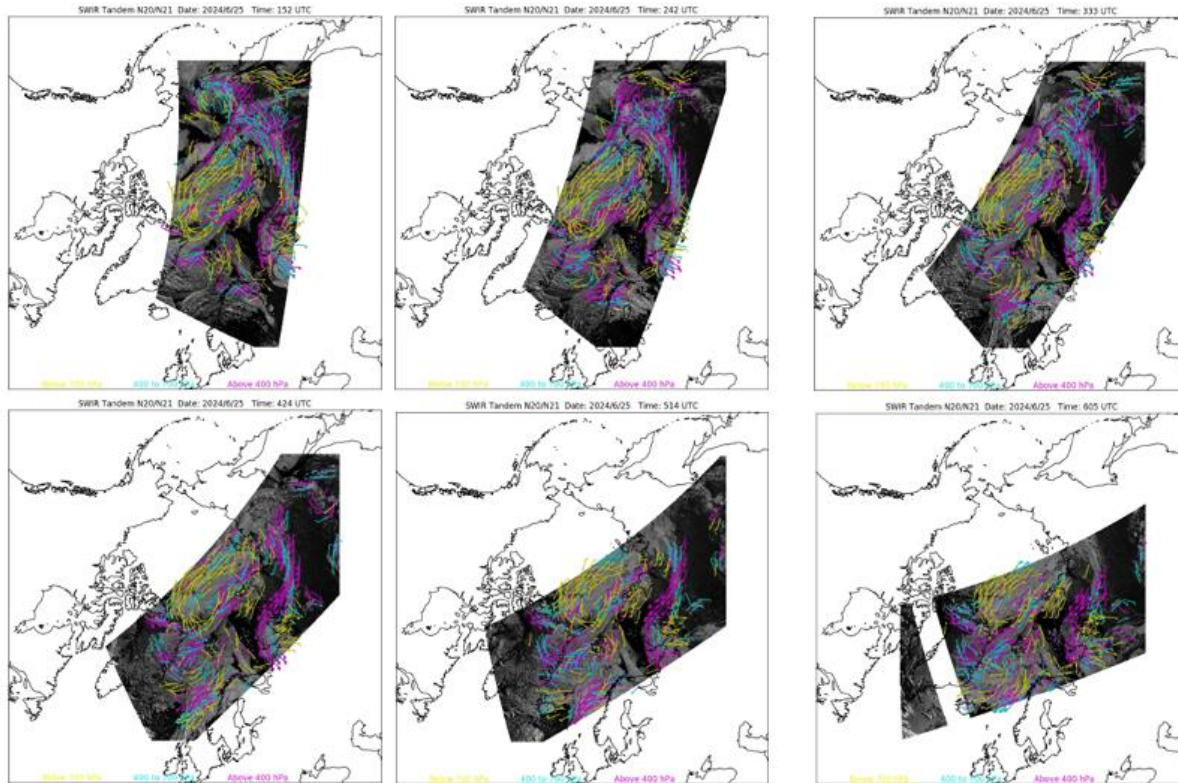**NOAA JPSS Monthly Program Office**

AMP/STAR
FY24 TTA

Lihang Zhou, LEO Satellite Product Manager
Ingrid Guch, Acting JPSS STAR Program Manager

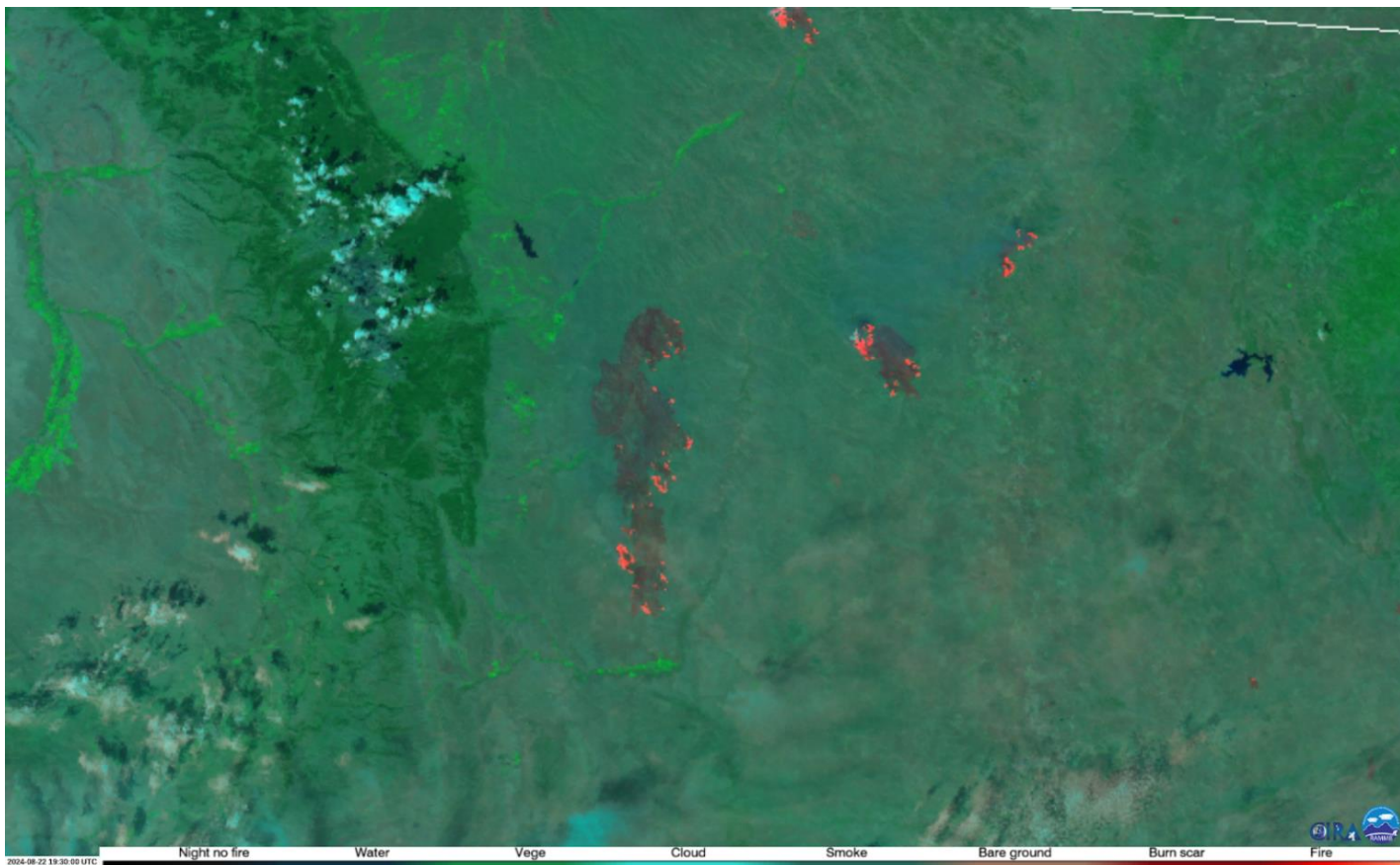September, 2024

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.

Figure. 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.

Wyoming Fires August 2024

Bill Line published a blog post titled "Wyoming Fires August 2024". The post shares GOES and VIIRS Imagery of several large wildfires that developed quickly in Wyoming in August, and how satellite imagery was used by NWS offices to communicate the threat. See Figure below. The link to the post can be found here.

Figure. 22 August 2024 VIIRS 375-m Day Fire RGB captures in detail hot spots and burn scars associated with several large Wyoming wildfires.

Accomplishments

Delivery Date	Delivery Algorithm Packages (DAPs) – Enterprise Products:	Recipient
8/02/24	This delivery is the second preliminary delivery of the Blended Flood Mapping CCAP (also known as Enterprise Flood Mapping, CCAP version 3.0).	NCCF
8/02/24	Patch Delivery for Ocean Color v1-3 to NCCF is now available on the S3 bucket. This patch includes an update to the output filenames for the Daily and Weekly Assembly units.	NCCF
8/02/24	Delivered Advanced Layer Precipitable Water System Maintenance Manual (SMM) documentation	NCCF
8/06/24	Patch delivery of the VegHealth v1-2 CCAP to NCCF for integration. This patch fixes a log being overwritten. The DATA tarball is not being redelivered as no changes occurred.	NCCF
8/06/24	This delivery is a full CCAP intended to become a part of the Community Satellite Processing Package (CSPP). This delivery is supposed to be functionally identical to the delivery of ACSPO SST L3S supplied to NCCF on April 17, 2024.	NCCF
8/15/24	Final delivery of the GAASP (AMSR-2) Soil Moisture v1-0 CCAP to NCCF for integration.	NCCF
8/19/24	Delivery of SRF v2-0 documents (EUM, SMM, ATBD)	NCCF
8/28/14	GAASP-Preprocessor (L1B) v1-1 patch CCAP to NCCF for integration. This patch corrects a bug that caused the sea ice file to not be used for the L1R correction and was introduced while changing to static compilation.	NCCF
9/04/24	Patch delivery for the Blended Hydro CCAP to NCCF for integration.	NCCF
9/09/24	GAASP-Ocean (AMSR-2: SST, SSW, CLW, TPW) v1-0 NDE migration Final CCAP delivery to NCCF for integration.	NCCF

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**
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**
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**
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**
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**
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**
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**
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**
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**
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**

NOAA-21 Cal/Val Maturity Reviews

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

Upcoming 2024 Maturity Reviews			
Product	Maturity Review	Review Date	Review Panel Recommendations
OMPS TC Ozone EDR (V8TOz)	Validated	9/19/24	
OMPS NP Ozone EDR (V8Pro)	Validated	10/24/24 (TBC)	
OMPS LP (SDR & EDR)	Validated	9/19/24	

JSTAR Code/LUT/Product Deliveries

Date	Remaining J2-Ready DAPs to NCCF

March, 2023 (Delayed to January 2025 (TBC))	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
	  o Science team V2.7LIMB for SNPP was delivered to ASSISTT on December 19, 2023
	  o Science team delivered for NOAA-21 (2.7LIMB N21 delivery to ASSISTT) March 18, 2024.
	• ASSISTT Deliveries
	  o NDE Migration & J2 Provisional RDR to L2 CCAP Preliminary CCAP delivered on June 20, 2024 (software code review)
	  o Final CCAP target date pushed to September 27, 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 TTA Milestones

Algorithm Updates DAPs/CCAPs	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
OMPS-NP (J2 LUT Delivery)	Jan-24	Jan-24	Delivered on January 4, 2024.	
ACSPO SST_v2 release version + patch to CCAP for MetOP	Jan-24	Jan-24	Delivered on January 16, 2024	
GBBEPx (Enterprise Fires I-Band update)	Jan-24	Jan-24	Delivered on January 19, 2024	
RAVE (Science bug fix)	Jan-24	Jan-24	Delivered on January 29, 2024	
Vegetation Health	Jan-24	Jan-24	Delivered on January 30, 2024	
GCOM RDR to ASD Converter (GRAC) - includes JAXA executable (AMSR-3)	Feb-24	Feb-24	Delivered February 02, 2024	
LST EDR J2 Provisional (updates to LSE)	Dec-23	Feb-24	Delivered on February 12, 2024.	
Ozone Mapping and Profiler Suite (OMPS) - V8TOs	Mar-24	Feb-24	Delivered on February 13, 2024.	
Multi-platform Tropical Cyclone Surface Winds Algorithm (MTCSWA)	Feb-24	Feb-24	Delivered on February 16, 2024.	
Land Surface Albedo	Mar-24	Mar-24	Delivered on March 6, 2024.	
Hyperspectral Enterprise Algorithm Package (HEAP) updated to NOAA-21	Mar-24	Mar-24	Delivered on March 11, 2024.	
LAI Initial Delivery	Feb-24	Apr-24	Delivered on March 28, 2024	
VOLCAT (Phase 1) NCCF implementation	Dec-23	Jan-25	SCR: August 17, 2023 Target CCAP Final: Dec 2024	Meteeosat incorporation
Cloud Mask J2 Validated; Separate unit for Ancillary files to be included	Jan-24	Nov-24	CCAP SCR :**September 20,** 2024 Target CCAP Final: November 21, 2024	Integration complexities - additional person assigned at ASSIST

FY24 STAR JPSS Milestones

Milestones (Algorithm Cal/Val and LTM)	Original Date	Forecast Date	Actual Date of Completion	Variance Explanation
FY25 Program Management Review (all teams)	Jun-24	Jun-24	**On-going**	PMRs completed for SDR teams and EDR PMRs are ongoing. Remaining PMRs as of 9/6 are, (1) Aerosols, (2) GCOM, (3) MOBY, (4) Flood products, (5) JSTAR PM Support
GOSAT-GW End to End	Aug-24	Aug-24	On-check	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.
AST-2023 (VIIRS Annual Surface Type)	Sep-24	Sep-24	Ready to be Delivered (9/6/24)	Maturity Review held on June 13, 2024. Beta and Provisional approved. Effective date 11/30/2023. Validated after final AST2023 delivery on 9/30/2024
Reprocessing and transfer of EDRs to CLASS	Sep-24	Sep-24		JSTAR Team is coordinating with the EDR teams, CLASS and NCEI
JPSS-3 pre-launch test data review/analyze (SDR teams); JPSS-3/JPSS-4 activities/reviews support	Sep-24	Sep-24	On-schedule and on-going following JPSS-3 and JCT schedules	ATMS and CrIS submitted Cal/Val plan for J4 ATMS and CrIS team delivered J3 sensor characterization report.
Maintain / Update ICVS (develop ICVS modules to support various activities: monitoring, inter-sensor comparison, …)	Sep-24	Sep-24	On-schedule and additional improvements are on-going	ICVS has implemented modules for NRT monitoring of NOAA-21 ATMS. OMPS-NM, OMPS-NP, CrIS, and VIIRS. ICVS demonstrated basic functions for LP using SNPP data as a proxy and is waiting to receive NOAA-21 LP data.
Maintain / Expand (to include JPSS-2 products) JSTAR Mapper	Sep-24	Sep-24	On-schedule	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.
Images of the Month	Monthly	Monthly	On-schedule and on-going;	

JPSS Milestones	Original Date	Forecast Date	Accomplishments	Variance Explanation
OMPS SDR (NP & TC Validated)	Mar-24	Mar-24	Attained Validated status – effective date depends on ADR10825 Solar Flux implementation planned for April 2024	
Clouds (V: Mar-24)	Mar-24	Mar-24	Provisional Review held (except for DCOMP and NCOMP): October 26, 2023; Attained Provisional effective March 30. **DCOMP and NCOMP Provisional Review occurred virtually on December 4, 2023,** and attained **Validated status** effective March 30.	
Aerosol AOD (V: Jun-24)	Jun-24	Jun-24	Attained **Validated** status effective March 30, 2023	
Aerosol ADP (V: Jun-24)	Jun-24	Jun-24	Attained **Validated** status effective March 30, 2023	
Volcanic Ash (V: Mar-24)	Aug-23	Aug-23	Attained **Validated** status effective March 30, 2023	
Cryosphere (B: May-23; P: Aug-23 for Sea Ice & Binary Snow; V: Feb-24 (SI & Binary Snow); V (other) :Jul-24	Jul-24	Jul-24	Ice Thickness/Age: Attained **Validated** status effective May 1, 2023. Snow Cover & Fraction: Attained **Validated** status effective May 1, 2023. IST and Ice Concentration: Attained **Validated** status effective May 1, 2023.	
Active Fires (V: Jul-24)	Jul-24	Jul-24	Attained **Validated** status effective March 30,2023.	
LST/LSA/SR/GVF/VI (P: Jan-24; V: Jul-24 to Jan-25 FY25)	Sep-24	Sep-24	LST: Attained **Validated** status effective June 23, 2023. Surface Albedo: Attained **Validated** status effective August 30, 2023. Surface Reflectance: Attained **Validated** status effective Nov. 1, 2023. GVF, VI: Attained **Validated** status effective June 23, 2023.	
Vegetation Health (V: Apr-25 FY-25)	FY-25	FY-25	Attained **Validated** status effective March 30, 2023	
Ocean Color (B/P: Jan-24; V:Jul-25 FY25)	Jan-24	Sep-23	Attained **Validated** status effective March 1, 2024, to coincide with data availability from the NOAA CoastWatch program and MSL12 version 1.61 algorithm LUTs	
SST (V: Aug-24)	Aug-24	Aug-24	Attained **Validated** status effective March 20, 2023	
VPW (B/P: Jan-24; V: Mar-24)	Mar-24	Mar-24	**Attained Validated status effective November 16, 2023.**	
VFM (V: Jan-25)	FY-25	FY-25	Attained **Validated** status December 14, 2023.	
NUCAPS P: Jan-25; V: Mar-Jun-24)	Jun-24	Jun-24	Attained **Validated** status effective September 26, 2023.	
MiRS (V:Oct-24)	Oct-24	Oct-24	Attained **Validated** status effective May 12, 2023	
SFR (P: Feb-24; V: May-24)	May-24	May-24	Attained **Provisional status- effective** upon v2r0 algorithm currently planned for July 2024. Validated maturity is expected (in May 2025) after collecting more data in the spring. However, based on the material presented and considering the fact that the NOAA-21 SFR already meets the requirement, the JPSS Program is considering approving validated maturity.	
OMPS NP EDR V8Pro & V8TOz & V8TOS (V: Mar-24)	Mar-24	Mar-24	OMPS NP EDR V8Pro Attained Provisional Effective June 20, 2023. OMPS NP EDR V8Toz Attained Provisional September 19, 2023. **Validated review for V8TOz TC is planned for 9/19/2024. Validated review for OMPS NP V8Pro is planned for 9/19/24 awaiting majority of personnel from the Contract Bridge.**	
OMPS LP (B: Jan-24; P: Feb-24; V:Sep-24	Sep-24	Sep-24	**Beta and Provisional Review held on 04/25/2024.** The effective Provisional maturity date is upon implementation of the improved ephemeris handling software. Validated maturity is planned for 9/19/24..	

