0.28	1.04	-3.08	-1.04
2024	32	-0.002	0.03	-1.07	-0.57	-0.83

Vegetation Index and Green Vegetation Fraction

September 2024

Accomplishments / Events:

- Evaluated VI and GVF SNPP vs. NOAA-20 statistics for 2023 and 2024 (so far) for cal/ val report
- VI/ GVF integration with Vegetation Health progress:
  - Finished evaluation of the newly designed integrated system
  - Finished presentation to the land management
  - Started carrying out the integration

Overall Status:

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

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

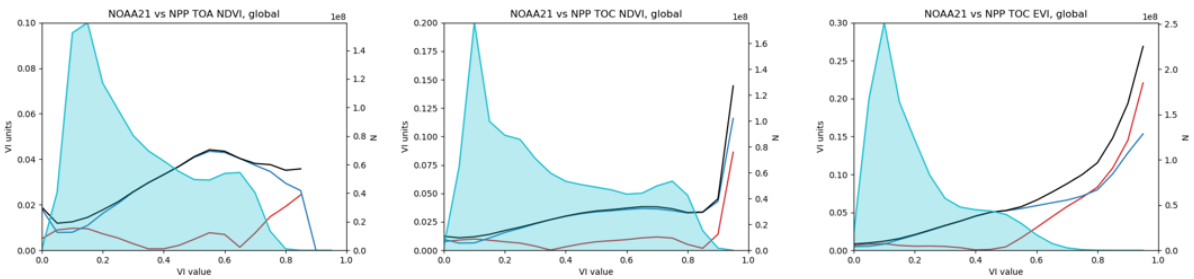
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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:

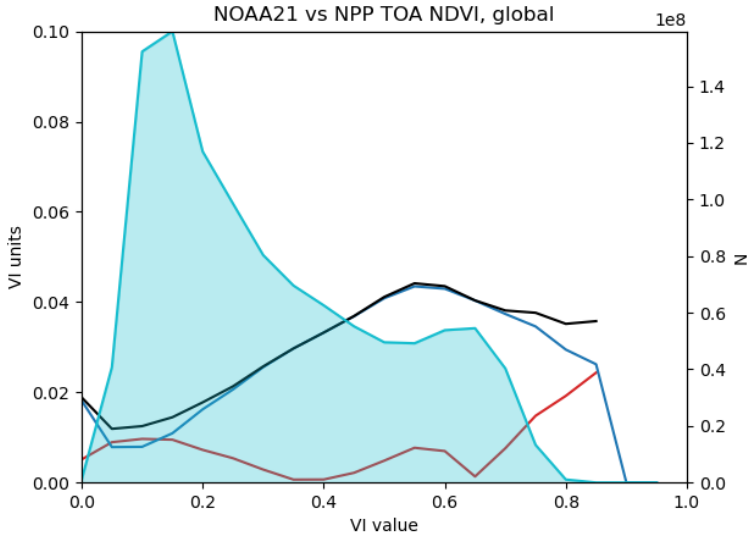
All statistics (mean difference, standard deviation, and RMS difference are less than 0.05, except for the highest values of TOC NDVI and TOC EVI, where there are few pixels.
This indicates continued consistent performance between SNPP and NOAA-20.

