NOAA JPSS Monthly Program Office

AMP/STAR
FY21 TTA

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October, 2021

Milky Seas publication by S. Miller highlighted in *NY Times*

On 27 August 2021, the *New York Times* posted an article titled "Satellites Spot Oceans Aglow With Trillions of Organisms" highlighting Steve Miller's recent *Scientific Reports* publication "Honing in on bioluminescent milky seas from space". **https://www.nytimes.com/2021/08/27/science/ocean-bioluminescent-satellite.html**

TRILOBITES

Satellites Spot Oceans Aglow With Trillions of Organisms

A new generation of detectors let scientists identify a dozen large episodes of bioluminescence, one a hundred times larger than Manhattan — and that's the smallest.

A false-color satellite image of a giant mass of glowing seawater at night, near the island of Java in Indonesia in August 2019. Steven D. Miller, NOAA

By William J. Broad   Aug. 27, 2021, 5:00 a.m. ET

Highlights from the Science Teams (September)

**Rapid land/water surface type change affects quality EDRs retrieved from MIRS**
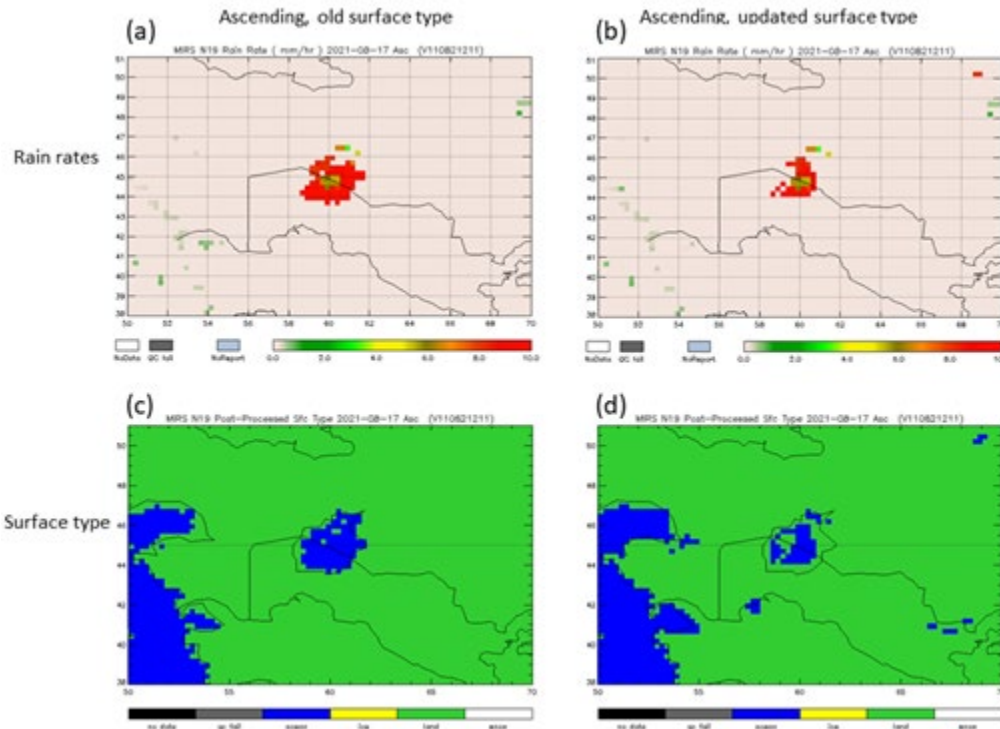
Since the surface emissivity is very different between land and water for the surface microwave channels, it is critical to have accurate surface type information in MiRS to generate appropriate outputs. A recent report from the team analyzed this issue using the ever shrinking Aral Sea in central Asia as a test case.

The team applied the updated surface type based on VIIRS measurements between 2012 and 2019 and noticed that the rain rate over the Aral Sea area is significantly affected by the surface type. The rain rates from MiRS NOAA-19 indicates that rain rates are affected by the surface type in where strong rain rate (no rain rate) is retrieved over water (land).

VIIRS Tandem Winds Product Tracks Post-Tropical Storm Larry
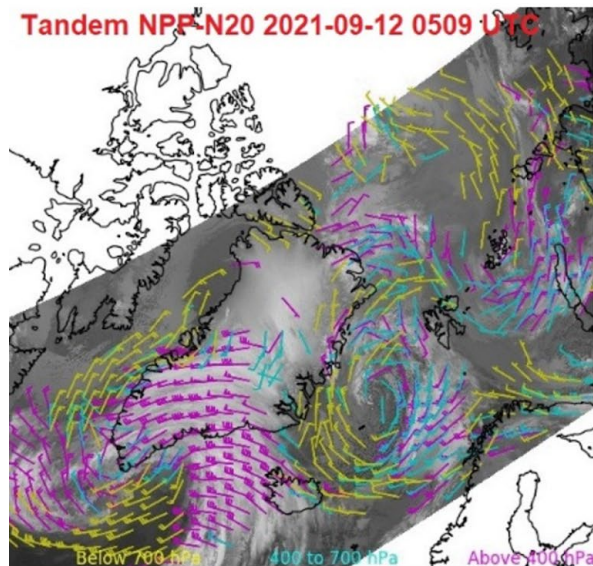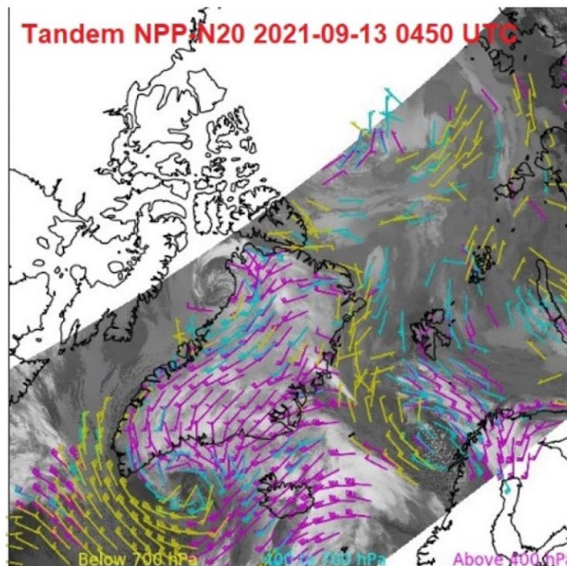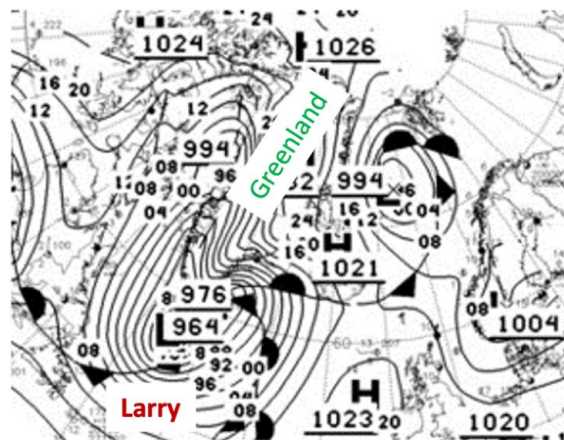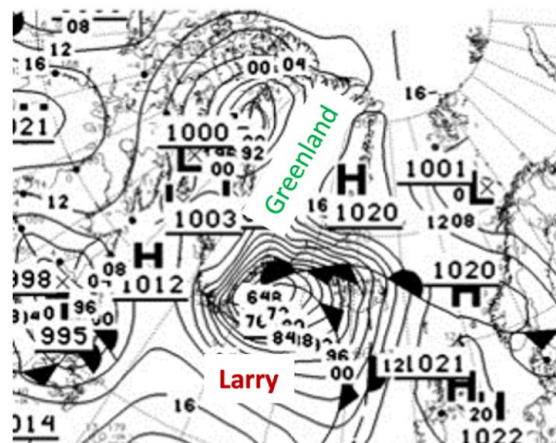
On 11 September 2021, Hurricane Larry moved to the northeast of Nova Scotia and transitioned into an extratropical storm and on 13 September reached peak intensity with a central minimum low pressure of 964 mb off the southeast coast of Greenland.

The VIIRS tandem winds product captured this progression well, as illustrated in the figure The significance of this case is that the VIIRS tandem winds product, which takes advantage of the fact that both S-NPP and NOAA-20 fly in the same orbit about 50 minutes apart, provides expanded latitudinal coverage over a single polar-orbiting satellite, extending the latitudinal range equatorward by 10 degrees or more.

Accomplishments

- Delivery Algorithm Packages (DAPs) - Mission Unique Products:
  - 09/08/2021: OMPS SDR team submitted "J2 OMPS NM high resolution risk preliminary analysis report" to DPMS/JSTAR

- DAPs – Enterprise Products:
  - 09/03/2021: HEAP CCAP (for MetOp-B/C) delivered to Cloud
  - 09/03/2021: ACSPO SST CCAP (for MetOp-B/C) documentations (SMM, EUM, & ATBD) delivered to Cloud (DAP delivery: 8/17/2021)
  - 09/16/2021: STAR delivered ACSPO SST (v2.80) VIIRS DAP to NDE
  - 10/05/2021: STAR delivered the ACSPO SST (v2.80) VIIRS DAP to NDE, along with the sample input and output files (per NDE's request)
  - 09/14/2021: STAR delivered VIIRS Flood Mapping DAP to NDE (Final DAP for VFM)
  - 10/15/2021: VIIRS Flood Mapping CCAP Delivery to NCCF (this is an initial delivery of the VIIRS Flood Mapping CCAP to NCCF as part of the JPSS reprocessing efforts)
  - 10/07/2021: Patch & Final J2 VIIRS Surface Reflectance DAP delivered to NDE, and OSPO (for software code review)
  - 09/27/2021: AST-2020 delivery (ready for users to download at STAR FTP site)
  - Received three MiRS end-of-year reports:
    - MiRS NOAA-20 Annual Validation Update (10/04/2021)
    - MiRS ATMS Recalibration Assessment and Reprocessing Verification (10/04/2021)
    - MiRS Preliminary Experiments with Machine Learning Based Sounding for Tropical Cyclones (10/07/2021)

- IDPS Builds Checkouts / JPSS-2 Pre-Launch Testing events:
  - 10/04/2021: JSTAR submitted data request for Mx5 SOL deploy regression review/checkout to DPMS
  - 10/06/2021: JSTAR submitted summary report for JCT2a-DSE review/checkout to DPMS
    - 08/31/2021   VIIRS Imagery team submitted report
    - 09/02/2021   VIIRS SDR team submitted report
    - 09/08/2021   ATMS SDR team (include ICVS checking) submitted report
    - 09/20/2021   OMPS SDR team submitted report
    - 09/27/2021   CrIS SDR team submitted report
    - *ICVS*: Verified JPSS-2 JCT2a-DSE data using ICVS LTM modules. Generated sample images from ATMS TDR, CrIS RDR, OMPS RDR, and SDR/GEO to verify the data format. Sample images are pushed to NOAA SSO protected ICVS-beta website for demonstration purpose

Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	09/07/21, 09/14/21, 09/21/21, 09/28/21, 10/05/21, 10/13/21
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	09/07/21, 09/14/21, 09/21/21, 09/28/21, 10/05/21, 10/13/21
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	09/14/21, 09/28/21, 10/13/21
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	09/07/21, 09/21/21, 10/05/21
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	09/14/21, 10/12/21
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	09/14/21, 10/12/21

- ***VIIRS Global Annual Surface Type (AST-2020***): The new VIIRS Annual Surface Type 2020 product (AST-2020, spatial resolution: 1km) based on 2020 whole year surface reflectance data is now ready for users to download at STAR FTP sites. There are three products:

  - 2020 AST IGBP types in Sinusoidal projection
  - 2020 AST IGBP types in Lat/Long
  - 2020 AST 20 types in Lat/Long

- Ocean Color highlight - VIIRS-derived global suspended particulate matter (SPM) images are now available in OCView, providing routine global daily SPM data
- Clouds highlight - Develop/improve a new aviation website for custom cloud cross-sections along user-selective flight routes
- Imagery Blog - VIIRS NCC used for Nighttime smoke detection
- AOD: Routine generation of the blended (LEO-GEO) AOD product (started on Nov 1, 2020)

Upcoming Milestones/Deliveries

- JSTAR Code/LUT/Product Deliveries:

  DAP to DPMS:
    - May-22: Final launch-ready JPSS-2 PCT/MM-coef DAP (ATMS & CrIS)
    - May-22: Final launch-ready JPSS-2 LUTs/MM-coef DAP (VIIRS & OMPS)
    - Sep-22: NOAA-20 NCC LUT update (VIIRS Imagery)

  NOAA-20/JPSS-2 Algorithm DAP to NDE/CoastWatch:
    - Oct-21: Initial/Final Vegetation Health J2 DAP (include NPP/N20 updates)
    - Oct-21: Final J2 NUCAPS DAP (include NPP/N20 updates)
    - Nov-21: Final J2 Super DAP (Clouds, Aerosol, Volcanic Ash, Cryosphere, VPW, LST, LSA)
    - Nov-21: Final J2 Active Fires DAP (include NPP/N20 updates)
    - Nov-21: Final NVPS J2 DAP (VI & GVF)
    - Nov-21: Final OMPS Ozone V8TOz DAP
    - Dec-21: Final OMPS Ozone V8Pro DAP
    - Dec-21: Global Gridded LST/LSA DAP
    - Jan-22: Final MiRS J2 DAP (include SFR)
    - Dec-21: J2-ready Ocean Color DAP to CoastWatch
    - Jun-22: J2-ready Ocean Color DAP to Cloud (NCCF)

FY21 STAR JPSS Milestones

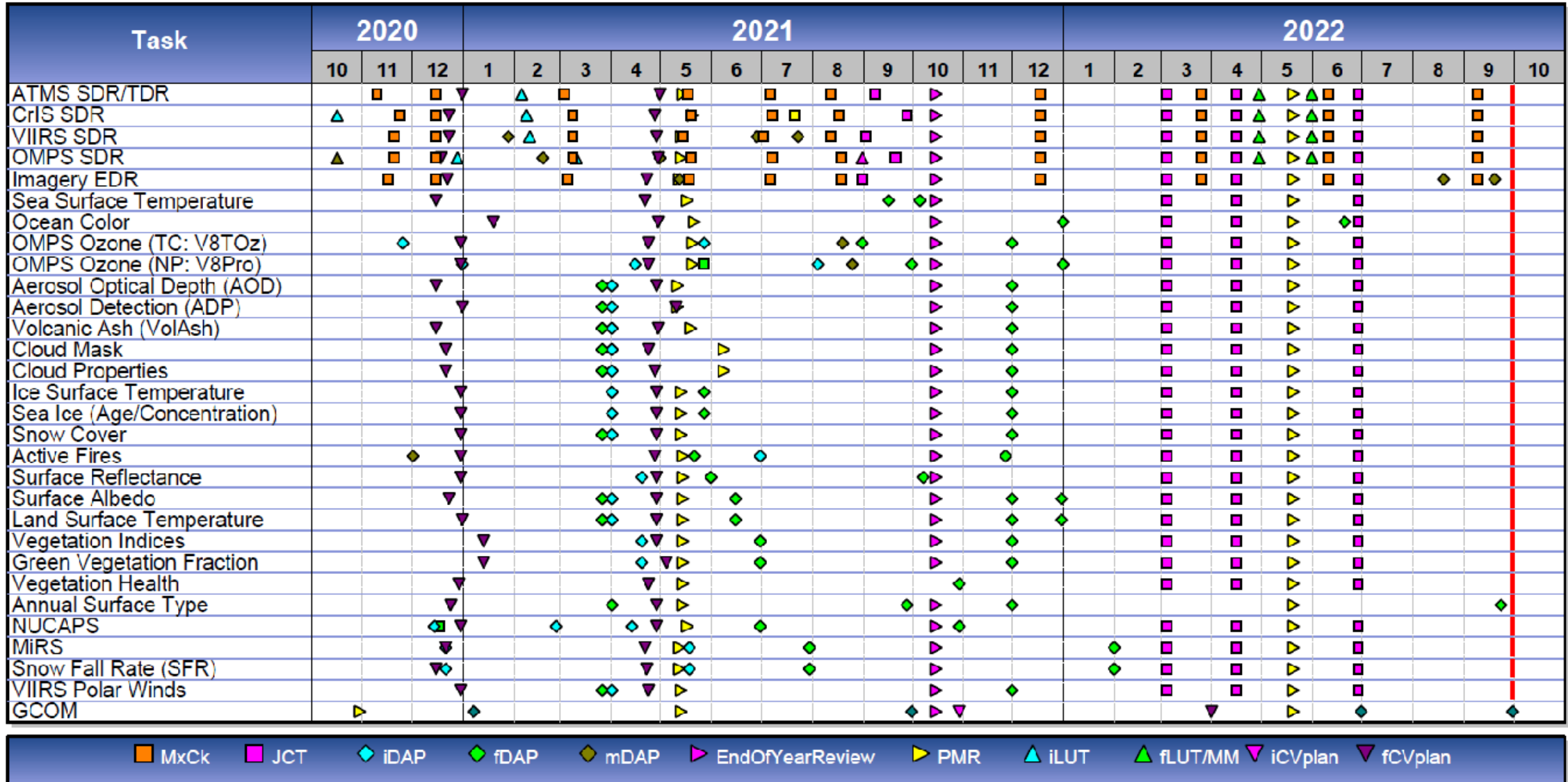| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates DAPs				
CrIS: Initial J2 PCT DAP	Oct-20	Oct-20	10/16/20 02/08/21 (re-delivery, B2.3 Mx0)	
ATMS: Final J2 PCT/MM-coef DAP	Sep-21	May-22	All SDR J2 MM-coef updates pending on J2 instrument alignment measurement summary report from flight team, which may available to STAR by mid- to-late-September, 2021	
CrIS: Final J2 PCT/MM-coef DAP	Jul-21	May-22		
VIIRS: Final J2 Launch-ready LUTs/MM-coef DAP	Sep-21	May-22		
OMPS: Initial J2 Launch-ready LUTs DAP (combined code & LUT DAPs, ADR9095 & ADR9501)	Jan-21	Mar-21	03/10/21	12/28/20 DAP to ASSISTT
Imagery: N20 NCC LUT update DAP	Jul-21	Sep-22	NCC Banding Anomaly, ASF tool update	
Initial J2 ready DAP (include NPP/N20 updates), Clouds/Aerosol/VolcanicAsh/Cryosphere/LST/LSA/VPW	Jan-21	Mar-21	04/01/21 (to NDE) 05/26/21 (to CSPP)	downstream data testing
Initial J2 ready Active Fires DAP (include NPP/N20 updates, I–Band)	Jun-21	Jun-21	06/24/20	J2 I-Band AF
Surface Reflectance: Initial J2 ready DAP	Jan-21	Apr-21	04/19/21 (to NDE) 04/22/21 (to CSPP)	downstream data testing
NVPS (VI & GVF): Initial J2 ready DAP	Feb-21	Apr-21	04/19/21	Data testing
Vegetation Health: Initial J2 ready/final N20 DAP	Apr-21	Oct-21		Initial/Final combined
SST: Initial J2 ready DAP (ACSPO 2.80)	Apr-21	Sep-21	**09/16/21**	Initial/Final combined
NUCAPS: Initial J2 ready DAP	Apr-21	Apr-21	02/26/21 04/13/21 patch delivery 04/27/21 (to CSPP)	
MiRS & SFR: Initial J2 ready DAP	Mar-21	May-21	05/18/21 (v11.6, to NDE) 06/11/21 (v11.6, to CSPP)	documentation update
OMPS Ozone V8Pro: Initial J2 ready DAP	Dec-20	Dec-20	12/31/20 04/15/21 patch delivery 08/04/21 patch delivery 08/25/21 patch DAP	
OMPS Ozone V8TOz: Initial J2 ready DAP	Mar-21	May-21	05/27/21 08/19/21 patch DAP	11/25/20 DAP to ASSISTT

FY21 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Date	Variance Explanation
Algorithm Cal/Val/LTM				
J2/Enterprise Cal/Val Plan - final delivery (all SDR/EDR) Updated Cal/Val plans (address DPMS review comments)	Dec-20	Dec-20	12/31/20 04/30/21	
GCOM: AMSR-3 Cal/Val Plan - draft delivery	Sep-21	Oct-21		CAC renewal issue
Updated JPSS-2 OMPS SDRs Pre-launch Characterization Report	May-21	Aug-21	08/31/21	
JCT2 - Data System Event (SDR teams, test/run through RDRs from JCT2-DSE, generate J2 SDRs)	Aug-21	Aug-21	08/24/21	
NUCAPS CO2 Full Validated Maturity (N20 & NPP)	Dec-20	Dec-20	12/17/20	
N20 OMPS NP EDR (V8Pro) Full Validated Maturity	May-21	May-21	05/27/21	Dry run: 05/12/21
Transition of reprocessed SNPP SDR data to CLASS/NCEI	Sep-21	**Sep-22**		Due to the large size of the data (~1100TB) and limited transition speed (3TB/day)
Support JPSS-2 ICVS-LTM Test Readiness Review	Sep-21	Sep-21	**Sep-21**	ICVS Beta for JCT2a-DSE
ICVS-J2 prototype Website (ready for JCT-3 test run)	Sep-21	Sep-21	**Sep-21**	
Maintain / expand existing EDR LTM web pages and mappers	Sep-21	Sep-21	**Sep-21**	
Delivery of JPSS Product Monitoring Phase 9 DAP to OSPO	Sep-21	Sep-21	**May-21**	Delivery to NCCF
AST-2020 (VIIRS Annual Surface Type)	Sep-21	Sep-21	**09/27/21**	

Milestones	Original Date	Forecast Date	Actual Completion Date
Operational/Program Support			
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/06/20, 10/13/20, 10/20/20, 10/27/20, 11/03/20, 11/10/20, 11/17/20, 11/24/20, 12/01/20, 12/08/20, 12/15/20, 12/22/20, 01/05/21, 01/12/21, 01/19/21, 01/26/21, 02/02/21, 02/09/21, 02/16/21, 02/23/21, 03/02/21, 03/09/21, 03/16/21, 03/23/21, 03/30/21, 04/06/21, 04/13/21, 04/20/21, 04/27/21, 05/04/21, 05/11/21, 05/18/21, 05/25/21, 06/02/21, 06/08/21, 06/15/21, 06/22/21, 06/29/21, 07/06/21, 07/13/21, 07/20/21, 07/27/21, 08/03/21, 08/10/21, 08/17/21, 08/24/21, 08/31/21, **09/07/21, 09/14/21, 09/21/21, 09/28/21, 10/05/21, 10/13/21**
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/06/20, 10/20/20, 11/03/20, 11/17/20, 12/01/20, 12/15/20, 01/12/21, 01/26/21, 02/09/21, 02/23/21, 03/16/21, 03/30/21, 04/13/21, 04/27/21, 05/12/21, 05/25/21, 06/08/21, 06/22/21, 07/06/21, 07/20/21, 08/03/21, 08/17/21, 08/31/21, **09/14/21, 09/28/21, 10/13/21**
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/21/20, 11/24/20, 12/22/20, 01/19/21, 02/17/21, 03/23/21, 04/20/21, 05/18/21, 06/16/21, 07/20/21, 08/11/21, **09/14/21, 10/12/21**
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/06/20, 10/13/20, 10/20/20, 10/27/20, 11/03/20, 11/10/20, 11/17/20, 11/24/20, 12/01/20, 12/08/20, 12/15/20, 12/22/20, 01/05/21, 01/12/21, 01/19/21, 01/26/21, 02/02/21, 02/09/21, 02/16/21, 02/23/21, 03/02/21, 03/09/21, 03/16/21, 03/23/21, 03/30/21, 04/06/21, 04/13/21, 04/20/21, 04/27/21, 05/04/21, 05/11/21, 05/18/21, 05/25/21, 06/02/21, 06/08/21, 06/15/21, 06/22/21, 06/29/21, 07/06/21, 07/13/21, 07/20/21, 07/27/21, 08/03/21, 08/10/21, 08/17/21, 08/24/21, 08/31/21, **09/07/21, 09/14/21, 09/21/21, 09/28/21, 10/05/21, 10/13/21**
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/13/20, 10/27/20, 11/10/20, 11/24/20, 12/08/20, 12/22/20, 01/05/21, 01/19/21, 02/02/21, 02/16/21, 03/02/21, 03/23/21, 04/06/21, 04/20/21, 05/04/21, 05/18/21, 06/02/21, 06/15/21, 06/29/21, 07/13/21, 07/27/21, 08/10/21, 08/24/21, **09/07/21, 09/21/21, 10/05/21**
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/21/20, 11/24/20, 12/22/20, 01/19/21, 02/17/21, 03/23/21, 04/20/21, 05/18/21, 06/16/21, 07/20/21, 08/17/21, **09/14/21, 10/12/21**
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Mar-21 Mx1; May-21 Mx2; Jul-21 Mx3; Aug-21 Mx4)	Sep-21	Sep-21	11/24/20 Mx0 I&T review/checkout report; 12/10/20 updated Mx0 I&T review/checkout report 02/26/21: Mx1 SOL review/checkout report; 03/11/21: Mx1 I&T review/checkout report 05/20/21: Mx2 I&T review/checkout report 06/16/21: Mx3 SOL review/checkout report 07/08/2021: Mx3 I&T review/checkout report 08/03/2021: Mx4 SOL review/checkout report; 08/19/21: Mx4 I&T review/checkout report
Parallel OPS support	Dec-20 Jan-21	Dec-20 Jan-21	11/6/2020 - 12/4/2020: daily POC support, weekly/monthly DAP deliveries (to both OPS & Cloud); 1/11/2021 – 1/21/2021 daily reportts
Verification of cloud implementation	Dec-20	Dec-20	11/06/20 - 12/04/20 daily reports 12/10/20 Mx0 I&T review/checkout report

Color code:

Green: **Completed Milestones**

Gray: **Non-FY21 Milestones**

ATMS SDR

Accomplishments / Events:

- Discussed the JPSS-4 ATMS two additional instrument waiver items submitted by NASA/NG-Azusa. NOAA ATMS SDR team has concurred one of them. For the other one, due to the lack of J4 ATMS antenna measurement data, ATMS SDR science team recommended to delay the discussion until the data sets are analyzed. NASA/NG has provided both J3 and J4 Ka-band antenna measurements data two days after the initial discussion. The impact study is on-going.
- Discussed and finalized the request description of proposed new JPSS-2 ATMS PLT item to collect moon observations during the roll maneuver activity. The purpose of such PLT is to fill the G-band beam pointing error assessment gap and improve the assessment accuracy of other bands. The advantage of such PLT is to dramatically shorten the existing assessment time using long term coastal inflation point (CIP) method, which requires at least one month of data for analysis.
- Discussed the JPSS-2 spacecraft telemetry data format change with NASA Flight Project POC. Tested the updated J2 spacecraft telemetry data decoding program using JCT2 data to get ATMS related health status parameter for monitoring purpose.
- Analyzed the ATMS striping causes and studied the potential mitigation strategies. Studied the ATMS EDU noise level and channel correlation.
- Evaluated ATMS geolocation, satellite scan angle, and satellite zenith angle changes and impacts by applying updated experimental ATMS beam pointing angle correction coefficients.
- Kept updating ATMS SDR User's Guide document

Overall Status:

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

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

Issues/Risks:

None

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/31/20	
Updated Cal/Val plan (DPMS comments)			04/30/21	
Initial J2 PCT update: re-delivery			02/05/21	
JCT2 - Data System Event	Aug-21	Aug-21	08/24/21	
Update ATMS TDR antenna pattern correction coefficients to improve SDR data quality	Jun-21	Jun-21	6/30/21	
Evaluate JPSS-2 ATMS spacecraft pre-launch testing data	Sep-21	Sep-21	9/24/21	
Support NASA SNPP ATMS scan motor current anomaly analysis	May-21	May-21	12/31/20	
Reprocess NPP/NOAA-20 ATMS science data using latest calibration algorithm	Sep-21	Sep-21	9/30/21	
Annual ATMS TDR/SDR performance report	Sep-21	Oct-21	End of year team presentation	
Parallel OPS support	Dec-20	Dec-20	Dec-20 Jan-21	11/6-12/4/20 1/11-21/21
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Mar-21 Mx1; May-21 Mx2; Jul-21 Mx3; Aug-21 Mx4)	Sep-21	Sep-21	11/09/20 Mx0 I&T 02/16/21 Mx1 SOL 03/03/21 Mx1 I&T 05/17/21 Mx2 I&T 07/06/21 Mx3 I&T 08/12/21: Mx4 I&T	Report

