



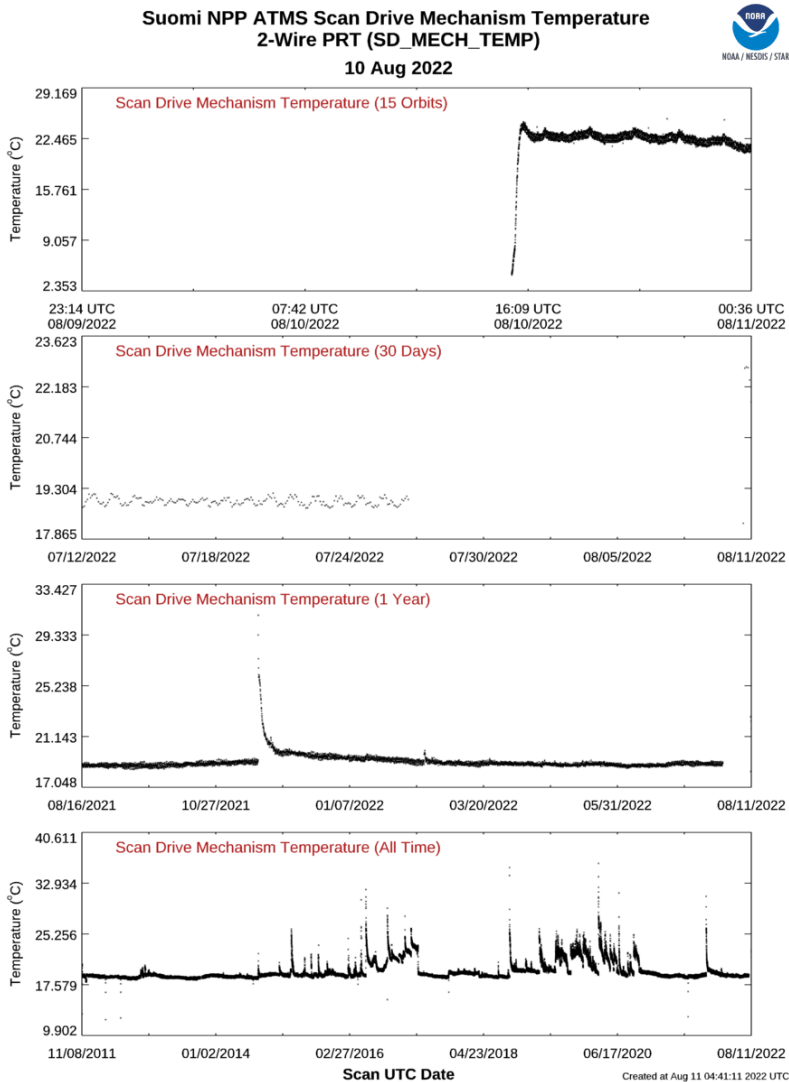
## NOAA JPSS Monthly Program Office

# AMP/STAR FY22 TTA

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## SNPP recovery effort



The SNPP satellite entered a non-nominal state at 1624 UTC on July 26, after which all science and telemetry data were inaccessible. The science instruments were reactivated on August 10, and data began flowing from the satellite on August 11. This data had to be checked for quality by the Cal/Val teams before being approved for operational use, which occurred in the following week (depending on the instrument.) The data for the period are not recoverable.

The STAR Cal/Val teams rapidly assessed the quality of the science data and found that there were no major issues. Visual and quantitative evaluation was also performed by the EDR teams to ensure that there had been no degradation of those products due to the anomaly.

Figure: Example of satellite and instrument monitoring tools from ICVS (in this case, ATMS Scan Drive Mechanism temperature).

## AMS Collective Madison Meeting



The American Meteorological Society (AMS) Collective Madison Meeting (CMM) was held 8-12 August 2022 at the Monona Terrace in Madison, Wisconsin. The University of Wisconsin-Madison Space Science and Engineering Center (SSEC) and the CIMSS co-sponsored the event. The CMM consisted of the following Conferences: the 25th Conference on Satellite Meteorology, Oceanography, and Climatology joint with the NOAA Satellite Meeting, the 17th Conference on Polar Meteorology and Oceanography, and the 16th Conference on Cloud Physics/16th Conference on Atmospheric Radiation. The Cryosphere Team had a number of posters demonstrating the VIIRS, AMSR2, and ABI ice and snow products covering both current operational products and new product developments.

Figure: Example of satellite and instrument monitoring tools from ICVS (in this case, ATMS Scan Drive Mechanism temperature).

## VOLCAT Sulfur Dioxide Composites

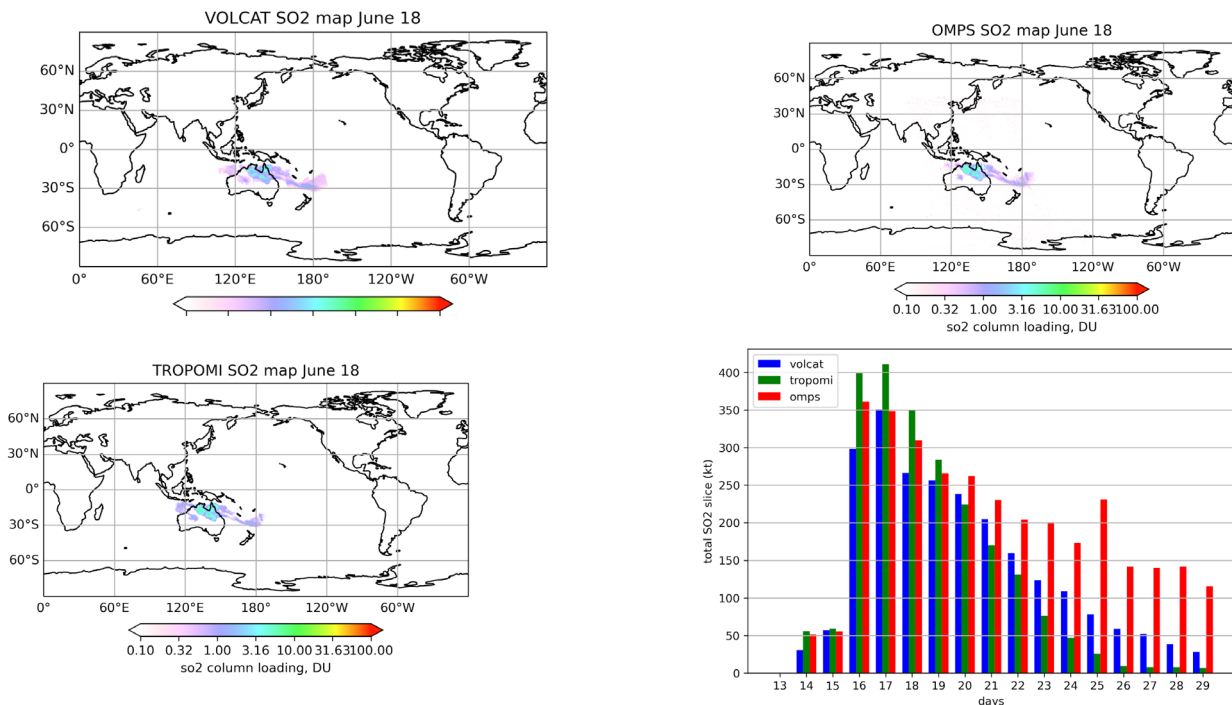


Figure. VIIRS/CrIS SO<sub>2</sub>, OMPS SO<sub>2</sub>, TROPOMI SO<sub>2</sub>, and a graph comparing the three.

VOLCAT will in the long-term replace the Volcanic Ash EDR algorithms. A significant tool from VOLCAT using JPSS VIIRS+CrIS is global SO<sub>2</sub> monitoring. SO<sub>2</sub> monitoring is critical for weather and climate impacts from significant volcanic eruptions as well as local to regional scale air quality concerns from all eruptions. The JPSS-based VOLCAT SO<sub>2</sub> composites have been compared to Ultra-Violet (UV) based SO<sub>2</sub> composites (OMPS and TROPOMI) and have shown good agreement (see figure for comparison for the Hunga Tonga eruption from January 2022). The VIIRS+CrIS Infrared (IR) SO<sub>2</sub> monitoring is especially useful for monitoring SO<sub>2</sub> in regions without solar illumination (e.g., night scenes and polar winter regions) since UV products require solar illumination. Additional SO<sub>2</sub> comparisons will be generated to ensure the JPSS products agree with UV SO<sub>2</sub> products.

# Accomplishments

- Delivery Algorithm Packages (DAPs) – Mission Unique Products:
  - **8/01/2022** STAR delivered DAP (ADR-10038/CCR-6103, JPSS-2 VIIRS SDR QA-V2 LUT Post-TVAC Update) to DPMS  
*List of changes:* LUT update only. VIIRS-SDR-QA-V2-LUT\_j02. Also include an improved VIIRS-RSBAUTOCAL-HISTORY-AUX file
  - **8/03/2022** VIIRS SDR team delivered updated VIIRS SDR (Version E) & Geo (Version B) ATBDs to JSTAR  
*List of files:* D0001-M01-S01-003\_JPSS\_ATBD\_VIIRS-SDR\_E.pdf; D0001-M01-S01-004\_JPSS\_ATBD\_VIIRS-Geolocation\_B.pdf
  - **8/04/2022** STAR delivered ATMS code update DAP (ADR-9815/CCR-6106, SNPP/ N20 / J2 ATMS WarmNEDT and ColdNEDT update) to DPMS  
*List of code changes:* c2k\_new.f90 (upgraded the NEDT calculation algorithm)
  - **8/05/2022** OMPS team delivered DAP (ADR-10037/CCR-6101, JPSS-2 OMPS pre-launch LUTs update) to ASSISTT team.  
**8/15/2022** ASSISTT delivered the DAP to DPMS.  
*List of changes (9 LUTs, LUT update only):* OMPS-NP-CALCONST-LUT\_j02; OMPS-NP-DARKS-GND-PI\_j02; OMPS-NP-FAM-LUT\_j02; OMPS-NP-WAVELENGTH-GND-PI\_j02; OMPS-TC-CALCONST-LUT\_j02; OMPS-TC-CF-EARTH-GND-PI\_j02; OMPS-TC-DARKS-GND-PI\_j02; OMPS-TC-FAM-LUT\_j02; OMPS-TC-STRAYLIGHT-LUT\_j02
  - **8/31/2022** VIIRS team delivered DAP (ADR-8823/CCR-6123, JPSS-2 VIIRS Mounting Matrix in Geo LUTs Update) to ASSIST team.  
**9/07/2022** ASSISTT delivered the DAP to DPMS.  
*List of changes (3 LUTs, LUT update only):* VIIRS-SDR-GEO-IMG-PARAM-V2-LUT\_j02; VIIRS-SDR-GEO-MOD-PARAM-V2-LUT\_j02; VIIRS-SDR-GEO-DNB-PARAM-V2-LUT\_j02
  - **9/07/2022** ATMS team delivered DAP (ADR-10041/CCR-6126, JPSS-2 ATMS Post TVAC Sensor Mounting Matrix PCT (v004) Update) to ASSISTT team. **9/09/2022** ATMS team re-delivered the package to ASSISTT (a minor update to be fully compatible with the CAL data book).  
**9/14/2022** ASSISTT delivered the DAP to DPMS.  
*List of changes (PCT update only):* ATMS-SDR-CC\_j02, for both SIDE-A and SIDE-B (two tables)
  - **9/08/2022** CrIS team delivered DAP (ADR-10042/CCR-6127, JPSS-2 CrIS Post TVAC Sensor Mounting Matrix PCT Update) to ASSIST team.  
**9/13/2022** ASSISTT delivered the DAP to DPMS.  
*List of changes (PCT update only):* CrIS-FS-SDR-CC\_j02
  - **9/09/2022** OMPS team delivered DAP (ADR-10044/CCR-6135, JPSS-2 OMPS Mounting Matrix Coefficients update) to ASSISTT team. **9/14/2022** OMPS team re-delivered the package to ASSISTT (regenerated the LUTs. Need define the constants as double precision).  
**9/16/2022** ASSISTT delivered the DAP to DPMS.  
*List of changes (2 LUTs: one for the OMPS-TC and one for OMPS-NP. LUT update only):* OMPS-NP-SDR-CC\_j02; OMPS-TC-SDR-CC\_j02
  - **9/12/2022** ATMS team delivered updated ATBD (Rev. B) to JSTAR  
*List of files:* D0001-M01-S01-001\_JPSS\_ATBD\_ATMS-SDR\_B

# Accomplishments

- Delivery Algorithm Packages (DAPs) – Enterprise Products:

- **8/03/2022** OMPS Ozone team delivered initial J2 OMPS LP package (Level 1 product sections) to ASSISTT (so that ASSISTT could start checking compilers and try to get that section of the code in for the code review)
- **8/05/2022** STAR delivered GBBEPx (GBBEPx: Blended Global Biomass Burning Emissions Product, for S-NPP, NOAA-20, & Meteosat-11, version 3) Final CCAP to NCCF
- **8/08/2022** STAR delivered JRR patch DAP to NDE (Patch to J2 Final “Super DAP”, addresses several fixes discussed with NDE)
- **8/12/2022** MiRS team delivered MiRS v11.9 DAP package to ASSISTT team  
Changes: (1) Extreme Gradient Boosting (XGB) machine learning Snowfall Detection algorithms; (2) Updated Neural Network machine learning Ice Water Path initialization and SFR bias correction; (3) New SFR low limit set at 0.05 mm/h and high limit at 6 mm/h; (4) Implementation of a new and up to date higher-resolution (0.05 degree lat/lon) land/water surface type database derived from global VIIRS data
- **8/23/2022** STAR delivered GAASP SST Bug Fix Patch DAP to NDE (Bug fix patch delivery: This bug causes the SST values to never go below 0 degrees Celsius when they should get to as low as -3 degrees Celsius near the poles. The only file that needs to be updated is the ocean\_algorithms\_module.f90. The only algorithm that will be affected is the Ocean EDR.)
- **9/01/2022** VFM team provided JPSS-2 VFM Cal/Val timeline for Beta/Provisional/Validated maturity
- **9/01/2022** STAR delivered JPSS Clouds Preliminary CCAP (v1.0) to NCCF/OSPO (This is an initial delivery of JPSS Clouds for software code review by OSPO. No scientific changes since the VIIRS “Super DAP” v3r2 delivery to NDE. The only new code in this delivery is the Python wrapper scripts for the CCAP)
- **9/08/2022** STAR delivered MiRS v11.8 Final CCAP (MiRS version number: 11.8; CCAP version number: 2.0) to NCCF (This delivery is a final Enterprise CCAP delivery to NCCF for NDE Migration)  
Changes: (1). Added new python script to produce the final MIRS-MONITORING text file; (2). Added functionality for JPSS satellites; (3). Updated Python scripts to accommodate processing the new satellites; (4). Updated docker configuration to match current team standards
- **9/08/2022** STAR delivered VIIRS Flood Mapping Patch CCAP (v1r1) to NCCF (This is a patch delivery of the VFM CCAP to NCCF as part of the JPSS reprocessing efforts. This patch prevents output files from having a creation time of 60.0 seconds and allows for partial processing of near-polar granules (allow data that lies below 80 degrees to be processed); Minor updates to netCDF attributes, and to the build scripts)
- **9/09/2022** STAR delivered VIIRS Flood Mapping (v1r0) to CSPP (This is the first VFM delivery to CSPP LEO)
- **9/13/2022** STAR delivered OMPS V8Pro (V4r2, final DAP for NOAA-21 and maintenance DAP for NOAA-20 and NPP) to CSPP  
Changes: (1). Modified scripts and codes for adding more source info into the metadata; (2). Updated soft-calibration adjustments for both S-NPP and N20 (set J02 soft-calibrations to be zero for later adjustments); (3). New-added/Modified metadata variables
- **9/16/2022** Surface Type science team delivered updated ATBD (v2.1, updates for AST-2021) to JSTAR (ATBD\_VIIRS-SurfaceType\_v2.1.pdf)

# Accomplishments

- JPSS-2 Pre-Launch Testing events:
  - JCT2a-DSE (8/24/2021): 10/06/2021 JSTAR submitted review/checkout [summary report](#)
  - JCT3-AMB DSE part2 (OMPS Science RDRs Not Timeshifted)
    - 5/04/2022 OMPS SDR team provided review/checkout report (no problem, as expected)
  - JCT3-TVAC Segment 1 (5/10-5/13, 72hr): 5/15/2022 JSTAR submitted review/checkout [summary report](#)
  - JCT3-TVAC Segment 2 (5/17–5/19, 39hr): 5/23/2022 JSTAR submitted review/checkout [summary report](#)
  - JCT3-TVAC Segment 3 (5/25-5/26, 33hr): 5/27/2022 JSTAR submitted review/checkout [summary report](#)
  - JCT3-TVAC SDR teams reports: 06/22/2022 [CrIS](#); 07/06/2022 [VIIRS](#); 05/23/2022 [OMPS](#)
  - JCT4 (7/11-12/2022) SDR teams reports: 07/14/2022 [ATMS](#); 07/14/2022 [CrIS](#); 08/04/2022 [JSTAR report](#) (data files STAR received during JCT4)
  - ICVS beta run through J2 pre-launch testing JCT3-TVAC S1/S2/S3, JCT4 data, figures are available at [ICVS-beta](#) website
  - One-Orbit JPSS-2 Proxy data
    - STAR teams checked/run the one-orbit data, provided [summary report](#) on 5/12/2022
  - Three-Orbit JPSS-2 Proxy data
    - 7/14/2022 STAR downloaded the three-orbit J2 proxy data, and posted on STAR FTP for OSPO/NDE to download for J2 EDR test runs
  
- S-NPP Recovery: instrument performance, science data, cal/val updates  
 8/10/2022 – 8/29/2022: STAR SDR/EDR teams work on checking/evaluating S-NPP data products, provide daily status update
  
- VIIRS Global Annual Surface Type (AST)  
**9/16/2022:** The new VIIRS Annual Surface Type 2021 product (AST-2021, spatial resolution: 1km) based on 2021 whole year surface reflectance data is ready for users to download at STAR FTP sites (see <https://www.star.nesdis.noaa.gov/jpss/index.php> for detail links of NetCDF version, and Zip version files)

# Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	08/16/22, 08/23/22, 08/30/22, 09/06/22, 09/13/22 (no NPP LUT for 08/02/22 & 08/09/22 due to S-NPP anomaly)
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	08/02/22, 08/09/22, 08/16/22, 08/23/22, 08/30/22, 09/06/22, 09/13/22
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	08/02/22, 08/16/22, 08/23/22, 08/30/22, 09/13/22
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	08/09/22, 08/23/22, 09/06/22
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	09/06/22 (no Aug NPP LUT due to S-NPP anomaly)
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	08/02/22, 09/06/22

- Transition of the reprocessed SDRs to CLASS/NCEI:

- The official transition of the reprocessed SNPP SDRs to CLASS/NCEI started on December 1, 2021
- The transition of the reprocessed SNPP ATMS, CrIS, and OMPS data was completed. These data are available at CLASS website now
- The transition of the reprocessed SNPP VIIRS started on March 15, 2022
- The reprocessed SNPP VIIRS SDR data from 1/2/2012 to 2/15/2014 (**498.46T, 30.86%** of total) has been completed as of **August 31, 2022**
- It's expected that the VIIRS data transition will complete in October, 2023

- Recent VIIRS Imagery Social Media/Blog Posts

- 8/05/2022 [VIIRS Natural Fire Color RGB and McKinney Fire](#)
- 8/17/2022 [VIIRS Snowmelt RGB and polar mesoscale cyclone](#)
- 8/18/2022 [Arctic Donut in VIIRS Snowmelt RGB](#)
- 8/23/2022 [Dallas Flash Flooding](#)
- 8/25/2022 [VIIRS Day Cloud Phase Distinction RGB and Lake Michigan low](#)
- 8/30/2022 [VIIRS NCC and Typhoon Hinnamnor](#)



- JSTAR Code/LUT/Product Deliveries:

DAP to DPMS:

NOAA-20/JPSS-2 Algorithm DAP to NCCF:

- Nov-22: J2-ready OMPS LP DAP to NCCF (Sep-22: to ASSISTT)
- Mar-23: J2-ready Ocean Color DAP to NCCF (ASSISTT → NCCF)

# FY22 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
<b>Algorithm Updates DAPs</b>				
Final launch-ready JPSS-2 ATMS PCT/MM-coef DAP	Aug-22	Aug-22	Post-TVAC: 09/14/22	Pre-dynamic: 03/08/22
Final launch-ready JPSS-2 CrIS PCT/MM-coef DAP	Aug-22	Aug-22	Post-TVAC: 09/13/22	Pre-dynamic: 03/11/22
Final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP	Aug-22	Aug-22	Post-TVAC: 09/07/22	Pre-dynamic: 02/24/22
Final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP	Aug-22	Aug-22	Post-TVAC: 09/16/22	Pre-dynamic: 03/08/22
Final J2 ready Super DAP (include NPP/N20 updates), Clouds/Aerosol/VolcanicAsh/Cryosphere/LST/LSA/VPW	Mar-22	May-22	12/06/21 v3.1 patch DAP 02/24/22 XML cnf file to NDE 05/17/22 v3.2 final DAP 07/13/22 patch DAP	
Final J2 ready Active Fires DAP (include NPP/N20 updates, I-Band)	Mar-22	Mar-22	03/17/22	
Surface Reflectance: Final J2 ready DAP	Oct-21	Oct-21	10/07/21 02/02/22 (patch DAP)	
NVPS (VI & GVF): Final J2 ready DAP	Mar-22	Mar-22	03/29/22 (code & docs) 04/08/22 data only	
Vegetation Health: Initial/Final (combined) J2 ready DAP	Dec-21	Dec-21	12/20/21	
SST: Final J2 ready DAP (ACSPO 2.80)	Dec-21	Dec-21	Initial/Final DAP: 09/16/21 EUM & SMM doc: 12/15/21	
NUCAPS: Final J2 ready DAP	Mar-22	Mar-22	04/08/22	
MiRS & SFR: Final J2 ready DAP	Mar-22	Mar-22	03/31/22	12/30/21 v11.6 patch
OMPS Ozone V8Pro: Final J2 ready DAP	Mar-22	Jun-22	07/08/22	02/17/22 to ASSISTT
OMPS Ozone V8TOz: Final J2 ready DAP	Jan-22	Jan-22	02/03/22 V8TOZ: v4r2; V8TOS: v5r0	11/26/21 to ASSISTT
L3 Global Gridded LST/LSA (J2 DAP)	Mar-22	May-22	12/30/21 Prelim J2 DAP 05/13/22 Final J2 DAP	
Reformatting Toolkit	Mar-22	May-22	05/25/22	
AMSR-3 ready DAP (include AMSR-2 updates)	Sep-22	FY23		NCCF schedule

# FY22 STAR JPSS Milestones

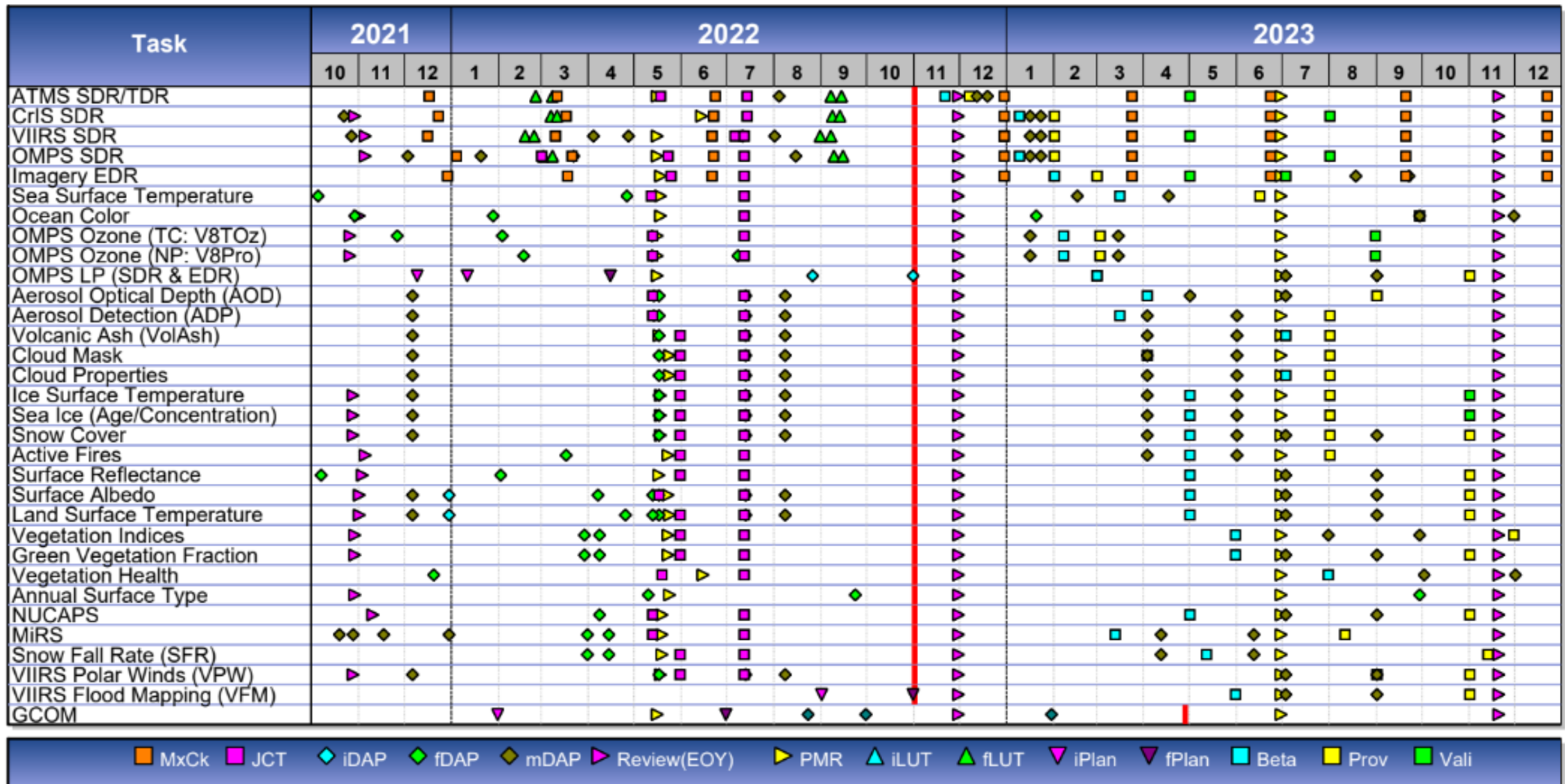
Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
<b>Algorithm Cal/Val/LTM</b>				
FY21 End of Year Science Team Presentations (all teams)	Oct-21	Oct-21	Oct/Nov-2021	
FY23 Program Management Review (all teams)	Jun-22	Jun-22	May/June-2022	
Enterprise Cal/Val plan for J2 OMPS LP SDR & EDR	Dec-21	Dec-21	12/09/21	
GCOM: AMSR-3/Enterprise Cal/Val Plan - draft delivery	Jan-22	Jan-22	Jan-22	
GCOM: AMSR-3/Enterprise Cal/Val Plan - final delivery	Jun-22	Jun-22	06/30/22	
AST-2021 (VIIRS Annual Surface Type)	Sep-22	Sep-22	09/16/22	
Support Alaska Demo (JPSS Aviation Initiative)	Sep-22	Sep-22	Sep-22	Ongoing work
JPSS-3 pre-launch test data review/analyze (SDR teams)	Sep-22	Sep-22	CrIS: Jul-2022	
Update J2-ICVS prototype to support J2 ICVS readiness (for JCT-3 test)	Sep-22	Sep-22	Oct-21: JCT2a-DSE Feb-22: one-orbit J2 data May-22: JCT3-TVAC S1/2/3 Jul-22: JCT-4	
Maintain / expand existing EDR LTM web pages and JSTAR Mappers	Sep-22	Sep-22	Sep-22	Ongoing work
Images of the Month	Monthly	Monthly	Sep-22	Ongoing work



# FY22 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date
<b>Operational/Program Support</b>			
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/05/21, 10/13/21, 10/19/21, 10/26/21, 11/02/21, 11/09/21, 11/16/21, 11/23/21, 11/30/21, 12/07/21, 12/14/21, 12/21/21, 01/04/22, 01/11/22, 01/18/22, 01/25/22, 02/01/22, 02/08/22, 02/15/22, 02/22/22, 03/01/22, 03/08/22, 03/15/22, 03/22/22, 03/29/22, 04/06/22, 04/12/22, 04/19/22, 04/26/22, 05/03/22, 05/10/22, 05/17/22, 05/24/22, 05/31/22, 06/07/22, 06/14/22, 06/22/22, 06/28/22, 07/06/22, 07/12/22, 07/19/22, 07/26/22, <b>08/16/22, 08/23/22, 08/30/22, 09/06/22, 09/13/22</b>
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/13/21, 10/26/21, 11/09/21, 11/23/21, 12/07/21, 12/21/21, 01/04/22, 01/18/22, 02/01/22, 02/15/22, 03/01/22, 03/15/22, 03/29/22, 04/12/22, 04/26/22, 05/10/22, 05/24/22, 06/07/22, 06/22/22, 07/06/22, 07/19/22, <b>08/02/22, 08/16/22, 08/23/22, 08/30/22, 09/13/22</b>
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/12/21, 11/09/21, 12/14/21, 01/11/22, 02/08/22, 03/08/22, 04/06/22, 05/04/22, 06/07/22, 07/05/22, <b>09/06/22</b>
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/05/21, 10/13/21, 10/19/21, 10/26/21, 11/02/21, 11/09/21, 11/16/21, 11/23/21, 11/30/21, 12/07/21, 12/14/21, 12/21/21, 01/04/22, 01/11/22, 01/18/22, 01/25/22, 02/01/22, 02/08/22, 02/15/22, 02/22/22, 03/01/22, 03/08/22, 03/15/22, 03/22/22, 03/29/22, 04/06/22, 04/12/22, 04/19/22, 04/26/22, 05/03/22, 05/10/22, 05/17/22, 05/24/22, 05/31/22, 06/07/22, 06/15/22, 06/22/22, 06/28/22, 07/06/22, 07/12/22, 07/19/22, 07/26/22, <b>08/02/22, 08/09/22, 08/16/22, 08/23/22, 08/30/22, 09/06/22, 09/13/22</b>
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/05/21, 10/19/21, 11/02/21, 11/16/21, 11/30/21, 12/14/21, 01/04/22, 01/11/22, 01/25/22, 02/08/22, 02/22/22, 03/08/22, 03/22/22, 04/06/22, 04/19/22, 05/03/22, 05/17/22, 05/31/22, 06/14/22, 06/28/22, 07/12/22, 07/26/22, <b>08/09/22, 08/23/22, 09/06/22</b>
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/12/21, 11/09/21, 12/14/21, 01/11/22, 02/08/22, 03/08/22, 04/06/22, 05/04/22, 06/07/22, 07/05/22, <b>08/02/22, 09/06/22</b>
Block 2.3 Mx builds deploy regression review/checkout (Jan-22 Mx5; Mar-22 Mx6; Jun-22 Mx7 SDRs and VIIRS Imagery teams)	Sep-22	Sep-22	<b>Mx5 SOL: 11/23/21; Mx5 I&amp;T: 01/06/22</b> <b>Mx6 I&amp;T: 03/22/22</b> <b>Mx7 SOL: 05/26/22; Mx7 I&amp;T: 06/23/22</b>
Participant/support JPSS-2 pre-launch testing events (Mar-22 JCT3-Ambient; May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	<b>10/06/21: JCT2a-DSE <a href="#">report</a>; 03/01/22: JCT3-Ambient (OMPS J2 RDRs) JCT3-TVAC: Segment 1 5/10-13 <a href="#">report</a>; Segment 2 5/17-19 <a href="#">report</a>; Segment 3 5/25-26 <a href="#">report</a></b> <b>SDR teams reports: 06/22/22 <a href="#">CrIS</a>; 07/06/22 <a href="#">VIIRS</a>; 05/23/22 <a href="#">OMPS</a></b> <b>07/11-12/22 JCT4: 07/14/22 team reports: <a href="#">ATMS</a>; <a href="#">CrIS</a>; 08/04/22: <a href="#">JSTAR Report</a></b>

# STAR JPSS Schedule: TTA Milestones



■ MxCk 
 ■ JCT 
 ◆ iDAP 
 ◆ fDAP 
 ◆ mDAP 
 ▶ Review(EOY) 
 ▶ PMR 
 ▲ iLUT 
 ▲ fLUT 
 ▼ iPlan 
 ▼ fPlan 
 ■ Beta 
 ■ Prov 
 ■ Vali

**Color code:**

**Green:**

**Completed Milestones**

**Gray:**

**Non-FY22 Milestones**

### Accomplishments / Events:

- Performed S-NPP ATMS recovery evaluation from the tune-off mode early August. Provided instrument health status/performance and science data quality assessment to ensure science data meet the operational requirement for downstream product applications.
- Conducted S-NPP ATMS recovery assessment on August 31 after the upload of new software patch to handle scan reversal related activities. Different from the previous assessment in early August, the ATMS was switched to safehold instead of fully turn-off. ATMS science data quality is suitable for operational use a few orbits after reactivation. The channel NEDT matches to what calculated before the safehold. The small glitch observed in calibration count are related to the instrument thermal instability during reactivation. All calibration parameters got to stabilized in about one day.
- Reviewed JPSS-2 ATMS Post-TVAC alignment measurement report and verified the coefficients supplied in the report. Checked the calculation resource of the additional set of coefficients and determined the optimal set of coefficients for the final PCT update.
- Worked with ASSISTT and JPSS IDPS team to verify the warm and cold NEDT calculation algorithm update for IDPS. Prepared the regression test verification results to support the transition.

