



NOAA JPSS Monthly Program Office

AMP/STAR FY22 TTA

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VIIRS land products featured in NESDIS informational video

The screenshot shows the NESDIS website navigation bar with links for Real-Time Imagery, Current Satellite Missions, Next Generation, Data, Research, & Services, Our Environment, Commercial Space, and About. Below the navigation bar, the breadcrumb trail reads 'Home / News & Events / Earth from Orbit'. The main heading is 'Earth From Orbit: Extreme Heat Wave is Fueling Fires Across Europe', dated July 21, 2022. The video player shows a satellite view of Europe with a red play button in the center. Below the video player are two buttons: 'Download MP4' and 'Download MP4 (Text-Free)'. At the bottom of the screenshot, the beginning of a caption is visible: 'Temperatures have soared to record-breaking highs across Europe. In the United

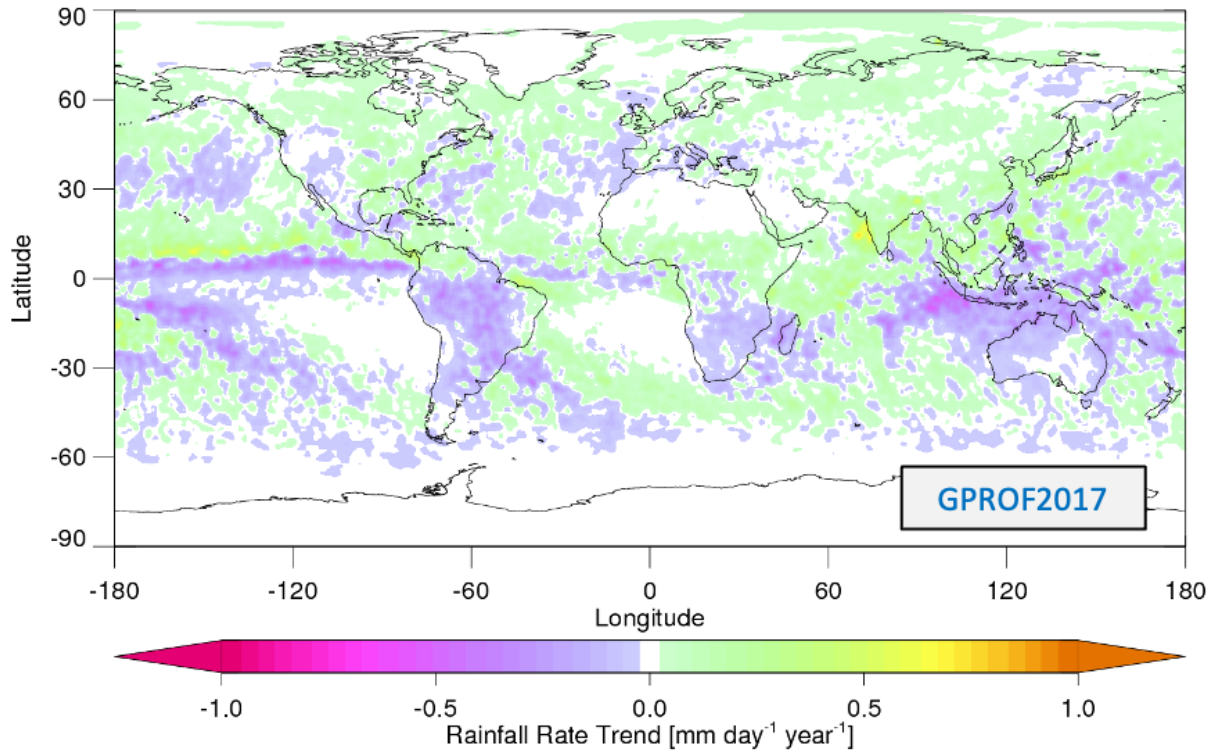
The operational VIIRS Land Surface Temperature and VIIRS Active Fire products, as visualized through STAR’s JSTAR Mapper website, are included in a new “Earth from Orbit” video “Extreme Heat Wave is Fueling Fires Across Europe”, released on July 21, 2022 (<https://www.nesdis.noaa.gov/news/earth-orbit-extreme-heat-wave-fueling-fires-across-europe>). This video follows another one “Earth from Orbit: Alaska Ablaze”, released on June 30, 2022 (<https://www.nesdis.noaa.gov/news/earth-orbit-alaska-ablaze>). Such communications not only demonstrate the value of information provided by the JPSS VIIRS products, but also the value of JSTAR Mapper as a communications platform that provides imagery readily available for NESDIS’s communications purposes.

Figure: Screenshot from NESDIS website showing JSTAR Mapper derived video

Trend in 2012-2021 precipitation from GCOM AMSR-2

Monthly Mean Rainfall Trend AMSR2 (0.25°)

Time Period: 2012-2021

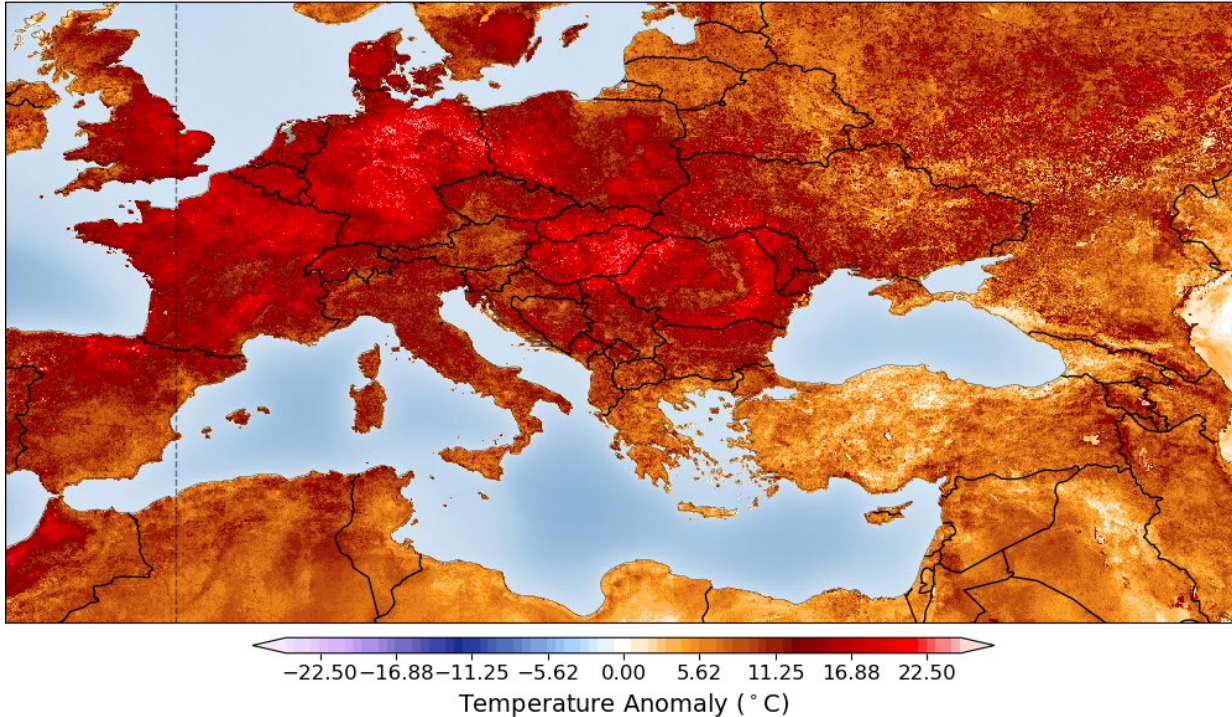


After completing the initial reprocessing of AMSR2 rainfall data record, the CISESS GCOM team (Petkovic, Arulraj, Meng) has performed rainfall trend analyses. Using CI computational resources, the team compared the current (v2010) and new (v2017; soon-to-be operational) GPROF retrieval mean monthly rainfall trends at 0.25° scale. Overall, the two algorithm versions long-term level-2 products agree. Notable are *i)* a pronounced northward shift of the ITCZ and *ii)* what appears to be MJO-related changes over the Indian Ocean and Pacific warm pool.

Figure: Global distribution of mean monthly rainfall rate trends at 0.25° for the period 2012 to early 2021.

Record breaking European Heat Wave

Maximum Land Surface Temperature anomaly: Jul 01 - Jul 24, 2022



Severe heatwaves have been continuously reported in Europe during June and July. This has raised serious risks to human lives, e.g., numerous wildfires were found in France, Spain, etc.; lots of deaths were reported due to the extreme hot weather. The STAR’s land team uses the satellite land surface temperature (LST) to study its impact area and intensity. Figure 1 shows the maximum LST the JPSS satellites captured in this area during the period between June 14 and July 24, and its deviation from the average of the same period for the past six year (2016 – 2021). High temperatures are spotted almost everywhere in Europe, including the UK, where a high of 40.3 °C was reported on July 19th. A maximum deviation of 10 – 20 °C above the previous six years’ average was found in much of the area and countries with most significant impacts include France, Germany, and Hungary, etc.

Accomplishments

- Delivery Algorithm Packages (DAPs) - Mission Unique Products:
 - 7/06/2022 VIIRS team submitted J2 JCT3-TVAC review/checkout report
 - 7/11-12/2022 STAR SDR teams supported JCT4 RDR data review/checkout
 - 7/11/2022 STAR delivered VIIRS DAP (ADR9904/CCR6099, VIIRS SDR Excessive Reflectance Values) to DPMS
List of code changes: checkLimits.cpp; Calibrate_Reflective_Bands.cpp
 - 7/22/2022 ATMS team delivered DAP (ADR9815/CCR6106, SNPP/ N20 / J2 ATMS WarmNEDT and ColdNEDT update) to ASSISTT team. 8/04/2022 STAR delivered the DAP to DPMS. *List of code changes:* c2k_new.f90
 - 8/01/2022 STAR delivered VIIRS DAP (ADR10038/CCR6103, 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
 - 8/05/2022 OMPS team delivered DAP (ADR10037/CCR6101, J2 OMPS pre-launch LUTs update) to ASSISTT team.
8/15/2022 STAR delivered the DAP to DPMS. LUT update only. *List of changes (9 LUTs):* 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

Accomplishments

- DAPs – Enterprise Products:
 - 7/8/2022 STAR delivered V8Pro DAP to NDE (V4r2, final delivery for NOAA-21 and maintenance delivery for NOAA-20 and NPP)
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; (3). New-added/Modified metadata variables
 - 7/13/2022 STAR delivered JRR patch DAP to NDE (Patch to J2 Final "Super DAP", addresses IP filename corrections for Land Mask and GFS via the Python wrapper scripts)
 - 7/19/2022 STAR delivered Enterprise V8TOZ Preliminary CCAP to OSPO for Code Review
 - 7/19/2022 STAR delivered Enterprise HEAP Final CCAP NCCF Cloud S3 bucket (Final CCAP for Enterprise HEAP for MetOp-B/C and JPSS/NPP). There were no science updates. Metadata update for NCCF.
 - 7/22/2022 STAR delivered BUFR Toolkit Patch CCAP to the Cloud (Final CCAP for BUFR Toolkit- SMOPS, ..., CrIS, ATMS products)
 - 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

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 – 8/26/2022: STAR SDR/EDR teams work on checking/evaluating S-NPP data products, provide daily status update

- 7/18/2022 IDPS Block 2.3 Mx7 Operational
Includes: OMPS Nadir Mapper Geolocation Code Change for Off-nadir Geolocation Error Correction; J2 Mounting Matrix coefficients based on the Pre-dynamic alignment measurement report; Quality Flag/DQTT Updates

- 7/21/2022 NDE2.0.32 operational
Includes: VFM; V8TOz & V8TOS; RH7 updates for AF (M-band) and GCOM RDR to ASD Converter (GRAC)

Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	07/06/22, 07/12/22, 07/19/22, 07/26/22, 08/16/22 (no NPP LUT for 08/02/22 & 08/09/22 due to S-NPP anomaly)
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	07/06/22, 07/12/22, 07/19/22, 07/26/22, 08/02/22, 08/09/22, 08/16/22
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	07/06/22, 07/19/22, 08/02/22, 08/16/22
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	07/12/22, 07/26/22, 08/09/22
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	07/05/22 (no Aug NPP LUT due to S-NPP anomaly)
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	07/05/22, 08/02/22

- 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 (**405.89T**, **25.13%** of total) has been completed as of **July 31, 2022**
 - It's expected that the VIIRS data transition will complete in October, 2023
- Recent VIIRS Imagery Social Media/Blog Posts
 - 7/01/2022 [VIIRS Day Land Cloud Fire RGB Imagery of Alaska Fires and Smoke](#)
 - 7/08/2022 [VIIRS Geocolor Imagery of Canada Smoke Plumes](#)
 - 7/11/2022 [VIIRS DNB NCC Imagery of Hurricane Darby](#)
 - 7/19/2022 [VIIRS Fire Temperature RGB Imagery of Moose Fire in Idaho](#)
 - 7/21/2022 [VIIRS Snow/Cloud Layers Imagery product capturing sea ice movement](#)

- JSTAR Code/LUT/Product Deliveries:

DAP to DPMS:

- Aug-22: Final launch-ready JPSS-2 PCT/MM-coef DAP (ATMS & CrIS)
- Aug-22: Final launch-ready JPSS-2 LUTs/MM-coef DAP (VIIRS & OMPS)

NOAA-20/JPSS-2 Algorithm DAP to NDE/CoastWatch:

- Oct-22: J2-ready OMPS LP DAP to NDE (Aug-22: to ASSISTT)
- Mar-23: J2-ready Ocean Color DAP to Cloud (ASSISTT □ NCCF)



FY22 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates DAPs				
Final launch-ready JPSS-2 ATMS PCT/MM-coef DAP	Aug-22	Aug-22	Pre-dynamic MM: 03/08/22	02/25/22 to ASSISTT
Final launch-ready JPSS-2 CrIS PCT/MM-coef DAP	Aug-22	Aug-22	Pre-dynamic MM: 03/11/22	03/07/22 to ASSISTT
Final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP	Aug-22	Aug-22	Pre-dynamic MM: 02/24/22	02/18/22 to ASSISTT
Final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP	Aug-22	Aug-22	Pre-dynamic MM: 03/08/22	03/02/22 to ASSISTT
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

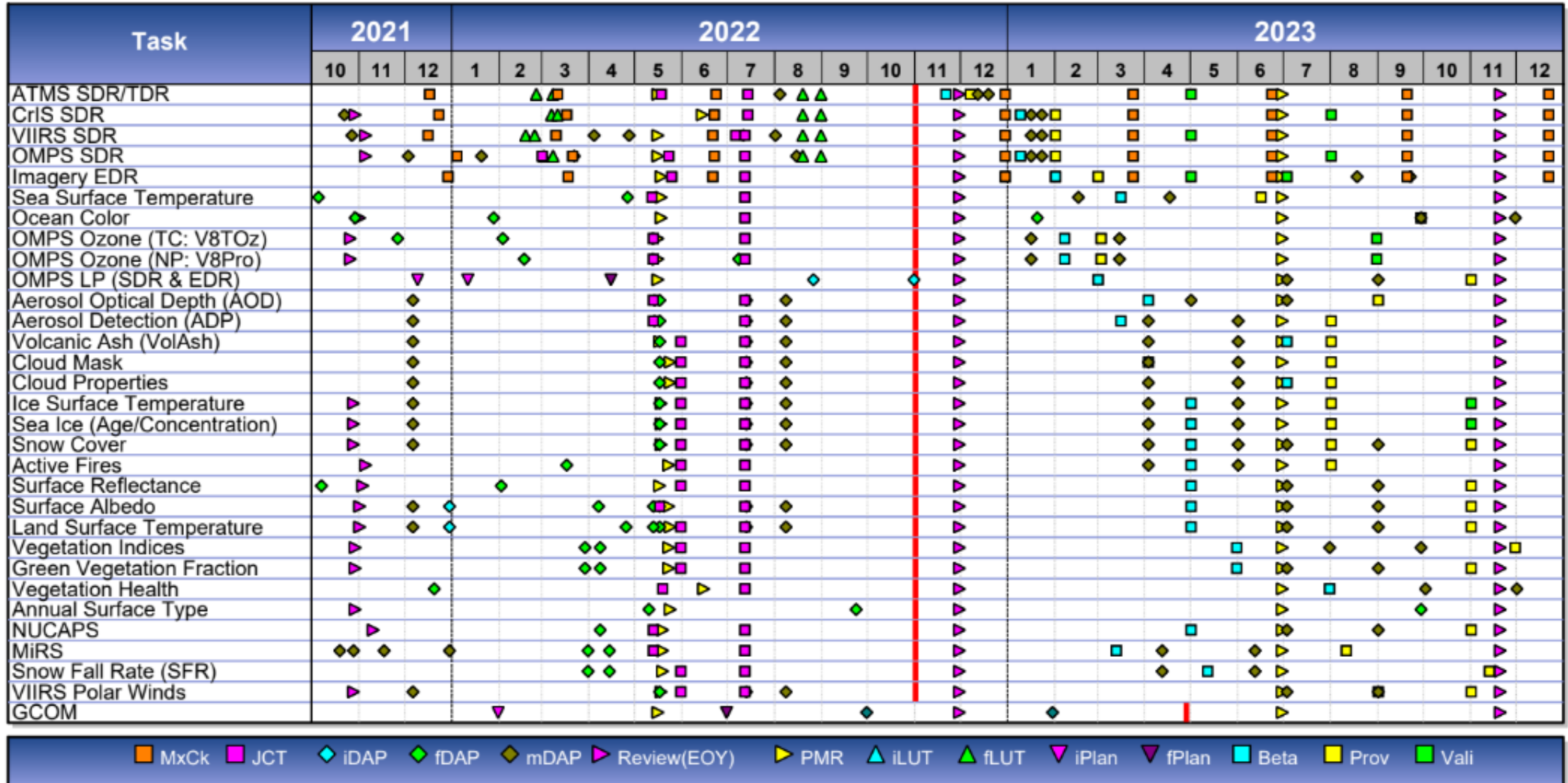
Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
Algorithm Cal/Val/LTM				
FY21 End of Year Science Team Presentations (all teams)	Oct-21	Oct-21	Oct/Nov-2021	
FY23 Program Management Review (all teams)	Jun-22	Jun-22	May/June-2022	
Enterprise Cal/Val plan for J2 OMPS LP SDR & EDR	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		
Support Alaska Demo (JPSS Aviation Initiative)	Sep-22	Sep-22		
JPSS-3 pre-launch test data review/analyze (SDR teams)	Sep-22	Sep-22		
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		
Images of the Month	Monthly	Monthly		



FY22 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date
Operational/Program Support			
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, 08/16/22
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, 08/02/22, 08/16/22
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
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, 08/02/22, 08/09/22, 08/16/22
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, 08/09/22
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, 08/02/22
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	Mx5 SOL: 11/23/21; Mx5 I&T: 01/06/22 Mx6 I&T: 03/22/22 Mx7 SOL: 05/26/22; Mx7 I&T: 06/23/22
Participant/support JPSS-2 pre-launch testing events (Mar-22 JCT3-Ambient; May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	10/06/21: JCT2a-DSE ; 03/01/22: JCT3-Ambient (OMPS J2 RDRs) JCT3-TVAC: Segment 1 5/10-13 ; Segment 2 5/17-19 ; Segment 3 5/25-26 SDR teams reports: 06/22/22 ; 07/06/22 ; 05/23/22 07/11-12/22 JCT4: 07/14/22 team reports: ; ; 08/04/22: JSTAR Report

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:

- Processed JPSS-2 JCT4 RFR ATMS test data, including science RDR, telemetry RDR, dwell RDR, and TDR/SDR/GEO, to verify the data format. However, due to the limits of data collection environment, the science radiance data in TDR/SDR are meaningless.
- Prepared JPSS-2 ATMS observatory TVAC analysis results in STAR radiance team leads meeting to report the J2 ATMS performance during the test and comparison to instrument TVAC performance. Results indicate that J2 ATMS still maintains the comparable channel sensitivity in observatory TVAC test.
- Contacted ATMS science data users, including major NWP centers and EDR teams, to collect users' comments about the updated NEdT values in SDR data by significantly reduce the scan to scan NEdT variations. Prepared the full NEdT algorithm update report and presented it to AERB for operational transition review. Delivered the updated package developed in ADL to ASSISTT for initial transition testing.
- Finalizing ATMS Calibration ATBD to include operational NEDT calculation algorithm description and recommended scan level NEDT algorithm, as well as the comparison of recommended NEDT using on-orbit data to instrument TVAC analysis results. The final version has been approved by reviewing board and ready for publication in STAR JPSS web.

Overall Status:

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

- 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.

