NOAA JPSS Monthly Program Office

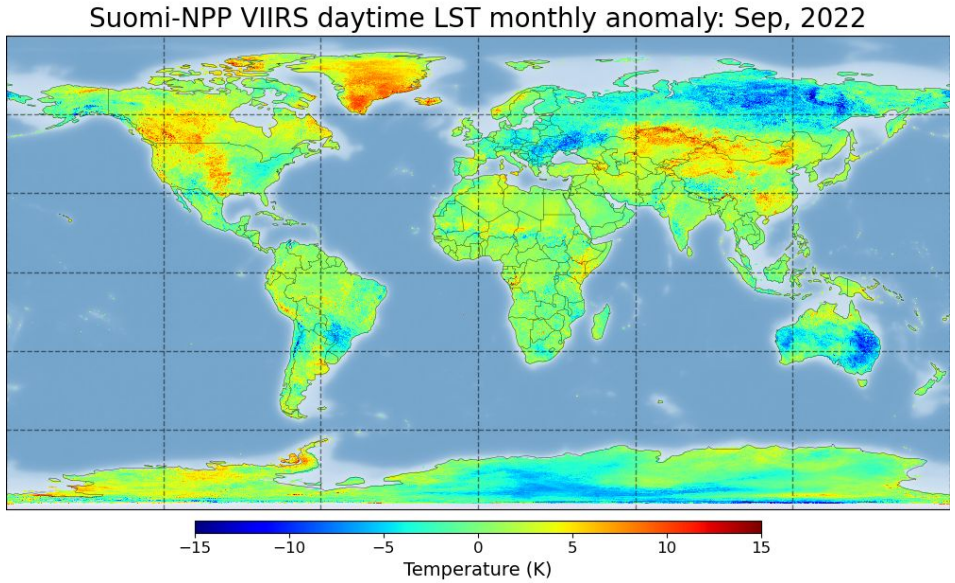
AMP/STAR FY23 TTA

Lihang Zhou, DPMS Deputy
Xingpin Liu, Algorithm Sustainment Lead
Alisa Young, AMP Deputy for Science & JPSS STAR Program Manager (on Detail)
Ingrid Guch, Acting JPSS STAR Program Manager

Nov, 2022

Highlights from the Science Teams (October)

September Land Surface Anomaly

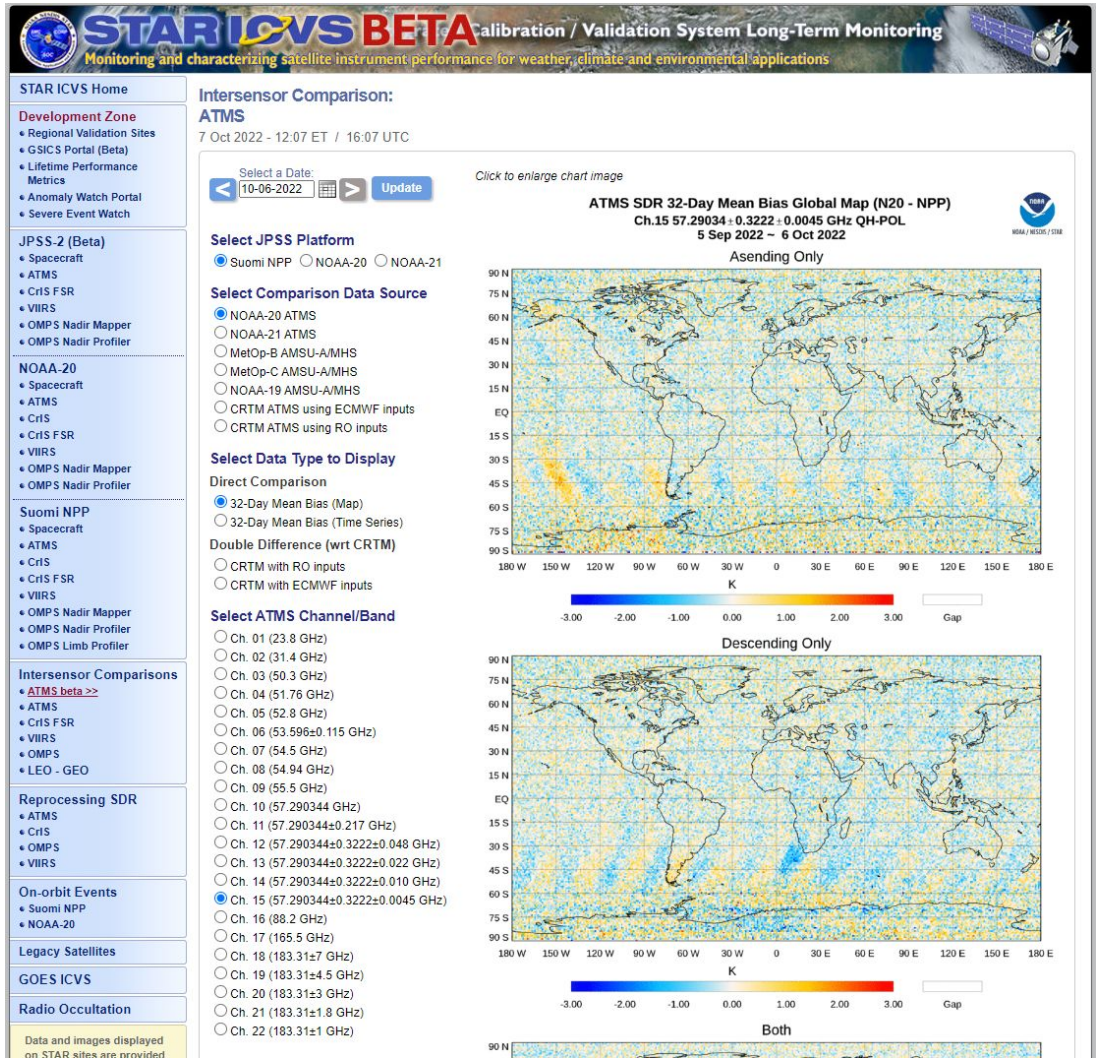


The global land surface temperature anomaly as calculated using SNPP VIIRS daytime monthly anomaly.

The routine global monthly land surface temperature (LST) anomaly has been analyzed and reported since June 2021. The LST anomaly analysis is based on multiple-year (since 2015) LST statistics (i.e., monthly mean and standard deviation). It reveals recent global extreme events relevant to surface temperature variation. The LST data were derived from JPSS/VIIRS sensor observations. It is observed, in September, that the summer heatwaves in Europe came to an end and was replaced by a cold anomaly. However, **a strong warm anomaly was observed in Greenland.** Warm temperatures and severe drought conditions have coexisted in Texas and its neighboring areas for more than half a year, though both of their intensities were reduced this month. In Asia, both the cold anomaly up north and the warm one in the middle extended its coverage further westward.

Highlights from the Science Teams (October)

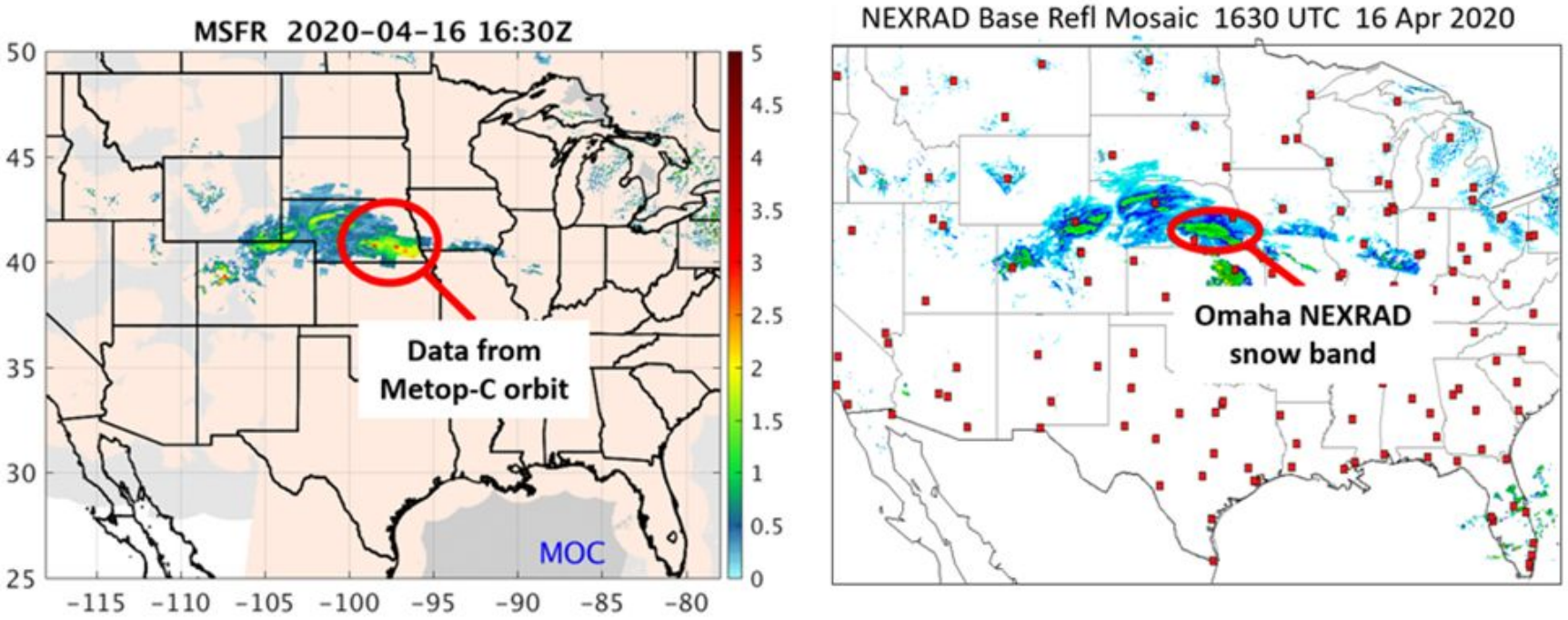
ICVS ATMS inter-sensor comparison web page developed



The ICVS team finished developing the new ATMS inter-sensor comparison web page by listing all comparison products in the same page. Users only need to click a few buttons to pick up target comparison result figures out of more than one hundred of all products. This web page is under pre-operational testing in the ICVS-Beta web site. It will be transitioned to ICVS operational web site soon. Inter-sensor comparison web pages for VIIRS, CrIS, and OMPS will be developed following the ATMS design template soon.

Highlights from the Science Teams (October)

NESDIS Snowfall rate used for snowfall forecasting lesson



The NCAR COMET program has published a new lesson “Satellite Applications for Winter Weather: Mesoscale Banded Snowfall”. The NESDIS snowfall rate (SFR) and its derived product, the radar-satellite merged snowfall rate (mSFR), are two of the products included in the lesson to train forecasters on using satellite observations to forecast mesoscale banded snowfall. The SFR team collaborated closely with the COMET group and provided various materials for the lesson such as images and product use instructions. The COMET lesson can be accessed here. The figure below shows an example of mesoscale banded snowfall captured by mSFR (left) and NEXRAD (right).

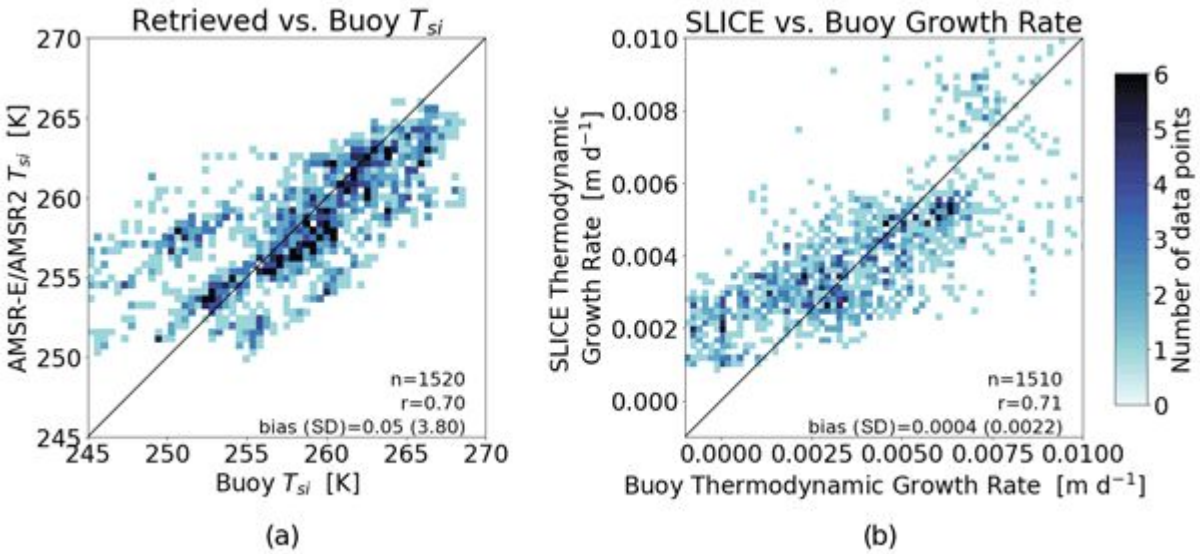
Highlights from the Science Teams (October)

CIRA hosts WMO/EUMETSAT/NOAA RGB Developers and Users Workshop

The RGB Developers and Users Workshop was held both in-person in the new CIRA Commons, and on-line (18-20 October 2022). It was co-hosted by B. Connell (CIRA), D. Lindsey (GOES-R), M. Higgins (EUMETSAT) and WMO. This workshop brought together a variety of national and international satellite imagery users, product developers and training staff, with attendees from 23 countries covering the six WMO Regions. Goals of the workshop include the development of best practices for new/existing RGB imagery products and training materials, improving product distribution to users, promoting a key list of “standardized” RGB recipes and coordinating with the WMO on the development of an official RGB Working Group within the WMO. The workshop also discussed recently developed and upcoming RGB imagery products for use with ABI (GOES-R), VIIRS (JPSS), AHI (Himawari-8/9), AMI (GeoKOMPSAT-2A), FCI (Meteosat Third Generation) and METImage (Metop-SG).

Highlights from the Science Teams (October)

Arctic basin-wide sea ice thickness retrieval paper published



A paper titled "A simple model for daily basin-wide thermodynamic sea ice thickness growth retrieval" by James Anheuser (CIMSS), Yinghui Liu (STAR), and Jeff Key (STAR), has been published in The Cryosphere. The focus of this paper is to develop a retrieval method for estimating thermodynamic sea ice thickness growth from space by linking a thermodynamic sea ice energy balance relation known as Stefan's law and retrieved snow–ice interface temperature from passive microwave satellite data. The paper is available at https://tc.copernicus.org/articles/16/4403/2022/. Citation: Anheuser, J., Liu, Y., and Key, J. R.: A simple model for daily basin-wide thermodynamic sea ice thickness growth retrieval, The Cryosphere, 16, 4403–4421, https://doi.org/10.5194/tc-16-4403-2022, 2022.

Accomplishments

- Delivery Algorithm Packages (DAPs) – Mission Unique Products:

- Delivery Algorithm Packages (DAPs) – Enterprise Products:
  - **10/06/2022** BUFR Toolkit Patch CCAP Delivery to the Cloud (BUFR Toolkit CCAP v5.3.1, Final CCAP Patch for BUFR Toolkit)
  - **10/08/2022** STAR LSA team delivered the VIIRS climatology files to OSPO/NDE/ASSISTT to replace the one used in the latest J2 DAP package (v2r2, No code change related during this replacement)
  - **10/14/2022** GBBEPx Patch CCAP v1r1 Delivery to the Cloud (to address potential stripe-line false alarms in VIIRS M-band fire observations)
  - **10/17/2022** Preliminary CCAP Delivery for MiRS v11r9 to OSPO for SCR (software code review)
    Changes: (1). Updates to the snowfall rate (SFR) algorithm; (2). Implementation of a new and up to date higher-resolution (0.05 degree lat/lon) land/water surface type database derived from global VIIRS data; (3). AIM interface was incorporated (run GFS/EDR units independently or both)
  - **10/26/2022** JPSS Cloud Mask/Height/Phase Final CCAP Delivery (v1.0, for Cloud Mask, Cloud Height, and Cloud Phase products. No scientific changes since the VIIRS Super DAP v3r2 delivery to NDE)
  - **10/26/2022** JPSS Cloud COMP Final CCAP Delivery (v1.0, for Cloud DCOMP and Cloud NCOMP products. No scientific changes since the VIIRS Super DAP v3r2 delivery to NDE)
  - **10/26/2022** JPSS Cloud Base Height/Cloud Cover Layers Final CCAP Delivery (v1.0, for Cloud Base Height (CBH) and Cloud Cover Layers (CCL) products. No scientific changes since the VIIRS Super DAP v3r2 delivery to NDE)
  - **10/26/2022** JPSS Aerosols Final CCAP Delivery (v1.0, for Aerosol Optical Depth (AOD) and Aerosol Detection (ADP) products. No scientific changes since the VIIRS Super DAP v3r2 delivery to NDE)
  - **10/27/2022** Patch DAP to NDE (for VPW SuperDAP to fix winds projection python script)
  - **10/31/2022** ACI CCAP preliminary delivery (Arctic Composite Imagery (ACI) produces hourly a mosaic of geostationary and polar-orbiting satellite data over the Arctic region. For: GOES-16, GOES-17, GOES-18, Meteosat-8, Meteosat-11, Himawari-8, Metop-B, Metop-C, S-NPP, NOAA-20)
  - **11/01/2022** Patch DAP to NDE (CCL Single file patch to SuperDAP to adjust valid ranges of variables)
  - **11/01/2022** Patch DAP to NDE (Offline LSA VIIRS albedo climatology LUT replacement)

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
    - **Oct-2022 STAR teams review/checkout NDE 3-orbit run:**
      - **10/04/2022 OMPS Ozone team provided checkout results (V8TOz, V8Pro)**
      - **10/07/2022 Aerosol team provided ADP checkout results**
      - **10/12/2022 Aerosol team provided AOD checkout results**
      - **10/13/2022 Volcanic Ash provided checkout results**
      - **10/13/2022 Surface Albedo team provided LSA checkout results**
      - **10/14/2022 Cryosphere team provided checkout results (Sea Ice, Snow)**

Accomplishments

- **VIIRS Global Annual Surface Type (AST-2021)**

  09/16/2022: The new VIIRS Annual Surface Type 2021 product (AST-2021, spatial resolution: 1km) based on 2021 whole year surface reflectance data is ready for users to download at STAR FTP sites (see https://www.star.nesdis.noaa.gov/jpss/index.php for details).

  NetCDF version:
  - VIIRS-AST-EMC20-GEO
  - VIIRS-AST-IGBP17-GEO
  - VIIRS-AST-IGBP17-SIN

  Zip version:
  - VIIRS-AST-EMC20-GEO
  - VIIRS-AST-IGBP17-GEO
  - VIIRS-AST-IGBP17-SIN

  Science team also delivered updated ATBD (v2.1, updates for AST-2021):
  - VIIRS Surface Type AST-2021 ATBD

Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	10/04/22, 10/12/22, 10/19/22, 10/26/22, 11/01/22, 11/08/22
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	10/04/22, 10/12/22, 10/19/22, 10/26/22, 11/01/22, 11/08/22
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	10/12/22, 10/26/22, 11/08/22
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	10/04/22, 10/19/22, 11/02/22
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	10/04/22, 11/01/22
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	10/04/22, 11/01/22

Upcoming NOAA-21 Cal/Val Maturity Reviews

- **November, 2022 Maturity Review (11/30/2022):**
  - ATMS TDR/SDR (Beta Maturity)
- **December, 2022 Maturity Review:**
  - ATMS TDR/SDR (Provisional Maturity)
  - VIIRS SDR (Beta Maturity)
  - VIIRS KPP Imagery EDRs (Beta Maturity)
- **January, 2023 Maturity Review:**
  - CrIS SDR (Beta Maturity)
  - OMPS SDR (OMPS-NP & OMPS-TC, Beta Maturity)
- **February, 2023 Maturity Review:**
  - VIIRS SDR ((Provisional Maturity)
  - CrIS SDR ((Provisional Maturity)
  - OMPS SDR (OMPS-NP & OMPS-TC, (Provisional Maturity)
  - VIIRS KPP Imagery EDRs ((Provisional Maturity)
  - VIIRS non-KPP Imagery EDRs (Beta Maturity)
  - OMPS Ozone EDR (V8Pro & V8TOz, Beta Maturity)

Upcoming Milestones/Deliveries

- JSTAR Code/LUT/Product Deliveries:

  DAP to DPMS:
  - Jan-23: ATMS J2 PCT updates (as needed)
  - Jan-23: CrIS J2 Eng Pkg update delivery
  - Jan-23: VIIRS J2 LUTs update delivery
  - Jan-23: OMPS J2 LUTs update delivery

  NOAA-20/JPSS-2 Algorithm DAP to NCCF:
  - Nov-22: J2-ready OMPS LP DAP to ASSISTT
  - Mar-22: J2-ready OMPS LP DAP to NCCF (ASSISTT □ NCCF)
  - Mar-23: J2-ready Ocean Color DAP to NCCF (ASSISTT □ NCCF)

FY23 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates DAPs/CCAPs				
ATMS J2 PCT updates (as needed)	Jan-23	Jan-23		
CrIS J2 Eng Pkg update delivery	Jan-23	Jan-23		
VIIRS J2 LUTs update delivery	Jan-23	Jan-23		
OMPS J2 LUTs update delivery	Jan-23	Jan-23		
OMPS LP J2 ready DAP (to NCCF)	Mar-23	Mar-23		
Ocean Color J2 ready DAP (to NCCF)	Mar-23	Mar-23		
CCAP to NCCF (Aerosol AOD & ADP)	Oct-22	Oct-22	10/26/22	
CCAP to NCCF (CM,Phase, Height, CBH, CCL, COMP)	Oct-22	Oct-22	10/26/22	
CCAP to NCCF (VPW, Cryosphere, Volcanic Ash)	Nov-22	Nov-22		
CCAP to NCCF (LST, LSA)	Nov-22	Nov-22		
CCAP to NCCF (VI, GVF)	Dec-22	Dec-22		
CCAP to NCCF (MiRS, OMPS NP V8Pro)	Jan-23	Jan-23		
CCAP to NCCF (HEAP, N4RT)	Mar-23	Mar-23		
CCAP to NCCF (ACSPO SST)	Apr-23	Apr-23		
CCAP to NCCF (VH, VOLCAT Phase 1, OMPS V8TOz)	May-23	May-23		
CCAP to NCCF (Gridded Land)	Jul-23	Jul-23		
CCAP to NCCF (Cloud Provisional)	Jul-23	Jul-23		

FY23 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
Algorithm Cal/Val/LTM				
JPSS-2 First Light Images (Nov-22: ATMS; Dec-22: CrIS, VIIRS, OMPS)	Dec-22	Dec-22		
FY22 End of Year Science Team Presentations (all teams)	Nov-22	Nov-22		
FY24 Program Management Review (all teams)	Jun-23	Jun-23		
AST-2022 (VIIRS Annual Surface Type)	Sep-23	Sep-23		
Transfer reprocessed S-NPP SDR data to CLASS (finish by Oct-2023); Start EDR reprocessing for some products	Sep-23	Sep-23		
JPSS-3 pre-launch test data review/analyze (SDR teams); JPSS-3/JPSS-4 activities/reviews support	Sep-23	Sep-23		
Maintain / Update ICVS (develop ICVS JPSS-2 modules to support varies activities: monitoring, inter-sensor comparison, …)	Sep-23	Sep-23		
Maintain / Expand (to include JPSS-2 products) JSTAR Mappers	Sep-23	Sep-23		
Images of the Month	Monthly	Monthly		