### Overall Status:

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

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

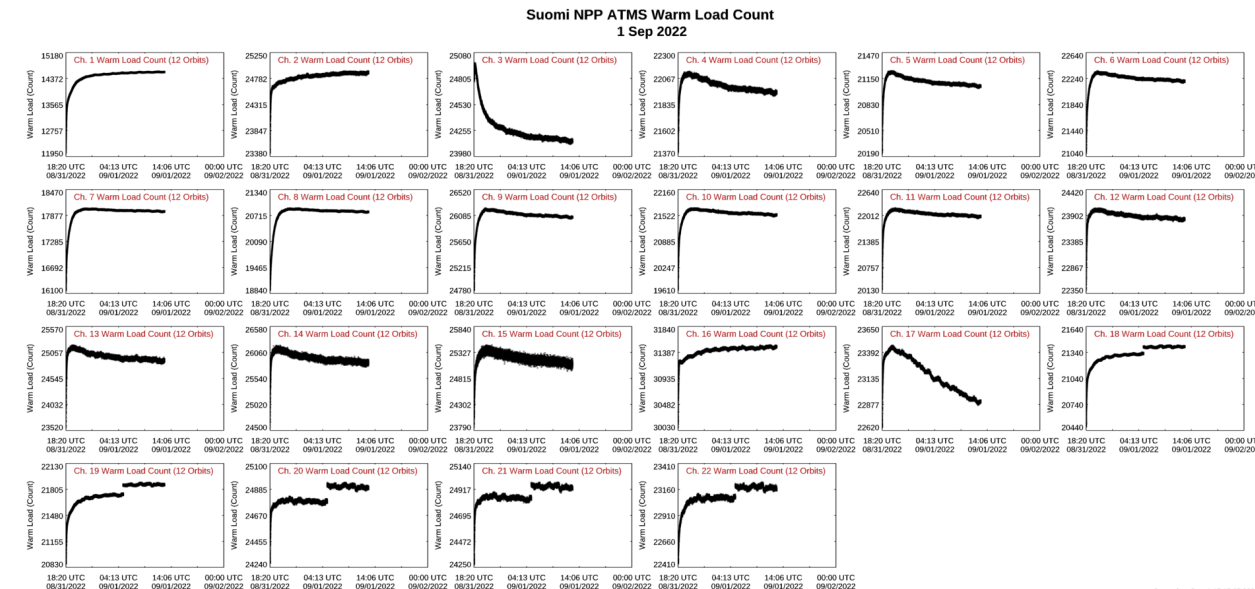
### Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Generate JPSS-2 ATMS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	02/25/22	pre-dynamic
Update of ATMS non-linearity correction coefficients after applying TVAC target thermal gradient correction	May-22	May-22	May-22	PMR slide6
Verify and finalize JPSS-2 ATMS processing coefficients table (PCT) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	May-22	May-22	May-22	PMR slide6
Deliver final launch-ready JPSS-2 ATMS PCT/MM-coef DAP to ASSISTT	May-22	Aug-22	Post-TVAC 09/07/22	pre-dynamic 02/25/22
Deliver final launch-ready JPSS-2 ATMS PCT/MM-coef DAP to DPMS	Jun-22	Aug-22	Post-TVAC 09/14/22	pre-dynamic 03/08/22
FY23 Program Management Review	Jun-22	Jun-22	05/16/22	
Improvement of ATMS lunar calibration algorithm by updating lunar temperature estimation model	Aug-22	Aug-22	May-22	PMR slide6
Analyze ATMS reprocessing data. Cooperate with EUMETSAT for ATMS reprocessing data application in climate study	Sep-22	Sep-22	May-22	PMR slide6
DAP (ADR9815/CCR6106, SNPP/N20/J2 ATMS WarmNEDT and ColdNEDT update) delivery			08/04/22	07/22/22 to ASSISTT
JPSS-3 ATMS pre-launch measurement and test data review/analyze	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/18/22 07/14/22	ICVS-Beta. report
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7)	Sep-22	Sep-22	12/17/21 Mx5 03/11/22 Mx6 06/23/22 Mx7	

### Highlights:

S-NPP ATMS warm calibration target showing a jump in channel 18 and 22 after the reactivation on August 31



## Accomplishments / Events:

- Provided daily assessment of the SNPP CrIS data quality during the SNPP Spacecraft Anomaly recovery from August 10, 2022 (Fig. 1) and continued the monitoring of SNPP CrIS sensor.
- Continued the development of analysis tools to support the evaluation of the CrIS sensor and SDR data: 1) investigated the JPSS-2 CrIS Neon calibration mitigation; 2) drafted a catalog of new potential telemetry for the monitoring of CrIS sensors.
- Continued the studies of: 1) Neon lamp mitigation ADL implementation (Fig. 2); 2) PC scores; 3) temperature drift algorithms; 4) the weighting functions for NOAA-20 CrIS (Fig. 3); 5) assessment of GOES-18 ABI and CrIS inter-comparison (Fig. 4); 6) development of the CrIS spike algorithm (Fig. 5)
- Continued the drafting of the manuscript of 1) the CrIS Spike Algorithm, 2) the Neon Lamp Mitigation Plan, and 3) On-orbit Performance of the NOAA-21 CrIS SDR Product.
- Continued the development of CrIS STAR SDR website. The completion of this milestone is expected by September 2022.
- Support to the official documents: 1) reviewed the IDPS document of "474-00448-02-03\_JPSS-CrIS-SDR-DD\_Part-3\_N\_CrIS-FS-SDR-PP.xml" and identified the description of Earth Scene data quality flags is missing; 2) reviewed the "CrIS-FSR-SDR-PP.xml" about the CrIS ICT/DS spike equality flags
- Support to the future CrIS instruments: development of the LUT update based on the J2 Post-TVAC alignment data is ongoing
- Submitted 1 abstract to the 2022 AGU Fall meeting and 4 abstracts to the 2023 AMS Annual Conference.
- Discussed the CrIS/VIIRS combined data product for radiance assimilation, and developed a list of the variables that can be potentially combined with CrIS SDR data.

## Overall Status:

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

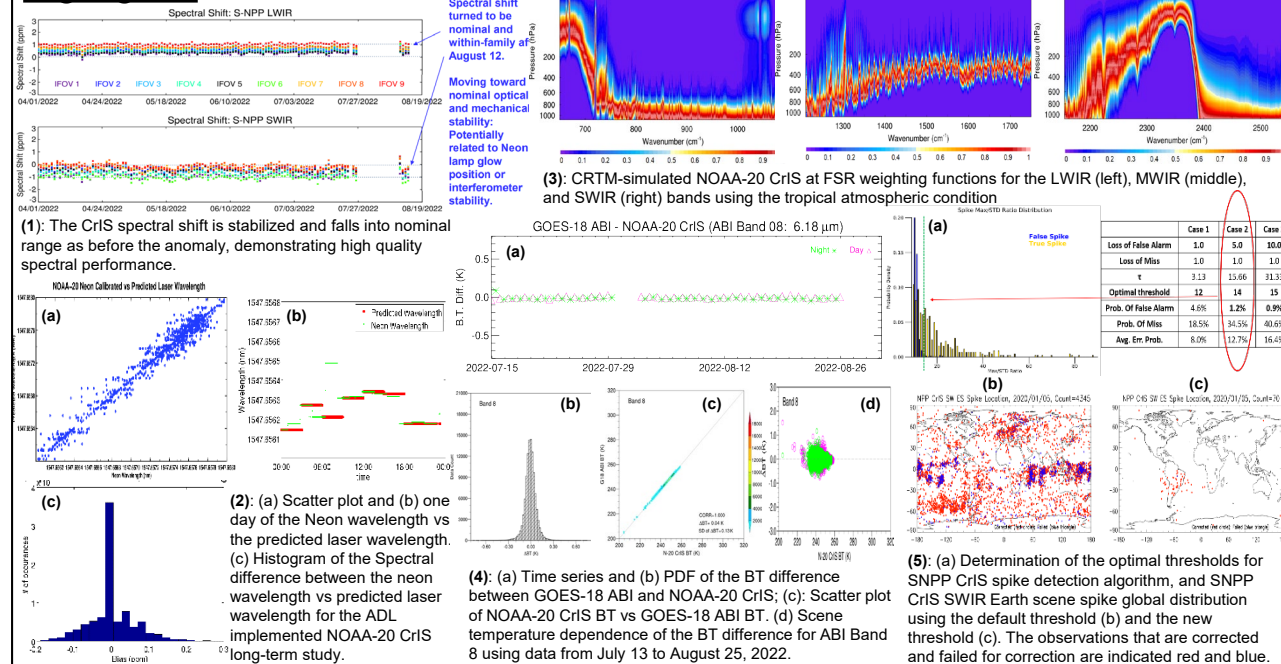
1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

## Issues/Risks:

- The CrIS Team got a 100TB on STAR servers (data638 and data645) in May 2022. However, the CrIS Team is still in need of hardware/software resources. Presently, there is only one server dedicated to 6 CrIS Team members. There is a **high risk** for the CrIS SDR Team to continue on such a single 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/storage as soon as possible (< 2 months) and add another server/storage in the next months, preferably before the launch of the J2 CrIS. A new MATLAB license is also required. Corresponding hardware/software quotations and SNO have been submitted.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/29/21	
Deliver the engineering packet v42 with new mapping parameters for SNPP CrIS	Oct-21	Oct-21	10/22/21	
Report the comparison assessment of CrIS radiometric nonlinearity correction formalism	Feb-22	Mar-22	03/16/22	Anomaly Resolution
Support and participate in the J3 CrIS Pre-ship Review	Mar-22	Apr-22	04/19/22	Vendor Rescheduled
Generate JPSS-2 CrIS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	03/07/22	pre-dynamic
Verify and finalize JPSS-2 CrIS processing coefficients table (PCT) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	May-22	Jun-22	Jun-22	JCT3-TVAC delay
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to ASSISSTT	May-22	Sep-22	09/08/22	03/07/22
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to DPMS	Jun-22	Sep-22	09/13/22	03/11/22
JSTAR CrIS Website upgrade	Aug-22	Sep-22		Dependency on 3rd party (Web Developer)
Demonstrate the functionality of the methods planned to be used to mitigate the failure of the J2 CrIS neon calibration system	Sep-22	Sep-22		
New developments and studies (working on the CrIS principal components generation, enhance the infrared cloud detection algorithm for radiometric assessment)	Aug-22	Jun-22		
FY23 Program Management Review	Jun-22	Jun-22	06/14/22	
JPSS-3 CrIS pre-launch measurement and test data review/analyze	Sep-22	Sep-22	Jul-22	
JPSS-3 CrIS Pre-launch evaluation tools development	Sep-22	Sep-22	Jul-22	
JPSS-3 Flight/Ground support	Sep-22	Sep-22	Jul-22	
Radiometric inter-comparison of S-NPP and NOAA-20 CrIS SDR data against other IR observations, including MetOp/IASI, AQUA/AIRS and GOES/ABI	Jun-22	Jun-22	Jun-22	
Perform regular RDR and SDR data analysis for instrument and data health	Sep-22	Sep-22		
Support investigation and resolution of anomalies from CrIS sensors including potential intensive Cal/Val activities	Sep-22	Sep-22		
Participate/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/18, 6/22, 07/14	ICVS-Beta, report
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7)	Sep-22	Sep-22	12/23/21 Mx5; 03/17/22 Mx6; Mx7: 05/23/22 SOL; 06/22/22 1&T	

## Highlights:





## Accomplishments / Events:

- Intensive Cal/Val for VIIRS SDRs were conducted by the STAR VIIRS Cal/Val team during the SNPP VIIRS recovery: Based on VIIRS SDR team recommendation, Suomi NPP VIIRS SDRs were approved for operational use at 21:30 UTC on August 18, 2022
- Created and delivered for deployment in the IDPS operations updated N20 and NPP DNB offset (DN0) and gain-ratios LUTs generated using the new moon calibration data from 8/27/2022: the NPP DN0 LUT update successfully reduced the additional DNB striping that remained after recovery from the satellite anomaly on 7/26/2022
- Published a peer-reviewed article "Evaluation of 10-Year NOAA/NASA Suomi NPP and NOAA-20 VIIRS Reflective Solar Band (RSB) Sensor Data Records (SDR) over Deep Convective Clouds" (*Remote Sensing*, 2022, **14**, 3566. <https://doi.org/10.3390/rs14153566>)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
VIIRS SDR (Rev.E) and Geo (Rev.B) ATBD update			08/03/22	
DAP delivery (ADR9760/CCR5724, N20 VIIRS-SDR-F-PREDICTED-LUT Update #7)			10/27/21	
ADR9903/CCR5939 VIIRS SDR Not Produced as Expected for Defective Data Packets			04/04/22	DAP to DPMS
DAP (ADR9904/CCR6099, VIIRS SDR Excessive Reflectance Values) to DPMS			07/11/22	
DAP (ADR10038/CCR6103, JPSS-2 VIIRS SDR QA-V2 LUT Post-TVAC Update) delivery			08/01/22	
Generate JPSS-2 VIIRS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	02/18/22	pre-dynamic
Verify and finalize JPSS-2 VIIRS lookup tables (LUTs) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	May-22	Aug-22	07/19/22	QA-V2 LUT
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to ASSISTT	May-22	Aug-22	08/31/22	02/18/22
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to DPMS	Jun-22	Sep-22	09/07/22	02/24/22
FY23 Program Management Review	Jun-22	Jun-22	05/16/22	
NOAA-20 VIIRS TEB RVS and Offset change testing and validation	Dec-21	Dec-21	Nov-21	
RDR code change to handle anomalous packets(similar to DB anomaly over Mexico)	Mar-22	Mar-22	Mar-22	
Develop VIIRS Global Area Coverage (VGAC) production capabilities in collaboration with NCEI to meet user needs (ISSCP, EUMETSAT, and others)	Sep-22	Sep-22		
OnDemand reprocessing delivery to CLASS (SNPP recalibrated & reprocessed VIIRS SDR)	Sep-22	Sep-22		
NOAA-20 VIIRS recalibration & reprocessing (on CLOUD)	Sep-22	Sep-22		
Delivery of VIIRS RSB calibration LUTs to mitigate degradation, as needed	Sep-22	Sep-22		
Delivery of VIIRS DNB straylight LUTs, as needed	Sep-22	Sep-22		
NOAA-20 VIIRS as GSICS reference	Mar-22	Mar-22	Mar-22	Report 1
Absolute calibration using CEOS RadCalNet Sites	Jun-22	Jun-22	Jun-22	Report 2
Offline RSB/DNB/TEB Cal/Val analyses	Jun-22	Jun-22	Jun-22	Report 3
Continue cross-calibration and monitoring between NOAA-20 and SNPP VIIRS	Sep-22	Sep-22		Report 4
JPSS-3 VIIRS pre-launch measurement and test data review/analyze	Sep-22	Sep-23		actual shipment
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/11, 07/06	JCT3-TVAC
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7)	Sep-22	Sep-22	12/16/21 Mx5; 03/10/22 Mx6 Mx7: 05/11/22 SOL: 06/21/22 I&T	
Operational Support: VIIRS LUT update of DNB Offsets and Gains (S-NPP & NOAA-20)	Monthly	Monthly		

## Overall Status:

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

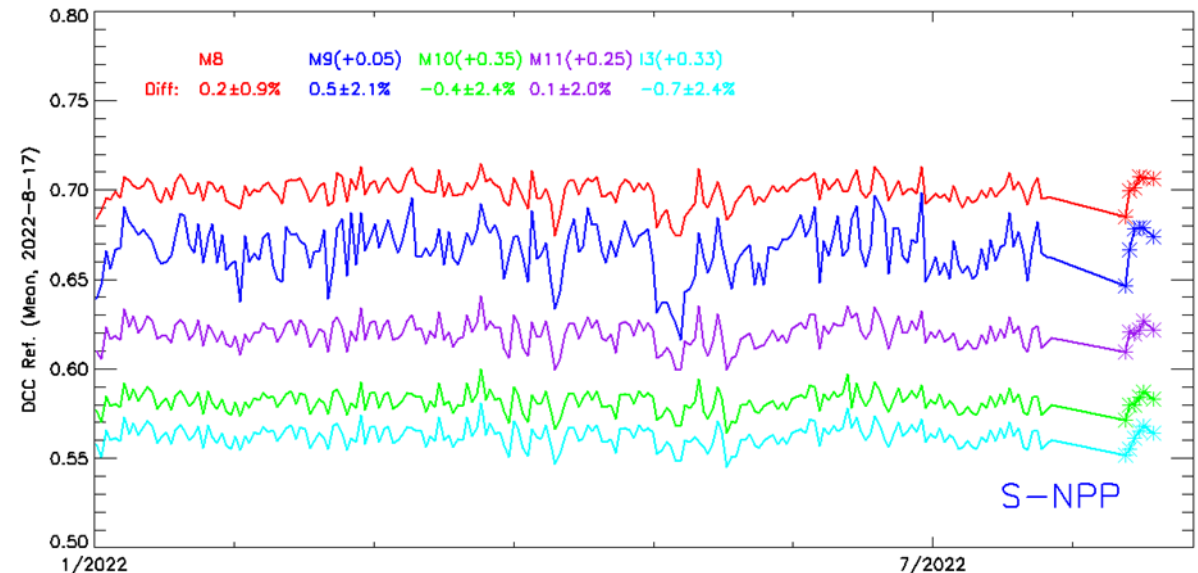
- Project has completed.
- Project is within budget, scope and on schedule.
- Project has deviated slightly from the plan but should recover.
- Project has fallen significantly behind schedule, and/or significantly over budget.

## Issues/Risks:

None

## Highlights:

Daily DCC reflectance values of SNPP VNIR/SWIR continue to be in family with those before the anomaly



## Accomplishments / Events:

- Delivered OMPS biweekly NP solar irradiance bi-weekly LUTs. Particularly, delivered an additional SNPP NP wavelength LUT during the SNPP recovery period to ensure the quality of the SDR data.
- Continued the analysis of the JCT3 TVAC OMPS test data by supporting the ADR10039.
- Conducted intensive calibration/validation analyses on the SNPP OMPS NM/NP SDR recovery quality towards operation of the SDR data.
- 1) Assessed and monitored the SNPP NM and NP dark rate trend;
- 2) Assessed and delivered new wavelength LUTs for the SNPP NP;
- 3) Evaluated and monitored the SNPP NM and NP instrument temperature trend;
- 4) Evaluated the quality of the SNPP NM SDR data after the recovery, by using the NOAA-20 NM, VIIRS M1, CRTM simulations, and NASA data as references respectively;
- 5) Evaluated the quality of the SNPP NP SDR data after the recovery, by using the NOAA-20 NP, VIIRS M1, CRTM simulations as references;
- 6) Evaluated the quality consistency of the SNPP NM/NP SDR data before and after the recovery event;
- 7) Evaluated the quality of the SNPP NM SDR data geolocation accuracy against the VIIRS geolocation;
- 8) Delivered weekly dark LUTs for SNPP NM and NP respectively to mitigate the impact of dark changes with time;
- 9) Delivered weekly wavelength LUTs for the SNPP NP;
- 10) Assessed the impact of dark change on SNPP OMPS NM and NP radiance accuracy during the recovery.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
DAP (ADR9633/CCR5577 OMPS TC geolocation code change for off-nadir geolocation error correction)			12/03/21	
DAP (ADR9908/CCR5926 OMPS J02 Nadir Version LUT Update N_TIM_PAT_VER Value)			03/22/22	
DAP (ADR10037/CCR6101, J2 OMPS pre-launch LUTs update) delivery			08/15/22	8/5/22 to ASSIST
Generate JPSS-2 OMPS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	03/02/22	pre-dynamic
Verify and finalize JPSS-2 OMPS lookup tables (LUTs) using JPSS-2 pre-launch JCT data (JCT-3 TVAC)	May-22	Aug-22	08/05/22	JCT3-TVAC delay
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to ASSIST	May-22	Aug-22	09/09/22	03/02/22
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to DPMS	Jun-22	Aug-22	09/16/22	03/08/22
FY23 Program Management Review	Jun-22	Jun-22	05/16/22	
OMPS SDR Calibration ATBD (update)	Jun-22	Sep-22		Low priority (e.g., SNPP recovery higher)
<b>Development/Update (Internal delivery):</b>				
ADL-OMPS offline processing code update (with flexible NM resolutions)	Jul-22	Jul-22	Jul-22	Keep improving
ADL-OMPS diagnostic (>380 nm) offline code development for geolocation	Aug-22	Aug-22	Aug-22	
OMPS polarization impact and mitigation algorithm development	Aug-22	Oct-22	FY23	SNPP recovery priority
1) J2 OMPS SNR calculation algorithm code update				
2) J2 OMPS SDR solar intrusion detection code prototype				
1) J2 OMPS NM/NP Day-1 solar analysis code prototype using NOAA-20 as proxy	Feb-22	Feb-22	Feb-22	
2) OMPS NM/NP x-sensor comparison code development (e.g., RTM/DCC methods)				
J2 OMPS geolocation error assessment code update using JCT3 OMPS SDR data and J2 mounting matrix coef.	May-22	Sep-22		Lack of measurement data
OMPS dark and solar raw flux processing code update	May-22	May-22	May-22	Updated with good progress, but not completed
Inter-sensor code prototype development (e.g., SNPP/NOAA-20/J2 OMPS, OMPS-GOME-2)	May-22	May-22	May-22	
1) OMPS Wavelength registration change investigation from ground to flight				
2) J2 High resolution risk mitigation algorithm development update in support to J2				
3) J2 OMPS pre-launch straylight correction analysis				
4) OMPS SDR quality validation baseline tool prototype developments (e.g., RTM-DD, SNO-DD, NM (VIIRS)-DD, 32D-AD)	Sep-22	Sep-22		
5) NM/NP SDR re-processing and data stability analysis update				
6) Assess impact of a new solar reference data on OMPS NM/NP SDR data quality				
Sustainment, monitoring, maintenance S-NPP & NOAA-20 in flight performance	Sep-22	Sep-22		
JPSS-3 OMPS pre-launch measurement and test data review/analyze	Sep-22	FY23		No data available
Participant/support JPSS-2 pre-launch testing events (Mar-22 JCT3-Ambient; May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	03/01/22 05/23/22	JCT3-Ambient JCT3-TVAC
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7)	Sep-22	Sep-22	01/04/22 Mx5; 03/21/22 Mx6 Mx7: 05/25/22 SOL; 06/22/22 I&T	
Operational Support: Weekly updates darks for NM and NP (S-NPP & NOAA-20)	Weekly	Weekly		
Operational Support: Bi-weekly update NP Wavelength and solar flux (S-NPP & NOAA-20)	Ri-Weekly	Ri-Weekly		

## Overall Status:

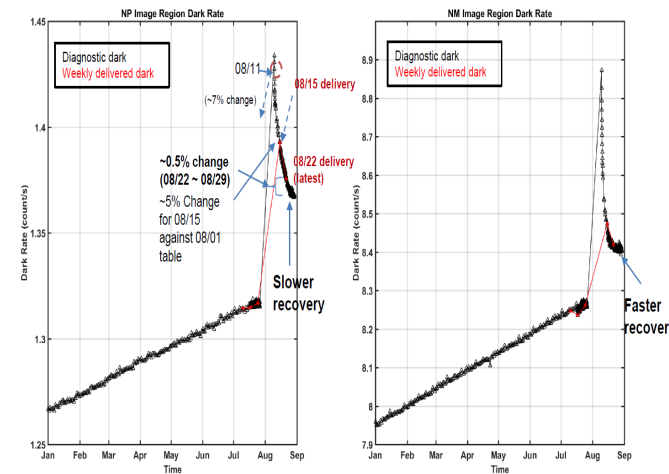
	Green <sup>1</sup> (Completed)	Blue <sup>2</sup> (On-Schedule)	Yellow <sup>3</sup> (Caution)	Red <sup>4</sup> (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule			X		

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:

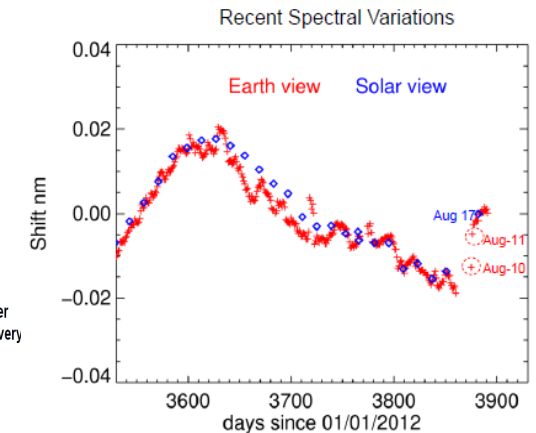
None

(a) SNPP NM/NP dark rate trend since 01/01/2022



- The SNPP OMPS NM and NP dark rates are still in recovery.
- The latest weekly dark table on 08/22 was implemented into operation at 19:15 UTC on 08/25.
- A routine weekly dark LUT will mitigate the variation of the dark in future.

(b) SNPP NP wavelength shift trend since 01/01/2022



- The latest weekly dark table on 08/22 was implemented into operation at 19:15 UTC on 08/25.
- A routine biweekly wavelength LUT will mitigate the variation of the wavelength shift in future.

## Accomplishments / Events:

- The official transition of the reprocessed SNPP SDRs to CLASS/NCEI started on December 1, 2021.
- The transition of the reprocessed SNPP ATMS (V1 and V2), CrIS, and OMPS (V1 and V2) data was completed in December 2021, February 2022 and March 9, 2022, respectively. These data are available at CLASS website now.
- The transition of the reprocessed SNPP VIIRS started on March 15, 2022.
- The VIIRS data transition is ongoing with 6 parallel jobs with data volume control of a stable daily data transition speed of ~2.97T/day
- The reprocessed SNPP VIIRS SDR data from 1/2/2012 to 8/13/2014 (498.46T, 30.86% of total) has been completed as of August 31, 2022.
- It's expected that the VIIRS data transition will complete in October, 2023.