Highlights:

ATMS Engineering Design Unit (EDU) channel correlation from original 2021 TVAC data (left) and after artificially adding 0.5K thermal noise (right)

CrIS SDR
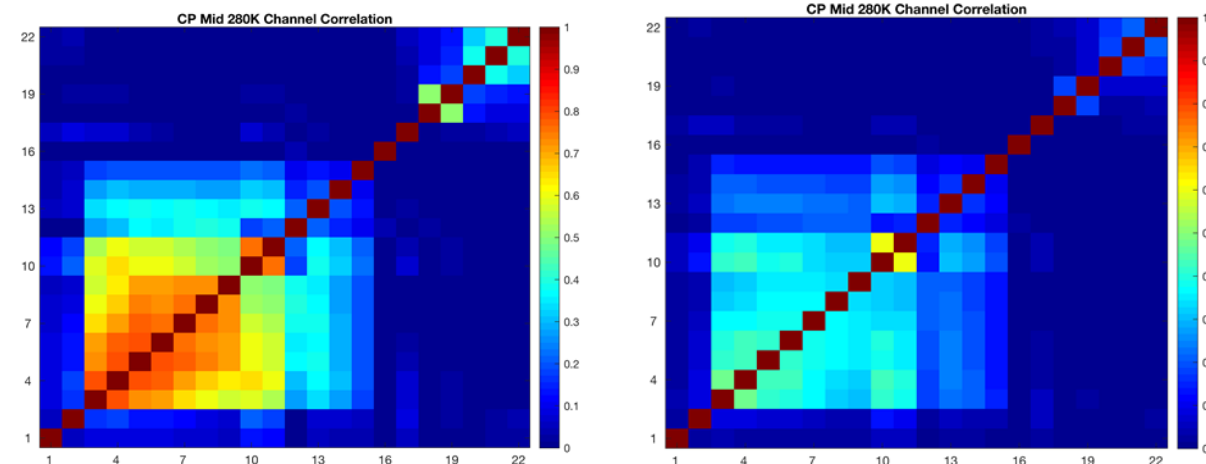
Accomplishments / Events:

- Submitted the manuscript entitled "Radiometric Intercomparison of CrIS and ABI IR Observations: Application to Calibration/Validation" to the IEEE TGRS Journal **(Fig. 1)**.
- Used existing Cal/Val tools to monitor the CrIS brightness temperature of Hurricane Ida over the Gulf of Mexico created between August 27 and September 1 **(Fig. 2)**. Highlighted in the September 7th Star Weekly Report and the NESDIS September 7th Weekly Report.
- Prepared material for the approval and upload of Engineering Packet v42 for SNPP CrIS to update the geolocation mapping parameters.
- Completed the CrIS SDR annual Performance Report **(Fig. 3)**
- Completed major updates and restructuring of the code to assess the CrIS geolocation accuracy relative to VIIRS to provide better handling of the parallel processing components. The implemented changes were tested and added functions to make the plots.
- Investigated and initiated an assessment on the Housekeeping Circuit Card Assembly rework on J2 and J3 CrIS. The major outcome is that Instrument ID swap is not expected to impact the generation of J2 CrIS SDR data. However, it has been recommended to update any documentation that lists the instrument IDs.
- Completed the JPSS-2 JCT2A Data System Event (DSE) CrIS RDR/SDR Data Checkout Report.
- Completed the development of an instrument responsivity calculation tool for NOAA-20 CrIS. This tool applies adjustment for the FIR filter and PGA **(Fig. 4)**
- Prepared a preliminary report on the CrIS SDR team's review and analysis of the JPSS-3 CrIS Prelaunch Tests.
- Supported the public distribution of CrIS Reprocessed SDR via NOAA CLASS

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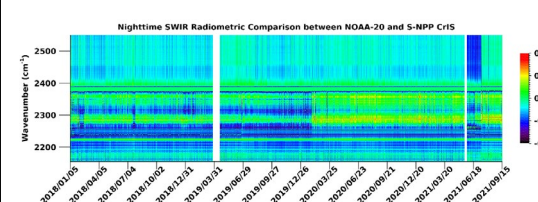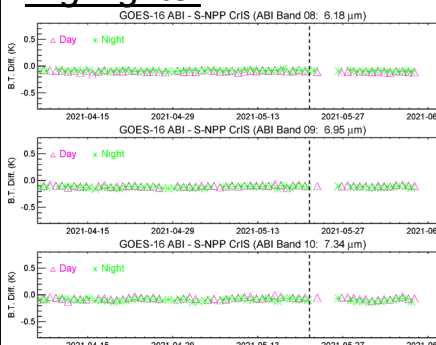4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

Dr. Zhipeng (Ben) Wang left the CrIS SDR team to work at NASA, he was mainly focused on the spectral calibration and CrIS/ABI intercomparison work. **The team is working on finding the corresponding support.**

Dr. Erin Lynch left the CrIS SDR team to work for NOAA/OPPA as a federal employee. She was mainly focused on the Geolocation calibration and the CrIS/IASI intercomparison work. **The team is working on finding the corresponding support.**

Milestones

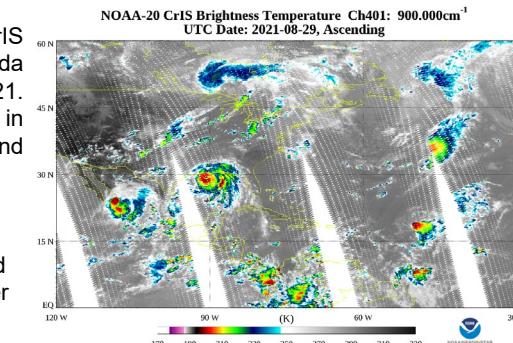| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
Updated Cal/Val plan (DPMD comments)			04/27/21	
Initial J2 PCT update based on pre-launch test data and other changes	Oct-20	Oct-20	10/16/20	
Initial J2 PCT update: re-delivery			02/08/21	
Verification of operational CrIS SDR data at FSR after the termination of NSR data			11/06/20	
S-NPP CrIS Side-1 SDR Product at Provisional Maturity Level			07/21/21	
JCT2 - Data System Event	Aug-21	Aug-21	08/24/21	
Inter-sensor comparison: S-NPP and NOAA-20 CrIS SDR data against other IR observations, including MetOp/IASI, AQUA/AIRS and GOES/ABI	Sep-21	Sep-21	09/15/21	
Annual CrIS SDR performance report	Sep-21	Oct-21	End of year team presentation	
Parallel OPS support	Dec-20	Dec-20	Dec-20 Jan-21	11/6-12/4/20 1/11-21/21
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Mar-21 Mx1; May-21 Mx2; Jul-21 Mx3; Aug-21 Mx4)	Sep-21	Sep-21	11/23/20 Mx0 I&T 02/24/21 Mx1 SOL 03/08/21 Mx1 I&T 05/19/21 Mx2 I&T 07/07/21 Mx3 I&T 08/17/21 Mx4 I&T	Report

Highlights:

(2) NOAA-20 CrIS observations of Hurricane Ida landfall on August 29, 2021. This work was highlighted in the SMCD Weekly Report and

(1) The intercomparison between GOES-16 ABI and SNPP CrIS before and after the May 21, 2021 SNPP CrIS LWIR failure in the MWIR spectral range

(4) NOAA-20 instrument responsivity function adjusted for the FIR filter and the PGA on 9/13/2021.

(3) Long-term trending of radiometric consistency between NOAA-20 and SNPP CrIS SWIR band.

VIIRS SDR
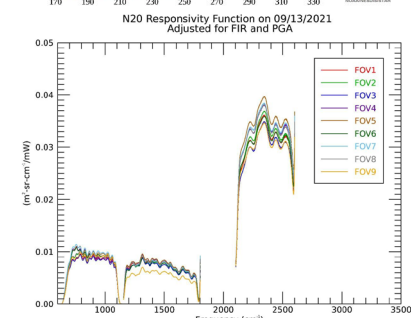
Accomplishments / Events:

- Created and delivered for deployment in the IDPS operations updated NOAA-20 and Suomi NPP DNB offset and gain ratios LUTs generated using the new moon calibration data from September 7, 2021
- Completed reevaluating NOAA-20 VIIRS geolocation uncertainty compliance with the JPSS requirements during the entire mission: 99.87% of the analyzed geolocation circular errors were not larger than 400 m (at nadir) in 2020, and 99.89% − in 2019, exceeding the required 99.7% ("3-sigma")
- Attended the 2021 CALCON virtual conference (August 30 - September 2, 2021) and presented "Estimation of VIIRS On-Orbit TEB Response Versus Scan and Zero Offsets Using Pitch Maneuver Data"
- Published paper "NOAA-20 VIIRS Relative Spectral Response Effects on Solar Diffuser Degradation and On-orbit Radiometric Calibration" (DOI: 10.1109/TGRS.2021.3101695)

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
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
Updated Cal/Val plan (address DPMS comments)			04/28/21	
Initial J2 LUTs: re-delivery			02/10/21	
JCT2 - Data System Event	Aug-21	Aug-21	08/24/21	
Cal/Val tool testing/upgrade in the cloud computing environment	Sep-21	Sep-21	09/15/21	
Generate Science Quality (SQv2.0) Suomi NPP VIIRS SDR from 2017 onward to meet user needs (COVID-19, TROPOMI)	Dec-20	Jan-21	01/31/21	Hardware failure/repair
Initial NOAA-20 VIIRS recalibration & reprocessing	Sep-21	Sep-21	09/30/21	
Cross-calibration and monitoring between NOAA-20 and SNPP VIIRS	Sep-21	Sep-21	09/29/21	
Annual VIIRS SDR performance report	Sep-21	Oct-21	End of year team presentation	
N20 DNB LGS-GAINS LUT #6 update (ADR9526)			01/28/21	
N20 VIIRS Post-VIGMU Geolocation LUTs Update (ADR9599)			06/28/21	
S-NPP VIIRS-RSBAUTOCAL-DNB-MOON-ILLUMINATION-LUT Update (ADR9578)			07/23/21	
VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	On schedule	NPP & N20
Parallel OPS support	Dec-20	Dec-20	Dec-20 Jan-21	11/6-12/4/20 1/11-21/21
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Mar-21 Mx1; May-21 Mx2; Jul-21 Mx3; Aug-21 Mx4)	Sep-21	Sep-21	11/20/20 Mx0 I&T 02/17/21 Mx1 SOL 03/08/21 Mx1 I&T 05/14/21 Mx2 I&T 07/02/21 Mx3 I&T 07/15/21 Mx4 SOL 08/12/21 Mx4 I&T	Report

Highlights:
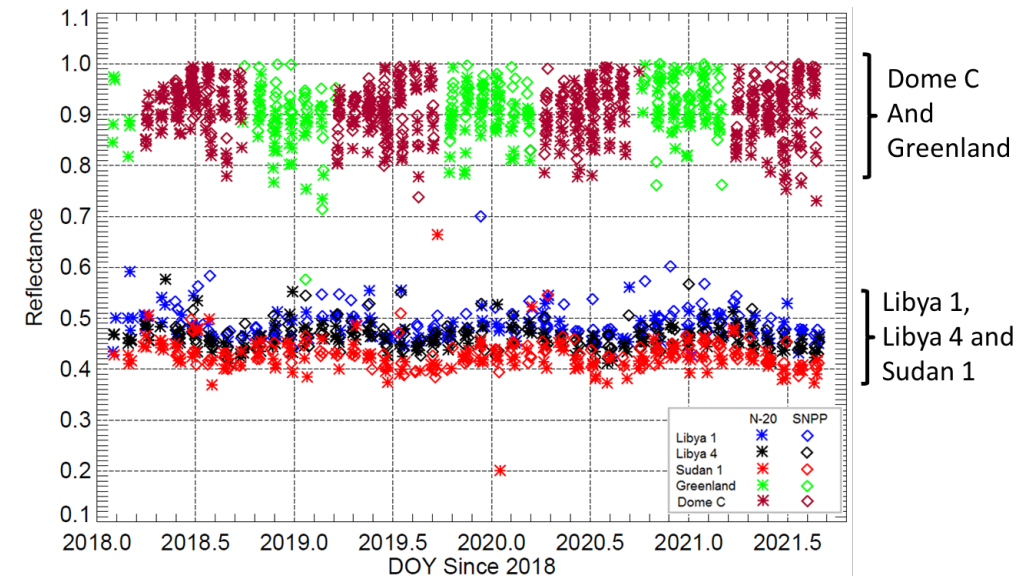
Comparison between VIIRS DNB nighttime radiometric measurements from NOAA-20 and Suomi NPP at polar snow flats and desert calibration sites shows consistency within 4% for all sites

OMPS SDR

Accomplishments / Events:

- Delivered OMPS biweekly NP solar irradiance bi-weekly LUTs.
- Completed the initial version of J2 medium resolution LUTs (backup resolution).
- Completed the prototype of NM/NP dark and solar raw flux processing package for J2.
- Completed the prototype of J2 backup resolution ADL code.
- Completed the prototype of J2 OMPS RDR to L1B processing code (NOAA-20 as proxy)
- Finished the JCT2a OMPS telemetry RDR data test.
- Initialized a prototype for J2 OMPS NM geolocation accuracy assessment (courtesy of L. Wang).
- Re-examined the SNPP OMPS NP solar wavelength shift LUT delivery methods to analyze multiple years of features.
- Tested the Blk2.3mx4 for OMPS high resolution SDR data.
- Significantly improved the performance of the V-CRTM simulations for NOAA-20 OMPS NM.
- Continued process of checking and validating reprocessed SNPP SDR data.
- Continued to coordinate with STAR CRTM and M. Liu to improve CRTM OMPS simulations.

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
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/18/20	
Updated Cal/Val plan (address DPMS comments)			04/29/21	
Updated JPSS-2 OMPS SDRs Pre-launch Characterization Report	May-21	Aug-21	08/31/21	
Launch-ready J2 LUTs (initial delivery), to ASSISTT	Dec-20	Dec-20	12/28/20	To ASSISTT
Launch-ready J2 LUTs (initial delivery), to DPMS	Jan-21	Mar-21	03/10/21	B2.3 Mx0 TTO
J2 NM/NP dark and solar raw flux processing package preparation	Sep-21	Sep-21	Sep-21	
J2 NM backup spatial resolution code development	Sep-21	Sep-21	Sep-21	
JCT2 - Data System Event	Aug-21	Aug-21	08/24/21	No OMPS SDR data
OMPS RDR to Level 1B processing code in preparation for J2	Sep-21	Sep-21	Sep-21	
NOAA-20 OMPS NP In-Band Stray Light (ADR9309)	Mar-21	Mar-21	02/08/21	1/14/21 to ASSISTT
SNPP/NOAA-20 NM off-nadir geolocation error correction LUTs (ADR9361)	Mar-21	Apr-21	04/16/21 (to ASSISTT) 04/30/21 (to DPMS)	NM FAM LUTs might include nadir geolocation adjustment due to a possible corner issue. Then, NP geolocation should be adjusted too.
Annual OMPS SDR performance report	Sep-21	Oct-21	End of year team presentation	
Weekly updates darks for NM and NP (NPP & N20)	Weekly	Weekly	on schedule	
Bi-weekly update NP Wavelength and solar flux (SNPP & N20)	Bi-Weekly	Bi-Weekly	on schedule	
Parallel OPS support	Dec-20	Dec-20	Dec-20 Jan-21	11/6-12/4/20 1/11-21/21
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Mar-21 Mx1; May-21 Mx2; Jul-21 Mx3; Aug-21 Mx4)	Sep-21	Sep-21	11/20/20 Mx0 I&T 02/24/21 Mx1 SOL 03/08/21 Mx1 I&T 05/19/21 Mx2 I&T 06/15/21 Mx3 SOL 07/07/21 Mx3 I&T 08/02/21 Mx4 SOL 08/18/21 Mx4 I&T	Report

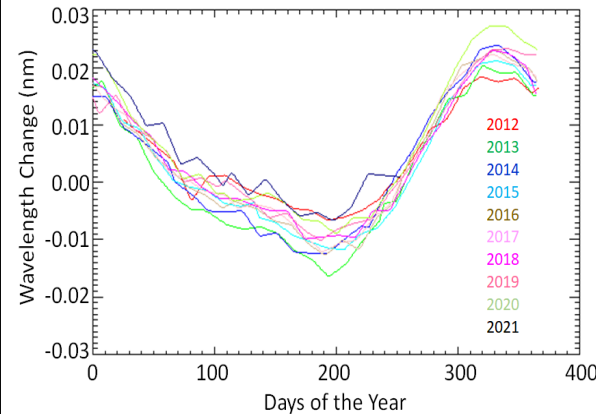**(A) Time Series of Multiple-Year OMPS NP Wavelength Shifts**

Fig. 1. Annual pattern of spectral wavelength change from Earth observation over SNPP-NP nearly 10-year operation, from year 2012 to 2021, demonstrating the significance of timely Earth view radiance wavelength registration update to ensure the OMPS NP SDR data quality continuity.

(B) Mimic mx4 Medium Resolution data (NOAA-20 medium resolution RDR as proxy)
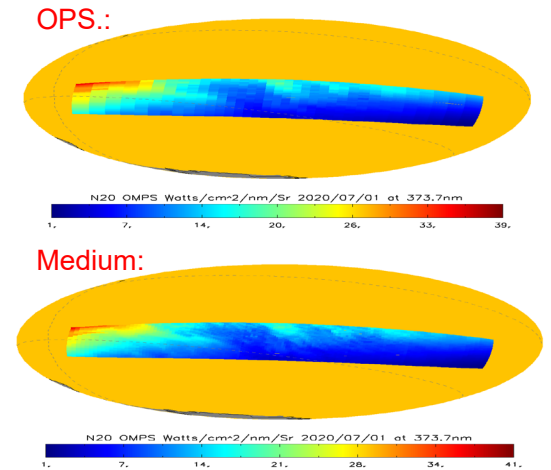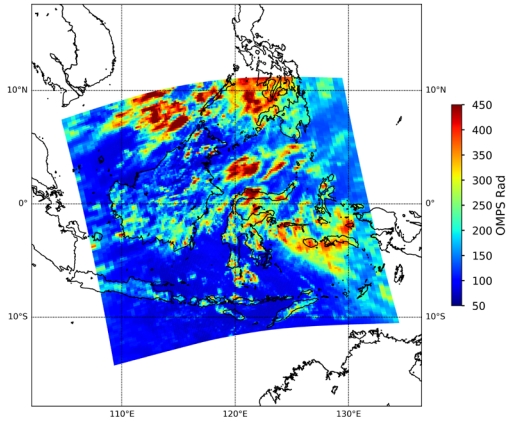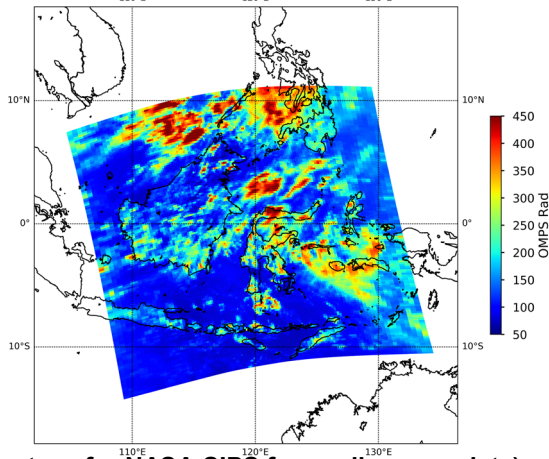
OPS.:

Medium:

Figure 2: NOAA-20 NM SDR operational (15x35) (upper) and medium-resolution (15x139) (lower) from the Blk2.3mx4 update. The increased resolution can easily be seen in the lower image.

Developmental OMPS NM Geolocation Accuracy Assessment Tool Prototype for J2 (Medium NOAA-20 OMPS NM Diagnostic SDR as Proxy)
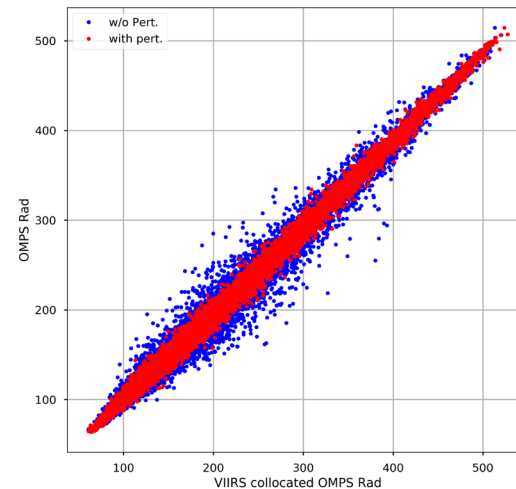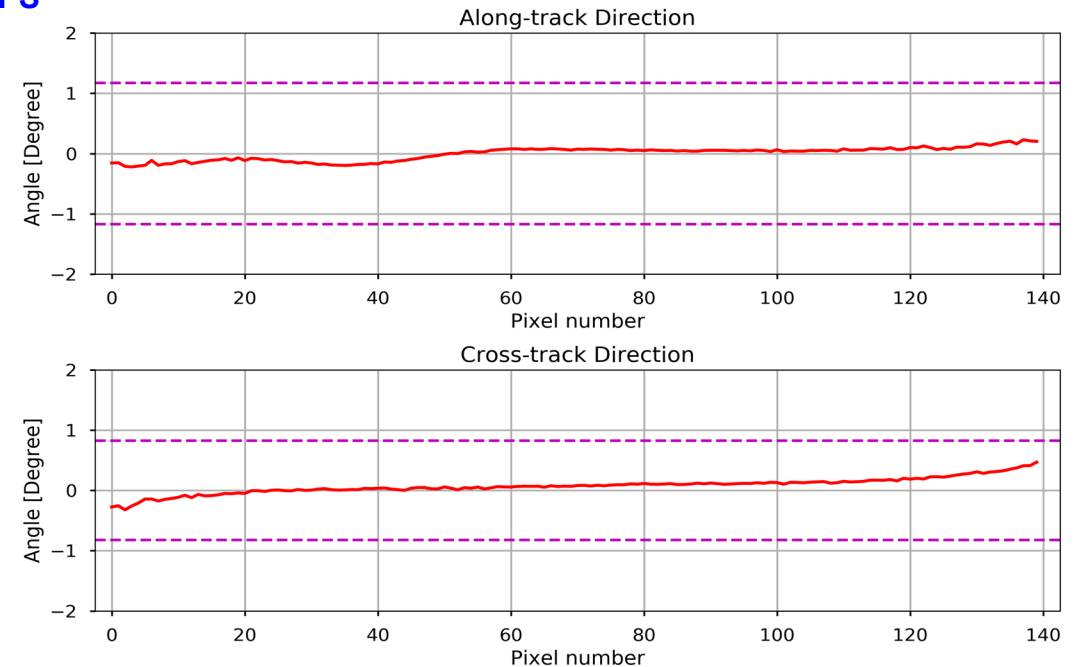
(a) VIIRS collocated with OMPS

(c) Scattering Plot between VIIRS &OMPS

(d) Geol. Error Monitoring for Med. Res. OMPS data against VIIRS

(b) 140CT Medium Res. OMPS

(Courtesy for NASA SIPS for medium res. data)

The preliminary results show that the updated OMPS Nadir Mapper (NM) SDR geolocation accuracy assessment tool using VIIRS data works well for mediate resolution data (140 pixels per scan), demonstrating its capability in accurately evaluating higher resolution of OMPS NM geolocation accuracy using VIIRS data.

(Courtesy of L. Wang)

SDR Reprocessing

Accomplishments / Events:

– per CLASS's requirement on the number of files and total size, the test reprocessed SDR data were separated into two Buckets for the test transition to CLASS (Highlights)

– The test transition of the reprocessed SDRs from STAR to CLASS started on Sept. 20.

– The test transition of the reprocessed SDRs from STAR to CLASS is ongoing and scheduled to complete by Oct. 8.

– The final check of the V2 SNPP OMPS SDR reprocessing is ongoing.

– Preparation of the reprocessed VIIRS and OMPS-V2 data for the official transition is ongoing.

– The operational transition of the reprocessed SDRs will likely start in October 2021.

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
Reprocessing of N20 CrIS for 2018-04-01 to 2019-06-23	Nov-20	Nov-20	Nov-20	
Extend SNPP VIIRS reprocessing to 2020	Dec-20	Jan-21	Jan-21	The short delay was caused by one hard drive on UMD server Bamboo was down in Dec. 2020
ECM reprocessing for 2018-04-01 to 2020-03-11	Dec-20	Jan-21	Jan-21	Same as above
Present validation results on the reprocessed S-NPP SDR data at the AMS Meeting	Jan-21	Jan-21	Jan-21	
Transition of SNPP RDR and reprocessed SDR data to CLOUD	Jun-21	Jun-21	May-21	
Complete planning and testing on transition of S-NPP reprocessed SDR data to CLASS	Sep-21	Oct-21		The test transition is in process. It's delayed due to technical issues occurred in the test.
Deliver preliminary evaluation results on radiometric stability of reprocessed CrIS SDR data	Sep-21	Sep-22		Postponed due to the higher priority of the data transition to CLASS.
Transition of reprocessed SNPP SDR data to CLASS/NCEI	Sep-21	Sep-23		Due to the large size of the data (~1100TB) and limited transition speed (3TB/day).

Highlights:

List of Test Data for Transition Test

Sensor (Version)	Included Data Type	Period	Number of Days	Data Size (T)	Number of Files	# Files /Day	Size of Data/Day (T)	Average file size (M)
ATMS_V1	GATMO, SATMS, TATMS	01/01/2012-10/26/2012	300	0.1388	159,465	532	0.00047	0.891
ATMS_V2	GATMO, SATMS, TATMS	01/01/2017-10/27/2017	300	0.1407	161,106	537	0.00047	0.894
OMPS_V1 NP	GONPO, SOMPS	01/01/2015-10/27/2015	300	0.0178	7,518	25	0.00006	2.424
OMPS_V1 TC	GOTCO, SOMTC	01/01/2015-10/27/2015	300	0.1438	7,702	27	0.00049	19.119
OMPS_V2 NP	GONPO, SOMPS	03/01/2021-03/31/2021	31	0.0017	930	30	0.00005	1.872
OMPS_V2 TC	GOTCO, SOMTC	07/01/2018-07/31/2018	31	0.0165	918	30	0.00053	18.405
CrIS_V2	GCRSO, SCRIS, SCRIF	01/01/2015-01/31/2015	59	3.7226	32,001	542	0.06309	119.119
VIIRS SDR	GDNBO, GIMGO, GMODO, GITCO, GMTCO, SVDNB, SVI01, SVI02, SVI03, SVI04, SVI05, SVM01, SVM02, SVM03, SVM04, SVM05, SVM06, SVM07, SVM08, SVM09, SVM10, SVM11, SVM12, SVM13, SVM14, SVM15, SVM16, IVOBC, ICDBG, IVCDB	04/01/2018-04/02/2018	2	1.055	15,240	7620	0.528	70.887
Total				5.237	384,380	9,341	0.593	

ICVS

Accomplishments / Events:

- Verified JPSS-2 JCT2a-DSE data using ICVS LTM modules. Generated sample images from ATMS TDR, CrIS RDR, OMPS RDR, and SDR/GEO to verify the data format. Sample images are pushed to NOAA SSO protected ICVS-beta website for demonstration purpose.
- Started updating JPSS-2 spacecraft RDR data decoding program using the update data format book from NASA flight project team.
- Finished developing ICVS top product metrices web pages. Worked with STAR web master to transition from ICVS-beta internal development site to ICVS operational web site in order to make sure the developed web page follow the STAR IT security policy.
- Kept organizing ICVS LTM module Git repository to let all modules are version and history control to meet the operational program development requirements.
- Developed Northern America 2021 heat dome 3D temperature structure animation product directly using ATMS radiance data.
- Provided near real time S-NPP and NOAA-20 spacecraft and instrument status and data quality monitoring report to support SDR team activities.