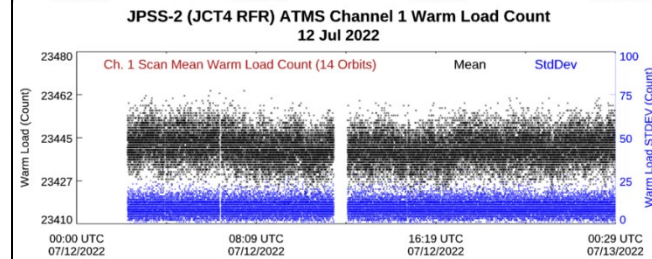
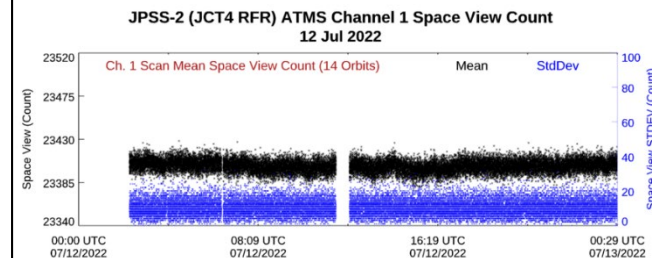
Issues/Risks:

None

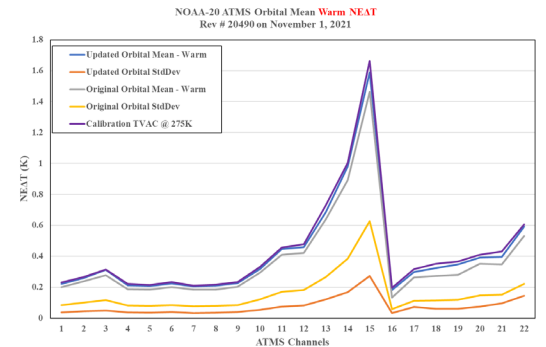
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Generate JPSS-2 ATMS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	02/25/22	pre-dynamic
Update of ATMS non-linearity correction coefficients 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	02/25/22	pre-dynamic
Deliver final launch-ready JPSS-2 ATMS PCT/MM-coef DAP to DPMS	Jun-22	Aug-22	03/08/22	pre-dynamic
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:

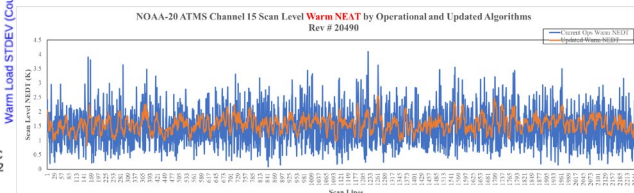
J2 ATMS JCT4 RFR Test Data Channel 1 Cold (upper) and Warm (lower) Calibration Counts



NOAA-20 ATMS Orbital Mean and Standard Deviation of Warm NEdT by Existing and Updated Algorithm



NOAA-20 ATMS Scan Level Warm NEdT by Existing (blue) and Updated (orange) Algorithms



Accomplishments / Events:

- Continued the evaluation of the operational processing system and development of analysis tools: 1) verified the CrIS SDR imaginary radiance flag implementation as a measure to mitigate potential J2 CrIS dynamic alignment (DA) y-axis tilt disturbances; 2) investigated the JPSS-2 CrIS Neon calibration mitigation; 3) modified the CrIS telemetry tools to assess the SNPP Spacecraft Safe Mode Anomaly on July 26, 2022; 4) Evaluated the impact of a potential J2 CrIS DA tilt anomaly.
- Continued the studies of: 1) Neon lamp mitigation ADL implementation (Fig. 1); 2) PC scores (Fig. 2); 3) Temperature drift algorithm; 4) generated the weighting function for N20 FSR CrIS (Fig. 3); 5) Assessment of the reprocessed NOAA-20 CrIS data through the intercomparison of IASI.
- Developed the CrIS and GOES-18 ABI intercomparison software. Preliminary analysis of two weeks (July 13 to July 29) shows stable results: both the BT difference and standard deviation are within 0.2 K for ABI bands 8-16. (Fig. 5).
- Continued the drafting of the manuscript of the CrIS Spike Algorithm and the Neon Lamp Mitigation Plan.
- Continued the development of CrIS STAR SDR website (Fig. 4)
- Support to the future CrIS instruments: assessed the JPSS-2 CrIS JCT-4 spacecraft test data
- Support to the SNPP and N20 CrIS operations: monitoring the SNPP Spacecraft Safe Mode Anomaly starting from July 26, 2022
- Chaired two invited sessions of 2022 IGARSS on the "Next Generation of LEO/GEO Microwave and Infrared Sounders"
- In the CrIS Science Team Meeting: 1) Discussed the potential bias-tilt adjustments to JPSS-2 once on-orbit; 2) Invited Prof. Honglie Qiu to present a talk entitled "Cloud Computing for GIS and Remote Sensing Applications"
- Had the CrIS Cloud mitigation interview with STAR staff as part of the transition to the NESDIS cloud computing environment.

Overall Status:

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

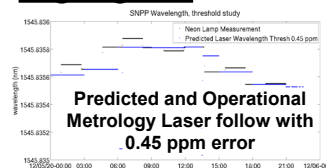
- Project has completed.
- Project is within budget, scope and on schedule.
- Project has deviated slightly from the plan but should recover.
- Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

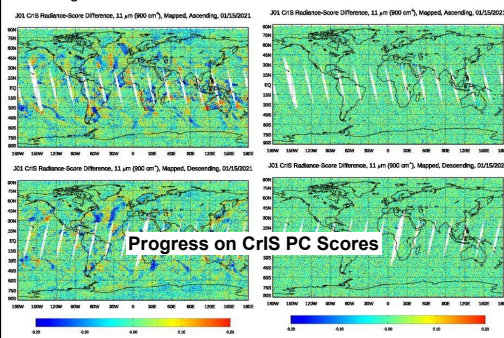
The CrIS Team got a 100TB on STAR servers (data638 and data645) on May, 2022. However, the CrIS Team is still in need of hardware/software resources. Presently, there is only one server dedicated to 6 CrIS Team members. There is high risk for the CrIS SDR Team to continue on such a single server environment for the operational CrIS Cal/Val activities that includes 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, preferable 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 ASSISTT	May-22	Aug-22	03/07/22	pre-dynamic
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to DPMS	Jun-22	Aug-22	03/11/22	pre-dynamic
JSTAR CrIS Website upgrade	Aug-22	Aug-22		
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	Aug-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	

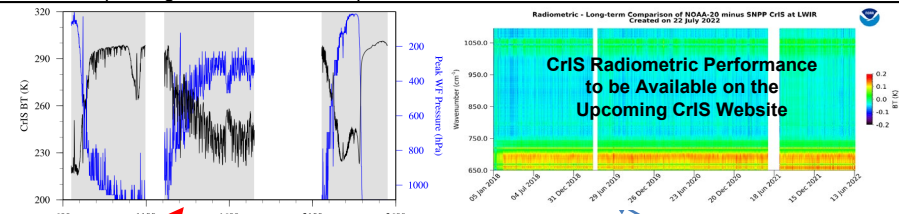
Highlights:



(1): Optimized the threshold to 0.45ppm with averaging over 40 Epochs used to refresh the computing of the Output Predicted Laser Wavelength. Results values compared to the operational neon lamp wavelength values shows that the two are consistent with each other.

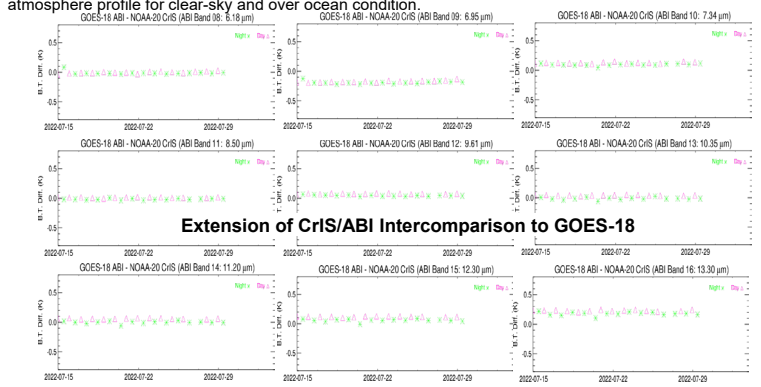


(2): Radiance residual (operational minus PC reconstruction) at 900 cm⁻¹ for latitude weighting (left) and without latitude weighting (right) on Jan. 15, 2021.



(3): CRTM-simulated N20 FSR CrIS brightness temperature (black) and weighing function peaks (blue) using the tropical atmosphere profile for clear-sky and over ocean condition.

(4): Long-term radiometric comparison between NOAA-20 and SNPP CrIS for LWIR band.



(5): Time series of BT differences between NOAA-20 CrIS and GOES-18 ABI for IR bands 8-16 from July 13 to July 29, 2022

Accomplishments / Events:

- Used the JPSS-2 VIIRS SDR files created during JCT-3 TVAC DSE (Data System Event) to verify that the at-launch version of IDPS (Mx7) produces the same radiometric and geolocation products as the previous one (Mx6) used during JCT-3 TVAC
- Published a peer-reviewed article “S-NPP VIIRS Lunar Calibrations over 10 Years in Reflective Solar Bands (RSB)” (*Remote Sensing*, 2022, **14**, 3367. <https://doi.org/10.3390/rs14143367>)
- 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 6/29/2022 and 7/28/2022 (N20 only – no NPP update in July due to the satellite anomaly on 7/26/2022): the NPP DN0 LUT update in June successfully reduced the additional DNB striping that remained after recovery from VIIRS anomaly on 6/28/2022

Overall Status:

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

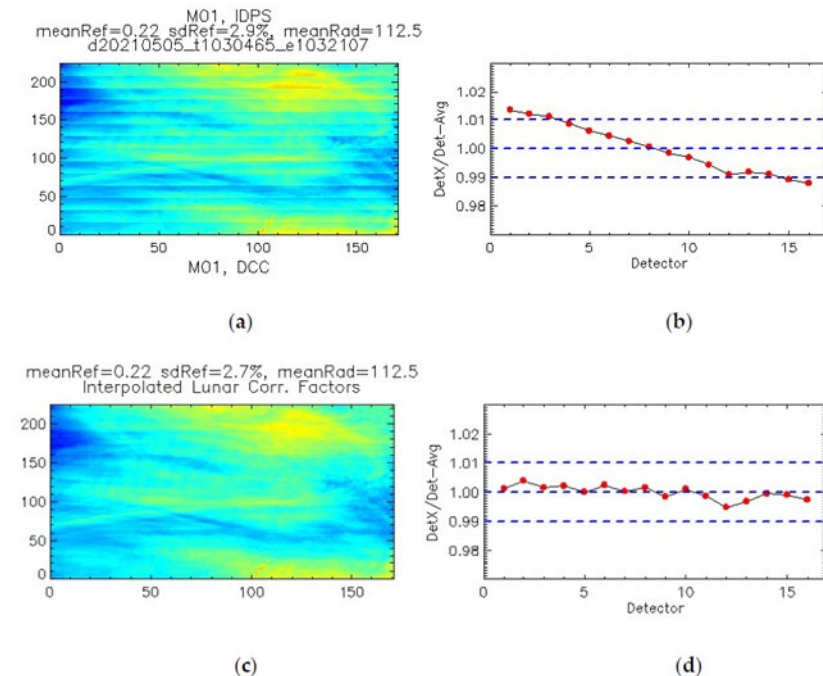
- Project has completed.
- Project is within budget, scope and on schedule.
- Project has deviated slightly from the plan but should recover.
- Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Highlights:

- An example of S-NPP VIIRS striping correction derived from the lunar observations:
- The top row subfigures (a,b) show the operational S-NPP VIIRS SDR product image and detector response differences, respectively
 - The bottom row subfigures (c,d) represent corrected image and detector differences



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	02/18/22	pre-dynamic
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to DPMS	Jun-22	Aug-22	02/24/22	pre-dynamic
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-22		
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		

Accomplishments / Events:

- Delivered OMPS biweekly NP solar irradiance bi-weekly LUTs. In addition, modified the fitting algorithm used in the derivation.
- The OMPS SDR team had a combined, ongoing analysis on the JCT3 TVAC and DSE test data verification and readiness.
 - The JCT3 TVAC OMPS NM SDR data were re-processed by using updated LUTs (see Fig. a).
 - Filed a new ADR 10039 to modify SDR algorithm codes to correct the error via a code change, and modification of two associate Fortran files.
 - Identified the JCT3 DSE geolocation problem (see Fig. b)
- Completed a beta version of the off-line ADL with multiple spatial resolutions to support the J2 high resolution risk analysis. An example is given in Fig. c.
- Continued work on testing and refining new calibration algorithm code to generate OMPS Dark LUTs from IDPS calibration RDR data.
- Continued working on updating and refining the OMPS VCRTM v3.0 interface by using the updated UV-band transmittance coefficients from the CRTM team and by fixing the remaining issues in the package.
- Continued examination of the lifecycle reprocessed NOAA-20 SDR data to re-derive the wavelength variations computed based on the reprocessed data.
- Completed IGARSS presentation on the 10-year performance assessment of the SNPP OMPS instrument.
- Investigated the feasibility of improving the SNPP OMPS SDR data quality during three historical dark anomaly periods per the OMPS EDR team's request.

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 ASSISTT
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 ASSISTT	May-22	Aug-22	03/02/22	pre-dynamic
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to DPMS	Jun-22	Aug-22	03/08/22	pre-dynamic
FY23 Program Management Review	Jun-22	Jun-22	05/16/22	
OMPS SDR Calibration ATBD (update)	Jun-22	Aug-22		Low priority
Development/Update (Internal delivery):				
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		
OMPS polarization impact and mitigation algorithm development	Aug-22	Aug-22		
1) J2 OMPS SNR calculation algorithm code update	Jan-22	Jan-22	Jan-22	
2) J2 OMPS SDR solar intrusion detection code prototype	Jan-22	Jan-22	Jan-22	
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)	Feb-22	Feb-22	Feb-22	
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)	Bi-Weekly	Bi-Weekly		

Overall Status:

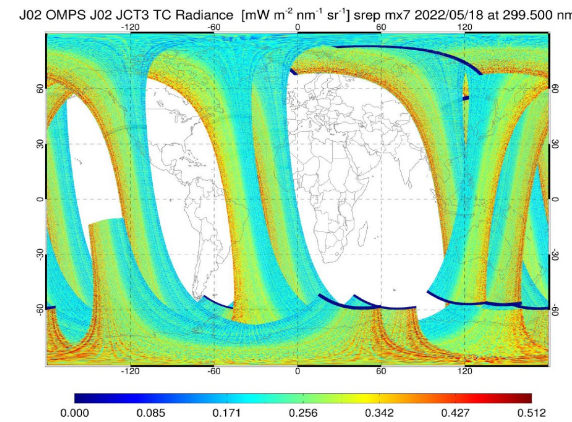
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule			X		

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

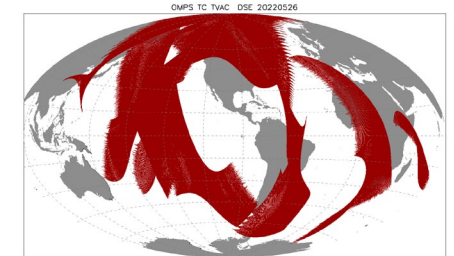
Issues/Risks:

None

(a) Re-processed JCT3 TVAC OMPS NM radiance at 299.5 nm



(b) JCT3 DSE Geolocation Map (Inaccurate Geolocation Information)



(c) Medium Res. N20 OMPS NM at 317.9 nm (139 Cross-Track) from an Off-line ADL

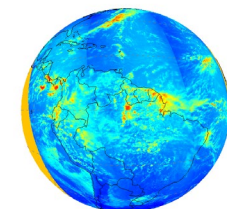


Fig. JPSS-02 OMPS NM JCT3 TVAC re-processed radiance on 299.5 nm on 18 May 2022 by using a series of updated LUTs including dark, stray light correction, Macropixel, calibration coefficient, wavelength and earth view sample LUTs.

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 2/15/2014 (405.89T, 25.13% of total) has been completed as of July 31, 2022.
- It's expected that the VIIRS data transition will complete in October, 2023.

Overall Status:

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

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

Issues/Risks:

None

Highlights:

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 25.13%
Total				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 1000 Tb of reprocessed S-NPP SDR data to CLASS	Sep-22	Sep-22		

Accomplishments / Events:

- Continued monitoring SNPP/NOAA-20 instruments'/spacecrafts' performance and the data quality, with timely report about detected anomalous events.
- Closely monitored SNPP spacecraft telemetry status in support to the SNPP flight and OSPO operational engineers (its telemetry temperature is shown in Fig. a) (more results: https://www.star.nesdis.noaa.gov/icvs/status_NPP_sc.php)
- Processed JPSS-2 JCT4 test data using ICVS modules updated for JPSS-2 and post sample data quality monitoring figures to internal ICVS-beta web site to support JPSS-2 prelaunch Cal/Val activities.
- Started testing the package to perform N20-NPP ATMS intersensory double difference time series through CRTM O-B trending using RO profiles.
- Kept processing N20 and NPP VIIRS TEB SDR data to build the 32-day mean N20-NPP VIIRS inter-sensor direct bias to support VIIRS SDR quality long term trending activities.
- Initiated ICVS team and OSPO radiance data quality monitoring team meeting to collect operational teams comments/recommendations to improve the current ICVS LTM capability for better operational support.
- Reprocessed N20-NPP ATMS 32-day mean inter-sensor direct bias data to produce long term data quality statistic results for upcoming intersensory bias paper
- Provided near real time Atlantic and Eastern Pacific tropical storm/hurricane evolution monitoring using JPSS SDR data to demonstrate the excellent support in sever weather monitoring directly using combined JPSS high quality satellite data.

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	Aug-22		
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 ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (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.
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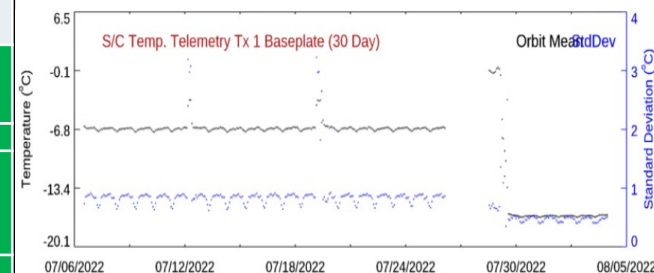
Issues/Risks:

None

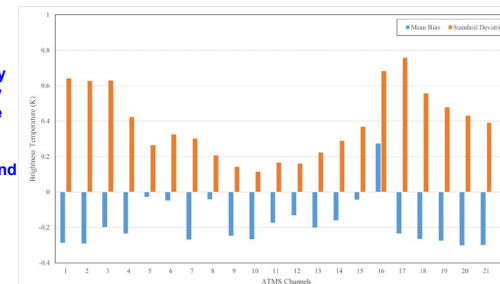
Highlights:

Significantly contribute to STAR SDR Teams

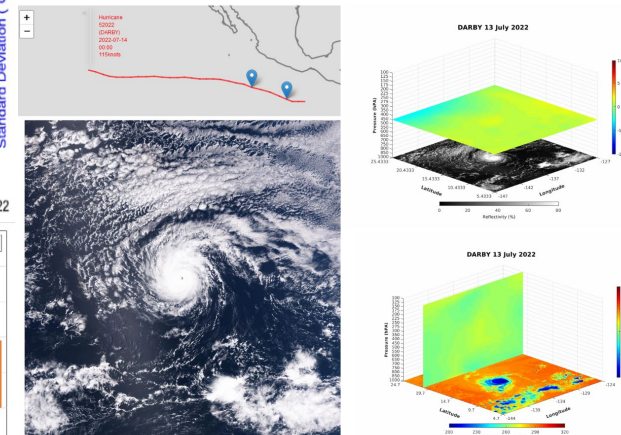
(a) SNPP S/C Telemetry Temperature Monitoring since 7 July 2022



(b) N20-NPP ATMS 32-day intersensory bias life time channel dependent mean bias and standard deviation



(c) Sever weather event monitoring using combined JPSS observations



Accomplishments / Events:

- Submitted J2 VIIRS Imagery launch readiness slides
- A CIRA SLIDER “VIIRS CONUS Domain” was recently developed, with numerous VIIRS Imagery products included. New capability is currently under evaluation on draft site
- Journal Articles Submitted or Published
 - “Ten Years of VIIRS EDR Imagery Validation and User Interactions” was submitted by the team to Remote Sensing’s VIIRS 10-year special issue
 - Miller, S.D., 2022: Boat encounter with the 2019 Java bioluminescent milky sea: Views from on-deck confirm satellite detection. Proceedings of the National Academies of Science, 119, no. 29, <https://doi.org/10.1073/pnas.2207612119>
 - Considerable media interaction followed publication
- Recent VIIRS Imagery Social Media Posts
 - [VIIRS Day Land Cloud Fire RGB Imagery of Alaska Fires and Smoke](#)
 - [VIIRS Geocolor Imagery of Canada Smoke Plumes](#)
 - [VIIRS DNB NCC Imagery of Hurricane Darby](#)
 - [VIIRS Fire Temperature RGB Imagery of Moose Fire in Idaho](#)
 - [VIIRS Snow/Cloud Layers Imagery product capturing sea ice movement](#)

Overall Status:

	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (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

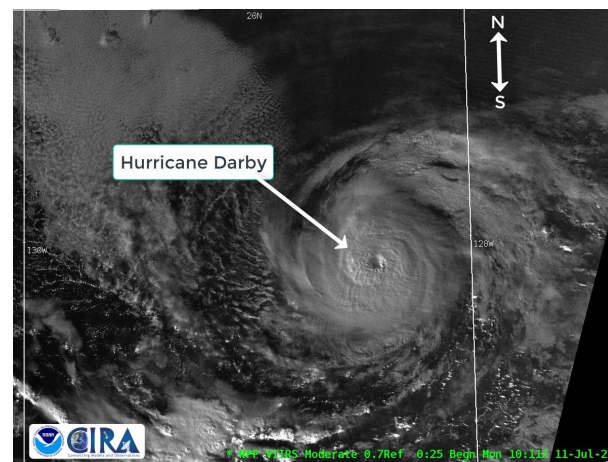


Figure: VIIRS DNB Near Constant Contrast product provides a detailed view of Eastern Pacific Hurricane Darby in the middle of the night.

