NOAA JPSS Monthly Program Office

AMP/STAR FY21 TTA

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May 28, 2021

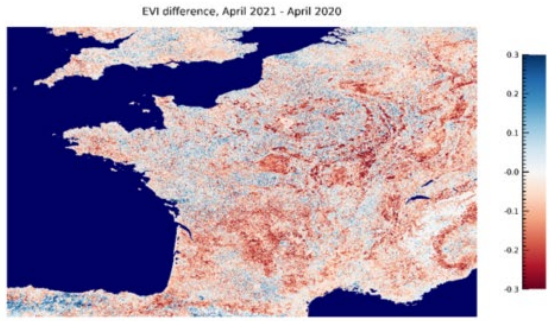
Highlights from the Science Teams (Apr- mid May)

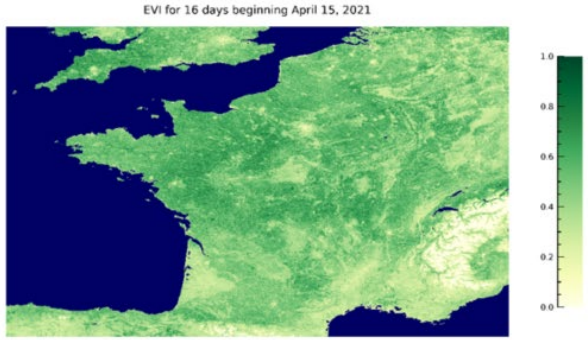
April Frost and Its Damage to Vineyards in France

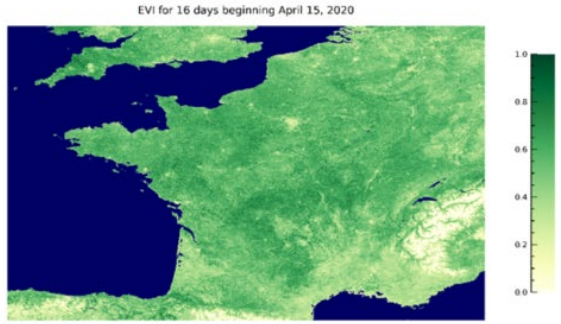
Cold event's impact on EVI

The Enhance Vegetation Index (EVI) over France for the 16 day periods beginning April 15, 2021 (bottom-left) and April 15, 2020 (bottom-right), and 2021 minus 2020 differences (right)

Lower EVI is also likely a response to the unusually cold temperatures earlier in April.2021



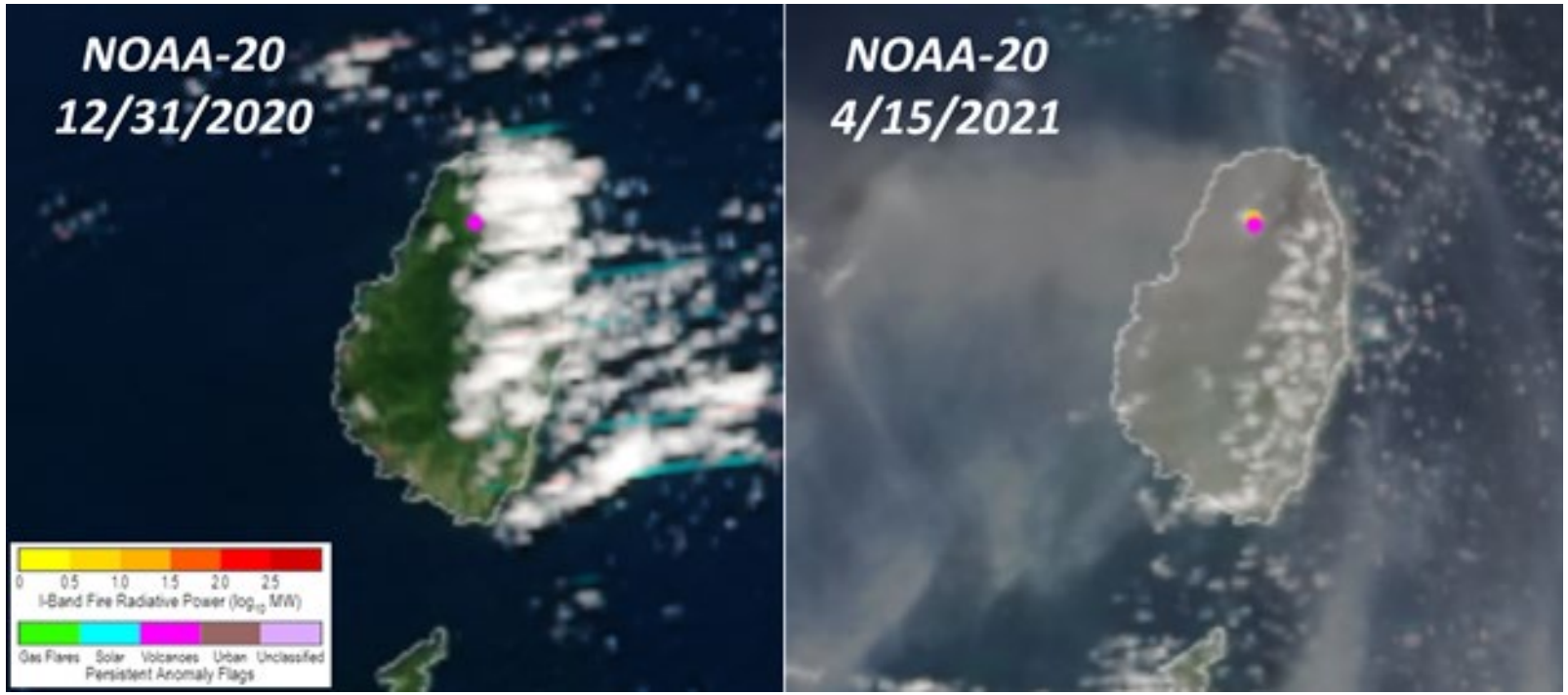




The Land Product Development (LPD) team has received a request from the JPSS program office for possible illustration of the frost damage of the Vineyards in France in April. We therefore have processed some of the LST and Vegetation Index data for the period in April 2021 and 2020. The quick response to JPSS program office was appreciated and acknowledged.

Highlights from the Science Teams (Apr-mid May)

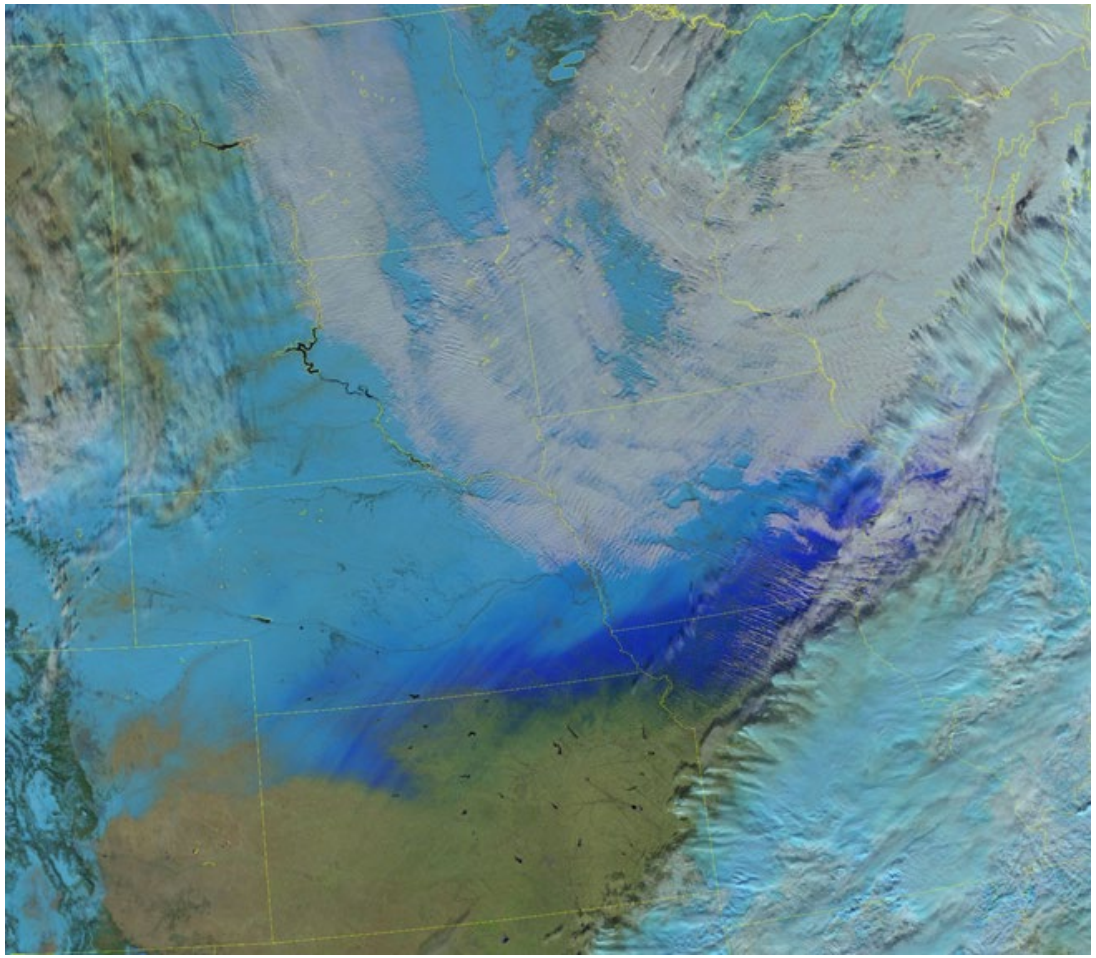
VIIRS I-band Active Fire Product detected Thermal Signature



The thermal signature from the ongoing eruption of the volcano La Soufrière on the island of St. Vincent has been detected by the operational NDE VIIRS I-band active fire product during relatively clear observing conditions. The heat signal during the effusive eruption, probably also including signal from vegetation fires in the surrounding areas, was first detected in December 2020. Observations continued during the explosive eruption that started on April 9, 2021. The VIIRS Active Fire product includes a persistent anomaly test, which flags possible sources of heat (or reflective) signal from non-fire sources, including volcanoes.

Highlights from the Science Teams (Apr- mid May)

Northeast River Forecast Center Success Story



The Northeast River Forecast Center is now ingesting the VIIRS Snowmelt RGB tiles provided by CIRA. In this RGB, fresh/fine/powdery snow appears cyan, while old/wet/slushy snow appears blue. Sleet and accumulated freezing rain appear dark blue. This RGB has utility for detecting melting snow, areas of mixed-precipitation, and fresh snow on top of old snow, and may have utility for identifying snow that is susceptible to being lofted in ground blizzards. Melting snow may be a precursor to river flooding, making this product attractive to the River Forecast Centers. An example is included in the figure below. NWS Alaska Region offices have been receiving the Snowmelt RGB since 2019 thanks to the efforts of UAF/GINA. CIRA began offering the Snowmelt RGB to CONUS NWS offices in late-March 2021, and the Northeast RFC is the first success story of this effort.

Accomplishments

- **Delivery Algorithm Packages (DAPs) - Mission Unique Products:**
  - OMPS SDR DAP (ADR9361/CCR5473, Errors in OMPS Nadir Mapper off-nadir geolocation, Out of Cycle FAM LUT updates for S-NPP and N20) delivery:
    - 4/16/2021: OMPS SDR team delivered DAP package to ASSISTT team
    - 4/30/2021: STAR delivered DAP package to DPMS AIT
  - VIIRS Imagery DAP (ADR9466/CCR5415 VIIRS NCC Banding Anomaly) delivery:
    - 5/12/2021: STAR delivered DAP package to Cloud S3 bucket for DPMS functional test
    - 5/19/2021: STAR delivered DAP package to Cloud S3 bucket for DPMS regression test

- **IDPS Builds Checkouts:**
  - 4/11/2021: JSTAR submitted data required for Block 2.3 Mx 2 I&T review/checkout to DPMS
  - 5/05/2021: JSTAR submitted Data Request for Block 2.3 Mx 3 SOL Deploy Regression Review/Checkout to DPMS
  - 5/20/2021: JSTAR submitted summary report for Block 2.3 Mx 2 I&T Deploy Regression Review/Checkout to DPMS/RTN/OSPO

- **DAPs – Enterprise Products:**
  - 4/01/2021: STAR delivered JRR Super DAP v3r0 (J01/NPP Maintenance DAP and Initial J2 DAP, for Clouds/Aerosol/VolcanicAsh/Cryosphere/LST/LSA/VPW products) to NDE; **5/26/2021**: delivered the DAP to CSPP
  - 4/13/2021: STAR delivered HEAP CrIS J01/J02/NPP Patch DAP (v3r1) to NDE; **4/27/2021**: delivered DAP to CSPP
  - 4/19/2021: STAR delivered surface reflectance DAP v1r2 to NDE; **4/22/2021**: delivered the DAP to CSPP; (J2 Initial DAP, SNPP/N20 maintenance DAP)
  - 4/15/2021: OMPS Ozone team delivered v4r0 V8PRO patch DAP to NDE/OSPO/ASSISTT
  - 4/19/2021: STAR delivered NVPS DAP v2r1 to NDE (J2 Initial DAP and SNPP/N20 maintenance for GVF and VI)
  - 5/18/2021: STAR delivered MiRS v11.6 DAP to NDE (for satellites: S-NPP, NOAA-20, and JPSS-2 (NOAA-21))
  - 5/27/2021: STAR delivered OMPS Ozone EDRs V8TOZ v4r2 and V8TOS v5r0 DAPs to NDE (J01/NPP Maintenance and Preliminary J02 DAP)
  - 5/27/2021: STAR delivered VIIRS Offline LSA and Gridded LSA ancillary data DAP to NDE (two ancillary data updates for NDE integration for VIIRS Offline LSA and Gridded LSA)

Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	04/06/21, 04/13/21, 04/20/21, 04/27/21, 05/04/21, 05/11/21, 05/18/21, 05/25/21
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	04/06/21, 04/13/21, 04/20/21, 04/27/21, 05/04/21, 05/11/21, 05/18/21, 05/25/21
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	04/13/21, 04/27/21, 05/12/21, 05/25/21
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	04/06/21, 04/20/21, 05/04/21, 05/18/21
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	04/20/21, 05/18/21
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	04/20/21, 05/18/21

- 5/27/2021: NOAA-20 OMPS V8Pro Validated Maturity Review - Completes NOAA-20 Product Maturity Reviews. All products have achieved validated status.
  - Full Validated Maturity: NOAA-20 OMPS NP Ozone EDR (V8Pro)
  - Dry Run: 5/12/2021

- 4/30/2021: STAR delivered updated Cal/Val plans (addressing the DPMS review comments) to DPMS

Upcoming Milestones/Deliveries

- JSTAR Code/LUT/Product Deliveries:

  DAP to DPMS:

  NOAA-20 Algorithm DAP to NDE/CoastWatch:
  - Jun-21: Vegetation Health – Final N20 / initial J2 DAP
  - Jun-21: Initial J2 DAP (SST, include NPP/N20 updates)

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	
ATMS: Final J2 PCT/MM-coef DAP	Sep-21	FY22	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	FY22		
VIIRS: Final J2 Launch-ready LUTs/MM-coef DAP	Sep-21	FY22		
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	FY22	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 ~~Enterprise~~ Fires DAP (NPP/N20/J2, I/~~M~~-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	Jun-21		Cloud deliveries
SST: Initial J2 ready DAP (ACSPO 2.80)	Apr-21	Jun-21		Cloud deliveries
NUCAPS: Initial J2 ready DAP	Apr-21	Apr-21	02/26/21 04/13/21 Patch 04/27/21 (to CSPP)	
MiRS & SFR: Initial J2 ready DAP	Mar-21	May-21	05/18/21 (v11.6)	documentation update
OMPS Ozone V8Pro: Initial J2 ready DAP	Dec-20	Dec-20	12/31/20 04/15/21 Patch	
OMPS Ozone V8TOz: Initial J2 ready DAP	Mar-21	May-21	05/27/21	11/25/20 DAP to ASSISTT

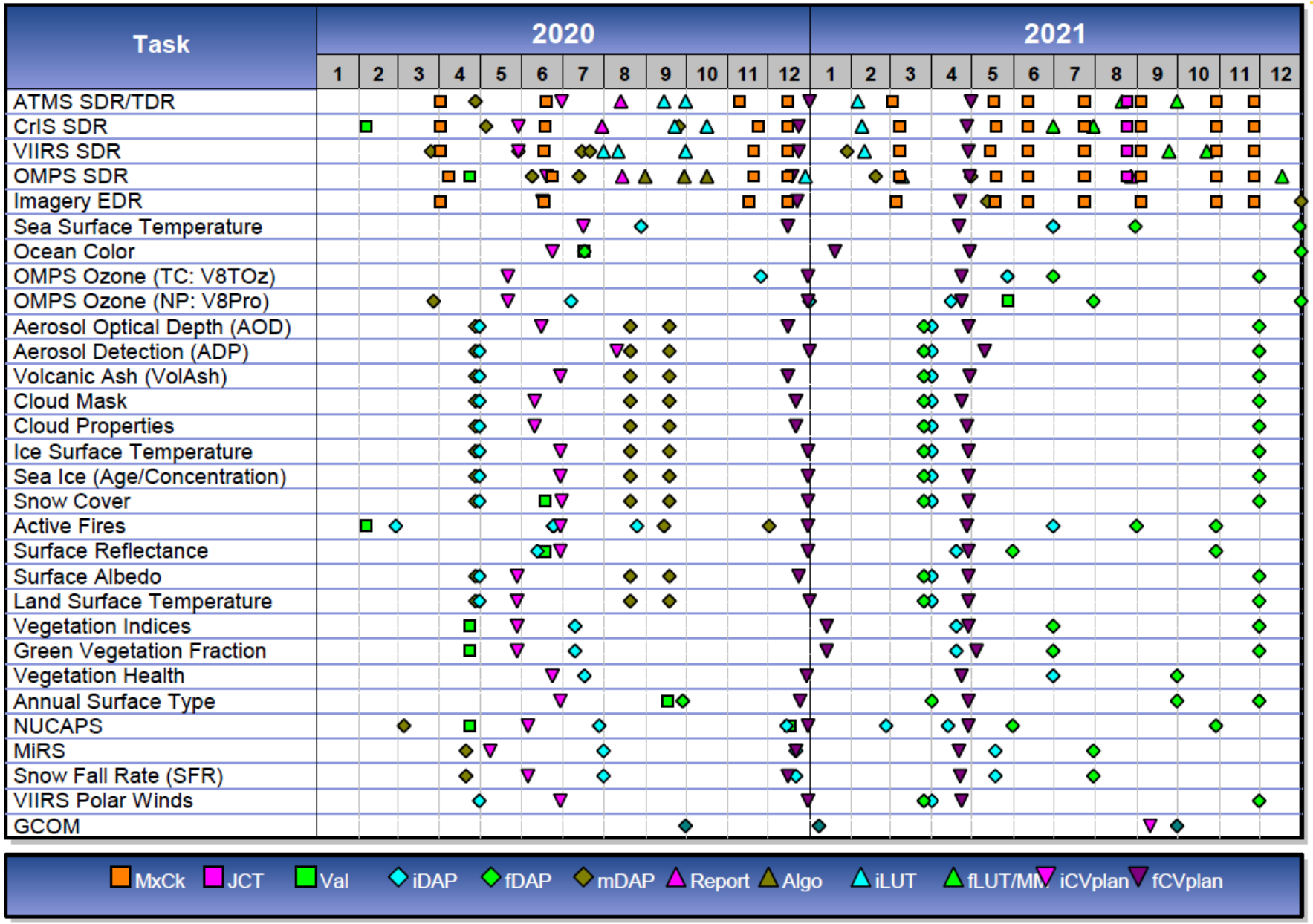
FY21 STAR JPSS Milestones

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	Sep-21		
Updated JPSS-2 OMPS SDRs Pre-launch Characterization Report	May-21	Aug-21		
JCT2 - Data System Event (SDR teams, test/run through RDRs from JCT2-DSE, generate J2 SDRs)	Aug-21	Aug-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-21		
JPSS-2 ICVS-LTM Test Readiness Review	Sep-21	Sep-21		
ICVS-J2 prototype Website (ready for JCT-3 test run)	Sep-21	Sep-21		
Maintain / expand existing EDR LTM web pages and mappers	Sep-21	Sep-21		
Delivery of JPSS Product Monitoring Phase 9 DAP to OSPO	Sep-21	Sep-21		
AST-2020 (VIIRS Annual Surface Type)	Sep-21	Sep-21		

FY21 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date
Operational/Program Support			
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/06/20, 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**
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**
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**
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**
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**
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**
Block 2.3 Mx builds I&T deploy regression data review/checkout (**Nov-20 Mx0**; **Mar-21 Mx1**; **May-21 Mx2**; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	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**
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

STAR JPSS Schedule: TTA Milestones



DPMS/STAR FY21

Lihang Zhou, DPMS Deputy
Bonnie Reed, DPMS Algorithm Sustainment

May 2021

Accomplishments - Transition to Operations and Algorithms

- SNPP/N20
  - Executing ESPDS Release 3.8 (NDE & PDA systems)
  - OMPS Limb Profiler Latency issue was fixed and promoted to OPS 4/28
  - Blended Hydro ORR scheduled for May 2021
  - HEAP Updates have been delivered and promoted to NDE I&T for checkout by PAL
- DPMS Cloud ADA
  - STAR delivered all initial J2 table updates to DPMS AIT; AIT checked out deliveries and provided to Raytheon - all will be integrated before the JCT2-Data System Event (Mid Aug)
  - AIT Team participated in an AWS bucket retention policy meeting April 22@11:30. All previously agreed to retention times were lowered. ACP bucket to 10 days, tesinput bucket remained 5 days and all other buckets lowered to 8 days retention.
  - Alg Sustainment Lead worked with GP SEIT (Bolden) to identify I&T String Test Data needs from Cloud for NDE
- ADL and CommonCM Migration
  - Started to utilize DOC Kiteworks as a highly efficient in practice for delivering the Block 2.3 Mx 2 ADL pre-release distribution, as a replacement for Common CM.
  - Completed pre-release checkout of ADL5.3_I2.3.02.00 (Block 2.3 Mx2 ADL)
  - New ADR system (JIRA) is up and running successfully and DPMS is initiating twice-weekly JPSS Jira ADR Project exports for Raytheon SCM integration into Raytheon Jira
- EPS-SG project support
  - Participated in MetOp-SG Level 1 Requirements Document walkthrough (4/29)
- J2 and Beyond
  - JPSS Algorithm Managers provided updates to the Delegated Authority List document for J2 Fast Track Table Updates for VIIRS and OMPS
  - Working with Ground SEIT to update requirements documents for GOSAT AMSR-3
- Satellite Product Management (Legacy Migration, non-NOAA, MetOp-C) DACS PPM
  - Reviewed and provided comments on Jim McNitt's Lifecycle presentation
  - Lihang briefed OPPA on the PPM status and processes

JPSS Project Milestones

Product Name	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Product Monitoring Phase V				
-- CDR	Dec-16	May-17	May 2017	Completed
-- SRR	Jun-19	Jul-21		
-- ORR	Aug-19	Jul-21		
-- Operations	Sep-21	Sep-21		
NOAA-20: Microwave Tropical Cyclone Products				
-- CDR	Oct-16	-	10/27/2016	Completed
-- SCR	Apr-19	--	4/2/19	Completed
-- ARR	Oct-19	Jul-21		
-- ORR	Dec-19	Oct-21		
-- Operations	Feb-20	Nov-21		
Enhanced TOAST with S-NPP OMPS Limb Profiles				
-- CDR	Jan-17	NA		No longer required
-- SCR	Apr-17	NA		No longer required
-- ORR	NA	NA		
-- Operations	Jun-17		2/2021	Completed
S-NPP and N-20 Flood Mapping Product				
-- CDR	Dec-19	Dec-19	Dec 2019	Completed
-- ARR	Mar-21	Feb-21	2/26/2021	Completed
-- ORR	May-21	Jun-21		Additional metadata and product file content updates being added
-- Operations	Jun-21	Jul-21		

JPSS Project Milestones

Product Name	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
S-NPP/N20 SST - ACSPO L3SST				
-- CDR	Dec-21	Dec-21		
-- ARR	Dec-22	Dec-22		
-- ORR	Jun-23	Jun-23		
-- Operations	Aug-23	Aug-23		
Advected Layer Precipitable Water (Blended TPW)				
-- CDR	Dec-21	Oct-21		
-- ARR	Oct-22	Oct-22		
-- ORR	Feb-23	Feb-23		
-- Operations	May-23	May-23		
Global Biomass Burning Emissions with VIIRS I-Band Fire (GBBEPx V5)				
-- CDR	Jan-21	-	1/27/21	Completed
-- ARR	Dec-22	Dec-22		
-- ORR	Apr-23	Apr-23		
-- Operations	Oct-22	May-23		
Ocean Color - OKEANOS SNPP and N-20 Legacy Migration				
-- CDR	Oct-20	-	1/27/21	Completed
-- ARR	Dec-21	Mar-22		
-- ORR	Mar-22	Mar-22		
-- Operations	Apr-22	Apr-22		
J2 Algorithm Updates Completed				
Delivered to IDPS and NDE	Nov-21	Nov-21		

JPSS Risk Summary
Top Risks

Status as of: 05/06/2021

Rank Risk ID	Summary	LxC Trend	Aprch	Status
1 AMP-19-003	Some IDPS and STAR algorithms cannot use APIDs with 10Hz sample freq	3x2 ⇔	M	05/05/2021: Actual JPSS-2 S/C RDRs will be available during JCT-2 A test event and it will be provided to J-STAR manually. After the data is provided to J-STAR they will have 1 month to perform analysis on the data and provide their findings.

LIKELIHOOD	1	2	3	4	5
5					
4					
3		1			
2					
1					
	CONSEQUENCES				

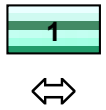
⇩

Criticality
HIGH
MED
LOW

Approach
A – Accept
M – Mitigate
W – Watch
R – Research

LxC Trend
⇩ – Decreasing (Improving)
⇧ – Increasing (Worsening)
⇔ – Unchanged
NEW – Added this month

JPSS Top Risks

Rank	Risk ID	Risk Statement	Approach	Status
 Some IDPS and STAR algorithms cannot use APIDs with 10Hz sample freq	AMP-19-003	**Given that:** APID 11 (S/C Attitude and Ephemeris) and 30 (S/C Telemetry) sampling frequencies are at 10Hz on JPSS-2 **There is a possibility that:** Some IDPS and STAR algorithms will not be able to use any science products that has APID 11 and 30 or any APIDs with a sampling frequency of 10Hz **Resulting in:** Delays since IDPS geolocation algorithms cannot use 10Hz APIDs. During JCT3 IDPS has to geolocate J2 RDRs with J2 S/C Diary and if the geolocation algorithm is not compatible with the 10hz freq, it will affect IDPS's ability to geolocate J2 RDRs. STAR needs to consider the effect 10Hz APIDs will have on their GEO and sensor product algorithms.	**Mitigate**	05/05/2021: Actual JPSS-2 S/C RDRs will be available during JCT-2 A test event and it will be provided to J-STAR manually. After the data is provided to J-STAR they will have 1 month to perform analysis on the data and provide their findings. 04/2/2021: Actual JPSS-2 S/C RDRs will be available during JCT-2 A test event and it will be provided to J-STAR manually. After the data is provided to J-STAR they will have 1 month to perform analysis on the data and provide their findings. To ensure the items identified in the "Resulting in" statement does not occur, IDPS and J-STAR must take necessary mitigation actions. Some things to consider/mitigations points: 1. IDPS will utilize JPSS-2 simulated data to test and confirm that RDRs are correctly geolocated. 2. IDPS will provide updates to JSTAR and DPMS on the geolocation of JPSS-2 RDRs. This action will continue until IDPS completes and present a report of JPSS-2 RDR geolocation confirmation. ADR 9017 (Adapt IDPS code to changes in J2 spacecraft diary data) was written in 2019 to update IDPS Geo code for J2 S/C diary. This update should make point 1 much easier to confirm. 3. J-STAR will utilize JPSS-2 data (from S/C Bus) to test and confirm that RDRs are correctly geolocated. 4. J-STAR will provide updates to DPMS and IDPS on the status of their analysis. This action will continue until J-STAR completes and present a report of JPSS-2 RDR geolocation confirmation. 03/05/2021: Waiting on the release of JPSS-2 S/C RDRs during JCT-2 to perform additional Analysis on the data. JCT-2 GSE event Aug 19th 2021 (which can be considered the Trigger date). STAR will need to provide an answer on how long it would take to perform analysis of the data. 03/03/2021: Same update as AMP-19-003 are applicable to this Risk. Dated 03/03/2021. 02/05/2021: STAR reviewed JPSS-2 SIM data in January and the data has been analyzed. Some issues were identified with the data which STAR will present during when a TIM is scheduled with IDPS, Raytheon and relevant segments. 01/8/2021: TTO for block 2.3 will occur on January 21st 2021 and thereafter during the IDPS Block 2.3 Site Acceptance Test the JPSS-2 SIM data will be made available. 12/3/2020: JPSS-2 Test data will not be available until after block 2.3 TTO is completed. There?s no plan to flow JPSS-2 simulated data during the 30-day flow. 11/04/2020: Status unchanged. DPMS-AMP review board have identified this risk as a candidate for closure, final decision will be made in future board meeting.