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.
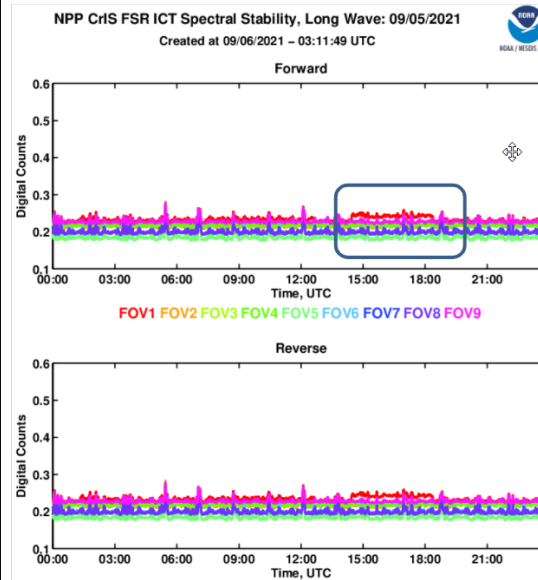
Issues/Risks:

None

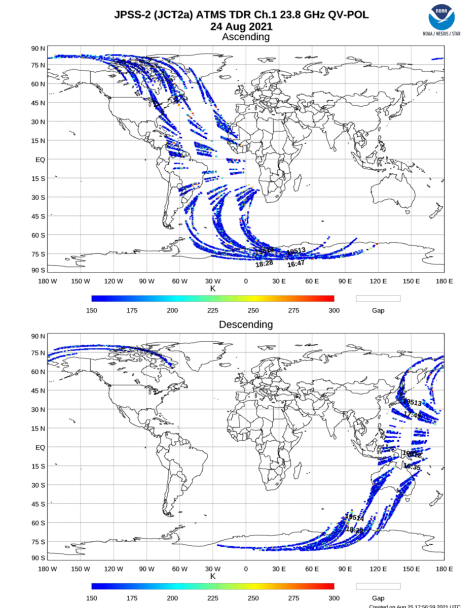## Highlights:

Significantly contribute to STAR SDR Teams

SNPP CrIS LW FOV1 Spectral Stability Anomaly

JPSS-2 JCT2a-DSE ATMS TDR data at Channel 1

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Develop JPSS-2 ICVS prototype RDR portion (beta) (SNPP or N20 as proxy)	Jan-21	Jan-21	Jan-21	
Develop JPSS-2 ICVS prototype SDR portion (beta)	Apr-21	Apr-21	Apr-21	
Develop ICVS-Vector code prototype (beta)	Jun-21	Jun-21	Jun-21	
Develop ICVS anomaly impact watch (AWP) portal prototype (beta)	Jul-21	Jul-21	Jul-21	
Develop ICVS testbed code (beta)	Aug-21	Aug-21	Aug-21	
Support JPSS-2 ICVS-LTM Test Readiness Review	Sep-21	Sep-21	Sep-21	
Implement the Git repository for ICVS (beta)	Set-21	Set-21	Sep-21	
Promote the ICVS top product matrices for operation	Sep-21	Sep-21	Sep-21	
Maintenance and update of SNPP/NOAA-20 ICVS monitoring tool	Sep-21	Sep-21		Daily as needed
Provide Instrument Performance Weekly, Monthly, Quarterly and Annual Reports	Sep-21	Sep-21		Monthly, quarterly and annual
Support SDR Team, NASA Flight Project, and OSPO Anomaly Analysis	Sep-21	Sep-21		Ad hoc

VIIRS Imagery

Accomplishments / Events:

- **Two VIIRS updates** will become operational in the Mx4 build, now effective **7 Oct 2021**:
  - **NCC banding anomaly fix** affecting otherwise homogenous Arctic scenes.
  - **All 16 M-band EDR Imagery** for the first time in 10 years of VIIRS imagery!
- **Mx4 Imagery EDR test files** have been provided to the McIDAS-V programmers, for them to be able to accommodate 16 M-band EDR Imagery when that starts.
- Several **Imagery Team AOPs** have been entered into StAR's tracking system.
- The Imagery Team is drafting **abstracts for manuscripts** to be submitted to a *Remote Sensing* special issue "VIIRS 2011–2021: Ten Years of Success in Earth Observations"
- The Imagery Team gave it's feedback about **DQTTs and DQNs,** which are not currently being used by anyone on the Imagery Team at CIRA.
- Reminder: **Bill Line** will be the **new StAR Imagery Team Lead** starting CY2022. Be sure to include Bill in Team Lead correspondence and meeting notices.

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:

Code-change solution for NCC banding over Antarctica and Greenland for both NPP and J01 will be followed thru into operations.

Highlights:

| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/22/20	
Updated Cal/Val plan (address DPMS review comments)			04/22/21	
DAP (ADR9466/CCR5415 VIIRS NCC Banding Anomaly) to DPMS			05/12/21	
N20 NCC LUT update DAP	Jun-21	Dec-21		To ASSISTT
N20 NCC LUT update DAP	Jul-21	Dec-21		To DPMS
Images of the Month to STAR JPSS Program/website and interesting Imagery to Social Media	Monthly	Monthly	Monthly	
Annual VIIRS Imagery performance report	Sep-21	Oct-21	End of year team presentation	
JCT2a-DSE			08/24/21	
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy regression support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Mar-21 Mx1; May-21 Mx2; Jul-21 Mx3; Aug-21 Mx4)	Sep-21	Sep-21	11/15/20 Mx0 I&T 02/17/21 Mx1 SOL 03/05/21 Mx1 I&T 05/18/21 Mx2 I&T 06/09/21 Mx3 SOL 07/06/21 Mx3 I&T 07/20/21 Mx4 SOL 08/18/21 Mx4 I&T	
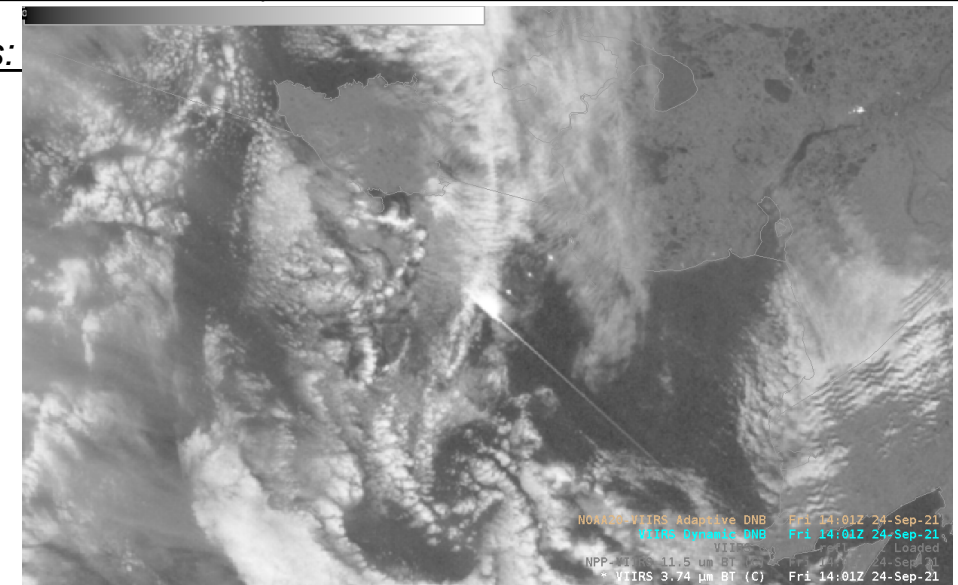
Figure: A sequence of bright dots (center), characteristic of DNB/NCC capturing a satellite under-flight; whereas the bright line extending from one dot is along the scan and is most likely a hysteresis effect of encountering a very bright pixel.

Clouds

Accomplishments / Events:

- The ECM team added a filter to ECM2 phase calc to remove ring of water phase pixels surrounding ice cloud - this issue adversely affects AMVs and is also seen in the Enterprise phase.

- Methods and initial evaluations of GOES ABI cloud optical depths against ground-based measurements developed in collaboration with the Global Monitoring Laboratory. While there is only one high latitude site, similar types of measurements can be applied in the evaluation of VIIRS cloud products. This type of validation is a key source of independent validation for the cloud products.

- The CIRA team completed an internal review on the new aviation website for custom cloud cross-sections with key users participating in the JPSS Aviation Initiative/AK Cloud Demo, and set up a new server for the public release (early Oct). The local version of CLAVR-x has been updated to provide necessary input for ML model for multilayer clouds. METAR data were collected for validation in addition to ARM data. The research on satellite cloud retrieval was introduced to grad students at CSU ATS seminar.

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:

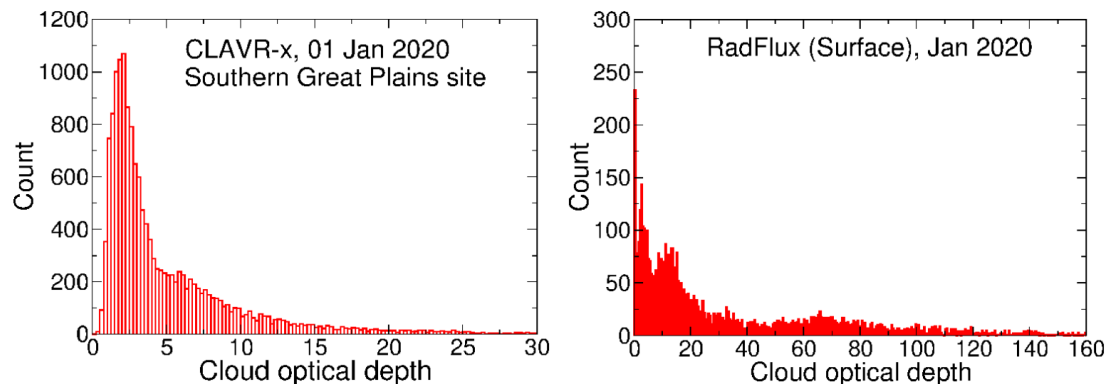- ***See next slides***

Highlights:

Figure 1. Distributions of coincident cloud optical depths from GOES ABI CLAVRx (left) and from surface-based observations (right) for a site in Oklahoma. Distribution shapes are similar up through the maximum range of the CLAVRx retrievals.

Clouds (Cloud Mask)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/10/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Updated Cal/Val plan (address DPMS review comments)			04/23/21	
Initial J1 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream data testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Add in DNB into ECM2 LUTs	Mar-21	Mar-21	Feb-21	
Work with NCEP on ASR assimilation. Adjust mask as necessary	Mar-21	Nov-21		ASR team did an evaluation of the current ECM and is waiting for SuperDAP for ECM2 testing.
Verify ECM LUT against J2 simulated data	Aug-21	Dec-21		No J2 simulated data has been provided to teams
Support Alaska Demo and ESRL usage and reviews	Aug-21	Aug-21	Sep-Nov, 2020	
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Apply CALIPSO tools to NDE Mask with Lunar Ref	Sep-21	Sep-21	May-21	
Develop collaboration wtith OAR/ESRL/GML on use of RadFlux Cloud Fraction for Verification including high-latitude sites	Sep-21	Sep-21	Sep-21	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21	Sep-21	

Clouds (Cloud Phase/Type)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	07/29/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Updated Cal/Val plan (address DPMS review comments)			04/23/21	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream data testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Optimize cloud phase thresholds for NOAA-21 and maintain code consistency with GOES-R deliveries	Mar-21	Mar-21	Feb-21	To ASSISTT
Modify phase as needed based on height/winds interaction and development from GOES-R	Aug-21	Aug-21	Aug-21	This is ongoing interaction with each delivery
Support S-NPP and NOAA-20 EDR monitoring	Sep-21	Sep-21	Sep-21	
Support consistency validation of products from CSPP	Sep-21	Sep-21	Sep-21	Note, due to CSPP being transitioned to SAPF, CSPP will be taking this over for future checks and ensure the DAP deliveries are consistent
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21	Sep-21	

Clouds (ACHA)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/10/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Updated Cal/Val plan (address DPMS review comments)			04/27/21	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream data testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Support NCEPs use for ASR assimilation	Mar-21	Mar-21	Mar-21	To ASSISTT
Continue improving multilayer ACHA by analysis of CALIPSO and AEOLUS lidars and extend to level of best fit of Polar Winds	Mar-21	Dec-21		This is an ongoing assessment requiring large subset of data. Task is on track
Extend the treatment of scattering to support 3.75 micron	Aug-21	Dec-21		This is an ongoing assessment requiring large subset of data. Task is on track
Continue working with FAA for them to use ACHA products	Sep-21	Sep-21	Sep-21	
Continue support of Alaska Demo CTH requests	Sep-21	Sep-21	Sep-Nov, 2020	
Support consistency validation of products from CSPP	Sep-21	Sep-21	Sep-21	Note, due to CSPP being transitioned to SAPF, CSPP will be taking this over for future checks and ensure the DAP deliveries are consistent
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21	Sep-21	

Clouds (DCOMP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/10/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Updated Cal/Val plan (address DPMS review comments)			05/11/21	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream data testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Develop a method that includes IR measurements to improve the performance of potentially thin clouds using ACHA technique	Aug-21	Dec-21		This is undergoing active development
Inter-sensor calibration studies by using visible reflectance and cloud optical thickness from GOES, JPSS and MODIS. Adjust VIIRS M5 and M7 as needed	Sep-21	Dec-21		Ongoing analysis
Develop collaboration with OAR/ESRL/GML on use of RadFlux Cloud Optical Depth for Verification	Sep-21	Sep-21	Sep-21	
~~Support Alaska Demo, primarily during AK rainy season~~	~~Sep-21~~	~~Sep-21~~		~~Developer was unable to participate this year. Will attempt next year~~
Consistency checks for day and night retrievals	Sep-21	Sep-21	Sep-21	
Support consistency validation of products from CSPP	Sep-21	Sep-21	Sep-21	Note, due to CSPP being transitioned to SAPF, CSPP will be taking this over for future checks and ensure the DAP deliveries are consistent
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21	Sep-21	

Clouds (NCOMP)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	07/29/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Updated Cal/Val plan (address DPMS review comments)			05/11/21	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream data testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Extend NCOMP with JPSS-2 LUT	Jul-21	Jul-21	Jun-21	
Adding improved unit test tools to science code	Sep-21	Sep-21	Sep-21	
Consistency checks for day and night retrievals	Sep-21	Sep-21	Sep-21	
Support consistency validation of products from CSPP	Sep-21	Sep-21	Sep-21	CSPP task
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21	Sep-21	

Clouds (Cloud Base)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/10/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Updated Cal/Val plan (address DPMS review comments)			04/23/21	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream data testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Leverage GOES-RR to target characterization of overlapping cloud assess CBH performance for multi-layer cloud systems	Jun-21	Dec-21		Model dev and performance ready for VIIRS assessment Implementation to take several months
leverage DCOMP nighttime COD (DNB) to improve performance over IR-only	Sep-21	Sep-21	Feb-21	To ASSISTT
Validate products from SAPF and begin ARM data analysis to fill CALIOP/CloudSat void	Sep-21	Sep-21	Sep-21	
Support Alaska Demo and necessary reviews	Sep-21	Sep-21	Sep-Nov, 2020	
Support consistency validation of products from CSPP	Sep-21	Sep-21		Note, due to CSPP being transitioned to SAPF, CSPP will be taking this over for future checks and ensure the DAP deliveries are consistent
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21	Sep-21	

Clouds (CCL)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	07/31/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Updated Cal/Val plan (address DPMS review comments)			04/27/21	
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream data testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Include super-cooled and convective probability	Mar-21	Mar-21	Feb-21	To ASSISTT
Continue the visualization and demonstration of CCL for the Aviation Weather Center, with focus on Alaska Region and Hawaii	Sep-21	Sep-21	Sep-21	
Support Alaska Demo and necessary reviews	Sep-21	Sep-21	Sep-Nov, 2020	
Support consistency validation of products from CSPP	Sep-21	Sep-21		Note, due to CSPP being transitioned to SAPF, CSPP will be taking this over for future checks and ensure the DAP deliveries are consistent
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21	Sep-21	

Aerosol

Accomplishments / Events:

- Generated blended (LEO-GEO) AOD product sufficiently long for robust evaluation: routine generation of the blended product started on Nov 1, 2020. Data for the period of Nov 2020 – Jul 2021 was evaluated for the domains common to the LEO and GEO satellites and for selected regions. (see highlight)

- Organized Fall AGU sessions for GEO/LEO atmospheric composition and air quality

- Participated in NESDIS summer product workshop

Overall Status:

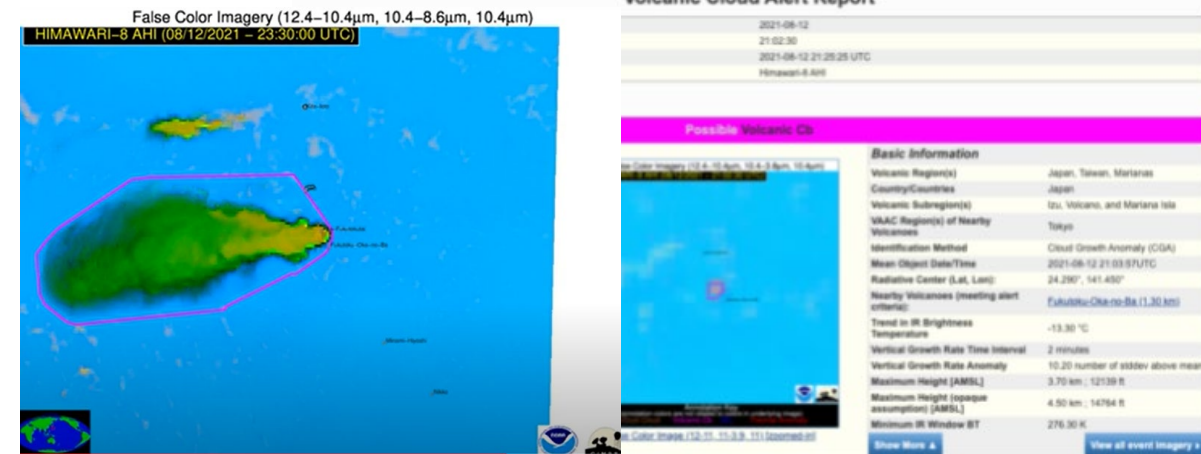|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/15/20	AOD
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	08/10/20	ADP
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	AOD
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/31/20	ADP
Updated Cal/Val plan (address DPMS review comments)			04/28/21	AOD
			05/10/21	ADP
Initial J2 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	08/18/20	
Algorithm Updates/Cal-Val Activities				
Details in next slides				

Highlights:

- Evaluation of Blended GEO-LEO AOD for 11/01/2020 – 07/31/2021

  Routine generation of the blended (GOES-16, GOES-17, S-NPP and NOAA-20) product started on Nov 1, 2020. Data for the period of Nov 2020 – Jul 2021 was evaluated for the domains common to the LEO and GEO satellites and for selected regions.
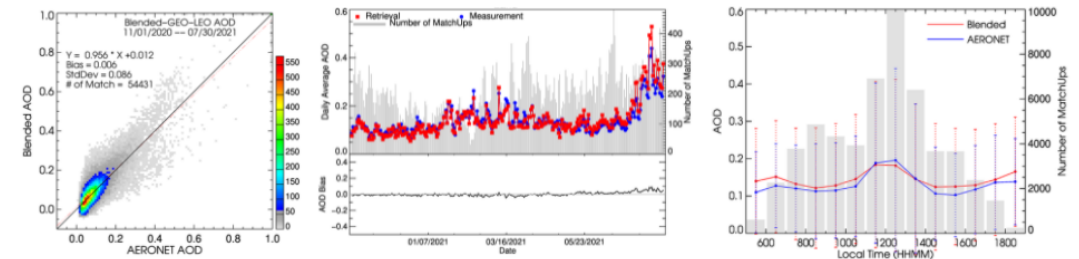
High quality blended GEO-LEO AOD in comparison with AERONET during 11/01/2020 – 07/30/2021. *Left*: scatter-density plot. *Middle*: time series of AOD and error. *Right*: diurnal cycle.

Aerosol (AOD & ADP) Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates/Cal-Val Activities				
Aerosol Optical Depth (AOD):				
Update surface reflectance relationships using current functional relationship with extended S-NPP, NOAA-20 and AERONET data	May-21	May-21	May 2021	
Improve angular and seasonal representation of surface reflectance relationships	Jul-21	Jul-21	July 2021	
Update preliminary LUT and gas-absorption parameterization for J2 if needed	Sep-21	Sep-21	Sep 2021	
Evaluate merged S-NPP/NOAA-20 AOD product	Jun-21	Jun-21	June 2021	
Evaluate gridded AOD products	Jul-21	Jul-21	July 2021	
Continue individual AOD product (S-NPP, NOAA-20) validation and cross-validation	Aug-21	Aug-21	Aug 2021	
Maintain satellite-ground AOD matchups used for products evaluation	Sep-21	Sep-21	Sep 2021	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
Aerosol Detection (ADP):				
Improve dust detection over the vegetated surface	Jun-21	Jul-21	July 2021	
Develop surface type-dependent thresholds over land	Jun-21	Jun-21	June 2021	
Exploring the use of trace gases product from TROPOMI to separate smog from smoke	Jun-21	Jun-21	June 2021	
Exploratory research on an approach to combine CO/CO2 absorption bands with AAI to expand smoke detection for thick/brownish smoke plumes even over clouds	Sep-21	Sep-21	Sep 2021	
Continue long-term validation of SNPP and NOAA-20 VIIRS ADP by comparisons with AERONET, CALIPSO, MISR, and IMPROVE	Jun-21	Jun-21	June 2021	
Exploring the angular dependence of ADP by combing NOAA-20 with SNPP	Jun-21	Aug-21	Sep 2021	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	

Volcanic Ash

Accomplishments / Events:

- Demonstrated tailored agile processes, putting together lessons learned presentation for October
- Finalized v1 of event driven VOLCAT/HYSPLIT workflow
- Responded to VAAC user request for new VOLCAT image sectors
- Maintained and verified quality of S-NPP and NOAA-20 Volcanic Ash products (JPSS EDR and Volcat)

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: *Early detection of submarine volcanic eruption impacting atmosphere*

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	
Updated Cal/Val plan (address DPMS review comments)			04/29/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Software and LUT updates in preparation for J2	Sep-21	Sep-21	9/1/2021	
Refine thresholds and LUT's for S-NPP and NOAA-20 as needed	Sep-21	Sep-21	9/1/2021	
Development activities that support transition to VOLCAT	Sep-21	Sep-21	9/1/2021	
Routinely validate volcanic ash products	Sep-21	Sep-21	9/1/2021	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	

The eruptive cloud was only composed of a few pixels when VOLCAT first detected it in NRT.

Cryosphere

Accomplishments / Events:

•The effect of alternating **severe snow storms and record heat waves** in South America in winter 2021 is clearly seen in satellite-based snow cover products. *See highlight.*

•The VIIRS snow fraction product performed well in identifying the **Dry Valleys of Antarctica**...due to the absence of snow!

Overall Status:

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

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

Issues/Risks:

None

Highlights:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation/Comments
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Preparation for JPSS-2	Sep-21	Sep-21	Sep-21	
Transition VIIRS Enterprise snow algorithms to operations for ABI	Mar-21	Mar-21	Mar-21	
Continued validation of NOAA-20 and S-NPP products: Product error assessments and improvements/updates	Sep-21	Sep-21	Sep-21	
Continuous monitoring of S-NPP and NOAA-20 products	Sep-21	Sep-21	Sep-21	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	

The Effects of Severe Snowstorms and Record Heatwaves in South America

Early season snowfall in Argentina and Chile in May and June changed to extremely dry and unusually hot conditions with temperatures reaching 40C in July and in the first half of August. The second half of August brought another extreme Antarctic blast with anomalous temperatures below -20C and anomalous snowfall of over 2 meters in parts of Chile and Argentina.

The effects of these weather patterns are clearly seen in the NOAA's GMASI satellite-derived snow cover product (right, red).
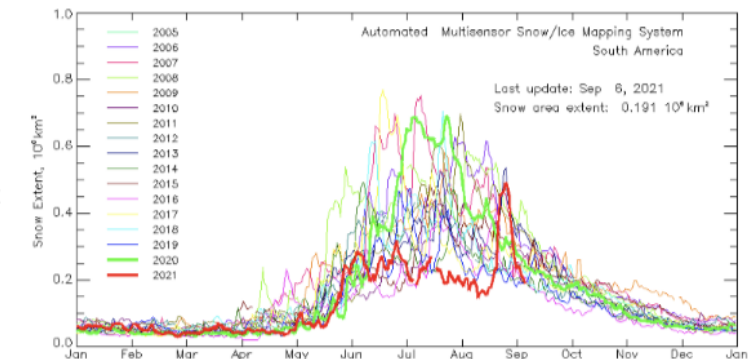
Daily snow extent estimates over South America derived from GMASI snow and ice maps.

Accomplishments / Events:

- Working with OSPO/SAB, the team has obtained the coefficient for fire radiative power FRP retrieval for JPSS-2 VIIRS, accounting for the M13 spectral response function provided by the STAR sensor team
- Evaluated product performance during the Cumbre Vieja volcanic eruption event on the island of La Palma, Spain, including the performance of the persistent anomaly flag and the ability to monitor the spatial extent of the lava flow

Overall Status:

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

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/27/21	
Initial J2 Active Fires DAP (I-Band) to NDE			06/24/20	
Final J2 updates DAP to ASSISTT	Aug-21	Aug-21	Jun-21	
Final J2 Active Fires DAP to NDE	Oct-21	Oct-21		
I-band algorithm improvements	Sep-21	Sep-21	Sep-21	
J2 readiness and sensor performance evaluation	Sep-21	Sep-21	Sep-21	
ASSIST, NDE and DB integration and testing support	Sep-21	Sep-21	Sep-21	
Suomi NPP / NOAA-20 data analysis and feedback	Sep-21	Sep-21	Sep-21	
Persistent anomaly data files updates	Quarterly	Quarterly	Sep-21	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
Active Fires Patch DAP to NDE			12/01/20	

Highlights: Eruption of Cumbre Vieja, La Palma, Spain
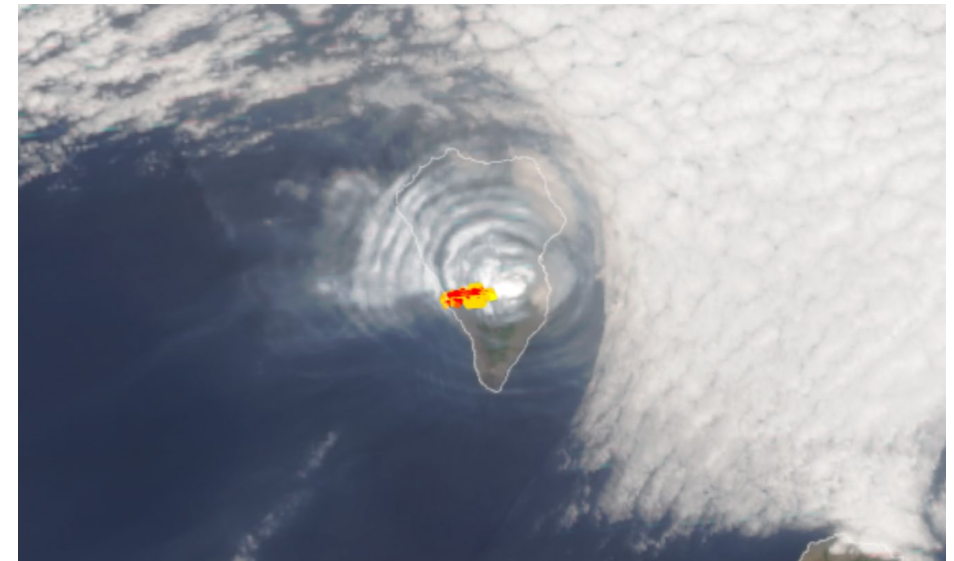
NOAA-20 VIIRS I-band fire radiative power retrievals of the lava flow from the Cumbre Vieja volcano on the island of La Palma, Spain on October 1, 2021

Accomplishments / Events:

– STAR-UMD VIIRS Surface Type team has processed S-NPP and NOAA-20 VIIRS granule surface reflectance data acquired in August 2021.