Accomplishments / Events:

- The DCOMP Team continued analysis on the NPP LUT and impact on the product..
- CIMSS provided a new version of VIIRS ECM LUT to CIRA, which is supposed to avoid false clouding over the cloud-free very cold surfaces during the cold period. The results show improvement. CIMSS will continue to work on further improvement and validation.
- The CIRA team started porting a machine learning model (Random Forest) from ABI to VIIRS using ABI-VIIRS channel translation functions for improved low-layer detection in multilayer clouds, and completed a Python version of 3D cloud data processing codes for both Alaska and CONUS to be implemented on CIRA's aviation website. These efforts for aviation applications of satellite 3D cloud data were presented at the SBC seminar.
- CIRA and CIMSS researchers presented NOAA Enterprise cloud products for aviation applications at FAA's Clouds, Cloud Ceiling, and Visibility Technical Exchange Meeting.

Milestones:

- See next slides

Overall Status:

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

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

Issues/Risks:

None

Highlights:

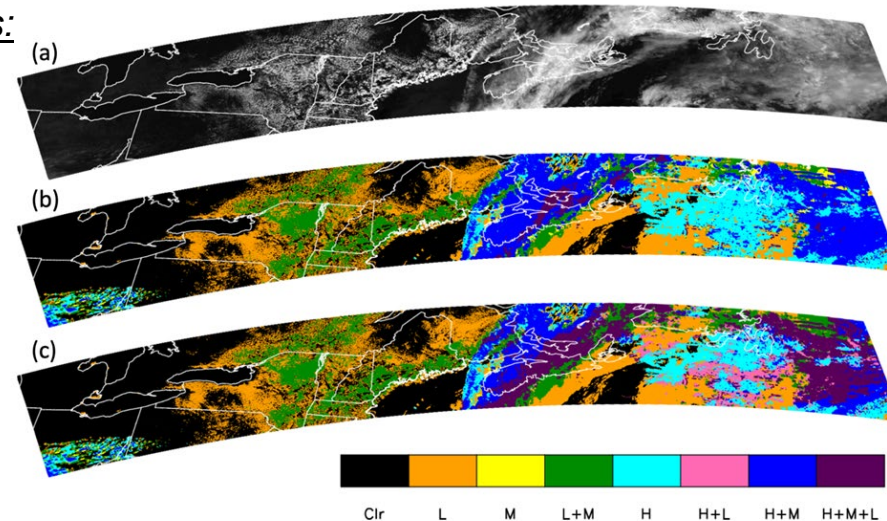


Figure 1. Development of translation functions between VIIRS and ABI to transition the machine learning model for improved low-layer detection in multi-layer cloud scenes. Example Cloud Layers product for NOAA-20 VIIRS at 1718 UTC on 28 June 2022. (a) Channel M5 (0.672 μm) reflectance, (b) CCL product without machine learning model, and (c) CCL product with machine learning model applied. Colorbar refers to cloud layer categories in (b) and (c).

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:

Schedule for Aerosol J2 Beta Deliveries and NDE Migration to NCCF updated: Latest dates indicate that final CCAP Delivery Date will be 10/31/2022, ARR/ORR by 1/31/2023, J2 ORR by 9/30/2023.

Potential increase in users: Per July 2022 SPSRB, OSPO is proposing that the MODIS Dusk Algorithm be retired October 30, 2022 and impacted users be referred to NASA-produced MODIS products or NOAA/NDE Aerosol Products from S-NPP and N20 VIIRS.

Publication: Long-term observations from VIIRS day/night band can be used to study urban growth and night aerosols, with recalibrated data and artificial intelligence technologies. Paper published was: Exploring VIIRS Night Light Long-Term Time Series with CNN/SI for Urban Change Detection and Aerosol Monitoring, Remote Sensing: Special Issue "Remote Sensing of Night-Time Light", Changyong Cao (STAR/SMCD/SCDAB), Bin Zhang (University of Maryland/CISESS), Frank Xia (ESRI), Yan Bai (University of Maryland/CISESS), Published on 29 Jun 2022

FAA Aviation Weather Research Program C&V Meeting: Steve Miller and Yoo-Jeong Noh presented CIRA's research activities on cloud and aerosol topics related to aviation and visibility at the Federal Aviation Administration (FAA) Clouds, Cloud Ceiling, and Visibility Technical (C&V) Exchange Meeting on 13 July 2022 in Boulder, CO.

Milestones:

- See next slides

Overall Status:

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

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

Issues/Risks:

No risks

Highlight: New methodologies using VIIRS da/night band for understanding aerosols and urban growth

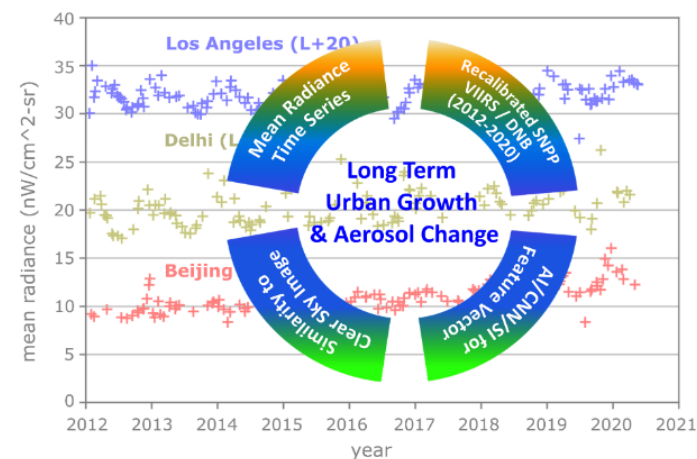


Figure 1. A new methodology to explore long-term observations from VIIRS/DNB for study of urban growth and aerosol change

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		
Complete first assessment of multi-year VIIRS aerosol optical depth product (Summary report on accuracy and precision)	Aug-22	Aug-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		
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		
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		
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		
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		
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22		
Continue long-term validation of SNPP and NOAA-20 VIIRS ADP by comparisons with AERONET, CALIPSO, MISR, and IMPROVE	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

Accomplishments / Events:

•**AMS Short Course:** Scott (CIMSS) led a 2-hour session titled “Volcanic Eruptions as seen from Satellite” as the penultimate session of a 4-part American Meteorological Society (AMS) Short Course. The interactive session showed students how data from GOES-R (and other geostationary) and JPSS (and other polar orbiting) satellites can be used to observe and monitor volcanic eruptions and clouds. The class included a tutorial on the use of the Volcanic Cloud Monitoring website, which is overseen by M. Pavolonis (STAR) at CIMSS. Class materials are available at this website maintained by J. Torres, CIRA. (S. Lindstrom, CIMSS, 608 263 4425)

•**Quality/Oversight** Continued to ensure high quality Volcanic Ash retrievals from EDR algorithms and VOLCAT. VOLCAT is long-term plan.

Overall Status:

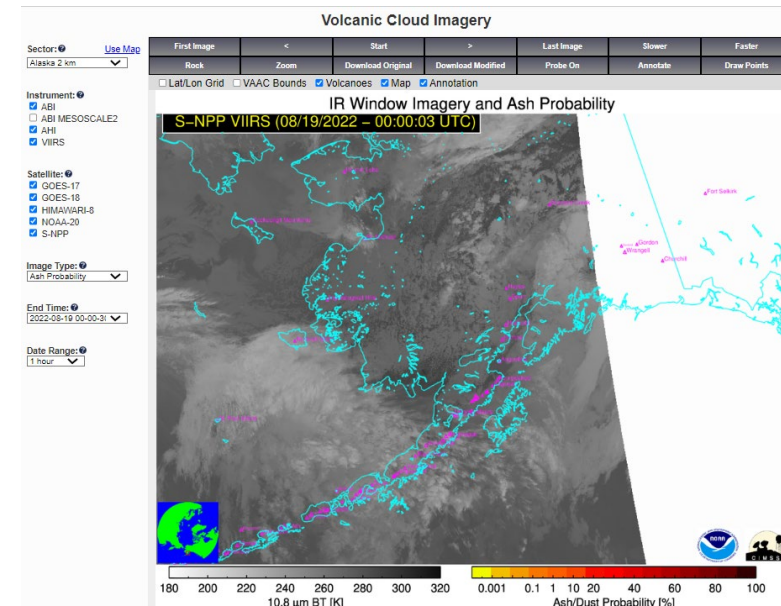
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

None

Highlights: Volcanic Cloud Monitoring website interface



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:

- Schedule updated for NDE Migration and J2 Beta Deliveries to the NCCF. Cryosphere ARR/ORR expected January 2023. J2 ORR expected July 2023.

Overall Status:

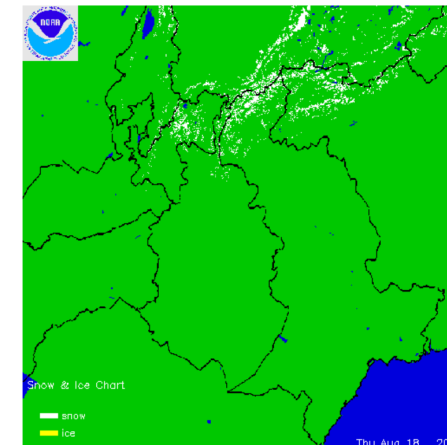
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

None

Highlight: Example of Afghanistan Snow/Ice chart from Interactive Multisensor Snow and Ice Mapping System which uses VIIRS data as one of the inputs, for August 18 2022,



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	

Accomplishments / Events:

- The VIIRS Active Fire product, as visualized through STAR's JSTAR Mapper System, is featured again in a new "Earth from Orbit" video "Extreme Heat Wave is Fueling Fires Across Europe", released on July 21, 2022. The video, which also includes a map of the VIIRS Land Surface Temperature product from JSTAR Mapper, can be viewed at <https://www.nesdis.noaa.gov/news/earth-orbit-extreme-heat-wave-fueling-fires-across-europe>.
- This video follows another one "Earth from Orbit: Alaska Ablaze", released on June 30, 2022 (<https://www.nesdis.noaa.gov/news/earth-orbit-alaska-ablaze>). These communications not only demonstrate the value of information provided by the JPSS Active Fire product, but also the value of JSTAR Mapper as a communications platform that provides imagery readily available for NESDIS's communications purposes.

Overall Status:

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

- 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: : VIIRS Active Fires monitoring wildfires across Europe



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 July 2022 for the production of AST-2022.
 - Global daily and monthly composites created from the granule data are examined regularly to ensure early detection of potential data quality issues with VIIRS and to demonstrate its capability to monitor flooding and other natural disasters across the globe.
- The team is improving the 2021 VIIRS Annual Surface Type product through post-processing.
- The team continues to update the surface type validation points, which will be used to validate and post process AST2021 to be delivered to JSTAR in Sept 2022.

Overall Status:

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

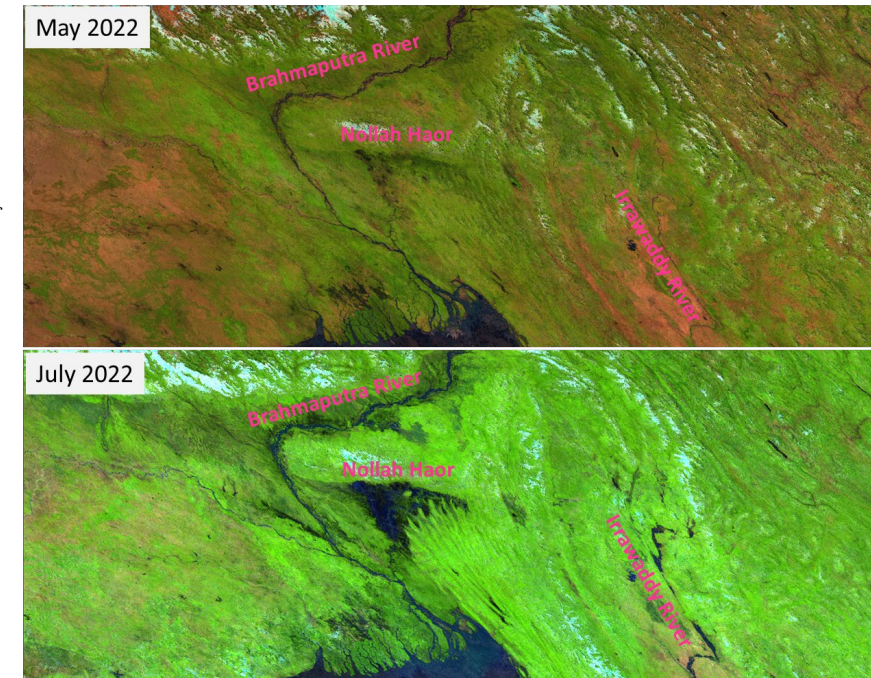
1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Highlights:

Flooding is common in South Asia during the monsoon season. These image composites created based on VIIRS data acquired by NOAA-20 and S-NPP show the extent of flooding over the Brahmaputra River (India, Bangladesh), the Irrawaddy River (Myanmar), and the Nollah Haor (Bangladesh) brought by heavy rains of the 2022 summer monsoon season. The images were created with M10 in red, M7 in green, and M5 in blue. Water and wet areas appear 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		
Comparison of AST21 with surface type validation data	Sep-22	Sep-22		
Delivery of AST21 (made available for users through STAR FTP)	Sep-22	Sep-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		

Accomplishments / Events:

- Compared the aerosol models used in NASA VNP09 and NOAA NDE SR.
- Tested the SR algorithm for the upcoming LUT update, evaluated the spectral response function impact on each component (include gas transmittance, Rayleigh optical depth and LUTs) in the atmospheric correction.
- Investigated the potential impact of the inconsistency between S-NPP and NOAA-20 SR on downstream users (BRDF, LAI and Vegetation index), particularly for the blended product which combining two satellite data.
- Maintain the SR routinely monitoring by daily global true color map and the UpToDate weekly validation at the AERONET, post the results to the team websites for quick diagnose.

Overall Status:

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

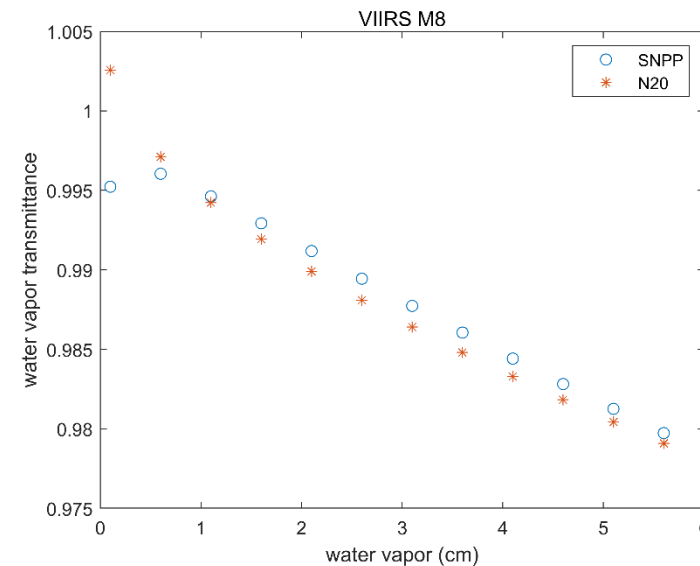
- Project has completed.
- Project is within budget, scope and on schedule.
- Project has deviated slightly from the plan but should recover.
- Project has fallen significantly behind schedule, and/or significantly over budget.

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:



Fitting the water vapor transmittance using NOAA20 spectral response function and compared with current operational coefficients. The difference is limited except the lower water vapor.

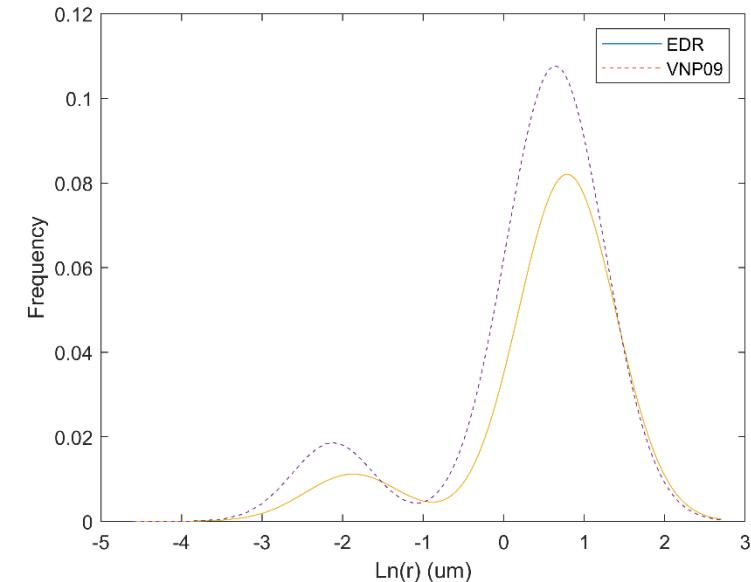
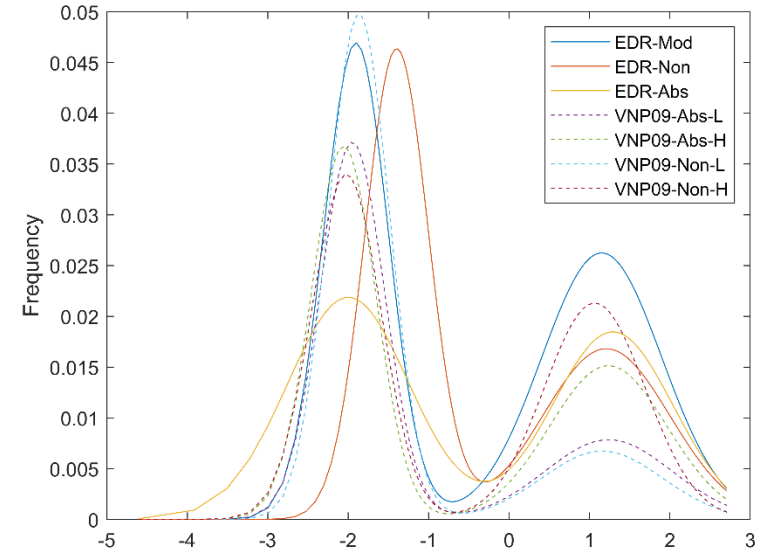
The latest NDE AOD product aerosol model setting, (from EPS AOD ATBD, Laszlo & Liu, 2022)