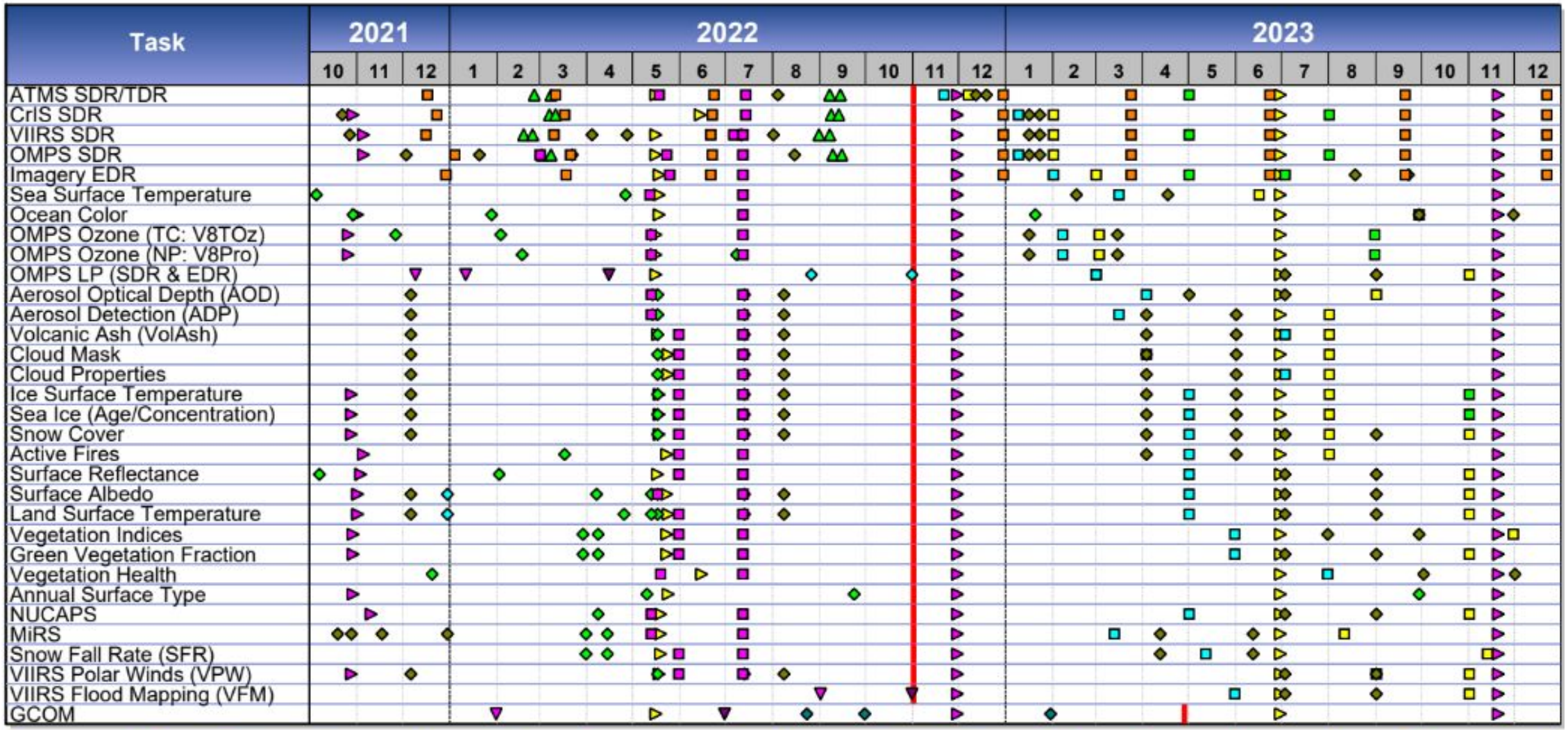
FY23 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
NOAA-21 Cal/Val Maturity Reviews				
ATMS TDR/SDR (B/P: Dec-2022; V: May-2023)	May-23	May-23		
CrIS SDR (B: Jan-23; P: Feb-23; V: Aug-23)	Aug-23	Aug-23		
VIIRS SDR (B: Dec-22; P: Feb-23; V: May-23)	May-23	May-23		
OMPS SDR (B: Jan-23; P: Feb-23; V: Aug-23)	Aug-23	Aug-23		
KPP VIIRS Imagery (B: Jan-23; P: Feb-23; V: May-23)	May-23	May-23		
Non-KPP VIIRS Imagery (B: Feb-23; P: Mar-23; V: Jul-23)	Jul-23	Jul-23		
Clouds (B: CM: Apr-23; Others: Jul-23; P: Aug-23)	Aug-23	Aug-23		
Aerosol AOD (B: Apr-23; P: Sep-23)	Sep-23	Sep-23		
Aerosol ADP (B: Mar-23; P: Aug-23)	Aug-23	Aug-23		
Volcanic Ash (B: Jul-23; P: Aug-23)	Aug-23	Aug-23		
Cryosphere (B: May-23; P: Aug-23 for Sea Ice & Binary Snow)	Aug-23	Aug-23		
Active Fires (B: May-23; P: Aug-23)	Aug-23	Aug-23		
LST/LSA/SR/GVF/VI (B: May-23)	May-23	May-23		
Vegetation Health (B: Jul-23)	Jul-23	Jul-23		
Ocean Color (B: Sep-23)	Sep-23	Sep-23		
SST (B: Mar-23; P: Jun-23)	Jun-23	Jun-23		
VPW (B: Sep-23)	Sep-23	Sep-23		
VFM (B: May-23)	May-23	May-23		
NUCAPS (B: May-23)	May-23	May-23		
MiRS (B: Mar-23; P: Aug-23)	Aug-23	Aug-23		
SFR (B: May-23)	May-23	May-23		
OMPS NP EDR V8Pro & V8TOz (B: Feb-23; P: Mar-23)	Mar-23	Mar-23		
OMPS LP (B: Mar-23)	Mar-23	Mar-23		

FY23 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	**10/04/22, 10/12/22, 10/19/22, 10/26/22, 11/01/22, 11/08/22**
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	**10/12/22, 10/26/22, 11/08/22**
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	**10/04/22, 11/01/22**
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	**10/04/22, 10/12/22, 10/19/22, 10/26/22, 11/01/22, 11/08/22**
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	**10/04/22, 10/19/22, 11/02/22**
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	**10/04/22, 11/01/22**
NOAA-21: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	
NOAA-21: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	
NOAA-21: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	
Mx builds deploy regression review/checkout (Mar-23 Mx8; Jun-23 Mx9; Sep-23 Mx10; SDRs and VIIRS Imagery teams)	Sep-22	Sep-22	

STAR JPSS Schedule: TTA Milestones



Color code:

Green: Completed Milestones

Gray: Non-FY22 Milestones

ATMS SDR

September, 2022

Accomplishments / Events:

- Performed S-NPP ATMS recovery evaluation before and after the EEPROM patch update. Provided instrument health status/performance and science data quality assessment to ensure science data meet the operational requirement for downstream product applications.
- Verified JPSS-2 ATMS Processing Coefficients Table (PCT) with the Post-TVAC alignment measurement mounting coefficients.
- Reviewed all JPSS-2 ATMS Post-Launch Tasks (PLTs) and JPSS-2 ATMS Cal/Val Plan tasks to provide science team comments to NASA flight team. The reviewed PLTs include ATMS roll maneuver, pitch maneuver, activation evaluation, optimal space view profile selection, and environmental characterization. The new PLT, scan sync offset, will be discussed within team to ensure what the expected outputs will be provided in the test report.
- Revisited JPSS-2/JPSS-3 nonlinearity correction coefficients generation algorithm by including the instrument TVAC target temperature gradient correction. Compared the SDR bias between two sets of nonlinearity correction coefficients. The JPSS-2 ATMS nonlinearity coefficients will be updated after obtaining more accurate reflector emissivity from pitch maneuver PLT.

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.*

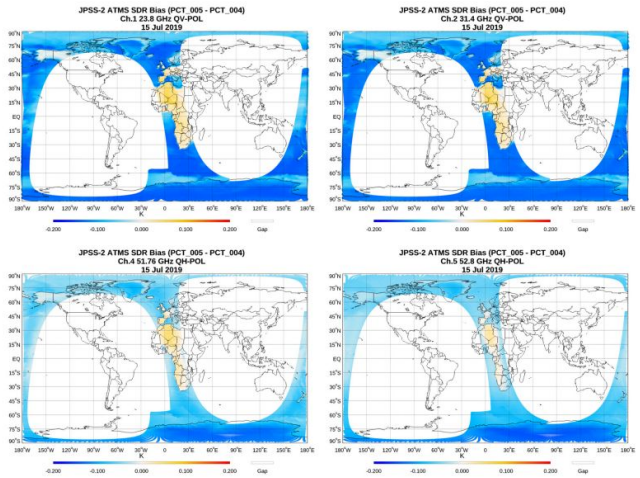
Issues/Risks:

None

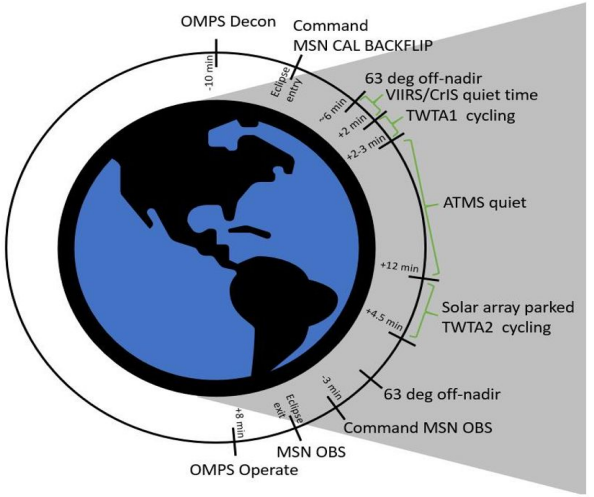
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Generate JPSS-2 ATMS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	02/25/22	pre-dynamic
Update of ATMS non-linearity correction coefficients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

JPSS-2 ATMS SDR bias after nonlinearity correction coefficients updated by applying the thermal gradient correction



JPSS-2 ATMS pitch maneuver PLT configuration



CrIS SDR

September, 2022

Accomplishments / Events:

- Developed the PCT file based on the J2 Post-TVAC mounting matrix data and delivered it to ASSISTT team
- A completed working draft of the CrIS STAR SDR Cal/Val website is available at https://www.star.nesdis.noaa.gov/cris/. It includes the SNPP and NOAA-20 daily metrics and cumulative metrics in terms of telemetry, radiometric, spectral, noise, geolocation, and inter-comparison, and events and anomalies log (**Figs. 1-4).**
- Presented and discussed recent developments of the CrIS PC scores and plans for the operationalization of the CrIS PC score product with the JPSS management.
- Continued the development of analysis tools to support the evaluation of the CrIS sensor and SDR data: 1) extended the CrIS Telemetry toolbox to provide the stage cooler temperature data and neon-calibrated laser wavelength and laser wavelength drift data, and to generate plots for the CrIS Cal/Val website; 2) extend the current geolocation assessment code to be able to generate daily and hourly time series
- Continued the studies of: 1) the sensitivity plots of NOAA-20 CrIS (**Fig. 5**); 2) CrIS and COSMIC-2 Intercomparison; 3) development of the CrIS spike algorithm (**Fig. 6**); 4) PC scores (**Figs. 7-9)**; 5) temperature drift algorithms
- Continued the drafting of the manuscript of 1) the CrIS Spike Algorithm, 2) the Neon Lamp Mitigation Plan, and 3) On-orbit Performance of the NOAA-21 CrIS SDR Product.
- In the JPSS CRIS SDR Team Biweekly Meeting, discussed: 1) CrIS Principal Component (PC) scores development; 2) T(z) and H_2O(z) Trends Derived from SNPP-CrIS: Testing Stability.

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

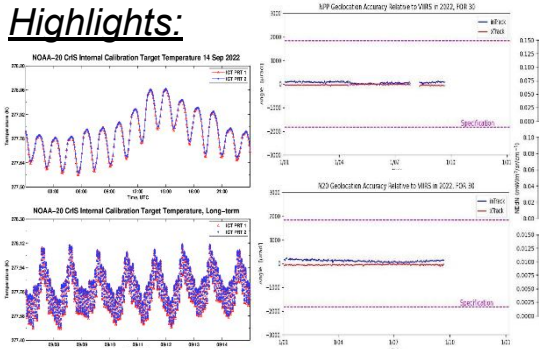
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

- The CrIS Team got a 100TB on STAR servers (data638 and data645) in May 2022. However, the CrIS Team is still in need of hardware/software resources. Presently, there is only one server dedicated to 6 CrIS Team members. There is a high risk for the CrIS SDR Team to continue on such a single server environment for the operational CrIS Cal/Val activities that include 5 CrIS sensors (SNPP, JPSS-1 to -4). This may affect the timely completion of deliverables and program milestones. The recommendation is to have one additional server/storage as soon as possible (< 2 months) and add another server/storage in the next months, preferably before the launch of the J2 CrIS. A new MATLAB license is also required. Corresponding hardware/software quotations and SNO have been submitted.

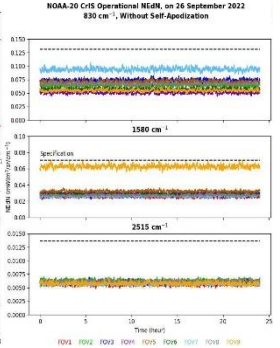
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	10/29/21	
Deliver the engineering packet v42 with new mapping parameters for SNPP CrIS	Oct-21	Oct-21	10/22/21	
Report the comparison assessment of CrIS radiometric nonlinearity correction formalism	Feb-22	Mar-22	03/16/22	Anomaly Resolution
Support and participate in the J3 CrIS Pre-ship Review	Mar-22	Apr-22	04/19/22	Vendor Rescheduled
Generate JPSS-2 CrIS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	03/07/22	pre-dynamic
Verify and finalize JPSS-2 CrIS processing coefficients table (PCT) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	May-22	Jun-22	Jun-22	JCT3-TVAC delay
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to ASSISTT	May-22	Sep-22	09/08/22	03/07/22
Deliver final launch-ready JPSS-2 CrIS PCT/MM-coef DAP to DPMS	Jun-22	Sep-22	09/13/22	03/11/22
JSTAR CrIS Website upgrade	Aug-22	Sep-22	09/25/2022	Dependency on 3rd party (Web Developer)
Demonstrate the functionality of the methods planned to be used to mitigate the failure of the J2 CrIS neon calibration system	Sep-22	Sep-22	Sep-22	
New developments and studies (working on the CrIS principal components generation, enhance the infrared cloud detection algorithm for radiometric assessment)	Aug-22	Jun-22	Jun-22	
FY23 Program Management Review	Jun-22	Jun-22	06/14/22	
JPSS-3 CrIS pre-launch measurement and test data review/analyze	Sep-22	Sep-22	Jul-22	
JPSS-3 CrIS Pre-launch evaluation tools development	Sep-22	Sep-22	Jul-22	
JPSS-3 Flight/Ground support	Sep-22	Sep-22	Jul-22	
Radiometric inter-comparison of S-NPP and NOAA-20 CrIS SDR data against other IR observations, including MetOp/IASI, AQUA/AIRS and GOES/ABI	Jun-22	Jun-22	Jun-22	
Perform regular RDR and SDR data analysis for instrument and data health	Sep-22	Sep-22	Sep-22	
Support investigation and resolution of anomalies from CrIS sensors including potential intensive Cal/Val activities	Sep-22	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 I&T	

Highlights:

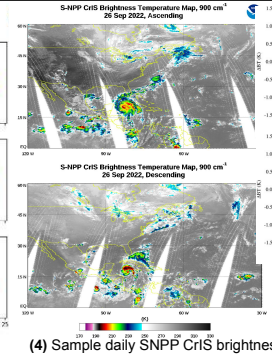


(1) Single-Day (top) and long term monitoring (bottom) of the NOAA-20 CrIS telemetry- ICT temperature.

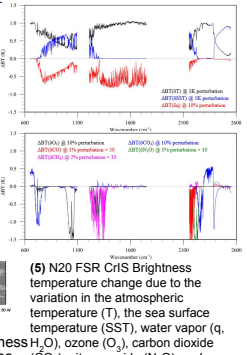
(2) Geolocation accuracy for CrIS S-NPP (top) and NOAA-20 (bottom) in 2022 for FOR 30.



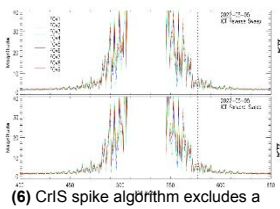
(3) Sample daily NOAA-20 CrIS NEDN for 830 cm^{-1}, 1580 cm^{-1}, and 2515 cm^{-1} for Sept. 26, 2022.



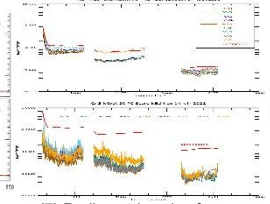
(4) Sample daily SNPP CrIS brightness temperature maps for Sept. 26, 2022 to show **Hurricane Ian** and other cyclones over the Atlantic and Pacific basins.



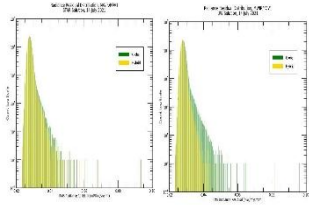
(5) N20 FSR CrIS Brightness temperature change due to the variation in the atmospheric temperature (T), the sea surface temperature (SST), water vapor (q, H_2O), ozone (O_3), carbon dioxide (CO_2), nitrous oxide (N_2O), carbon monoxide (CO), and methane (CH_4) for clear-sky and over ocean condition.



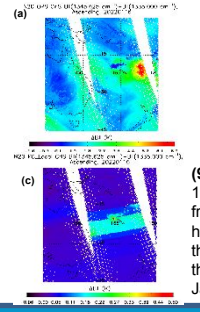
(6) CrIS spike algorithm excludes a wider kernel portion of interferogram to avoid false detection. The excluded portion is set to be the IFGM index range [475 – 576] indicated by two vertical dotted lines.



(7) Radiometric noise from operational N20 SDR (left) and from the PC reconstructed radiance on July 14, 2021. The NEdN improved by 8X.



(8) Residual RMS distribution (global and hybrid) for (a) STAR approach and (b) the UW approach. The small differences are due to the different SVD packages (STAR: Python, UW: Matlab).



(9) BT difference between 1345.625 cm^{-1} and 1335 cm^{-1} from (**a**) the operational, (**b**) the hybrid PC-reconstruction, and (**c**) the local PC-reconstruction for the Tonga Volcanic Eruption on Jan. 16, 2022.

VIIRS SDR

September, 2022

Accomplishments / Events:

- Participated in the CALCON 2022 meeting and presented NOAA-20 VIIRS Day Night Band (DNB) on-orbit calibration results using solar diffuser and lunar observations
- Attended the Committee on Earth Observation Satellite (CEOS) Working Group on Calibration and Validation (WGCV) Infrared and Visible Optical Sensors (IVOS) subgroup meeting in Reston, VA, from Aug. 29 to Sep. 2, 2022: noted interest in the reprocessed NPP VIIRS SDR data for the Libya-4 Pseudo-Invariant Calibration Site (PICS) for PICSCAR (https://picscar.magellium.com/)
- Delivered report on "The Use of the Railroad Valley (RRV) Site at NOAA" as input for NOAA/NASA Collaboration meeting
- 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 9/25/2022

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21	11/05/21	
VIIRS SDR (Rev.E) and Geo (Rev.B) ATBD update			08/03/22	
DAP delivery (ADR9760/CCR5724, N20 VIIRS-SDR-F-PREDICTED-LUT Update #7)			10/27/21	
ADR9903/CCR5939 VIIRS SDR Not Produced as Expected for Defective Data Packets			04/04/22	DAP to DPMS
DAP (ADR9904/CCR6099, VIIRS SDR Excessive Reflectance Values) to DPMS			07/11/22	
DAP (ADR10038/CCR6103, JPSS-2 VIIRS SDR QA-V2 LUT Post-TVAC Update) delivery			08/01/22	
Generate JPSS-2 VIIRS mounting matrix coefficients (MM-coef) based on the JPSS-2 pre-launch instrument interface alignment measurements report	Mar-22	Mar-22	02/18/22	pre-dynamic
Verify and finalize JPSS-2 VIIRS lookup tables (LUTs) using JPSS-2 pre-launch JCT data (JCT-3 satellite TVAC data)	May-22	Aug-22	07/19/22	QA-V2 LUT
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to ASSISTT	May-22	Aug-22	08/31/22	02/18/22
Deliver final launch-ready JPSS-2 VIIRS LUTs/MM-coef DAP to DPMS	*Jun-22*	*Sep-22*	09/07/22	02/24/22
FY23 Program Management Review	Jun-22	Jun-22	05/16/22	
NOAA-20 VIIRS TEB RVS and Offset change testing and validation	Dec-21	Dec-21	Nov-21	
RDR code change to handle anomalous packets(similar to DB anomaly over Mexico)	Mar-22	Mar-22	Mar-22	
Develop VIIRS Global Area Coverage (VGAC) production capabilities in collaboration with NCEI to meet user needs (ISSCP, EUMETSAT, and others)	Sep-22	Sep-22	Sep-22	
OnDemand reprocessing delivery to CLASS (SNPP recalibrated & reprocessed VIIRS SDR)	Sep-22	Oct-23		Data volume
NOAA-20 VIIRS recalibration & reprocessing (on CLOUD)	Sep-22	Dec-22		Adding 2021
Delivery of VIIRS RSB calibration LUTs to mitigate degradation, as needed	Sep-22	Sep-22	11/04/21	
Delivery of VIIRS DNB straylight LUTs, as needed	Sep-22	Sep-22		Not needed
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	09/21/22	Report 4
JPSS-3 VIIRS pre-launch measurement and test data review/analyze	Sep-22	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	Monthly	no NPP in 7/22

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			

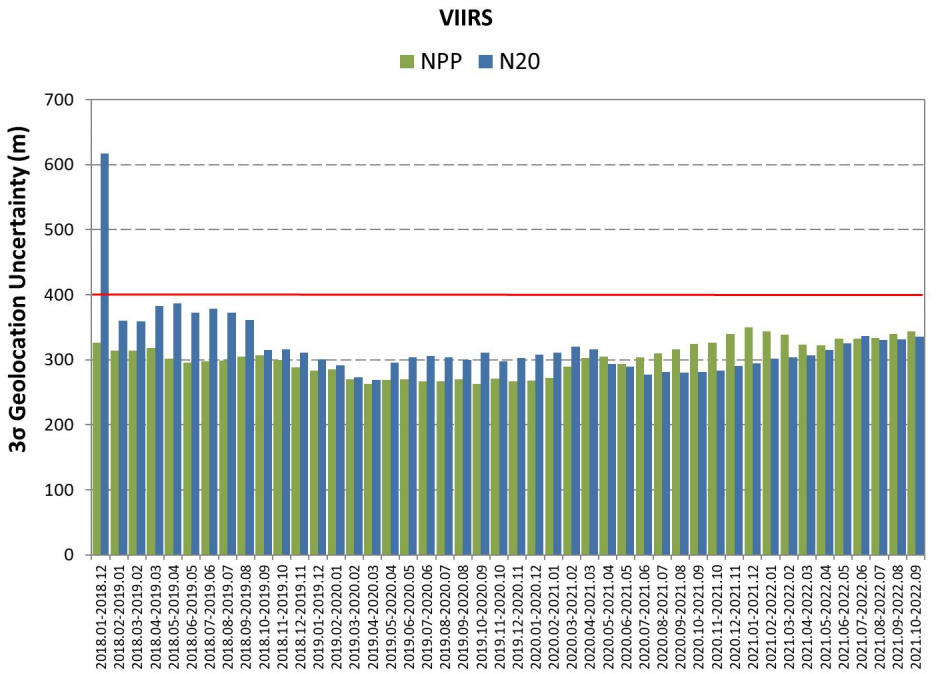
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Highlights:

Uncertainty of the VIIRS SDR geolocation products for Suomi NPP and NOAA-20 (N20) since January 2018: the at-nadir requirement (<400 m) is shown by the red line



OMPS SDR

September, 2022

Accomplishments / Events:

- Derived and delivered OMPS biweekly NP solar irradiance bi-weekly LUTs.
- Delivered the OMPS NM/NP weekly dark LUTs.
- Derived and delivered the J2 OMPS mounting matrix coefficient LUTs and error assessment.
- Conducted the J2 OMPS pre-launch straylight correction analysis and opened a new DR10037. An analysis report was completed. Fig. 1 provided an example of the results on impact on radiance quality improvement.
- Continued improving the inter-sensor code prototype development, e.g., SNPP/NOAA-20/J2 OMPS, OMPS-GOME-2, by leveraging the ICVS work.
- Continued the risk analysis for high-resolution JPSS-02 OMPS NM by using high-resolution RDR data. Fig. 2 presents preliminary results of the averaged radiance differences, showing the difference less than 1.5%. However, they have relatively large standard deviations depending upon wavelength and/or viewing condition (the figure is omitted).
- Continued further updating, refining, and improving the OMPS SDR VCRTM V3.0 packages.
- Continued improving the NOAA OMPS dark calibration packages by adding a geolocation computation capability.
- Continued analyzing SNPP NP and NM Dark data from both the Image Region and the Storage Region to prepare for future weekly dark LUTs by using our own code processing package.
- Revised the manuscript about OMPS NP lifetime performance per the reviewers' comments.

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	09/09/22	03/02/22
Deliver final launch-ready JPSS-2 OMPS LUTs/MM-coef DAP to DPMS	Jun-22	Aug-22	09/16/22	03/08/22
FY23 Program Management Review	Jun-22	Jun-22	05/16/22	
OMPS SDR Calibration ATBD (update)	Jun-22	Sep-22	FY23	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	Aug-22	
OMPS polarization impact and mitigation algorithm development	Aug-22	Oct-22	FY23	SNPP recovery priority
1) J2 OMPS SNR calculation algorithm code update 2) J2 OMPS SDR solar intrusion detection code prototype	Jan-22	Jan-22	Jan-22	
1) J2 OMPS NM/NP Day-1 solar analysis code prototype using NOAA-20 as proxy 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 matric coef.	May-22	Sep-22	Sep-22	Lack of measurement data
OMPS dark and solar raw flux processing code update (use NASA L1B data as inputs)	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	
J2 High resolution risk mitigation algorithm development update in support to J2	Sep-22	Sep-22	Sep-22	DR 10039 about J2 TC code change was open
J2 OMPS pre-launch straylight correction analysis	Sep-22	Sep-22	Aug-22	DR10037 (J2 stray light LUT update)
OMPS SDR quality validation baseline tool prototype developments (e.g., RTM-DD, SNO-DD, NM (VIIRS)-DD, 32D-AD)	Sep-22	Sep-22	Sep-22	
NM/NP SDR re-processing and data stability analysis update	Sep-22	Sep-22	Sep-22	
OMPS Wavelength registration change investigation from ground to flight	Sep-22	FY23		Launch delay (no data)
Assess impact of a new solar reference data on OMPS NM/NP SDR data quality	Sep-22	FY23		Very low priority
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		Sep-22	
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	Sep-22	
Operational Support: Bi-weekly update NP Wavelength and solar flux (S-NPP & NOAA-20)	Bi-Weekly	Bi-Weekly	Sep-22	

Overall Status:

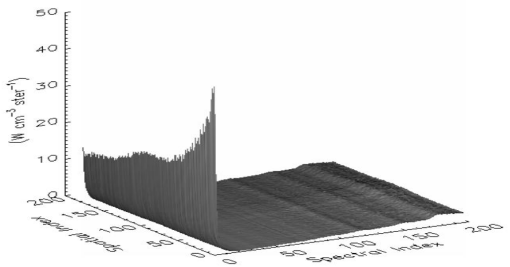
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule			x		

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) Initial calibration (JCT3 OMPS TC radiance image) (An erroneous SL LUT; Strips remain)



(b) Improved calibration (Reprocessed OMPS TC radiance image) (Update SL LUT; Strips removed)

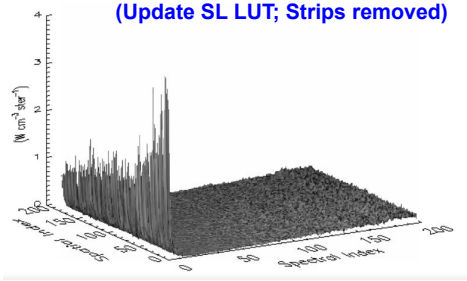


Fig. 1 Comparison of original radiance images by using the J2 JCT TVAC OMPS TC test data and reprocessed data with the corrected stray light LUT. Improvement was made for spatial pixels, especially for the nadir pixel and the right edge pixel where OMPS operational codes erroneously parsed Earth view sample table.