## Overall Status:

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

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

## Issues/Risks:

None

## Highlights:

## Status of the Reprocessed SNPP Data Transition

Sensor	Data Type (name)	Period	Notes	Volume (Tb)	Status
ATMS	TDR (TATMS)	2011-11-08 to 2019-10-15	V2	0.406	Completed on Dec. 20, 2021
	SDR (SATMS)	2011-11-08 to 2019-10-15	V2	0.431	
	GEO (GATMO)	2011-11-08 to 2019-10-15	V2	0.420	
ATMS	TDR (TATMS)	2011-11-08 to 2017-03-08	V1	0.273	Completed on Dec. 30, 2021
	SDR (SATMS)	2011-11-08 to 2017-03-08	V1	0.289	
	GEO (GATMO)	2011-11-08 to 2017-03-08	V1	0.283	
CrIS	GCRSO	2012-02-20 to 2020-01-29	V2	0.369	Completed on Feb. 25, 2022
	SCRIS	2012-02-20 to 2020-01-29	V2	67.994	
	SCRIF	2014-12-04 to 2020-01-29	V2	74.455	
OMPS	TC (SOMTC, GOTCO)	2012-01-30 to 2018-09-30	V1	1.2	Completed on Mar. 4, 2022
	NP (SOMPS, GONPO)	2012-01-25 to 2017-03-08	V1	0.134	
OMPS	NP (SOMPS, GONPO)	2012-01-25 to 2021-06-30	V2	0.246	Completed on Mar. 9, 2022
	TC (SOMTC, GOTCO)	2012-01-30 to 2021-06-30	V2	1.695	
VIIRS	VIIRS ALL SDR	2012-01-02 to 2020-04-30	V2	1615	Completed 30.86%
<b>Total</b>				1764.65	

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY23 Program Management Review	Jun-22	Jun-22		Not scheduled
Complete planning and testing on transition of S-NPP reprocessed SDR data to CLASS	Oct-21	Oct-21	Oct-21	
Complete transition of 800 Tb of reprocessed S-NPP SDR data to CLASS	Sep-22	Sep-22		

Accomplishments / Events:

- Supported S-NPP recovery activities by providing near real time S-NPP spacecraft RDR, instrument RDR, and SDR data analysis and trending products in ICVS web site. Updated processing modules to deal with long term data missing situations.
- Provided S-NPP CrIS and VIIRS telemetry data to NASA flight team to support S-NPP recovery analysis activities.
- Developed new code and reprocessed S-NPP VIIRS life time telemetry RDR data to generate additional VIIRS key instrument temperature trending products for NASA flight teams to support S-NPP recovery analysis.
- Started upgrading ATMS intersensory comparison web page to reorganize the multiple comparison products.
- Fixed VIIRS calibration LUT trending modules to handle data duplication/gap situations. Reprocessed missing data to keep the trending product up to date so as to better support S-NPP recovery activities.
- Improved the OMPS NM 380 nm and VIIRS M1 band inter-sensor comparison module.
- Attended ICVS cloud migration kick-off meeting with OSPO team about the ICVS LTM module information.
- Provided near real time Atlantic and Eastern Pacific tropical store/hurricane evolution monitoring using JPSS SDR data to demonstrate JPSS high quality satellite data.
- Presented two posters about the OMPS –GOME-2 inter-sensor and ATMS AI analysis at the AMS Collective Madison Meeting.
- Submitted a manuscript about ATMS mechanical temperature anomaly AI analysis to J. Atmosphere.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Update ICVS JPSS-2 modules to support J2 pre-launch JCT verification (May-22 JCT3-TVAC; Jul-22 JCT4) and on-orbit NRT monitoring	Sep-22	Sep-22	05/18/22 07/14/22	JCT3-TVAC JCT-4
Maintain the ICVS for SNPP and NOAA-20 including ICVS-GSICS Portal and provide anomaly reports	Sep-22	Sep-22		
Work closely with JPSS cal/val teams to facilitate the evaluations of SDR anomaly events	Sep-22	Sep-22		
Initialize a NRT geolocation accuracy monitoring module for SNPP/NOAA-20 OMPS NM in coordination with OMPS SDR team together	Nov-21	Nov-21	Nov-21	
Improve the ICVS SDR data quality evaluation testbed with more sensors	Dec-21	Dec-21	Dec-21	
Update the following sub-systems within the ICVS towards operations a) SNPP and NOAA-20 ICVS-Vector (dynamic visualization information) b) Git repository for ICVS software package version control	Feb-22	Feb-22	Feb-22	
Update the following sub-systems within the ICVS towards operation a) ICVS-Anomaly Impact Watch Portal (AWP) b) SNPP/NOAA-20 inter-sensor bias monitoring tool via the 32D-AD method	Mar-22	Mar-22	Mar-22	
Upgrade the ICVS-Vector (dynamic visualization information) for J2 using JCT as proxy data	May-22	May-22	May-22	
Initialize the instrument and data anomaly detection development using AI methods	Jun-22	Jun-22	Jun-22	
Initialize the S-NPP vs NOAA-20 ATMS inter-sensor bias trending product using double difference through RO profiles	Jul-22	Jul-22	Jul-22	
Initialize the cloud mask module for ICVS-OMPS (beta version)	Aug-22	Oct-22	FY23	Snpp omps recovery assessment and low priority
FY22 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/01/21	
FY23 Program Management Review	Jun-22	Jun-22	06/14/22	

Overall Status:

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

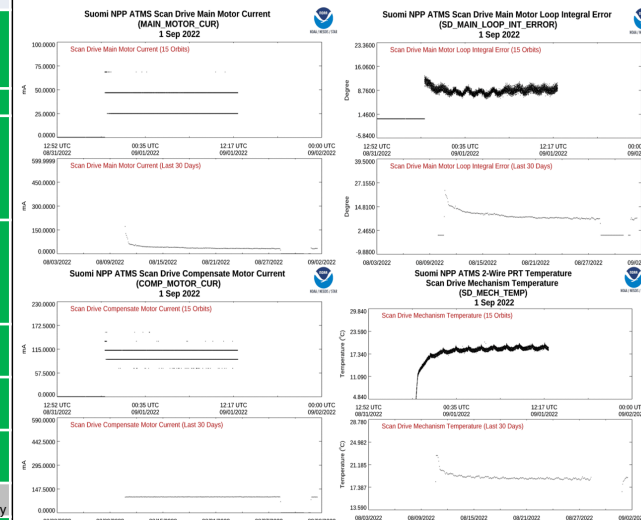
- Project has completed.
- Project is within budget, scope and on schedule.
- Project has deviated slightly from the plan but should recover.
- Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

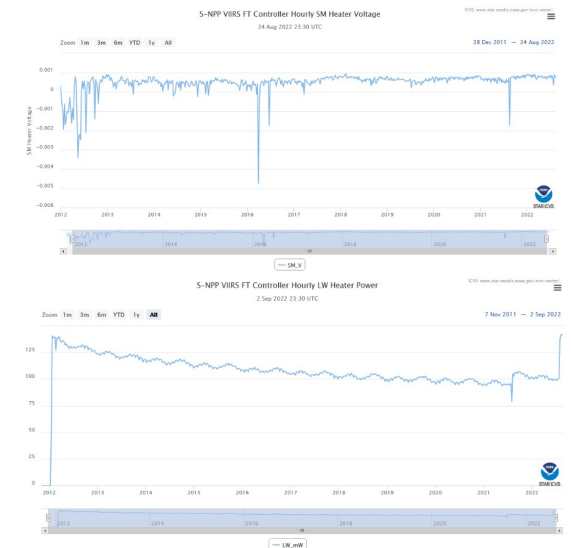
Highlights:

(a) SNPP ATMS instrument scan drive status in ICVS to support NPP ATMS recovery activities



Significantly contribute to STAR SDR Teams

(b) S-NPP VIIRS telemetry trending in ICVS vector web page for NASA flight team



## Accomplishments / Events:

- Imagery Team reviewed VIIRS EDRs for SNPP recovery, presented to recovery team
- Numerous team members attended and presented at the CMM in Madison, WI
- A team member attended and presented on JPSS Fire Monitoring capabilities at the NWA annual meeting in Pittsburgh, PA
- Journal Articles Submitted or Published by team member(s) on VIIRS topic
  - Hillger, D.; Line, W.E.; Seaman, C.; Miller, S.D.; Finley, S.; Kopp, T.J. Ten Years of VIIRS EDR Imagery Validation and User Interactions. Remote Sens. 2022, 14, 4167. <https://doi.org/10.3390/rs14174167>
- Recent VIIRS Imagery Blog Posts
  - [Arctic Donut in VIIRS Snowmelt RGB](#)
  - [Dallas Flash Flooding](#)
- Recent VIIRS Imagery Social Media Posts
  - [VIIRS Natural Fire Color RGB and McKinney Fire](#)
  - [VIIRS Snowmelt RGB and polar mesoscale cyclone](#)
  - [VIIRS Day Cloud Phase Distinction RGB and Lake Michigan low](#)
  - [VIIRS NCC and Typhoon Hinnamnor](#)

## Overall Status:

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

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

## Issues/Risks:

N20 NCC LUT update

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/18/22	
Deliver updated ATBD (16 M-Band Imagery)			06/29/22	
N20 NCC LUT update DAP (to ASSISTT)	Aug-22	FY23		PMR slide 7: move to FY23 due to challenges with DNB statistics and complex curve fitting
N20 NCC LUT update DAP (to DPMS)	Sep-22	FY23		
New Imagery products or product enhancements (display on SLIDER)	Sep-22	Sep-22	continuing	
Realtime Imagery monitoring and display systems (SLIDER, etc.)	Sep-22	Sep-22	continuing	
Images of the Month to STAR JPSS Program/website and interesting Imagery to Social Media outlets	Monthly	Monthly	continuing	
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/25/22	JCT3-TVAC
Block 2.3 Mx builds deploy regression review/checkout (Dec-21 Mx5; Mar-22 Mx6; Jun-22 Mx7)	Sep-22	Sep-22	11/23/21 Mx5 SOL; 12/29/21 Mx5 I&T 03/18/22 Mx6 I&T 06/21/22 Mx7 I&T	

## Highlights: Image of the Month

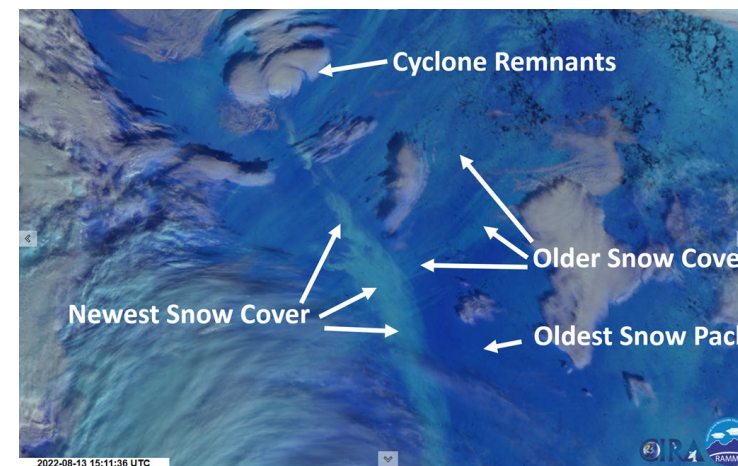


Figure: VIIRS Snowmelt RGB captured a trail of fresh snow, atop older snow, in the wake of a Polar Mesoscale Cyclone over the Arctic.

## Accomplishments / Events:

- The Cloud team helped perform analysis on the VIIRS ECM and other algorithms from SNPP as part of the recovery process from the SNPP shutdown event. This is critical because the ECM is an input to most JPSS EDRs. Analysis showed that there were no noticeable impacts and the team recommended the algorithms become operational.
- The CIRA team will be working with the HRRR smoke team to investigate incorporation of the HRRR Smoke model into the Aviation flight path tool. This will be able to serve users, particularly those in Alaska better for flight decision making ability

## Overall Status:

	Green <sup>1</sup> (Completed)	Blue <sup>2</sup> (On-Schedule)	Yellow <sup>3</sup> (Caution)	Red <sup>4</sup> (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:

- See next slides

## Highlights:

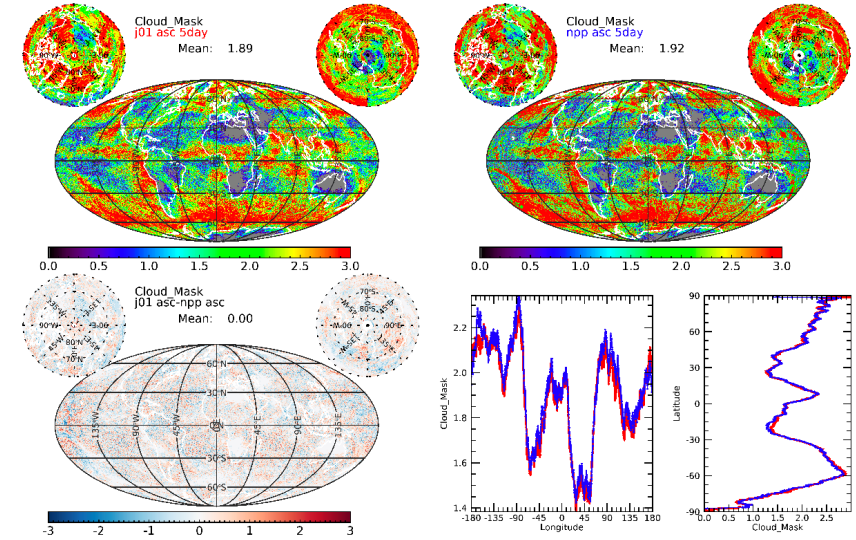


Figure 1. This figure shows the 5-day mean cloud mask from the ascending node from NOAA-20 and SNPP, with data from 18-21 August. The zonal plots show the consistency between the two satellites indicating the performance of the SNPP data has not degraded significantly.

# Clouds (Cloud Mask)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/24/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Verify DNB and new ECM implementation within STAR Algorithm Processing Framework (SAPF) and adjust LUT based on feedback from teams	Jan-22	Apr-22	Apr-22	SAPF run delayed
Verify ECM LUT against J2 simulated data prior to J2 launch	Aug-22	Aug-22	Jun 22	J2 data provided early
Support Alaska Demo and ESRL usage and reviews	Aug-22	Sep-22		This is ongoing work
Work with NCEP on All Sky Radiance (ASR) assimilation. Adjust mask as necessary	Sep-22	Sep-22		
Apply CALIPSO tools to NDE Mask with Lunar Ref	Sep-22	Sep-22		
Continue collaboration with OAR/ESRL/GML on use of RadFlux Cloud Fraction for Verification including high-latitude sites	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

# Clouds (Cloud Phase/Type)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/24/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Optimize cloud phase thresholds for NOAA-21 and maintain code consistency with GOES-R deliveries	Aug-22	Sep-22		This is ongoing work
Modify phase as needed based on height/winds interaction and development from GOES-R	Aug-22	Sep-22		This is ongoing work
Support S-NPP and NOAA-20 EDR monitoring	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	



# Clouds (ACHA)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/24/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Support NCEPs use for ASR assimilation	Jan-22	Sep-22		Making consistent with ECM date
Continue improving multilayer ACHA by analysis of CALIPSO and AEOLUS lidars and extend to level of best fit of Polar Winds	Jan-22	Sep-22		This is ongoing work
Verify extending the treatment of scattering to support 3.75 micron. Needed for NCOMP replacement	Aug-22	Sep-22		This is ongoing work
Continue work on ACHA COMP and begin JPSS-2 ACHA COMP validation plan	Aug-22	Sep-22		This is ongoing work
Continue working with FAA to adopt ACHA products instead of simplistic NCAR cloud heights. Continue support of Alaska Demo CTH requests	Aug-22	Sep-22		This is ongoing work
Support Polar AMVs as needed including use of CrIS	Aug-22	Sep-22		This is ongoing work
Continue to display ACHA products in CIMSS and STAR LTM site	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

# Clouds (DCOMP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/24/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Improve the performance of thin ice clouds by using ACHA COD and will work with the ACHA team on development and validation	Aug-22	Sep-22		This is ongoing work
Validate DCOMP at night using DNB	Aug-22	Sep-22		This is ongoing work
Incorporate method to identify pixels with potentially incorrect phase within DCOMP DQFs	Sep-22	Sep-22		
Inter-sensor calibration studies by using visible reflectance and cloud optical thickness from GOES, JPSS and MODIS. Use this to adjust VIIRS M5 and M7 as needed	Sep-22	Sep-22		
Consistency checks for day and night retrievals	Sep-22	Sep-22		
Continuous use of microwave-based LWP data for validation	Sep-22	Sep-22		
Develop collaboration with OAR/ESRL/GML on use of RadFlux Cloud Optical Depth for Verification	Sep-22	Sep-22		
Improving the near real-time monitoring tools with (simple ) web application	Sep-22	Sep-22		
Support several projects (i.e., processing of data, visualization tools, & ATMS/VIIRS precip for Alaska Demo)	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

# Clouds (NCOMP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/24/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Consistency checks for day and night retrievals	Sep-22	Sep-22		
Continuous use of microwave-based LWP data for validation. (coordinate with DCOMP)	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

# Clouds (Cloud Base Height)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/24/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Verify DCOMP nighttime COD (DNB) improvement in Cloud Base for performance over NWP or IR-only	Jan-22	Apr-22	Apr-22	SAPF run delayed
Apply fix for SZA expansion of daytime DCOMP to 82° (degraded between 75-82° SZA)	Jan-22	Jan-22	Jan-22	
Implement low layer cloud confidence flags for multi-layer cloud systems, leveraging GOES-RR	Jan-22	Sep-22		This is ongoing work
Develop gridded products for vertical cross-sections and AWIPS-2	Sep-22	Sep-22		
Develop a new aviation website and incorporate feedback from NWS/AWC	Sep-22	Sep-22		
Support Alaska Demo and any necessary reviews	Sep-22	Sep-22		
Validate products from SAPF and continue data analysis using ARM, METAR, PIREPs, and CloudSat/CALIPSO	Sep-22	Sep-22		
Implement an updated lunar irradiance model in CLAVR-x for nighttime COD and compare products	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

# Clouds (CCL)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/24/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	ASSIST provided data for analysis last week of March. Analyzed by team. ASSISTT is responsible for DAP delivery
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Continue CCL visualization and demo for the Aviation Weather Center, with focus on Alaska Region and Hawaii. Work directly with respective POC's and use feedback to improve CCL	Sep-22	Sep-22		
Support Alaska Demo and any necessary reviews	Sep-22	Sep-22		
Validate NDE CCL output, supercooled/convective probability layers for nighttime cases with lunar DCOMP included for Base	Sep-22	Sep-22		
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22		
Support consistency validation of products from CSPP	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

## Accomplishments / Events:

- Participated in S-NPP Data Assessment after safehold period. As of Tuesday, August 23, 2022, the S-NPP VIIRS Aerosol Optical Depth (AOD) EDR and Aerosol Detection Product (ADP) EDR are approved for operational use and NDE/PDA subscriptions for all VIIRS EDR and tailoring products will be enabled at 2130 UTC,
- Manuscript entitled “Markers of economic activity in satellite aerosol optical depth data” submitted to AGU journal Earth’s Future.
- Analyzed ten years of surface PM2.5 data derived from reprocessed VIIRS AOD to report on trends in fire activity and air quality for NOAA’s science advisory board
- Extending the reprocessing of AOD and ADP products on AWS Cloud to keep current with the dataset (2021 to present reprocessing is ongoing)

## Overall Status:

	Green <sup>1</sup> (Completed)	Blue <sup>2</sup> (On-Schedule)	Yellow <sup>3</sup> (Caution)	Red <sup>4</sup> (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.

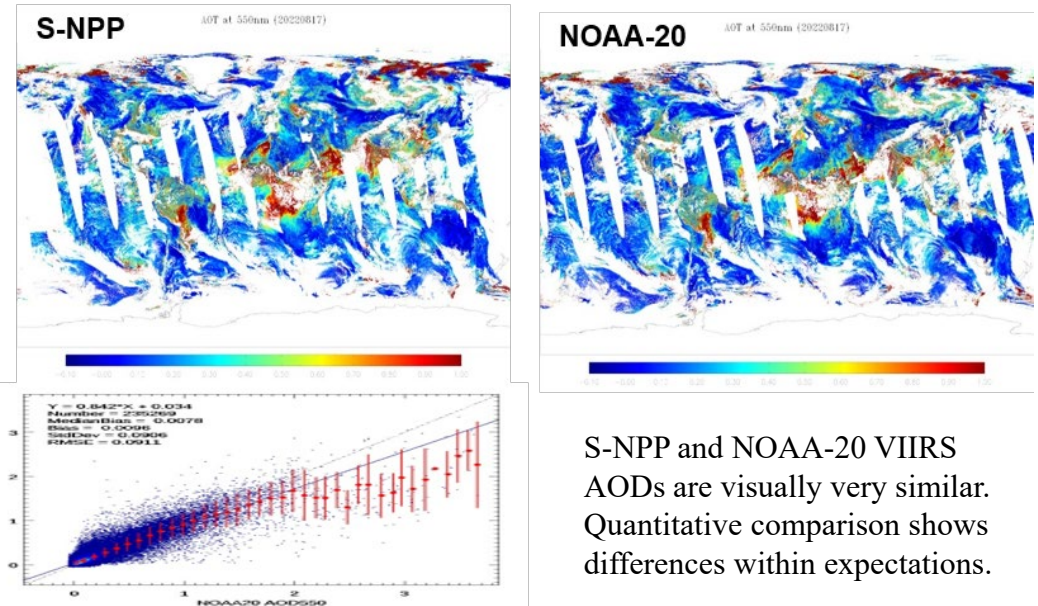
## Issues/Risks:

No risks

## Milestones:

- See next slides

## Highlight: Suomi-NPP Anomaly/Instrument Reactivation



S-NPP and NOAA-20 VIIRS AODs are visually very similar. Quantitative comparison shows differences within expectations.

# Aerosol (AOD)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/17/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Evaluate robustness of method to determine AOD bias characteristics	May-22	Sep-22		Departure of affiliate; 80% complete as of May 2022
Complete implementation of AI-based surface reflectance relationship in VIIRS enterprise aerosol optical depth algorithm	Jun-22	Jun-22	May-22	PMR slide17
Extend record and evaluation of merged S-NPP/NOAA-20 and gridded global AOD products	Jul-22	Jul-22	07/07/22	
Based on latest J2 SRF update LUTs and other processing coefficients used in AOD algorithm	Aug-22	Aug-22	08/18/22	
Complete first assessment of multi-year VIIRS aerosol optical depth product (Summary report on accuracy and precision)	Aug-22	Aug-22	08/18/22	
Explore VIIRS AOD error characteristics for any relationship with aerosol model selection/residuals (Summary report identifying relationship between AOD error and retrieval residual, surface type)	Aug-22	Aug-22	08/11/22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/13/22	JCT3-TVAC

# Aerosol (ADP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/17/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Exploring callback approach by including other bands for thick smoke/dust plumes, which are frequently missed due to cloud mask	Jun-22	Jun-22	June 2022	
Further refining smoke detection over land in IR-Visible path by including more surface type from IGBP classifications to defining surface reflectance relationship, such as the approaches used in AOD algorithm. In addition, work will be carried out for reducing/eliminating the detected smoke plumes difference between two orbits	Jun-22	Jun-22	Jun-22	
Exploring regional thresholds for dust detection over land in deep-blue algorithm path	Jun-22	Jun-22		
Reprocess the entire SNPP and NOAA-20 VIIRS ADP and generate smoke and dust climatologies	Jun-22	Jun-22	May-22	PMR slide15
Analyze near real time aerosol optical depth and detection products for performance of quality flags and how to optimize the quality flags for a given scenario that can potentially lead to data artifacts	Jun-22	Jun-22		Work is still ongoing
Reducing false smoke detection for SO2 plumes over ocean from volcanic eruptions by including 8.4 μm band, which is SO2 absorption band	Sep-22	Sep-22	Aug-22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22	Aug-22	
Continue long-term validation of SNPP and NOAA-20 VIIRS ADP by comparisons with AERONET, CALIPSO, MISR, and IMPROVE	Sep-22	Sep-22	Aug-22	
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/13/22	JCT3-TVAC



Accomplishments / Events:

•**Sulfur Dioxide (SO<sub>2</sub>) VOLCAT Composites:** VOLCAT will in the long-term replace the Volcanic Ash EDR algorithms. A significant tool from VOLCAT using JPSS VIIRS+CrIS is global SO<sub>2</sub> monitoring. SO<sub>2</sub> monitoring is critical for weather and climate impacts from significant volcanic eruptions as well as local to regional scale air quality concerns from all eruptions. The JPSS-based VOLCAT SO<sub>2</sub> composites have been compared to Ultra-Violet (UV) based SO<sub>2</sub> composites (OMPS and TROPOMI) and have shown good agreement (see figure for comparison for the Hunga Tonga eruption from January 2022). The VIIRS+CrIS Infrared (IR) SO<sub>2</sub> monitoring is especially useful for monitoring SO<sub>2</sub> in regions without solar illumination (e.g., night scenes and polar winter regions) since UV products require solar illumination. Additional SO<sub>2</sub> comparisons will be generated to ensure the JPSS products agree with UV SO<sub>2</sub> products.

•**Quality/Oversight** Continued to ensure high quality Volcanic Ash retrievals from EDR algorithms (August 2022 S-NPP products were assessed and confirmed to be as expected after S-NPP recovery from satellite anomaly) and VOLCAT. VOLCAT is long-term plan.

Overall Status:

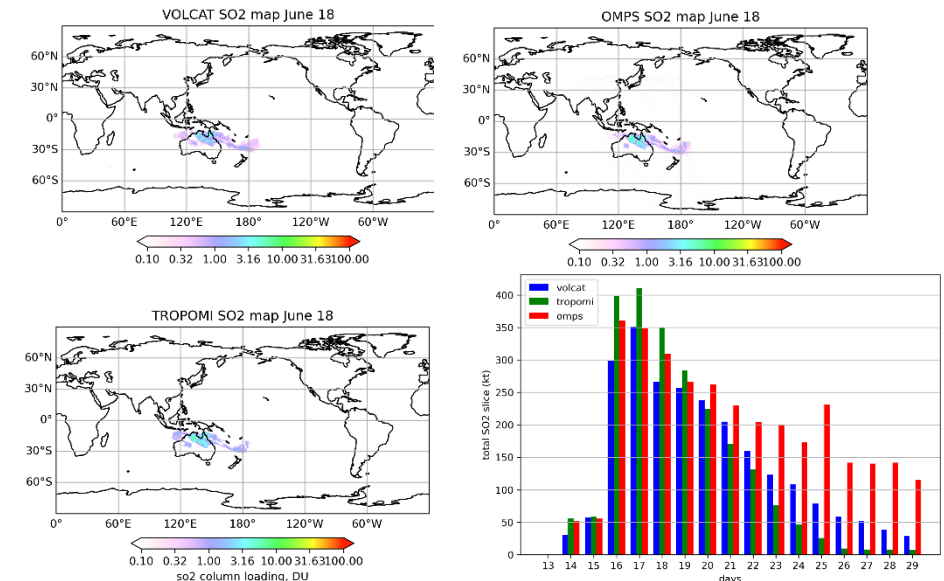
	Green <sup>1</sup> (Completed)	Blue <sup>2</sup> (On-Schedule)	Yellow <sup>3</sup> (Caution)	Red <sup>4</sup> (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

None

Highlights: VIIRS/CrIS-based VOLCAT SO<sub>2</sub> daily composites compared to UV-based SO<sub>2</sub> daily composites



Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/17/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) delivery			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Development activities that support transition to VOLCAT	Sep-22	Sep-22		
Software and LUT updates for J2	Sep-22	Sep-22		
Update thresholds and LUT's, if needed	Sep-22	Sep-22		
Routinely validate volcanic ash products	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

Accomplishments / Events:

- Provided operational environmental data record support after the Suomi National Polar-orbiting Partnership (SNPP) satellite came back online after it experienced an anomaly. Qualitative and quantitative comparisons were made between SNPP and NOAA-20 snow, and sea ice products during pre- and post-anomaly periods. It was recommended that the SNPP products be produced and distributed in operational mode.
- Case study demonstrates superior VIIRS Sea Ice Concentration (SIC) and detection versus Landsat.
- The Cryosphere Team had a number of posters at the AMS Collective Madison Meeting illustrating the VIIRS and AMSR2 snow and ice products, including a blended AMSR2-VIIRS sea ice concentration product.
- VIIRS Cloud-Gap-Filled Snow Product: Summertime Snow Extent Evaluation. VIIRS cloud-gap-filled snow products have been examined to understand whether this technique can provide realistic estimates of the summertime snow extent for climate applications.

Overall Status:

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

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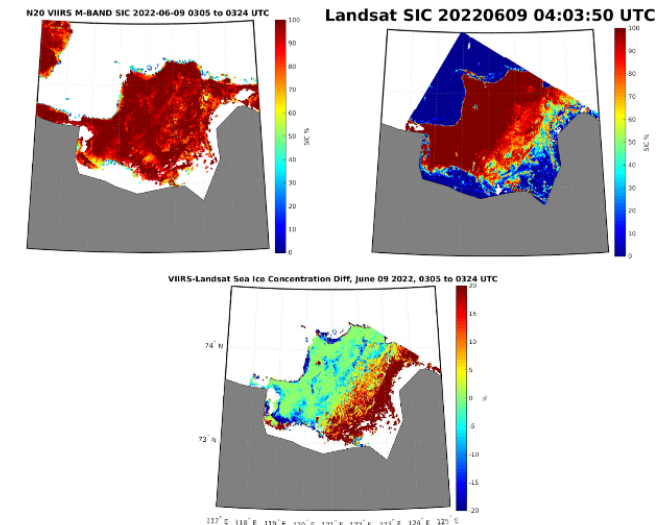
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/28/21	
FY23 Program Management Review	Jun-22	Jun-22	05/18/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) delivery			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Incorporate passive microwave filter to improve ice products	Dec-21	Dec-21	Dec-21	
Cloud shadow flag, blended snow cover product	Sep-22	Sep-22		
New physically-based snow and snow-free land BRDF, algorithm to infer the snow fraction	Sep-22	Sep-22	Apr-22	
Generate new lookup tables, retrieval coefficients for JPSS-2 (all snow, and ice products)	Sep-22	Sep-22	Oct-21	
Weekly and monthly ice products composite	Sep-22	Sep-22		
Continuous monitoring of S-NPP and NOAA-20 products	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

Highlight: Sea Ice Concentration at the coastline from VIIRS

VIIRS captures darker blue ice near the coastline better than Landsat in this case study. VIIRS also compares very closely to Landsat at capturing the sea ice edge, despite Landsat's higher resolution at 30 m compared to 750 m for VIIRS.



Top left is the NOAA-20 Enterprise VIIRS SIC for 03:11 UTC. Middle is the SIC difference (VIIRS - Landsat) for the two images shown above. Bottom is the Landsat SIC derived using the QA for 04:03:50 UTC used in difference plots. Both VIIRS and Landsat SICs are remapped into 1-km EASE2 grids

## Accomplishments / Events:

- The VIIRS Active Fire product team performed a detailed analysis of the Suomi NPP data product to support the recovery effort. Visual and quantitative evaluation provided evidence of adequate post-anomaly product performance (see Highlight)
- Ivan Csiszar gave the oral presentation “Ensuring Continuity of Active Fire Observations from Polar Orbiting Satellites to Meet NOAA's Mission Needs” at the Collective Madison Meeting
- Marina Tsidulko gave the oral presentation “VIIRS Algorithm Updates Towards Better Fire Representation in Cloudy Conditions” at the Collective Madison Meeting

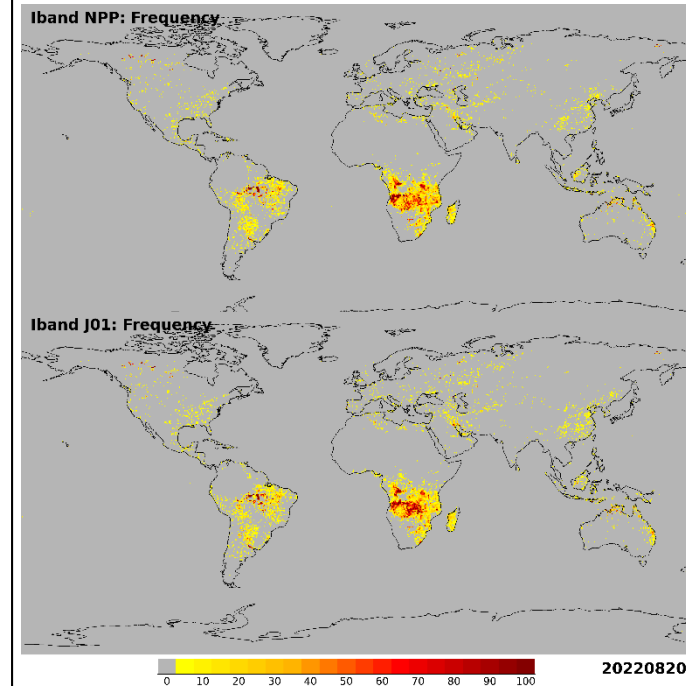
## Overall Status:

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

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

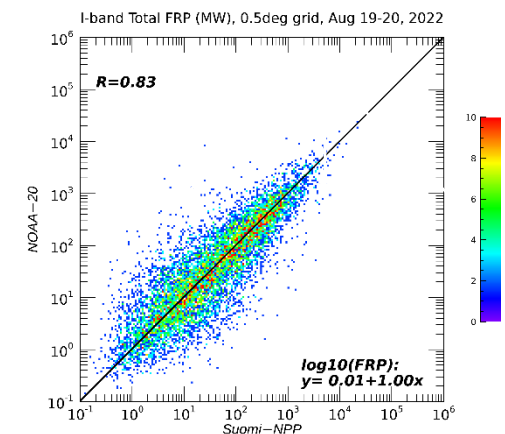
## Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
FY23 Program Management Review	Jun-22	Jun-22	05/23/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Mar-22	Mar-22	03/17/22	
Final J2 ready DAP to CSPP			05/26/22	
I-band algorithm improvements for non-optimal conditions	Sep-22	Sep-22		
J2 readiness and sensor performance evaluation	Sep-22	Sep-22		
Opportunistic validation using in-situ data (Error rates and FRP APU)	Sep-22	Sep-22		More limited validation
Persistent anomaly data files updates	Sep-22	Sep-22		Less frequent updates
Suomi NPP / NOAA-20 data analysis and feedback	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	



## Highlight: : Suomi NPP VIIRS fire product recovery

VIIRS I-band fire detections on August 20, 2022. Top: Suomi NPP; bottom: NOAA-20



Suomi NPP vs. NOAA-20 fire radiative power on August 19-20, 2022

## Accomplishments / Events:

- STAR-UMD VIIRS Surface Type team has downloaded and processed S-NPP and NOAA-20 VIIRS daily granule surface reflectance data acquired in August 2022 for the production of AST-2022.
  - A comparison of the composites created from the newly acquired data against those acquired in 2021 revealed the severity of the impact of the ongoing droughts reported over many regions (see the highlights for an example).
- The team has completed the post-processing and produced the final the 2021 VIIRS Annual Surface Type product.
- The team continues to update the surface type validation points, which will be used to validate the AST2021 product.