Color code:

Green: **Completed Milestones**

Gray: **Non-FY21 Milestones**

ATMS SDR

April/May, 2021

Accomplishments / Events:

- Finished reprocessing lifetime NOAA-20 and S-NPP ATMS reprocessing science data O-B w.r.t. ECMWF forecast profiles daily global mean bias time series to demonstrate the improvements of ATMS reprocessing science data.
- Host a NOAA-EUMESAT ATMS reprocessing data working group meeting to promote the application of ATMS reprocessing science data for NWP reanalysis
- Analyzed JPSS-2 ATMS spectral response function (SRF) data and generated radiative transfer model coefficients to support JPSS-2 ATMS Cal/Val tasks
- Revisited JPSS-2 ATMS thermal vacuum test data and discussed the potential improvements of non-linearity coefficients by applying the corrected ICT conversion coefficients in TVAC calibration
- Analyzed NGSysTE TVAC test constant forward scanning mode data to propose the improvements in TVAC data analysis
- Kept developing ATMS SDR User's Guide document
- Discussed the ATMS science data quality journal article manuscript

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.*

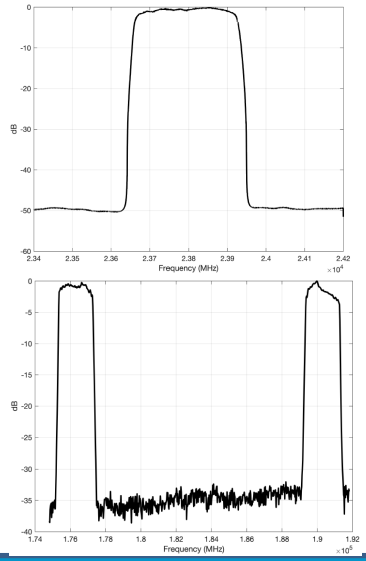
Issues/Risks:

None

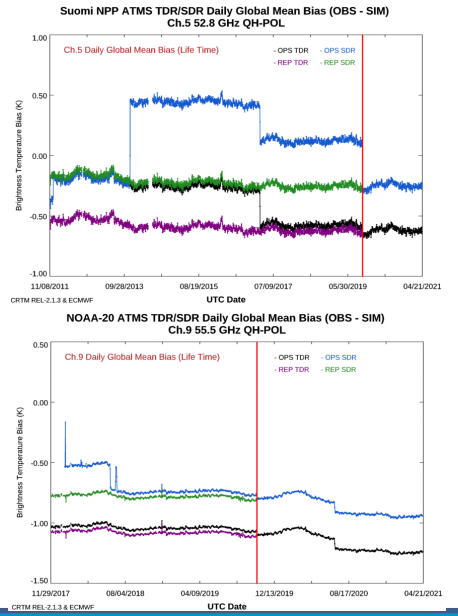
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/31/20	
Updated Cal/Val plan (DPMS comments)			04/30/21	
Initial J2 PCT update: re-delivery			02/05/21	
Final J2 PCT update, including Mounting Matrix Coefficients update based on the pre-launch mounting measurement report	Aug-21	Aug-21		SER + 6w (to ASSISTT)
Final J2 PCT/MM-coef delivery	Sep-21	Sep-21		To DPMS
JCT2 - Data System Event	Aug-21	Aug-21		
Update ATMS TDR antenna pattern correction coefficients to improve SDR data quality	Jun-21	Jun-21		
Evaluate JPSS-2 ATMS spacecraft pre-launch testing data	Sep-21	Sep-21		
Support NASA SNPP ATMS scan motor current anomaly analysis	May-21	May-21		
Reprocess NPP/NOAA-20 ATMS science data using latest calibration algorithm	Sep-21	Sep-21		
Annual ATMS TDR/SDR performance report	Sep-21	Sep-21		
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**; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	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**	Report

Highlights:

JPSS-2 ATMS SRF at channel 1 (upper) and channel 18 (lower)



ATMS reprocessing O-B w.r.t. ECMWF profile daily global mean time series at NPP channel 4 (upper) and N20 channel 9 (lower)



CrIS SDR

April, 2021

Accomplishments / Events:

- Between 12 - 22 April 2021, NOAA-20 CrIS experienced the eighth noise anomaly associated with the MW FOV5 detector following which the detector noise returned to nominal levels.
- Concluded the long-term investigation into the occurrence of false alarm flags in the proposed implementation of the spike correction algorithm. The false alarms in the mid-wave band can be eliminated by setting optimal escape parameters for the portion of the interferogram where the spike detection algorithm is not applied. (**Fig. 1**).
- Developed additional NEdN monitoring tools to track the change in responsivity of the CrIS instruments. By comparing the percent change in the noise at the present time to a fix day near the start of the mission, degradation in responsivity resulting in higher noise can be seen about the 1260 cm-1 and 1720 cm-1 frequencies (**Fig. 2**).
- Modified tools to read and monitor the contents of the housekeeping (HK) packets in diagnostic-mode RDR files. These tools will be used to assess the potential root causes of the intermittent noise anomalies observed on the NOAA-20 CrIS LW FOV2, MW FOV5, MW FOV9 and SW FOV2 detectors when the instrument is commanded to downlink diagnostic-mode data containing additional HK dwell channels.
- Manuscript "Radiometric noise assessment of the Cross-track Infrared Sounder on the NOAA-20 Satellite", Tremblay et al., was accepted for publication. A new result showing the PCA NEdN estimate using 6 scans compared to the nominal case of 30 scans was included (**Fig. 3**).
- Further refinements were made to the CrIS SDR Telemetry Toolbox enabling the display the ICT temperature (**Fig. 4**) and to other monitoring plots. These plots will be displayed and updated regularly on the upcoming CrIS Calibration and Validation website.

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			

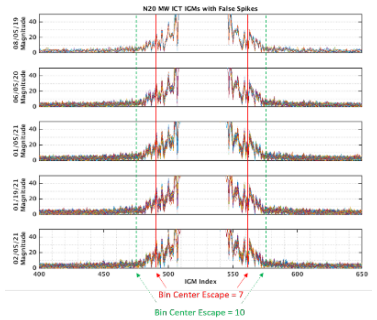
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

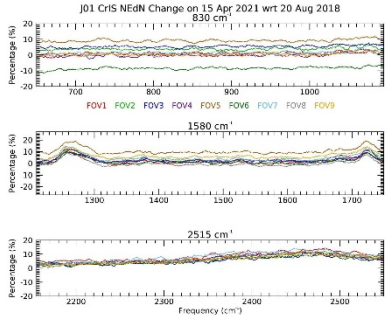
None

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 (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	
Final J2 PCT update, including Mounting Matrix Coefficients update based on the pre-launch mounting measurement report	Jun-21	Jun-21		SER + 6w (to ASSISTT)
Final J2 PCT/MM-coef delivery	Jul-21	Jul-21		To DPMS
JCT2 - Data System Event	Aug-21	Aug-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		Report
Annual CrIS SDR performance report	Sep-21	Sep-21		
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; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	Sep-21	Sep-21	11/23/20 Mx0 I&T 02/24/21 Mx1 SOL 03/08/21 Mx1 I&T	Report

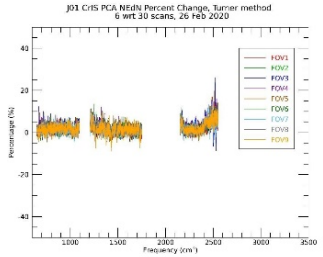
Highlights:



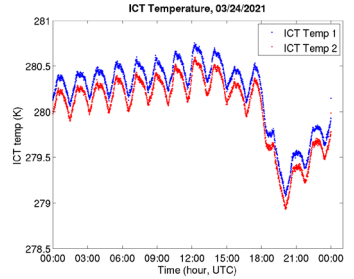
(1) MW ICT interferograms for 5 days. Optimal MW escape region shown in green.



(2) NOAA-20 PCA NEdN orbital average change on 4/15/2021 with respect to 8/20/2018.



(3) NOAA-20 PCA NEdN from a data set with 6 scans in the sliding window.



(4) ICT temperature trending as measured using the CrIS SDR Telemetry Toolbox.

CrIS SDR

May, 2021

Accomplishments / Events:

- On 21 May 2021 at approximately 11:20 EDT, the S-NPP CrIS Side-2 Longwave (LW) signal processor failed. Attempts to recover the LWIR band were unsuccessful. The performance of the mid-wave (MW) and shortwave (SW) bands remains nominal.
- Assessments of the S-NPP CrIS MW and SW data following the LW anomaly were made. The noise following the anomaly shows minimal impact (**Figure 1**).
- The CrIS geolocation accuracy assessment algorithm uses the agreement between collocated VIIRS I05 band pixels and CrIS LWIR band spectra convolved with the I05 SRF. Without the longwave band for S-NPP CrIS, the algorithm was updated to use the VIIRS M13 band and the CrIS SWIR band to demonstrate that the SNPP CrIS geolocation remains within specification following the anomaly (**Figure 2**).
- Support for the decision to reduce the primary RDR threshold from 97% to 60% in order to resume operational production of S-NPP CrIS SDR data was provided by assessing the I&T data. Comparisons to ADL processed data that had been previously validated against the MWIR and SWIR data prior to the anomaly showed minimal differences (**Figure 3**).
- NOAA-20 CrIS experienced the ninth instance of the MWIR FOV-5 noise increase from 30 April to 1 May 2021. Following the event the detector noise returned to nominal levels.
- Intercomparison between CrIS and the ABI sensors was extended to NOAA-20 CrIS. A report covering the methodology of the comparison was submitted. Outliers in the long-term time series of biases were traced to CrIS lunar intrusion events (**Figure 4**).

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			

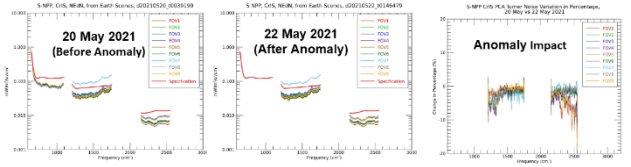
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

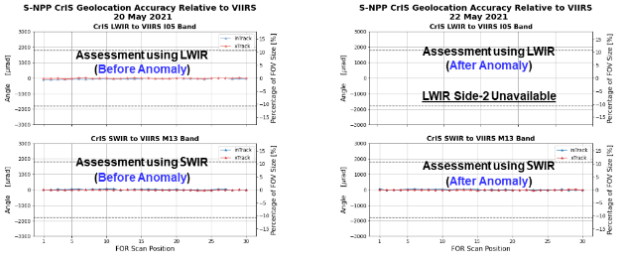
None

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 (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	
Final J2 PCT update, including Mounting Matrix Coefficients update based on the pre-launch mounting measurement report	Jun-21	Jun-21		SER + 6w (to ASSISTT)
Final J2 PCT/MM-coef delivery	Jul-21	Jul-21		To DPMS
JCT2 - Data System Event	Aug-21	Aug-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		Report
Annual CrIS SDR performance report	Sep-21	Sep-21		
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**; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	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**	Report

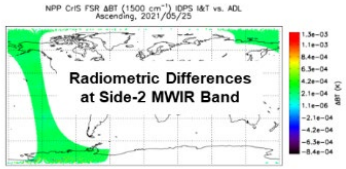
Highlights:

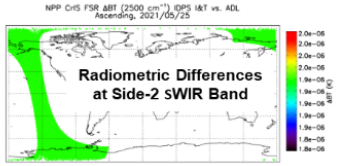


(1) The noise before and after the SNPP LWIR anomaly and the difference between the two.

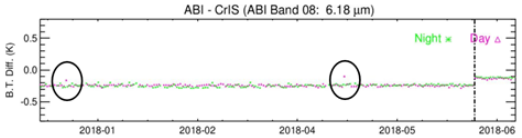


(2) The geolocation accuracy assessed before the SNPP LWIR anomaly assessed using the LW and SW, and following using only the SW..





(3) Differences between the IDPS I&T SNPP CrIS SDR and the ADL SDR following the LWIR anomaly.



(4) Biases between GOESABI bands 8-16 and SNPP CrIS for 200 days with two outliers circled.

VIIRS SDR

April/May, 2021

Accomplishments / Events:

- Created and delivered for deployment in the IDPS operations updated NOAA-20 and S-NPP DNB offset and gain ratios LUTs generated using new moon calibration data from April 12 and May 11, 2021
- Analyzed lunar calibration data from the NOAA-20 and S-NPP measurements on April 23 and May 22, 2021
- Created reports on VIIRS geolocation and TEB performance
- Compared S-NPP VIIRS SDR radiometric and geolocation products generated by IDPS B2.3 Mx2 on the I&T system (DP-TE) and by IDPS B2.3 Mx1 on the OPS system (DP-OE): prepared and submitted VIIRS SDR Cal/Val team's report from the checkout of IDPS Block 2.3 Release Mx2
- Calculated NOAA-20 VIIRS E_{sun} values using the TSIS-1 solar irradiance spectrum that is newly recommended by GSICS

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			

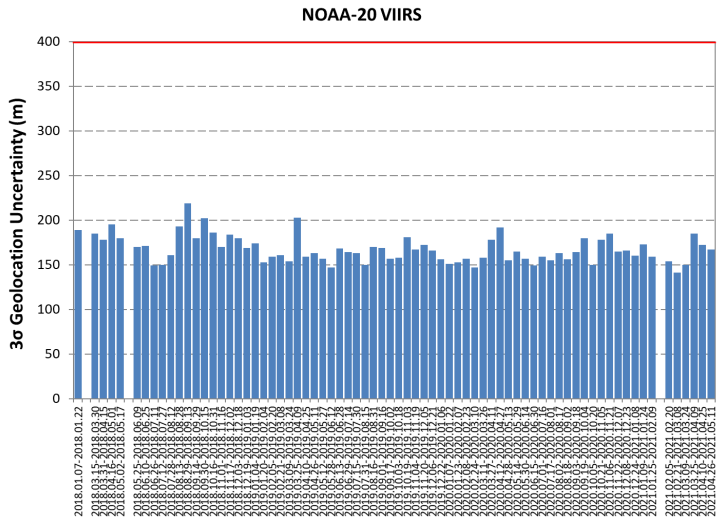
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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	
Launch-ready J2 LUTs (final delivery), including Mounting Matrix Coefficients update based on the pre-launch mounting measurement report	Sep-21	Sep-21		SER + 6w (to ASSISTT)
Launch-ready J2 LUTs (final delivery)/MM-coeff.	Oct-21	Oct-21		To DPMS
JCT2 - Data System Event	Aug-21	Aug-21		
Cal/Val tool testing/upgrade in the cloud computing environment	Sep-21	Sep-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		
Cross-calibration and monitoring between NOAA-20 and SNPP VIIRS	Sep-21	Sep-21		
Annual VIIRS SDR performance report	Sep-21	Sep-21		
N20 DNB LGS-GAINS LUT #6 update (ADR9526)			01/28/21	
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**; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	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**	Report

Highlights:



Uncertainty of the NOAA-20 VIIRS SDR geolocation products in comparison to the 400-m at-nadir requirement

OMPS SDR

April/May, 2021

Accomplishments / Events:

- Delivered OMPS weekly Dark tables and NP solar irradiance bi-weekly LUTs.
- Completed the analysis report to close the 3 SDR-actions (Fig. 1a is an example)
- Completed the OMPS SDR FY22-mid term review, with actions to be done.
- Completed the validation and delivery of the updated OMPS-TC FAM LUTs for both SNPP & NOAA-20 to make off-nadir geolocation error correction.
- Completed the new LUTs for SNPP NM/NP SDR reprocessing from January 2012 through March 2021 (Fig. 1b is an example for solar wavelength shift).
- Initialized the interface coding development for V-CRTM for global OMPS NM/NP simulations.
- Initialized transition of OMPS geolocation accuracy assessment software from Likun Wang to the OMPS SDR team (and also the ICVS team).
- Reprocessed SNPP NP SDR in March 2021 and NOAA-20 NP SDR in March 2020/2021 to support the EDR review, including deriving new LUTs.
- Examined comparisons between SNPP and NOAA-20 OMPS TC solar irradiance spectral values regarding the V-CRTM developer's request.
- Assessed the impact of different hyperspectral solar reference data sets on solar synthetic.

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		
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		
J2 NM backup spatial resolution code development	Sep-21	Sep-21		
JCT2 - Data System Event	Aug-21	Aug-21		
OMPS RDR to Level 1B processing code in preparation for J2	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	Sep-21		
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**; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	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**	Report

Highlights:

(a) TomRad-DD between SNPP and NOAA-20 NP SDR
(b) Time series of solar wavelength shift (prediction and measurements)

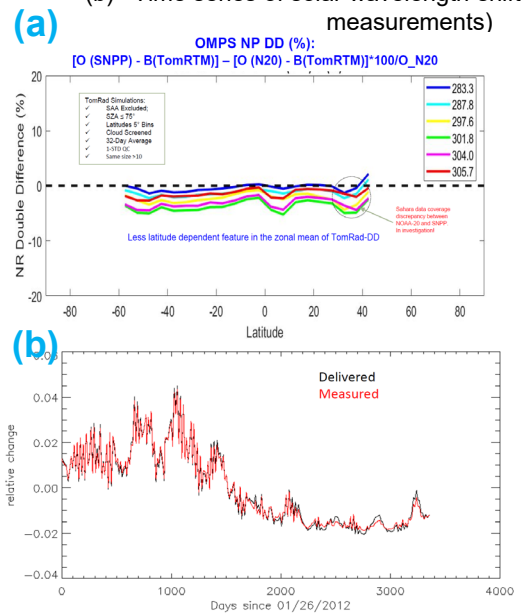


Figure 1 (a) TomRad-double differences between SNPP and NOAA-20 NP SDR. (b) Comparison of the wavelength shift time series since 01/26/2012 between the delivered and measured for SNPP NP, showing a good agreement with margins between the predictions and the measurements.

SDR Reprocessing

April/May, 2021

Accomplishments / Events:

- With the ongoing reprocessing on Cloud, the reprocessed SNPP VIIRS SDR data is available on Cloud for the period of 1/2/2012 to 1/30/2020 as of 5/17/2021)
- The transition of the reprocessed VIIRS SDR and VIIRS Enterprise Cloud Mask (ECM) for the period of 2018-04-01 to 2020-03-11 to ESA is completed
- Discussion is ongoing to finalize the implementation details in CLASS for the transition of the reprocessed SNPP SDR data
- The version 2 SNPP OMPS SDR reprocessing is scheduled and in preparation stage
- A journal letter entitled “Assessment of the reprocessed Suomi NPP VIIRS enterprise cloud mask product” has been reviewed and is in revision (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.*

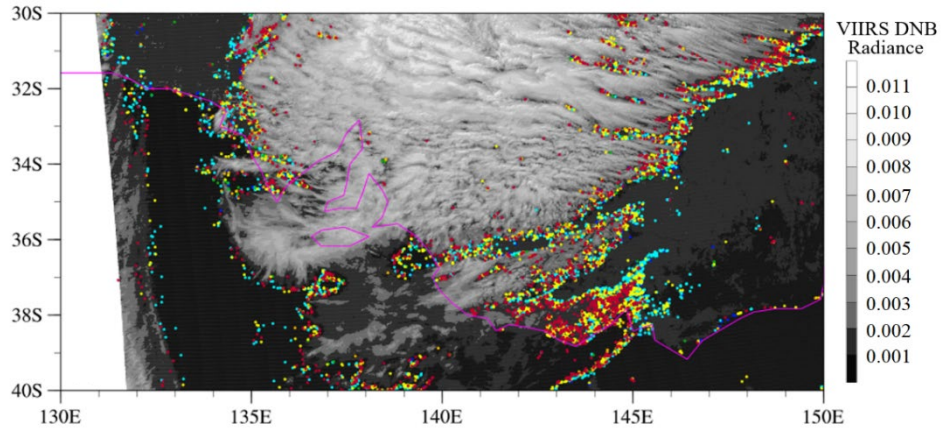
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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.,
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	Sep-21		
Deliver preliminary evaluation results on radiometric stability of reprocessed CrIS SDR data	Sep-21	Sep-22		
Transition of reprocessed SNPP SDR data to CLASS/NCEI	Sep-21	Sep-22		

Highlights:

Mismatches of cloud mask types between operational and reprocessed ECM products



The mismatches of cloud mask types mostly occur at the edge of the clouds.

Lin, L., X. Hao, B. Zhang, C.-Z. Zou, and C. Cao, 2021: Evaluation of the Impact of Suomi NPP VIIRS Reprocessing on Cloud Mask Retrieval, Remote Sens. Lett., (in revision)

ICVS

April/May, 2021

Accomplishments / Events:

- Finished updating ICVS SDR data processing modules (beta version) to support JPSS-2 SDR data processing capability. Generated JPSS-2 ICVS SDR sample images using NOAA-20 SDR data as proxy data and demonstrated the sample images in internal ICVS-JPSS2 web site.
- Provided S-NPP CrIS near real time status and data quality monitoring report to support S-NPP CrIS side-2 to side-1 switch analysis.
- Provided NOAA-20 and S-NPP VIIRS and CrIS instrument parameter long term data sets to support NASA Flight Project engineering activities.
- Updated ATMS operational status warning message by adding event starting and ending time according to user's request in order to provide detailed information for engineering analysis.
- Kept updating ICVS vector webpage development with STAR IT web master.
- Finished generating NOAA-20 vs S-NPP VIIRS 32-day inter-sensor zonal mean bias for RSB and TEB
- Started working on OMPS geolocation accuracy monitoring package based on research version developed by L. Wang (UMD and OMPS SDR team).

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:

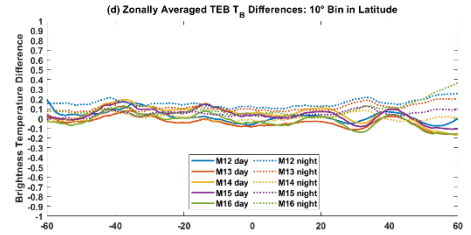
None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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		
Develop ICVS anomaly impact watch portal prototype (beta)	Jul-21	Jul-21		
Develop ICVS testbed code (beta)	Aug-21	Aug-21		
Support JPSS-2 ICVS-LTM Test Readiness Review	Sep-21	Sep-21		
Implement the Git repository for ICVS (beta)	Set-21	Set-21		
Promote the ICVS top product matrices for operation	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

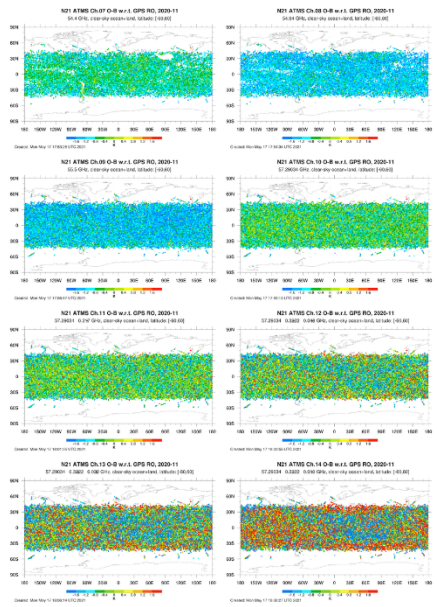
Highlights:

Significantly contribute to STAR SDR Teams

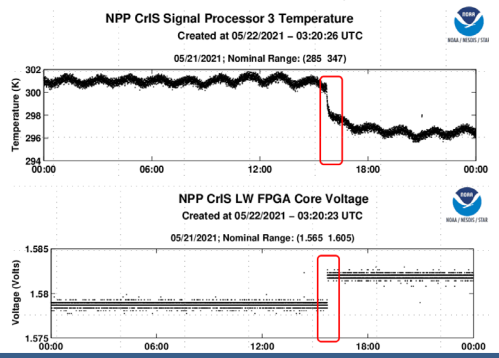
N20 vs. NPP VIIRS 32-day zonal mean bias for TEB



JPSS-2 (N20 Proxy Data) Sample O-B w.r.t. RO Profile



S-NPP CrIS H/S Parameters on May. 21st , 2021



VIIRS Imagery

April/May, 2021

Accomplishments / Events:

- **NCC banding anomaly**: The code changes to fix the NCC banding anomaly are going ahead in spite of the discovery of additional banding in the NCC which was later traced back to the DNB. Consultations with the VIIRS Geo Team, the VIIRS SDR Team, and the JPSS Program were considered in this decision to proceed. Tim Dorman, imagery JAM, is overseeing the CCR process, and Don Hillger provided a PPT to accompany the CCR explaining the anomaly and its fix.
- **Checkout of orbital data for ground system updates:** The Imagery Team checked VIIRS EDR Imagery for at least 2 ground system updates, even for changes unrelated to the VIIRS EDR Imagery product. In one case some M1 striping was noticed that was in both the old and new datasets, and the VIIRS SDR Team was notified.
- **Checkout of J2 simulated data**: The Imagery Team checked some J2 simulated orbital data, which was J1 data with J2 headers.

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.*

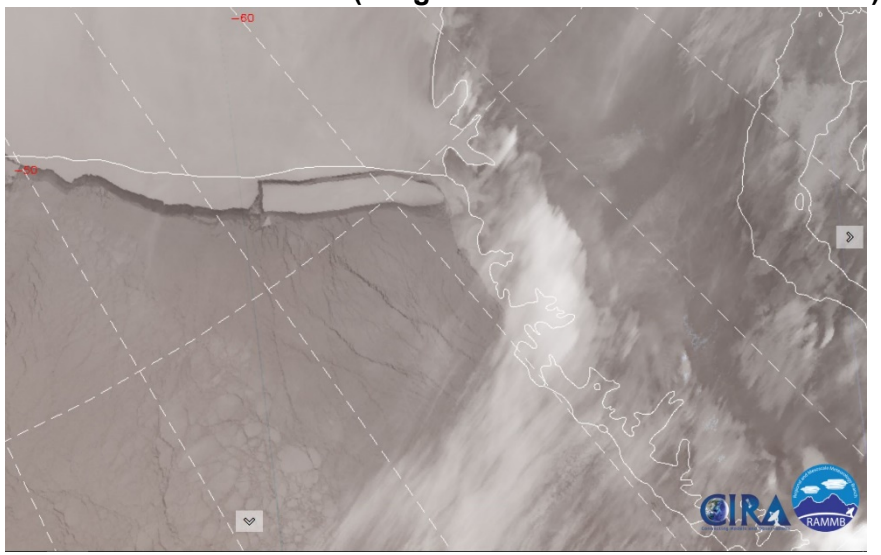
Issues/Risks:

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

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	ongoing	
Annual VIIRS Imagery performance report	Sep-21	Sep-21		Report
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**; Jun-21 Mx3; Jul-21 Mx4; Sep-21 Mx5)	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**	

Highlights: Image of the Month

VIIRS GeoColor image of iceberg A-76 (~1668 km²) that broke off of the Antarctic ice shelf (image from 2021-05-15 21:39:16 UTC)



Clouds

April, 2021

Accomplishments / Events:

- The Cloud Team decided to utilize the April 2021 ECM2 LUT for the current delivery. This LUT will improve detection over the current operational LUT, and incorporate the DNB for nighttime detection
- Evaluation of the CBH product was conducted using ground-based measurements (ceilometer and lidar) from ARM sites (NSA/AK and SPG/OK). Comparisons between VIIRS and ARM data were completed for 2019-2020 matchups and will continue for 2021 cases.
- Satellite cloud vertical cross-sections derived from the Enterprise cloud products (CIRA) were presented at the Virtual Alaska Weather Symposium (4/21) together with IFR/Turbulence products (CIMSS) for aviation users.