Preliminary averaged radiance difference (%) between high. and med resolutions

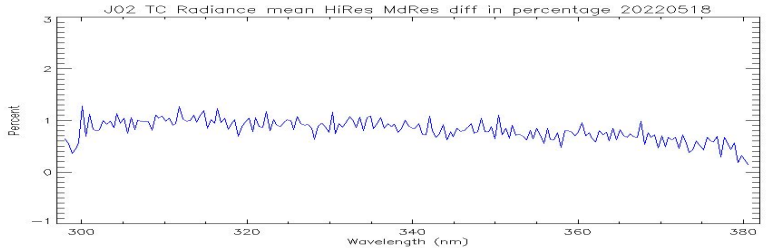


Fig. 2 Averaged radiance Difference (%) between J2 OPS and backup resolutions using the JCT2 TVAC OMPS TC RDR data (~4 orbits). Here, the difference = [High Resol. (J2 OPS) – Med. Resol. (J2 Backup)]*100.0/ High Resol. (J2 OPS)

SDR Reprocessing

September, 2022

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 ~2.97 T/day
- The reprocessed SNPP VIIRS SDR data from 1/2/2012 to 1/26/2015 (**585.82T, 36.27**% of total) has been completed as of September 30, 2022.
- In September 2022, we completed transition of 87.36T VIIRS data (1,264,444 files).
- It's expected that the VIIRS data transition will complete in October, 2023.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
~~FY23 Program Management Review~~	~~Jun-22~~	~~Jun-22~~		~~Not scheduled~~
Complete planning and testing on transition of S-NPP reprocessed SDR data to CLASS	Oct-21	Oct-21	Oct-21	
Complete transition of 800 Tb of reprocessed S-NPP SDR data to CLASS	Sep-22	Sep-22	Sep-22	The transition of all reprocessed data is projected to complete in Oct-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 **36.27**%
Total				1764.65	

ICVS

September, 2022

Accomplishments / Events:

- Provided near real time US east coast hurricane Ian and Fiona warm core 3D evolution monitoring using JPSS ATMS and VIIRS SDR data to demonstrate JPSS high quality satellite data.
- Supported S-NPP ATMS EEPROM patch upload recovery activities by providing NRT S-NPP ATMS RDR and SDR trending products. Submitted ATMS status report to JPSS and OSPO teams.
- Added new VIIRS and CrIS instrument telemetry trending dynamic display to ICVS beta for pre-operational testing per the NASA flight team's request to support JPSS instrument trending analysis.
- Developed new ICVS interactive vector web page to include ICVS all available dynamic trending product display ability. JPSS-2 post-launch data dynamic trending capability is also ready.
- Updated the OMPS RDR parameter monitoring tool by using newly generated NOAA dark SDR data.
- Worked with the OMPD EDR team together to prepare monitoring tool of OMPS LP SDR data.
- Updated ATMS SDR data quality notification email to include detailed information about all triggered SDR quality flags.
- Finished developing new ATMS inter-sensor comparison web page to display all NOAA-20 vs. S-NPP ATMS related inter-sensor bias products, as well as ATMS vs. AMSU/MHS inter-sensor bias products.
- Initialized the cloud detection algorithm development by using VIIRS cloud products as truth.
- Revise the manuscript about ATMS AI manuscript per reviewers' comments.

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

Overall Status:

	Green[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.*

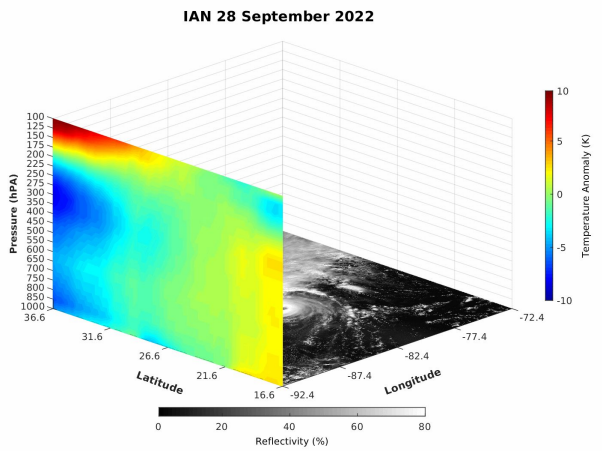
Issues/Risks:

None

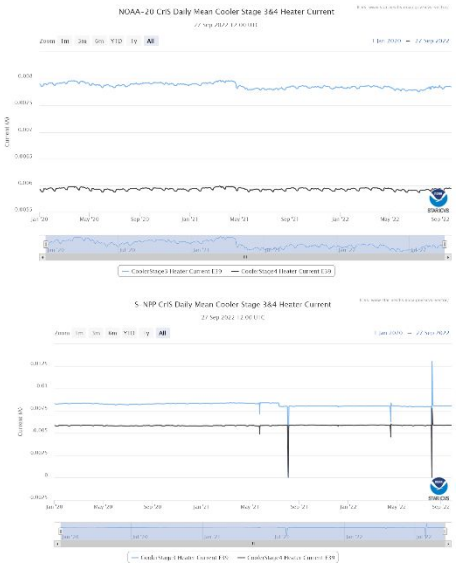
Highlights:

Significantly contribute to STAR SDR Teams

(a) Hurricane Ian warm core 3D structure derived from NOAA-20 ATMS and VIIRS SDR data



(b) CrIS trending in ICVS vector web page for NASA flight team



VIIRS Imagery

September, 2022

Accomplishments / Events:

- Continued efforts to develop a CONUS sector for VIIRS Imagery on Polar SLIDER
  - Images are being generated, display infrastructure work continues
- Real-time Imagery monitoring via Polar SLIDER continues year-round
- McIDAS-V Display capability for VIIRS EDRs and RGBs has been developed and polished over the past year, and sample scripts were developed for users
- NPP and N20 new moon data being saved locally for development of new N20 NCC LUT
- Journal Articles Submitted or Published by team member(s) on VIIRS Imagery topic
  - Combs, C.L.; Miller, S.D. The Far-Reaching Usage of Low-Light Nighttime Data. Remote Sens. 2022, submitted
- Recent VIIRS Imagery Blog Posts
  - Mid-Sep 2022 Western US Fires
  - Hurricane Ian
- Recent VIIRS Imagery Social Media Posts
  - VIIRS NCC captures smoke from Mosquito wildfire
  - VIIRS NCC imagery of Hurricane Ian morning before FL landfall

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			

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:

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	Sep-22	continuing
Realtime Imagery monitoring and display systems (SLIDER, etc.)	Sep-22	Sep-22	Sep-22	continuing
Images of the Month to STAR JPSS Program/website and interesting Imagery to Social Media outlets	Monthly	Monthly	Sep-22	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

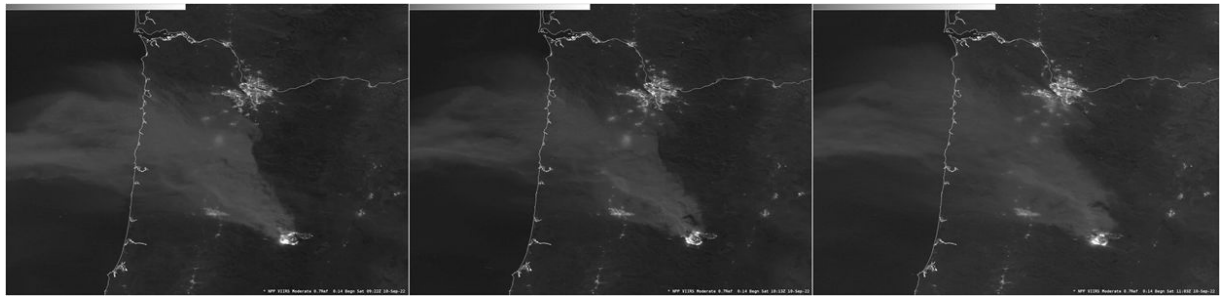


Figure: 0922 UTC, 1013 UTC, 1103 UTC 10 Sep 2022 S-NPP and NOAA-20 VIIRS Day Night Band (DNB) Near Constant Contrast (NCC) product over northwest Oregon. Cedar Creek Fire (lower right) glow and smoke plume are apparent, as well as city lights.

Clouds

September, 2022

Accomplishments / Events:

- CIRA's new website for long-term monitoring and product evaluation of VIIRS CBH/CGT is now publicly released, which includes daily global mean distributions of NDE operational and local CLAVR-x CBH/CGT, time series, and comparisons with ARM surface data.
- The CIRA team submitted a manuscript on VIIRS CBH and aviation applications using 3D cloud information to *Remote Sensing JPSS VIIRS 10-yr Special Issue* (by Y.J. Noh and CIRA/NOAA co-authors).

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:

- ***See next slides***

Highlights:

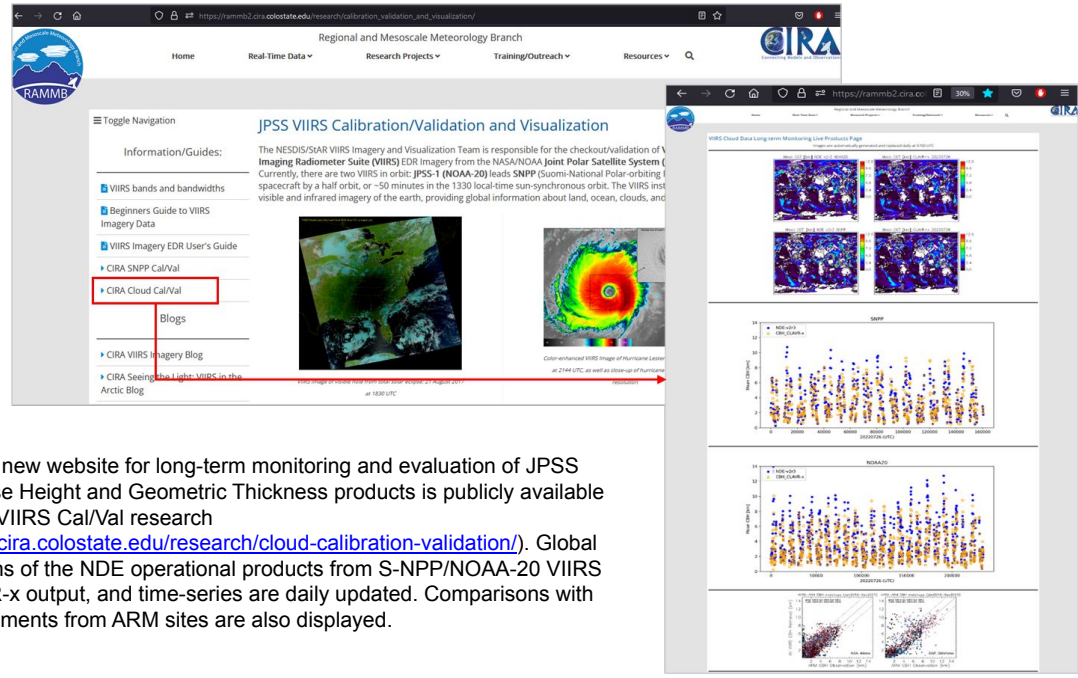


Figure 1. CIRA's new website for long-term monitoring and evaluation of JPSS VIIRS Cloud Base Height and Geometric Thickness products is publicly available as part of JPSS VIIRS Cal/Val research (https://rammb2.cira.colostate.edu/research/cloud-calibration-validation/). Global mean distributions of the NDE operational products from S-NPP/NOAA-20 VIIRS and local CLAVR-x output, and time-series are daily updated. Comparisons with surface measurements from ARM sites are also displayed.

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	Sep-22	ongoing work
Work with NCEP on All Sky Radiance (ASR) assimilation. Adjust mask as necessary	Sep-22	Sep-22	Sep-22	ongoing work
Apply CALIPSO tools to NDE Mask with Lunar Ref	Sep-22	Sep-22	Sep-22	ongoing work
Continue collaboration wtith OAR/ESRL/GML on use of RadFlux Cloud Fraction for Verification including high-latitude sites	Sep-22	Sep-22	Sep-22	ongoing work
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22	Sep-22	
Support consistency validation of products from CSPP	Sep-22	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	Sep-22	ongoing work
Modify phase as needed based on height/winds interaction and development from GOES-R	Aug-22	Sep-22	Sep-22	ongoing work
Support S-NPP and NOAA-20 EDR monitoring	Sep-22	Sep-22	Sep-22	
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22	Sep-22	
Support consistency validation of products from CSPP	Sep-22	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	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	Sep-22	ongoing work
Verify extending the treatment of scattering to support 3.75 micron. Needed for NCOMP replacement	Aug-22	Sep-22	Sep-22	ongoing work
Continue work on ACHA COMP and begin JPSS-2 ACHA COMP validation plan	Aug-22	Sep-22	Sep-22	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	Sep-22	ongoing work
Support Polar AMVs as needed including use of CrIS	Aug-22	Sep-22	Sep-22	ongoing work
Continue to display ACHA products in CIMSS and STAR LTM site	Sep-22	Sep-22	Sep-22	
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22	Sep-22	
Support consistency validation of products from CSPP	Sep-22	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	Sep-22	ongoing work
Validate DCOMP at night using DNB	Aug-22	Sep-22	Sep-22	ongoing work
Incorporate method to identify pixels with potentially incorrect phase within DCOMP DQFs	Sep-22	Sep-22	Sep-22	ongoing work
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	Sep-22	ongoing work
Consistency checks for day and night retrievals	Sep-22	Sep-22	Sep-22	ongoing work
Continuous use of microwave-based LWP data for validation	Sep-22	Sep-22	Sep-22	ongoing work
Develop collaboration with OAR/ESRL/GML on use of RadFlux Cloud Optical Depth for Verification	Sep-22	Sep-22	Sep-22	ongoing work
Improving the near real-time monitoring tools with (simple) web application	Sep-22	Sep-22	Sep-22	ongoing work
Support several projects (i.e., processing of data, visualization tools, & ATMS/VIIRS precip for Alaska Demo)	Sep-22	Sep-22	Sep-22	ongoing work
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22	Sep-22	
Support consistency validation of products from CSPP	Sep-22	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	Sep-22	ongoing work
Continuous use of microwave-based LWP data for validation. (coordinate with DCOMP)	Sep-22	Sep-22	Sep-22	
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22	Sep-22	
Support consistency validation of products from CSPP	Sep-22	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	Sep-22	ongoing work
Develop gridded products for vertical cross-sections and AWIPS-2	Sep-22	Sep-22	Sep-22	ongoing work with TOWR-S
Develop a new aviation website and incorporate feedback from NWS/AWC	Sep-22	Sep-22	Sep-22	ongoing work
Support Alaska Demo and any necessary reviews	Sep-22	Sep-22	Sep-22	ongoing work
Validate products from SAPF and continue data analysis using ARM, METAR, PIREPs, and CloudSat/CALIPSO	Sep-22	Sep-22	Sep-22	ongoing work
Implement an updated lunar irradiance model in CLAVR-x for nighttime COD and compare products	Sep-22	Sep-22	Sep-22	ongoing work
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22	Sep-22	
Support consistency validation of products from CSPP	Sep-22	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	Sep-22	ongoing work
Support Alaska Demo and any necessary reviews	Sep-22	Sep-22	Sep-22	ongoing work
Validate NDE CCL output, supercooled/convective probability layers for nighttime cases with lunar DCOMP included for Base	Sep-22	Sep-22	Sep-22	ongoing work
Support ASSISTT update to NESDIS Data Exploitation (NDE) at appropriate time(s)	Sep-22	Sep-22	Sep-22	
Support consistency validation of products from CSPP	Sep-22	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	

Aerosol

September, 2022

Accomplishments / Events:

Hourly biomass burning emissions product from blended geostationary and polar-orbiting satellites for air quality forecasting applications. Paper published in Remote Sensing of Environment with authors F. Li, X. Zhang, S. Kondragunta, X. Liu, I. Csiszar, and C. Schmidton 07 September 2022. It describes a new fire emissions product for NWS operational air quality forecasting models. For the first time, fire emissions in the model will be updated hourly.

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			

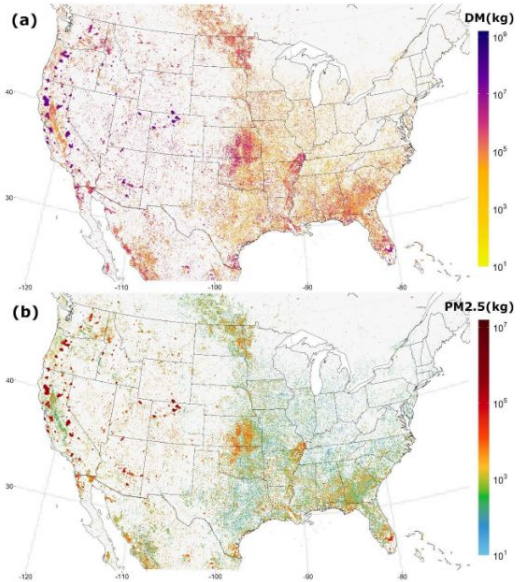
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

No risks

Highlight:

RAVE algorithm estimates of the amount of annual dry mass burned due to fires between April 2020 and March 2021 is shown in (a). The amount of fine particulate matter ($PM_{2.5}$) released from the fires consuming the dry mass is shown in (b).



Aerosol (AOD)

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

Aerosol (ADP)

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

Volcanic Ash

September, 2022

Accomplishments / Events:

- **Utility of JPSS-based Thermal Anomaly Detections**: Two JPSS-based (S-NPP VIIRS and NOAA-20 VIIRS) VOLCAT thermal anomaly alerts identified new volcanic activity at Home Reef located in Tonga (there was no known recent volcanic activity at Home Reef prior to these alerts). The left and middle figures show the thermal anomalies automatically identified in VIIRS RGB imagery on September 9, 2022. The alert information was relayed from NOAA and USGS representatives to the Tonga Geological Service (TGS). The TGS has continued to utilize the VOLCAT thermal monitoring dashboard and VOLCAT imagery to create frequent advisories (right figure) on the ongoing volcanic activity at Home Reef, demonstrating the usefulness of VOLCAT (and JPSS) products to the volcanic community (e.g., USGS, TGS).

- **Quality/Oversight** Continued to ensure high quality Volcanic Ash retrievals from EDR algorithms (August 2022 S-NPP products were assessed and confirmed to be as expected after S-NPP recovery from satellite anomaly) and VOLCAT. Routine validation of existing JPSS volcanic ash EDRs from current sensors and JPSS-2 will continue as needed, including support for ASSISTT/NDE evaluations. 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			

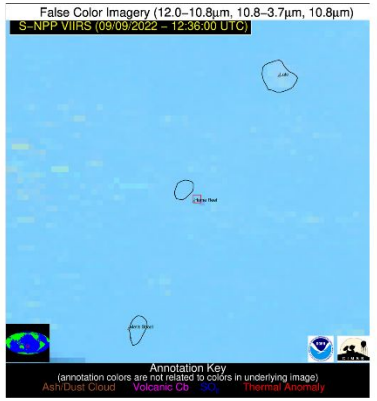
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

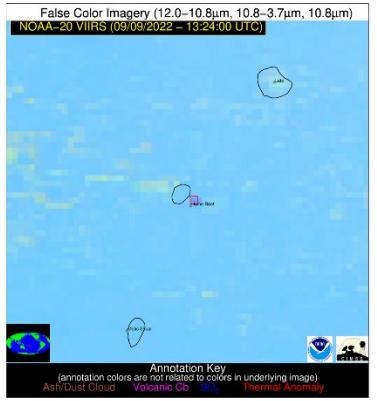
Issues/Risks:

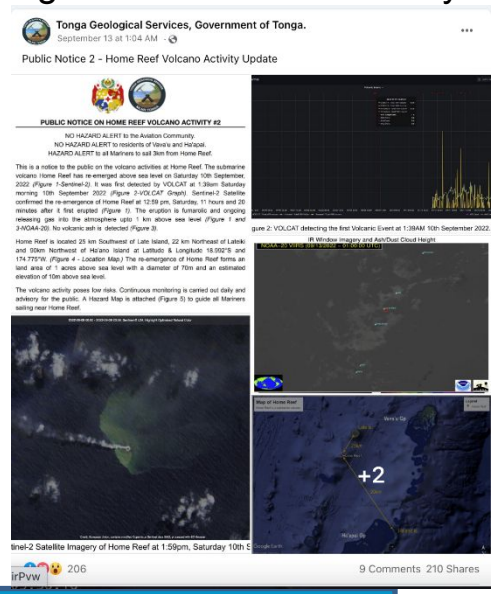
None

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	Sep-22	
Software and LUT updates for J2	Sep-22	Sep-22	May-22	No further updates
Update thresholds and LUT's, if needed	Sep-22	Sep-22	May-22	No further updates
Routinely validate volcanic ash products	Sep-22	Sep-22	Sep-22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	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: Tonga Geological Service utilized S-NPP and NOAA-20 VOLCAT thermal anomaly alerts and monitoring for new volcanic activity at Home Reef in September 2022.







Cryosphere

September, 2022

Accomplishments / Events:

Polar Pathfinder CDRs: The VIIRS Polar Pathfinder Climate Data Records: NOAA and the Cooperative Institute for Meteorological Satellite Studies (CIMSS) have begun testing the extension (in time) of the AVHRR Polar Pathfinder (APP) and the Extended AVHRR Polar Pathfinder (APP-x) climate data records using a VIIRS data product developed by NCEI and now generated by STAR that is similar to the AVHRR Global Area Coverage (GAC) data upon which APP is based. The VIIRS product, called VGAC, will be used in place of the AVHRR GAC going forward.

VIIRS Ice Surface Temperature: The VIIRS IST comparison to MOSAiC shows good agreement: The Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC) field campaign provides year-long in situ measurements of IST at multiple locations over central Arctic sea ice for validation of the VIIRS IST EDR from the Enterprise algorithm.

VIIRS Daily Cloud-Gap-Filled Snow Product: Evaluation over South America. VIIRS daily cloud-gap-filled snow products over South America have been compared with GMASI snow extent and shows the two products are comparable. In the event that GMASI is discontinued, VIIRS is a reliable new source of similar data for mapped daily continental-scale snow extent.

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	10/28/21	
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	Sep-22	
Continuous monitoring of S-NPP and NOAA-20 products	Sep-22	Sep-22	Sep-22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	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: Extended VIIRS Polar Pathfinder Climate Data Record ready to follow Extended AVHRR Polar Pathfinder Climate Data Record

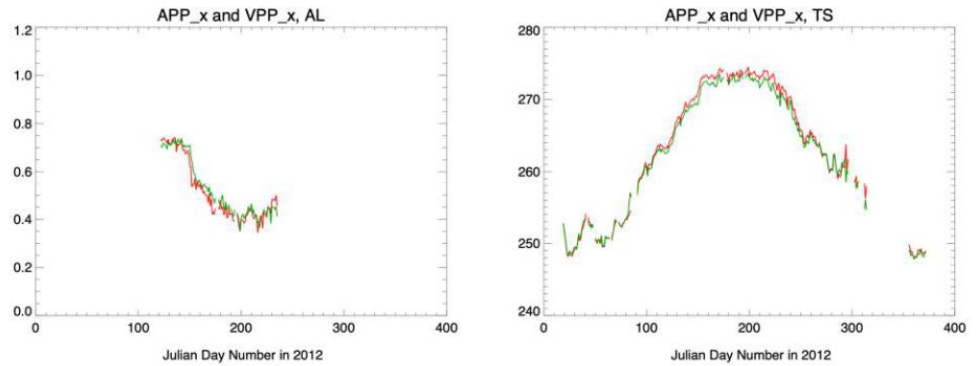


Figure 2. Time series of surface broadband albedo (left) and surface skin temperature (right) for ice and snow surfaces at a local solar time of 14:00 over the Arctic area north of 60^{0}N through the year of 2012 from APP-x (red curve) and VPP-x (green curve). Only are those days used when the amount of missing data is less than 20%.

Active Fires

September, 2022

Accomplishments / Events:

- The updated version of **the VIIRS M-band code** has been delivered to enable the processing of JPSS-2 data. This update was necessary to ensure continuity of input to key downstream applications that have not transitioned yet to the VIIRS I-band product.
- **Hourly biomass burning emissions product from blended geostationary and polar-orbiting satellites for air quality forecasting applications**. Paper published in Remote Sensing of Environment with authors F. Li, X. Zhang, S. Kondragunta, X. Liu, I. Csiszar, and C. Schmidton 07 September 2022. It describes a new fire emissions product for NWS operational air quality forecasting models. For the first time, fire emissions in the model will be updated hourly

Overall Status:

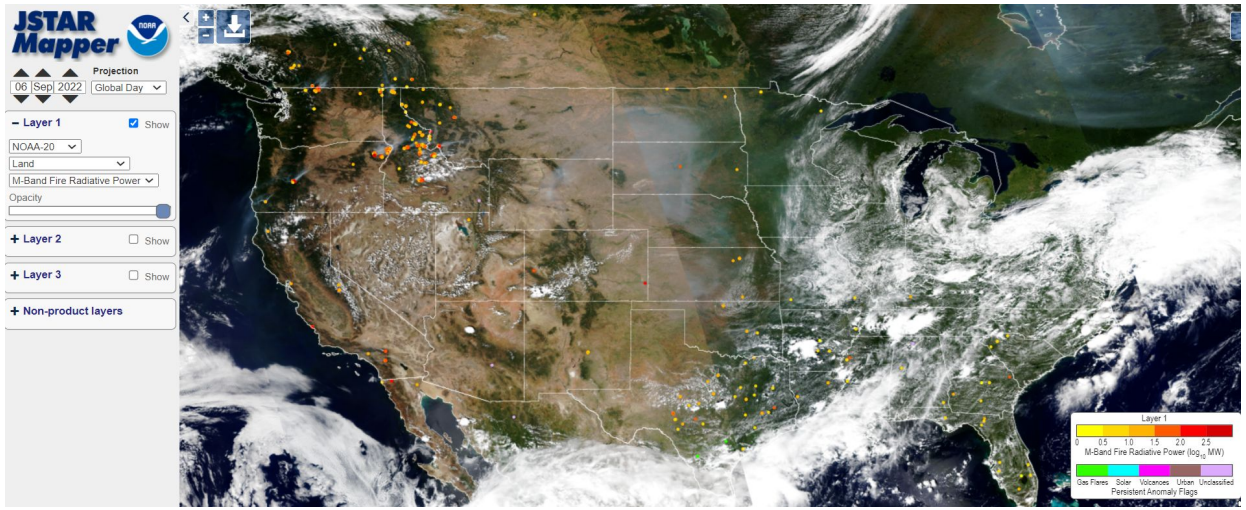
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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	Sep-22	
Opportunistic validation using in-situ data (Error rates and FRP APU)	Sep-22	Sep-22	Sep-22	More limited validation
Persistent anomaly data files updates	Sep-22	Sep-22	Sep-22	Less frequent updates
Suomi NPP / NOAA-20 data analysis and feedback	Sep-22	Sep-22	Sep-22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	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 M-Band Fire Radiative Power as seen from JSTAR Mapper



Surface Type

September, 2022

Accomplishments / Events:

- STAR-UMD VIIRS Surface Type team has downloaded and processed S-NPP and NOAA-20 VIIRS daily granule surface reflectance data acquired in September 2022 for the production of AST-2022.
- The team has completed and delivered to STAR-JPSS and NCEI the 2021 VIIRS Annual Surface Type (AST2021) product:
  - Fine resolution land cover products released in recent years were harmonized and incorporated into the post-processing process to improve the mapping of urban, water, cropland, and other surface types (see the highlights for an example).
  - The final AST2021 product has an overall accuracy of 79.3 ± 0.6%.
  - The product has been archived at NCEI. It is available to the public from the STAR FTP site (ftp://ftp.star.nesdis.noaa.gov/pub/smcd/JPSS/VIIRS-AST).