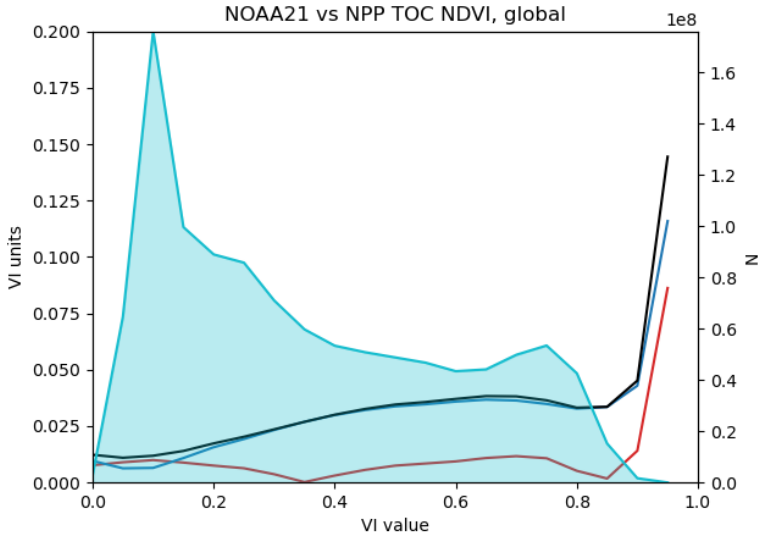


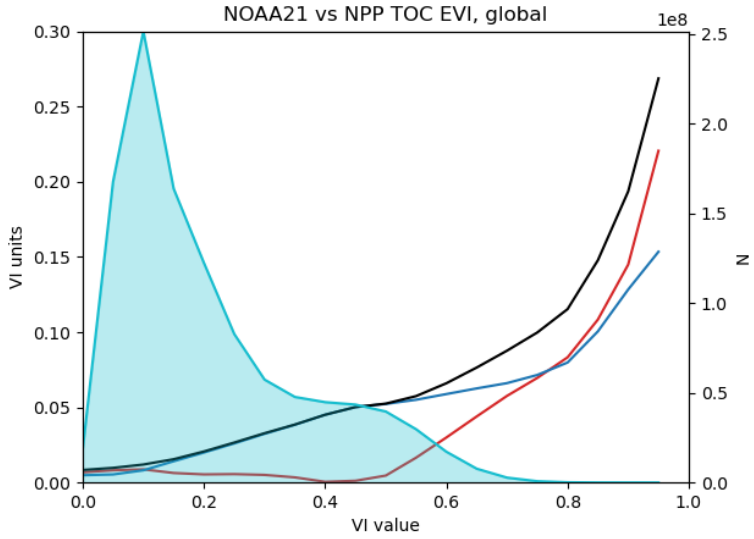
Mean difference
Standard deviation
RMS difference
Number of pixels

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.