## Overall Status:

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

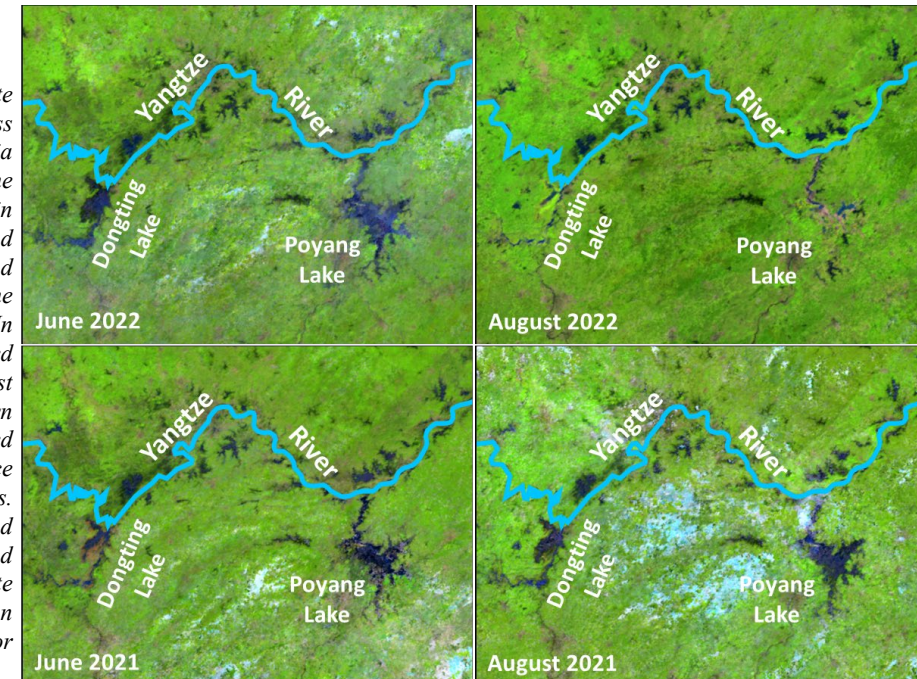
1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

## Issues/Risks:

None

## Highlights:

Severe drought driven by climate change was reported across North America, Europe, and Asia in recent months. Two of the largest freshwater lakes in China, Poyang Lake and Dongting Lake, normally had peak water levels throughout the summer months (bottom row). In 2022, however, both lakes dried out almost completely by August (top row). The images shown were VIIRS composites generated as part of the Annual Surface Type (AST) mapping process. They show VIIRS M10, M7, and M5 bands in red, green, and blue. Green tones indicate different levels of vegetation cover. Water appears dark or dark blue.



Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/29/21	
FY23 Program Management Review	Jun-22	Jun-22	05/24/22	
Deliver AST-2020 to NDE (with JRR Super DAP)	May-22	May-22	05/17/22	
Complete global monthly composites based on 2021 VIIRS data	Apr-22	Apr-22	Apr-22	
Generate global annual classification metrics	May-22	May-22	May-22	
Develop approaches for using newly available high resolution global maps on urban and water	Sep-22	Sep-22		
Experiment methods for mapping surface type change	Sep-22	Sep-22		
Generate VIIRS AST21 based on 2021 VIIRS data using SVM algorithm	Aug-22	Aug-22	Aug-22	
Comparison of AST21 with surface type validation data	Sep-22	Sep-22	Sep-22	
Delivery of AST21 (made available for users through STAR FTP)	Sep-22	Sep-22	09/16/22	
Routinely monitor surface type changes in the training and validation data sets	Sep-22	Sep-22		
Improve and update training and validation data, ATBD and VIIRS AST web sites	Sep-22	Sep-22	09/16/22	ATBD delivery

## Accomplishments / Events:

- Continue to test the SR algorithm for the upcoming LUT update, verify the coefficients of the analytical equations and atmospheric correction parameters in LUTs.
- Meeting with aerosol team to understand the aerosol product details including the aerosol model parameters, AOD validation performance and the latest update for NOAA20.
- Maintain the SR validation tool and monitoring tool.
- Use the SR routinely monitoring tool to check the status of SNPP SR product during the recent outage issue, using the inter-comparison with NASA VNP09 product to verify the data performance after resumed.

## Overall Status:

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

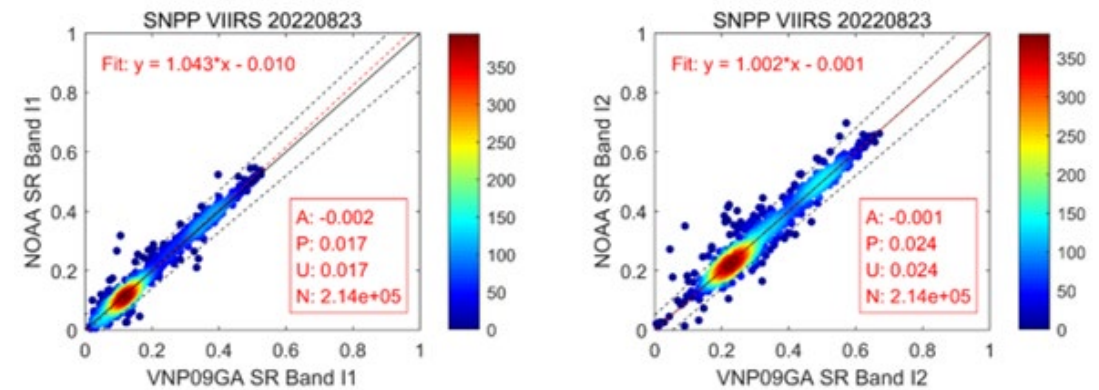
- Project has completed.
- Project is within budget, scope and on schedule.
- Project has deviated slightly from the plan but should recover.
- Project has fallen significantly behind schedule, and/or significantly over budget.

## Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/03/21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Oct-21	Oct-21	10/07/21	
Continue to validate against in-situ measurements and inter-comparison with other SR Products	Dec-21	Dec-21	12/15/21	
J2 final patch DAP to NDE			02/02/22	
The SR Long-term monitoring improvement and perform the time-series analysis	Mar-22	Mar-22	03/15/22	
FY23 Program Management Review	Jun-22	Jun-22	05/17/22	
JPSS-2 pre launch readiness	Jun-22	Jun-22	Jun-22	
Cal/Val update for SNPP and NOAA20 SR product; Collect the vegetation product feedback of the impact of SR	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

## Highlights:

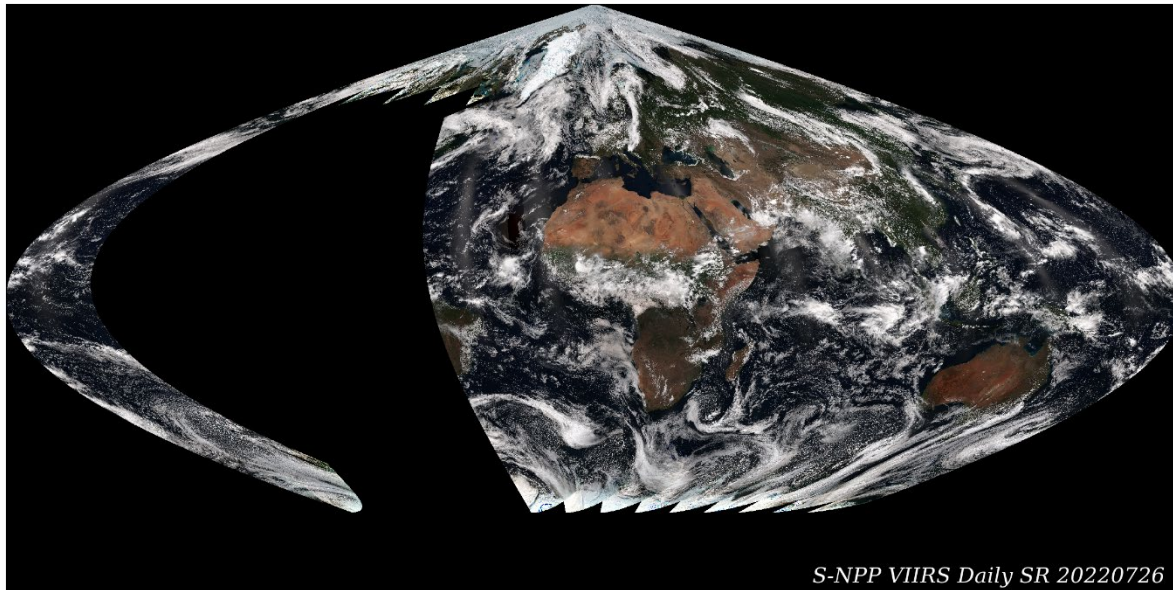
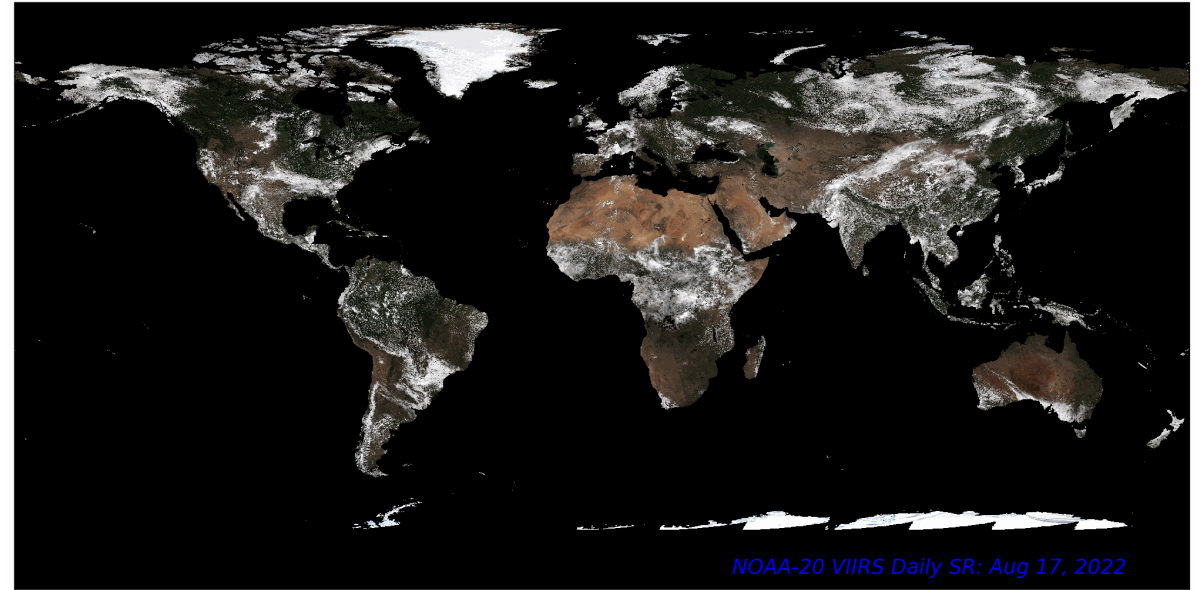


Using the inter-comparison between NASA VNP09GA SR product and NOAA SR EDR to verify the SR performance after the outage.

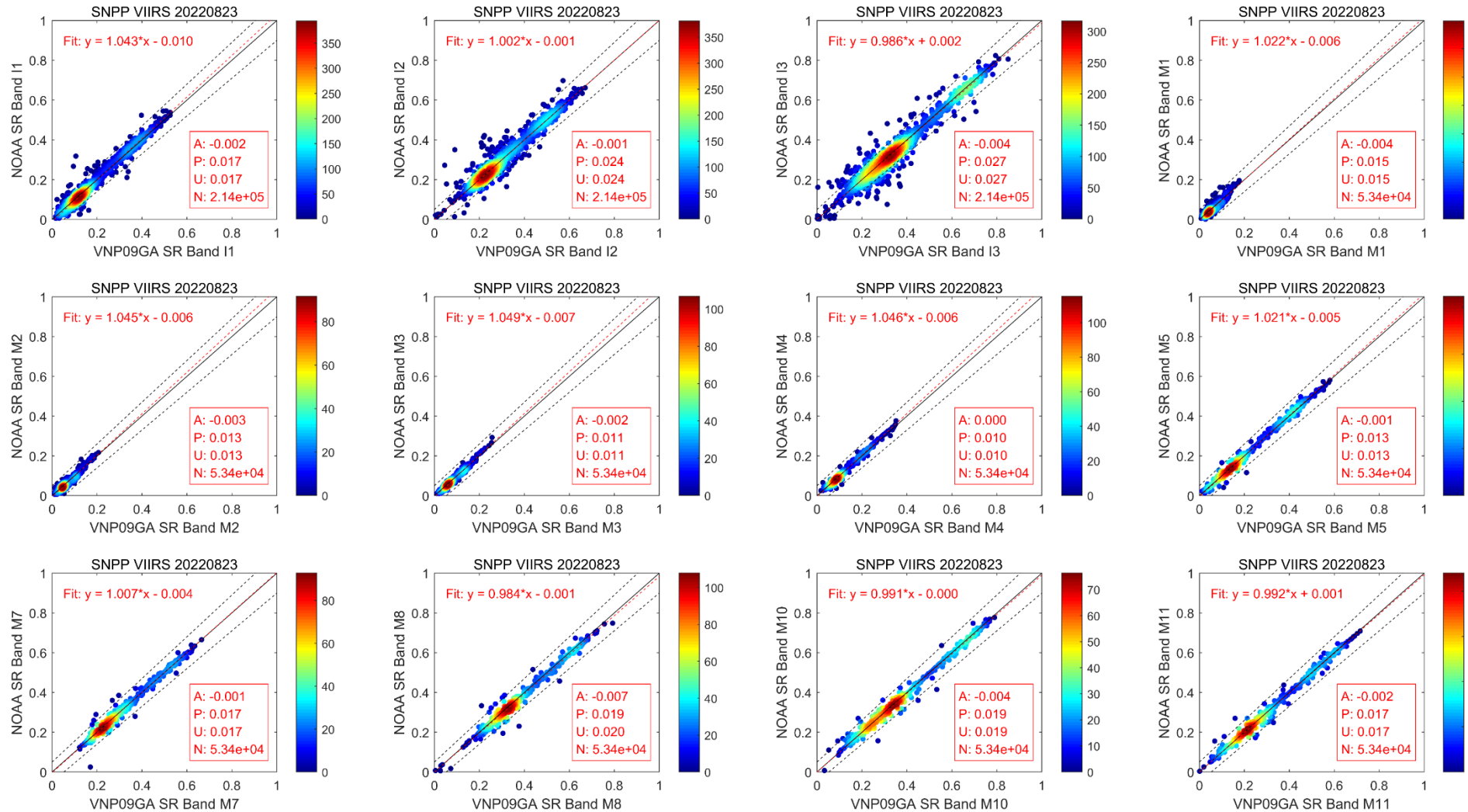
- SNPP
  - Missing: 20220726-20220823
  - Resume: 0823 (part: UTC19:09:08-)
- NOAA-20
  - No missing (latest week animation as right figure shows)

Monitoring website:

<https://www.star.nesdis.noaa.gov/smcd/emb/land/animation.php?sat=JPSS1&product=SR&variable=SR-Land>



## Verify Resumed SR by the Inter-Comparison (Day August 23, 2022)



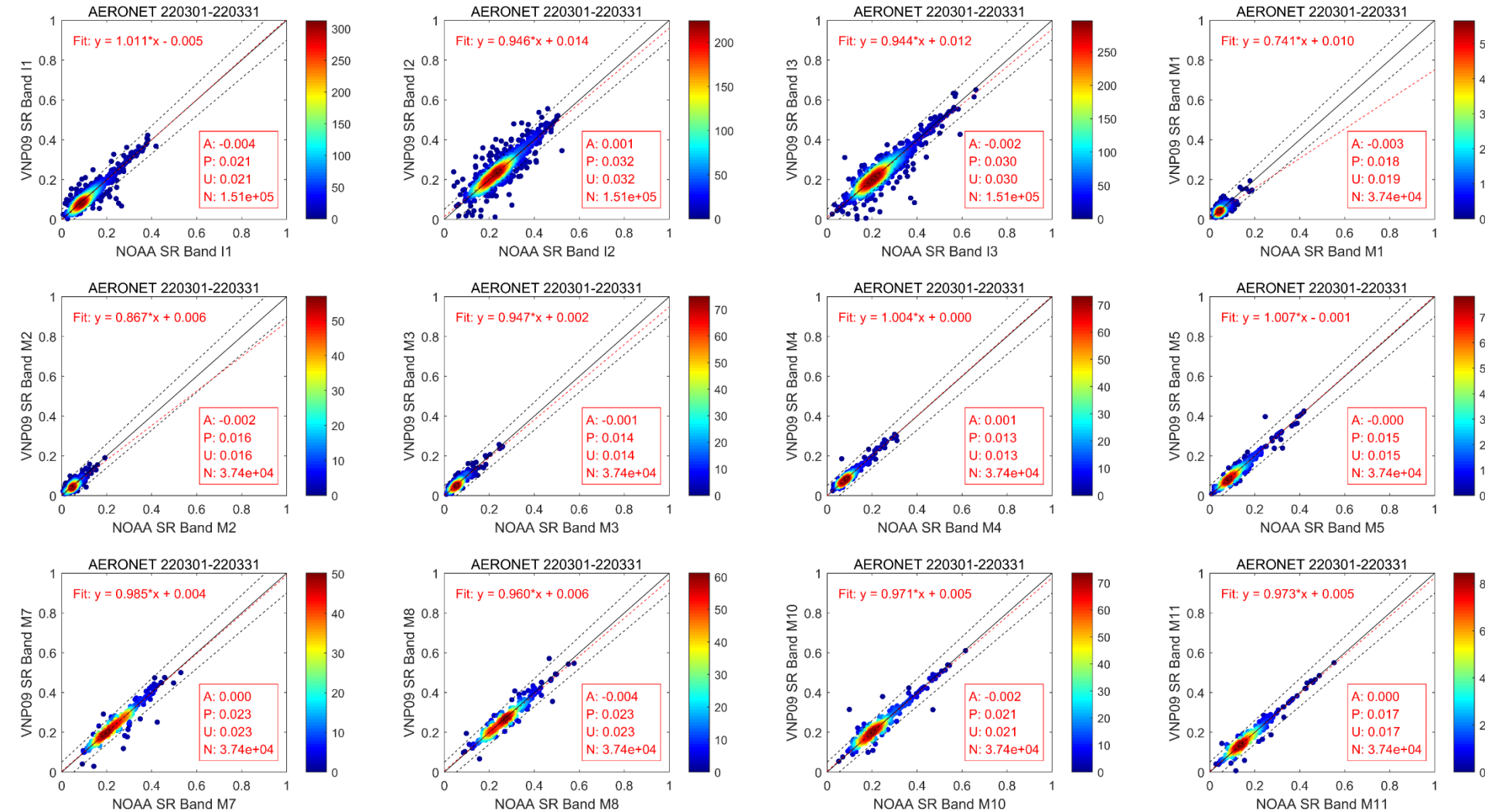
- Method:
  - Use NASA's SNPP VIIRS SR product (VNP09GA) as reference data, to do the inter-comparison with NOAA SR product
  - Compared the APU statistics of the test data with previous long term inter-comparison results.

- Datasets
  - NOAA SNPP SR: Test data from the (PDA\_IT), Day of August 23, 2022.
  - VNP09GA, August 23, 2022. **(Resumed and released Since August 21)**

- Data selection criteria:
  - Confidently clear, no cloud shadow, no cirrus
  - Not high AOD
  - Not snow
  - SR within [0, 1].

- Use the previous Inter-Comparison for reference (March, 2022)

- Results:
  - The resumed the NOAA SR data and matched NASA VNP09GA have a good agreement, the difference are mainly due to the input data (TOA reflectance, AOD et.al).
  - Compared with previous long-term global inter-comparison results, the APU statistic are similar for all the 12 bands.
  - Overall, the test data shows the SR with comparable performance.
- Other verifications
  - Downstream products verification to further verify SR.
  - AERONET SR validation when the data are available.





## Accomplishments / Events:

- Finalized the all weather LST readme file.
- Presented the poster titled “Quantifying the Uncertainty of VIIRS LST Product” at Collective Madison Meeting.
- Generated the interpolated LST LUT and conducted a preliminary evaluation through the comparison with ground observations from SURFRAD and ARM networks. (slide 2-4)  
Completed the verification of the NPP recovery LST generated at NDE through the comparison with the local LST generated using the framework. Minor LSE difference is observed. (slide 5)
- Completed the NPP post-recovery LST verification for a whole day at global scale. The verification results have been summarized into a report. (highlights and slide 6)
- Conduct the input availability investigation for LST reprocess.
- Prepare the materials for the external review.

## Overall Status:

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

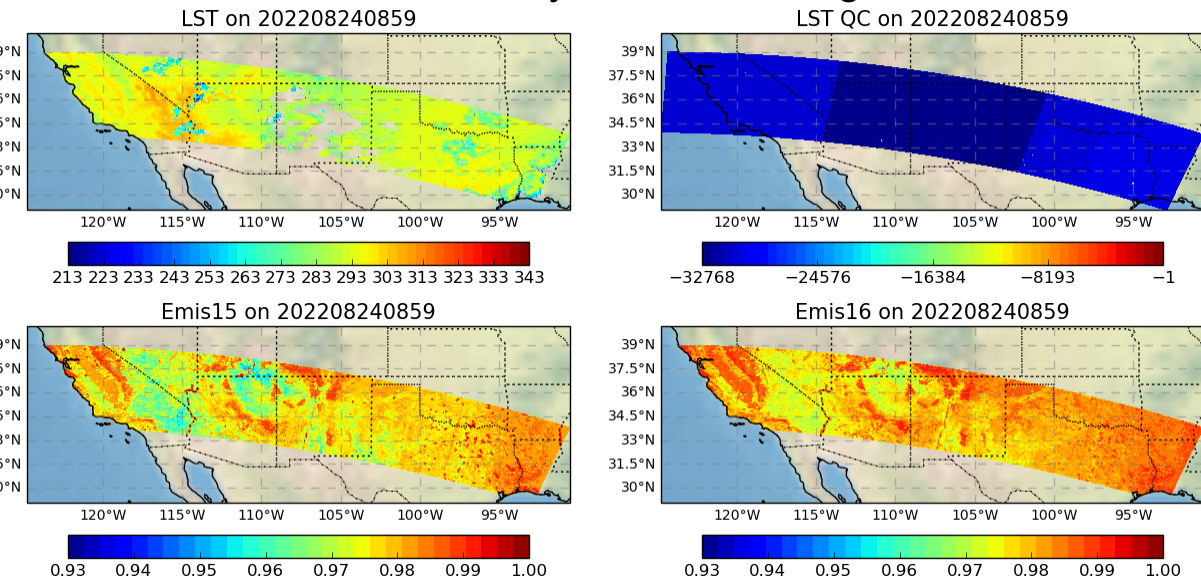
- Project has completed.
- Project is within budget, scope and on schedule.
- Project has deviated slightly from the plan but should recover.
- Project has fallen significantly behind schedule, and/or significantly over budget.

## Issues/Risks:

None

## Highlights:

## Post-recovery NPP LST image

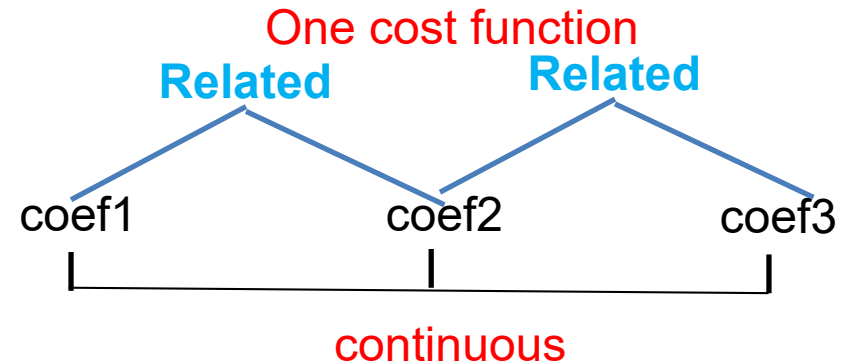


LST(top left); LST quality flag(top right); Emissivity band 15 and band 16 (bottom left and bottom right)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/01/21	
ATBD update	Oct-21	Dec-21	Dec-21	
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
L3 Global Gridded LST/LSA DAP to NDE (Prelim J2 DAP)			12/30/21	
Offline LSE DAP delivery (J2)			04/25/22	
Manuscript ready for Remote Sensing special issue “VIIRS 2011–2021: Ten Years of Success in Earth Observations”	Apr-22	Apr-22	Apr-22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	
L3 Global Gridded LST/LSA DAP to NDE (final J2 DAP)	May-22	May-22	05/13/22	
All weather LST generation based on the microwave LST and VIIRS LST: methodology development and experiment	May-22	May-22	May-22	PMR slide7
FY23 Program Management Review	Jun-22	Jun-22	05/24/22	
LUT interpolation method development and test	Jun-22	Jun-22	Jun-22	
Routine Validation Summary/report of LST product including L2 and L3	Jul-22	Jul-22	Jul-22	
LST uncertainty evaluation and calibration	Aug-22	Aug-22	Aug-22	
Routine monitoring tool and its update	Aug-22	Aug-22	Aug-22	
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

# Interpolated LST LUT generation

One single cost function is built and the LUT item can be obtained through the optimization of the cost function.

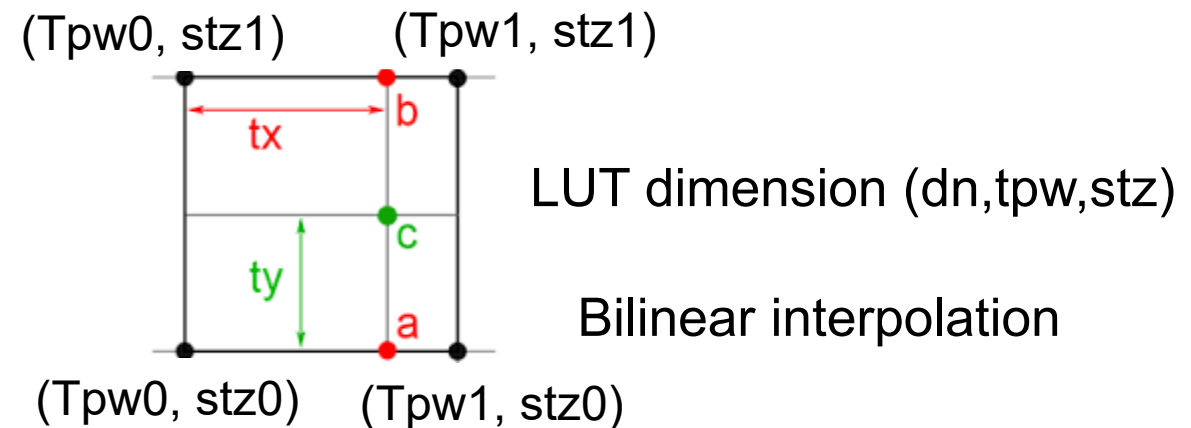


Optimization Algorithm:

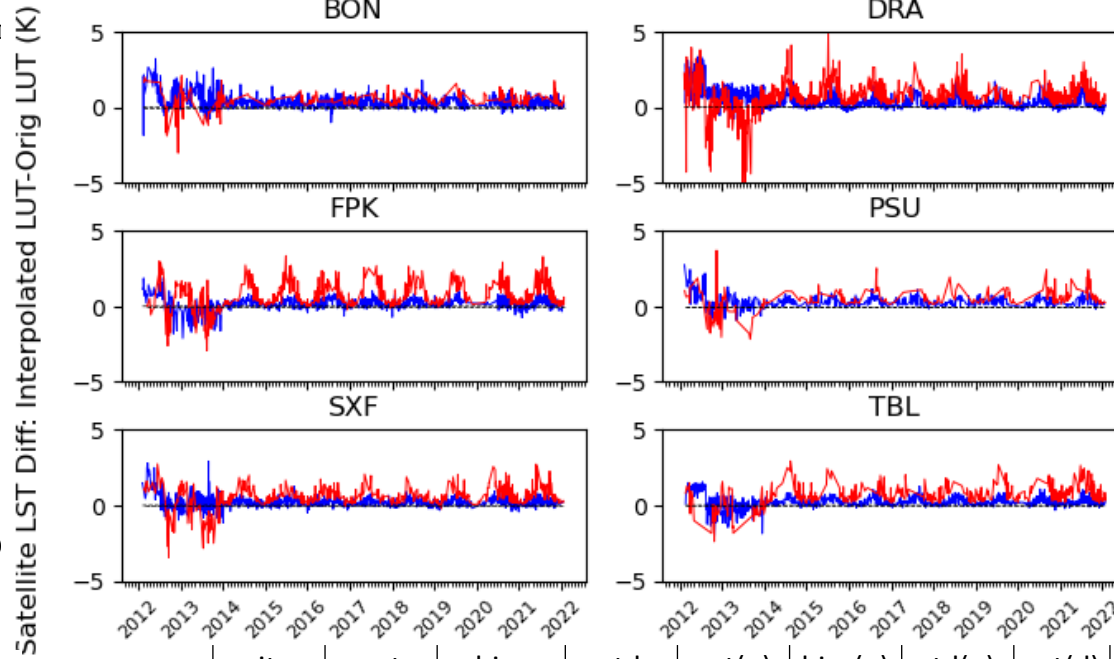
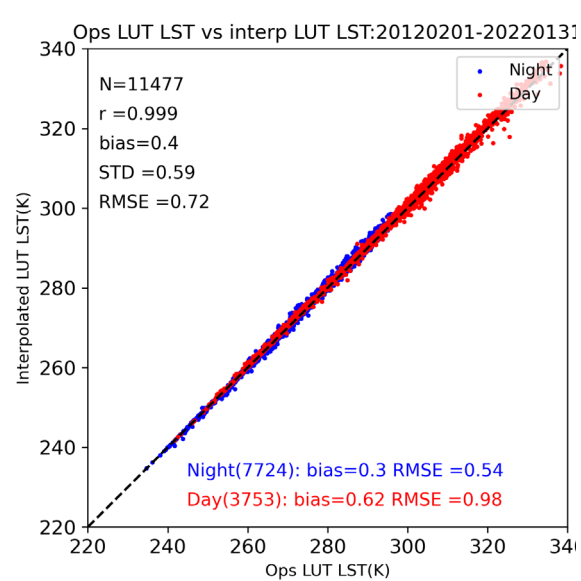
**BFGS**: Faster convergence (Cost function + Gradient)

LST calculation

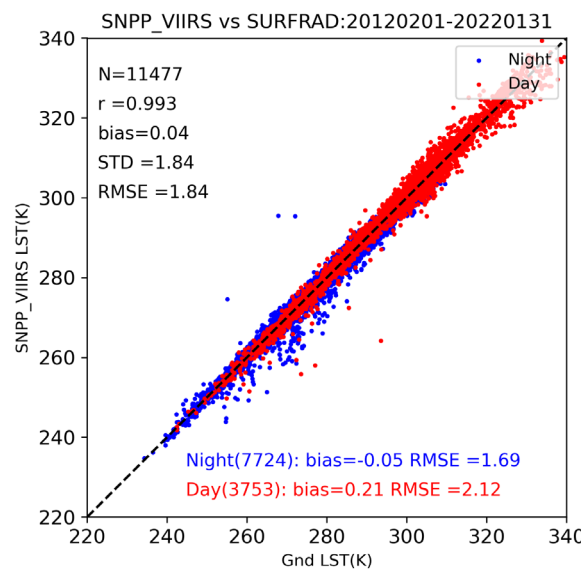
Selected Seebor profiles are used as the data source for both day and night LST LUT derivation