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 slides after May highlights***

Highlights:

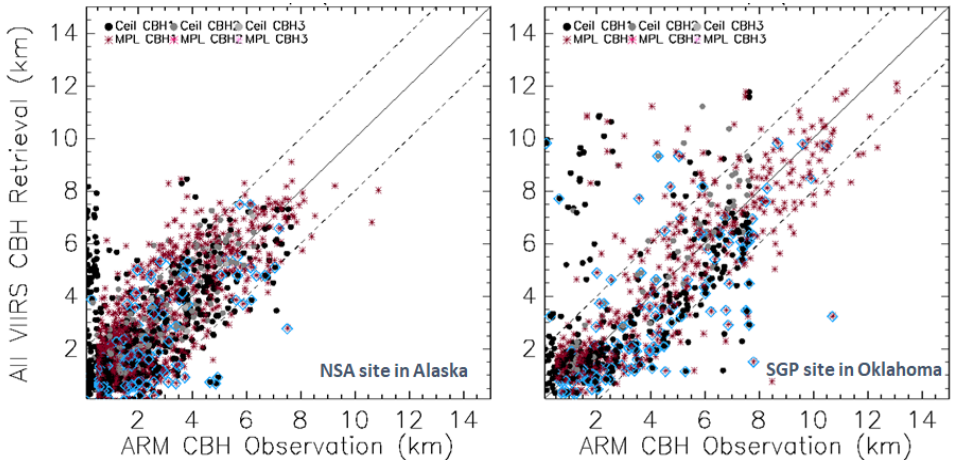


Figure 1. Comparisons of CBHs from VIIRS and ARM ground-based measurements for Jan 2019 - Dec 2020 (Micro-Pulse Liar in red-brown asterisk and Ceilometer in black-gray circles). Note that "within-spec" comparisons were performed when VIIRS CTH is within 2 km against surface lidar CTH, and nighttime CBHs from NLCOMP using DNB are colored in blue (together with 2-km error range lines).

Clouds

May, 2021

Accomplishments / Events:

- The CIRA team generated gridded 3-D cloud field data from the Enterprise cloud products (top/base and phase) in 0.02 x 0.02 degree grids over Alaska with 0-50 kft vertical levels. Temperatures (NWP/NUCAPS) and sub-layer phase were also integrated in 3-D cloud fields with PIREPs (icing/turb). The preliminary data will be tested to create random cloud vertical cross-sections for a new aviation website and AWIPS-2 implementation.
- The ECM made a code change to significantly reduce artificial probably cloudy pixels around small frozen lakes (see the Figure).
- The ACHA team worked on reducing cloud height retrieval errors caused by upstream cloud phase issues. Some improvements were observed and it has the potential for ACHA to be less sensitive to input phase errors.

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.*

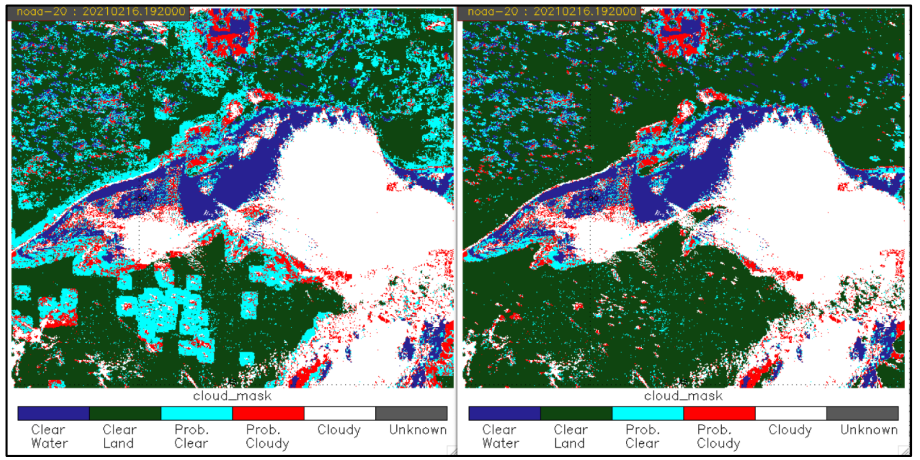
Issues/Risks:

None

Milestones:

- ***See next slides***

Highlights:



Before After

Figure 1. Figure on the left shows VIIRS ECM performance with the artificial Probably Clear (cyan) around frozen lakes. It is coming from the filter that applies to the visible channel classifiers. Figure on the right is after code change, where visible channels are staying on.

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
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	Sep-21		Waiting for ASR team assessment of new LUT
Verify ECM LUT against J2 simulated data	Aug-21	Aug-21		
Support Alaska Demo and ESRL usage and reviews	Aug-21	Aug-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Apply CALIPSO tools to NDE Mask with Lunar Ref	Sep-21	Sep-21		
Develop collaboration wtith OAR/ESRL/GML on use of RadFlux Cloud Fraction for Verification including high-latitude sites	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	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
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		
Support S-NPP and NOAA-20 EDR monitoring	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	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
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	Sep-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	Aug-21		
Continue working with FAA for them to use ACHA products	Sep-21	Sep-21		
Continue support of Alaska Demo CTH requests	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	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
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	Aug-21		
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	Sep-21		
Develop collaboration with OAR/ESRL/GML on use of RadFlux Cloud Optical Depth for Verification	Sep-21	Sep-21		
Support Alaska Demo, primarily during AK rainy season	Sep-21	Sep-21		
Consistency checks for day and night retrievals	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	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
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		
Adding improved unit test tools to science code	Sep-21	Sep-21		
Consistency checks for day and night retrievals	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	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
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	Jun-21		
leverage DCOMP nighttime COD (DNB) to improve performance over IR-only	Sep-21	Sep-21		
Validate products from SAPF and begin ARM data analysis to fill CALIOP/CloudSat void	Sep-21	Sep-21		
Support Alaska Demo and necessary reviews	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	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
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		
Support Alaska Demo and necessary reviews	Sep-21	Sep-21		
Support consistency validation of products from CSPP	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
LTM: Implement a warning-based monitoring system	Sep-21	Sep-21		

Aerosol

April/May, 2021

Accomplishments / Events:

- Initial J2 DAP to ASSIST/NDE
- Updated Enterprise Cal/Val Plan
- Presented at FY22 JSTAR PMR on May 11
- Conducted virtual trainings on STAR VIIRS AOD and ADP
- Finished development of the code for merging ABI (GOES16 and 17) and VIIRS (SNPP and NOAA20) AOD products. Generated and evaluated the merge data for Nov-Dec, 2020.
- Delivery of report to the Program on expected 3MI aerosol products and their benefits to VIIRS AOD

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			

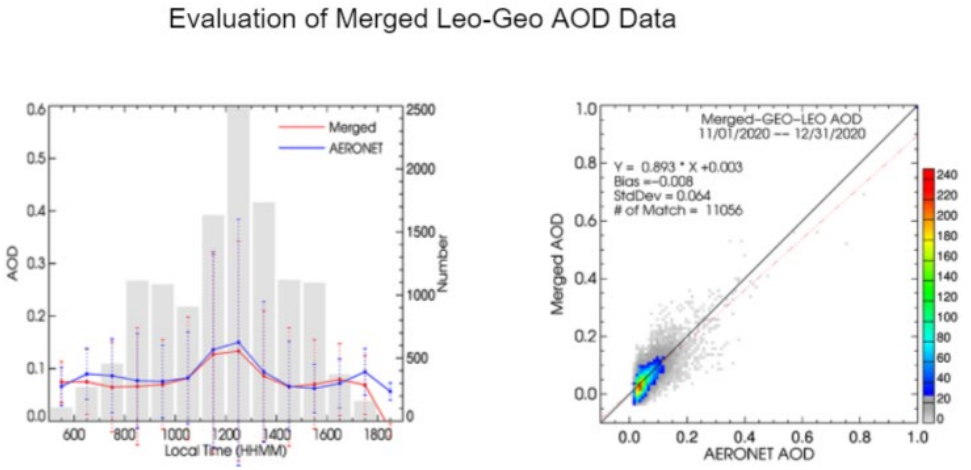
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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
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:



Merged JPSS/GOES-R Aerosols compare well with in-situ Aeronet data

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		
Improve angular and seasonal representation of surface reflectance relationships	Jul-21	Jul-21		
Update preliminary LUT and gas-absorption parameterization for J2 if needed	Sep-21	Sep-21		
Evaluate merged S-NPP/NOAA-20 AOD product	Jun-21	Jun-21		
Evaluate gridded AOD products	Jul-21	Jul-21		
Continue individual AOD product (S-NPP, NOAA-20) validation and cross-validation	Aug-21	Aug-21		
Maintain satellite-ground AOD matchups used for products evaluation	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		
Aerosol Detection (ADP):				
Improve dust detection over the vegetated surface	Jun-21	Jun-21		
Develop surface type-dependent thresholds over land	Jun-21	Jun-21		
Exploring the use of trace gases product from TROPOMI to separate smog from smoke	Jun-21	Jun-21		
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		
Continue long-term validation of SNPP and NOAA-20 VIIRS ADP by comparisons with AERONET, CALIPSO, MISR, and IMPROVE	Jun-21	Jun-21		
Exploring the angular dependence of ADP by combing NOAA-20 with SNPP	Jun-21	Jun-21		Report
Annual algorithms/products performance report	Sep-21	Sep-21		

Volcanic Ash

April/May, 2021

Accomplishments / Events:

- Held Volcanic Ash FY22 PMR on 19 May 2021
- Refining plans to transition to VOLCAT and retire VIIRS-only Volcanic Ash products in approximately 2023
- Manuscript on remote sensing of volcanic SO2 plumes was accepted and published
- JPSS Science Digest article on VOLCAT was published

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			

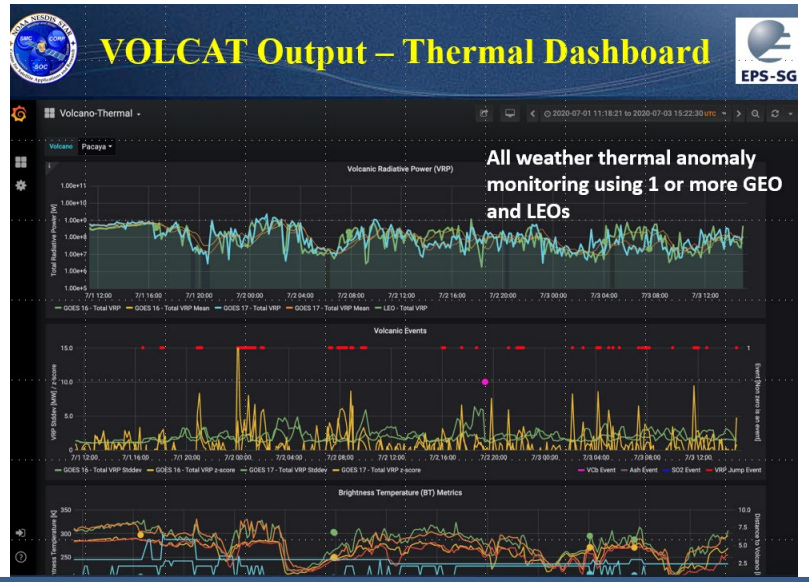
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	
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
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		
Refine thresholds and LUT's for S-NPP and NOAA-20 as needed	Sep-21	Sep-21		
Development activities that support transition to VOLCAT	Sep-21	Sep-21		
Routinely validate volcanic ash products	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights: VOLCAT Thermal Dashboard with interactive, customized download options



Cryosphere

April/May, 2021

Accomplishments / Events:

- *Held FY22 PMR on 13 May 2021*
- *I-band (375-m) ice surface temperature and concentration algorithms have been implemented and products are currently being routinely generated for S-NPP at CIMSS.*
- *Blended VIIRS and AMSR2 Sea Ice Concentration. Continued to update algorithm based on new validation results and produce daily; weekly and monthly ice concentration products. Paper recently submitted.*

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:

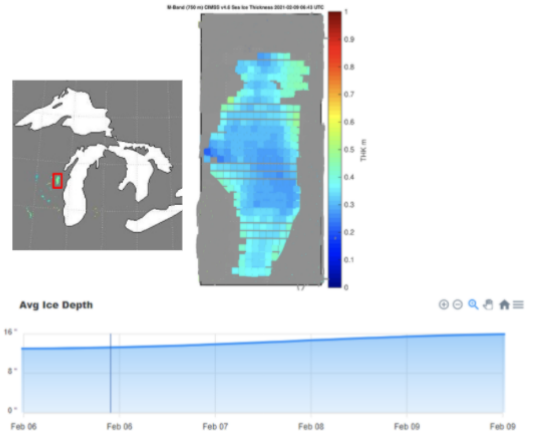
None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation/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
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		
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		
Continuous monitoring of S-NPP and NOAA-20 products	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights: *VIIRS ice thickness product shows excellent agreement with ice thicknesses report by anglers (fishermen/women) over Lake Winnebago WI.*

Ice Thickness Validation Study over Lake Winnebago

While extensive validation of the VIIRS Ice Thickness and Age product has been done over Arctic sea ice, there has been relatively little in situ data over inland lakes. Lake Winnebago is a popular location for ice fishing, where average ice depths are reported by anglers on a daily basis. The average depth reported by anglers over the period was close to 16 inches (0.4 meters) by February 9, which closely matches the calculated ice thicknesses from VIIRS.



VIIRS ice thickness (meters) over Lake Winnebago, WI on 9 Feb 2021. Bottom: Average in situ ice depth (inches) from angers over the period 6-9 Feb 2021, with a range of 12-16" (0.3-0.4m).

Active Fires

April/May, 2021

Accomplishments / Events:

- The Community Satellite Processing Package (CSPP) software changes to fix data anomalies discovered in the Direct Broadcast fires product were implemented
- Worked with the RealEarth(™) team on the incorporation of global VIIRS I-band product
- Completed Enterprise Active Fire Product Design
- Held FY22 Active Fire PMR on 14 May 2021
- Gave a presentation on NOAA's active fire products at the EUMETSAT workshop and training on wildfire monitoring
- Provided input for the LEO fire listening session at the 13th AMS Fire and Forest Meteorology symposium
- Analyzed FRP time series for the Camp Fire event

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			

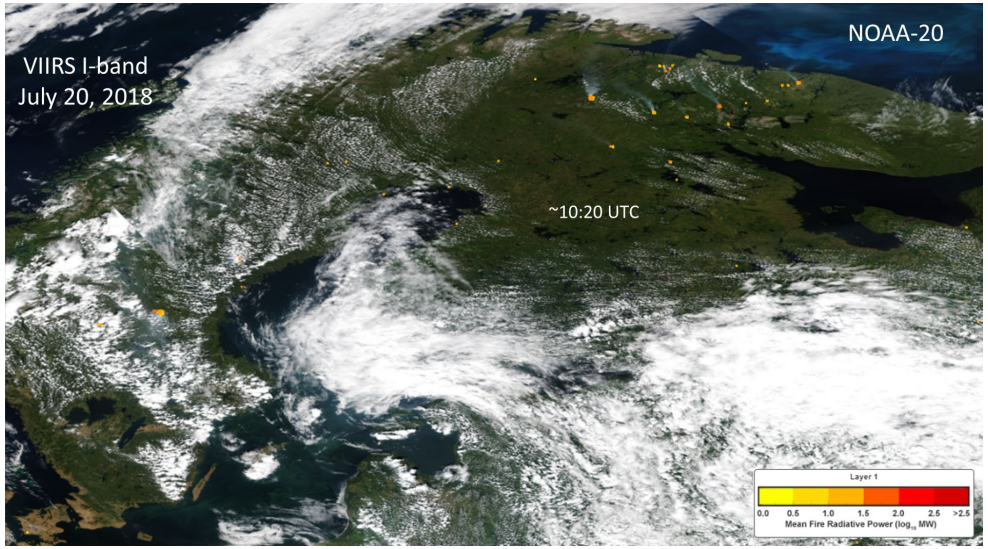
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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	
Enterprise Active Fires DAP to ASSISTT	Aug-20	Aug-20	08/25/20	
Initial Enterprise Fires DAP to NDE	Jun-21	Jun-21		
Final J2 updates DAP to ASSISTT	Aug-21	Aug-21		
Final Enterprise Fires DAP to NDE	Oct-21	Oct-21		
I-band algorithm improvements	Sep-21	Sep-21		
J2 readiness and sensor performance evaluation	Sep-21	Sep-21		
ASSIST, NDE and DB integration and testing support	Sep-21	Sep-21		
Suomi NPP / NOAA-20 data analysis and feedback	Sep-21	Sep-21		
Persistent anomaly data files updates	Quarterly	Quarterly		
Annual algorithms/products performance report	Sep-21	Sep-21		
Active Fires Patch DAP to NDE			12/01/20	

Highlights: illustration of VIIRS I-Band Fire Product coverage over Northern Europe presented at a training for EUMETSAT stakeholders



Surface Type

April/May, 2021

Accomplishments / Events:

- STAR-UMD VIIRS Surface Type team has downloaded and processed S-NPP and NOAA-20 VIIRS granule surface reflectance data acquired in March 2021.
- The team has completed derivation of monthly composites and annual classification metrics using 2020 VIIRS data acquired by both S-NPP and NOAA-20.
- The team has started to extract training data based on the 2020 annual metrics and use them to train the SVM classification model.

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			

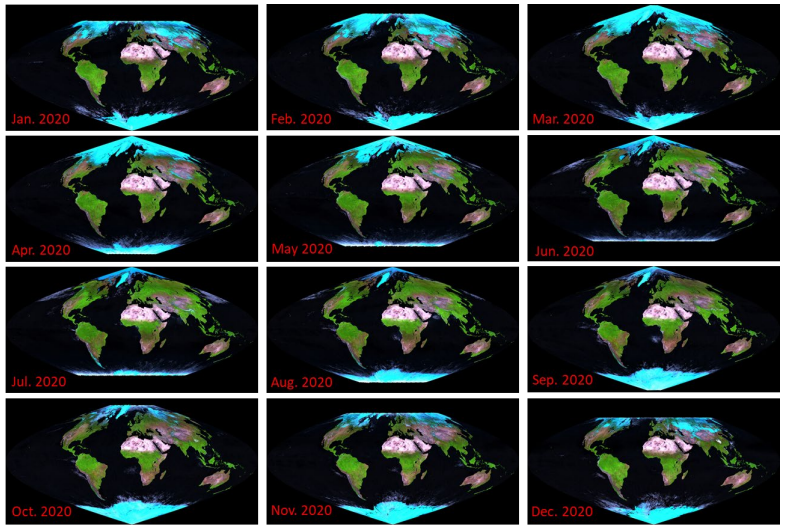
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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		
Comparison of AST20 with surface type validation data	Sep-21	Sep-21		
Delivery of AST20 (available for users through STAR FTP)	Sep-21	Sep-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	Sep-21	Sep-21		

Highlights:



VIIRS Monthly composites created using daily observations from S-NPP and NOAA-20. Green and cyan indicate areas covered by vegetation and snow.

Surface Reflectance

April/May, 2021

Accomplishments / Events:

- VIIRS SRF v1r2 Preliminary DAP delivery.
- Developed the AERONET matchup tool and routinely generate the VIIRS subsets of interested sites
- Based on the AEROENT data availability analysis, expanding the interested sites from 39 to more than 150.
- Developed the 6S atmospheric correction tool for VIIRS at AEROENT site using the AEROENT observations and inversion.

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			

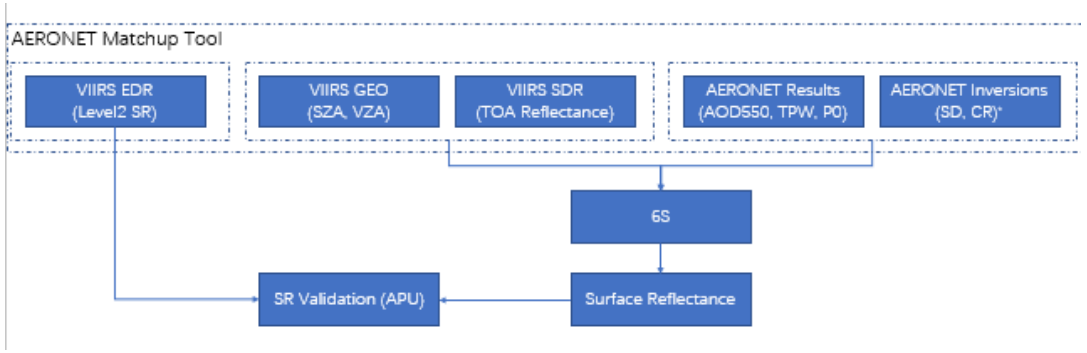
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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
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		
ASSIST integration and testing support of updated code delivery	Sep-21	Sep-21		
Continuing LTM and extension to NOAA SR products	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights:

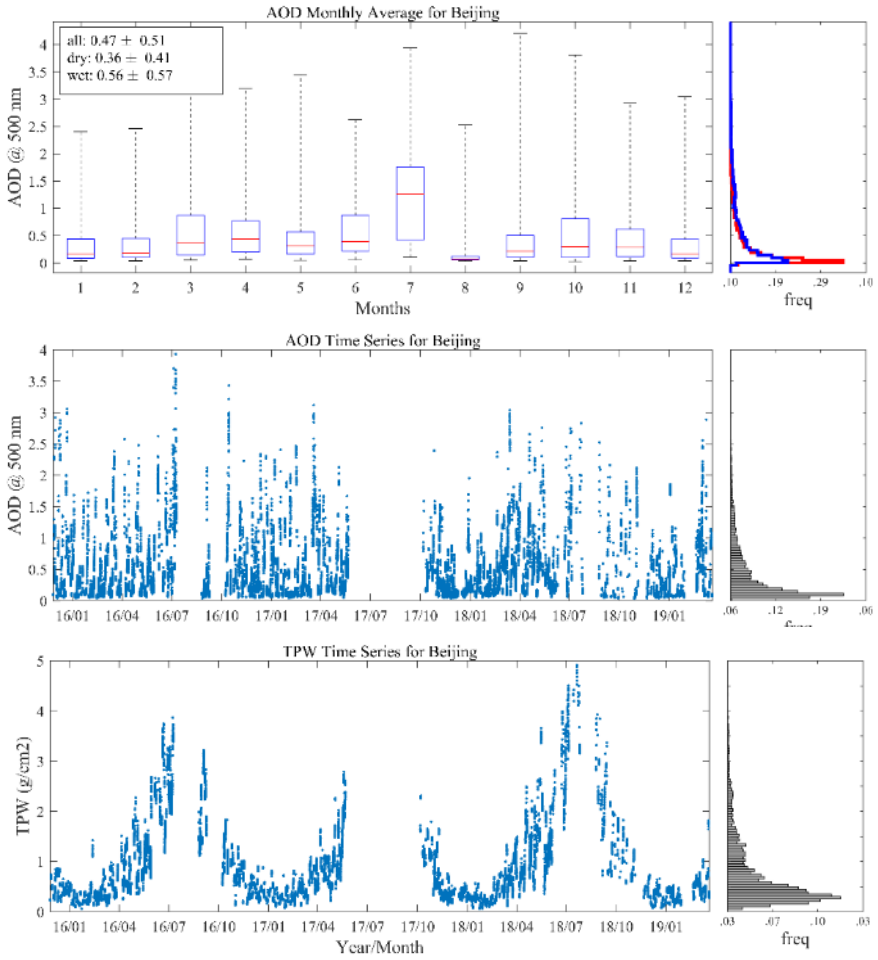


Developed the first in-house version AEROENT validation tool for SNPP/NOAA20 VIIRS SR.

Monthly Progress – SR PRODUCT

■ Validation Data Preparing

- AERONET matchup data: VIIRS GMTCO/GITCO, VIIRS SDR TOA Reflectance, VIIRS SR with a subset size of 51*51 M Band Pixels.
- AERONET AOD and TPW data under clear sky condition at 39 selected sites.



AERONET AOD and TPW data time series analysis

■ SR Product Sensitivity Analysis

- Simulated based on the middle latitude summer standard atmosphere using MODTRAN 5.
- Using transmittance as indicator to show the sensitivity of each atmospheric components.

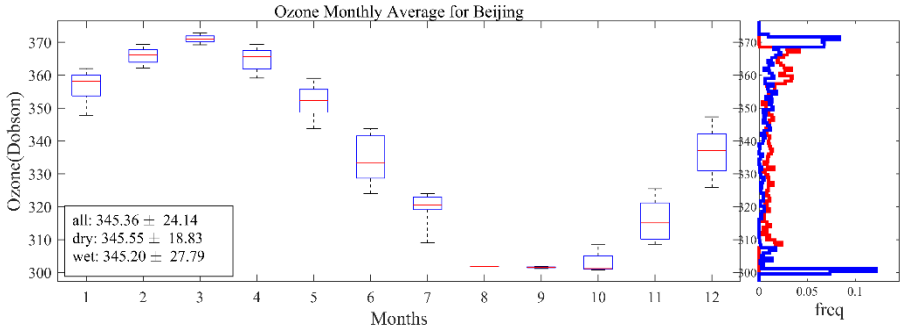
	Total	AER	Mol	UMix	H2O	O3	Oth.
I1	0.6935	**0.7628**	**0.9467**	0.9970	0.9910	**0.9718**	1.0000
I2	0.8161	**0.8378**	**0.9840**	1.0000	0.9909	0.9992	0.9999
I3	0.9060	**0.9373**	0.9987	**0.9738**	0.9942	1.0000	0.9997
M1	0.4688	**0.6496**	**0.7245**	0.9998	0.9994	0.9999	0.9970
M2	0.5266	**0.6697**	**0.7905**	0.9996	0.9990	0.9990	0.9972
M3	0.5840	**0.6935**	**0.8514**	0.9981	0.9994	0.9934	0.9982
M4	0.6337	**0.7230**	**0.9063**	0.9991	0.9974	**0.9710**	0.9994
M5	0.7286	**0.7761**	**0.9565**	0.9984	0.9975	0.9855	1.0000
M7	0.8164	**0.8377**	**0.9840**	1.0000	0.9913	0.9992	0.9999
M8	0.8730	**0.9041**	0.9963	0.9879	**0.9815**	1.0000	0.9995
M10	0.9064	**0.9373**	0.9987	**0.9742**	0.9942	1.0000	0.9997
M11	0.9016	**0.9651**	0.9997	**0.9463**	0.9919	1.0000	0.9956

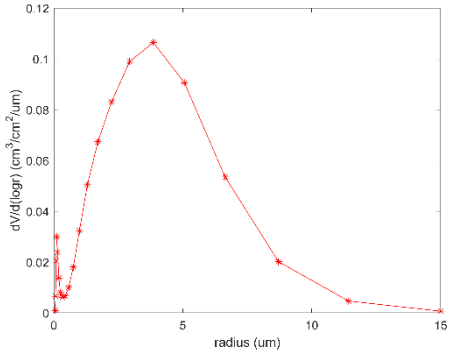
- ✓ Water vapor is not as sensitive as in thermal channels, O3 mainly impact on M4 & M5.
- ✓ Aerosol is most sensitive component, followed by molecule, particularly at shorter wavelength.