– The team has delivered the AST2020 product to public FTP site of STAR-JPSS:
  – The delivery will be announced from the STAR JPSS webpage
  – The product files have been uploaded to a staging server at NCEI for their archiving

– The team has derived accuracy estimates for the new AST2020 product using the validation dataset, which has been updated in 2020 (see highlights).

Overall Status:

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

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
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/24/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
AST2020 (Annual Surface Type):				
Complete monthly composites of global gridded VIIRS data (9 land bands + thermal bands) for VIIRS AST20 based on 2020 VIIRS data. Generate global annual classification metrics	May-21	May-21	May-21	
Generate VIIRS AST20 based on 2020 VIIRS data using SVM algorithm	Aug-21	Aug-21	Aug-21	
Comparison of AST20 with surface type validation data	Sep-21	Sep-21	Sep-21	
Delivery of AST20 (available for users through STAR FTP)	Sep-21	Sep-21	09/27/21	
AST DAP NDE delivery (ASSISTT, with JRR DAP)				
Deliver AST-2018 to NDE	Jan-21	Mar-21	04/01/21	10/1/20: SCR
Deliver AST-2019 to NDE	Nov-21	Nov-21		
Annual performance report	Oct-21	Oct-21	End of year team presentation	

Highlights:

Accuracy matrix for AST2020 derived based on 6000 validation points selected using a stratified random sampling method. The values for the 17 IGBP classes and the row/column totals are area proportions in percentage (%). U Acc. and P Acc. are user's and producer's accuracies (%), respectively. The overall accuracy is $79.6 \pm 0.6\%$, which exceeded the 70% L1RD requirement.

AST	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	total	U Acc
1	2.05	0.02	0.06	0.05	0.29	0.00	0.01	0.22	0.04	0.02	0.02	0.01	0.01	0.02	0.00	0.00	0.02	2.86	71.6
2	0.00	8.40	0.00	0.09	0.12	0.00	0.00	0.40	0.11	0.03	0.00	0.06	0.03	0.05	0.00	0.00	0.00	9.28	90.48
3	0.04	0.00	1.07	0.00	0.12	0.00	0.04	0.12	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.41	75.63
4	0.00	0.00	0.01	0.94	0.06	0.00	0.00	0.10	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.14	82.12
5	0.19	0.12	0.30	0.72	3.63	0.00	0.00	0.61	0.13	0.00	0.02	0.02	0.02	0.19	0.00	0.00	0.02	5.95	61.02
6	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	50.67
7	0.21	0.02	0.09	0.02	0.14	0.09	12.02	0.63	0.30	1.32	0.23	0.26	0.05	0.12	0.00	0.46	0.05	16	75.11
8	0.19	0.18	0.04	0.23	0.13	0.01	0.32	5.35	0.61	0.10	0.06	0.04	0.03	0.21	0.00	0.00	0.01	7.5	71.38
9	0.00	0.22	0.00	0.03	0.06	0.14	0.36	1.15	4.97	0.19	0.03	0.41	0.00	0.55	0.00	0.00	0.00	8.08	61.49
10	0.06	0.00	0.00	0.03	0.06	0.08	0.83	0.26	0.29	6.48	0.00	0.50	0.01	0.08	0.00	0.23	0.00	8.9	72.74
11	0.01	0.00	0.00	0.00	0.01	0.00	0.06	0.04	0.06	0.01	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.73	71.93
12	0.01	0.01	0.00	0.02	0.03	0.02	0.07	0.06	0.17	0.44	0.02	7.09	0.06	0.44	0.00	0.00	0.02	8.44	83.94
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.38	0.01	0.00	0.00	0.00	0.42	89.31
14	0.00	0.13	0.02	0.09	0.04	0.02	0.07	0.44	0.43	0.17	0.00	0.23	0.02	2.69	0.00	0.01	0.00	4.35	61.84
15	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.17	0.00	0.00	0.00	0.00	10.02	0.00	0.00	10.36	96.72
16	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.14	0.00	0.05	0.00	0.05	0.00	12.83	0.00	13.37	95.93
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	1.13	100
total	2.75	9.1	1.58	2.2	4.69	0.39	14.28	9.39	7.14	9.07	0.94	8.68	0.6	4.39	10.02	13.53	1.25		
P Acc	74.51	92.3	67.35	42.47	77.37	9.15	84.19	57.02	69.6	71.36	56.15	81.62	62.47	61.26	100	94.83	90.76		

Surface Reflectance

Accomplishments / Events:

- Keep monitoring the S-NPP and NOAA20 SR product by daily routine global image and inter-comparison with VNP09 product.
- Check and improve the AEROENT validation tool, analyzed the validation results.
- To complete the SR validation, using the RadCalNet in-situ SR measurements to validation the VIIRS SR product, .and selected three sites to do the validation for both S-NPP and NOAA20 over three months. The results indicate good agreement with the ground measurements, and consistent SR value over time for these bare surface.
- Performed the algorithm test and learned the details about the quality flag definition and performance for the operational products.

Overall Status:

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

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Apr-21	04/19/21	downstream testing
Initial J2 ready DAP to CSPP			04/22/21	
Final J2 ready DAP to ASSISTT	May-21	May-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Oct-21	Oct-21		
NOAA-20 algorithm adjustments (I3 bad detector)	May-21	May-21	04/19/21	
Algorithm testing and updates (ECM, QF)	Sep-21	Sep-21	09/15/21	
ASSIST integration and testing support of updated code delivery	Sep-21	Sep-21	Sep-21	
Continuing LTM and extension to NOAA SR products	Sep-21	Sep-21	Sep-21	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	

Highlights:
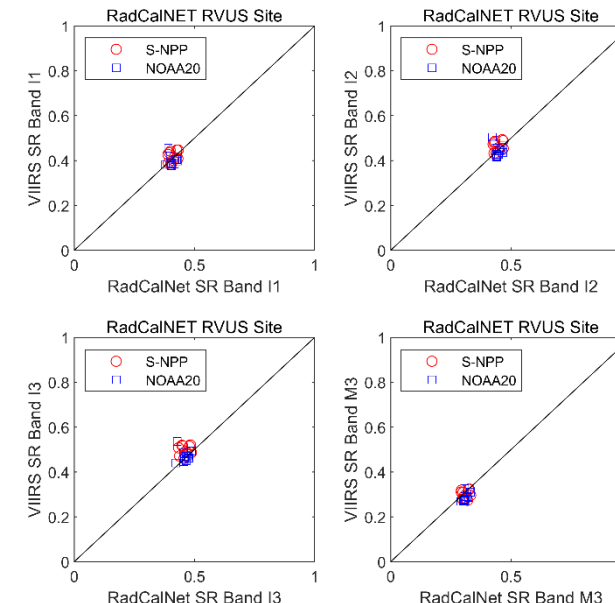
- Use the RadCalNet in-situ measured surface reflectance to validate S-NPP and NOAA20 SR product.
- To match the ground and satellite data, the matchup restrict to within 30 min and less than 20 degree view zenith angle.
- The results shows the SR is consistent over three months (April – June, 2021), and both S-NPP and NOAA20 have good agreements with the ground measurements.

In-Situ Validation Tool

- Radcalnet Validation tool.
  - RadCalNet, the Radiometric Calibration Network, is a network of sites that can be used to compare different satellite sensors to each other and to a common reference. The sites with automatic surface reflectance measurement every 30 minutes.
  - A Matchup tool is developed to match the in-situ SR with VIIRS SR & the auxiliary data like GEO and AOD)
  - Three RadCalNet sites: Gobabeb (GONA), La crau (LCFR) and Railroad Valley(RVUS) are used for the SNPP and NOAA20 VIIRS SR validation from April to June, 2021.
  - The validations results for these three sites are presented in the following slides.

Picture Credit: Marc Bouvet, RadCalNet Team

Gobabeb Namibia

- April-June, 2021
- Closest time (< 30min)
- VZA < 20 (limited data, around 10 matchups)
- Desert site supposed with stable SR, so the outlier (smaller SR than most ones) mainly due to the ground measurement.
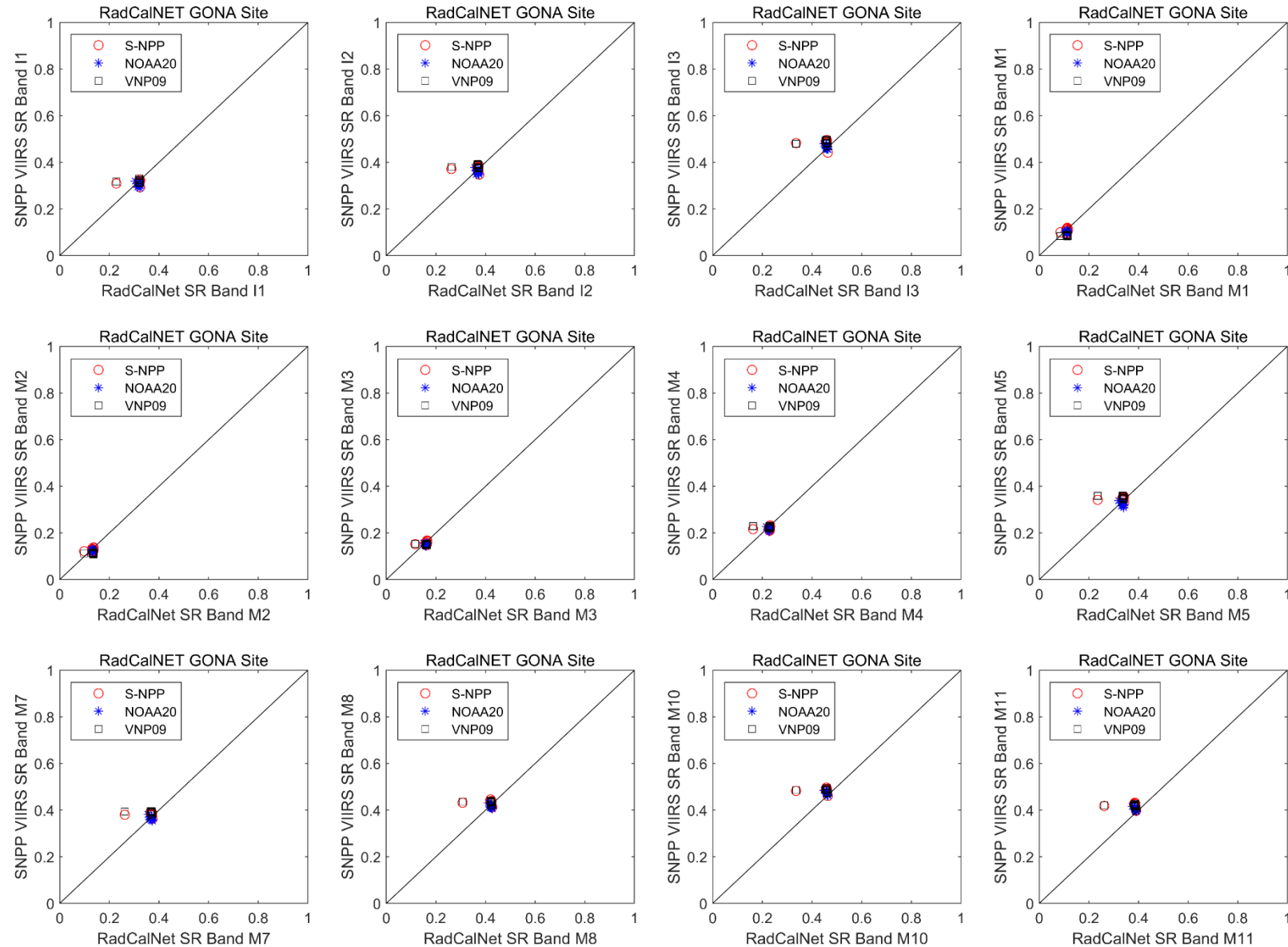
La Crau, France

- ■ April-June, 2021
- • Closest time (< 30min)
- • VZA < 20 (limited data, around 12 matchups)
- • S-NPP, NOAA20 and VNP09 product are have a good agreements with the ground measured SR.
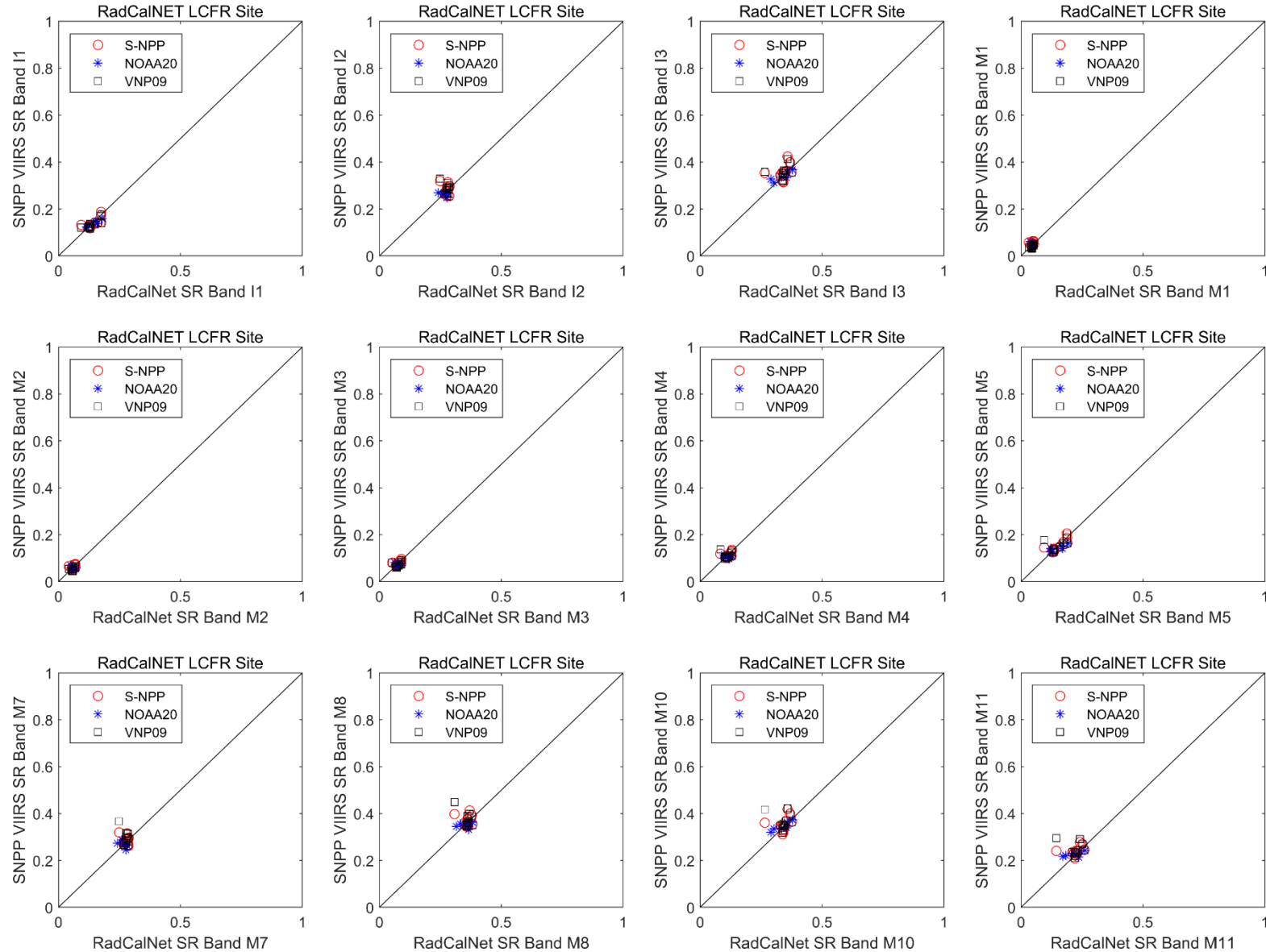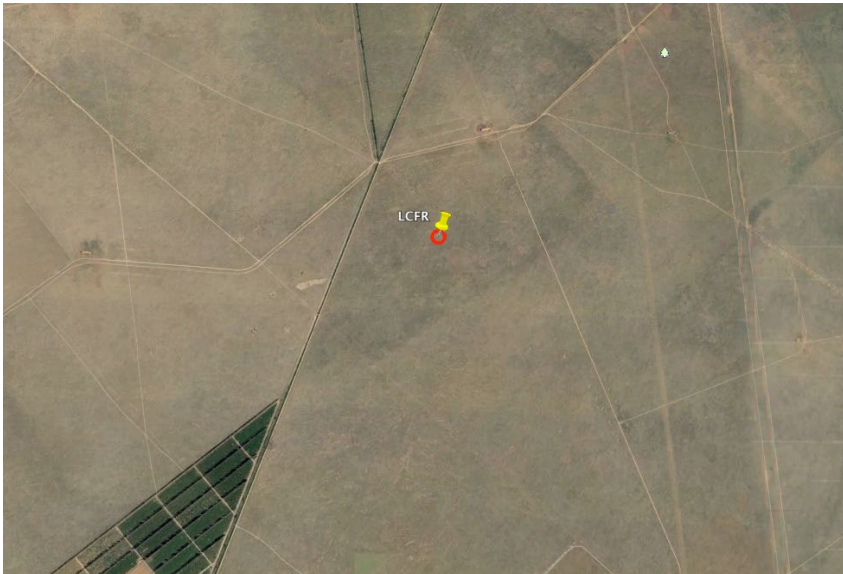
Railroad Valley

- April-June, 2021
- Closest time (< 30min)
- VZA < 20 (limited data, around 12 matchups)

Land Surface Temperature
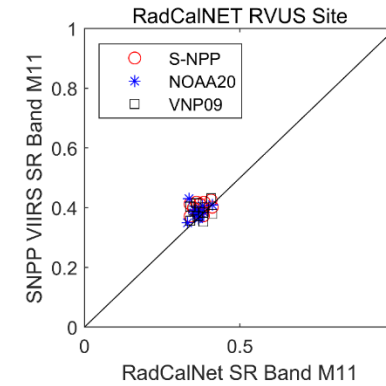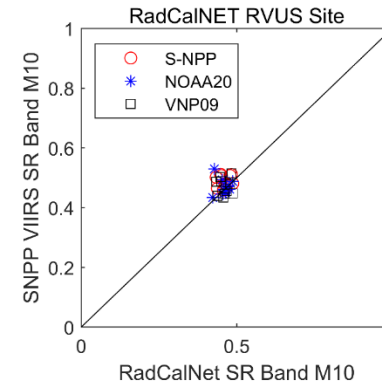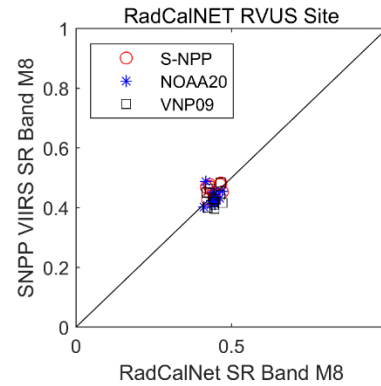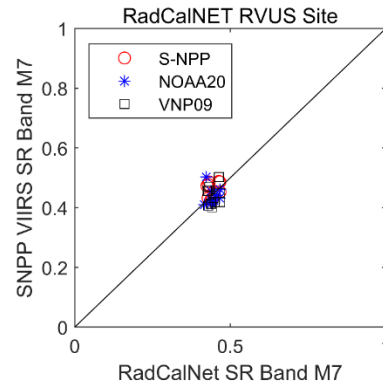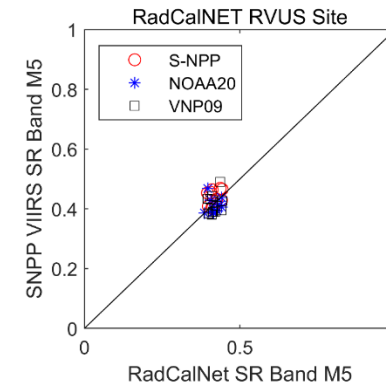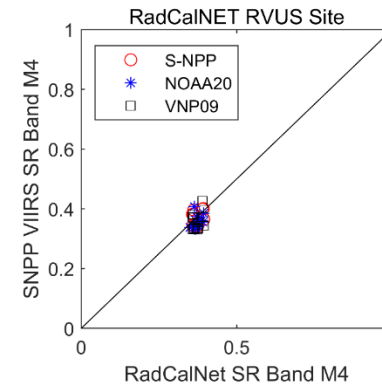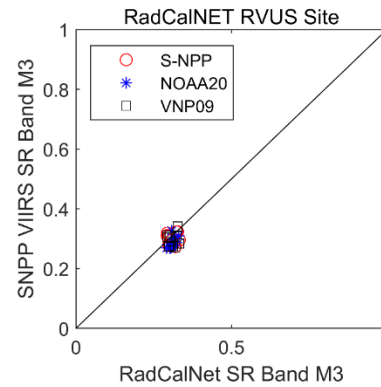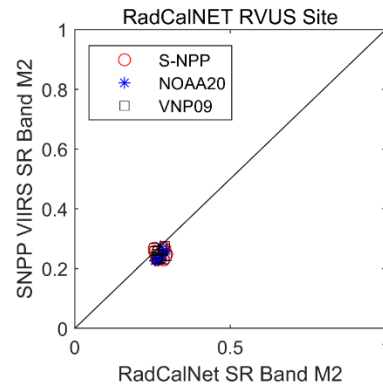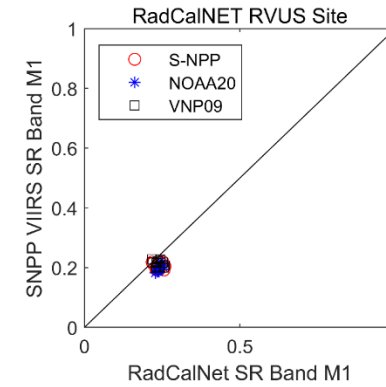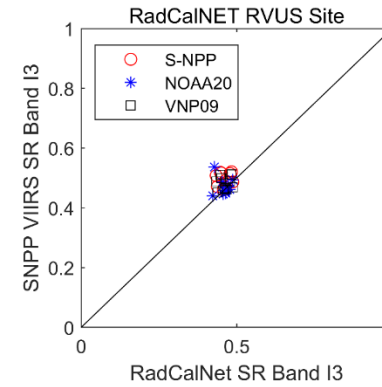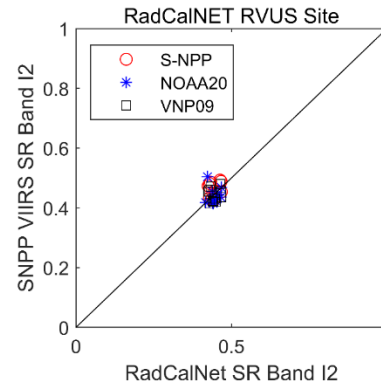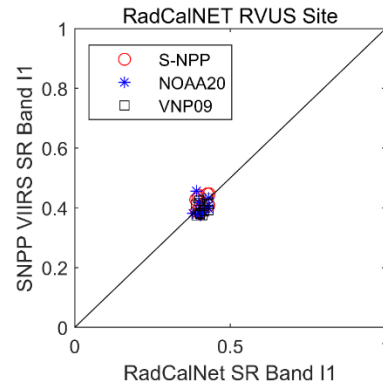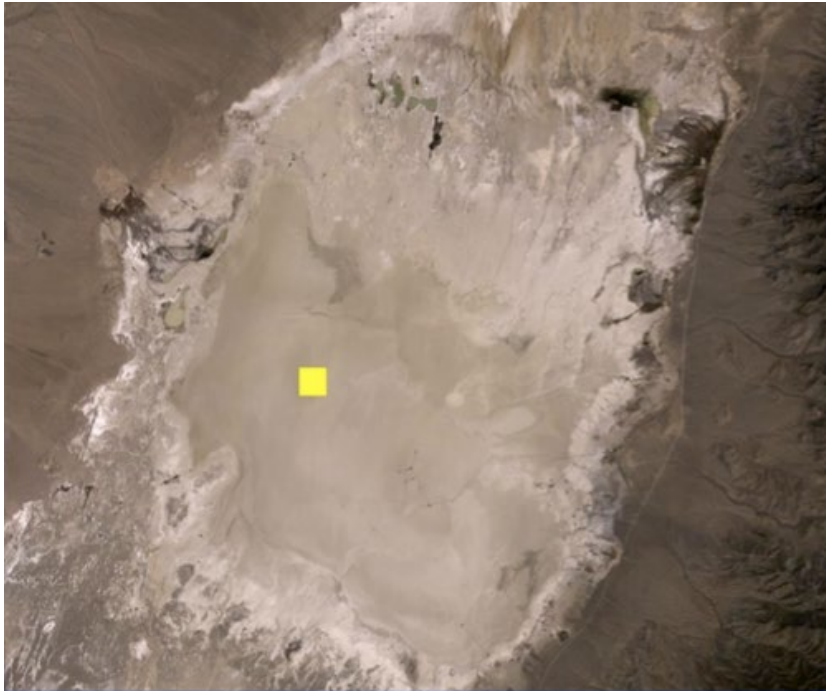
Accomplishments / Events:

- Investigated the ground validation over SURFRAD Desert Rock site due to the observed increase of discrepancy in recent three years. (slide 2-4)
- Verified the J2 VIIRS LST DAP integration from ASSISTT team. Found some issues and sent the feedback to the ASSITT team.
- Verified the operational emissivity data through comparison with the local emissivity. (slide 5)
- Updated the original simulation database with respect to the method used in the surface temperature and emissivity interpolation. Finish the second version simulation database and description document. It is ready for the algorithm test
- Performed the algorithm test based on the updated simulation database. It is an ongoing effort.