FY24 STAR JPSS Milestones

Operational/Program Support	Original Date	Forecast Date	Actual Completion Date
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, **07/30/24, 08/06/24, 8/13/24, 8/20/24, 8/27/24, 09/3/24**
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	12/05/23, 12/19/23, 01/03/24, 01/17/24, 01/30/24, 02/13/24, 02/27/24, 03/12/24, 03/26/24, 04/08/24, 04/23/24, 05/07/24, 05/21/24, 06/04/24, 06/18/24, 07/02/24, 07/16/24, **07/30/24, 08/13/24, 08/27/24**
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24 6/12/24, 7/12/24, **8/11/24**
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, **07/30/24, 08/06/24, 8/13/24, 8/20/24, 8/27/24, 09/3/24**
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	11/28/23, 12/12/23, 01/03/24, 01/10/24, 01/23/24, 02/06/24, 02/21/24, 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24, 05/14/24, 05/28/24, 06/11/24, 06/25/24, 07/09/24, 07/23/24 **08/06/24, 08/20/24, 09/03/24**
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains,	Monthly	Monthly	12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24 7/16/24, **8/12/24**
NOAA-21: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	12/5/23, 12/12/23, 12/19/23, 01/03/24, 01/10/24, 01/23/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/12/24, 03/19/24, 03/26/24, 04/02/24, 04/09/24, 04/16/24, 04/23/24, 04/30/24, 05/07/24, 05/14/24, 05/21/24, 05/28/24, 06/04/24, 06/11/24, 06/18/24, 06/25/24, 07/02/24, 07/09/24, 07/16/24, 07/23/24, **07/30/24, 08/06/24, 8/13/24, 8/20/24, 8/27/24, 09/3/24**
NOAA-21: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	11/28/23, 12/12/23, 01/04/24, 01/10/24, 01/17/24, 01/23/24, 01/30/24, 02/06/24, 02/13/24, 02/21/24, 02/27/24, 03/05/24, 03/19/24, 04/02/24, 04/16/24, 04/30/24, 05/14/24, 05/28/24, 05/28/24, 06/11/24, 06/25/24, 07/09/24, 07/23/24, **07/30/24, 08/06/24, 08/20/24, 09/03/24**
NOAA-21: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	12/18/23, 01/22/24, 02/15/24, 03/18/24, 4/15/24, 5/13/24, 6/12/24, 7/12/24, **8/12/24**
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;** OPS Sep 17 TTO: Sep 19, 2024

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																							◆										

Legend: Milestone Forecast | Review(EOY) | mDAP | PMR | ILUT | fLUT | IPlan | fPlan | Beta | Prov | Val | Milestone Complete

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
Active Fires: Suomi NPP / NOAA-20 NOAA-21 data analysis and feedback																							◆										
LST: SDR and EDR Support to JPSS-3 Data System Test Event in early 2024																		◆															
LST: Experimental Development of high spatial resolution LST																			◆														
LST:SDR and EDR Enterprise Cal/Val Plan Initial Updates																				◆													
LST: CCAP final delivery-All weather LST																						◆											
LST: Monitoring and Anomaly watch, analysis and report																							◆										
VI & GVF: 1km global VIIRS GVF code and documentation ready for delivery																		◆															
VI & GVF: Experimental data test of blended VI and GVF products																			◆														
VI & GVF: Support to JPSS-3 Data System																			◆														
VI & GVF: Operational readiness for NCCF migration																						◆											
VI & GVF: Calibration/ Validation update for SNPP and NOAA20 VI and GVF products,																							◆										
OCC: Continue VIIRS Cal/Val data analysis (SNPP, NOAA-20, and NOAA-21)																							◆										

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

STAR JPSS Schedule: TTA Milestones

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

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

18

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
SST: SST EDR Enterprise Cal/Val and ACSPO Algorithm "Agency Report" Presentation to GHRSST science community																				◆													
SST: SST EDR Enterprise Cal/Val Plan Initial Updates																					◆												
SST: Promote experimental iQuam updates to live access																					◆												
VFM: Addition of CAMEL emissivity database for the emissivity first guess																							◆										
NUCAPS: Mission-long reprocessing of NOAA-21 NUCAPS products: Reprocessing version and evaluation of reprocessed products																				◆													
SFR: Enterprise SFR science code delivery to ASSISTT including N21 provisional maturity SFR																		◆															
OMPS EDR: Reprocess NPP V8Pro for 2023																		◆															
OMPS EDR: Reprocess N20 V8Pro for full record																				◆													

Color code:

Green: **Completed Milestones**

Gray: **Ongoing FY24 Milestones**

Active Fires

Accomplishments / Events:

- On July 18, Ivan Csiszar gave a Spanish-language lecture on Active Fire Detection and Characterization, including VIIRS capabilities and products, at the virtual session on fires of the AmeriGEO course "Multivariate Risk Analysis based on Earth Observations"

- On July 31, Ivan Csiszar participated in a discussion with representatives of Senegal's Centre de Suivi Écologique (CEC; Ecological Monitoring Center) on NOAA's VIIRS fire monitoring activities

- Ivan Csiszar worked on restoring the creation of tailored / reformatted VIIRS I-band data for external partners
  - production resumed on August 2

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		
eFire NOAA-21 validated maturity analysis	Jul-24	Jul-24		
ASSIST, NCCF and DB I&T support	Dec-23	Dec-23	Dec-23	
Reactive maintenance of Suomi NPP, NOAA-20 and NOAA-21 I-band NDE and NCCF products	Sep-24	Sep-24		
Suomi NPP / NOAA-20 NOAA-21 data analysis and feedback	Sep-24	Sep-24		

Highlight: VIIRS fire detections in Senegal

N21 January 28, 2024
VIIRS I-band daytime

N21 January 28, 2024
VIIRS I-band nighttime
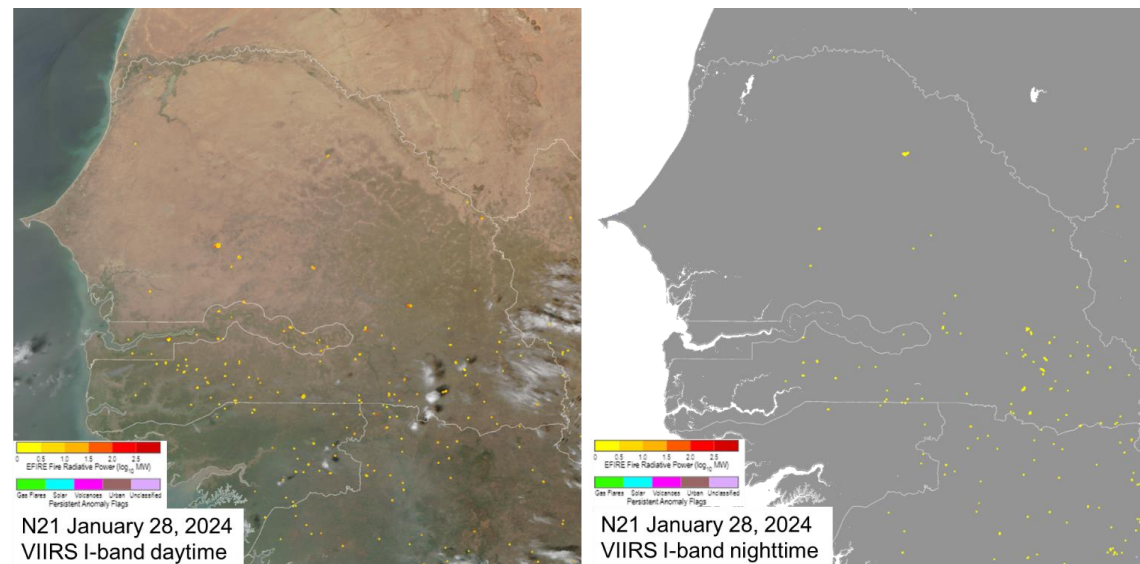
An example of VIIRS fire data in Senegal, presented at the NOAA - CEC meeting on fire monitoring

Aerosol

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:

Socioeconomic demographics in Cold vs Hot spots (Atlanta, 98th percentile $PM_{2.5}$ (low sample count pixels removed))
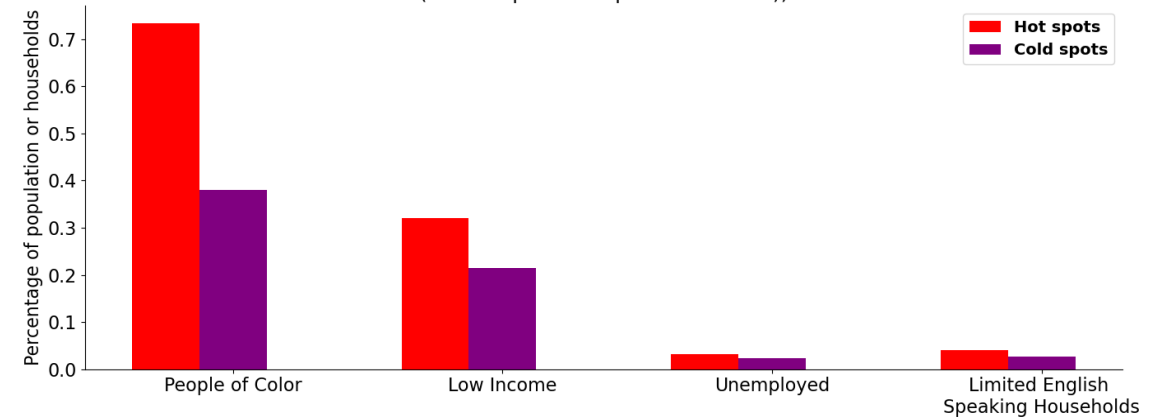
Statistics in the figure show analysis for Atlanta where hot spots and cold spots are those areas with high and low fine particle pollution respectively based on Moran's I analysis

ATMS SDR

Accomplishments / Events:

- Evalue IDPS B2.3 Mx 11 SOL and I&T string ATMS SDR/GEO sample data to support JPSS ATMS operational data processing system upgrade pre-launch review activities. Both SOL and I&T sample data sets of NOAA-21, NOAA-20, and S-NPP are compared to current operational data from IDPS B2.3 Mx10 to verify the data quality. The science data content, including radiance and geolocation, comparison results are submitted in the checkout/review report. The analysis results indicate that there is no discrepancy between current operational and upcoming released upgraded data. ATMS SDR team approves the TTO of new IDPS based on ATMS analysis results. Shown in Figure 1 is the NOAA-21 ATMS channel 8 I&T and operational SDR discrepancy map on August 29, 2024. The light color indicate a zero difference between two data sets.

- Update the ATMS 2-W shelf temperature calculation coefficients based on the telemetry data book provided by NG ATMS team. Some data conversion description in previous JPSS ATMS RDR data book is missing the key sentence in the selection of coefficients in K/Ka and V-band 2-W shelf temperature calculation from original measurements. STAR ATMS, NASA ATMS, and MIT-LL ATMS team, as well as NG, work together to have the coefficients verified and included in the Matalab version TVAC analysis package developed by MIT-LL ATMS team.

- Finalized a presentation draft that comprehensively outlines the impacts to the STAR ATMS Cal/Val Team workflow related to clarified restrictions of having CUI EAR/ITAR information on NESDIS and STAR computing assets.

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

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			
Review/Checkout of IDPS Mx Builds SOL and I&T Deploy Regression data	Sep-24			
Review of JPSS-3/4 ATMS pre-launch data to provide Ground support	Sep-24			
Conduct maintenance including anomaly resolution of on-orbit ATMS sensors	Sep-24			
Provide support to Metop-SG Joint Cal/Val Activities	Sep-24			

Highlights:

Figure 1. NOAA-21 ATMS channel 8 SDR bias between IDPS B2.3 Mx11 I&T and Mx10 operational data on August 29, 2024

NOAA-21 ATMS SDR Brightness Temperature Bias (Mx11 I&T - OPS)
Ch.8 54.94 GHz QH-POL
29 Aug 2024
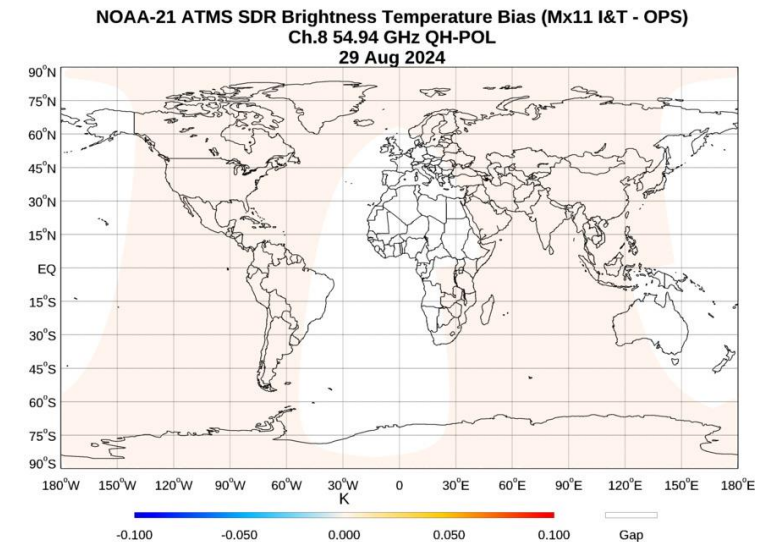
Accomplishments / Events:

- 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 manner.

- Analysis of the COMP from ACHA to replace NCOMP is ongoing as well as the ECM type as a replacement for the cloud type algorithm

- 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 Cloud team is working closely with ASSISTT to know when the code is ready for us to check out.

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:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Develop VIIRS/CALIOP validation tools for JPSS-2	Dec-22	TBD	Jun 23	Code completed but requires N21 data to test
Integrate latest Enterprise Cloud Mask (ECM) version within NDE	Dec-22	Dec-22	Mar-23	A future update will be made post Provisional
Prepare Cloud Base Height (CBH)/Cloud Cover Layers (CCL) algorithm transition and operation for JPSS-2	Jan-23	Apr-23		Algorithm is being evaluated for Prov maturity
Integrate new ECM lookup table to allow easier threshold changes	Mar-23	Sept-24		Validation of the new LUT is ongoing
JPSS-2 Beta Review (ECM)	Apr-23	Jun-23	June-23	Changed due to Transmitter issue
Validate CCL that was recently delivered, especially convective/supercooled layers as part of CCL Beta review	Jul-23	Dec-24		Ongoing
NOAA-21 Cloud Products Beta Maturity	Jul-23	Nov-23		COMP at end of Nov. Others Prov
NOAA-21 Cloud Products Provisional Maturity	Aug-23	Nov-23		COMP at end of Nov. Others Prov
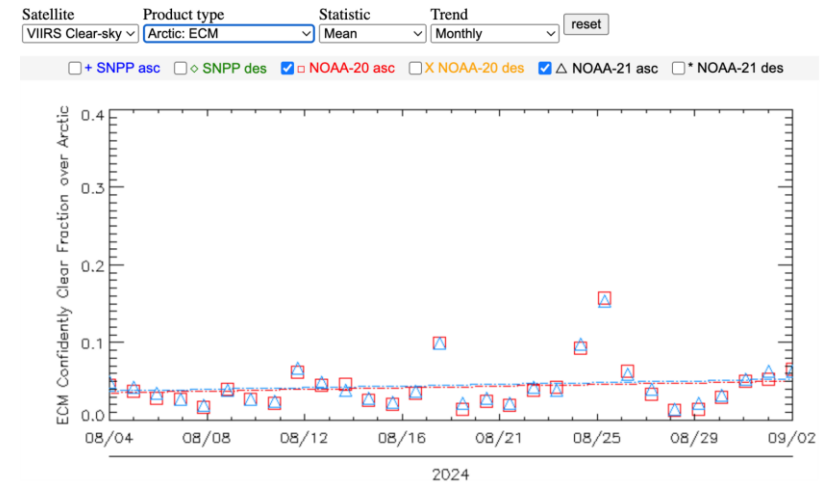
Figure 1.Example of the LTM trends of SNPP and NOAA-21 cloud mask for August 2024 for the ascending node for the arctic. The Arctic is extremely important to look at the performance of the ECM due to the challenging conditions in the region.

Accomplishments / Events:
- Performed an analysis of JPSS-4 CrIS Neon lamp data, including the calculation of the derived metrology laser wavelength Standard Deviations and SNR. Made corrections to the laser temperature telemetry scaling parameters for JPSS-4 CrIS. (**Fig. 1**)
- Compared the daily 2023 and 2024 earth eclipse exit imaginary radiance spikes for NOAA-21. (**Fig. 2**). Noted that overall occurrences of the seasonal maxima in the Imaginary Radiance increase events had decreased in 2024 (blue) compared to 2023 (orange).
- Assessed MX11C_SOL CrIS SDR data. (**Fig. 3, 4**). Resolved the discrepancy in the radiometric and noise differences in the RDR data. submitted the Mx11C SOL checkout Report
- Documented PCA NEdN calculation for CrIS algorithm flow. (**Fig. 5**)
- Made improvements to the CrIS-ABI Intercomparison tool (**Fig. 6**)
- Assessed the re-calibration of the JPSS-4 ICT A1 (Side 2) PRTs by assessing the ECT residuals (**Fig. 7**). This is to confirm that the A1 ICT PRT, when re-calibrated and when implemented into the CrIS radiance calibration, produces expected brightness temperature measurements when looking at the TVAC ECT with a known 287K temperature (i.e, a minimal ECT residual).
- Investigated invalid/degraded scan on 29 August 2024 for S-NPP CrIS. (**Fig. 8**)
- Drafting a technical report on the JPSS CrIS spectral calibration process.
- Supported the recovery of the SNPP CPD reset by assessing the radiometric, spectral, and geolocation accuracy of SNPP CrIS
- Delivered the "*Application Discovery Workbook – CrIS SDR*" to OCS as part of the cloud migration process on August 2, 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	X	X	See Issues/Risks
Schedule			X		See Issues/Risks

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

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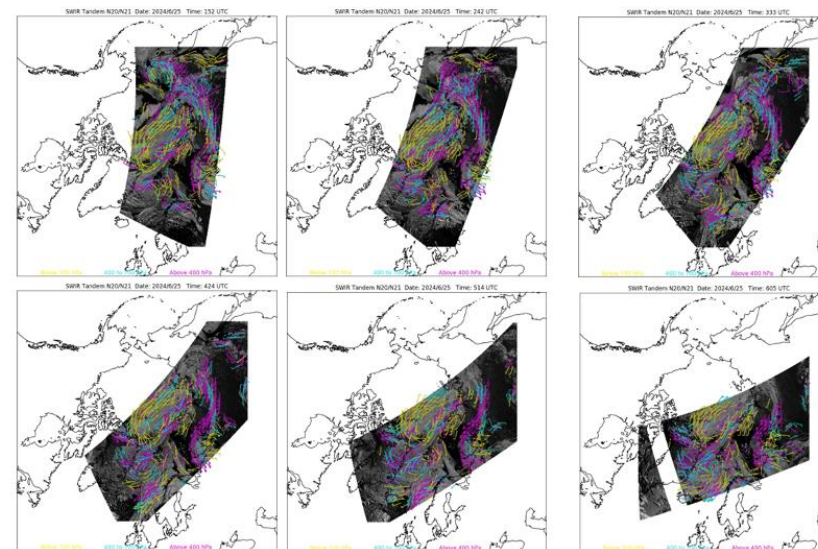**Red:** It has been announced that JPSS-4 TVAC data and documents are now ITAR. STAR IT does not have a secured environment to host or process ITAR data.
Yellow: The CrIS Team is still in need of hardware resources. Presently, there is only two servers dedicated to 6 CrIS Team members. Access to additional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

Highlights:

(1) Computed SNR in dB for both sweep directions for Side 1 (left panel) and Side 2 (right panel). The background colors denote the data collection plateaus with blue=PFL, green=MN, and red=PFH.

(4) Statistics of the radiometric noise difference between MX10 (operational) and MX11C_SOL (Cloud generated product) during the orbit 09015

(7) ECT Residuals and ICT Bias JPSS-4

(2) Comparison of 2023 & 2024 Imaginary radiance spikes for NOAA-21

(5) CrIS PCA NEdN calculation algorithm flow.

(3) Brightness temperature differences between Mx11 SOL and Mx10 OPS SDR data for the LWIR band. Some granules over the south pole show radiometric bias greater than 0.1 K

(8) S-NPP CrIS overall SWIR data quality flag on 29 August 2024 showing the missing granules, the degraded and invalid scans of the ascending orbits.

(6) Example ABI-CrIS intercomparison between GOES-18 ABI and NOAA-21 CrIS.

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		
Review/Checkout of IDPS Mx Builds SOL and I&T Deploy Regression data	Maintain	Sep-24		
Perform the transition of Cal/Val activities to the Cloud environment	Maintain	Sep-24		
Conduct maintenance including investigation and anomaly resolution of on-orbit CrIS sensors	Maintain	Sep-24		
Provide Support to Metop-SG Joint Cal/Val Activities	Maintain	Sep-24		

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.*
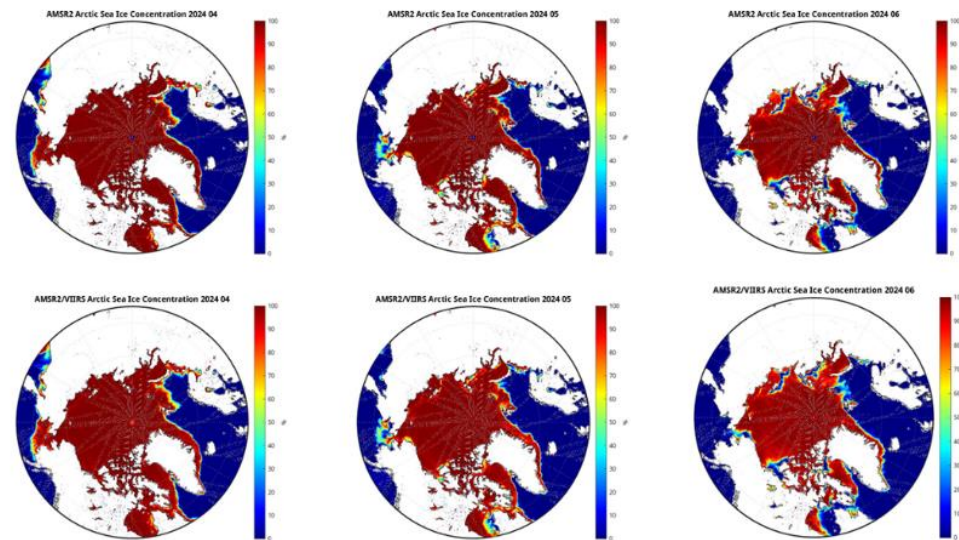
Issues/Risks:

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.