Monthly Progress – SR PRODUCT (details)

■ AERONET data for atmospheric correction

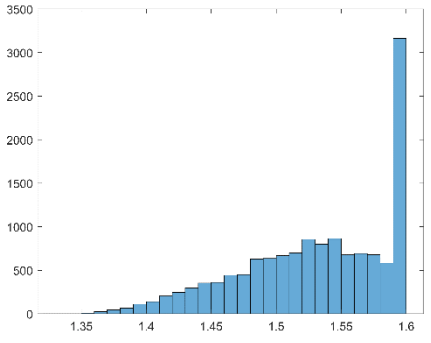
- AOD 500, Ångström Exponent
- TPW & Ozone.
- Size distribution and refractive indices

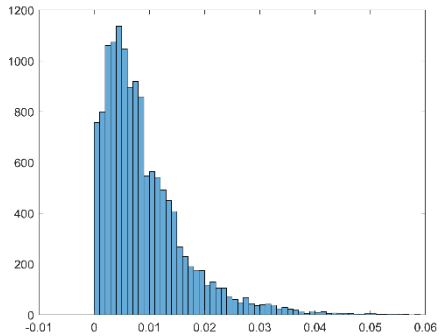




AERONET observations for atmospheric correction

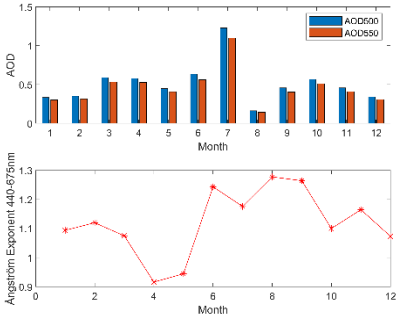
- Ozone monthly value (Upper)
- Particle size distribution (Left)
- Complex Refractive histogram: real part (bottom left), imaginary part (bottom right)



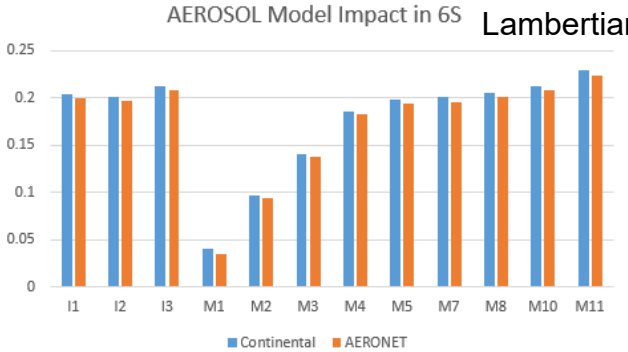


■ AERONET Atmospheric correction using 6S

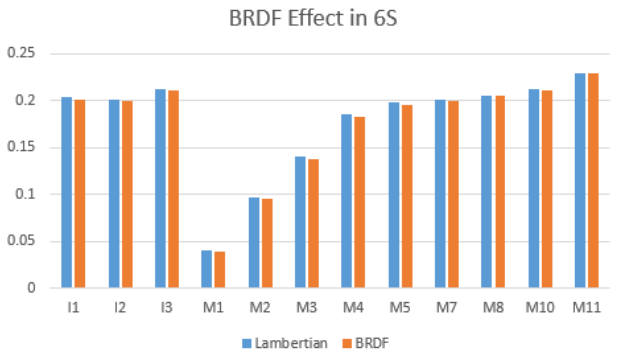
- AERONET AOD 500 to AOD 550 conversion.
- Aerosol model test
- BRDF effect



The difference between AOD500 and AOD 550 is around 10%
Aerosol model inversed from AERONET could bring 2-3% (M1 band > 10%) difference compared with standard model.
BRDF model could bring < 1.5% (M1-M3 < 2.5%) difference compared with Lambertian assumption



Use Continental aerosol model for comparison.



Use MODIS BRDF product.

Land Surface Temperature

April/May, 2021

Accomplishments / Events:

- Finished the preliminary design and development of the blended VIIRS LST based on the L3 gridded SNPP and NOAA20 VIIRS LST input data. The composition method needs further improvement. (slide 2)
- Investigated the frost occurrence in France in April 2021 using the L3 VIIRS LST data. (slide 3)
- The L2 SNPP VIIRS LST was compared with the VNP21 LST product at global scale using all granules in one day.
- Checked the VIIRS Super DAP v3r0 final NDE DAP delivery package. Requested to replace the LST ATBD with the new version
- Finished the code update of L3 VIIRS LST by adding the handling of the tile input in NetCDF format.
- Updated the uncertainty estimation method by including the model error contribution which was estimated based on the regression procedure. A NetCDF format file is prepared as input for model error. (slide4)
- Modified the VIIRS LST configuration file format from nc to ascii.
- Updated the total water vapor missclassification proabability based on the combined validation against ARM and radiosonde observations.
- Finished the science code update for the VIIRS LST uncertainty estimation.
- Conducted the LST uncertainty test at both granule and global scale. (slide 5 & 6).
- Finished the book chapter and received FRC system approval after the revision following the comments from the technical review.

Overall Status:

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

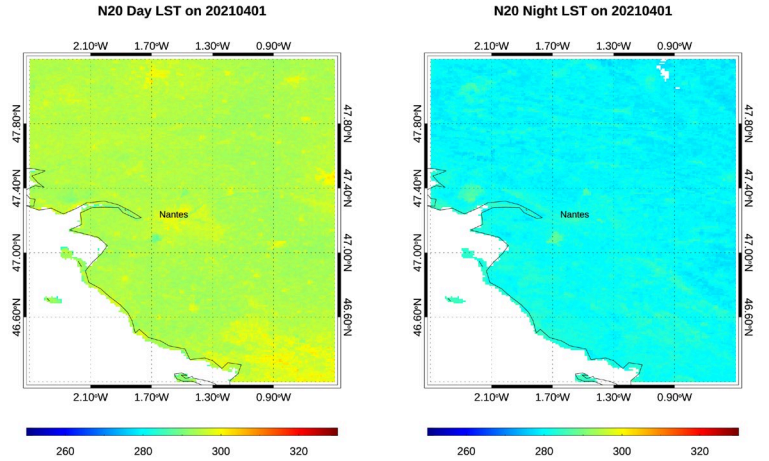
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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
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 J2ready DAP
Annual algorithms/products performance report	Aug-21	Aug-21		
Validation tool update; Validation with extended data set	Sep-21	Sep-21		
Routine Validation of L2 LST & gridded LST products	Sep-21	Sep-21		
Final J2 ready DAP to NDE (include NPP/N20 updates, ASSISTT delivery)	Nov-21	Nov-21		

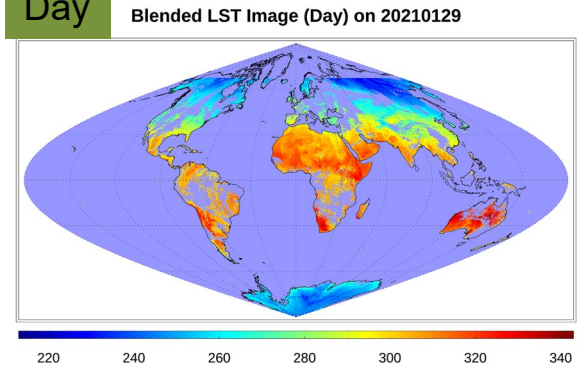
Highlights: LST monitoring in Nantes, western France

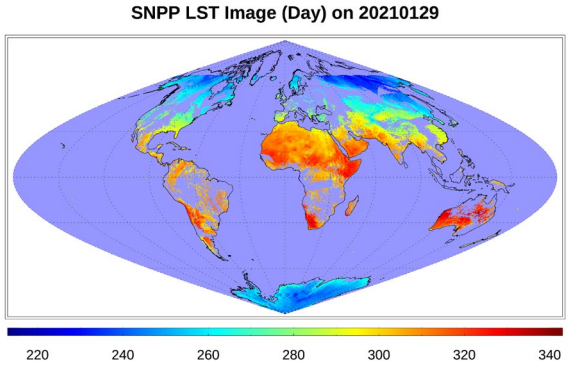


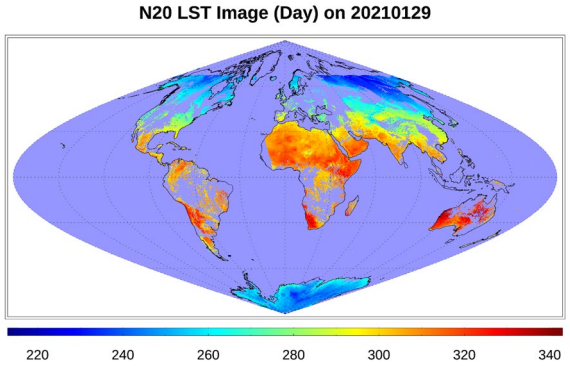
- The daytime and nighttime LST images were generated based on the L3 NOAA20 VIIRS LST
- The nighttime VIIRS LST captures the low LST each day for entire globe. Freezing temperature is observed on April 6-9.

Experiment blended SNPP and NOAA20 VIIRS LST

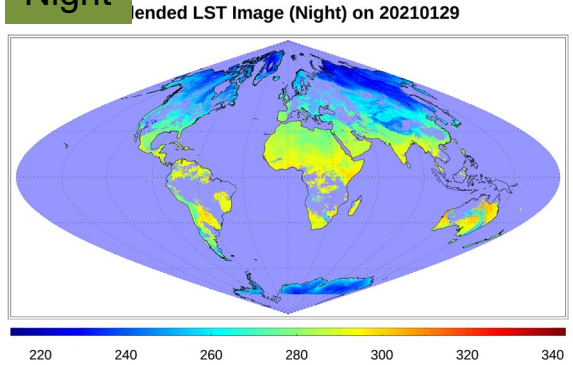
Day

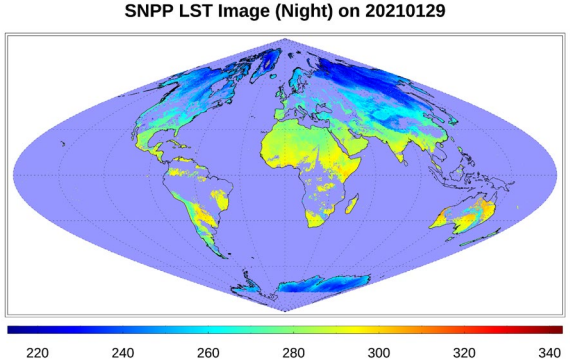


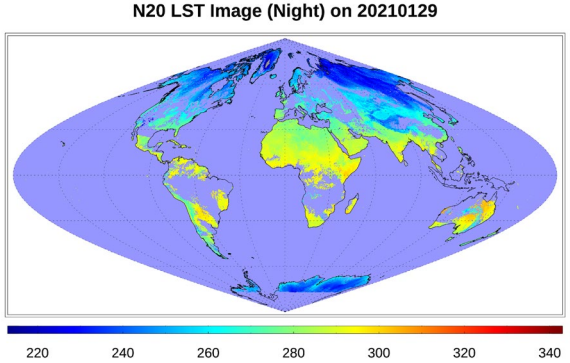




Night







Daytime statistics

	SNPP	N20	Blend
cloud=0	81.122	81.329	83.067
cloud=1	9.67	9.529	8.569
cloud=2	9.208	9.142	8.364

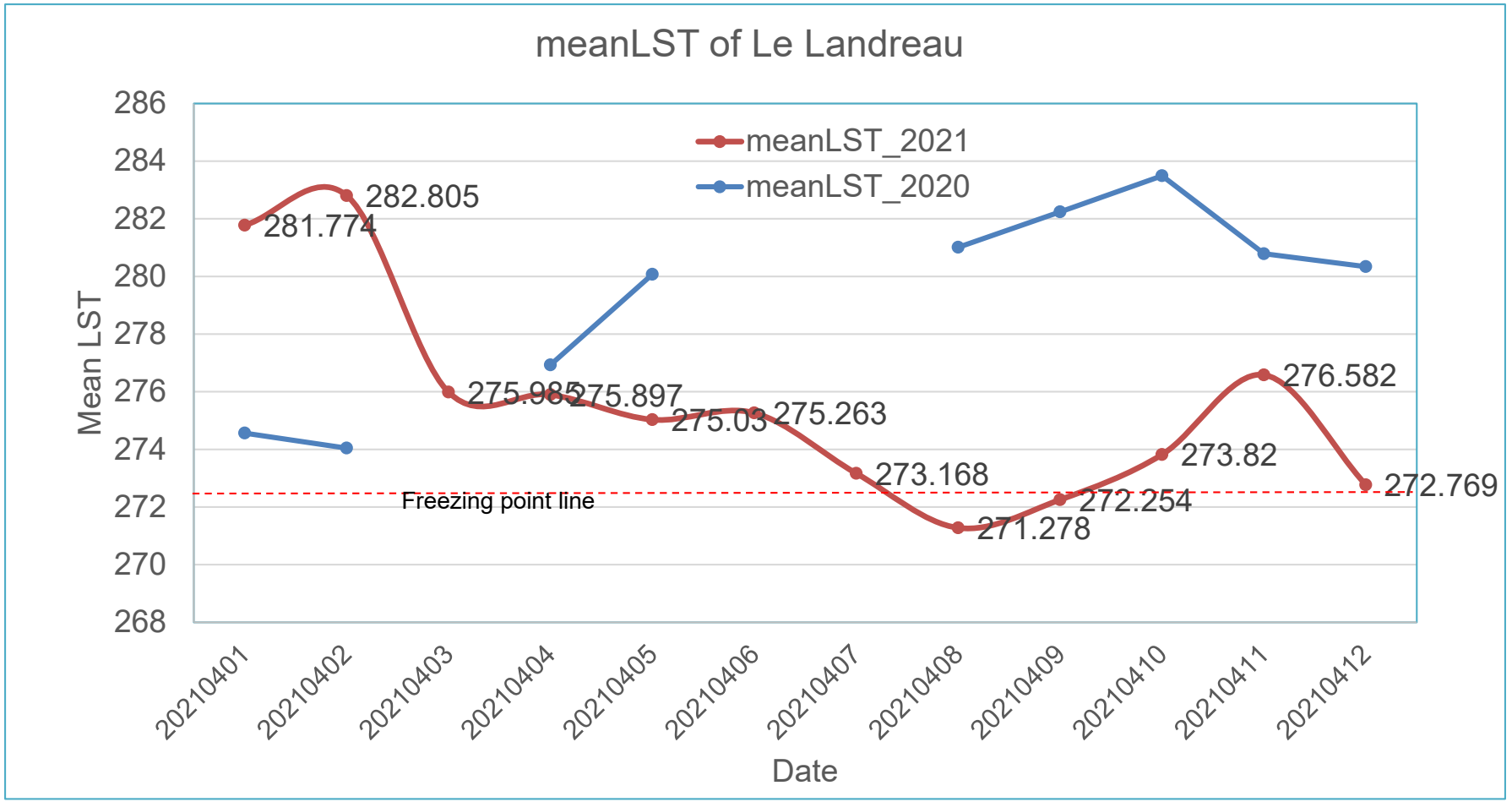
~2% increase of cloud clear pixels
Increase of pixels with smaller angles

Nighttime statistics

	SNPP	N20	Blend
cloud=0	73.935	72.613	75.749
cloud=1	12.591	12.892	11.715
cloud=2	13.473	14.495	12.536

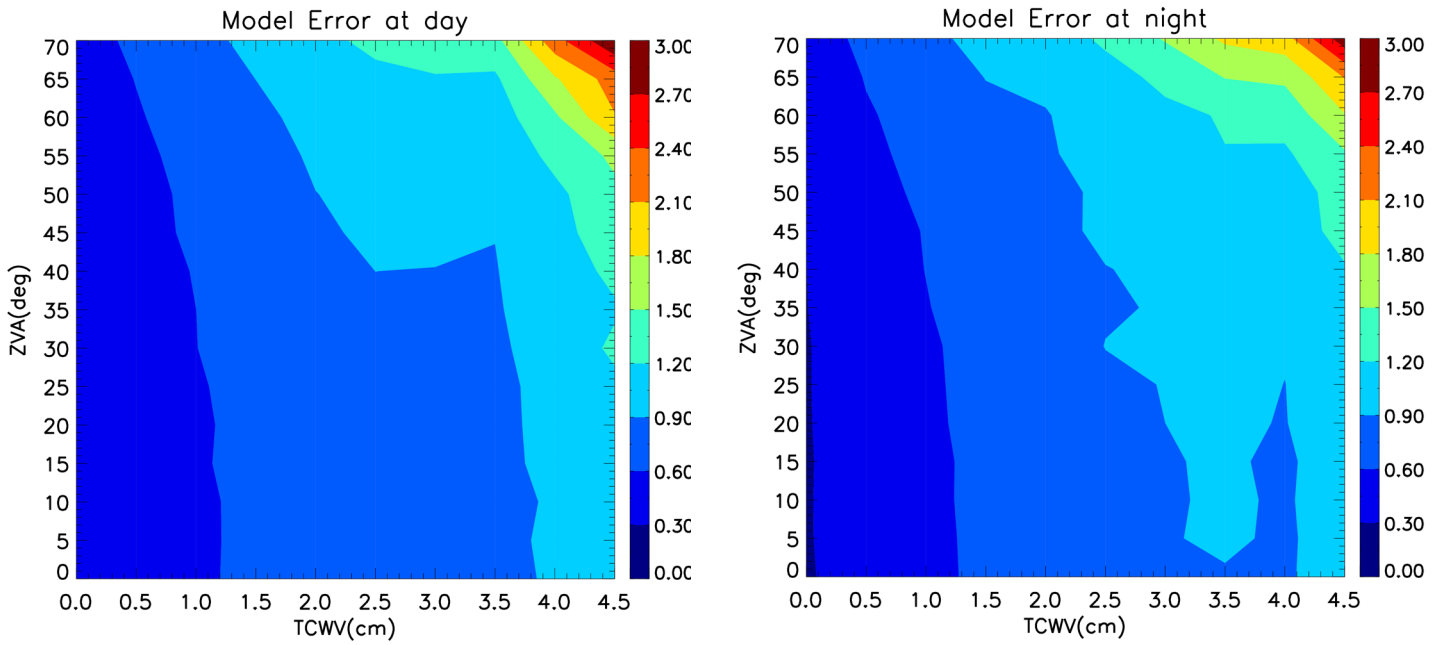
~2% increase of cloud clear pixels
Increase of pixels with smaller angle

The LST time series over Le Landreau area



- The mean nighttime LST is calculated each day for the spatial area of 5 km around the Le Landreau city center under cloud clear condition for the time period April 1-12th, 2021. The data for the same period of 2020 is provided for comparison. There are data missing for days on April 3, 6 and 7, 2020 due to cloud.
- The mean LST shows the consecutive days below freezing temperature from April 7th to April 9th as well as April 12th, while the LST is over 280 K for the same time period in 2020.

VIIRS LST model error & updated total water vapor misclassification probability



VIIRS LST model error estimated based on the regression procedure for daytime(left) and nighttime(right)

Recent Files /data/data329/pub/yliu/enterpriseSystem/code/src/20210218_uncertainty_estimation/LST_TPW_PROB_FILE.nc

LST_TPW_PROB_FILE.nc
- ni
- nj
- num_tpw
- tpw_probability
- tpw_range1
- tpw_range2

TableView - tpw_probability - / - /data/data329/pub/yliu/enterpriseSystem/code/src/20210218_uncertainty_estimation/LST_TPW_PROB_FILE

Table

7, 8 = 32.311

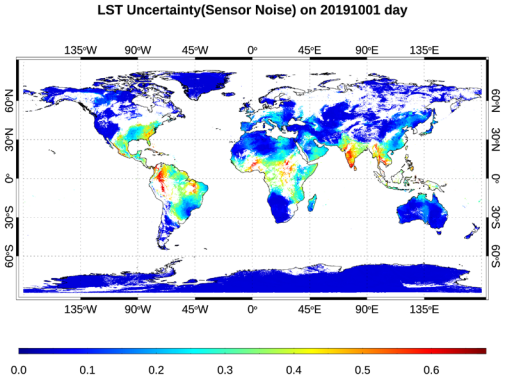
	0	1	2	3	4	5	6	7	8	9
0	89.915	2.701	0.001	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	10.083	88.094	7.387	0.425	0.136	0.062	0.035	0.012	0.006	0.001
2	0.0	9.049	82.603	12.929	1.611	1.091	0.766	0.309	0.204	0.251
3	0.0	0.154	9.921	75.337	19.116	2.73	1.413	1.223	0.7	0.592
4	0.0	0.0	0.083	11.123	66.689	19.384	3.412	2.044	1.662	1.712
5	0.001	0.001	0.001	0.181	12.06	63.21	23.012	3.505	1.846	2.527
6	0.0	0.0	0.0	0.001	0.321	12.658	59.51	29.348	5.265	2.161
7	0.0	0.0	0.001	0.001	0.06	0.667	10.827	50.921	32.311	5.973
8	0.0	0.0	0.0	0.001	0.004	0.179	0.878	12.188	49.224	31.72
9	0.001	0.001	0.001	0.001	0.003	0.019	0.147	0.449	8.782	55.063

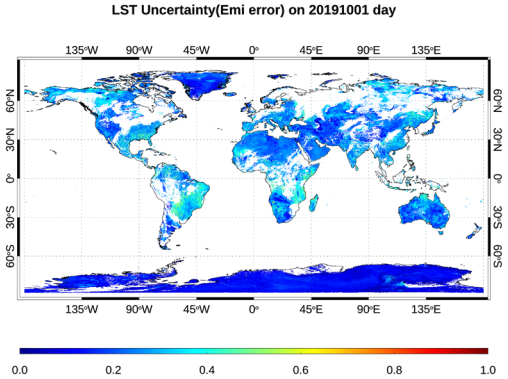
tpw_probability (1058, 2)
32-bit floating-point, 10 x 10
Number of attributes = 3
DIMENSION_LIST = 514,239
LONG_NAME = tpw_probability is the tpw missclassfication probability for the enterprise LST retrieval algorithm
TYPE = float

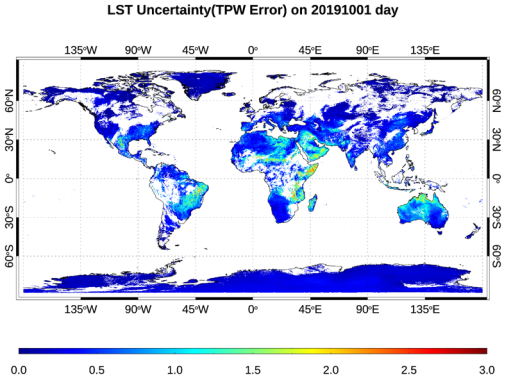
Updated the total water vapor missclassification proabability based on the combined validation against ARM and radiosonde observations

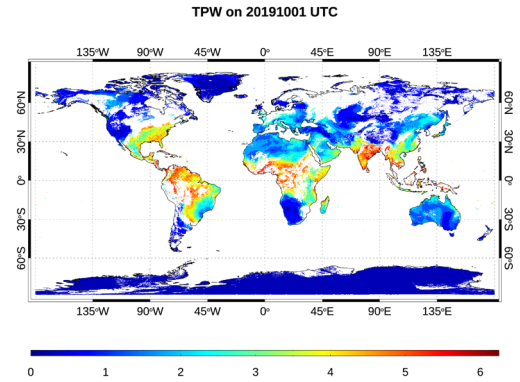
VIIRS LST uncertainty global test-daytime

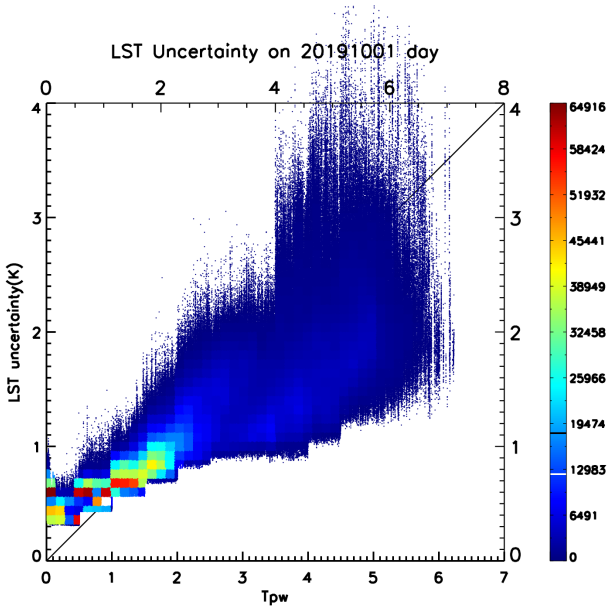
20191001 Day

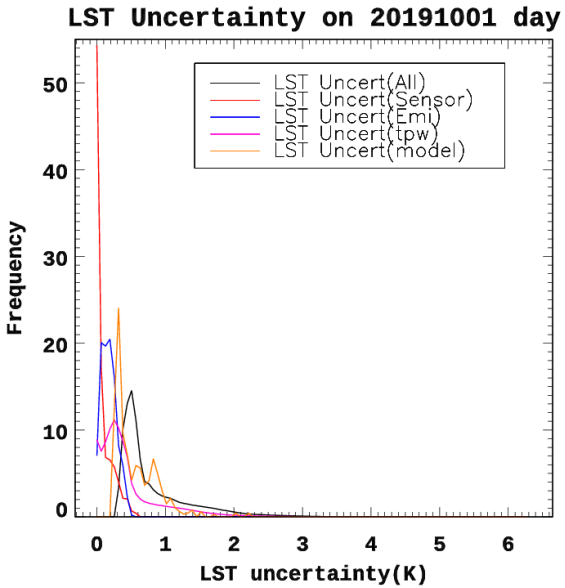


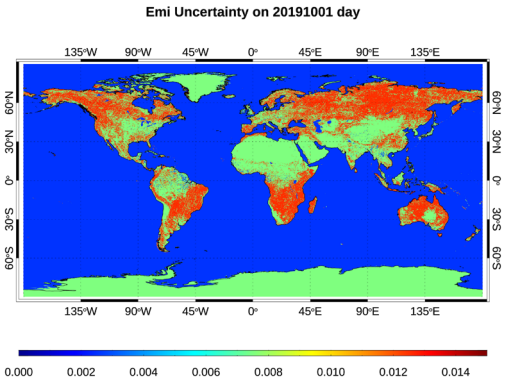








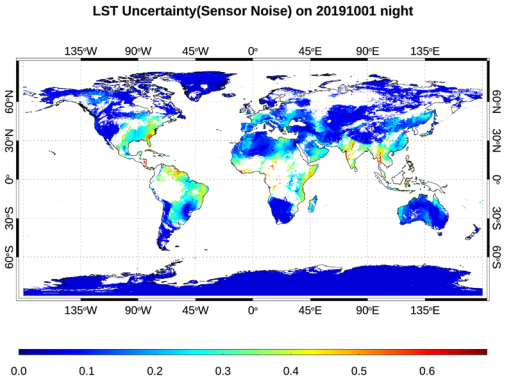


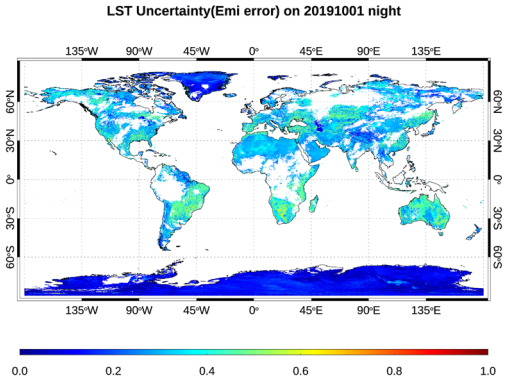


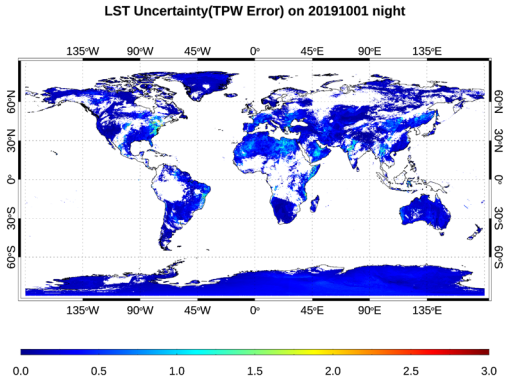
VIIRS LST uncertainty estimation contributed by the sensor noise(top left), emissivity uncertainty(top medium) and total water vapor error(top right); tpw global map(Middle left) and the emissivity error(bottom left); the scatter plot and histogram of the LST uncertainty(bottom left and right);