# Interpolated LST LUT Evaluation-SURFRAD



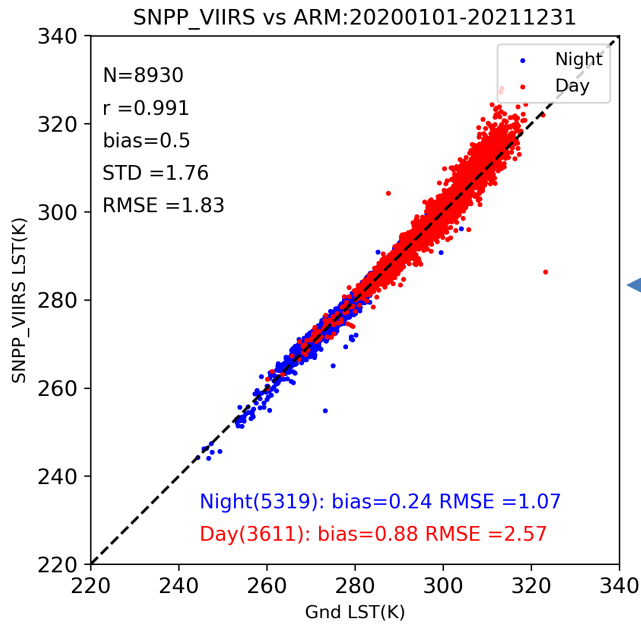
- The LST retrieved using the interpolated LUT is compared with LST retrieved using the operational LUT
  - The interpolated LUT shows a warmer LST retrieval compared with the operational LST with a bias of 0.6 K and 0.3 K for daytime and nighttime, respectively (top left)
  - Obvious seasonal pattern appears in nearly each site. (top right)



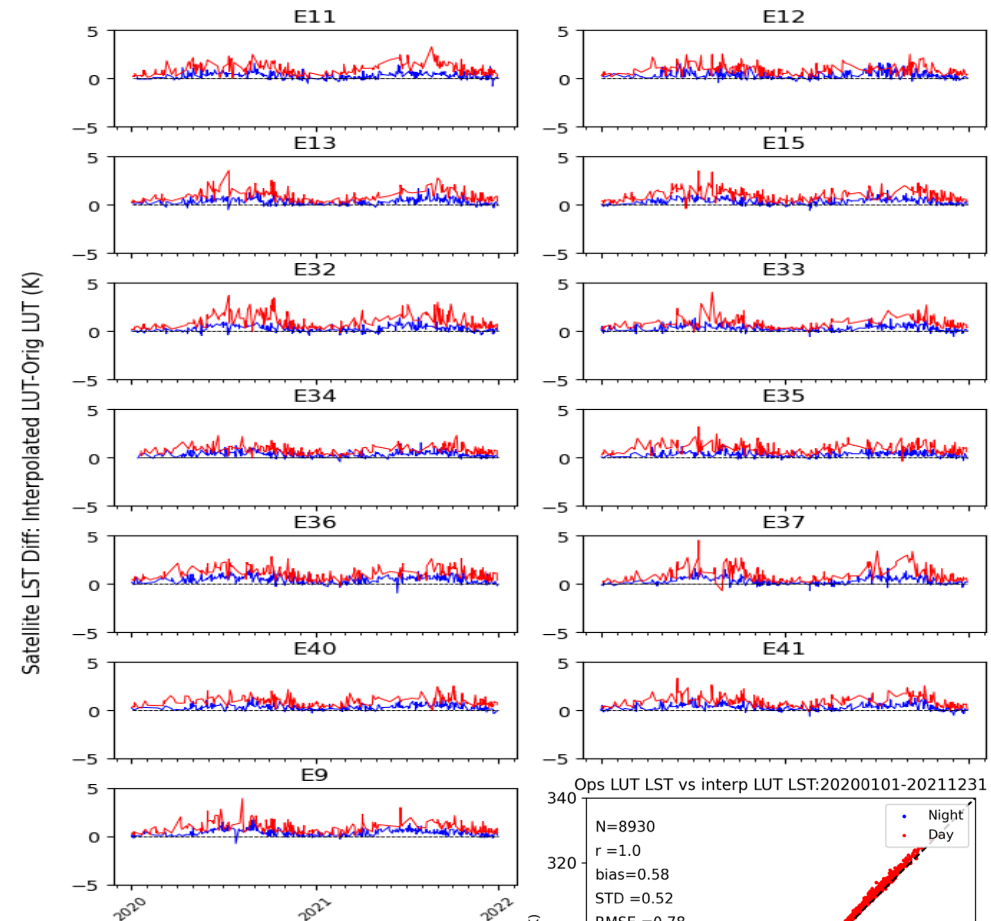
	site	cnt	bias	std	cnt(n)	bias(n)	std(n)	cnt(d)	bias(d)	std(d)
Interp	BON	1755	0.41	1.82	1424	0.45	1.69	331	0.22	2.25
Ops		1755	0.08	1.85	1424	0.18	1.72	331	-0.32	2.32
Interp	DRA	2835	-0.76	1.69	1677	-1.29	1.12	1158	0.01	2.05
Ops		2835	-1.49	2.3	1677	-1.67	2.09	1158	-1.23	2.58
Interp	FPK	1974	0.16	1.85	1189	0.04	1.72	785	0.35	2.03
Ops		1974	-0.31	1.88	1189	-0.21	1.75	785	-0.46	2.06
Interp	PSU	915	0.81	1.88	679	0.89	1.99	236	0.6	1.49
Ops		915	0.47	1.91	679	0.64	2.06	236	-0.03	1.4
Interp	SXF	2121	0.37	1.87	1412	0.61	1.53	709	-0.12	2.33
Ops		2121	-0.03	1.92	1412	0.36	1.58	709	-0.8	2.45
Interp	TBL	1877	0	1.59	1343	-0.28	1.27	534	0.72	2.03
Ops		1877	-0.4	1.64	1343	-0.54	1.38	534	-0.02	2.15

- The interpolated LST LUT is evaluated using the ground observations from SURFRAD. The bottom left figure presents the combined evaluation results of six sites. The table shows the site wide evaluation results between the two LSTs retrieved based on interpolated LUT and operational LUT.
- The validation results indicate an overall improved STD over SURFRAD. A significant improvement is found over DRA site, a significant bias improvement particularly at daytime

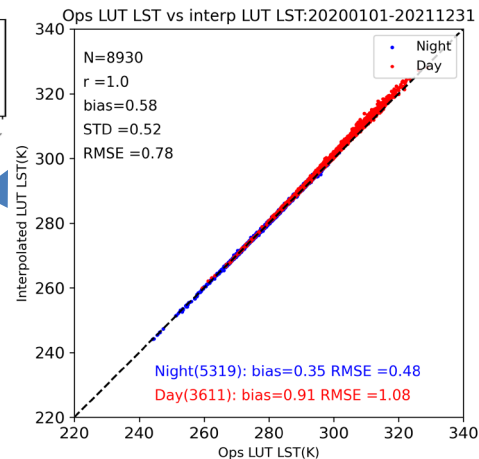
# Interpolated LST LUT Evaluation-ARM



- The interpolated LST LUT is evaluated using the ground observations from ARM. The top left figure presents the statistics of combined results of 13 sites. The table shows the site wide evaluation results. Red color indicates the improved bias comparing the ops results.
- The validation results indicate a slightly worse RMSE compared to the operational LST.



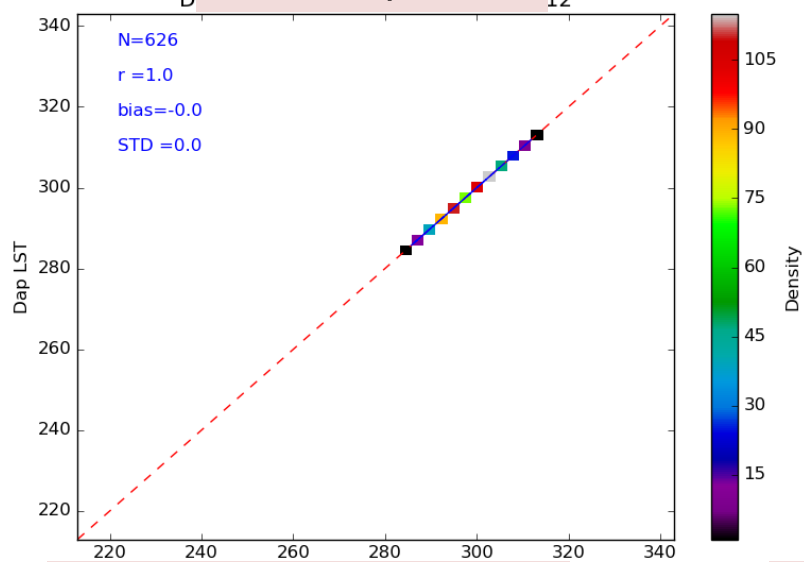
- The LST retrieved using the interpolated LUT is compared with LST retrieved using the operational LUT. A warm bias is observed for both daytime and nighttime (right figures)



site	cnt	bias	std	Cnt (n)	Bias (n)	Std (n)	Cnt (d)	Bias (d)	Std (d)
E11	660	0.63	1.72	399	0.26	1.3	261	1.2	2.09
E12	672	0.48	1.36	385	0.11	1.08	287	0.99	1.54
E13	680	0.18	2.5	412	0.32	0.95	268	-0.05	3.79
E15	723	0.71	1.36	415	0.34	0.83	308	1.21	1.73
E32	662	0.24	2.26	387	0.46	0.98	275	-0.06	3.29
E33	661	0.75	1.92	414	0.73	1	247	0.78	2.87
E34	711	0.48	1.56	428	-0.2	1.01	283	1.52	1.68
E35	701	0.52	1.31	414	0.96	0.77	287	-0.11	1.63
E36	729	0.43	1.53	436	-0.32	0.94	293	1.53	1.57
E37	643	0.43	2.21	377	0.27	0.89	266	0.66	3.25
E40	658	0.2	1.63	398	-0.22	1.3	260	0.84	1.87
E41	707	0.99	1.58	424	0.26	0.82	283	2.09	1.8
E9	723	0.41	1.34	430	0.17	0.83	293	0.75	1.8

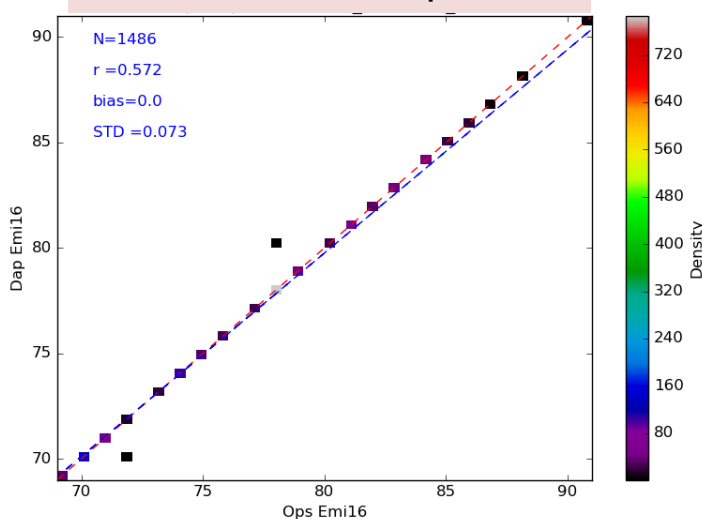
# LST Verification between NDE and framework

LST comparison

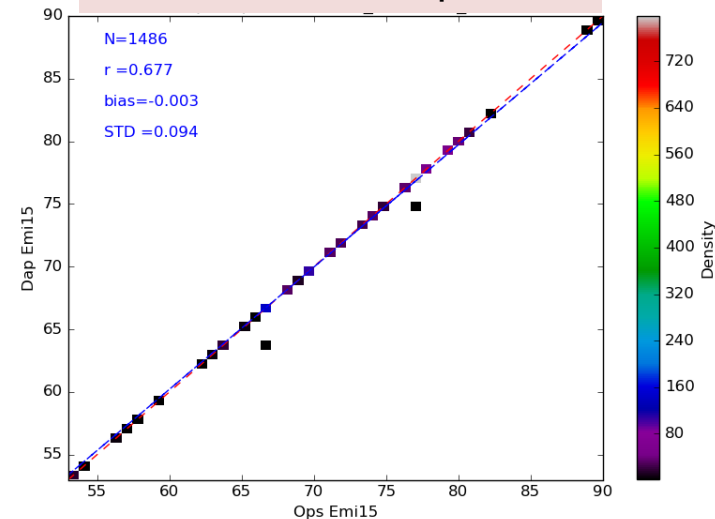


- The LST result is found nearly identical between the two sources after removing the bowtie pixels (top left).
- The bowtie pixel interpolation method is found to have an impact on the LST difference between NDE and the framework
- Minor differences are found in the associated land surface emissivity for both band15 and band16. Note that the emissivity in the plot is a scaled value. The real value is between 0.97 to 0.99 (bottom left) and between 0.955 to 0.99 (bottom right)

LSE band 16 comparison

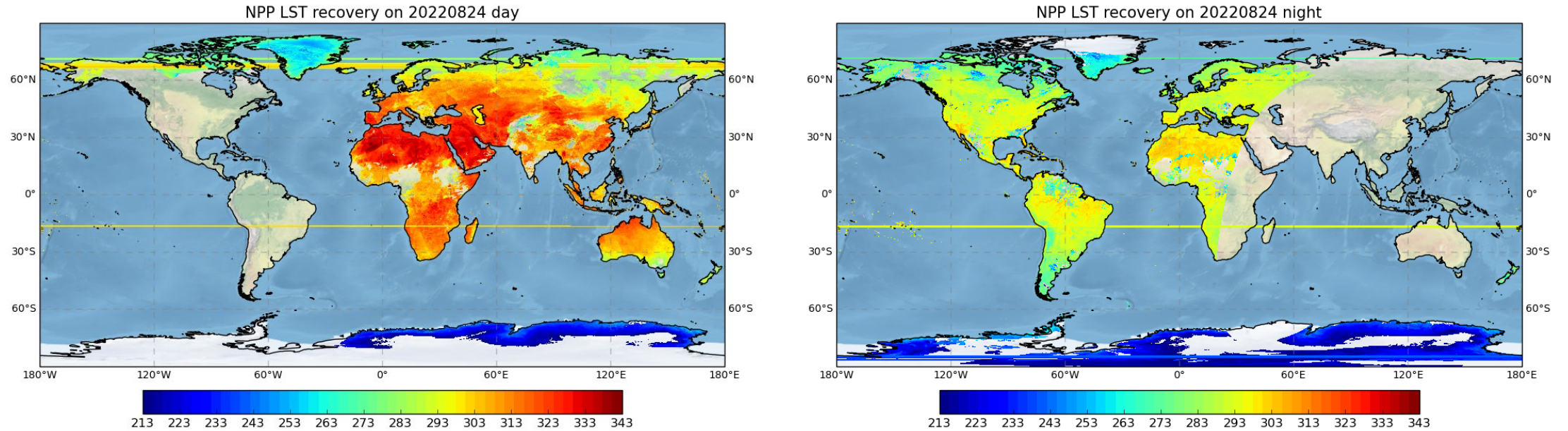


LSE band 15 comparison



- The LST granule with the time stamp at 20220819\_t0126492 is used for the verification
- DAP LST represents the NDE test output
- Ops LST represents the locally generated LST based on the framework which takes the same SDR and emissivity in the NDE test as input.

# NPP Post-Recovery LST Verification



- LST of all granules available at `/data/scdr060/PDA_IT/JPSS-RR/NPP/LST/` on day Aug. 24, 2022 are checked for both daytime (left figure) and nighttime(right figure)
- The LST data distribution looks reasonable within valid range
- The lines in the plot are caused by the mapping issue in the software code not the data issue.

## Accomplishments / Events:

- Albedo anomaly study over Texas, Hungary, Tibetan, and North Brazil about the correlation among different parameters
- Analyzed the the resumed NPP surface albedo after its recovery
  - Three days' worth of data was available for checking
  - The data production is back to normal
  - The data quality needs continuous monitoring
- Received positive review feedback for the L3 VIIRS albedo product manuscript
- Summarized the cloudy-sky surface albedo generation using PMW observations
- Submitted an abstract to AWS about multi-parameter analysis of interannual land surface change using satellite products

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year PMR	Oct-21	Oct-21	11/01/21	
Manuscript ready for Albedo Climatology update	Dec-21	Apr-22	Mar-22	
Generating the VIIRS BRDF climatology and real-time BRDF/Albedo test data generation	Jan-22	Jan-22	Jan-22	
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections)			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Offline LSA DAP delivery (J2, climatology files)			04/07/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	
L3 Global Gridded LST/LSA DAP to NDE (Prelim J2 DAP)			12/30/21	
L3 Global Gridded LST/LSA DAP to NDE (final J2 DAP)	May-22	May-22	05/13/22	
BRDF data development plan ready	Mar-22	Mar-22	Mar-22	Ready in team, but Project Postponed
VIIRS cloudy-sky albedo improvement	May-22	May-22	May-22	PMR slide7
FY23 Program Management Review	Jun-22	Jun-22	05/23/22	
Routine monitoring tool and its update	Aug-22	Aug-22	Aug-22	
NOAA-21 data test if provided	Aug-22	Aug-22	Aug-22	
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/17/22	JCT3-TVAC

## Overall Status:

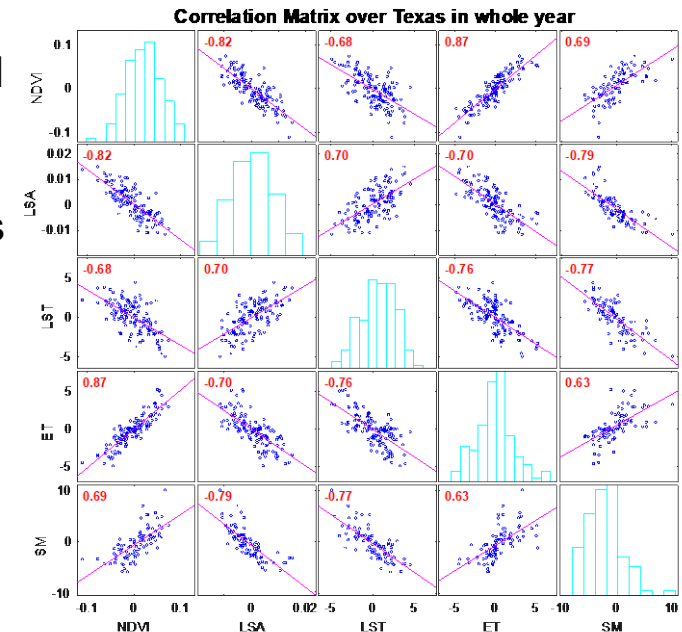
	Green <sup>1</sup> (Completed)	Blue <sup>2</sup> (On-Schedule)	Yellow <sup>3</sup> (Caution)	Red <sup>4</sup> (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

## Issues/Risks:

## Highlights:

- Strong correlations could be observed in multi-parameter anomaly over Texas. The variable pairs including:
  - >> LSA & LST
  - >> LST & NDVI
  - >> NDVI & LSA
  - >> NDVI & ET
  - >> ET & LST

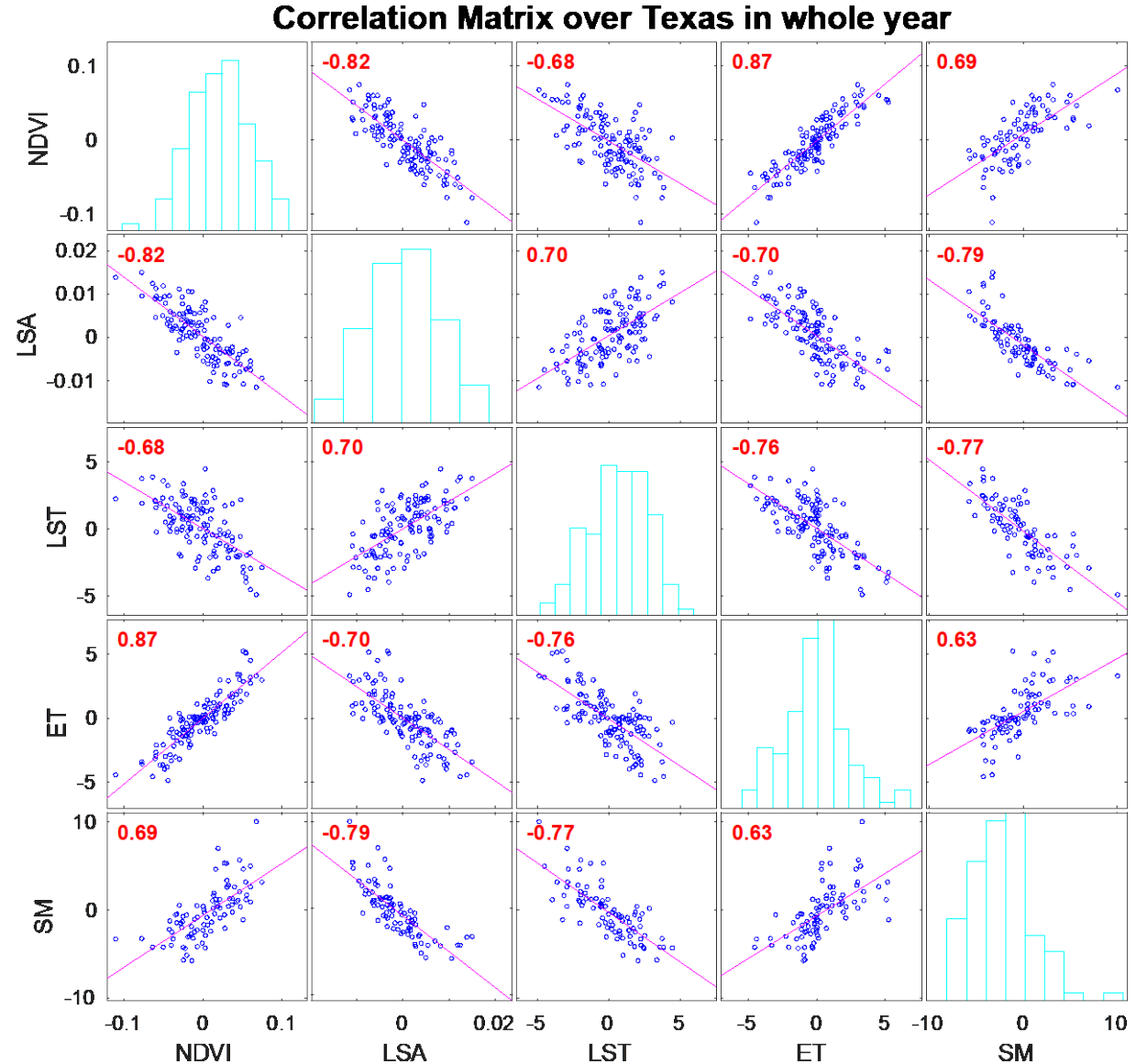


# Correlation analysis among variables in Texas

- Correlation analysis among the variable pairs including:
  - >> LSA & LST
  - >> LST & NDVI
  - >> NDVI & LSA
  - >> NDVI & ET
  - >> ET & LST
- Strong correlations could be observed in each pair.
- For these time series, all pairs of variables have correlations significantly different from zero (highlighted in red).
- Pearson's linear correlation coefficient is written in each subplot

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

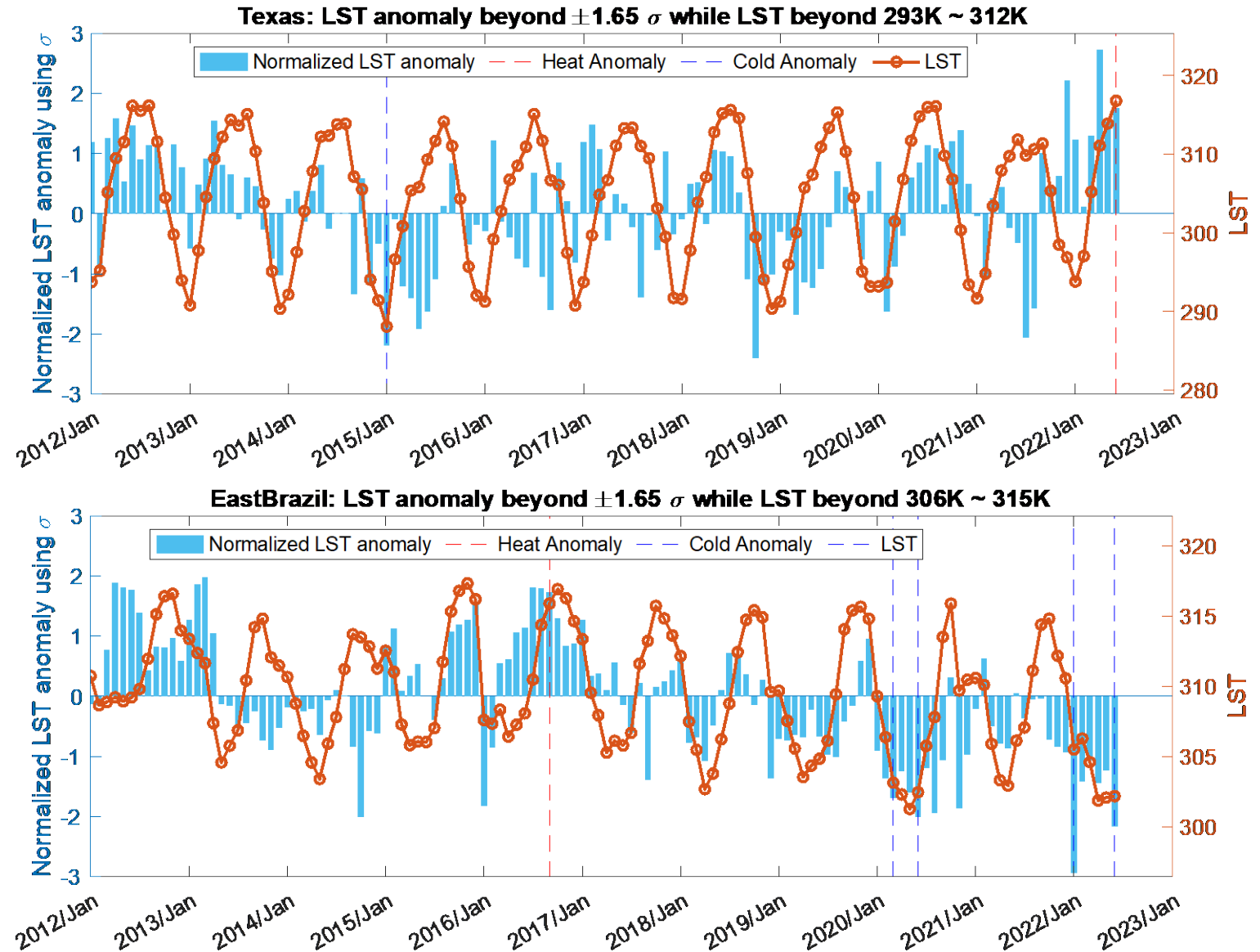
$r$  = correlation coefficient  
 $x_i$  = values of the x-variable in a sample  
 $\bar{x}$  = mean of the values of the x-variable  
 $y_i$  = values of the y-variable in a sample  
 $\bar{y}$  = mean of the values of the y-variable





# Using LST anomaly to detect extreme heat/cold condition

- Real-time monitoring of climate variables is crucial for weather service.
- Land surface temperature gridded products are available at kilometric resolution; With historical dataset, LST climatology is helpful for diagnose if current LST is abnormal
- If both the LST anomaly and LST temperature are beyond some range, it could imply some unexpected heat/cold weather conditions for inhabitants.
- A test method was applied on regional time-series LST data and got alerts of heat in Texas and cold in East Brazil recently.



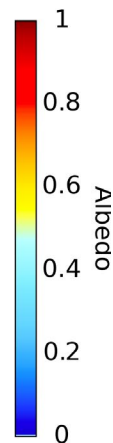
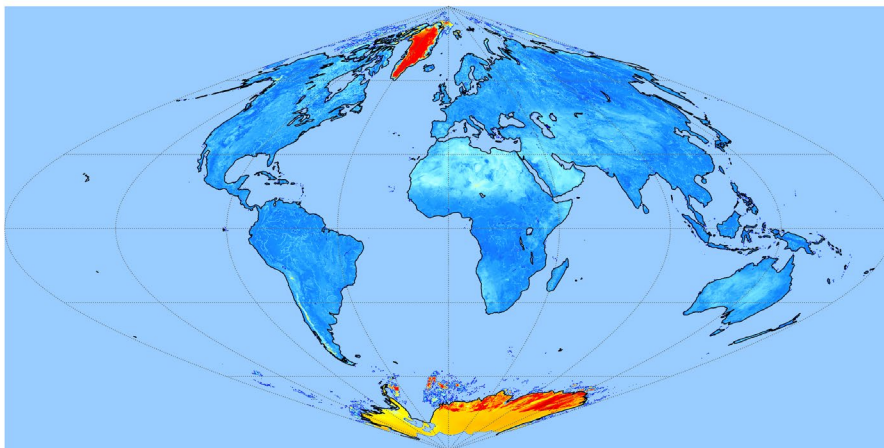
The recovered SNPP albedo shows consistency with NOAA20 albedo from visual inspection.

Albedo

Overall quality

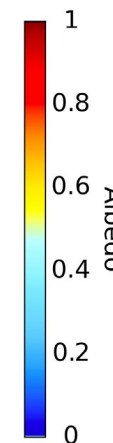
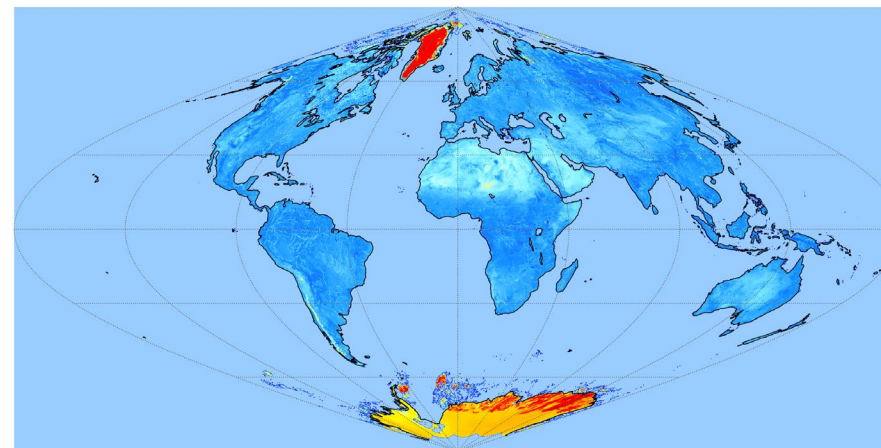
## NOAA-20

J01 VIIRS Global Albedo (L3 NDE): Aug 22 2022

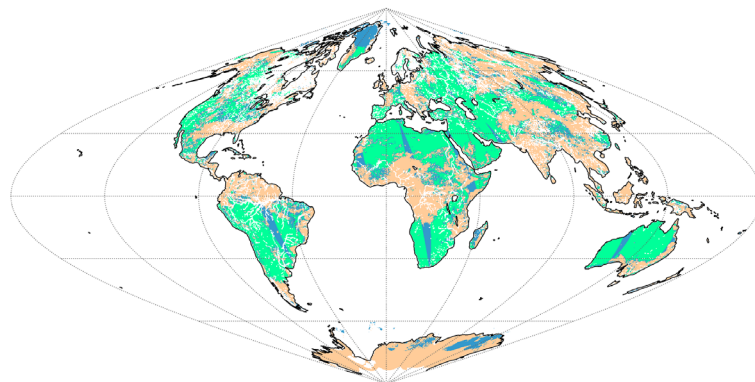


## SNPP

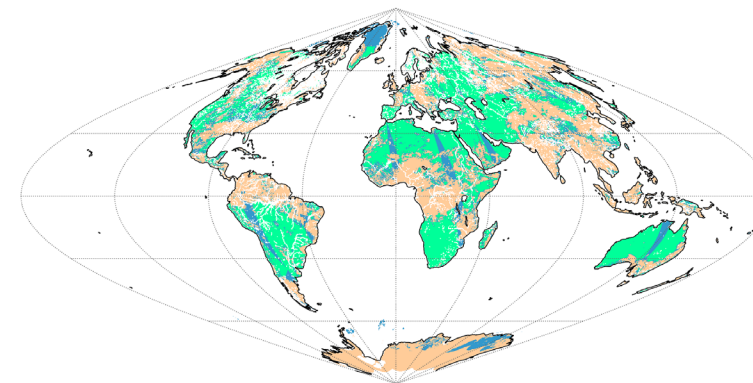
NPP VIIRS Global Albedo (L3 NDE): Aug 22 2022



J01 VIIRS Global Albedo Overall Quality: Aug 22 2022



NPP VIIRS Global Albedo Overall Quality: Aug 22 2022

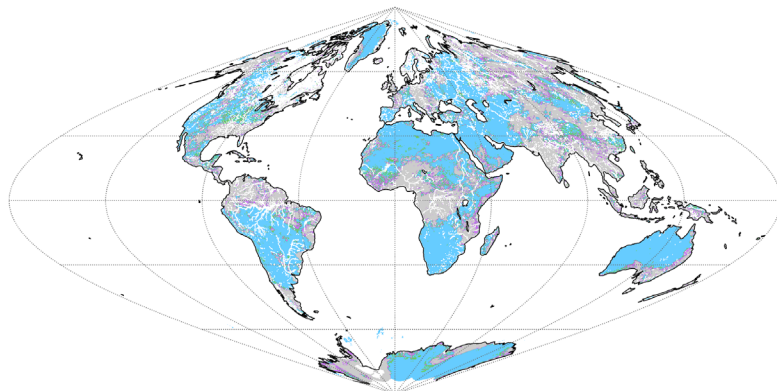


The quality flag in the recovered SNPP albedo is also consistent with NOAA-20 from visual inspection.