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.*

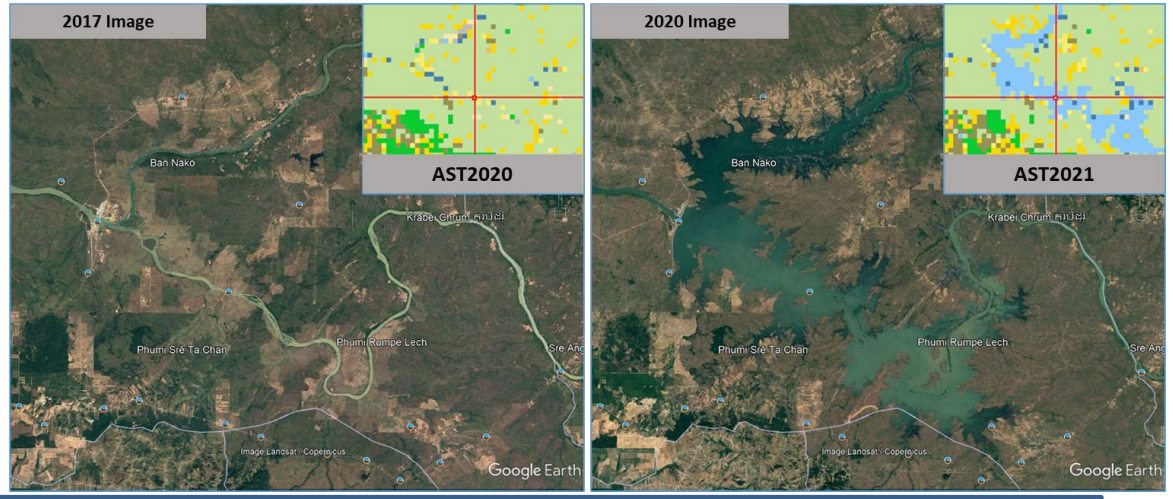
Issues/Risks:

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	
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	Sep-22	
Experiment methods for mapping surface type change	Sep-22	Sep-22	Sep-22	
Generate VIIRS AST21 based on 2021 VIIRS data using SVM algorithm	Aug-22	Aug-22	Aug-22	
Comparison of AST21 with surface type validation data	Sep-22	Sep-22	Sep-22	
Delivery of AST21 (made available for users through STAR FTP)	Sep-22	Sep-22	09/16/22	
Routinely monitor surface type changes in the training and validation data sets	Sep-22	Sep-22	Sep-22	
Improve and update training and validation data, ATBD and VIIRS AST web sites	Sep-22	Sep-22	09/16/22	ATBD delivery

*Highlights: **Improved Mapping of Surface Water in AST2021***

The Surface Type team developed a new land water mask by harmonizing seven global fine resolution (10m – 30m) land cover products released in recent years. By using this mask to replace the one used to produce previous year AST products, we mapped surface water more accurately in 2021 than in the previous years. For an example in Cambodia shown below, a reservoir constructed in recent years showed up in AST2021, but not in early AST product. A MODIS-based surface water mask has been used in most applications in the communities and may need to be replaced with this newly generated one.



Surface Reflectance

September 2022

Accomplishments / Events:

- Fixed the issue of the SR validation and monitoring tool, add the exception handling module to deal the issues such as outrage and disk issues.
- Validated the both SNPP and NOAA20 SR using the AERONET based dataset after the SNPP data resumed (August 28, 2022).
- Keep working on the SR LUT update using the new spectral response function, and prepared the test case for the verification of the LUT update.
- Generated monthly surface reflectance for the true color image compositing bands (M3, M4 and M5), and provide the monthly color image since April, 2021, serving as the background map for related applications.
- Prepared for the external review.

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			

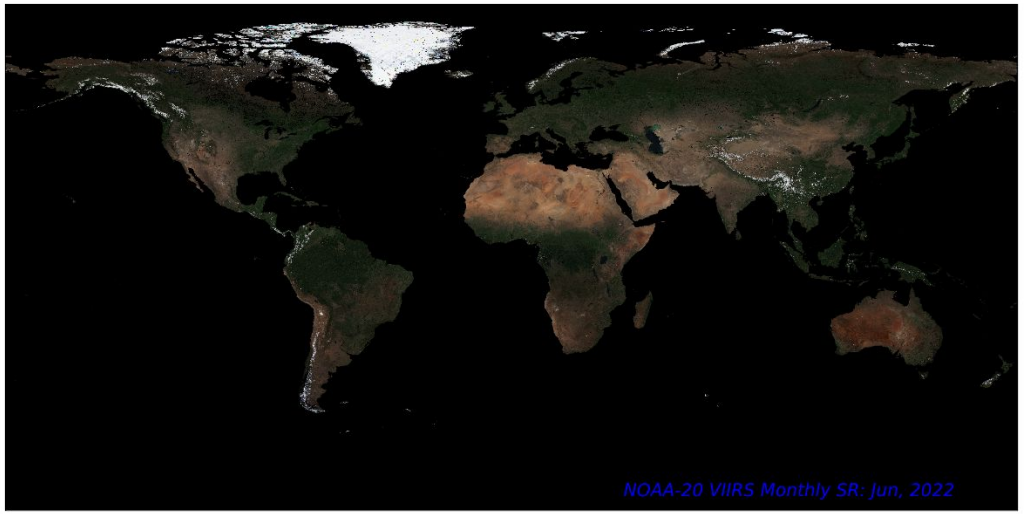
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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	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	Sep-22	
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

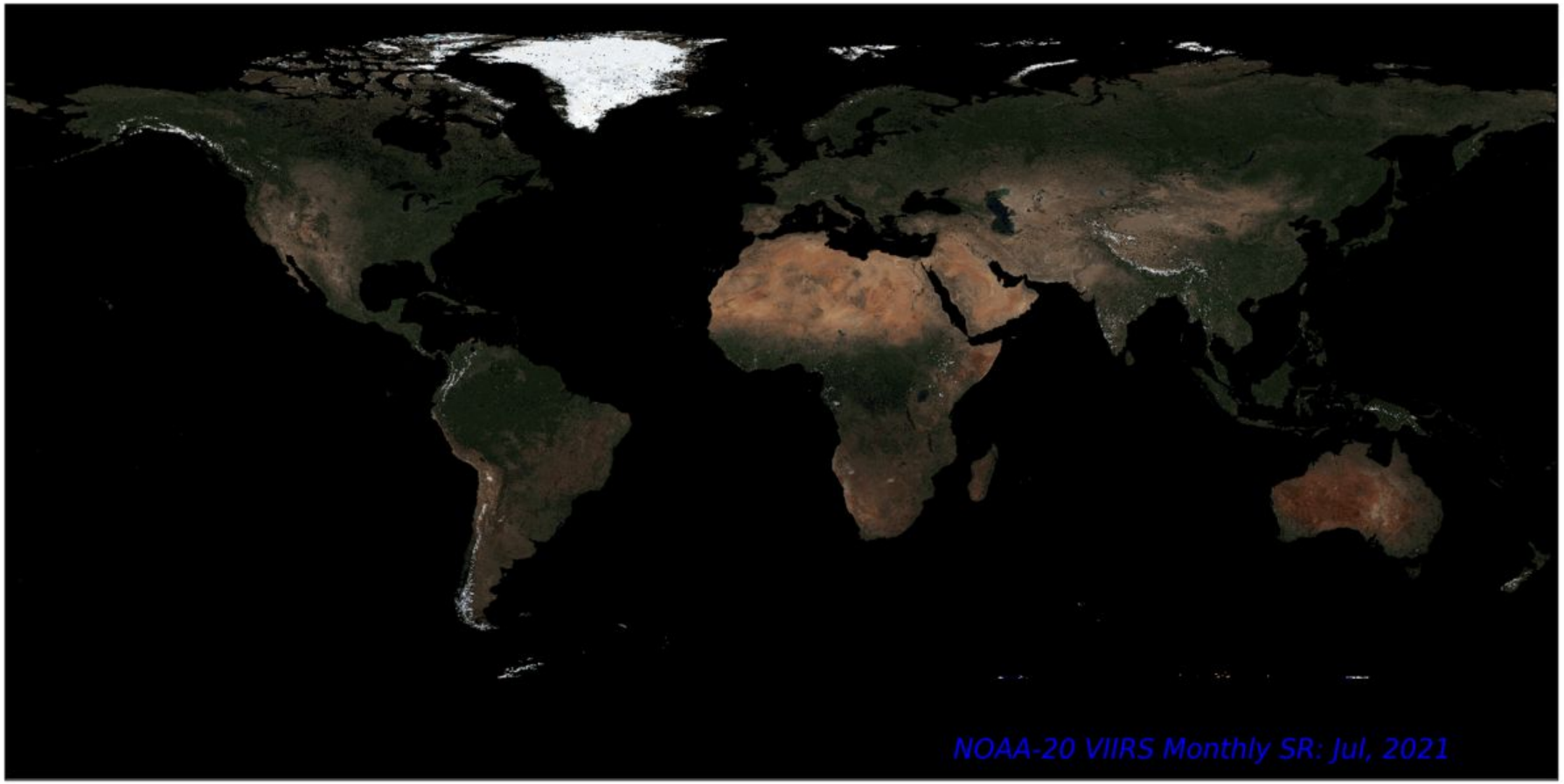
Highlights:



VIIRS Monthly SR true color image (June, 2022)

Monthly Surface Reflectance True Color Image

Whole year true color animation (July, 21 – June, 22)

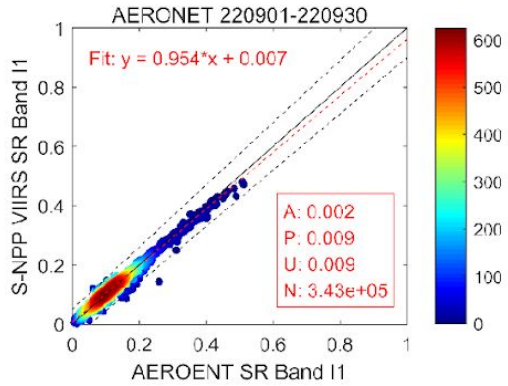


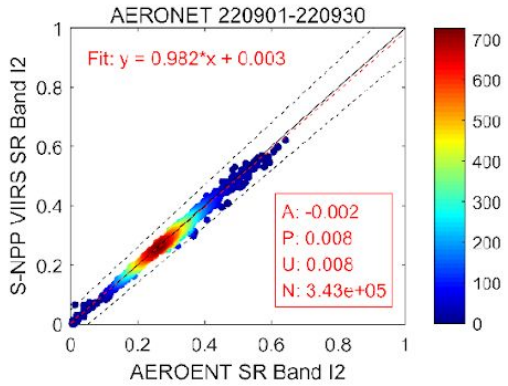
- Compositing method
- Using daily gridded SR
- Select the best quality data over one month.
- The data quality criteria is same as the daily SR compositing.

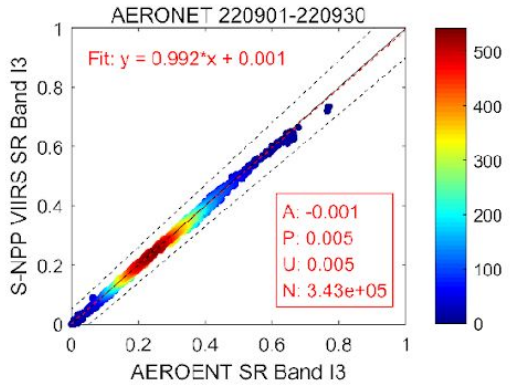
- Applications.
- Use as the background map
- Use to demonstrate the dynamic changes from the perspective of true color image.
- Use as reference map when check the anomaly.

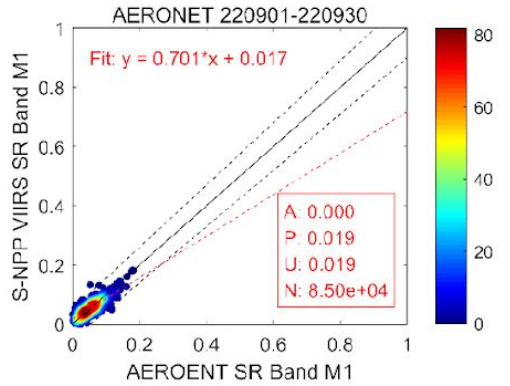
Resumed SNPP SR Product Validation

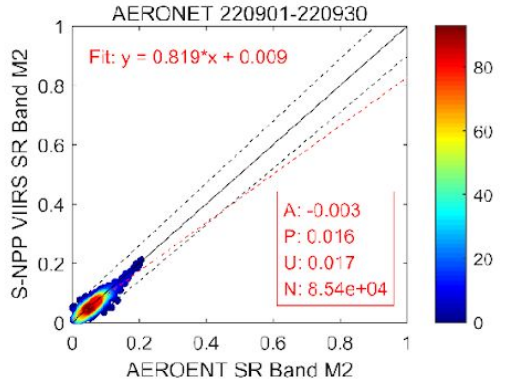
September 2022

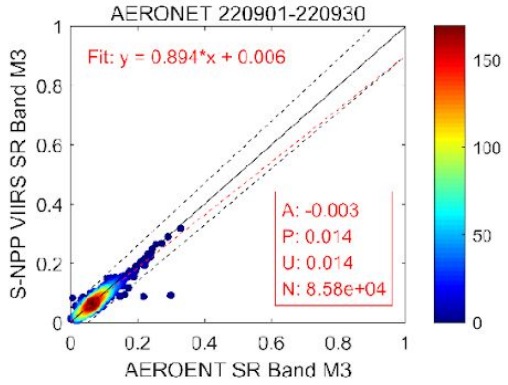


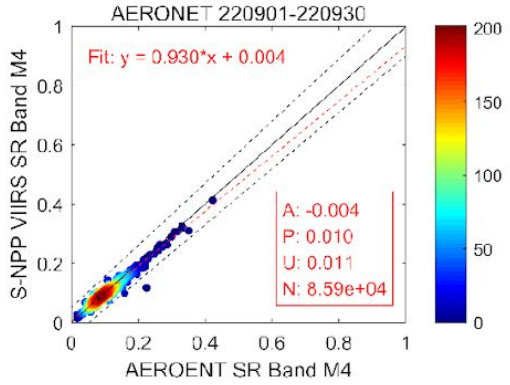


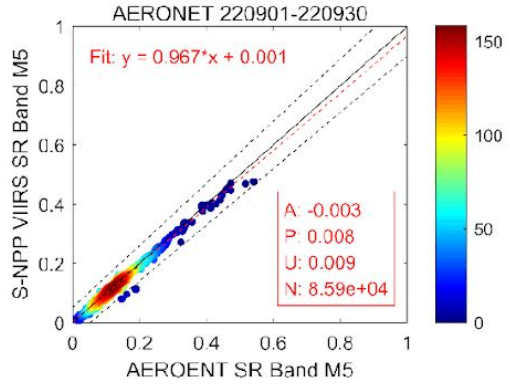


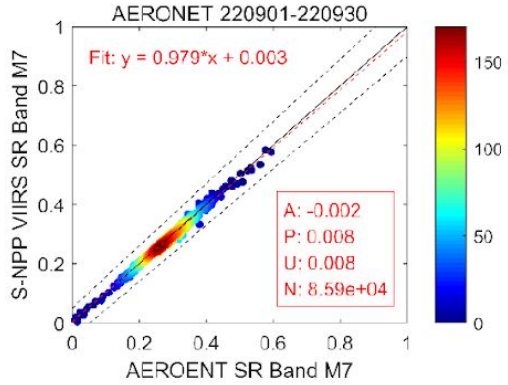


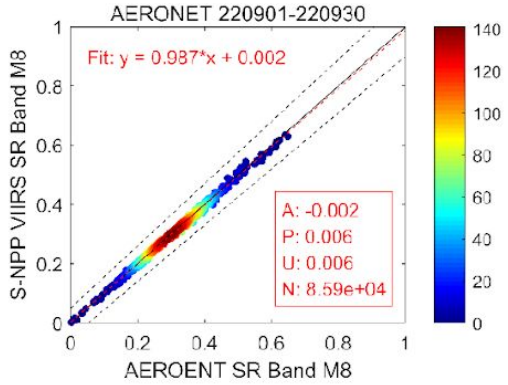


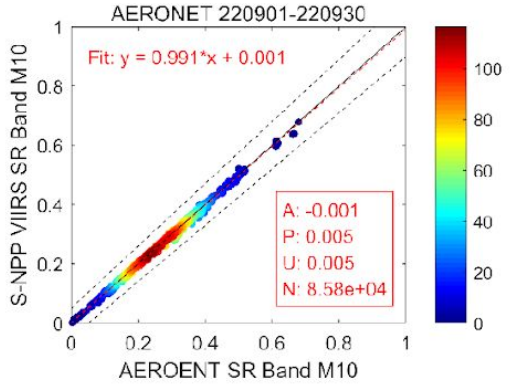


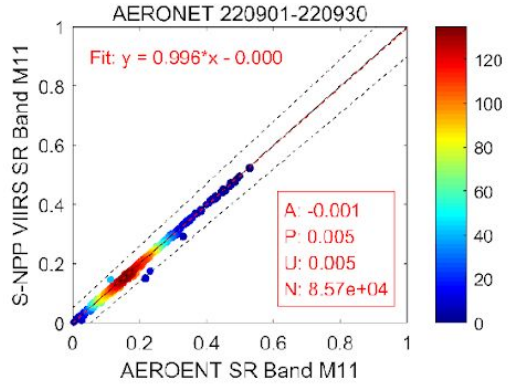




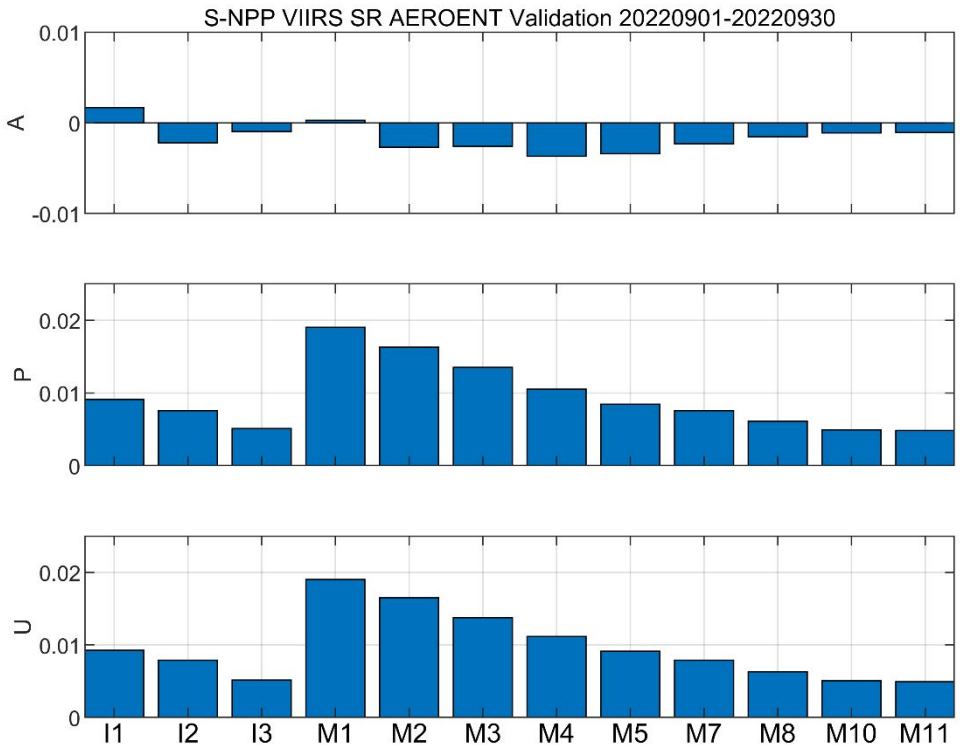


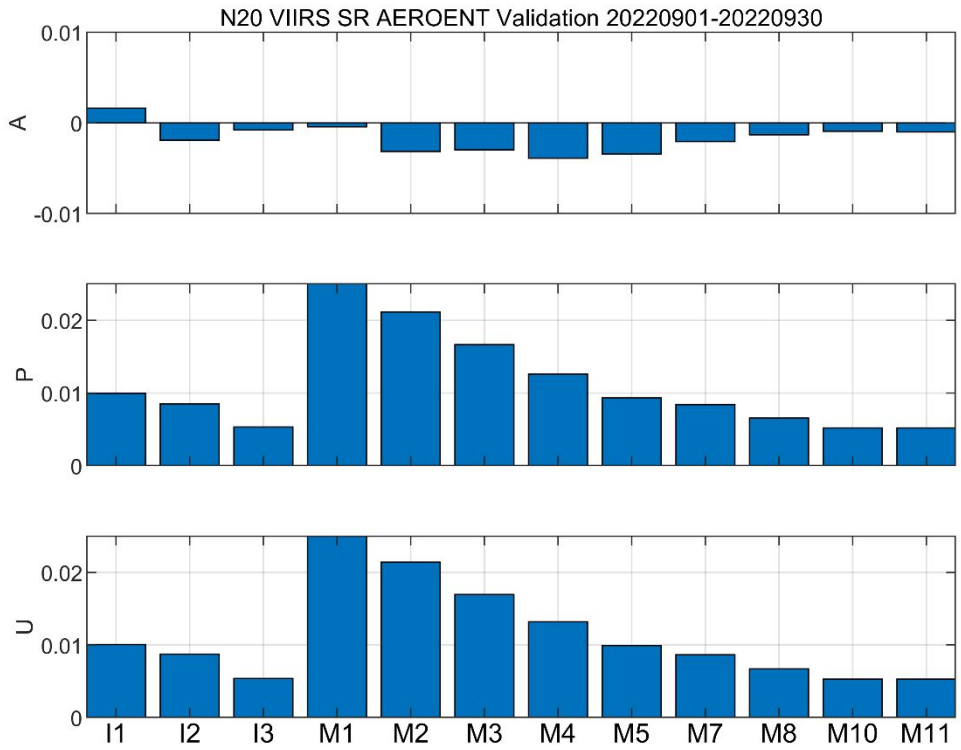






Resumed SNPP SR Product Validation





The S-NPP data has been resumed since August, 28, 2022, the SR validation is performed for the September data using the AERONET based SR, the validation results show S-NPP SR have a good performance (both scattering plot and APU statistics), and has comparable accuracy with NOAA20.