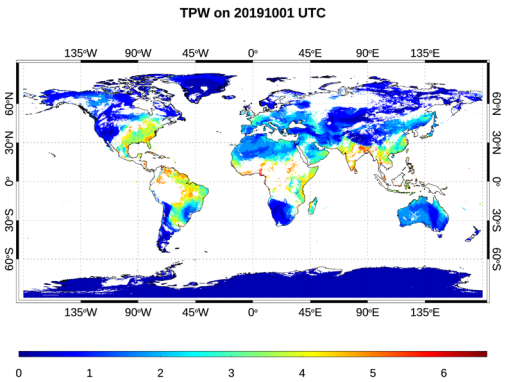
VIIRS LST uncertainty global test-nighttime

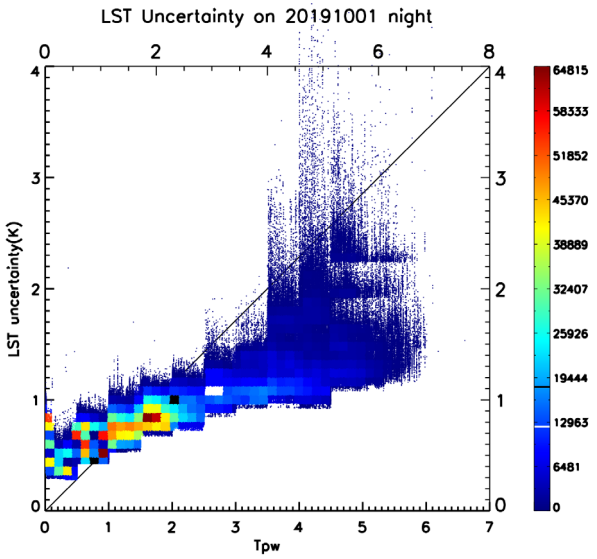
20191001 Night

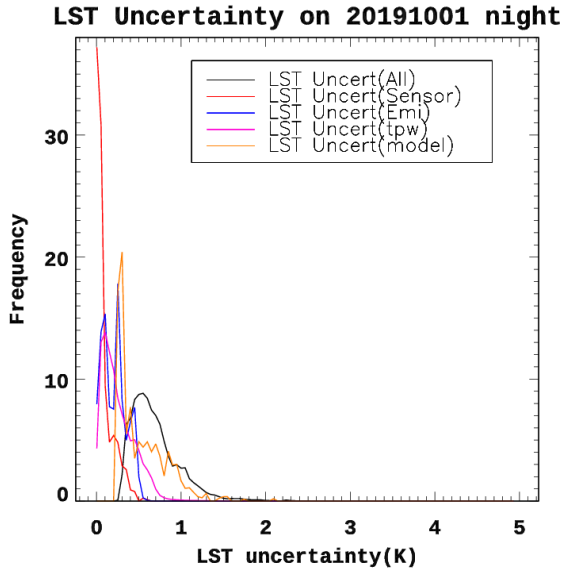


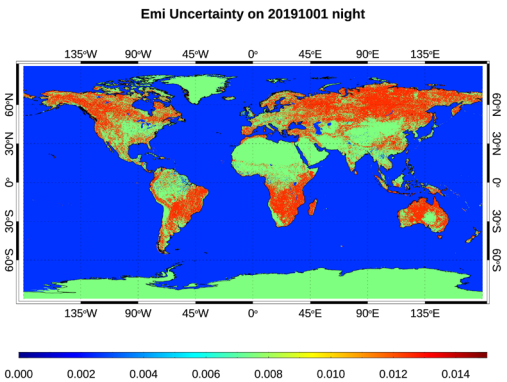












VIIRS LST uncertainty estimation contributed by the sensor noise(top left), emissivity uncertainty(top medium) and total water vapor error(top right); tpw global map(Middle left) and the emissivity error(bottom left); the scatter plot and histogram of the LST uncertainty(bottom left and right);

Surface Albedo

April/May, 2021

Accomplishments / Events:

- Summarized the study in new snow LUTs and made the final decision to use the current snow LUT **(Slides #2-3)**
- Addressed the snow albedo improved in the offline algorithm through distinguishing snow-only and snow-free retrievals in temporal filtering **(Slides #4-5)**
- Tested the combined effect of offline algorithm updates in the upcoming DAP (**Slides #6-7**)
- Revised the direct albedo algorithm LUTs ***(Slide #8)***
- Achieved improvement in the main algorithm subroutine of the VIIRS BRDF calculation algorithm. Tested the VIIRS BRDF code on sample tile and compared with VNP43A1 BRDF (***Slide #9-10)*** Integrating BRDF accuracy indicators including RMSE and WoD
- Improved the in-situ cloud flag algorithm and fully tested over SURFRAD sites with three years' worth of data. The current cloud flag data becomes mature and could support the ground validation of land products. (**Slides #11**)
- Gridded surface reflectance data generation: Fixed the bug in the netCDF data deflating and the data storage was reduced to one fifth (daily data from 200G to 40G); Add gridding module to the mapping script
- Prepared for the DAP package for ASSISTT
- Responded to ASSISTT request to check the v2r0 DAP data (**Slides #12**)

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.*

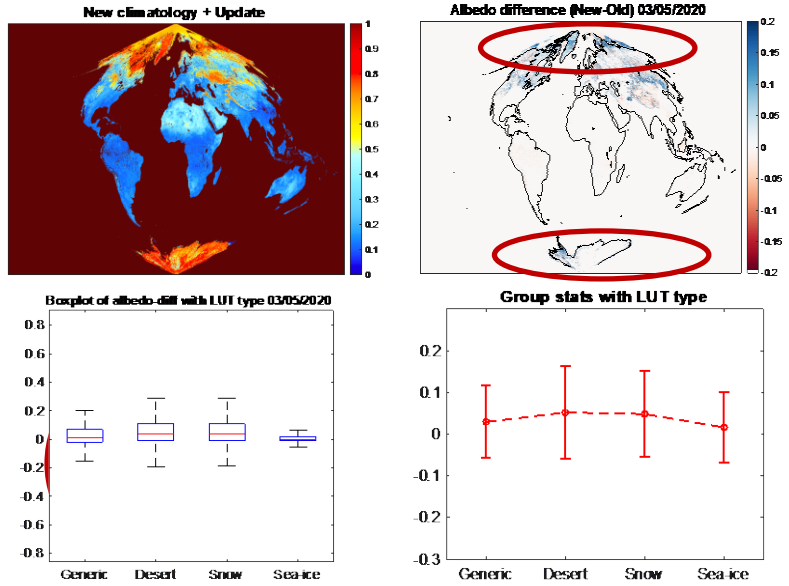
Issues/Risks:

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
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		
Annual algorithms/products performance report	Aug-21	Aug-21		
BRDF component code integration done	Sep-21	Sep-21		
Support to the NDE and STAR ASSIST requests	Sep-21	Sep-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		

Highlights:

- Effect of offline algorithm update in DAP



Snow LUTs Development

- **Test LUT 1**: Using the simulated snow anisotropy from ART model to generate test LUT. Compare the LUT effect with the Current LUT using matchups since Sep 20, 2019.
- Hypothesis: The snow albedo LUT emphasizes the spectral dimension rather than the surface anisotropy, which could cause an error by assuming surface Lambertian.
- Result: 1) The tested LUT and current LUT have very similar output with minor difference. 2) The new method could not bring in actual benefit to the product, so the original LUT is reserved, and more methods will be tried.

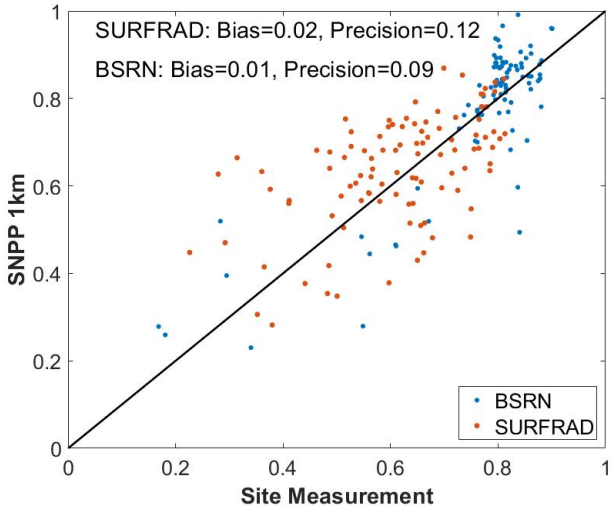
site	Current J1 LUT		tested J1 LUT		Current NPP LUT		tested NPP LUT		MODIS	
	A	P	A	P	A	P	A	P	A	P
Boulder_CO	-0.031 (18)	0.076	-0.035	0.062	-0.05	0.083	-0.058	0.073	-0.15 (15)	0.093
Fort_Peck_MT	0 (21)	0.079	-0.024	0.095	0.045	0.162	0.019	0.172	0.175 (18)	0.159
Penn_State_PA	-0.042 (3)	0.027	-0.036	0.019	-0.054	0.037	-0.06	0.03	NaN (0)	NaN
Sioux_Falls_SD	0.135 (19)	0.107	0.153	0.114	0.135	0.107	0.152	0.114	0.03 (11)	0.146
SGPE11	-0.127 (4)	0.065	-0.104	0.065	-0.105	0.041	-0.117	0.019	-0.101 (2)	0.032
SGPE13	-0.188 (2)	0.175	-0.141	0.149	-0.218	0.226	-0.227	0.252	-0.405 (1)	0.000
SGPE15	0.033 (4)	0.056	0.062	0.049	0.046	0.07	0.041	0.096	0.029 (2)	0.072
SGPE31	0.058 (4)	0.063	0.081	0.064	0.059	0.083	0.037	0.079	-0.067 (2)	0.000

Note: The () denotes the matchup size. Red fonts denotes the largest error. MODIS shows less matchups then VIIRS due to data missing.

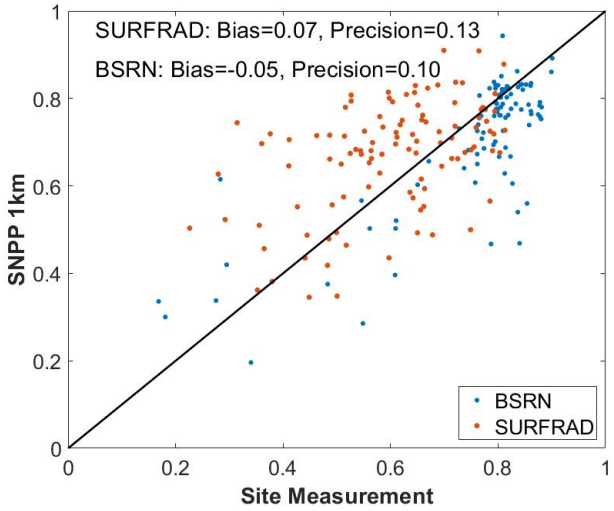
Snow LUT Development (Cont.)

Test LUT 2: Using the MODIS BRDF to generate test LUT. Compare the LUT effect with the Current LUT.

Current LUT



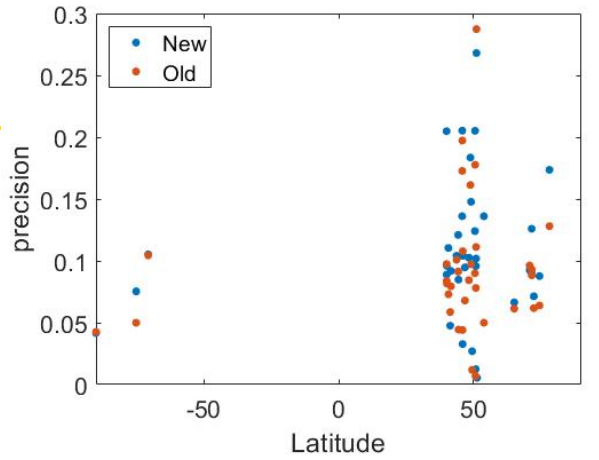
New LUT

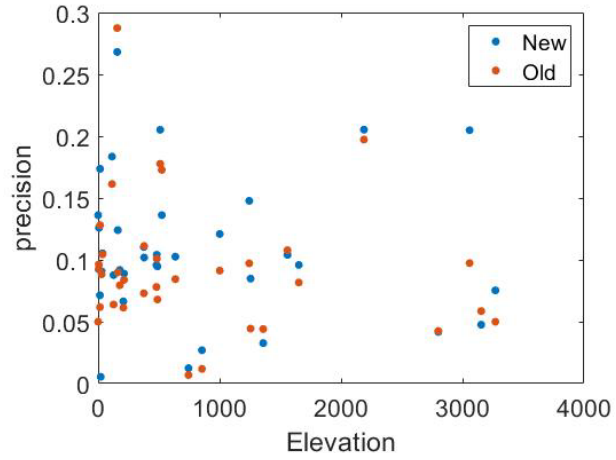


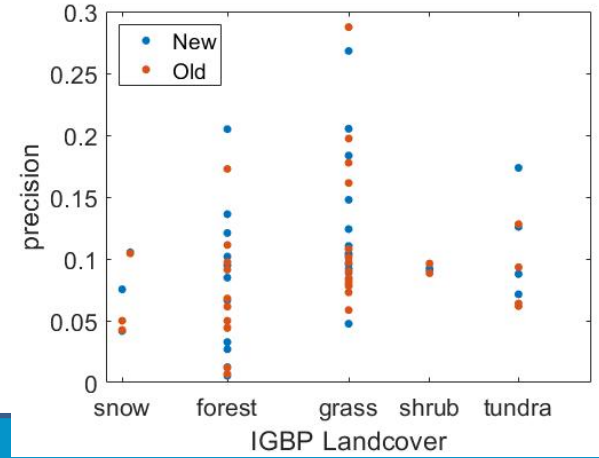
Result: 1) The tested LUT shows higher bias and precision than the current LUT. 2) The new method could not bring in actual benefit to the product, so the original LUT is reserved.
3) Error analysis with latitude and elevation and surface type has suggested the new LUT can not handle the seasonal snow well.

<u>Lessons learned:</u>

Under the current stage, a more applicable method to improve overall snow albedo is in offline filtering process: Using new snow climatology + separate snow-covered and snow-free albedo in temporal filtering (Done in DAP);





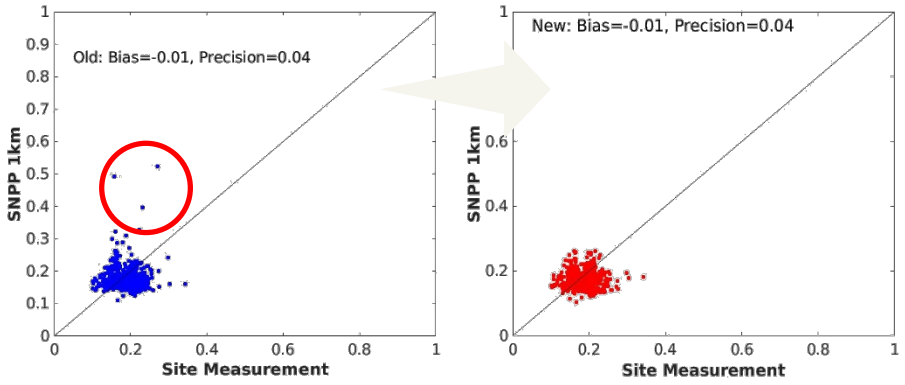


Update of offline algorithm for snow season

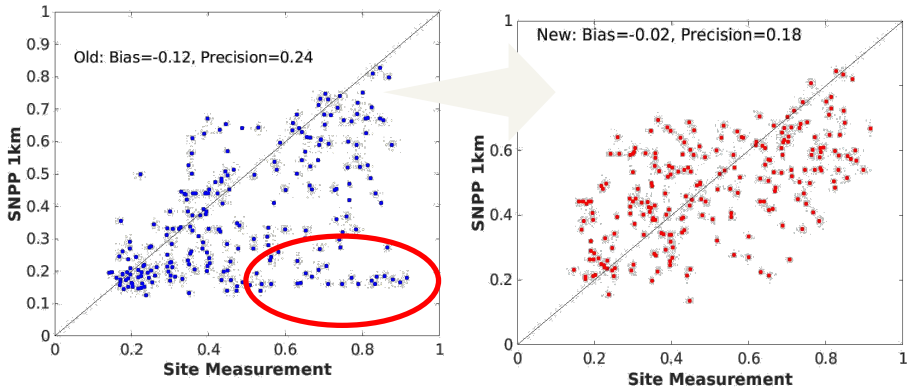
- **Benefit: Improve albedo quality in seasonal snow period**
- **The proposed algorithm change:**

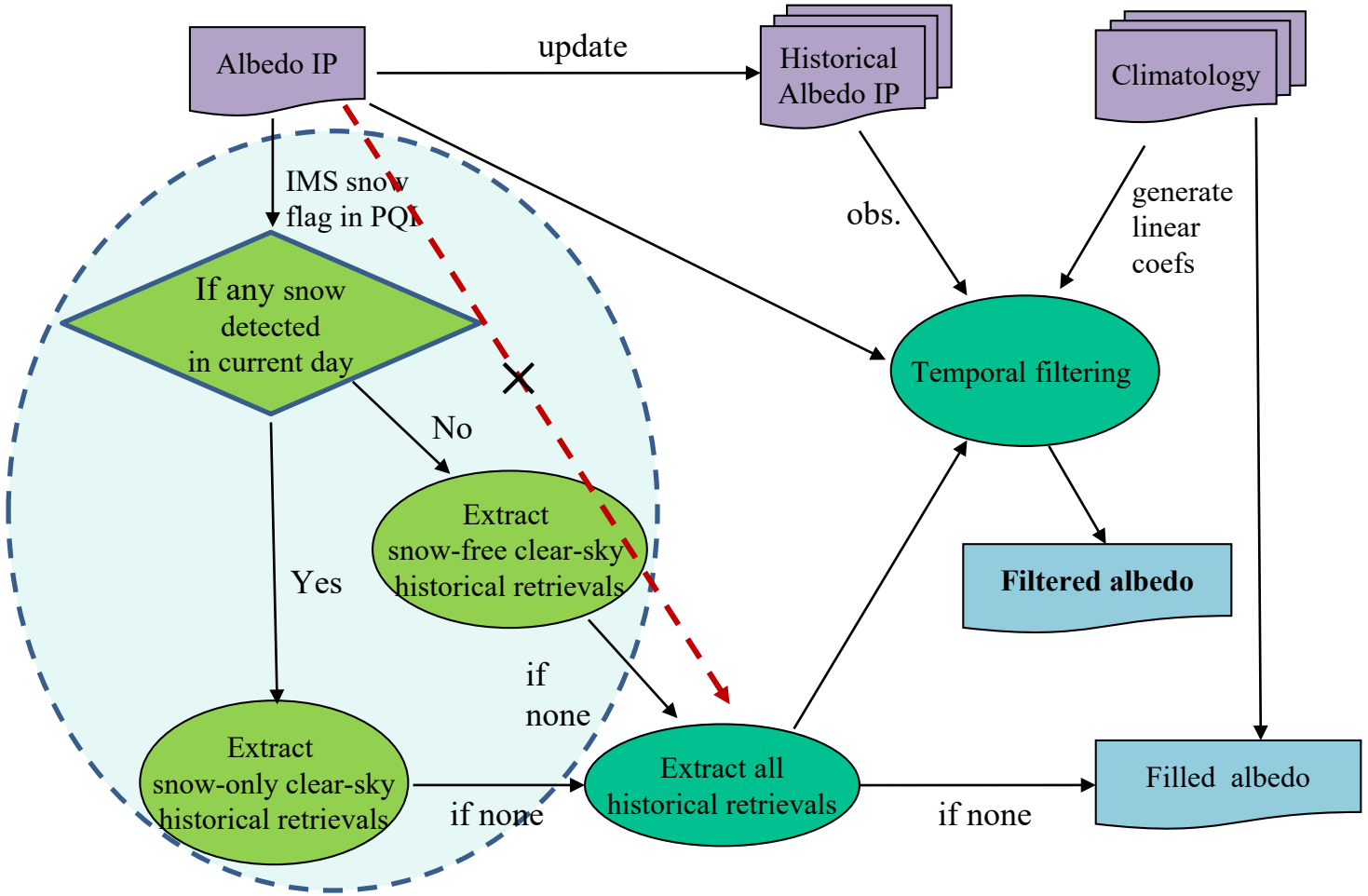
With previous clear-sky values, select the historical value with same **snow flag** to do the filtering. IMS snow flag enables to distinguish snow in cloudy days. Then the filtering process, the neighboring observed values that have same snow cover conditions could be selected to used. In other words, if the target day is snow covered, the observed snow albedo in the neighboring days will be removed, vice versa.

non-snow cloudy



snow-covered cloudy





Updates in the offline filtering temporal filtering method:

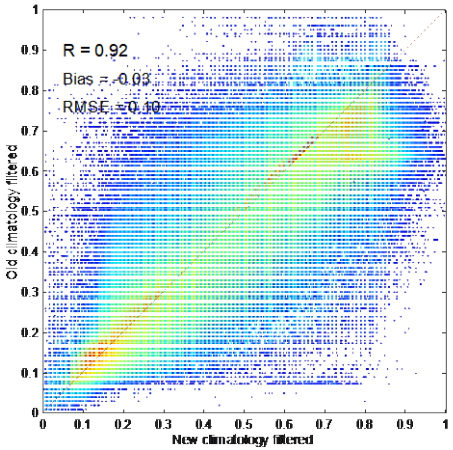
Using mixed snow and non-snow historical retrievals as input for all pixels.

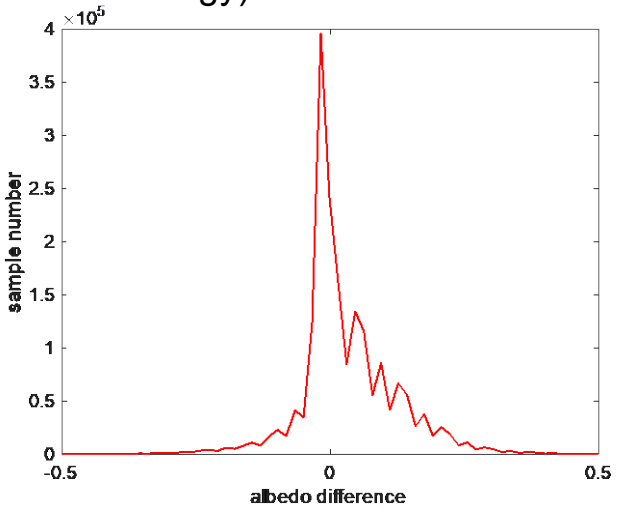
Using separated snow and non-snow observations as input for pixels with the same snow flag.

Note: For a safer transition, if none of historical retrievals has same snow flag, all the mixed historical retrievals would be used, which is the original method, so that the algorithm quality would not be degraded at least.

Effect of update: Climatology + algorithm

(Old climatology) vs. (New climatology)

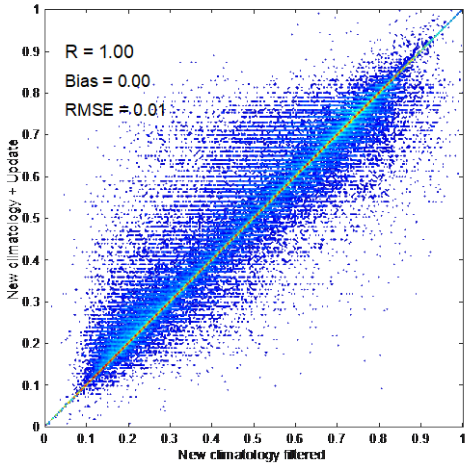


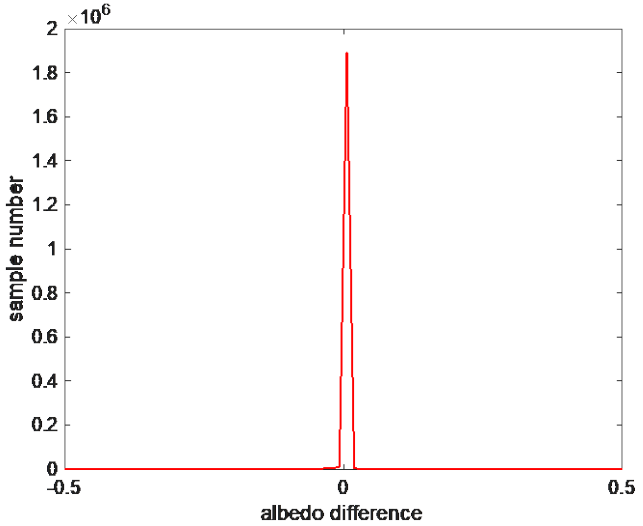


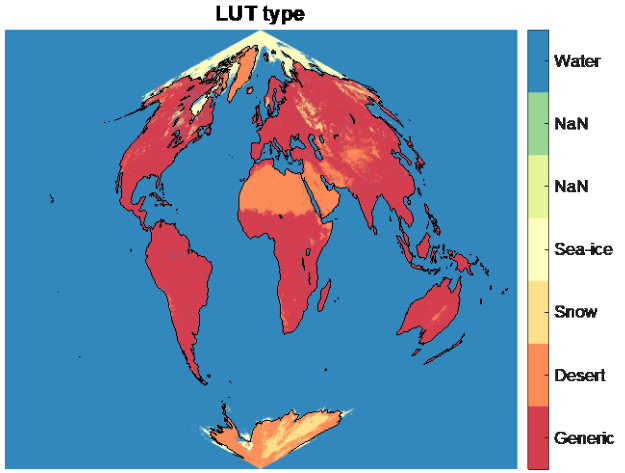
The snow climatology has been improved by using the latest two decades observations so that the snow albedo magnitude has been tuned. With the algorithm update, the snow season albedo has could fit better with the actual surface condition.

Note: This test data can not reveal the full effect of the algorithm update since the VIIRS snow mask is still used in operational from where the test data comes from. The VIIRS snow mask does not include cloudy-snow information (as the LUT type shows in the image).