Cloud flag

## NOAA-20

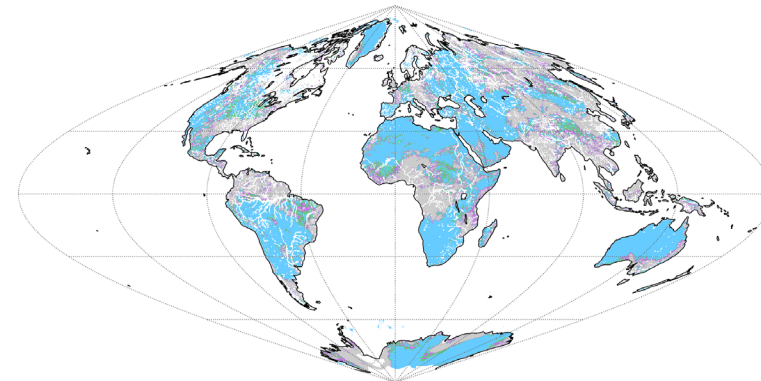
NPP VIIRS Global Albedo Cloud Flag: Aug 22 2022



Cloud condition

## SNPP

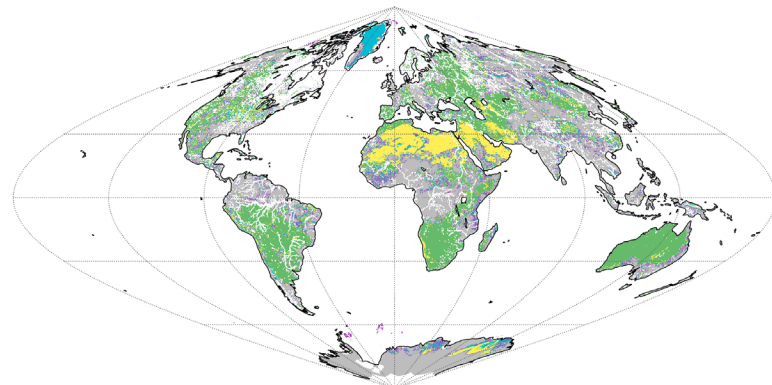
J01 VIIRS Global Albedo Cloud Flag: Aug 22 2022



Cloud condition

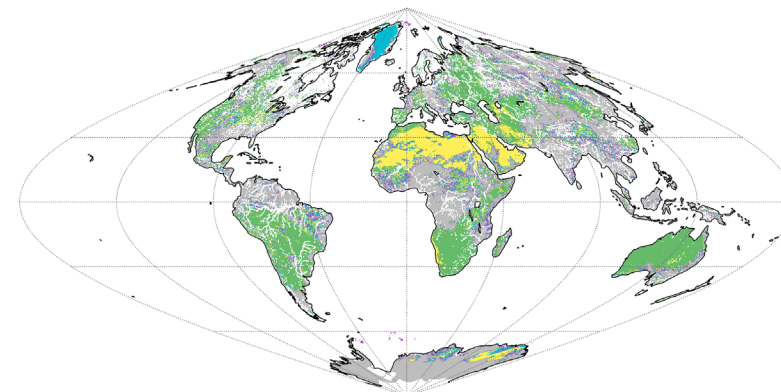
Retrieval Path

NPP VIIRS Global Albedo Retrieval Path: Aug 22 2022



Retrieval type

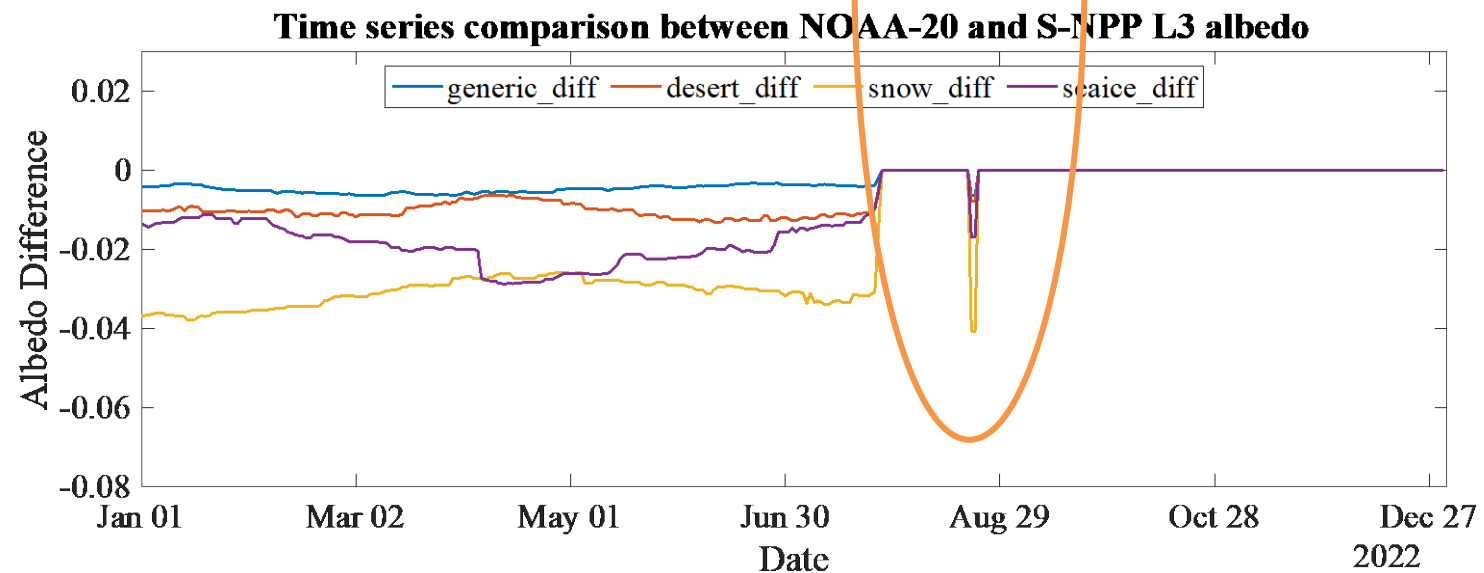
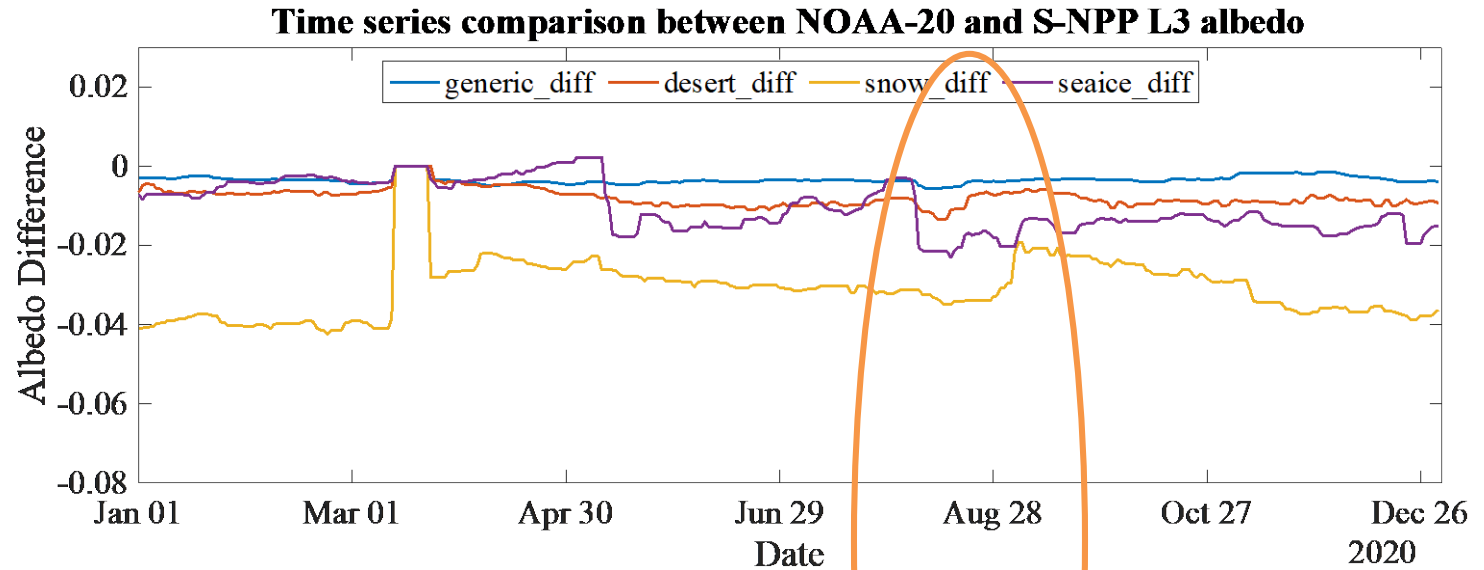
J01 VIIRS Global Albedo Retrieval Path: Aug 22 2022



Retrieval type

# Comparison between recovered SNPP and NOAA-20

- The mean difference in the two test days over globe similar level, but slightly larger than that in year 2020, when they both have sample size drop in this period
- The mean difference over different surface types (produced from separate LUTs) are also in a similar magnitude.

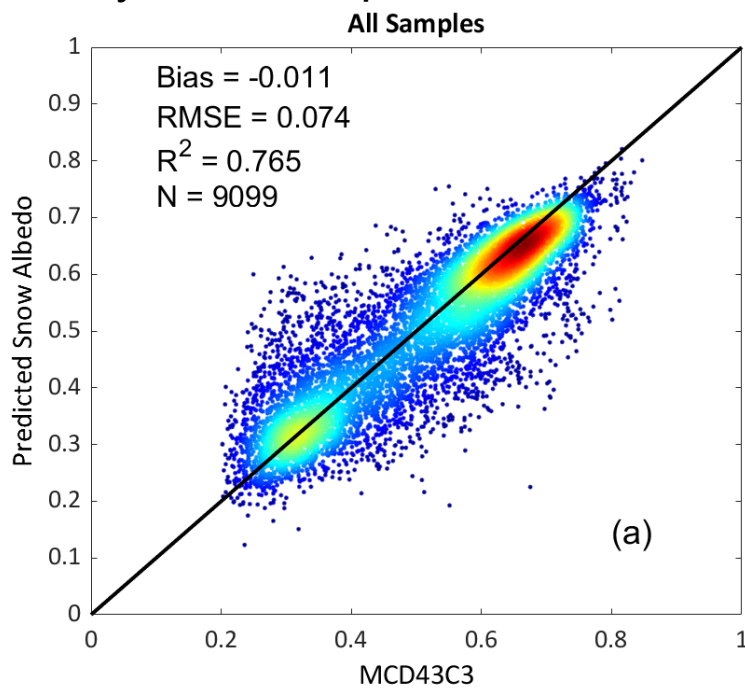


# Follow-on analysis of cloudy-sky albedo from PMW data

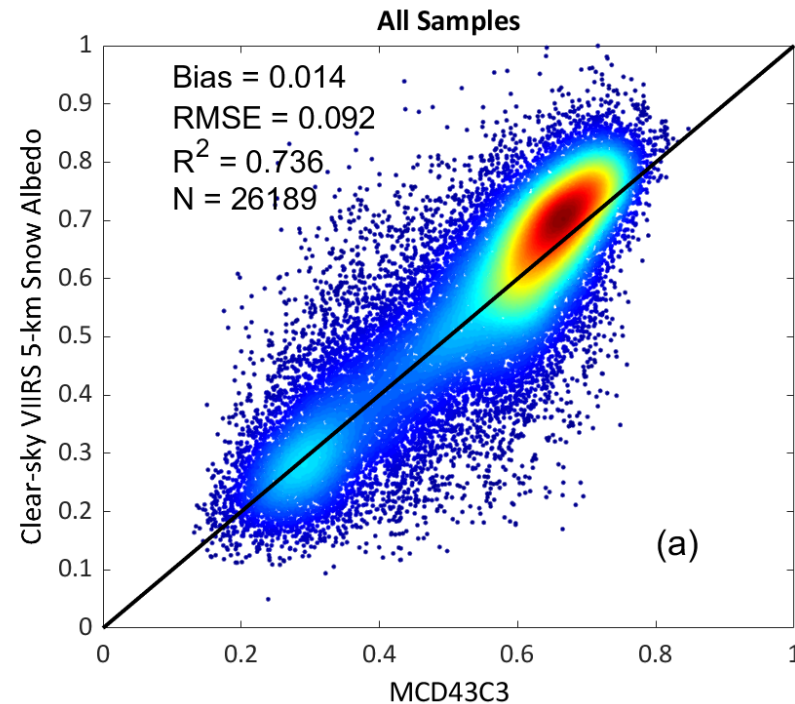
There are some innovative studies in our team to retrieve cloudy snow albedo using PMW data. The training reference is MCD43 snow albedo. The retrieved albedo shows good consistency with MCD43 albedo (*left*) and the scattered matchups are less;

This new method has advantage in cloudy conditions when the snow was not recognized; but the accuracy increase is not that apparent in overall comparison with current VIIRS operational shortwave albedo (*right*) due to the limitation in spatial resolution of PMW data;

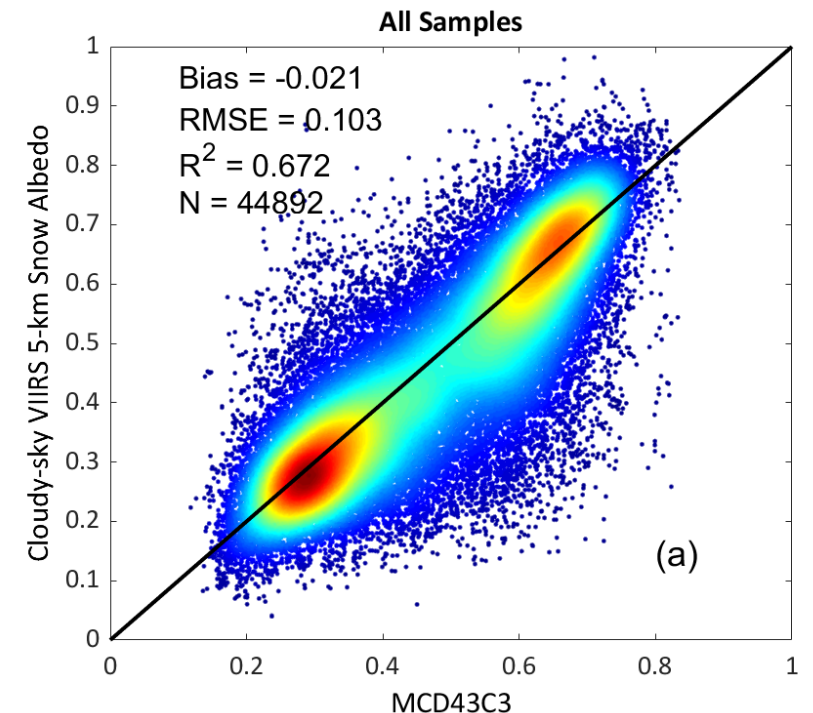
This is a potential direction for continuous exploration of applying all-weather PMW observations in cloudy-sky albedo improvement.



AMSR2 derived;



VIIRS 5km clear-sky;



VIIRS 5km cloudy-sky

## Accomplishments / Events:

- Produced VIIRS monthly GVF anomaly maps for July 2022 and found that GVF is lower than average year in large area of Europe
- Compared EVI data in July 2022 with other years and found that biweekly EVI in July 2022 is lower than the last year in Europe and the Midwest of America
- Found that ABI VI variation is reduced when only data from the time period from 10:00 AM to 2:00 PM local time are considered.
- Found that ABI VI differences with VIIRS VI are reduced in June time period if only data from 10:00 AM to 2:00 PM are considered. (This was not the case for the February time period which was also tested.)
- Check test data from re-started NPP data stream against equivalent NOAA-20 data. Daily VI results were found to be consistent.
- Working on resolving discrepancy in statistics calculation in GVF.

## Overall Status:

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

- Project has completed.
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- Project has deviated slightly from the plan but should recover.
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## Issues/Risks:

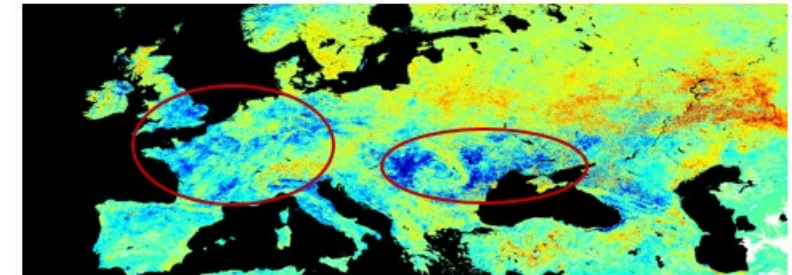
None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/29/21	
Prototype code of 1km global GVF product	Oct-21	Dec-21	Dec-21	
Prototype of VI generation using ABI data	Feb-22	Feb-22	Feb-22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Mar-22	Mar-22	03/29/22 (code & docs) 04/08/22 (data)	
LAI data development plan ready	Mar-22	Mar-22	Mar-22	NPPWG project rescheduled
Technical readiness of 1km GVF development	May-22	May-22	May-22	PMR slide7
Operational support readiness of J2 VI and GVF products	Jun-22	Jun-22	Jun-22	
FY23 Program Management Review	Jun-22	Jun-22	05/23/22	
Ground measurements collection and processing. LAI experimental product preliminary in-situ validation and cross-comparison with other products.	Sep-22	Sep-22		
Calibration/Validation update for SNPP and NOAA20 VI and GVF products	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

## Highlights:

- Calculated monthly mean GVF for July 2022
- Monthly GVF anomaly was calculated by subtracting GVF climatology from the monthly GVF

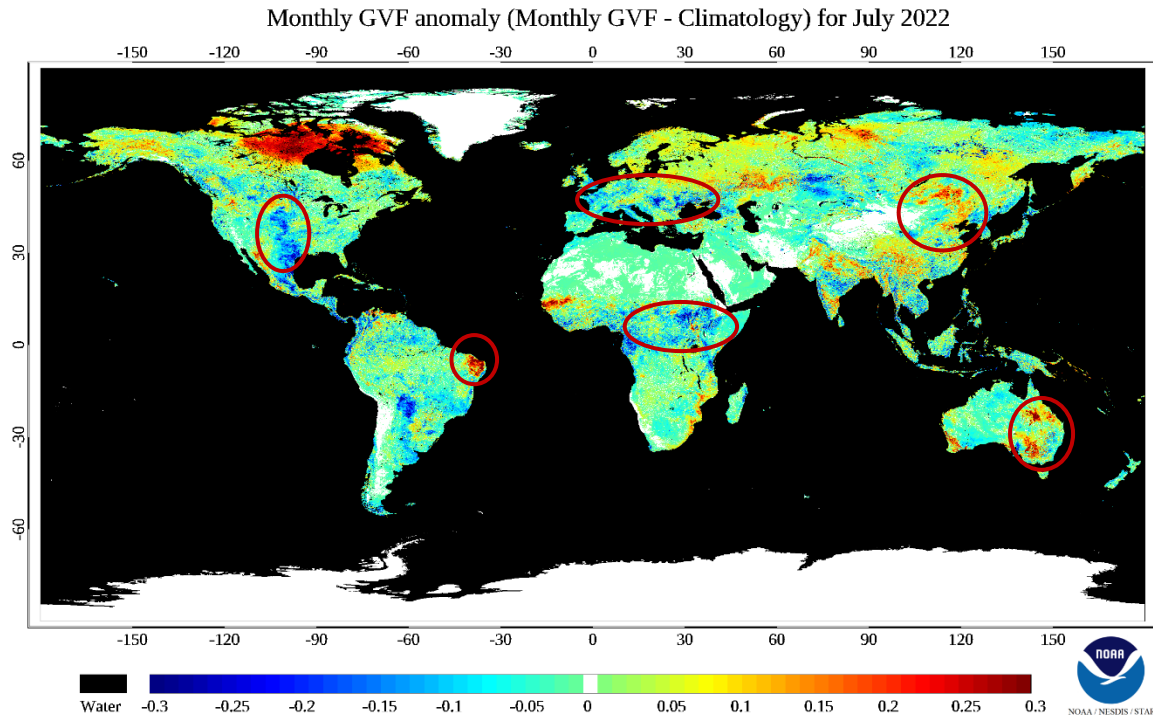
VIIRS GVF anomaly In Europe for July 2022



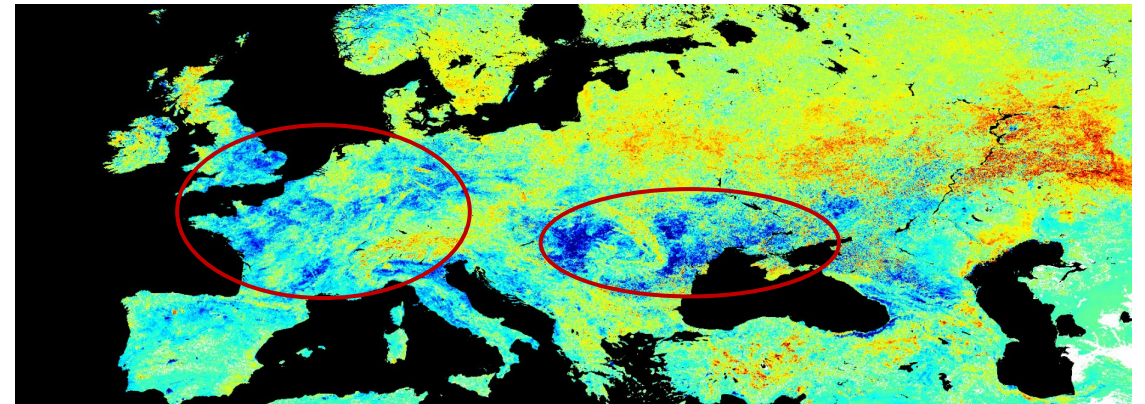
GVF is lower than average year in large area of Europe, which maybe related to the heatwave

# VIIRS Monthly GVF anomaly for July 2022

- Calculated monthly mean GVF for July 2022
- Monthly GVF anomaly was calculated by subtracting GVF climatology from the monthly GVF



## VIIRS GVF anomaly In Europe for July 2022



GVF is lower than average year in large area of Europe, which maybe related to the heatwave

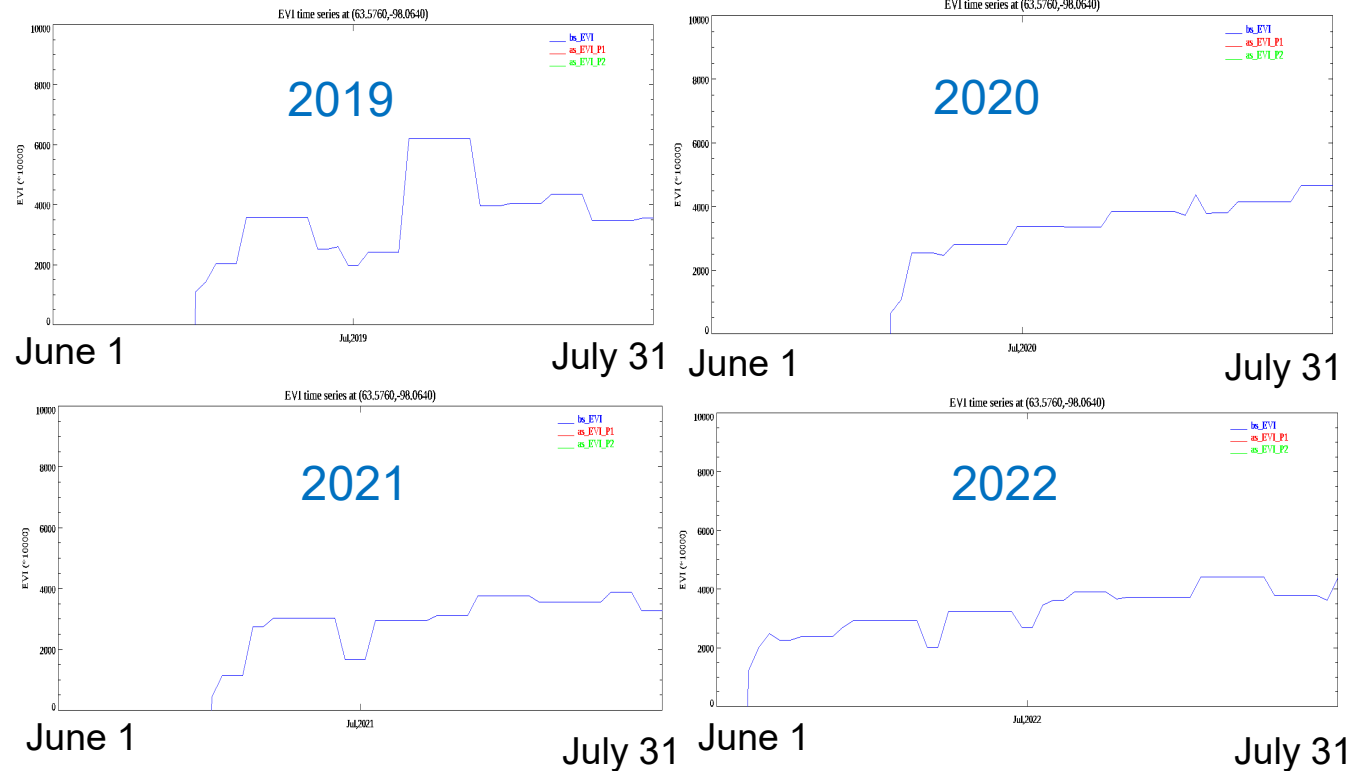
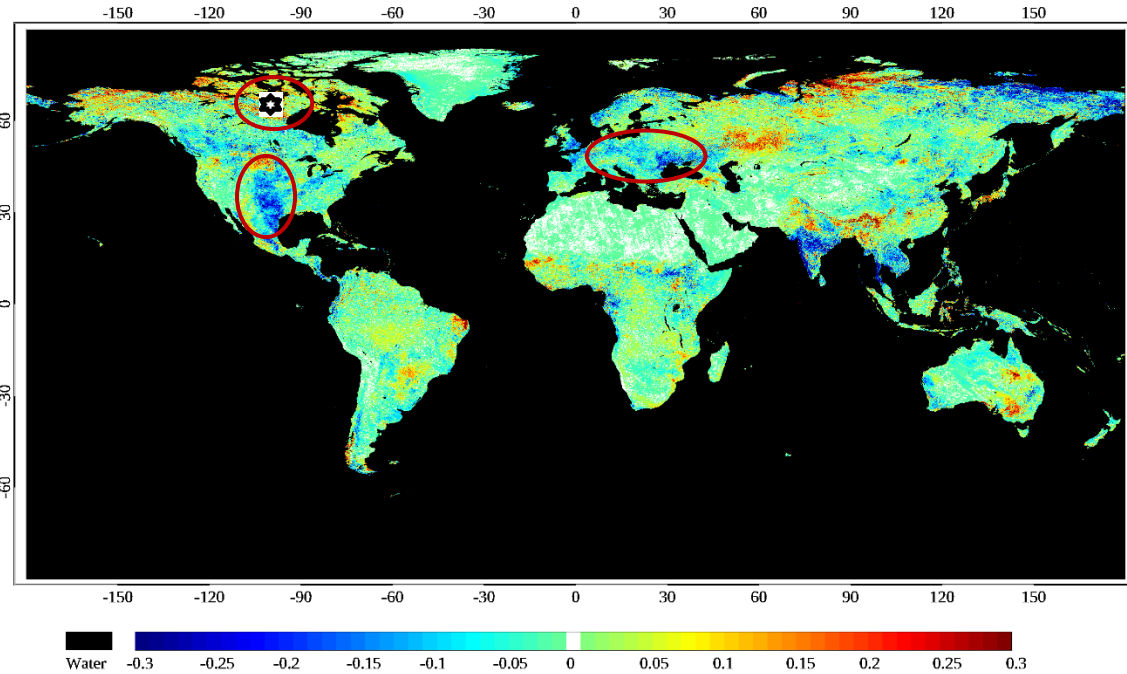
- VIIRS GVF in July 2022 is higher than average year in the northeast of China, the east of Australia and the east of South America
- VIIRS GVF in July 2022 is lower than average year in the central Africa and Midwest of America

# Biweekly EVI difference in July between 2022 and 2021

## Biweekly EVI difference in July (2022-2021)

## Weekly EVI time series at site(63.567°, -98.064°)

Biweekly EVI difference (20220716 - 20210716)



- VIIRS biweekly EVI in July 2022 is lower than the last year in Europe and the Midwest of America
- VIIRS biweekly EVI in July 2022 is higher than the last year in the north of Canada

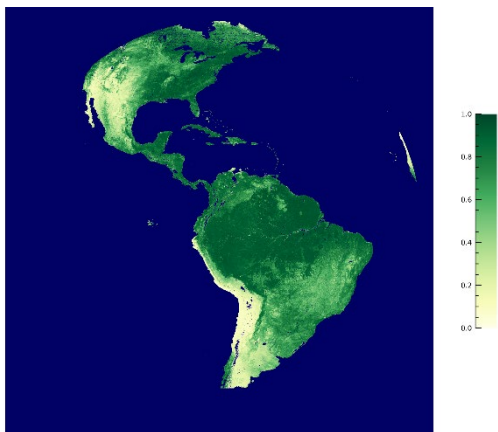
- A site at (63.567°, -98.064°) was selected in the north of Canada and EVI time series were extracted
- EVI increased much earlier in 2022 than the previous year



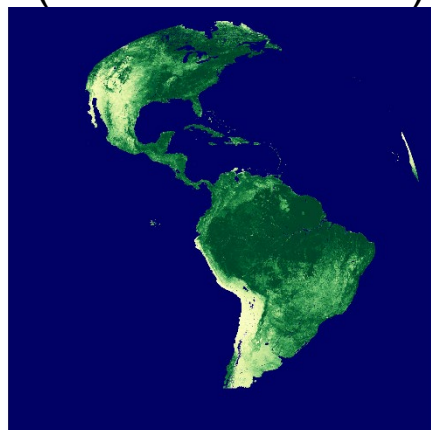
- GOES-R ABI VIs and reflectances were found to vary less during the middle of the day (10:00 to 14:00 local time)
- 16-day February 2022 and June 2022 composite ABI VIs were generated using only the data between 10:00 and 14:00 local time, using solar zenith angle adjusted SAVI compositing
- For February 2022, comparisons were made to VIIRS equivalent, SZA-adjusted SAVI compositing, and SZA-adjusted SAVI compositing with higher weight on SAVI.
- For June 2022, comparisons were made to VIIRS equivalent and SZA-adjusted SAVI compositing.