Table 3-10. Microphysical properties of land aerosols

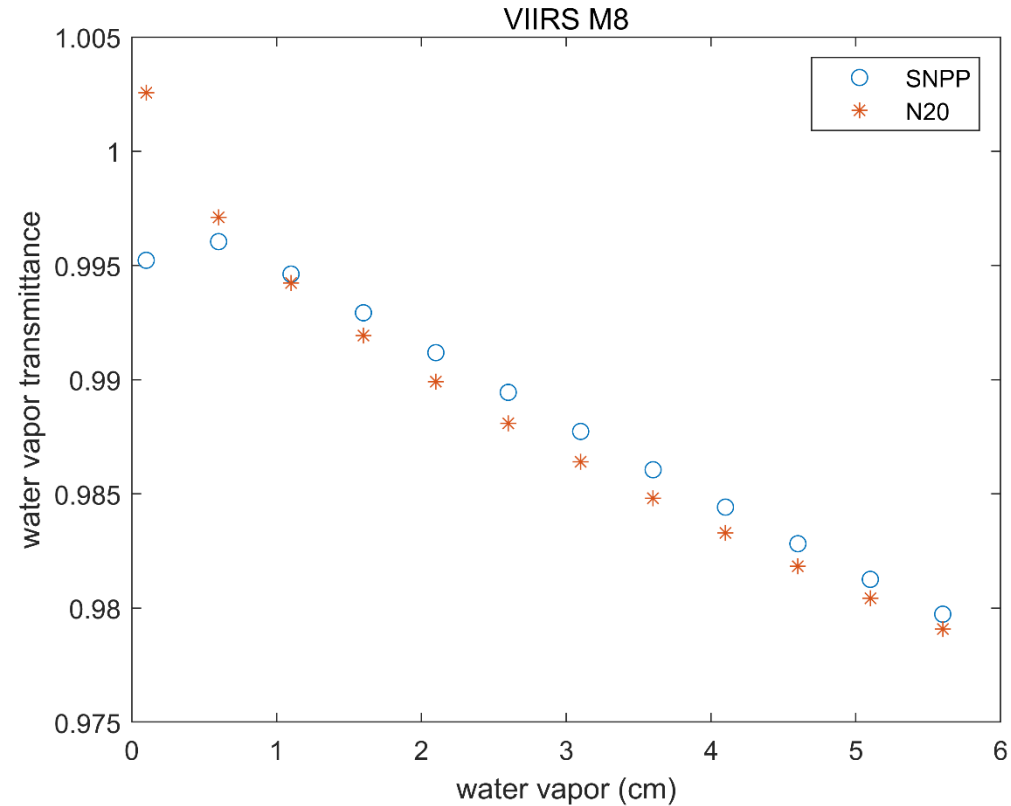
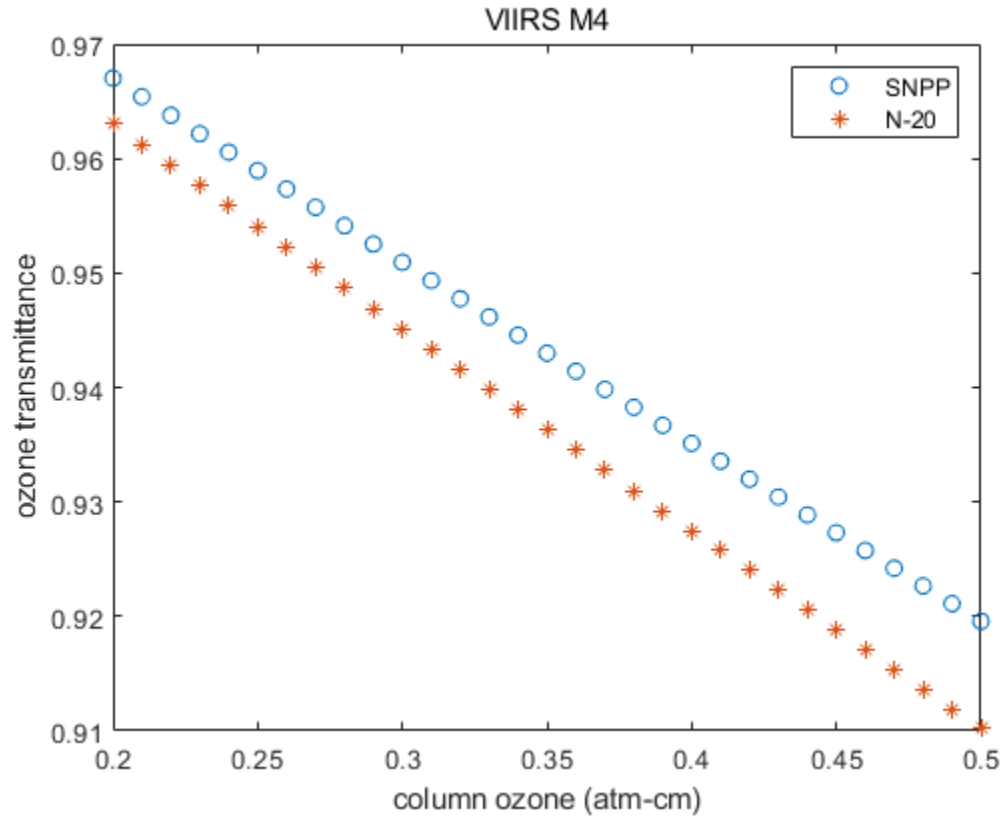
Aerosol Model	Mode	Volume median radius r_V	Standard Deviation σ	Volume Concentration C_V ($\mu\text{m}^3/\mu\text{m}^2$)	Complex Refractive Index
Generic	Fine	$0.145 + 0.0203 \tau^{\&}$	$0.3738 + 0.1365 \tau$	$0.1642 \tau^{0.7747}$	$1.43 - (0.008 - 0.002\tau)i^{\#}$
	Coarse	$3.1007 + 0.3364 \tau$	$0.7292 + 0.098 \tau$	$0.1482 \tau^{0.6846}$	
Urban	Fine	$0.1604 + 0.0434 \tau$	$0.3642 + 0.1529 \tau$	$0.1718 \tau^{0.8213}$	$1.42 - (0.007 - 0.0015\tau)i$
	Coarse	$3.3252 + 0.1411 \tau$	$0.7595 + 0.1638 \tau$	$0.0934 \tau^{0.6394}$	
Smoke	Fine	$0.1335 + 0.0096 \tau$	$0.3834 + 0.0794 \tau$	$0.1748 \tau^{0.8914}$	$1.51 - 0.02i$
	Coarse	$3.4479 + 0.9489 \tau$	$0.7433 + 0.0409 \tau$	$0.1043 \tau^{0.6824}$	
Dust	Fine	$0.1416 \tau^{-0.0519}$	$0.7561 \tau^{0.148}$	$0.087 \tau^{1.026}$	$(1.48\tau^{-0.021}) - (0.0025 \tau^{0.132})i$ at $0.47\mu\text{m}^*$ $(1.48\tau^{-0.021}) - 0.002i$ at $0.55\mu\text{m}$ $(1.48\tau^{-0.021}) - (0.0018 \tau^{-0.08})i$ at $0.66\mu\text{m}$ $(1.46\tau^{-0.040}) - (0.0018 \tau^{-0.30})i$ at $2.12\mu\text{m}$
	Coarse	2.20	$0.554 \tau^{-0.0519}$	$0.6786 \tau^{1.0569}$	

[&] Aerosol optical depth (τ) is the spectral value at $0.55\mu\text{m}$. The properties (r_V , σ and refractive index) of smoke and generic aerosol model are defined for $\tau < 2.0$, and $\tau = 2.0$ is used in calculation when $\tau > 2.0$. Likewise, parameters of urban and dust aerosol are defined for $\tau < 1.0$, and $\tau = 1.0$ is applied for higher τ .
^{*} Refractive index at other shortwave wavelength is estimated by spectral interpolation. No extrapolation is performed if wavelength is shorter than $0.47 \mu\text{m}$ or longer than $2.12 \mu\text{m}$.
[#] For NOAA-20, the imaginary part of the refractive index of the generic model was changed to $-(0.008 + 0.002\tau)$ based on the personal communication with MODIS dark-target aerosol team.

The previous version AOD product (IDPS) use the same aerosol models as NASA MODIS/VIIRS SR product, the size distribution difference are show in the right figures.



Rebuilt the transmittance regression coefficients and compared with current operation one.



For the 12 SR bands, ozone has biggest impact on M4 band while water vapor has strongest absorption in M8. current SNPP and NOAA20 share same coefficients, here fitting the NOAA20 coefs using its spectral response function and compare with current operational results, the difference do exist but not significant enough to impact the final SR.

Accomplishments / Events:

- Prepared the slides on all weather LST development and inland water LST availability and validation, and presented them in the collaboration meeting-land production status and model applications with EMC group on July 7th. (Highlights)
- Further modified the all weather LST test data. One month test data is now available. Summarized all weather development work into three documents: the algorithm description document, readme file as well as technical details document.
- Worked on the LST uncertainty evaluation based on the ground validation results.(slide 2)
- Completed the poster titled “Quantifying the Uncertainty of VIIRS LST Product” for Collective Madison Meeting.
- Worked on the conversion of buoy bulk temperature measurements to skin temperature. (Slide 2)

Overall Status:

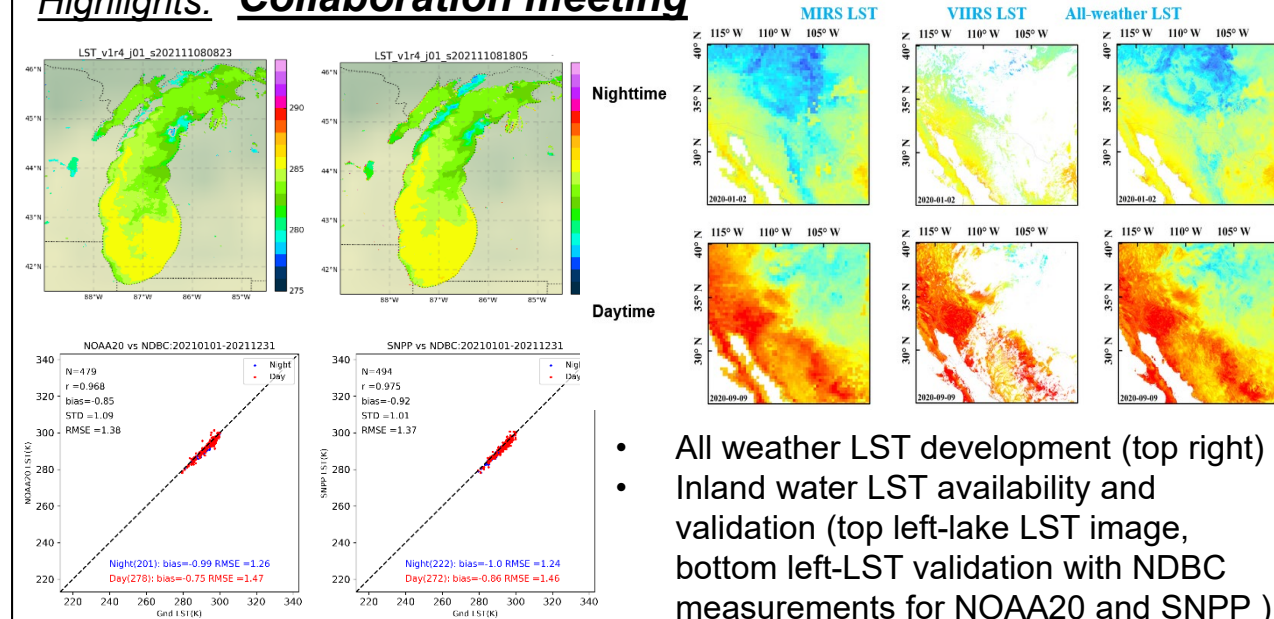
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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Issues/Risks:

None

Highlights: Collaboration meeting

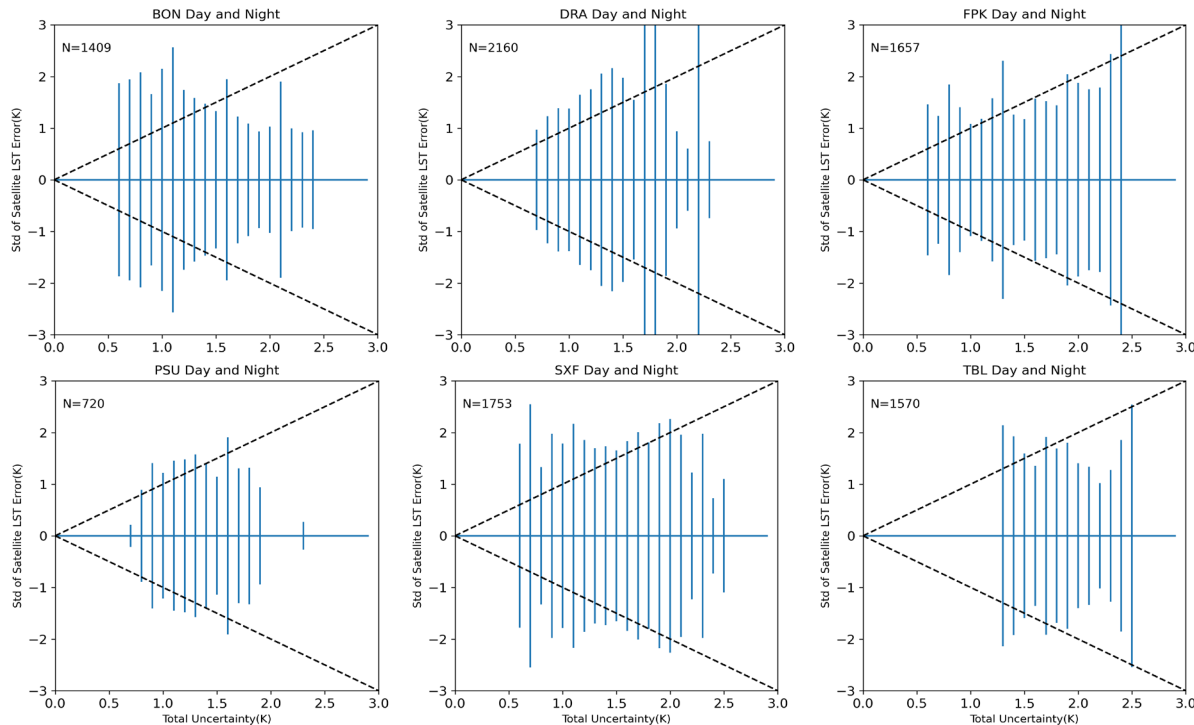


- All weather LST development (top right)
- Inland water LST availability and validation (top left-lake LST image, bottom left-LST validation with NDBC measurements for NOAA20 and SNPP)

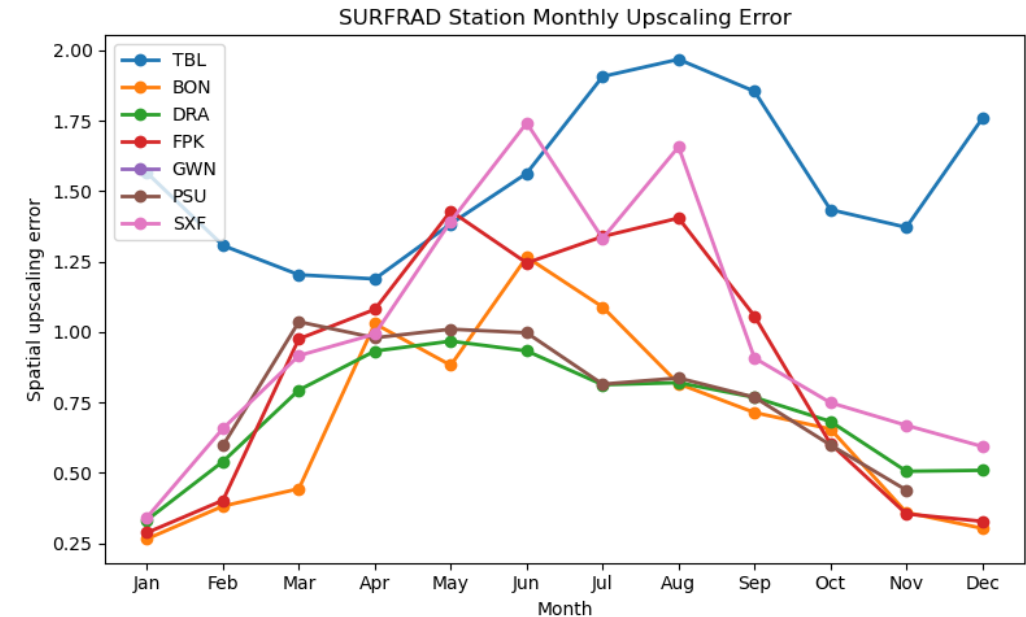
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/01/21	
ATBD update	Oct-21	Dec-21	Dec-21	
Super DAP v3.1 patch delivery			12/06/21	
Patch DAP (final J2 DAP, IP filename corrections) deliver to NDE			07/13/22	
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		
Routine monitoring tool and its update	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	

$$\sigma_{total} = \sqrt{\sigma_{sat}^2 + \sigma_{gnd}^2 + \sigma_{space}^2 + \sigma_{time}^2}$$

σ_{total} is the total LST uncertainty for the validation with the ground measurements. It is estimated from four components: satellite LST uncertainty (σ_{sat}), ground LST uncertainty (σ_{gnd}), spatial matchup uncertainty (σ_{space}) as well as the temporal matchup uncertainty (σ_{time})



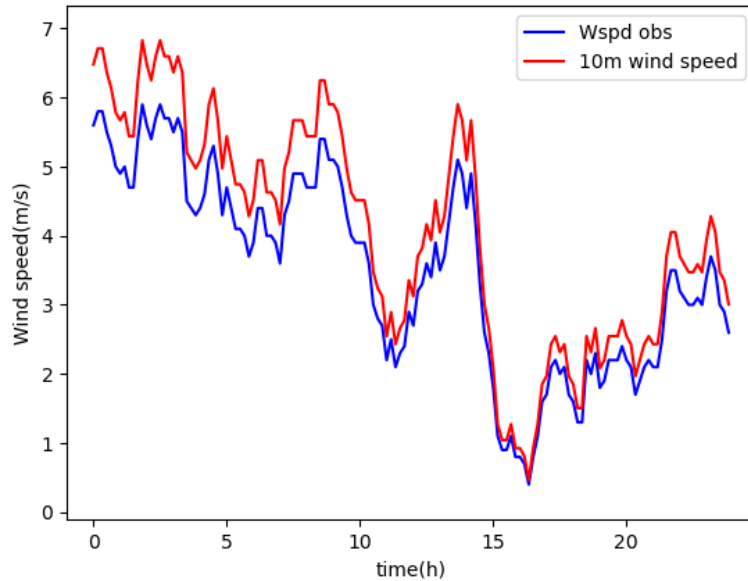
The total LST uncertainty is calculated for each matchup record.



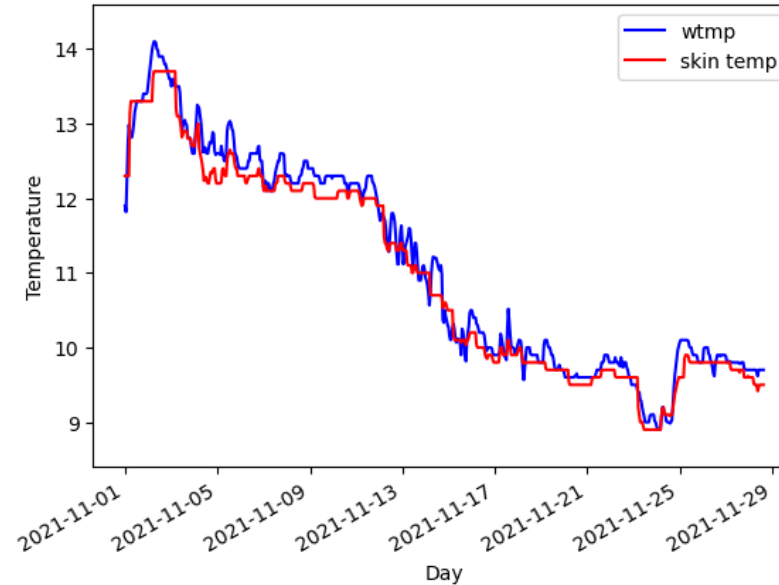
- The monthly mean upscaling uncertainty is calculated for each station in SURFRAD network, which is used to represent the spatial matchup uncertainty
- PSU site has missing value in Jan and Dec due to cloud coverage so the mean value in other months are used to represent the error in these two months.
- Seasonal feature is fairly significant generally high in spring and summer and low in fall and winter

Conversion of bulk temperature to skin temperature

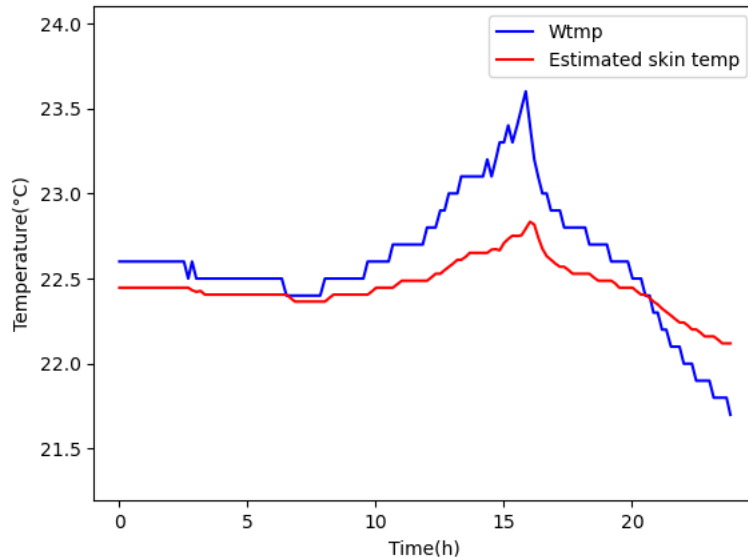
Wind speed on day 20210612



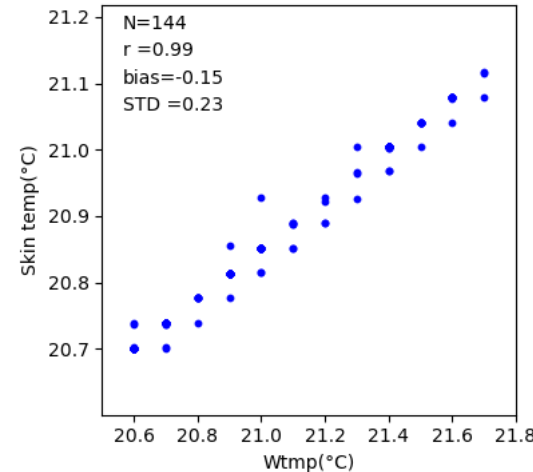
Wtmp vs Skin temp



Skin temp and bulk temp on day 20210701



Skin temp vs bulk temp on day 20210627



- The surface temperature measurements from NDBC stations are used to validate the performance of LST over inland water. The observed bulk temperature at a certain depth needs to be converted to skin temperature by correcting the cool-skin effect and warm layer effect.
- The method proposed by Zeng et al.(1999) was used for the conversion. The skin temperature is calculated using daily averaged skin temperature and the diurnal wave of skin temperature.