Overall Status:

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

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

Issues/Risks:

None

Milestones

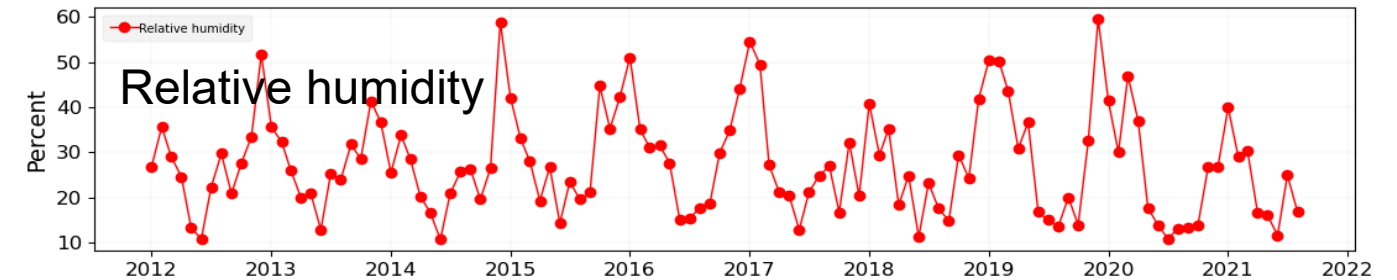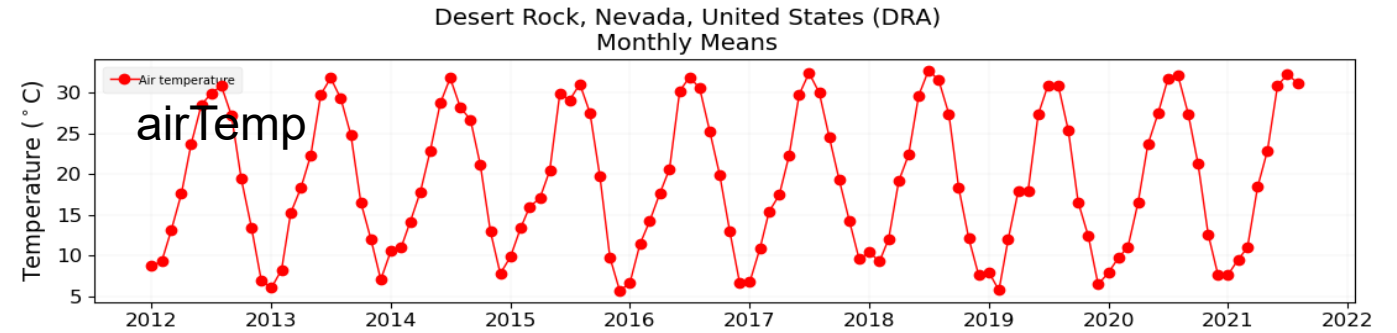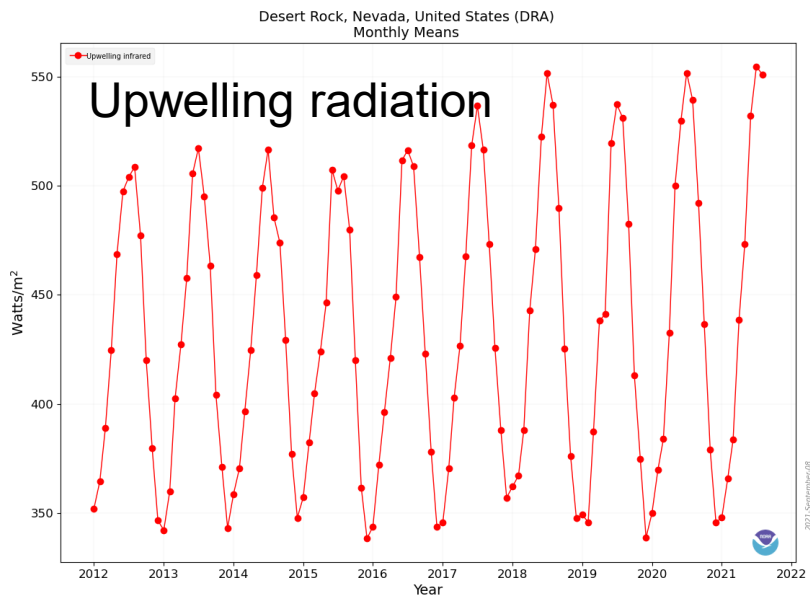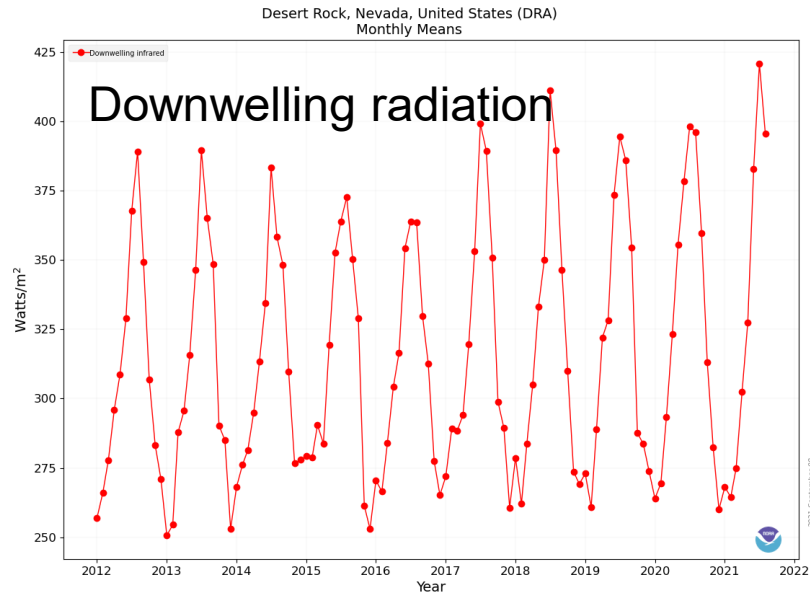| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
CalVal report on current SNPP and N-20 Product	Dec-20	Dec-20	Dec-20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/31/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates, ASSISTT delivery)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	May-21	May-21	
Experimental error estimate dataset	May-21	May-21	May-21	
Validation and improvement of L3 LST product	Jul-21	Jul-21	May 21	Delivered together with J2 ready DAP
Annual algorithms/products performance report	Aug-21	Aug-21	Aug-21	
Validation tool update; Validation with extended data set	Sep-21	Sep-21	Sep-21	
Routine Validation of L2 LST & gridded LST products	Sep-21	Sep-21	Sep-21	
Final J2 ready DAP to NDE (include NPP/N20 updates, ASSISTT delivery)	Nov-21	Nov-21		

Highlights:

VIIRS LST Validation Update
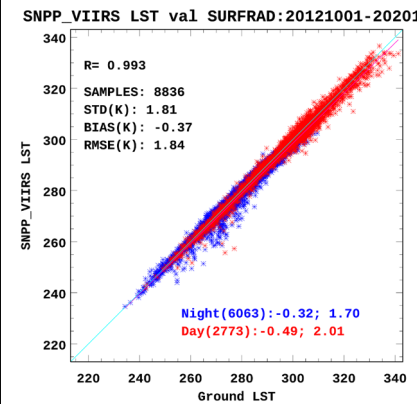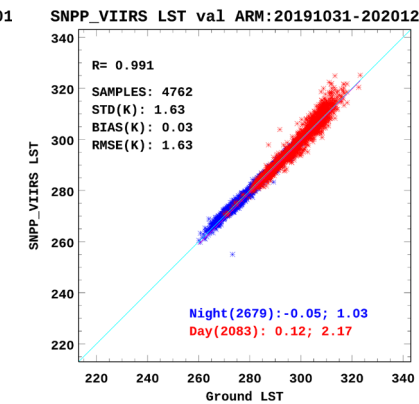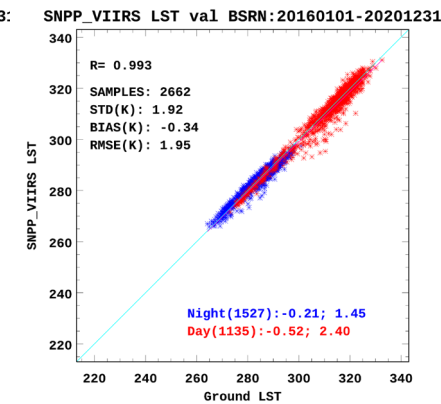
SNPP VIIRS LST validation against ground observations from SURFRAD, ARM and BSRN network.

LST validation over DRA site

SNPP_VIIRS LST over DRA:20121001-20201031

DRA emis11-12 :20121001-20201031

DRA emis Mean :20121001-20201031

AOD at DRA :20190612-20210611

DRA tpw :20121001-20201031

DRA stz :20121001-20201030
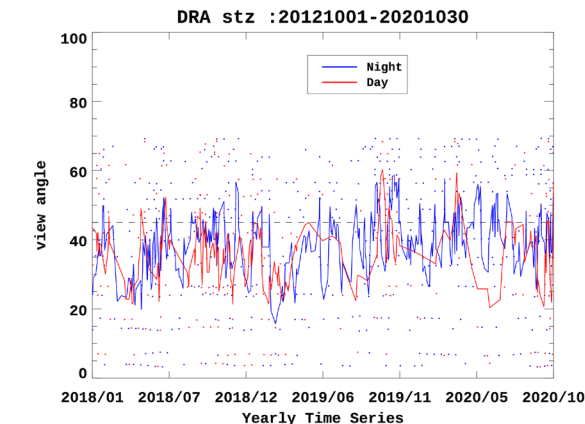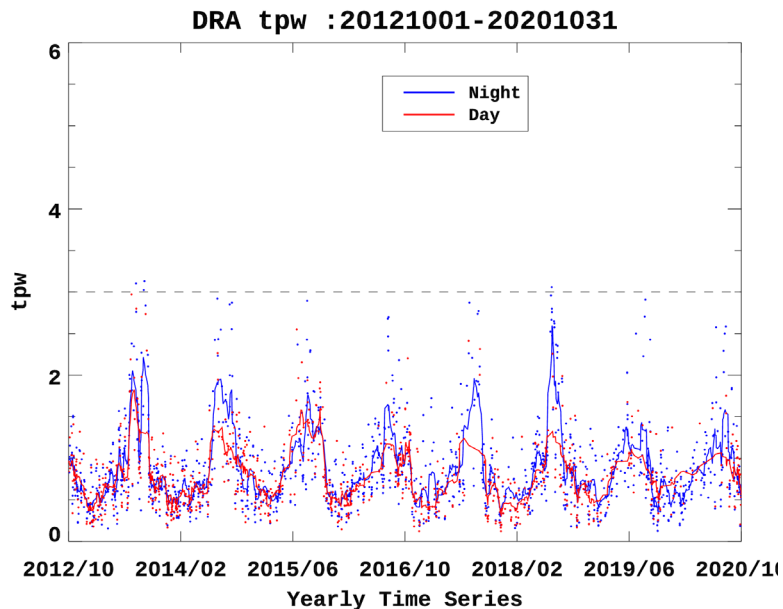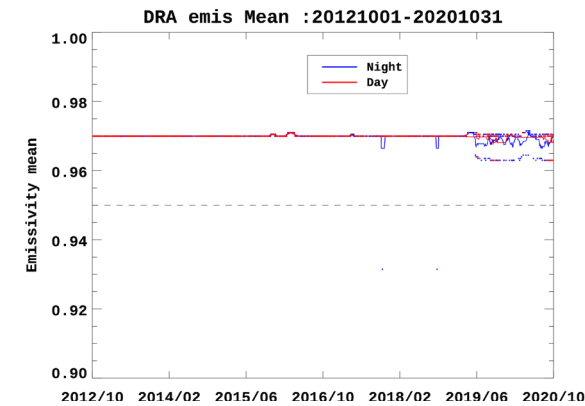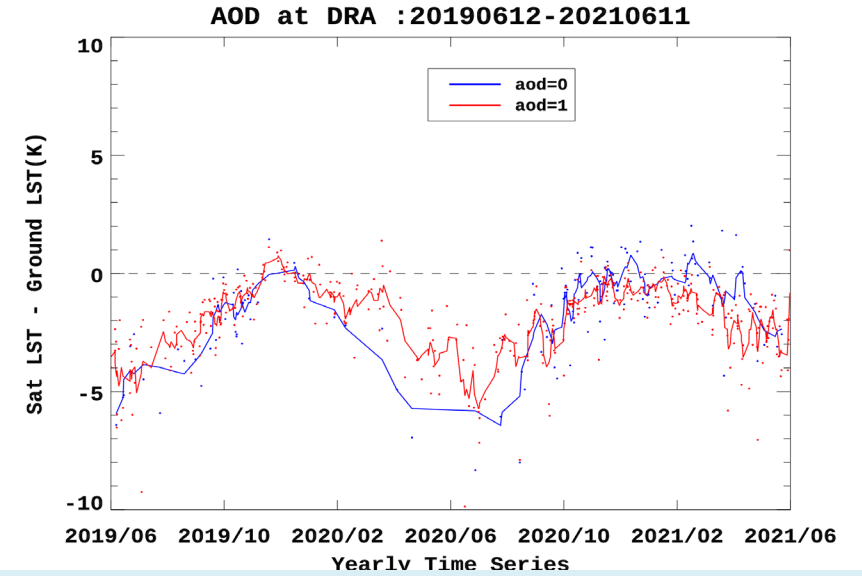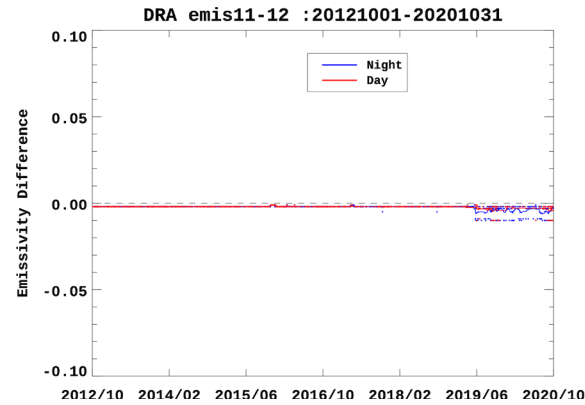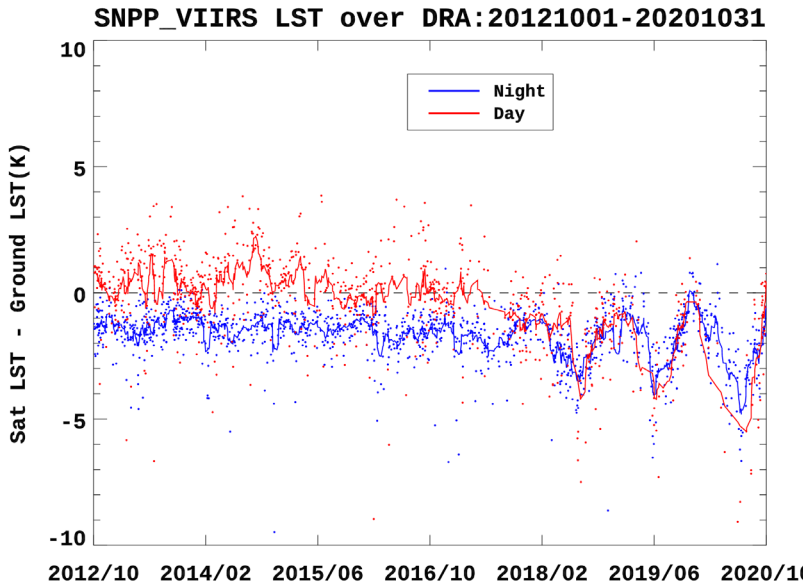
- Recent validation study shows the increase of deviation since mid of 2018 over DRA site. It features with seasonal variation with biggest difference in July, smallest difference in Dec for both daytime and nighttime.
- Investigation is performed regarding the emissivity impact, site heterogeneity analysis, site management update and related meteorology observations, AOD impact etc.
- Note that the matchup records impacted by AOD accounted for the overwhelming majority. there is no AOD detection at nighttime so it is 0 by default. (top right plot)
- The large stz over 50 degree takes about 1/3 of all matchups while the matchups with Less than 40 degree take about 47%. (bottom middle plot)
- The total water vapor plot indicates the local atmosphere becomes drier in recent years. (bottom left plot)

Desert Rock, Nevada, United States (DRA)
Monthly Means

Downwelling radiation

Upwelling radiation

airTemp

Relative humidity
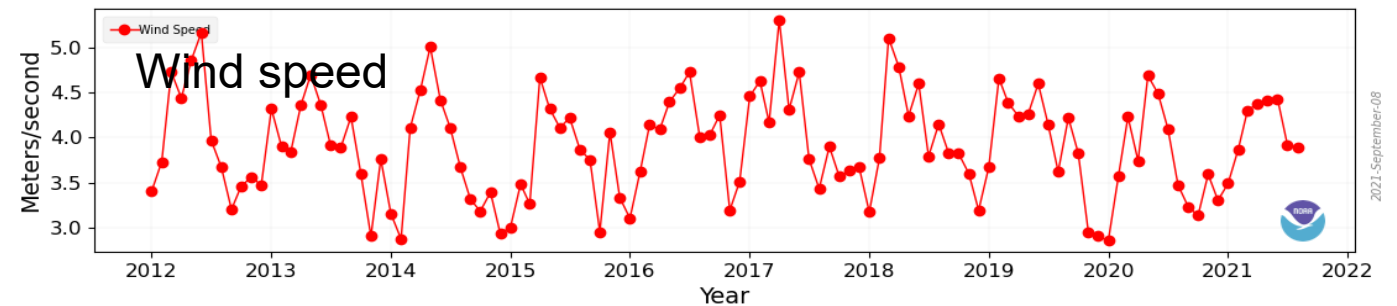
Wind speed

- Air temp, relative humidity and wind speed plots in recent 3 years do not show unusual feature compare to historical data
- Both upwelling and downwelling longwave radiation shows increase comparing to the historical data
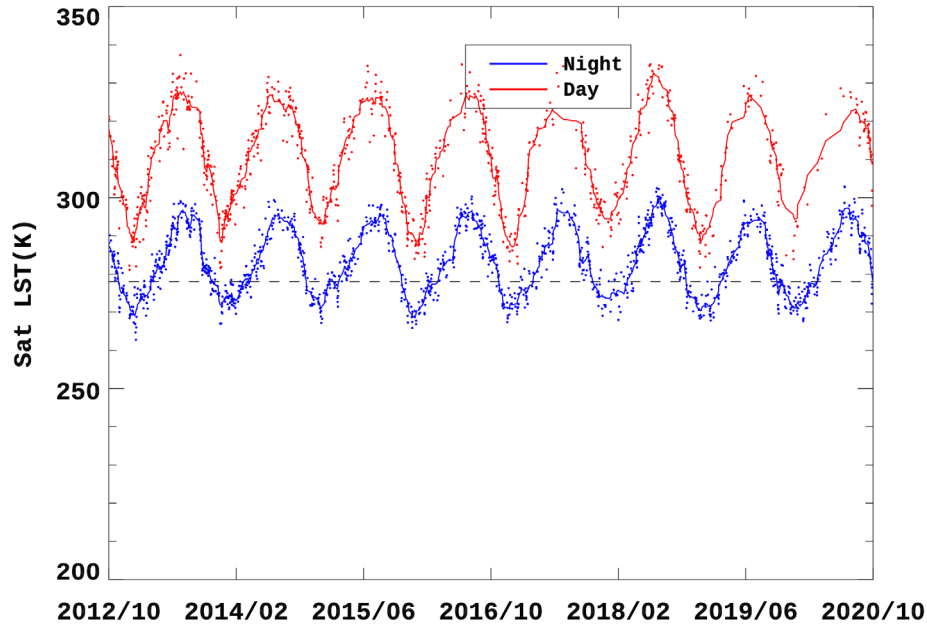
https://gml.noaa.gov/dv/iadv/graph.php?code=DRA&program=g-rad&type=gradts

Satellite and Ground LST vs Brightness temperature(BT)

DRA Gnd LST :20121001-20201031
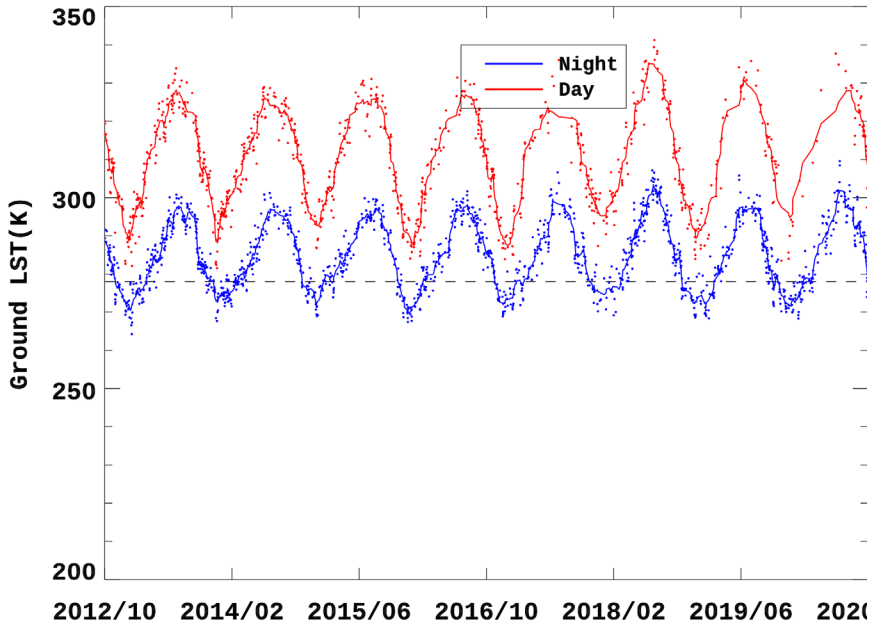
DRA Sat LST :20121001-20201031

DRA Gnd LST-BT11 :20121001-20201030
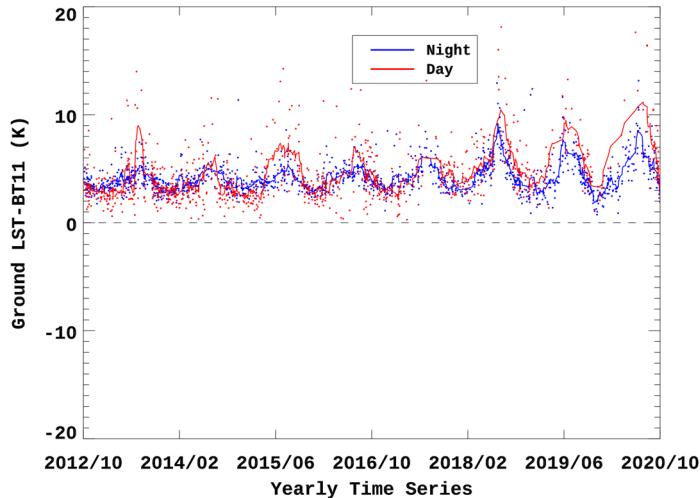
DRA Sat LST-BT11 :20121001-20201030

$$F^{\uparrow} = \varepsilon\sigma T_s^4 + (1-\varepsilon)F^{\downarrow}$$

$$T_s^4 = \frac{F^{\uparrow} - (1-\varepsilon)F^{\downarrow}}{\varepsilon\sigma}$$
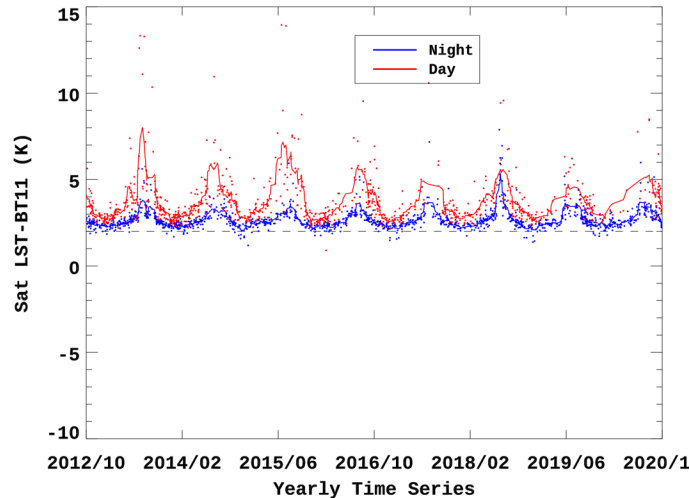
- Satellite LST and ground LST time series were investigated for both daytime and nighttime. The ground LST presents increase trend in recent years
- More significant seasonal variations are observed between ground LST and satellite BT in recent years
- Less seasonal variations are observed between satellite LST and satellite BT in recent years

Land Surface Emissivity(LSE) Data Check

■ Operational and local land surface emissivity difference
- Limited difference located at snow area, previous snow + instantaneous snow product

VIIRS M15 — SNPP

VIIRS M16 — SNPP
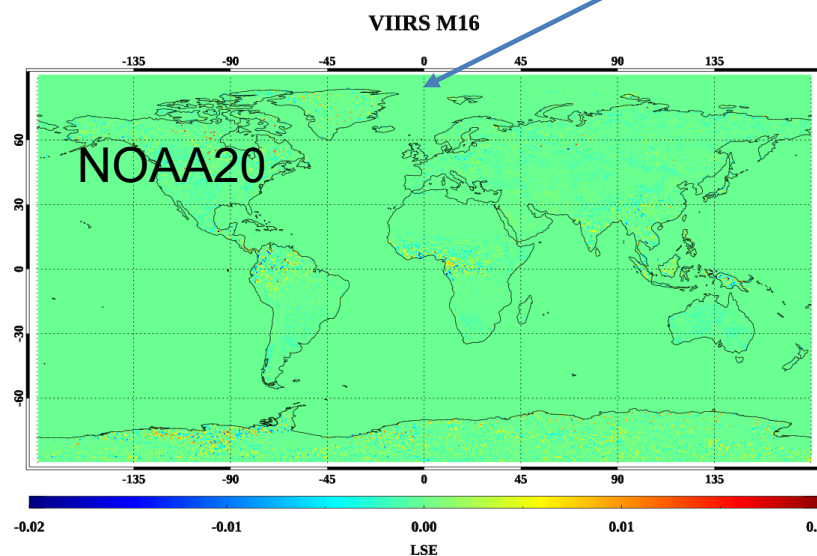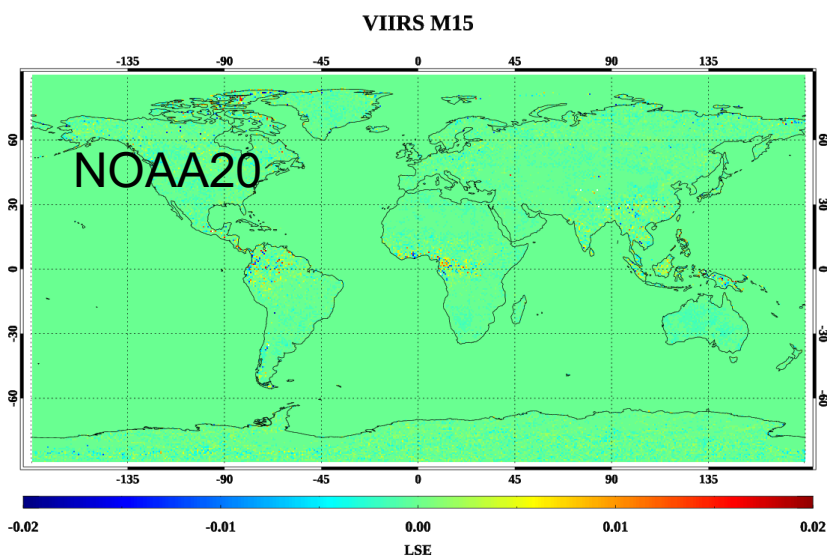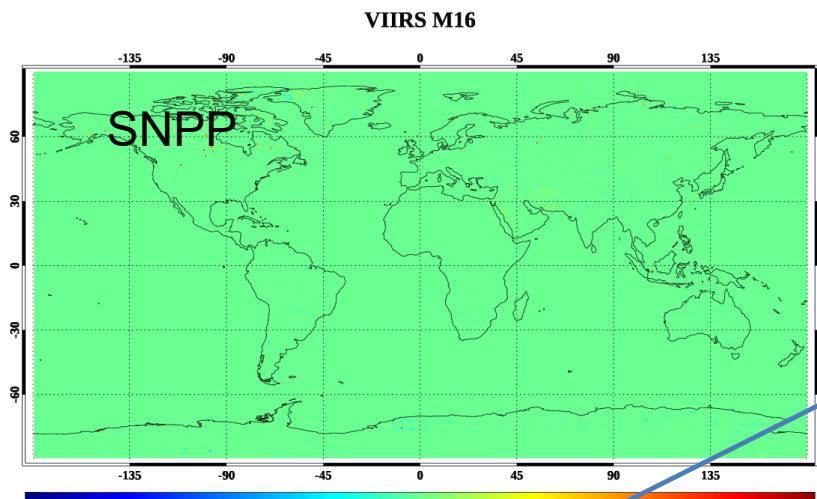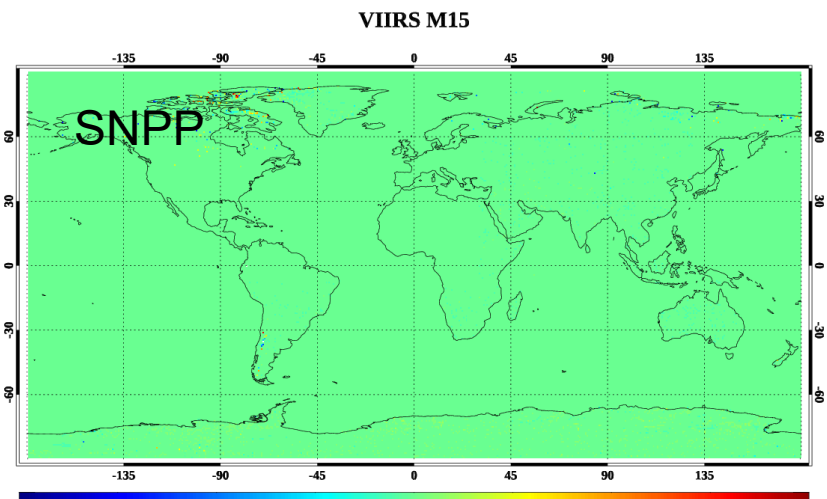
S-NPP VIIRS M15 (top-left), M16(top-right) LSE Difference between LSE IP and local LSE on 20210908

NOAA20 VIIRS M15 (bottom-left), M16(bottom-right) LSE Difference between LSE IP and local LSE on 20210908

VIIRS M15 — NOAA20

VIIRS M16 — NOAA20

- Operational SNPP LSE is very close to the local LSE; slight difference is observed over high latitude with snow cover.
- More differences are observed for NOAA20 LSE. Because the operational LSE uses the NOAA20 GVF and snow as input while local LSE takes the SNPP GVF and snow as input.