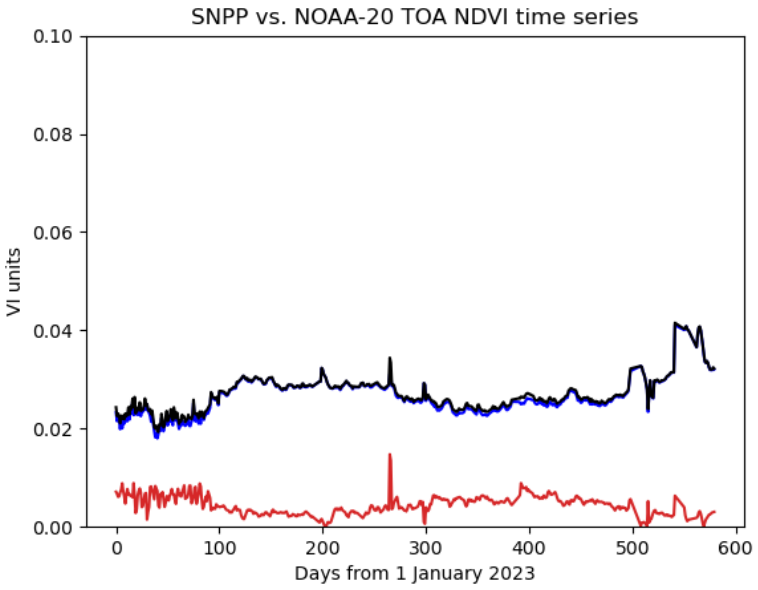


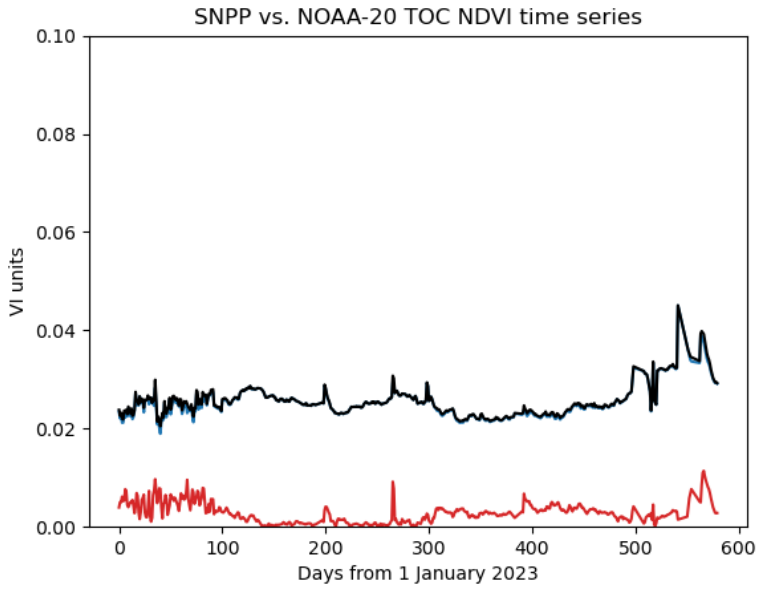


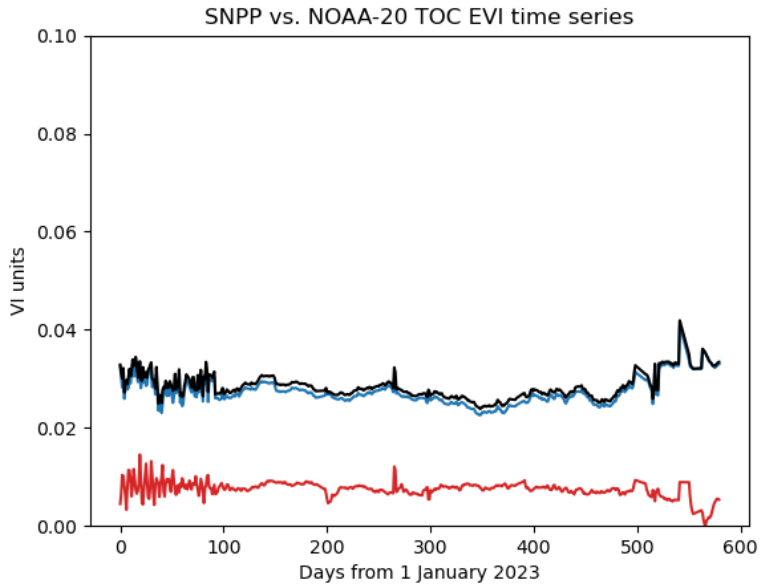
Mean difference
Standard deviation
RMS difference
Number of pixels

SNPP vs. NOAA-20 Vegetation Index for 2023 and 2024: Time series

All statistics (mean difference, standard deviation, and RMS difference are less than 0.05 across the time period (January 2023 – August 2024)
This indicates continued stable and consistent performance between SNPP and NOAA-20.



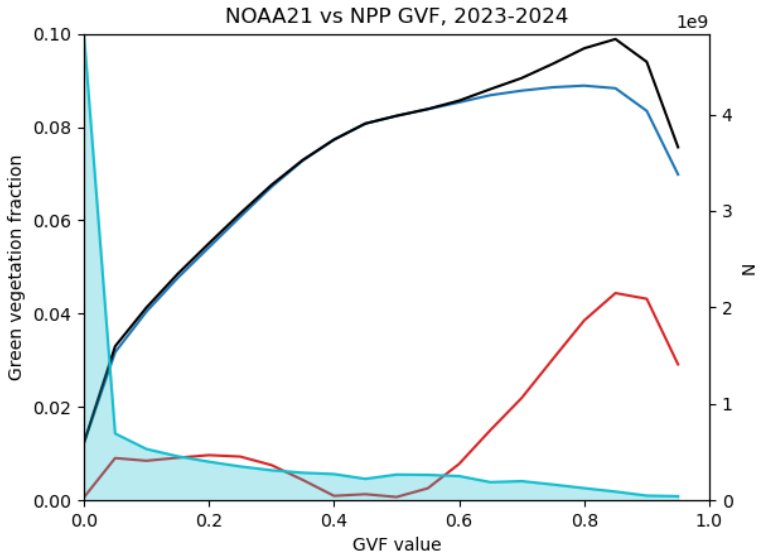




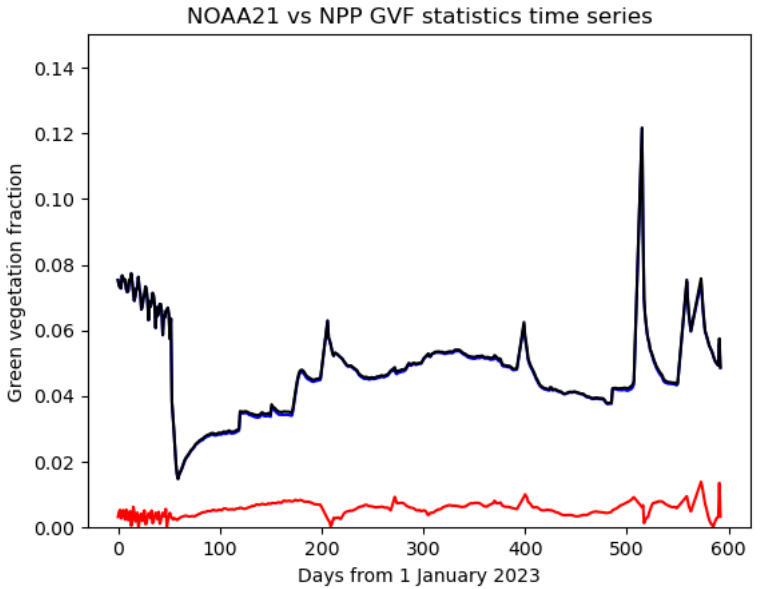
Mean difference
Standard deviation
RMS difference