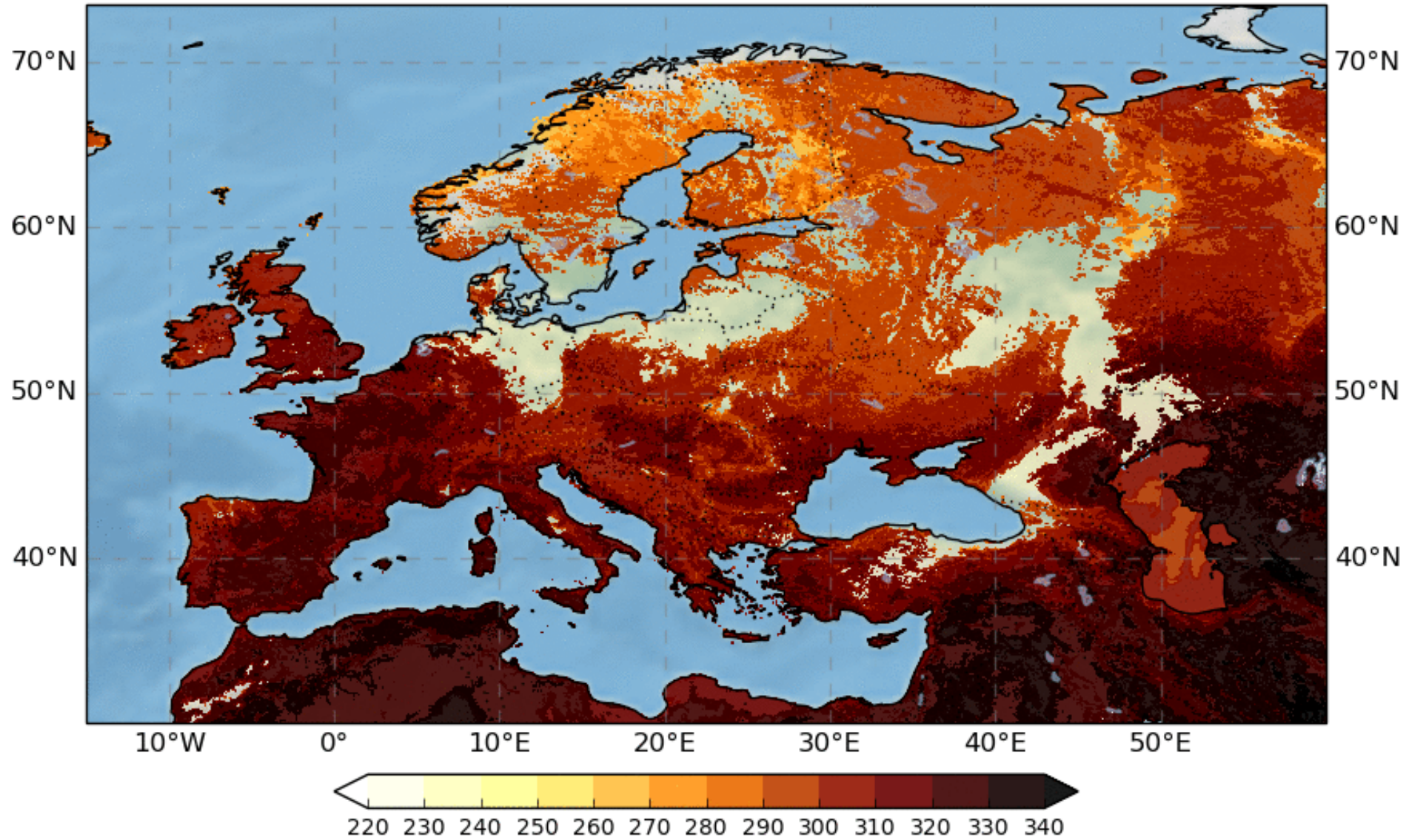
$$Ts(t) = Ts^{\wedge} + f(t)$$
- Underestimation is found for the amplitude of the diurnal variation of the skin temperature. Further investigation is needed.

Top left top figure shows the calculated 10m wind speed, top right and bottom left figures show the time series and daily variation of observed bulk temperature and skin temperature, respectively; bottom right figure shows the scatter plot between the two temperatures.

Zeng, X., M. Zhao, R. E. Dickinson, and Y. He. 1999. "A Multiyear Hourly Sea Surface Skin Temperature Data Set Derived from the TOGA TAO Bulk Temperature and Wind Speed Over the Tropical Pacific." *Journal of Geophysical Research: Oceans* 104 (C1): 1525–1536. "

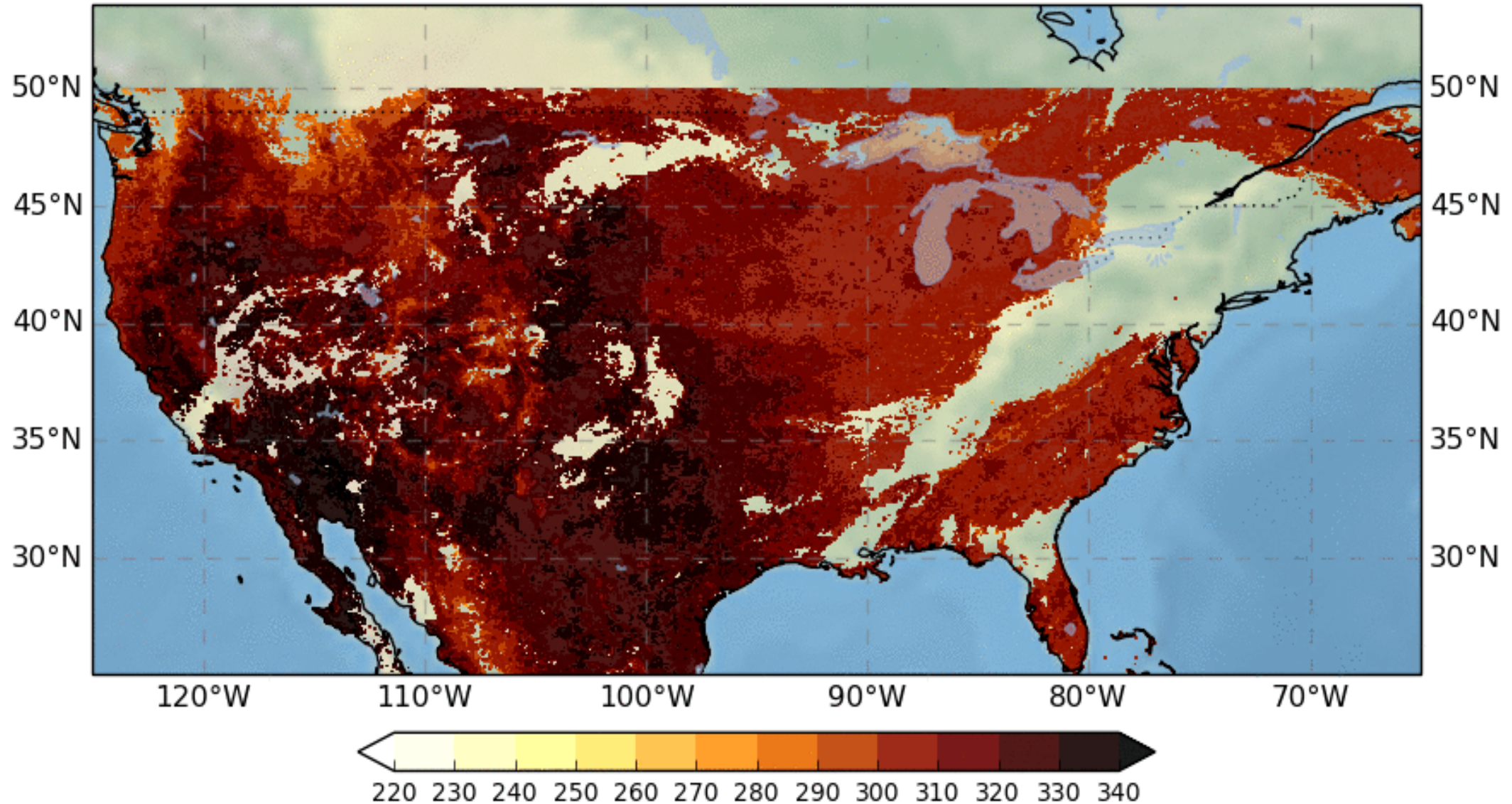
Heatwave occurrence monitoring over Europe

LST on 20220718



Heatwave occurrence monitoring over US

LST on 20220718



Accomplishments / Events:

- Drafted a manuscript about BRDF climatology
 - Introduce the VIIRS BRDF climatology dataset to community
 - Summarize the BRDF climatology algorithm and quality control
 - Demonstrate the BRDF climatology temporal pattern in some surface types
- Improved the VIIRS albedo climatology standard deviation variables
 - Filled minor gaps in persistent cloudy area due to insufficient historical retrievals
- Albedo anomaly study over Texas with NDVI and LST to observe the impact from drought
- Presented in EMC meeting to model team about albedo product progress

Overall Status:

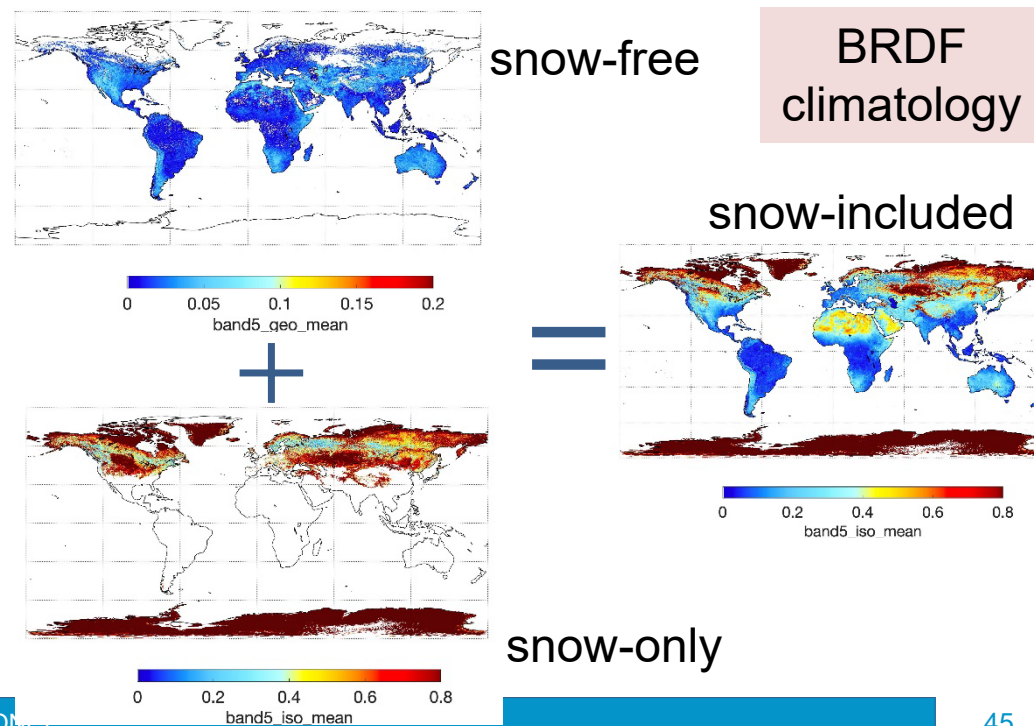
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

1. Project has completed.
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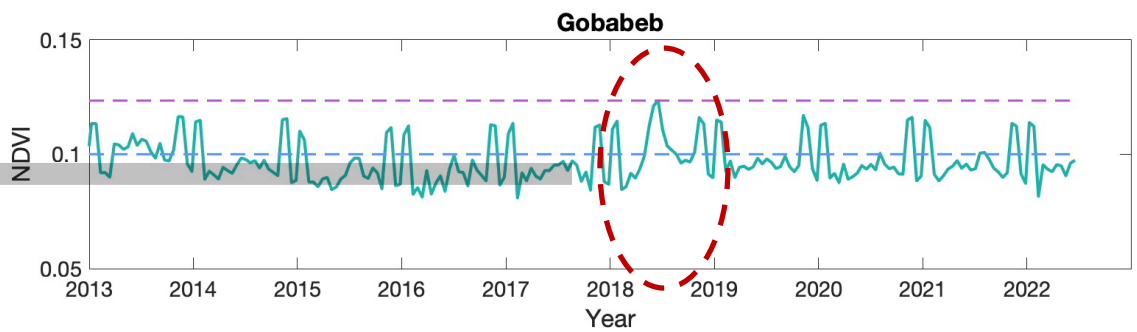
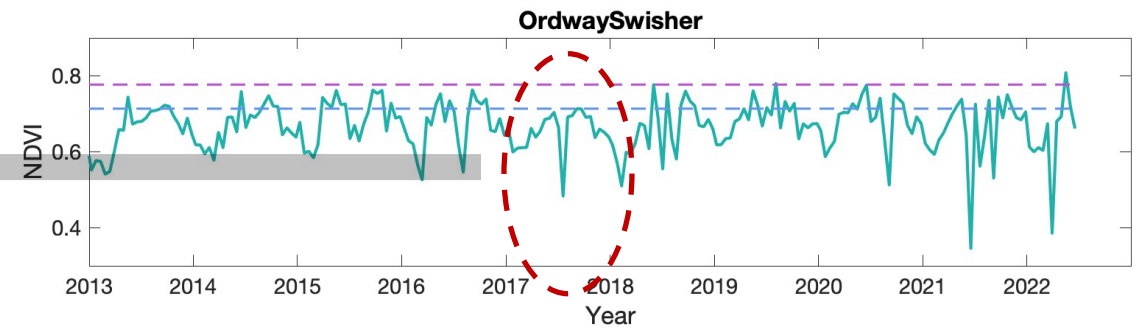
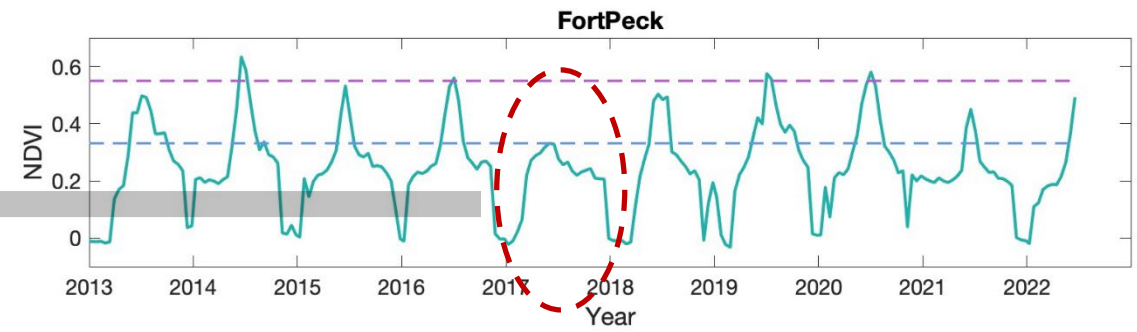
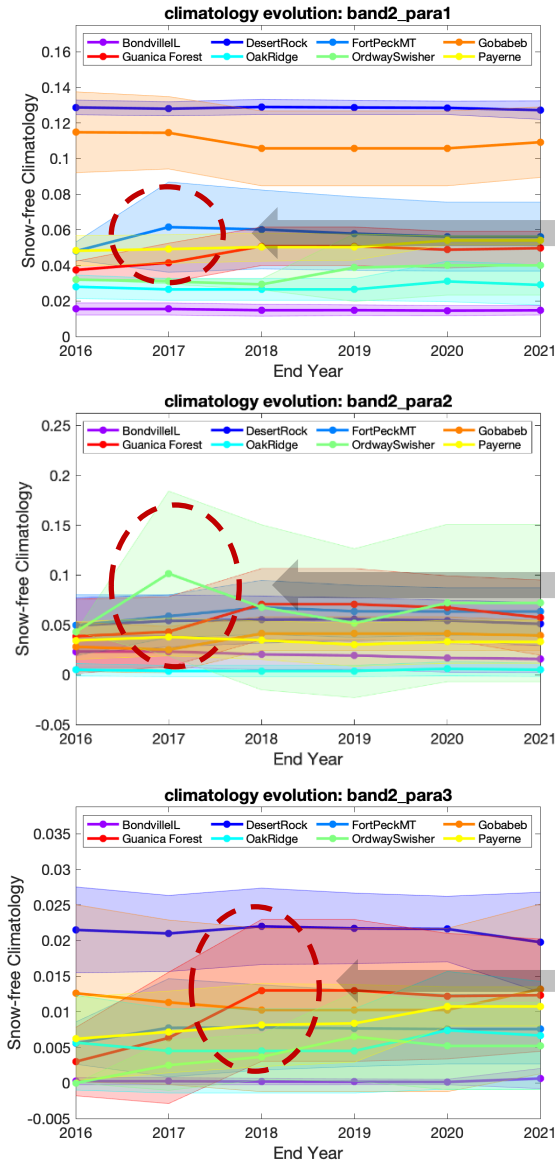
Issues/Risks:

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		
NOAA-21 data test if provided	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

Highlights:



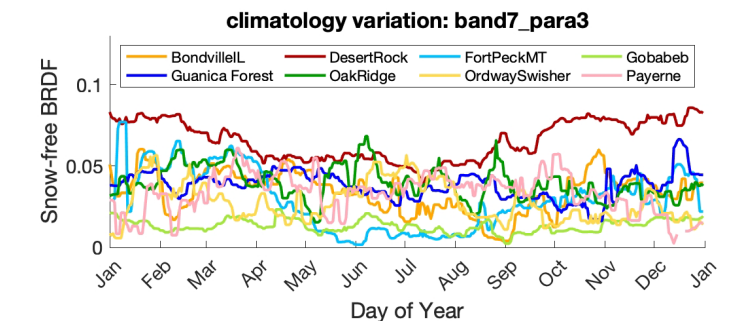
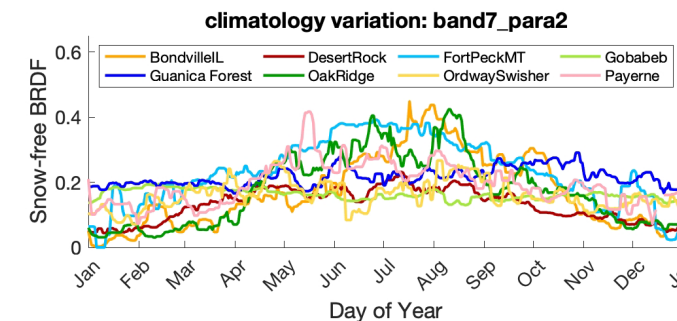
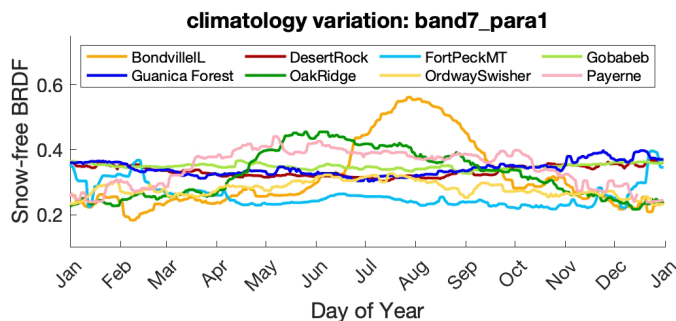
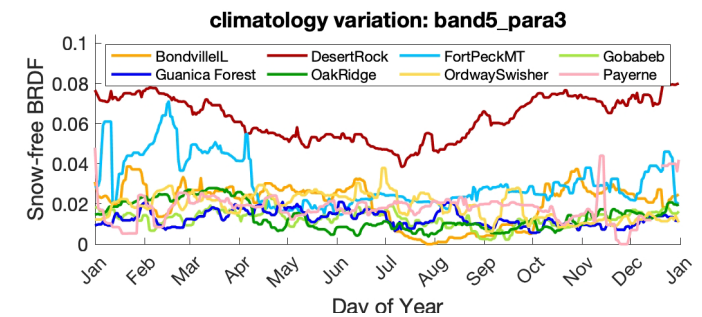
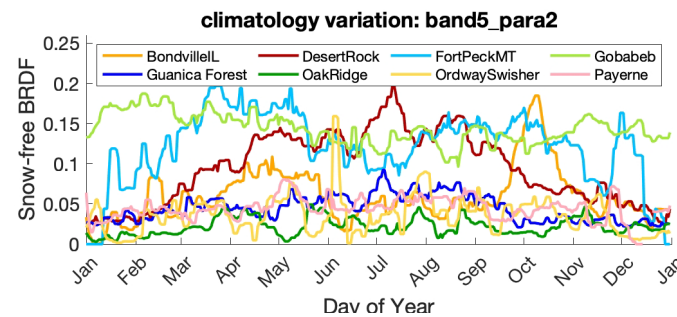
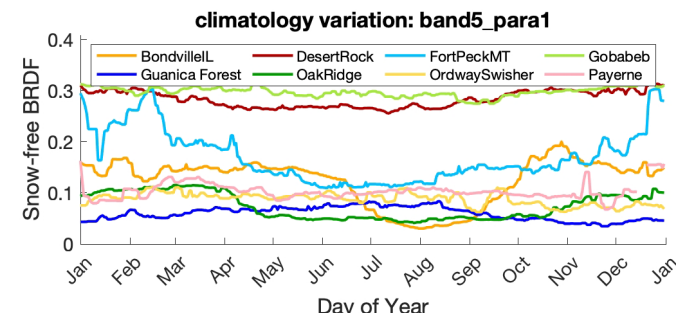
- BRDF evolution is analyzed over several sites representing different surface types.
- The BRDF mean and std becomes stable with the time.
- Some abrupt change in BRDF climatology results from the surface change, such as vegetation status change.
- Keeping climatology updated is necessary.