Surface Albedo

Accomplishments / Events:

- Developed the BRDF backup algorithm
  - Using the BRDF climatology as prior knowledge for BRDF inversion under insufficient clear-sky observations
- Assessed LSA/LST/NDVI heterogeneity influence over VIIRS L2 pixel in validation of land parameters using SURFRAD/ARM-SGO/NEON/BSRN sites
  - The heterogeneity (scale effect) which contributes to the error budget.
  - The method could serve for the long-term monitoring of land products
- Keep producing the BRDF climatology
- Drafted and revised the milestone for FY22

Overall Status:

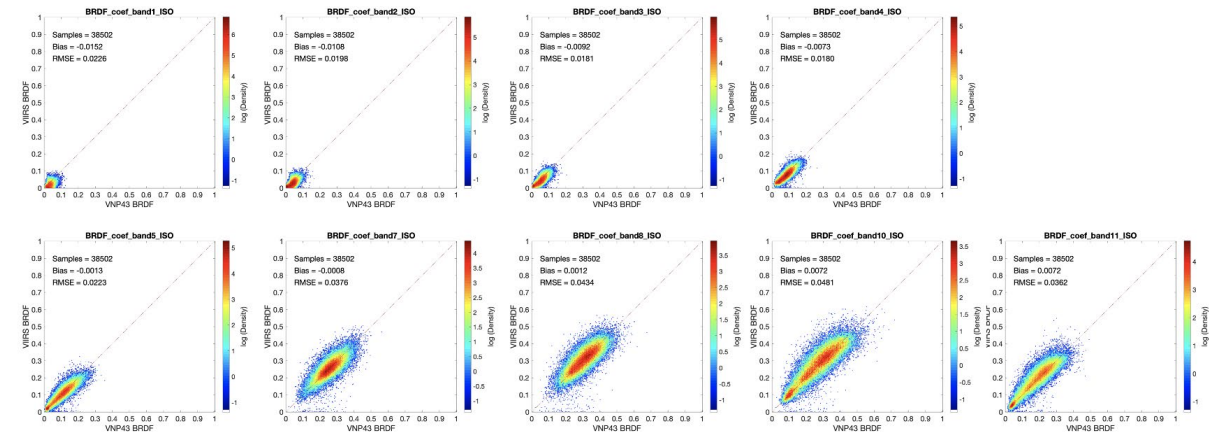|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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
CalVal Report on current SNPP and N-20 data	Dec-20	Dec-20	Dec 20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates, ASSISTT delivery)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Code developed for BRDF computation	Mar-21	Mar-21	Mar-21	
Snow albedo LUT and update	Apr-21	Apr-21	Apr-21	
Sample BRDF data evaluation comparing to MODIS data	Jun-21	Jun-21	Jun-21	
Annual algorithms/products performance report	Aug-21	Aug-21	Sep-21	
BRDF component code integration done	Sep-21	Sep-21		Pending in the SPSRB process
Support to the NDE and STAR ASSIST requests	Sep-21	Sep-21	Done	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21	Done	

Highlights:

The VIIRS BRDF back-up algorithm has generated comparable results as VNP43 BRDF product.
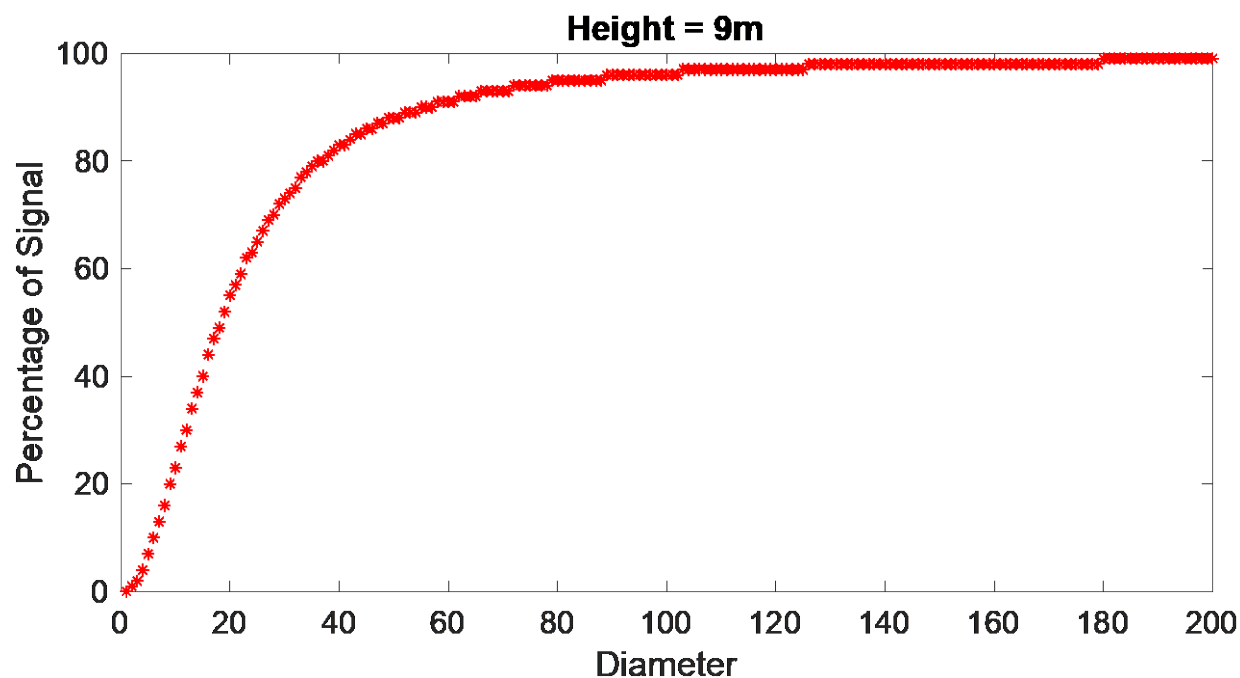
- The influence is assessed through the albedo difference between the aggregated albedo at two scales: the VIIRS pixel range and the station site field-of-view

$$diff = Alb_{site} - Alb_{pixel}$$
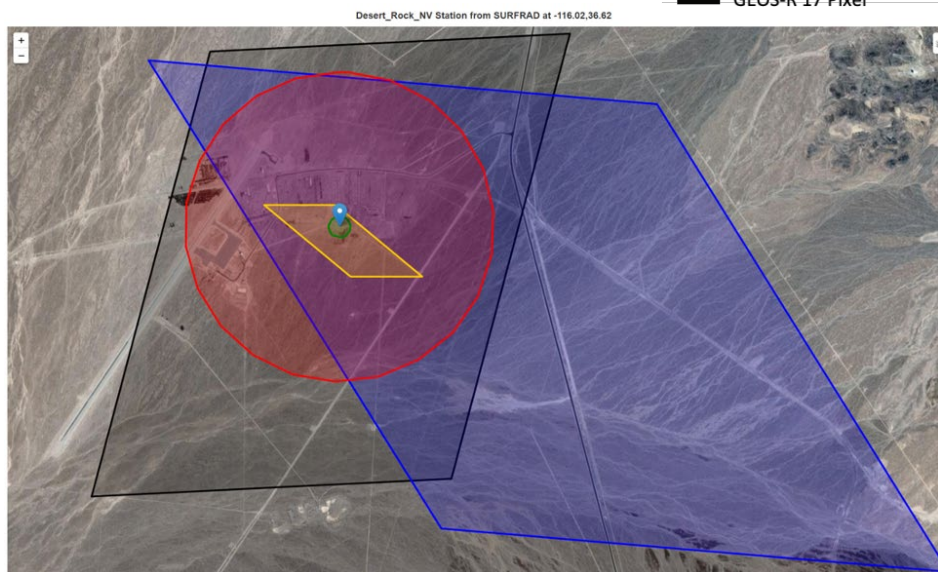
Footprint of View difference between instrument and the pixel

Variation of the percentage of signal with the FOV diameter (cosine response of the radiometer)

- When taking 90% radiometer signal into consideration, FOV is regarded to a circle with 70m as diameter
- The satellite pixel FOV is set as a circle with 500m radius or fixed grid cell
- The observation difference between these two FOVs due to the surface cover difference causes scale effect

- **Methodology** (following ATBD)
  - 8-day averaged data used
  - >50% clear-sky condition days only
  - SZA filtered → 0° < SZA < 80°

- **Overall results**
  - $R^2 = 0.45$
  - RMSE = 0.12
  - MAE = 0.08
  - Best performance: Queens
    (RMSE = 0.02, MAE = 0.02)
  - Worst performance: Staten Island.
    (RMSE = 0.15, MAE = 0.15)

Location	Site ID	Bias	RMSE	Instrument Height above Ground Level (m)	Mean Scale Effect
Brooklyn, NY	BKLN	0.055	0.059	8	0.0118
Queens, NY	QUEE	0.016	0.024	8	0.0028
Staten Island, NY	STAT	0.148	0.146	8	0.0722
Rosemount, MN	Ro6	0.115	0.168	3	0.0087

The validation result of L2 VIIRS albedo is largely influenced by the scale effect.
The site Staten Island is not recommended to use in albedo validation due to the pretty large inherent scale difference.
The site Queens is recommended to use in albedo validation as it is homogeneous such that the ground measurements are representative.
The other sites such as Rosemount should be used by cautious, and part of the bias is caused by the heterogeneity influence.
The yearly mean scale effect is proportional to the bias of each site when the instrument height is at the same level.
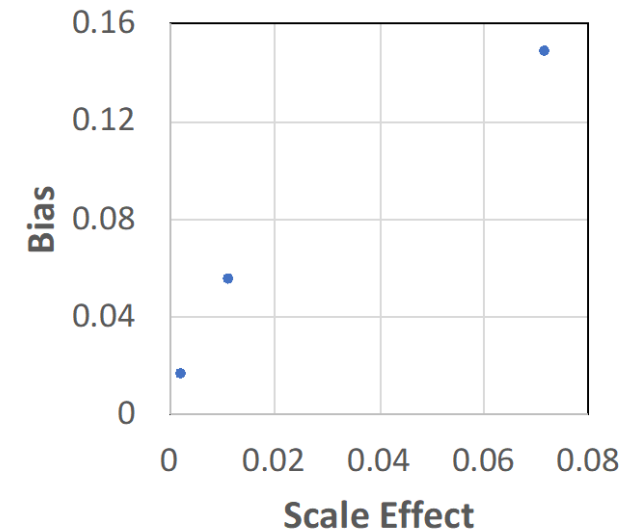
- Bayes statistical estimation is used as a regularized least square regression.
- The standard deviation in the BRDF climatology is added into the solution of the least square result.

$$\mathbf{x} = (K^T C_{\mathbf{n}}^{-1} K + C_{\mathbf{x}}^{-1})^{-1} K^T C_{\mathbf{n}}^{-1} \mathbf{y}.$$
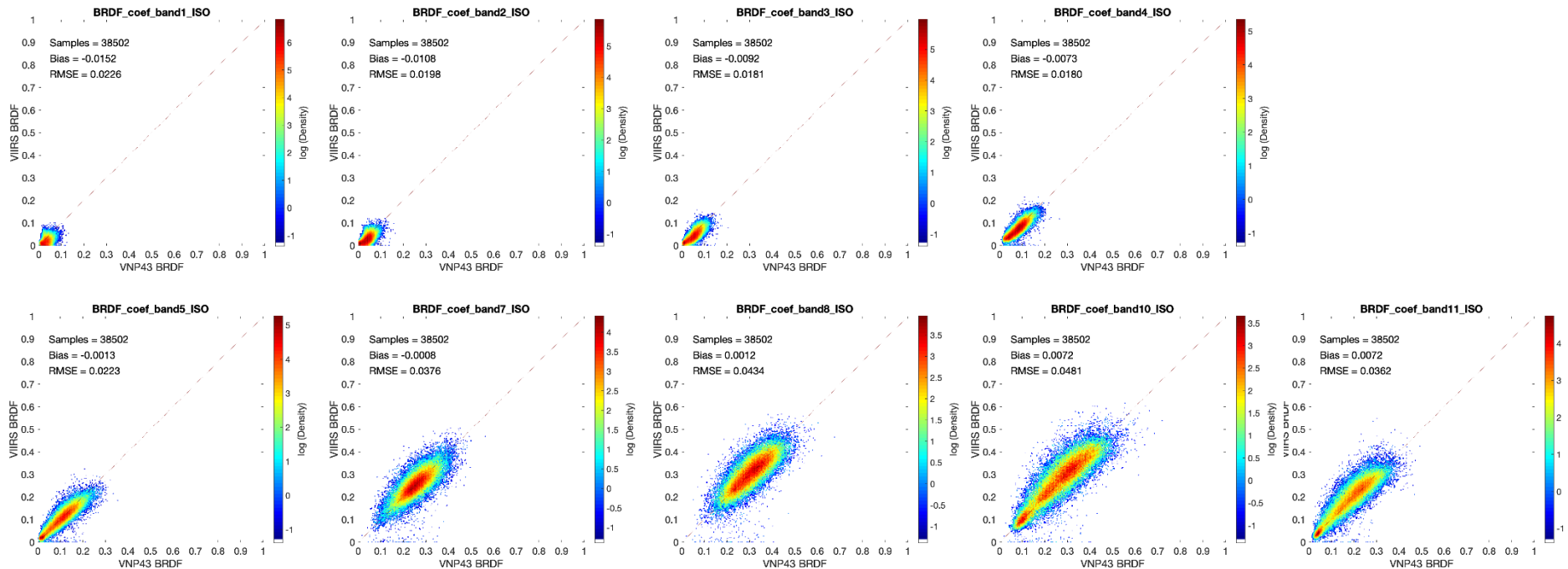
$$C_{\mathbf{n}} = \sigma_{\mathbf{n}}^2 I_M, \quad C_{\mathbf{x}} = \sigma_{\mathbf{x}}^2 I_N,$$

$$\mathbf{x} = (K^T K + \xi I_M)^{-1} K^T \mathbf{y},$$

where C_n is the noise covariance of the observation noise and model inaccuracy.

where C_x is the covariance matrix of a priori information of x.
σ_x is the standard deviation in the BRDF climatology.

The back-up algorithm applied on whole image has generated comparable results as VNP43 BRDF product.

Vegetation Index and Green Vegetation Fraction

Accomplishments / Events:

- Expected completion of SNPP and NOAA20 VI and GVF cal/ val report based on time series plots and correlations of vegetation products with PhenoCam Green Chromatic Coordinate (GCC) at 38 sites
- Experimental SNPP/ NOAA20 VIIRS VI blended product has been produced earlier in 2021.
- Compared weekly EVI of GVF v3.0 with that of GVF v2.2 using 6 months of testing data and found that weekly EVI of GVF v3r0 has more high EVI value pixels than that of GVF v2r2.
- Assess impact of wild fire at Caldor in California in August of 2021 on daily and 1-km top of canopy normalized difference of vegetation index (TOC-NDVI)

Overall Status:

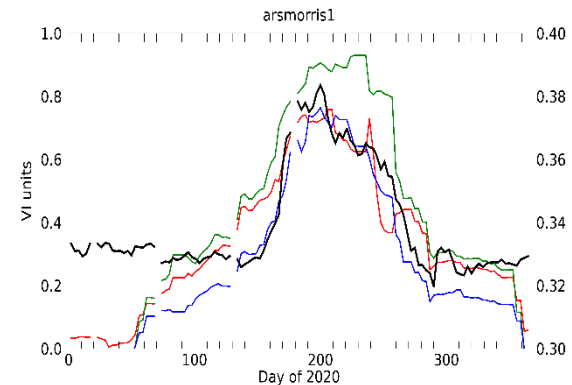|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		x			
Technical / Programmatic		x			
Schedule		x			

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

Issues/Risks:

None

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Evaluation of the V2.1 VI algorithms	Dec-20	Dec-20	Dec-20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	01/13/21	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	VI
			05/04/21	GVF
ATBD update, Detail Design Document Development	Jan-21	Jan-21	01/31/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Feb-21	Feb-21	04/19/21	
Software optimization update	Apr-21	Apr-21	05/17/21	Additional testing
Final J2 ready DAP to ASSISTT	Jun-21	Jun-21	Jun-21	
Annual algorithms/products performance report	Aug-21	Oct-21	End of year team presentation	
SNPP and NOAA-20 product calibration and validation	Sep-21	Sep-21	Sep-21	
Experimental blended data developed	Sep-21	Sep-21	Sep-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		

Highlights: Sample NOAA20 VIIRS VI comparisons with PhenoCam GCC


arsmorris1

TOA NDVI
TOC NDVI
TOC EVI
PhenoCam GCC

R	
TOA NDVI	0.7974
TOC NDVI	0.8249
TOC EVI	0.8877

Rs	
TOC EVI	0.5236

R is standard correlation coefficient, Rs is rank correlation

Mean correlation coefficients between NOAA20 vegetation indices and PhenoCam GCC for all 38 sites:

TOA NDVI	0.7103
TOC NDVI	0.6742
TOC EVI	0.7506

Sample NOAA20 VI/ PhenoCam GCC comparisons

arsmorris1

R	
TOA NDVI	0.7974
TOC NDVI	0.8249
TOC EVI	0.8877
Rs	
TOC EVI	0.5236

austincary
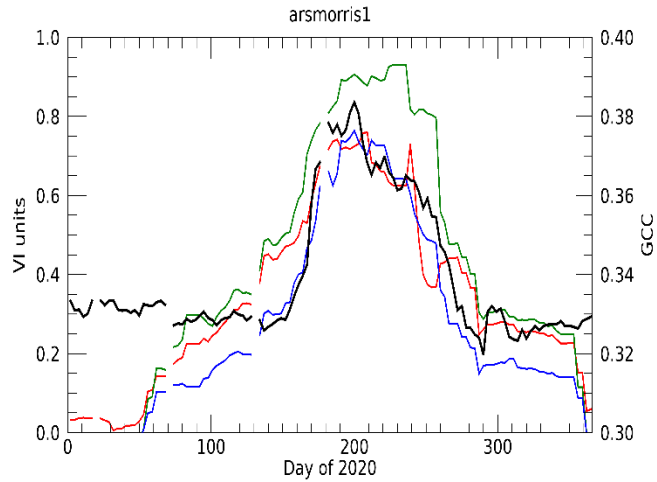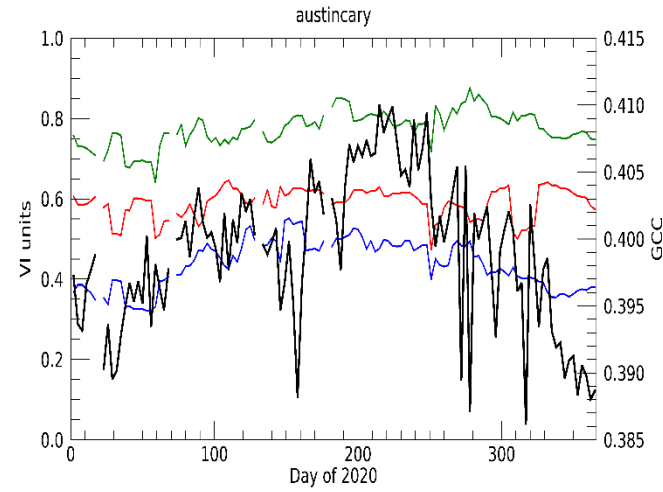
R	
TOA NDVI	0.1543
TOC NDVI	0.3096
TOC EVI	0.5512
Rs	
TOC EVI	0.5921

burnssagebrush
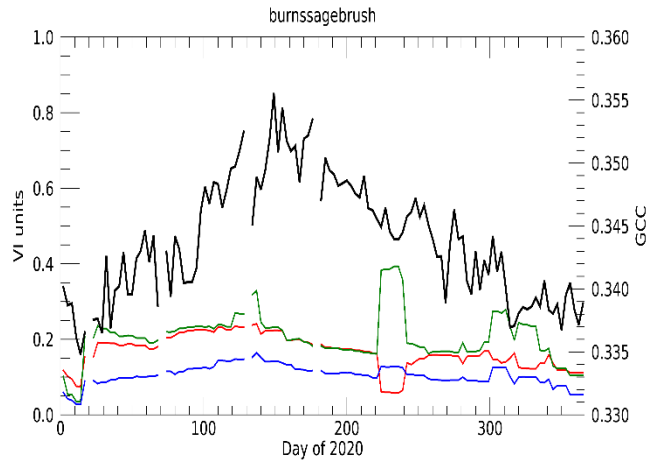
R	
TOA NDVI	0.4766
TOC NDVI	0.2649
TOC EVI	0.6972
Rs	
TOC EVI	0.7355

cafboydnorthltar01
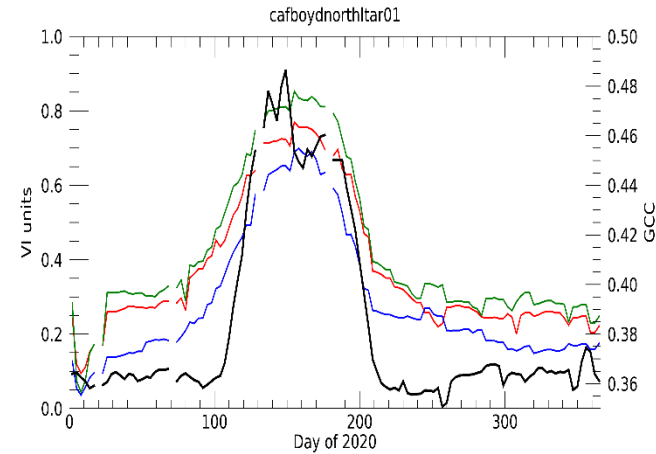
R	
TOA NDVI	0.9293
TOC NDVI	0.9274
TOC EVI	0.9315
Rs	
TOC EVI	0.4758

TOA NDVI
TOC NDVI
TOC EVI
PhenoCam
GCC

R is standard correlation coefficient, Rs is rank correlation

Mean correlation coefficients between NOAA20 vegetation indices and
PhenoCam GCC for all 38 sites:

TOA NDVI	0.7103
TOC NDVI	0.6742
TOC EVI	0.7506

Sample SNPP VI/ PhenoCam GCC comparisons

arsmorris1
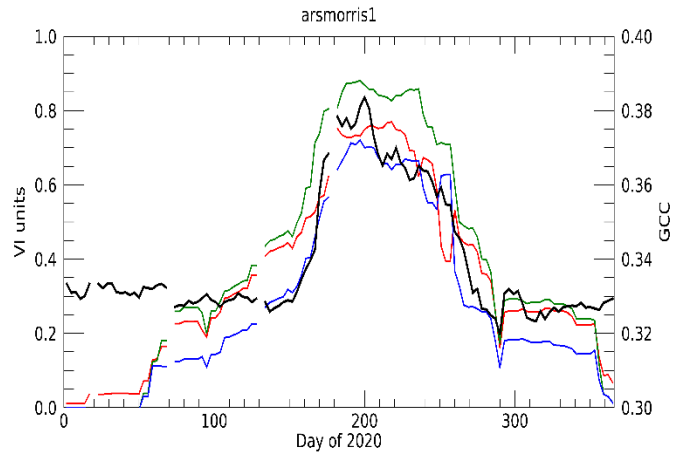
R	
TOA NDVI	0.8242
TOC NDVI	0.8358
TOC EVI	0.8888
Rs	
TOC EVI	0.5286

austincary

R	
TOA NDVI	-0.0279
TOC NDVI	0.3746
TOC EVI	0.3733
Rs	
TOC EVI	0.5029

burnssagebrush
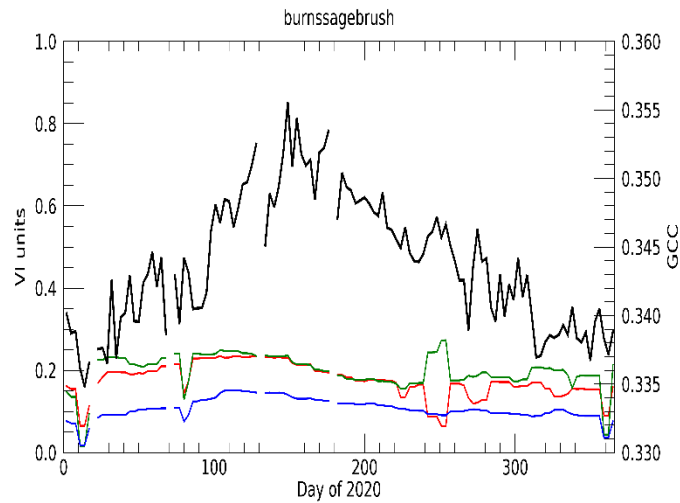
R	
TOA NDVI	0.4251
TOC NDVI	0.3432
TOC EVI	0.7378
Rs	
TOC EVI	0.7693

cafboydnorthltar01
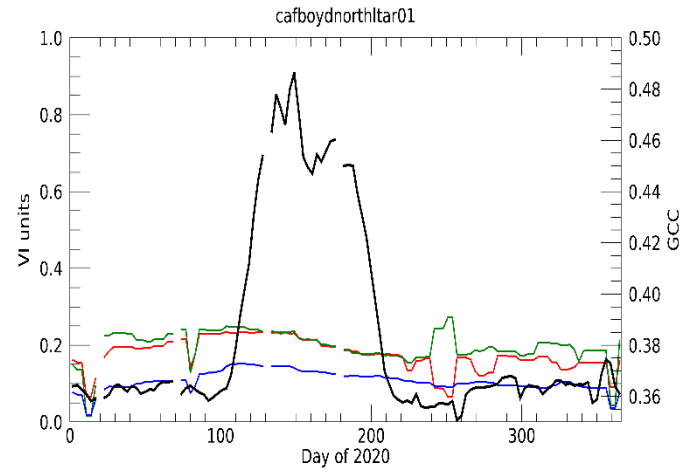
R	
TOA NDVI	0.4866
TOC NDVI	0.2098
TOC EVI	0.5982
Rs	
TOC EVI	0.5195

TOA NDVI
TOC NDVI
TOC EVI
PhenoCam
GCC

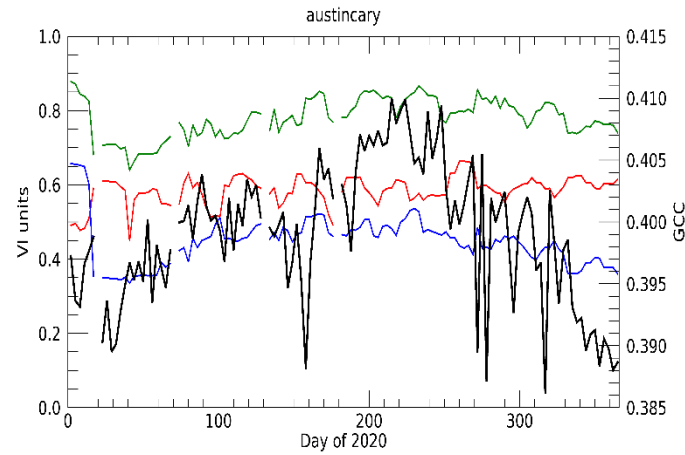Mean correlation coefficients between NOAA20 vegetation indices and PhenoCam GCC for all 38 sites:

TOA NDVI	0.7071
TOC NDVI	0.6617
TOC EVI	0.7583

R is standard correlation coefficient, Rs is rank correlation

Vegetation Products cal/ val summary

- SNPP and NOAA20 VI and GVF were correlated with PhenoCam GCC at 38 sites for the full year 2020.

- SNPP and NOAA20 VI and GVF PhenoCam comparision results are consistent with those from the validated maturity review.

- SNPP and NOAA20 VIIRS GVF correlations with PhenoCam GCC are greater than AVHRR climatology correlations with PhenoCam GCC. This indicates that VIIRS GVF products correspond more closely to ground conditions and should be used in models instead of AVHRR climatology.

- VI/ GCC rank correlation coefficients are greater when using the entire year 2020 than those found in previous work with MERIS[1] and in comparison with validated maturity review, when only a partial year of data was included.

- VI/ GCC correlation coefficients are lower than those found in another published study[2], but were consistent with the result from the other study that EVI/ GCC correlations are greater than NDVI/ GCC correlations.