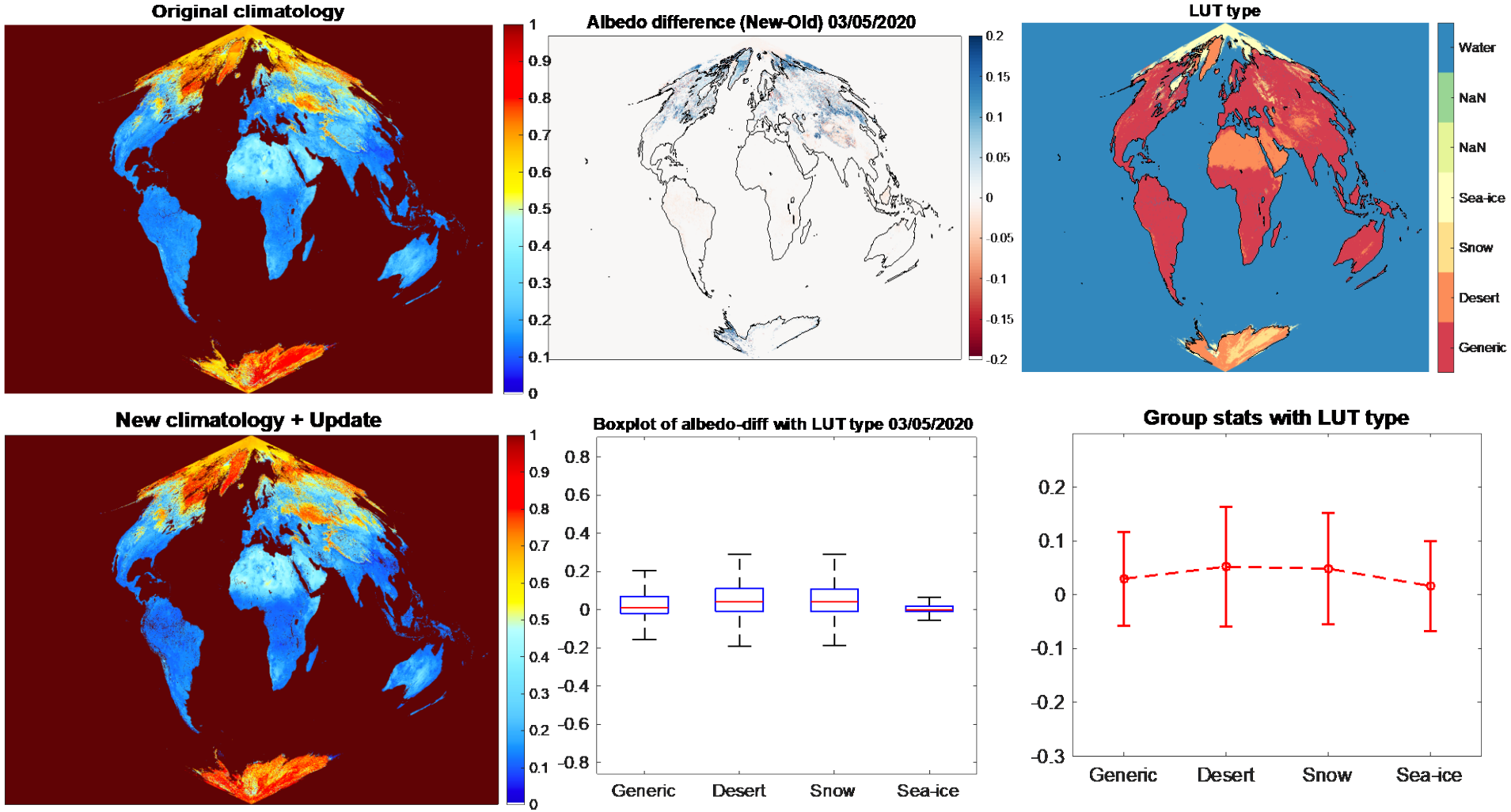
(New climatology) vs. (New climatology + Update)







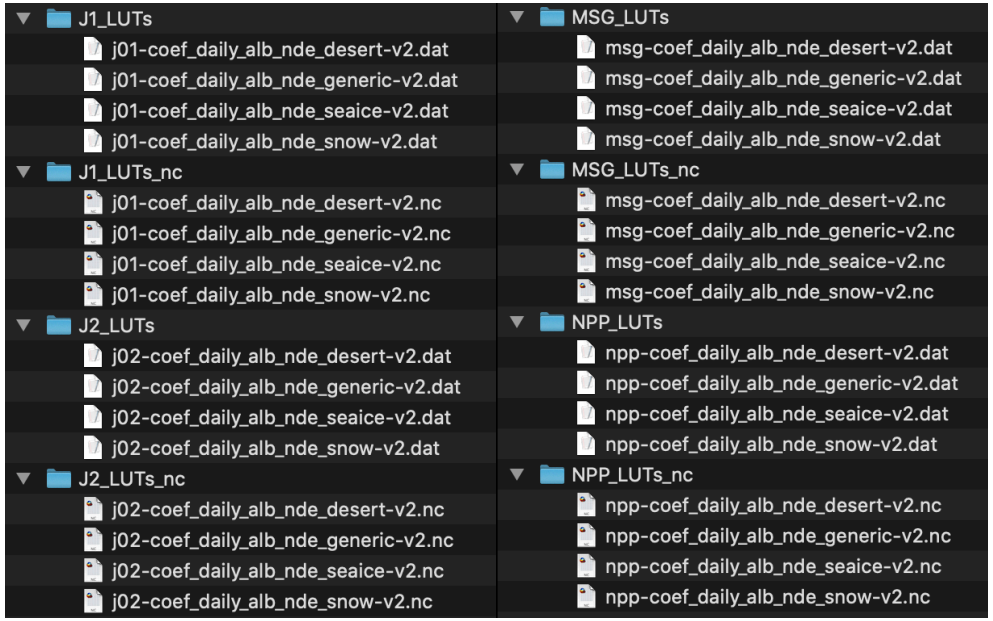
Effect of update: Climatology + algorithm

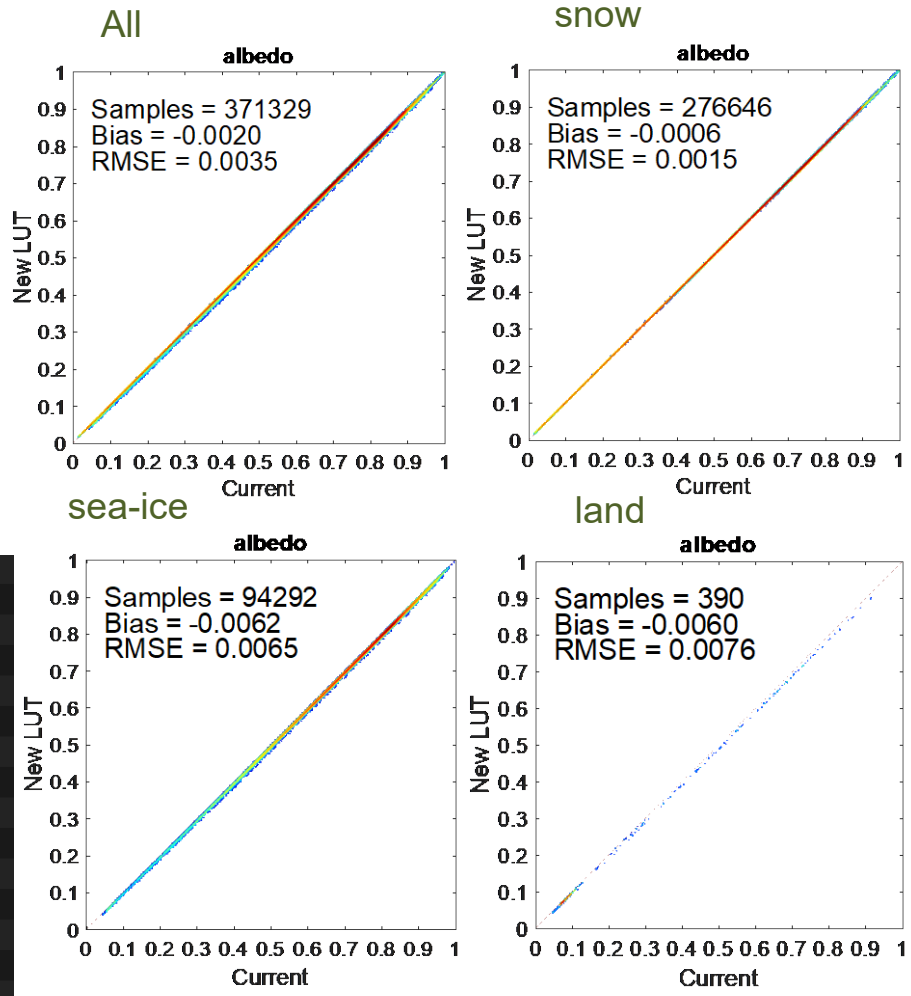


The update effect is as expected, which mainly shown on areas retrieved using snow and desert LUTs. Desert LUT is involved since 1) the snow mask does not cover cloudy-sky area; and 2) the snow surface was categorized as bare soil according to the operationally used AVHRR surface type. Genetic LUT (vegetation and urban area dominates) shows slight change which also happens in snow season.

Update of direct albedo LUTs of product portfolio

- Surface albedo LUTs fill and generation, including
  - J1 LUT nan-value fill
  - J2 sea-ice LUT generation
  - METimage Band conversion coefficients generation using the Spectral response function
  - METimage LUTs generation





- The J1 output was compared with the current operational output to confirm the valid retrievals are consistent

Draft code for VIIRS BDRF computation

Current status

- The first version of BRDF calculation was tested on NOAA server and generated expected output
- The core C++ code is for single tile BRDF calculation for fixed kernel combination under conditions with sufficient input data
- The code is called using a python script in which the tile ID and dates could be flexibly customized
- The output shows general consistency with VNP43 BRDF product (further validation result would be provided in monthly report)

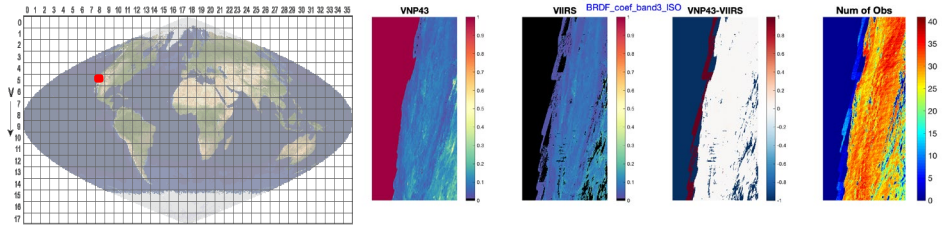
Ongoing improvements

- The backup algorithm is pending testing
- The multiple kernel combination version is pending development on the integral coefficients.
- The BRDF gap filling algorithm is pending development
- The albedo and NBAR algorithms are pending integration

BRDF output data content

BRDF_IP_2020337_h16v21.nc	BRDF_IP_2020337_h16v21.nc	Local File
BRDF_Parameter_Band1	BRDF_Parameter_Band1	2D
BRDF_Parameter_Band10	BRDF_Parameter_Band10	2D
BRDF_Parameter_Band11	BRDF_Parameter_Band11	2D
BRDF_Parameter_Band2	BRDF_Parameter_Band2	2D
BRDF_Parameter_Band3	BRDF_Parameter_Band3	2D
BRDF_Parameter_Band4	BRDF_Parameter_Band4	2D
BRDF_Parameter_Band5	BRDF_Parameter_Band5	2D
BRDF_Parameter_Band7	BRDF_Parameter_Band7	2D
BRDF_Parameter_Band8	BRDF_Parameter_Band8	2D
BRDF_QC	BRDF_QC	2D
Kernel_Selection	Kernel_Selection	2D
MeanVZA	MeanVZA	2D
NumObs	NumObs	2D

Sample Output data



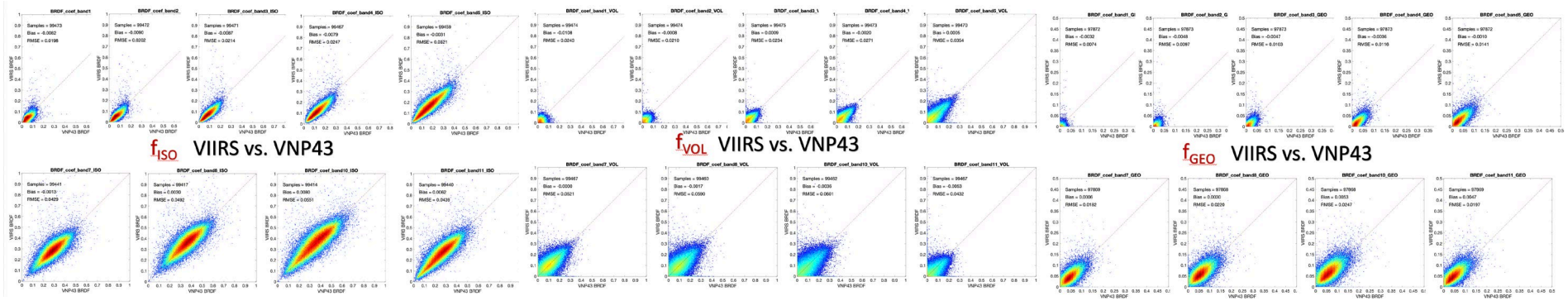
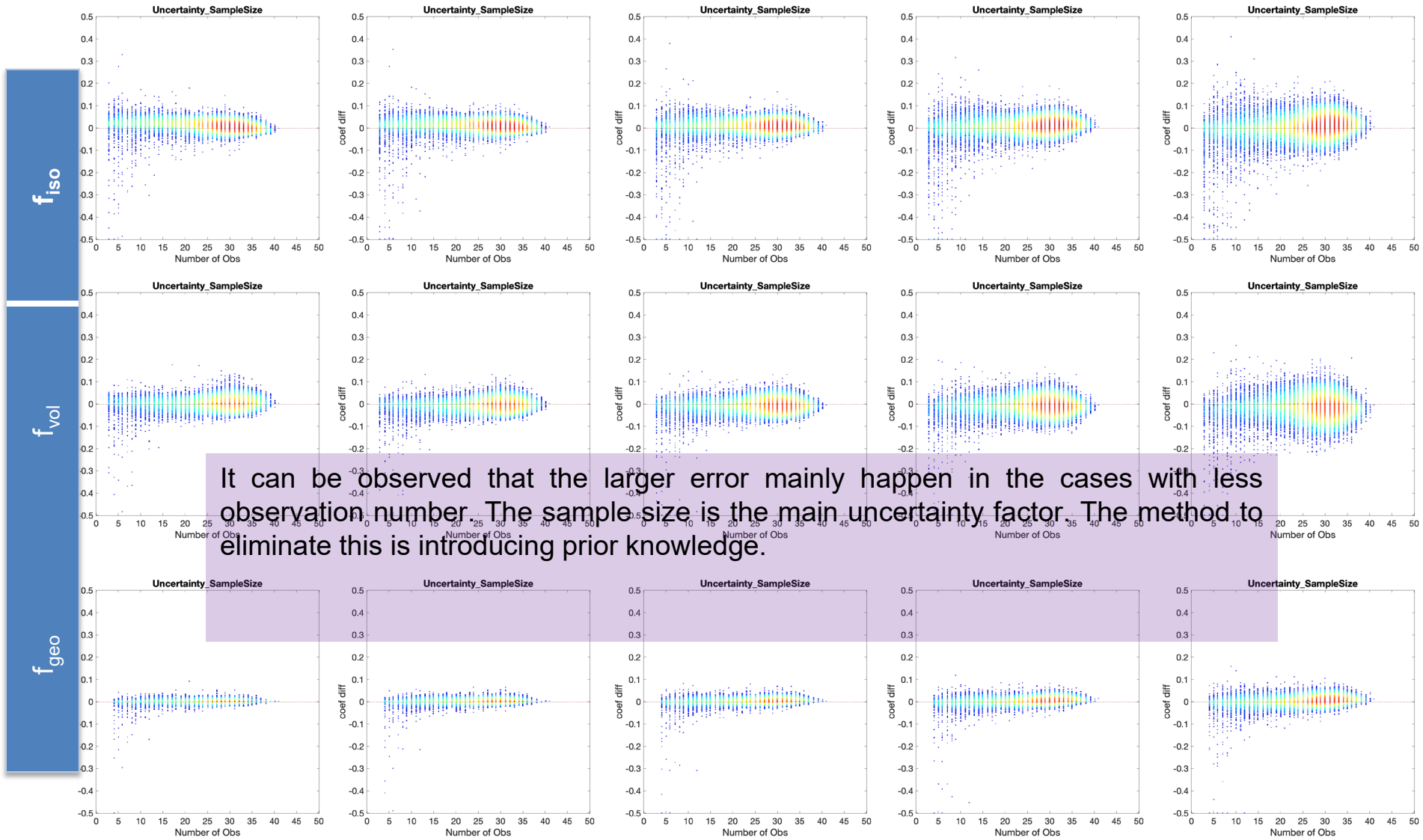


Figure . VIIRS BRDF vs. VNP43 BRDF under full retrieval conditions

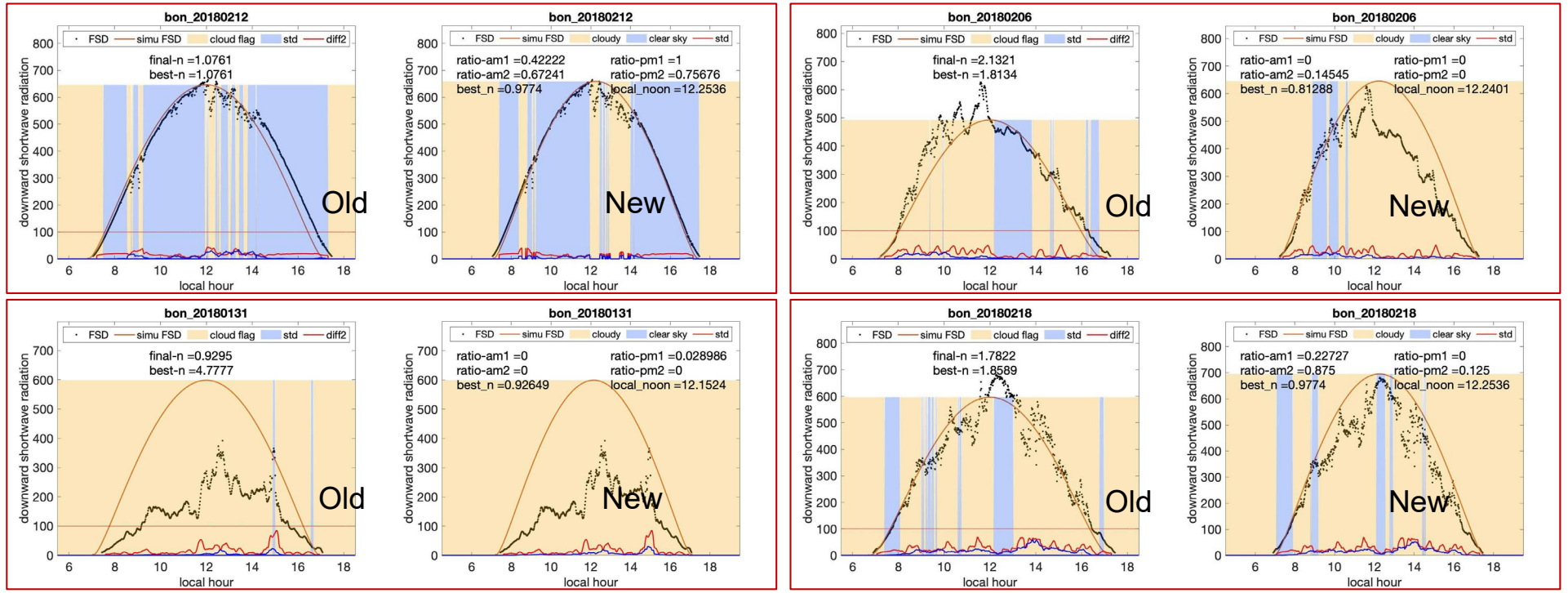
BRDF error with valid Sref observation number



It can be observed that the larger error mainly happen in the cases with less observation number. The sample size is the main uncertainty factor. The method to eliminate this is introducing prior knowledge.

in situ cloud detection algorithm improvement

- Motivation
  - Support the in-situ daily mean albedo calculation
  - Aim to add cloud flag into the standardized in situ dataset
- What have been modified
  - Downward radiation optimization improvement:
    - Change the local noon time from static value into a variable
  - Add handling of the exception cases
  - Adjust the post-processing thresholds
- Effect: The in-situ cloud mask becomes mature

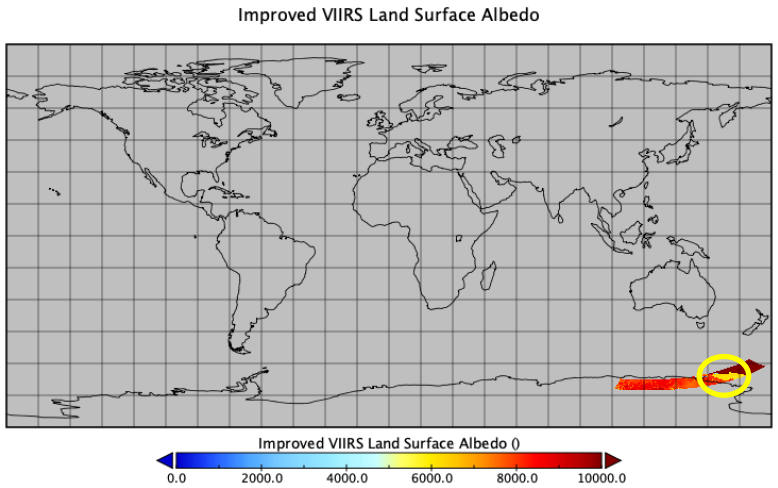


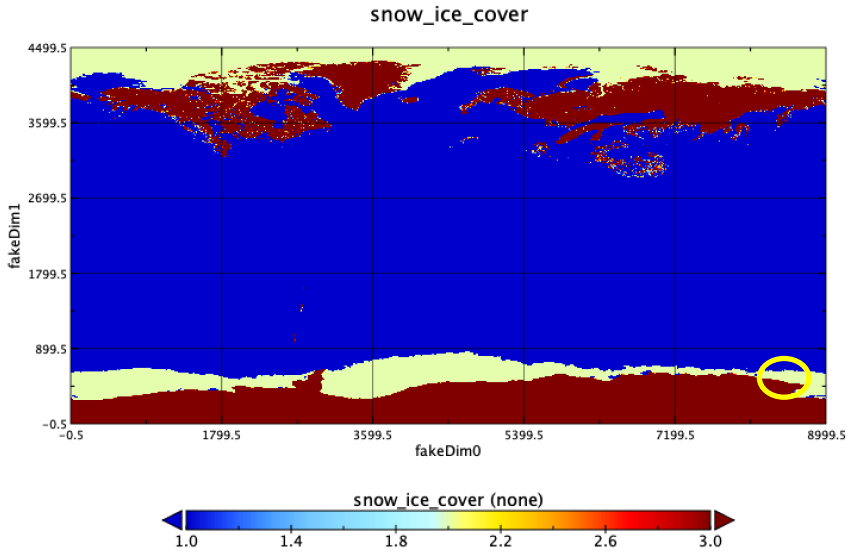
LSA Test Case Checking for DAP test

Background: One of the ASSISTT colleague found a test case of JPSS RR LSA that identified an area of sea-ice in a granule over the Antarctic while the Ice Concentration product identified no ice in the same area. The land mask identified the area as ocean. Further checking is requested to check if it is correct.

The granule that was used for this test case was from the J01 satellite with the timestamp: 01_d20191105_t0506557_e0508202_b10170

Conclusion: The sea-ice albedo range looks normal and identical as the IMS ice mask. Note that IMS is deployed as our first ice mask in FY20 DAP. If IMS is unavailable, then NWP and then VIIRS ice would be used. It was confirmed that the case result is correct.





NDE Vegetation Product System (NVPS)
Vegetation Index (VI) & Green Vegetation Fraction (GVF)

April/ May 2021

Accomplishments / Events:

- Delivered an optimized NVPS VI & GVF J2 ready DAP v3.0 to ASSITT with a number of significant improvements over the operational NVPS VI & GVF. GVF run time reduced from about 4 hours to about 1 hour.
- Verified the daily surface reflectance of the new GVF version 3.0 with the original daily SR and found very small difference between them
- Verified the GVF version 3.0 with the previous version and found very small difference between them.
- Produced experimental GOES-R vegetation index data from one hour, one day, and three days of BRF input.
- Evaluated impact of updated surface reflectance on VI and GVF. I&T surface reflectance was identical to operational surface reflectance, so no impact is expected.
- Preparation for and initial contact with Lapenta intern

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			

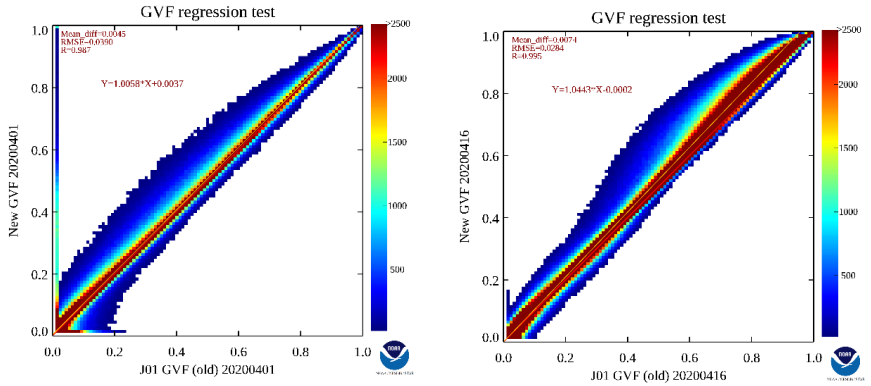
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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	
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	02/28/21	
Software optimization update	Apr-21	Apr-21	05/17/21	Additional testing
Final J2 ready DAP to ASSISTT	Jun-21	Jun-21		
Annual algorithms/products performance report	Aug-21	Aug-21		
SNPP and NOAA-20 product calibration and validation	Sep-21	Sep-21		
Experimental blended data developed	Sep-21	Sep-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		

Highlights:



- Consistency is good between new, more efficient GVF version 3.0 and current operational GVF.

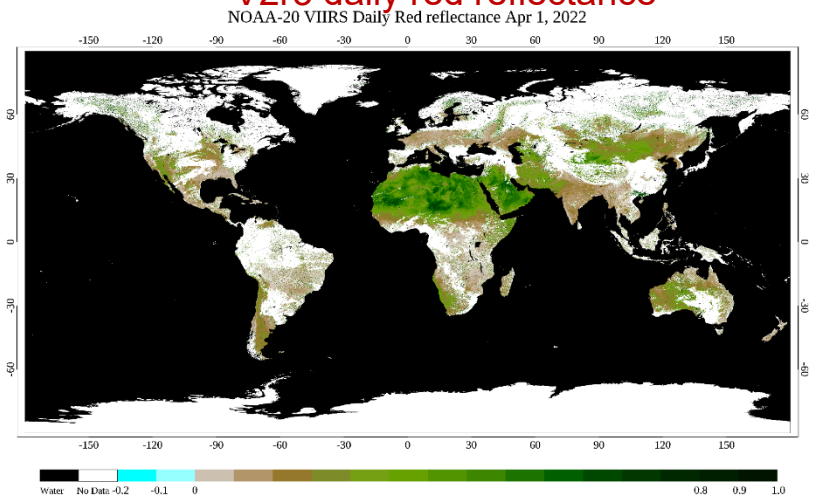
J2 Ready NVPS VI & GVF DAP delivery

- This DAP version 3.0 includes optimized GVF and VI codes, the updated documents, and 16-day testing data from SNPP and NOAA-20 observations.
- VI and GVF algorithm implementations in this DAP are enterprise for SNPP, NOAA-20, and NOAA-21.
- GVF version 3.0 code has been optimized in three aspects over operational GVF version 2.3: (1) by using gridded surface reflectance intermediate data from VI processing rather than performing this gridding for GVF separately; (2) changing original single-thread implementation into multi-thread; (3) substituting land masks for original water masks to reduce the repeated logical judgements in loop operations.
- VI version 3.0 code has been optimized in three aspects over operational VI version 1.4: (1) first performing daily aggregation, then doing 8-day composition, finally doing 16-day composition based on previous two 8-day compositions; (2) changing original single-thread implementation into multi-thread; (3) substituting block land masks for tile-based water masks to reduce the repeated logical judgements in loop operations.
- The updated GVF reduces the processing time from 4+ hours in operational GVF to 2- hours per run; The updated VI reduces the processing time from 7+ hours in operational VI v1.4 to 3- hours per run.
- Regression analyses have testified the updated GVF and VI are consistent with the corresponding operational GVF & VI.
- Updated codes and documents were delivered to ASSITT on May 17 of 2021.