Land Surface Temperature

September, 2022

Accomplishments / Events:

- For VIIRS LST reprocessing needs, checked the input availability and how to download the data. Coded to check the GFS data to make up for missing files and files with problems, etc. Further checked the framework regarding the data layer requirement for each dataset. (slide 2)
- Convert the L3 VIIRS LST from sinusoidal projection to Latlon projection and complement the dataset from 2020 to the present for both SNPP and NOAA20.
- Started to calculate the monthly mean LST based on the L3 VIIRS LST using the past three years' data from 2020 to 2022. It is ongoing work.
- Prepared a vignette draft on all-weather LST development for the external review.(Highlights). Provided input on JPSS LST for the external review.
- Attend the LST CCI user workshop.
- Studied the machine learning method and tried it on the LST error prediction. (slide 3)

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

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			

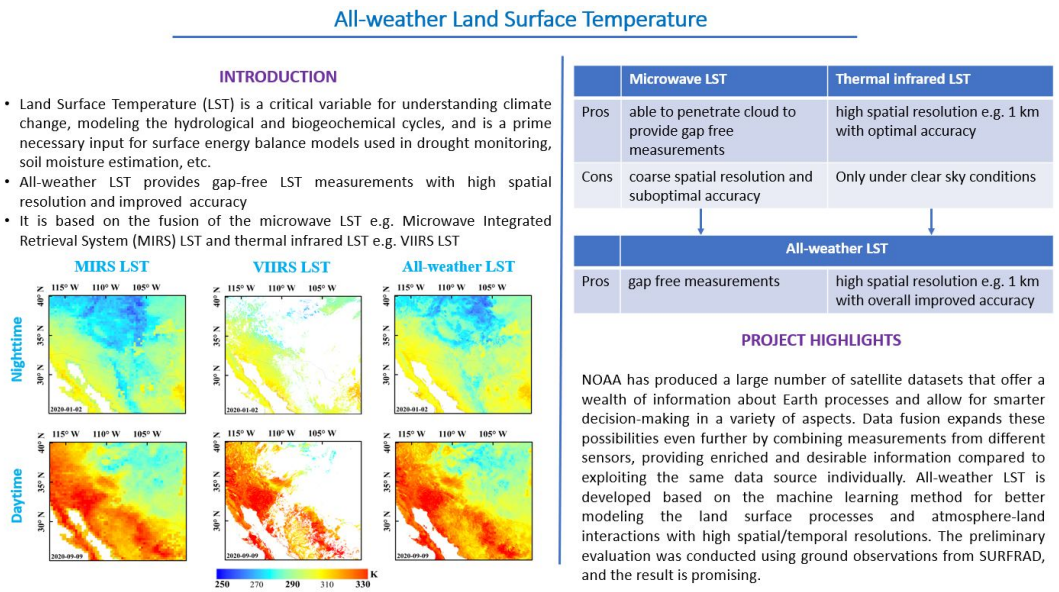
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Highlights:

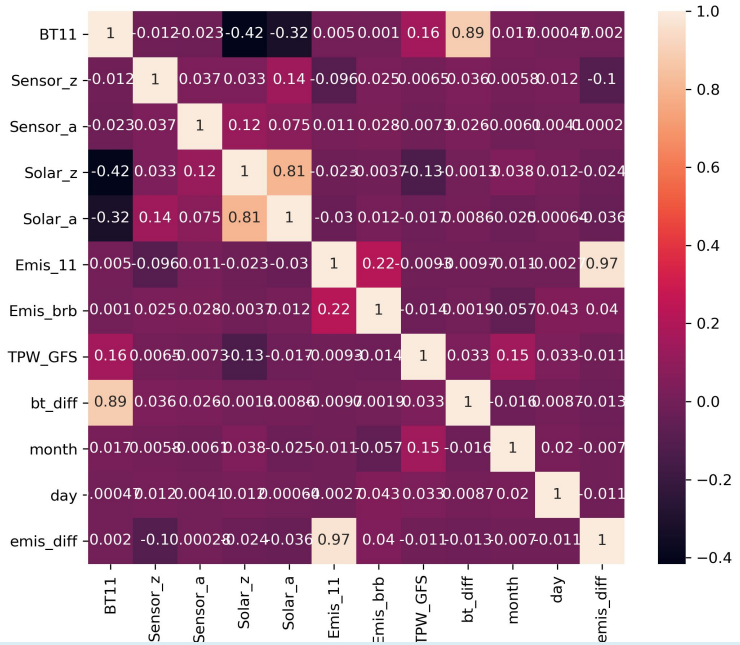
Vignette draft of the all weather LST for the external review



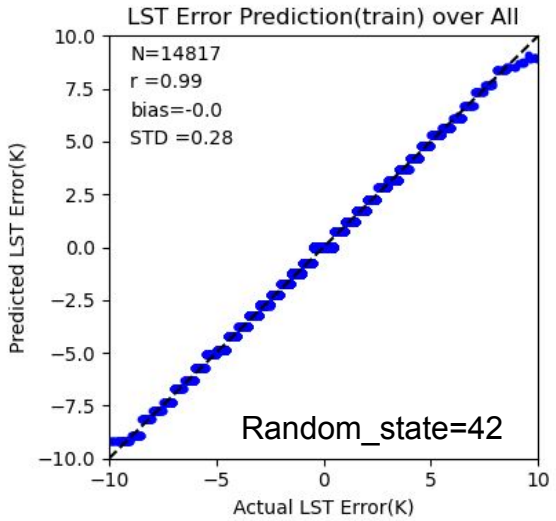
The data availability for VIIRS LST reprocessing

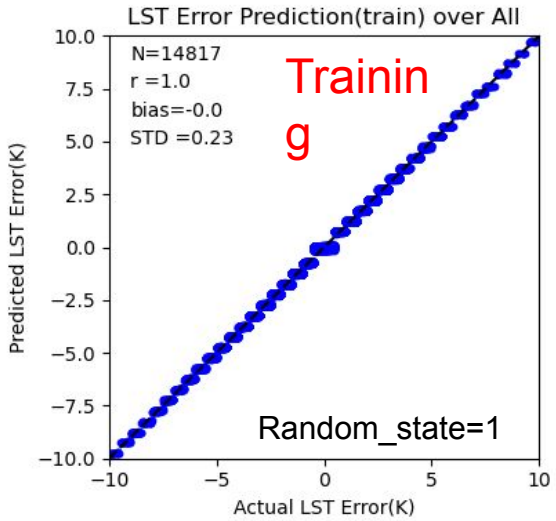
	Data Name	Begin date	End Date	Location	Description
1	CMCSST	20200210	~present	/data/data257/mfan/DATA/cmcsst_0p10	
		20200210	20201025	/data/data090/mfan/data/cmc_0.1deg_daily	20200929120000-CMC-L4_GHRSST-SSTfnd-CMC0.1deg-GLOB-v02.0-fv03.0.nc
2	OISST_daily	20140101	20201025	/data/data090/mfan/data/oisst_daily	Avhrr only v2.1 or v2.2; avhrr-only-v2.20201003.nc
					CMC SST is replacing OISST
3	IMS Snow	recent 30 days		/data/data257/mfan/DATA/IMS_SNOW_MASK/	tiff and asc format
	Ait snow map	20171003	20190309	/data/data090/mfan/data/ait_snow_map	snow_map_4km_171122.nc (default neccesary input)
4	GFS TPW	20220809	~present		/data/data257/mfan/DATA/gfs_grib2_0.25degree
		20140105	20201231	/data/data090/mfan/data/gfs_grib2_0.5deg/	missing date is found in this location
				/data/data257/mfan/DATA/gfs_grib2_0.25degree	
5	VIIRS reprocess SDR	1/2/2012	4/30/2020	NOAA CLASS	It is under JPSS VIIRS senso rdata record reprocessed(RPVIIRSSDR), Version 2 . But the data is not available yet. It is supposed to complete by 10/2023
		12/19/2012	12/31/2012	/data/data624/class/delivery/VIIRS/2012	not all days are checked
		7/2/2014	10/30/2014	/data/data600/star_rwg/bin.zhang/RP_CLASS/	not all days are checked
		20150221	20150731	/data/data627/kahmad/CLASS_REP	no access after 20140430, the data is in 5 min granule
		Apr-13	about 1 year	ftp://ftp-jpss.avl.class.noaa.gov/STAR/	
6	emissivity	20140101	~present	/data/data315/lst/hwang/lse/v2p1/SNPP_VIIRS/	daily global nc format

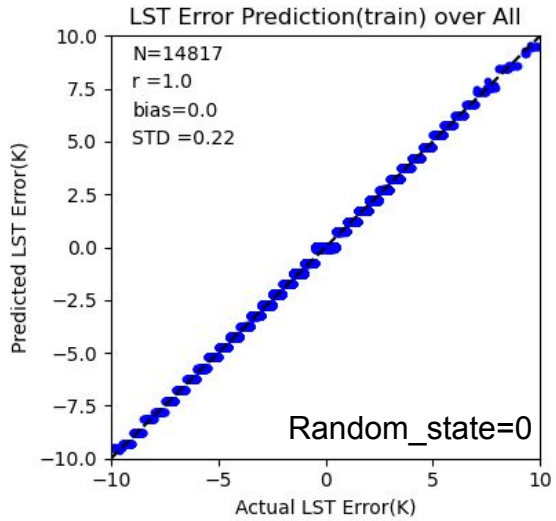
Random forest method for LST error prediction

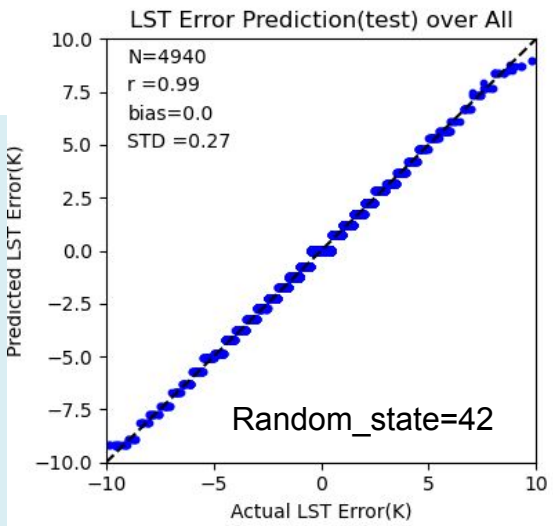


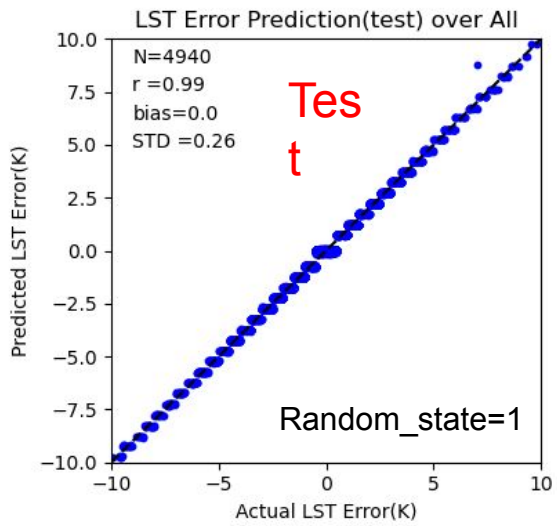
- Random forest method is used to predict the LST error
- The matchups from the ground validation are used as the data source for the test
- The data feature correlation is analyzed(top left).
- The training and test results are shown on the right for different parameter selection of random data state.

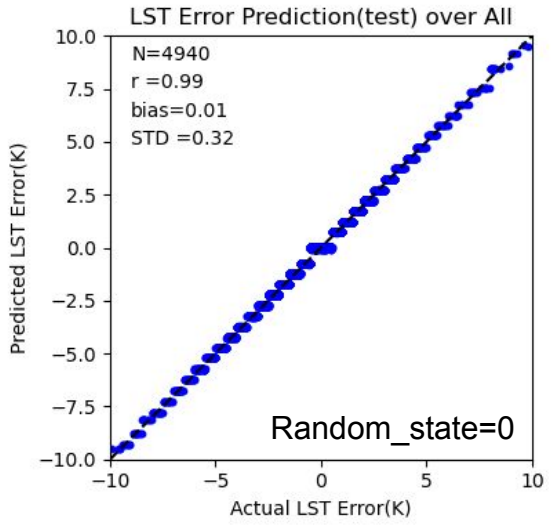












Surface Albedo

September 2022

Accomplishments / Events:

- Added precipitation into the multi-parameter anomaly assessment
- Collected BRDF test data for group test
  - One month of L2 input data with GMTCO, VIIRS-SR, JPSS-SnowMask
  - Generated output BRDF data for group test & comparison
- Responding to the review comments of the L3 VIIRS manuscript
- Created a poster about VIIRS BRDF for EUMETSAT conference
- Start to monitor the v2r2 VIIRS albedo in pre-operational system

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	
climatology files delivery to replace the one in OPS (v2r2)			10/08/22	
Final J2 ready DAP to NDE (include NPP/N20 updates)	May-22	May-22	05/17/22	
L3 Global Gridded LST/LSA DAP to NDE (Prelim J2 DAP)			12/30/21	
L3 Global Gridded LST/LSA DAP to NDE (final J2 DAP)	May-22	May-22	05/13/22	
BRDF data development plan ready	Mar-22	Mar-22	Mar-22	Ready in team, but Project Postponed
VIIRS cloudy-sky albedo improvement	May-22	May-22	May-22	PMR slide7
FY23 Program Management Review	Jun-22	Jun-22	05/23/22	
Routine monitoring tool and its update	Aug-22	Aug-22	Aug-22	
NOAA-21 data test if provided	Aug-22	Aug-22	Aug-22	
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/17/22	JCT3-TVAC

Overall Status:

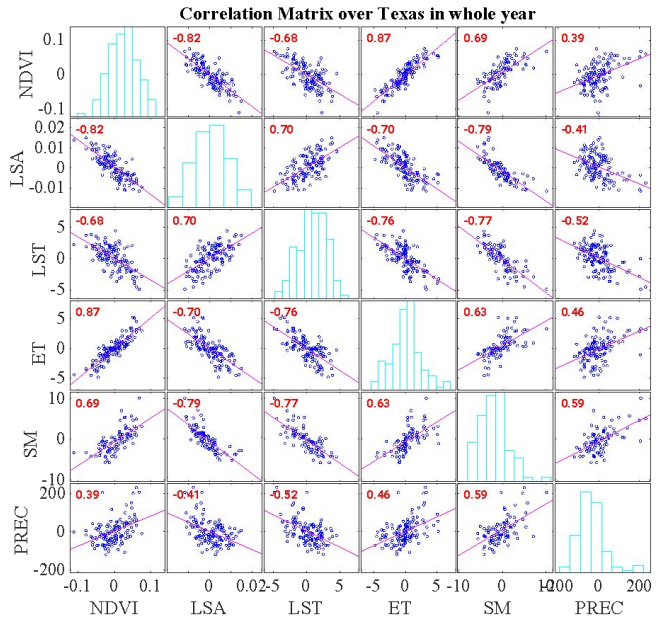
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		x			
Schedule		X			

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

Issues/Risks:

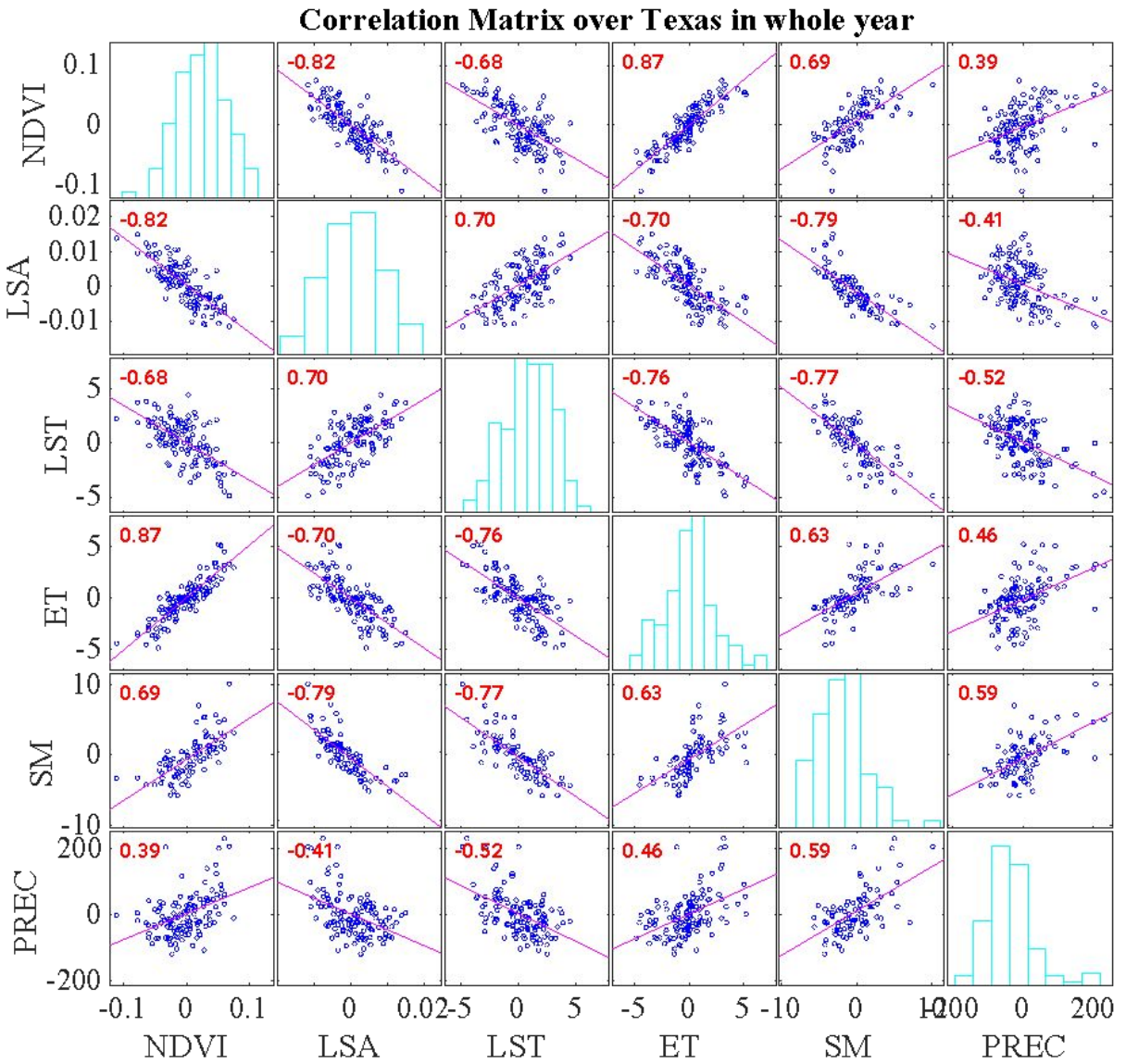
Highlights:

- Correlations between multi-parameter anomaly in Texas area to understand the surface change
- Positive correlations are observed between precipitation and NDVI, ET, SM; negative correlations are observed between precipitation and LSA, LST



Correlation analysis among variables in Texas

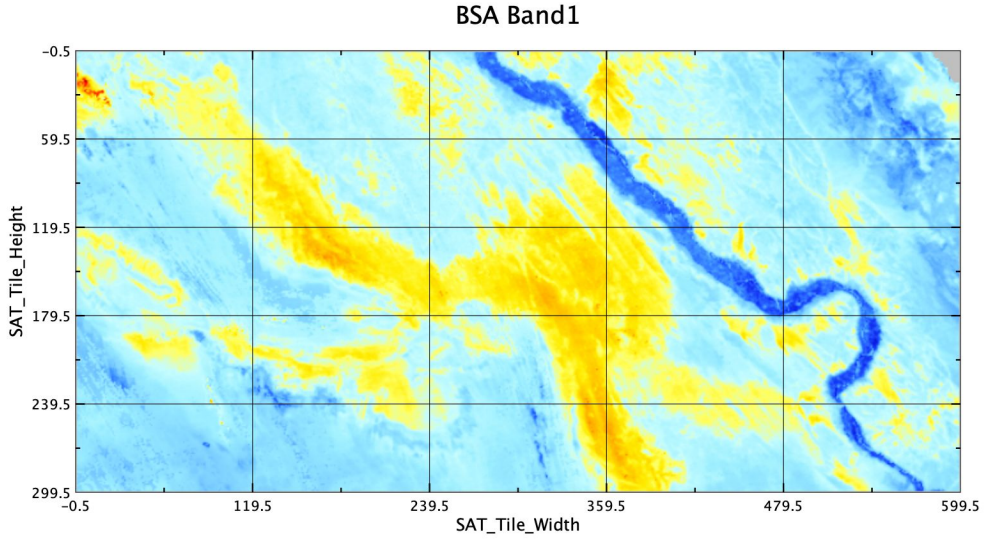
- Last month we reported the multi-parameter anomaly correlation including
  - >> LSA: albedo
  - >> LST: temperature
  - >> NDVI: vegetation index
  - >> ET: evapotranspiration
  - >> SM: soil moisture
- Added precipitation into the variable list
  - Two precipitation products were tested and the NASA GPM data was selected
- **Positive** correlations are observed between **precipitation and NDVI, ET, SM**; **negative** correlations are observed **between precipitation and LSA, LST**



BRDF test in dust area

Test output:
VIIRS_BRDF_LSA_NBAR_2022191_h41v25

- Input granules:
July 1 ~ July 30
- Output BRDF tiles:
July 8 ~ July 23
- Target tile:
h41v25



Gridding

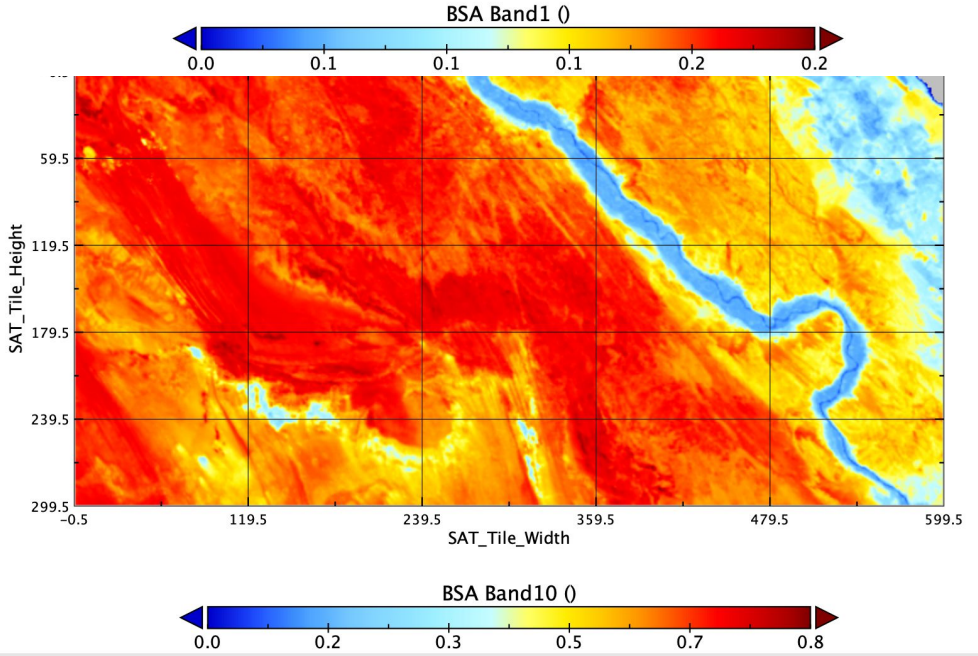
- Input: Lat/lon of granules
- Output: gridding index

Mapping

- Input: gridding index and variables in granules
- Output: Tiles with variables

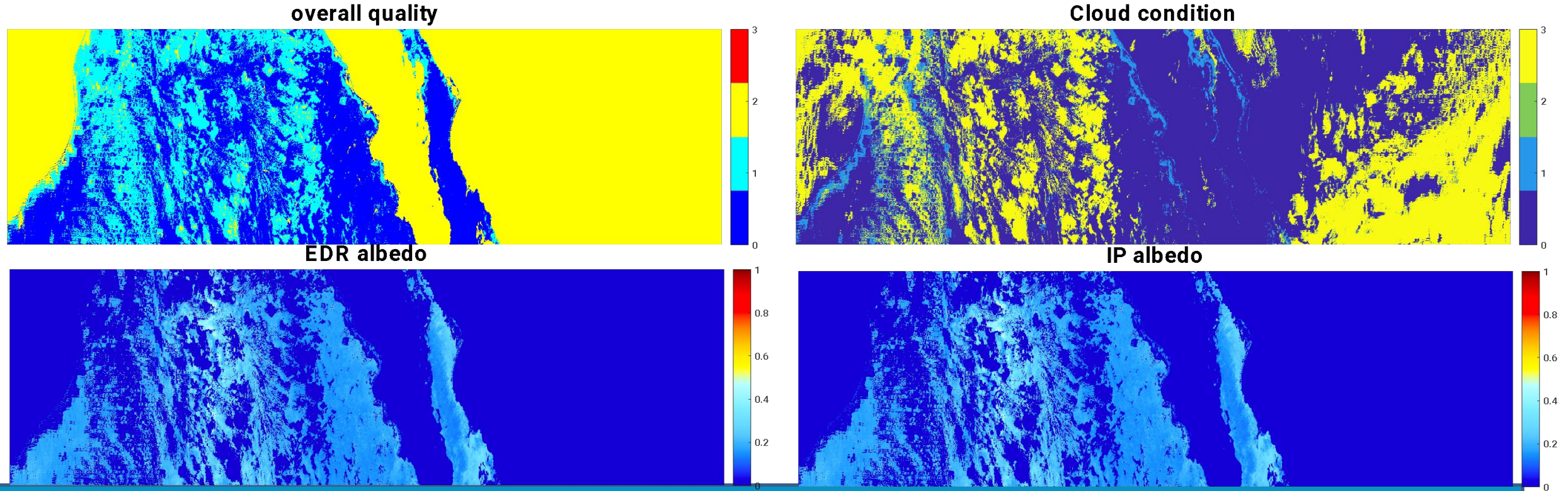
Retrieving

- Input: tiles with variables
- Output: BRDF tiles



Checking the v2r2 test data in pre-operational system

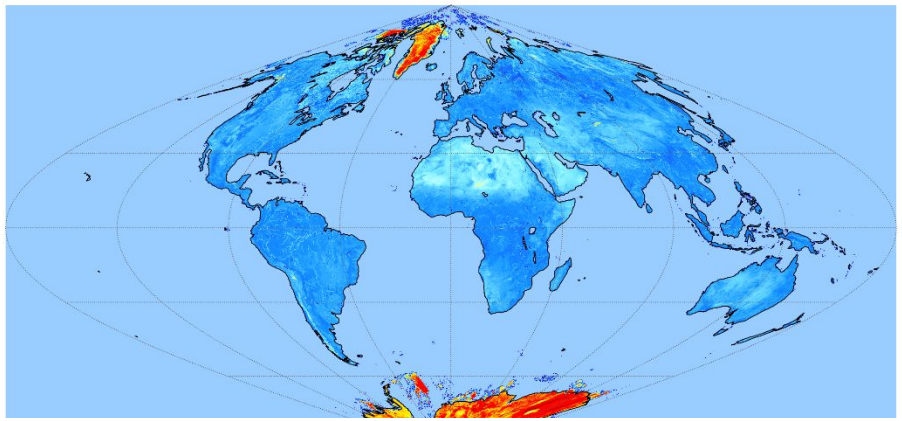
- Background: checked the v2r2 (advanced version than current operational v1r4) SURFALB data
- Location: /data/scdr060/PDA_IT/
- Issue:
  - **Gaps of albedo over cloudy pixels**
  - **EDR albedo is not improved based IP albedo (figure)**
  - Reason is largely due to the incorrect offline path in configuration
  - Reported to the operational team and in communication
  - The goal is to confirm the v2r2 albedo could be operational soon