- Time limitation did not reduce VI coverage
- Time limitation reduced saturation of NDVI and produced closer match to VIIRS
- Time limitation also reduced EVI, but effect was less pronounced
- Solar zenith angle was lower for ABI than for VIIRS, but little different between time limited and non-time limited ABI results

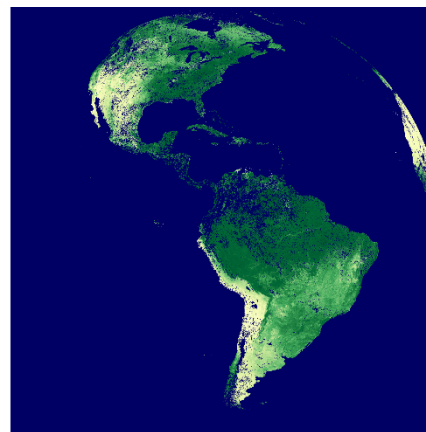
Time limited



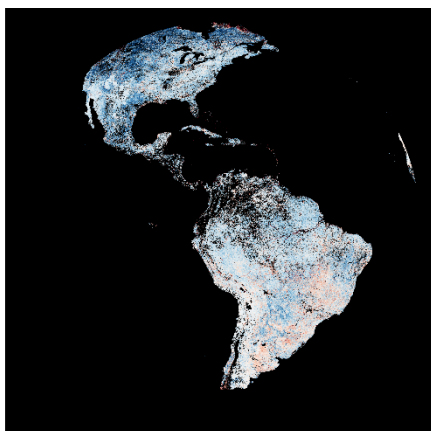
SZA adjusted  
(no time limitation)



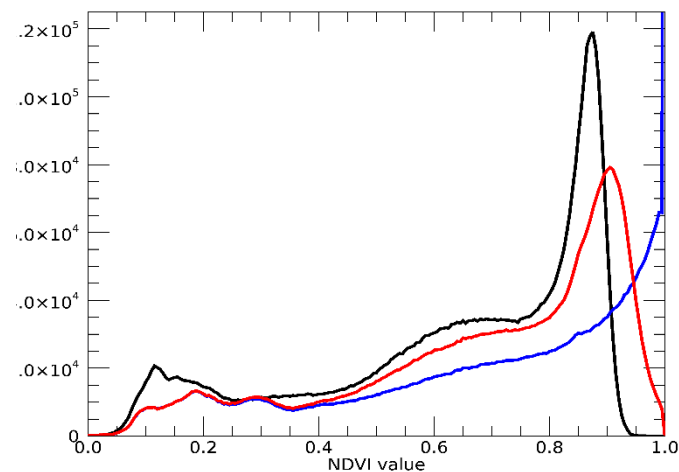
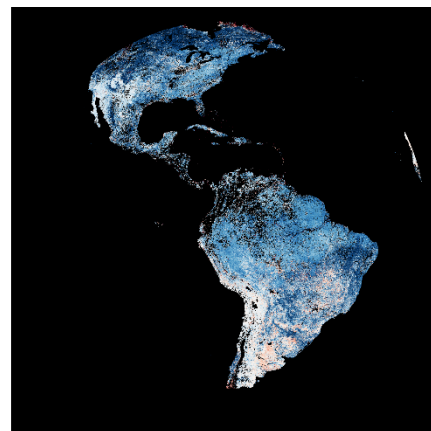
VIIRS



Time limited - VIIRS



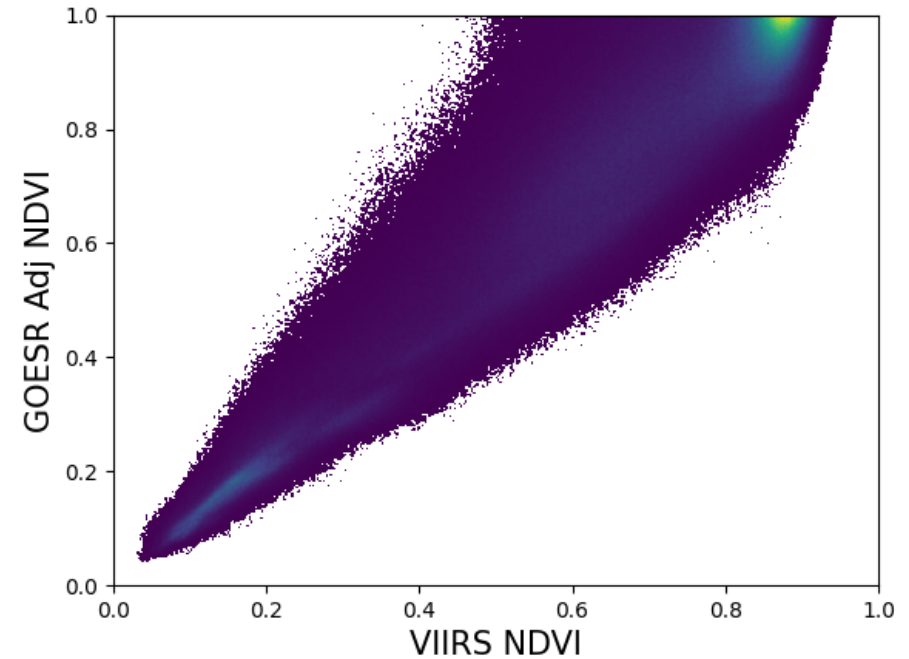
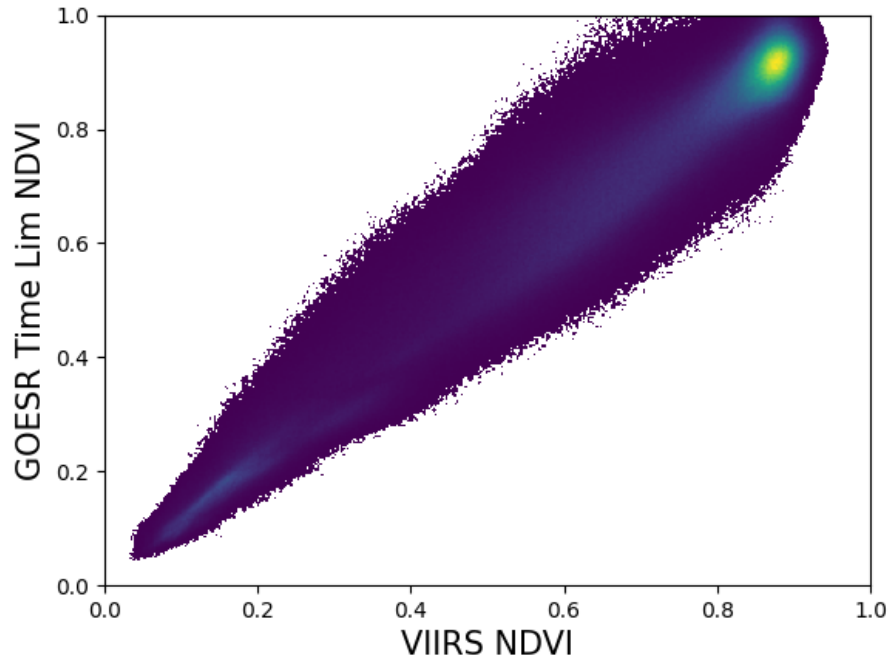
SZA adjusted -VIIRS



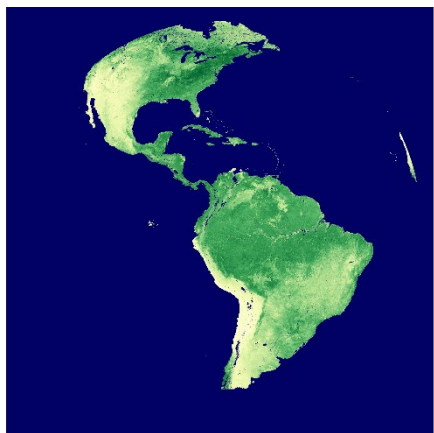
Histogram of NDVI values:  
VIIRS  
Time limited  
SZA adjusted

# June 2022 GOES-R ABI vs VIIRS NDVI scatterplots

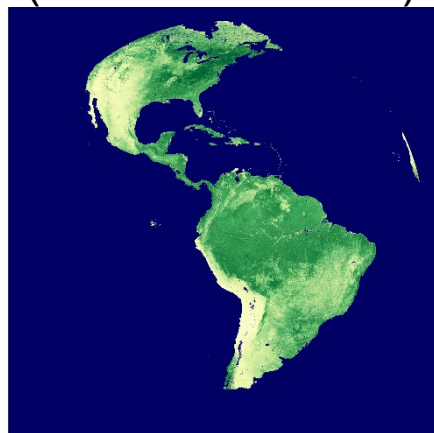
- Saturation (NDVI values close to 1) is reduced when GOES-R ABI data are limited to those between 10:00 AM and 2:00 PM local time.



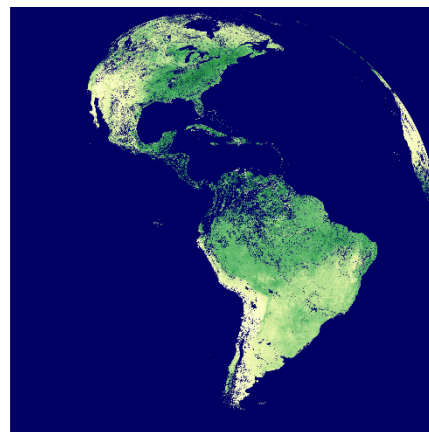
Time limited



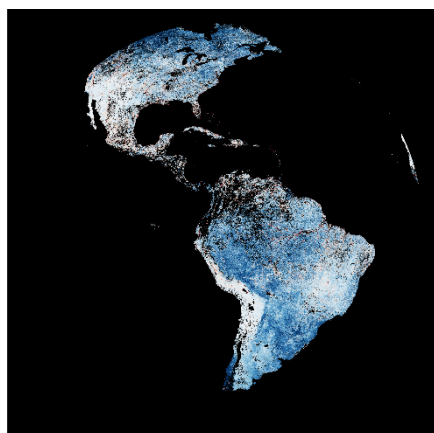
SZA adjusted  
(no time limitation)



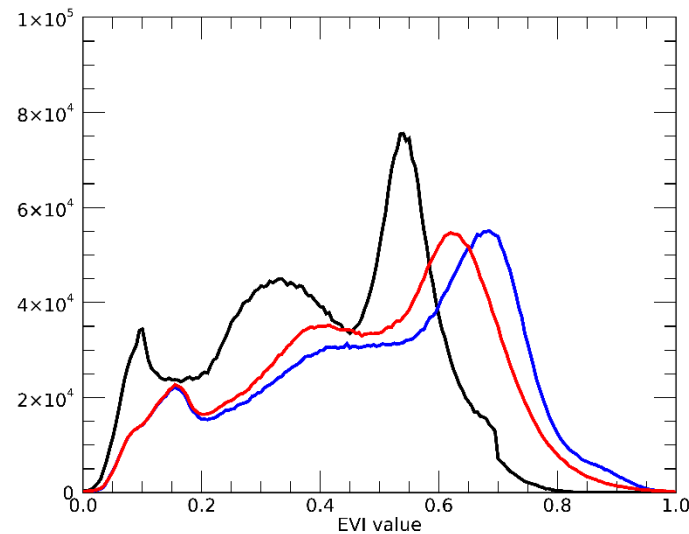
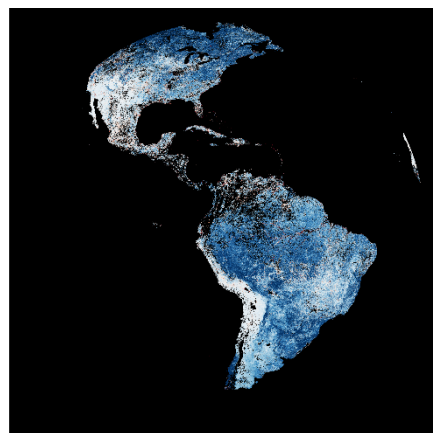
VIIRS



Time limited - VIIRS



SZA adjusted -VIIRS



Histogram of EVI values:  
VIIRS  
Time limited  
SZA adjusted

## Accomplishments / Events:

- Reprocess the LAI climatology and long-term statistics (such as standard deviation) using GLASS LAI dataset from (2001-2018).
- Process the long term VIIRS surface type (ST) data and generate a IGBP ST climatology and match with MODIS LAI biome types for LAI retrieval.
- Prepared 5-year datasets (2014-2018) as the new training dataset, this include NASA VIIRS 8-Day LAI (VNP15H2), daily surface reflectance (VIIRS I1, I2 and I3) along with the QFs and Angles.
- Screening the training dataset using the LAI & SR QFs, then using machine learning method to further exclude the data not good for training.
- Training the Cubist and Random Forest model using the updated training datasets.

## Overall Status:

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

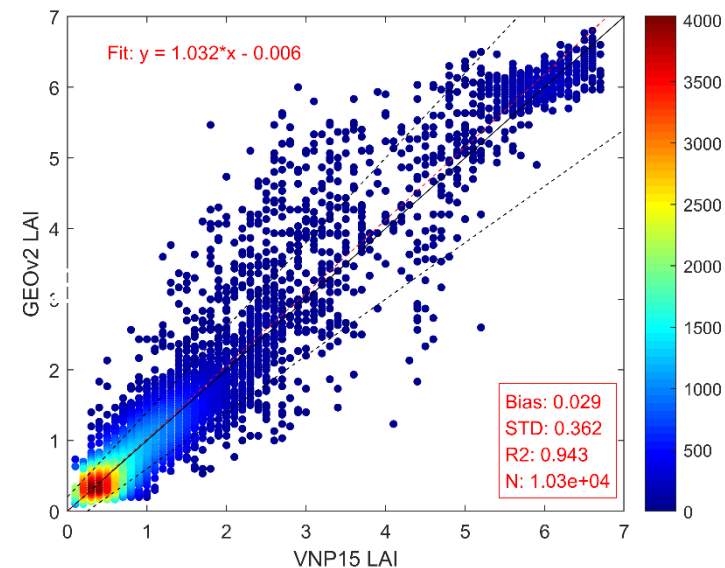
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- Project is within budget, scope and on schedule.
- Project has deviated slightly from the plan but should recover.
- Project has fallen significantly behind schedule, and/or significantly over budget.

## Issues/Risks:

None

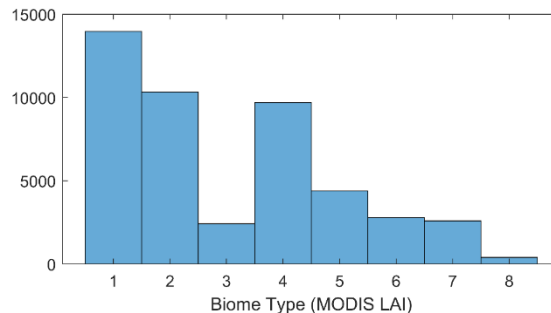
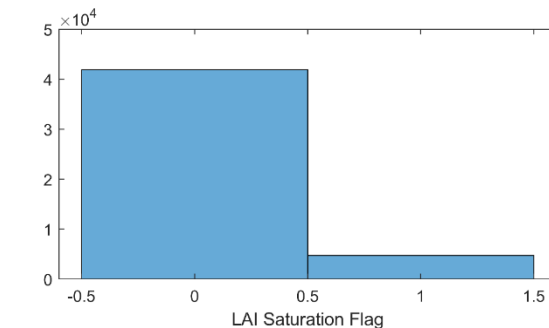
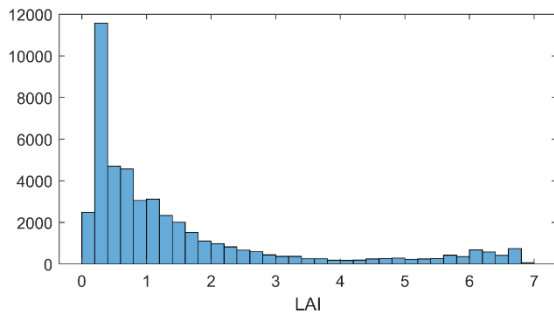
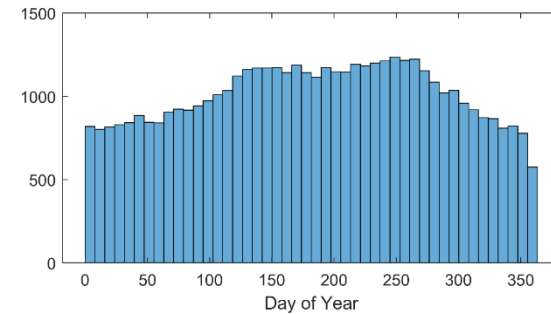
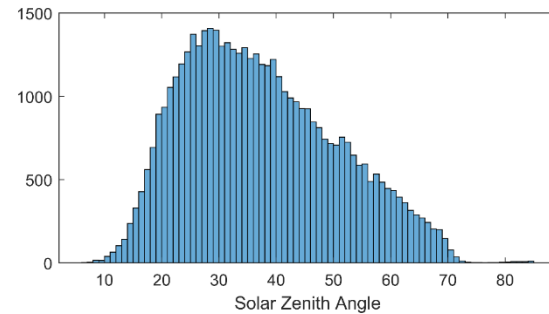
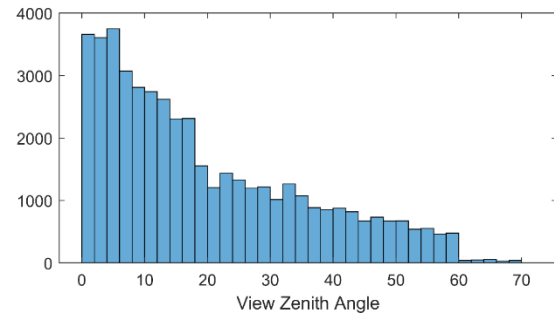
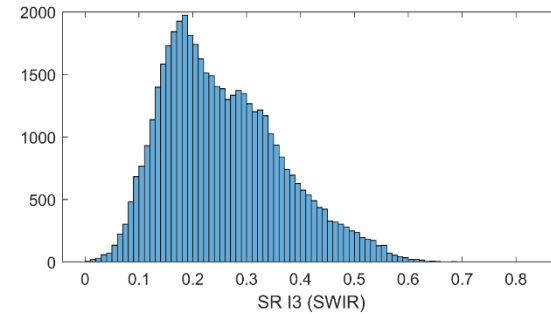
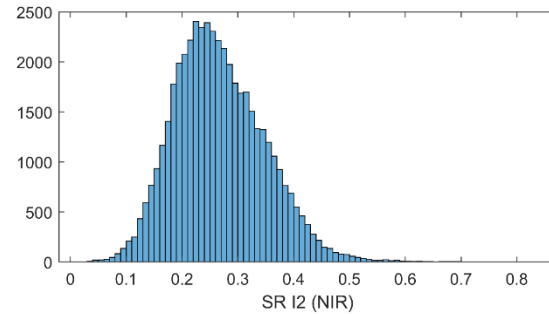
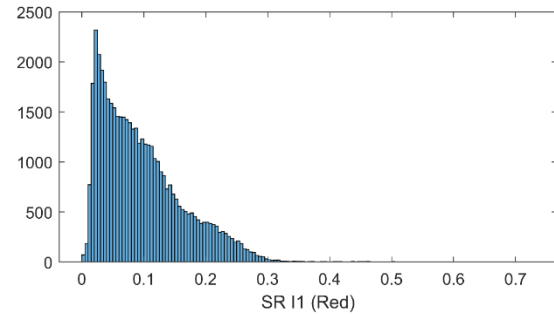
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Discussion with users for the requirements and Initial Archive Requirements identified	Aug-22	Aug-22		
Quality Monitoring Concept and Long-term Maintenance Concept defined	Oct-22	Oct-22		
Experimental dataset produced for model test	Nov-22	Nov-22		
Development processing system and Initial Information Technology (IT) Security concept defined	Dec-22	Dec-22		
Test case processed	Jan-23	Jan-23		
Critical Design Review (CDR)	Feb-23	Feb-23		
Code is prepared for implementation	Apr-23	Apr-23		
Final Archive requirements identified & Operational and backup processing defined	Jun-23	Jun-23		

## Highlights:



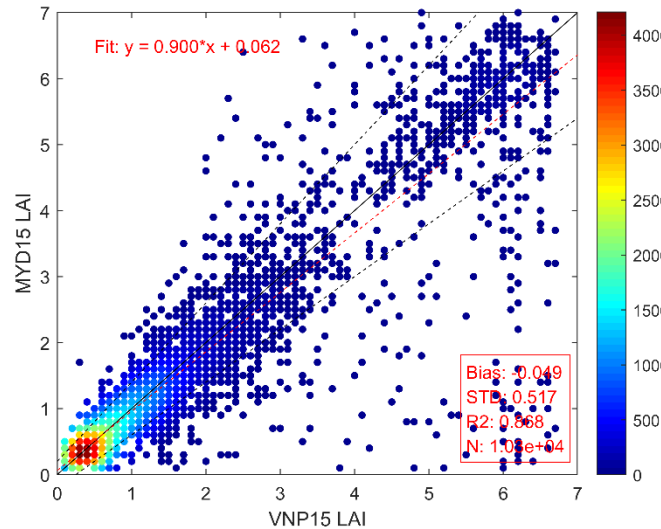
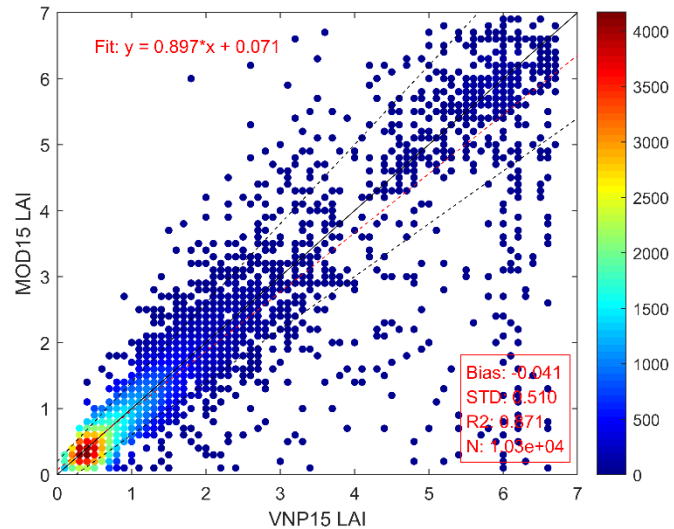
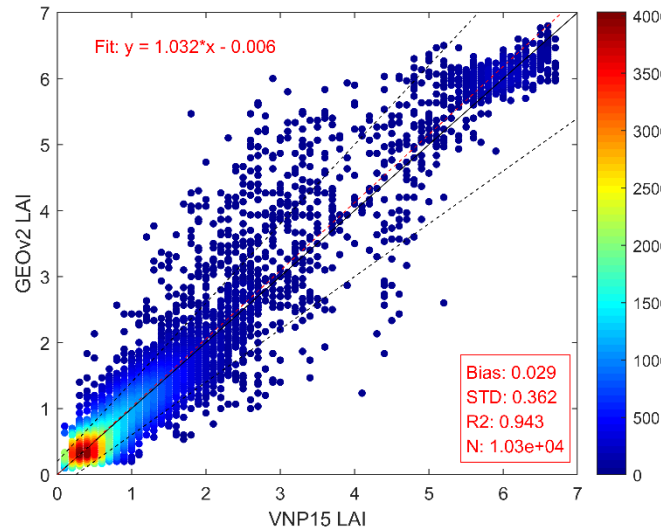
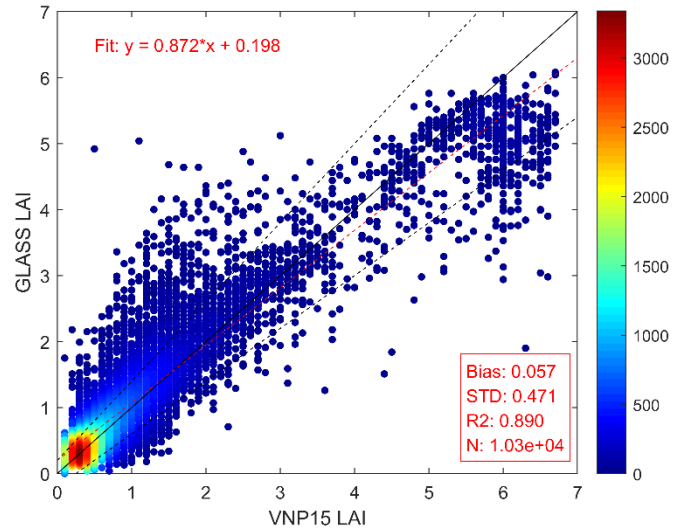
- The updated 5-year VNP15H2 LAI training datasets compared with the GEO v2 LAI data. Two products show good agreements.
- With the new dataset, the Cubist LAI algorithm performed with  $R^2 = 0.957$ ,  $RMSE = 0.32$

## 5-Year LAI training datasets histograms



- Date: 2014-2018
- Sites: BELMANIP2 (445 sites)
- Daily SR (I1, I2, I3) along with angles and QFs
- Compositing to 8-Day SR using the modified MODIS algorithm.
- 8-Day LAI (VNP15H2) along with QFs
- 8 Years VIIRS ST climatology
- Main LAI algorithm only (3D LUT), include saturated data good to use.
- Confidently clear without cloud shadow or cirrus.
- No high AOD, No snow.
- SR within [0, 1]

■ The Training dataset inter-comparison with GLASS, GEOv2 and MODIS LAI



■ The Training dataset performance in the Cubist LAI algorithm

- Predictors: NDVI, NDWI, OSAVI, EVI2, SR I1, I2, I3, SZA, VZA, RAA, Biome
- Method: Cubist regression
- Test 1:
  - Original datasets (good quality only according to QFs)
  - R2 = 0.793, RMSE = 0.56
- Test 2
  - Use more cloud, AOD & snow QFs to select best quality data.
  - R2 = 0.8596, RMSE = 0.513
- Test 3
  - Exclude the data fail to do the correct biome classification & saturation classification
  - R2 = 0.8839, RMSE = 0.4970
- Test 4
  - New updated training (based on the best quality data, use GLASS and GEOv2 as reference to exclude suspicious data)
  - **R2 = 0.957, RMSE = 0.32 (mean LAI: 1.27, ~25%)**



Accomplishments / Events:

- Nothing significant to report

Overall Status:

	Green <sup>1</sup> (Completed)	Blue <sup>2</sup> (On-Schedule)	Yellow <sup>3</sup> (Caution)	Red <sup>4</sup> (Critical)	Reason for Deviation
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Technical / Programmatic		X			
Schedule		X			

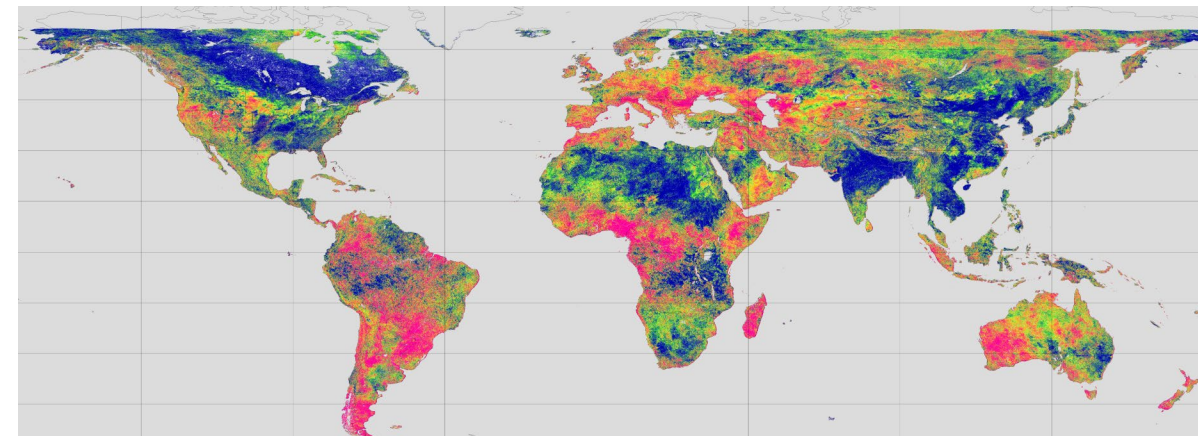
1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		Not needed
FY23 Program Management Review	Jun-22	Jun-22	06/15/22	
Final J2 ready DAP to NDE (include NPP/N20 updates, initial/final DAPs combined)	Dec-21	Dec-21	12/20/21	
Algorithm: VHindices-Malaria (South America)	Sep-22	Sep-22		
VIIRS-0.5 km SMN & SMT (8-year Max-Min Climatology)	Sep-22	Sep-22		Not needed
40-year Vegetation Greenness (NDVI) & Global warming	Sep-22	Sep-22		
Climate warming & temperature (SMT) in agricultural regions	Sep-22	Sep-22		
FAO locust activity vs VHindices in 2021	Sep-22	Sep-22	01/12/22	
NDVImax/min & BTmax/min: 0.5 and 1 km correlation	Sep-22	Sep-22		
Regional drought and global warming trends	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/19/22	JCT3-TVAC

Highlights: Sample image – Temperature Condition Index for August 2022



## Accomplishments / Events:

- Conducted in-water and above-water measurements of water-leaving radiances to characterize the optical signatures of important physical and biological processes relevant to the project and to validate and assess VIIRS performance in a variety of water types and conditions on the 3rd East Coast Ocean Acidification Cruise (see highlight).
- Participated in Fiducial Reference Measurements for Satellite Ocean Colour (FRM4SOC) Phase-2 Radiometric Field and Laboratory Inter-Comparison Exercises: This is an ongoing international project for data quality assurance and control among agencies responsible for producing ocean color satellite data.
- Participated in S-NPP Data Anomaly assessment efforts for VIIRS Ocean Color

## Overall Status:

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

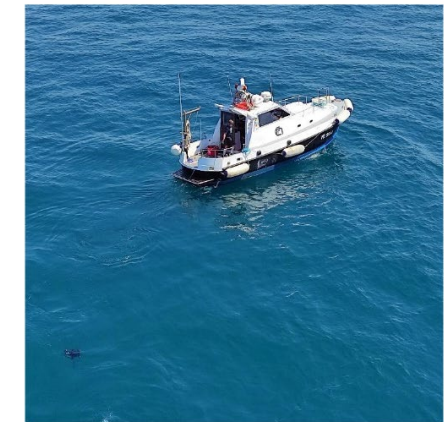
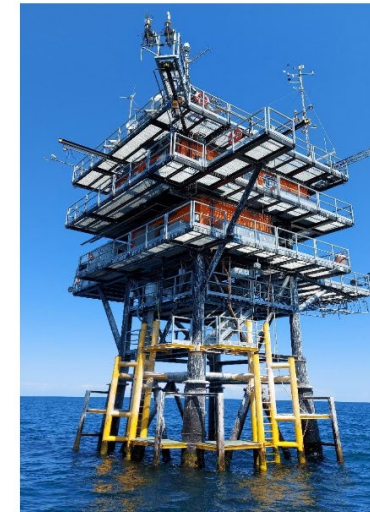
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## Issues/Risks:

Reviewing NDE Migration/J2 Beta Deliveries to NCCF to minimize delays for end users to access J2 data as early as possible without compromising quality

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/01/21	
FY23 Program Management Review	Jun-22	Jun-22	05/18/22	
J2 ready DAP to CoastWatch (include NPP/N20 updates)	Dec-21	Dec-21	10/29/21	cc ASSISTT
Re-deliver the J2 DAP to CW			01/28/22	
J2 ready DAP to ASSISTT (include NPP/N20 updates)	Mar-22	Mar-22	Mar-22	CoastWatch delivery
J2 ready DAP to Cloud (include NPP/N20 updates)	Jun-22	Mar-23		ASSISTT delivery
Support CoastWatch/ASSISTT for J2 OC MSL12 testing/verification, if needed	Sep-22	Sep-22	03/31/22	PMR slide15
J2 OC data processing (MSL12) ready for J2 launch	Sep-22	Sep-22		
Start mission-long VIIRS OC data reprocessing	Mar-22	Aug-22		J2 DAP issues
Evaluation of MSL12 ver 1.51 performance over global ocean	Sep-22	Sep-22		
Producing consistent VIIRS SNPP and NOAA-20 ocean color products	Sep-22	Sep-22		
Cal/Val team complete the 7th VIIRS ocean color dedicated cruise	Jul-22	Jul-22	03/31/22	PMR slide15
Improvement of the OCView tool or web presentation	Aug-22	Aug-22		
Continue working on improvement of the ocean color data processing system (MSL12), particularly over global coastal and inland water regions	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

## Highlight: Cal/Val in the field – above and in-water measurements



The AAOT tower (left) used in the above-water measurements and the RV Litus (right) used for the in-water measurements.