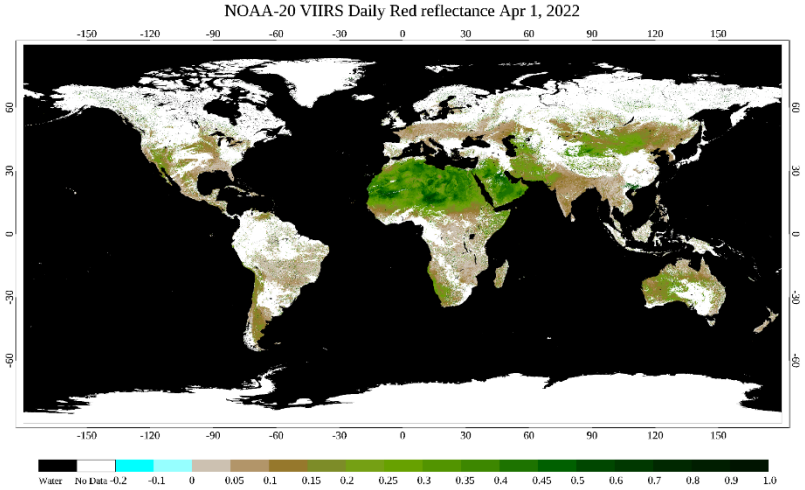
Verification of daily SR of GVF version 3.0

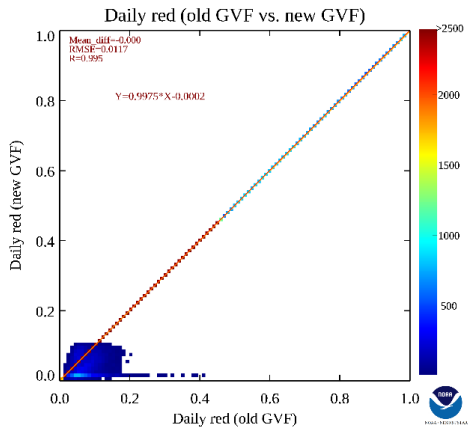
- The V3r0 GVF daily surface reflectance is very close to the V2r3 GVF daily surface reflectance (RMSE=0.01, R=0.99)
- The small difference is mainly from the high latitude areas with multiple daily orbit observations, which is expected

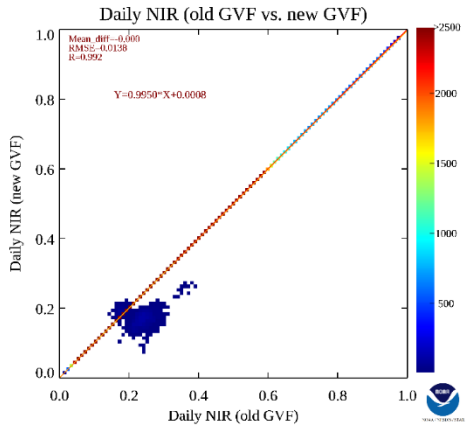
V2r3 daily red reflectance



V3r0 daily red reflectance



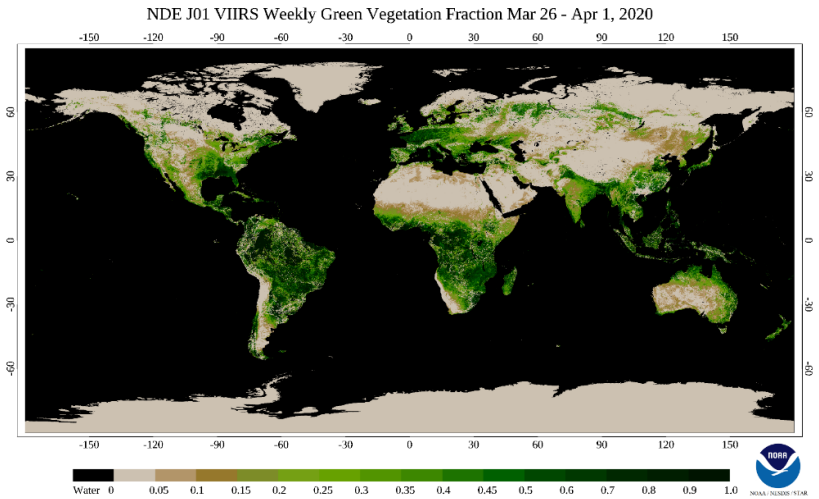


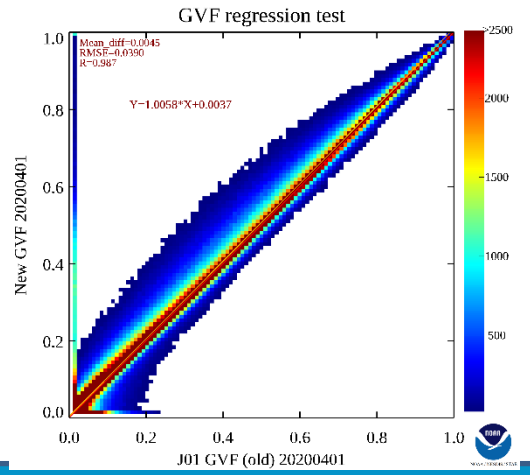


Verification of GVF version 3.0

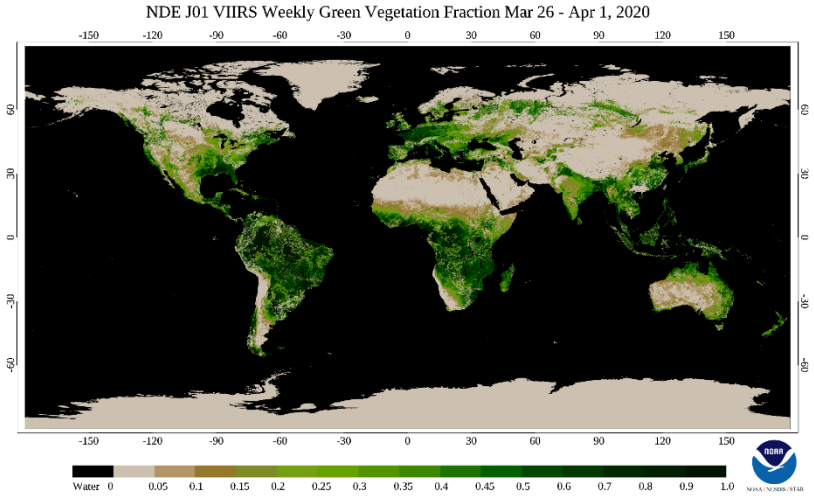
- The V3r0 GVF share the daily surface reflectance with the VI system, which saved 2 hours of processing time compared with the previous version
- The V3r0 GVF is very close to the V2r3 GVF daily surface reflectance (RMSE=0.04, R=0.98)

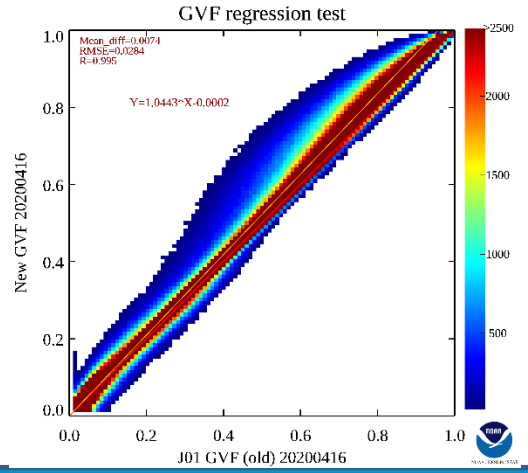
V2r3 NOAA-20 GVF





V3r0 NOAA-20 GVF





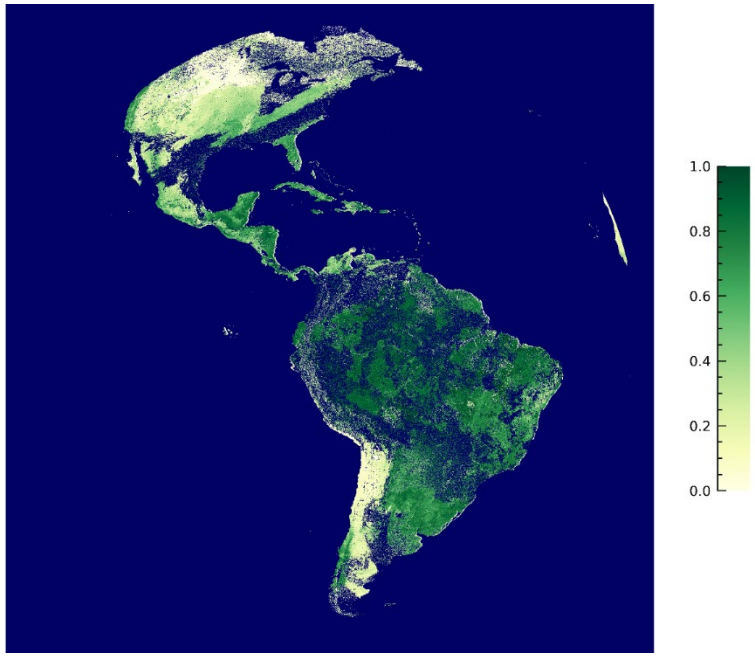
VIIRS and GOES-R band comparison and GOES-R VI calculation methods

- VIIRS Vegetation Index and Green Vegetation Fraction are calculated from bands M3, I1, and I2
- GOES-R ABI bands 1, 2, and 3 are very similar to M3, I1, and I2 respectively
- VIs were calculated from GOES-R band 1, 2, 3 BRFs
- Compositing was performed for single days and three days (all test data available) keeping maximum VI

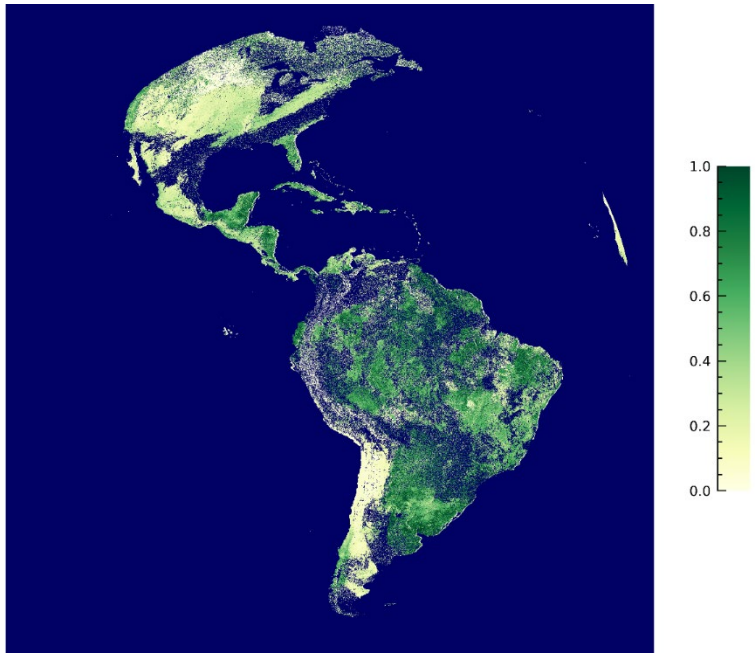
VIIRS band	Wavelength	Resolution	GOES-R ABI band	Wavelength	Resolution
M3	0.49μm	750m	1	0.47μm	1km
I1	0.64μm	375m	2	0.64μm	0.5km
I2	0.865μm	375m	3	0.86μm	1km

GOES-R VI for 20190315 (maximum VI composite)

NDVI

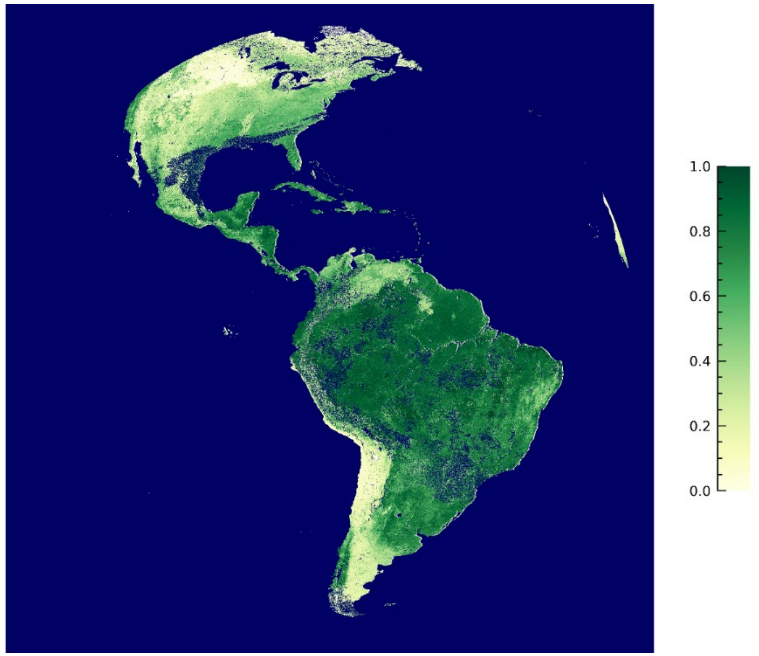


EVI



GOES-R VI for 20190315-20190317 (maximum VI composite)

NDVI



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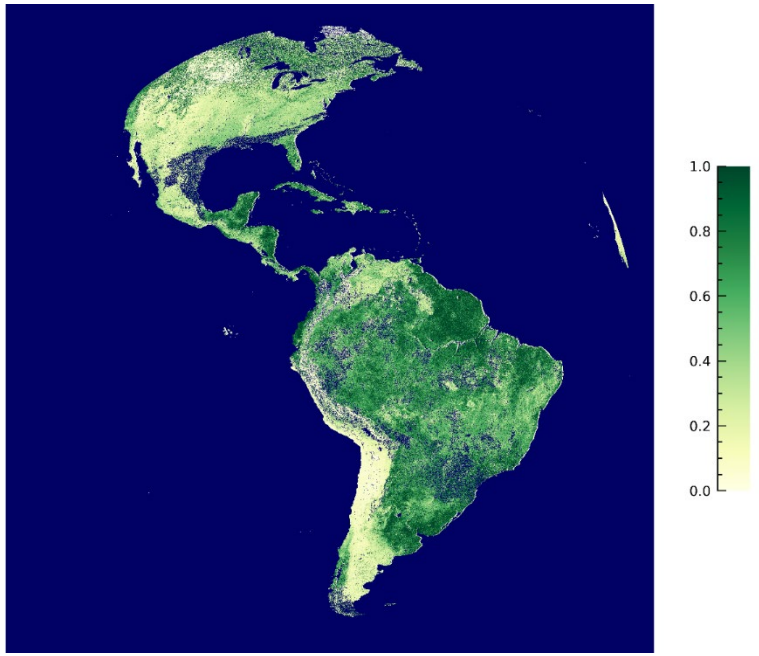
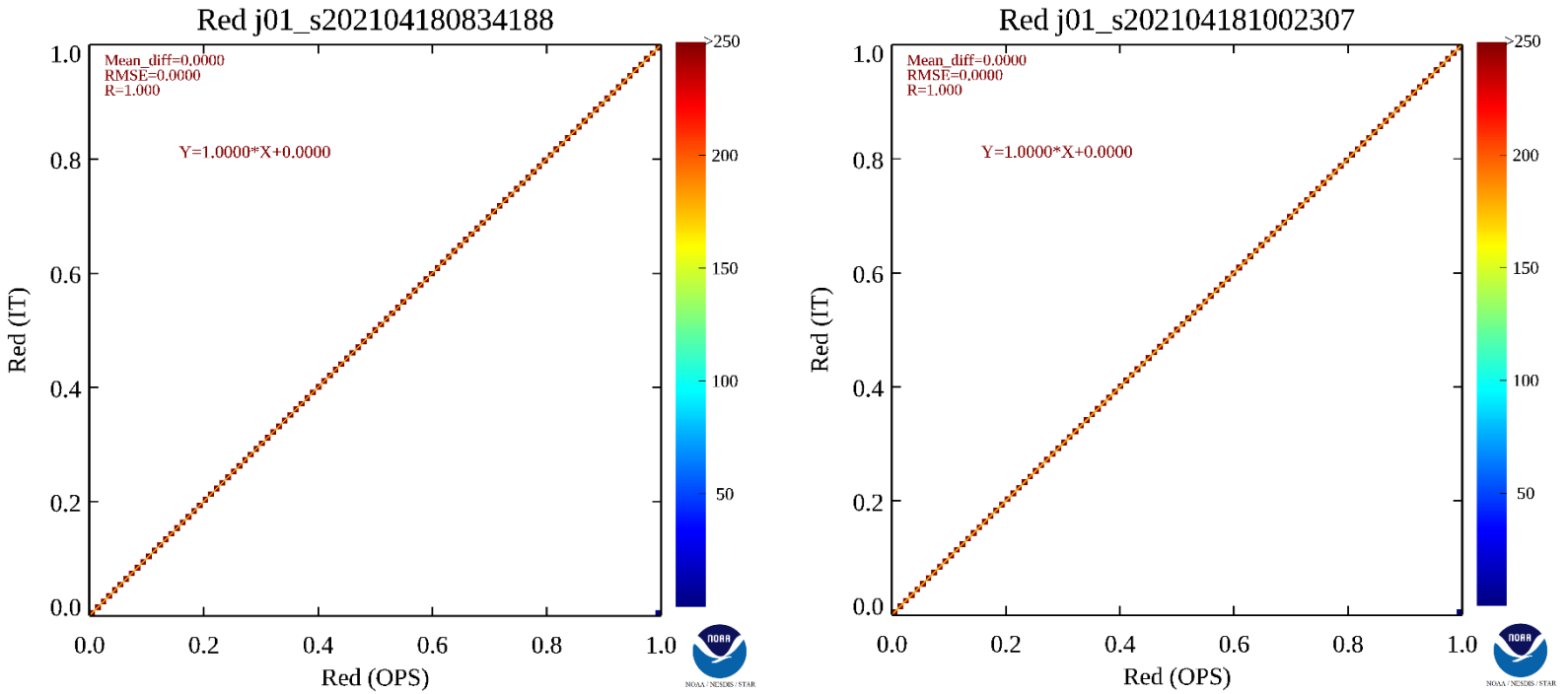


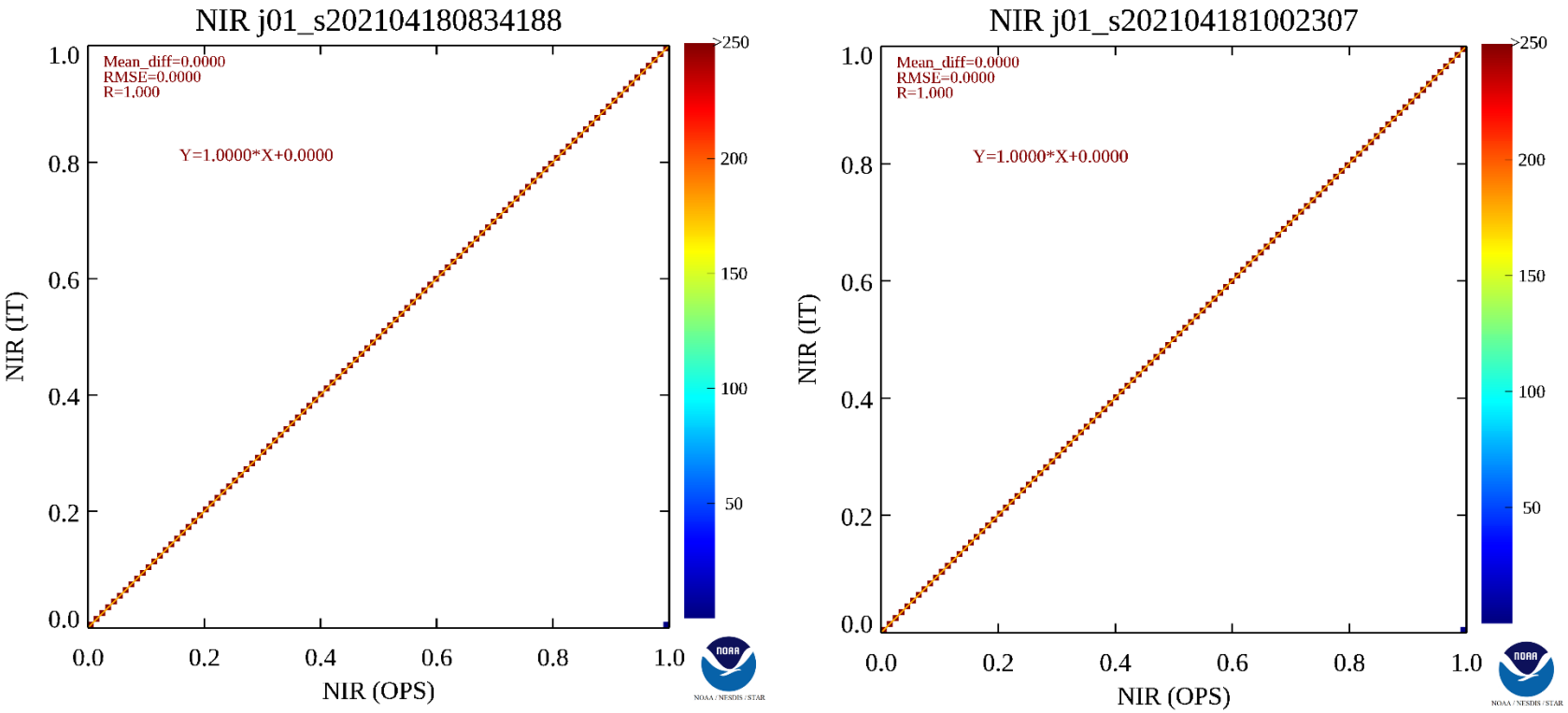
IT-OPS red reflectance comparison

- VI and GVF use only red, near-infrared, and blue reflectance.
- These reflectances were found to be exactly the same between operational and I&T versions, as illustrated by this slide and the following two slides.



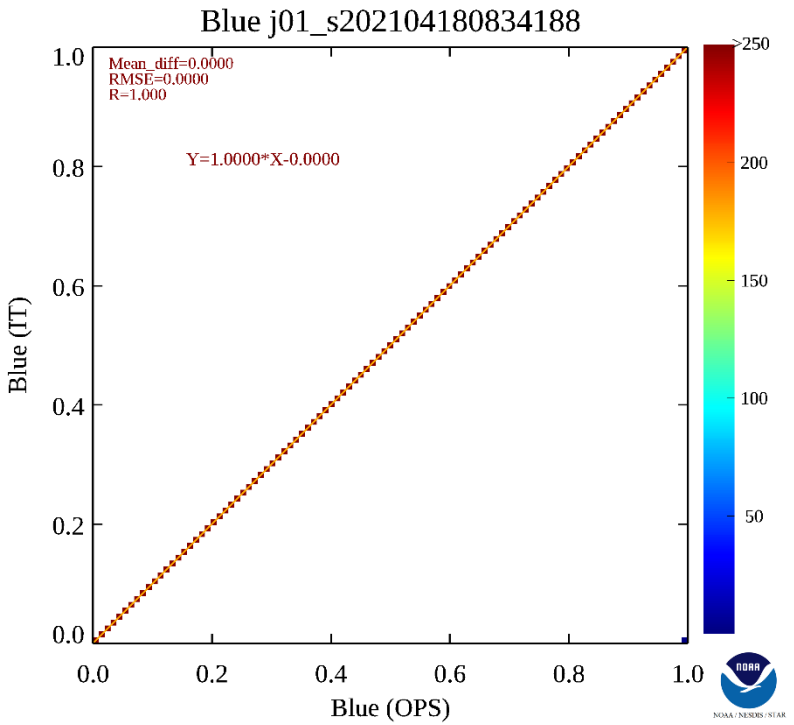
- The I&T SR is exactly the same as operational SR data

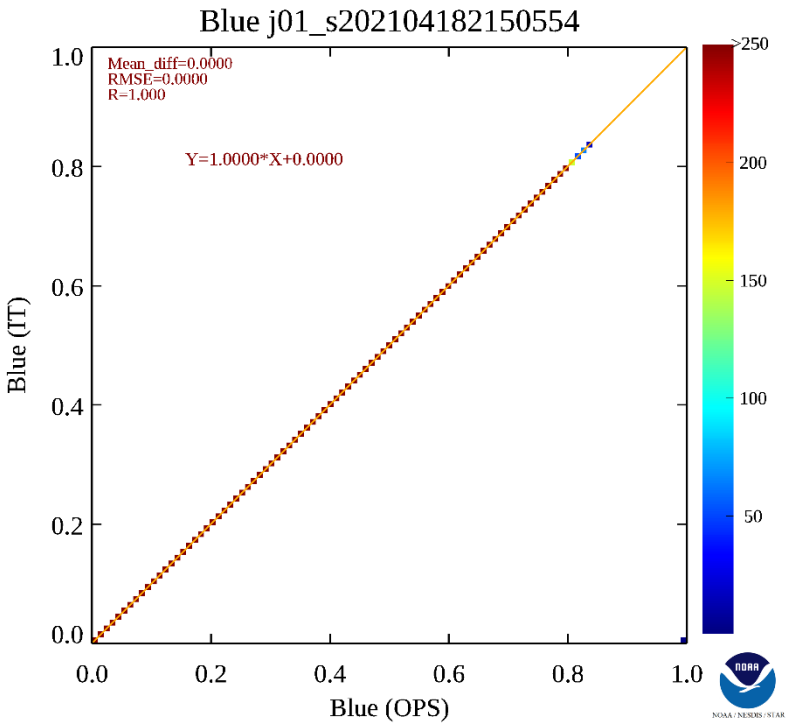
IT-OPS NIR reflectance comparison



- The I&T SR is exactly the same as operational SR data

IT-OPS blue reflectance comparison





- The I&T SR is exactly the same as operational SR data

Vegetation Health

April/May, 2021

Accomplishments / Events:

- Further helped NDE with latency issue, to compare their newly generated weekly data with our weekly data, to validate their solution works;
- After further three rounds of revision, the re-compositing paper has been formally accepted (Highlighted);
- Generated new locust-VH data based on 9-year S-NPP climatology, compared with similar data based on pseudo 36-year S-NPP climatology, identified former problems.
- Worked on revising the Cal-Val plan;
- Generated a series of data and figures of VIIRS/VHP-1 and -4, -16 km resolution products, covering April and May 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			

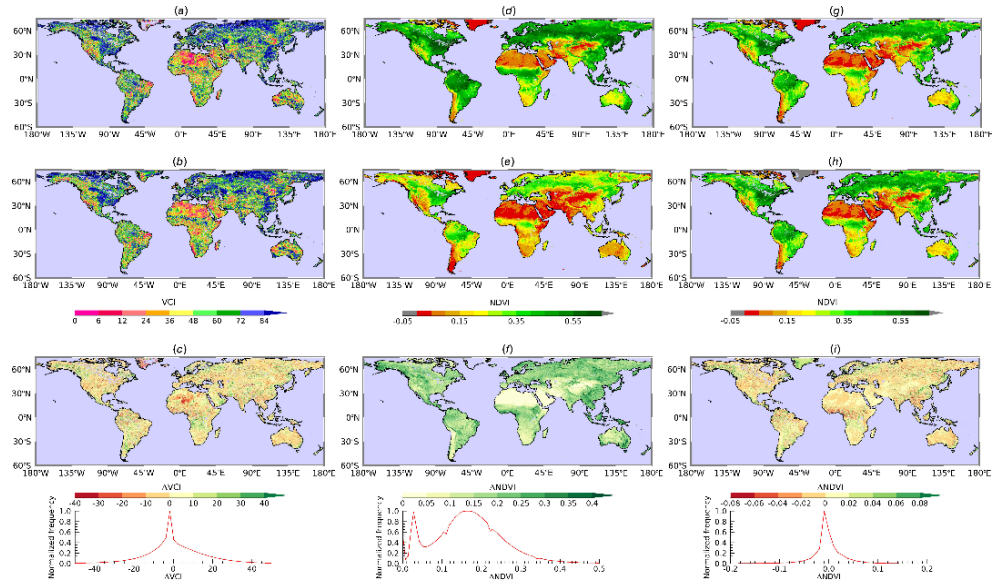
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

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 J2 ready DAP to NDE (include NPP/N20 updates)	Apr-21	Jun-21		N20 final DAP
Final J2 ready DAP to ASSISTT	Jul-21	Sep-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Feb-22		
Update 1 km VH data for OSPO, USDA, NIDIS	Sep-21	Sep-21		
VIIRS-0.5 km SMN & SMT (8-year Max-Min Climatology)	Sep-21	Sep-21		
40-year Vegetation Greenness (MDVI) & Global warming	Sep-21	Sep-21		
Climate warming & temperature (SMT) in agricultural regions	Sep-21	Sep-21		
FAO locust activity vs VHindices in 2021	Sep-21	Sep-21		
NDVImax/min & BTmax/min: 0.5 and 1 km correlation	Sep-21	Sep-21		
Regional drought and global warming trends	Sep-21	Sep-21		
Algorithm: VHindices-Locust (Africa, Arabia & India)	Sep-21	Sep-21		
Algorithm: VHindices-Malaria (South America)	Sep-21	Sep-21		
VHindices vs Locust (Africa, Arabia & India) 2020 & 2019	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights: Demonstration of Re-Compositing



Ocean Color

April/May, 2021

Accomplishments / Events:

- The Report for Dedicated JPSS VIIRS Ocean Color Calibration/Validation Cruise September 2019 is now available at NOAA Library! It can be accessible online at https://repository.library.noaa.gov/view/noaa/28881
- M269 data after post-calibration has been posted. Lw1 for water leaving radiances (using top and middle arm) was used until March 5, 2020 when part of the optical train for the middle arm was flooded. We found the cause of the flooding and have added a new step in our pre-deployment routine to check for possible leaks.