SNPP vs. NOAA-20 Green Vegetation Fraction for 2023 and 2024: Stratified by GVF value and time series

All stratified statistics (mean difference, standard deviation, and RMS difference are less than 0.05, except for the highest values of GVF, where there are few pixels.
The time series statistics for GVF indicate that when there are gaps in the data, the differences between SNPP and NOAA-20 increase. This is likely due to differences in the 15-week history that result from the data gaps. This issue is under investigation.



Mean difference
Standard deviation
RMS difference
Number of pixels

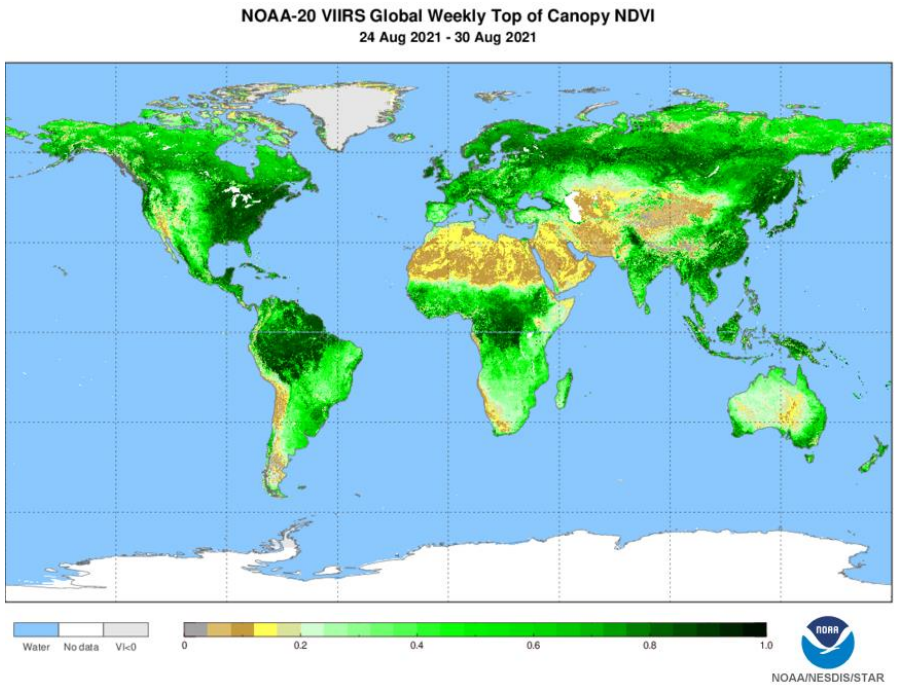


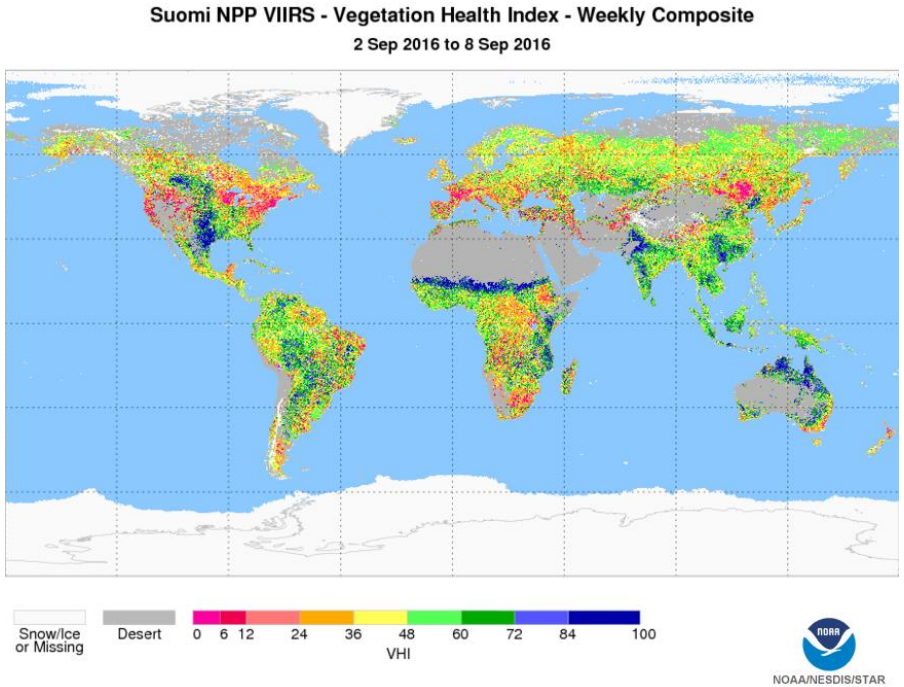
Mean difference
Standard deviation
RMS difference