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

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.

Accomplishments / Events:

- Updated and transitioned a user-friendly vector display web page to operational website to provide interactive function for selected LTM trending products covering 3 JPSS missions. Shown in Figure 1 is the vector display page of S-NPP ATMS scan drive main motor current lifetime orbital mean trending time series.

- Implement the ATMS K/Ka and V-band 2-W shelf temperature updated coefficients in ICVS ATMS LTM package to provide accurate instrument health status trending monitoring for 3 ATMS sensors. The differences are less than 0.2 K by adopting new coefficients.

- Continue to monitor NOAA-21 CrIS solar intrusion impact on SDR data quality. This annual event has finished by end of August, 2024. Shown in Figure 2 is the N21 CrIS overall QF.

- Updated a beta version of OMPS NM and VIIRS M1 inter-sensor code to a high latitude area (ARM site) and added the function to the beta ICVS website, help detecting anomalous features of the data.

- Explored the feasibility of capturing OMPS NM geolocation errors using a ML method.

- Updated the CrIS-ANO SNO package to a Python version in support of cloud migration.

- Completed a beta version of the ICVS cloud migration discovery workbook (a big effort).

- Discussed possible updates in the ICVS user manual and delayed it to alter time due to its lower priority.

Overall Status:

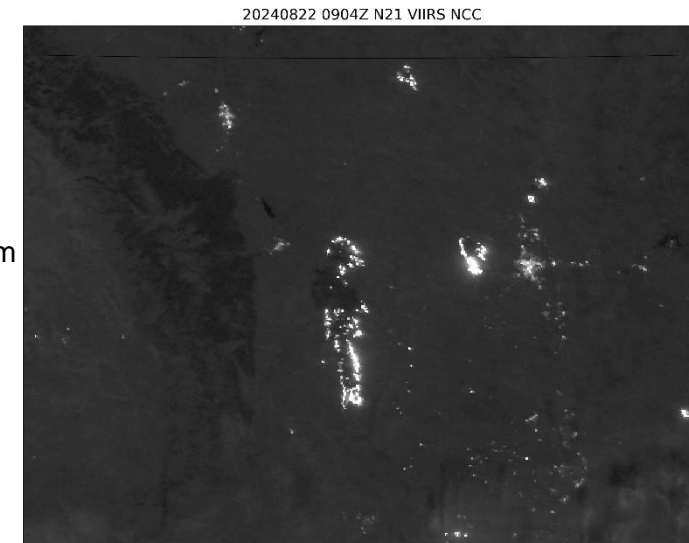|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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:

Frequent crash of processing servers may lead to the delay of NRT trending in ICVS website

Highlights:

Significantly contribute to STAR SDR Teams

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		
Initialize an ICVS core-function prototype in cloud environment	Sep-24		
Develop new ICVS modules to support J3/J4 prelaunch testing	Sep-24		
ICVS maintenance for SNPP/NOAA-20/NOAA-21 (including 3D-ATMD hurricane tool)	Sep-24		

(a) S-NPP ATMS scan drive main motor current in vector display page

(b) NOAA-21 CrIS overall quality flag indicating the end of solar intrusion impact on SDR data quality
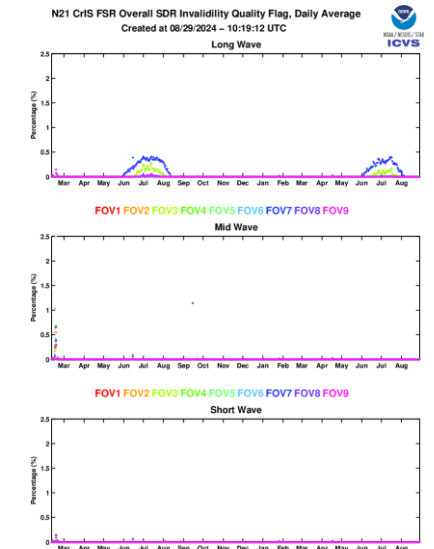
VIIRS Imagery

Accomplishments / Events:

- Completed update of VIIRS Imagery Cal/Val Plan for J3/J4
- Provided review of VIIRS Imagery for IDPS Block 2.3 Mx11 SOL
- Presentation: Jorel Torres presented for Aug 8 Satellite Book Club:
  - "CIRA SLIDER: the JPSS Sectors"
- Media: VIIRS Imagery of Iceberg A23a featured by NPR and Washington Post
- Blog Posts with VIIRS Imagery
  - Wyoming Fires August 2024
- 21 VIIRS Imagery Posts on CIRA Social Media (X) this Month. A few posts:
  - VIIRS Nighttime Microphysics RGB of AK fog (8.4K views)
  - VIIRS Day Fire RGB of California Park Fire (8.8K views)
  - VIIRS NCC Imagery of aurora borealis over NA (23.6K views)

Overall Status:

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

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

Issues/Risks:

Highlights: Image of the Month

Figure: 0904 UTC 22 August 2024 NOAA-21 VIIRS DNBNCC Imagery over Wyoming Wildfires, highlighting glow from wildfire flames, along with burned area.

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

Leaf Area Index

Accomplishments / Events:

- Continue work on the LAI time series reconstruction using the machine learning method, focus on the data transform method, outliers' detection, and reconstruction algorithm evaluation.

- Compared the machine learning methods for fcover retrieval from VIIRS surface reflectance data, used the best method to estimate a whole year's fcover data in Maryland.

- Keep working on the LAI in-situ validation, collected the existing field campaign data and explore the matched VIIRS data for the LAI reprocessing.

- Start to develop the LAI product monitoring tools, including the 8-day global LAI map for visual check, statistics comparison with the climatology for abnormal detection.

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.
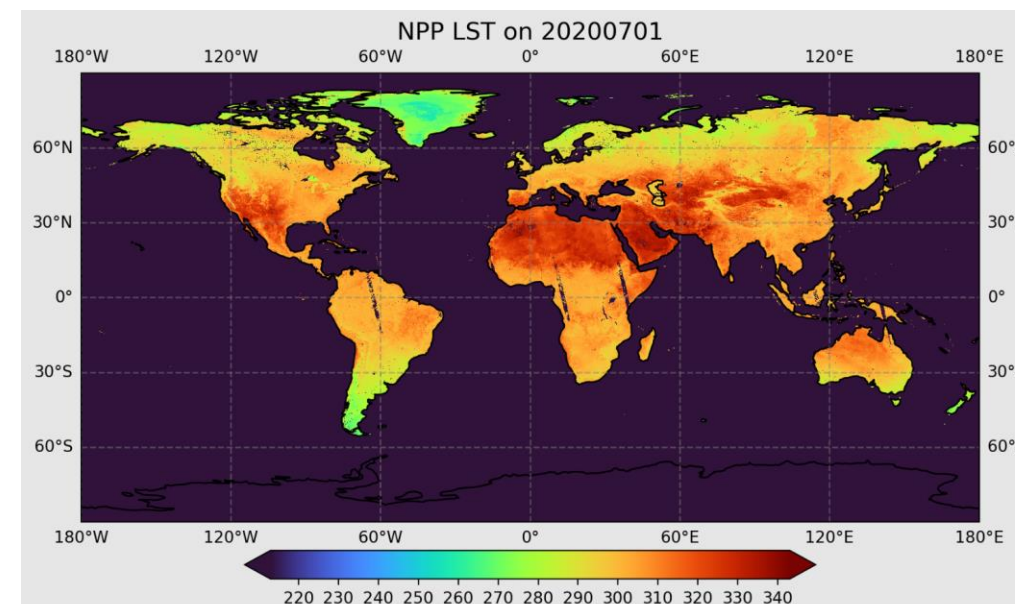
Issues/Risks:

None

Highlights:

Using the new developed machine learning algorithm, the Monthly predicted fCover maps for Maryland during 2023.

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

- Background:

  LAI time series data contains noise (outliers) and data gaps due to cloud, aerosol, darkness and other issues.

- Purpose:

  Leverage machine learning models to address the mechanical and environmental factors impacting LAI time series. Outlier Detection Data Reconstruction Forecasting

- Data Datasets:
  - VNP15A2H: LAI/FPAR 8-Day L4 Global 500m SIN Grid
  - SRTM DEM
  - Biome type.
- Procedure
  - Extract features from LAI raster data.
  - Apply feature engineering.
  - Assess model performance using MAE and R-Squared
  - Adjust feature engineering process and model parameters based on performance metrics.
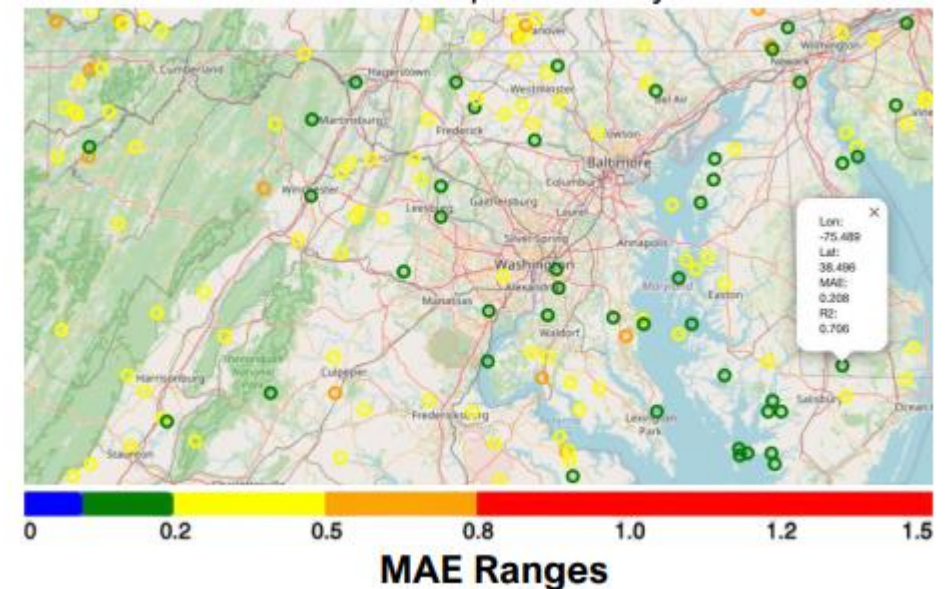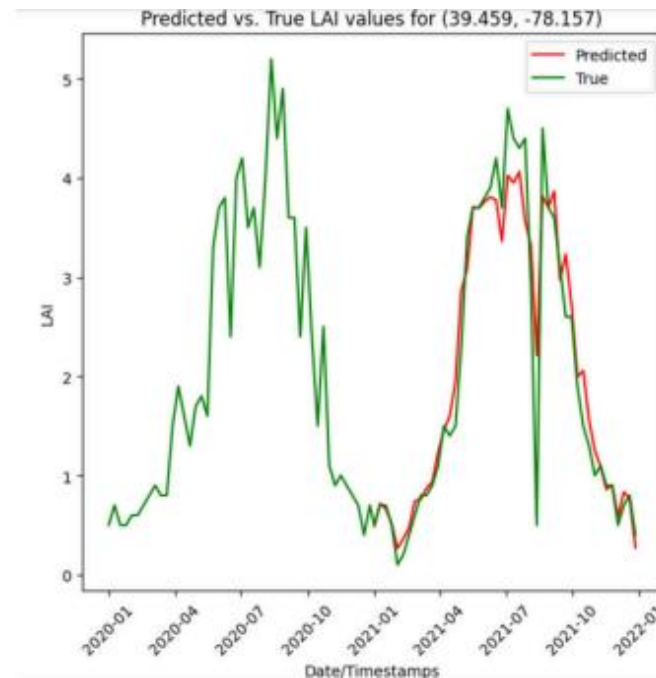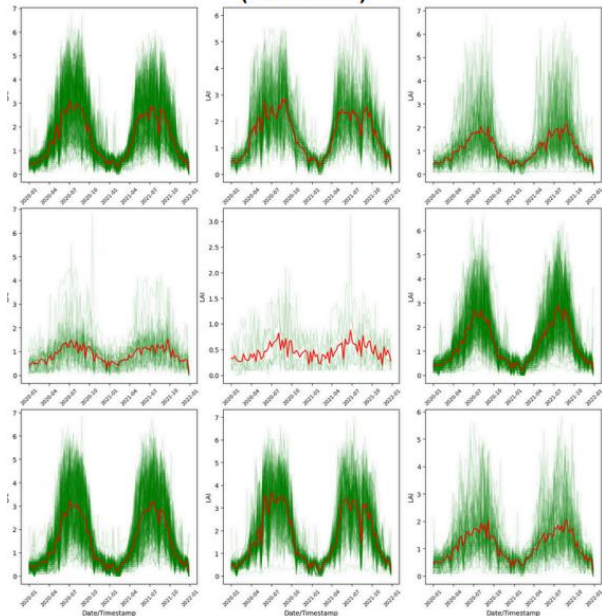
Folium map of model performance over validation dataset.

Objectives

- Test Machine learning models to compare effectiveness for fCover estimation.
- Understand importance of features and their relation to fCover
- Use the best method to generate seasonal predictions

Methodology

- Combined reflectance and land class data from Google Earth Engine with ground measurements of fCover
- Filtered to select high quality data for model training
- Tuned models through strategies such as hyperparameter optimization, cross-validation, and weighted sampling
- Perform the fcover estimation using the trained models, and evaluate the results.

Results

- The whole year fcover of 2023 in Maryland are retrieved using the four models.
- Best results from random forest regression model.
- Cubist model performs most similarly, followed by neural network
- SVM model tends to deviate most.
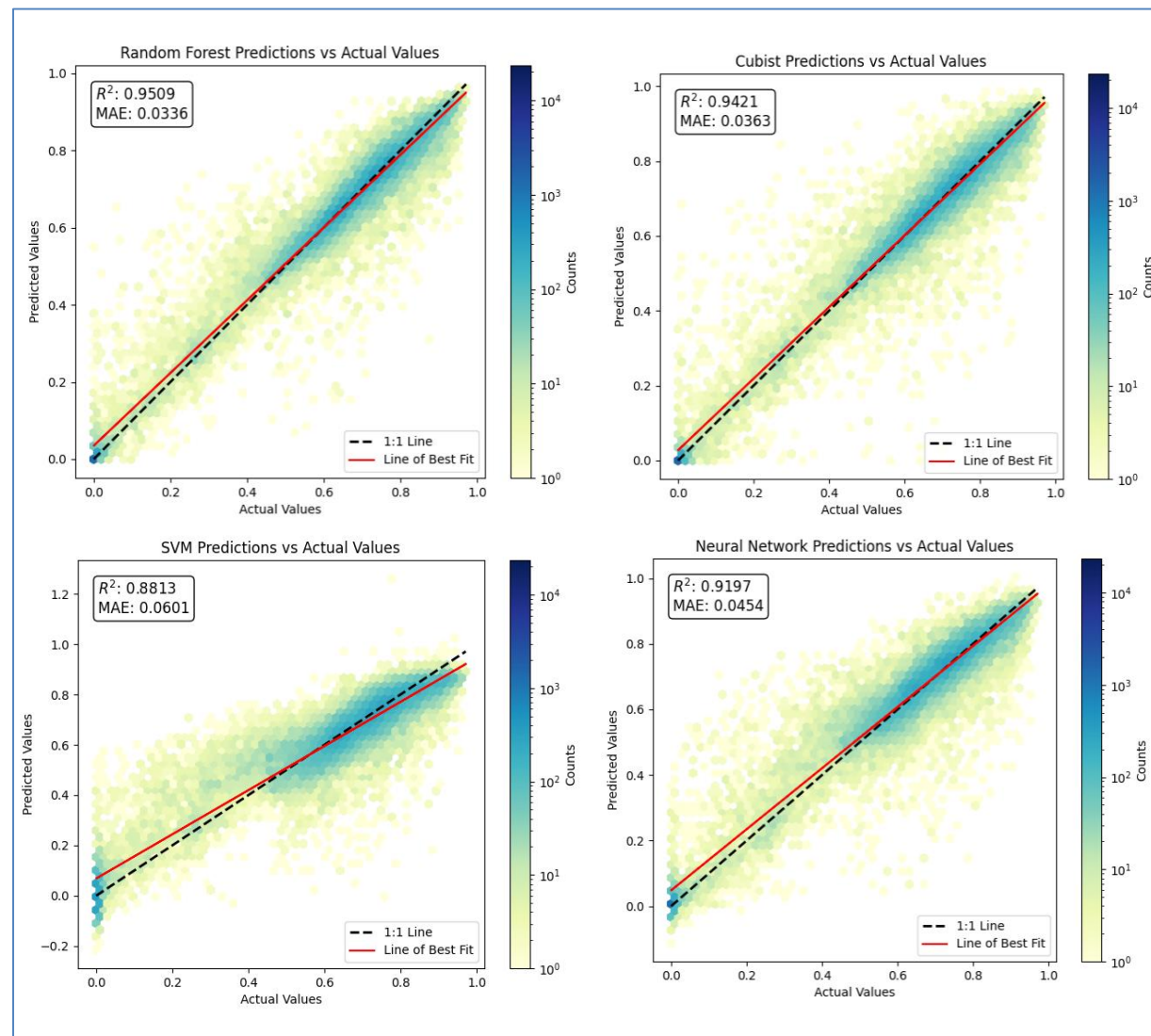
Four machine learning methods performance for FCOVER retrieval.

Land Surface Temperature

Accomplishments / Events:

- Explored the data availability for VIIRS LST reprocessing, including SNPP and NOAA-20. (slide 2-3)
- Continued the development of a machine learning based method for all weather LST generation : further tested the scenario by removing surface type in the model training; updated the quality flag and modified the code for LST output. The scientific software is generally completed .
- Conduct code testing on the STAR server and provided specific comments on issues.
- Evaluated the all weather LST output through comparison with the original L3 VIIRS LST data focusing on the dataset including LST value, view time and quality flag, as well as the detailed quality flag bits structure. (Highlights, slide 4-6)
- Updated the software code for L3 VIIRS LST projection conversion from sinusoidal to regular latlon and included it into the all weather LST science code.
- Supervised a summer intern on cross comparison with Landsat-8 LST data. Held weekly meetings to discuss the progress and address questions and issues.
- Prepared and submitted an abstract titled "All-weather VIIRS LST: Machine Learning Based Methodology and Experiment' to AMS2025.
- Completed data storage management of data330.
- Review the PPM LST milestone and made modifications
- Completed review of a manuscript on the algorithm parameters for a multichannel LST algorithm

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

Highlights:

All weather NPP VIIRS LST on 20200701 Daytime

NPP LST on 20200701

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		

Preparation of VIIRS LST Reprocessing for SNPP – data availability check

Product	Input	Data source weblink	Availability
L2 VIIRS LST	M15 SDR	https://noaa-jpss.s3.amazonaws.com/index.html#SNPP/VIIRS/SNPP_VIIRS_M-Band_15_SDR_SVM15_Reprocessed_V2/	2014/04/27 ~ 2020/4/30
	M16 SDR	https://noaa-jpss.s3.amazonaws.com/index.html#SNPP/VIIRS/SNPP_VIIRS_M-Band_16_SDR_SVM16_Reprocessed_V2/	2014/04/27 ~ 2020/4/30
	GMTCO	https://noaa-jpss.s3.amazonaws.com/index.html#SNPP/VIIRS/SNPP_VIIRS_M-Band_SDR_TC_GEO_GMTCO_Reprocessed_V2/	2014/04/27 ~ 2020/4/30
	GFS TPW	/data/smcd6/yliu/Input/tpw/nc/0P25/	2021/11/15 ~ present
		/data/smcd6/yliu/Input/tpw/nc/0P50/ /data/data090/mfan/data/gfs_grib2_0.5deg/	2020/01/01 ~ present 2014/01/05 ~ 2020/10/25
	Cmcsst (0.1degree daily)	/data/data090/mfan/data/cmc_0.1deg_dailycd /data/data257/mfan/DATA/cmcsst_0p10	2020/02/10 ~ 2020/10/25 2020/02/10 ~ present
	Snowmap (4km)	/data/data090/mfan/data/ait_snow_map	2017/10/03 ~ 2019/03/09
	OISST	/data/data090/mfan/data/oisst_daily/	2013/12/10 ~ 2020/10/25

Preparation of VIIRS LST Reprocessing for NOAA-20 – data availability check

Product	Input	Data source weblink	Availability
L2 VIIRS LST	M15 SDR	https://noaa-nesdis-n20-pds.s3.amazonaws.com/index.html#reprocessed/VIIRS-M15-SDR_R/	2018/01/01 ~ 2022/12/31
	M16 SDR	https://noaa-nesdis-n20-pds.s3.amazonaws.com/index.html#reprocessed/VIIRS-M16-SDR_R/	2018/01/01 ~ 2022/12/31
	GMTCO	https://noaa-nesdis-n20-pds.s3.amazonaws.com/index.html#reprocessed/VIIRS-MOD-GEO-TC_R/	2018/01/01 ~ 2022/12/31
	Cmcsst (0.1degree daily)	/data/data090/mfan/data/cmc_0.1deg_dailycd /data/data257/mfan/DATA/cmcsst_0p10	2020/02/10 ~ 2020/10/25 2020/02/10 ~ present
	Snowmap (4km)	/data/data090/mfan/data/ait_snow_map	2017/10/03 ~ 2019/03/09
	OISST	/data/data090/mfan/data/oisst_daily/	2013/12/10 ~ 2020/10/25

20200101 Daytime -LST

Operational L3 VIIRS LST on January 1, 2020 daytime

All-weather L3 VIIRS LST on January 1, 2020 daytime

All weather LST is developed based on the fusion of MIRS surface temperature and TIR VIIRS LST using neural network method. The right image shows an example of the all weather LST on Jan. 1, 2020.