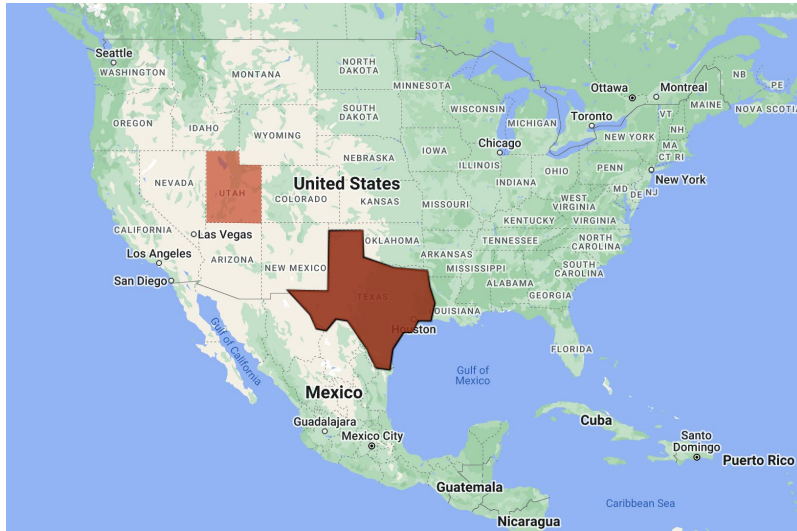
Snow-free BRDF seasonal feature

SiteID	Category	Latitude	Longitude	Network	State/Country
<i>Oak_Ridge</i>	Deciduous forest	35.964	-84.283	NEON	Tennessee, USA
<i>Guanica_Forest</i>	Evergreen forest	17.97	-66.869	NEON	Puerto Rico, USA
<i>Ordway_Swisher</i>	evergreen forest; woody wetlands	29.689	-81.993	NEON	Florida, USA
<i>Gobabeb</i>	Desert	-23.561	15.042	BSRN	Namibia
<i>Desert_Rock</i>	Shrub	36.624	-116.019	SURFRAD	Nevada, USA
<i>Bondville_IL</i>	Crop	40.05	-88.37	SURFRAD	Illinois, USA
<i>Fort_Peck_MT</i>	Grassland	48.31	-105.1	SURFRAD	Montana, USA
<i>Tõravere</i>	Grassland	58.254	26.462	BSRN	Estonia
<i>Payerne</i>	Crop	46.815	6.944	BSRN	Switzerland
<i>Woodworth</i>	Wetland	47.128	-99.241	NEON	North Dakota, USA
<i>Healy</i>	Shrub	63.876	-149.213	NEON	Alaska, USA

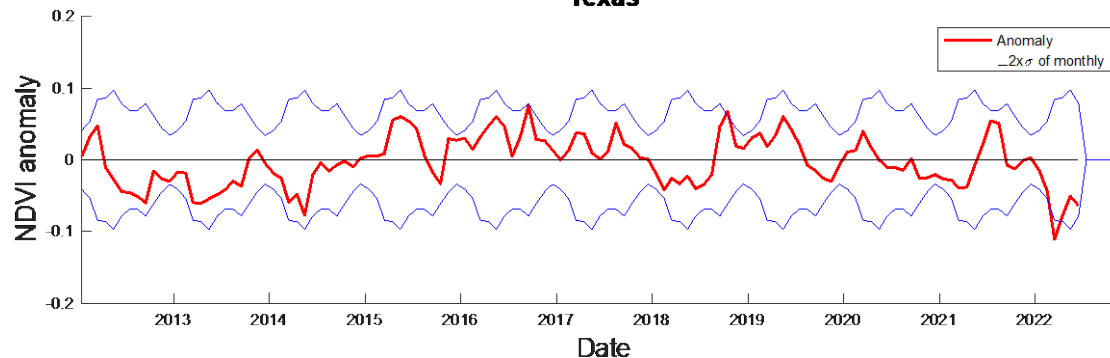
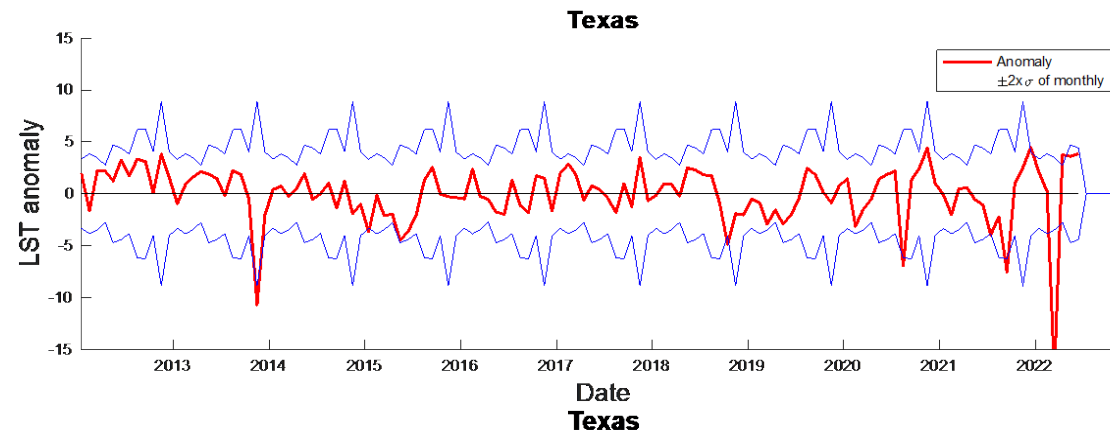
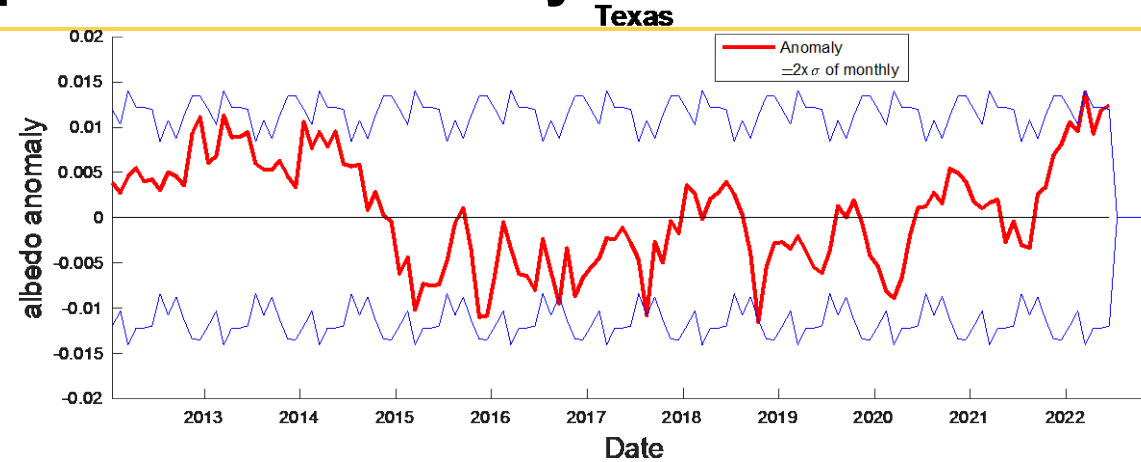
The seasonal variation of the BRDF parameters climatology displays the features of different surface and vegetation status, including snow melting, green up, and the dormant period. It could be observed that the f_{iso} parameter of bare soil or desert (e.g. at Desert Rock site and the Gobabeb) are quite stable through out the year and is significantly higher than that of vegetation, cropland, and forest stations in visible and shortwave-IR channels.



Texas drought caused parameter anomaly



- Texas is currently experiencing some level of drought conditions. The drought has caused wildfires across the state earlier this year.
- The mean anomaly of albedo, LST, and NDVI have indicated the impact of the drought condition.
- The albedo and temperature are the highest in the recent decade, and the NDVI is the lowest.



- All the statistics is the mean over Texas
- The red line is the monthly anomaly relative to a monthly climatology from 2012 to 2021. The shaded area is $2 * \sigma$ (standard deviation of the monthly value) for **95.4%**.

Accomplishments / Events:

- Made a presentation for the EMC user meeting on Land Production Status and Model applications on July 7
- Verified the global 1km GVF statistics and confirmed the statistical values are correct except for the global mean GVF.
- Updated the NVPS external user manual on the Data Fields of the NVPS VI Products and GVF statistics tables
- Compared ABI VIs generated using mean value of all non-cloud VIs to ABI VIs generated using other methods and to VIIRS
- Made time series of ABI VIs and surface reflectances and found that there are patterns of significant diurnal variation in the VIs and reflectances, as well as potential quality issues with some of the data.

Overall Status:

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

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

Issues/Risks:

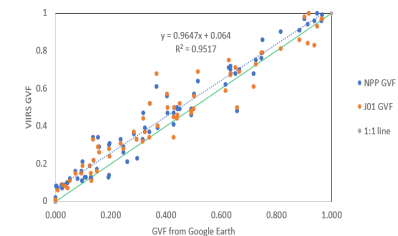
None

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:

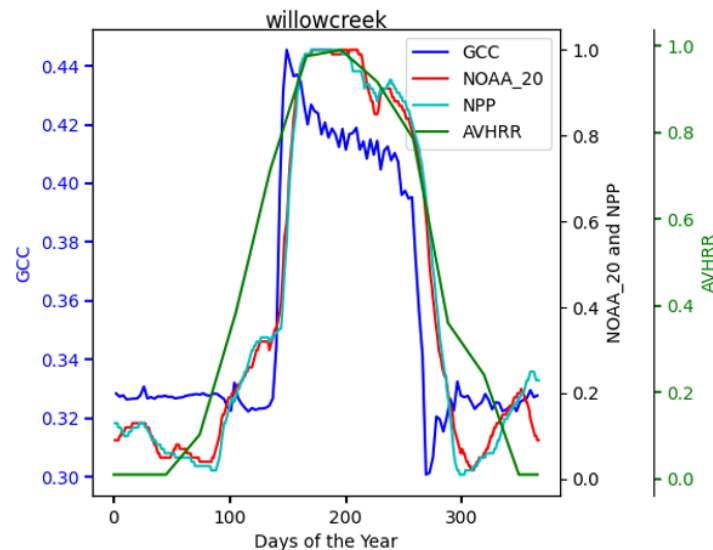
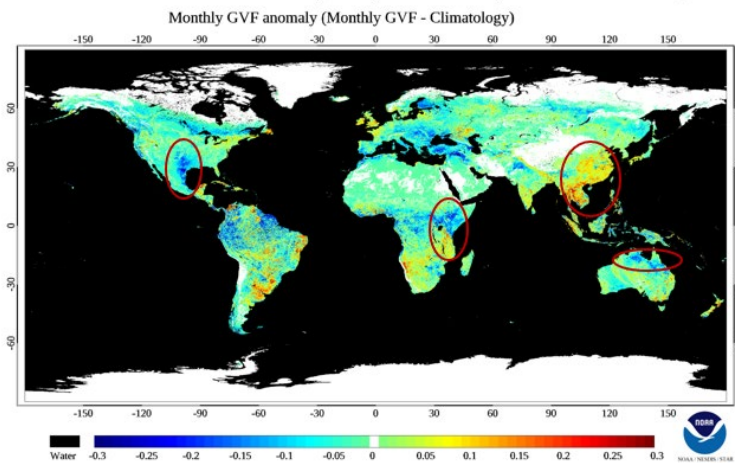
Made a presentation entitled “VIIRS GVF climatology, anomaly analysis and GVF data validation” for the EMC user meeting on Land Production Status and Model applications on July 7. Highlights of this presentation included GVF anomaly maps, VIIRS vs AVHRR climatology GVF compared to PhenoCam GCC, and GVF validation using Google Earth images.

VIIRS 4-km GVF compared with Google Earth GVF



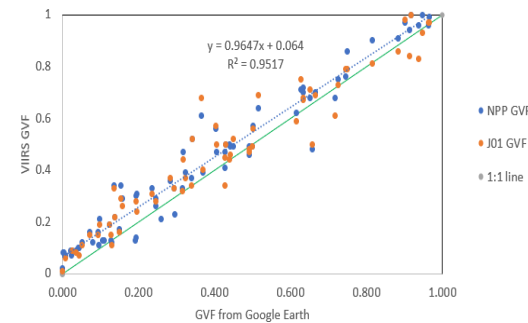
	Accuracy	Precision	Uncertainty
NPP GVF	0.051	0.063	0.081
NOAA-20 GVF	0.043	0.075	0.086
Requirement	0.12	0.15	0.17

- Made a presentation entitled “VIIRS GVF climatology, anomaly analysis and GVF data validation” for the EMC user meeting on Land Production Status and Model applications on July 7
- The GVF anomaly maps for April and May were produced and comparable with vegetation health index
- Comparisons between VIIRS GVF, AVHRR climatology, and ground-based PhenoCam Green Chromatic Coordinate (GCC) were performed for 37 sites with 7 different land surface types.
- VIIRS GVF validation using high resolution Google Earth images was introduced for the EMC users



Dataset	Correlation Values
NOAA_20	0.90
S_NPP	0.88
AVHRR	0.83

VIIRS 4-km GVF compared with Google Earth GVF



	Accuracy	Precision	Uncertainty
NPP GVF	0.051	0.063	0.081
NOAA-20 GVF	0.043	0.075	0.086
Requirement	0.12	0.15	0.17

Verification of the global 1km GVF statistics

GVF-WKL-REG_v3r1_j01_s20210209_e20210215_c202201261507010_stat.txt

Area	Ecosystem	lon_W	lon_E	lat_S	lat_N	num_pixels	min_gvf	max_gvf	mean_gvf	std_gvf
Global	global	-180	180	-40	40	92968325	1	100	22.6	33
E-Sahara(LYBIA)	desert	23	24	28	29	12544	1	5	2.2	0.6
Great-Sandy(AUS)	semi-desert	125	126	-21	-20	12656	1	31	11.9	3.5
Colorado(USA)	steppe	-103	-102	36	37	12656	1	96	13.5	13
Illinois(USA)	crops	-89	-88	39	40	12544	1	37	6.6	5.5
Kentucky(USA)	broad_leaf_fore	-85	-84	36	37	12656	1	58	24.6	7.4
Oregon(USA)	coniferous_fore:	-123	-122	43	44	12531	1	93	32.9	14.1
Amazon(BRAZIL)	tropical_forest	-63	-62	-3	-2	12544	1	99	57	16.3

Unverified value

- The GVF system produce GVF statistics (minimum, maximum, mean and standard deviation) over certain areas for the quality monitoring purpose
- The statistics of the new global 1km GVF product were calculated by IDL code for verification and compared with those produced by the GVF code
- It was found that the GVF statistics for the 1-degree areas were correct
- But the global mean GVF produced by the code was less than the verification value
- More investigation is needed to debug the GVF code for global mean GVF calculation.

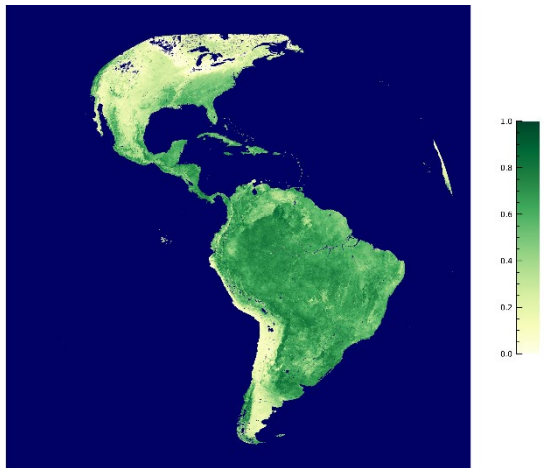
Verified values

Date	1km Global mean GVF statistic	Calculated 1km global mean (by IDL code for verification)	4km Global mean GVF statistic
Oct 15, 2020	32.0	32.1648	32.3
Jan 9, 2021	24.4	28.7669	28.8
Feb 15, 2021	22.6	28.8891	28.9
July 9, 2021	32.0	32.1746	32.3

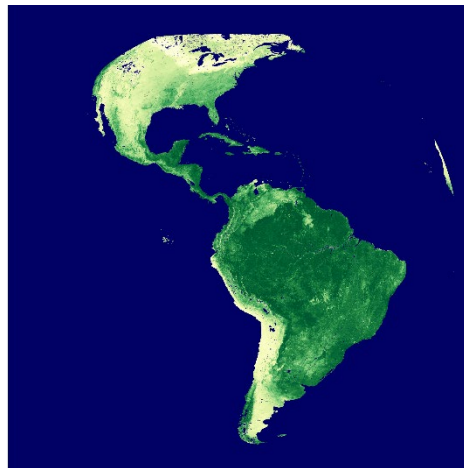
- Use GOES-R ABI reflectances from 20220201 through 20220216
- Composite NDVI and EVI using mean VI values
- Compare to VIIRS and to range-limited SZA-adjusted ABI VIs
- Mean ABI NDVIs are significantly lower than SZA-adjusted ABI NDVIs or VIIRS NDVIs
- SZA-adjusted ABI NDVIs are a better match to VIIRS than mean ABI NDVIs
- Mean ABI EVIs are lower than SZA-adjusted ABI EVIs
- Mean ABI EVIs are better match to VIIRS than SZA-adjusted ABI EVIs.