Background: Integration of VI and GVF with Vegetation Health processing

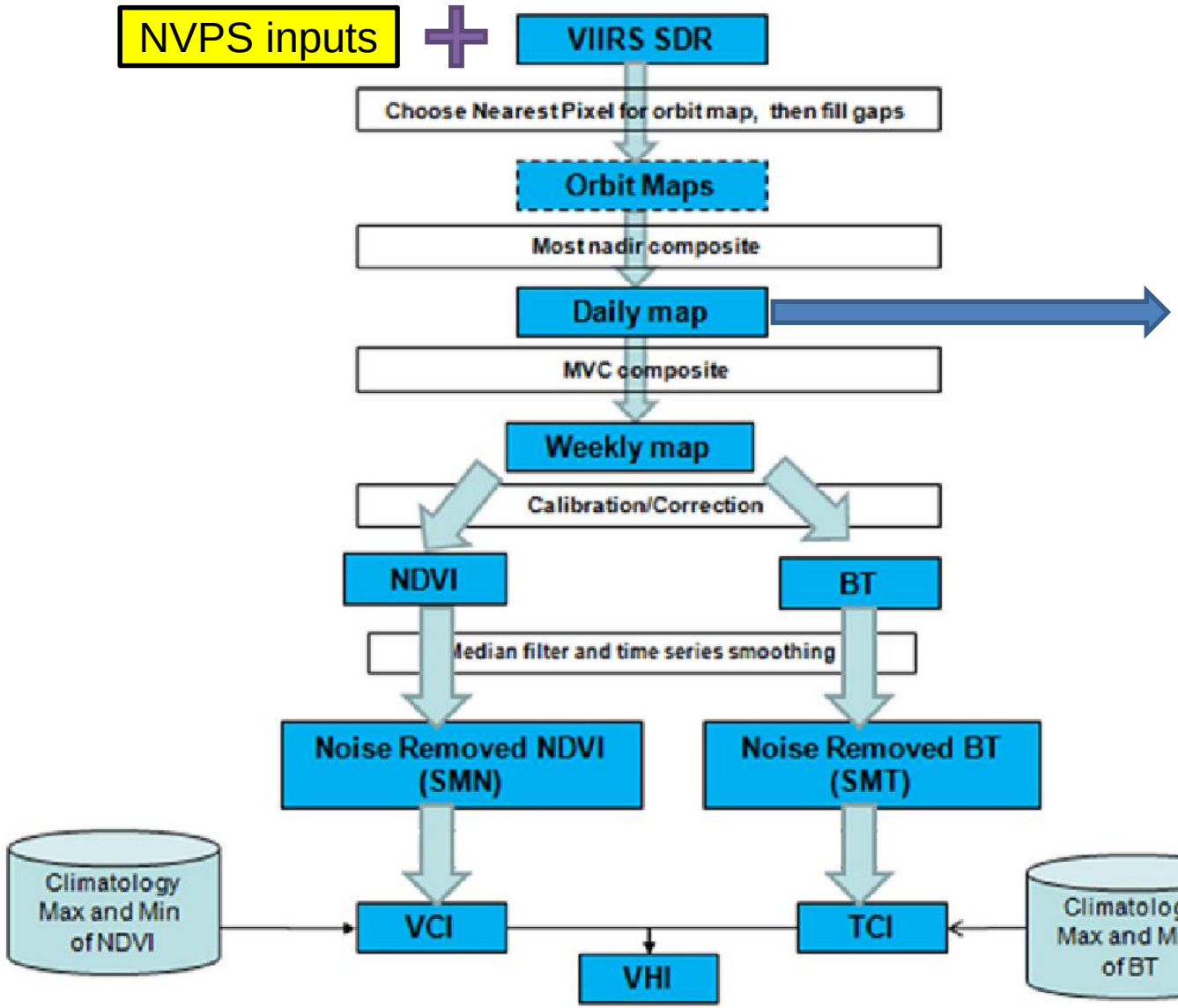
- NVPS (VI and GVF) and Vegetation Health Product (VHP) are the major three vegetation products at NOAA, providing comprehensive monitoring of vegetation health and environmental conditions, as well as playing key roles in the NOAA/NCEP/EMC land models and the USDA crop growth monitoring project.