NPP LST on 20200101
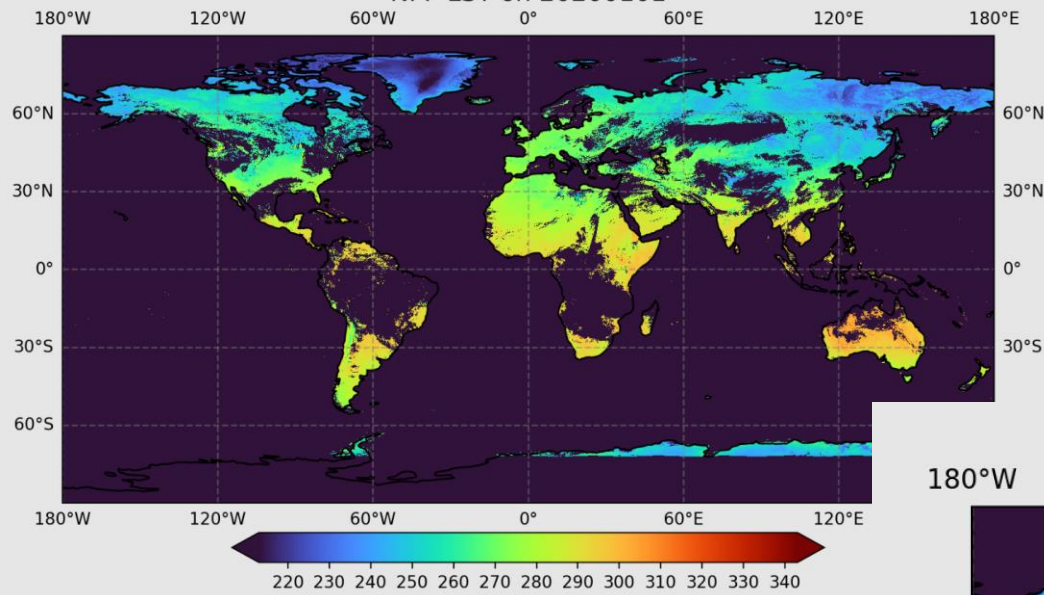
20200101 Nighttime-LST
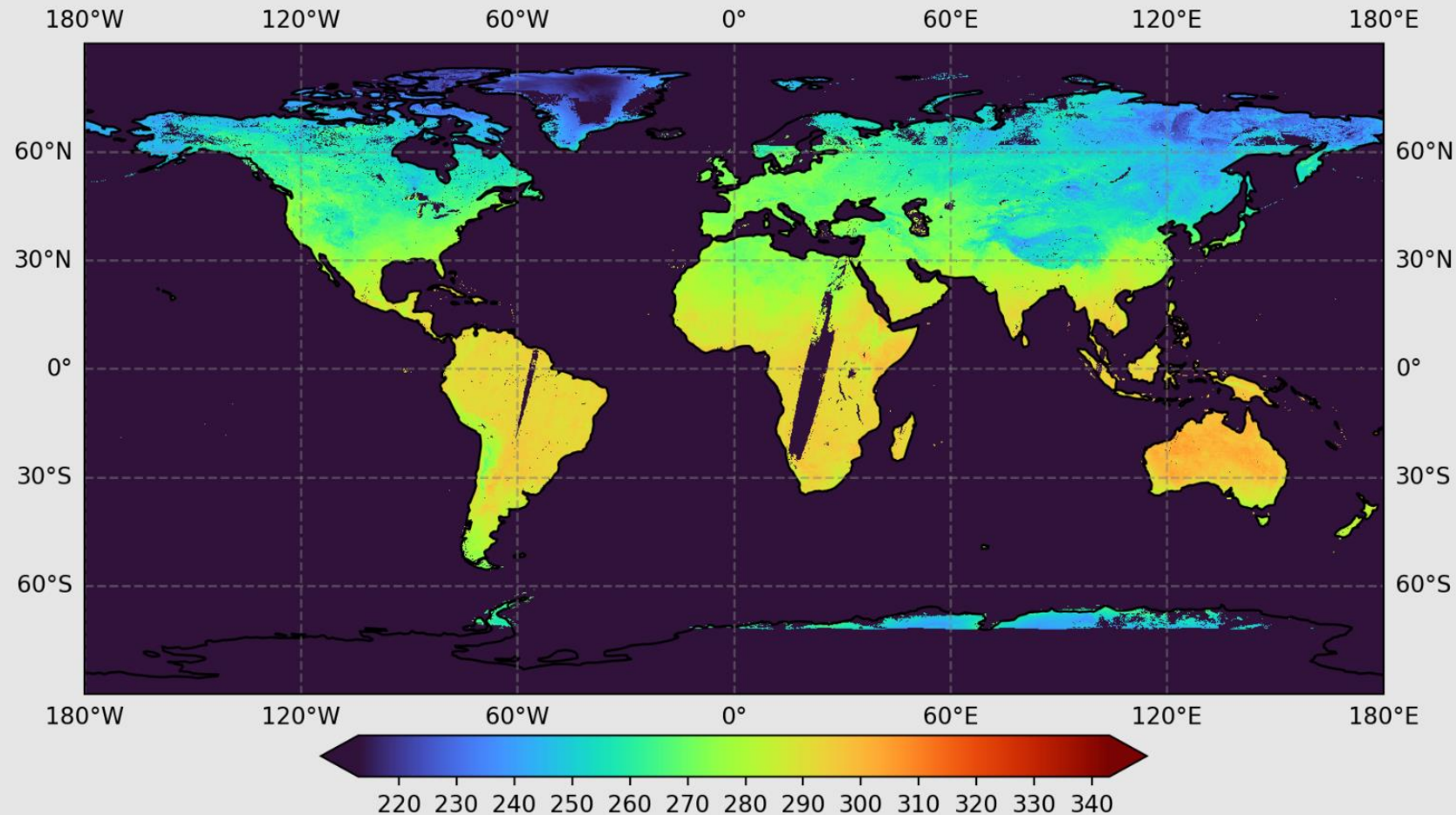
Operational L3 VIIRS LST in on January 1, 2020 daytime

All-weather L3 VIIRS LST on January 1, 2020 daytime

All weather LST is developed based on the fusion of MIRS surface temperature and TIR VIIRS LST using neural network method. The right image shows an example of the all weather LST on Jan. 1, 2020.

npp Original Viewtime on s20201001 Day

npp All Weather Viewtime on s20201001 Day

20201001 Daytime
-View Time
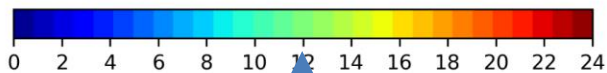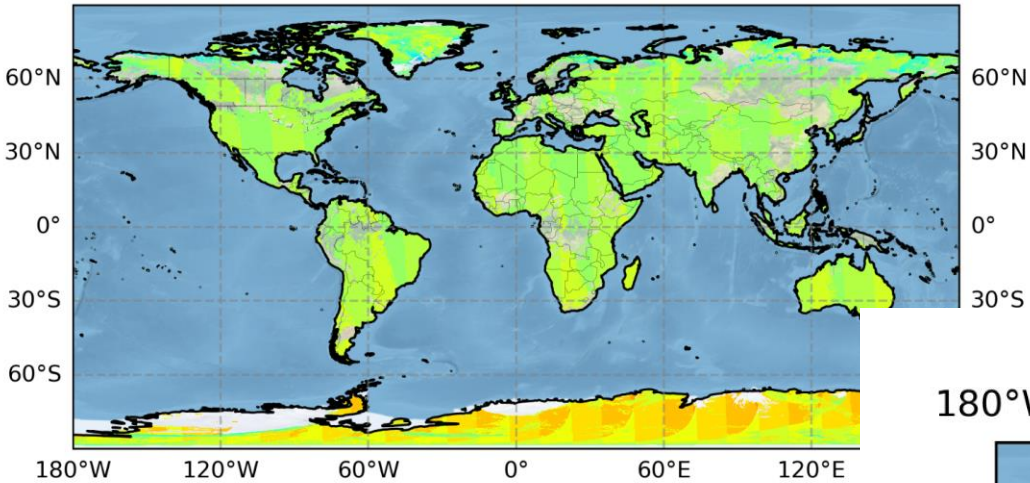
View time in operational L3 VIIRS LST

View time in all-weather L3 VIIRS LST

- The right image shows an example of the view time in all weather LST on Jan. 1, 2020. The view time needs further update as it is not all weather dataset.
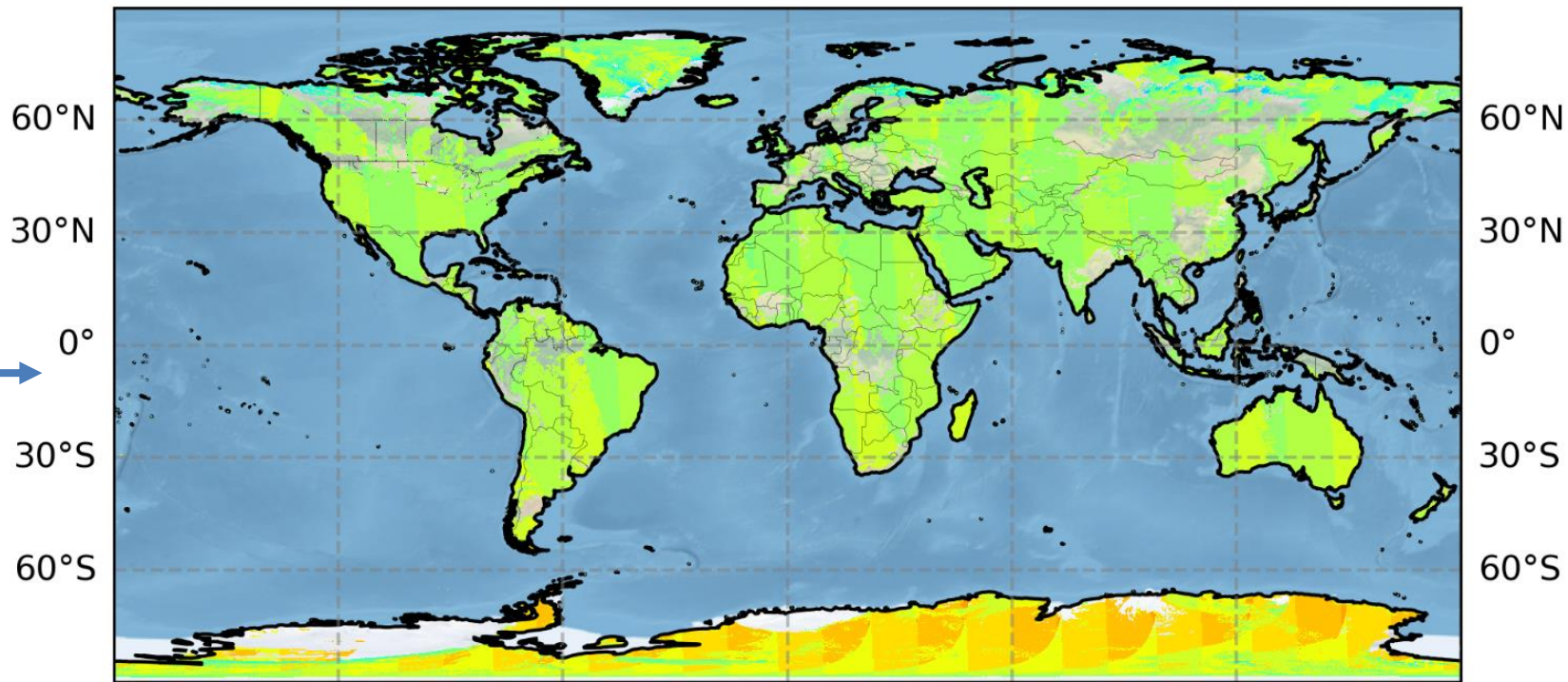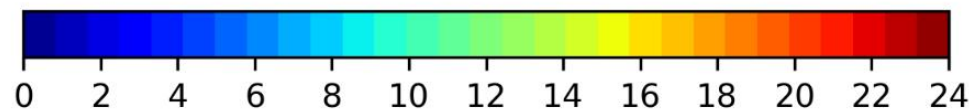
npp Original QC on s20201001 Day
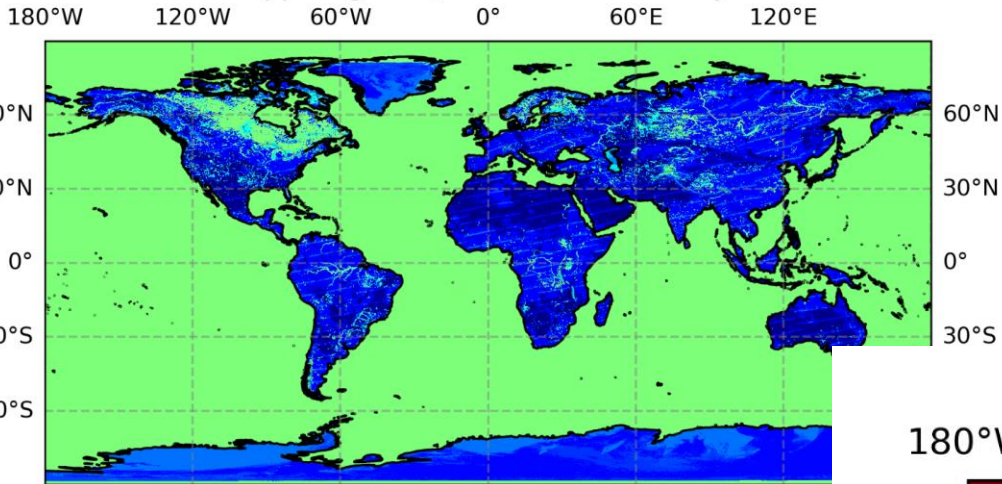
npp All Weather QC on s20201001 Day
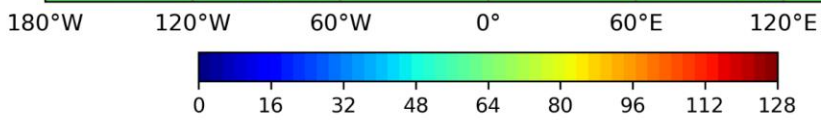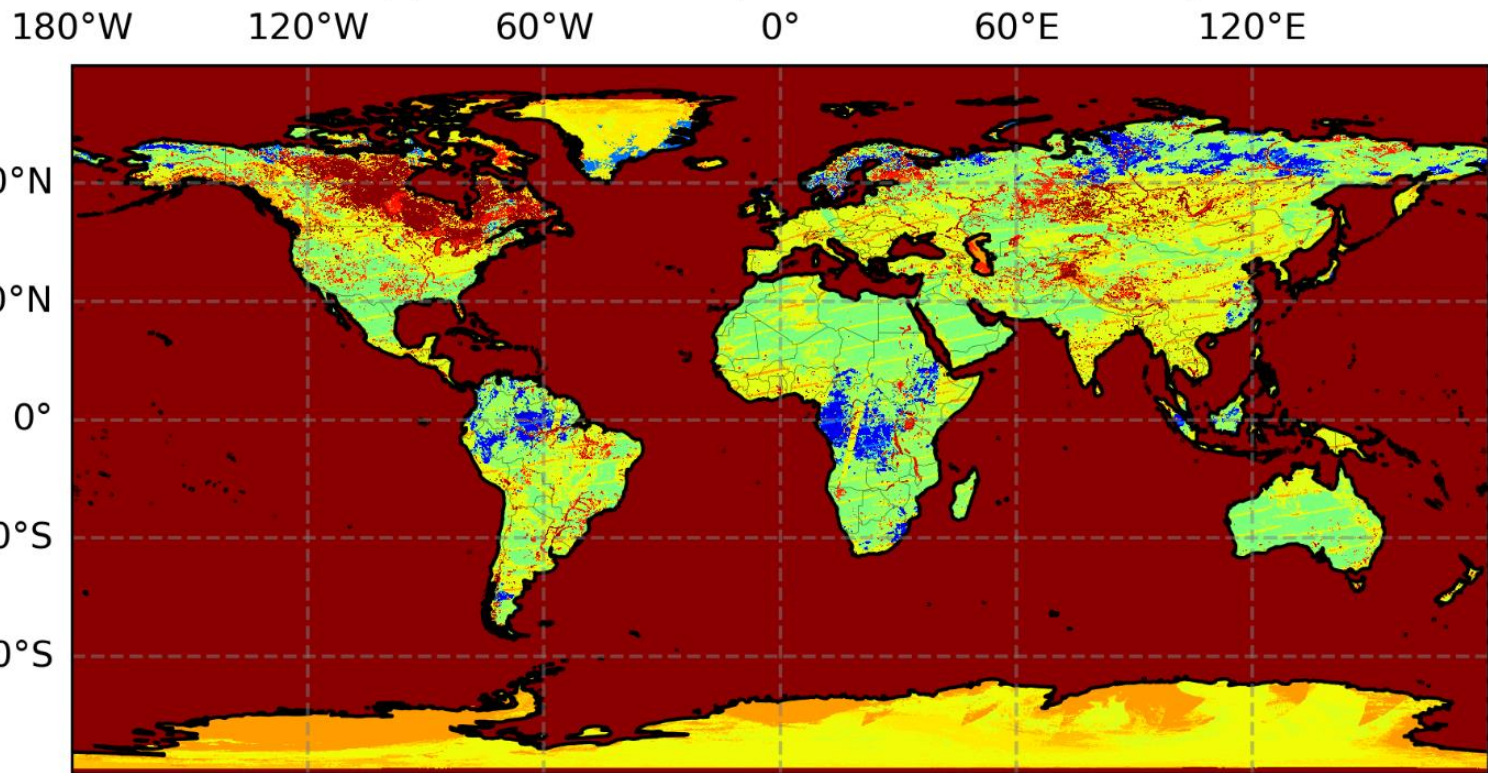
Bits	Long Name	Comments
1 & 0	Data quality flag	00=high quality 01=Medium quality 10=low quality 11= filled or no data
3 & 2	Cloud Confidence	00=confidently clear 01=probably clear 10=probably cloudy 11=confidently cloudy
5 & 4	Land/water	00=land 01=snow/ice 10=in land water 11=coastal/sea water
6	GapFilling	0 = Filled by Neural N 1 = Other
7	Empty	For future use

The quality flag has been updated by adding bit6 as an indicator of gap filling status, as shown in table above. The other bits remain unchanged.