Examination of the v2r2 NOAA20 SURFALB product

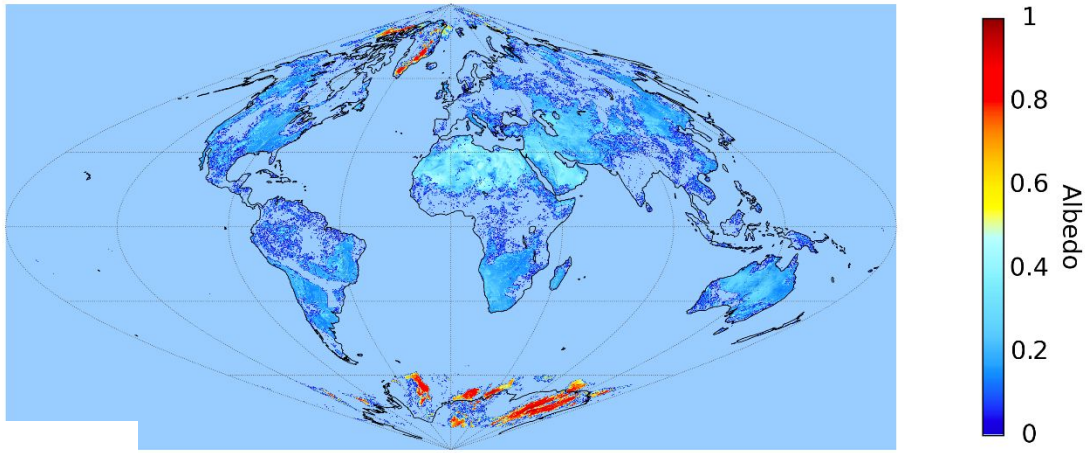
v1r4 NOAA-20

VIIRS Global Albedo (L3 NDE): Sep 13 2022

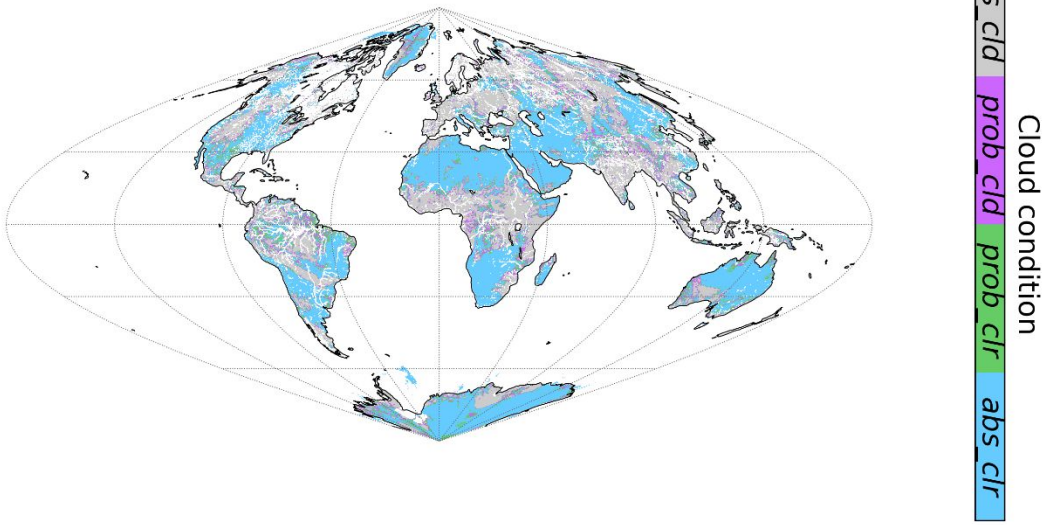


v2r2 NOAA-20

VIIRS Global Albedo (L3 NDE): Sep 13 2022



VIIRS Global Albedo Cloud Flag: Sep 13 2022

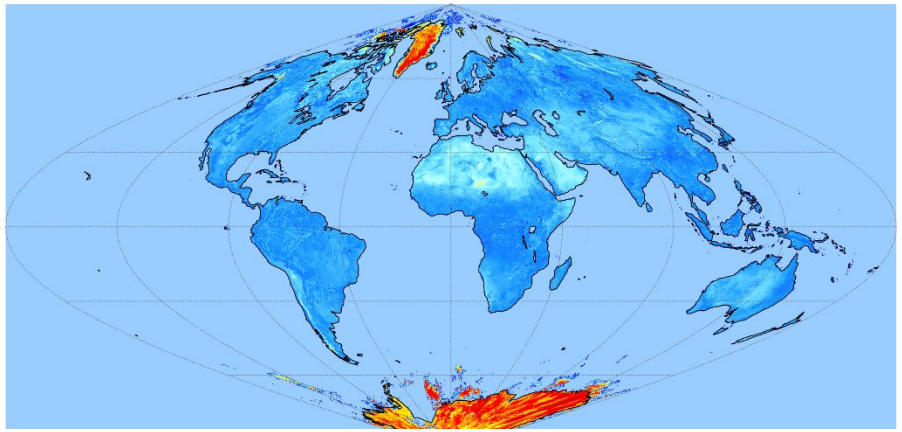


Conclusion:

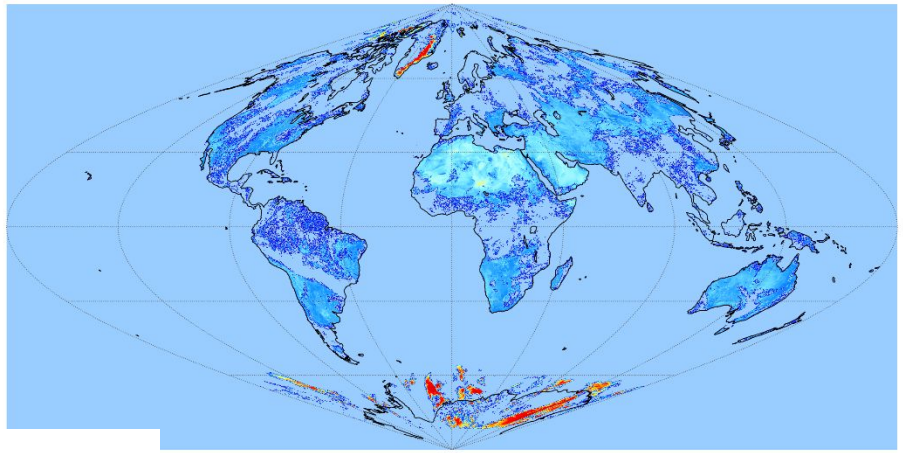
1. The ice albedo has more coverage in v2r2, since the ice mask has used the IMS data, which is the improvement as expected.
2. The cloudy pixels has gaps in the v2r2 test data, largely due to incorrect offline path

Examination of the v2r2 S-NPP SURFALB product

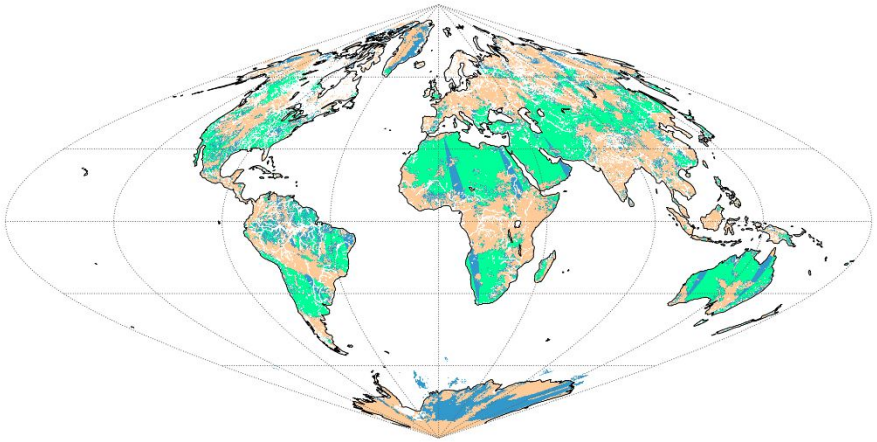
NPP VIIRS Global Albedo (L3 NDE): Sep 14 2022



NPP VIIRS Global Albedo (L3 NDE): Sep 14 2022



NPP VIIRS Global Albedo Overall Quality: Sep 14 2022



Conclusion:
1. Similar as in NOAA-20 data

Vegetation Index and Green Vegetation Fraction

September 2022

Accomplishments / Events:

- Generated stratified and time series statistics for differences between SNPP and NOAA-20 global VI and GVF for year 2021. Differences tended to be small in time series and higher only for high VI/ GVF pixels, which are less frequent. Began investigating GVF anomaly noted in the June 22, 2021 data.
- Completed calibration/ validation report for FY2022.
- Produced VIIRS monthly GVF anomaly maps for August 2022 and found that GVF is lower than average in a large area of Europe
- Ensured that SNPP vegetation products were being generated again after data outage period July 26 – Aug 22, 2022
- Evaluated the impact of S-NPP data outage on GVF product and found the most recent SNPP-NOAA20 GVF difference is close to the normal level

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:

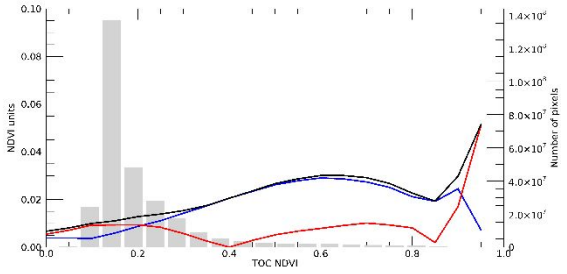
None

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	Sep-22	
Calibration/Validation update for SNPP and NOAA20 VI and GVF products	Sep-22	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	

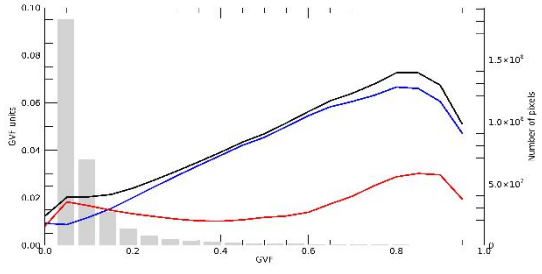
Highlights:

Stratified VI and GVF statistics for year 2021 indicate that bias is low, and standard deviation and RMSE are only high at high VI/ GVF pixels, which are less frequent.

TOC NDVI



GVF

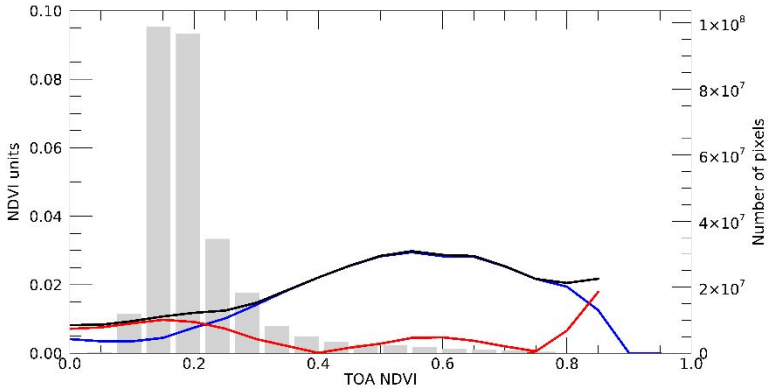


Bias
Standard deviation

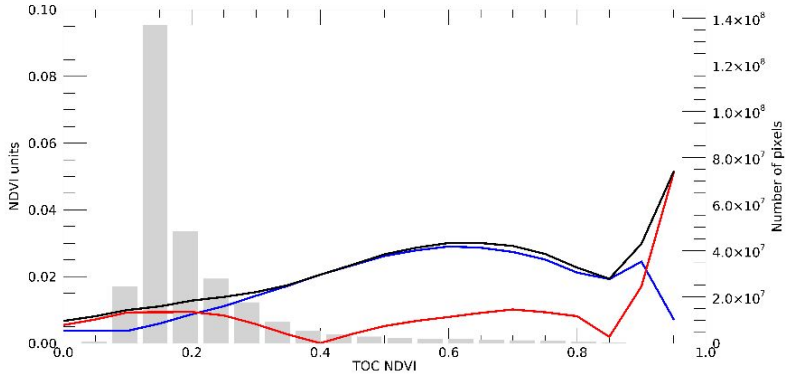
RMS difference
Gray bars: Pixel frequency

SNPP vs. NOAA-20 biweekly global VI comparison for 2021: Stratified by VI values

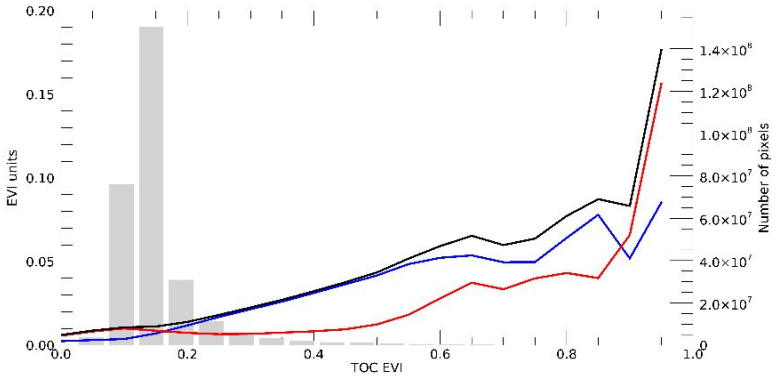
TOA NDVI



TOC NDVI



TOC EVI

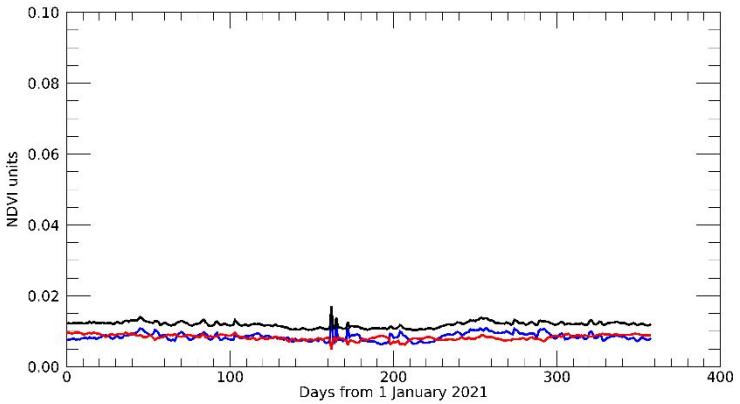


Higher standard deviation and RMS difference values occur only for higher VI values, where there are fewer high-quality pixels.

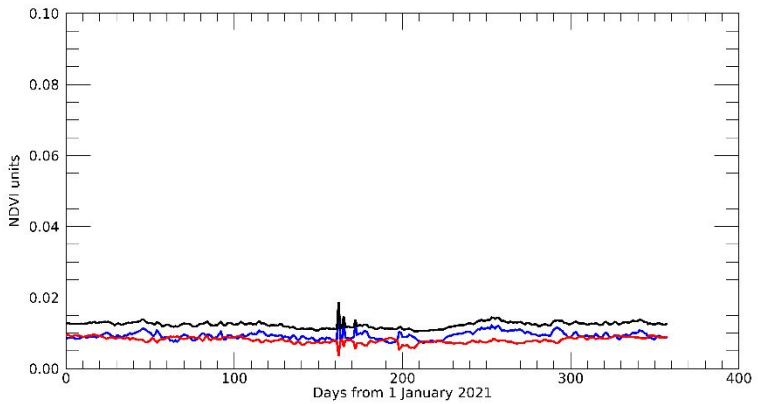
Bias
Standard deviation
RMS difference
Gray bars: Pixel frequency

SNPP vs. NOAA-20 biweekly global VI comparison for 2021: Time series

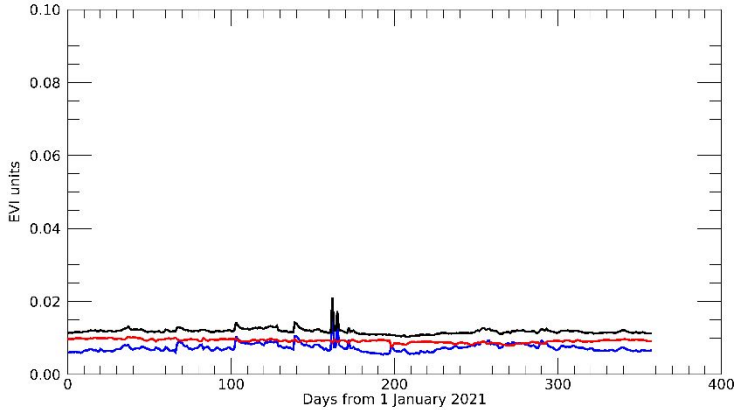
TOA NDVI



TOC NDVI



TOC EVI

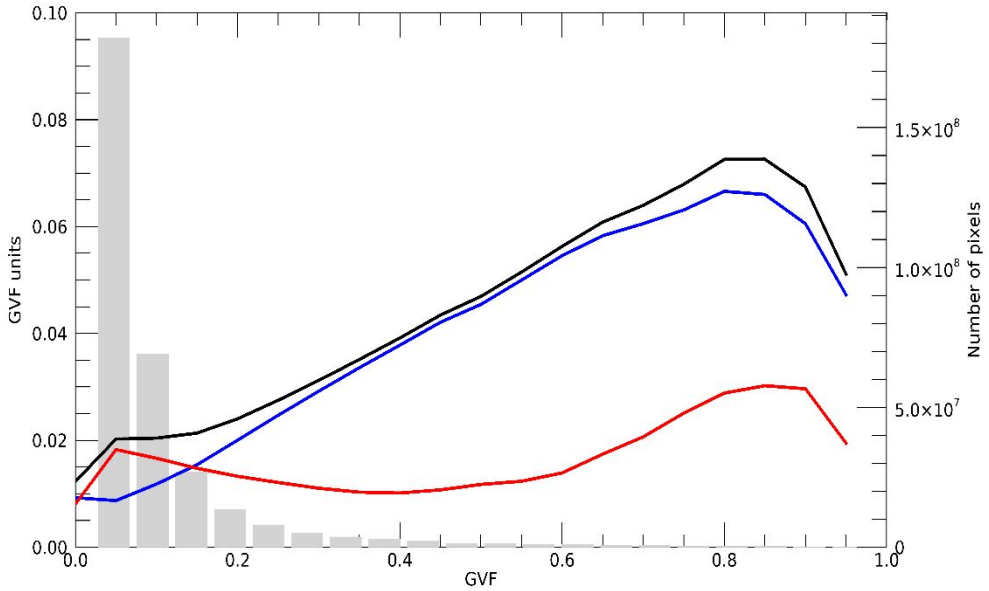


Time series statistics demonstrate low (< 0.02) overall differences and stability in those differences over the year 2021.

Bias
Standard deviation
RMS difference

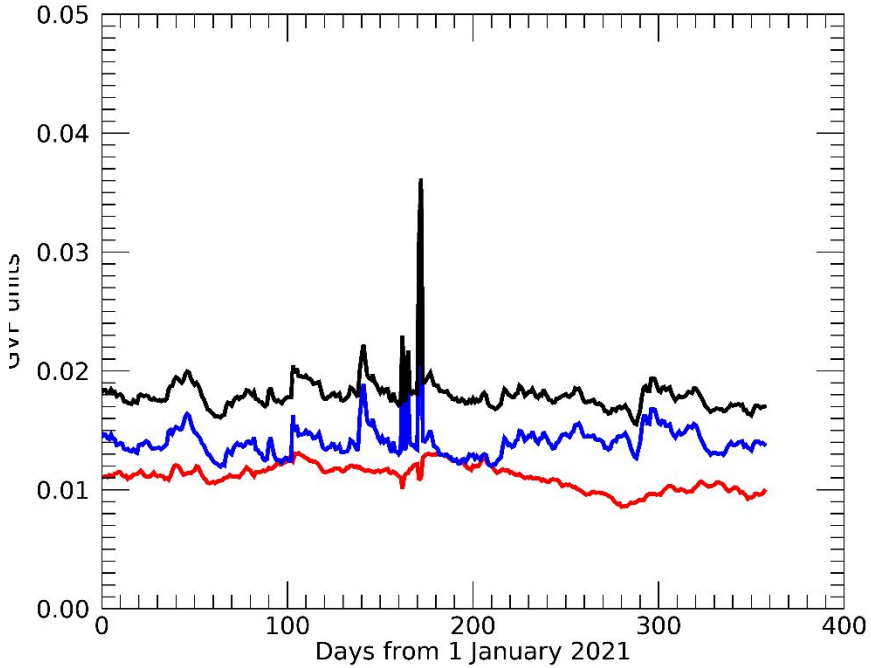
SNPP vs. NOAA-20 global GVF comparison

Stratified by GVF value



Higher standard deviation and RMS difference values occur only for higher GVF values, where there are fewer high-quality pixels.

Time series

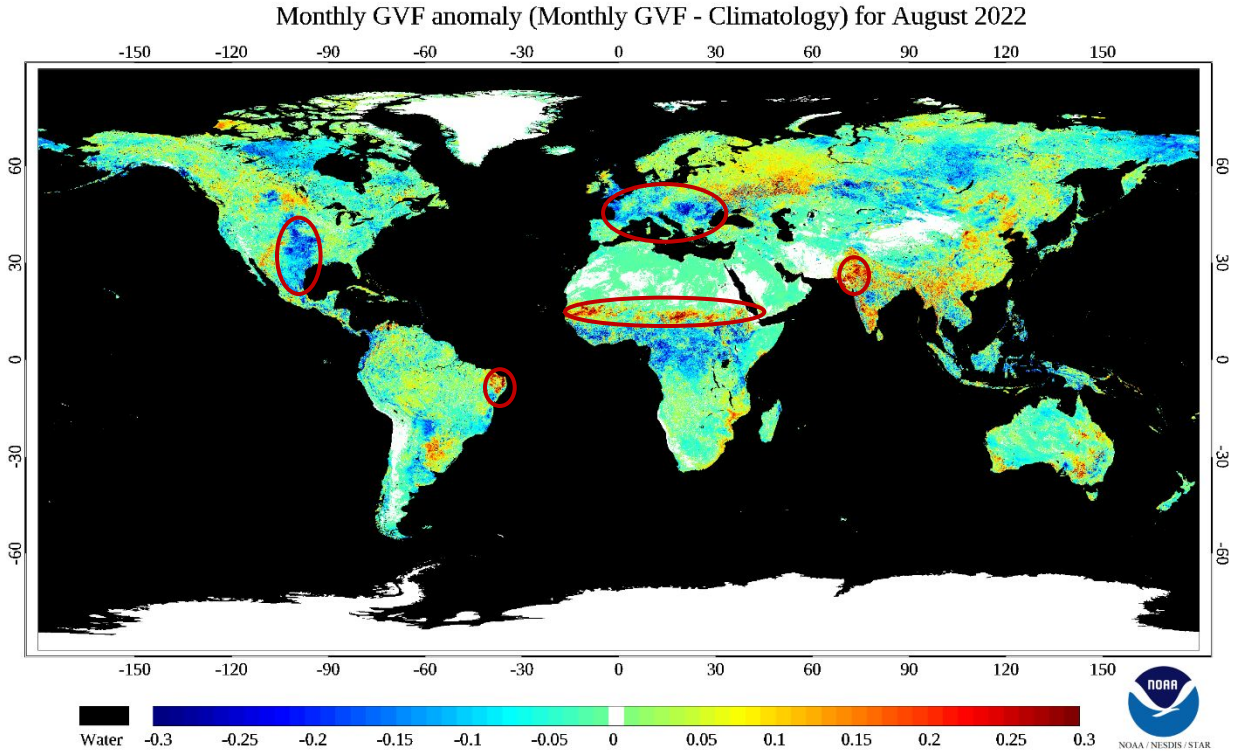


GVF standard deviation and RMS anomaly on 20210622 is under investigation.

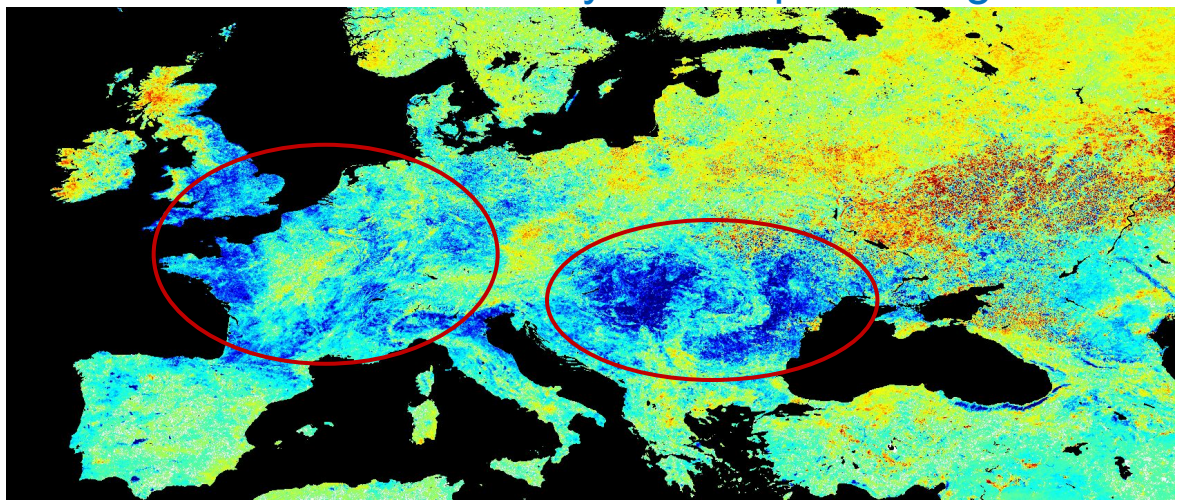
Bias
Standard deviation
RMS difference

VIIRS Monthly GVF anomaly for July 2022

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



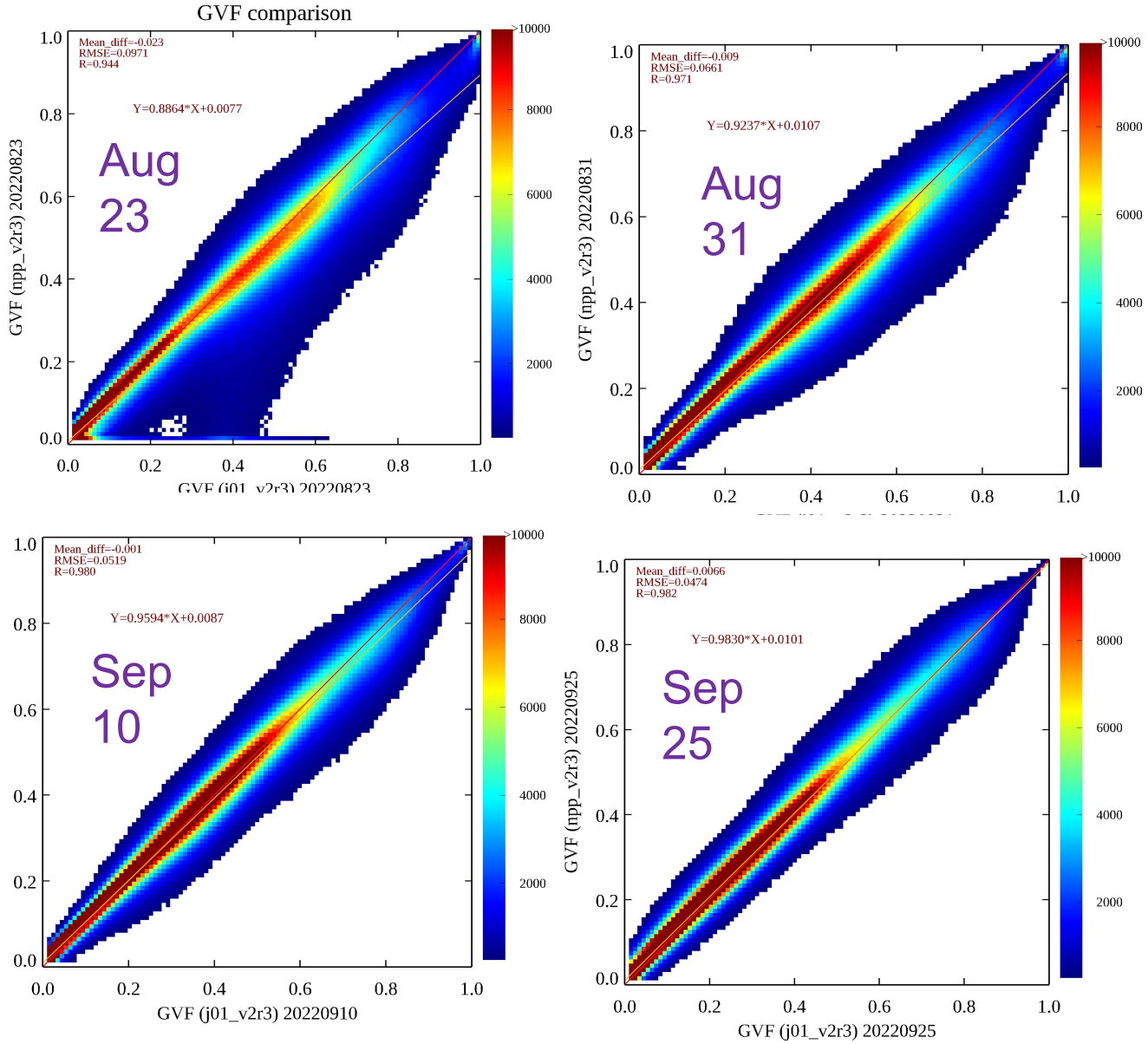
VIIRS GVF anomaly In Europe for August 2022