- Currently, NVPS and VHP are separately produced at OSPO. Science teams are working on a way to combine, all or part of, both systems to save the duplicated efforts, release the computation resources, and improve the product quality.



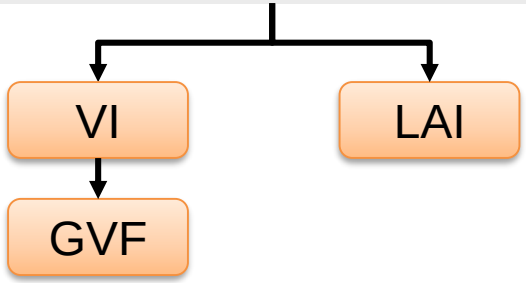


Integrated framework for VH/ VI/ GVF: feasible plan



Extended daily map

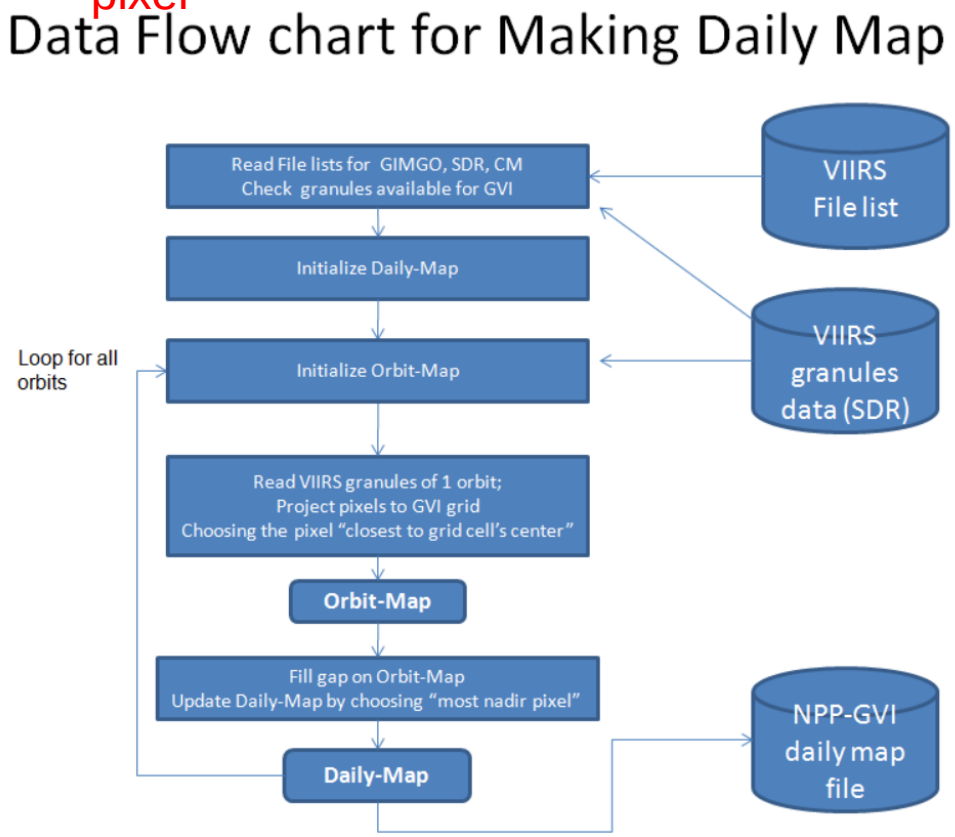
ADO_QCAll	ADO QCAll	2D
latitude	latitude	1D
longitude	longitude	1D
packed_cloud_mask	packed cloud mask	2D
PLATE_CARREE	PLATE CARREE	—
quality_information	percentage of optimal, suboptimal a...	—
reflectance_I1	reflectance I1	2D
reflectance_I2	reflectance I2	2D
reflectance_M3	reflectance M3	2D
sensor_azimuth	sensor azimuth	2D
sensor_zenith	sensor zenith	2D
solar_azimuth	solar azimuth	2D
solar_zenith	solar zenith	2D
SurfRefl_I1	SurfRefl I1	2D
SurfRefl_I2	SurfRefl I2	2D
SurfRefl_I3	SurfRefl I3	2D
SurfRefl_QF1	SurfRefl QF1	2D
SurfRefl_QF2	SurfRefl QF2	2D
SurfRefl_QF3	SurfRefl QF3	2D
SurfRefl_QF4	SurfRefl QF4	2D
SurfRefl_QF5	SurfRefl QF5	2D
SurfRefl_QF6	SurfRefl QF6	2D
SurfRefl_QF7	SurfRefl QF7	2D
temperature_I5	temperature I5	2D