MiRS Products
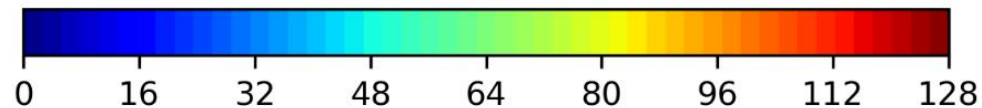
Accomplishments / Events:

- The MiRS science team recently completed reprocessing of SNPP and N20 ATMS data from respective launches through 2020. Analysis of the reprocessed data has been continuing, with recent efforts focused on extending the time record by supplementing it with archived data from 2021-2024. This has allowed an analysis of TPW trends spanning the last three distinct El Nino events: 2015-2016, 2018-2019, and 2023-2024. The highlight figure shows the monthly global TPW anomalies from MiRS reprocessed and archived SNPP/ATMS data and ERA5 reanalyses for the period January 2012 – April 2024. The three most recent El Nino events are evident in positive TPW anomalies, with the larger anomalies associated with the stronger 2015-2016 and 2023-2024 events.

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

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:
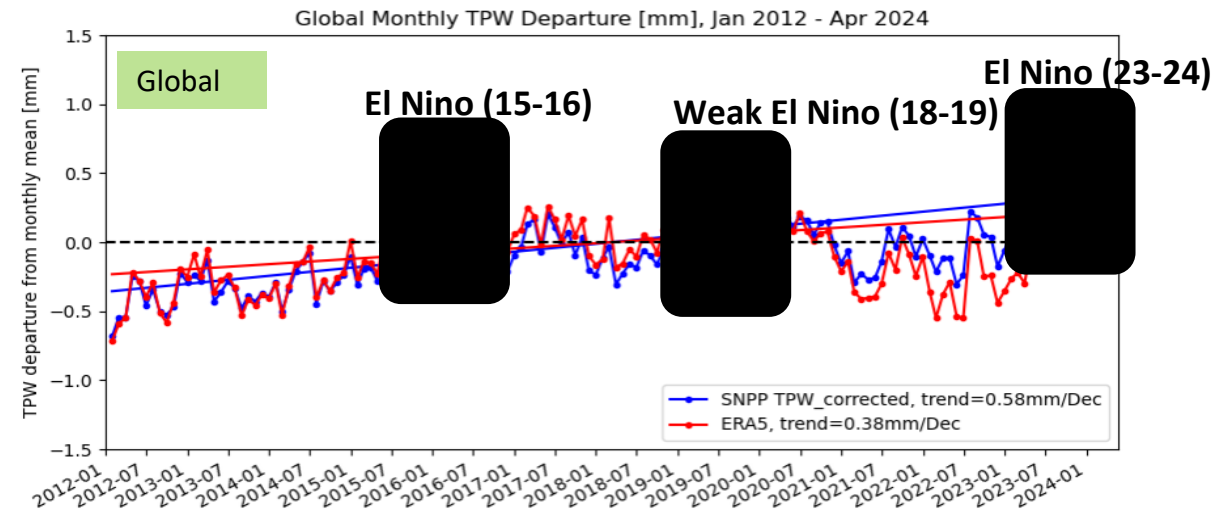
Time series of monthly TPW anomalies from reprocessed and archived MiRS SNPP ATMS data, and ERA5 reanalyses. The three most recent El Nino events are evident in positive TPW anomalies, with the larger anomalies associated with the stronger 2015-2016 and 2023-2024 events.

Accomplishments / Events:

.
- IMSG support contractors have restored/backfilled missing data products from S-NPP, N-20, and N-21 from the end of June through the end of August, across the entire available EDR product suite and the Mapper team is ready to declare the product tile restoration and return to normal operation is nominally complete.

- IMSG support contractors returned as of August 1 and restored NPROVS data products that were missing through the IMSG support gap (June 26 to July 31) compounded by the failure of STAR FTP directories which routinely support NPROVS data access; it was decided to replace FTP by "https" data services per STAR IT recommendation.

- The JPSS / DOE InterAgency Agreement (IAA) for the dedicated radiosonde program was approved by NOAA (July) and by DOE and the Raob purchase (by DOE) supporting FY25 filed activities will proceed as planned.

- The NPROVS and JSTAR teams restored the routine monitoring of NUCAPS **(Highlight)**

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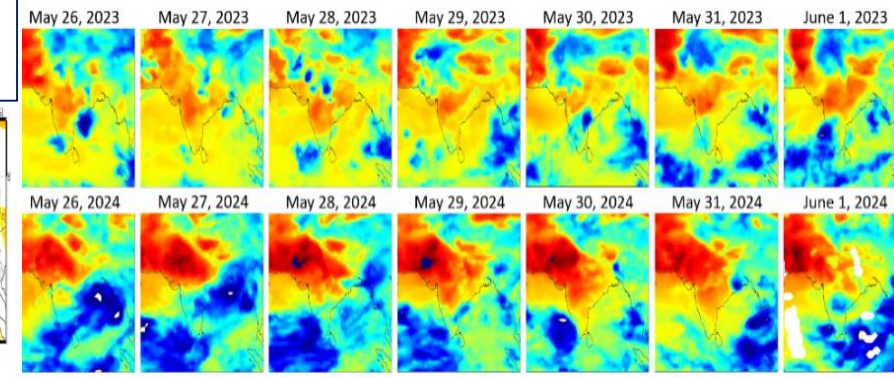4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks: None

Highlights

NPROVS: Clear Cloudy Precipitation   **JSTAR Mapper: Clear Cloudy Precipitation**

The above panels illustrate gridded imagery of NUCAPS sounding type quality flags accessed from NPROVS (left) and JSTAR Mapper (right) for daytime soundings across identical portions of the western Northern hemisphere on August 31, 2024. Other than the color coding which differs for the cloudy flag, it can be seen that the NPROVS and JSTAR Mapper images are identical, verifying the restoral and consistency of NPROVS and JSTAR Mapper monitoring functions upon the return of IMSG support contractors after the June 26 to August 1 service gap.

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	

NUCAPS Products

Accomplishments / Events

- Fixed NUCAPS compilation errors due to STAR Linux transition to CentOS9 operating systems. These fixes included syntax, missing libraries, and issues with other installed libraries in the new environment. Performed sanity checks and retrieval statistics metrics to ensure the results produced by the NUCAPS v3.2 on CentOS9 are consistent with the earlier v3.2 runs.
- 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.
  - VALAR data processing and extending the VALAR data to April 2024.
  - TCCON measurements of CO, CH_4, and CO_2.
- NUCAPS team evaluated the Indian subcontinent heatwave event by contrasting NUCAPS retrieved temperature fields between May 29, 2024 and the last year (May 29, 2023). The NUCAPS team extended the analysis using the OLR product retrieved from the CrIS sensor.

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		Recovery from contract lapse

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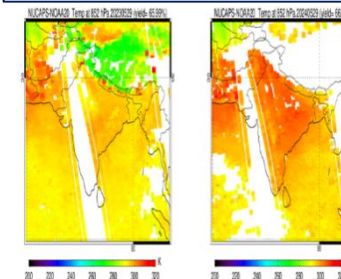4. Project has fallen significantly behind schedule, and/or significantly over budget.

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	Contract lapse and additional improvements
Mission-long reprocessing of NOAA-21 NUCAPS products: Reprocessing version and evaluation of reprocessed products	Jun-24	Jul-24	Delayed	Contract lapse and Additional improvements

Heatwave over the Indian subcontinent: Analysis with CrIS OLR product

Comparison of NUCAPS retrieved 850 hPa temperatures (a) May 29, 2023 **vs** (b) May 29, 2024 clearly depicts the heatwave over the Indian subcontinent. An extension of the analysis with the CrIS OLR product also shows a significant difference between May 26 and June 1 2023 and 2024 periods—an intense increase in radiation over the northwestern part of the Indian subcontinent and a severe drop in radiation, corresponding with the extreme heatwave, and cyclone Remal and the onset of the monsoon season.

NUCAPS retrieved 850 hPA temperature fields May 29, 2023 vs May 29,2024.

Accomplishments / Events:

- Continue working with the STAR IT team for the upgrade Linux to CenOS 9 for VIIRS global ocean color data processing.
- Started working on the mission-long VIIRS ocean color data reprocessing using the MSL12 ocean color data processing system.
- Worked 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.

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
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	

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.
- Developed new code to read and analyze the available JPSS-03 OMPS TVAC data (see Fig. a for J3 OMPS NP housing temperature pre-launch data sets).
- Compared NOAA-derived NOAA-21 OMPS NP solar flux L1b data with the NASA RawFlux data recently available through the NASA SIPS site (see Fig. 1b).
- Continued the ADR 10832 to apply solar activity impact adjustments to all days of data for NP Solar Flux data.
- Developed a OMPS dark rate delivery QC check procedure to avoid wrong delivery, which happened in late July 2024
- Continued assessing the recovery of the SNPP OMPS instruments following the SNPP CDP reset event that occurred on July 24th and 25th.
- Initialized an OMPS SDR PCA method for aerosol index-related channels

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		Day-1 improvement is on-going analysis
Improve latitude dependency of inter-sensor biases; reprocess (limited) N21 OMPS NM/NP SDR data sets (new dark LUTs); assess the consistency of N21 OMPS NM and NP at the dichroic range; conduct the inter-sensor comparison with Tropomi	Feb-24	Feb-24		
Finalize the NOAA-21 solar day-1 towards validated maturity; validate NOAA-21 OMPS SDR data quality using multiple ways (e.g., RTM, DCC, inter-sensor comparison with VIIRS); prepare NOAA-21 OMPS NM/NP SDR validated maturity review	Mar-24		Mar-24	
Reprocess the (SNPP, NOAA-20 and NOAA-21) OMPS NP SDR data by using the new dark, OSOL and SL tables; Initialize the OMPS and GEMS inter-sensor comparison analysis	May-24			
Document the technical reports (e.g., SL correction, solar intrusion correction, solar activity impact correction, NM along-track wavelength shift correction; update OMPS NM/NP SDR ATBD	Jul-24			
Develop new algorithm or code to support J3/J4 prelaunch testing and verification; analyze the pre-launch test data sets for J3 or J4 upon the availability of the data sets	Aug-24			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			
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			

(a) JPSS-03 OMPS NP TVAC Housing Temperatures
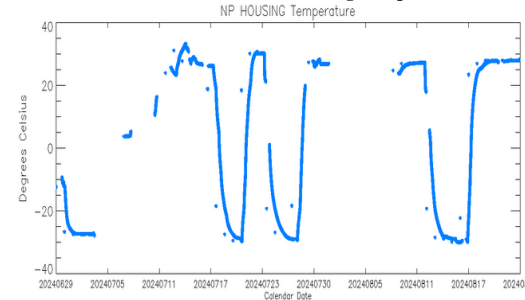
(b) NOAA-21 NP Wavelength Shift Time Series Using Two Data Sources: NOAA-QC- L1b and NASA-QC Raw Flux
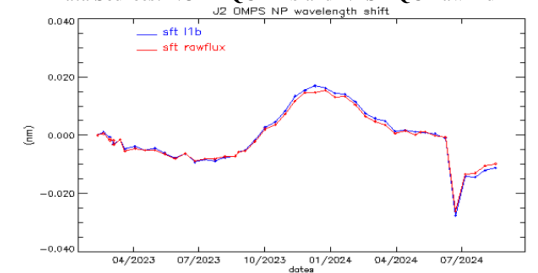
(c) Comparison between Original positional-based (black) and updated curve-fit (red) Mg-II Index values for 3 NPs

OMPS Ozone (V8Pro, V2Limb & V8TOz)
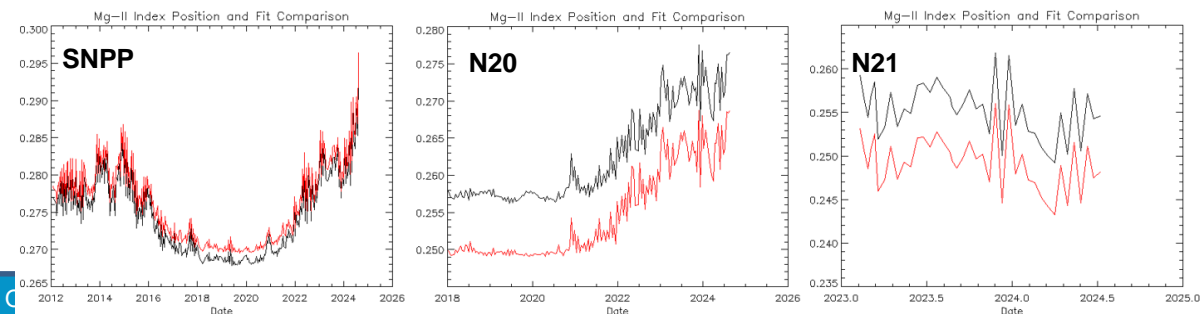
Accomplishments / Events:

- 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.

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.

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			

Enterprise V8TOz Applied to TEMPO

Accomplishments / Events:

- We completed migration of SST IT infrastructure from CentOS 7 (C7) to CentOS 9 Stream (C9S) and Red Hat Enterprise 9 (RHEL9). Due to significantly degraded stability of C9S, we purchased 25 RHEL9 licenses and are in the process of updating as many C9S machines to RHEL9 as we have licenses for. We expect all recent SST servers (purchased in last 5 years) to be converted to RHEL9 while older machines will remain on C9S.

- As a part of the August 22 "NCCF Product Upgrade 1.16.1", OSPO/NCCF started production of L3S-LEO PM and AM SST products. The L3S data was made available to us (STAR) on SCDR for routine monitoring on August 30.

- We finished initial implementation of revised ACSPO cloud mask filters based on comparison of modeled and measured reflectance in VIIRS M7 and M10 channels. Previous version of the filter used a simple parametrization of expected reflectance which proved to be inadequate. In the revised version of the filter, a lookup table based on solar zenith and glint angles is used to predict mean reflectance for a given solar zenith/glint angles and the corresponding standard deviation is used to adjust thresholds for cloud determination (see Figure in the lower right panel).

Overall Status:

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

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

Issues/Risks:

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

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
SST EDR support to SDR team on Warm up - Cool down anomalies	Feb-24	Feb-24	Jan-22	
SST EDR Support to JPSS-3 Data System Test Event *(Dependency on JPSS)*	Apr-24	Apr-24		Delay due to dependency on JPSS test event; new timeline unknown
SST EDR Enterprise Cal/Val and ACSPO Algorithm "Agency Report" Presentation to GHRSST science community	Jun-24	Jun-24	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
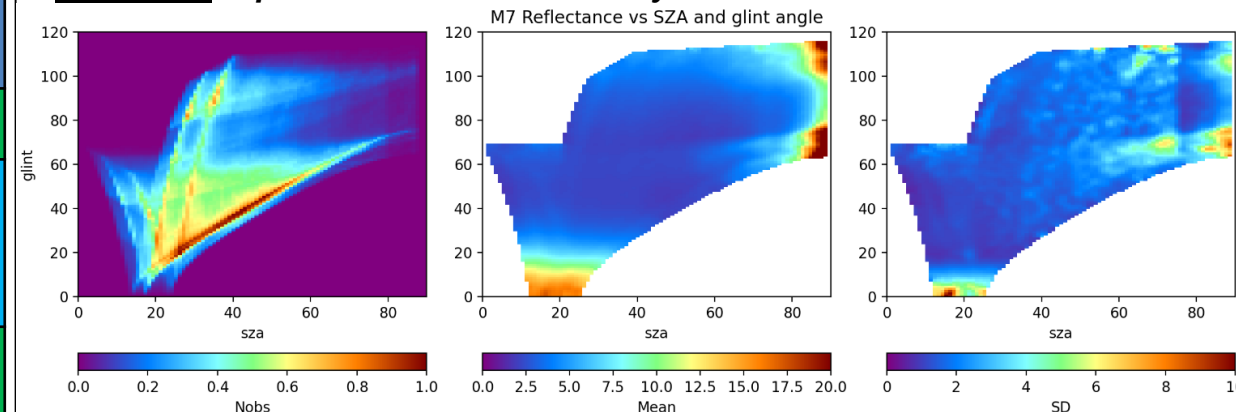
NOAA-20 clear-sky VIIRS M7 channel reflectance as function of solar zenith and glint angles (both in degrees). Left panel shows number of observations (Nobs), center panel shows mean clear-sky reflectance, and the right panel shows the corresponding standard deviation (SD). Both mean and SD are given as a percentage. For low glint angles and high solar zenith angles (twilight), measured reflectance deviates strongly from a nominal value of about 2-4% and SD is elevated.

Snowfall Rate

Accomplishments / Events:

- The updated SFR, v2r0, started operational production in NCCF on August 15. This package includes the Validated NOAA-21 and GPM SFR.

- MetOp-B channel-6 (54.4 GHz) experienced an anomaly in August. This was one of the channels used in the MetOp-B SFR snowfall detection algorithm. The SFR developers modified the SD algorithm to remove this channel so SFR can continue to be produced from MetOp-B.

- The SFR team has started exploring microphysics enhancement. Specifically, the team is examining various single scattering property databases for both spherical and non-spherical ice habits.

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

Overall Status:

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

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

Issues/Risks: None

Highlights:

Left: The MetOp-B SFR produced with the original snowfall detection algorithm including the 54.4 GHz channel
Right: Same as the image on the left but using a retrained snowfall detection algorithm that does not include the 54.5 GHz channel

Surface Albedo

August 2024

Accomplishments / Events:

- VIIRS BRDF science code demo slides
- Running VIIRS BRDF global test data through collecting time series input data
- NCCF generated VIIRS albedo data test (Slides **#3-5)**
- CISESS intern program summary reports
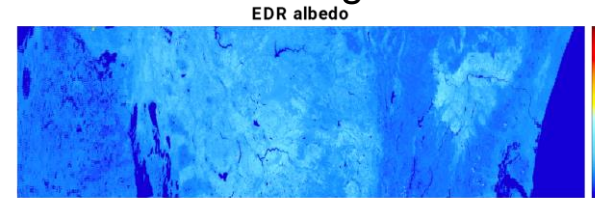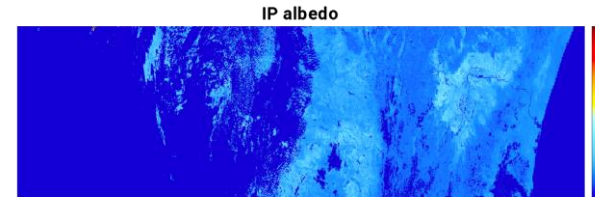- Drafted the SNPP and JPSS-1 reprocessing plan

Overall Status:

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

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

Issues/Risks:

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

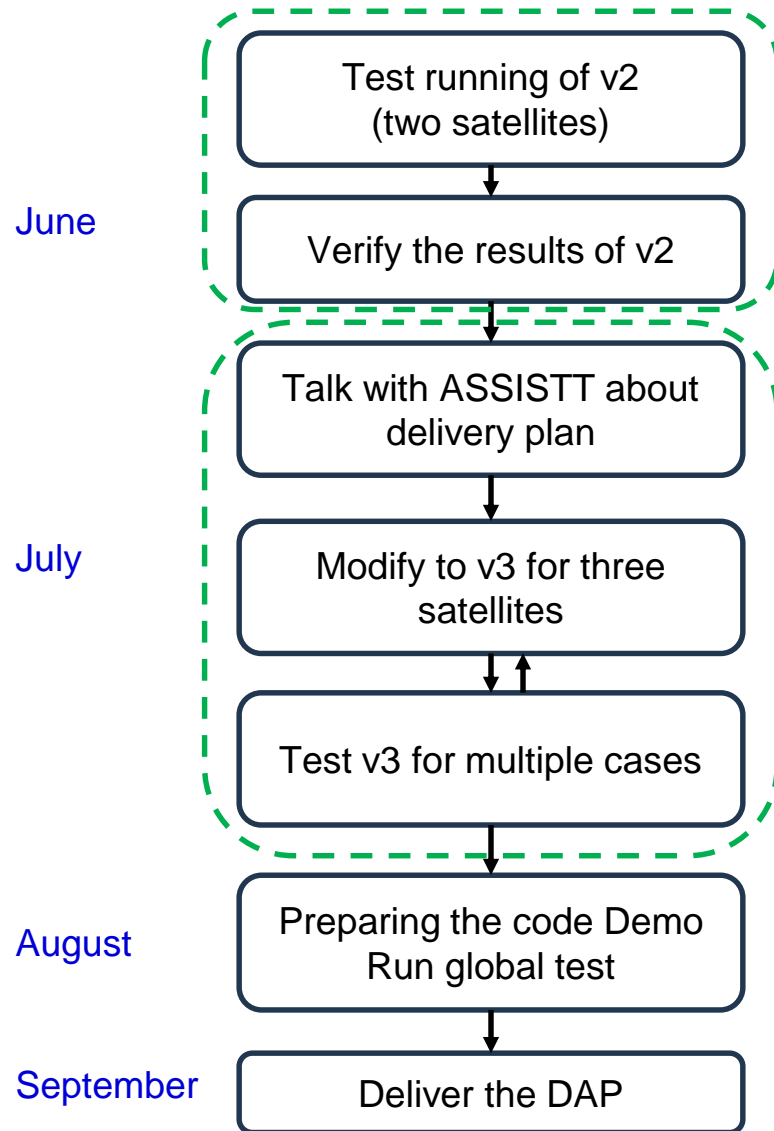### Highlights: NCCF-generated VIIRS albedo data test

Final LSA

Intermediate LSA
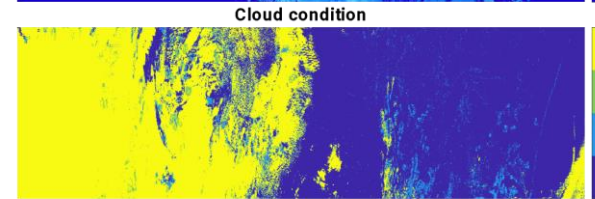
Cloud condition

VIIRS BRDF program preparation

June

Test running of v2 (two satellites)

↓

Verify the results of v2

July

Talk with ASSISTT about delivery plan

↓

Modify to v3 for three satellites

↓

Test v3 for multiple cases

August

Preparing the code Demo Run global test

↓

September

Deliver the DAP

- We have completed the first version of the VIIRS BRDF code demo slides and are currently generating the global test data, which consists of 16 days of input data.