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

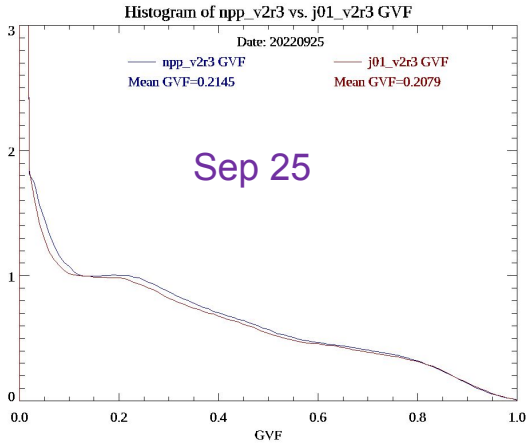
- VIIRS GVF in August 2022 is higher than average year in the northwest of India, north of the central Africa and the east of South America
- VIIRS GVF in August 2022 is lower than average year in Europe, the central Africa and Texas, USA

Evaluation of the impact S-NPP data outage on GVF product



- SNPP data outage period July 26 – Aug 22, 2022
- Since NOAA20 data were not affected, SNPP GVF was compared with NOAA20 GVF to evaluate the SNPP outage impacts on GVF

	RMSE	bias	R
Aug 23	0.097	-0.023	0.944
Aug 31	0.066	-0.009	0.971
Sep 10	0.052	-0.001	0.980
Sep 25	0.047	-0.006	0.982



- RMSE between the SNPP GVF and NOAA-20 GVF decreased from 0.097 to 0.047 and Bias decreased from -0.023 to -0.006 since Aug 23, 2022
- The histogram of the SNPP global GVF matched that of the NOAA-20 GVF
- The most recent SNPP-NOAA20 GVF RMSE is 0.047, which is close to the normal level before the SNPP data outage (RMSE=0.04)

Leaf Area Index

September 2022

Accomplishments / Events:

- LAI algorithm test, including the hyperparameters optimization, test the balance between performance and computing efficiency, the overfitting issue for the dense vegetation area.
- Based on the 5-year datasets (2014-2018), prepared more data (2013, 2019, 2020) for the training, particularly for the dense vegetation area, to improve the performance for the possible saturated LAI.
- Complete the 500m daily gridded surface reflectance, which is subsequently used for the LAI retrieval.
- Test the daily 500m LAI retrieval at global scale and inter compared with NASA VNP15 LAI product.

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.*

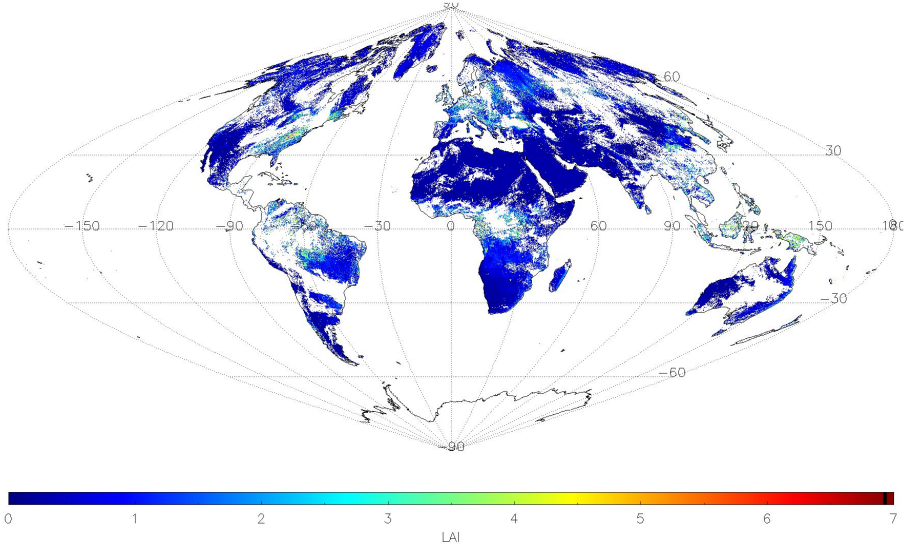
Issues/Risks:

None

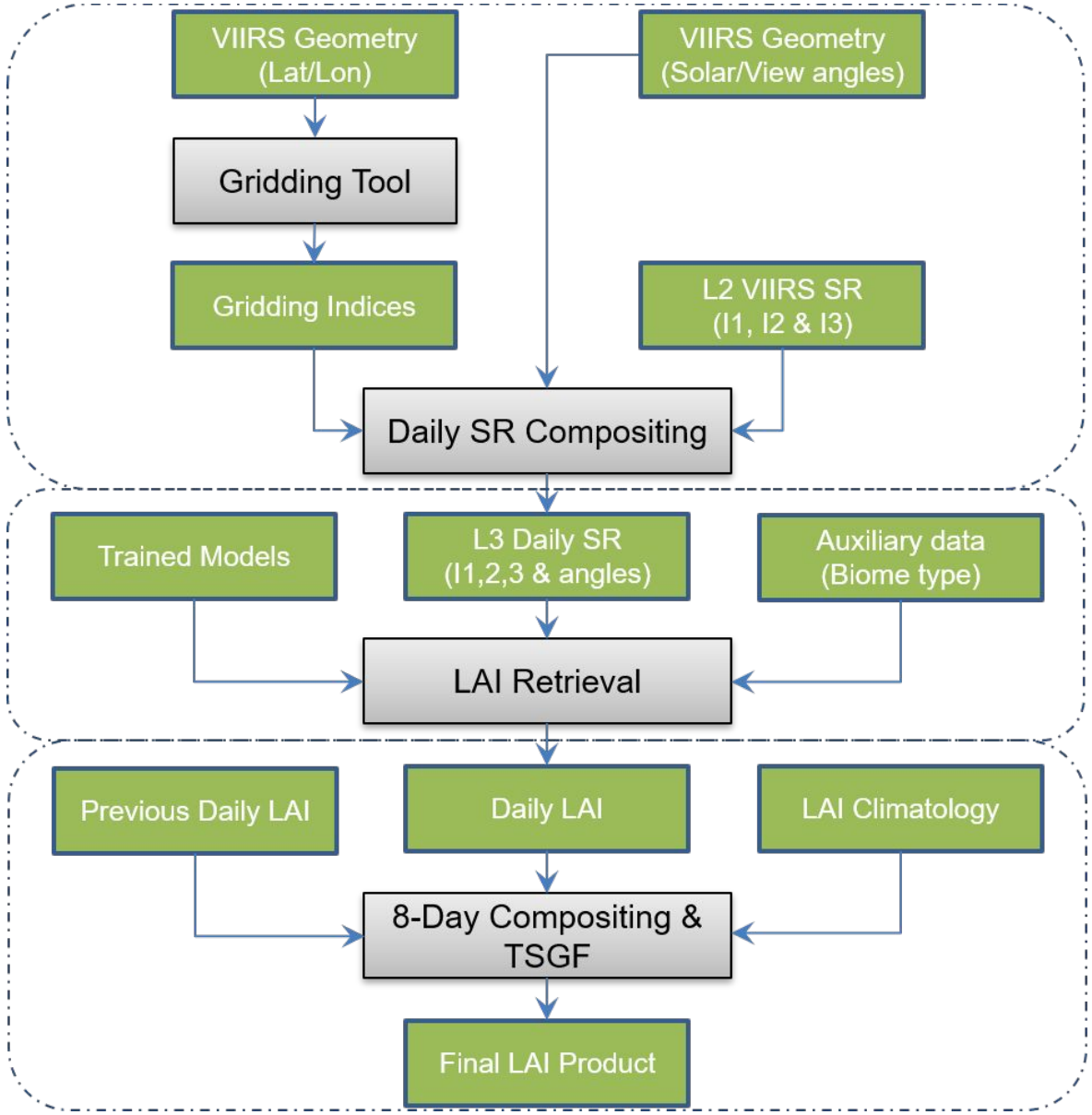
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Discussion with users for the requirements and Initial Archive Requirements identified	Aug-22	Aug-22		
Quality Monitoring Concept and Long-term Maintenance Concept defined	Oct-22	Oct-22		
Experimental dataset produced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

Highlights:

SNPP VIIRS global daily LAI at 500m resolution, June 1st, 2022



LAI Product Process Flowchart



1. Daily SR Generation

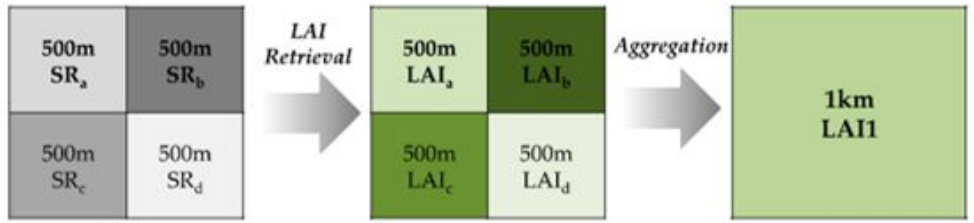
2. Daily LAI Retrieval

3. 8-day Composting & post processing

At this stage we are working on the routinely daily SR generation and daily LAI retrieval test.:

1. Daily surface reflectance generation. The VIIRS gridding tool is used to mapping the granule data into global grid in sinusoidal projection. SR compositing process select the best quality SR and related angles in each grid.
2. Daily LAI retrieval. A pre-trained machine learning algorithm is used for the clear-sky LAI retrieval using the daily SR along with the auxiliary data.

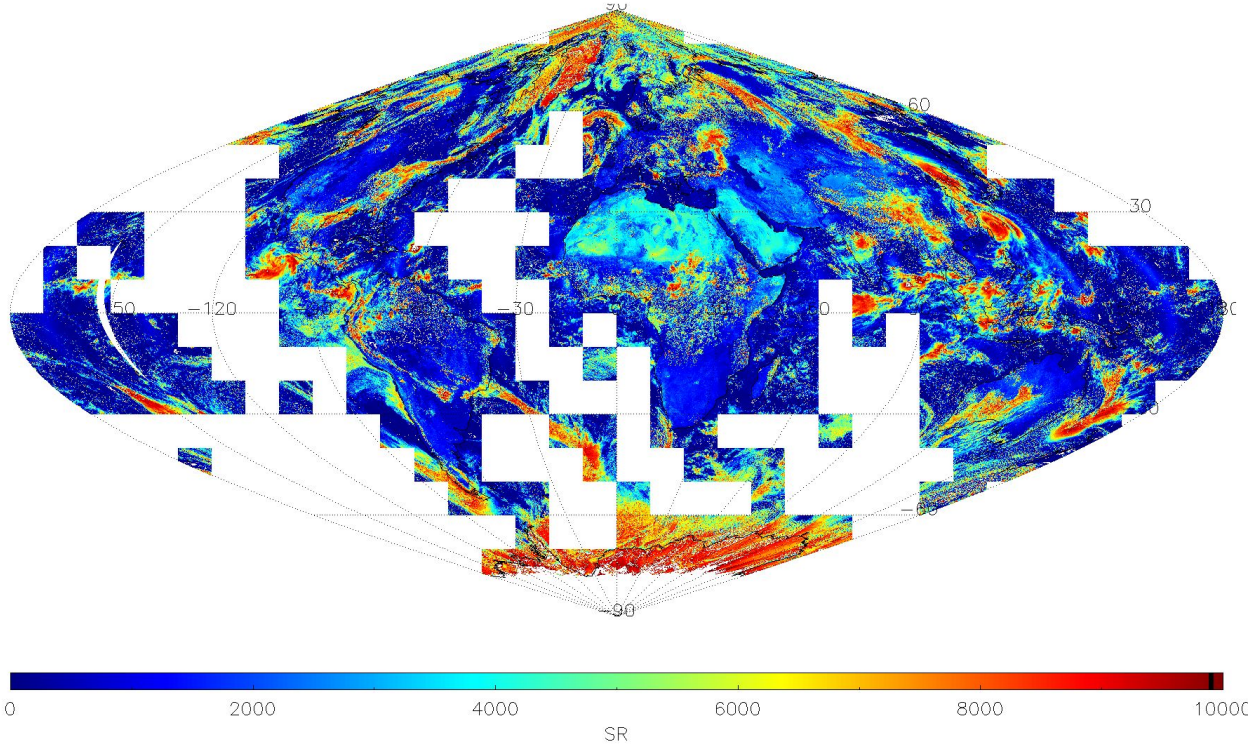
- Process from the high resolution (500m) data to avoid the scale effect.



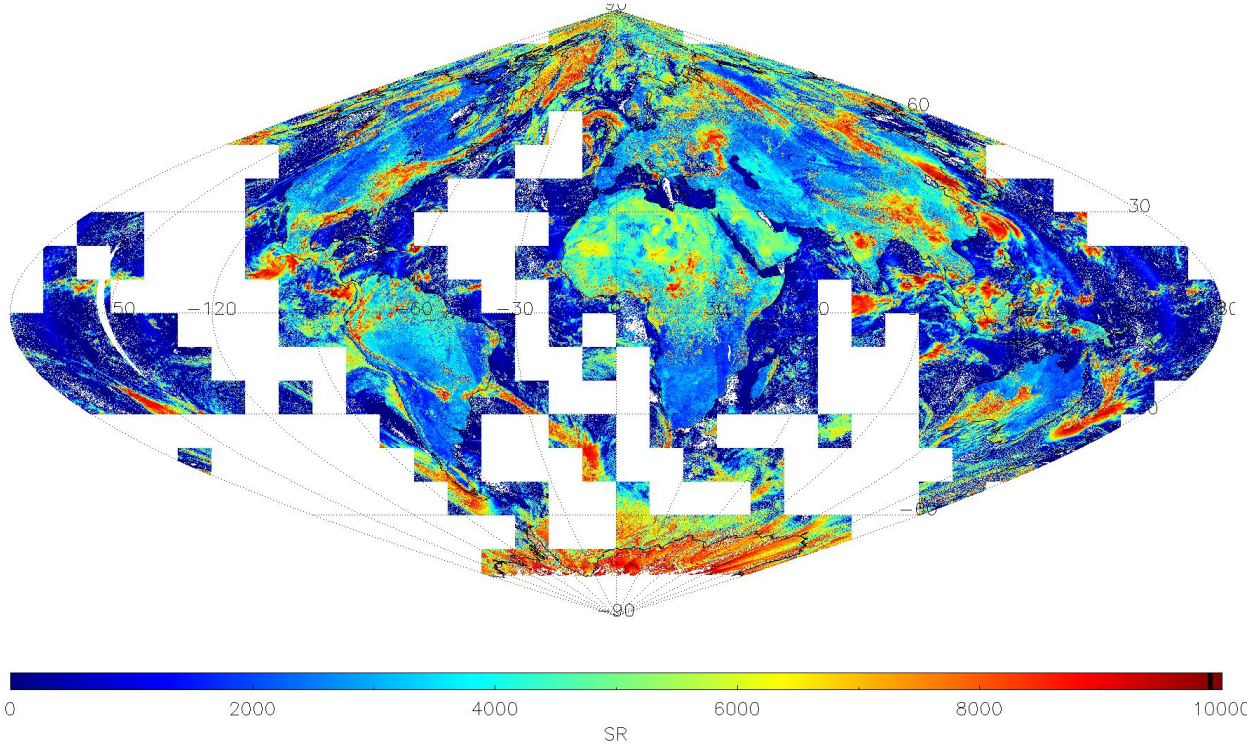
500m Daily Gridded SR

Dailly gridded SR (I1, I2 & I3) is routinely generated at local machine.

- Using the VIIRS gridding tool (500m sinusoidal projection)
- Output all the LAI algorithm required input: I1, I2 & I3 SR, view and solar angles, along with 2 bytes Quality flags.
- The compositing method is refer to MODIS daily SR, the best quality SR will be selected for the grid with multiple observations.
- The data save in 10 ° x10 ° tiles (18*36)



SNPP SR (I1) 06/01/2022

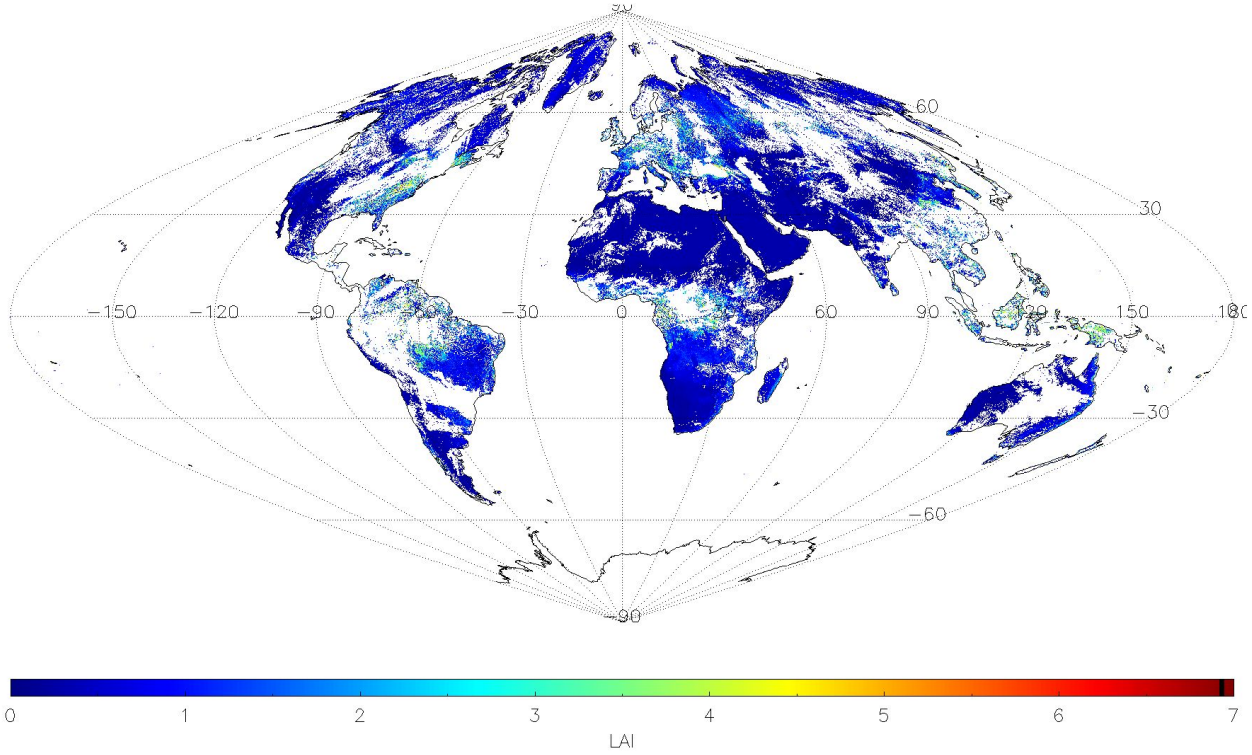


SNPP SR (I2) 06/01/2022

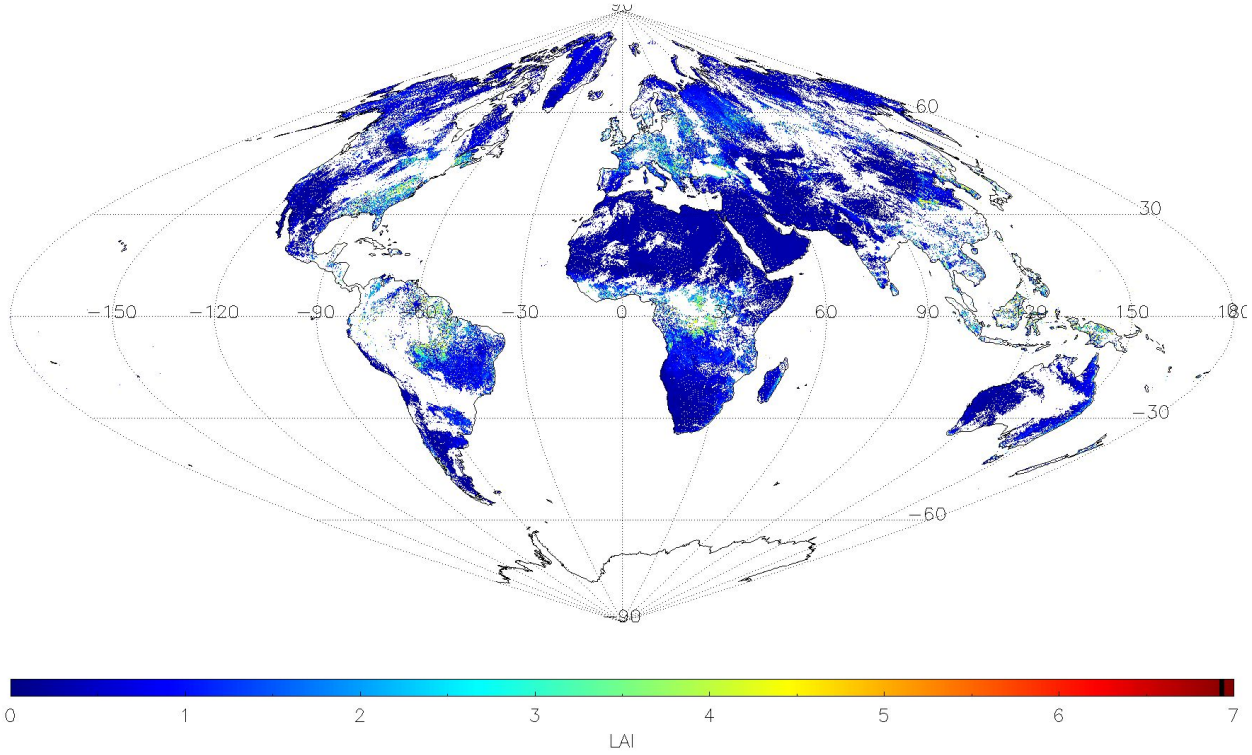
Global Daily LAI Generation for both SNPP and NOAA20

The global daily LAI is under test.

- Using the machine learning algorithms (Random forest and Cubist)
- Test the perform compared with training LAI (VNP15).
- Test the parameters setting and computing efficiency balance.
- Dealing with the dense vegetation area.



SNPP 06/01/2022



NOAA-20 06/01/2022

Vegetation Health

September, 2022

Accomplishments / Events:

- Preparing for J2 Launch!
- First light for Visible Infrared Imaging Radiometer Suite (VIS/NIR, DNB Day) L+25 Days
- First light for VIIRS IR and DNB band L+48 Days

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.*

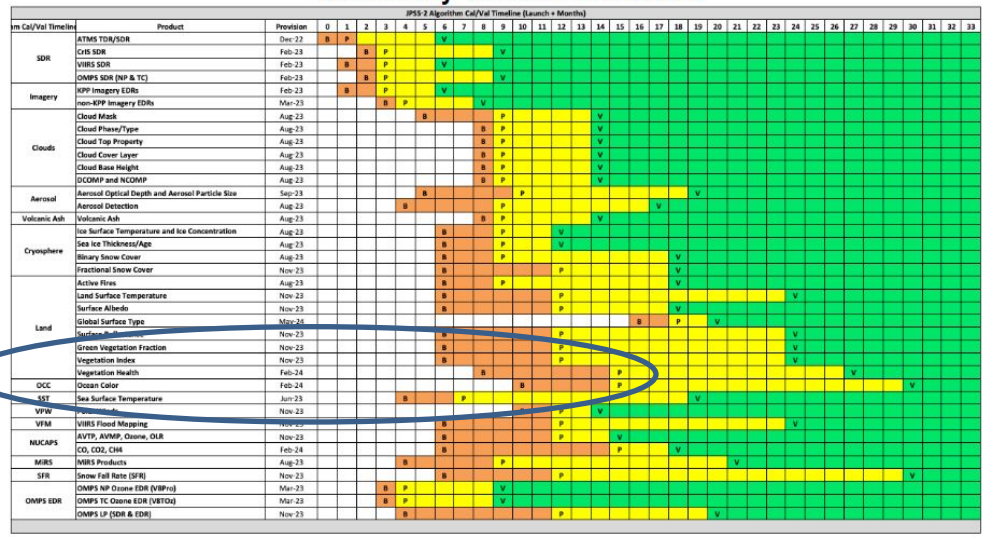
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
FY21 End of Year Science Team Presentations (PMR)	Oct-21	Oct-21		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	Sep-22	
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	05/19/22	JCT3-TVAC

Highlights: Key J2 Date for Vegetation Health Provisional is Feb 2024

J2 Maturity Timeline 09/02/2022



Ocean Color

September, 2022

Accomplishments / Events:

- **Ocean Color Team Monitoring of Severe Flooding in Pakistan Using VIIRS False Color Images**
  Routine daily monitoring of the recent severe flood (still ongoing) in Pakistan is also underway in the Ocean Color Team (see Highlight). The NOAA OCView (Mikelsons and Wang, 2018, https://doi.org/10.1029/2018EO096563) displays the VIIRS-SNPP (Suomi National Polar-orbiting Partnership) daily global true color and false color imageries, which extends to the beginning of the SNPP mission, and is updated hourly.