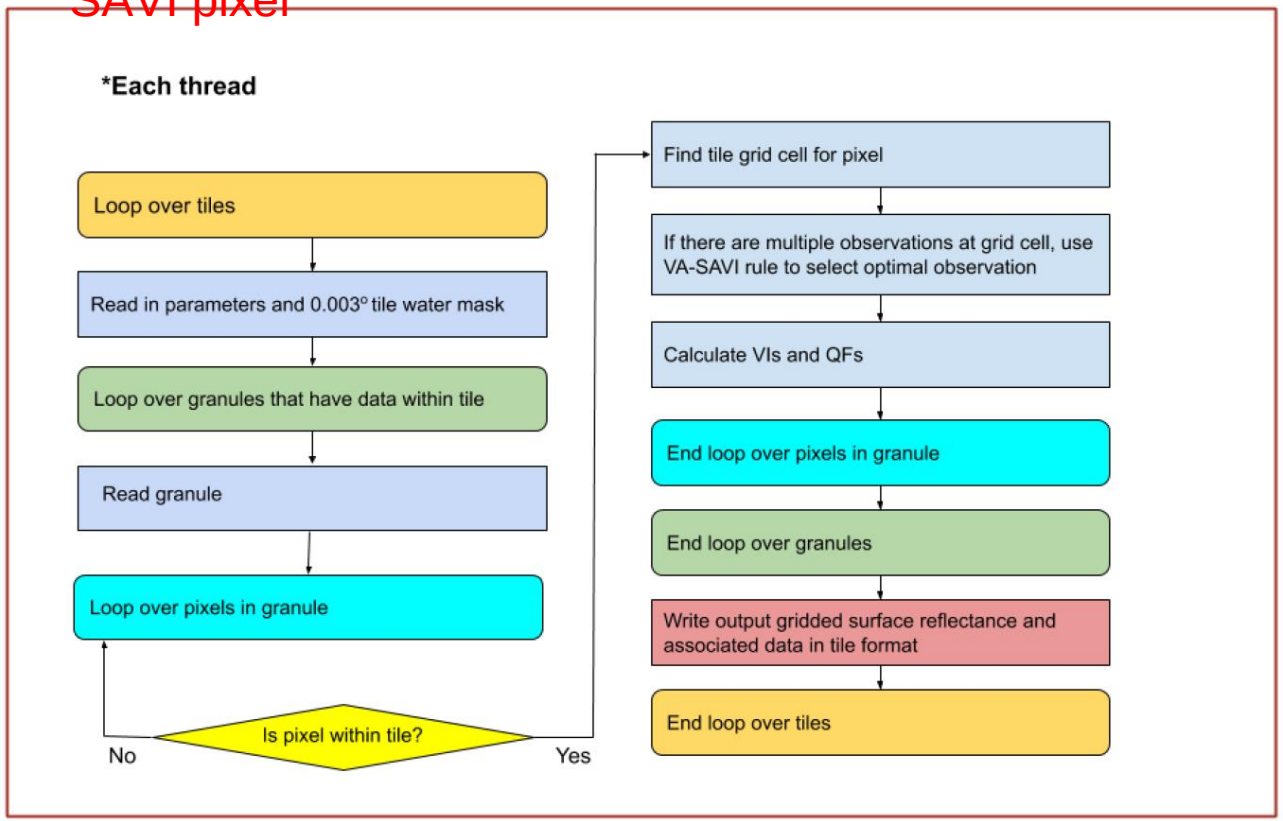
Integrated framework: challenges

- VH employs a different method from NVPS for gridding and mapping to produce the daily map