Background

- The Bidirectional Reflectance Distribution Function (BRDF) is a fundamental concept in the field of computer graphics, remote sensing, and surface science, particularly in the study of how light interacts with surfaces
  - The BRDF is important for applications in climate modeling, vegetation monitoring, and for calculating Albedo
- The BRDF package is designed to process 16-day accumulated VIIRS surface reflectance data, producing daily global land surface products that are segmented into individual tiles.

NCCF-generated VIIRS Albedo Test Data

N21 VIIRS Global Albedo (L3 local): Sep 02 2024
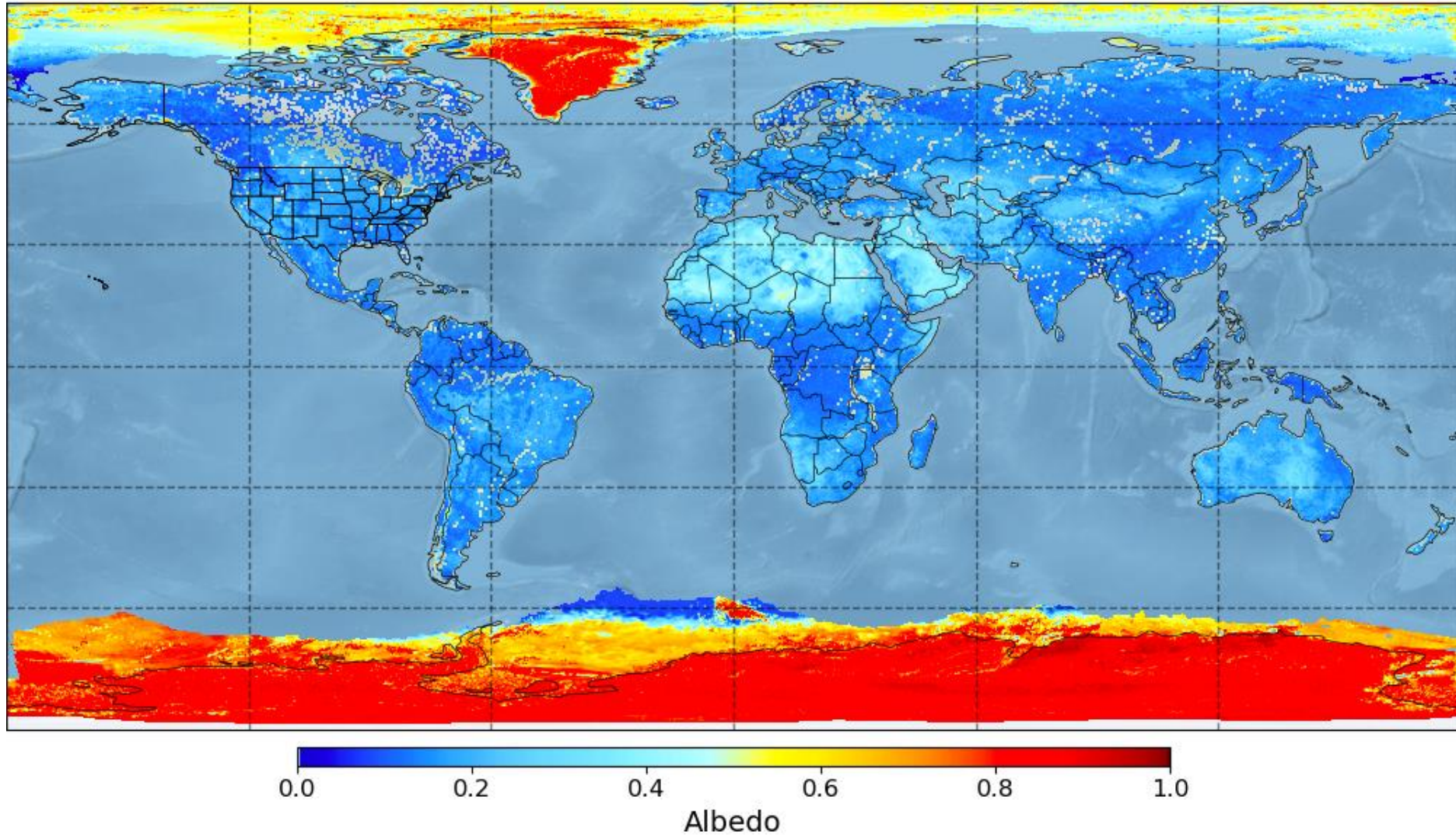
NCCF-generated VIIRS Albedo Test Data

VIIRS Global Albedo Overall Quality: Sep 02 2024

high_qc   med_qc   low_qc
Overall Quality
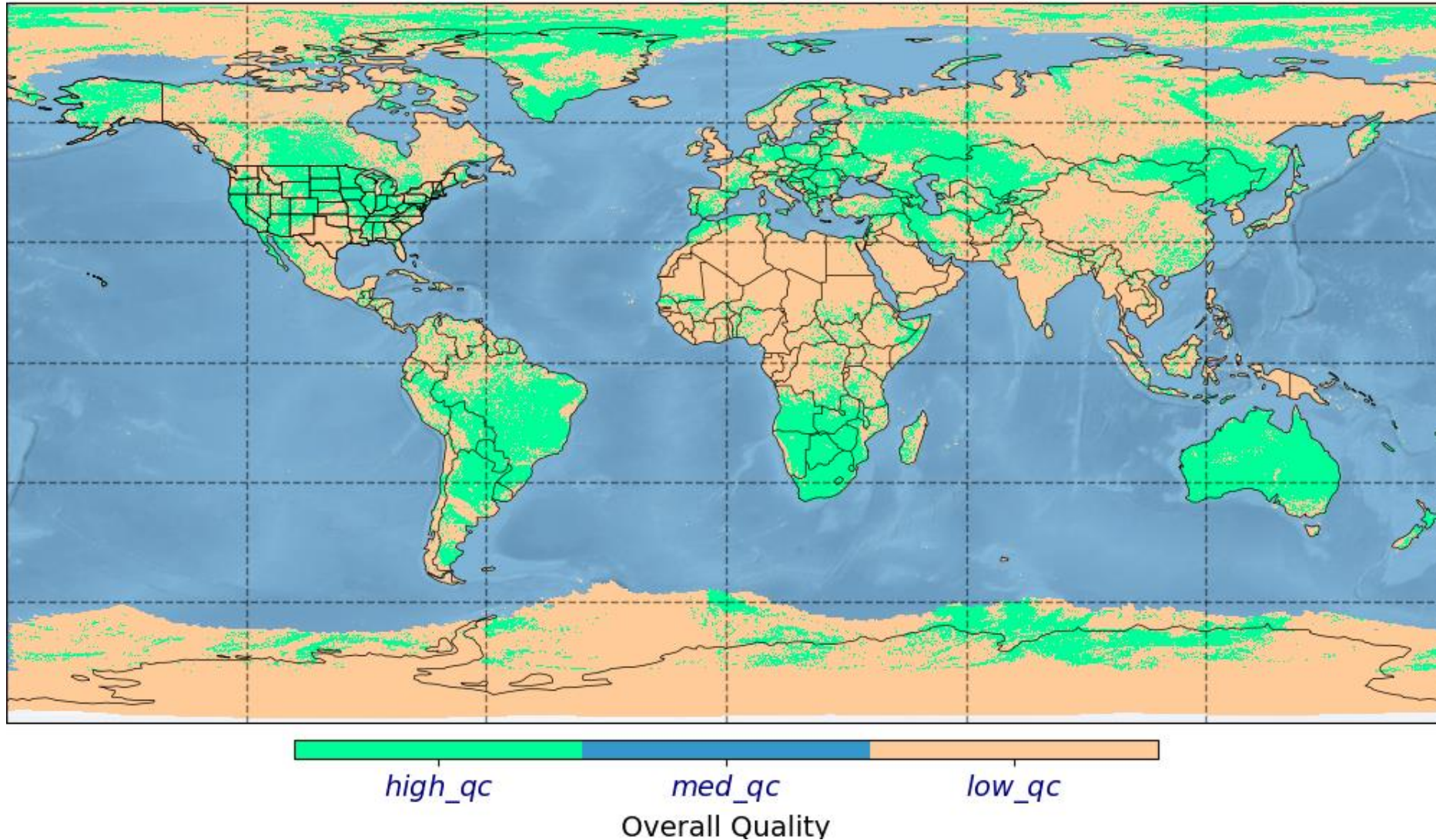
NCCF-generated VIIRS Albedo Test Data

VIIRS Global Albedo Cloud: Sep 02 2024

abs_clr | prob_clr | prob_cld | abs_cld

Cloud
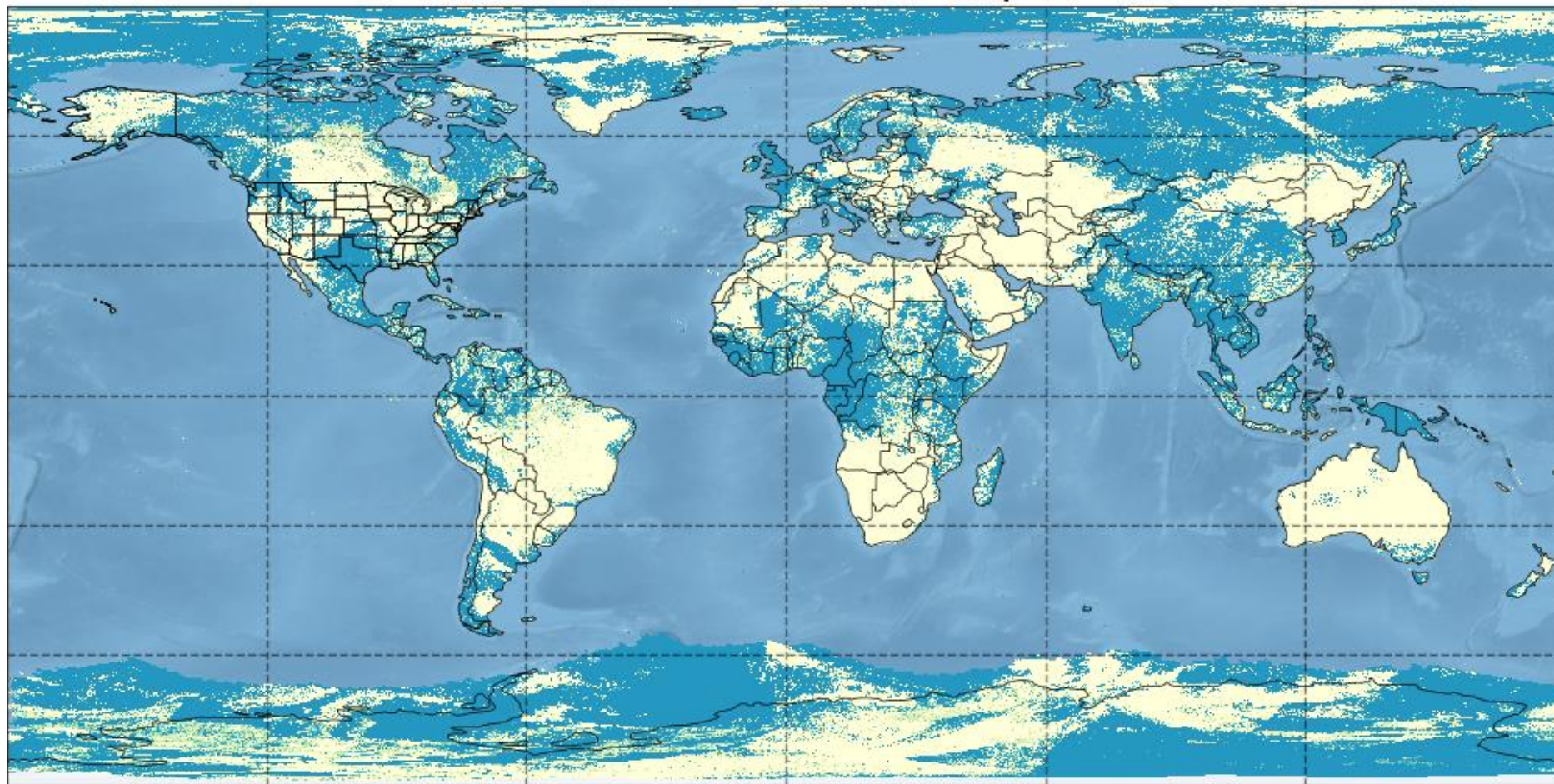
NCCF-generated VIIRS Albedo Test Data

VIIRS Global Albedo Retrieval Path: Sep 02 2024

Retrieval Path: general | desert | snow | ice | ocean
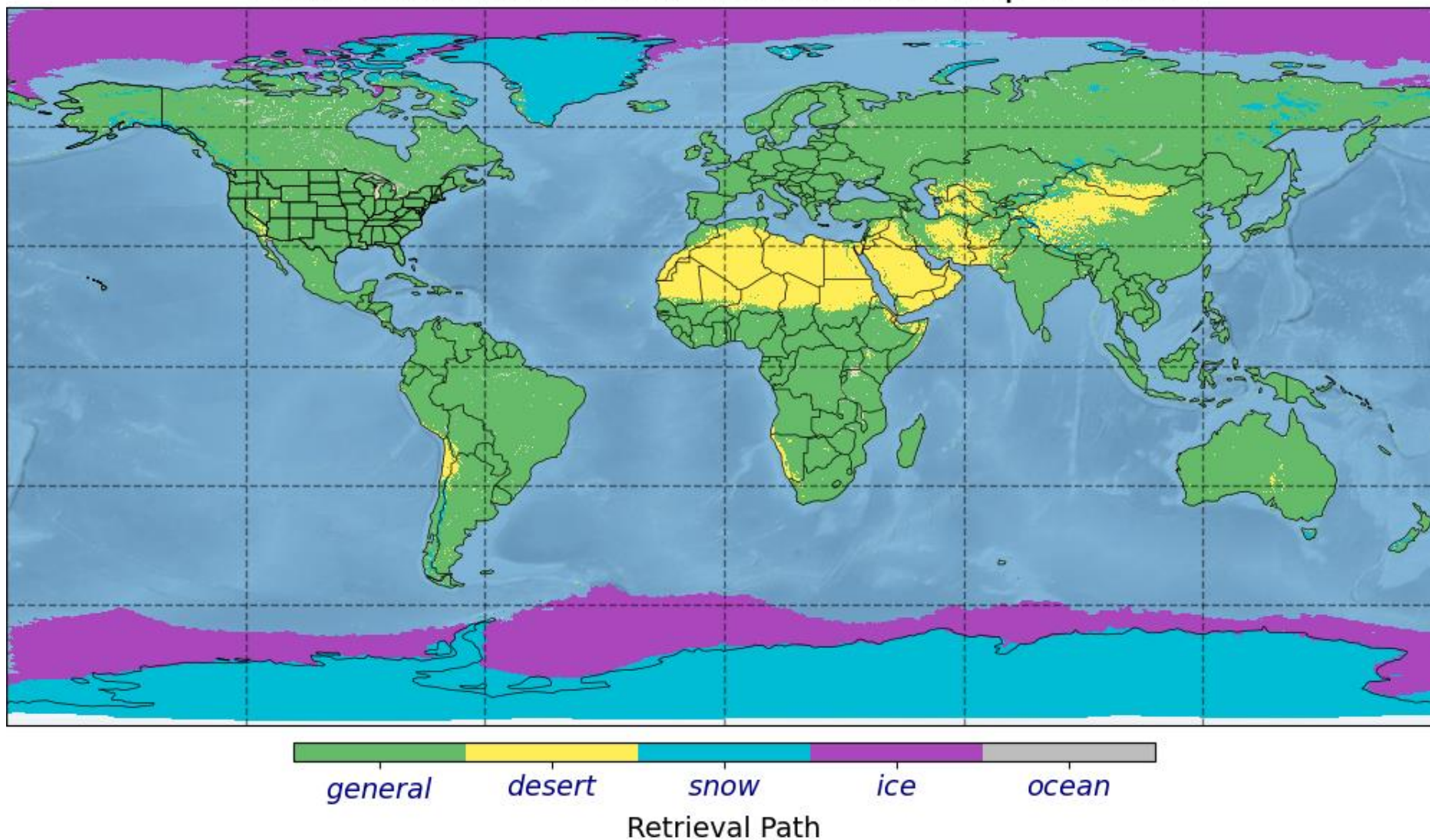
Preparation of VIIRS albedo and BRDF Reprocessing -- input data needs

Input (Dependency) List for Albedo:

Product	Input Data Dependencies
L1b	GMTCO, SVM01, SVM02, SVM03, SVM04, SVM05, SVM06, SVM07, SVM08, SVM09, SVM10, SVM11, SVM12, SVM13, SVM14, SVM15, SVM16, GITCO, SVI01, SVI02, SVI03, SVI04, SVI05, SVDNB
GFS Grib2 0.5deg	gfs_grib2_0.5deg
OISST Daily	oisst_daily
Snow Map (IMS)	IMS (180421-240826 available, needs to find more)

Approximate Running Time for Completion of One Day of Generation of Each Product:
- Online: running framework, 17 hours for per day/satellite using single_core
- Offline: standalone, 3.5 hours for per day/satellite using single_core

Storage Size to Save One Day of Each Product:
- L2: 5G/day/satellite
- L3: 0.25G/day/satellite

Standalone Script for Products Not Included in the Framework:
- The offline part code is standalone

Surface Reflectance

Accomplishments / Events:

- Investigate the reprocessing of VIIRS products, SR together with other products like LST, albedo and vegetation products. Including the product dependency, data availability, processing time and storage requirements.

- Keep working on the SR data monitoring and routinely validation at AERONET, visual check the data completeness and check the validation performance for SNPP, N20 and N21.

- Double check the warnings during OSPO SR monitoring, check the warning data quality from both the visual check and validation performance. Make sure the product quality and also diagnose the warning source, work on the new LUT evaluation and design the new monitoring method.