GOES-R ABI mean and solar zenith adjusted composited NDVI, 20220201-20220216 Compared to VIIRS NDVI for same period

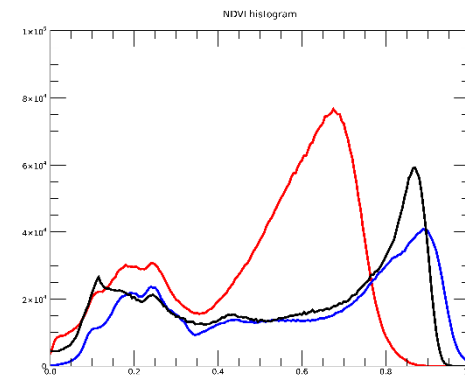
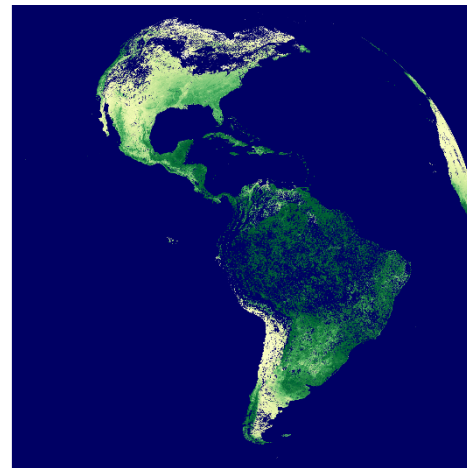
ABI mean NDVI



ABI SZA-adj NDVI

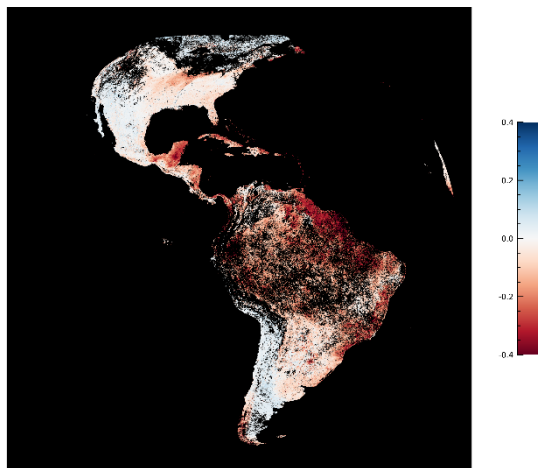


VIIRS NDVI

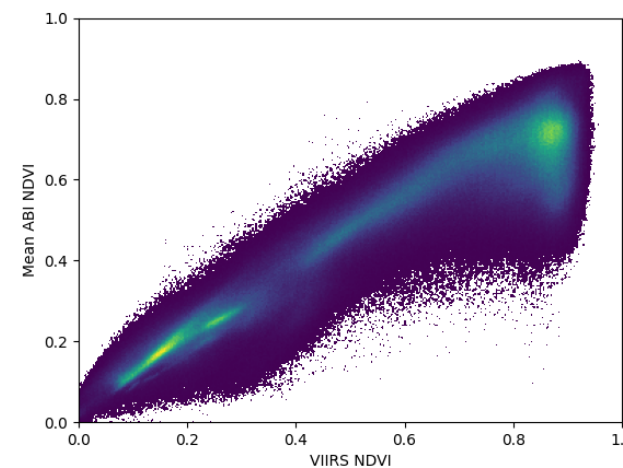
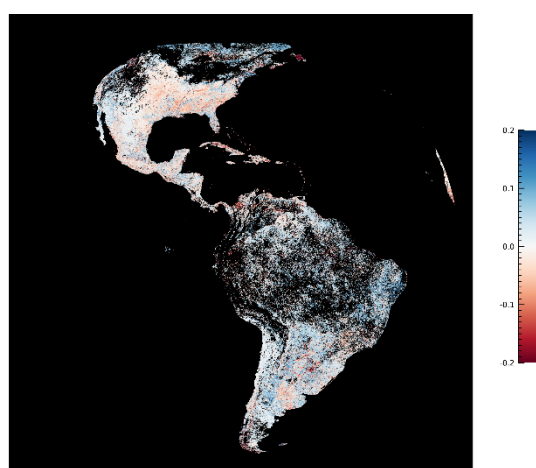


ABI mean
ABI SZA-adj
VIIRS

ABI mean - VIIRS

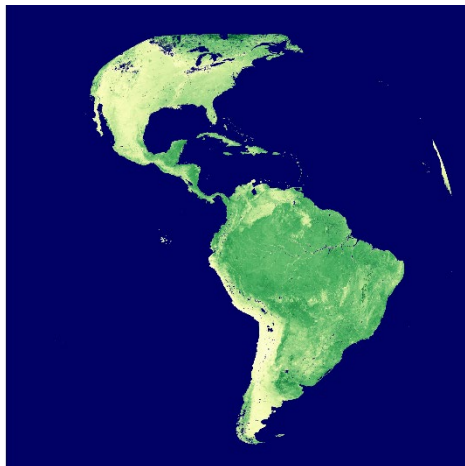


ABI SZA adj - VIIRS

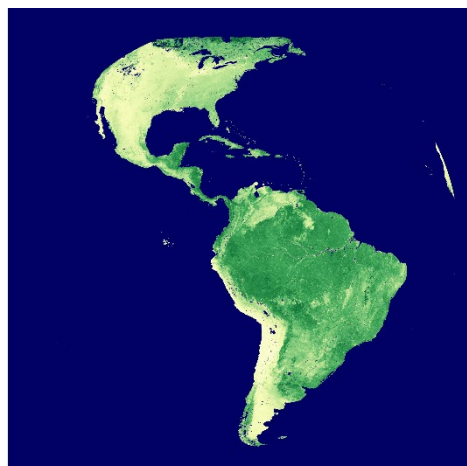


GOES-R ABI mean and solar zenith adjusted composited EVI, 20220201-20220216 Compared to VIIRS EVI for same period

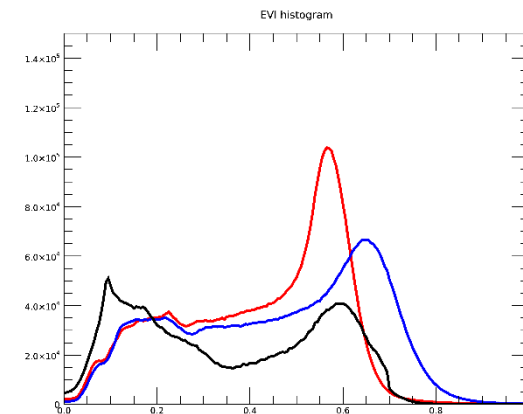
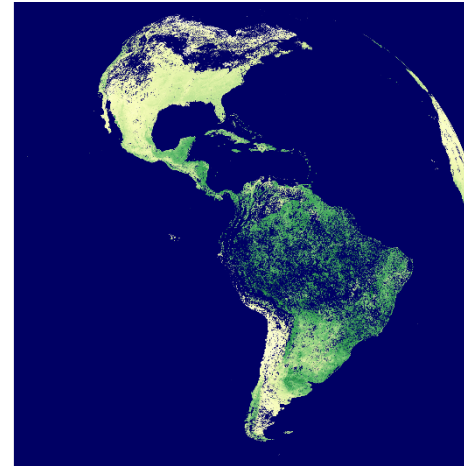
ABI mean EVI



ABI SZA-adj EVI

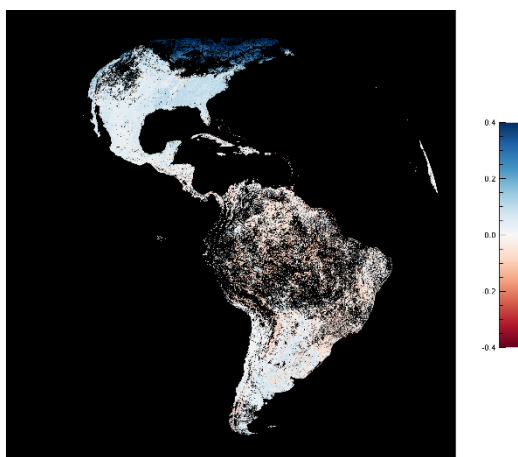


VIIRS EVI

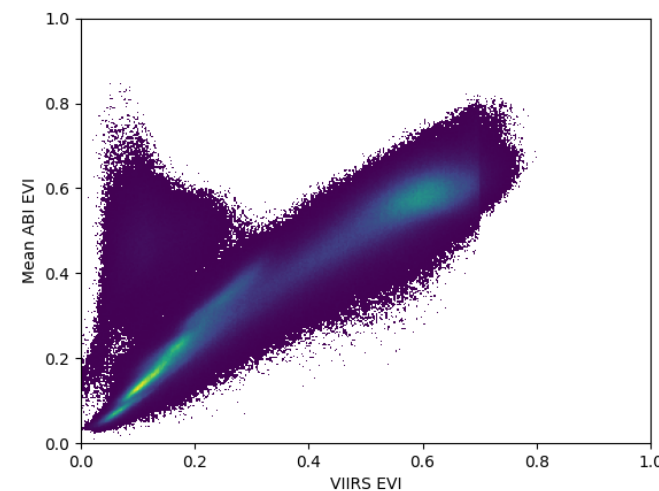
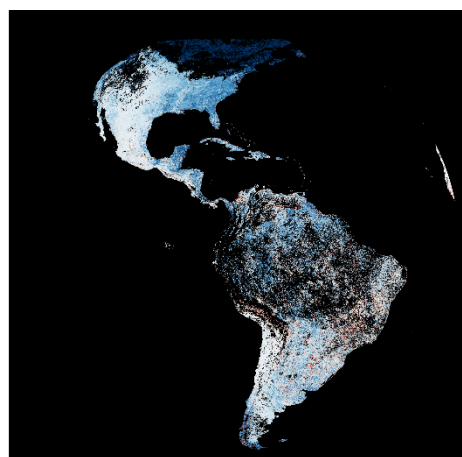


ABI mean
ABI SZA-adj
VIIRS

ABI mean - VIIRS



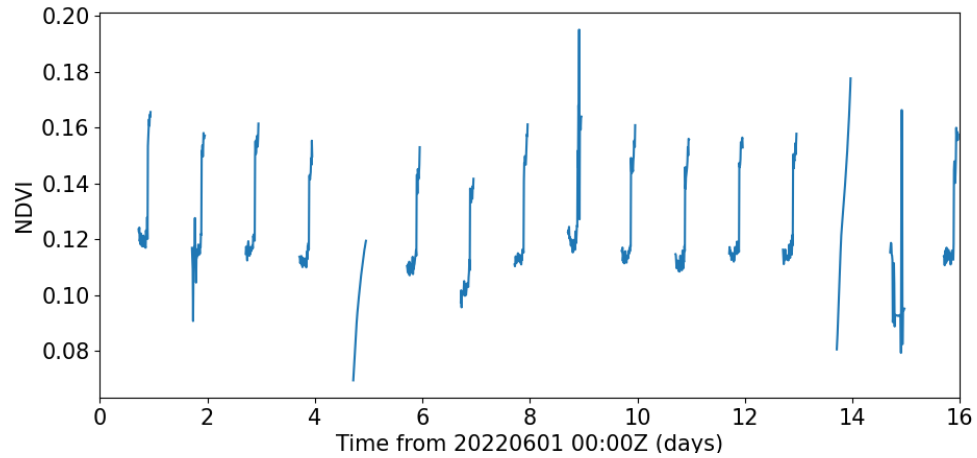
ABI SZA adj - VIIRS



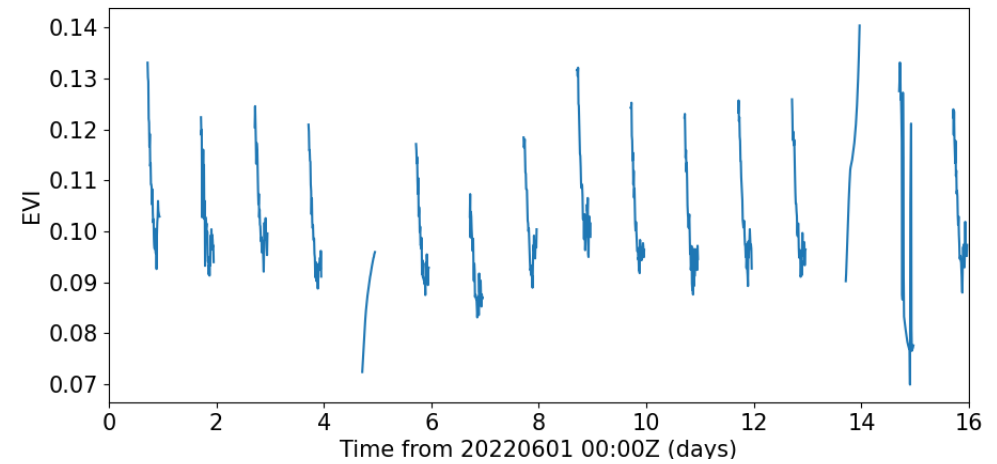
- Nearest neighbor pixel in ABI data found for multiple Ameriflux sites and one RadCalNet site (Railroad Valley)
- Time series of Channels 1-3 reflectance, NDVI, and EVI plotted for February 1-16 and June 1-16, 2022
- There is clearly a lot of poor quality data included in the time series. Better quality screening would probably improve the ABI VI retrievals.
- Most sites show repeating patterns of reflectance and VI on a diurnal basis.
- Reflectance and VI values often vary by > 0.1 diurnally, making selection of “correct” value difficult

Example time series of ABI VIs and surface reflectances: Amargosa, 20220201- 20220216

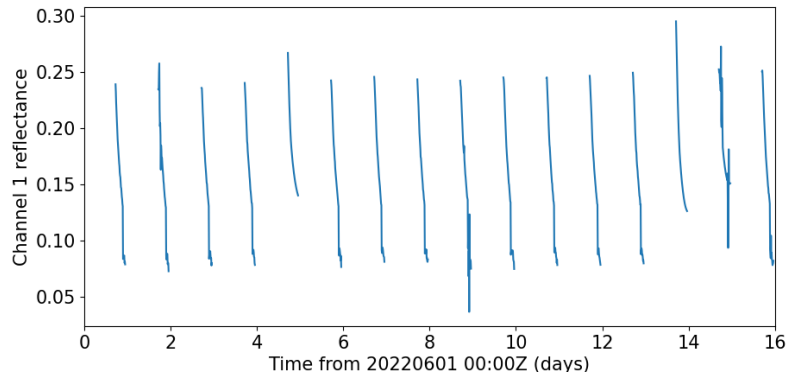
NDVI



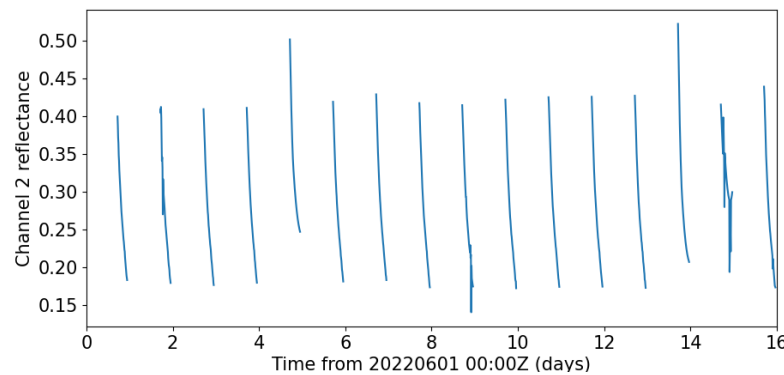
EVI



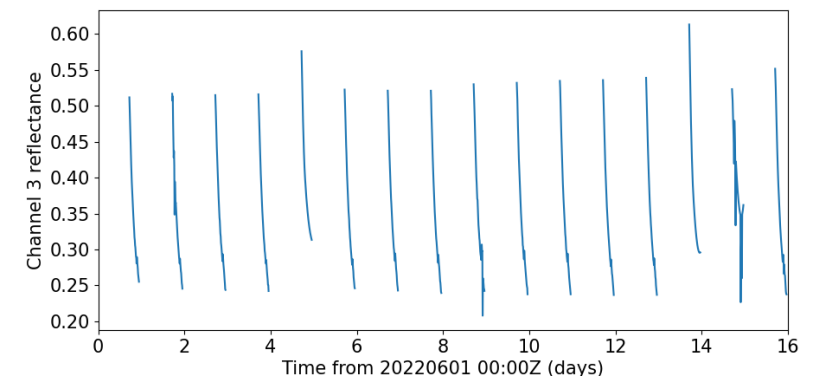
Ch. 1 reflectance



Ch. 2 reflectance



Ch. 3 reflectance



Accomplishments / Events:

- Updates on NDE Migration and J2 Beta Deliveries to the NCCF: Vegetation Health ARR/ORR expected July 2023; J2 ORR expected August 2023

Overall Status:

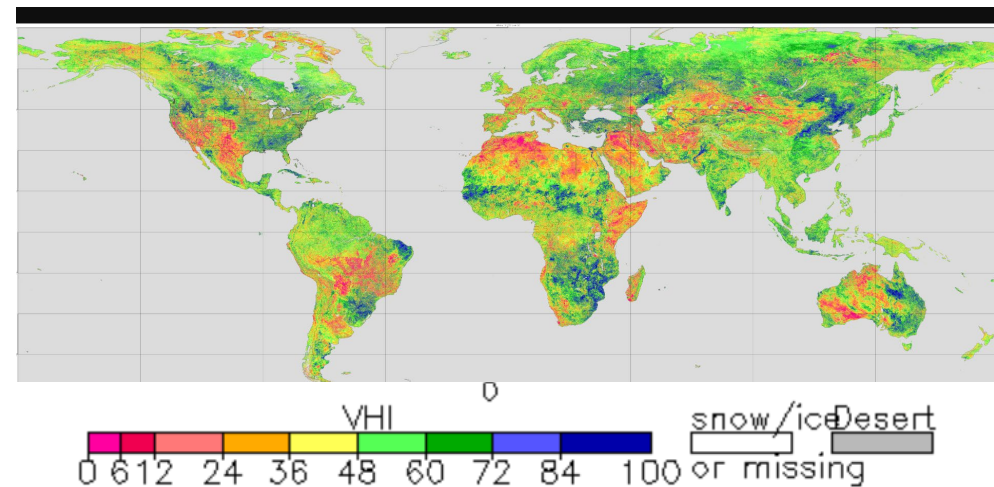
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

None

Highlights: Example of Final Global Vegetation Health Index TIF image available from NESDIS for June 18, 2022 (week 25)



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

Accomplishments / Events:

- NDE Migration and J2 Beta Deliveries to the NCCF dates are being finalized. Current expectation is for S-NPP and N20 (NDE Migration) to have ARR/ORR in August 2023 and for J2 Provisional to be Jan-May 2024.
- Algal Bloom identified in Black Sea on July 5 2022 (See highlight)

Overall Status:

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

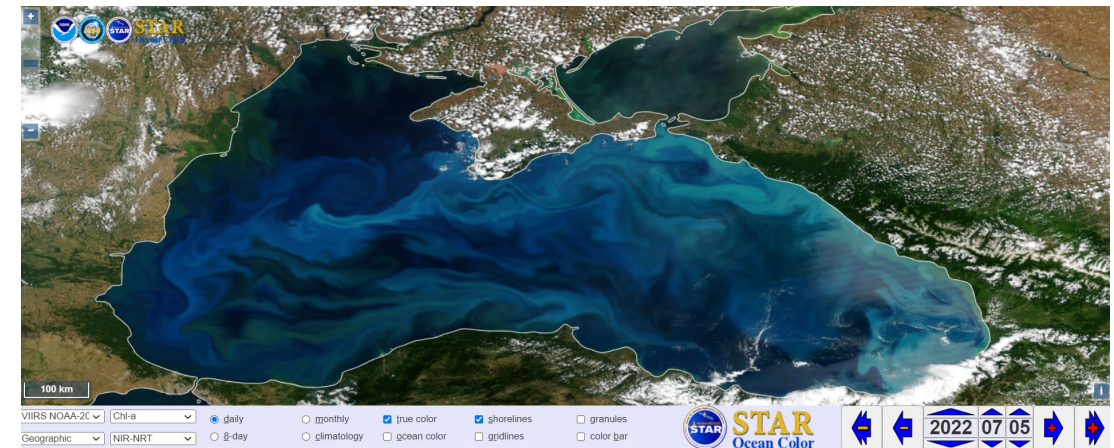
1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

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	

Highlights: Algae bloom in the Black Sea on July 5, 2022 (NOAA-20)



Accomplishments / Events:

- Paper “JPSS VIIRS SST Reanalysis V3” <https://www.mdpi.com/2072-4292/14/14/3476> published as a part of "Ten Years of VIIRS Success in Earth Observations" Special issue of Remote Sensing https://www.mdpi.com/journal/remotesensing/special_issues/VIIRS_10years.
- It documents the 3rd complete reprocessing of VIIRS SST record with the NOAA enterprise ACSPO SST system, which became the 2nd publicly released SST full-mission dataset. RAN3 improves upon RAN2 by introducing two new thermal fronts layers (location of fronts, and their intensity in units of K/km), mitigating warm SST biases in high latitudes, reducing false positive cloud detection in dynamic areas, reducing L2P data size by a factor of 4 (from 10 to 2.5 TB/year/sensor), and adding N20 data. RAN3 is fully archived in NASA PO.DAAC & NOAA CoastWatch.
- Time series of VIIRS SST accuracy (global satellite minus in situ SST biases) are shown in Figure. They meet the NOAA SST specs and at night beat by a good margin. Seasonality in day SST is due to skin-bulk differences and are not an indication of problems with satellite retrievals.
- Preparation for N21 launch continues. SST online monitoring systems SQUAM, MICROS, ARMS are being updated to be ready to support N21 Cal/Val.

Overall Status:

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

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

Issues/Risks:

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

Highlights:

ACSPO RAN3 global ‘subskin’ minus (Drifters + Tropical Moorings) SST. NPP/N20 SSTs are very consistent.