- Much of the published work comparing satellite vegetation parameters to PhenoCam GCC includes comparison of phenological transition dates. Further work will be done to obtain and compare phenological transition dates from our products with those from PhenoCam GCC.

[1] Brown, L. A., J. Dash, B. O. Ogutu, and A. D. Richardson, 2017. *On the relationship between continuous measures of canopy greenness derived using near-surface remote sensing and satellite-derived vegetation products.* Agricultural and Forest Meteorology, 247: 280-292. DOI: 10.1016/j.agrformet.2017.08.012

2 Zhang, X., S. Jayavelu, L. Liu, M. A. Friedl, G. M. Henebry, Y. Liu, C. B. Schaaf, A. D. Richardson, and J. Gray, 2018. *Evaluation of land surface phenology from VIIRS data using time series of PhenoCam imagery.* Agricultural and Forest Meteorology, 256-257: 137-149. DOI: 10.1016/j.agrformet.2018.03.003

Comparison of weekly EVI (GVF v3.0 vs. GVF v2.2)

- Weekly EVI of GVF v3r0 is compared with that of GVF v2r2 in the testing period July-Dec 2020.
- Weekly EVI of GVF v3r0 is higher than that of GVF v2r2 in the rain forest areas (Amazon and central Africa)
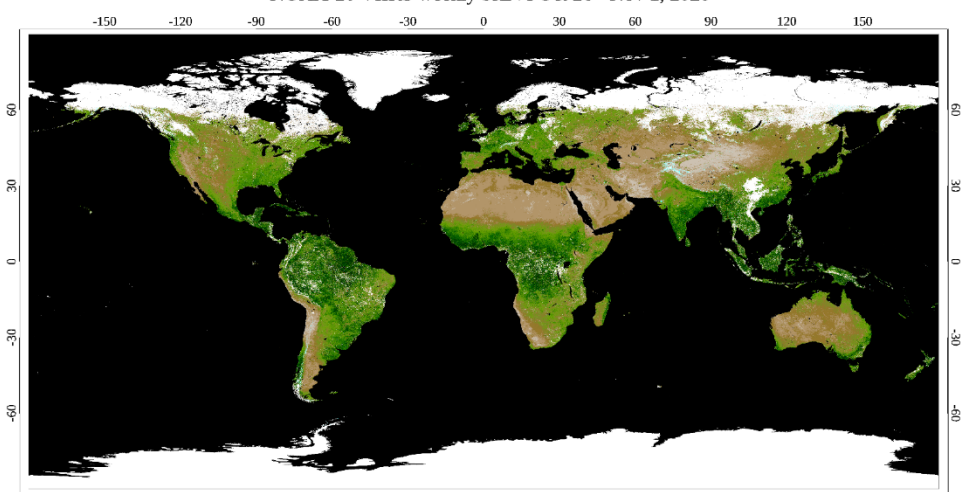

Weekly EVI (V2r2 GVF)

NOAA-20 VIIRS weekly bsEVI Oct 26 - Nov 1, 2020
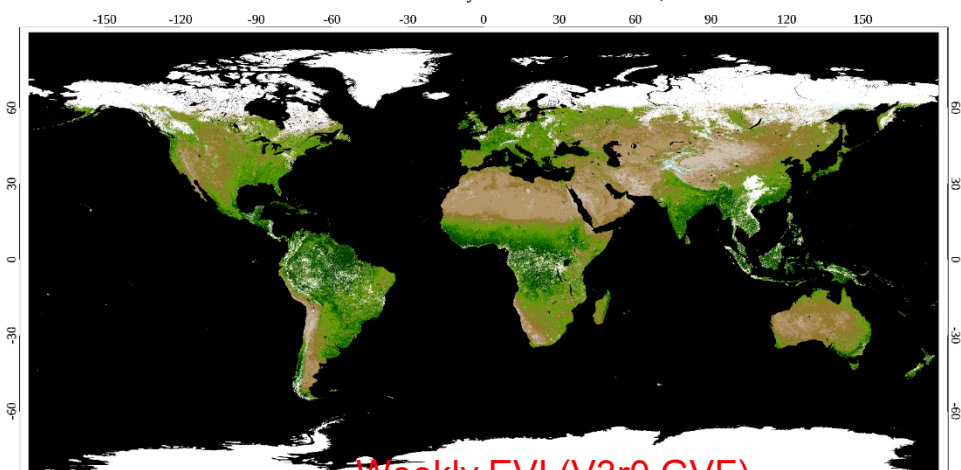
Weekly EVI (V3r0 GVF)

NOAA-20 VIIRS weekly bsEVI Oct 26 - Nov 1, 2020

Weekly EVI (v2r2 GVF vs. v3r0 GVF)

Mean_diff=0.0011
RMSE=0.0863
R=0.896

Y=0.9379*X+0.020?
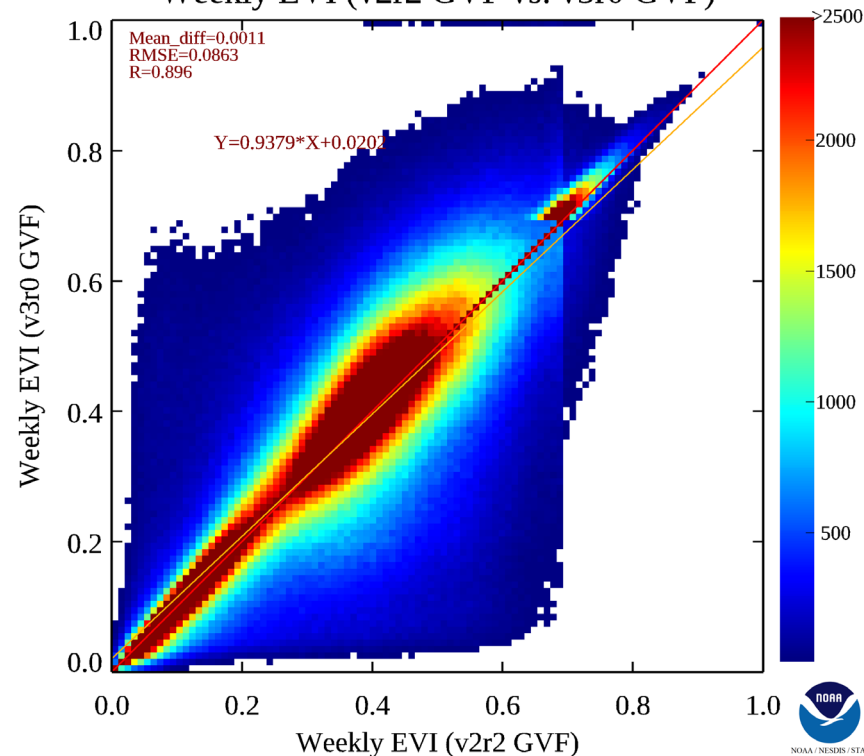
weekly EVI of GVF v3r0 has more high EVI value (EVI>0.7) pixels than that of GVF v2r2

Comparison of high EVI (GVF v3.0 vs. GVF v2.2)

Global maps of high EVI (EVI>0.7) pixels

Map of High EVI (V2r2 GVF)

Map of High EVI (V3r0 GVF)

NOAA-20 VIIRS weekly bsEVI Jul 2 - Jul 8, 2020

N=141236

NOAA-20 VIIRS weekly bsEVI Jul 2 - Jul 8, 2020

N=298620
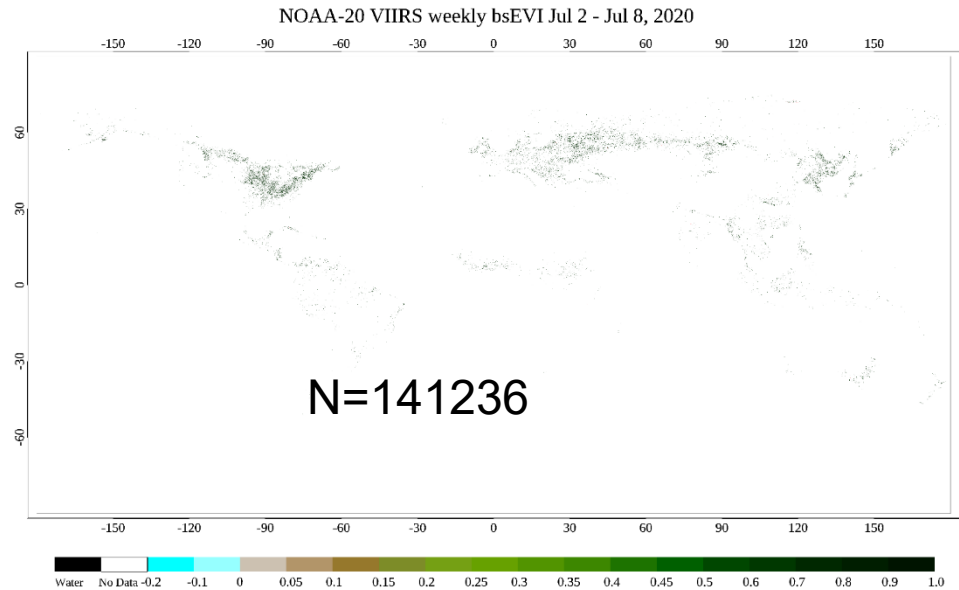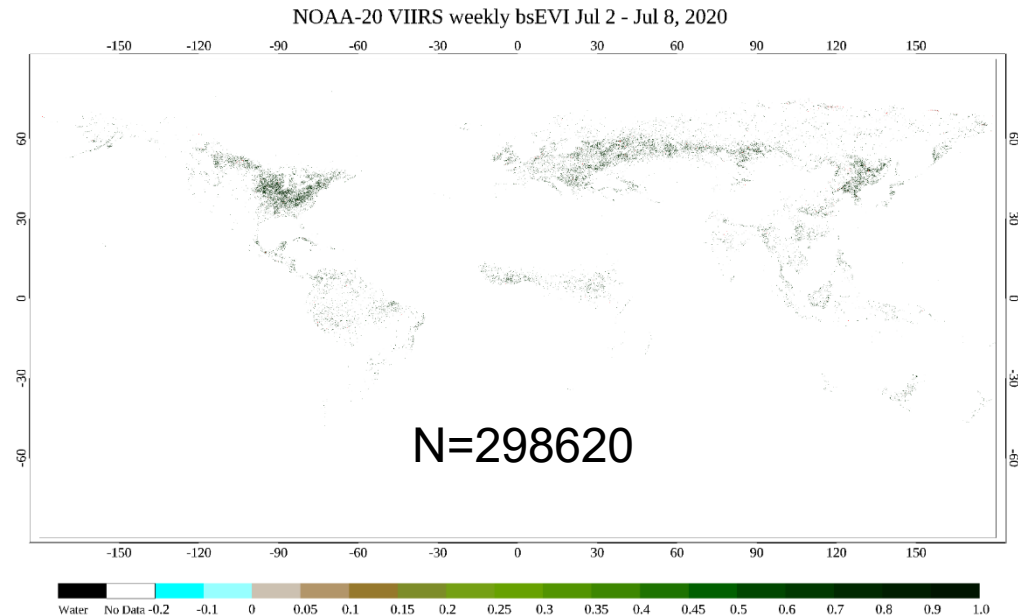
- Weekly EVI of GVF v3r0 has two times of high EVI value (EVI>0.7) pixels than that of GVF v2r2
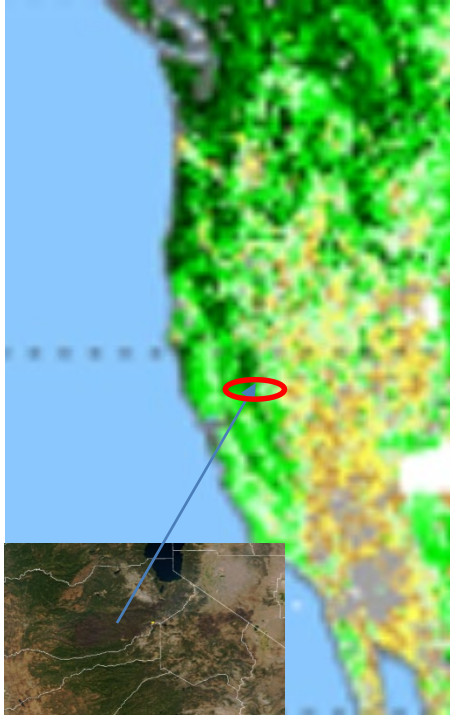
Aug. 14, 2021   Aug. 18, 2021   Aug. 22, 2021   Aug. 26, 2021
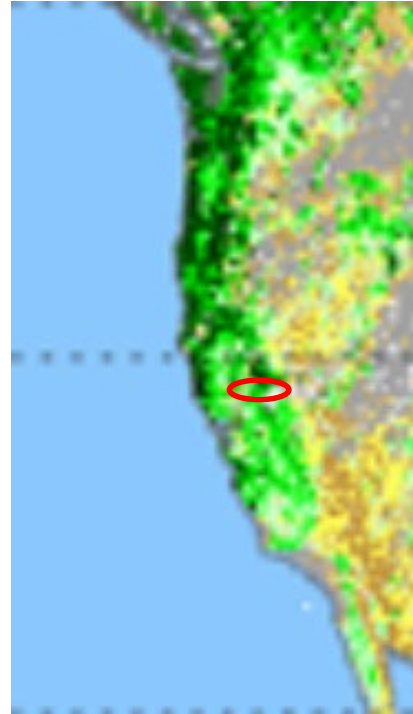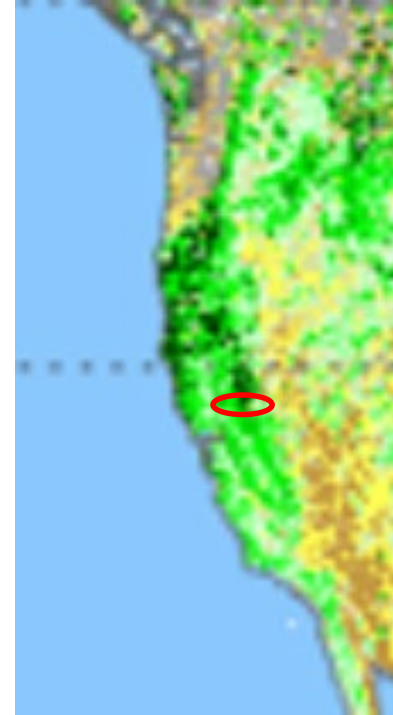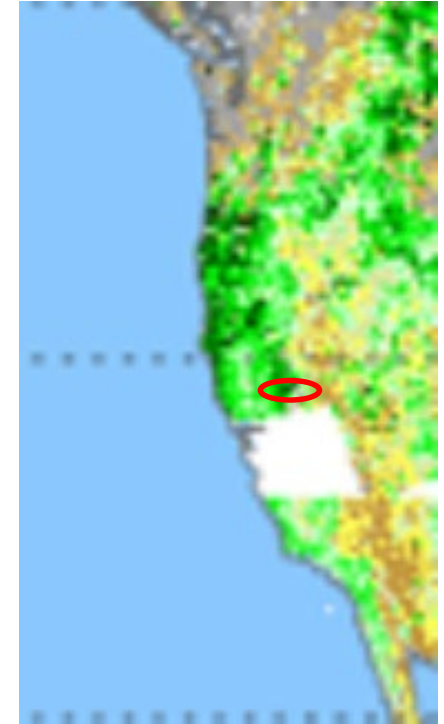
- Above images show wildfire at Caldor in California on has had significant impact on daily TOC-NDVI
- The fire, which ignited Aug. 14 near Little Mountain between Omo Ranch and Grizzly Flats, has burned at least 218,857 acres, or about 342 square miles, and containment stands at 71%, Cal Fire said in its Friday morning update. It is currently the 15th-largest wildfire in state history and the 16th-most destructive.

DAILY 1-KM AVERAGE TOC-NDVI AT CALDOR FIRE AREA
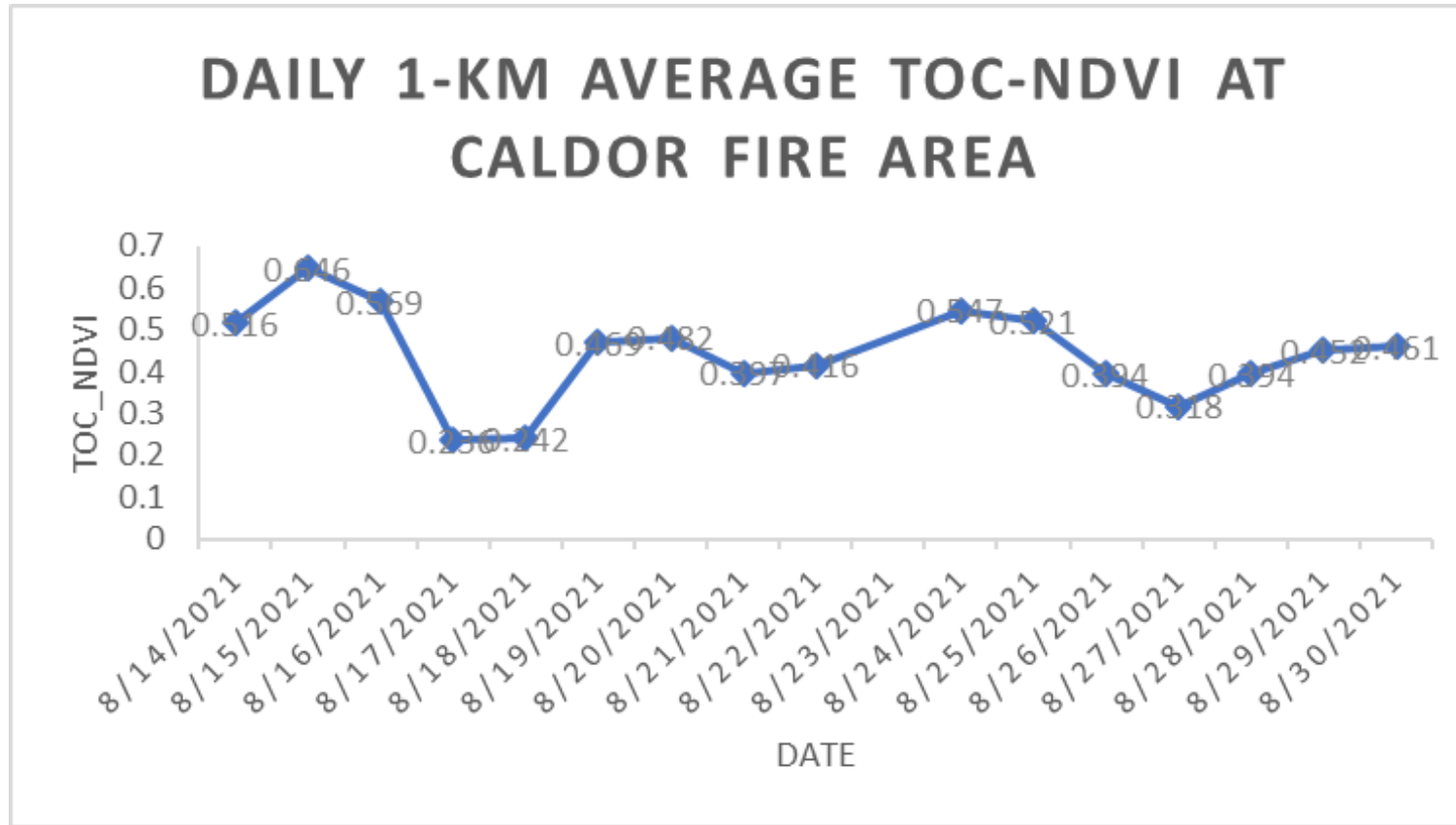
Above figure showed daily change of TOC-NDVI at Caldor fire area (39.1 N~38.5 N, -120.75 W ~ -119.5 W) in California.
Time series analysis verified the wild fire resulted in significant reduction of TOC-NDVI

Summary of LaPenta summer internship

- During the summer of 2021, NVPS hosted Naylah Perodin as a LaPenta summer intern. Naylah is a rising senior computer science major at Maryland Loyola University.

- Nayla learned background information about ground-based and satellite vegetation parameters through reading and interactions with mentors.

- She obtained Green Chromatic Coordinate data from 38 PhenoCam sites and completed the download of 2020 NPP and NOAA20 VIIRS VI and GVF global data from CLASS.

- She developed code in Python for making time series plots of VIIRS GVF and PhenoCam GCC and obtaining correlation coefficient values between the GVF and GCC data sets. Her results showed that both NPP and NOAA20 VIIRS GVF data more closely corresponded to the ground-measured greenness parameter than the AVHRR climatology GVF previously used in the NMC model.

- She developed code for generation of GVF climatology. (Some fixes/ refinements to this code will be required before it can be used to generate the climatology.)

- Both Naylah and her mentors are satisfied with her learning and research result production during the summer.

- Naylah has submitted an abstract to the AGU meeting in December 2021.

Vegetation Health

Accomplishments / Events:

- Compressed map tiles to reduce the number of images;
- Added "Percentage of drought area for specific crop type" to our webpage;
- Went on implementing the plan on switching S-NPP weekly processing with NOAA-20, including 1) Routinely generate 4km blended SMN/SMT from NOAA-20; 2) Tested generating a whole set (44) of weekly figures at 16 km resolution using blended products based on NOAA-20; 3) Tried to merge generating NOAA-20 weekly maptiles into crontab jobs;
- Investigated VHP products and figures, as replies to queries from our users of USDA (Highlighted);
- Generated a series of data and figures of VIIRS/VHP-1 and -4, -16 km resolution products, covering September 2021;

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
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/29/20	
Updated Cal/Val plan (DPMS comments)			04/23/21	
Initial/Final J2 ready DAP to NDE (include NPP/N20 updates)	Oct-21	Oct-21		Combined
Update 1 km VH data for OSPO, USDA, NIDIS	Sep-21	Sep-21		On-going
VIIRS-0.5 km SMN & SMT (8-year Max-Min Climatology)	Sep-21	Sep-21		On-going
40-year Vegetation Greenness (MDVI) & Global warming	Sep-21	Sep-21		On-going
Climate warming & temperature (SMT) in agricultural regions	Sep-21	Sep-21		On-going
FAO locust activity vs VHindices in 2021	Sep-21	Sep-21		On-going
NDVImax/min & BTmax/min: 0.5 and 1 km correlation	Sep-21	Sep-21		On-going
Regional drought and global warming trends	Sep-21	Sep-21		On-going
Algorithm: VHindices-Locust (Africa, Arabia & India)	Sep-21	Sep-21	05/18/21	
Algorithm: VHindices-Malaria (South America)	Sep-21	Sep-21		
VHindices vs Locust (Africa, Arabia & India) 2020 & 2019	Sep-21	Sep-21	07/21/21	
Annual algorithms/products performance report	Sep-21	Oct-21		End of year team presentation

Highlights: Time series of Ukraine to be used by our USDA users
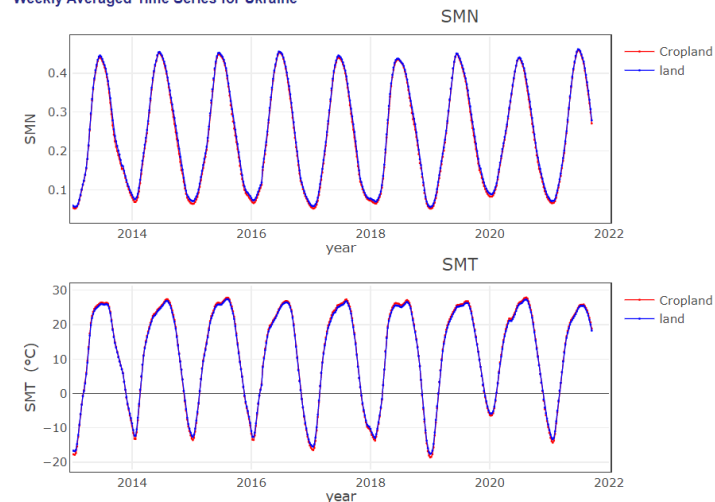
Accomplishments / Events:

- Completed initial testing/verification of J-2 OC data processing (see highlight)

- A new paper published in ***ISPRS Journal of Photogrammetry and Remote Sensing*** describing our effort for deriving global clear sky near-surface imagery from multiple satellite daily imagery time series, including VIIRS and OLCI measurements. The algorithm has been implemented in the OCView for routinely producing global clear sky near-surface imagery.

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
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	01/19/21	
Updated Cal/Val plan (DPMS comments)			04/29/21	
Update MSL12 LUTs and various coefficients for J-2	Jun-21	Jun-21	Jun-21	
Complete testing/verification of J-2 OC data processing	Sep-21	Sep-21	Sep-21	
Final J2 ready DAP delivery (include NPP/N20 updates) to CW	Dec-21	Dec-21		cc ASSISTT
Complete MSL12 v1.40 preparation and implementation	Jun-21	Jun-21	Jun-21	
Working on improvement of the ocean color data processing system (MSL12), particularly over global coastal and inland water regions	Sep-21	Sep-21	Sep-21	
Improve the merged VIIRS OC data from SNPP and NOAA-20, and gap-free global Chl-a data	Sep-21	Sep-21	Sep-21	
Continue VIIRS Cal/Val data analysis (SNPP & NOAA-20 comparison)	Mar-21	Mar-21	Mar-21	
In situ data collections from OC Cal/Val team including NOAA dedicated cruise and other opportunities, and continue Cal/Val for ocean color EDR	Sep-21	Sep-21	Sep-21	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	

Highlights:

J2 MSL12 Ocean Color Data Processing Testing/Verification
Testing Case: March 19, 2019 in the East China Sea
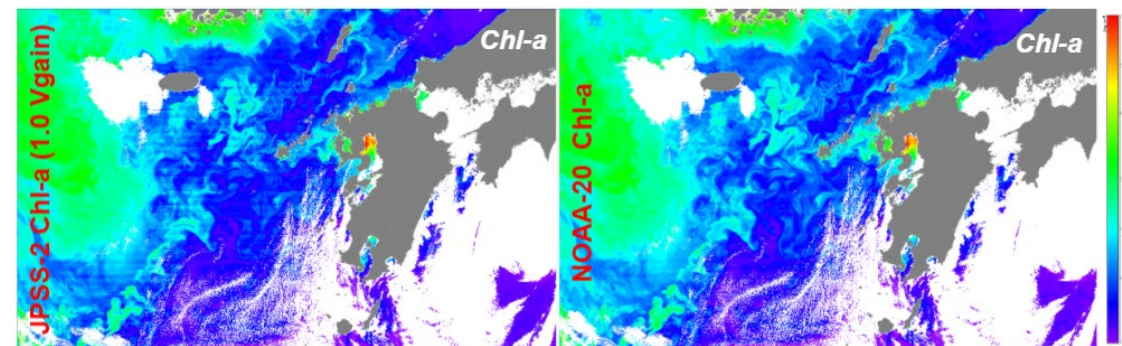
- Completed milestone May-21: Complete MSL12 v1.40 preparation and implementation.
- Completed milestone June-21: Update MSL12 LUTs and various coefficients for J-2.
- **Completed milestone Sep-21: Complete testing/verification of J-2 OC data processing.**

Accomplishments / Events:

– SST Team worked with U. Wisconsin Community Satellite Processing Package (CSPP) Team (Liam Gumley, CSPP Lead; James Davies; CSPP-ACSPO Lead). CSPP is used by Direct Broadcast (DB) users. CSPP_ACSPO v2.0 is in internal testing & will be released in Oct-Nov 2021. Feedback from CSPP Team: "We are really pleased to be able to offer this update to our users; we know how much it is used and appreciated, and access to state-of-the-art SST retrievals from their own DB data is a great benefit to our users - in the USA and around the world."

– SST Team is working with OSPO to reconcile file naming convention. The current naming convention uses "STAR" as the Regional Data Assembly Center (RDAC) if file is produced in STAR, and "OSPO" if produced in OSPO (see examples in Figure). A. Ignatov is working with the Group for Hi-Res SST (GHRSST) to add a new RDAC to the GHRSST list, "NOAA" which will be used by both STAR band OSPO, and will facilitate stitching the operational and reprocessed data streams.