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

| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NCCF SR DAP redelivery and verification	Sep-23	Sep-23	Sep 20, 2023	
Mitigation algorithm development for the dust aerosol model	Dec-23	Dec-23	Dec 19, 2023	
Provional Maturity of NOAA-21	Feb-24	Feb-24	Jan 25, 2024	
The JPSS (SNPP, N20, N21) SR consistency evaluation and correction	Mar-24	Mar-24	Mar 28, 2024	
GOES-R enterprise SR algorithm development and experimental product	Jun-24	Jun-24	Jun 28, 2024	
Operational Readiness Review (ORR) for NDE Migration to NCCF	Aug-24	Aug-24	Nov 13, 2023	Completed ahead of schedule

## Highlights:

VIIRS products reprocessing dependency.
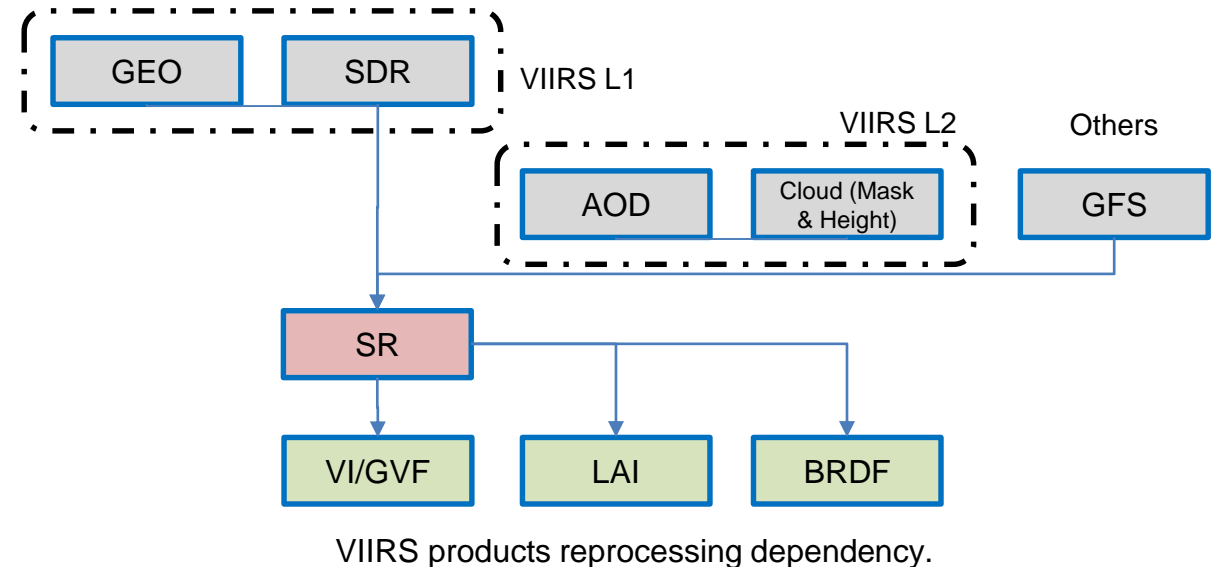
- Investigate the VIIRS products reprocessing
  - Data availability of SDR/GEO data, both the operational one and recalibrated one.
  - The framework status for available products and the standalone script status.
  - Products dependency and the latency requirements.
 - Processing time consuming and storage requirements.
  - Reprocessing plan and strategy.
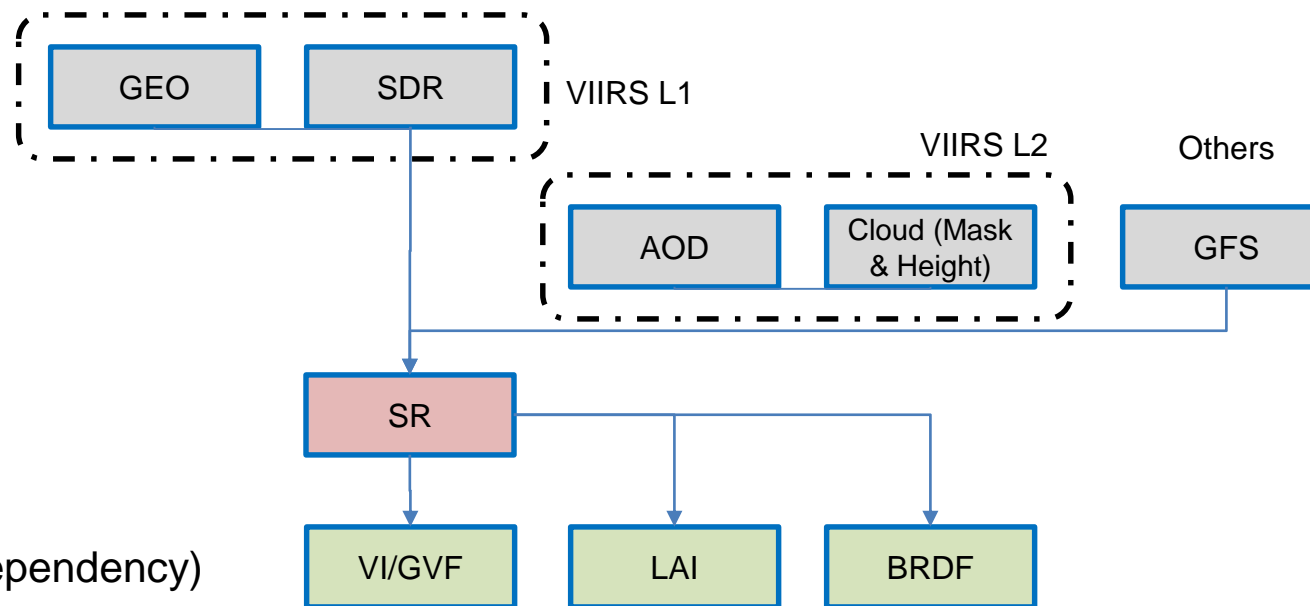

VIIRS products flowchart (dependency)
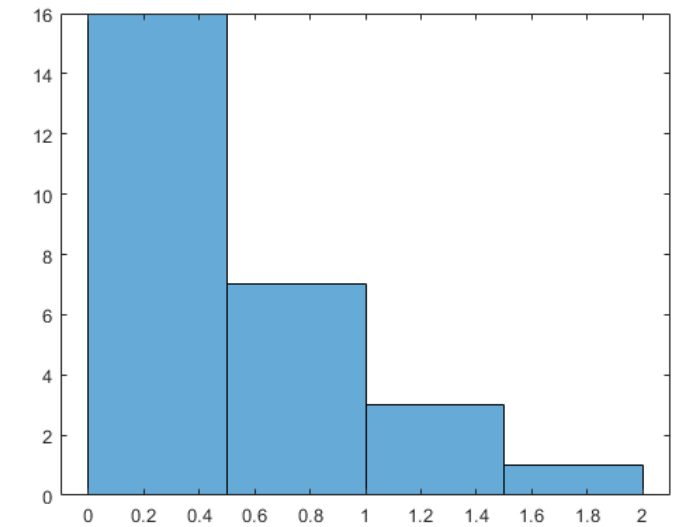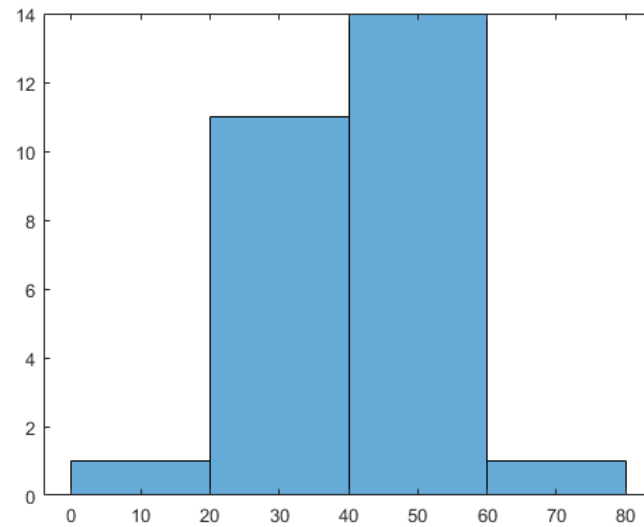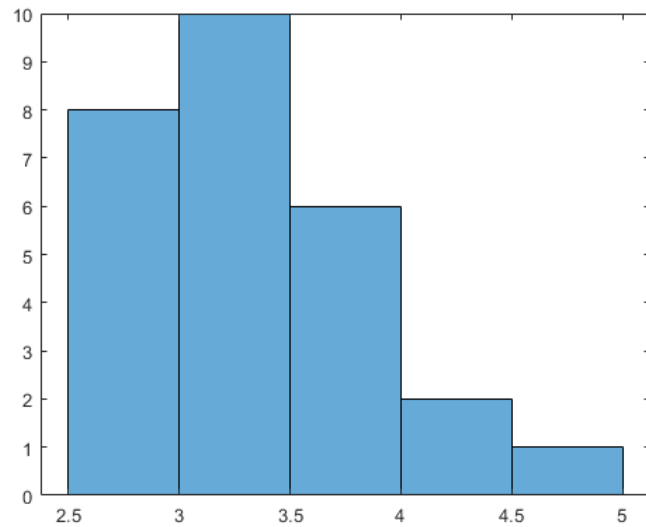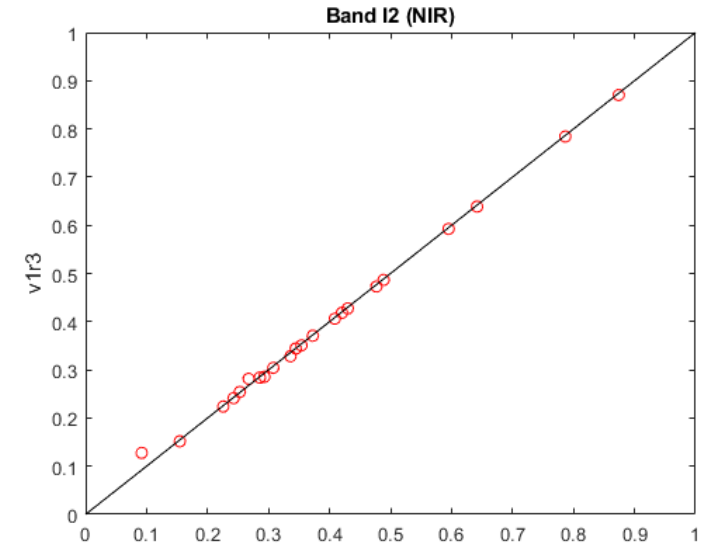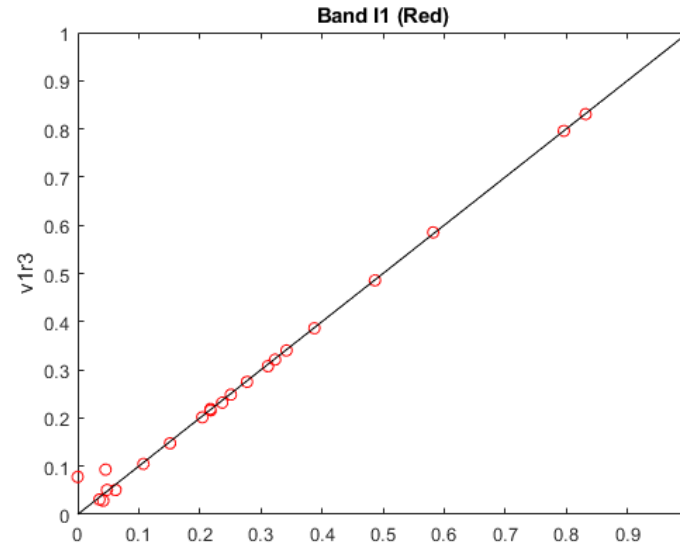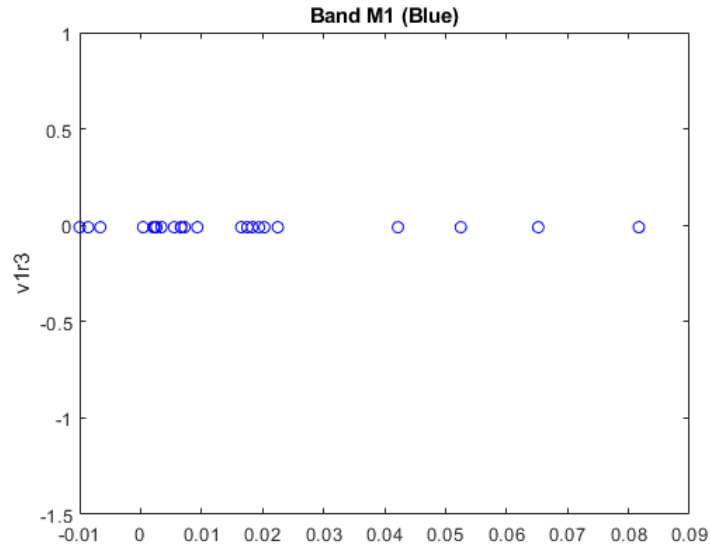
Compared with v1r2, v1r3 do have more granules with optimal retrieval percentage < 80%, which would trigger a warning, but check the warning data, all these data are unusable (confidently cloud), so no impact on SR quality, but further investigation are needed.

SR Monitoring and Routine Validation.

- Check the SR monitoring tools (true color images) and routine validation (AERONET) status and performance.
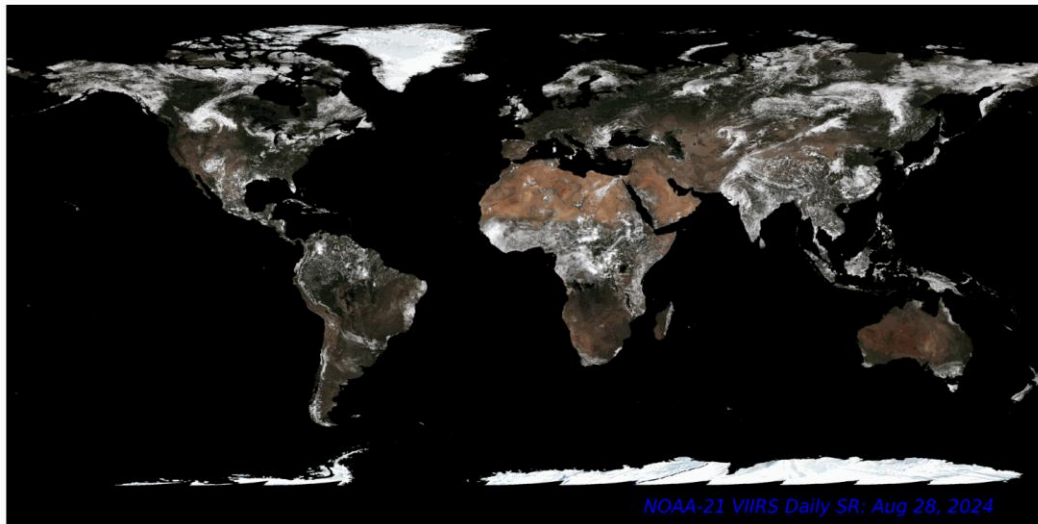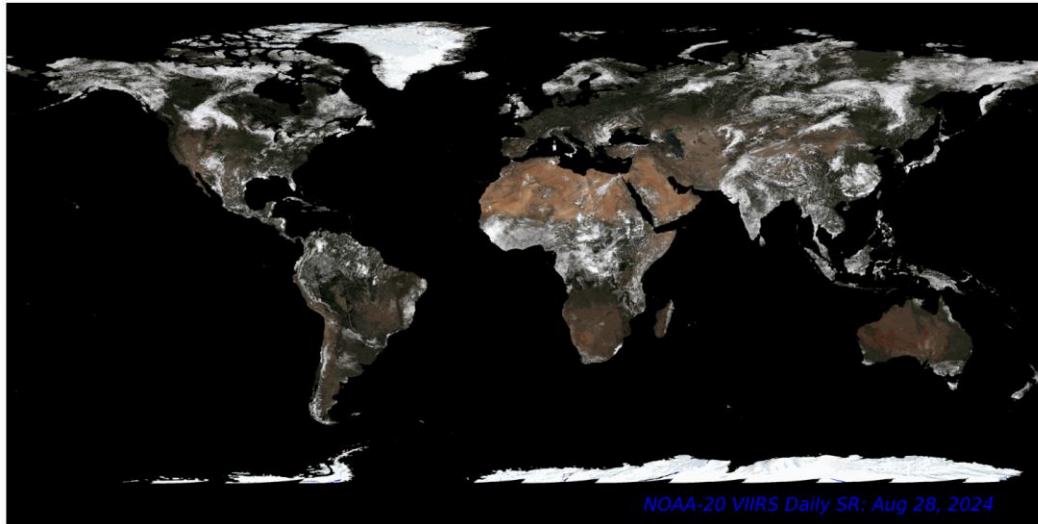
NOAA20 and NOAA21 SR (I1 and I2) validation at AERONET.

SNPP VIIRS EDR Reprocessing
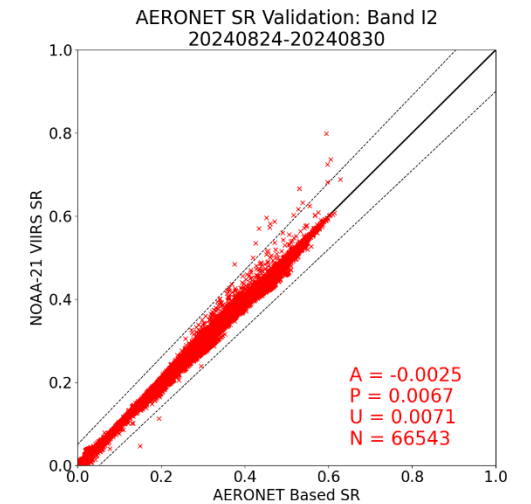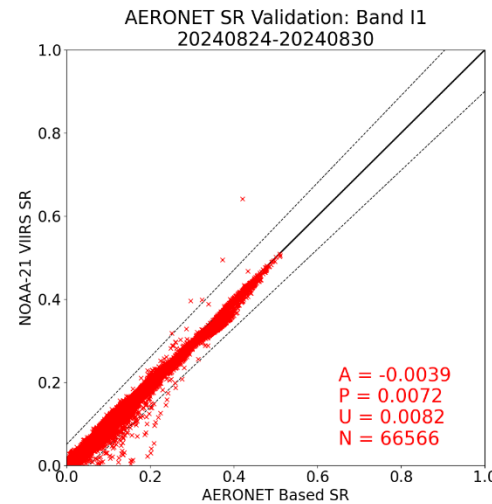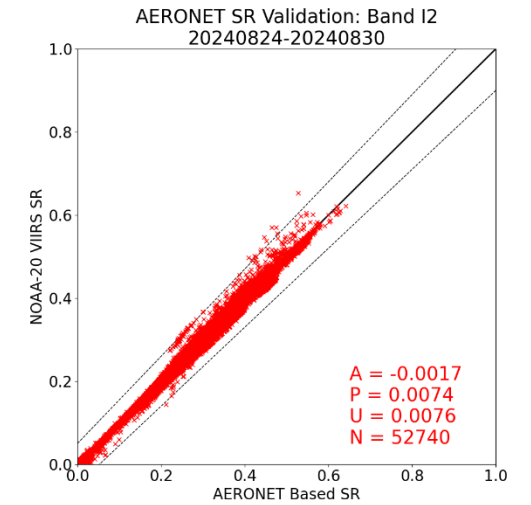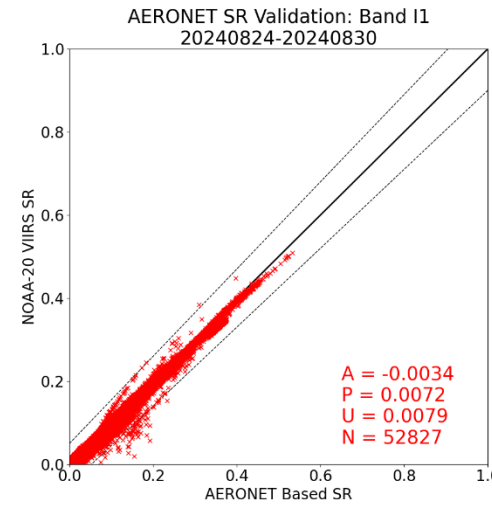
Accomplishments / Events:

- The RWG continue to assess the quality of reprocessed cloud EDRs against both the operational EDRs and corresponding CloudSat data. However, part of operational SNPP VIIRS Cloud Base Height (CBH) and related CloudSat products are unavailable over the period of reprocessed VIIRS EDRs. Therefore, the RWG takes different strategies to assess different periods of data:

- Currently, Aug. 20, 2018 ~ Jul. 10, 2019 have been reprocessed for all the cloud EDRs, whereas operational CBH data over Aug. 20, 2018 ~ Mar. 9, 2019, and related CloudSat cloud products over Aug. 20, 2018~Oct. 10, 2018 are missing from their official website. Therefore, the assessment will be conducted for data after Oct. 10, 2018; and only reprocessed CBH EDRs will be compared against CloudSat data before Mar.9, 2019.