Overall Status:

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

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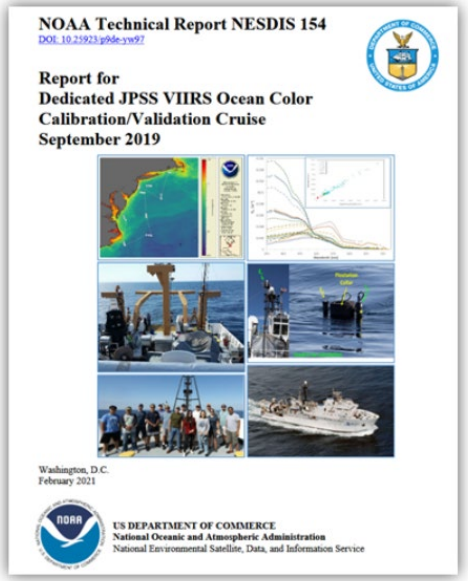
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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		
Complete testing/verification of J-2 OC data processing	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		
Working on improvement of the ocean color data processing system (MSL12), particularly over global coastal and inland water regions	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		
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		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights: *New Report with detailed information regarding JPSS and Suomi-NPP Ocean Color Data*



Sea Surface Temperature

April/May, 2021

Accomplishments / Events:

- Oral presentation “Algorithmic Improvements and Consistency Checks of the NOAA Global Gridded Super-Collated SSTs from Low Earth Orbiting Satellites (ACSPO L3S-LEO)” presented at the Ocean Remote Sensing Conference, conducted as a part of the “SPIE Defense + Commercial Sensing” Symposium from 12-16 April 2021. Corresponding extended abstract paper published
- The focus is on two algorithmic updates to improve SST imagery and mitigate cloud leakages, and on checking how the L3S-LEO product reported 4 times daily (PM, derived from NPP/N21 VIIRSs and AM derived from Metop-A/B/C AVHRRs, each reported twice daily) capture the diurnal cycle (see Figure)
- There is a good agreement between GEO and LEO SSTs is good, both qualitative and even quantitative. The shape of the diurnal cycle is close but offset by 0.1 K
- Why this is important: GEO provides full diurnal cycle but in a limited domain. The LEO product is global, but does not resolve diurnal cycle. We plan to bring the L3S-LEO and GEO products together and produce an L3S, which will be global (advantage of LEO) and resolve full diurnal cycle hourly (advantage of GEO)

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	Jun-21		ACSPO 2.80
ACSPO 2.90 DAP to ASSISTT	Aug-21	Aug-22		ACSPO 2.90
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Dec-21		
Improved clear-sky mask, SST fronts) to support data fusion (ACSPO 2.90)	Aug-21	Aug-21		
J2 ACSPO and Cal/Val Readiness	Sep-21	Sep-21		
Support N20/NPP SST Cal/Val & fixes	Sep-21	Sep-21		
Continue archival w/PO.DAAC/NCEI. Work w/NCEI to complete holdings	Sep-21	Sep-21		
Maintain SQUAM, *i*Quam, ARMS, match-up codes, RAN infrastructure. Improve & optimize	Sep-21	Sep-21		
NOAA SST Cal/Val Tools ready to monitor N21 SST	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Overall Status:

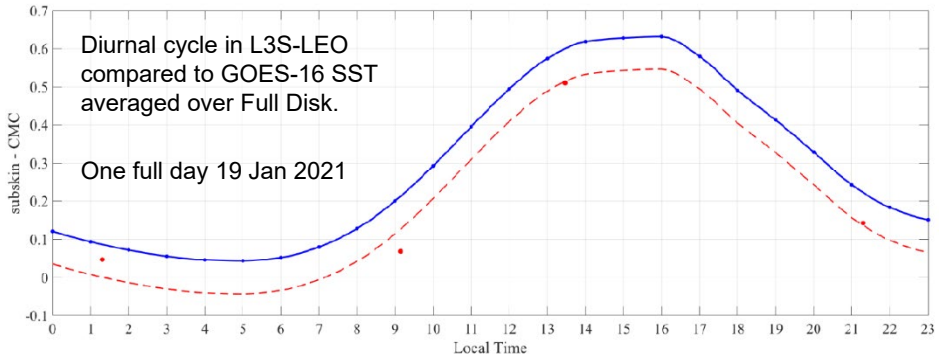
	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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:



Red dots: Four L3S-LEO SSTs (corresponding to 9:30am/pm & 1:30 am/pm)
Blue line: Diurnal Cycle in GOES-16 SST (1hr resolution) averaged over the full disk
Red line: Blue curve offset by ~0.1 K to pass through the red points (on average)

The L3S-LEO well reproduces the diurnal cycle in GEO SST except is offset by 0.1K. Work is underway to understand the root cause of the bias and mitigate

VIIRS Polar Winds

April/May, 2021

Accomplishments / Events:

- The 15th International Winds Workshop was held in April 2021. NWP centers showed once again that the various polar winds products have a positive impact on numerical weather prediction, particularly on a per-observation basis
- "Tandem" NOAA-20/S-NPP AMVs now being routinely produced via STAR/ASSISTT's Enterprise Framework 2.0 at CIMSS. This provides cloud motion wind observations over both the Arctic and Antarctic in near real-time..
- Held FY22 Polar Winds PMR on 13 May 2021
- New VIIRS wind products have been derived from VIIRS M11 (2.2 um) band

Overall Status:

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

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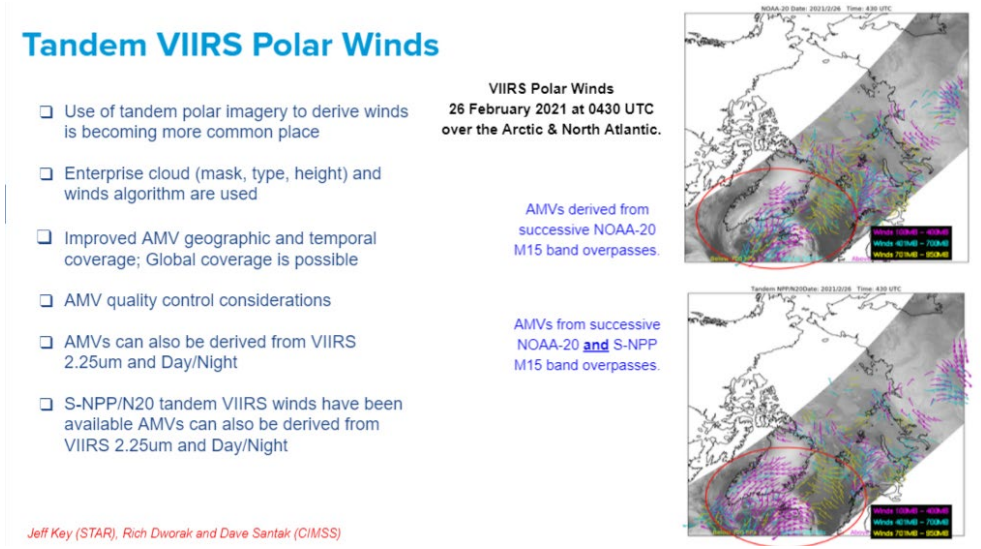
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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
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		
Implementation of the shortwave IR (2.25 μm) band winds	Sep-21	Sep-21		
Adapt QC method designed for winds derived using optical flow from image pairs to VIIRS tandem winds	Sep-21	Sep-21		
Assess the use of cloud heights derived from LEO hyperspectral sounders (CrIS, IASI)	Sep-21	Sep-21		
Collaborate with NWP community on model assimilation and impact studies	Sep-21	Sep-21		
Continue to improve products monitoring capability	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights: Tandem VIIRS winds in STAR/ASSISTT Enterprise Framework 2.0 at CIMSS significantly increasespolar wind observations in near real-time



NUCAPS Products

April/May 2021

Accomplishments / Events

- Continued work on (1) NUCAPS versions for mission-long reprocessing, (2) SARTA RTA updates for implementing Ammonia retrievals, (3) MW fast-model for the IASI-NG augmentation, (4) verifying NUCAPS retrievals with CLIMCAPS and O3SNDS over the Antarctica Plateau during summer to spring transition, (5) impact of using the reconstructed radiances in NUCAPS retrievals, (6) emissivity model improvements, (7) rigorous statistical comparison tests with NPROVS team, (8) system design and wrapper scripts for routine evaluations of NUCAPS trace gas products against other satellite data sources (e.g. Sentinel TROPOMI, OCO-2, etc.), (9) GML-NESDIS collaborations on trace gases, ozone and water vapor themes.
- As part of GML-NESDIS trace gas theme, developed a merged data set for a 3-way statistical analysis of the NUCAPS and CarbonTracker CO2 versus ATom GML truth collections (see Figure).
- Team members also worked on the *BAMS* manuscript revisions based on reviewers' recommendations, "Utility of Satellite Retrievals of Atmospheric Profiles in Detecting and Monitoring Severe Weather Events at NOAA" *(Kalluri et al.)*.

Overall Status:

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Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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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
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	
Final J2 ready DAP to ASSISTT	May-21	May-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		
Improve trace gas retrievals	Sep-21	Sep-21		
Explore the use of alternate technologies for certain NUCAPS modules such as AI-based bias tuning and regression	Sep-21	Sep-21		
Collection of validation data sets and collocated matches of satellite radiances and ancillary data sets for product validations and monitoring	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights:

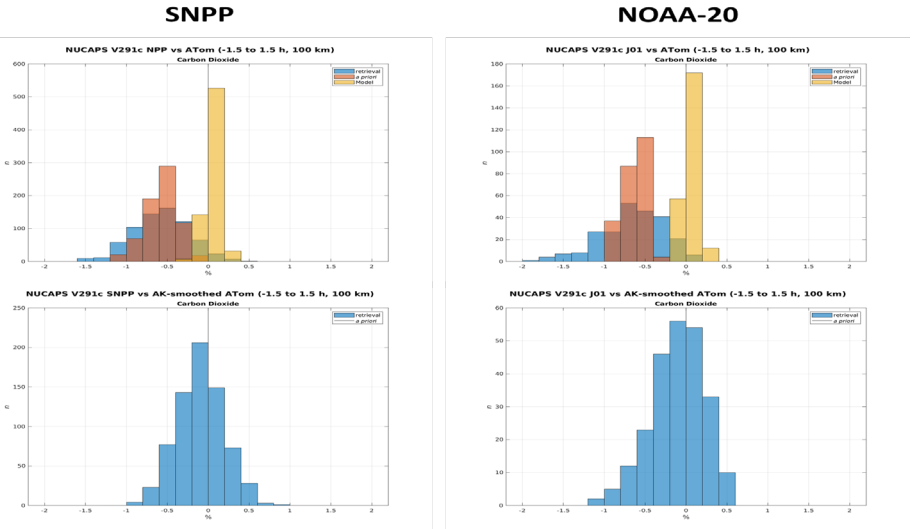


Figure: 3-way histogram comparisons of CO2 versus GML ATom aircraft data (%), (blue) retrievals, (red) *a priori*, and (gold) GML CarbonTracker; the bottom plots show the retrievals with AKs applied. CarbonTracker agrees well with Atom, revealing CarbonTracker to be a good asset for global NUCAPS CO2 validation, *a priori*, tuning and routine monitoring.

MiRS Products

April/May, 2021

Accomplishments / Events:

- Currently testing a machine learning approach to estimating the MiRS retrieval error in sea surface temperature (Tskin). Satellite data from GPM/GMI were used, although work is also underway using ATMS data, with similar results expected. A deep neural network (2 layers, 200 nodes/layer) was trained to predict the MiRS-ECMWF difference in SST. This estimated error can be used to correct the original retrieval. Training data was from 2021-04-10, independent testing data were on 2021-04-20. Results show significant improvement of the corrected SST retrievals compared to the original retrievals. The error standard deviation was reduced from 2.9 K to 1.2 K. 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			

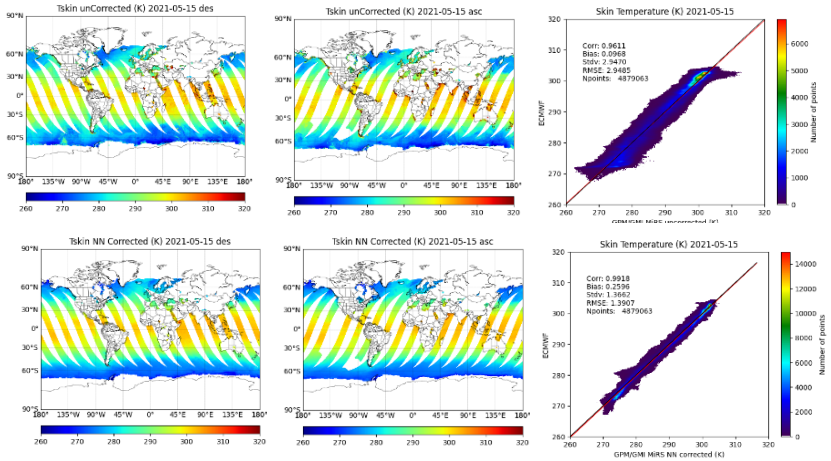
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
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
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Jan-22		
Integrate SFR updates	Jun-21	Jun-21		
AI based radiometric bias correction	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		
ATMS SDR reprocessing data verification	Sep-21	Sep-21		
Algorithm maintenance and monitoring	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights:



Results from a neural network trained to predict MiRS GPM/GMI SST (Tskin) retrieval errors, which are then used to correct the original operational retrieval. Case shown is from 2021-04-20. Top row shows original retrievals and comparison with ECMWF analysis. Bottom row shows corrected retrievals and comparison with ECMWF.

Snowfall Rate

April/May, 2021

Accomplishments / Events:

– A new S-NPP Snowfall Detection (SD) model has been developed using machine learning (ML) technique. The training dataset consists of over one million records of collocated ATMS measurements, ground observations, and GFS parameters. Below is a comparison of the ML SD model (DNN) and the current operational SD model (LR).

	T2m>-15°C		T2m<-15°C		All Data	
	DNN	LR	DNN	LR	DNN	LR
Probability of Detection	90.5%	80.9%	76.6%	N/A	89.0%	N/A
False Alarm Rate	14.5%	31.4%	17.7%	N/A	15.8%	N/A
Heidke Skill Score	0.754	0.496	0.535	N/A	0.735	N/A

The comparison is separated by 2 m temperature (T2m) because snowfall is challenging to detect under cold conditions (e.g., T2m<-15 °C). The ML model significantly outperforms the current model. The SFR team is developing NOAA-20 ML SD algorithm and will update the J2 SD model based on this effort. The ML SD algorithms, along with other updates, will be implemented in the enterprise SFR system and delivered to the MiRS team in June 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			

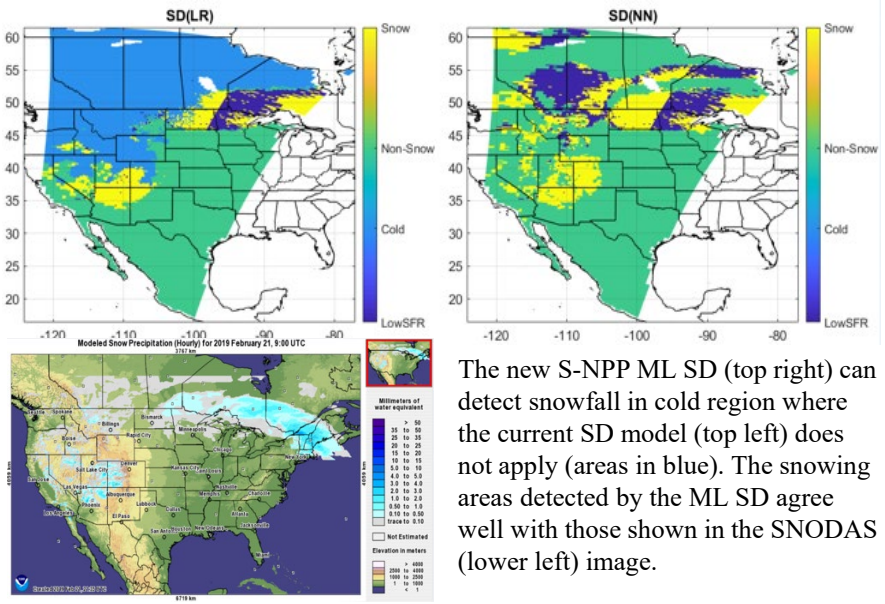
1. *Project has completed.*
2. *Project is within budget, scope and on schedule.*
3. *Project has deviated slightly from the plan but should recover.*
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	
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
Final J2 ready DAP to ASSISTT	Jul-21	Jul-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		
Deliver updated SFR package (for JPSS-2, NOAA-20, and S-NPP) to MiRS team for integration	Jun-21	Jun-21		11/20/20 SFR package to MiRS
Explore AI-based snowfall detection	Sep-21	Sep-21		
NOAA-20 and S-NPP cross-calibration/comparison	Sep-21	Sep-21		
Algorithm maintenance and monitoring	Sep-21	Sep-21		
Annual algorithms/products performance report	Sep-21	Sep-21		

Highlights: *Machine Learning Improves Snowfall Detection*



The new S-NPP ML SD (top right) can detect snowfall in cold region where the current SD model (top left) does not apply (areas in blue). The snowing areas detected by the ML SD agree well with those shown in the SNODAS (lower left) image.

OMPS Ozone

April/May, 2021

Accomplishments / Events:

- The V8Pro Validated Maturity Briefing was conducted 5/27/2021. An improvement beyond the required performance was identified – better bandpass modeling for the as-interpolated channels – and new tables are under development
- The V8TOz and V8TOS algorithms with updates to handle J02/NOAA-21 OMPS NM SDRs were delivered to NDE.
- Operational NDE OMPS V2Limb products now have acceptable latency.
- CAC Badge renewals and related updates did not proceed as smoothly as we would like. Contractors lost some amount of access to machines and systems for as many as five work days.

Overall Status:

	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X	←		Ozone Profile agreement between S-NPP * NOAA-20 has been achieved. See below.

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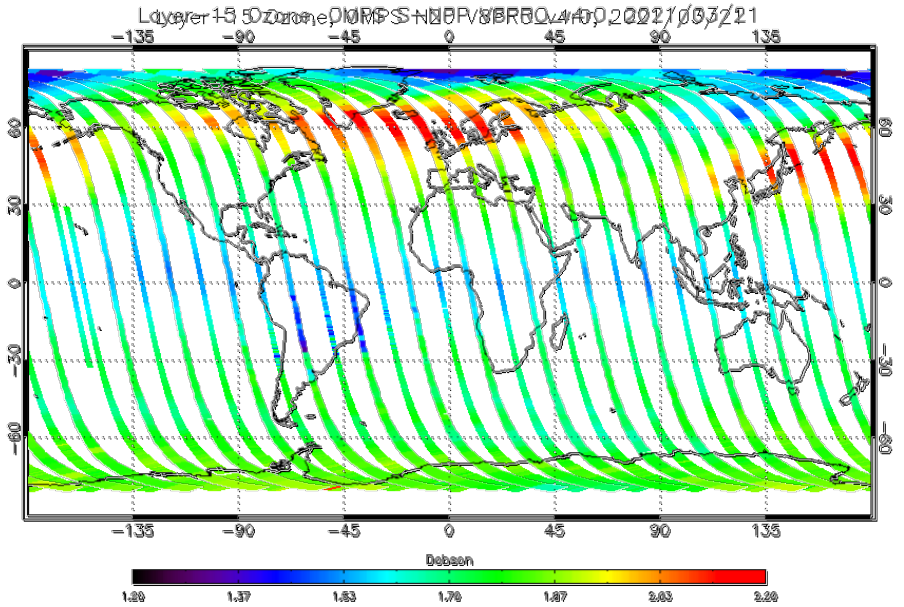
4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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	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		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: Overlay of NPP/N20 Layer 15 Ozone for 3/21/21



OMPS Ozone (V8Pro, V2Limb & V8TOz) Milestones

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.	Jun-21	SDR Data sets will not be available until at least September
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	
Complete rehosting of CloudRR algorithm at STAR	Aug-21	

GCOM-W1 Products

April/May, 2021

Accomplishments / Events:

- Annual PMR held, including FY22 ramp up request and justification for GOSAT-2 AMSR3.
- Algorithm updates to ASSISTT for planned GAASP updates in FY21
  - RR and SSW in progress
- Continued product O&M
- Meeting with NASA GPM team on May 4, which included and update on the rain rate EDR (GPROF2017) (See highlights)
- Presentation at May JSTAR team leads on the updated RR EDR
- Keeping abreast of GOSAT-2 AMSR3 activities so plans can be developed for use at STAR
- Ralph Ferraro retiring from STAR on June 30; Huan Meng will take over as AMSR precipitation EDR lead; Jeff Key will assume project deputy role.

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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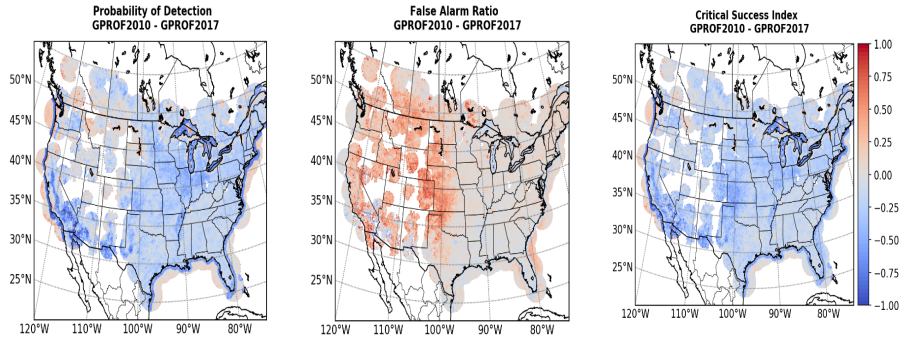
Issues/Risks:

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	Sep-21		
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	Aug-21		
Reprocess mission data set	Sep-21	Sep-21		
Technical Information Meeting between NOAA and JAXA	Sep-21	Sep-21		
Annual report on AMSR2 algorithms and data product performance	Sep-21	Sep-21		

Highlights:

Improvements in Detection Metrics Relative to GPROF-2010v3
CONUS, L2 Products, 2017



Blue colors indicate improvement made by GPROF2017

Red colors indicate improvement made by GPROF2017

Blue colors indicate improvement made by GPROF2017

NOAA Products Validation System (NPROVS) and Environmental Data Record (EDR) Long Term Monitoring (LTM)

April/May, 2021

Accomplishments / Events:

- Held FY22 NPROVS/EDR LTM PMR on 14 May 2021
- Expanding GNSS-RO Data in NPROVS
  - Currently, data (profiles) for COSMIC-2 from UCAR, GRAS from MetOp and KOMPSAT (Korea), are routinely accessed and collocated with radiosonde. To this we are working to add preliminary COSMIC-2 profiles (data) currently processed by STAR in a Test mode (Shupeng Ho).
  - expanding the GRAS data to include "reprocessed" (60-day delay) products targeted for Climate; currently, only the initial "nrt" product is stored; both sets will be retained in NPROVS.
  - Processing experimental (Kursinski, PlanetiQ), NWP-independent H20 vapor profiles for C2; these in fact consider NWP Temperature but not the moisture as done in existing (UCAR and STAR) 1d-var retrieval

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		
NPROVS				
Support NUCAPS / MiRS EDR soundings for NPP, NOAA-20 and MetOp-C; COSMIC-2, ...	Aug-21	Aug-21		
Manage JPSS dedicated radiosonde program (ARM, AEROSE, ...), expand to store SDR (GSICS)	Aug-21	Aug-21		
Support AWIPS- NUCAPS initiatives and case studied demonstrating NUCAPS value to users	Aug-21	Aug-21		

*Highlights: NPROVS now includes UCAR **and** STAR experimental COSMIC-2 Products*

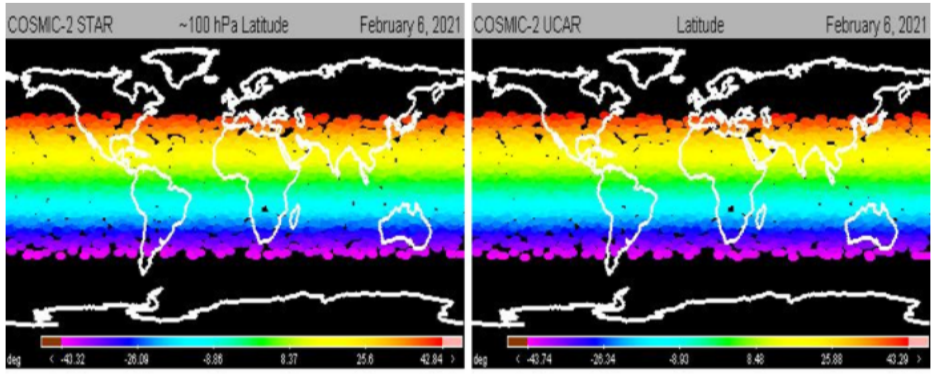

Figure 1: Preliminary demonstration of the successful integration of COSMIC C2 products processed by STAR into NPROVS showing global distributions (latitude) of STAR (left) and UCAR (right) geophysical profiles on a given day. Each circle represents a C2 location (100km resolution) at 100 hPa (15km). The dates are identical and as can be seen so is the coverage; no QC flags are applied.