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:

CAC badges of 4 main SST developers were let expired by the STAR Resource Management Division. Two were badged 3 weeks later, and two 6 weeks later. This delays deliverables by at least a month

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	
Updated Cal/Val plan (address DPMS review comments)			04/21/21	
Initial (same as Final) J2 ready DAP to NDE (include NPP/N20 updates)	Apr-21	Sep-21	09/16/21	ACSPO 2.80
ACSPO 2.90 DAP to ASSISTT	Aug-21		Post-launch	ACSPO 2.90
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21		Will be omitted because 2.80 is initial and at the same time final J2-ready DAP	
Improved clear-sky mask, SST fronts to support data fusion (ACSPO 2.90)	Aug-21		Post-launch	Next ACSPO version will be J2-tweaked
J2 ACSPO and Cal/Val Readiness	Sep-21	Oct-21		Delayed by expired CAC cards
Support N20/NPP SST Cal/Val & fixes	Sep-21	Oct-21		Delayed by expired CAC cards
Continue archival w/PO.DAAC/NCEI. Work w/NCEI to complete holdings	Sep-21	Oct-21		Delayed by expired CAC cards
Maintain SQUAM, iQuam, ARMS, match-up codes, RAN infrastructure. Improve and optimize	Sep-21	Oct-21		Delayed by expired CAC cards
NOAA SST Cal/Val Tools ready to monitor N21 SST	Sep-21	Oct-21		Delayed by expired CAC cards
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	

Highlights:

– Current and proposed file naming convention in NDE operations and STAR moderate assurance operational processing and reprocessing is shown in two top rows of Table 1
– The inconsistent file names create problems stitching NDE operational and STAR reprocessed data
– This issue will be addressed by using a unique RDAC=NOAA in both NDE operations and STAR moderate assurance/reprocessing
– We plan to implement this change in v2.80, which was already delivered by ASSISTT to NDE for testing. This may delay implementation in NDE by a few weeks, but STAR/NDE consistency is critically important for STAR/NDE consistency moving forward.

Processing	File Name
NDE	20211007000000-**OSPO**-L2P_GHRSST-SSTsubskin-VIIRS_N20-ACSPO_V2.61-v02.0-fv01.0
STAR	20211007000000-**STAR**-L2P_GHRSST-SSTsubskin-VIIRS_N20-ACSPO_V2.61-v02.0-fv01.0
Proposed	20211007000000-**NOAA**-L2P_GHRSST-SSTsubskin-VIIRS_N20-ACSPO_V2.61-v02.0-fv01.0

VIIRS Polar Winds

Accomplishments / Events:

- Evaluated ASSISTT reprocessed NOAA-20 VIIRS winds (00Z/12Z; June 2021) and Metop-C/AVHRR winds (Sep 2021) using the updated enterprise cloud height algorithm configurations used for GOES-16/17. Supports the ASSISTT April SuperDAP patch delivery to NDE and upcoming Metop-B/C Cloud/Wind ARR/ORR (Oct 21; Exact date TBD)

- Continued evaluation of routinely produced DNB Winds (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

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (DPMS comments)			04/23/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Prototype the derivation of winds with the DNB using the heritage windco algorithm	Sep-21	Sep-21	Sep 2021	
Implementation of the shortwave IR (2.25 μm) band winds	Sep-21	Sep-21	Jun-21	
Adapt QC method designed for winds derived using optical flow from image pairs to VIIRS tandem winds	Sep-21	Sep-21	Sep 2021	
Assess the use of cloud heights derived from LEO hyperspectral sounders (CrIS, IASI)	Sep-21	Sep-21	Sep 2021	
Collaborate with NWP community on model assimilation and impact studies	Sep-21	Sep-21	Sep 2021	
Continue to improve products monitoring capability	Sep-21	Sep-21	Sep 2021	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	

Highlights: DNB Winds

Polar Winds Derived from VIIRS Day/Night Band

- VIIRS Day-Night band (DNB) enables tracking of clouds in moonlight
- Uses Near Constant Contrast (NCC) imagery
- Contributes to improving satellite winds coverage (spatial and temporal) in polar regions.
- Being routinely generated at CIMSS
- DNB AMVs are being evaluated and validated against available rawinsonde wind observations
- Overall, the DNB AMVs compare well to colocated rawinsonde winds and are similar in quality to the operational VIIRS winds derived using the VIIRS LWIR window band
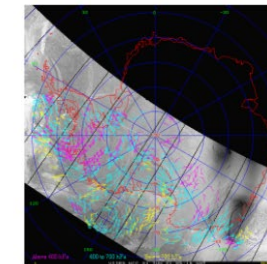
Jeff Key (STAR), Rich Dworak, and Dave Santek (CIMSS)
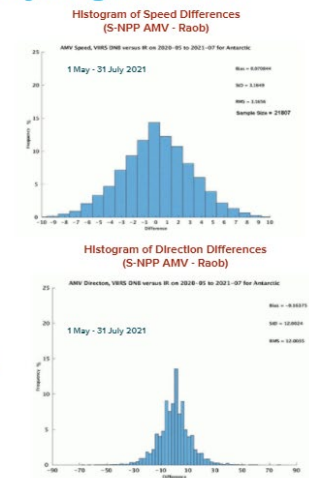
Accomplishments / Events

- Continued work on three major updates to the current NUCAPS V3.0 towards NUCAPS V3.1 for mission long reprocessing of S-NPP products. These include, (a) Averaging Kernels and surface corrections implementation into the NUCAPS product output file, (b) updates to the ozone climatology, (c) improving PBL temperature biases optimizing the temperature damping. The reprocessing version will be implemented on the Cloud through NCIS Cloud infrastructure.

- Continued work on the S-NPP (LW/SW) mini-validation package and validation exercises using the collocated matches (ECWMF, TCCON, OCO-2) collected for 12 focus days spanning different seasons. The aim is to provide a mini-validation report identifying impacts on the NUCAPS products due to loss of MW band, and a comparison of the S-NPP (LW/SW) statistical metrics with NOAA-20 operational products. The report will enable the JPSS program to decide on whether the S-NPP (LW/SW) products should be put into operation.

- The OLR manuscript, "Validation of Near-Real-Time NOAA-20 CrIS Outgoing Longwave Radiation with Multi-satellite Data Sets on Broad Timescales" has been accepted for publication in the Remote Sensing journal. Team members also continued work on the Elsevier reference book on Field Measurements.

Overall Status:

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

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

Issues/Risks:

None

Highlights:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Validated Maturity: CO2 (S-NPP & NOAA-20)	Dec-20	Dec-20	12/17/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
NUCAPS3.0/HEAP2.3 to ASSISTT			12/14/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Apr-21	Apr-21	02/26/21 04/13/21 patch	
Initial J2 ready DAP to CSPP			04/27/21	
Final J2 ready DAP to ASSISTT	May-21	Aug-21	Jun-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Oct-21	Oct-21		
NUCAPS averaging kernels for T/H2O/O3/CO/CH4/CO2	Sep-21	Sep-21	**Oct-21**	These are the projected dates of completion. The variance is due to additional improvements such as damping factor, ozone-a-priori etc. In addition, The S-NPP midwave band loss has made us to develop S-NPP (LW/SW) and has necessitated this variance
Improve ozone and other trace gas retrievals	Sep-21	Sep-21	**Oct/Nov-21**	
Explore the use of alternate technologies for certain NUCAPS modules such as AI-based bias tuning and regression	Sep-21	Sep-21	**Feb-22**	
Collection of validation data sets and collocated matches of satellite radiances and ancillary data sets for product validations and monitoring	Sep-21	Sep-21	**Dec-21**	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	
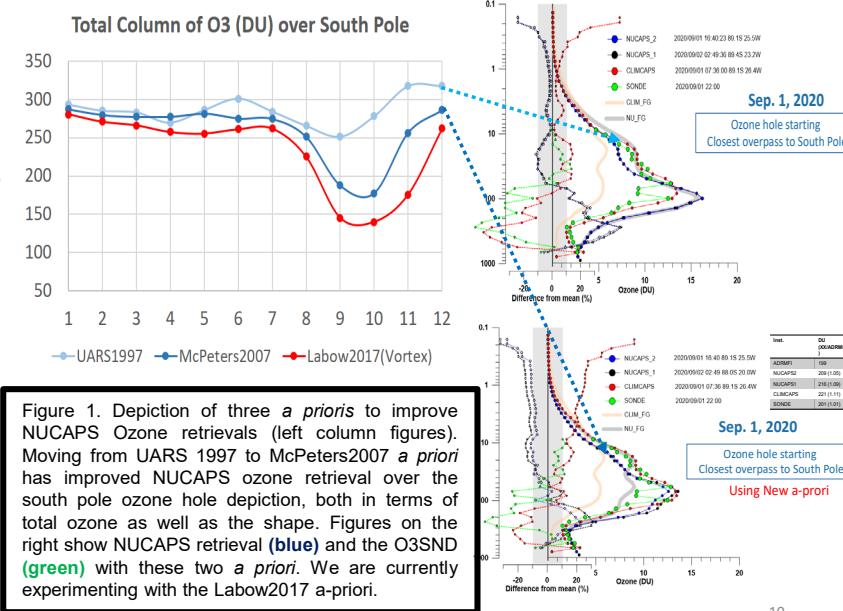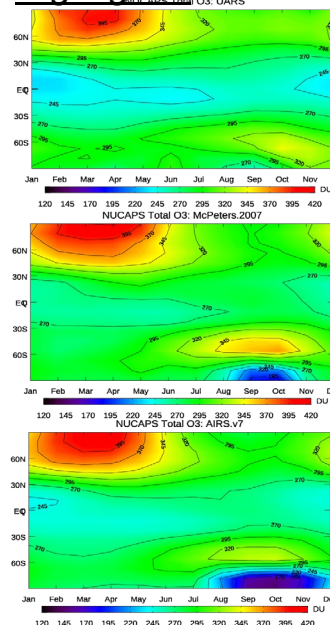
Figure 1. Depiction of three *a prioris* to improve NUCAPS Ozone retrievals (left column figures). Moving from UARS 1997 to McPeters2007 *a priori* has improved NUCAPS ozone retrieval over the south pole ozone hole depiction, both in terms of total ozone as well as the shape. Figures on the right show NUCAPS retrieval (**blue**) and the O3SND (**green**) with these two *a priori*. We are currently experimenting with the Labow2017 a-priori.

MiRS Products

Accomplishments / Events:

- Completed annual algorithms/products performance report (separate slide package to be sent). No significant changes in performance noted. Meets milestone below.
- Completed ATMS recalibrated data assessment and initial JPSS mission data reprocessing verification (separate slide package to be sent). Meets milestone below.
- Preliminary MiRS JPSS reprocessing has begun on the flood2 ESSIC cluster. Three months have been processed, 2 months of SNPP data and 1 month of N20 data. Results show normal stable behavior (see highlights).

Overall Status:

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

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

Issues/Risks:

None

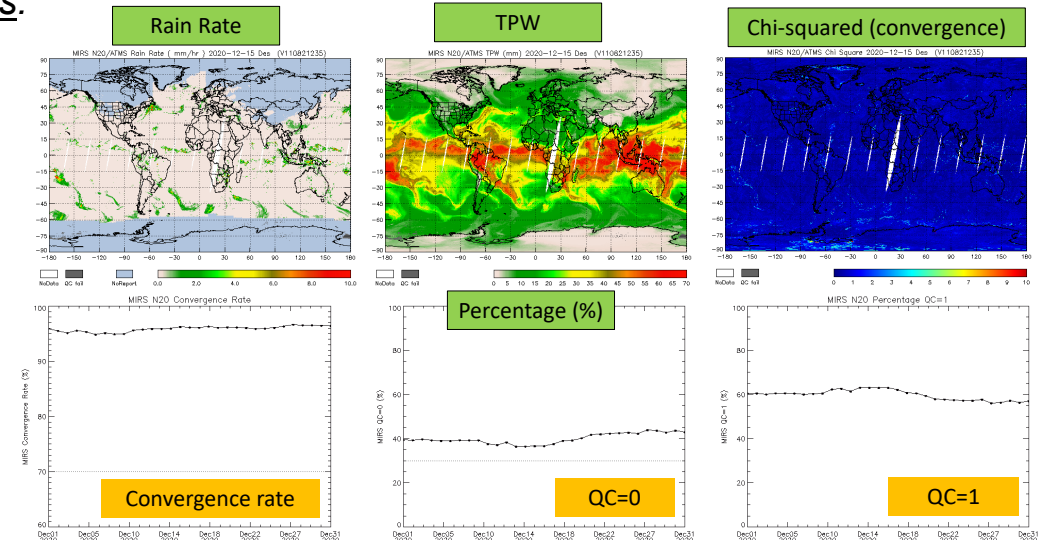| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Updated Cal/Val plan (address DPMS review comments)			04/21/21	
MiRS v11.7 to ASSISTT			12/21/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Mar-21	May-21	05/18/21	documentation update
Initial J2 ready DAP to CSPP			06/11/21	
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21	7/30/21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Jan-22		
Integrate SFR updates	Jun-21	Jul-21	Jul-21	Received SFR code package
AI based radiometric bias correction	Aug-21	Aug-21	Aug-21	
Explore AI application for improved first guess for all weather temperature and water vapor retrievals in particular the enhancement under hurricane conditions	Sep-21	Sep-21	Sep-21	
ATMS SDR reprocessing data verification	Sep-21	Sep-21	Sep-21	
Algorithm maintenance and monitoring	Sep-21	Sep-21	Sep-21	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	

Highlights:

Example of MIRS v11.8 NOAA-20 ATMS reprocessing on flood2. Top row: rain rate, TPW, and chi-square (convergence) metric on 2020-12-15. Bottom row: quality control time series for processing of 1-31 December 2020 data showing convergence, QC=0, and QC=1 percentages. Time series show stable behavior with high convergence levels. QC=0 and 1 indicate good retrievals and combine to nearly 100% of all retrievals.

Snowfall Rate

Accomplishments / Events:

- A new machine learning (ML) technique, eXtreme Gradient Boosting (XGB), has been used to develop snowfall detection (SD) algorithm. Algorithms trained with XGB are more accurate than neural network (NN) models and much easier to implement in processing system than random forest (RF) models. The initial XGB SD algorithms for ATMS and MHS (6 satellites) have been developed and are currently being refined. See the September 24 weekly report for the S-NPP SD results.
- Conducted NOAA-20 and S-NPP intercomparison following the latest algorithm update (plots in the Highlights Section). The one-year mean of the two products agree well with each other. Their difference is generally below 0.1 mm/hr except in relatively warm region, e.g., between 20° - 40° latitude over CONUS where the mean SFR is heavily influenced by small differences from infrequent snowfall.

Overall Status:

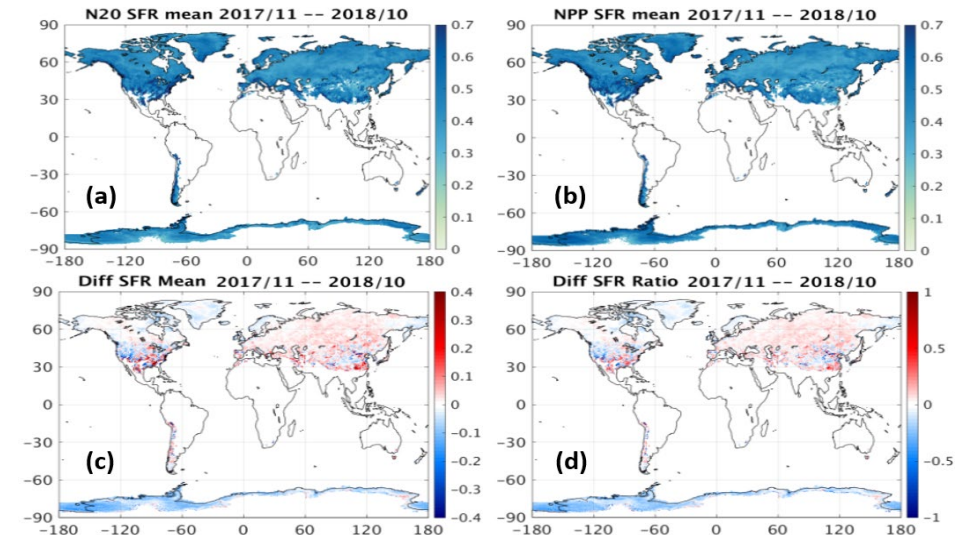|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

None

Milestones Table

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	
Updated Cal/Val plan (address DPMS review comments)			04/22/21	
MiRS v11.7 to ASSISTT			12/21/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Mar-21	May-21	05/18/21	ASSISTT delivery
Initial J2 ready DAP to CSPP			06/11/21	
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21	07/30/21	MiRS delivery
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Jan-22		ASSISTT delivery
Updated SFR algorithms for JPSS-2	Jun-21	Jun-21	Jun-21	
Deliver updated SFR package (for JPSS-2, NOAA-20, and S-NPP) to MiRS team for integration	Jun-21	Jun-21	06/21/21	11/20/20 SFR package to MiRS
Explore AI-based snowfall detection	Sep-21	Sep-21	Sep-21	
NOAA-20 and S-NPP cross-calibration/comparison	Sep-21	Sep-21	Sep-21	
Algorithm maintenance and monitoring	Sep-21	Sep-21	Sep-21	
Annual algorithms/products performance report	Sep-21	Oct-21	End of year team presentation	

Highlights: NOAA-20 and S-NPP SFR Intercomparison

Comparison of mean SFR from NOAA-20 (a) and S-NPP (b) from Nov 2017 to Oct 2018 with their difference (c) and relative ratio (d)

Accomplishments / Events:

•For the V2Limb, we are investigating a limited number of failures per day on NDE operations. Some have been traced to incomplete or repaired granules. We have reproduced the NDE cloud height fill error in our STAR processing and are working to transition new climatologies from NASA to STAR.

Overall Status:

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

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Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	05/21/20	
J2 Cal/Val Plan – V2.0 delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/23/21	
Initial J2 ready DAP to ASSISTT	Jul-20	Jul-20	v4r0: 07/07/20	V8Pro
Initial J2 ready DAP to ASSISTT	Nov-20	Nov-20	v4r2: 11/25/20	V8TOz
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Dec-20	Dec-20	12/31/20 04/15/21 patch 08/04/21 Patch	V8Pro
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Apr-21	May-21	05/27/21	V8TOz: v4r2 V8TOS: v5r0
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21		V8Pro
Final J2 ready DAP to ASSISTT	Jun-21	Jun-21	Jun-21	V8TOz
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Dec-21		V8Pro
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		V8TOz
Algorithm Updates Review	Sep-20	Sep-20	08/18/20	
Algorithm Updates/Cal-Val Activities				
Details in next slides				

Highlights: South Atlantic Anomaly (SAA) seen in composite N20/SNPP product

Layer 15 (1.6 to 1.0 hPa) STAR N20 & NPP Ozone Profile Composite
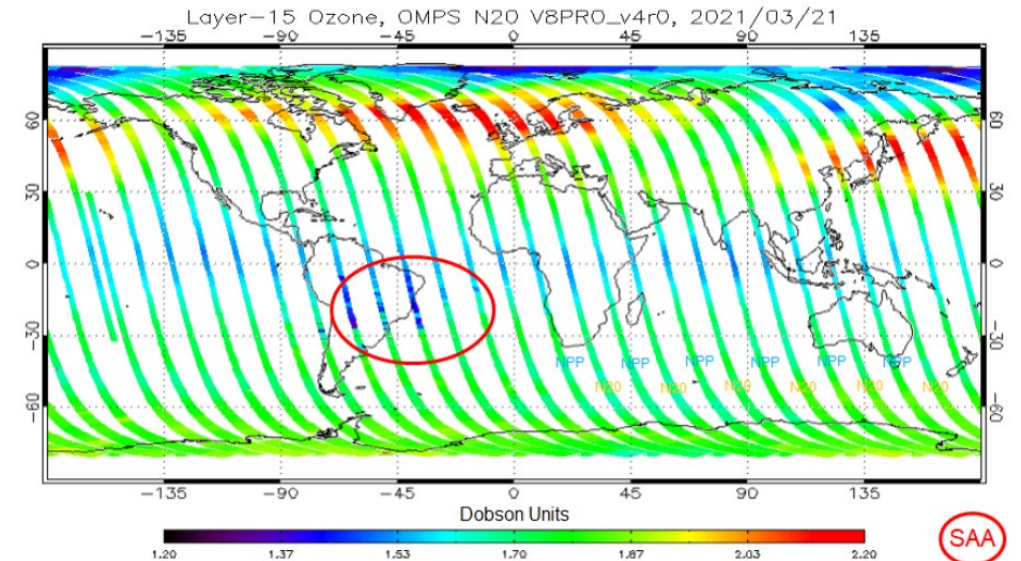
Milestones	Scheduled Date	Actual Completion Date
Provide V8TOz and V8TOS DAP to ASSISTT with new code and tables for broad bandpasses, and updated capability to handle 30x241 FOVs SDR Granules in preparation for J02.	Nov-20	11/25/20 v4r2 V8TOz
Provide One-Line V8Pro Code fix and New NOAA-20 Adjustment Table as a Patch Delivery to NDE with CC to ASSISTT to progress to validated maturity.	Jan-21 Apr-21	04/15/21
Complete work with NDE to resolve two OMPS V2Lmb issues -- Latency / TIme Out and Ancillary File errors.	Feb-21	Patch DAP to NDE 2/11/21 V2Limb.
Demonstrate V8TOz and V8Pro processing of J02 test data as provided by the OMPS SDR team.	Sep-21	SDR Data sets will not be available until at least December
Complete evaluation of NDE resource needs for three-slit processing of the S-NPP OMPS Limb with V2Limb and make a decision on whether to switch from 1 slit to 3 slits.	Jul-21	Testing complete at STAR. Waiting for NDE implementation of previous improvements.
Complete rehosting of CloudRR algorithm at STAR	Aug-21	Work was suspended as personnel dealt with Mx4 and other issues.
V8TOZ Patch DAP to work with SDRs and Geolocation files generated by ADL Block 2.3 MX4		08/19/21
V8PRO Patch DAP to work with SDRs and Geolocation files generated by ADL Block 2.3 MX4		08/25/21

Accomplishments / Events:

- A manuscript titled "A Blended Sea Ice Concentration Product from AMSR2 and VIIRS" has been published in the journal *Remote Sensing* (https://doi.org/10.3390/rs13152982). See figure.
- Continued drafting of AMSR3 cal/val plan.
- Continued product O&M, keeping abreast of GOSAT-2 AMSR3 activities so plans can be developed for use at STAR.
- Participated in the 22nd Meeting of the International Ice Charting Working Group (IICWG), 20-24 September 2021, promoting AMSR2 and VIIRS sea ice products.
- Participated, and led a session in the NOAA three-day, cross-line office (LO) virtual workshop focused on sea ice, 30 August - 1 September 2021.

Overall Status:

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

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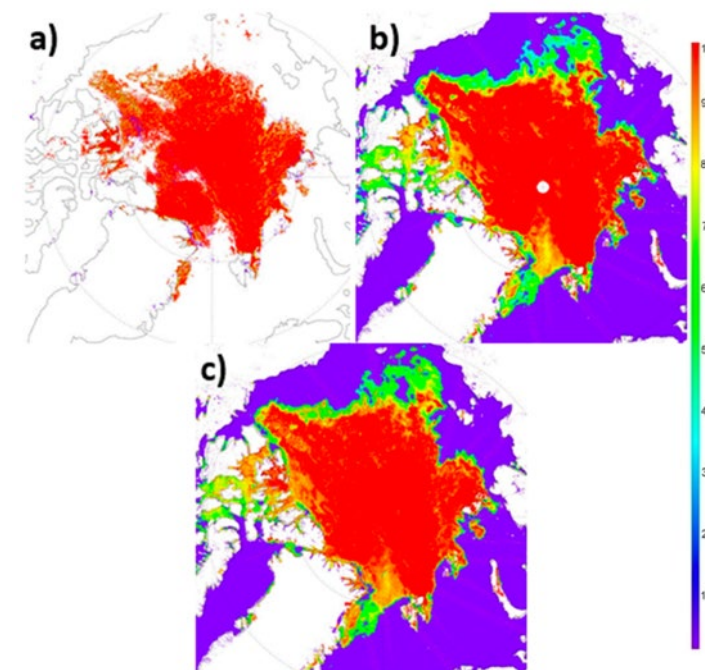
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
AMSR-3 Schedule (launch: Apr-2023)				
AMSR-3 Cal/Val Plan - draft delivery	Sep-21	Oct-21		CAC card renewal issues
AMSR-3 Cal/Val Plan - final delivery	Mar-22	Mar-22		
Initial AMSR-3 ready DAP to ASSISTT	FY22	FY22		
Initial AMSR-3 ready DAP to NDE (include AMSR-2 updates)	FY22	FY22		
Final AMSR-3 ready DAP to ASSISTT	FY22	FY22		
Final AMSR-3 ready DAP to NDE (include AMSR-2 updates)	FY22	FY22		
Algorithm Updates Review	FY22	FY22		
Algorithm Updates/Cal-Val Activities				
GAASP patch DAP to NDE			01/07/21	
GAASP patch DAP to CSPP			01/19/21	
Improved SSW and RR algorithms	Mar-21	May-21	May-21	
Transition algorithm updates to operations	Aug-21	Oct-21		Additional update to SSW algorithm
Reprocess mission data set	Sep-21	Nov-21		Product updates
Technical Information Meeting between NOAA and JAXA	Sep-21	Nov-21		Finalize draft cal.val plan
Annual report on AMSR2 algorithms and data product performance	Sep-21	Oct-21	End of year team presentation	

Highlights:

Figure: Sea ice concentration over the Arctic for 29 July 2019 from (a) S-NPP VIIRS; (b) AMSR2; (c) blended AMSR2/VIIRS.

Accomplishments / Events:

- The NPROVS team is troubleshooting the "Test" system received from the Algorithm Scientific Software Integration and System Transition (ASSIST) using the STAR Algorithm Processing Framework (SPAF) near-real-time (nrt) processing system. The NPROVS Test system provides feedback to the NUCAPS Team on the performance of pending RTO candidates and is a critical component of NPROVS assessment protocol. At this time the Test system is configured to be identical to the operational NUCAPS v3 being run by OSPO. However, on June 15, the NPROVS Test system (running v3.0) began being degraded. (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			

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Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
LTM				
Maintain / expand existing EDR LTM web pages and mappers	Aug-21	Aug-21	Aug 21	
NPROVS				
Support NUCAPS / MiRS EDR soundings for NPP, NOAA-20 and MetOp-C; COSMIC-2, ...	Aug-21	June-21	June-21	
Manage JPSS dedicated radiosonde program (ARM, AEROSE, ...); expand to store SDR (GSICS)	Aug-21	Aug-21	Aug 21	
Support AWIPS- NUCAPS initiatives and case studied demonstrating NUCAPS value to users	Aug-21	Aug-21	Aug 21	

Highlights: NPROVS Test system troubleshooting
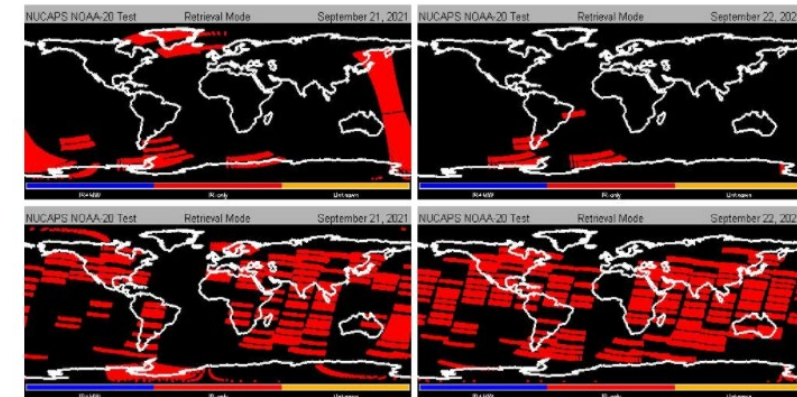
Examples of the frequency of IR-only NUCAPS (v3) soundings (red) being observed in NPROVS Test systems received from ASSIST / SPAF and used to support the NUCAPS Algorithm Team is shown in the 4-panels. The top panels show locations of NUCAPS IR-only soundings on consecutive days of ascending node and the bottom panels the IR-only locations for (the same) consecutive days of ascending node NUCAPS observed for the Test system