- The following figure shows the scatter plot with densities between both reprocessed (left) and operational (right) Cloud Base Height (CBH) and CloudSat data over Mar. 2019; the R-square values against CloudSat data are 0.73 and 0.72 for reprocessed and operational data respectively.
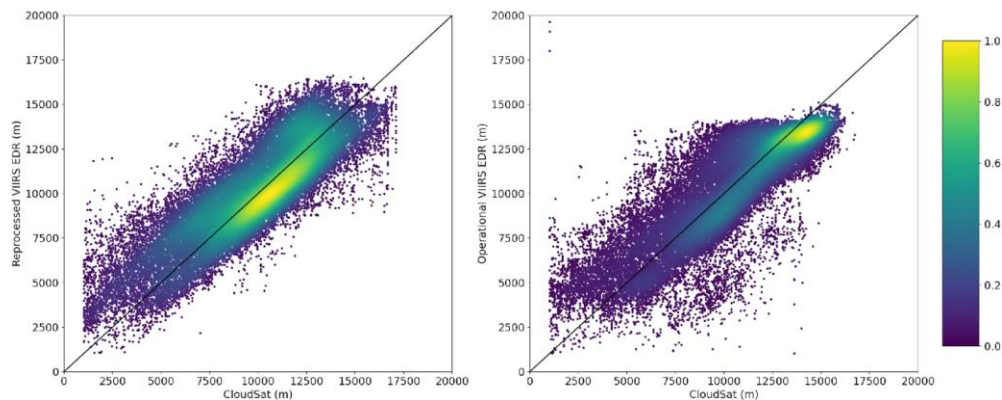
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Complete the reprocessing of SNPP VIIRS EDRs for all the cloud properties over , Aug. 20, 2018 ~ Jul. 10, 2019	02/2024	06/2024		5 month
Assess the quality and accuracy of reprocessed cloud base height and cloud top height 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

Accomplishments / Events:

- STAR-UMD VIIRS Surface Type team has downloaded and processed S-NPP, NOAA-20, and NOAA-21 VIIRS daily granule surface reflectance data acquired in August of 2024 for the production of AST-2024.

- The team has completed post-processing of AST2023 and produced the final product suite:
  - It includes maps with 17 IGBP types, 20 EMC types, and 9 Biome types in both Sinusoidal and Geographic (Lat/Lon) projections.
  - Major inputs to this product included VIIRS surface reflectance data acquired by S-NPP and NOAA-20 from January 1 to December 31, 2023. When NOAA-21 data became available in November 2023, those acquired in 2023 were also used.

- The team is on track towards delivering this product suite in September, along with validation statistics and an updated surface type ATBD.

Overall Status:

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

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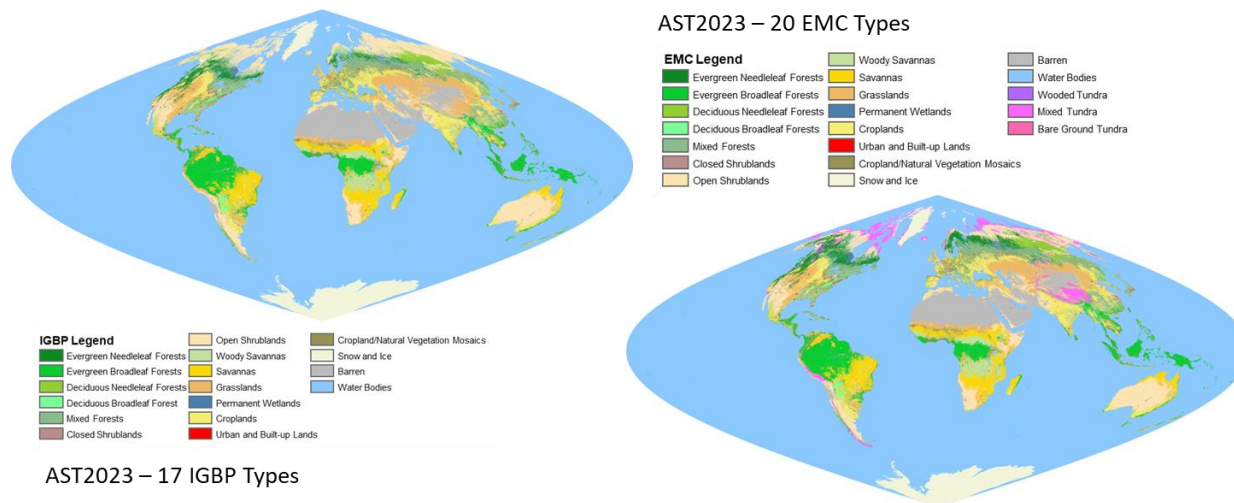4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Highlights:

Annual Surface Type (AST) Maps Developed Based on 2023 VIIRS Surface Reflectance Data (AST2023)

AST2023 – 20 EMC Types

AST2023 – 17 IGBP Types

The AST product suite includes maps with 17 IGBP types, 20 EMC types, and 9 Biome types in both Sinusoidal and Geographic (Lat/Lon) projections. The maps shown here are in the Sinusoidal projection. The 2023 product (AST2023) was primarily based on VIIRS surface reflectance data acquired by S-NPP and NOAA-20 from January 1 to December 31, 2023. When NOAA-21 data became available in November 2023, those acquired in 2023 were also used.

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

Vegetation Health

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							DIFF (OSPO-STAR)				
year	week	SMN	SMT	VCI	TCI	VHI	year	week	SMN	SMT	VCI	TCI	VHI
2024	19	0.373	296.09	73.34	32.29	52.83	2024	19	-0.014	-0.94	-5.77	8.77	1.5
2024	20	0.392	296.91	70.15	35.22	52.7	2024	20	-0.026	-2.02	-11.16	18.34	3.59
2024	21	0.405	297.46	66.63	37.99	52.31	2024	21	-0.016	-0.18	-7.38	0.92	-3.22
2024	22	0.414	297.79	62.57	40.81	51.69	2024	22	-0.007	0.65	-3.36	-6.69	-5.02
2024	23	0.428	299	64.92	32.81	48.87	2024	23	-0.015	-0.73	-8.58	6.6	-0.99
2024	24	0.435	299.33	65.55	32.52	49.04	2024	24	-0.024	-1.63	-13.29	15.87	1.29
2024	25	0.439	299.92	67.98	29.63	48.81	2024	25	-0.013	-1.63	-7.86	15.91	4.02
2024	26	0.438	300.42	68.31	27.1	47.71	2024	26	0.001	-0.87	0.26	7.71	3.98
2024	27	0.434	300.77	67.53	26.07	46.8	2024	27	0.004	-0.09	2.05	0.63	1.34
2024	28	0.427	300.93	66.9	26.9	46.9	2024	28	0.007	0.63	3.57	-6.36	-1.4
2024	29	0.419	300.89	66.11	29.07	47.6	2024	29	0.004	0.51	2.07	-5.86	-1.9
2024	30	0.41	300.7	65.99	32.35	49.18	2024	30	0.002	0.27	0.9	-3.01	-1.07
2024	31	0.401	300.45	66.12	34.45	50.3	2024	31	0.002	0.28	1.04	-3.08	-1.04
2024	32	0.392	300.22	66.95	34.57	50.77	2024	32	-0.002	0.03	-1.07	-0.57	-0.83

Vegetation Index and Green Vegetation Fraction

Accomplishments / Events:

- Completed algorithms/ products production report
- Gathering data for cal/ val report
- Reprocessing:
  - Algorithm design
  - Investigation of input data resources
  - Produced experimental reprocessed product
- Continue work on integrating VI and GVF into Vegetation Health processing

Overall Status:

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

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

Issues/Risks:

None

Highlights:

- Sample reprocessed daily VI has been generated.

Reprocessed daily NDVI_TOA, 20221218

Reprocessed daily NDVI_TOC, 20221218

Reprocessed daily EVI_TOC, 20221218

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		Deferred by system: 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		

Annual algorithms/ products performance report summary

- NOAA21 reviews
  - Beta review for VI and GVF passed in August 2023
  - Provisional/ validated review passed in January 2024
- Data gaps and read issues
  - Analysis of SNPP VI and GVF data for periods including 20230726-20230731 data gap showed significant decrease in weekly VI relative to NOAA-20. After the data gap, differences were comparable to before the gap.
  - NDE had an input data issue for GVF. As of July 2023, only one day of data was read in. The issue was resolved in August 2023.
- NCCF migration
  - Proposed global mean VI and GVF thresholds for NCCF production of at least 55% valid retrievals for VI and 50-75% optimal retrievals for GVF
  - NCCF migration for VI and GVF were successful. Worked with OSPO to finish the Operational Readiness Review. Daily and weekly VI are 100% match. Biweekly VI and GVF mismatch can be explained by missing granules in biweekly input or 15-week historical data
- 1km global VI and GVF
  - 1km global VI produced locally since September 2023. Evaluation and documentation of this code was done in October 2023.
 - 1km GVF code development was finished in January 2024.

Preparation of Reprocessing for SNPP:
# VI/GVF reprocessing input data sources and availability

| Product	Input	Data source	Availability
VIIRS VI/GVF	GITCO	https://noaa-jpss.s3.amazonaws.com/index.html#SNPP/VIIRS/SNPP_VIIRS_I-Band_SDR_TC_GEO_GITCO_Reprocessed_V2/	04/27/2014 ~ 04/30/2020
		https://noaa-nesdis-snpp-pds.s3.amazonaws.com/index.html#VIIRS-IMG-GEO-TC/	08/22/2022 ~ present
	SVI01	https://noaa-jpss.s3.amazonaws.com/index.html#SNPP/VIIRS/SNPP_VIIRS_I-Band_01_SDR_SVI01_Reprocessed_V2/	04/27/2014 ~ 04/30/2020
		https://noaa-nesdis-snpp-pds.s3.amazonaws.com/index.html#VIIRS-I1-SDR/	08/18/2022 ~ present
	SVI02	https://noaa-jpss.s3.amazonaws.com/index.html#SNPP/VIIRS/SNPP_VIIRS_I-Band_02_SDR_SVI02_Reprocessed_V2/	04/27/2014 ~ 04/30/2020
		https://noaa-nesdis-snpp-pds.s3.amazonaws.com/index.html#VIIRS-I2-SDR/	08/18/2022 ~ present
	SR	Need reprocessed SR	
	JRR-AOD	https://noaa-jpss.s3.amazonaws.com/index.html#SNPP/VIIRS/SNPP_VIIRS_Aerosol_Optical_Depth_EDR_Reprocessed/	01/19/2012 ~ 12/31/2022
	JRR-CloudMask	Could be generated from the assembled framework	

Reprocessing for SNPP: Examples of reprocessed VI

Reprocessed daily NDVI_TOA, 20221218
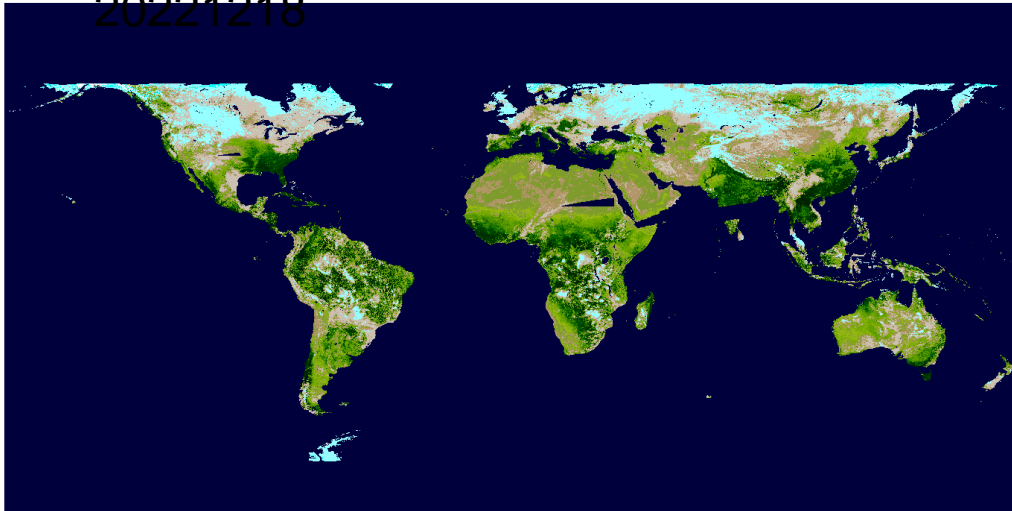
Reprocessed daily NDVI_TOC, 20221218
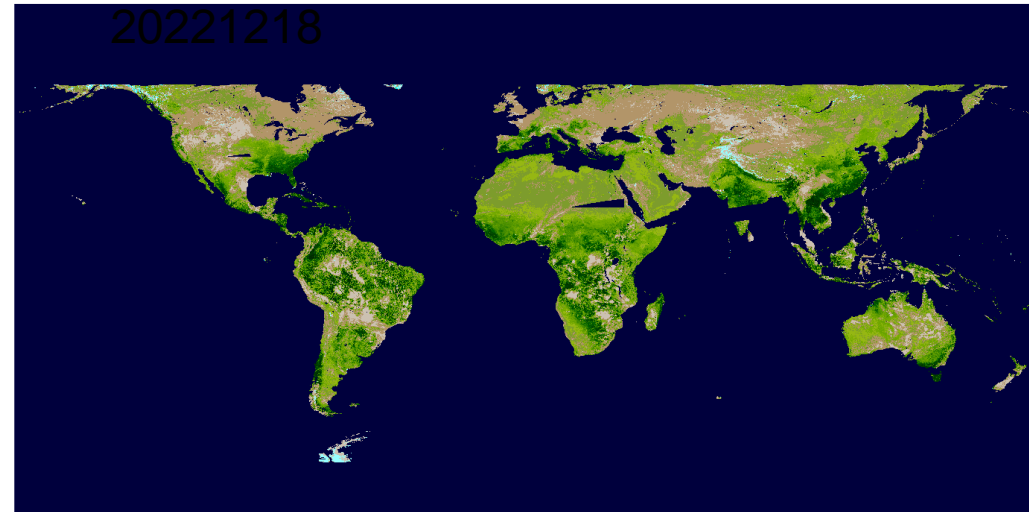
Reprocessed daily EVI_TOC, 20221218
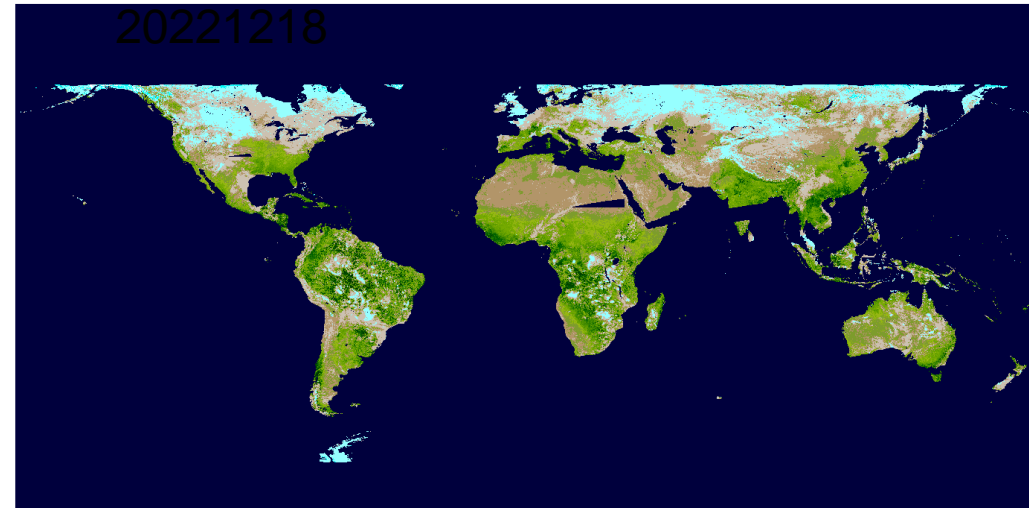
Accomplishments / Events:

- Presented "Evaluation of VIIRS thermal emissive bands inter-sensor consistency using radiative transfer modeling" at the SPIE Optics and Photonics conference in San Diego, CA, on Aug. 18-22, 2024
- After downloading from AWS S3 the required VIIRS SDR products, conducted checkout of the IDPS Block 2.3 Release Mx11 software deployed on DP-FE (SOL) in AWS Pub Cloud
- After downloading from GRAVITE the required VIIRS SDR products, conducted checkout of the IDPS Block 2.3 Release Mx11 software deployed on DP-TE (I&T) in AWS Pub Cloud
- Began monitoring small NOAA-21 SWIR-band degradation after MMOG-2 that reached ~0.5% for the most affected band/detector combination
- Generated and delivered for deployment in the IDPS operations the updated NOAA-21, NOAA-20 and S-NPP VIIRS SDR DNB DN0 and GAIN-RATIOS LUTs as well as the improved NOAA-21 DNB STRAY-LIGHT-CORRECTON LUT for August that were created based on data acquired around the new moon on 8/4/2024

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:

J3/J4 VIIRS granule size change test data for IDPS

Milestones

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

Highlights:

Comparison of the reanalyzed F factors for the SWIR band M8 with those from the F-PREDICTED LUT currently in the IDPS operations: while the rate of the apparent response degradation after MMOG-2 is many times smaller than before it, the detector (and band) dependence appears to be similar
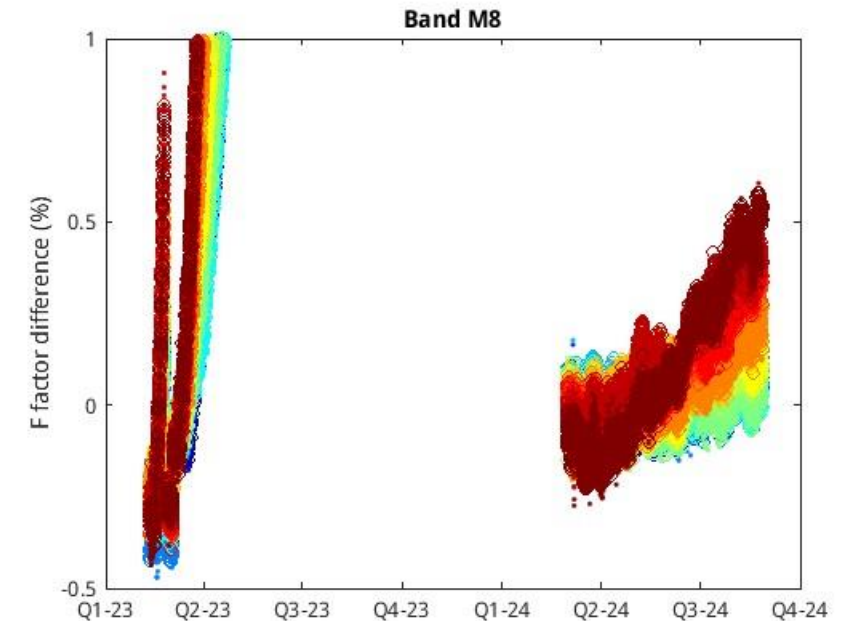
Accomplishments / Events:

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

- VOLCAT VIIRS volcanic ash plume identification and extraction work is an enhancement to the VOLCAT methodology. The most recent research focus has been developing a web-page based tool to manually classify VOLCAT volcanic cloud objects by a science team expert (as yes (containing volcanic ash) or no (not containing volcanic ash)). This will enable a full training database to be generated for ash and non-ash clouds for training the AI/ML methodology, including both detected and missed volcanic clouds by the current VOLCAT algorithm. In August the science team has worked on identifying and reprocessing scientifically interesting cases (e.g., volcanic clouds, VOLCAT false alarms, etc.) to be included in the AI/ML training dataset. The figure shows two examples, one is an ash cloud over the Kamchatka Peninsula in Russia and the other is a false alarm from the current VOLCAT algorithm off the coast of southern California.

Overall Status:

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

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

Issues/Risks:

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

Highlights: Examples of recently identified and reprocessed cases to be used in the AI/ML training dataset. The left is an ash cloud over the Kamchatka Peninsula and the right is a false alarm off the coast of California.