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.*

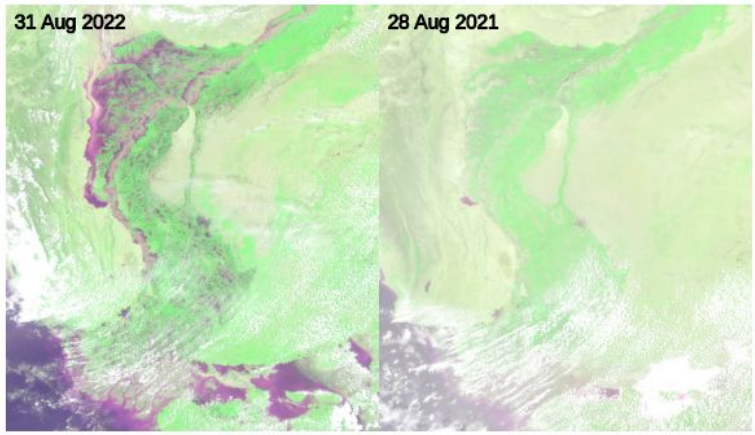
Issues/Risks:

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	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	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	Sep-22	
Participant/support JPSS-2 pre-launch testing events (May-22 JCT3-TVAC; Jul-22 JCT4)	Sep-22	Sep-22	May-22	

Highlight: Pakistan Floods

. Shown below in an example of false color imagery from August 31, 2022 (left, purple color for flooding area), compared to non-flood conditions on August 28, 2021 (right).



Sea Surface Temperature

September, 2022

Accomplishments / Events:

- A major milestone is completion of 3rd full VIIRS reprocessing (RAN3) from both NPP (Feb'2012-pr) and N20 (Jan'2018-pr), archival in PO.DAAC, and documenting in peer-reviewed publication.
- Another major milestone is release of the two L3S-LEO products, AM (from 3 Metop's) and PM (from 2 VIIRS's), full 1st reprocessing (RAN1) back to Dec'2006 (AM) and Feb'2012 (PM), archival in PO.DAAC, and work with NESDIS (Reynolds/OISST), OAR (Great Lakes Environmental Research Lab), NOS (WCOFS) and OSU (DA in regional West-Cist analysis). Work on L3S-LEO ATBD and documenting the L3S-LEO-AM/PM in peer-reviewed literature is underway.
- Following requests of multiple users, development of L3S-LEO-Daily product is underway which aggregated four L3S-LEO files (AM/PM and Day/Night). Example shown in Figure below.
- Monitoring of NPP/N20 SSTs in SQUAM, MICROS and ARMS continues. No issues (other that the NPP outage) have been identified.
- Work is underway to improve the stability and completeness of the in situ data in iQuam system for the use in Cal/Val. Currently it overly relies on FNMOC product, which has been unstable recently. Adding ICOADS NRT and CMRMS redundant flows is being explored.

Overall Status:

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

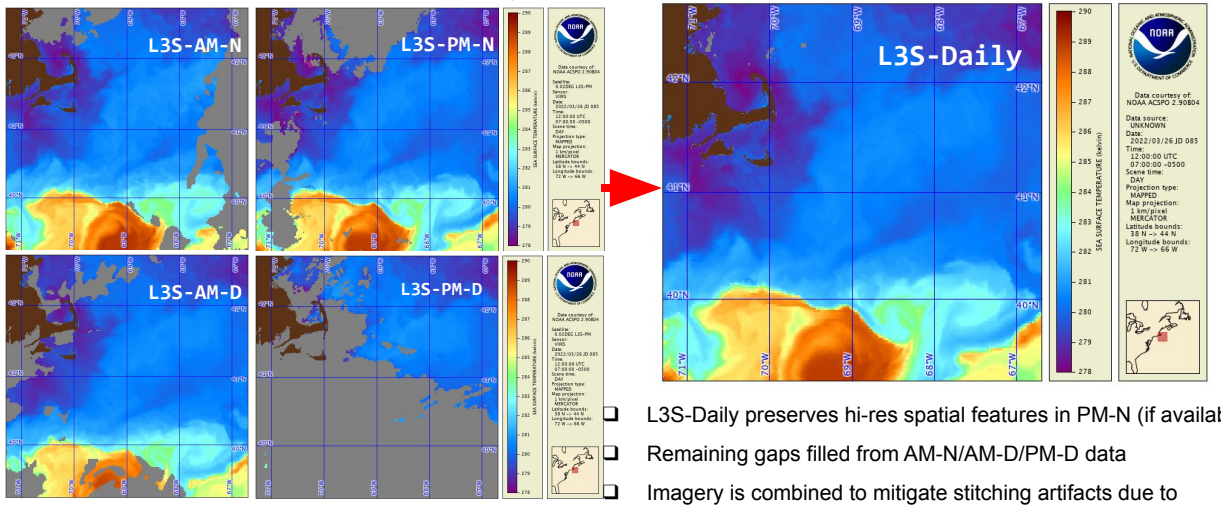
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

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

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 filename change)
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	Aug-22	
Continue NOAA SQUAM and ARMS monitoring & validation against iQuam. Provision for N21 infrastructure	Aug-22	Aug-22	Aug-22	
Maintain ACSPO, SQUAM, iQuam, ARMS, match-up & RAN infrastructure & codes. Improve/optimize/add N21	Sep-22	Sep-22	Sep-22	
Monitor SST performance online. Identify anomalies. Work w/SST Algorithms & SDR Team and archives to address	Sep-22	Sep-22	Sep-22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22	Sep-22	
Participant/support J2 pre-launch testing events (May'22 JCT3/TVAC; Jul'22 JCT4). Include N21 in Matchup code & SST Monitoring systems	Sep-22	Sep-22	05/12/22	JCT3-TVAC
Release VIIRS RAN3. Archive in PO.DAAC, document in pub	Sep-22	Sep-22	Sep-22	
Release L3S-LEO-AM/PM products. Archive and document	Sep-22	Sep-22	Sep-22	

Highlights: New L3S-LEO-Daily product under development



Example aggregating 4 L3S-LEO AM/PM files in one L3S-LEO-Daily file

- L3S-Daily preserves hi-res spatial features in PM-N (if available)
- Remaining gaps filled from AM-N/AM-D/PM-D data
- Imagery is combined to mitigate stitching artifacts due to systematic and non-systematic biases between PM/AM SSTs
- SSTs at large VZAs (swath edges) and near cloud boundaries, taken w/lower weights, reducing errors in SST & cloud leakages

VIIRS Polar Winds

September, 2022

Accomplishments / Events:

- **Validation of VIIRS polar winds by comparing to the ERA5 reanalysis**. The wind field in ECMWF's ERA5 reanalysis provides hourly estimates of many atmospheric climate variables, from 1950 to the present. At this time, the VIIRS winds are not included in the ERA5, making the reanalysis an independent 'observation' for comparisons. Initial results provide information similar to comparisons from Rawinsondes but are much faster and easier to obtain. (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

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	
VPW patch DAP to NDE (to fix granule filtering of +/- 50 deg)			09/21/22	
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	Sep-22	
Continuous monitoring of S-NPP and NOAA-20 products	Sep-22	Sep-22	Sep-22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	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 Wind Speeds compared to ERA5 Reanalysis

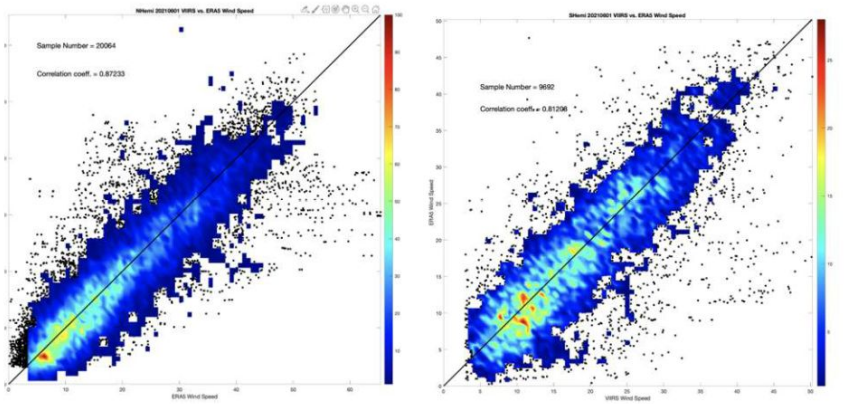


Figure 2: Density scatter plots of the wind speed for the ERA5 vs VIIRS AMVs for 01 June 2021, for the northern (left) and southern (right) hemispheres. The correlation coefficient for the northern and southern regions is 0.87 and 0.81, respectively.

NUCAPS Products

Accomplishments / Events

September, 2022

- NUCAPS team updated the CO2 flag with a 2nd degree polynomial using the updated ESRL CO2 monthly mean (for trend), and Carbon Tracker 2019B monthly mean profiles up to 201903. Performed a preliminary evaluation of the NOAA-20 CO2 product retrieved with the OCO-2 V11 CO2, and found them match well.
- Hurricane Ian: NUCAPS captured several retrievals along the track of Hurricane Ian from prior to landfall over southwestern Florida to its second landfall on the South Carolina coast. In general, NUCAPS accurately indicated a very convectively unstable atmosphere with low-level saturation and dry air aloft and a possible stratospheric intrusion that favored strong downburst winds.
- NUCAPS team continued work on adding the Averaging Kernel implementation for the MetOp-B/C system, and also fixed some minor fixes (Gravity calculation, NaNs microwave emissivities that occasionally appear). The fixes incorporated into the pre-processor will be implemented as a patch delivery for the NCCF operations.
- An Elsevier reference book entitled Field Measurements for Passive Environmental Remote Sensing: Instrumentation, Intensive Campaigns, and Satellite Applications (ISBN 978-0-12-823953-7, edited by Nicholas Nalli) was published in September.
- One of the NUCAPS team members attended the EUMETSAT-2022 conference and presented NUCAPS system, products, and ongoing efforts towards the augmentation of NUCAPS for the EPS-SG IASI-NG.

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			

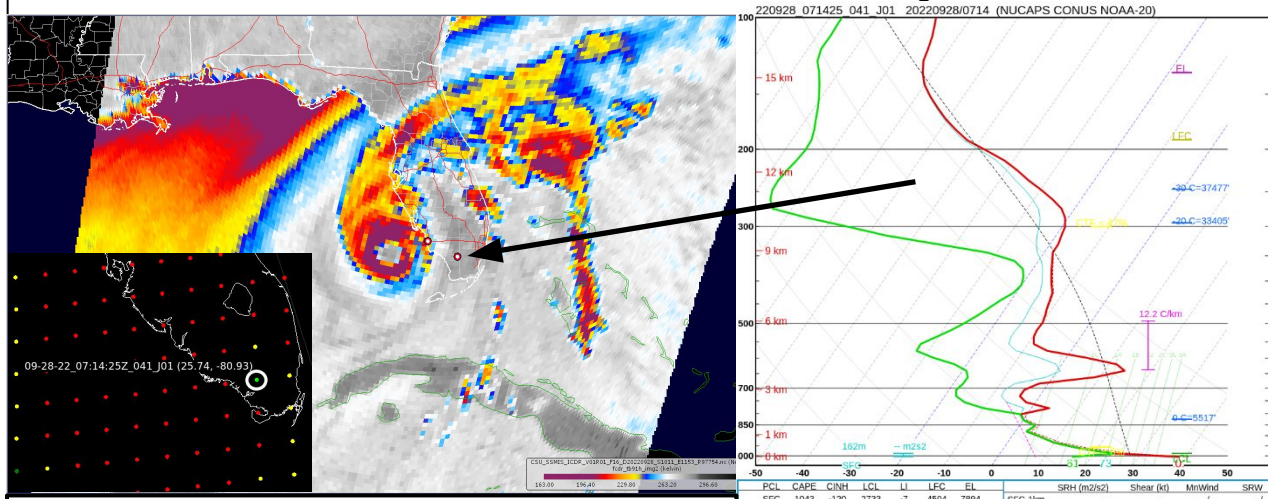
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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	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	Sep-22	continuing
NOAA-GML Theme 2: NUCAPS ozone and water vapor products validations with CLIMCAPS and O3SNDS, and collaboration with GML and other stakeholders in support of NOAA/NESDIS initiatives	Sep-22	Sep-22	Sep-22	continuing
Routine monitoring of trace gas products, T(p) and q(p) bias improvements	Sep-22	Sep-22	Sep-22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	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

Hurricane Ian and NUCAPS Soundings



A NOAA-20 NUCAPS sounding profile was captured in a dry slot on the eastern periphery of the eye wall of Hurricane Ian during the morning of September 28, 2022. The profile accurately indicated large potential instability and the favorability of strong downburst winds over south Florida.

MiRS Products

September, 2022

Accomplishments / Events:

- The science team continues to work on potential improvements to the ATMS precipitation retrieval product using machine learning methods. Previously, a U-Net approach was developed and tested using over CONUS data from 2021 and 2022. Most recently, additional testing has been done with a deep neural network (DNN) and a random forest (RF). All machine learning models used MiRS operational rain rate and TPW as inputs. Figure shows results for a case over the CONUS on 2022-05-05. Shown are the reference MRMS radar-gauge analysis, as well as the N20/ATMS operational MiRS retrieval, the U-Net, DNN, and RF predictions. Both the U-Net and DNN predictions improve relative to the operational retrieval in that they largely eliminate the false signal of light rainfall that surrounds the main storm system. The RF prediction is not reliable and contains numerous artifacts. Further testing is underway to better understand retrieval performance of each model and to examine the performance of the models outside the CONUS region.

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	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

Overall Status:

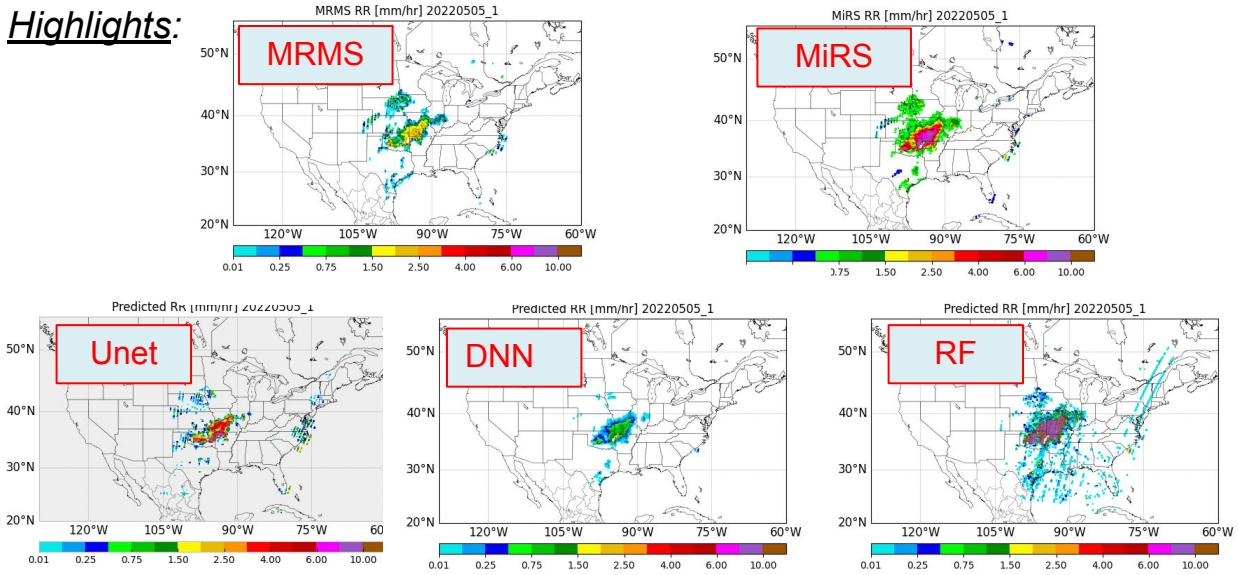
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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:



Intercomparison of MRMS reference rainfall, with N20/ATMS rainfall estimates from the MiRS operational algorithm (both top row), a U-Net, a deep neural network, and a random forest model (all bottom row) on 2022-05-05.

Snowfall Rate

September, 2022

Accomplishments / Events:

- The SFR team is working to correct an issue with noisy retrievals under certain heavy snow conditions. The bias correction is trained using a machine learning model. The noise issue can occur when some of the input features are close to the extreme values of the training dataset. These heavy snowfall cases will be incorporated in the training dataset and a new bias correction model will be trained in the near future. Another identified cause is that some input features, e.g. satellite observations at 183±1 GHz and some GFS model parameters, are noisy. Further analysis will determine if these features should be removed from the bias correction model.
- Contributed to the STAR Q4 QPR including reporting the SFR team's major accomplishments in the past 6 months.

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			

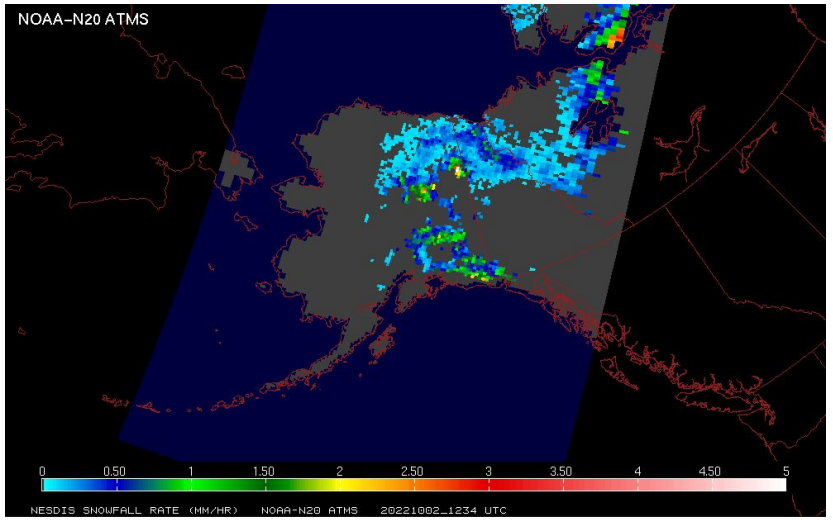
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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

Highlights: SFR for Alaska



SFR in Alaska derived from NOAA-20 on October 2, 12:34Z (image from SPoRT SFR Alaska page, https://weather.msfc.nasa.gov/cgi-bin/sportPublishData.pl?dataset=snowfallratealaska)

OMPS Ozone (V8Pro, V2Limb & V8TOz)

September, 2022

Accomplishments / Events:

- Preparing for J2 Launch!
- First light for OMPS approximately L+48 days

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			

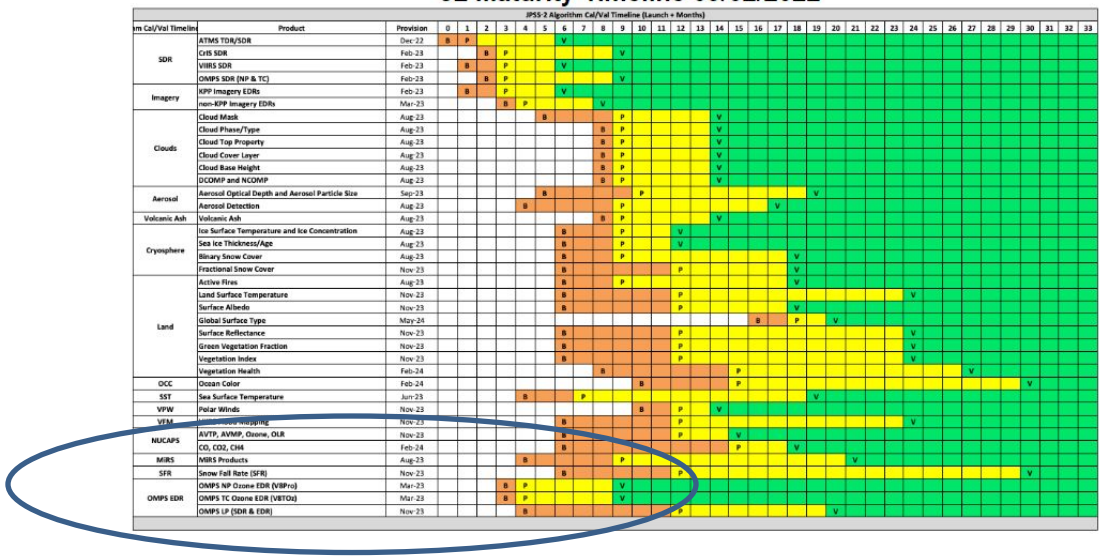
1. Project has completed. 2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

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	10/26/21	
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	Nov-22		To ASSISTT:
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	FY23	**FY23**	SDR Delay
Limb Darks and Orbital Definition files: ancillary file deliveries to PDA / NDE	Sep-22	Sep-22	Sep-22	Ongoing
Overpass data sets and comparisons to GB and MERRA2	Sep-22	Sep-22	Sep-22	Ongoing
Support ASSISTT/NDE evaluation as required/needed	Sep-22	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: Key dates for J2 Ozone Provisional Status are March 2023 for NP and TC, November 2023 for LP

J2 Maturity Timeline 09/02/2022



GCOM-W

September, 2022

Accomplishments / Events:

– Reviewing options/schedule for GCOM-W AMSR2 and GOSAT-GW AMSR3 Continuity given funding concerns. GOSAT-GW to launch in Spring 2023 (TBC).

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.*

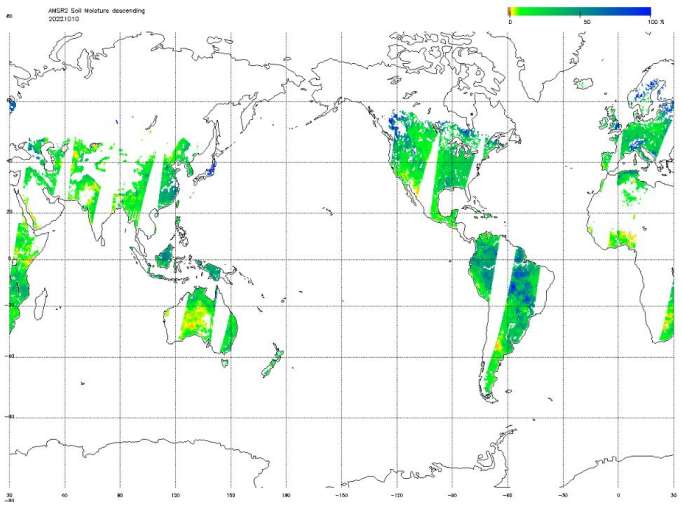
Issues/Risks:

Need additional funding for continuity of GCOM-W AMSR2 and GOSAT-GW AMSR3 products

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	Sep-22	
Support ASSISTT/NDE evaluation as required/needed	Sep-22	Sep-22	Sep-22	

Highlights: Soil Moisture from GCOM-W AMSR2

Descending Pass



JSTAR Mapper and NPROVS

September, 2022

Accomplishments / Events:

- The ability to change background (i.e. water) color was added to the JSTAR Mapper website. Work is now progressing on allowing land to be changed in a similar fashion.
- The NPROVS team successfully integrated the now (since July 27) operational MetOp-B and C NUCAPS v3 sounding products **(HIGHLIGHT)**
- Work continues to reprocess the NPROVS Specials datasets from the GCOS Reference Upper Air network (GRUAN) including a detailed first light dataset which confirmed overall scientific integrity.

Overall Status:

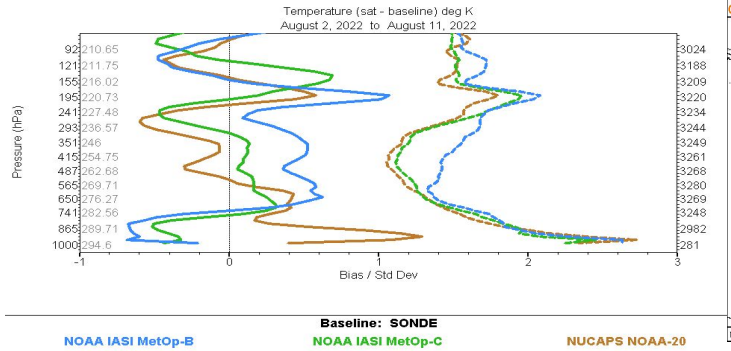
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

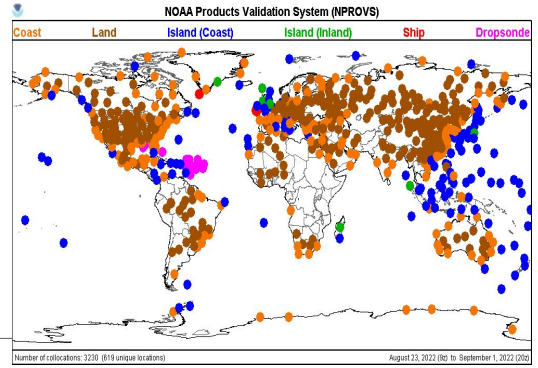
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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		not required - no major issues
FY23 Program Management Review	Jun-22	Jun-22	06/14/22	
Maintain / expand existing JSTAR Mapper web site	Aug-22	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	Aug-22	
Manage JPSS dedicated Radiosonde program (DOE-ARM), EDR/Raob collocations (Special), expand to store SDR (GSICS / GRUAN; 75TB)	Aug-22	Aug-22	Aug-22	
Support JPSS AWIPS (NUCAPS) and Hydrological (MiRS) Initiatives and Case Studies	Aug-22	Aug-22	Aug-22	

Highlights:





Vertical temperature statistics vs Radiosonde (left) for NUCAPS v3 from **MetOp-B, MetOp-C** and **NOAA-20**, respectively, for a 10-day period (August-2022); bias (solid), standard deviation (dashed), vertical (y-axis) pressure (hPa; 15km) with sample size on right and (SAT-Raob) difference ranging from -1K to 3K (x-axis). Assessment is enterprise, same radiosondes used for all systems increasing confidence, with global distribution shown on right on right.

Summary: Temperature bias for **MetOp-B** and **-C** are fairly well correlated in the vertical but vary significantly from **NOAA-20** with distinct features both below and above 700 hPa with differences approaching 2K. **Metop-B** vs **C** (same orbit) are more similar but bias differences above 700 hPa approach 0.5K with increased (30%) standard deviation for **MetOp-B**. More to come …