VH: orbit-by-orbit, choose most nadir pixel



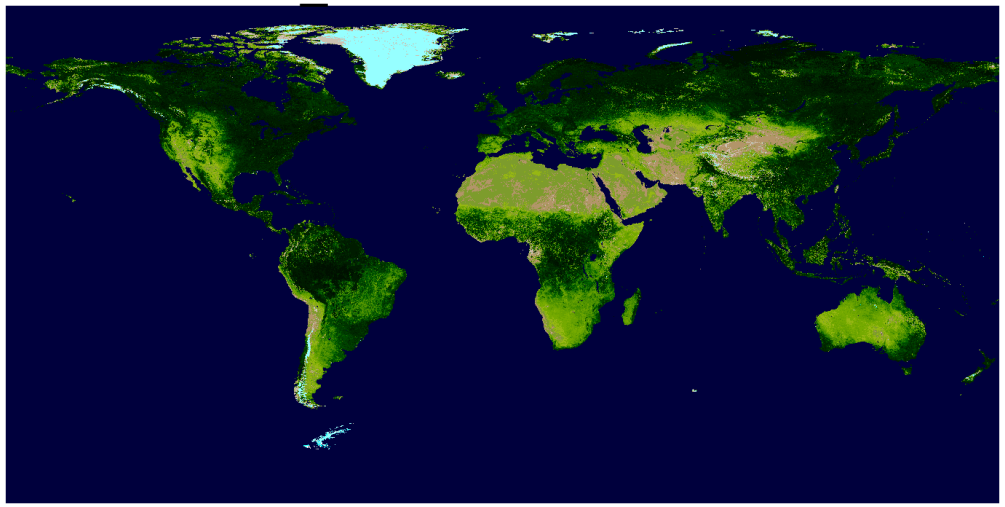
NVPS: pixel-by-pixel, choose maximum VA-SAVI pixel



Integrated framework for VI/ GVF and Vegetation Health: challenges

Procedure for generating daily map differs between VI/ GVF and Vegetation Health. Vegetation Health must stay consistent, so any changes would result in differences between current and future VI and GVF. These differences have not been evaluated yet.

Current NVPS weekly NDVI_TOC



VH generated weekly NDVI_TOC

Unknown

Difference

Unknown

NCEP/EMC uses NVPS GVF as one of their model inputs

Impacts on GVF product will be evaluated once Wei produces updated daily map for a certain period of time.

VIIRS SDR

September 2024

Accomplishments / Events:

- Supported the 9/24/2024 Suomi NPP GPS anomaly investigation by using geolocation validation system (CPM), off-line analysis of sample data (coastline images), and modeling using orbital perturbation: confirmed recovery from the anomaly at ~16:34 UTC on 9/27/2024
- After downloading from GRAVITE the required VIIRS SDR products, conducted checkout of the IDPS Block 2.3 Release Mx11 software deployed on DP-OE (POP) in AWS Pub Cloud
- Downloaded from the Field Terminal Support server, installed on a STAR Linux system (after modifying the source code for OS 9), and tested the ADL software based on IDPS release Mx11: verified that the recent problem with the Polar Wander data ingest has been resolved
- Generated 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 9/3/2024
- Published paper "NOAA-21 VIIRS Thermal Emissive Bands Early On-Orbit Calibration Performance and Improvements" in IEEE TGRS (https://ieeexplore.ieee.org/document/10677470)

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:

J3/J4 VIIRS granule size change test data for IDPS

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Complete SNPP VIIRS SDR 2012-2020 reprocessing delivery to CLASS	Dec-23	Dec-23	Oct-23	
SNPP and NOAA-20 VIIRS intermediate recalibration	Sep-24	Sep-24	4/15/2024	SNPP only
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		Export Control
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:

Alignment of Suomi NPP VIIRS SDR projected image with the Cyprus coastline before (left) and after (right) recovery from the spacecraft GPS anomaly on 9/24/2024: the geolocation errors are still visible on 9/27/2024 before the GPS reset at ~16:34 UTC

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

September, 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 applications currently utilize VIIRS M-bands. Research is being conducted to make use of the VIIRS I-bands in the VOLCAT workflow. One necessary step in this process is to create VOLCAT imagery using the I-band data so the VOLCAT output can be evaluated relative to the the 375-m I-band imagery. The included figure shows an example of the VOLCAT thermal/ash RGB image using the VIIRS M-bands and VIIRS I-bands for comparisons.
- 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. In September the science team continued work on identifying and reprocessing scientifically interesting cases (e.g., volcanic clouds, VOLCAT false alarms, etc.) 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: This figure demonstrates the higher spatial resolution VOLCAT thermal/ash RGB using VIIRS I-bands (right) compared to using only VIIRS M-bands (left). Differences are readily apparent, especially when viewed fullscreen.