## Accomplishments / Events:

- Mai focus of the SST team was to evaluate the effect of NPP outage on SST product. SST Team participated in two meetings, on 16 and 18 Aug and presented progress with SST recovery. The gap lasted from 26 Jul (part day) through 10 Aug (part day). The last full day of data before the outage was collected 25 July, and the first full day of data after outage was collected on 11 Aug. According to our preliminary analyses (see the time series, separately shown for night and day), the NPP product returned back to normal shortly after enabling L1b data flow. More analyses are needed to more accurately assess the impact, and it will be performed in the following months of 2022.
- Preparation for N21 launch continues. SST monitoring systems SQUAM, MICROS, ARMS have been updated and ready to support N21 Cal/Val. SST Team is ready for N21 data flow and Cal/Val.
- Monitoring of NPP/N20 SSTs in SQUAM, MICROS and ARMS continues. No issues (other than the NPP outage) have been identified.
- Work is underway to improve the stability and completeness of the in situ data in iQuam system for the use in Cal/Val. Currently it overly relies on FNMOC product, which has been unstable recently. Adding ICOADS NRT and CMRMS redundant flows is being explored.

## Overall Status:

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

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## Issues/Risks:

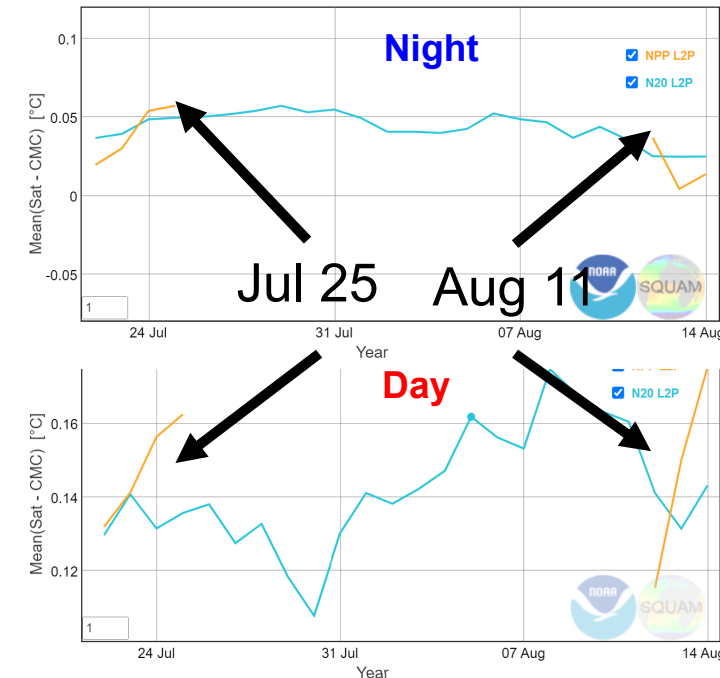
Tonga volcanic eruption may result in cold SST biases of unknown magnitude.

## Highlights:

ACSP0 RAN3 global 'subskin' minus CMC L4 SST are shown. NPP and N20 SSTs are very consistent, and show no "steps" after re-enabling VIIRS SDRs on 10 Aug.

The product is fully within specs. Post-hiatus performance is consistent to that before 25 July, and with N20. We recommend to resume distributing OSPO NPP SST to users.

More analyses will be performed in the near future, to ensure that there are no steps in products coverage and performance statistics.



Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/18/22	
Final J2 ready DAP to NDE (no science code update: initial/final combined)	Dec-21	Dec-21	12/15/21 SPSRB docus (EUM, SMM)	if needed (e.g., update for Intel 19.0.5, filename change, etc)
Continue development of ACSP0 3.00. Improve Clear-Sky Mask & SST Algorithms. Focus on NPP/N20 SST consistency	Dec-23	Dec-23	PMR slide6	V2.9 for Goes-R
Integrate in ACSP0. Test in STAR environment. Include N21 functionalities in NOAA Match-Up code/Monitoring	Aug-22	Aug-22	Aug-22	
Continue NOAA SQUAM and ARMS monitoring & validation against iQuam. Provision for N21 infrastructure	Aug-22	Aug-22	Aug-22	
Maintain ACSP0, SQUAM, iQuam, ARMS, match-up & RAN infrastructure & codes. Improve/optimize/add N21	Sep-22	Sep-22		
Monitor SST performance online. Identify anomalies. Work w/SST Algorithms & SDR Team and archives to address	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/12/22	JCT3-TVAC

## Accomplishments / Events:

- Dave Santek (CIMSS) and Jeff Key (STAR) had an oral presentation on the use of the VIIRS day/night band (DNB) for polar winds retrieval at the AMS Madison Collective Summer Meeting
- Experimental VIIRS Tandem Duplet Winds Product Shows Good Agreement with Radiosonde: The duplet (two orbit) version of the VIIRS tandem winds product was produced over a period from 18 September through 3 November 2021. Unlike the single-satellite VIIRS polar winds, the duplet tandem winds can be derived globally.

## Overall Status:

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

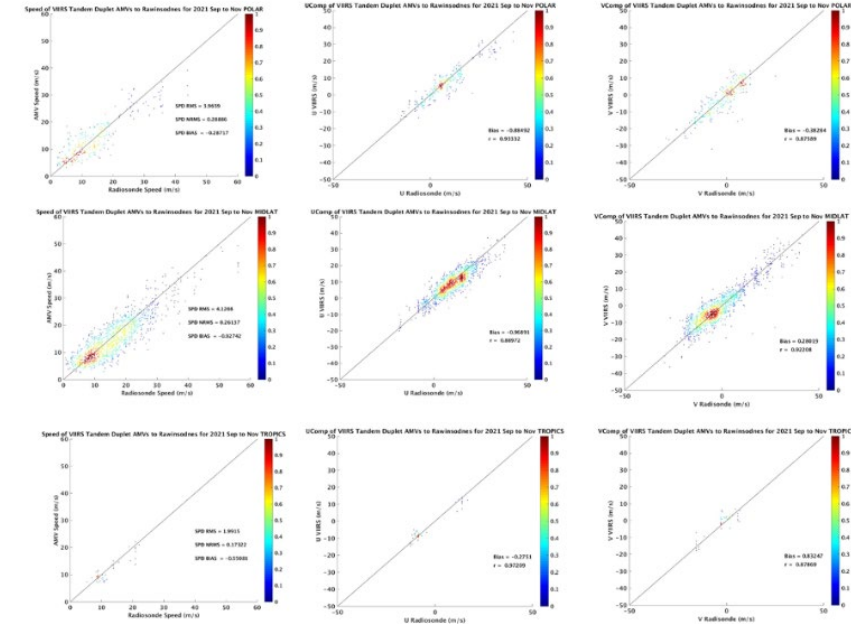
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## Issues/Risks:

None

## Highlights: Promising JPSS VIIRS Tandem Duplet Winds Product compared to Radiosonde

TDJWP AMV value on y-axis, with Radiosonde value on x-axis, for speed (left), u-component (middle) and v-component (right). Top row is for Polar regions (60 to 90 deg) latitudes, middle is for mid-latitudes (30 to <60 deg) and tropics (<30 deg) latitudes. The scale on the right is the density distribution



Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/28/21	
FY23 Program Management Review	Jun-22	Jun-22	05/18/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) delivery			07/13/22	
Patch DAP (final J2 DAP) deliver to NDE			08/08/22	
Implement VIIRS tandem winds	Mar-22	Mar-22	Dec-21	Running routinely at CIMSS
Generate new lookup tables, retrieval coefficients for JPSS-2	Sep-22	Sep-22		
Continuous monitoring of S-NPP and NOAA-20 products	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

- NUCAPS team evaluated S-NPP (LW/SW) EDR products in support of the CrIS SDR user feedback after the recovery of the S-NPP (CrIS/ATMS) sensors. The S-NPP (LW/SW) system NUCAPS AVTP, AVMP, Ozone, and trace gas products (CO, CH4) products are as expected, and consistent with the earlier evaluations presented at the JPSS S-NPP (LW/SW) mini-validation review (2021/11/08). The loss of S-NPP CrIS midwave band precludes retrieval of CH4 product from the S-NPP (LW/SW) NUCAPS system.
- NUCAPS team continued work on some minor fixes (Gravity calculation, NaNs microwave emissivities that occasionally appear, impacting 1 to 2 granules per day (but usually none)). These retrieval errors are due to some bad data (e.g. missing view angle) in the Level-1C input data stream for the MetOp-B/C satellites impacting the preprocessor. The fixes incorporated into the pre-processor will be implemented as a patch delivery for the NCCF operations.
- NUCAPS team members attended and presented a paper at the AMS Collective Madison Meeting (CMM) held at Madison, WI, August 8-12, 2022. The NUCAPS team also submitted a set of five abstracts for AMS 2023 conference (8-12 January 2023) on various facets of the NUCAPS system, products improvements, advances, optimization, and augmentation for the next generation hyperspectral sounders.

## Overall Status:

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

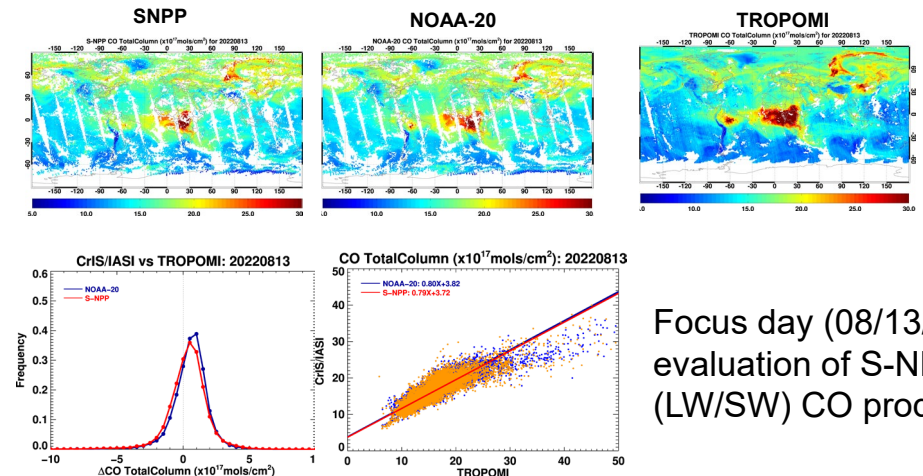
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## Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/10/21	
FY23 Program Management Review	Jun-22	Jun-22	05/19/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Mar-22	Mar-22	04/08/22	
NUCAPS Averaging Kernels (AK) and improved stability indices. S-NPP Mission long reprocessing version (NUCAPS v3.1)	Dec-21	May-22	OSPO PPM approved AK implementation. 04/29/22 (to AIT)	The NUCAPS DAP with AK is with the ASSISTT team for a delivery to the NDE
Addition of Ammonia product to NUCAPS operational retrievals ( NUCAPS v3.2)	May-22	May-22	May-22 Offline retrieval	Optimized NH3 for CrIS
NUCAPS augmentation for EPS-SG (NUCAPS v3.3)	Jul-22	Jul-22	Jul-22	
NUCAPS IR-only retrieval for risk mitigation and conceptual GEO-CrIS retrieval products (NUCAPS v3.4)	Jan-22	Jan-22	Results published in a joint paper with the CrIS SDR team	No plans yet for an operational DAP
Land, Snow/Ice and Ocean Spectral Emissivity Improvements	Mar-22	Mar-22	Mar-22	Paper accepted for publication
Reactive maintenance and Improvements to surface emissivity first guess using CAMEL, temperature lower-tropospheric bias improvements over land, optimized cloud clearing and Local Angle Corrections (LAC) for S-NPP/NOAA-20 NUCAPS	Sep-22	Sep-22		
NOAA-GML Theme 1: NUCAPS trace gas product validation with corroborative data sets and collaboration with GML and other stakeholders in support of NOAA/NESDIS initiatives	Sep-22	Sep-22		continuing
NOAA-GML Theme 2: NUCAPS ozone and water vapor products validations with CLIMCAPS and O3SND5, and collaboration with GML and other stakeholders in support of NOAA/NESDIS initiatives	Sep-22	Sep-22		continuing
Routine monitoring of trace gas products, T(p) and q(p) bias improvements	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/13/22, 05/19/22	JCT3-TVAC

## S-NPP Recovery Efforts: NUCAPS (CrIS/ATMS) EDR Product Evaluations



Focus day (08/13/2022) evaluation of S-NPP (LW/SW) CO product

NUCAPS S-NPP CO product is consistent with the NOAA-20 CO with no noticeable degradation, and matches in patterns with the TROPOMI. These results are consistent with the earlier evaluations presented at the JPSS S-NPP (LW/SW) mini-validation review.

## Accomplishments / Events:

- Following the S-NPP spacecraft anomaly on 2022-07-26, and subsequent recovery on 2022-08-10, an assessment was performed of MiRS product quality. Products examined included temperature and water vapor profiles, TPW, surface emissivity, T<sub>skin</sub>, sea ice concentration and precipitation rate. All products appear to be of normal operational quality with nearly identical performance on both 2022-07-25 and 2022-08-11. (see highlights for TPW example).
- MiRS v11.9 DAP was delivered to ASSISTT on August 12<sup>th</sup>.

## Overall Status:

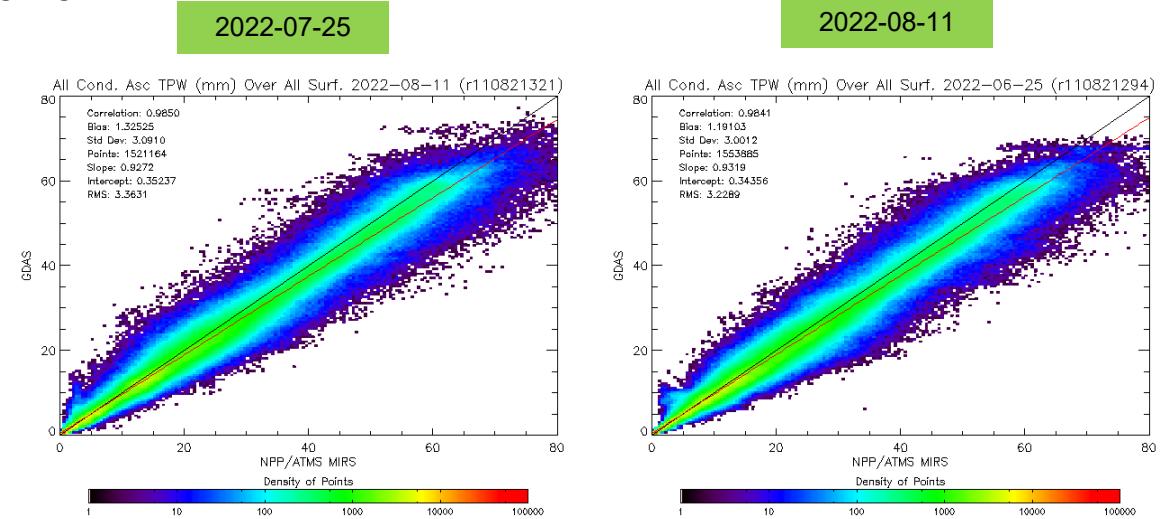
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Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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## Issues/Risks:

None

## Highlights:



MiRS retrieved TPW compared to GDAS analysis before SNPP anomaly on 2022-07-25 (left) and after recovery on 2022-08-11 (right). Results are nearly identical.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required
FY23 Program Management Review	Jun-22	Jun-22	05/19/22	
Patch DAP delivery (to ASSISTT)			V11.6 10/19/21 V11.8 10/28/21 V11.8 11/17/21	
MiRS 11.6 Patch Delivery (Patch DAP for MiRS (J1, J2, S-NPP))			12/30/21	To NDE
Final J2 ready DAP to NDE (include NPP/N20 updates)	Mar-22	Mar-22	03/31/22	
Complete collocation and evaluation of experimental MiRS-TC version for one year of Atlantic and Pacific basin TCs in 2020	Jan-22	Jan-22	Jan-22	
Update snow and ice emissivity catalogs (look-up tables) for EPS-SG/MWS to account for polarization differences at 23 and 31 GHz	Apr-22	Apr-22	Apr-22	
Develop AI (post processing) approaches to precipitation retrieval in MiRS, leveraging the collocated MiRS-MRMS datasets for training and validation	Jun-22	Jun-22	Jun-22	
MiRS DAP (v11.9 or v11.10): integrate SFR algorithm updates, code/science improvements, final pre-J2 launch delivery	Jul-22	Aug-22	08/12/22	More time for testing SFR
Begin reprocessing entire JPSS mission data for both SNPP and N20 using latest version of MiRS. Complete reprocessing for SNPP for the period 2011-2015	Sep-22	Sep-22	May-22	PMR slide6
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/13, 05/19	JCT3-TVAC

## Accomplishments / Events:

- A NOAA-20 and S-NPP comparison study was conducted on the recently delivered ATMS SFR algorithm. The images in the Highlights section show the year 2021 average snowfall rate derived from S-NPP (left) and NOAA-20 (right). They show very similar patterns in coverage and intensity over most of the global land.
- The SFR team has also completed the S-NPP and NOAA-20 validation study stratified by regions and environmental parameters against estimates from both ground and space-borne radars.
- More functionalities have been developed for the interactive SFR webpage. The site will become available to the public before the next snow season starts.

## Overall Status:

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

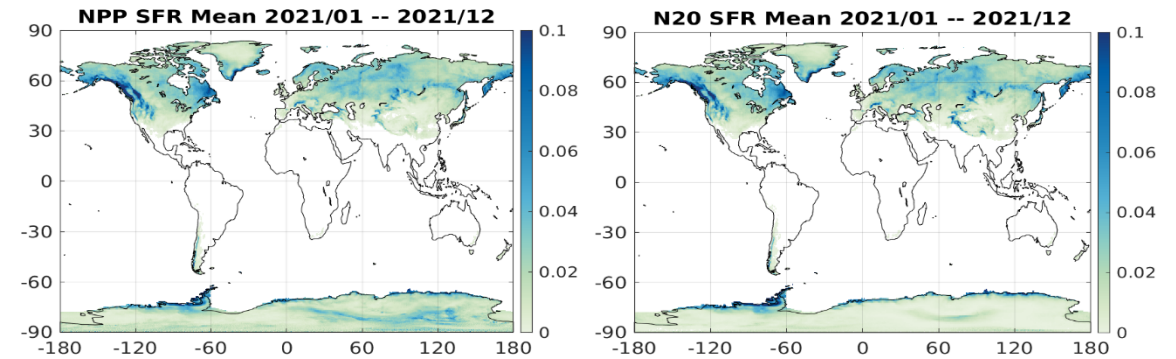
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## Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
Final J2 ready DAP to NDE (include NPP/N20 updates)	Mar-22	Mar-22	03/31/22	
Patch DAP delivery (to ASSISTT)			V11.6 10/19/21 V11.8 10/28/21 V11.8 11/17/21	
MiRS 11.6 Patch Delivery (Patch DAP for MiRS (J1, J2, S-NPP))			12/30/21	To NDE
FY23 Program Management Review	Jun-22	Jun-22	05/19/22	
Develop NOAA-20 ML Snowfall Detection model. Improve SFR algorithm through ML	Jun-22	Jun-22	May-22	PMR slide9
NOAA-20 and S-NPP cross-calibration & comparison after algorithm update	Aug-22	Aug-22	Aug-22	
NOAA-20 and S-NPP stratified validation after algorithm update	Aug-22	Aug-22	Aug-22	
SFR near real-time webpage, operational monitoring	Sep-22	Sep-22	May-22	PMR slide9
Implement ML ATMS SD in the Enterprise SFR system	Sep-22	Sep-22	Aug-22	
Deliver ATMS SFR with ML SD to MiRS	Sep-22	Sep-22	June -22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

## Highlights: SFR v02r01 Delivered to MiRS



Year 2021 average SFR from S-NPP (left) and NOAA-20 (right)

### Accomplishments / Events:

- Participated in S-NPP Data assessment after instruments were in safe mode. As of Monday, August 29, 2022, the S-NPP OMPS Limb Profile (LP) SDRs and EDRs (V2Limb) and Nadir Profile (NP) SDRs and EDRs (V8Pro) are approved for operations and the NDE/PDA subscriptions for these products will be enabled at 1930 UTC, August 29, 2022.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/26/21	
FY23 Program Management Review	Jun-22	Jun-22	05/16/22	
Final J2 ready DAP to NDE (include NPP/N20 updates), V8TOz	Jan-22	Jan-22	02/03/22	05/04 to CSPP
Final J2 ready DAP to NDE (include NPP/N20 updates), V8Pro	Apr-22	Jun-22	07/08/22	To ASSISTT: 02/17/22
Revise Cal/Val Plan to include JPSS-2 Limb and draft schedule	Dec-21	Dec-21	12/09/21	
Update Version 2.5Limb, three improved Climatologies, Cloud Top, Repaired	Jan-22	Jan-22	Jan 22*	*Cloud Top not resolved
Version 2.7 Limb Profile SDR and EDR (include J2 LP)	Sep-22	Oct-22	PMR slide8	To ASSISTT: Aug-22
J2 Radiative Transfer & Bandpass Tables for V8Pro and V8TOz	Sep-22	Mar-22	Jan-22 (for V8TOz)	
Soft calibration adjustments for V8TOz (TC) and V8Pro (NP) NPP reprocessing for V8Pro & V8TOz	Nov-21 May-22	Feb-21 Apr-22	11/26/21 (TC) 02/17/22 (NP)	SDR Delays
N20 V8Pro and V8TOz reprocessing	May-22	Aug-22		SDR Delay
Limb Darks and Orbital Definition files: Weekly ancillary file deliveries to PDA / NDE	Sep-22	Sep-22		Ongoing
Overpass data sets and comparisons to GB and MERRA2	Sep-22	Sep-22		Ongoing
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		As Needed
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; July JCT4)	Sep-22	Sep-22	05/13/22	JCT3-TVAC

### Overall Status:

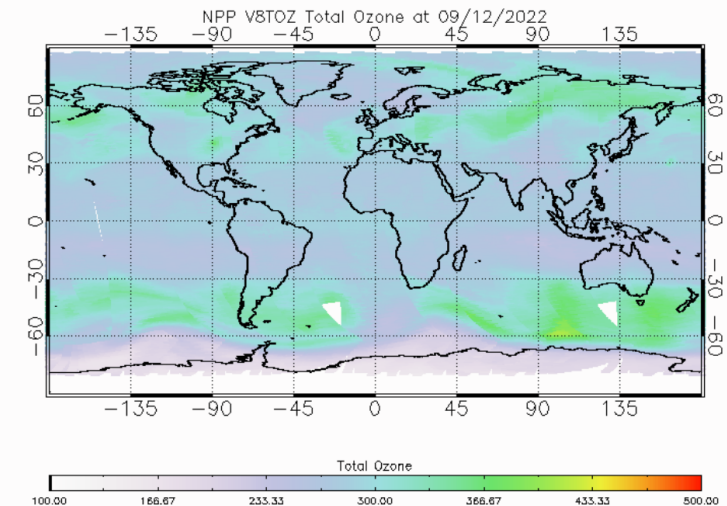
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Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

### Issues/Risks:None

### Highlights: S-NPP Ozone Products Online after Spacecraft safe-mode reactivation in August

OMPS V8TOZ Total Ozone from Daily Product





## Accomplishments / Events:

- A virtual poster about GCOM-W1 AMSR2 Rainfall Rate (RR) was presented at the AMS Collective Madison Meeting by Veljko Petkovic from CISESS. The AMSR2 operational retrieval package is currently being updated to accommodate NASA's latest version of passive microwave precipitation algorithm - GPROF (version 5).
- A poster about blended GCOM-W1 AMSR2-VIIRS sea ice concentration products was presented at the AMS Collective Madison Meeting.
- On 29 August 2022, the NOAA-20 VIIRS-AMSR2 blended SIC product observed the opening of the Northern Sea Route of the Northwest Passage (Highlight).

## Overall Status:

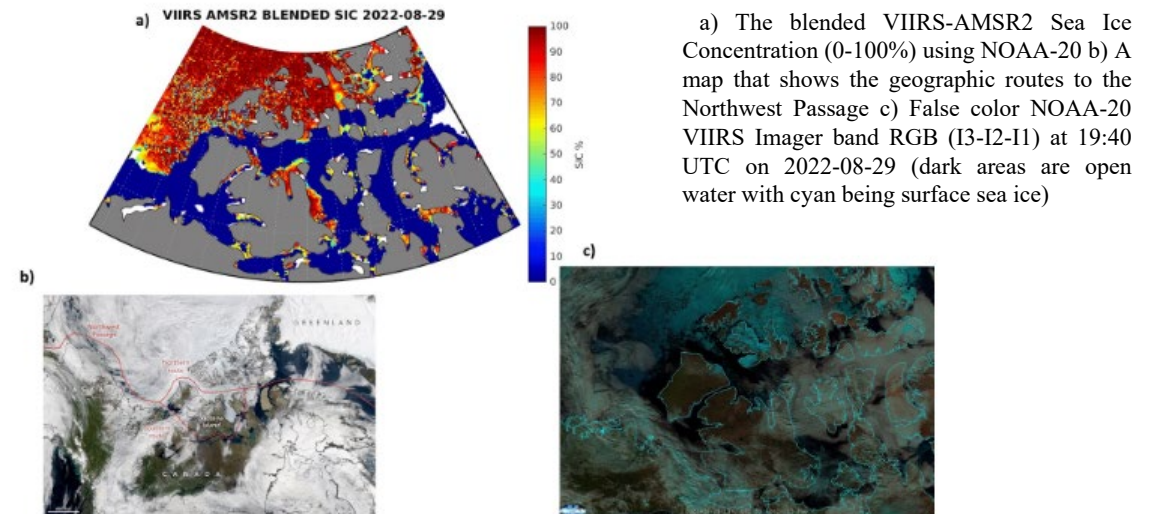
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4. Project has fallen significantly behind schedule, and/or significantly over budget.

## Issues/Risks:

None

## Highlights: Blended Sea Ice Concentration product during Opening of Northern Sea Route of the Northwest Passage



Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	05/16/22	
AMSR-3 Cal/Val Plan - draft delivery	Jan-21	Jan-22	Jan-22	
AMSR-3 Cal/Val Plan - final delivery	Jun-22	Jun-22	06/30/22	
GAASP SST Bug Fix Patch DAP Delivery (to NDE)			08/23/22	
AMSR-3 ready DAP to ASSISTT (include AMSR-2 updates)	Jun-22		FY23	To NCCF CCAP schedule
AMSR-3 ready DAP to NDE (include AMSR-2 updates)	Sep-22		FY24	
Algorithm Updates Review	Sep-22		FY23	
Assessment of new algorithms for enterprise algorithms for both AMSR2 and AMSR3	Jun-22		FY23	PMR slide4
Reprocessing of L2 EDR's (Full L2 products from launch through July 2022)	Jul-22	Jul-22	FY23, due to some algorithm updates implementation delay	
Continue AMSR2 L1 monitoring; develop AMSR3 capabilities	Sep-22	Sep-22		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		

## Accomplishments / Events:

- The JSTAR Mapper team conducted the first EDR LTM/JSTAR Mapper Quarterly User Review. The review brought users up to speed with the current state of the program, and future plans, as well as discussing means of obtaining user inputs.
- The JSTAR Mapper team finalized the ATMS Limb Correction automatic backfill script, allowing for the program to be handed off to the ICVS team who will take over production of those images.
- The NPROVS team successfully integrated the now (since July 27) operational MetOp-B and C NUCAPS v3 sounding products. Temperature bias for MetOp-B and -C are fairly well correlated in the vertical but vary significantly from NOAA-20 particularly below 700 hPa where differences approach 2K. Past analysis suggests that these differences (bias) appear rooted in the associated first guess profiles for each satellite and differences among the associated samples (focus days) used to generate them.

## Overall Status:

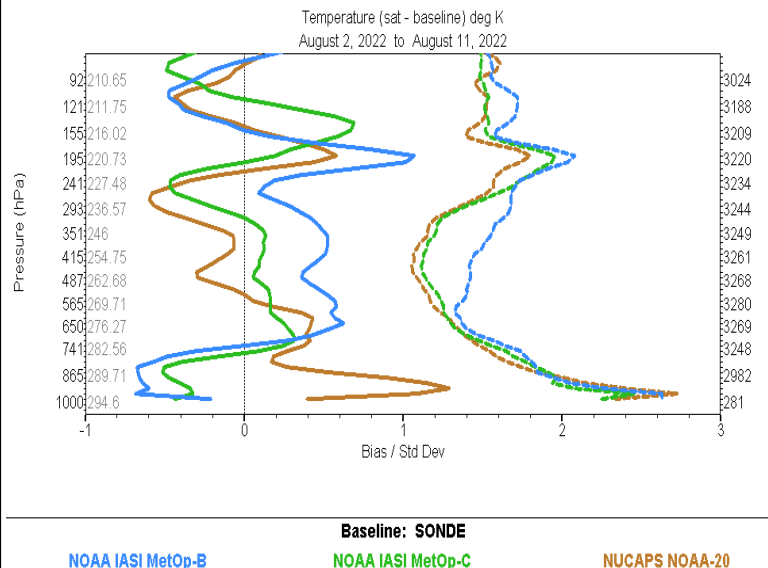
	Green <sup>1</sup> (Completed)	Blue <sup>2</sup> (On-Schedule)	Yellow <sup>3</sup> (Caution)	Red <sup>4</sup> (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

**Issues/Risks:** None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	06/14/22	
Maintain / expand existing EDR LTM web pages and JSTAR Mapper web site	Aug-22	Aug-22		Remove LTM
Maintain /expand NPROVS and support NUCAPS / MiRS EDR assessments for NPP, NOAA-20, JPSS-2 and MetOp-A,B,C; GNSS NESDIS-COSMIC-2	Aug-22	Aug-22		
Manage JPSS dedicated Radiosonde program (DOE-ARM), EDR/Raob collocations (Special), expand to store SDR (GSICS / GRUAN; 75TB)	Aug-22	Aug-22		
Support JPSS AWIPS (NUCAPS) and Hydrological (MiRS) Initiatives and Case Studies	Aug-22	Aug-22		

## Highlights:



Vertical statistics for temperature for the NUCAPS v3 from MetOp-B, MetOp-C and NOAA-20. Statistics cover a 10-day period (August 2-11, 2022) for bias (solid) and standard deviation (dashed) with pressure (hPa) indicated along the leftside y-axis (vertical) and sample size along the rightside axis.