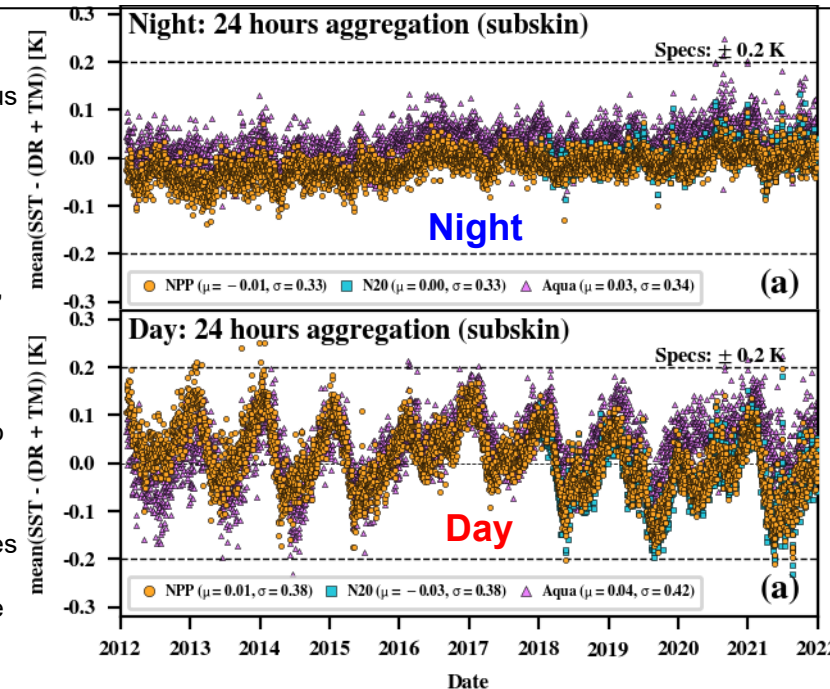
Both night & day SSTs meet NOAA specs for accuracy $\pm 0.2K$.

Seasonality in day SST is expected, due to changes in diurnal warming between ‘skin’ and in situ ‘bulk’

Daytime SSTs show a declining trend of $-0.14K/decade$, likely due to degradation of some longwave IR bands used in daytime retrievals

Night SST is stable as it mostly relies on the $3.7\mu m$ band. But it shows a $+0.05K$ step around 2016, likely due to changes in the in situ network.

Analyses are underway to reconcile



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 ACSPO 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 ACSPO. Test in STAR environment. Include N21 functionalities in NOAA Match-Up code/Monitoring	Aug-22	Aug-22		
Continue NOAA SQUAM and ARMS monitoring & validation against iQuam. Provision for N21 infrastructure	Aug-22	Aug-22		
Maintain ACSPO, 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:

VIIRS Tandem Winds Assimilation and Forecast Impact: An experimental product was developed by the NOAA/CIMSS polar winds team that uses a doublet (pair) of images from Suomi-NPP and NOAA-20, tandem winds. The result is significant overlap in the two VIIRS swaths, allowing for daily **global** coverage of satellite winds from polar satellites. Initial experiments show that adding the tandem winds to the GDAS/GFS significantly improves the Northern Hemisphere geopotential height bias throughout the troposphere at the 24-hr forecast (see highlight).

Overall Status:

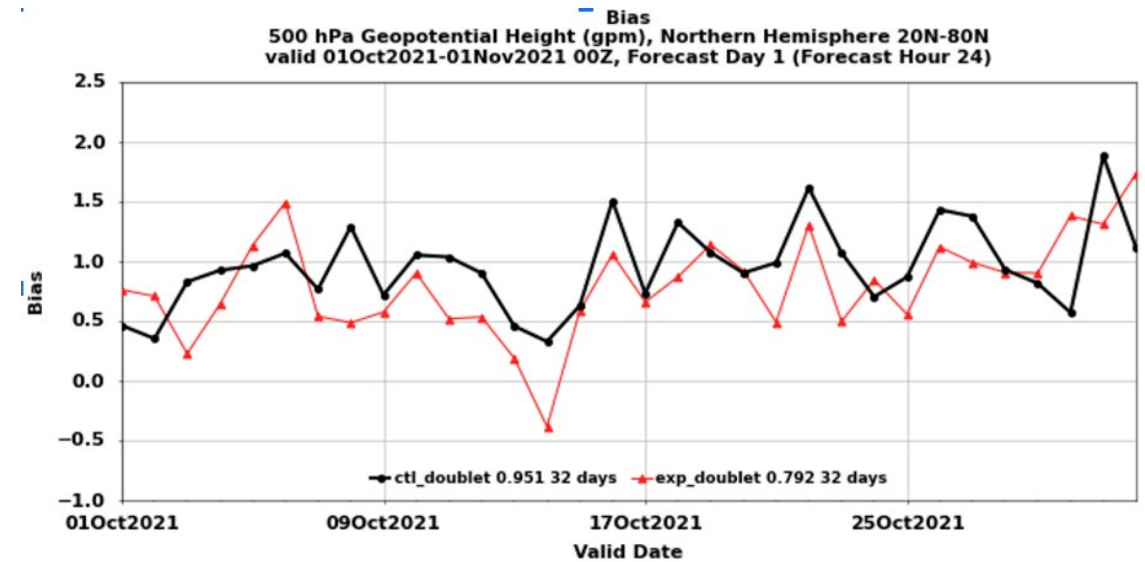
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

None

Highlights: Improvements in GDAS/GFS Geopotential height bias of troposphere for 24h forecast



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 Atmospheric Vertical Temperature Profile (AVTP) product and the depiction of the historic and deadly Europe Heatwave during the period July 17-20. The NOAA-20 NUCAPS AVTP product composite map produced using July 18-20 NOAA-20 NUCAPS products captured the heat dome at the 850 hPa and 500 hPa levels.
- NUCAPS team continued work on some minor fixes (Gravity calculation, occasionally appearing NaN microwave emissivities, 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 IGARSS-2022 international conference held July 17-22, and prepared oral talks for the upcoming AMS Collective Madison Meeting (CMM) to be held August 8-12, 2022. The NUCAPS team also prepared a set of four abstracts for a submission to the upcoming AMS 2023 conference (8-12 January 2023) on various facets of the NUCAPS system, product improvements, advances, optimization, and augmentation for the next generation hyperspectral sounders.

Overall Status:

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

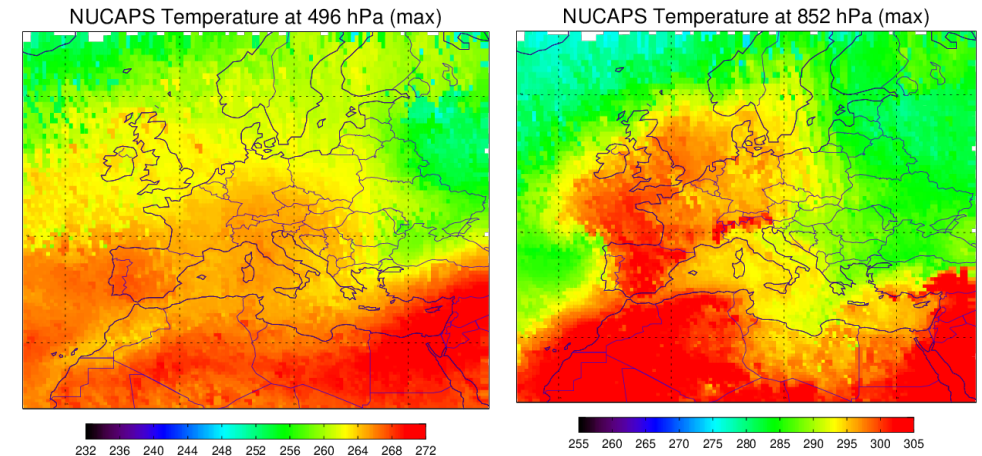
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2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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

NUCAPS NOAA-20 Temperature Product Depiction of Europe Heatwave – July 18-20, 2022



NUCAPS NOAA-20 retrieved temperatures captured the Europe Heatwave starting July 17. The heatwave scorched western Europe, killing hundreds in Spain and Portugal (Washington Post). Shown are the NUCAPS Atmospheric Vertical Temperature Profile (AVTP) product composite map created from July 18-20 data for the atmospheric layers at 500 hPa (left) and 850 hPa (right).

Accomplishments / Events:

- Evaluation of proposed update to ATMS instrument NEDT specification (Yang and Yang, 2021, "A New Algorithm for Determining the Noise Equivalent Delta Temperature of In-Orbit Microwave Radiometers", IEEE TGRS) was conducted. One full day of N20 ATMS data for 2022-06-01 were processed using (1) operational SDR files with standard NEDT values, and (2) reprocessed SDR files with updated NEDT values. Comparisons with ECMWF analysis show that all impacts are extremely minor (see highlights).

Overall Status:

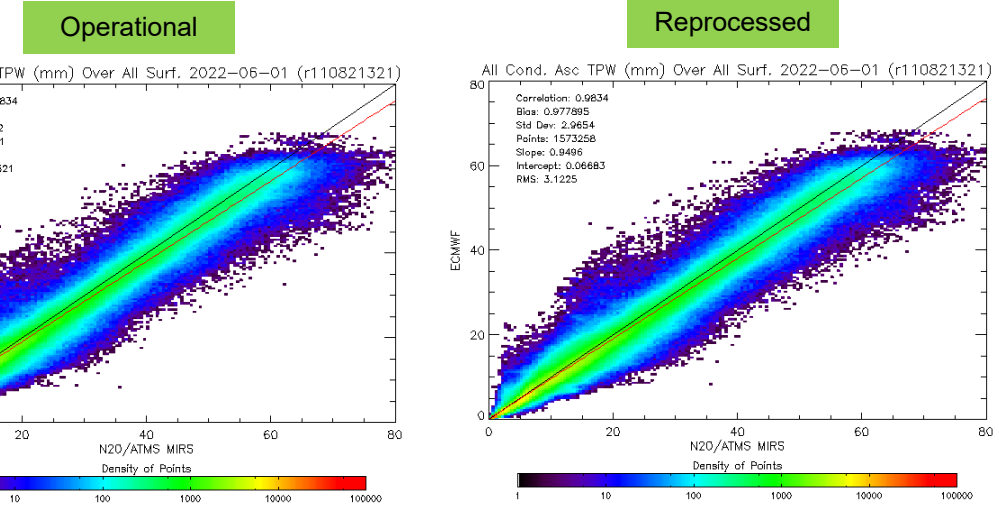
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

- Project has completed.
- Project is within budget, scope and on schedule.
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Issues/Risks:

None

Highlights:



MIRS retrieved TPW compared to ECMWF analysis for the case of operational NEDT values (left) and new proposed NEDT values (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 comprehensive validation study was conducted on the recently delivered ATMS SFR algorithm against both the gauge corrected radar precipitation estimates Stage IV, and snowfall rate estimates from CloudSat Cloud Profiling Radar (CPR). The validation against Stage IV is over CONUS as the radar product is CONUS-only. The CPR-based study is global as well as stratified by regions. The plots in the Highlights section show the validation results against Stage IV. The table below gives the validation statistics against CPR. All metrics meet the JPSS Validated Requirements.

	Global	CONUS	N. America	Eurasia	Greenland	S. Hemi.
Corr. Coe	0.51	0.52	0.57	0.53	0.45	0.49
Bias (mm/hr)	-0.00	0.10	0.01	-0.02	-0.00	-0.01
RMS (mm/hr)	0.37	0.49	0.33	0.32	0.50	0.37

Overall Status:

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

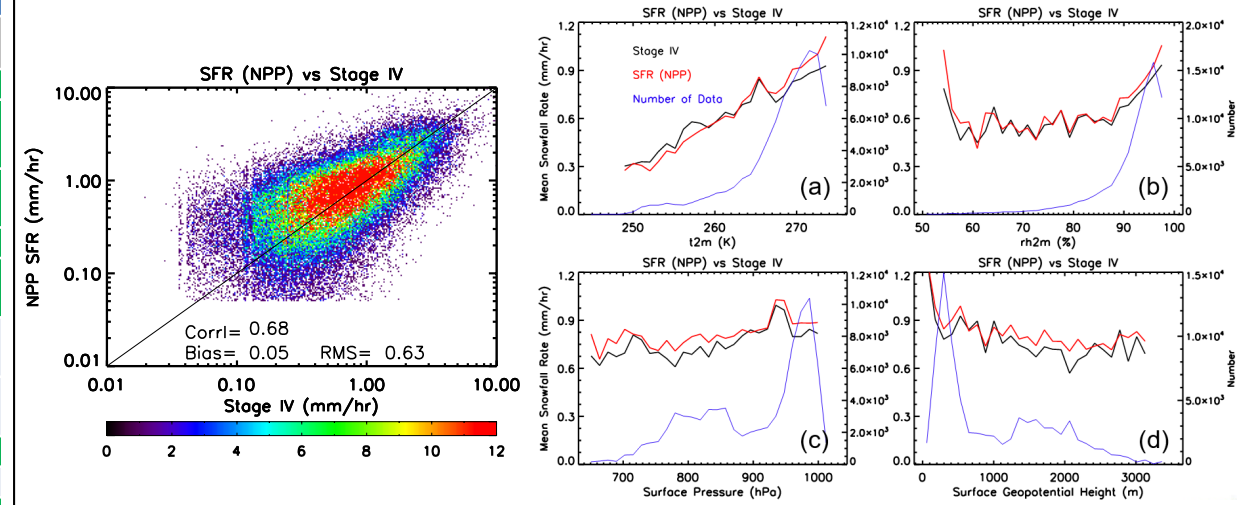
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4. Project has fallen significantly behind schedule, and/or significantly over budget.

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 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		
NOAA-20 and S-NPP stratified validation after algorithm update	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		
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



Left: S-NPP SFR vs. Stage IV scatter plot. Right: Comparisons of averaged SFR and Stage IV stratified by GFS parameters: (a) 2 m temperature; (b) 2 m relative humidity; (c) surface pressure; and (d) surface geopotential height

Accomplishments / Events:

- Assisted OSPO and NDE with anomaly resolution for J02-ready V8TOz. It is now in NDE Operations.
- Assisted OSPO and NDE with OMPS V2.5Limb three-slit processing, ancillary data, and BUFR conversion on NDE I&T. It is now ready for promotion to operations in August.
- Assisted OSPO and NDE with V8Pro Glueware failures. New offsets were derived and tested. They should be in operations soon.
- The J02-ready v4r2 delivery was completed by ASSISTT in July.
- V2.7Limb work is progressing. The Level 1 conversion to granule processin is almost finished. Ancillary and Level 2 code work will begin next.
- Reviewed activities planned for J2 Algorithm Updates and presented in 2020, compared to activities that occurred, and collected lessons learned for J3 Algorithm Updates. All planned science team activities have been completed, with the exception of minor updates to the ATBD/EUM/SMM ASSIST delivery to NDE for V8Pro did not occur as scheduled although delivered to ASSIST in 2/2022 from the science team. Lesson learned is to better coordinate ASSIST deliveries/tracking. These were difficult this year due to contract and personnel changes from STAR to OSGS.

Overall Status:

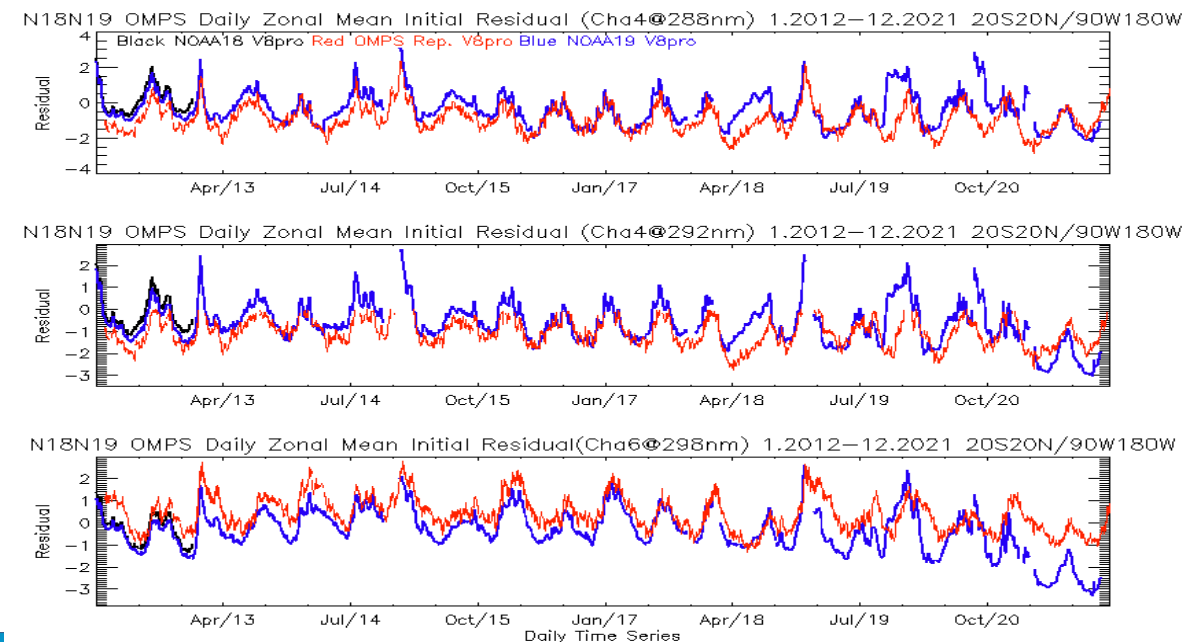
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Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:None

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

Highlights: Ten Years of Reprocessed S-NPP OMPS V8Pro: Initial Residuals



Accomplishments / Events:

- Initial findings regarding reprocessed Passive Microwave Rainfall Retrieval for JPSS GCOMW1 Advanced Microwave Scanning Radiometer-2 (AMSR2) After completing the initial reprocessing of AMSR2 rainfall data record, CISESS GCOM team (Petkovic, Arulraj, Meng) has performed rainfall trend analyses. Using CI computational resources, the team compared the current (v2010) and new (v2017; soon-to-be operational) GPROF retrieval mean monthly rainfall trends at 0.25° scale. Overall, the two algorithm versions long-term level-2 products agree. Notable are i) a pronounced northward shift of the ITCZ and ii) what appears to be MJO-related changes over the Indian Ocean and Pacific warm pool..

Overall Status:

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

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Issues/Risks:

None

Highlights: Trends identified between 2012 and 2021 for Rainfall

- Notable are i) a pronounced northward shift of the ITCZ and ii) what appears to be MJO-related changes over the Indian Ocean and Pacific warm pool..

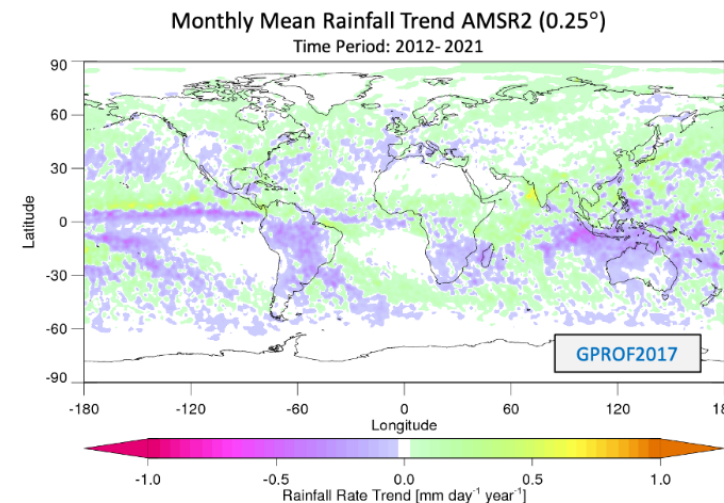


Figure 1 depicts a global distribution of mean monthly rainfall rate trends at 0.25° for the period 2012 to early 2021.

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:

- Assessment results showing H2O vertical statistics for MiRS soundings from respective NPP, NOAA-20, MetOp-B and MetOp-C satellites covering the period from 2019 to present. Overall the MiRS for MetOp appear drier (order of 10%) than their counterparts from NOAA satellites in the lower troposphere. Such differences are of interest since MiRS Total Precipitable Water (TPW) computed from H2O vapor profiles from all satellites are assimilated into NESDIS blended models distributed to users.
- Assessment results for MetOp-B,C v3 NUCAPS sounding products were compiled for a second test period covering 10-days in late May 2022; these complement earlier results from October, 2021. While standard deviations among the NUCAPS are overall similar, bias differences approaching 2K are observed among the 3 NUCAPS MetOp-B products and also versus v3 NOAA-20 likely due to first guess differences. Recommend further study reviewing ECMWF and NUCAPS clear column radiances used for first guess look up tables.

Overall Status:

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Cost / Budget		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
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: NPROVS assesses MiRS soundings

Vertical statistics plots for MiRS H2O vapor fraction (%) from each satellite using special radiosondes as baseline are shown from April 2020 to September 2021 (top) and from September 2021 to July 2022 (bottom); H2O vapor fraction (%) is defined as the ((SAT-Raob) / Raob) for H2O vapor mixing ratio (g/kg). The samples are collocations for which each MiRS system is within 2 hours and 50 km of a given special radiosonde (enterprise assessment). The respective satellite color-coding is NPP, NOAA-20, MetOp-B and MetOp-C with the mean H2O vapor mixing ratio indicated on the inner left axis.

